

TER

WE CARE

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HISTORY



TER Tecno Elettrica Ravasi srl was established in Olgiate Molgora (Lecco), in 1962, the brainchild of its founder, Sergio Blasi, who saw the possibility of successfully entering the field of switches and controls for industrial hoisting machines.

Growth was fast from the start, favoured by the phase of industrialization under way in Italy. From the early 70s, TER started a process of internationalization, with the first export sales to the Spanish market.

TER's gradual expansion in various markets around the world was combined with increasing diversification of its product range linked to the search for new business sectors, including, already in the mid 80s, the wind energy industry.

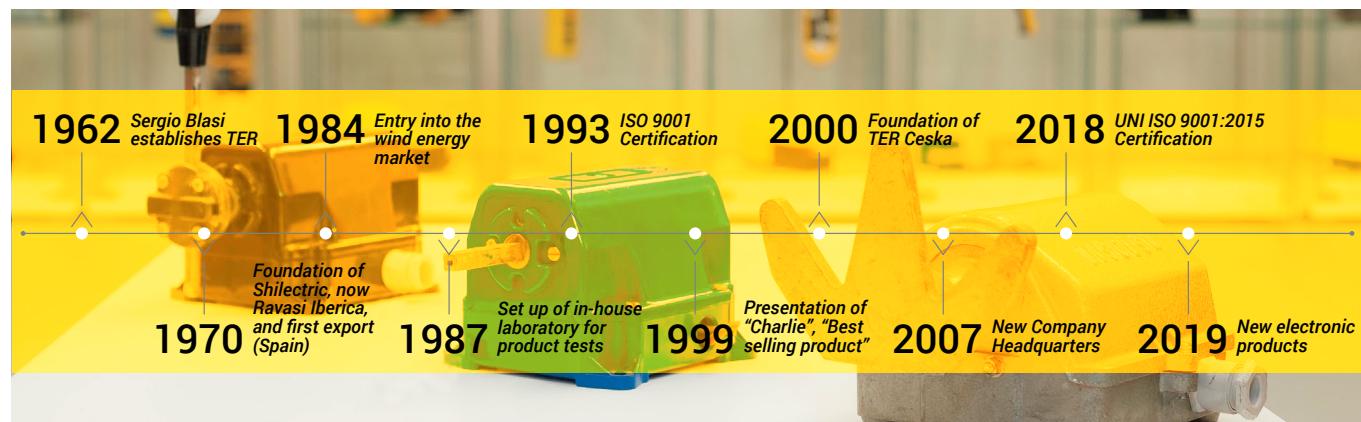
Over the years, TER focused its strategy on the creation of innovative, reliable products that could anticipate demands from the market. To this end, it started combining mechanical technology with electronics in some of its products.

In 1987, TER set up an in-house lab for product testing and in 1993 it was the first Italian company to obtain the ISO 9001 certification from the Dutch certification company KEMA.

New headquarters were opened in Calco (Lecco) in 2007 and in 2017 TER celebrated its first fifty-five years of industrial history, looking to the future and to new market challenges.

At the beginning of 2018 TER's Quality Management System is updated according to the new UNI ISO 9001:2015 standard.

The last two years have been focused in particular on the development and launch on the market of various new products, in which electronics plays an increasingly important role.



• MARKETING



TER's aim is to simplify the control of the machines equipped with its devices, designing reliable, ergonomic and intuitive safety products, capable of predicting the demands of the market and becoming the industry benchmark.

At the basis of this company mission is the will to establish a connection between market and company, by giving an increasingly central role to the sales department, seen as a continuous relationship between TER and its customers.

TER exports to **88 countries** around the world and manages its customers through a network of agents and **19 distributors**.

Commercial relations with customers are supported by a well-structured back office and by the wealth of technical and sales documentation available through the company's website, which also includes a new **e-commerce area**. Over the last year TER has introduced the new and easier domain **ter.it**, which can be used both for website and e-mail boxes.

Since 2012, orders have been managed by means of **configurators**, also accessible through the web, created to enable TER's back office staff to choose the product options requested by the customers and to summarize them in an item code preventing the entry of incongruent or infeasible features.



• TECHNOLOGY



TER products are the result of capacity for innovation, experience and application of technological expertise. Over the years, the company has stood up to competitors by researching new solutions, new materials and shapes, developing new skills and finding new applications for its products.

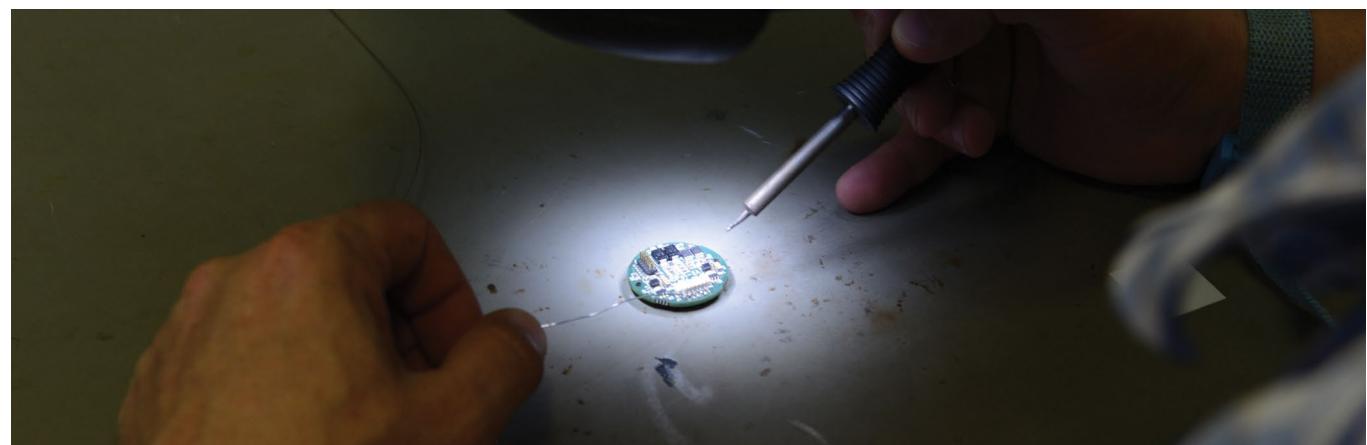
The quality standard of TER products stems from a thorough **knowledge of the materials** used and from a constant attention to technical, construction, performance, quality and ergonomic aspects.

TER has gained extensive expertise in the area of plastic

moulding and associated processes, thanks to the experience acquired in the 70s, when a plastic moulding plant was opened.

In the early 90s, TER introduced the use of 3D modelling in the design process and started a progressive **integration of electronics** in its products.

In the last two years electronics has taken a more and more important role leading to the design of a new and innovative line of electronic products, including a series of limit switches, encoders and transducers.



• PRODUCTION



TER acknowledges the central importance of the production process to achieve quality products that meet the needs of its customers.

From order reception in the Sales Department through to shipment, each step is organized by process, in order to **respect delivery times**, ensure **product traceability** and carry out all the required conformity checks during the phases of material reception, assembly and final inspection.

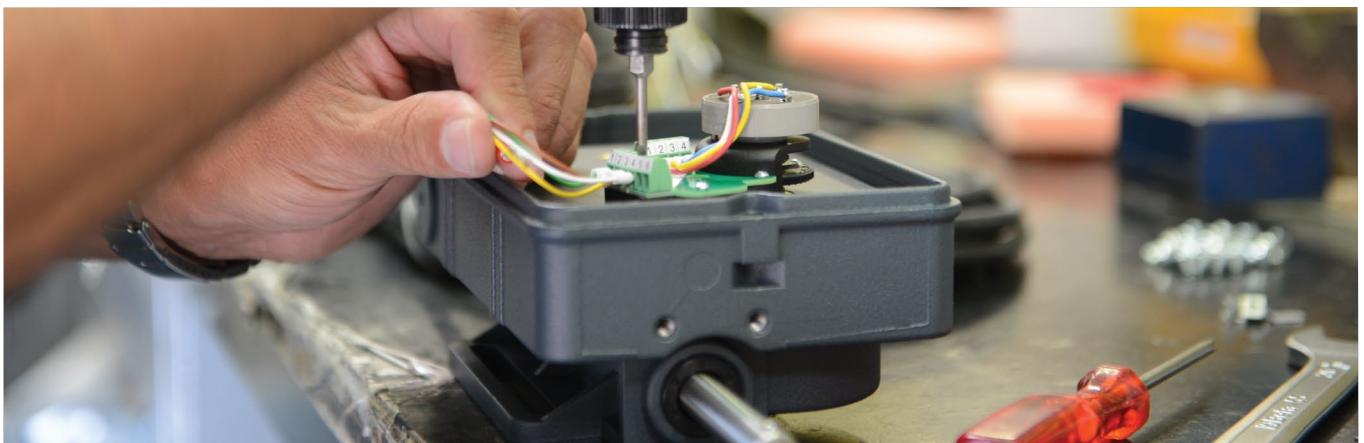
For the sake of protection of quality, all TER products are "**Made in Italy**" and production has always been concentrated in Italy, to guarantee excellence of materials and greater controls on products and components.



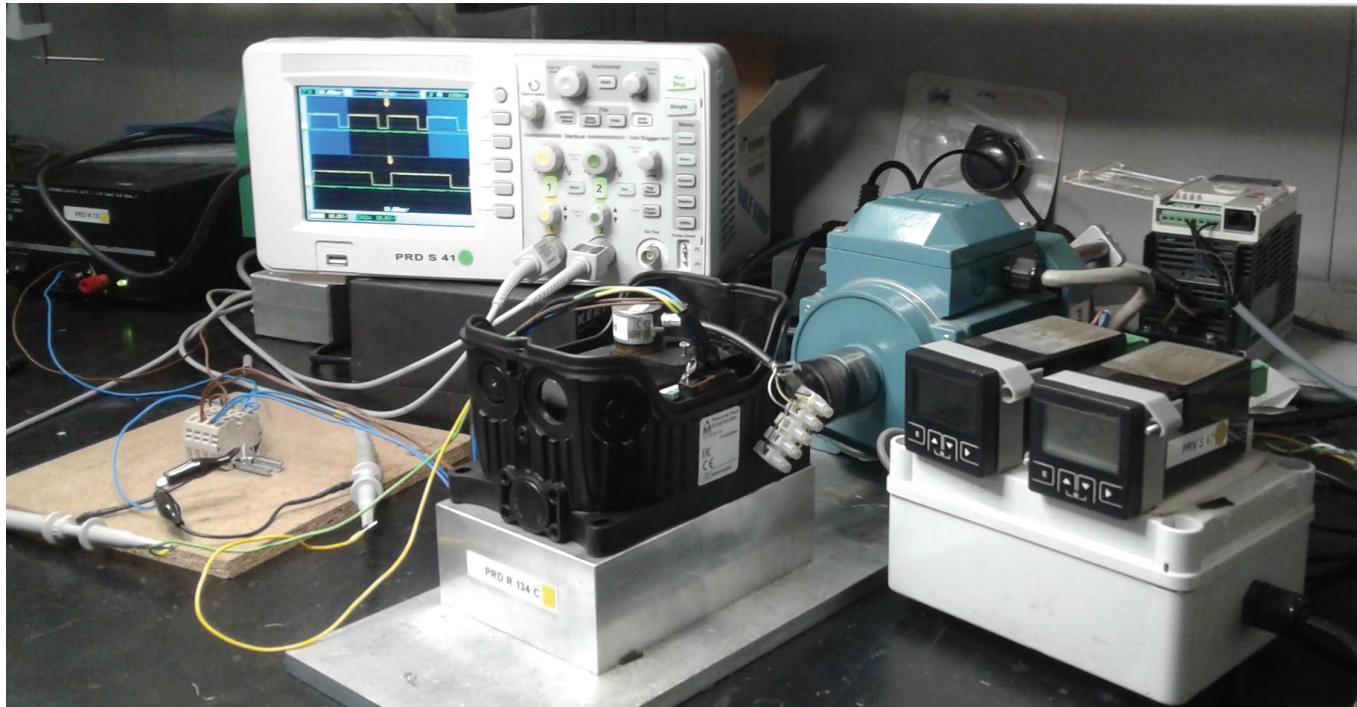
Product families



Product configurations



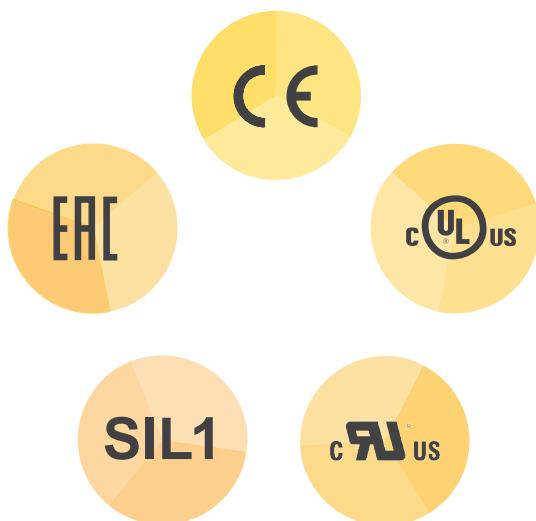
• QUALITY ASSURANCE



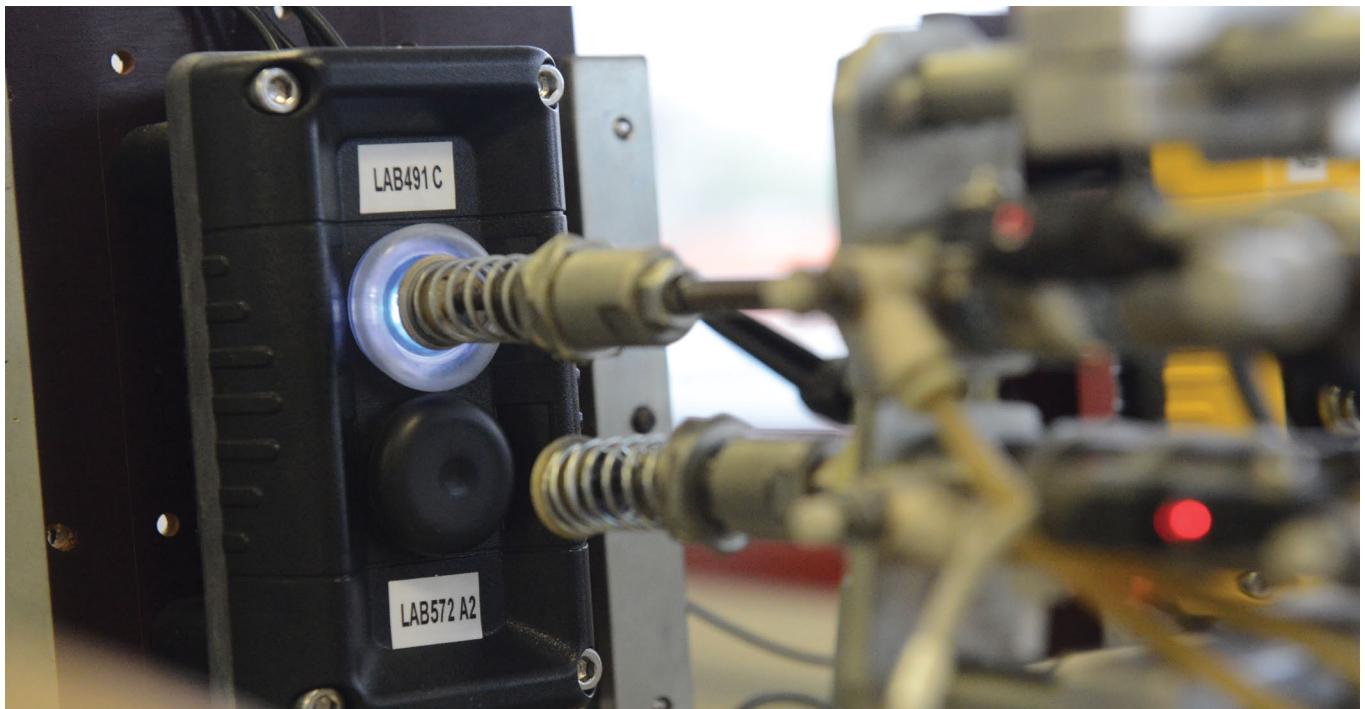
S09001 certified since 1993, TER's Quality Management System is now based on processes according to UNI ISO 9001: 2015, ensuring coordination of all company activities, from design to production organization, from purchases to sales, from after-sales support to dimensional and functional checks of samples and products.

TER has obtained cULus product certification for the US and Canadian markets, and EAC for the Russian market.

TER has also carried out a careful hazard analysis to certify its products at the first safety integrity level SIL 1 according to Standard IEC 61508.



• TEST LABORATORY

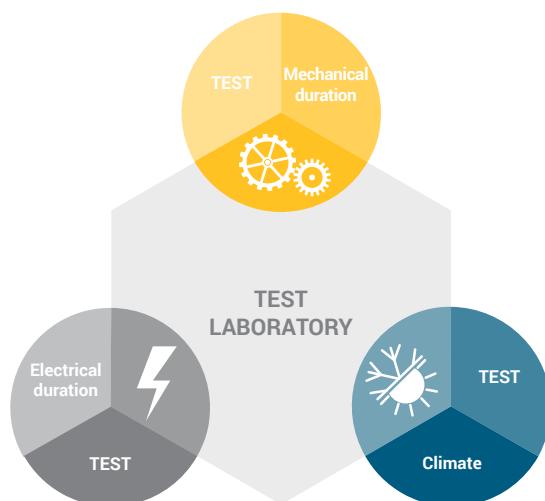


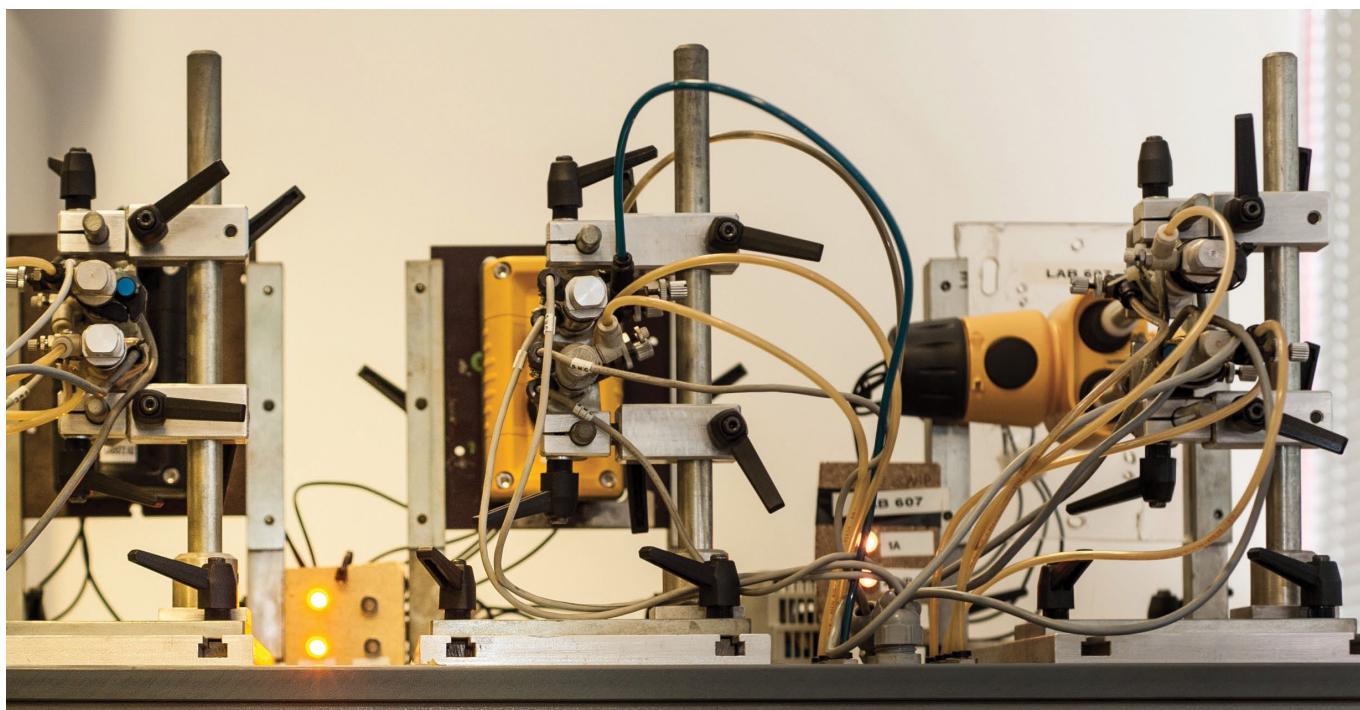
Since 1987, TER has been running an in-house Test Lab, designed to test the **operating safety** of the products and guarantee conformity with the different regulations that apply to the electromechanical industry.

TER's Test Lab is equipped with all the instruments needed to carry out electrical, mechanical and climatic tests on the products:

- **Mechanical life**
- **Mechanical properties of the terminals:**
 - Sturdiness test
 - Impact damage test
 - Pull test
 - Checking access to conductors

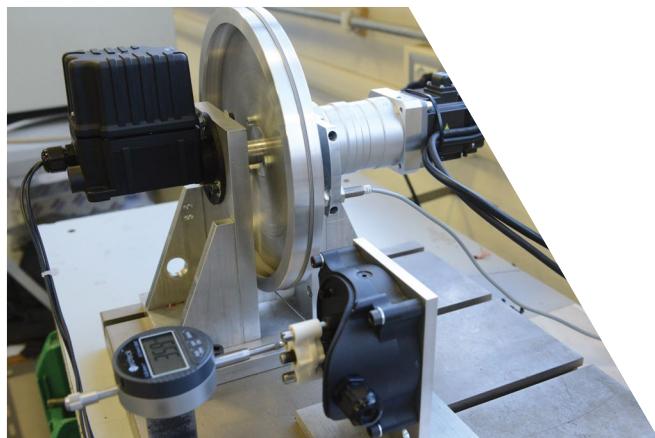
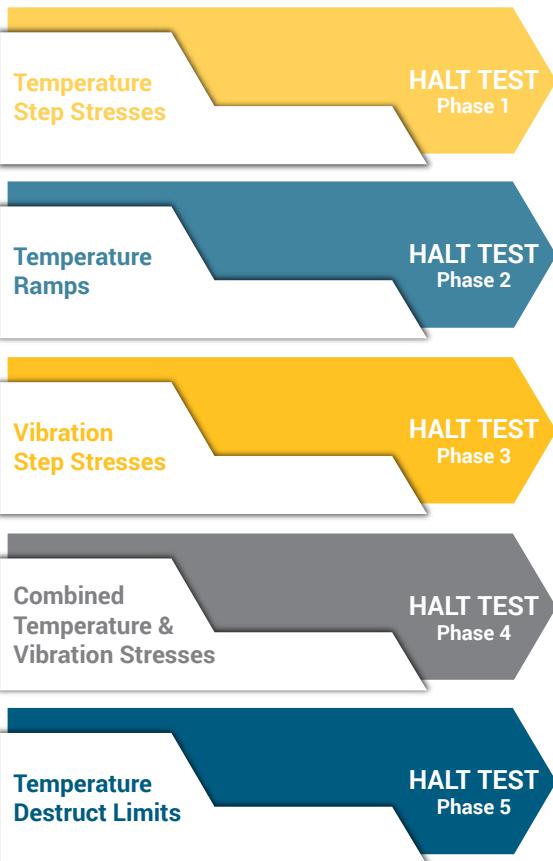
- **IP code - protection degree**
- **IK code - protection degree**
- **Electrical life**
- **Electrical heating**
- **Electrical properties**
- **Making and breaking capacity under normal and abnormal conditions**
- **Short-circuit test**
- **Fitness of equipment for storage and/or use in particular climatic conditions:**
 - Testing efficiency in cold environment
 - Testing efficiency in dry hot environment
 - Testing efficiency in damp hot environment
 - Testing uniformity of behaviour with temperature changes
 - Testing efficiency in cyclic damp hot environment





Some TER products have also successfully undergone the **HALT Test** (Highly Accelerated Life Test) in external certified laboratories.

In some cases, when evaluating the technological potential of new products to be introduced on the market, additional tests are carried out on top of the ones required by regulations. Upon customer's request, Test Lab staff are available to carry out more complex, in-depth measurements.



• REFERENCES



Industrial Power Transmission & Motion Control





WALL-MOUNTED CONTROL STATIONS

1





VICTOR

Wall-mounted control station



Wall-mounted auxiliary control station, featuring an innovative design, cutting-edge technology and an ergonomic enclosure that is smooth, practical and wear resistant.

Designed to reduce maintenance down time to a minimum, Victor is also available with magnetic mounting case and it can be configured according to customers' needs.

FEATURES

- Reduced installation and wiring time and costs: the cable inlet and the switches fitted in the base of the control station are separated from the actuators, mounted on the cover.
- Rubber pushbuttons with symbol disks to ensure protection against dust and prevent jamming when the control station is used in harsh environments.
- The emergency stop mushroom pushbutton complies with standard ISO 13850.
- Positive opening NC contacts for safety functions.
- Mechanical life of pushbuttons and switches: 10 million operations.
- IP protection degree: Victor 1-2-3-4 actuators is classified IP66, IP67 and IP69K; Victor 6-8 actuators is classified IP65.
- NEMA protection degree: Victor 1-2-3-4 actuators is classified Type 1, 4 and 4X.
- Extreme temperature resistance: -40°C to +80°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration from 1 to 8 actuators.
- Cable clamp can be installed at the top, at the bottom or on the back of the control station.
- Available with magnetic mounting case to make the control station even more versatile.
- 1NO or 1NC switches, LEDs voltage 24/48 Vac/dc or 110/230 Vac and potentiometers.
- Mechanical interlock to prevent simultaneous operation of opposite functions.

- Wide range of actuators in different colours: one or two speed pushbuttons, selector switches and key-selector switches in various operation configurations, pilot lights, impulse or latched mushroom pushbuttons with rotation or key-operated release.
- One speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Latched on-off maintained pushbutton to give an effective visual perception of the activated function.
- Available with labels (symbols and lettering) to be applied next to the actuators, or with pushbuttons with two-colour moulded permanent symbols.

CERTIFICATIONS

- CE marking, cULus* marking and EAC certification.
- Victor is available, upon request, with the SIL1 certification (Safety Integrity Level 1), according to Standard IEC 61508.
- Complying with accident prevention regulation BGV C 1 (only for Germany).
- HALT TEST (Highly Accelerated Life Test) passed, simulating conditions largely exceeding standard operating conditions.

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

* Not available on all versions.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60947-5-5 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function EN 60529 Degrees of protection provided by enclosures ISO 13850 Safety of machinery - Emergency stop - Principles for design
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical / electronic / programmable electronic safety-related systems
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
HALT TEST	Highly Accelerated Life Test, simulation of conditions largely exceeding the standard operating conditions (data available on request)
Markings and homologations	CE  * 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	Victor 1-2-3-4 actuators IP 66/IP 67/IP 69K Victor 6-8 actuators IP 65
NEMA protection degree	Victor 1-2-3-4 actuators Type 1, 4 and 4X
Insulation category	Class II
Cable entry	Cable clamp M20 x 1.5
Operating positions	Any position
Mechanical life	1 speed pushbutton: 10x10 ⁶ operations 2 speed pushbutton: 10x10 ⁶ operations Illuminated pushbutton: 10x10 ⁶ operations



* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL1800PI	PRSL1801PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Electrical Reliability EN 60947-5-4	$\lambda < 2.5 \times 10^{-8}$ at 24 V, 5 mA, 5×10^6 cycles	-
Mechanical life	10x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	2x0.5mm ² - 2x1.5 mm ² - 1x2.5 mm ² (UL (c)UL: use 60°C or 75°C copper (CU) conductors and stiff or flexible wire 14-22 AWG)	
Tightening torque	0.5 Nm	
Microswitch type	Double break, slow action	
Contacts	1NO	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	  	

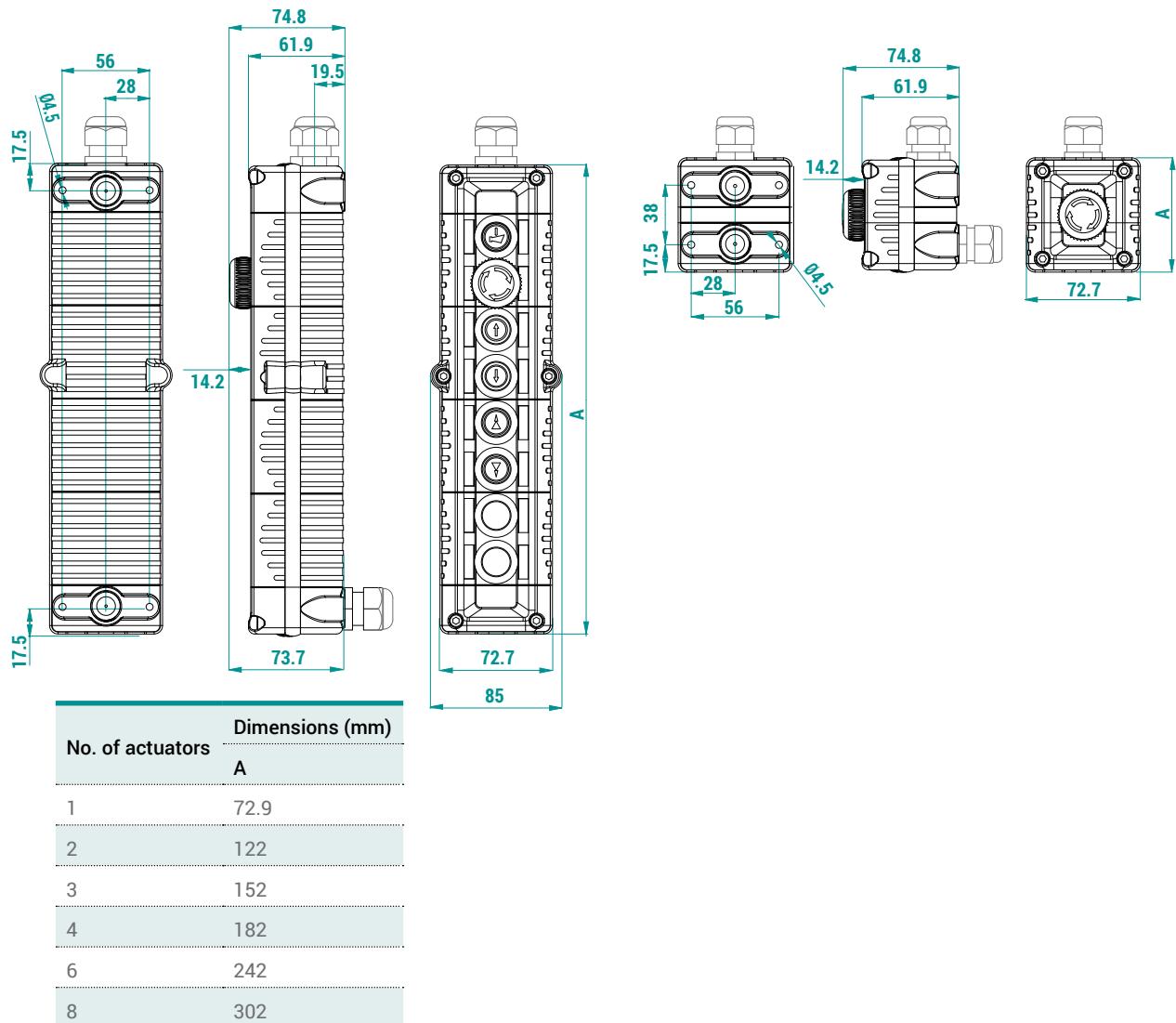
TECHNICAL SPECIFICATIONS OF THE LEDS

Code	PRSL1820PI	PRSL1821PI
Rated operational voltage	24-48 Vac/dc	110-240 Vac
Rated current consumption	1.30-2.70 mA	1.15-2.50 mA
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

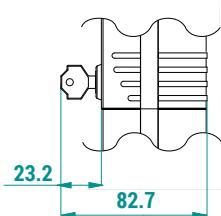
Code of potentiometer with support	PRSL1893PI	PRSL1891PI	PRSL1892PI
Ohmic value	1 kΩ	4.7 kΩ	10 kΩ
Life time		15x10 ³ movements (minimum)	
Operational ambient temperature		-25°C/+70°C	
Mechanical angle		300°	
Actual electrical angle		267°	
Ohmic value tolerance		±20%	

OVERALL DIMENSIONS (mm)

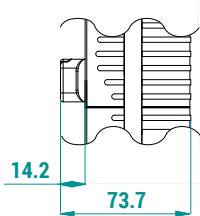


Actuators

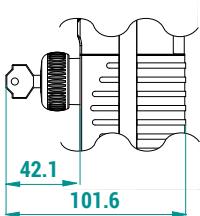
Key selector switches



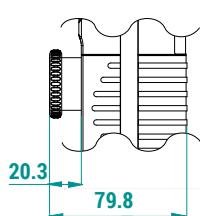
Selector switches



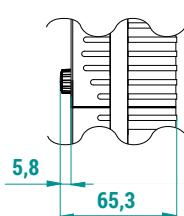
Key mushroom pushbutton



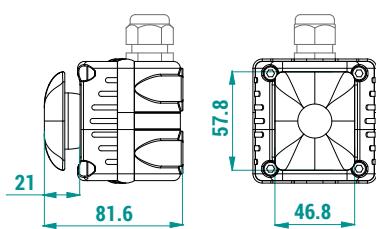
Mushroom pushbutton Ø 40 mm



Potentiometer



Rectangular mushroom pushbutton (available only for Victor with 1 actuator)



Dimensions of all mushroom pushbuttons refer to the released position.

EMPTY CONTROL STATIONS

No. of buttons	Cover color			Code
	Grey	Yellow	Black	
 1	X			F71EG000000000001
		X		F71EY000000000001
			X	F71EB000000000001
 2	X			F71FG000000000001
		X		F71FY000000000001
			X	F71FB000000000001
 3	X			F71GG000000000001
		X		F71GY000000000001
			X	F71GB000000000001
 4	X			F71HG000000000001
			X	F71HB000000000001
 6	X			F71IG000000000001
			X	F71IB000000000001
 8	X			F71JG000000000001
			X	F71JB000000000001

STANDARD CONTROL STATIONS

Standard control stations are supplied with a cable clamp. Standard control stations are not cULus certified.

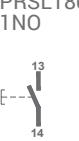
1 actuator

Type of actuator	Cover color			Code
	Grey	Yellow	Black	
 Latched mushroom pushbutton PRSL1801PI switch 1NC 	X			F71EG10000000001
		X		F71EY10000000001
			X	F71EB10000000001
 Key mushroom pushbutton PRSL1801PI switch 1NC 	X			F71EG10000000007
		X		F71EY10000000002
			X	F71EB10000000008
 Impulse mushroom pushbutton PRSL1801PI switch 1NC 	X			F71EG10000000022
		X		F71EY10000000003
			X	F71EB10000000009
 2 position selector switch PRSL1800PI switch 1NO 	X			F71EG00000001001
		X		F71EY00000001006
			X	F71EB00000001007
 3 position selector switch No.2 PRSL1800PI switches 1NO+1NO 	X			F71EG00000001012
		X		F71EY00000001007
			X	F71EB00000001008

2 actuators

Type of actuator	Cover color			Code
	Grey	Yellow	Black	
 Latched mushroom pushbutton PRSL1801PI switch 1NC 	X			F71FG11000000001
		X		F71FY11000000001
			X	F71FB11000000001
 Key mushroom pushbutton PRSL1801PI switch 1NC 	X			F71FG11000000002
		X		F71FY11000000002
			X	F71FB11000000002
 White button PRSL1800PI switch 1NO 	X			F71FG0002000001
		X		F71FY0002000001
			X	F71FB0002000001

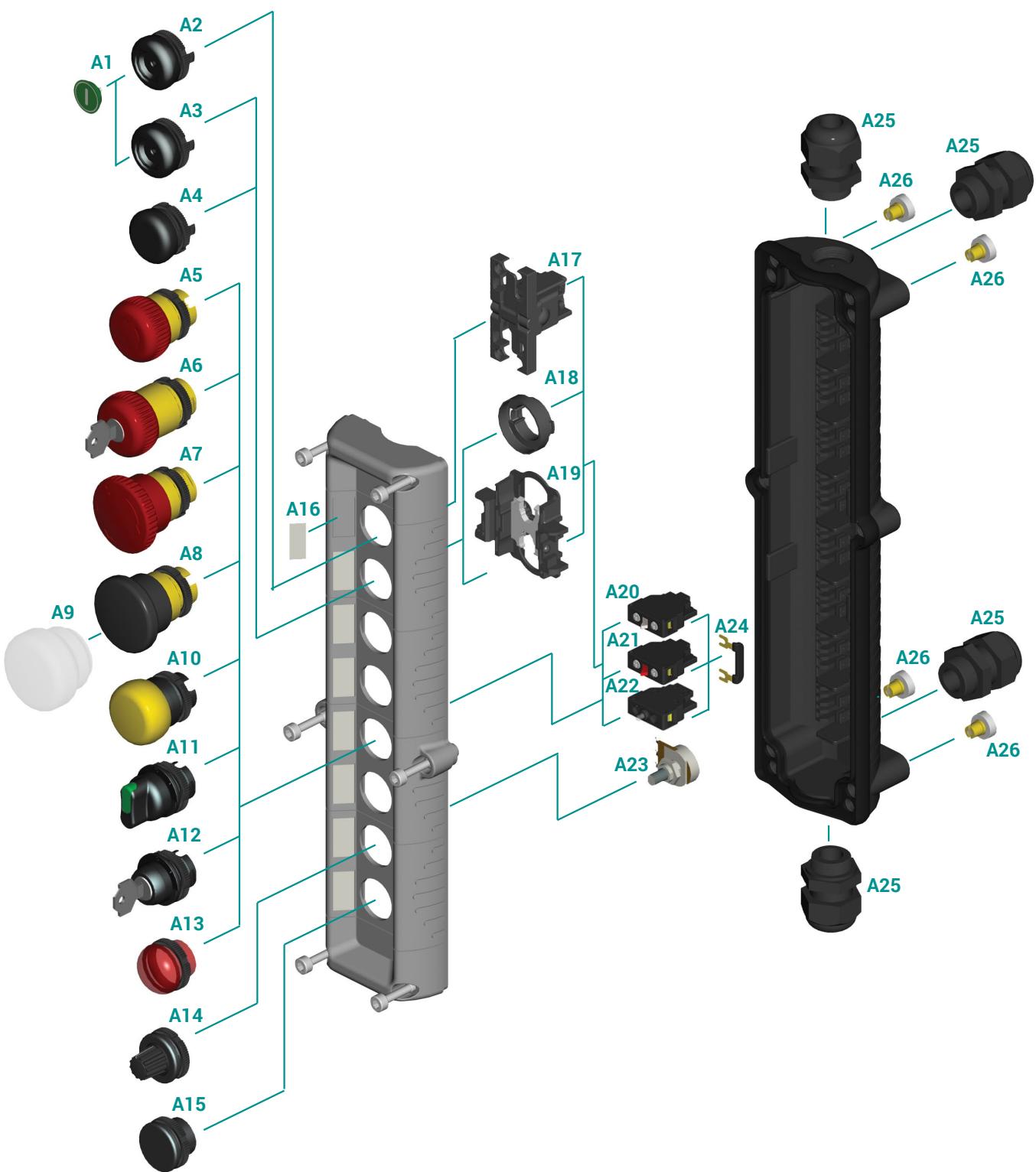
3 actuators

Type of actuator			Cover color	Code	
			Grey	Yellow	Black
Latched mushroom pushbutton PRSL1801PI switch 1NC		White button PRSL1800PI switch 1NO 	Black button PRSL1800PI switch 1NO 	X	F71GG10020000001
Key mushroom pushbutton PRSL1801PI switch 1NC		White button PRSL1800PI switch 1NO 	Black button PRSL1800PI switch 1NO 	X	F71GY10020000001
				X	F71GB10020000001
				X	F71GG10020000002
2 position selector switch PRSL1800PI switch 1NO		White button PRSL1800PI switch 1NO 	Black button PRSL1800PI switch 1NO 	X	F71GG00020001014
				X	F71GY00020001010
				X	F71GB00020001004
3 position selector switch No.2 PRSL1800PI switches 1NO+1NO		White button PRSL1800PI switch 1NO 	Black button PRSL1800PI switch 1NO 	X	F71GG00020001015
				X	F71GY00020001011
				X	F71GB00020001005

ASSEMBLY DRAWING

2-8 actuators

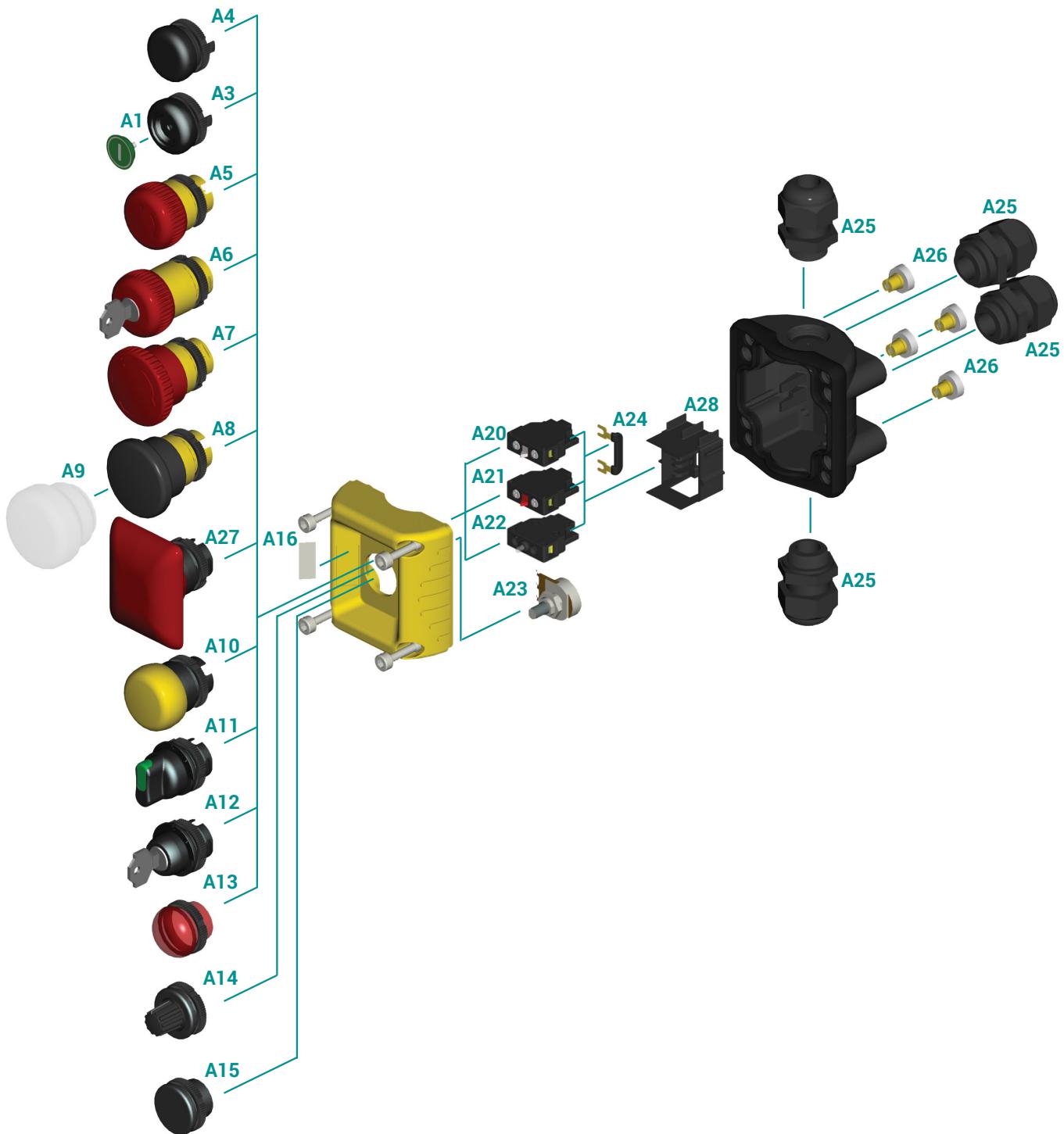
1



ASSEMBLY DRAWING

1 actuator

1



Refer to the following tables for descriptions of components: "Switches", "Potentiometers", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Key selector switches", "Selector switches" and Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A20		1NO switch		PRSL1800PI
A21		1NC switch		PRSL1801PI
A22		LED 24/48 Vac/dc LED 110/230 Vac	 	PRSL1820PI PRSL1821PI

Potentiometers

Ref.	Drawing	Description	Code
		Potentiometer 4.7 kΩ	PRSL1891PI
A14+A23		Potentiometer 10 kΩ	PRSL1892PI
		Potentiometer 1 kΩ	PRSL1893PI

Actuators

Ref.	Drawing	Description	Code
A1		Disk for pushbutton	PRTA_____ See disk table
A2		Pushbutton for latched ON-OFF maintained actuator	PRSL1803PI
A3		2 speed pushbutton	PRSL1810PI
		1 speed pushbutton	PRSL1811PI
		1 speed illuminated pushbutton	PRSL1815PI
		1 speed black pushbutton	PRSL1806PI
		1 speed grey pushbutton	PRSL1807PI
A4		2 speed black pushbutton	PRSL1808PI
		2 speed grey pushbutton	PRSL1809PI
A15		Blanking plug	PRSL1845PI
A17		Latched ON-OFF maintained actuator	PRSL1804PI

Pilot lights

Ref.	Drawing	Description	Code
A13		White	PRSL1844PI
		Green	PRSL1841PI
		Blue	PRSL1846PI
		Red	PRSL1840PI
		Yellow	PRSL1842PI
		Orange	PRSL1843PI

Mushroom pushbuttons

Ref.	Drawing	Description	Head color	Code
A5		Latched mushroom pushbutton for emergency stop	Red	PRSL1880PI
A6		Key mushroom pushbutton	Red	PRSL1890PI
A7		Latched mushroom pushbutton for emergency stop Ø 40 mm	Red	PRSL1881PI
A8		Impulse mushroom pushbutton Ø 40 mm with yellow base	Black	PRSL1883PI
A10		Impulse mushroom pushbutton Ø 33 mm with black base	Red	PRSL1885ROC
			Blue	PRSL1885BLC
			Yellow	PRSL1885GIC
			Green	PRSL1885VEC
			Orange	PRSL1885ARC
			Black	PRSL1885NEC
A27		Rectangular mushroom pushbutton (available only for Victor with 1 actuator)	Red	PRSL1882PI
			Black	PRSL1882NEC

Key selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A12		0/1	X		0	PRSL1867PI
				X	0	PRSL1868PI
		1/0/2	X		0	PRSL1869PI
				X	0	PRSL1870PI
		0/1/1+2	X		0	PRSL1871PI
				X	0	PRSL1872PI
1/2 change-over		X			1	PRSL1873PI
				X	1	PRSL1874PI
		X			1+2	PRSL1875PI
				X	1+2	PRSL1876PI

Selector switches

Ref.	Drawing	Positions	Color		Code
			Transparent	Full	
A11		0/1 Spring return	White		PRSL1855BI
			Green		PRSL1855VE
			Blue		PRSL1855BL
			Red		PRSL1855RO
			Yellow		PRSL1855GI
		0/1 Maintained	Orange		PRSL1855AR
			White		PRSL1856BI
			Green		PRSL1856VE
			Blue		PRSL1856BL
			Red		PRSL1856RO
A12		0/1 Spring return	Yellow		PRSL1856GI
			Orange		PRSL1856AR
			White	White	PRSL1855BIC
			Green	Green	PRSL1855VEC
			Blue	Blue	PRSL1855BLC
		0/1 Maintained	Red	Red	PRSL1855ROC
			Yellow	Yellow	PRSL1855GIC
			Orange	Orange	PRSL1855ARC
			White	White	PRSL1856BIC
			Green	Green	PRSL1856VEC
A13		1/0/2 Spring return	Blue	Blue	PRSL1856BLC
			Red	Red	PRSL1856ROC
			Yellow	Yellow	PRSL1856GIC
			Orange	Orange	PRSL1856ARC
			White	White	PRSL1857BI
		1/0/2 Maintained	Green	Green	PRSL1857VE
			Blue	Blue	PRSL1857BL
			Red	Red	PRSL1857RO
			Yellow	Yellow	PRSL1857GI
			Orange	Orange	PRSL1857AR
A14		1/0/2 Spring return	White	White	PRSL1858BI
			Green	Green	PRSL1858VE
			Blue	Blue	PRSL1858BL
			Red	Red	PRSL1858RO
			Yellow	Yellow	PRSL1858GI
		1/0/2 Maintained	Orange	Orange	PRSL1858AR
			White	White	PRSL1857BIC
			Green	Green	PRSL1857VEC
			Blue	Blue	PRSL1857BLC
			Red	Red	PRSL1857ROC

Selector switches

Ref.	Drawing	Positions	Color		Code
			Transparent	Full	
A11		1/1+2/2 Spring return	White		PRSL1863BI
			Green		PRSL1863VE
			Blue		PRSL1863BL
			Red		PRSL1863RO
			Yellow		PRSL1863GI
			Orange		PRSL1863AR
A11		1/1+2/2 Maintained	White		PRSL1864BI
			Green		PRSL1864VE
			Blue		PRSL1864BL
			Red		PRSL1864RO
			Yellow		PRSL1864GI
			Orange		PRSL1864AR
A11		1/1+2/2 Spring return	White		PRSL1863BIC
			Green		PRSL1863VEC
			Blue		PRSL1863BLC
			Red		PRSL1863ROC
			Yellow		PRSL1863GIC
			Orange		PRSL1863ARC
A11		1/1+2/2 Maintained	White		PRSL1864BIC
			Green		PRSL1864VEC
			Blue		PRSL1864BLC
			Red		PRSL1864ROC
			Yellow		PRSL1864GIC
			Orange		PRSL1864ARC
A11		0/1/1+2 Spring return	White		PRSL1859BI
			Green		PRSL1859VE
			Blue		PRSL1859BL
			Red		PRSL1859RO
			Yellow		PRSL1859GI
			Orange		PRSL1859AR
A11		0/1/1+2 Maintained	White		PRSL1860BI
			Green		PRSL1860VE
			Blue		PRSL1860BL
			Red		PRSL1860RO
			Yellow		PRSL1860GI
			Orange		PRSL1860AR
A11		0/1/1+2 Spring return	White		PRSL1859BIC
			Green		PRSL1859VEC
			Blue		PRSL1859BLC
			Red		PRSL1859ROC
			Yellow		PRSL1859GIC
			Orange		PRSL1859ARC
A11		0/1/1+2 Maintained	White		PRSL1860BIC
			Green		PRSL1860VEC
			Blue		PRSL1860BLC
			Red		PRSL1860ROC
			Yellow		PRSL1860GIC
			Orange		PRSL1860ARC

Selector switches

Ref.	Drawing	Positions	Color		Code
			Transparent	Full	
A11		1/2 Spring return	White		PRSL1861BI
			Green		PRSL1861VE
			Blue		PRSL1861BL
			Red		PRSL1861RO
			Yellow		PRSL1861GI
		1/2 Maintained	Orange		PRSL1861AR
			White		PRSL1862BI
			Green		PRSL1862VE
			Blue		PRSL1862BL
			Red		PRSL1862RO
		1/2 Spring return	Yellow		PRSL1862GI
			Orange		PRSL1862AR
			White		PRSL1861BIC
			Green		PRSL1861VEC
			Blue		PRSL1861BLC
		1/2 Maintained	Red		PRSL1861ROC
			Yellow		PRSL1861GIC
			Orange		PRSL1861ARC
			White		PRSL1862BIC
			Green		PRSL1862VEC

Accessories

Ref.	Drawing	Description	Code
A9		Transparent protective cap for impulse mushroom pushbutton Ø 40 mm	PRGU6100PE
A16		Label sheet - Symbols	PRET0215PE
		Label sheet - German	PRET0220DE
		Label sheet - English	PRET0220EN
		Label sheet - Spanish	PRET0220ES
		Label sheet - French	PRET0220FR
		Label sheet - Italian	PRET0220IT
A18		Button-switch spacer	PRSL8512PI
A19		Mechanical interlock	PRSL1850PI
A24		Insulated connecting bridge - positions 3-4 (bag with 5 pieces)	PRSL1911PI
		Insulated connecting bridge - positions 2-4 (bag with 5 pieces)	PRSL1912PI
		Insulated connecting bridge - positions 1-4 (bag with 5 pieces)	PRSL1913PI
		Insulated connecting bridge - positions 1-3 (bag with 5 pieces)	PRSL1914PI
		Insulated connecting bridge - positions 1-2 (bag with 5 pieces)	PRSL1915PI
		Insulated connecting bridge - positions 1-2-3 (bag with 5 pieces)	PRSL1916PI
A25		Cable clamp M20x1.5 + washers	PRSL1837PI

Accessories

Ref.	Drawing	Description	Code
A26		Magnetic mounting kit	PRSL1851PI
A28		1-2-3 switch holder	PRSL8750PI

1

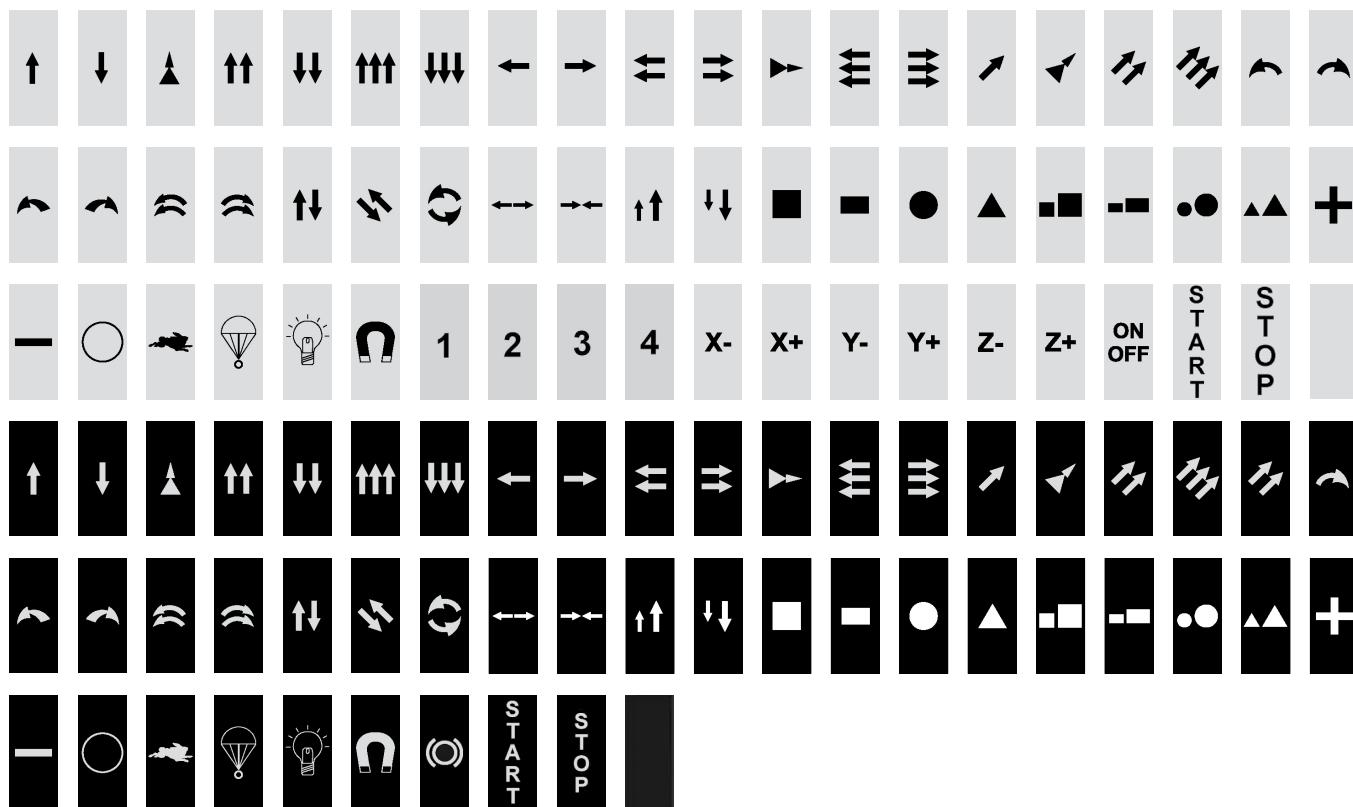
Full color disks



Transparent disks



Label sheet - Symbols



Label sheet - English

START	ALARM	RESET ALARM	RESET	STOP	LIGHT	RESET LINE	STOP LINE	START BUCKET	STOP BUCKET
BRAKE	BACK	UP	DOWN	UP LIFTING	DOWN LIFTING	UP LIFTING 1-2 SPEED	DOWN LIFTING 1-2 SPEED	UP LIFTING 3RD SPEED	DOWN LIFTING 3RD SPEED
UP LIFTING FAST	DOWN LIFTING FAST	LIFTING 2ND SPEED	LIFTING 3RDSPEED	UP AUXIL. LIFTING	DOWN AUXIL LIFTING	UP MAIN LIFTING	DOWN MAIN LIFTING	UP FAST MAIN LIFTING	DOWN FAST MAIN LIFTING
UP AUXIL. LIFTING 1-2 S.	DOWN AUXIL. LIFTING 1-2 S.	UP MAIN LIFTING 1-2 S.	DOWN MAIN LIFTING 1-2 S.	UP WINCH	DOWN WINCH	UP WINCH 1-2 SPEED	DOWN WINCH 1-2 SPEED	UP FAST WINCH	DOWN FAST WINCH
UP SLOW RIGHT WINCH	DOWN SLOW RIGHT WINCH	UP FAST RIGHT WINCH	DOWN FAST RIGHT WINCH	UP SLOW LEFT WINCH	UP FAST LEFT WINCH	DOWN FAST LEFT WINCH	UP HOIST	DOWN HOIST	UP HOIST 1-2 SPEED
DOWN HOIST 1-2 SPEED	UP FAST HOIST	DOWN FAST HOIST	FORWARD	BACKWARD	FORWARD TROLLEY	BACKWARD TROLLEY	FORWARD FAST TROLLEY	BACKWARD FAST TROLLEY	FORWARD TROLLEY 1-2 S.
BACKWARD TROLLEY 1-2 S.	FORWARD BRIDGE	BACKWARD BRIDGE	FORWARD FAST BRIDGE	BACKWARD FAST BRIDGE	FORWARD BRIDGE 1-2 S.	BACKWARD BRIDGE 1-2 S.	FORWARD TRANSLATION	BACKWARD TRANSLATION	LEFT
RIGHT	LEFT TROLLEY	RIGHT TROLLEY	LEFT FAST TROLLEY	RIGHT FAST TROLLEY	LEFT TROLLEY 1-2 S.	RIGHT TROLLEY 1-2 S.	LEFT BRIDGE	RIGHT BRIDGE	LEFT FAST BRIDGE
DOWN SLOW LEFT WINCH	RIGHT FAST BRIDGE	LEFT BRIDGE 1-2 S.	RIGHT BRIDGE 1-2 S.	CCW ROTATION	CW ROTATION	CCW FAST ROTATION	CW FAST ROTATION	CCW ROTATION 1-2 S.	CW ROTATION 1-2 S.
CCW ROTATION 3RD SPEED	CW ROTATION 3RD SPEED	LEFT CTRL STATION	RIGHT CTRL STATION	TROLLEY LEFT	TROLLEY RIGHT	SLOW	FAST	FAST TROLLEY	FAST BRIDGE
FAST LIFTING	FAST ROTATION	WINCH MATCHING	OPEN	CLOSE	OPEN GRAPPLE	CLOSE GRAPPLE	OPEN BUCKET	CLOSE BUCKET	OPEN DOOR
CLOSE DOOR	SPEED UP	SPEED DOWN	RAISE	LOWER	LOAD	DOWNLOAD	ENERGIZE	DE-ENERGIZE	ENERGIZE MAGNET
DE-ENERGIZE MAGNET	APPROACH	CONSENT	AUTOMATIC	MANUAL	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORTH	SOUTH	EAST	WEST	OVERLOAD	TARE	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - Italian

MARCA	ALLARME	MARCA ALLARME	ARRESTO	STOP	LUCE	MARCA LINEA	ARRESTO LINEA	MARCA BENNA	ARRESTO BENNA
FRENO	RITORNO	SALITA	DISCESA	SALITA SOLLEV.	DISCESA SOLLEV.	SALITA SOLL. 1-2 VEL.	DISCESA SOLL. 1-2 VEL.	SALITA SOLL. 3a VEL.	DISCESA SOLL. 3a VEL.
SALITA SOLL. VEL.	DISCESA SOLL. VEL.	2a VELOCITÀ SOLLEV.	3a VELOCITÀ SOLLEV.	SALITA SOLL. AUSILIARIO	DISCESA SOLL. AUSILIARIO	SALITA SOLL. PRINCIPALE	DISCESA SOLL. PRINCIPALE	SALITA SOLL. PRINCIP. VEL.	DISCESA SOLL. PRINCIP. VEL.
SALITA AUSIL. 1-2 V.	DISCESA AUSIL. 1-2 V.	SALITA PRINCIP. 1-2 V.	DISCESA PRINCIP. 1-2 V.	SALITA ARGANO	DISCESA ARGANO	SALITA ARGANO 1-2 V.	DISCESA ARGANO 1-2 V.	SALITA ARGANO VEL.	DISCESA ARGANO VEL.
ARGANO DX SALITA LENTA	ARGANO DX DISC. LENTA	ARGANO DX SALITA VEL.	ARGANO DX DISCESA VEL.	ARGANO SIN SALITA LENTA	ARGANO SIN SALITA VEL.	ARGANO SIN DISCESA VEL.	SALITA PARANCO	DISCESA PARANCO	SALITA PAR. 1-2 V.
DISCESA PAR. 1-2 V.	SALITA PAR. VEL.	DISCESA PAR. VEL.	AVANTI	INDIETRO	AVANTI CARRELLO	INDIETRO CARRELLO	AVANTI CARR. VEL.	INDIETRO CARR. VEL.	AVANTI CARR. 1-2 V.
INDIETRO CARR. 1-2 V.	AVANTI PONTE	INDIETRO PONTE	AVANTI PONTE VEL.	INDIETRO PONTE VEL.	AVANTI PONTE 1-2 V.	INDIETRO PONTE 1-2 V.	AVANTI TRASLAZIONE	INDIETRO TRASLAZIONE	SINISTRA
DESTRA	SINISTRA CARRELLO	DESTRA CARRELLO	SINISTRA CARR. VEL.	DESTRA CARR. VEL.	SINISTRA CARR. 1-2 V.	DESTRA CARR. 1-2 V.	SINISTRA PONTE	DESTRA PONTE	SINISTRA PONTE VEL.
ARGANO SIN DISC. LENTA	DESTRA PONTE VEL.	SINISTRA PONTE 1-2 V.	DESTRA PONTE 1-2 V.	SINISTRA ROTAZIONE	DESTRA ROTAZIONE	SINISTRA ROTAZ. VEL.	DESTRA ROTAZ. VEL.	SINISTRA ROTAZ. 1-2 V.	DESTRA ROTAZ. 1-2 V.
SINISTRA ROTAZ. 3a V.	DESTRA ROTAZ. 3a V.	SINISTRA PULSANTIERA	DESTRA PULSANTIERA	CARRELLO SINISTRO	CARRELLO DESTRO	LENTO	VELOCE	VELOCE CARRELLO	VELOCE PONTE
VELOCE SOLLEV.	VELOCE ROTAZIONE	ACCOPIAMENTO ARGANO	APRE	CHIUDE	APRE PINZA	CHIUDE PINZA	APRE BENNA	CHIUDE BENNA	APERTURA PORTELLO
CHIUSURA PORTELLO	ACCELERA	DECELERA	ALZA	ABBASSA	CARICO	SCARICO	ECCITA	DISECCITA	ECCITA MAGNETE
DISECCITA MAGNETE	ACCOSTA	CONSENSO	AUTOMATICO	MANUALE	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORD	SUD	EST	OVEST	SOVRACCARICO	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - French

MARCHE	ALARME	MARCHE ALARME	RESET	ARRET	LUMIERE	MARCHE LIGNE	ARRET LIGNE	MARCHE BENNE	ARRET BENNE
FREIN	RETOUR	MONTEE	DESCENTE	MONTEE LEVAGE	DESCENTE LEVAGE	MONTEE LEV. 1-2 VIT.	DESCENTE LEV. 1-2 VIT.	MONTEE LEV. 3EME VIT.	DESCENTE LEV. 3EME VIT.
MONTEE LEV. VITE	DESCENTE LEV. VITE	MONTEE LEV. 2EME VIT.	DESCENTE LEV. 3EME VIT.	MONTEE LEV. AUXILIAIRE	DESCENTE LEV. AUXILIAIRE	MONTEE LEV. PRINCIPAL	DESCENTE LEV. PRINCIPAL	MONTEE LEV. PRINC. VITE	DESCENTE LEV. PRINC. VITE
MONTEE LEV. AUX. 1-2 VIT.	DESCENTE LEV. AUX. 1-2 VIT.	MONTEE LEV. PRINC. 1-2 VIT.	DESCENTE LEV. PRINC. 1-2 VIT.	MONTEE TREUIL	DESCENTE TREUIL	MONTEE TREUIL 1-2 VIT.	DESCENTE TREUIL 1-2 VIT.	MONTEE TREUIL VITE	DESCENTE TREUIL VITE
TREUIL DROITE MONTEE LENTE	TREUIL DROITE DESC. LENTE	TREUIL DROITE MONTEE VITE	TREUIL DROITE DESCENTE VITE	TREUIL AUCHE MONTEE LENTE	TREUIL AUCHE MONTEE VITE	TREUIL AUCHE DESCENTE VITE	MONTEE PALAN	DESCENTE PALAN	MONTEE PALAN 1-2 VIT.
DESC. PALAN 1-2 VIT.	MONTEE PALAN VITE	DESCENTE PALAN VITE	AVANT	ARRIERE	AVANT CHARIOT	ARRIERE CHARIOT	AVANT CHARIOT VITE	ARRIERE CHARIOT VITE	AVANT CHARIOT 1-2 VIT.
ARR. CHARIOT 1-2 VIT.	AVANT PONT	ARRIERE PONT	AVANT PONT VITE	ARRIERE PONT VITE	AVANT PONT 1-2 VIT.	ARRIERE PONT 1-2 VIT.	AVANT TRANSLATION	ARRIERE TRANSLATION	GAUCHE
DROITE	GAUCHE CHARIOT	DROITE CHARIOT	GAUCHE CHARIOT VITE	DROITE CHARIOT VITE	GAUCHE CHARIOT 1-2 VIT.	DROITE CHARIOT 1-2 VIT.	GAUCHE PONT	DROITE PONT	GAUCHE PONT VITE
TREUIL GAUCHE DESC. LENTE	DROITE PONT VITE	GAUCHE PONT 1-2 VIT.	DROITE PONT 1-2 VIT.	GAUCHE ROTATION	DROITE ROTATION	GAUCHE ROTATION VITE	DROITE ROTATION VITE	GAUCHE ROT. 1-2 VIT.	DROITE ROT. 1-2 VIT.
GAUCHE ROT. 3EME VIT.	DROITE ROT. 3EME VIT.	GAUCHE BOITE A BOUTONS	DROITE BOITE A BOUTONS	CHARIOT GAUCHE	CHARIOT DROITE	LENT	VITE	VITE CHARIOT	VITE PONT
VITE LEVAGE	VITE ROTATION	ACCOUPLEMNT TREUIL	OUVRE	FERME	OUVRE PINCE	FERME PINCE	OUVRE BENNE	FERME BENNE	OUVRE PORTAIL
FERME PORTAIL	ACCELERATION	DECCELERATION	HISSE	ABAISSE	CHARGE	DECHARGE	EXCITER	DESEXCIER	MAGNETISE
DEMAGNETISE	APPROCHE	CONSENTEMENT	AUTOMATIQUE	MANUEL	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORD	SUD	EST	OUEST	SURCHARGE	TARE	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - German

BETRIEB	ALARM	FAHRT ALARM	SPERRE	STOP	LICHT	STROM AN	STROM AUS	GREIFER BETRIEB	GREIFER STOP
BREMSE	ZURUCK	RAUF	RUNTER	HUB RAUF	HUB RUNTER	HUB RAUF 1.-2. GANG	HUB RUNTER 1.-2. GANG	HUB RAUF 3. GANG	HUB RUNTER 3. GANG
HUB SCHNELL RAUF	HUB RUNTER SCHNELL	2. GANG HEBEN	3. GANG HEBEN	HILFSHUB RAUF	HILFSHUB RUNTER	HAUPTHUB RAUF	HAUPTHUB RUNTER	HAUPTHUB RAUF SCH.	HAUPTHUB RUNTER SCH.
HILFSHUB RAUF 1.-2. GANG	HILFSHUB RUNTER 1.-2. GANG	HAUPTHUB 1.-2. GANG	HAUPTHUB RUNTER 1.-2. GANG	WINDE RAUF	WINDE RUNTER	WINDE RAUF 1.-2. GANG	WINDE RUNTER 1.-2. GANG	WINDE RAUF SCHNELL	WINDE RUNTER SCHNELL
WINDE RECHTS LANGS. HOCH	WINDE RECHTS LANGS. RUNTER	WINDE RECHTS SCHNELL RAUF	WINDE RECHTS SCHNELL RUNTER	WINDE LINKS LANGSAM RAUF	WINDE LINKS SCHNELL RAUF	WINDE LINKS SCHNELL RUNTER	FLASCHENZUG HOCH	FLASCHENZUG RUNTER	FLASCHENZUG HOCH 1.-2. GANG
FLASCHENZUG RUNTER 1.-2. GANG	FLASCHENZUG HOCH SCHNELL	FLASCHENZUG RUNTER SCHNELL	VORWÄRTS	RÜCKWÄRTS	LAUFKATZE VORWÄRTS	LAUFKATZE RÜCKWÄRTS	LAUFKATZE VORWÄRTS SCHNELL	LAUFKATZE RÜCKWÄRTS SCHNELL	LAUFKATZE VORW. 1.-2. GANG
LAUFKATZE ZURÜCK 1.-2. GANG	KRANBRUECKE VORWÄRTS	KRANBRUECKE RÜCKWÄRTS	KRANBRUECKE VORW. SCHNELL	KRANBRUECKE RÜCKW. SCHNELL	KRANBRUECKE VORW. 1.-2. GANG	KRANBRUECKE ZUR. 1.-2. GANG	BEWEGUNG VORWÄRTS	BEWEGUBG RÜCKWÄRTS	LINKS
RECHTS	LAUFKATZE - LINKS	LAUFKATZE - RECHTS	LAUFKATZE LINKS SCHNELL	LAUFKATZE RECHTS SCHNELL	LAUFKATZE LINKS 1.-2. GANG	LAUFKATZE RECHTS 1.-2. GANG	KRANBRUECKE RECHTS	KRANBRUECKE LINKS	KRANBRÜCKE LINKS SCHNELL
WINDE LINKS LANGSAM RUNTER	KRANBRÜCKE RECHTS SCHNELL	KRANBRÜCKE LINKS 1.-2. GANG	KRANBRÜCKE RECHTS 1.-2. GANG	DREHUNG LINKS	DREHUNG RECHTS	DREHUNG LINKS SCHNELL	DREHUNG RECHTS SCHNELL	DREHUNG LINKS 1.-2. GANG	DREHUNG RECHTS 1.-2. GANG
DREHUNG LINKS 3. GANG	DREHUNG RECHTS 3. GANG	HÄNGETASTER LINKS	HÄNGETASTER RECHTS	LINKE LAUFKATZE	RECHTE LAUFKATZE	LANGSAM	SCHNELL	LAUFKATZE SCHNELL	KRANBRÜCKE SCHNELL
HEBEN - SCHNELL	DREHUNG - SCHNELL	WINDE PAAREN	OEFFNEN	SCHLIESSEN	ZANGE OEFFNEN	ZANGE SCHLIESSEN	GREIFER OEFFNEN	GREIFER SCHLIESSEN	DECKELÖFFNUNG
DECKELVERSCHLUSS	BESCHLEUNIGEN	VERZÖGERN	ANHEBEN	ABSENKEN	LADUNG	ABLADEN	ERREGEN	ABERREGEN	MAGNETISIERUNG
ENTMAGNETISIEREN	ANNÄHERN	ENTBLOCKKUNG	AUTOMATIK	HANDBETRIEB	HANDBETR. / AUTOMATIK	AUS HANDBETR. / AUTOMATIK	AN	AUS	AN - AUS
REIN	RAUS	NORD	SÜD	OST	WEST	ÜBERBELASTUNG	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - Spanish

MARCHA	ALARMA	MARCHA ALARMA	PARO	STOP	LUZ	MARCHA LINEA	PARO LINEA	MARCHA PALA	PARO PALA
FRENO	RETORNO	SUBIR	BAJAR	SUBIR ELEVACION	BAJAR ELEVACION	SUBIR ELEV. 1-2 VEL.	BAJAR ELEV. 1-2 VEL.	SUBIR ELEV. 3ª VEL.	BAJAR ELEV. 3ª VEL.
SUBIR ELEV. RAPIDA	BAJAR ELEV. RAPIDA	2ª VEL. ELEVACION	3ª VEL. ELEVACION	SUBIR AUX. ELEVACION	BAJAR AUX. ELEVACION	SUBIR ELEV. PRINCIPAL	BAJAR ELEV. PRINCIPAL	SUBIR ELEV. PRINC. RAPIDA	BAJAR ELEV. PRINC. RAPIDA
SUBIR AUX. 1-2 VEL.	BAJAR AUX. 1-2 VEL.	SUBIR PRINC. 1-2 VEL.	BAJAR PRINC. 1-2 VEL.	SUBIR POLIPASTO	BAJAR POLIPASTO	SUBIR POLIP. 1-2 VEL.	BAJAR POLIP. 1-2 VEL.	SUBIR POLIP. RAPIDO	BAJAR POLIP. RAPIDO
POLIP. DER. SUBIR LENTO	POLIP. DER. BAJAR LENTO	POLIP. DER. SUBIR RAPIDO	POLIP. DER. BAJAR RAPIDO	POLIP. IZQ. SUBIR LENTO	POLIP. IZQ. SUBIR RAPIDO	POLIP. IZQ. BAJAR RAPIDO	SUBIR GANCHO	BAJAR GANCHO	SUBIR GANCHO 1-2 VEL.
BAJAR GANCHO 1-2 VEL.	SUBIR GANCHO RAPIDO	BAJAR GANCHO RAPIDO	ADELANTE	ATRAS	ADELANTE CARRITO	ATRAS CARRITO	ADELANTE CARR. RAPIDO	ATRAS CARR. RAPIDO	ADELANTE CARR. 1-2 VEL.
ATRAS CARR. 1-2 VEL.	ADELANTE PUENTE	ATRAS PUENTE	ADELANTE PUENTE RAPIDO	ATRAS PUENTE RAPIDO	ADELANTE PUENTE 1-2 VEL.	ATRAS PUENTE 1-2 VEL.	ADELANTE TRASLACION	ATRAS TRASLACION	IZQUIERDA
DERECHA	IZQUIERDA CARRITO	DERECHA CARRITO	IZQUIERDA CARR. RAPIDO	DERECHA CARR. RAPIDO	IZQUIERDA CARR. 1-2 VEL.	DERECHA CARR. 1-2 VEL.	IZQUIERDA PUENTE	DERECHA PUENTE	IZQUIERDA PUENTE RAPIDO
POLIP. IZQUIER. BAJAR LENTO	DERECHA PUENTE RAPIDO	IZQUIERDA PUENTE 1-2 VEL.	DERECHA PUENTE 1-2VEL.	IZQUIERDA ROTACION	DERECHA ROTACION	IZQUIERDA ROT. RAPIDA	DERECHA ROT. 1-2 VEL.	IZQUIERDA ROT. 1-2 VEL.	DERECHA ROT. 1-2 VEL.
IZQUIERDA ROT. 3ª VEL.	DERECHA ROT. 3ª VEL.	BOTONERA IZQUIERDA	BOTONERA DERECHA	CARRITO IZQUIERDO	CARRITO DERECHO	LENTO	RAPIDO	CARRITO RAPIDO	PUENTE RAPIDO
ELEVACION RAPIDA	ROTACION RAPIDA	ACOPLAMIENTO POLIPASTO	ABRIR	CERRAR	ABRIR PINZA	CERRAR PINZA	ABRIR PALA	CERRAR PALA	ABRIR PUERTA
CERRAR PUERTA	ACELERAR	DESACELERAR	ELEVAR	DESCENDER	CARGAR	DESCARGAR	IMANTAR	DESIMANTAR	IMANTAR MAGNETO
DESIMANTAR MAGNETO	ACERCAR	CONFIRMAR	AUTOMATICO	MANUAL	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORTE	SUR	ESTE	OESTE	SOBRECARGA	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							



VICTOR - REQUEST FORM FOR NON STANDARD CONTROL STATION

Instructions

(See next page for list of components and legends)

Fill in the chart to the left according to the number of control elements required. Control stations are available with 1-2-3-4-6-8 control elements.

- 1 Control elements:** enter the number corresponding to the control element required (1 to 39) according to the legend. Eg. 25

ATTENTION: the rectangular mushroom pushbutton (10) - (11) is available only for Victor with 1 actuator.

- 2 Button disks:** for pushbuttons (1) to (3) enter the number corresponding to the disk required (50) to (88) according to the legend. Both full color disks and transparent disks (for illuminated buttons) are available. Eg. 57

- 3 Color of selectors, mushrooms, pilot lights:** for toggle selector switches (15) to (24), impulse mushroom pushbuttons (7) and pilot lights (12) enter the code corresponding to the color required according to the legend. Eg. RP

- 4** If you choose disks with arrows (legend 54 to 73), enter the direction of the arrow in the circle. Eg. ↗

- 5 Switches, LEDs and potentiometers:** enter the number corresponding to the switch, LED or potentiometer required (90) to (96) according to the legend. It is possible to enter up to 3 switches per position. Eg. 91

2 speed pushbuttons can activate two switches on the first speed and one switch on the second speed.

Selector switches can activate only two switches and possibly a LED.

ATTENTION: LEDs can be placed only in the central position and they are used for illuminated buttons and selector switches.

(See Control Element legend for switch activation)

- 6 Mechanical interlock and ON-OFF actuator:** tick the boxes where the mechanical interlock (MI) between two control elements or the latched ON-OFF maintained actuator (LA) is required. Eg. ☒

- 7 Cover:** tick the box corresponding to the cover color required (the base of the enclosure is always black).

ATTENTION: the yellow cover is available only for Victor with 1-2-3 actuators.

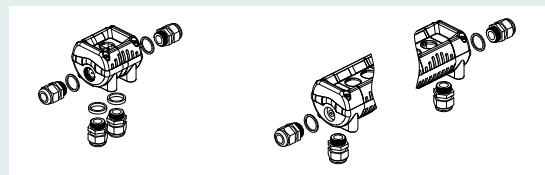
- 8 SIL 1 certified:** tick the box if you require SIL 1 certified units.

- 9 Label sheet:** stickers with letterings or symbols may be placed on the left and on the right of any control element. If label sheets are required, tick the corresponding box.

- 10 Magnetic version:** tick the box if you require magnetic mounting case.

- 11 cULus certified:** tick the box if you require cULus certified units. Not available on Victor with 6-8 actuators.

Cable clamp: the control stations are supplied with one cable clamp M20 x 1.5 and washer for assembling. The cable clamp can be mounted in various positions.



1 Control elements <input type="text"/>	2 Button disks <input type="text"/>	3 Color of selectors, mushrooms, pilot lights <input type="text"/>	4 	5 Switches and LEDs 	VICTOR 1 VICTOR 2 VICTOR 3 VICTOR 4 VICTOR 6 VICTOR 8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			6 MI LA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			MI LA
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
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1 Legend - Control elements

* SWITCH ACTIVATION

It is possible to mount up to 3 switches for each control element. The chart on the right of each pushbutton or selector switch specifies which position activates the switch on the top, in the middle or on the bottom. If the selector switches are mounted with the lever facing downwards, then the activation of the switches is reversed. Eg.: 2 speed pushbutton: the first speed activates the switches on the top and in the middle, while the second speed activates the switch on the bottom.

Pushbuttons

It is possible to mount up to 3 switches for each button. LEDs can be mounted only in the middle.

	SWITCH ACTIVATION*
1	1 speed pushbutton with disk
25	1 speed black pushbutton
26	1 speed grey pushbutton
2	2 speed pushbutton with disk
27	2 speed black pushbutton
28	2 speed grey pushbutton
3	1 speed illuminated pushbutton with disk
	speed 1 speed 1 speed 1
	speed 1 speed 1 speed 2
	speed 1 LED speed 1

Mushroom pushbuttons

All mushroom pushbuttons activate all the switches at the same time.

4	Latched mushroom pushbutton for emergency stop
5	Latched mushroom pushbutton for emergency stop Ø 40 mm
6	Key mushroom pushbutton
7	Impulse mushroom pushbutton Ø 33 mm with black base
8	Impulse black mushroom pushbutton Ø 40 mm with yellow base
9	Impulse black mushroom pushbutton Ø 40 mm with yellow base and protective cap
10	Rectangular red mushroom pushbutton
11	Rectangular black mushroom pushbutton

12 Pilot light

13 Blanking plug

Toggle selector switches

It is possible to mount only 2 switches for each selector. In the middle it is possible to mount only the LED for illuminated selector switches.

	SWITCH ACTIVATION*
15	0/1 spring return
16	0/1 maintained positions
17	1/0/2 spring return
18	1/0/2 maintained positions
19	1/1+2/2 spring return
20	1/1+2/2 maintained positions
21	0/1/1+2 spring return
22	0/1/1+2 maintained positions
23	1/2 spring return
24	1/2 maintained positions

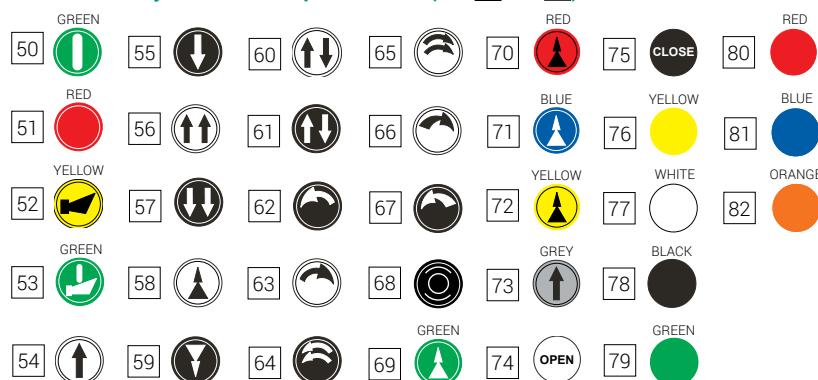
Key selector switches

It is possible to mount only 2 switches for each selector, and no switch/LED in the central position.

	SWITCH ACTIVATION*
30	0/1 spring return key out in position 0
31	0/1 maintained positions key out in position 0
32	1/0/2 spring return key out in position 0
33	1/0/2 maintained positions key out in position 0
34	0/1/1+2 spring return Key out in position 0
35	0/1/1+2 maintained positions key out in position 0
36	1/2 change over spring return key out in position 1
37	1/2 change over maintained positions key out in position 1
38	1/1+2/2 spring return key out in position 1+2
39	1/1+2/2 maintained positions key out in position 1+2

2 Legend - Button disks

Full color and symbol disks for pushbuttons (ref. 1 and 2)



Transparent disks for illuminated pushbuttons (ref. 3)



3 Legend - Color of selector switches, mushroom pushbuttons, pilot lights

Non-illuminated toggle selector switches (ref. 15 to 24)

RP	Red	BP	Blue	AP	Orange
GP	Yellow	VP	Green	WP	White

Impulse mushroom pushbutton with black base (ref. 7)

R	Red	B	Blue	A	Orange
G	Yellow	V	Green	N	Black

Illuminated toggle selector switches (ref. 15 to 24)

RI	Red	BI	Blue	AI	Orange
GI	Yellow	VI	Green	WI	White

Pilot lights (ref. 12)

R	Red	B	Blue	A	Orange
G	Yellow	V	Green	W	White

5 Legend - Switches, LEDs, potentiometers

90 PRSL1800PI - Switch 1NO

91 PRSL1801PI - Switch 1NC

92 PRSL1820PI
LED 24/48 V AC/DC

93 PRSL1821PI
LED 110/230 V AC

94 PRSL1891PI
potentiometer 4.7 kΩ

95 PRSL1892PI
potentiometer 10 kΩ

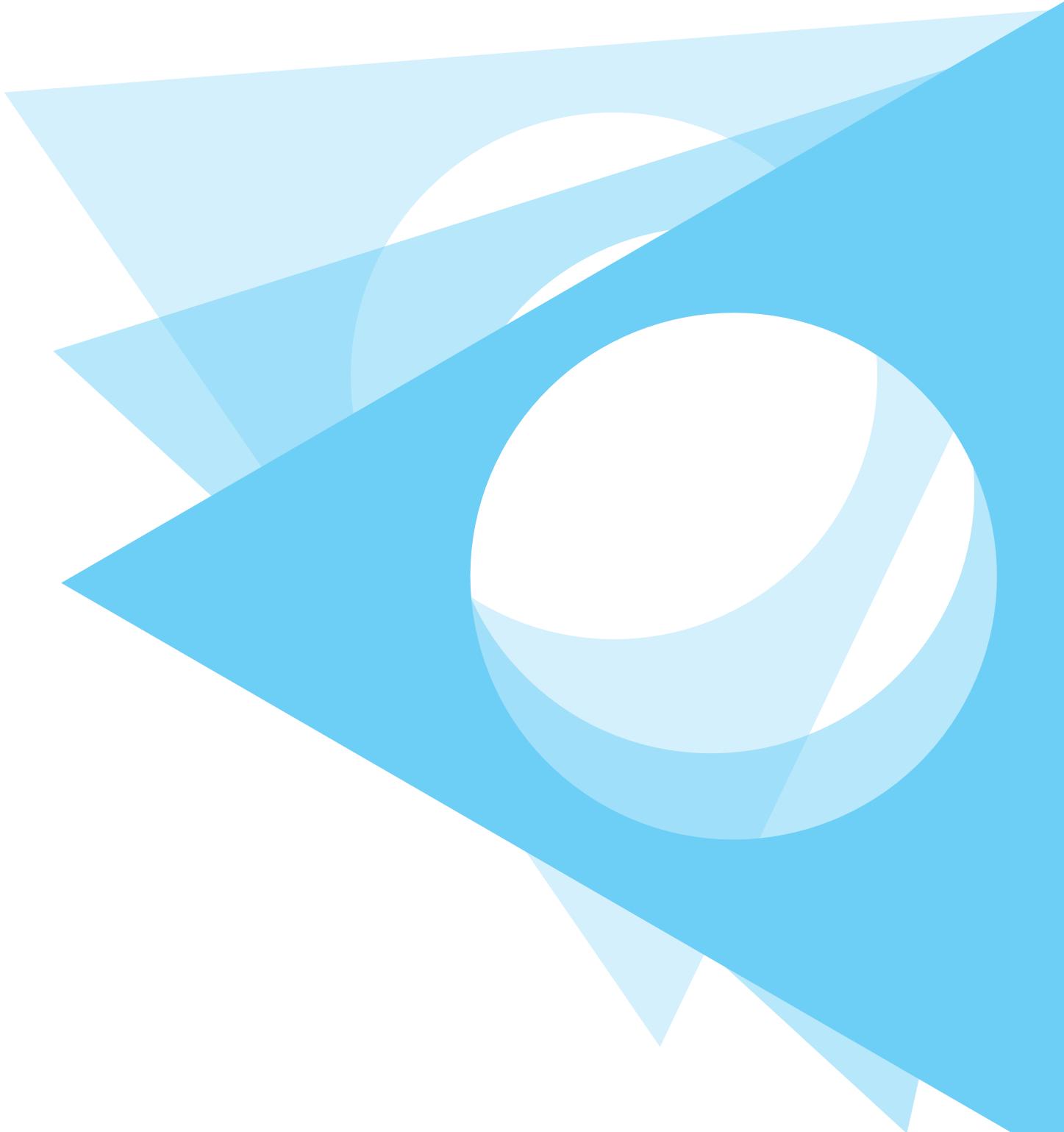
96 PRSL1893PI
potentiometer 1 kΩ

REMARKS



PENDANT CONTROL STATIONS

2



MIKE

Pendant control station



Pendant station for auxiliary control of modern ergonomic shape, easy to handle, user friendly and sturdy.

Mike is the result of careful analysis of ergonomic aspects and it is rich in high-performing features to meet the most demanding requirements.

FEATURES

- Reduced installation and wiring time and costs: the cable inlet and the switches fitted in the base of the control station are separated from the actuators, mounted on the cover.
- Innovative suspension system with concealed cables to enable rapid, correct, ergonomic installation.
- Rubber pushbuttons with symbol disks to ensure protection against dust and prevent jamming when the control station is used in harsh environments.
- The emergency stop mushroom pushbutton complies with standard ISO 13850.
- Positive opening NC contacts for safety functions.
- Mechanical life of pushbuttons and switches: 10 million operations.
- IP protection degree: Mike is classified IP66, IP67 and IP69K.
- IK protection degree: Mike is classified IK08.
- NEMA protection degree: Mike is classified Type 1, 4 and 4X.
- Extreme temperature resistance: -40°C to +80°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration from 4 to 15 actuators.
- Available with specific protection for actuators mounted on the bottom of the control station.
- 1NO or 1NC switches, LEDs voltage 24/48 Vac/dc or 110/230 Vac, and potentiometers.

- Mechanical interlock to prevent simultaneous operation of opposite functions.
- Wide range of actuators in different colours: one or two speed pushbuttons, selector switches and key-selector switches in various operation configurations, pilot lights, impulse or latched mushroom pushbuttons with rotation or key-operated release.
- One speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Latched on-off maintained pushbutton to give an effective visual perception of the activated function.
- Available with labels (symbols and lettering) to be applied next to the actuators or with pushbuttons with two-colour moulded permanent symbols.

CERTIFICATIONS

- CE marking, cULus* marking and EAC certification.
- Mike is available, upon request, with the SIL1 certification (Safety Integrity Level 1), according to Standard IEC 61508.
- Complying with accident prevention regulation BGV C 1 (only for Germany).

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

* Not available on all versions.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
Conformity to CE Standards	EN 60947-5-5 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function
	EN 60529 Degrees of protection provided by enclosures
	ISO 13850 Safety of machinery - Emergency stop - Principles for design
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment
	UL 508 Industrial Control Equipment
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical / electronic / programmable electronic safety-related systems
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
Markings and homologations	  * 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 66 / IP 67 / IP 69K
IK protection degree	IK 08
NEMA protection degree	Type 1, 4 and 4X
Insulation category	Class II
Cable entry	Rubber cable sleeve (Ø 8÷26 mm) Cable clamp M20
Operating positions	Any position
Mechanical life	1 speed pushbutton: 10x10 ⁶ operations 2 speed pushbutton: 10x10 ⁶ operations Illuminated pushbutton: 10x10 ⁶ operations



* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL1800PI	PRSL1801PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Electrical Reliability EN 60947-5-4	$\lambda < 2.5 \times 10^{-8}$ at 24 V, 5 mA, 5×10^6 cycles	-
Mechanical life	10x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	2x0.5mm ² - 2x1.5 mm ² - 1x2.5 mm ² (UL (c)UL: use 60°C or 75°C copper (CU) conductors and stiff or flexible wire 14-22 AWG)	
Tightening torque	0.5 Nm	
Microswitch type	Double break, slow action	
Contacts	1NO	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE LEDS

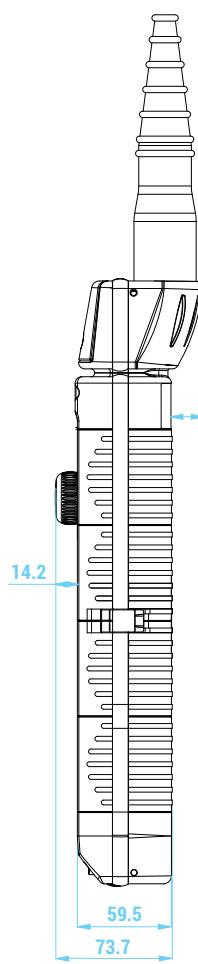
Code	PRSL1820PI	PRSL1821PI
Rated operational voltage	24-48 Vac/dc	110-240 Vac
Rated current consumption	1.30-2.70 mA	1.15-2.50 mA
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

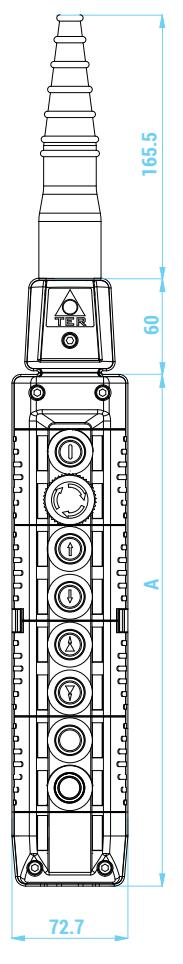
Code of potentiometer with support	PRSL1893PI	PRSL1891PI	PRSL1892PI
Ohmic value	1 kΩ	4.7 kΩ	10 kΩ
Life time		15x10 ³ movements (minimum)	
Operational ambient temperature		-25°C/+70°C	
Mechanical angle		300°	
Actual electrical angle		267°	
Ohmic value tolerance		±20%	

OVERALL DIMENSIONS (mm)

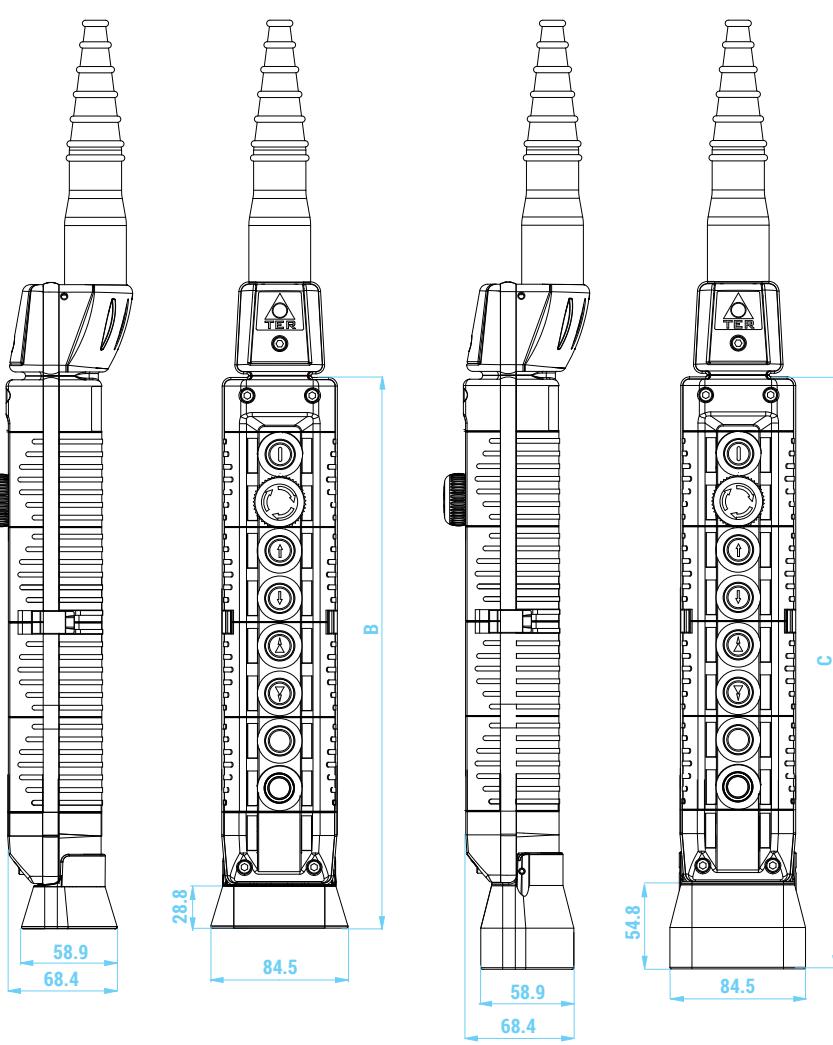
Standard



With small lower protection



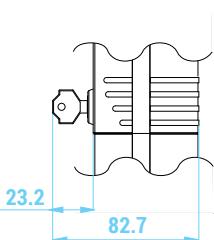
With large lower protection



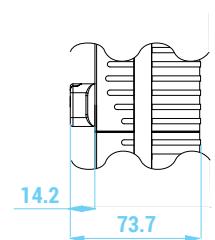
No. of actuators	Dimensions (mm)		
	A	B	C
4	201	229.8	255.8
5	201	229.8	255.8
6	261	289.8	315.8
7	261	289.8	315.8
8	321	349.8	375.8
9	321	349.8	375.8
12	441	469.8	495.8
13	441	469.8	495.8
14	501	529.8	555.8
15	501	529.8	555.8

Actuators

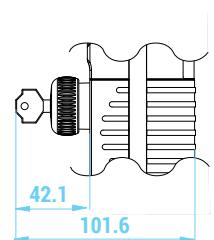
Key selector switches



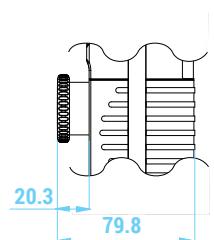
Selector switches



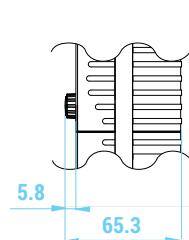
Key mushroom pushbutton



Mushroom pushbutton Ø 40 mm



Potentiometer



Dimensions of all mushroom pushbuttons refer to the released position.

STANDARD CONTROL STATIONS

Standard control stations are supplied with symbol label sheet. Standard control stations are not cULUS certified.

4 actuators

Reset-Alarm button	Latched mushroom pushbutton	Black buttons mechanically interlocked between pairs		Cover color	Code
No.2 PRSL1800PI 1NO+1NO	No.1 PRSL1801PI 1NC	No.1 PRSL1800PI 1NO	No.2 PRSL1800PI 1NO+1NO		
1	1	2		Yellow	F70AY12020000001
1	1	2		Black	F70AB12020000001
1	1		2	Yellow	F70AY12000200001
1	1		2	Black	F70AB12000200001

6 actuators

Reset-Alarm button	Latched mushroom pushbutton	Black buttons mechanically interlocked between pairs		Cover color	Code
No.2 PRSL1800PI 1NO+1NO	No.1 PRSL1801PI 1NC	No.1 PRSL1800PI 1NO	No.2 PRSL1800PI 1NO+1NO		
1	1	4		Yellow	F70EY12040000002
1	1	4		Black	F70EB12040000001
1	1		4	Yellow	F70EY12000400002
1	1		4	Black	F70EB12000400001

8 actuators

Reset-Alarm button	Latched mushroom pushbutton	Black buttons mechanically interlocked between pairs		Cover color	Code
No.2 PRSL1800PI 1NO+1NO	No.1 PRSL1801PI 1NC	No.1 PRSL1800PI 1NO	No.2 PRSL1800PI 1NO+1NO		
1	1	6		Yellow	F70BY12060000001
1	1	6		Black	F70BB12060000001
1	1		6	Yellow	F70BY12000600001
1	1		6	Black	F70BB12000600001

12 actuators

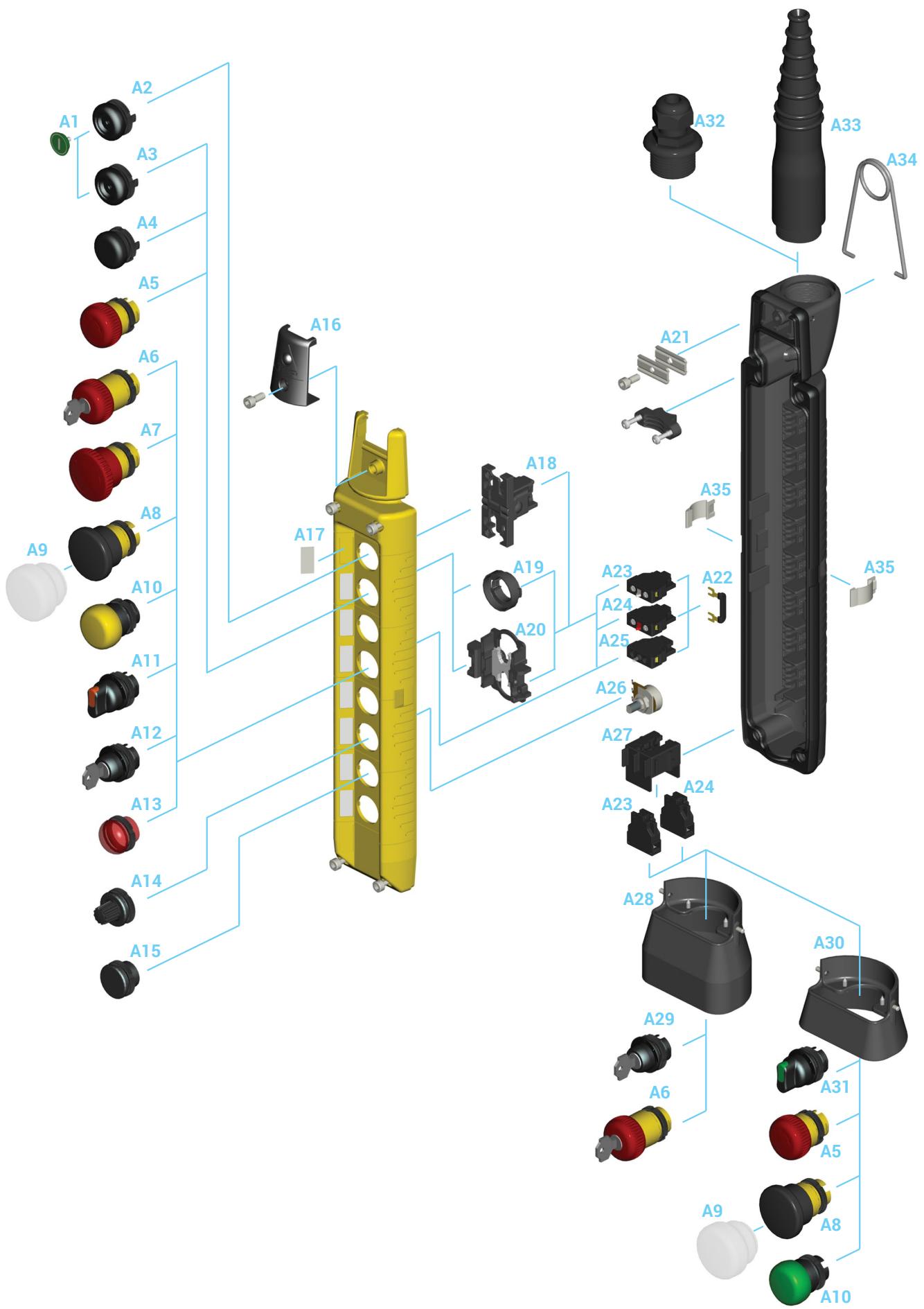
Reset-Alarm button	Latched mushroom pushbutton	Black buttons mechanically interlocked between pairs		Cover color	Code
No.2 PRSL1800PI 1NO+1NO	No.1 PRSL1801PI 1NC	No.1 PRSL1800PI 1NO	No.2 PRSL1800PI 1NO+1NO		
1	1	10		Yellow	F70CY12100000001
1	1	10		Black	F70CB12100000001
1	1		10	Yellow	F70CY12001000001
1	1		10	Black	F70CB12001000001

14 actuators

Reset-Alarm button	Latched mushroom pushbutton	Black buttons mechanically interlocked between pairs		Cover color	Code
No.2 PRSL1800PI 1NO+1NO	No.1 PRSL1801PI 1NC	No.1 PRSL1800PI 1NO	No.2 PRSL1800PI 1NO+1NO		
1	1	12		Yellow	F70DY12120000001
1	1	12		Black	F70DB12120000001
1	1		12	Yellow	F70DY12001200001
1	1		12	Black	F70DB12001200001

ASSEMBLY DRAWING

2



Refer to the following tables for descriptions of components: "Switches", "Potentiometers", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Key selector switches", "Selector switches" and Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A23		1NO switch		PRSL1800PI
A24		1NC switch		PRSL1801PI
A25		LED 24/48 Vac/dc		PRSL1820PI
		LED 110/230 Vac		PRSL1821PI

Potentiometers

Ref.	Drawing	Description	Code
A14 + A26		Potentiometer 4.7 kΩ	PRSL1891PI
		Potentiometer 10 kΩ	PRSL1892PI
		Potentiometer 1 kΩ	PRSL1893PI

Actuators

Ref.	Drawing	Description	Code
A1		Disk for pushbutton	PRTA See disk table
A2		Pushbutton for latched ON-OFF maintained actuator	PRSL1803PI
A3		2 speed pushbutton	PRSL1810PI
		1 speed pushbutton	PRSL1811PI
		1 speed illuminated pushbutton	PRSL1815PI
		1 speed black pushbutton	PRSL1806PI
A4		1 speed grey pushbutton	PRSL1807PI
		2 speed black pushbutton	PRSL1808PI
		2 speed grey pushbutton	PRSL1809PI
A15		Blanking plug	PRSL1845PI
A18		Latched ON-OFF maintained actuator	PRSL1804PI

Pilot lights

Ref.	Drawing	Description	Code
A13		White	PRSL1844PI
		Green	PRSL1841PI
		Blue	PRSL1846PI
		Red	PRSL1840PI
		Yellow	PRSL1842PI
		Orange	PRSL1843PI

Mushroom pushbuttons

Ref.	Drawing	Description	Head color	Code
A5		Latched mushroom pushbutton for emergency stop	Red	PRSL1880PI
A6		Key mushroom pushbutton	Red	PRSL1890PI
A7		Latched mushroom pushbutton for emergency stop Ø 40 mm	Red	PRSL1881PI
A8		Impulse mushroom pushbutton Ø 40 mm with yellow base	Black	PRSL1883PI
A10		Impulse mushroom pushbutton Ø 33 mm with black base	Red	PRSL1885ROC
			Blue	PRSL1885BLC
			Yellow	PRSL1885GIC
			Green	PRSL1885VEC
			Orange	PRSL1885ARC
			Black	PRSL1885NEC

Key selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A12 A29		0/1	X		0	PRSL1867PI
				X	0	PRSL1868PI
A12		1/0/2	X		0	PRSL1869PI
				X	0	PRSL1870PI
A12		0/1/1+2	X		0	PRSL1871PI
				X	0	PRSL1872PI
A12		1/2 change-over	X		1	PRSL1873PI
				X	1	PRSL1874PI
A12		1/1+2/2	X		1+2	PRSL1875PI
				X	1+2	PRSL1876PI

Selector switches

Ref.	Drawing	Positions	Color		Code
			Transparent	Full	
A11 A31		0/1 Spring return	White		PRSL1855BI
			Green		PRSL1855VE
			Blue		PRSL1855BL
			Red		PRSL1855RO
			Yellow		PRSL1855GI
		0/1 Maintained	Orange		PRSL1855AR
			White		PRSL1856BI
			Green		PRSL1856VE
			Blue		PRSL1856BL
			Red		PRSL1856RO
A11		0/1 Spring return	Yellow		PRSL1856GI
			Orange		PRSL1856AR
			White		PRSL1855BIC
			Green		PRSL1855VEC
			Blue		PRSL1855BLC
		0/1 Maintained	Red		PRSL1855ROC
			Yellow		PRSL1855GIC
			Orange		PRSL1855ARC
			White		PRSL1856BIC
			Green		PRSL1856VEC
A11		1/0/2 Spring return	Blue		PRSL1856BLC
			Red		PRSL1856ROC
			Yellow		PRSL1856GIC
			Orange		PRSL1856ARC
			White		PRSL1857BI
		1/0/2 Maintained	Green		PRSL1857VE
			Blue		PRSL1857BL
			Red		PRSL1857RO
			Yellow		PRSL1857GI
			Orange		PRSL1857AR
A11		1/0/2 Spring return	White		PRSL1858BI
			Green		PRSL1858VE
			Blue		PRSL1858BL
			Red		PRSL1858RO
			Yellow		PRSL1858GI
		1/0/2 Maintained	Orange		PRSL1858AR
			White		PRSL1857BIC
			Green		PRSL1857VEC
			Blue		PRSL1857BLC
			Red		PRSL1857ROC

Selector switches

2

Ref.	Drawing	Positions	Color	Code
			Transparent	Full
A11		1/1+2/2 Spring return	White	PRSL1863BI
			Green	PRSL1863VE
			Blue	PRSL1863BL
			Red	PRSL1863RO
			Yellow	PRSL1863GI
			Orange	PRSL1863AR
		1/1+2/2 Maintained	White	PRSL1864BI
			Green	PRSL1864VE
			Blue	PRSL1864BL
			Red	PRSL1864RO
			Yellow	PRSL1864GI
			Orange	PRSL1864AR
		1/1+2/2 Spring return	White	PRSL1863BIC
			Green	PRSL1863VEC
			Blue	PRSL1863BLC
			Red	PRSL1863ROC
			Yellow	PRSL1863GIC
			Orange	PRSL1863ARC
		1/1+2/2 Maintained	White	PRSL1864BIC
			Green	PRSL1864VEC
			Blue	PRSL1864BLC
			Red	PRSL1864ROC
			Yellow	PRSL1864GIC
			Orange	PRSL1864ARC
		0/1/1+2 Spring return	White	PRSL1859BI
			Green	PRSL1859VE
			Blue	PRSL1859BL
			Red	PRSL1859RO
			Yellow	PRSL1859GI
			Orange	PRSL1859AR
		0/1/1+2 Maintained	White	PRSL1860BI
			Green	PRSL1860VE
			Blue	PRSL1860BL
			Red	PRSL1860RO
			Yellow	PRSL1860GI
			Orange	PRSL1860AR
		0/1/1+2 Spring return	White	PRSL1859BIC
			Green	PRSL1859VEC
			Blue	PRSL1859BLC
			Red	PRSL1859ROC
			Yellow	PRSL1859GIC
			Orange	PRSL1859ARC
		0/1/1+2 Maintained	White	PRSL1860BIC
			Green	PRSL1860VEC
			Blue	PRSL1860BLC
			Red	PRSL1860ROC
			Yellow	PRSL1860GIC
			Orange	PRSL1860ARC



A11

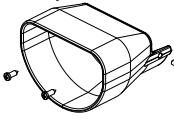
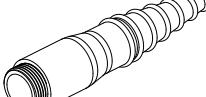
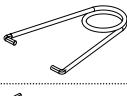
Selector switches

Ref.	Drawing	Positions	Color		Code
			Transparent	Full	
A11		1/2 Spring return	White		PRSL1861BI
			Green		PRSL1861VE
			Blue		PRSL1861BL
			Red		PRSL1861RO
			Yellow		PRSL1861GI
		1/2 Maintained	Orange		PRSL1861AR
			White		PRSL1862BI
			Green		PRSL1862VE
			Blue		PRSL1862BL
			Red		PRSL1862RO
A16		1/2 Spring return	Yellow		PRSL1862GI
			Orange		PRSL1862AR
			White		PRSL1861BIC
			Green		PRSL1861VEC
			Blue		PRSL1861BLC
		1/2 Maintained	Red		PRSL1861ROC
			Yellow		PRSL1861GIC
			Orange		PRSL1861ARC
			White		PRSL1862BIC
			Green		PRSL1862VEC
A17		1/2 Spring return	Blue		PRSL1862BLC
			Red		PRSL1862ROC
			Yellow		PRSL1862GIC
			Orange		PRSL1862ARC
			White		
		1/2 Maintained	Green		
			Blue		
			Red		
			Yellow		
			Orange		

Accessories

Ref.	Drawing	Description	Code
A9		Transparent protective cap for impulse mushroom pushbutton Ø 40 mm	PRGU6100PE
A16		Cable cover with TER logo	PRSL1832PI
		Blank cable cover	PRSL1836PI
		Label sheet - Symbols	PRET0215PE
A17		Label sheet - German	PRET0220DE
		Label sheet - English	PRET0220EN
		Label sheet - Spanish	PRET0220ES
		Label sheet - French	PRET0220FR
		Label sheet - Italian	PRET0220IT
		Button-switch spacer	PRSL8512PI
		Mechanical interlock	PRSL1850PI
A21		Complete wire clamp	PRSL1896PI
A22		Insulated connecting bridge - positions 3-4 (bag with 5 pieces)	PRSL1911PI
		Insulated connecting bridge - positions 2-4 (bag with 5 pieces)	PRSL1912PI
		Insulated connecting bridge - positions 1-4 (bag with 5 pieces)	PRSL1913PI
		Insulated connecting bridge - positions 1-3 (bag with 5 pieces)	PRSL1914PI
		Insulated connecting bridge - positions 1-2 (bag with 5 pieces)	PRSL1915PI
		Insulated connecting bridge - positions 1-2-3 (bag with 5 pieces)	PRSL1916PI

Accessories

Ref.	Drawing	Description	Code
A27		1-2-3 switch holder	PRSL8750PI
A28		Large protection	PRSL1831PI
A30		Small protection	PRSL1830PI
A32		Cable clamp M20 with reduction	PRSL1910PI
A33		Cable sleeve	PRSL0145PE
A34		Hook	PRGA0012PE
A35		Closing clip	PRTR1035PE

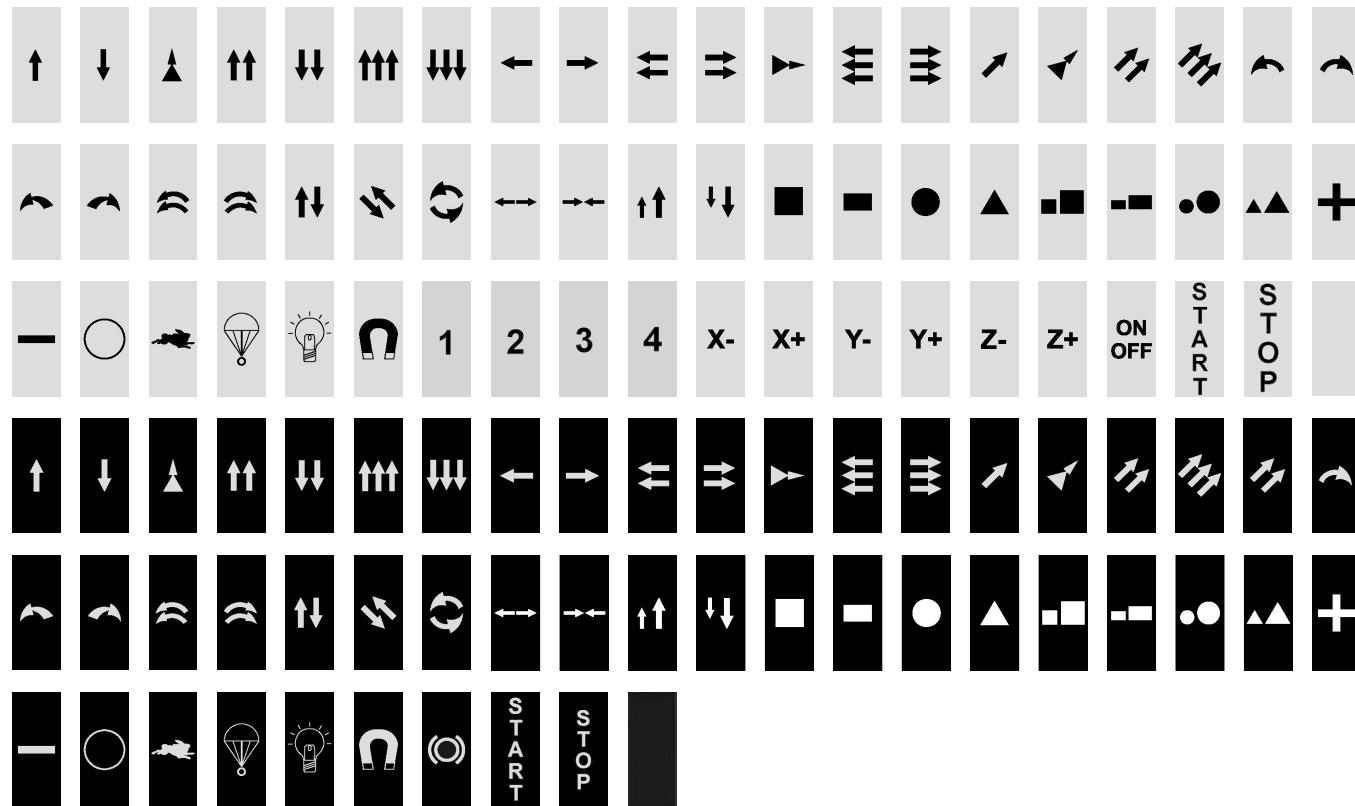
Full color disks



Transparent disks



Label sheet - Symbols



Label sheet - English

START	ALARM	RESET ALARM	RESET	STOP	LIGHT	RESET LINE	STOP LINE	START BUCKET	STOP BUCKET
BRAKE	BACK	UP	DOWN	UP LIFTING	DOWN LIFTING	UP LIFTING 1-2 SPEED	DOWN LIFTING 1-2 SPEED	UP LIFTING 3RD SPEED	DOWN LIFTING 3RD SPEED
UP LIFTING FAST	DOWN LIFTING FAST	LIFTING 2ND SPEED	LIFTING 3RDSPEED	UP AUXIL. LIFTING	DOWN AUXIL. LIFTING	UP MAIN LIFTING	DOWN MAIN LIFTING	UP FAST MAIN LIFTING	DOWN FAST MAIN LIFTING
UP AUXIL. LIFTING 1-2 S.	DOWN AUXIL. LIFTING 1-2 S.	UP MAIN LIFTING 1-2 S.	DOWN MAIN LIFTING 1-2 S.	UP WINCH	DOWN WINCH	UP WINCH 1-2 SPEED	DOWN WINCH 1-2 SPEED	UP FAST WINCH	DOWN FAST WINCH
UP SLOW RIGHT WINCH	DOWN SLOW RIGHT WINCH	UP FAST RIGHT WINCH	DOWN FAST RIGHT WINCH	UP SLOW LEFT WINCH	UP FAST LEFT WINCH	DOWN FAST LEFT WINCH	UP HOIST	DOWN HOIST	UP HOIST 1-2 SPEED
DOWN HOIST 1-2 SPEED	UP FAST HOIST	DOWN FAST HOIST	FORWARD	BACKWARD	FORWARD TROLLEY	BACKWARD TROLLEY	FORWARD FAST TROLLEY	BACKWARD FAST TROLLEY	FORWARD TROLLEY 1-2 S.
BACKWARD TROLLEY 1-2 S.	FORWARD BRIDGE	BACKWARD BRIDGE	FORWARD FAST BRIDGE	BACKWARD FAST BRIDGE	FORWARD BRIDGE 1-2 S.	BACKWARD BRIDGE 1-2 S.	FORWARD TRANSLATION	BACKWARD TRANSLATION	LEFT
RIGHT	LEFT TROLLEY	RIGHT TROLLEY	LEFT FAST TROLLEY	RIGHT FAST TROLLEY	LEFT TROLLEY 1-2 S.	RIGHT TROLLEY 1-2 S.	LEFT BRIDGE	RIGHT BRIDGE	LEFT FAST BRIDGE
DOWN SLOW LEFT WINCH	RIGHT FAST BRIDGE	LEFT BRIDGE 1-2 S.	RIGHT BRIDGE 1-2 S.	CCW ROTATION	CW ROTATION	CCW FAST ROTATION	CW FAST ROTATION	CCW ROTATION 1-2 S.	CW ROTATION 1-2 S.
CCW ROTATION 3RD SPEED	CW ROTATION 3RD SPEED	LEFT CTRL STATION	RIGHT CTRL STATION	TROLLEY LEFT	TROLLEY RIGHT	SLOW	FAST	FAST TROLLEY	FAST BRIDGE
FAST LIFTING	FAST ROTATION	WINCH MATCHING	OPEN	CLOSE	OPEN GRAPPLE	CLOSE GRAPPLE	OPEN BUCKET	CLOSE BUCKET	OPEN DOOR
CLOSE DOOR	SPEED UP	SPEED DOWN	RAISE	LOWER	LOAD	DOWNLOAD	ENERGIZE	DE-ENERGIZE	ENERGIZE MAGNET
DE-ENERGIZE MAGNET	APPROACH	CONSENT	AUTOMATIC	MANUAL	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORTH	SOUTH	EAST	WEST	OVERLOAD	TARE	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - Italian

MARCIA	ALLARME	MARCIA ALLARME	ARRESTO	STOP	LUCE	MARCIA LINEA	ARRESTO LINEA	MARCIA BENNA	ARRESTO BENNA
FRENO	RITORNO	SALITA	DISCESA	SALITA SOLLEV.	DISCESA SOLLEV.	SALITA SOLL. 1-2 VEL.	DISCESA SOLL. 1-2 VEL.	SALITA SOLL. 3a VEL.	DISCESA SOLL. 3a VEL.
SALITA SOLL. VEL.	DISCESA SOLL. VEL.	2a VELOCITÀ SOLLEV.	3a VELOCITÀ SOLLEV.	SALITA SOLL. AUSILIARIO	DISCESA SOLL. AUSILIARIO	SALITA SOLL. PRINCIPALE	DISCESA SOLL. PRINCIPALE	SALITA SOLL. PRINCIP. VEL.	DISCESA SOLL. PRINCIP. VEL.
SALITA AUSIL. 1-2 V.	DISCESA AUSIL. 1-2 V.	SALITA PRINCIP. 1-2 V.	DISCESA PRINCIP. 1-2 V.	SALITA ARGANO	DISCESA ARGANO	SALITA ARGANO 1-2 V.	DISCESA ARGANO 1-2 V.	SALITA ARGANO VEL.	DISCESA ARGANO VEL.
ARGANO DX SALITA LENTA	ARGANO DX DISC. LENTA	ARGANO DX SALITA VEL.	ARGANO DX DISCESA VEL.	ARGANO SIN SALITA LENTA	ARGANO SIN SALITA VEL.	ARGANO SIN DISCESA VEL.	SALITA PARANCO	DISCESA PARANCO	SALITA PAR. 1-2 V.
DISCESA PAR. 1-2 V.	SALITA PAR. VEL.	DISCESA PAR. VEL.	AVANTI	INDIETRO	AVANTI CARRELLO	INDIETRO CARRELLO	AVANTI CARR. VEL.	INDIETRO CARR. VEL.	AVANTI CARR. 1-2 V.
INDIETRO CARR. 1-2 V.	AVANTI PONTE	INDIETRO PONTE	AVANTI PONTE VEL.	INDIETRO PONTE VEL.	AVANTI PONTE 1-2 V.	INDIETRO PONTE 1-2 V.	AVANTI TRASLAZIONE	INDIETRO TRASLAZIONE	SINISTRA
DESTRA	SINISTRA CARRELLO	DESTRA CARRELLO	SINISTRA CARR. VEL.	DESTRA CARR. VEL.	SINISTRA CARR. 1-2 V.	DESTRA CARR. 1-2 V.	SINISTRA PONTE	DESTRA PONTE	SINISTRA PONTE VEL.
ARGANO SIN DISC. LENTA	DESTRA PONTE VEL.	SINISTRA PONTE 1-2 V.	DESTRA PONTE 1-2 V.	SINISTRA ROTAZIONE	DESTRA ROTAZIONE	SINISTRA ROTAZ. VEL.	DESTRA ROTAZ. VEL.	SINISTRA ROTAZ. 1-2 V.	DESTRA ROTAZ. 1-2 V.
SINISTRA ROTAZ. 3a V.	DESTRA ROTAZ. 3a V.	SINISTRA PULSANTIERA	DESTRA PULSANTIERA	CARRELLO SINISTRO	CARRELLO DESTRO	LENTO	VELOCE	VELOCE CARRELLO	VELOCE PONTE
VELOCE SOLLEV.	VELOCE ROTAZIONE	ACCOPIAMENTO ARGANO	APRE	CHIUDE	APRE PINZA	CHIUDE PINZA	APRE BENNA	CHIUDE BENNA	APERTURA PORTELLO
CHIUSURA PORTELLO	ACCELERA	DECELERA	ALZA	ABBASSA	CARICO	SCARICO	ECCITA	DISECCITA	ECCITA MAGNETE
DISECCITA MAGNETE	ACCOSTA	CONSENSO	AUTOMATICO	MANUALE	MAN-O-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORD	SUD	EST	OVEST	SOVRACCARICO	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - French

MARCHE	ALARME	MARCHE ALARME	RESET	ARRET	LUMIERE	MARCHE LIGNE	ARRET LIGNE	MARCHE BENNE	ARRET BENNE
FREIN	RETOUR	MONTEE	DESCENTE	MONTEE LEVAGE	DESCENTE LEVAGE	MONTEE LEV. 1-2 VIT.	DESCENTE LEV. 1-2 VIT.	MONTEE LEV. 3EME VIT.	DESCENTE LEV. 3EME VIT.
MONTEE LEV. VITE	DESCENTE LEV. VITE	MONTEE LEV. 2EME VIT.	DESCENTE LEV. 3EME VIT.	MONTEE LEV. AUXILIAIRE	DESCENTE LEV. AUXILIAIRE	MONTEE LEV. PRINCIPAL	DESCENTE LEV. PRINCIPAL	MONTEE LEV. PRINC. VITE	DESCENTE LEV. PRINC. VITE
MONTEE LEV. AUX. 1-2 VIT.	DESCENTE LEV. AUX. 1-2 VIT.	MONTEE LEV. PRINC. 1-2 VIT.	DESCENTE LEV. PRINC. 1-2 VIT.	MONTEE TREUIL	DESCENTE TREUIL	MONTEE TREUIL 1-2 VIT.	DESCENTE TREUIL 1-2 VIT.	MONTEE TREUIL VITE	DESCENTE TREUIL VITE
TREUIL DROITE MONTEE LENTE	TREUIL DROITE DESC. LENTE	TREUIL DROITE MONTEE VITE	TREUIL DROITE DESCENTE VITE	TREUIL AUCHE MONTEE LENTE	TREUIL AUCHE MONTEE VITE	TREUIL AUCHE DESCENTE VITE	MONTEE PALAN	DESCENTE PALAN	MONTEE PALAN 1-2 VIT.
DESC. PALAN 1-2 VIT.	MONTEE PALAN VITE	DESCENTE PALAN VITE	AVANT	ARRIERE	AVANT CHARIOT	ARRIERE CHARIOT	AVANT CHARIOT VITE	ARRIERE CHARIOT VITE	AVANT CHARIOT 1-2 VIT.
ARR. CHARIOT 1-2 VIT.	AVANT PONT	ARRIERE PONT	AVANT PONT VITE	ARRIERE PONT VITE	AVANT PONT 1-2 VIT.	ARRIERE PONT 1-2 VIT.	AVANT TRANSLATION	ARRIERE TRANSLATION	GAUCHE
DROITE	GAUCHE CHARIOT	DROITE CHARIOT	GAUCHE CHARIOT VITE	DROITE CHARIOT VITE	GAUCHE CHARIOT 1-2 VIT.	DROITE CHARIOT 1-2 VIT.	GAUCHE PONT	DROITE PONT	GAUCHE PONT VITE
TREUIL GAUCHE DESC. LENTE	DROITE PONT VITE	GAUCHE PONT 1-2 VIT.	DROITE PONT 1-2 VIT.	GAUCHE ROTATION	DROITE ROTATION	GAUCHE ROTATION VITE	DROITE ROTATION VITE	GAUCHE ROT. 1-2 VIT.	DROITE ROT. 1-2 VIT.
GAUCHE ROT. 3EME VIT.	DROITE ROT. 3EME VIT.	GAUCHE BOITE A BOUTONS	DROITE BOITE A BOUTONS	CHARIOT GAUCHE	CHARIOT DROITE	LENT	VITE	VITE CHARIOT	VITE PONT
VITE LEVAGE	VITE ROTATION	ACCOUPLEMNT. TREUIL	OUVRE	FERME	OUVRE PINCE	FERME PINCE	OUVRE BENNE	FERME BENNE	OUVRE PORTAIL
FERME PORTAIL	ACCELERATION	DECCELERATION	HISSE	ABAISSE	CHARGE	DECHARGE	EXCITER	DESEXCIITER	MAGNETISE
DEMAGNETISE	APPROCHE	CONSENTEMENT	AUTOMATIQUE	MANUEL	MAN-O-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORD	SUD	EST	OUEST	SURCHARGE	TARE	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							



Label sheet - German

BETRIEB	ALARM	FAHRT ALARM	SPERRE	STOP	LICHT	STROM AN	STROM AUS	GREIFER BETRIEB	GREIFER STOP
BREMSE	ZURUCK	RAUF	RUNTER	HUB RAUF	HUB RUNTER	HUB RAUF 1.-2. GANG	HUB RUNTER 1.-2. GANG	HUB RAUF 3. GANG	HUB RUNTER 3. GANG
HUB SCHNELL RAUF	HUB RUNTER SCHNELL	2. GANG HEBEN	3. GANG HEBEN	HILFSHUB RAUF	HILFSHUB RUNTER	HAUPTHUB RAUF	HAUPTHUB RUNTER	HAUPTHUB RAUF SCH.	HAUPTHUB RUNTER SCH.
HILFSHUB RAUF 1.-2. GANG	HILFSHUB RUNTER 1.-2. GANG	HAUPTHUB 1.-2. GANG	HAUPTHUB 1.-2. GANG	WINDE RAUF	WINDE RUNTER	WINDE RAUF 1.-2. GANG	WINDE RUNTER 1.-2. GANG	WINDE RAUF SCHNELL	WINDE RUNTER SCHNELL
WINDE RECHTS LANGS. HOCH	WINDE RECHTS LANGS. RUNTER	WINDE RECHTS SCHNELL RAUF	WINDE RECHTS SCHNELL RUNTER	WINDE LINKS LANGSAM RAUF	WINDE LINKS SCHNELL RAUF	WINDE LINKS SCHNELL RUNTER	FLASCHENZUG HOCH	FLASCHENZUG RUNTER	FLASCHENZUG HOCH 1.-2. GANG
FLASCHENZUG RUNTER 1.-2. GANG	FLASCHENZUG HOCH SCHNELL	FLASCHENZUG RUNTER SCHNELL	VORWÄRTS	RÜCKWÄRTS	LAUFKATZE VORWÄRTS	LAUFKATZE RÜCKWÄRTS	LAUFKATZE VORWÄRTS SCHNELL	LAUFKATZE RÜCKWÄRTS SCHNELL	LAUFKATZE VORW. 1.-2. GANG
LAUFKATZE ZURÜCK 1.-2. GANG	KRANBRUECKE VORWÄRTS	KRANBRUECKE RÜCKWÄRTS	KRANBRUECKE VORW. SCHNELL	KRANBRUECKE RÜCKW. SCHNELL	KRANBRUECKE VORW. 1.-2. GANG	KRANBRUECKE ZUR. 1.-2. GANG	BEWEGUNG VORWÄRTS	BEWEGUNG RÜCKWÄRTS	LINKS
RECHTS	LAUFKATZE - LINKS	LAUFKATZE - RECHTS	LAUFKATZE LINKS SCHNELL	LAUFKATZE RECHTS SCHNELL	LAUFKATZE LINKS 1.-2. GANG	LAUFKATZE RECHTS 1.-2. GANG	KRANBRUECKE RECHTS	KRANBRUECKE LINKS	KRANBRÜCKE LINKS SCHNELL
WINDE LINKS LANGSAM RUNTER	KRANBRÜCKE RECHTS SCHNELL	KRANBRÜCKE LINKS 1.-2. GANG	KRANBRÜCKE RECHTS 1.-2. GANG	DREHUNG LINKS	DREHUNG RECHTS	DREHUNG LINKS SCHNELL	DREHUNG RECHTS SCHNELL	DREHUNG LINKS 1.-2. GANG	DREHUNG RECHTS 1.-2. GANG
DREHUNG LINKS 3. GANG	DREHUNG RECHTS 3. GANG	HÄNGETASTER LINKS	HÄNGETASTER RECHTS	LINKE LAUFKATZE	RECHTE LAUFKATZE	LANGSAM	SCHNELL	LAUFKATZE SCHNELL	KRANBRÜCKE SCHNELL
HEBEN - SCHNELL	DREHUNG - SCHNELL	WINDE PAAREN	OEFFNEN	SCHLIESSEN	ZANGE OEFFNEN	ZANGE SCHLIESSEN	GREIFER OEFFNEN	GREIFER SCHLIESSEN	DECKELÖFFNUNG
DECKELVERSCHLUSS	BESCHLEUNIGEN	VERZÖGERN	ANHEBEN	ABSENKEN	LADUNG	ABLADEN	ERREGEN	ABERREGEN	MAGNETISIERUNG
ENTMAGNETISIEREN	ANNÄHERN	ENTBLOCKUNG	AUTOMATIK	HANDBETRIEB	HANDBETR. / AUTOMATIK	AUS HANDBETR. / AUTOMATIK	AN	AUS	AN - AUS
REIN	RAUS	NORD	SÜD	OST	WEST	ÜBERBELASTUNG	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

Label sheet - Spanish

MARCHA	ALARMA	MARCHA ALARMA	PARO	STOP	LUZ	MARCHA LINEA	PARO LINEA	MARCHA PALA	PARO PALA
FRENO	RETORNO	SUBIR	BAJAR	SUBIR ELEVACION	BAJAR ELEVACION	SUBIR ELEV. 1-2 VEL.	BAJAR ELEV. 1-2 VEL.	SUBIR ELEV. 3ª VEL.	BAJAR ELEV. 3ª VEL.
SUBIR ELEV. RAPIDA	BAJAR ELEV. RAPIDA	2ª VEL. ELEVACION	3ª VEL. ELEVACION	SUBIR AUX. ELEVACION	BAJAR AUX. ELEVACION	SUBIR ELEV. PRINCIPAL	BAJAR ELEV. PRINCIPAL	SUBIR ELEV. PRINC. RAPIDA	BAJAR ELEV. PRINC. RAPIDA
SUBIR AUX. 1-2 VEL.	BAJAR AUX. 1-2 VEL.	SUBIR PRINC. 1-2 VEL.	BAJAR PRINC. 1-2 VEL.	SUBIR POLIPASTO	BAJAR POLIPASTO	SUBIR POLIP. 1-2 VEL.	BAJAR POLIP. 1-2 VEL.	SUBIR POLIP. RAPIDO	BAJAR POLIP. RAPIDO
POLIP. DER. SUBIR LENTO	POLIP. DER. BAJAR LENTO	POLIP. DER. BAJAR RAPIDO	POLIP. DER. BAJAR RAPIDO	POLIP. IZQ. SUBIR LENTO	POLIP. IZQ. SUBIR RAPIDO	POLIP. IZQ. BAJAR RAPIDO	SUBIR GANCHO	BAJAR GANCHO	SUBIR GANCHO 1-2 VEL.
BAJAR GANCHO 1-2 VEL.	SUBIR GANCHO RAPIDO	BAJAR GANCHO RAPIDO	ADELANTE	ATRAS	ADELANTE CARRITO	ATRAS CARRITO	ADELANTE CARR. RAPIDO	ATRAS CARR. RAPIDO	ADELANTE CARR. 1-2 VEL.
ATRAS CARR. 1-2 VEL.	ADELANTE PUENTE	ATRAS PUENTE	ADELANTE PUENTE RAPIDO	ATRAS PUENTE RAPIDO	ADELANTE PUENTE 1-2 VEL.	ATRAS PUENTE 1-2 VEL.	ADELANTE TRASLACION	ATRAS TRASLACION	IZQUIERDA
DERECHA	IZQUIERDA CARRITO	DERECHA CARRITO	IZQUIERDA CARR. RAPIDO	DERECHA CARR. RAPIDO	IZQUIERDA CARR. 1-2 VEL.	DERECHA CARR. 1-2 VEL.	IZQUIERDA PUENTE	DERECHA PUENTE	IZQUIERDA PUENTE RAPIDO
POLIP. IZQUIER. BAJAR LENTO	DERECHA PUENTE RAPIDO	IZQUIERDA PUENTE 1-2 VEL.	DERECHA PUENTE 1-2 VEL.	IZQUIERDA ROTACION	DERECHA ROTACION	IZQUIERDA ROT. RAPIDA	DERECHA ROT. RAPIDA	IZQUIERDA ROT. 1-2 VEL.	DERECHA ROT. 1-2 VEL.
IZQUIERDA ROT. 3ª VEL.	DERECHA ROT. 3ª VEL.	BOTONERA IZQUIERDA	BOTONERA DERECHA	CARRITO IZQUIERDO	CARRITO DERECHO	LENTO	RAPIDO	CARRITO RAPIDO	PUENTE RAPIDO
ELEVACION RAPIDA	ROTACION RAPIDA	ACOPLAMIENTO POLIPASTO	ABRIR	CERRAR	ABRIR PINZA	CERRAR PINZA	ABRIR PALA	CERRAR PALA	ABRIR PUERTA
CERRAR PUERTA	ACELERAR	DESACELERAR	ELEVAR	DESCENDER	CARGAR	DESCARGAR	IMANTAR	DESIMANTAR	IMANTAR MAGNETO
DESIMANTAR MAGNETO	ACERCAR	CONFIRMAR	AUTOMATICO	MANUAL	MAN-0-AUTO	OFF-MAN-AUTO	ON	OFF	ON-OFF
IN	OUT	NORTE	SUR	ESTE	OESTE	SOBRECARGA	TARA	1-1+2-2	1-2-1+2
1+2	ON-OFF	A-A+B-B							

MIKE - REQUEST FORM FOR NON STANDARD CONTROL STATION

Instructions

(See next page for list of components and legends)

Fill in the chart according to the number of control elements required. Control stations are available with enclosures from 4 to 15 control elements. It is possible to assemble a control element on the bottom of the control station only with enclosures with an odd number of holes.

- 1 Control elements:** enter the number corresponding to the control element required (1 to 39) according to the legend. Eg.
 - 2 Button disks:** for pushbuttons (1 to 3) enter the number corresponding to the disk required (50 to 88) according to the legend. Both full color disks and transparent disks (for illuminated buttons) are available. Eg.
 - 3 Color of selectors, mushrooms, pilot lights:** for toggle selector switches (15 to 24), impulse mushroom pushbuttons (7) and pilot lights (11) enter the code corresponding to the color required according to the legend. Eg.
 - 4** If you choose disks with arrows (legend 54 to 73), enter the direction of the arrow in the circle. Eg.
 - 5 Switches, LEDs and potentiometers:** enter the number corresponding to the switch, LED or potentiometer required (90 to 93) according to the legend. It is possible to enter up to 3 switches per position. Eg.

2 speed pushbuttons can activate two switches on the first speed and one switch on the second speed.

Selector switches can activate only two switches and possibly a LED.

ATTENTION: LEDs can be placed only in the central position and they are used for illuminated buttons and selector switches.
(See Control Element legend for switch activation).
 - 6 Hook:** tick the box at the top or at the bottom if the hook is required. Eg.
 - 7 Cable sleeve and cable clamp:** tick the box if the cable sleeve or the cable clamp are required.
Eg.
 - 8 Mechanical interlock and ON-OFF actuator:** tick the boxes where the mechanical interlock (MI) between two control elements or the latched ON-OFF maintained actuator (LA) is required. Eg.
 - 9 Protection:** when a control element is mounted on the bottom of the control station, it is possible to use a protection; in this case tick the box corresponding to the protection required.
Eg.
 - 10 Cover:** tick the box corresponding to the cover color required (the base of the enclosure is always black).
 - 11 SIL 1 certified:** tick the box if you require SIL 1 certified units.
 - 12 Label sheet:** stickers with letterings or symbols may be placed on the left and on the right of any control element. If label sheets are required, tick the corresponding box.
 - 13 cULus certified:** tick the box if you require cULus certified units.

Control element on the bottom of the control station*

- Control element **1**
- Color **3**
- Switches **5**
- Small
- Large
- None
- Protection **9**

*ATTENTION: only mushroom pushbuttons ref. 4, 5, 6 with one or two switches, or **non illuminated** selector switches ref. 15, 16, 30, 31 with only one switch can be assembled on the bottom of the control station. LEDs can not be mounted in this position.

Cover	10	<input type="checkbox"/> Yellow	<input type="checkbox"/> Black	SIL 1 certified	11
Label sheet	12	<input type="checkbox"/> Symbols	<input type="checkbox"/> English	<input type="checkbox"/> French	cULus certified



1 Legend - Control elements

* SWITCH ACTIVATION

It is possible to mount up to 3 switches for each control element. The chart on the right of each pushbutton or selector switch specifies which position activates the switch on the top, in the middle or on the bottom. If the selector switches are mounted with the lever facing downwards, then the activation of the switches is reversed. Eg.: 2 speed pushbutton: the first speed activates the switches on the top and in the middle, while the second speed activates the switch on the bottom.

Pushbuttons

It is possible to mount up to 3 switches for each button. LEDs can be mounted only in the middle.

	SWITCH ACTIVATION*
1	1 speed pushbutton with disk
25	1 speed black pushbutton
26	1 speed grey pushbutton
2	2 speed pushbutton with disk
27	2 speed black pushbutton
28	2 speed grey pushbutton
3	1 speed illuminated pushbutton with disk

speed 1
LED
speed 1

Toggle selector switches

It is possible to mount only 2 switches for each selector. In the middle it is possible to mount only the LED for illuminated selector switches.

	SWITCH ACTIVATION*
15	0/1 spring return
16	0/1 maintained positions
17	1/0/2 spring return
18	1/0/2 maintained positions
19	1/1+2/2 spring return
20	1/1+2/2 maintained positions
21	0/1/1+2 spring return
22	0/1/1+2 maintained positions
23	1/2 spring return
24	1/2 maintained positions

pos 1
pos 2
pos 1
pos 2
pos 1
pos 2
pos 1 and 1+2
pos 2 and 1+2
pos 1 and 1+2
pos 2 and 1+2
pos 1+2
pos 1 and 1+2
pos 1+2
pos 1 and 1+2
pos 1 and 1+2
pos 1
pos 2
pos 1
pos 2
pos 1
pos 2
pos 1
pos 2

Key selector switches

It is possible to mount only 2 switches for each selector, and no switch/LED in the central position.

	SWITCH ACTIVATION*
30	0/1 spring return key out in position 0
31	0/1 maintained positions key out in position 0
32	1/0/2 spring return key out in position 0
33	1/0/2 maintained positions key out in position 0
34	0/1/1+2 spring return key out in position 0
35	0/1/1+2 maintained positions key out in position 0
36	1/2 change over spring return key out in position 1
37	1/2 change over maintained positions key out in position 1
38	1/1+2/2 spring return key out in position 1+2
39	1/1+2/2 maintained positions key out in position 1+2

Pilot light

Blanking plug

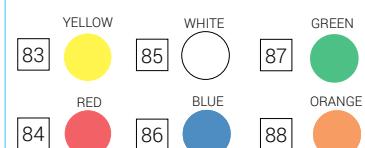
2

2 Legend - Button disks

Full color and symbol disks for pushbuttons (ref. 1 and 2)



Transparent disks for illuminated pushbuttons (ref. 3)



3 Legend - Color of selector switches, mushroom pushbuttons, pilot lights

Non-illuminated toggle selector switches (ref. 15 to 24)

RP	Red	BP	Blue	AP	Orange
GP	Yellow	VP	Green	WP	White

Impulse mushroom pushbutton with black base (ref. 7)

R	Red	B	Blue	A	Orange
G	Yellow	V	Green	N	Black

Illuminated toggle selector switches (ref. 15 to 24)

RI	Red	BI	Blue	AI	Orange
GI	Yellow	VI	Green	WI	White

Pilot lights (ref. 11)

R	Red	B	Blue	A	Orange
G	Yellow	V	Green	W	White

5 Legend - Switches, LEDs, potentiometers

90 PRSL1800PI - 1NO switch

91 PRSL1801PI - 1NC switch

92 PRSL1820PI
LED 24/48 Vac/dc

93 PRSL1821PI
LED 110/230 Vac

94 PRSL1891PI
potentiometer 4.7 kΩ

95 PRSL1892PI
potentiometer 10 kΩ

96 PRSL1893PI
potentiometer 1 kΩ

REMARKS

NPA

Pendant control station



Pendant station for auxiliary control of industrial machines.

Sturdy and handy, NPA is a classic control station, available with plastic pushbuttons or with dust-tight rubber pushbuttons, with up to 3 speed switches.

FEATURES

- The cable sleeve can be angled up to 20° to give the operator the best view of all the control elements and enable a natural, comfortable working position.
- Rectangular pushbuttons in thermoplastic material or rubber pushbuttons with symbol disks to ensure protection against dust.
- Two-colour moulded pushbuttons and disks to guarantee clear reading and wear resistance.
- The emergency stop mushroom pushbutton complies with standard EN 418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: NPA is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration from 2 to 12 actuators.
- One, two or three speed switches with NO and/or NC contacts.
- Mechanical interlock to prevent simultaneous operation of opposite functions.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

2

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	 

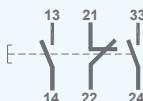
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	2÷6 buttons: rubber cable sleeve (Ø 10÷18 mm) 8÷12 buttons: rubber cable sleeve (Ø 17÷26 mm)
Operating positions	Any position

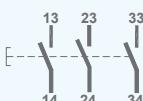
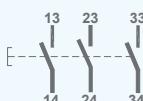
TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0502PI	PRSL0503PI
Utilisation category	AC 15	
Rated operational current	1.9 A	
Rated operational voltage	380 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.8 Nm	
Switch type	Switch with two connecting terminals	Switch with two connecting terminals
Contacts	1NC	1NO
Scheme		
Markings and homologations	 	



Code	PRSL0504PI	PRSL0505PI
Utilisation category	AC 15	
Rated operational current	1.9 A	
Rated operational voltage	380 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.8 Nm	
Switch type	1 speed switch with two connecting terminals each contact	2 speed switch with two connecting terminals each contact
Contacts	1NO+1NC+1NO simultaneous	1NO+1NC+1NO staggered
Scheme		

Markings and homologations  

Code	PRSL0506PI	PRSL0507PI
Utilisation category	AC 15	
Rated operational current	1.9 A	
Rated operational voltage	380 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.8 Nm	
Switch type	1 speed switch with two connecting terminals each contact	3 speed switch with two connecting terminals each contact
Contacts	3NO simultaneous	3NO staggered
Scheme		

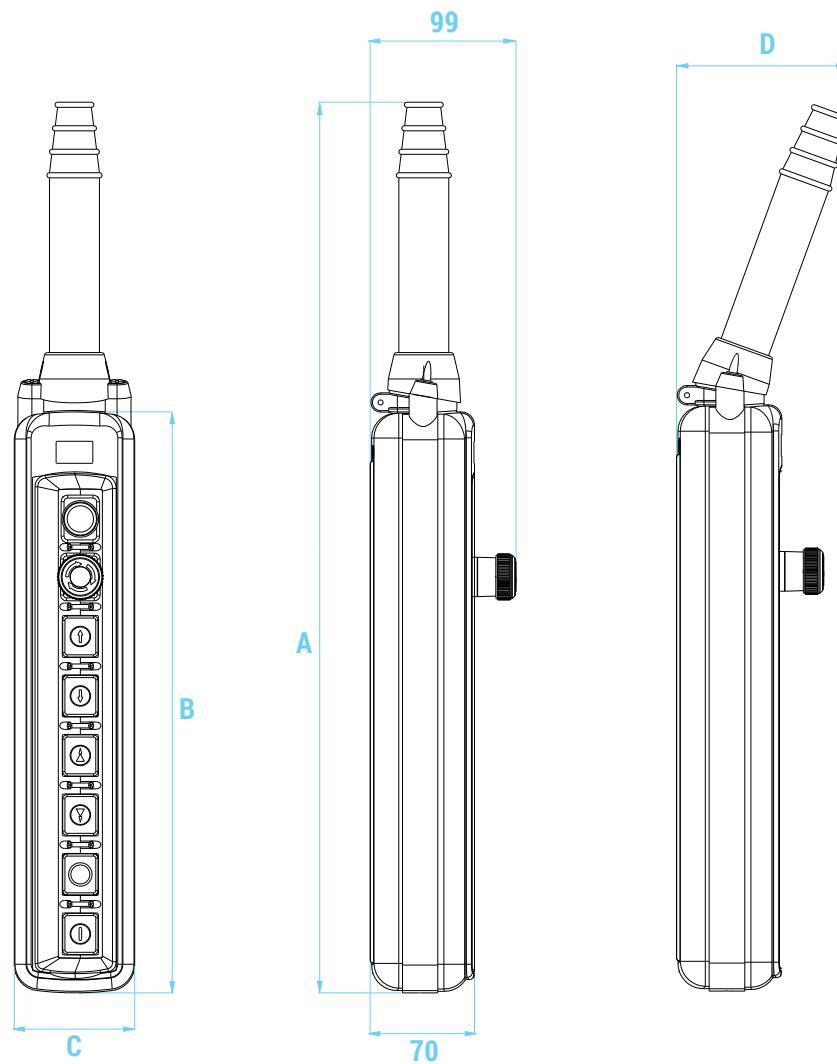
Markings and homologations  

TECHNICAL SPECIFICATIONS OF THE LAMP HOLDERS

Code	PRSL0501PI
Maximum voltage	125 V
Maximum power	2.6 W
Lamp type	With bayonet coupling
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Tightening torque	0.8 Nm
Markings and homologations	

OVERALL DIMENSIONS (mm)

2



No. of actuators	Dimensions (mm)				Weight (kg)
	A	B	C	D	
2	292	140	76	87	0.450
3	333	181	76	87	0.550
4	372	222	76	87	0.650
6	459	307	76	87	0.900
8	605	393	83	116	1.200
10	685	474	83	116	1.400
12	771	560	90	116	1.700

STANDARD CONTROL STATIONS

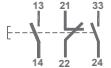
Standard control stations are equipped with cable sleeve, hook and mechanical interlock between opposite function pushbuttons.

2 actuators

PF03020005 with standard pushbutton
PF24020002 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.2 PRSL0503PI 1NO 1 speed	Pushbutton  Pushbutton 

PF03020014 with standard pushbutton
PF24020003 with dust-tight pushbutton

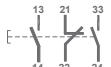
Switch scheme	Switch type	Actuator type
	No.2 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton  Pushbutton 

3 actuators

PF03030004 with standard pushbutton
PF24030004 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
	No.2 PRSL0503PI 1NO 1 speed	Pushbutton  Pushbutton 

PF03030020 with standard pushbutton
PF24030003 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
	No.2 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton  Pushbutton 

4 actuators

PF03040105 with standard pushbutton
PF24040024 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0503PI 1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton

PF03040106 with standard pushbutton
PF24040006 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0503PI 1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton

PF03040022 with standard pushbutton
PF24040001 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.4 PRSL0503PI 1NO 1 speed	Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 

PF03040030 with standard pushbutton
PF24040003 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.4 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 

PF03040243 with standard pushbutton
PF24040002 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton 
	No.1 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton 
	No.2 PRSL0503PI 1NO 1 speed	Pushbutton 
		Pushbutton 

6 actuators

PF03060098 with standard pushbutton
PF24060062 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
	No.4 PRSL0503PI 1NO 1 speed	Pushbutton  Pushbutton  Pushbutton  Pushbutton 
-	-	Blanking plug

PF03060139 with standard pushbutton
PF24060011 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
	No.4 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton  Pushbutton  Pushbutton  Pushbutton 
-	-	Blanking plug

PF03060113 with standard pushbutton
PF24060063 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
	No.2 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton Pushbutton
	No.2 PRSL0503PI 1NO 1 speed	Pushbutton Pushbutton
-	-	Blanking plug

PF03060293 with standard pushbutton
PF24060029 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
-	-	Pushbutton

PF03060399 with standard pushbutton
PF24060064 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
-	-	Pushbutton
	No.4 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton Pushbutton Pushbutton

PF03060192 with standard pushbutton
PF24060031 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
-	-	Pushbutton
	No.2 PRSL0505PI 1NO+1NC+1NO 2 speeds	Pushbutton Pushbutton Pushbutton
-	-	Pushbutton
-	-	Pushbutton

8 actuators

PF03080201 with standard pushbutton
PF24080044 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 

PF03080471 with standard pushbutton
PF24080101 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 

PF03080544 with standard pushbutton
PF24080108 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 

PF03080545 with standard pushbutton
PF24080107 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
	No.4 PRSL0505PI 1NO+1NC+1NO 2 speeds	
	No.2 PRSL0503PI 1NO 1 speed	

10 actuators

PF03100334 with standard pushbutton
PF24100051 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton

PF03100398 with standard pushbutton
PF24100072 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.3 PRSL0503PI 1NO 1 speed	Pushbutton YELLOW
	No.1 PRSL0502PI 1NC	Pushbutton
		Pushbutton

PF03100399 with standard pushbutton
PF24100071 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton

12 actuators

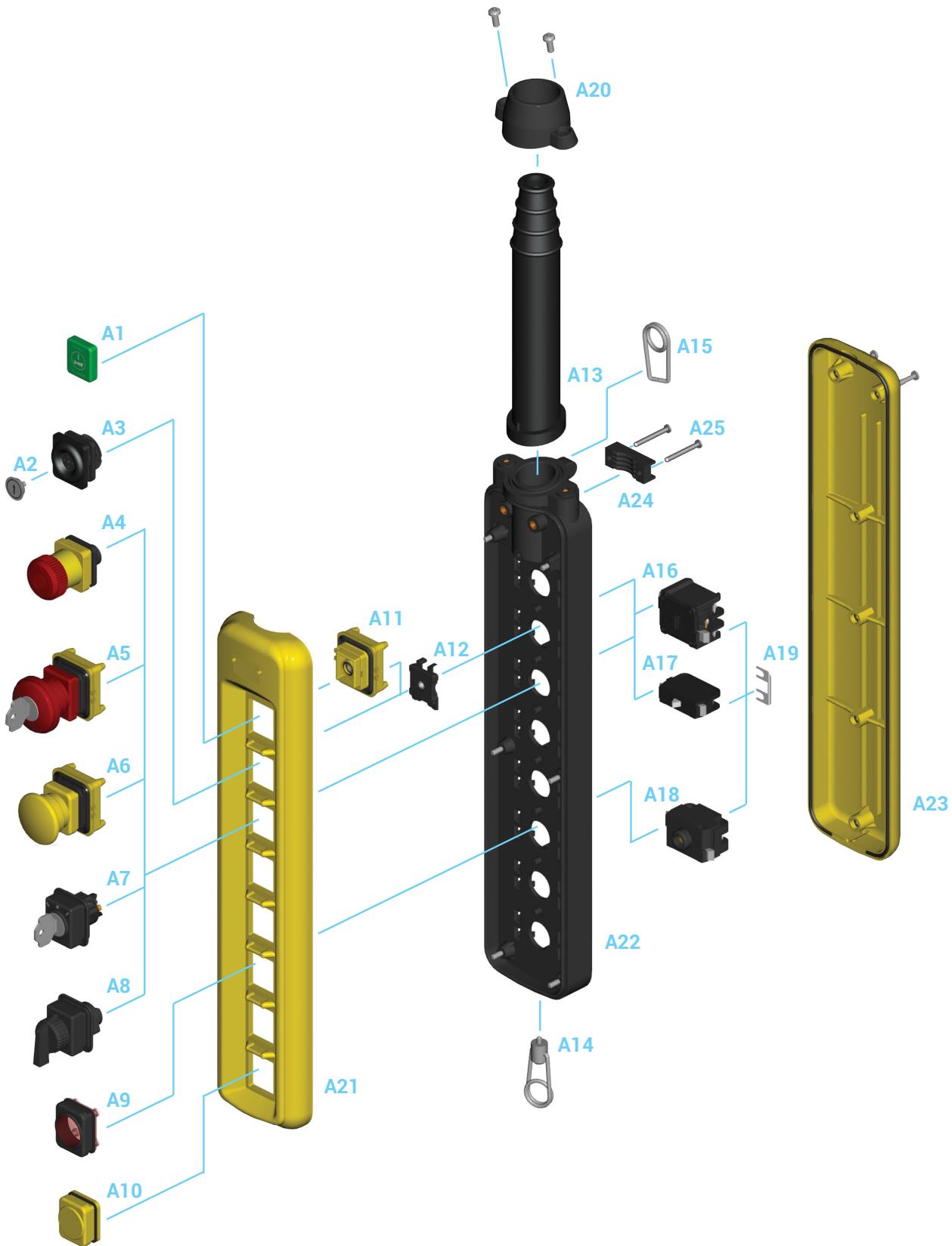
PF03120282 with standard pushbutton
PF24120031 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.1 PRSL0504PI 1NO+1NC+1NO 1 speed	Pushbutton  GREEN
	No.1 PRSL0502PI 1NC	Latched mushroom pushbutton
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
	No.10 PRSL0503PI 1NO 1 speed	

PF03120283 with standard pushbutton
PF24120032 with dust-tight pushbutton

Switch scheme	Switch type	Actuator type
	No.3 PRSL0503PI 1NO 1 speed	Pushbutton  YELLOW
	No.1 PRSL0502PI 1NC	Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
		Pushbutton 
	No.8 PRSL0503PI 1NO 1 speed	Pushbutton 
		Pushbutton 

ASSEMBLY DRAWING

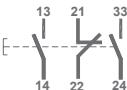
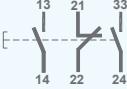
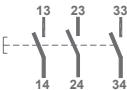


Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Selector switches" and "Accessories".

COMPONENTS

Switches

2

Ref.	Drawing	Description	Scheme	Code
A16		1 speed, 1NO+1NC+1NO simultaneous switch		PRSL0504PI
		2 speeds, 1NO+1NC+1NO staggered switch		PRSL0505PI
		1 speed, 3NO simultaneous switch		PRSL0506PI
		3 speeds, 3NO staggered switch		PRSL0507PI
A17		1NC switch		PRSL0502PI
		1NO switch		PRSL0503PI
A18		Lamp holder with bayonet coupling		PRSL0501PI

Actuators

Ref.	Drawing	Description	Code
A1		Pushbutton	PRTA_----- See standard buttons
A2		Disk for dust-tight pushbutton	PRTA_---_PI See standard disk
A3		Dust-tight pushbutton	PRSL0550PI
A10		Blanking plug	PRSL0517PI
A11		Button housing	PRSL0518PI

Pilot lights

Ref.	Drawing	Color	Code
A9		Red	PRSL0515PI
		Green	PRSL0516PI
		Yellow	PRSL0521PI

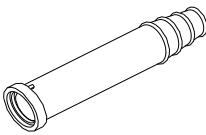
Mushroom pushbuttons

Ref.	Drawing	Description	Code
A4		Latched mushroom pushbutton for emergency stop	PRSL0500PI
A5		Key mushroom pushbutton	PRSL0520PI
A6		Impulse mushroom pushbutton	PRSL0512PI

Selector switches

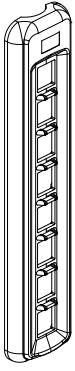
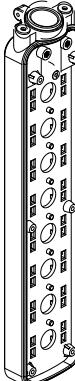
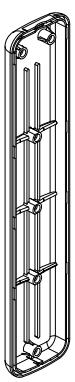
Ref.	Drawing	Description	Code
A7		Key selector switch - 2 or 3 maintained positions	PRSL0513PI
A8		Selector switch - 2 or 3 maintained positions	PRSL0514PI
		Selector switch - 2 or 3 spring return positions	PRSL0519PI

Accessories

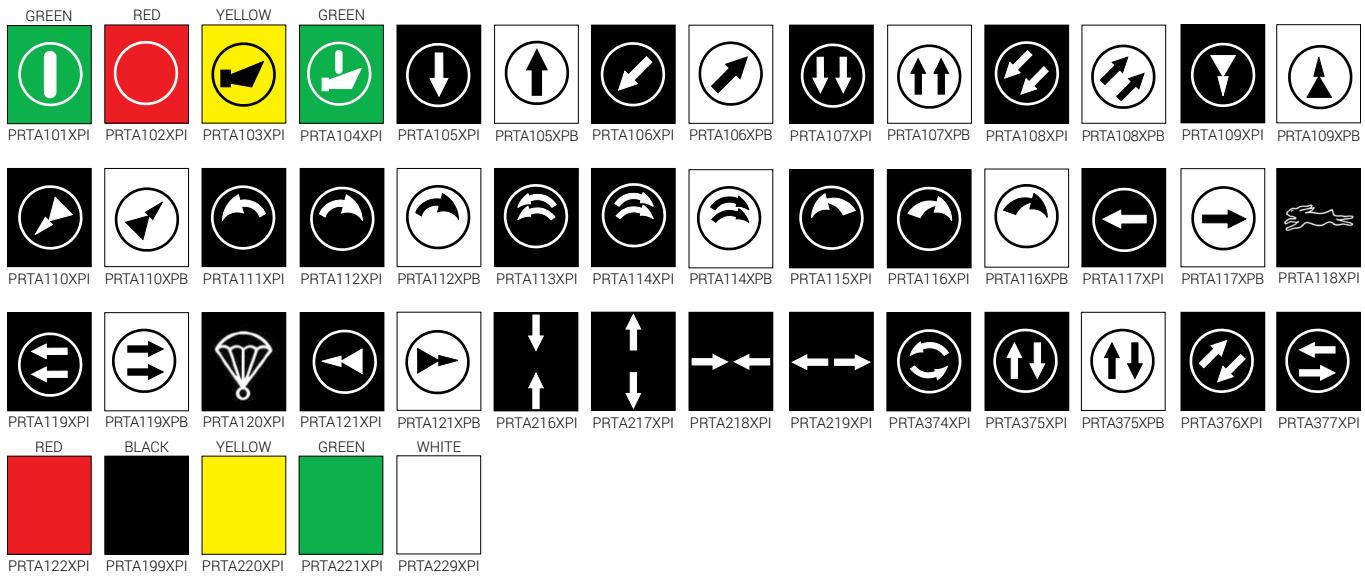
Ref.	Drawing	Description	Code
A12		Mechanical interlock	PRSL7816PI
A13		Cable sleeve - NPA 2-6 buttons	PRGO0100PE
		Cable sleeve - NPA 8-12 buttons	PRGO0105PE
A14		Wire fixing	PRT06626PE
A15		Hook	PRGA0001PE

Accessories

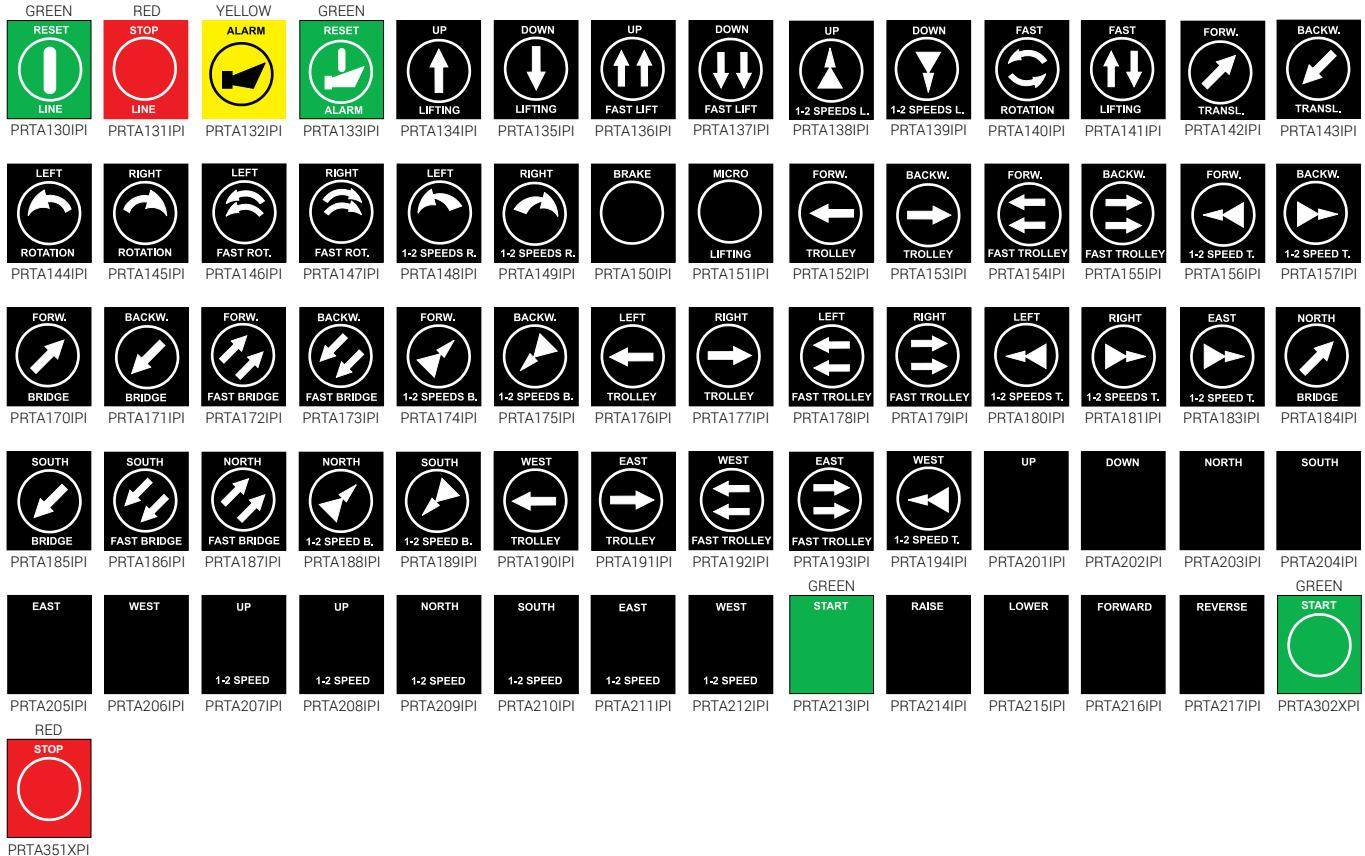
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Ref.	Drawing	Description	Code
A19		22 mm connecting bridge	PRTR6120PE
		28 mm connecting bridge	PRTR6121PE
		25 mm connecting bridge	PRTR6122PE
		31 mm connecting bridge	PRTR6123PE
		47 mm connecting bridge	PRTR6124PE
A20		Cable sleeve holder - NPA 2-6 buttons	PRSL9735PI
		Cable sleeve holder - NPA 8-12 buttons	PRSL9740PI
A21		Upper cover with tightening rubber - NPA 2 buttons	PRSL5810PI
		Upper cover with tightening rubber - NPA 3 buttons	PRSL5838PI
		Upper cover with tightening rubber - NPA 4 buttons	PRSL5815PI
		Upper cover with tightening rubber - NPA 6 buttons	PRSL5820PI
		Upper cover with tightening rubber - NPA 8 buttons	PRSL5825PI
		Upper cover with tightening rubber - NPA 10 buttons	PRSL5830PI
		Upper cover with tightening rubber - NPA 12 buttons	PRSL5835PI
A22		Central section - NPA 2 buttons	PRSL5811PI
		Central section - NPA 3 buttons	PRSL5839PI
		Central section - NPA 4 buttons	PRSL5816PI
		Central section - NPA 6 buttons	PRSL5821PI
		Central section - NPA 8 buttons	PRSL5826PI
		Central section - NPA 10 buttons	PRSL5831PI
		Central section - NPA 12 buttons	PRSL5836PI
A23		Lower enclosure, tightening rubber, screws - NPA 2 buttons	PRSL5812PI
		Lower enclosure, tightening rubber, screws - NPA 3 buttons	PRSL5840PI
		Lower enclosure, tightening rubber, screws - NPA 4 buttons	PRSL5817PI
		Lower enclosure, tightening rubber, screws - NPA 6 buttons	PRSL5822PI
		Lower enclosure, tightening rubber, screws - NPA 8 buttons	PRSL5827PI
		Lower enclosure, tightening rubber, screws - NPA 10 buttons	PRSL5832PI
		Lower enclosure, tightening rubber, screws - NPA 12 buttons	PRSL5837PI
A24		Cable clamp	PRSL9210AU
A25		Screws for cable clamp	PRVI0089PE

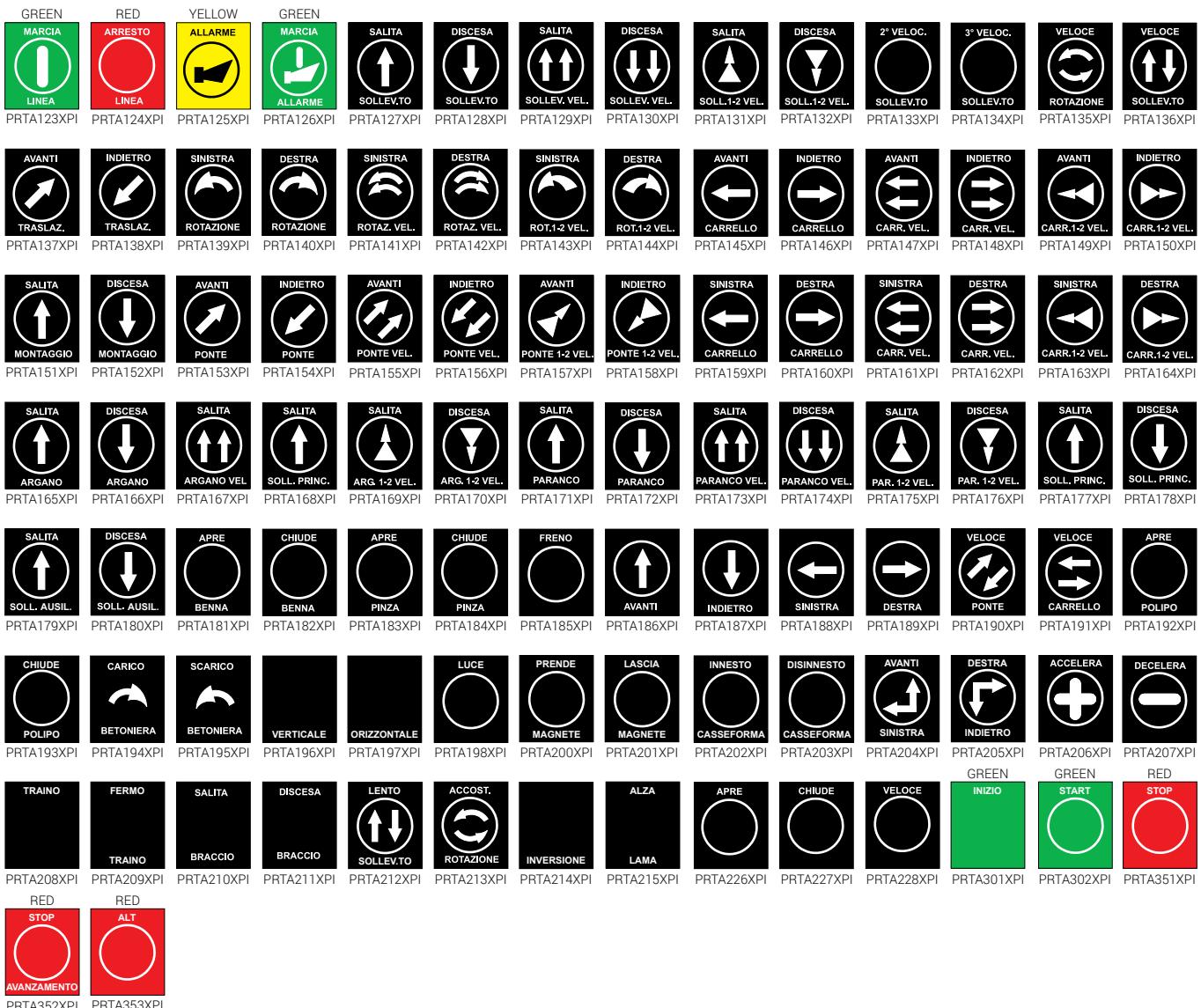
Standard buttons - Symbols



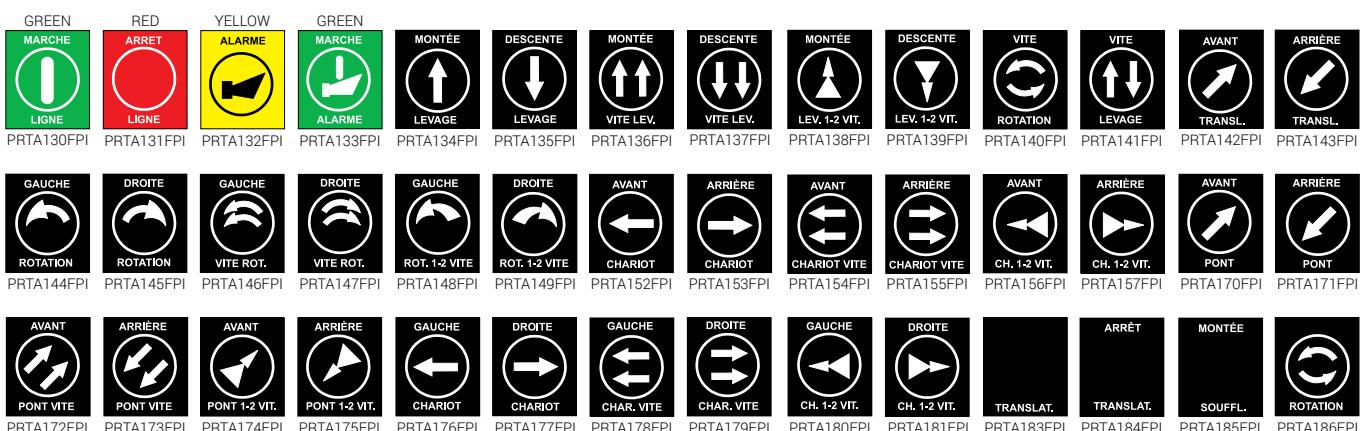
Standard buttons - English



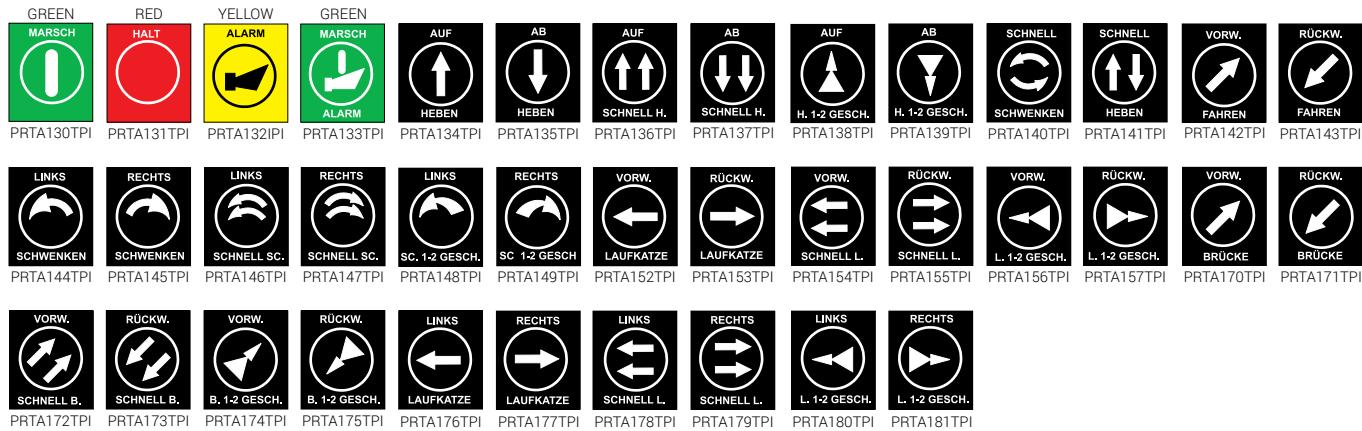
Standard buttons - Italian



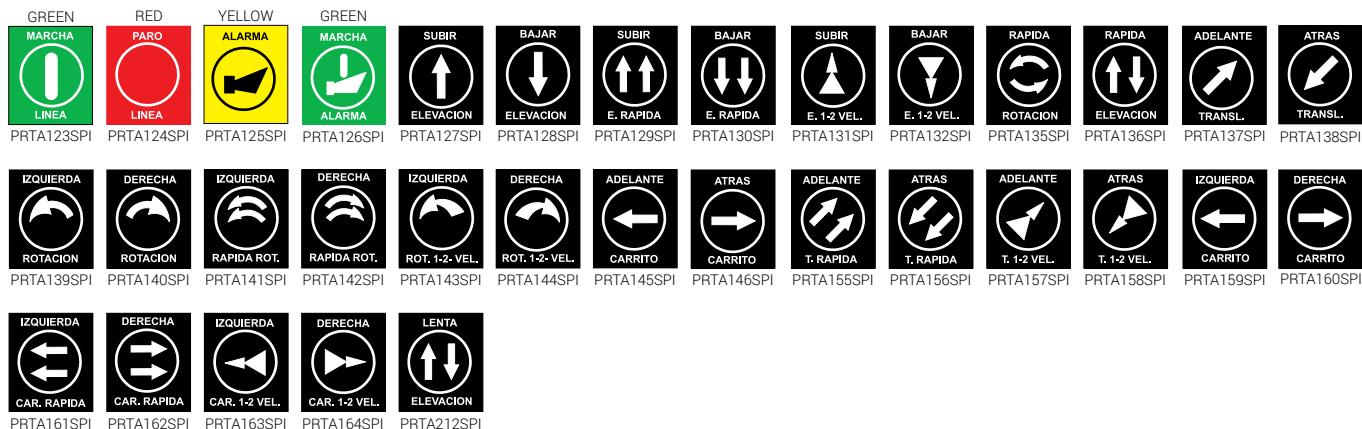
Standard buttons - French



Standard buttons - German



Standard buttons - Spanish

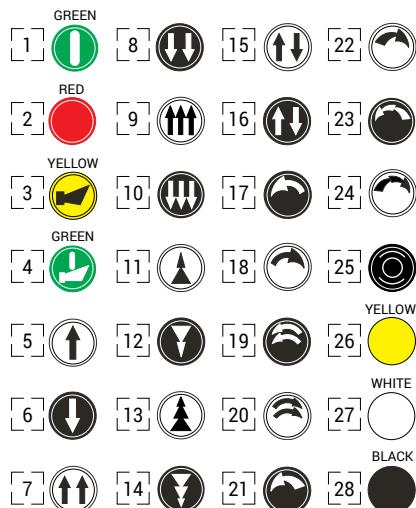


Standard disks



NPA - REQUEST FORM FOR NON STANDARD CONTROL STATION

Disk for dust-tight pushbutton



Switches

- A PRSL0501PI Lamp holder
- B PRSL0502PI Switch 1NC
- C PRSL0503PI Switch 1NO
- D PRSL0504PI Switch 1 speed
1NO+1NC+1NO simultaneous
- E PRSL0505PI Switch 2 speeds
1NO+1NC+1NO sequenced
- F PRSL0506PI Switch 1 speed
3NO simultaneous
- G PRSL0507PI Switch 3 speeds
3NO sequenced

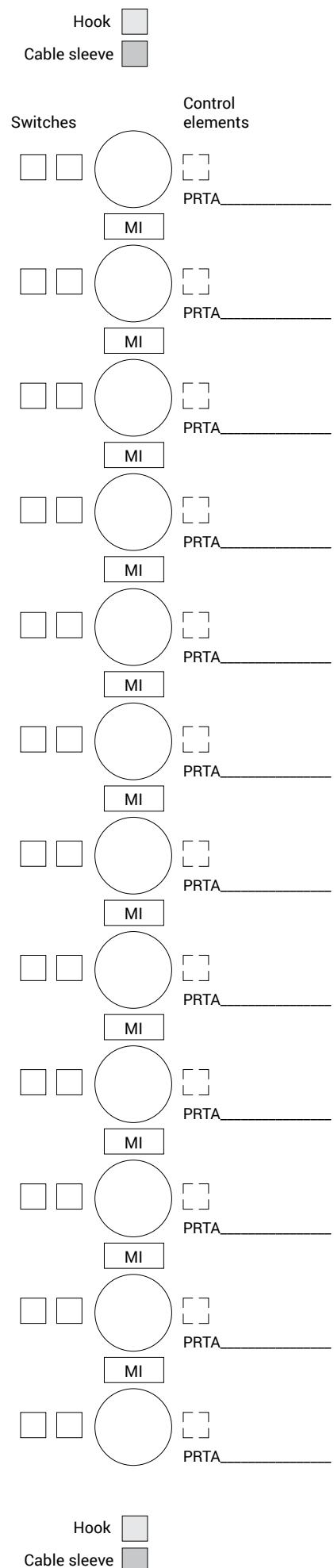
Control elements

- 30 PRTAXXXXXX Pushbutton
- 31 PRSL0517PI Blanking plug
- 32 PRSL0500PI Latched mushroom pushbutton for emergency stop
- 33 PRSL0512PI Impulse mushroom pushbutton
- 34 PRSL0520PI Key mushroom pushbutton
- 35 PRSL0513PI 2 or 3 maintained positions key selector switch
- 36 PRSL0514PI 2 or 3 maintained positions selector switch
- 37 PRSL0519PI Spring return 2 or 3 positions selector switch
- 38 PRSL0515PI Red pilot light
- 39 PRSL0516PI Green pilot light
- 40 PRSL0521PI Yellow pilot light

Instructions

- Fill in the chart to the left according to the number of control elements required (2, 3, 4, 6, 8, 10, or 12 actuators).
- Enter the number corresponding to the control element required. For dust-tight pushbuttons enter the number corresponding to the symbol required; for standard pushbuttons write the code number. Mark the direction of the arrow into the corresponding circle.
- Enter the letters corresponding to the switches required (max. 2) into the unbroken boxes.
- Tick the box corresponding to the mechanical interlock between pushbuttons when required . MI
- Tick the appropriate box to show where the cable sleeve and the hook must be assembled (top or bottom).

Remarks



CHARLIE

Pendant control station



Compact-sized pendant station for auxiliary control. Modern user-friendly design, developed by an industrial design firm on technical, anthropomorphic, futuristic and ergonomic specifications. Easy to handle and designed to reduce installation time and costs and maintenance down time.

FEATURES

- Reduced time and costs for installation and wiring: the switches are assembled inside the pendant station without screws, with all the terminals facing the cable inlet and screws in the opposite direction to facilitate wiring.
- A threaded ring is used to secure the enclosure and cover, providing easy access to the internal components without any need for tools or screws.
- Thanks to the hollow handle the control station can be quickly and easily set down onto a pin.
- The emergency stop mushroom pushbutton complies with standard EN 418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Charlie is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration with 2 or 3 actuators.
- Single switches with NO or NC contacts and double switches with NO contacts, one or two speeds, with electrical interlock to prevent simultaneous operation of opposite functions.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

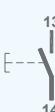
CERTIFICATIONS

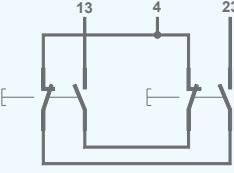
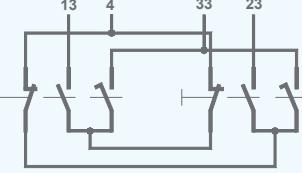
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE EAC

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	Cable clamp M20 Spiral cable clamp M20
Operating positions	Any position
Weight	~ 320 g

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL1000PI	PRSL1001PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double break, slow action	Double break, slow action
Contacts	1NO	1NC
Scheme		
Markings and homologations	CE cULus EAC	

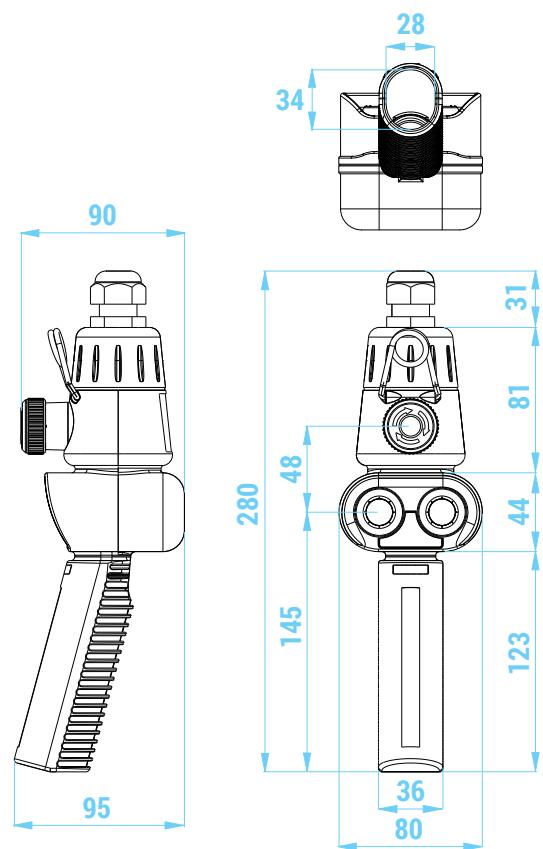
Code	PRSL1002PI	PRSL1003PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1×10^6 operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double switch, 1 speed	Double switch, 2 speeds
Contacts	2NO+common	3NO+common
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE LAMP HOLDERS

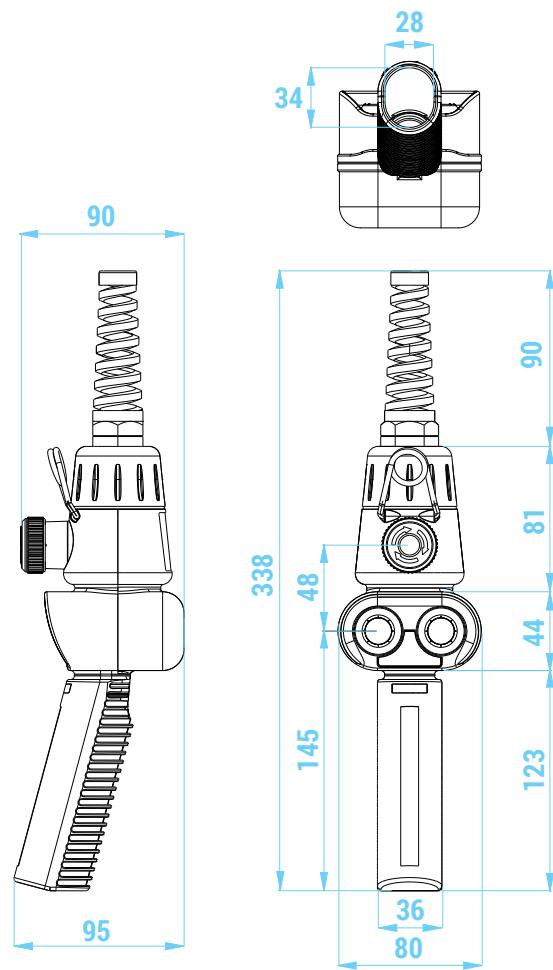
Code	PRSL1004PI
Maximum voltage	125 V
Maximum power	2.6 W
Lamp type	T5.5K 22 mm
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Tightening torque	0.6 Nm
Markings and homologations	

OVERALL DIMENSIONS (mm)

With cable clamp M20



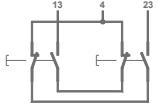
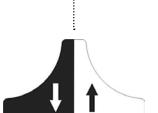
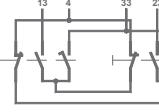
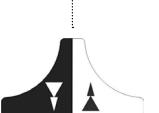
With spiral cable clamp M20



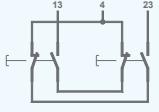
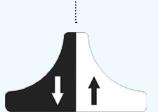
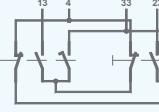
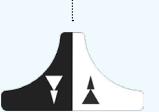
STANDARD CONTROL STATIONS

Standard control stations are equipped with cable clamp M20, hook and electrical interlock between opposite function pushbuttons.

2 actuators

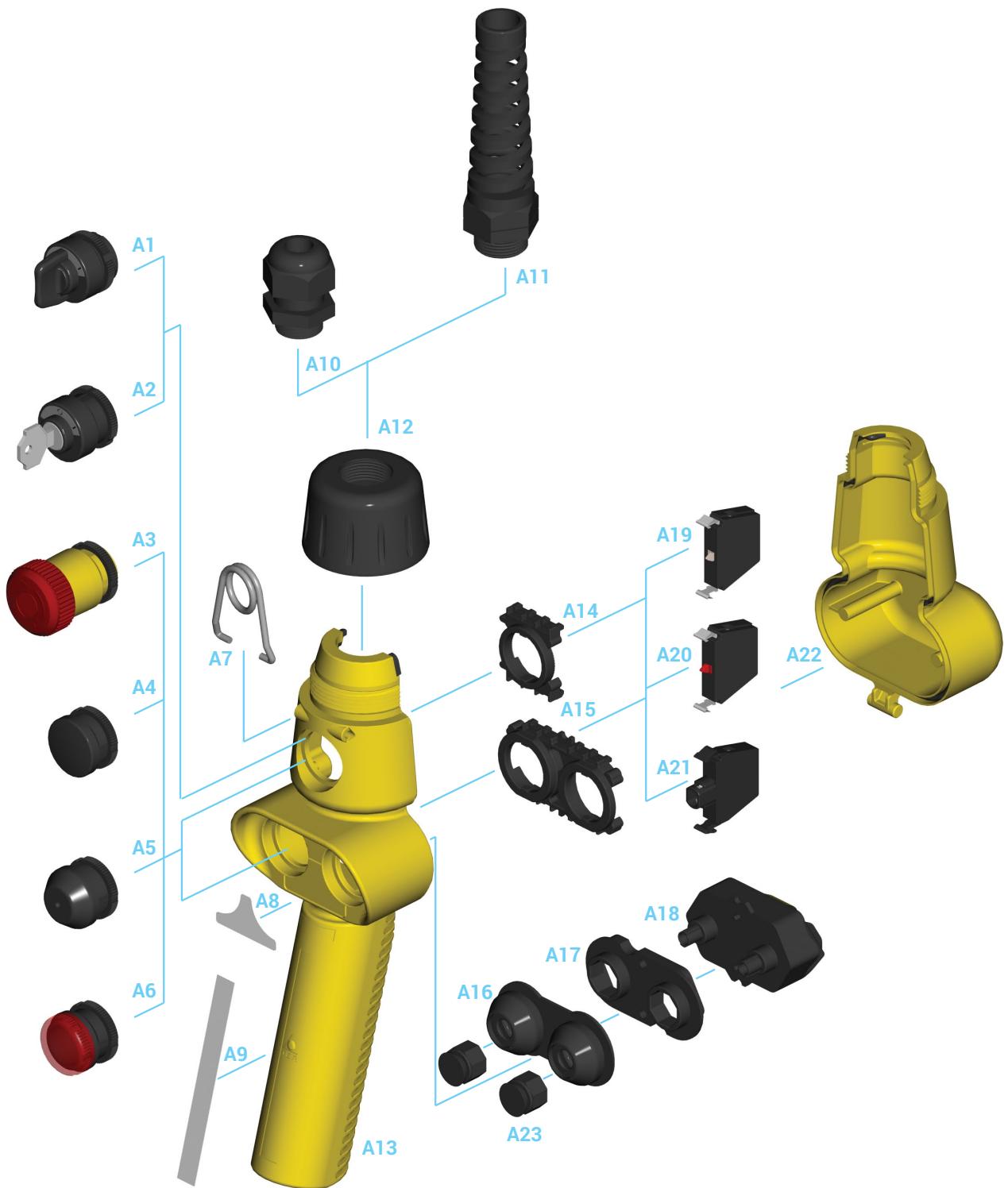
PF39020001			PF39020002		
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type
	PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton 		PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton 

3 actuators

PF39030001			PF39030002		
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type
	PRSL1001PI 1NC	Latched mushroom pushbutton		PRSL1001PI 1NC	Latched mushroom pushbutton
	PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton 		PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton 

ASSEMBLY DRAWING

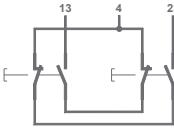
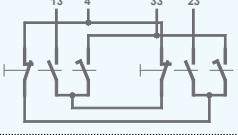
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Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Selector switches" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A18		1 speed, 2NO+common double switch		PRSL1002PI
		2 speeds, 3NO+common double switch		PRSL1003PI
A19		1NO switch		PRSL1000PI
A20		1NC switch		PRSL1001PI
A21		Lamp holder	-	PRSL1004PI

Actuators

Ref.	Drawing	Description	Code
A4		Blanking plug	PRSL1023PI
A5		Single pushbutton	PRTS000001
A16		Rubber for double pushbutton	PRGO0020PE
A16+A23		Double pushbutton with rubber	PRTD000001
A17		Holding plate for double pushbutton	PRSL8737PI

Pilot lights

Ref.	Drawing	Color	Code
A6		Red	PRSL1012PI
		Yellow	PRSL1013PI
		Green	PRSL1014PI

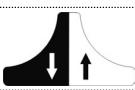
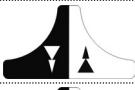
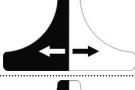
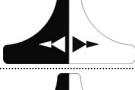
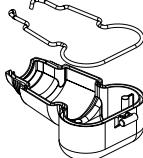
Mushroom pushbuttons

Ref.	Drawing	Description	Code
A3		Latched mushroom pushbutton for emergency stop	PRSL1009PI

Selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A1		0/1	X			PRSL1015PI
		0/1		X		PRSL1016PI
		1/0/2	X			PRSL1026PI
		1/0/2		X		PRSL1027PI
A2		0/1		X	0	PRSL1017PI
		0/1	X		0	PRSL1024PI

Accessories

Ref.	Drawing	Description	Code
A7		Hook	PRGA0015PE
A8		Label	ET39030001
		Label	ET39030021
		Label	ET39030014
		Label	ET39030069
		Label	ET39030015
		Label	ET39030007
A9		Blank label for handle	PRET0127PE
A10		Cable clamp M20	PRPS0064PE
A11		Spiral cable clamp M20	PRPS0025PE
A12		Closing ring for cable clamp and spiral cable clamp	PRSL5524PI
A13		Cover	PRSL5008PI
A14		Holding plate for 3 switches	PRSL8739PI
A15		Holding plate for 2+2 switches	PRSL8735PI
A22		Enclosure	PRSL5518PI

CHARLIE - REQUEST FORM FOR NON STANDARD CONTROL STATION

Control elements	Label symbols	
① PRTS000001 Single pushbutton		Cable clamp M20
② PRTD000001 Double pushbutton		Spiral cable clamp M20
③ PRSL1023PI Blanking plug		
④ PRSL1009PI Emergency stop mushroom pushbutton		
⑤ PRSL1012PI Red pilot light		
⑥ PRSL1013PI Yellow pilot light		
⑦ PRSL1014PI Green pilot light		
⑧ PRSL1015PI Selector switch 0/1 spring return		
⑨ PRSL1016PI Selector switch 0/1 maintained positions		
⑩ PRSL1026PI Selector switch 1/0/2 spring return		
⑪ PRSL1027PI Selector switch 1/0/2 maintained positions		
⑫ PRSL1017PI Key selector switch 0/1 maintained positions		
⑬ PRSL1024PI Key selector switch 0/1 spring return		

Single switches

- PRSL1000PI 1NO
 - PRSL1001PI 1NC
 - PRSL1004PI Lamp holder

Double switches

- PRSL1002PI 1 speed
 - PRSL1003PI 2 speeds

Instructions

- Fill in the chart according to the number of control elements required.
 - Enter the number corresponding to the control element required in the circle. Selector switches can be mounted only in the central position.
 - In the broken-line box enter the number corresponding to the symbol required on the label. Next to the number mark the direction of the arrow and the customized lettering, if requested.
 - In the unbroken boxes enter the letters corresponding to the single or double switches required.
 - Tick the box if the cable clamp or the spiral cable clamp is required.
 - The label on the handle of the control station can be customized on request: please write the text requested under Remarks or e-mail the logo.

Remarks

REMARKS

SPA

Pendant control station



Pendant control station for auxiliary control, sturdy and reliable, designed for heavy industry.
Modular enclosure with actuators arranged on a double row to pair opposite functions and keep size compact.

FEATURES

- Modular enclosure with actuators arranged on a double row to enable grouping of a large number of functions in a single control.
- Rectangular pushbuttons in thermoplastic material or rubber pushbuttons with symbol disks to ensure protection against dust.
- The emergency stop mushroom pushbutton complies with standard EN 418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: SPA is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration from 2 to 20 actuators, arranged on a double row.
- One or two speed switches with NO or NC contacts.
- Double switches with mechanical interlock to prevent simultaneous operation of opposite functions.
- Wide range of actuators: pushbuttons, selector switches and key-selector switches, pilot lights, impulse or latched mushroom pushbuttons with rotation release.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

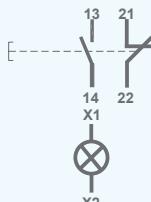
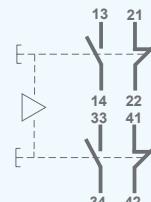
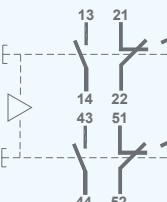
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Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	 

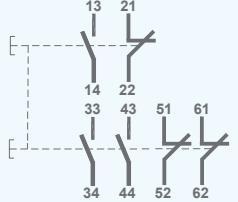
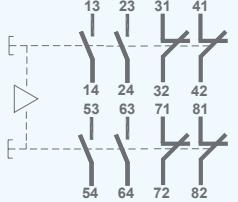
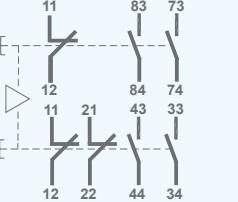
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	Rubber cable sleeve (Ø 14÷26 mm)
Operating positions	Any position

TECHNICAL SPECIFICATIONS OF THE SWITCHES

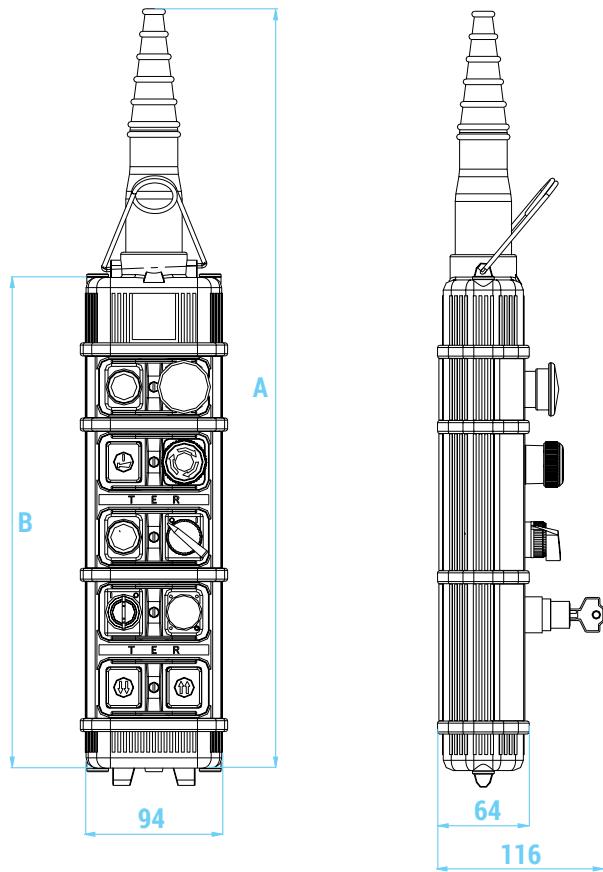
Code	PRSL0073XX	PRSL0074XX	PRSL0075XX
Utilisation category		AC 15	
Rated operational current		1.9 A	
Rated operational voltage		380 Vac	
Rated thermal current		10 A	
Rated insulation voltage		500 Vac	
Mechanical life		1x10 ⁶ operations	
Connections		Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)		
Tightening torque		0.8 Nm	
Microswitch type	Single switch, 1 speed with lamp holder with bayonet coupling (bulb not supplied)	Double switch, 1 speed with mechanical interlock	Double switch, 2 speeds with mechanical interlock
Contacts	1NO+1NC	1NO+1NC/1NO+1NC	1NO+1NC+1NO/1NO+1NC+1NO
Scheme			
Markings and homologations	 		



Code	PRSL0076XX	PRSL0077XX	PRSL0090XX
Utilisation category		AC 15	
Rated operational current		1.9 A	
Rated operational voltage		380 Vac	
Rated thermal current		10 A	
Rated insulation voltage		500 Vac	
Mechanical life		1x10 ⁶ operations	
Connections		Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)		
Tightening torque		0.8 Nm	
Microswitch type	Double switch, 1 speed	Double switch, 1 speed with mechanical interlock	Double switch, 2 speeds with mechanical interlock
Contacts	1NO+1NC/2NO+2NC	2NO+2NC/2NO+2NC	1NC+2NO/2NC+2NO
Scheme			
Markings and homologations	 		

OVERALL DIMENSIONS (mm)

2

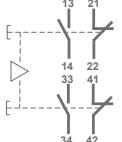
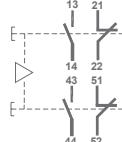


No. of actuators	Dimensions (mm)		Weight (kg)
	A	B	
2	318	132	0.520
4	370	184	0.700
6	422	236	0.880
8	474	288	1.040
10	526	340	1.300
12	578	392	1.380
14	630	444	1.550
16	682	496	1.710
18	734	548	1.890
20	786	600	2.050

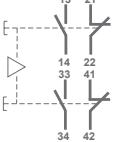
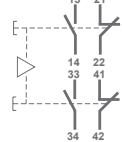
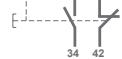
STANDARD CONTROL STATIONS

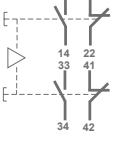
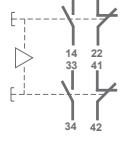
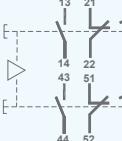
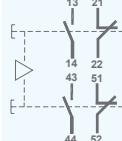
Standard control stations are equipped with cable sleeve, hook and mechanical interlock between opposite function pushbuttons.

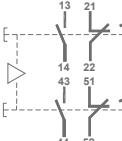
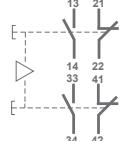
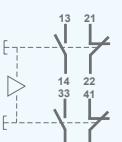
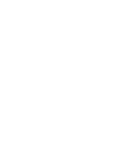
2 actuators

PF02020007			PF02020039				
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type		
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 		PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton 

4 actuators

PF02040185			PF02040241				
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type		
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Blanking plug	Latched mushroom pushbutton		PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 		PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 

PF02040186			PF02040240				
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type		
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	-	Latched mushroom pushbutton		PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Latched mushroom pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton 		PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton 

PF02040242			PF02040063				
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type		
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton 		PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 		PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 

PF02040243

Switch scheme	Switch type	Actuator type	
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton

6 actuators**PF02060455**

Switch scheme	Switch type	Actuator type	
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Blanking plug 	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton

PF02060401

Switch scheme	Switch type	Actuator type	
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Blanking plug 	Latched mushroom pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton

PF02060456

Switch scheme	Switch type	Actuator type	
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Blanking plug 	Latched mushroom pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton

PF02060439

Switch scheme	Switch type	Actuator type	
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton 	Latched mushroom pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton 	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton

PF02060355

Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton

PF02060356

Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton

8 actuators

PF02080237

Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton

PF02080440

Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton

PF02080702

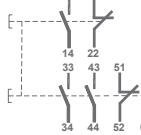
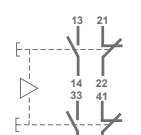
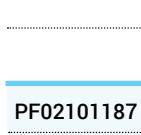
Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton

PF02080703

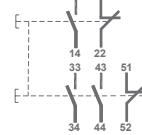
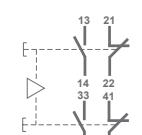
Switch scheme	Switch type	Actuator type
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0075XX 1NO+1NC/1NO+1NC 2 speeds	Pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton

10 actuators

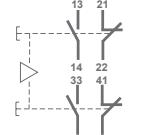
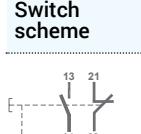
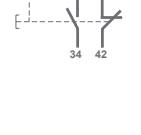
PF02100324

Switch scheme	Switch type	Actuator type	
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton  GREEN	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 

PF02100308

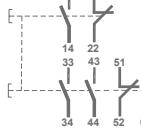
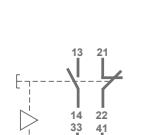
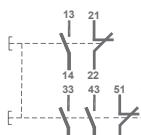
Switch scheme	Switch type	Actuator type	
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton  GREEN	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 

PF02101187

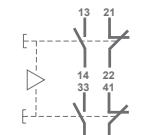
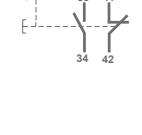
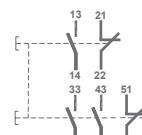
Switch scheme	Switch type	Actuator type	
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton  YELLOW	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton  GREEN	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 

12 actuators

PF02120306

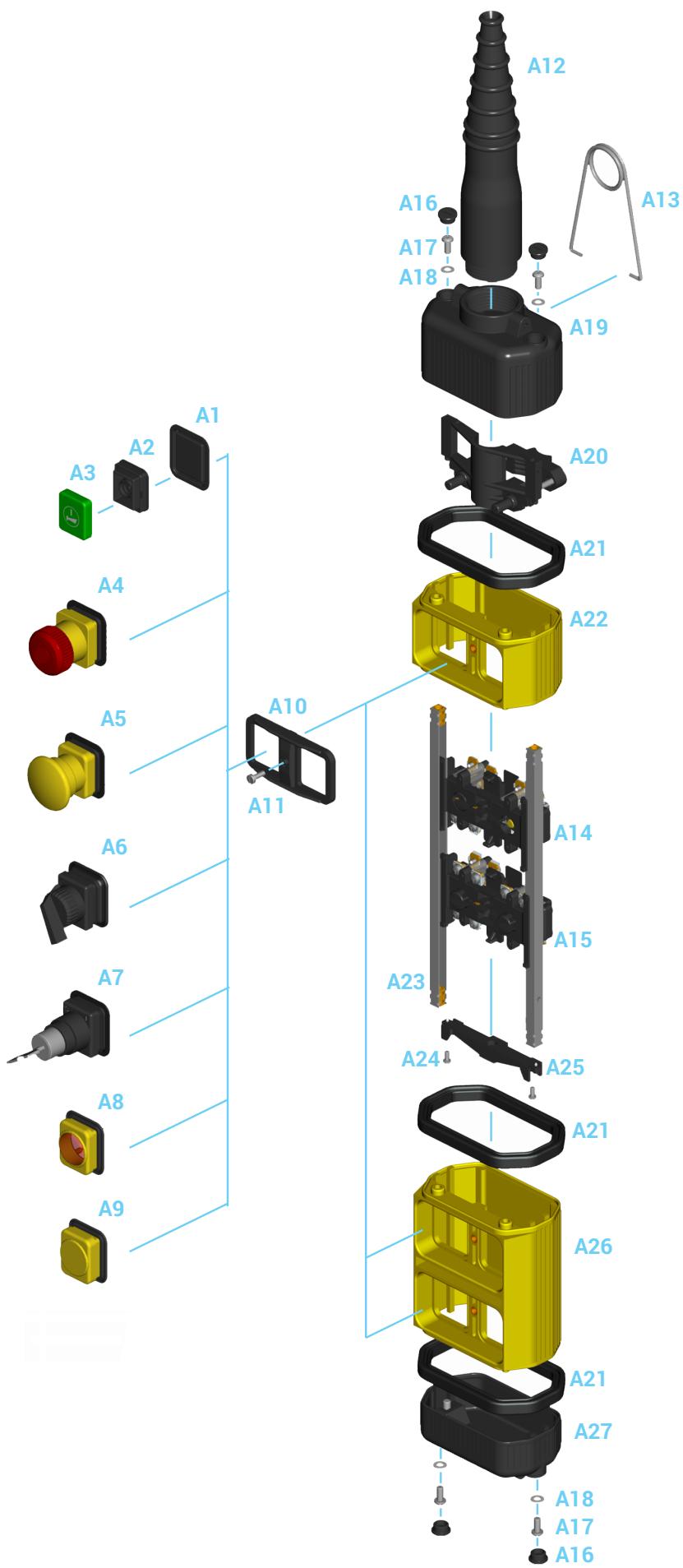
Switch scheme	Switch type	Actuator type	
	PRSL0076XX 1NO+1NC/2NO+2NC 1 speed	Pushbutton  GREEN	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1INC 1 speed	Pushbutton 	Pushbutton 

PF02101187

Switch scheme	Switch type	Actuator type	
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton  YELLOW	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton  GREEN	Latched mushroom pushbutton
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 
	PRSL0074XX 1NO+1NC/1NO+1NC 1 speed	Pushbutton 	Pushbutton 



ASSEMBLY DRAWING

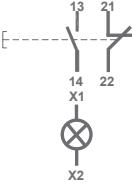
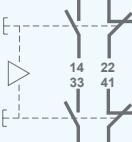
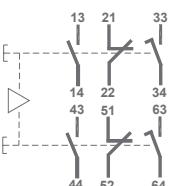
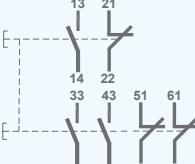
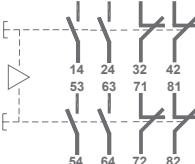
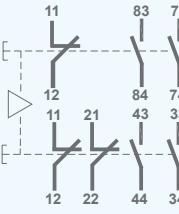


Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Mushroom pushbuttons" and "Accessories".

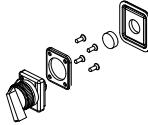
COMPONENTS

Switches

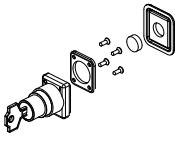
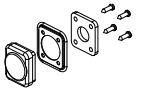
2

Ref.	Drawing	Description	Scheme	Code
A14		1 speed, 1NO+1NC single switch with lamp holder with bayonet coupling (bulb not supplied)		PRSL0073XX
		1 speed, 1NO+1NC/1NO+1NC double switch with mechanical interlock		PRSL0074XX
		2 speed, 1NO+1NC+1NO/1NO+1NC+1NO double switch with mechanical interlock		PRSL0075XX
A15		1 speed, 1NO+1NC/2NO+2NC double switch		PRSL0076XX
		1 speed, 2NO+2NC/2NO+2NC double switch with mechanical interlock		PRSL0077XX
		2 speed, 1NC+2NO/2NC+2NO double switch with mechanical interlock		PRSL0090XX

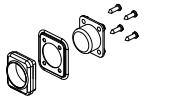
Actuators

Ref.	Drawing	Description	Code
A1		Rubber for button	PRGU6031PE
A2		Button holder	PRSL9284PI
A3		Button	PRTA See standard buttons
A6		Selector switch 0/1 maintained positions	PRSL3540PI
		Selector switch 1/0/2 maintained positions	PRSL3543PI

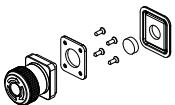
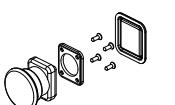
Actuators

Ref.	Drawing	Description	Code
A7		Key selector switch 0/1 maintained positions, pull-out position 0	PRSL3539PI
A9		Blanking plug	PRSL5557PI

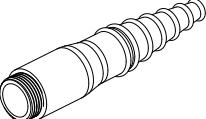
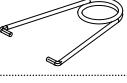
Pilot lights

Ref.	Drawing	Color	Code
A8		Red	PRSL3534PI
		Green	PRSL3535PI
		Yellow	PRSL3542PI

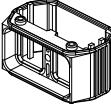
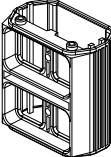
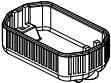
Mushroom pushbuttons

Ref.	Drawing	Description	Code
A4		Latched mushroom pushbutton for emergency stop	PRSL3500PI
A5		Impulse mushroom pushbutton	PRSL3531PI

Accessories

Ref.	Drawing	Description	Code
A10		Frame with 2 holes	PRSL5535PI
		Frame with 1 hole	PRSL5537PI
		Frame without holes	PRSL5538PI
A11		Screw for frame	PRVI6027PE
A12		Cable sleeve	PRSL0145PE
A13		Hook	PRGA0012PE
A16		Head plug	PRSL8610PI
A17		Head locking screw	PRVI1020PE
A18		Washer	PRRN1061PE
A19		Upper head	PRSL5525PI

Accessories

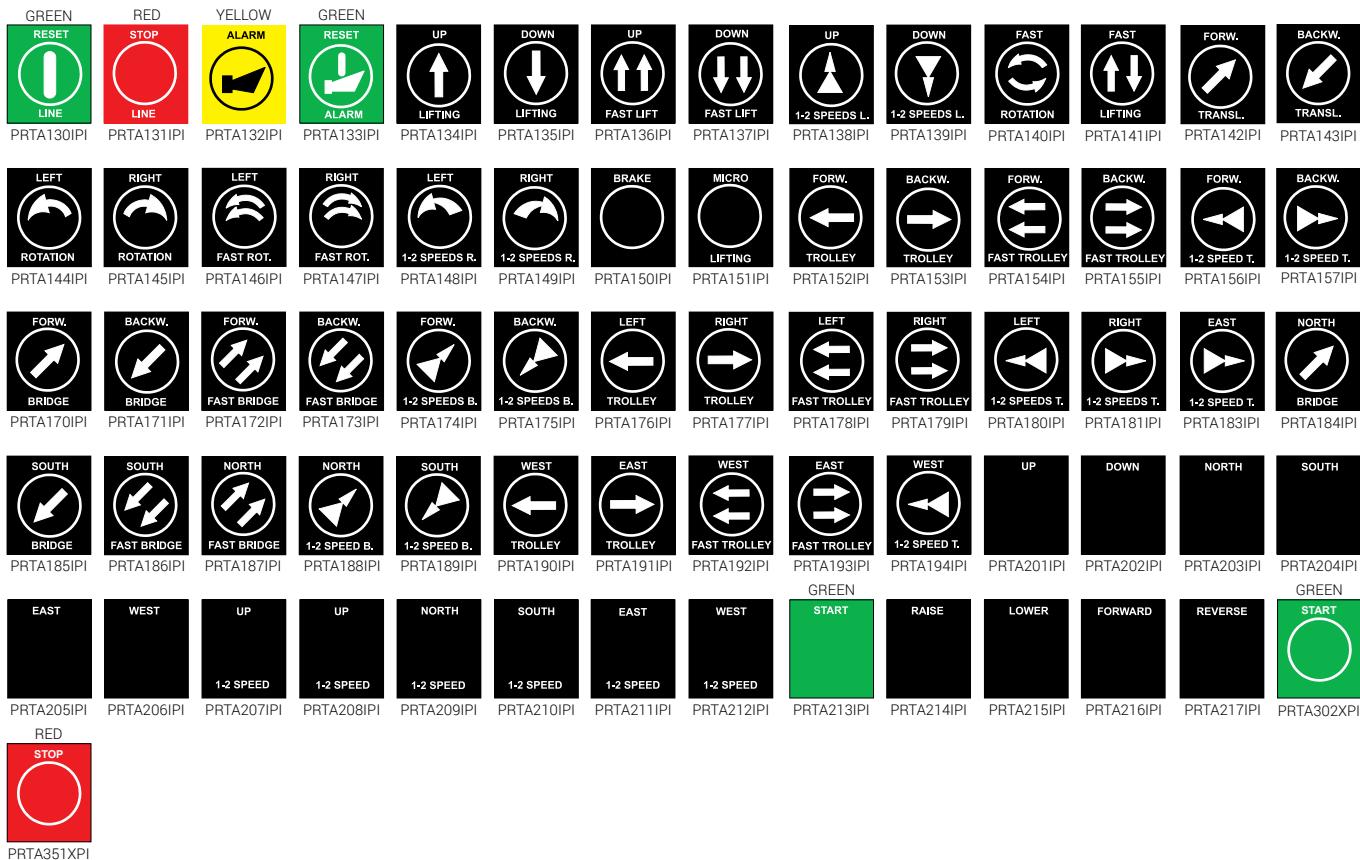
Ref.	Drawing	Description	Code
A20		Cable clamp with screws	PRSL3545PI
A21		Tightening rubber	PRGU6021PE
A22		Single section	PRSL5016AU
A23		Rod for SPA 2 buttons	PRTR0071PE
		Rod for SPA 4 buttons	PRTR0076PE
		Rod for SPA 6 buttons	PRTR0081PE
		Rod for SPA 8 buttons	PRTR0086PE
		Rod for SPA 10 buttons	PRTR0091PE
		Rod for SPA 12 buttons	PRTR0096PE
		Rod for SPA 14 buttons	PRTR0101PE
		Rod for SPA 16 buttons	PRTR0106PE
		Rod for SPA 18 buttons	PRTR0111PE
		Rod for SPA 20 buttons	PRTR0116PE
A24		Screw	PRVI0005PE
A25		Switch holder with screw	PRSL3558PI
A26		Double section	PRSL5017AU
A27		Lower head	PRSL5530PI

Standard buttons - Symbols

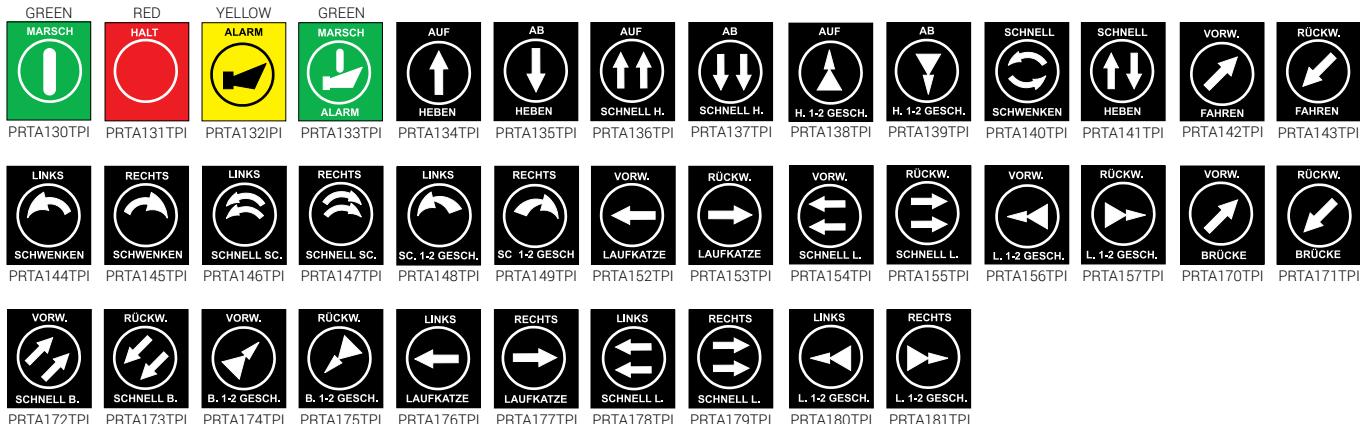
													
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PRTA119XPI	PRTA119XPB	PRTA120XPI	PRTA121XPI	PRTA121XPB	PRTA216XPI	PRTA217XPI	PRTA218XPI	PRTA219XPI	PRTA374XPI	PRTA375XPI	PRTA375XPB	PRTA376XPI	PRTA377XPI
													
PRTA122XPI	PRTA199XPI	PRTA220XPI	PRTA221XPI	PRTA229XPI									



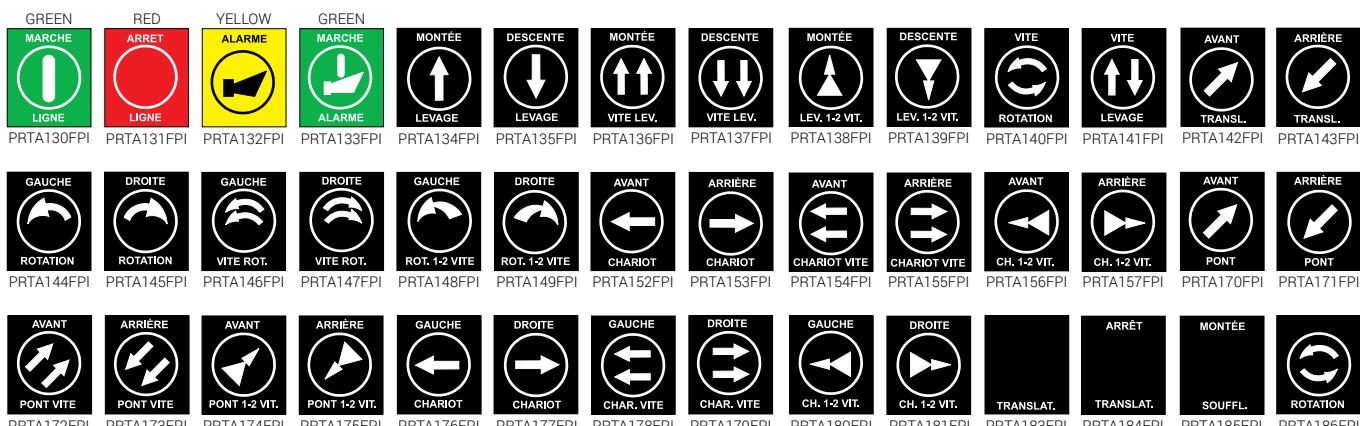
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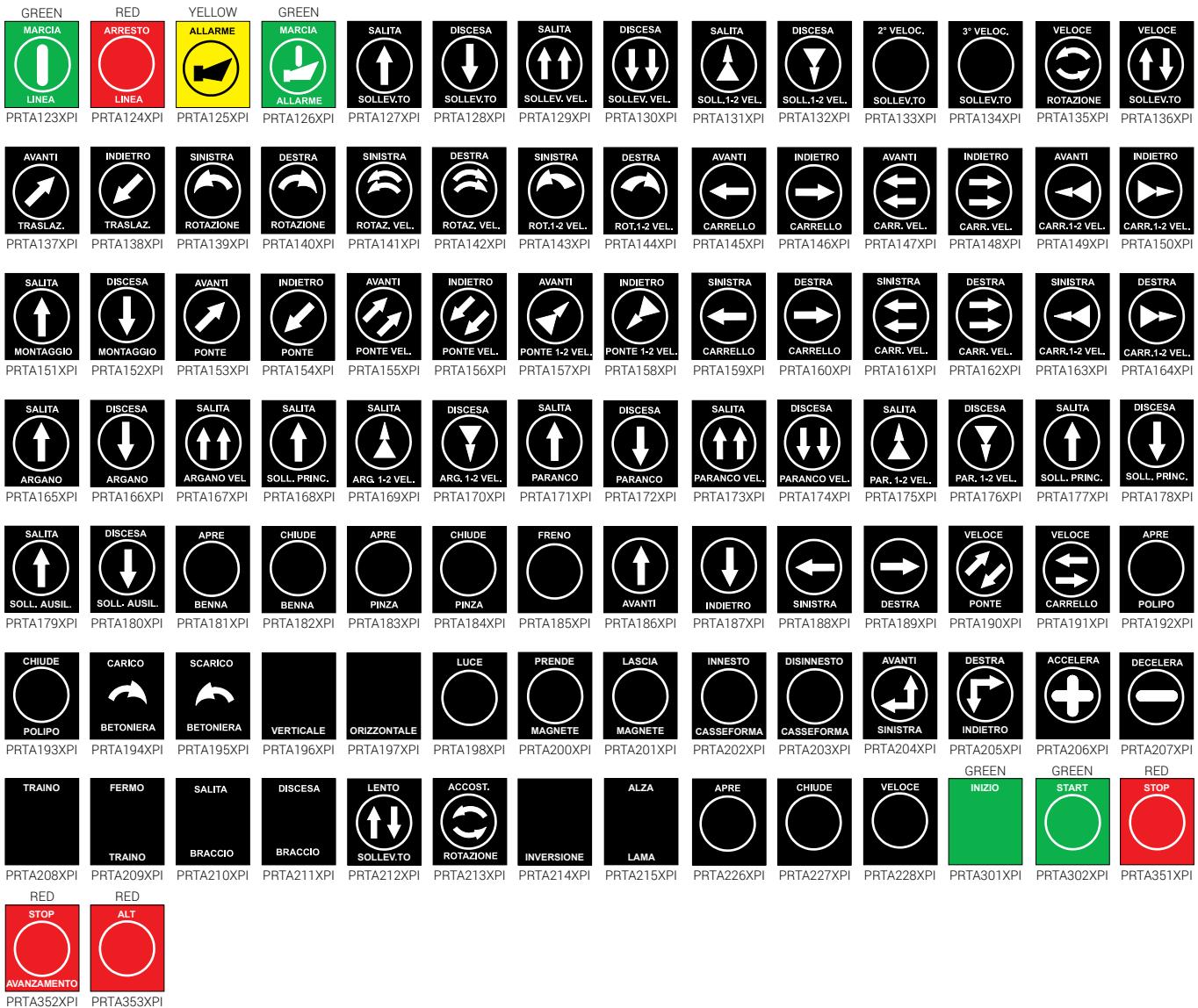
Standard buttons - German



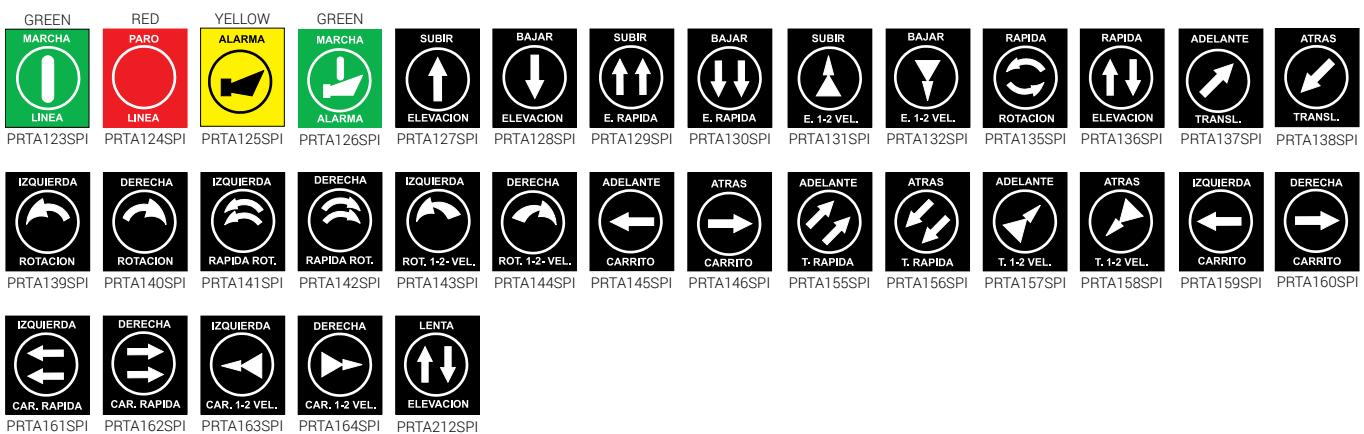
Standard buttons - French



Standard buttons - Italian



Standard buttons - Spanish



SPA - REQUEST FORM FOR NON STANDARD CONTROL STATION

Control elements

- PRSL3500PI Emergency stop mushroom pushbutton
- PRSL3531PI Impulse mushroom pushbutton
- PRSL3539PI 2 position key selector switch
- PRSL3540PI 2 position selector switch
- PRSL3543PI 3 position selector switch
- PRSL3534PI Red pilot light
- PRSL3535PI Green pilot light
- PRSL3542PI Yellow pilot light
- PRSL5557PI Blanking plug

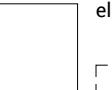
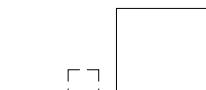
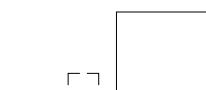
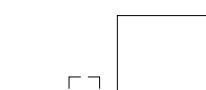
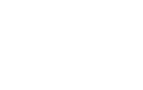
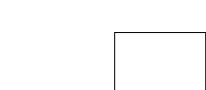
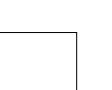
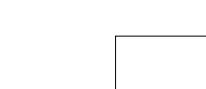
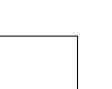
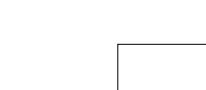
Switches

- PRSL0073XX 1NO+1NC/Lamp holder
- PRSL0074XX 1NO+1NC/1NO+1NC
- PRSL0075XX 2NO+1NC/2NO+1NC
- PRSL0076XX 1NO+1NC/2NO+2NC
- PRSL0076XX 2NO+2NC/1NO+1NC
- PRSL0077XX 2NO+2NC/2NO+2NC
- PRSL0090XX 1NC+2NO/2NC+2NO

Instructions

- Fill in the chart to the left according to the number of control elements required (2, 4, 6, 8, 10, 12, 14, 16, 18 or 20 actuators).
- Enter the number corresponding to the control element required (broken-line box). When buttons are required, fill in the PRTA_____ code and mark the direction of the arrow into the corresponding box.
- Enter the number corresponding to the switches required.
- Tick the box corresponding to the mechanical interlock between pushbuttons when required. MI
- Tick the appropriate box to show where the cable sleeve and the hook must be assembled (top or bottom).

Remarks

Control elements  PRTA _____	Hook <input type="checkbox"/> Cable sleeve <input type="checkbox"/> Switches  <input type="checkbox"/> MI PRTA _____	Control elements  PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
 PRTA _____	 <input type="checkbox"/> MI PRTA _____	 PRTA _____
Hook <input type="checkbox"/> Cable sleeve <input type="checkbox"/>		

REMARKS

2

ALPHA

Pendant control station



Pendant control station for auxiliary control with an innovative and modern design, where all the graphic elements refer to specific technical functions. Resulting from a thorough analysis of the ergonomic features combined with the research of a graphic style suitable for a modern industrial environment, Alpha is easy to handle through its size and shape.

FEATURES

- Reduced installation and wiring time and costs: the switches feature terminals facing the cable clamp of the control station and screws on the opposite site to facilitate wiring.
- The control station has an angle of inclination giving the operator the best view of all the control elements and enabling a natural, comfortable working position.
- The emergency stop mushroom pushbutton complies with standard EN 418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Alpha is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configurations from 2 to 13 actuators arranged on a double row.
- Single or double switches with NO or NC contacts featuring one or two speeds.
- Wide range of actuators: pushbuttons, selector switches and key-selector switches in various operation configurations, pilot lights, latched mushrooms pushbuttons with rotation release or key-operated.
- Available with label (symbols and lettering) to be stuck next to the actuators.

CERTIFICATIONS

- CE marking and EAC certifications.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

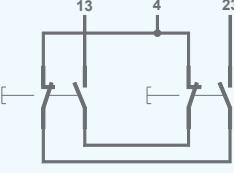
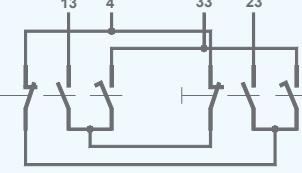
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE EAC

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	Rubber cable sleeve (Ø 14÷26 mm)
Operating positions	Any position

TECHNICAL SPECIFICATIONS OF THE SWITCHES

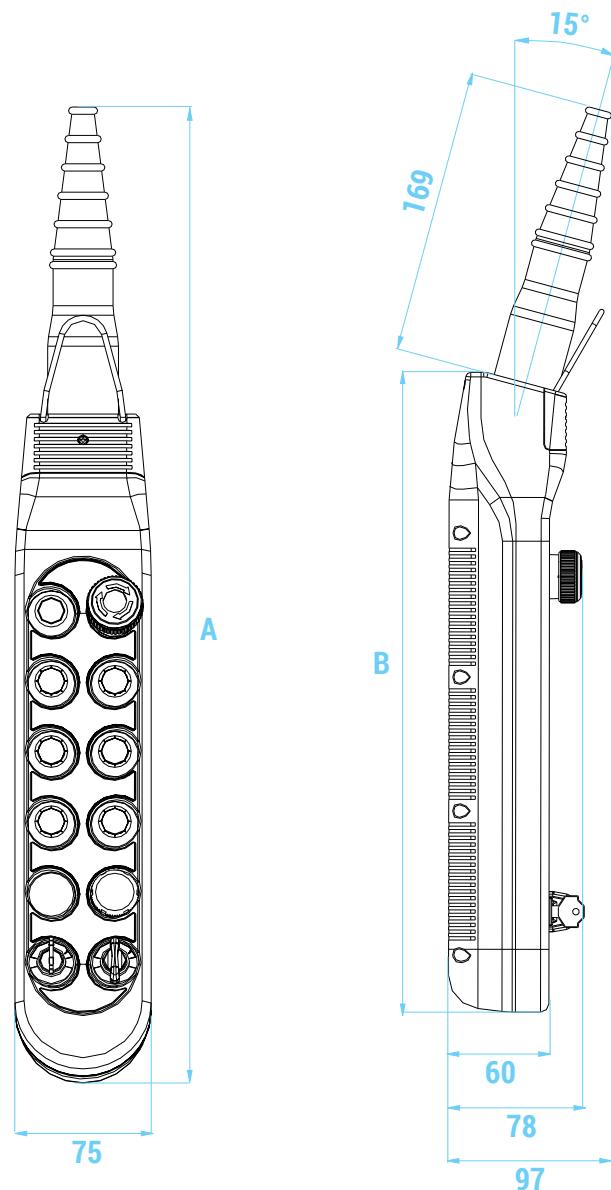
Code	PRSL1000PI	PRSL1001PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double break, slow action	Double break, slow action
Contacts	1NO	1NC
Scheme		
Markings and homologations	CE cUL us EAC	

Code	PRSL1002PI	PRSL1003PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double switch, 1 speed	Double switch, 2 speeds
Contacts	2NO+common	3NO+common
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE LAMP HOLDERS

Code	PRSL1004PI
Maximum voltage	125 V
Maximum power	2.6 W
Lamp type	T5.5K 22 mm
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Tightening torque	0.6 Nm
Markings and homologations	

OVERALL DIMENSIONS (mm)

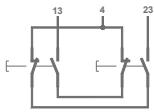
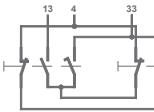


No. of actuators	Dimensions (mm)	
	A	B
2 - 3 - 4 - 5	382	222
6 - 7 - 8 - 9	462	302
10 - 11 - 12 - 13	542	382

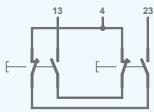
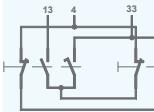
STANDARD CONTROL STATIONS

Standard control stations are equipped with cable sleeve, hook and electrical interlock between opposite function pushbuttons.

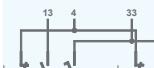
2 actuators

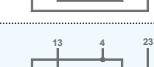
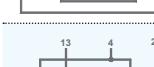
PF38020005				PF38020002			
Switch scheme	Switch type	Actuator type		Switch scheme	Switch type	Actuator type	
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		N.1 PRSL1003PI 3NO+comune 2 speeds	Pushbutton 	Pushbutton 
-	-	Blanking plug	Blanking plug	-	-	Blanking plug	Blanking plug

3 actuators

PF38030001				PF38030002			
Switch scheme	Switch type	Actuator type		Switch scheme	Switch type	Actuator type	
	N.1 PRSL1001PI 1NC	Latched mushroom pushbutton			N.1 PRSL1001PI 1NC	Latched mushroom pushbutton	
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton 	Pushbutton 
-	-	Blanking plug	Blanking plug	-	-	Blanking plug	Blanking plug

4 actuators

PF38040002				PF38040003				
Switch scheme	Switch type	Actuator type		Switch scheme	Switch type	Actuator type		
	N.1 PRSL1000PI 1NO	N.1 PRSL1001PI 1NC	Pushbutton  GREEN		N.1 PRSL1000PI 1NO	N.1 PRSL1001PI 1NC	Pushbutton  GREEN	Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton 	Pushbutton 	

PF38040004				PF38040006			
Switch scheme	Switch type	Actuator type		Switch scheme	Switch type	Actuator type	
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton 	Pushbutton 
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton Pushbutton

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton

5 actuators

PF38050003		
Switch scheme	Switch type	Actuator type
	N.1 PRSL1001PI 1NC	Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

PF38050004		
Switch scheme	Switch type	Actuator type
	N.1 PRSL1001PI 1NC	Latched mushroom pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

6 actuators

PF38060001		
Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton
-	-	Blanking plug

PF38060002		
Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
-	-	Blanking plug

8 actuators

PF38080001

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

PF38080006

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

PF38080007

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton Pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

PF38080008

Switch scheme	Switch type	Actuator type
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton GREEN Latched mushroom pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1003PI 3NO+common 2 speeds	Pushbutton Pushbutton
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton Pushbutton

10 actuators

PF38100001					
Switch scheme	Switch type	Actuator type			
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton 	Latched mushroom pushbutton		
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
-	-	Blanking plug	Blanking plug		

12 actuators

PF38120001					
Switch scheme	Switch type	Actuator type			
	N.2 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton 	Latched mushroom pushbutton		
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		

STANDARD PENDANT CONTROL STATIONS WITH CABLE OUTPUT ON THE BOTTOM

These pendant control stations are upside down, i.e. the cable output is on the bottom.

Standard control stations are equipped with cable sleeve, hook and electrical interlock between opposite function pushbuttons.

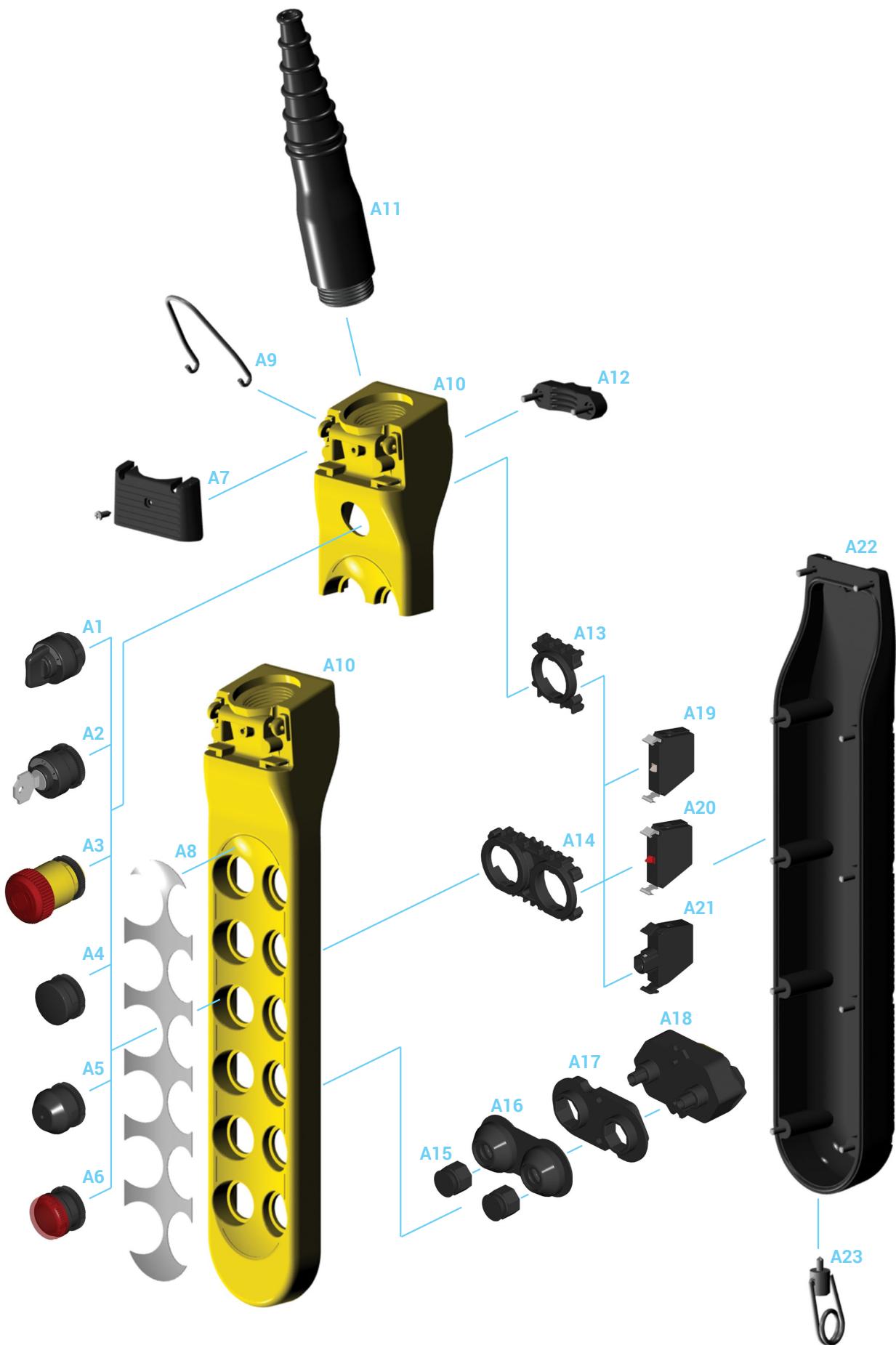
10 actuators

PF38100002					
Switch scheme	Switch type	Actuator type			
	N.1 PRSL1000PI 1NO N.1 PRSL1000PI 1NO	Pushbutton 	Pushbutton 		
	N.1 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton 	Latched mushroom pushbutton		
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
-	-	Blanking plug	Blanking plug		

12 actuators

PF38120002					
Switch scheme	Switch type	Actuator type			
	N.1 PRSL1000PI 1NO N.1 PRSL1000PI 1NO	Pushbutton 	Pushbutton 		
	N.1 PRSL1000PI 1NO N.1 PRSL1001PI 1NC	Pushbutton 	Latched mushroom pushbutton		
	N.1 PRSL1002PI 2NO + common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
	N.1 PRSL1002PI 2NO+common 1 speed	Pushbutton 	Pushbutton 		
-	-	Blanking plug	Blanking plug		

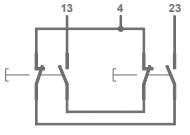
ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Selector switches" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A18		1 speed, 2+common double switch		PRSL1002PI
A19		1NO switch		PRSL1000PI
A20		1NC switch		PRSL1001PI
A21		Lamp holder	-	PRSL1004PI

Actuators

Ref.	Drawing	Description	Code
A4		Blanking plug	PRSL1023PI
A5		Single pushbutton	PRTS000001
A15+A16		Double pushbutton with rubber	PRTD000001
A16		Rubber for double pushbutton	PRG00020PE
A17		Holding plate for double pushbutton	PRSL8737PI

Pilot lights

Ref.	Drawing	Color	Code
A6		Red	PRSL1012PI
		Yellow	PRSL1013PI
		Green	PRSL1014PI

Mushroom pushbuttons

Ref.	Drawing	Description	Code
A3		Latched mushroom pushbutton for emergency stop	PRSL1009PI

Selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A1		0/1	X			PRSL1015PI
		0/1		X		PRSL1016PI
		1/0/2	X			PRSL1026PI
		1/0/2		X		PRSL1027PI
A2		0/1		X	0	PRSL1017PI
		0/1	X		0	PRSL1024PI

Accessories

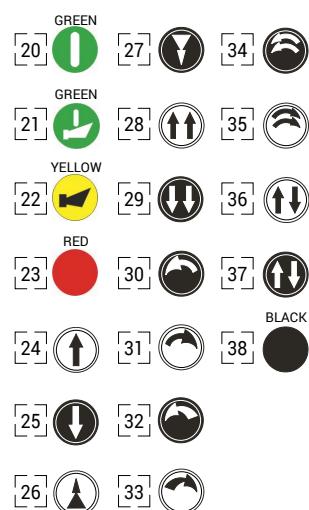
Ref.	Drawing	Description	Code
A7		Cable cover	PRSL5603PI
A8		Label	ET38xxxxx Codes on request
A9		Hook	PRGA0020PE
A10		Cover 2/4 actuators	PRSL5607PI
		Cover 3/5 actuators	PRSL5611PI
		Cover 6/8 actuators	PRSL5608PI
		Cover 7/9 actuators	PRSL5612PI
		Cover 10/12 actuators	PRSL5609PI
		Cover 11/13 actuators	PRSL5613PI
A11		Cable sleeve	PRSL0145PE
A12		Cable clamp	PRSL1020PI
A13		Holding plate for 3 switches	PRSL8739PI
A14		Holding plate for 2+2 switches	PRSL8735PI
A22		Enclosure 2/3/4/5 actuators	PRSL5066PI
		Enclosure 6/7/8/9 actuators	PRSL5067PI
		Enclosure 10/11/12/13 actuators	PRSL5068PI
A23		Lower hook	PRGA0051PE

ALPHA - REQUEST FORM FOR NON STANDARD CONTROL STATION

Control elements

- (1) PRTS00001 Single pushbutton
- (2) PRTD00001 Double pushbutton
- (3) PRSL1023PI Blanking plug
- (4) PRSL1009PI Emergency stop mushroom pushbutton
- (5) PRSL1012PI Red pilot light
- (6) PRSL1013PI Yellow pilot light
- (7) PRSL1014PI Green pilot light
- (8) PRSL1015PI Selector switch 0/1 spring return
- (9) PRSL1016PI Selector switch 0/1 maintained positions
- (10) PRSL1026PI Selector switch 1/0/2 spring return
- (11) PRSL1027PI Selector switch 1/0/2 maintained positions
- (12) PRSL1017PI Key selector switch 0/1 maintained positions
- (13) PRSL1024PI Key selector switch 0/1 spring return

Label symbols

Hook Cable sleeve 
Single
Double
Single
Double
Single
Double
Single
Double
Single
Double
Single
Double
SingleHook Cable sleeve

Single switches

- A PRSL1000PI 1NO
- B PRSL1001PI 1NC
- C PRSL1004PI Lamp holder

Double switches

- D PRSL1002PI 1 speed
- E PRSL1003PI 2 speeds

Instructions

- Fill in the pendant station scheme for the number of control elements required.
 - Enter the number corresponding to the control element required in the circle.
 - In the broken-line box enter the number corresponding to the symbol required on the label. Next to the number mark the direction of the arrow and the customized lettering, if requested.
 - In the unbroken boxes enter the letters corresponding to the single or double switches required.
- ATTENTION: it is possible to mount 3 single switches for each control element only if they are placed in the first 2 rows or in the last one.
- In any other positions it is only possible to mount up to 2 single switches for each control element.
- Tick the appropriate box to show where the cable sleeve and the hook must be assembled (top or bottom).

MIKE-D

Pendant control station



Pendant control station for **direct control** of industrial machines. Ergonomic shape, easy to handle, user-friendly and sturdy, Mike-D is the result of careful analysis of ergonomic aspects and it is rich in high-performing features to meet the most demanding requirements.

FEATURES

- Reduced installation and wiring time and costs: the cable inlet and the switches fitted in the base of the control station are separated from the actuators, mounted on the cover.
- Innovative suspension system with concealed cables to enable rapid, correct, ergonomic installation.
- Rubber pushbuttons with symbol disks to ensure protection against dust and prevent jamming when the control station is used in harsh environments.
- The emergency stop mushroom pushbutton complies with standard ISO 13850.
- IP protection degree: Mike-D is classified IP66, IP67 and IP69K.
- IK protection degree: Mike-D is classified IK09.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configurations with 3 (1 speed version) or 4 actuators (2 speed version).
- Direct control 1 speed two-pole switches and 1 speed three-pole switches for emergency mushroom pushbutton.
- Mechanical interlock to prevent simultaneous operation of opposite functions.
- 1 speed pushbuttons available in different colours and mushroom pushbuttons with rotation release.
- Available with labels (symbols and lettering) to be applied next to the actuators or with pushbuttons with two-colour moulded permanent symbols.

CERTIFICATIONS

- CE marking.

Fill in the "request form" for accurate product configuration.

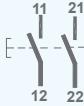
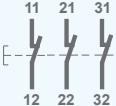
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-3 Low-voltage switchgear and controlgear - Switches, disconnectors, switch-disconnectors and fuse-combination units EN 60529 Degrees of protection provided by enclosures ISO 13850 Safety of machinery - Emergency stop - Principles for design
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

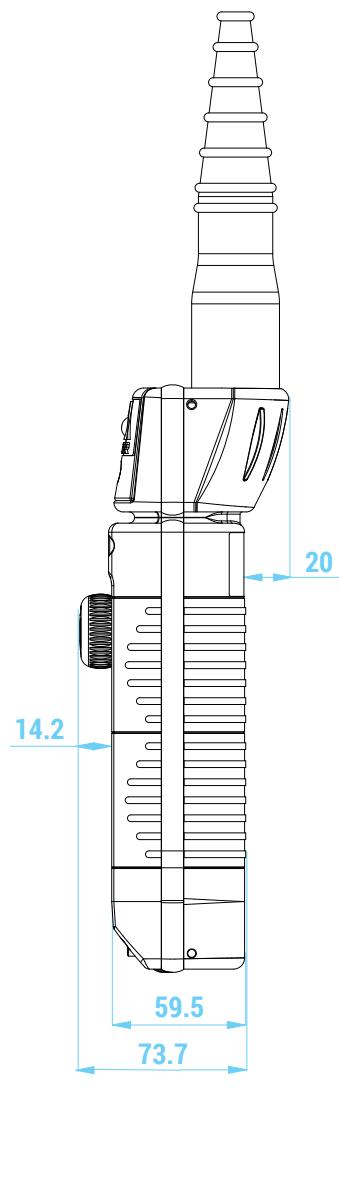
Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 66 / IP 67 / IP 69K
IK protection degree	IK 09
Insulation category	Class II
Cable entry	Rubber cable sleeve (Ø 8÷26 mm) Cable clamp M20
Operating positions	Any position
Pushbuttons mechanical life	10x10 ⁶ operations

TECHNICAL SPECIFICATIONS OF THE SWITCHES

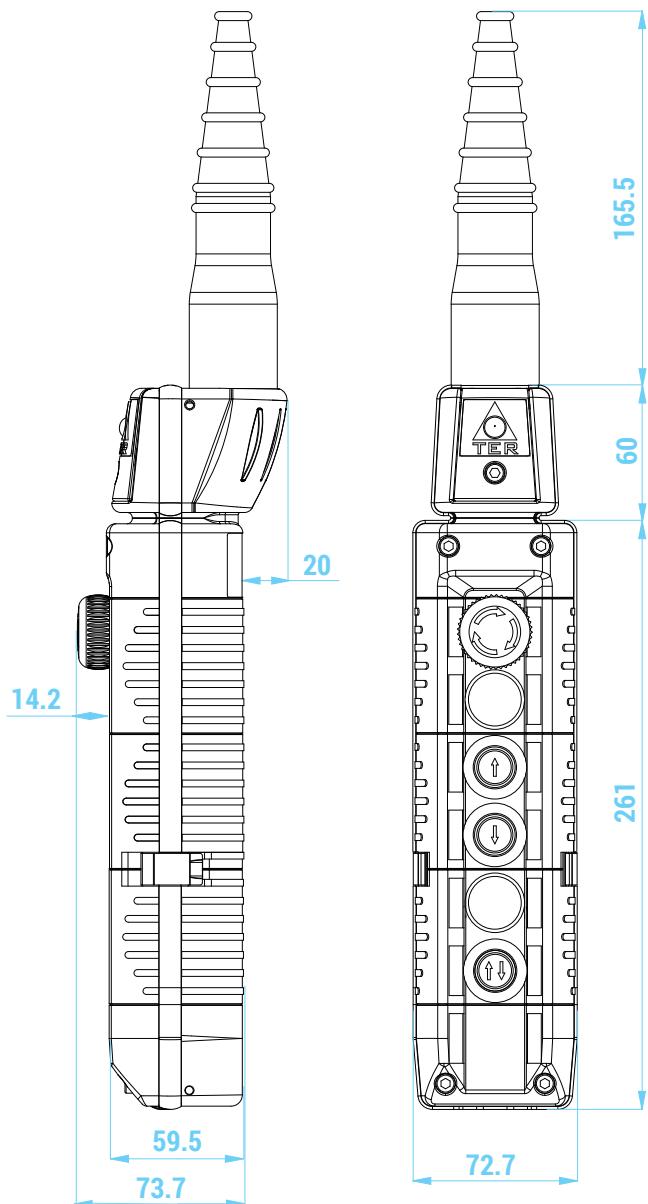
Code	PRSL1900PI	PRSL1902PI
Utilisation category	AC 3 - AC 4	AC 23B
Rated operational current	10 A	
Rated operational voltage	400 Vac	
Rated operational power	2.2 kW	
Rated thermal current	20 A	
Rated insulation voltage	660 Vac	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ²	
Tightening torque	0.8 Nm	
Microswitch type	1 speed, two-pole single switch	1 speed, three-pole single switch
Contacts	2NO	3NC
Scheme		
Markings and homologations	CE	

OVERALL DIMENSIONS (mm)

1 speed



2 speeds



Dimensions of mushroom pushbutton refer to the released position.

STANDARD CONTROL STATIONS

1 speed

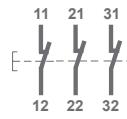
F72AY00001

2



Latched
mushroom pushbutton

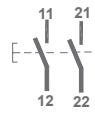
No. 1 PRSL1902PI



Blanking plug



No. 1 PRSL1900PI



No. 2 buttons mechanically
interlocked



No. 1 PRSL1900PI



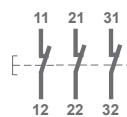
2 speeds

F72EY00001



Latched
mushroom pushbutton

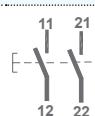
No. 1 PRSL1902PI



Blanking plug



No. 1 PRSL1900PI



No. 2 buttons mechanically
interlocked



No. 1 PRSL1900PI



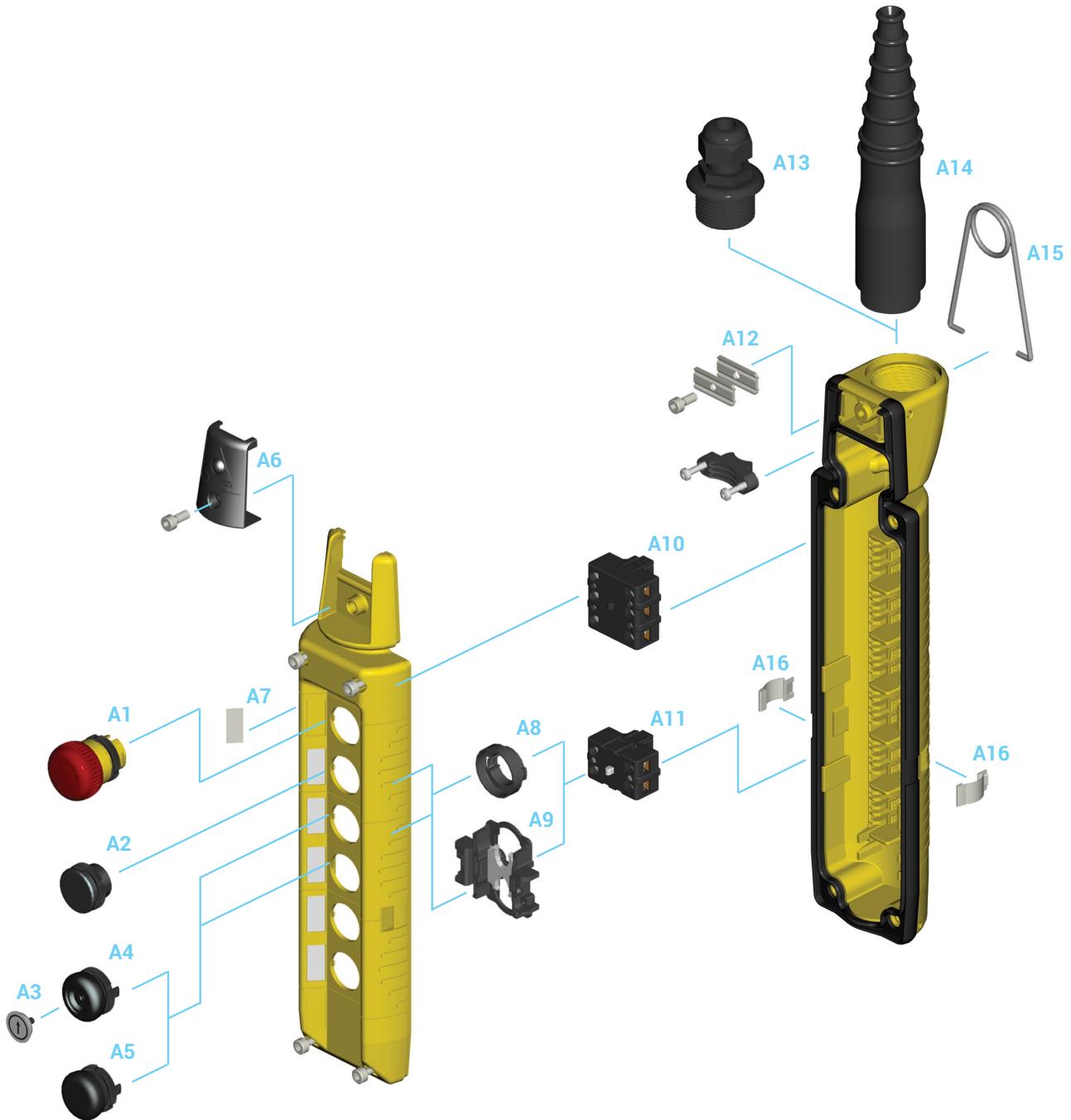
Blanking plug



No. 1 PRSL1900PI



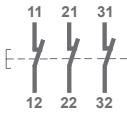
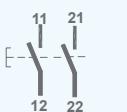
No. 1 button



See the following tables for description of components: "Switches", "Actuators", "Mushroom pushbuttons" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A10		1 speed three-pole 3NC switch for emergency mushroom pushbutton		PRSL1902PI
A11		1 speed two-pole 2NO switch		PRSL1900PI

Actuators

Ref.	Drawing	Description	Code
A2		Blanking plug	PRSL1845PI
A3		Disk for pushbutton	PRTA See disk table
A4		1 speed pushbutton	PRSL1811PI
A5		1 speed black pushbutton	PRSL1806PI
		1 speed grey pushbutton	PRSL1807PI

Mushroom pushbuttons

Ref.	Drawing	Description	Code
A1		Latched mushroom pushbutton for emergency stop	PRSL1880PI

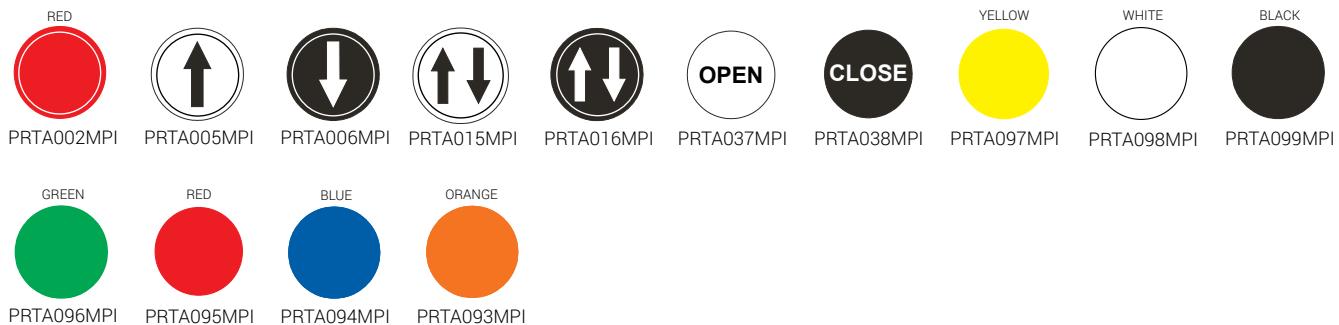
Accessories

Ref.	Drawing	Description	Code
A6		Cable cover with TER logo	PRSL1832PI
		Blank cable cover	PRSL1836PI
A7		Label sheet	Code on request
A8		Button-switch spacer	PRSL8512PI
A9		Mechanical interlock	PRSL1850PI
A12		Complete wire clamp	PRSL1896PI
A13		Cable clamp M20 with reduction	PRSL1910PI

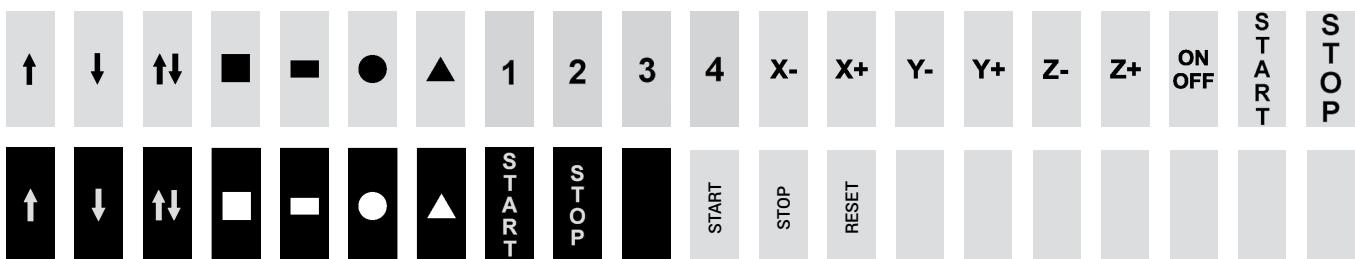
Accessories

Ref.	Drawing	Description	Code
A14		Cable sleeve	PRSL0145PE
A15		Hook	PRGA0012PE
A16		Closing clip (only for 2 speed version)	PRTR1035PE

Disks



Label sheet



MIKE-D - REQUEST FORM FOR NON STANDARD PENDANT STATION

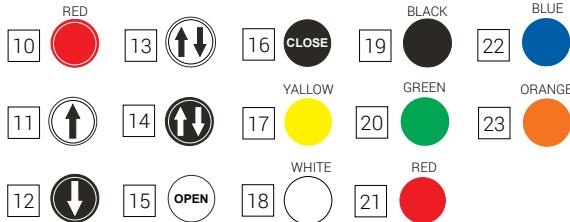
Instructions

Fill in the chart according to the type of the pendant station required (1 or 2 speeds).

- 1 Button disks:** for pushbuttons with disks enter the number corresponding to the disk required (10 to 23) according to the legend.
If you choose **disks with arrows** (legend 11 to 14), enter the direction of the arrow in the circle. Eg. .
- 2 Pushbuttons:** tick the box corresponding to the type of pushbutton required.
- 3 Hook:** tick the box at the top or at the bottom if the hook is required. Eg. Hook
- 4 Cable sleeve and cable clamp:** tick the box if the cable sleeve or the cable clamp are required.
Eg. sleeve
- 5 Label sheet:** stickers with letterings or symbols may be placed on the left and on the right of any control element. If label sheets are required, tick the corresponding box.

1 Legend - Button disks

Color and symbol disks for pushbuttons



3 Hook

4 Cable sleeve

Cable clamp



1
Button disk



2

- Pushbutton with disk
- Grey pushbutton
- Black pushbutton

Button disk



- Pushbutton with disk
- Grey pushbutton
- Black pushbutton



Button disk



- Pushbutton with disk
- Grey pushbutton
- Black pushbutton

3 Hook

5 Label sheet

Remarks

NPA-CP

Pendant control station



Pendant station for **direct control** of industrial machines. Sturdy and handy, NPA-CP is specifically designed for heavy duty in industrial environments.

FEATURES

- The cable sleeve can be angled up to 20° to give the operator the best view of all the control elements and enable a natural, comfortable working position.
- Rubber pushbuttons with symbol disks to ensure protection against dust and prevent jamming when the control station is used in harsh environments.
- Two-colour moulded pushbutton disks to guarantee clear reading and wear resistance
- The emergency stop mushroom pushbutton complies with standard EN 418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: NPA-CP is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Available in configuration from 2 to 8 actuators.
- 1 or 2 speed two-pole switches or 1 speed three-pole switches, with or without brake contact, for direct control.
- Mechanical interlock to prevent simultaneous operation of opposite functions.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

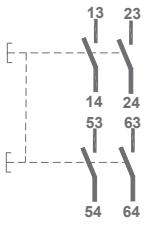
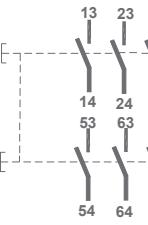
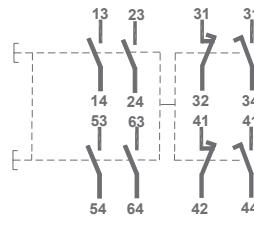
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-3 Low-voltage switchgear and controlgear - Switches, disconnectors, switch-disconnectors and fuse-combination units
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	2÷6 buttons: rubber cable sleeve (Ø 10÷18 mm) 8 buttons: rubber cable sleeve (Ø 17÷26 mm)
Operating positions	Any position

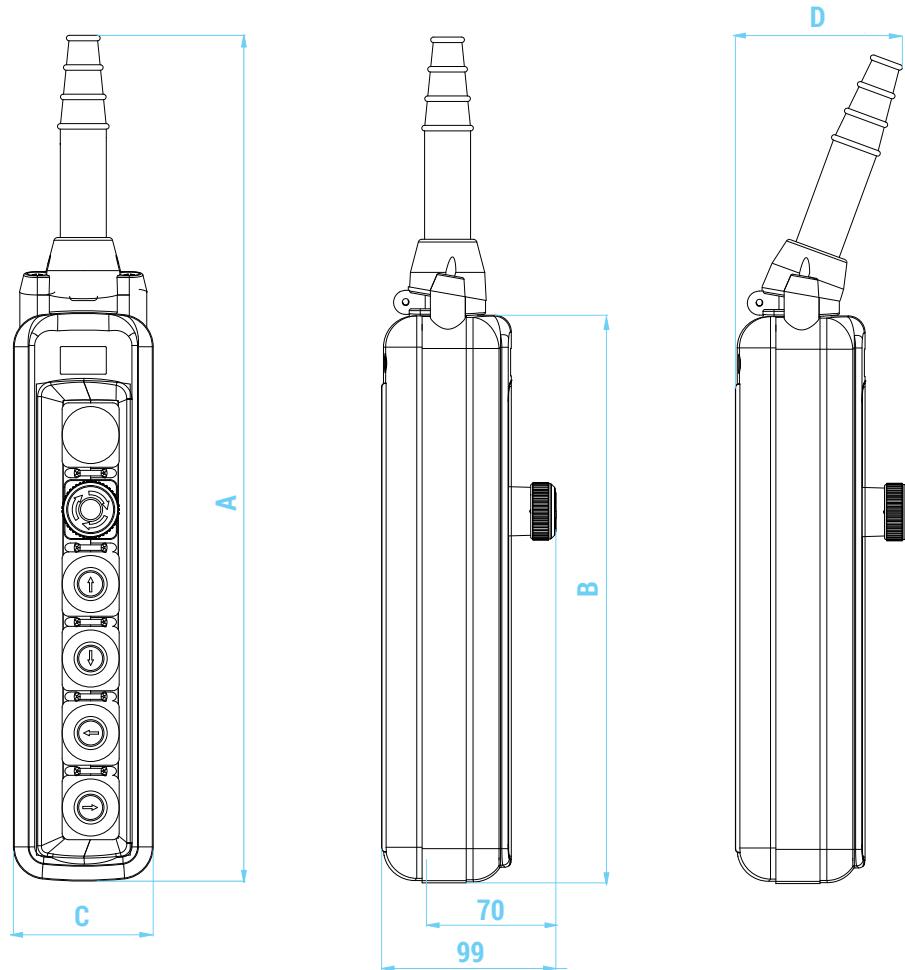
TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0458PI	PRSL0459PI	PRSL0460PI
Utilisation category	AC 3 - AC 4	AC 3 - AC 4	AC 3 - AC 4
Rated operational current		10 A	
Rated operational voltage		400 Vac	
Rated operational power		2.2 kW	
Rated thermal current		20 A	
Rated insulation voltage		660 Vac	
Brake operating contact	-	100 Vac, 0.7 A, L/R=100 ms	-
Mechanical life		1x10 ⁶ operations	
Connections	Screw-type terminals with self-lifting pads		
Wires	1x2.5 mm ² , 2x1.5 mm ²		
Tightening torque	0.8 Nm		
Switch type	1 speed, two-pole double switch	1 speed, two-pole double switch, with brake contact	2 speeds, two-pole double switch
Scheme			
Markings and homologations	CE 		

Code	PRSL0461PI	PRSL0471PI
Utilisation category	AC 3 - AC 4	AC 3 - AC 4
Rated operational current	10 A	
Rated operational voltage	400 Vac	
Rated operational power	2.2 kW	
Rated thermal current	20 A	
Rated insulation voltage	660 Vac	
Brake operating contact	100 Vac, 0.7 A, L/R=100 ms	-
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals with self-lifting pads	
Wires	1x2.5 mm ² , 2x1.5 mm ²	
Tightening torque	0.8 Nm	
Switch type	2 speeds, two-pole double switch, with brake contact	1 speed, three-pole double switch
Scheme		
Markings and homologations		

Code	PRSL0472PI	PRSL0508PI
Utilisation category	AC 3 - AC 4	AC 23B
Rated operational current	10 A	
Rated operational voltage	400 Vac	
Rated operational power	2.2 kW	
Rated thermal current	20 A	
Rated insulation voltage	660 Vac	
Brake operating contact	100 Vac, 0.7 A, L/R=100 ms	-
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals with self-lifting pads	
Wires	1x2.5 mm ² , 2x1.5 mm ²	
Tightening torque	0.8 Nm	
Switch type	1 speed, three-pole double switch, with brake contact	1 speed, three-pole single switch
Scheme		
Markings and homologations		

OVERALL DIMENSIONS (mm)



No. of actuators	Dimensions (mm)			
	A	B	C	D
2	292	140	76	87
3	333	181	76	87
4	372	222	76	87
6	459	307	76	87
8	605	393	83	116

STANDARD CONTROL STATIONS

Standard control stations are equipped with cable sleeve, hook and mechanical interlock between opposite functions pushbuttons.

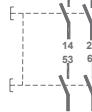
3 actuators

PF30030001			PF30030003		
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton		PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
	PRSL0471PI 1 speed three-pole	Pushbutton 		PRSL0460PI 2 speeds two-pole	Pushbutton
		Pushbutton 			Pushbutton
PF30030004					
Switch scheme	Switch type	Actuator type			
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton			
	PRSL0458PI 1 speed two-pole	Pushbutton 			
		Pushbutton 			

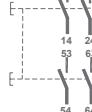
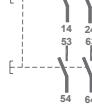
6 actuators

PF30060002			PF30060004		
Switch scheme	Switch type	Actuator type	Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton		PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
-	-	Blanking plug	-	-	Blanking plug
	PRSL0460PI 2 speeds two-pole	Pushbutton Pushbutton 		PRSL0471PI 1 speed three-pole	Pushbutton Pushbutton
		Pushbutton Pushbutton 			Pushbutton Pushbutton
	PRSL0460PI 2 speeds two-pole	Pushbutton Pushbutton 		PRSL0471PI 1 speed three-pole	Pushbutton Pushbutton

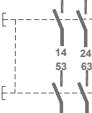
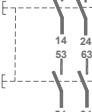
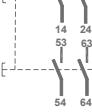
PF30060019

Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
-	-	Blanking plug
	PRSL0458PI 1 speed two-pole	Pushbutton 
	PRSL0458PI 1 speed two-pole	Pushbutton 
	PRSL0458PI 1 speed two-pole	Pushbutton 

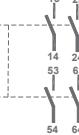
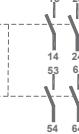
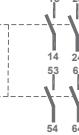
8 actuators**PF30080001**

Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
-	-	Blanking plug
	PRSL0460PI 2 speeds two-pole	Pushbutton  Pushbutton 
	PRSL0460PI 2 speeds two-pole	Pushbutton  Pushbutton 
	PRSL0460PI 2 speeds two-pole	Pushbutton  Pushbutton 

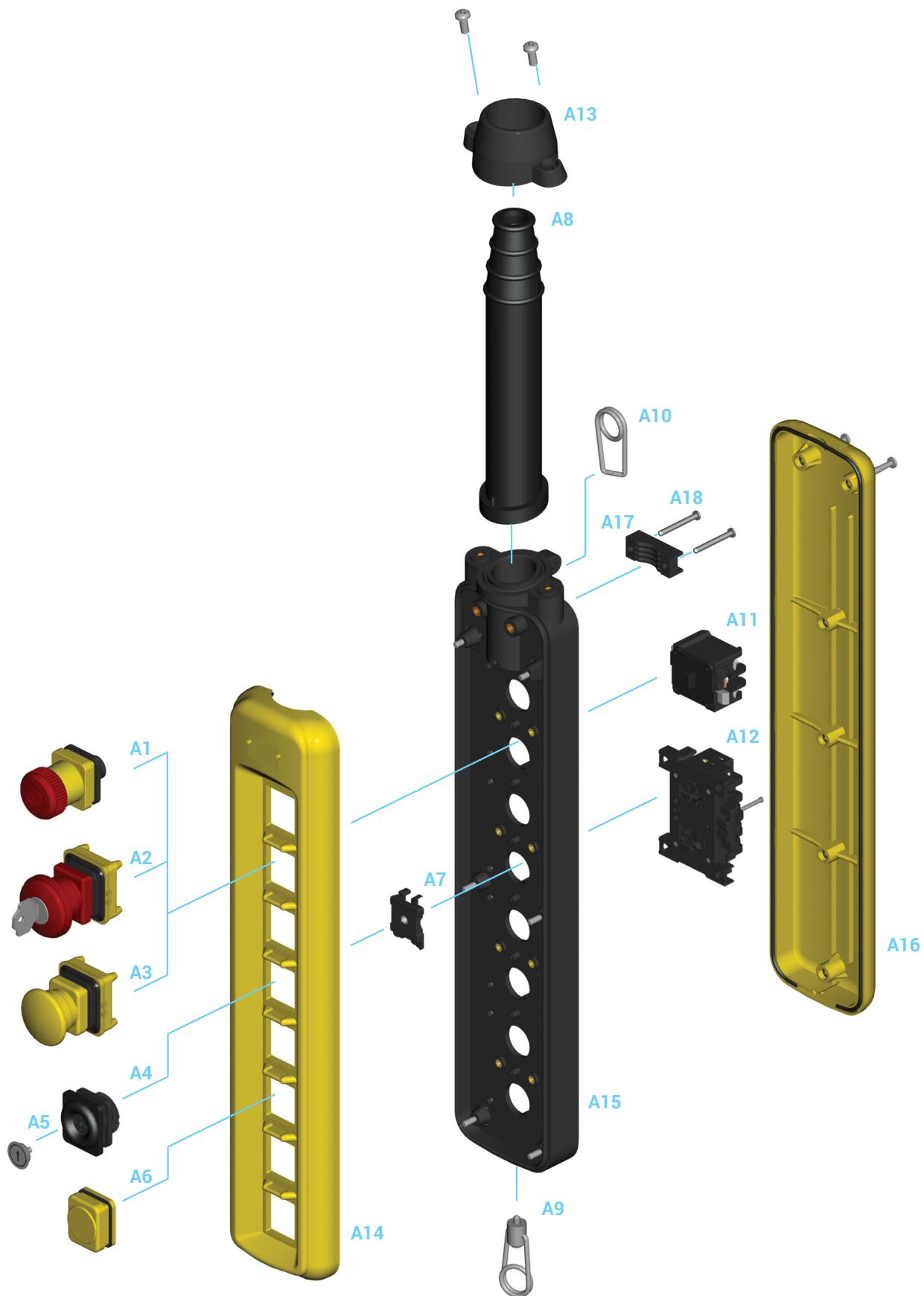
PF30080010

Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
-	-	Blanking plug
	PRSL0471PI 1 speed three-pole	Pushbutton  Pushbutton 
	PRSL0471PI 1 speed three-pole	Pushbutton  Pushbutton 
	PRSL0471PI 1 speed three-pole	Pushbutton  Pushbutton 

PF30080022

Switch scheme	Switch type	Actuator type
	PRSL0508PI 3NC 1 speed	Latched mushroom pushbutton
-	-	Blanking plug
	PRSL0458PI 1 speed two-pole	Pushbutton 
	PRSL0458PI 1 speed two-pole	Pushbutton 
	PRSL0458PI 1 speed two-pole	Pushbutton 
	PRSL0458PI 1 speed two-pole	Pushbutton 

ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switches", "Actuators", "Mushroom pushbuttons" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
		1 speed, two-pole double switch		PRSL0458PI
		1 speed, two-pole double switch, with brake contact		PRSL0459PI
A12		2 speeds, two-pole double switch		PRSL0460PI
		2 speeds, two-pole double switch, with brake contact		PRSL0461PI
		1 speed, three-pole double switch		PRSL0471PI
		1 speed, three-pole double switch, with brake contact		PRSL0472PI
A11		1 speed, three-pole single switch, for mushroom pushbutton		PRSL0508PI

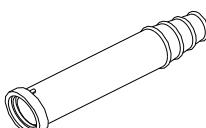
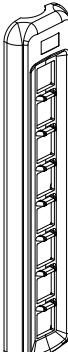
Actuators

Ref.	Drawing	Description	Code
A6		Blanking plug	PRSL0517PI
A5		Disk for dust-tight pushbutton	PRTA_----- See standard disk
A4		Dust-tight pushbutton	PRSL0550PI

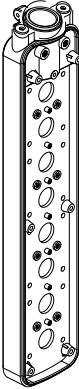
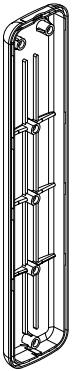
Mushroom pushbuttons

Ref.	Drawing	Description	Code
A1		Latched mushroom pushbutton for emergency stop	PRSL0600PI
A2		Key mushroom pushbutton	PRSL0520PI
A3		Impulse mushroom pushbutton	PRSL0512PI

Accessories

Ref.	Drawing	Description	Code
A7		Mechanical interlock	PRSL7817PI
A8		Cable sleeve for 2 - 6 button units	PRGO00100PE
		Cable sleeve for 8 button units	PRGO00105PE
A9		Wire fixing	PRT06626PE
A10		Hook	PRGA0001PE
A13		Cable sleeve holder - NPA-CP 2-6 buttons	PRSL9735PI
		Cable sleeve holder - NPA-CP 8 buttons	PRSL9740PI
A14		Upper cover with tightening rubber - NPA-CP 2 buttons	PRSL5810PI
		Upper cover with tightening rubber - NPA-CP 3 buttons	PRSL5838PI
		Upper cover with tightening rubber - NPA-CP 4 buttons	PRSL5815PI
		Upper cover with tightening rubber - NPA-CP 6 buttons	PRSL5820PI
		Upper cover with tightening rubber - NPA-CP 8 buttons	PRSL5825PI

Accessories

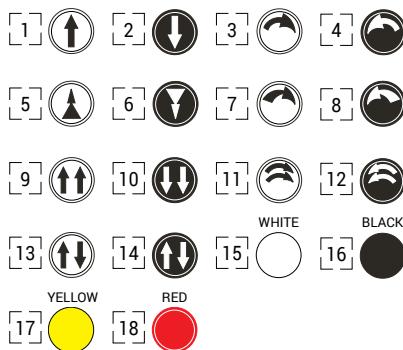
Ref.	Drawing	Description	Code
A15		Central section - NPA-CP 2 buttons	PRSL5813PI
		Central section - NPA-CP 3 buttons	PRSL5841PI
		Central section - NPA-CP 4 buttons	PRSL5818PI
		Central section - NPA-CP 6 buttons	PRSL5823PI
A16		Central section - NPA-CP 8 buttons	PRSL5828PI
		Lower enclosure, tightening rubber, screws - NPA-CP 2 buttons	PRSL5812PI
		Lower enclosure, tightening rubber, screws - NPA-CP 3 buttons	PRSL5840PI
		Lower enclosure, tightening rubber, screws - NPA-CP 4 buttons	PRSL5817PI
		Lower enclosure, tightening rubber, screws - NPA-CP 6 buttons	PRSL5822PI
A17		Lower enclosure, tightening rubber, screws - NPA-CP 8 buttons	PRSL5827PI
		Cable clamp	PRSL9210AU
A18		Screws for cable clamp	PRVI0089PE

Standard disks



NPA-CP - REQUEST FORM FOR NON STANDARD CONTROL STATION

Control elements



[19] PRSL0517PI Blanking plug

[20] PRSL0600PI Emergency stop mushroom pushbutton

[21] PRSL0512PI Impulse mushroom pushbutton

[22] PRSL0520PI Key mushroom pushbutton

Mushroom pushbuttons are fitted with PRSL0508PI switches (1 speed 3NC).

1 speed switches

[A] PRSL0458PI Two-pole switch

[B] PRSL0459PI Two-pole switch with brake contact

[C] PRSL0471PI Three-pole switch

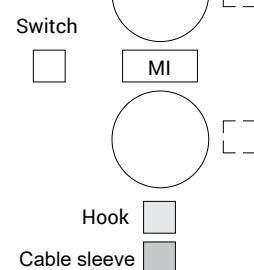
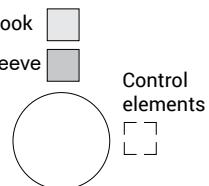
[D] PRSL0472PI Three-pole switch with brake contact

2 speed switches

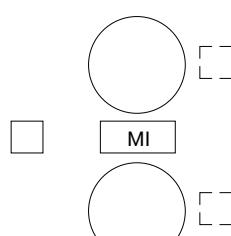
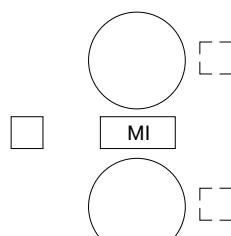
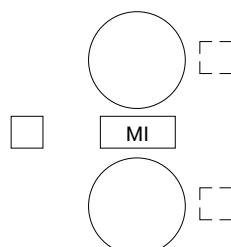
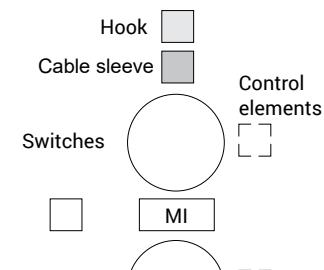
[E] PRSL0460PI Two-pole switch

[F] PRSL0461PI Two-pole switch with brake contact

3 actuators



2-4-6-8 actuators



Hook
Cable sleeve

Instructions

- Fill in the chart to the left according to the number of control elements required (2, 3, 4, 6, or 8 actuators).
- Enter the number corresponding to the control element required. Mark the direction of arrow into the corresponding circle.
- Enter the letters corresponding to the switches required.
- Tick the box corresponding to the mechanical interlock between pushbuttons when required . MI
- Tick the appropriate box to show where the cable sleeve and the hook must be assembled (top or bottom).

Remarks

REMARKS

JOYSTICKS

3





JULIET

Joystick



Small-sized, compact and handy joystick for control of industrial machines.
Juliet is a user-friendly, ergonomic product, suitable for daily use in an industrial environment.

FEATURES

- Designed to facilitate maintenance, reducing down time and costs: the switches are assembled on pull-out or fixed terminal boards.
- Light and handy: weight 250 grams.
- Mechanical life of switches: 5 million operations.
- IP protection degree: Juliet is classified IP00 or IP65, when housed in Juliet-PK or in a specific enclosure.
- Extreme temperature resistance: -25°C to +70°C.

OPTIONS

- Available with up to 5 speeds for each direction.
- Stepped or linear operations.
- Cross or 360° movement.
- Available with terminal boards or potentiometers.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
Marcature e omologazioni	CE 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 00 (IP 65 max. when assembled in Juliet-PK or in a specific enclosure)
Operating positions	Any position
Weight	250 g

TECHNICAL SPECIFICATIONS OF THE SWITCHES

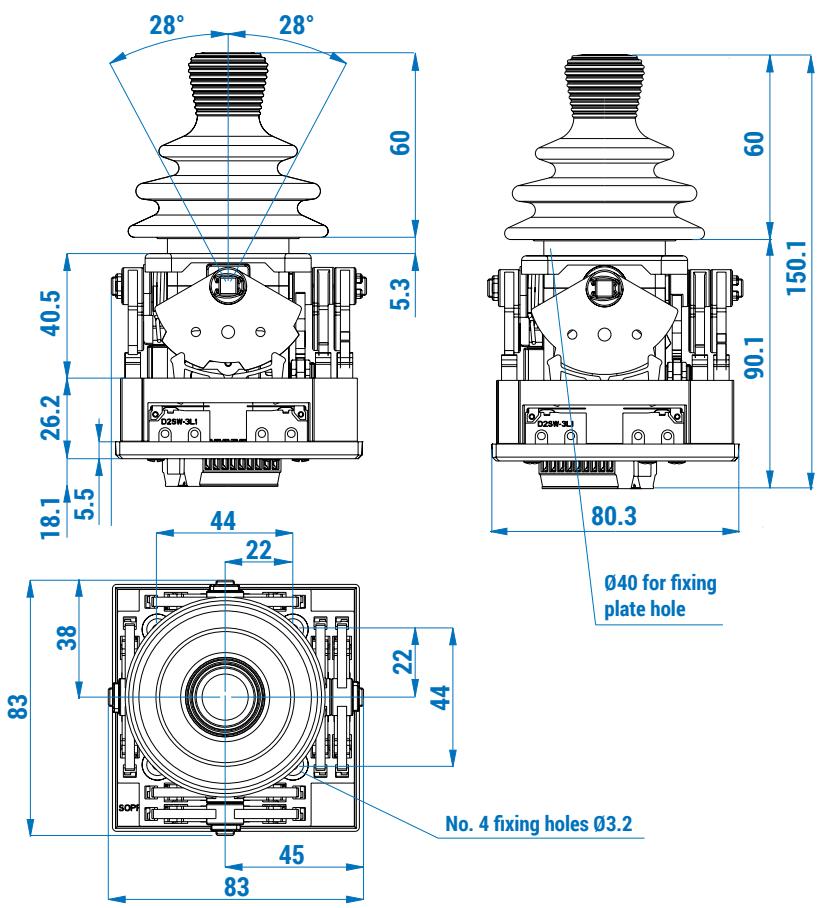
Code	PRVV0804PE
Utilisation category	AC 15
Rated operational current	2 A
Rated operational voltage	48 Vac
Rated thermal current	8 A
Rated insulation voltage	1000 Vac
Mechanical life	5x10 ⁶ operations
Connections	Screw-type terminals
Wires	0.14 mm ² - 1.5 mm ²
Tightening torque	0.22 Nm - 0.25 Nm
Microswitch type	Single break
Contacts	1NO+1NC
Scheme	
Markings and homologations	CE

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

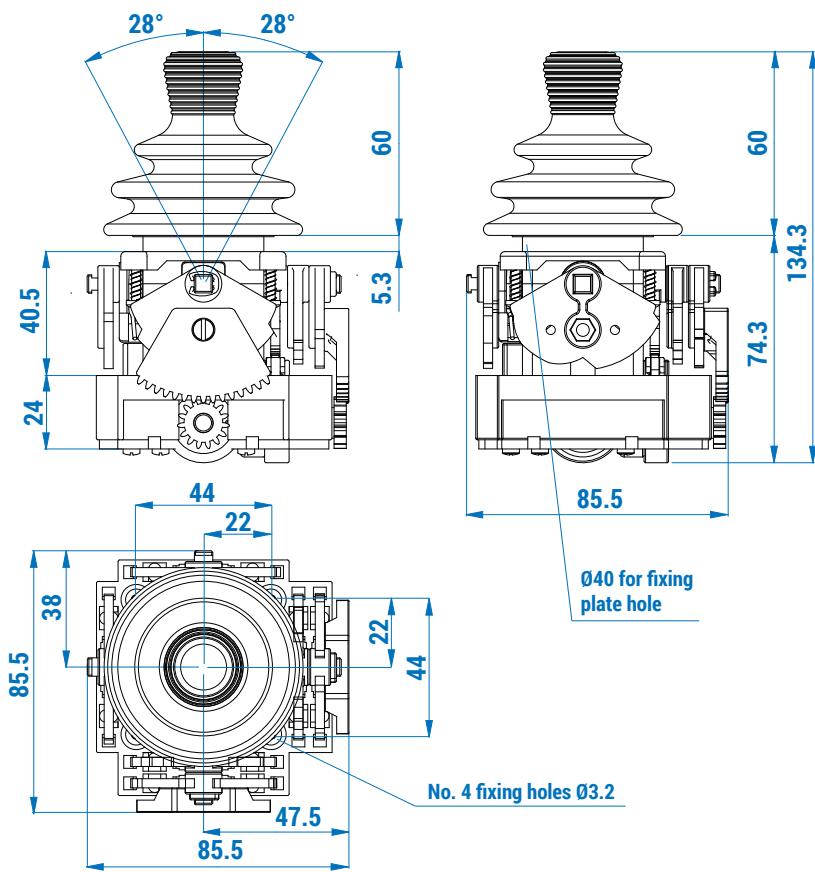
Code	PRVV9021PE	PRVV9026PE
Ohmic value	5 kΩ	10 kΩ
Connections	4 turrets	
Indipendent linearity (over AEA -3°)	≤ ±1%	
Life time	5x10 ⁶ movements	
Operational ambient temperature	-55 °C/+125 °C	
Mechanical angle	360° continuous	
Actual Electrical Angle (AEA)	340°±5°	
Ohmic value tolerance	Max ±2% at 20°C	
Dissipation	0.3 W	

OVERALL DIMENSIONS (mm)

Standard



With potentiometer



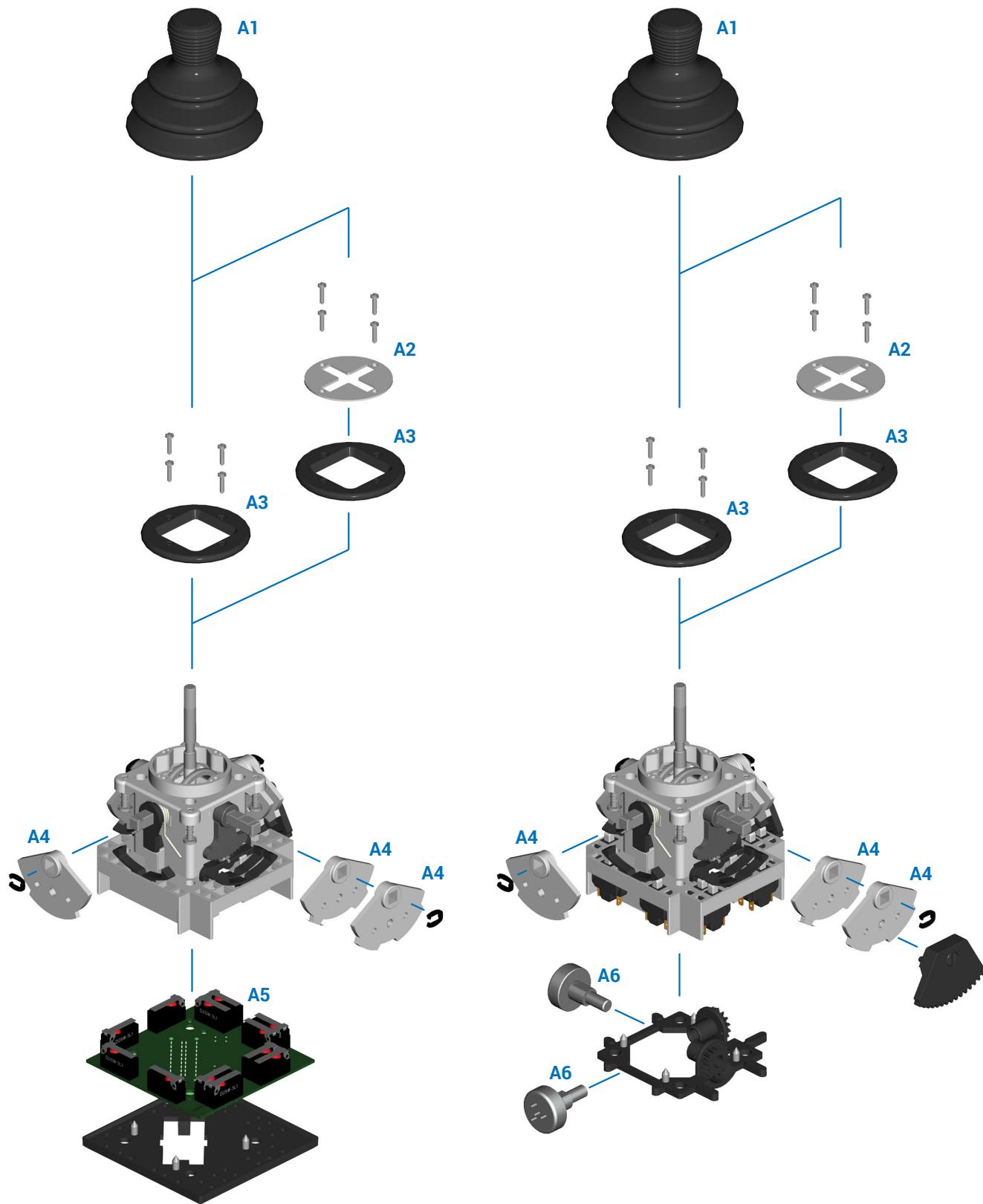
STANDARD JOYSTICKS

Juliet standard joysticks feature spring return stepped movement and they are equipped with 1NO+1NC switches PRVV0804PE and fixed terminal board.

3

Positions	Direction of movement		Code
	360°	Cross	
1-0		X	PF340210000004
1-1	X		PF340211000001
1-2	X		PF340212000001
1-3		X	PF340213000001
2-0		X	PF340220000004
2-2	X		PF340222000001
2-3	X		PF340223000001
3-0		X	PF340230000004
3-3	X		PF340233000001
3-3		X	PF340233000004
4-0		X	PF340240000004
1-5	X		PF340215000001
3-5	X		PF340235000001
5-5	X		PF340255000001
5-5		X	PF340255000004

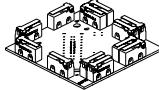
ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switch boards", "Potentiometers", "Lever guides", "Cams" and "Accessories".

COMPONENTS

Switch boards

Ref.	Drawing	Description	Code
A5		12 switch board with fixed terminal board - 5 positions	93547
		8 switch board with fixed terminal board - 3 positions	93558

Potentiometers

Ref.	Drawing	Description	Code
A6		Potentiometer 5 kΩ	PRVV9021PE
		Potentiometer 10 kΩ	PRVV9026PE

Lever guides

Ref.	Drawing	Description	Code
A2		Cross lever guide	PRTR0160PE
		Lever guide 3-0	PRSL9824PI
		Lever guide 5-4	PRSL9825PI
		Lever guide 3-3	PRSL9826PI
		Lever guide 5-2	PRSL9828PI
		Lever guide 5-5	PRSL9830PI
		Lever guide 5-0	PRSL9834PI
		Lever guide 4-0	PRSL9835PI
		Lever guide 1-3	PRSL9838PI
		Lever guide 1-5	PRSL9839PI
A3		Lever guide 3-2	PRSL9841PI
		Lever guide 3-5	PRSL9842PI
		Lever guide 2-4	PRSL9843PI
		Lever guide 4-1	PRSL9844PI
		Lever guide 3-4	PRSL9845PI
		Lever guide 4-4	PRSL9849PI
		Lever guide 1-1	PRSL9871PI
		Lever guide 1-0	PRSL9872PI
		Lever guide 1-2	PRSL9873PI
		Lever guide 2-2	PRSL9876PI
		Lever guide 2-0	PRSL9880PI

Cams

Ref.	Drawing	Description	Code
A4		Cam 1 st step	PRSL7300PI
		Cam 2 nd -3 rd steps	PRSL7301PI
		Cam 4 th -5 th steps	PRSL7302PI

Accessories

Ref.	Drawing	Description	Code
A1		Bellows	PRSL0173PI

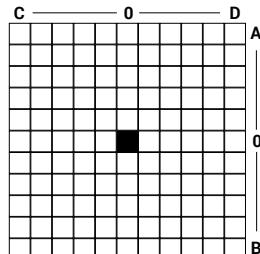
JULIET - REQUEST FORM FOR NON STANDARD JOYSTICK

Movement

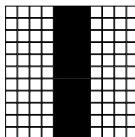
- Stepped
 Linear

Lever guide

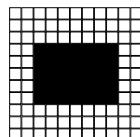
Number of steps in each direction



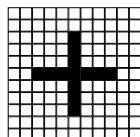
Examples



5 steps direction A-B
1 step direction C-D
360° movement

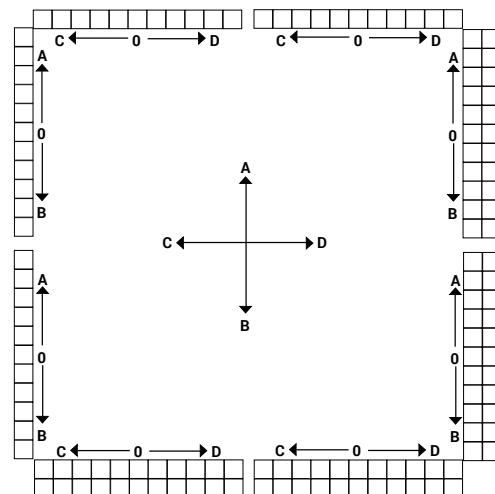


2 steps direction A-B
3 steps direction C-D
360° movement



3 steps direction A-B
3 steps direction C-D
Cross movement

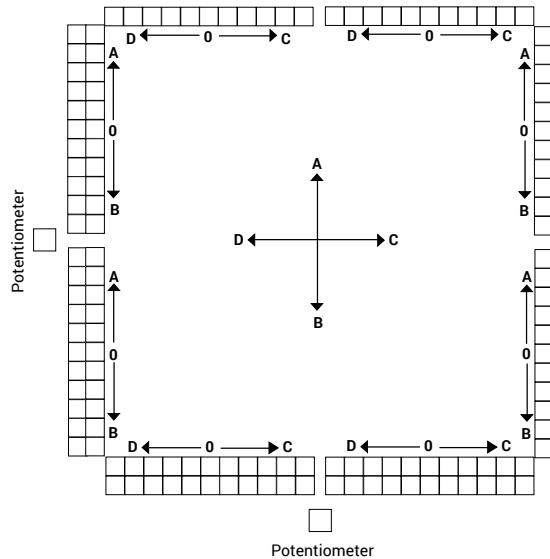
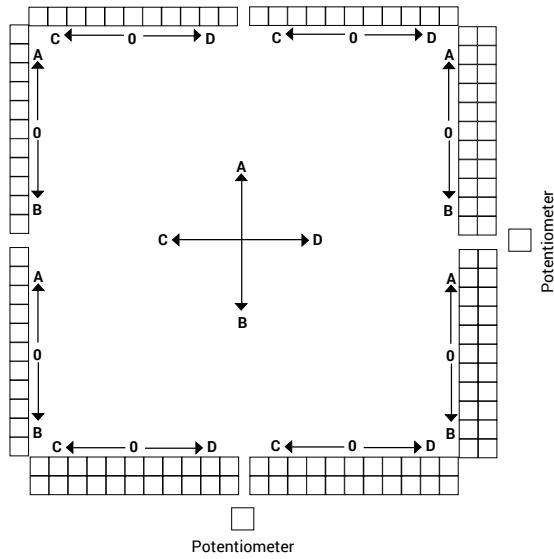
- Joystick with terminal board



Joystick with potentiometers

PotentiometerS

- 1 5 kΩ 2 10 kΩ 3 Pre-set only



Instructions

- Tick the box corresponding to the type of movement required.
- Choose the type of lever guide required blackening the boxes corresponding to the number of steps of the lever in each direction.
- In case of potentiometers, write the number corresponding to the potentiometer.
- Fill in the contact scheme blackening the boxes corresponding to the positions where the cams close the contacts (each bar of 11 boxes corresponds to a switch; the central box corresponds to the zero position of the joystick). In the example, the contact is closed in positions 1-2-3 to the left and 3-4 to the right.

5	4	3	2	1	0	1	2	3	4	5

JULIET-PK

Joystick station



Handy and compact joystick station. Juliet PK is a user-friendly, ergonomic product, whose size and shape are the result of careful analysis of the aspects linked to daily use in modern industrial environments.

FEATURES

- Designed for Juliet joysticks.
- Designed to facilitate maintenance, reducing down time and costs.
- Aluminium protection against accidental operation in case of impact.
- The emergency stop mushroom pushbutton complies with standard EN 418 and is positioned in the middle for intuitive operation in case of danger.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Juliet PK is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Wide range of actuators: pushbuttons, selector switches and key-selector switches, pilot lights.
- Switches with 1NC or 1NO contacts.
- The variable length strap, for waist or shoulder wear, features a quick fastening system.
- Available with customized labels and enclosures with different size holes.

CERTIFICATIONS

- CE marking and EAC certification.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Cable entry	Cable sleeve (Ø 14÷26 mm)
Operating positions	Any position
Weight	~1.5 kg

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL1000PI	PRSL1001PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double break, slow action	Double break, slow action
Contacts	1NO	1NC
Scheme		
Markings and homologations	CE  EAC	

TECHNICAL SPECIFICATIONS OF THE LAMP HOLDERS

Code	PRSL1004PI
Maximum voltage	125 V
Maximum power	2,6 W
Lamp type	T5.5K 22 mm
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Tightening torque	0.6 Nm
Markings and homologations	CE

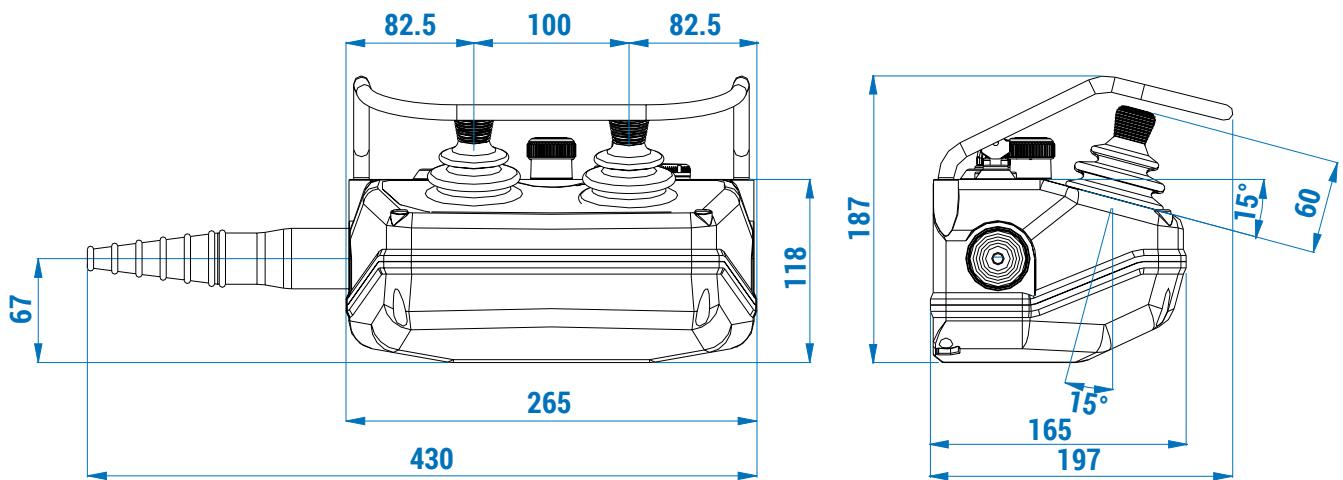
TECHNICAL SPECIFICATIONS OF THE SWITCHES (JOYSTICK)

Code	PRVV0804PE
Utilisation category	AC 15
Rated thermal current	8 A
Rated insulation voltage	1000 Vac
Mechanical life	5x10 ⁶ operations
Connections	Screw-type terminals
Wires	0.14 mm ² - 1.5 mm ²
Tightening torque	0.22 Nm - 0.25 Nm
Microswitch type	Single break
Contacts	1NO+1NC
Scheme	
Markings and homologations	CE

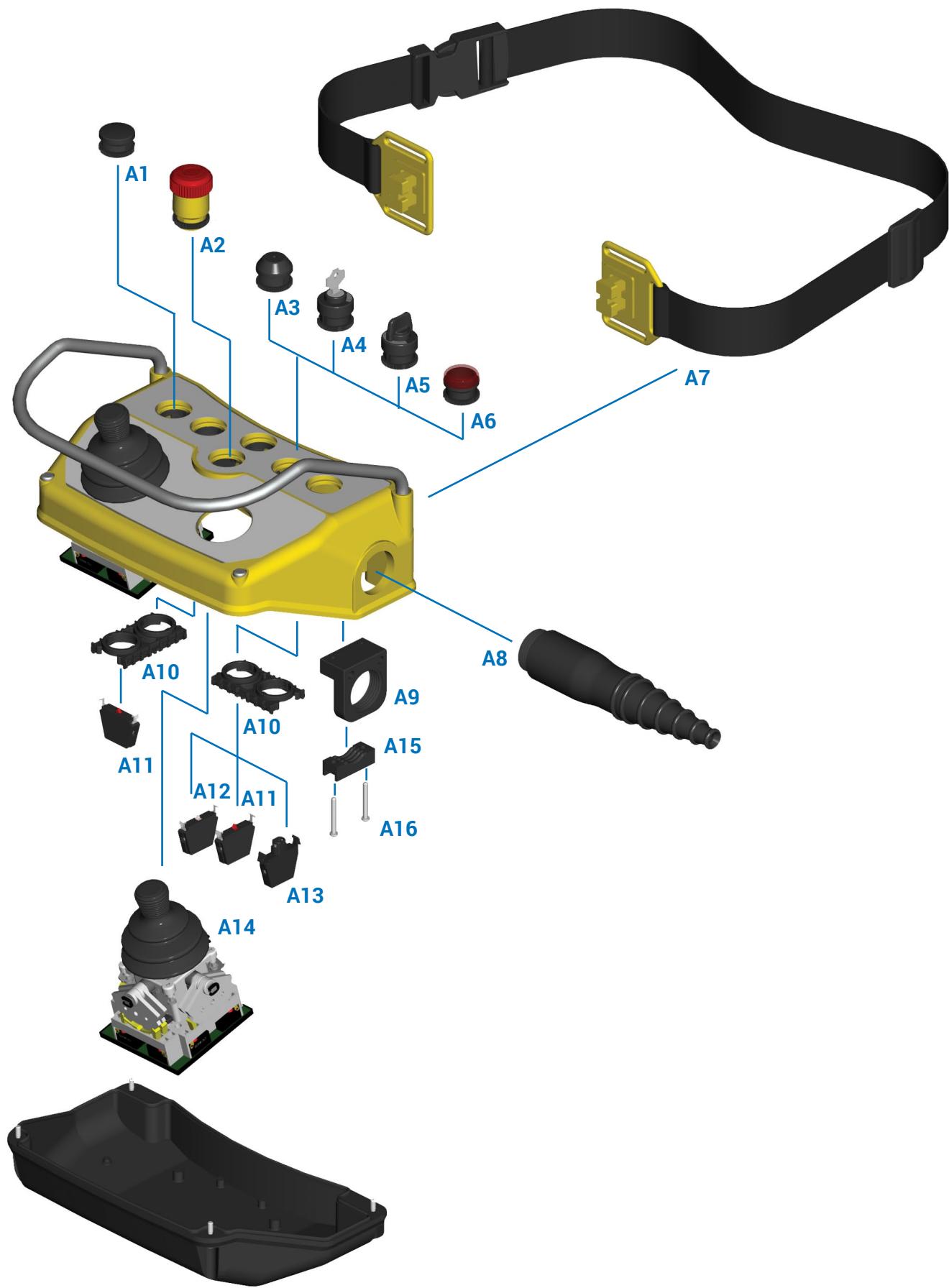
TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS (JOYSTICK)

Code	PRVV9021PE	PRVV9026PE
Ohmic value	5 kΩ	10 kΩ
Connections	4 turrets	
Independent linearity (over AEA -3°)	≤ ±1%	
Life time	5x10 ⁶ movements	
Operational ambient temperature	-55 °C/+125 °C	
Mechanical angle	360° continuous	
Actual Electrical Angle (AEA)	340°±5°	
Ohmic value tolerance	Max ±20% at 20°C	
Dissipation	0.3 W	

OVERALL DIMENSIONS (mm)



ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Mushroom pushbuttons", "Selector switches", "Joystick's and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A11		1NC single switch		PRSL1001PI
A12		1NO single switch		PRSL1000PI
A13		Lamp holder	-	PRSL1004PI

Actuators

Ref.	Drawing	Description	Code
A1		Blanking plug	PRSL1023PI
A3		Pushbutton	PRTS000001

Pilot lights

Ref.	Drawing	Color	Code
A6		Red	PRSL1012PI
		Yellow	PRSL1013PI
		Green	PRSL1014PI

Mushroom pushbuttons

Ref.	Drawing	Description	Code
A2		Latched mushroom pushbutton for emergency stop	PRSL1009PI

Selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A4		0/1		X	0	PRSL1017PI
		0/1	X		0	PRSL1024PI
A5		0/1	X			PRSL1015PI
		0/1		X		PRSL1016PI
		1/0/2	X			PRSL1026PI
		1/0/2		X		PRSL1027PI

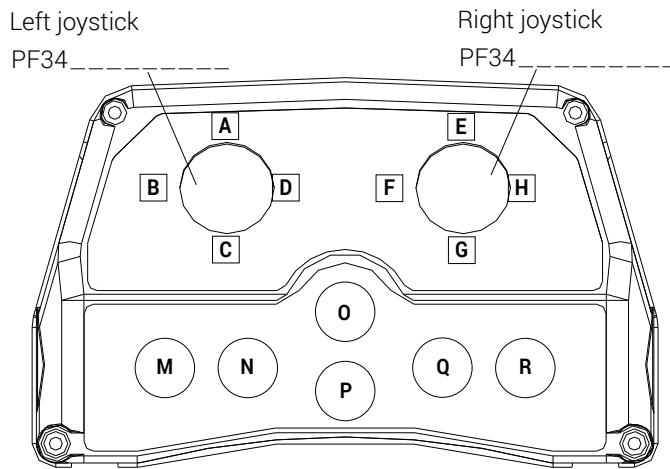
Joysticks

Ref.	Drawing	Description	Code
A14		Joystick Juliet	PF34 Refer to joystick Juliet documentation

Accessories

Ref.	Drawing	Description	Code
A7		Waist strap	PRSL0160PE
		Shoulder strap	PRSL0161PE
A8		Cable sleeve	PRSL0145PE
A9		Cable sleeve holder	PRSL9207PI
A10		Holding plate for 3+3 switches	PRSL8736PI
A15		Cable clamp	PRSL9210AU
A16		Screws for cable clamp	PRVI0089PE

JULIET-PK - REQUEST FORM FOR JOYSTICK STATION



Control elements and switches

Control element	Switches
[M]	_____
[N]	_____
[O]	_____
[P]	_____
[Q]	_____
[R]	_____

Joystick label

Text	
[A]	_____
[B]	_____
[C]	_____
[D]	_____
[E]	_____
[F]	_____
[G]	_____
[H]	_____

Control element label

Symbol	Label color	Text
[M]	_____	_____
[N]	_____	_____
[O]	_____	_____
[P]	_____	_____
[Q]	_____	_____
[R]	_____	_____

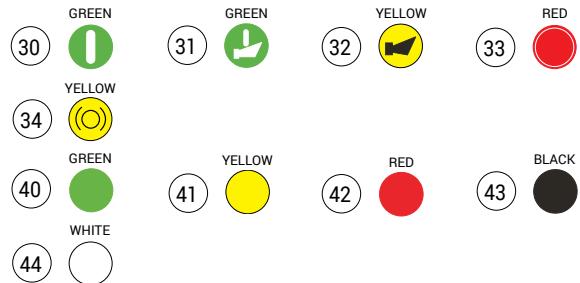
Control elements

- | | | |
|------|------------|--|
| (1) | PRSL1009PI | Mushroom pushbutton |
| (2) | PRTS000001 | Single pushbutton |
| (3) | PRSL1023PI | Blanking plug |
| (4) | PRSL1012PI | Red pilot light |
| (5) | PRSL1013PI | Yellow pilot light |
| (6) | PRSL1014PI | Green pilot light |
| (7) | PRSL1015PI | Selector switch 0/1 spring return |
| (8) | PRSL1016PI | Selector switch 0/1 maintained positions |
| (9) | PRSL1026PI | Selector switch 1/0/2 spring return |
| (10) | PRSL1027PI | Selector switch 1/0/2 maintained positions |
| (11) | PRSL1017PI | Key selector switch 0/1 maintained positions |
| (12) | PRSL1024PI | Key selector switch 0/1 spring return |

Switches

- | | | |
|------|------------|-------------|
| (20) | PRSL1000PI | 1NO |
| (21) | PRSL1001PI | 1NC |
| (22) | PRSL1004PI | Lamp holder |

Symbols and colors of control element label



Position of cable sleeve

- Right
 Left

Instructions

- Write the code number of the left and right Juliet joysticks required.
- Write the number or the code corresponding to the control elements and switches (max 3) required in each position. ATTENTION: mushroom pushbutton PRSL1009PI can be placed only in the O position.
- Write the text required on the label for each position of the joystick.
- Write the symbol, the color and the text required on the label for each control element.
- Tick the appropriate box to show where the cable sleeve must be assembled.

HERCULES

Joystick



New joystick, completely renewed and specifically designed for harsh environments and situations. Materials, technical solutions and sizing of critical components guarantee reliability and sturdiness, mechanical resistance and long life, while special attention is paid to design, ergonomics, operation accuracy and sensitivity.

FEATURES

- Fiberglass nylon structural components and steel levers ensure maximum resistance.
- Mechanical life of switches: 5 million operations.
- IP protection degree: Hercules is classified IP00 or IP65, when housed in a specific enclosure.
- Extreme temperature resistance: -25°C to +70°C.

OPTIONS

- Available with up to 5 speeds for each direction.
- Stepped or linear operations with spring return.
- Cross or 360° movement.
- 3 different versions: with free movement, with dead man safety device (with mechanical interlock with or without NO/NC contact), or with NO pushbutton to be used as electrical interlock.
- 4 different handles, also available with pushbuttons and selector switches.

- Available with potentiometers.
- Stepless proportional version available, with built-in analogue actuator and current, voltage or PWM outputs.

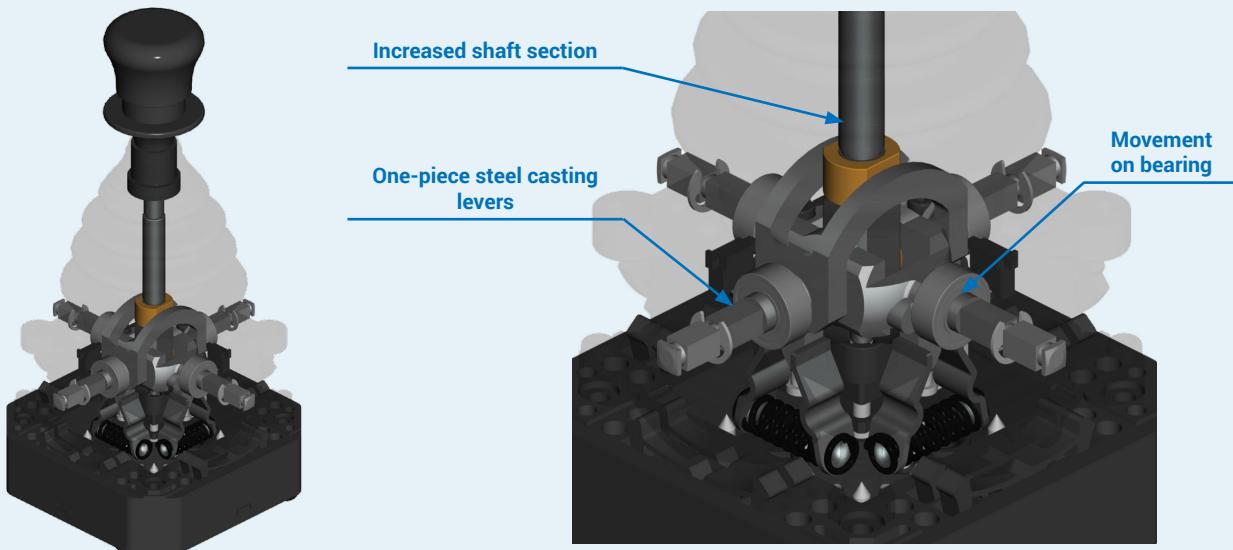
HERCULES-CK

- Hercules-CK is a joystick specially designed for controlling industrial handling machines and it features switches with electrical capacity of 3A / 250 Vac.

CERTIFICATIONS

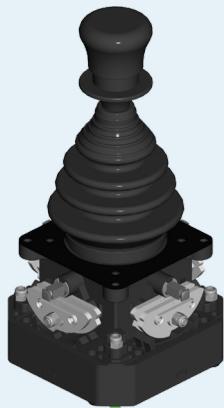
- CE marking.

Fill in the "request form" for accurate product configuration.



POSSIBLE ASSEMBLIES

Hercules (version with switch board)



Hercules-CK (version with switches)



CERTIFICATIONS

Conformity to Community Directives

2014/35/UE Low Voltage Directive

2006/42/CE Machinery Directive

EN 60204-1 Safety of machinery - Electrical equipment of machines

EN 60947-1 Low-voltage switchgear and controlgear

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices

Conformity to CE Standards

EN 61000-6-2 Electromagnetic compatibility (EMC) - Generic standards - Immunity for industrial environments

EN 61000-6-3 Electromagnetic compatibility (EMC) - Generic standards - Emission standard for residential, commercial and light-industrial environments

Markings and homologations

CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature

Storage -40°C/+70°C

Operational -25°C/+70°C

IP protection degree

IP 00 (IP 65 max. when housed in a specific enclosure)

Insulation category

Class I

Operating positions

Any position

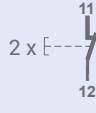
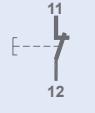
Mechanical life

5x10⁶ operations

HERCULES - TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRVV0804PE
Utilisation category	AC 15
Operating electrical usages	Inductive load 48 Vac/1 A 125 Vac/1 A 250 Vac/0,5 A 30 Vdc/1 A
	Resistive load 48 Vac/2 A 125 Vac/3 A 250 Vac/2 A 30 Vdc/3 A
Rated thermal current	8 A
Rated insulation voltage	1000 Vac
Mechanical life	5x10 ⁶ operations
Connections	Screw-type terminals
Wires	0.2 mm ² - 2.5 mm ²
Tightening torque	0.5 Nm - 0.6 Nm
Switch type	Single break
Contacts	1NO+1NC
Scheme	
Markings and homologations	   

HERCULES-CK - TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0190XX	PRSL0191XX	PRSL1000PI	PRSL1001PI
Use	Hercules-CK		"Dead – man" safety device	
Utilisation category		AC 15		
Rated operational current		3 A		
Rated operational voltage		250 Vac		
Rated thermal current		10 A		
Rated insulation voltage	300 Vac		500 Vac	
Connections		Screw-type terminals		
Wires	2x0.5mm ² - 2x1.5 mm ² - 1x2.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 14-22 AWG)		1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.5 Nm		0.6 Nm	
Switch type		Double break, slow action		
Contacts	1NC + 1NC		1NO	1NC
Scheme				
Markings and homologations			  	

TECHNICAL SPECIFICATIONS OF THE BUTTONS

Code	PRVV5019PE	PRVV5020PE	PRVV5080PE
Color	Green	Black	Green
Contact current rating	Resistive load 32 Vac/400 mA Resistive load 50 Vdc/100 mA Resistive load 125 Vac/125 mA		Resistive load 28 Vdc/5 A Resistive load 125 Vac/125 mA
Contact resistance	50 mΩ		-
Mechanical life	1x10 ⁶ operations		1x10 ⁶ operations
Contacts	1NO		1NO
Markings and homologations	CE		CE

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

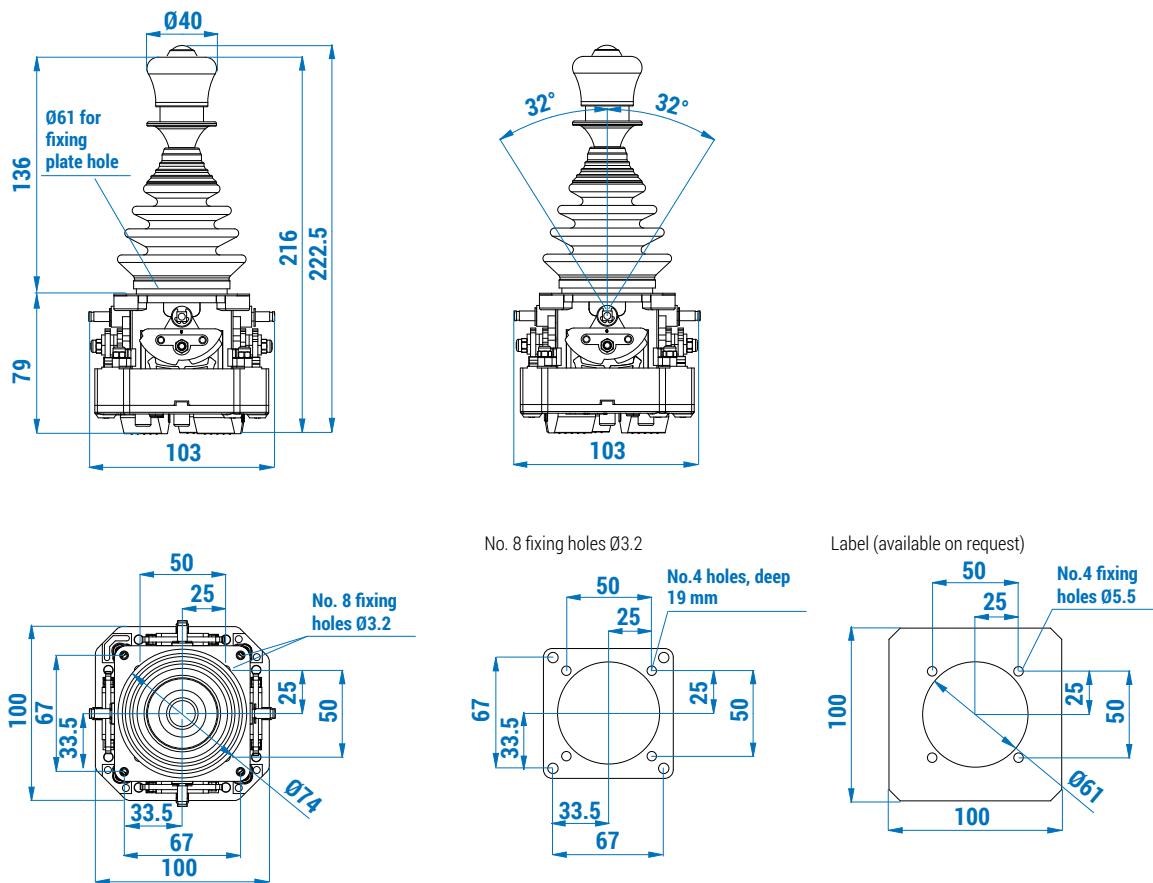
Code	PRVV9020PE	PRVV9025PE	PRVV9035PE
Ohmic value	4,7 kΩ	10 kΩ	2,2 kΩ
Indipendent linearity (over AEA -3°)		±0,25%	
Life time		3x10 ⁶ movements	
Operational ambient temperature		-55°C/+125°C	
Mechanical angle		360° continuous	
Actual Electrical Angle (AEA)		355°±5°	
Ohmic value tolerance		±5%	
Temperature drift		< 50 PPM/°C	
Dissipation		4 W	

TECHNICAL SPECIFICATIONS OF STEPLESS HERCULES

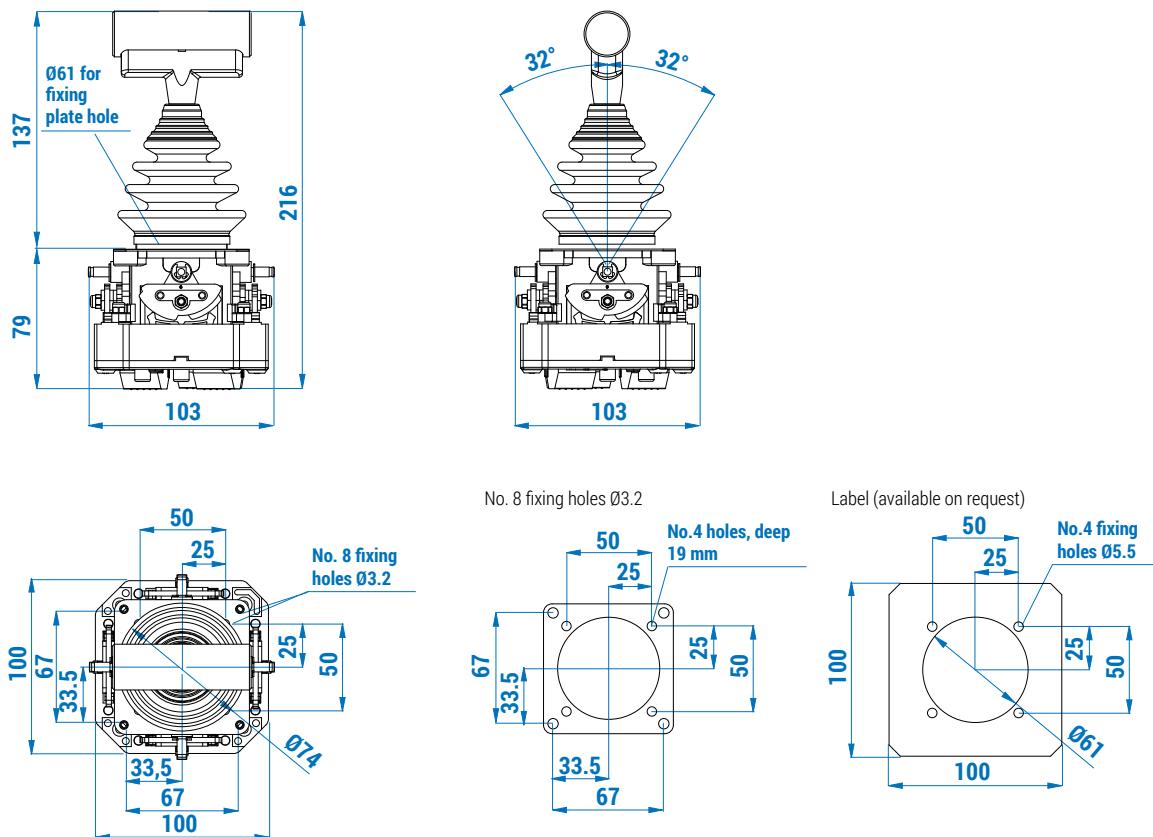
Supply voltage	12 ÷ 48 Vac/dc 2 voltage outputs: 0 ÷ +10 Vdc
Proportional outputs	2 current outputs: 4 ÷ 20mA 2 PWM outputs: 0 ÷100% D.C. (freq=1KHz)
Resolution	10 bit
4 directional switches	Inductive load 48 Vac/1 A 125 Vac/1 A 250 Vac/0,5 A 30 Vdc/1 A
	Resistive load 48 Vac/2 A 125 Vac/3 A 250 Vac/2 A 30 Vdc/3 A
Connections	Screw-type terminals
Wires	0.2 mm ² - 2.5 mm ²
Tightening torque	0.5 Nm - 0.6 Nm

HERCULES - OVERALL DIMENSIONS (mm)

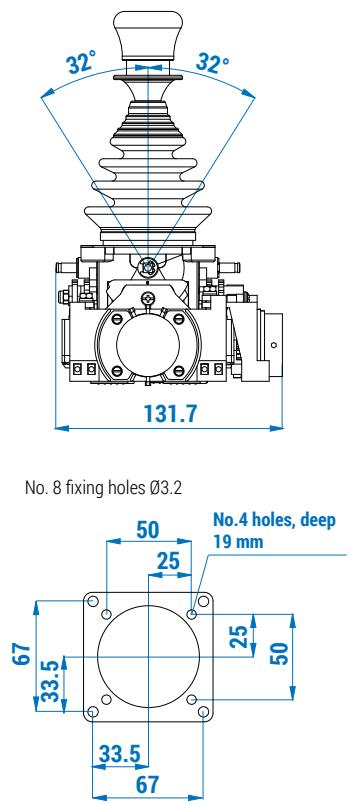
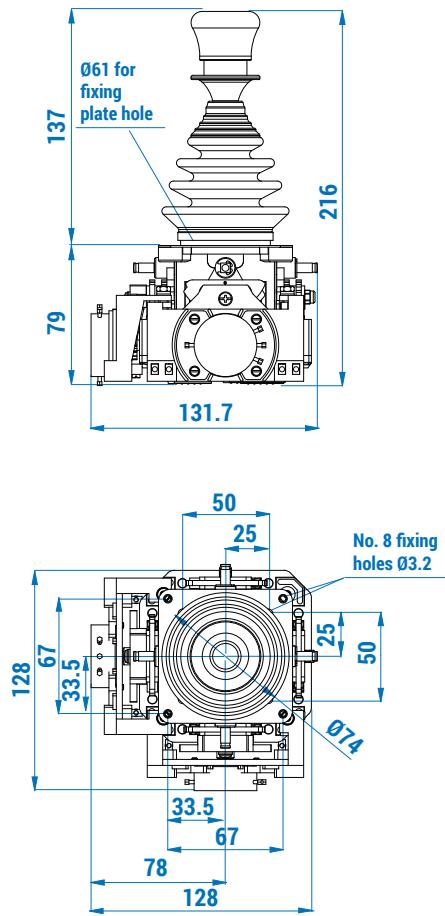
With knob



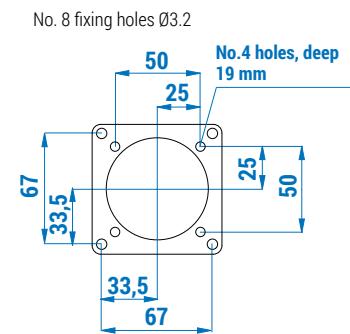
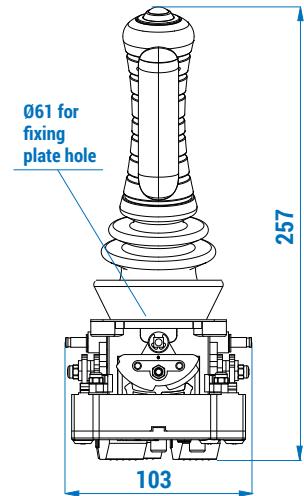
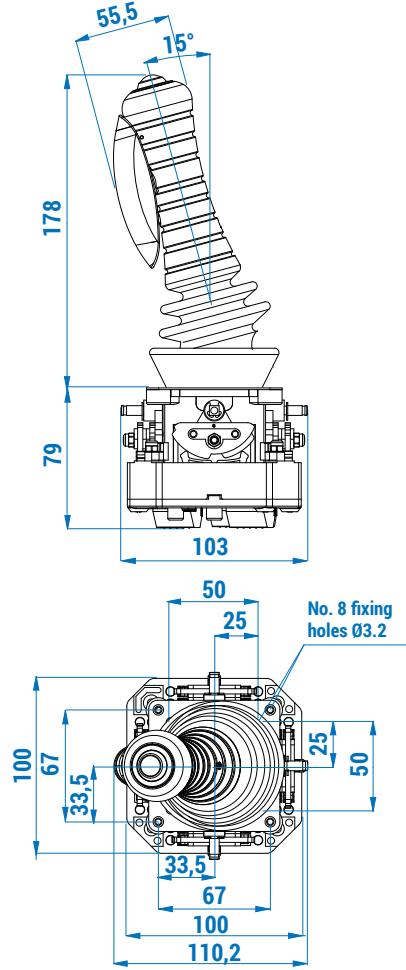
With T handle



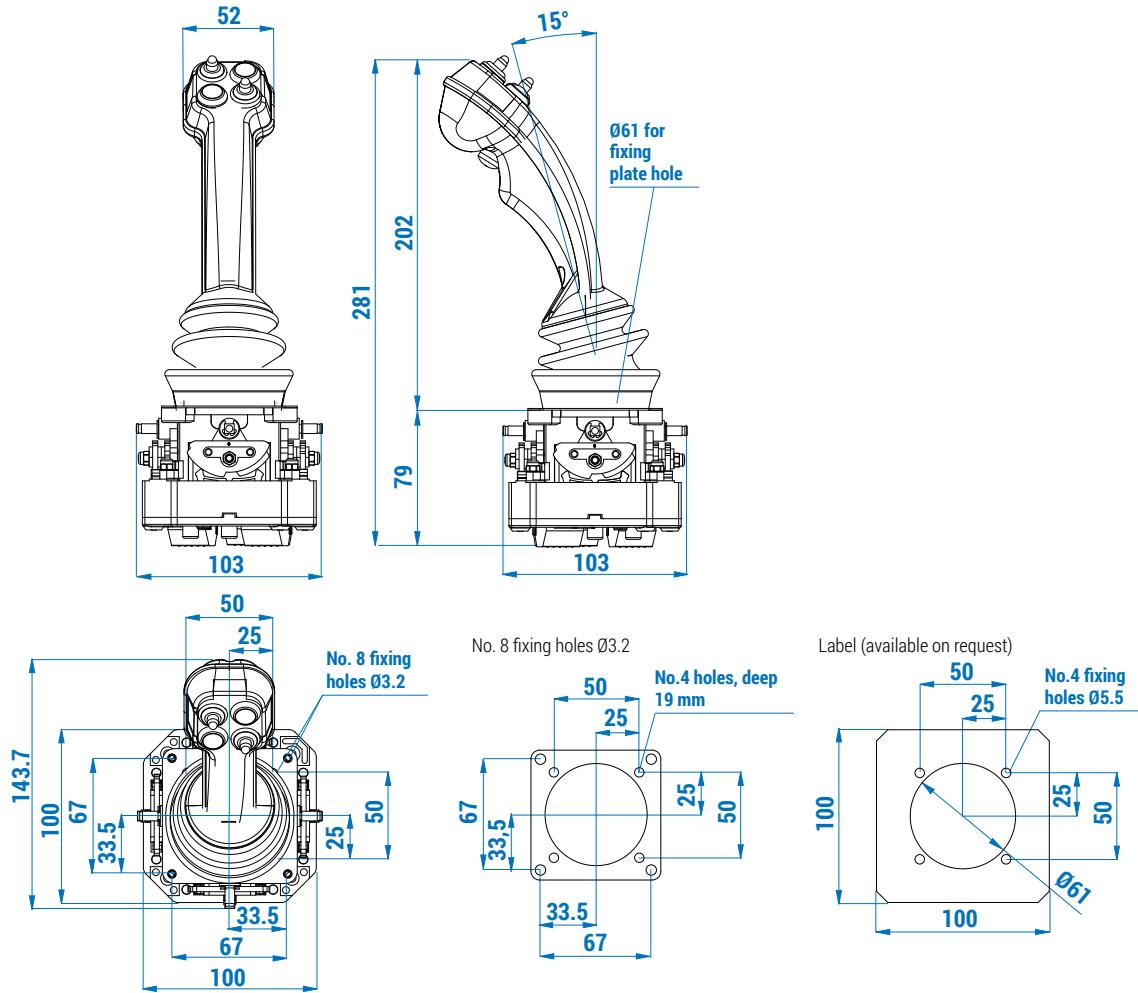
With potentiometer



With handle



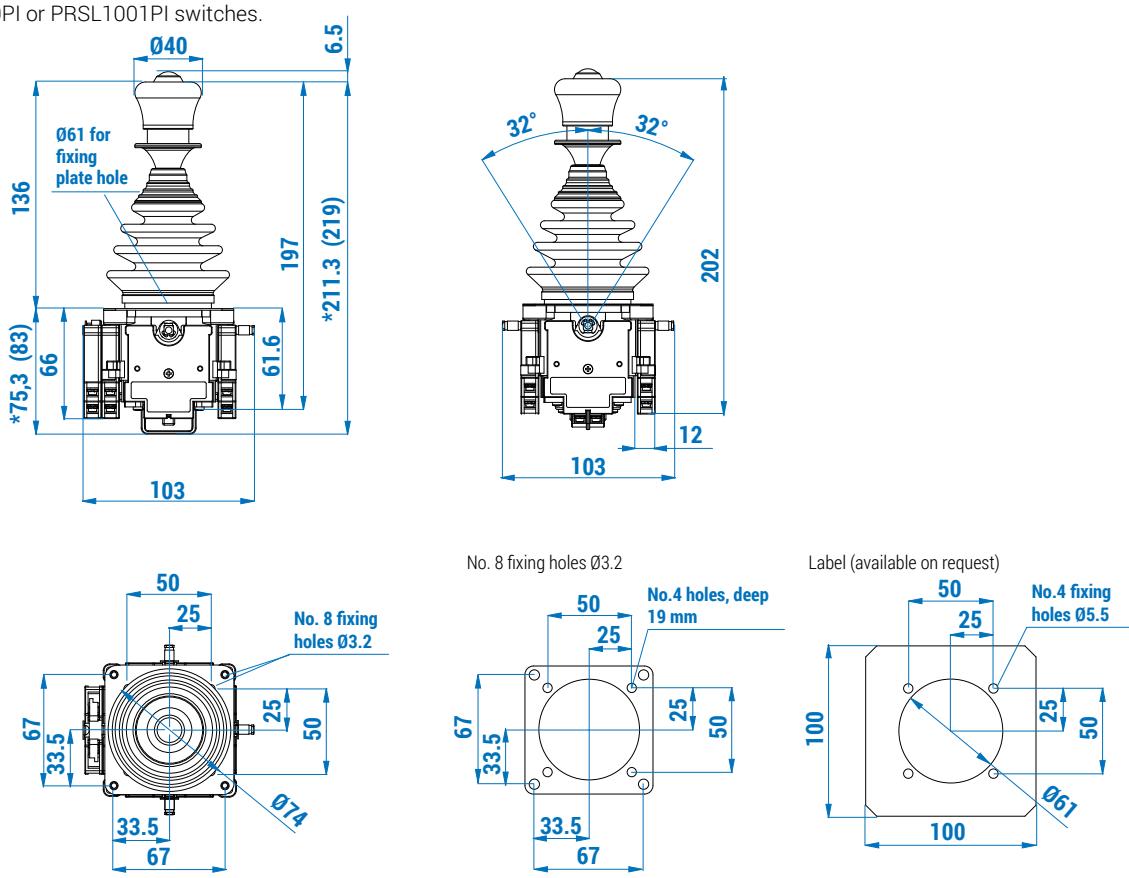
With ergonomic handle



HERCULES-CK - OVERALL DIMENSIONS (mm)

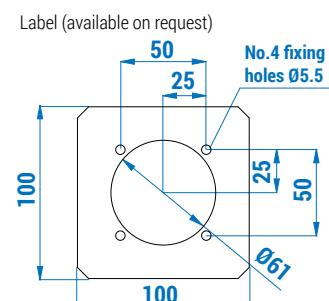
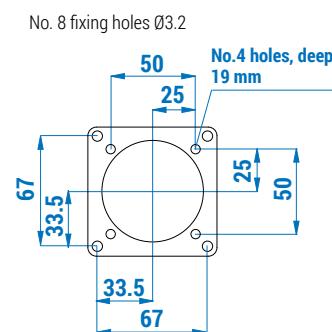
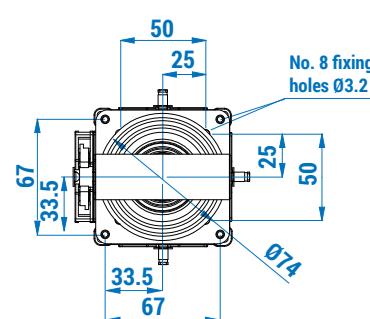
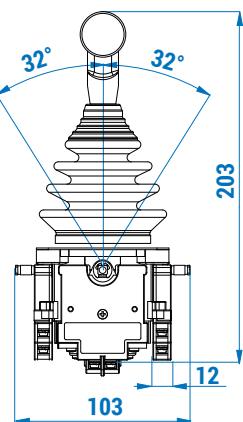
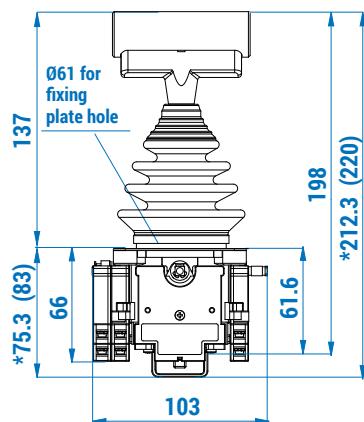
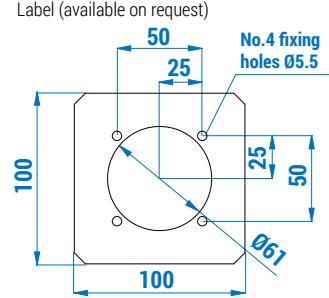
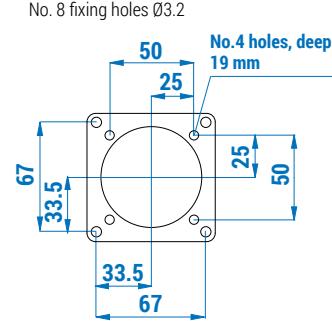
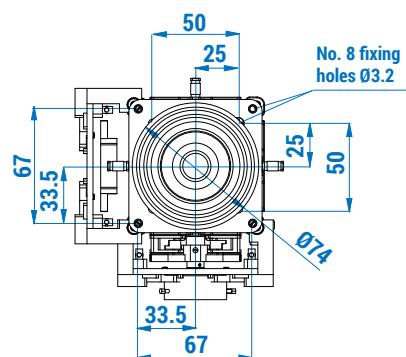
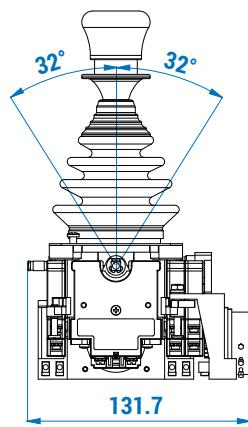
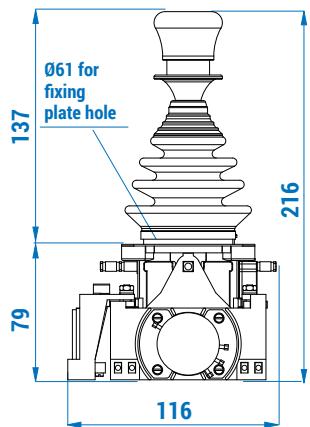
With knob

* PRSL0191XX switches
() PRSL1000PI or PRSL1001PI switches.

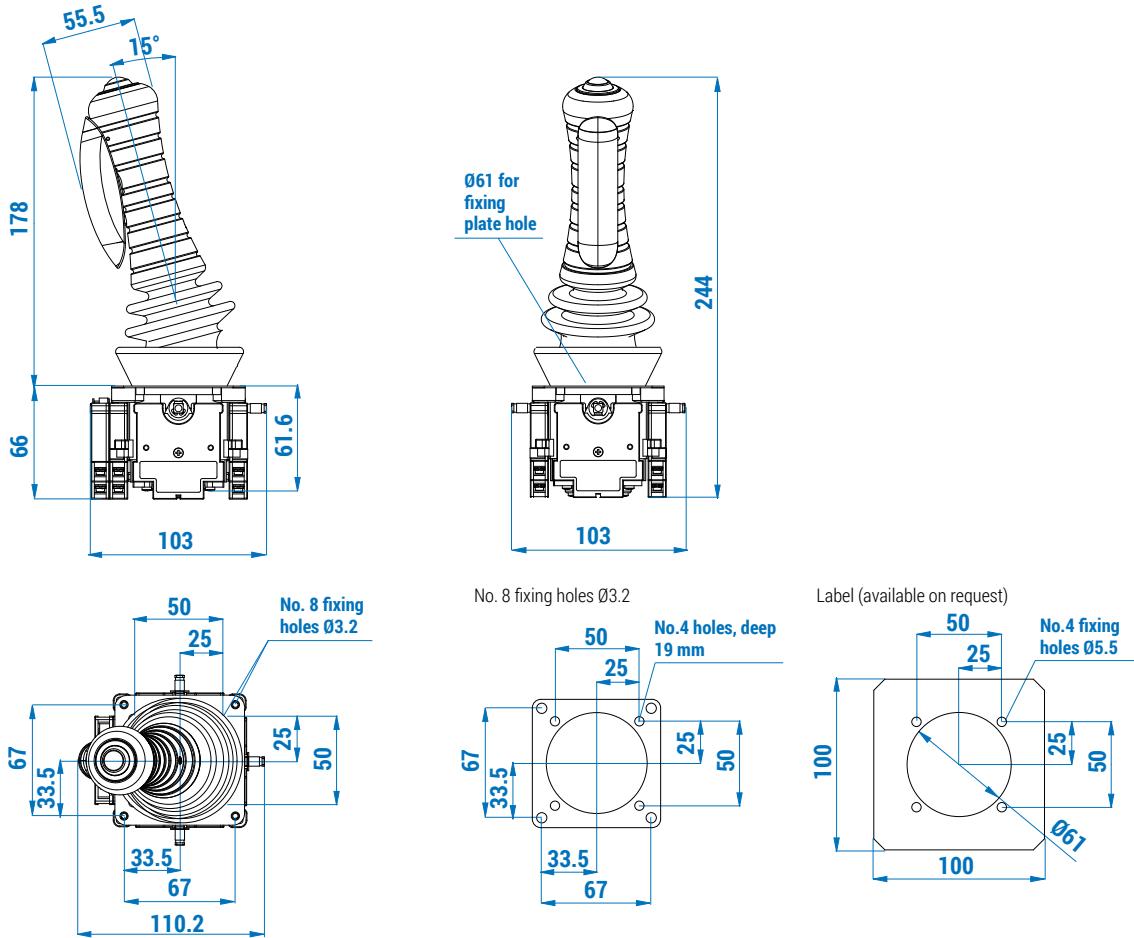


With T handle

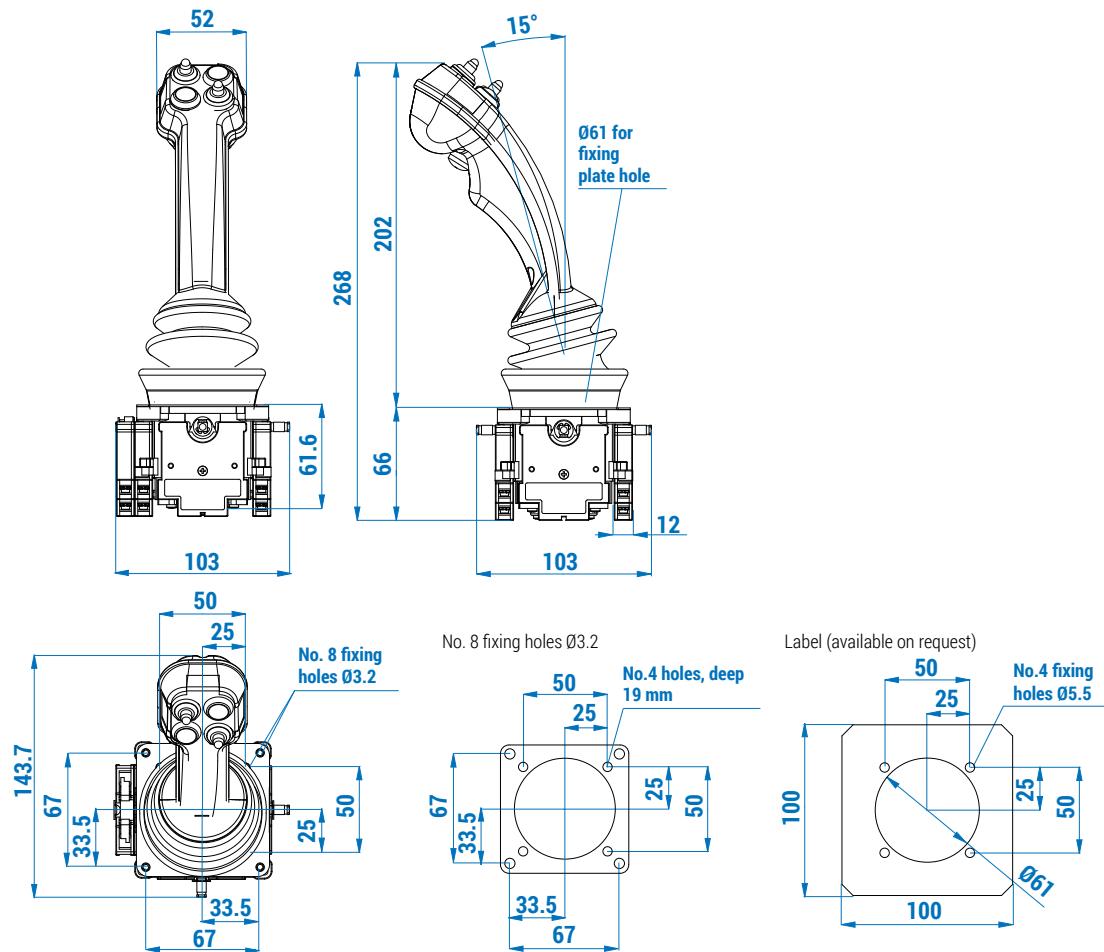
- * PRSL0191XX switches
- (-) PRSL1000PI or PRSL1001PI switches.

**With potentiometer**

With simple handle



With ergonomic handle

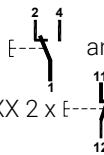


STANDARD JOYSTICKS

All standard joysticks feature spring return stepped movement.

Hercules joysticks are equipped with 1NO+1NC switches PRV0804PE and fixed terminal board.

Hercules-CK joysticks are equipped with 1NC+1NC switches PRSL0190XX 2 x E----



Grip type	Positions	Direction of movement		Hercules code		Hercules-CK code	
		360°	Cross	Free movement	Mechanical interlock + NC/NO contact	Free movement	Mechanical interlock + NC/NO contact
Knob 	1-0	X		F661CC01100001	F661AC01100001	/	/
	1-1	X		F661CL01111001	F661AL01111001	/	/
	2-0	X		F661CC02200001	F661AC02200001	F662CC02200001	F662AC02200001
	2-2	X		F661CL02222001	F661AL02222001	/	/
	3-0	X		F661CC03300001	F661AC03300001	/	/
	3-1	X		F661CL03311001	F661AL03311001	/	/
	3-2	X		F661CL03322001	F661AL03322001	/	/
	3-3	X		F661CL03333001	F661AL03333001	F662CL03333001	F662AL03333001
	4-0	X		F661CC04400001	F661AC04400001	/	/
	4-1	X		F661CL04411001	F661AL04411001	/	/
	4-2	X		F661CL04422001	F661AL04422001	/	/
	4-3	X		F661CL04433001	F661AL04433001	/	/
	4-4	X		F661CL04444001	F661AL04444001	F662CL04444001	F662AL04444001
	5-0	X		F661CC05500001	F661AC05500001	/	/
	5-1	X		F661CL05511001	F661AL05511001	F662CL05511001	F662AL05511001
	5-2	X		F661CL05522001	F661AL05522001	/	/
	5-3	X		F661CL05533001	F661AL05533001	/	/
	5-4	X		F661CL05544001	F661AL05544001	/	/
	5-5	X		F661CL05555001	F661AL05555001	F662CL05555001	F662AL05555001



Grip type	Positions	Direction of movement		Hercules code	Hercules-CK code
		360°	Cross	1NO button	1NO button
Knob with button					
	4-4		X	F661BC04444001	F662BC04444001



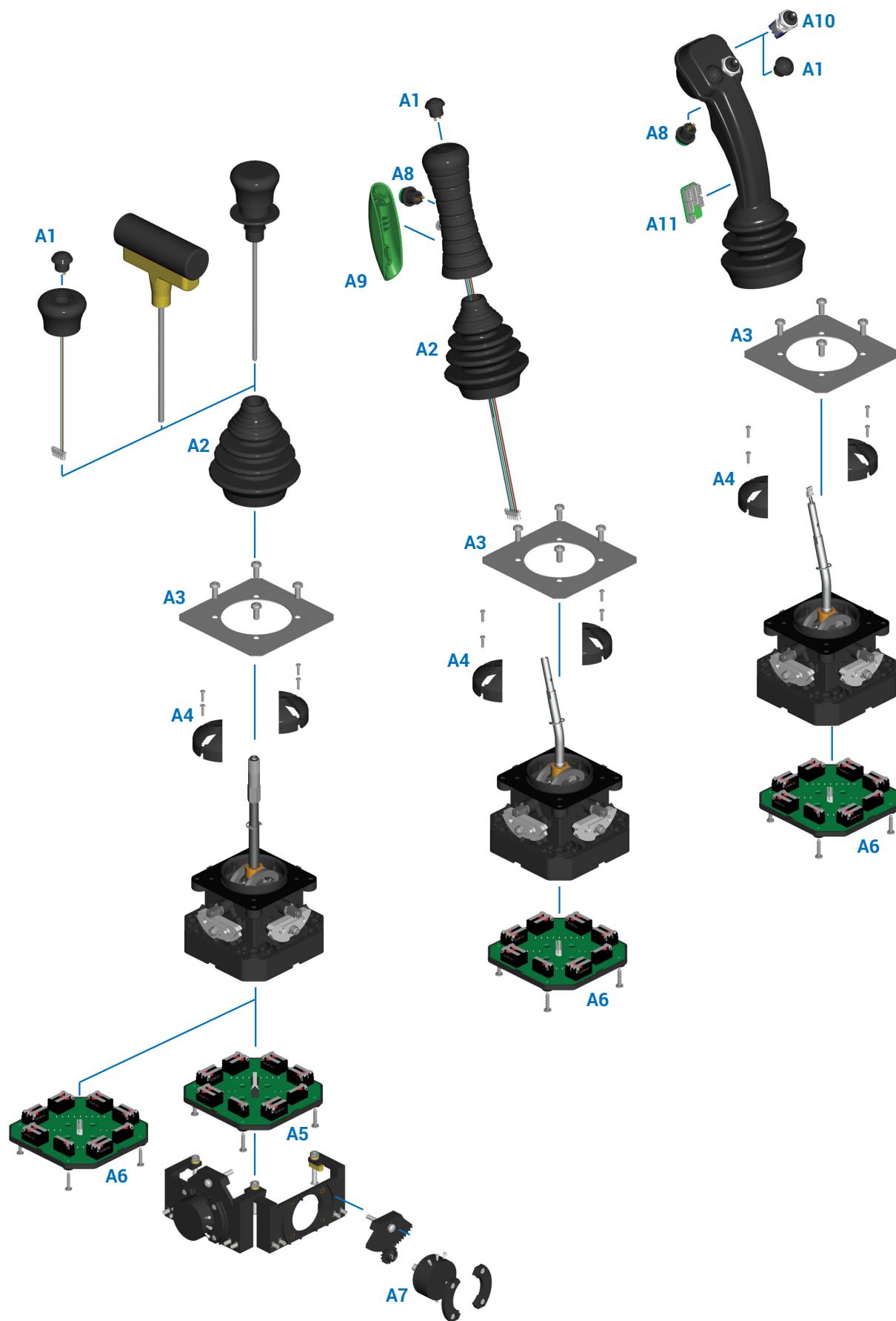
Grip type	Positions	Direction of movement		Hercules code		Hercules-CK code	
		360°	Cross	Free movement	Mechanical interlock + NC/NO contact	Free movement	Mechanical interlock + NC/NO contact
 T handle	2-0	X		F661MC02200001	F661MC02200001	F662MC02200001	F662MC02200001
	3-3	X		F661ML03333001	F661ML03333001	F662ML03333001	F662ML03333001
	4-4	X		F661ML04444001	F661ML04444001	F662ML04444001	F662ML04444001
	5-1	X		F661ML05511001	F661ML05511001	F662ML05511001	F662ML05511001
	5-5	X		F661ML05555001	F661ML05555001	F662ML05555001	F662ML05555001



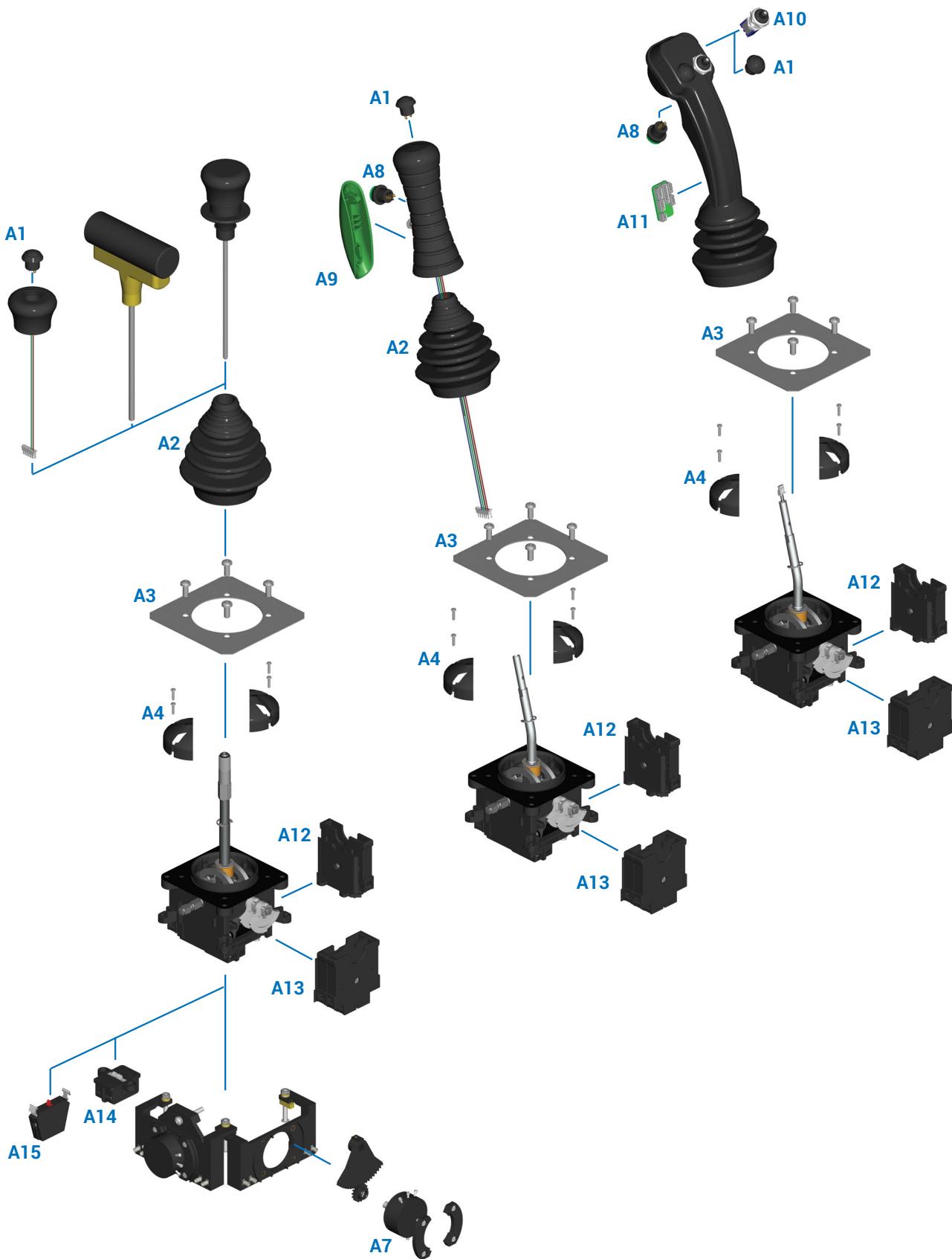
Grip type	Positions	Direction of movement		Hercules code		Hercules-CK code	
		360°	Cross	Free movement	1NO button (for use as electrical interlock)	Free movement	1NO button (for use as electrical interlock)
Simple handle	1-0		X	F661GC01100001	F661EC01100001	/	/
	1-1	X		F661GL0111001	F661EL0111001	/	/
	2-0		X	F661GC02200001	F661EC02200001	F662GC02200001	F662EC02200001
	2-2	X		F661GL0222001	F661EL0222001	/	/
	3-0		X	F661GC03300001	F661EC03300001	/	/
	3-1	X		F661GL03311001	F661EL03311001	/	/
	3-2	X		F661GL03322001	F661EL03322001	/	/
	3-3	X		F661GL03333001	F661EL03333001	F662GL03333001	F662EL03333001
	4-0		X	F661GC04400001	F661EC04400001	/	/
	4-1	X		F661GL04411001	F661EL04411001	/	/
	4-2	X		F661GL04422001	F661EL04422001	/	/
	4-3	X		F661GL04433001	F661EL04433001	/	/
	4-4	X		F661GL04444001	F661EL04444001	F662GL04444001	F662EL04444001
	5-0		X	F661GC05500001	F661EC05500001	/	/
Ergonomic handle	5-1	X		F661GL05511001	F661EL05511001	F662GL05511001	F662EL05511001
	5-2	X		F661GL05522001	F661EL05522001	/	/
	5-3	X		F661GL05533001	F661EL05533001	/	/
	5-4	X		F661GL05544001	F661EL05544001	/	/
	5-5	X		F661GL05555001	F661EL05555001	F662GL05555001	F662EL05555001
	1-0		X	F661LC01100001	F661LC01100002	/	/
	1-1	X		F661LL01111001	F661LL01111002	/	/
	2-0		X	F661LC02200001	F661LC02200002	F662LC02200001	F662LC02200002
	2-2	X		F661LL02222001	F661LL02222002	/	/
	3-0		X	F661LC03300001	F661LC03300002	/	/
	3-1	X		F661LL03311001	F661LL03311002	/	/
	3-2	X		F661LL03322001	F661LL03322002	/	/
	3-3	X		F661LL03333008	F661LL03333009	F662LL03333002	F662LL03333003
	4-0		X	F661LC04400001	F661LC04400002	/	/
	4-1	X		F661LL04411001	F661LL04411002	/	/
	4-2	X		F661LL04422001	F661LL04422002	/	/
	4-3	X		F661LL04433001	F661LL04433002	/	/
	4-4	X		F661LL04444001	F661LL04444002	F662LL04444002	F662LL04444001
	5-0		X	F661LC05500001	F661LC05500002	/	/
	5-1	X		F661LL05511004	F661LL05511005	F662LL05511002	F662LL05511003
	5-2	X		F661LL05522001	F661LL05522002	/	/
	5-3	X		F661LL05533001	F661LL05533002	/	/
	5-4	X		F661LL05544002	F661LL05544001	/	/
	5-5	X		F661LL05555001	F661LL05555002	F662LL05555002	F662LL05555003



HERCULES - ASSEMBLY DRAWING



HERCULES-CK - ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switches", "Buttons", "Switch boards", "Potentiometers", "Selector switches", "Cams" and "Accessories".

COMPONENTS

Switches

3

Ref.	Drawing	Description	Scheme	Code
A12		N. 1 switch PRSL0190XX with holding plate, nut and screw.	2 x 	PRSL4540PI
A13		N. 2 switches PRSL0190XX with holding plate, nut and screw.	2 x  2 x 	PRSL4541PI
A14		1NC + 1NC switch	2 x 	PRSL0191XX
A15		1 NO switch		PRSL1000PI
		1 NC switch		PRSL1001PI

Buttons

Ref.	Drawing	Description	Code
A1		Green 1NO button	PRVV5019PE
		Black 1NO button	PRVV5020PE
A8		Green 1NO button	PRVV5080PE
A9		Trigger button	PRSL7595PI

Switch boards

Ref.	Drawing	Description	Code
A5		5 speed board, 12 switches + electrical interlock	93625
		3 speed board, 8 switches + electrical interlock	93621
A6		5 speed board, 12 switches	93626
A11		Board for ergonomic handle	93624

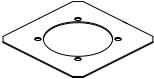
Potentiometers

Ref.	Drawing	Description	Code
A7		Potentiometer 2.2 kΩ	PRVV9035PE
		Potentiometer 4.7 kΩ	PRVV9020PE
		Potentiometer 10 kΩ	PRVV9025PE

Selector switches

Ref.	Drawing	Description	Code
A10		2 maintained position selector switch ON-ON wired	PRVV0830PE
		3 maintained position selector switch ON-OFF-ON wired	PRVV0831PE
		2 position spring return selector switch ON-MOM wire	PRVV0832PE
		3 position selector switch MOM-OFF-MOM wired	PRVV0833PE
		3 position selector switch ON-OFF-MOM wired	PRVV0834PE
		2 maintained position selector switch ON-OFF wired	PRVV0840PE
		2 position selector switch MOM-OFF wired	PRVV0842PE

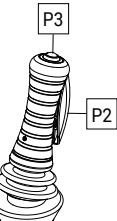
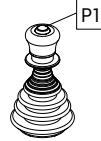
Accessories

Ref.	Drawing	Description	Code
A2		Bellows	PRGU6050PE
A3		Blank label	PRTA0150PE
		Lifting-Traverse label	PRTA0151PE
		Trolley-Rotation label	PRTA0152PE
A4		Cross lever guide	2 x PRSL9890PI

HERCULES - REQUEST FORM FOR NON STANDARD JOYSTICK

Grip

- Knob (IP 65 assembled in specific enclosure)
- Function
 Free movement
- Mechanical interlock + NC/NO contact (not available for proportional Hercules)
- P1 1NO button
- Colour of button
 black green
- T handle (IP 65 assembled in specific enclosure)
- Function
 Free movement
- Mechanical interlock + NC/NO contact (not available for proportional Hercules)
- Handle (IP 44 assembled in specific enclosure)
- Function
 Free movement
- P2 1NO button
- P2 1NO button + P3 1NO button
- Colour of button
 black green
- Ergonomic handle (IP43 assembled in specific enclosure)



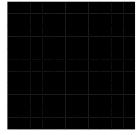
1NO buttons can be used as electrical interlock.

Movement

- Stepped - spring return
- Linear - spring return

Lever guide

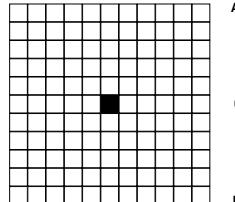
Standard lever guide



5 steps directions A-B
5 steps directions C-D
360° movement

- Customized lever guide (not available for proportional Hercules)

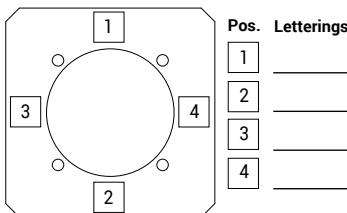
C ————— 0 ————— D



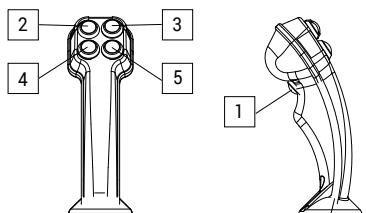
Joystick label

- Blank label
- Lifting-Traverse symbols
- Trolley-Rotation symbols

- Customized label



Actuators for ergonomic handle



Actuator* and label letterings

Pos.

- Yes No PRVV5080PE Green button 1NO contact + 1 common**

Type Lettering

2	<input type="text"/>	_____
3	<input type="text"/>	_____
4	<input type="text"/>	_____
5	<input type="text"/>	_____

Actuators for positions 2-3-4-5

- [A] PRVV5019PE Green button 1NO contact + 1 common
- [B] PRVV5020PE Black button 1NO contact + 1 common
- [C] PRVV0840PE 2 position selector ON-OFF 1 contact + 1 common
- [D] PRVV0842PE 2 position selector MOM-OFF 1 contact + 1 common
- [E] PRVV0830PE 2 maintained position selector ON-ON 2 contacts + 1 common
- [F] PRVV0831PE 3 maintained position selector ON-OFF-ON 2 contacts + 1 common
- [G] PRVV0832PE 2 position spring return selector ON-MOM 2 contacts + 1 common
- [H] PRVV0833PE 3 position selector MOM-OFF-MOM 2 contacts + 1 common
- [I] PRVV0834PE 3 position selector ON-OFF-MOM 2 contacts + 1 common

* Maximum 5 contacts + 1 common available.
Ex.: 1NO contact in position 1 + 4 buttons A type.
1NO contact in position 1 + 4 selectors C type.
1NO contact in position 1 + 2 selectors G type.

** In case of use of the electrical interlock function, connect it to actuator 1.

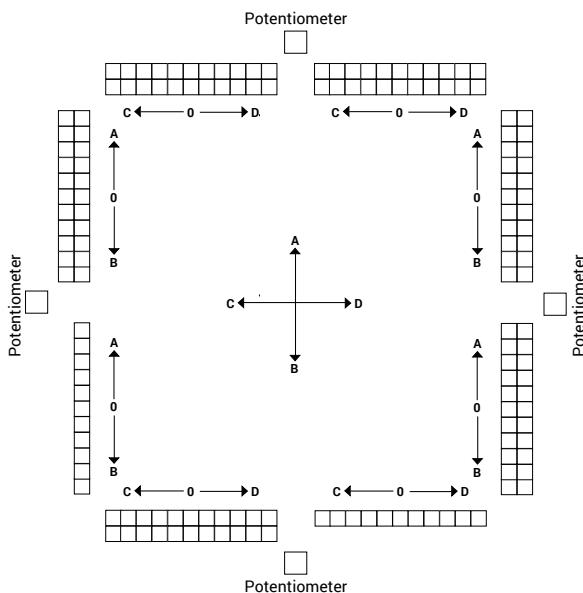
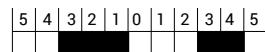
Joystick with potentiometers

Potentiometer

- PRVV9035PE 2.2 kΩ
- PRVV9020PE 4.7 kΩ
- PRVV9025PE 10 kΩ
- Preset only

Instructions

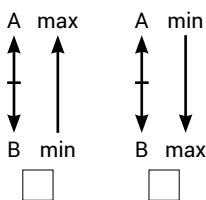
When necessary, write the number corresponding to the potentiometer or to the preset required. Fill in the contact scheme blackening the boxes corresponding to the positions where the cams close the contacts (each bar of 11 boxes correspond to a switch; the central box corresponds to the zero position of the joystick). In the example, the contact is closed in positions 1-2-3 to the left and 3-4-5 to the right.



Stepless proportional joystick

A-B LEVER DIRECTION

Select the increase / decrease direction of the signal



Standard outputs*

Standard outputs (A-B direction)			Select a version
Voltage	Current	PWM	
0-10V	4-20mA	0-100%	<input type="checkbox"/>
0-5V	4-12mA	0-50%	<input type="checkbox"/>
0.5-9.5V	4.5-19.5mA	5-95%	<input type="checkbox"/>
0.5-4.5V	4.5-11.5mA	5-45%	<input type="checkbox"/>

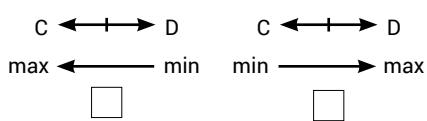
Customized outputs

Customized outputs (A-B direction)

Voltage (from 0 to 10 V)			Current (from 4 to 20 mA)			PWM (from 0 to 100%)		
min	Lever in central position	max	min	Lever in central position	max	min	Lever in central position	max
____V	____V	____V	____mA	____mA	____mA	____%	____%	____%

C-D LEVER DIRECTION

Select the increase / decrease direction of the signal



Standard outputs*

Standard outputs (C-D direction)			Select a version
Voltage	Current	PWM	
0-10V	4-20mA	0-100%	<input type="checkbox"/>
0-5V	4-12mA	0-50%	<input type="checkbox"/>
0.5-9.5V	4.5-19.5mA	5-95%	<input type="checkbox"/>
0.5-4.5V	4.5-11.5mA	5-45%	<input type="checkbox"/>

Customized outputs

Customized outputs (C-D direction)

Voltage (from 0 to 10 V)			Current (from 4 to 20 mA)			PWM (from 0 to 100%)		
min	Lever in central position	max	min	Lever in central position	max	min	Lever in central position	max
____V	____V	____V	____mA	____mA	____mA	____%	____%	____%

* Select the standard output required. In case of customized outputs, fill in the 'customized outputs' table paying attention at the value ranges. The value of 'Lever in central position' must be in between the minimum and maximum values chosen.

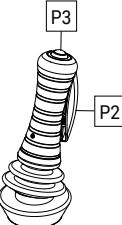
HERCULES-CK - REQUEST FORM FOR NON STANDARD JOYSTICK

Grip

- Knob (IP 65 assembled in specific enclosure)
- Function
 Free movement
 Mechanical interlock
- 

- P1 1NO button
 Colour of button
 black green

- T handle (IP 65 assembled in specific enclosure)
- Function
 Free movement
 Mechanical interlock
- 

- Handle (IP 44 assembled in specific enclosure)
- Function
 Free movement
- P2 1NO button
- P2 1NO button + P3 1NO button
- Colour of button
 black green
- 

- Ergonomic handle (IP43 assembled in specific enclosure)
- 

1NO buttons can be used as electrical interlock.

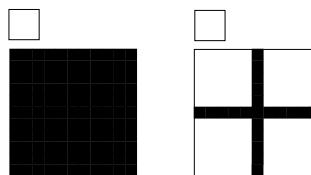
Movement

- Stepped - spring return
 Linear - spring return

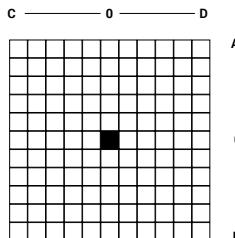
Lever guide

Standard lever guide

Customized lever guide



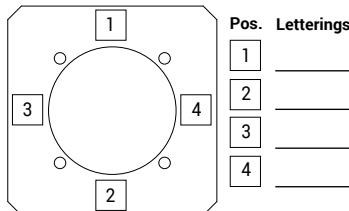
5 steps directions A-B
 5 steps directions C-D
 360° movement



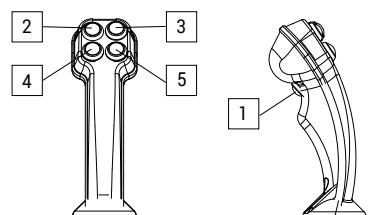
5 steps directions A-B
 5 steps directions C-D
 Cross movement

Joystick label

- Blank label
 Lifting-Traverse symbols
 Trolley-Rotation symbols
- Customized label



Actuators for ergonomic handle



Actuator* and label letterings

Pos.

- Yes No PRVV5080PE Green button 1NO contact + 1 common**

Type Lettering

2	<input type="checkbox"/>	_____
3	<input type="checkbox"/>	_____
4	<input type="checkbox"/>	_____
5	<input type="checkbox"/>	_____

Actuators for positions 2-3-4-5

- A PRVV5019PE Green button 1NO contact + 1 common
- B PRVV5020PE Black button 1NO contact + 1 common
- C PRVV0840PE 2 position selector ON-OFF 1 contact + 1 common
- D PRVV0842PE 2 position selector MOM-OFF 1 contact + 1 common
- E PRVV0830PE 2 maintained position selector ON-ON 2 contacts + 1 common
- F PRVV0831PE 3 maintained position selector ON-OFF-ON 2 contacts + 1 common
- G PRVV0832PE 2 position spring return selector ON-MOM 2 contacts + 1 common
- H PRVV0833PE 3 position selector MOM-OFF-MOM 2 contacts + 1 common
- I PRVV0834PE 3 position selector ON-OFF-MOM 2 contacts + 1 common

* Maximum 5 contacts + 1 common available.
 Ex.: 1NO contact in position 1 + 4 buttons A type.
 1NO contact in position 1 + 4 selectors C type.
 1NO contact in position 1 + 2 selectors G type.

** In case of use of the electrical interlock function, connect it to actuator 1.

Switches for mechanical interlock (when required)

- 1 switch PRSL0191XX with 1NC+1NC contacts.
 - 1 switch PRSL1000PI with 1NO contact.
 - 1 switch PRSL1000PI with1NO contact + 1 switch PRSL1000PI with1NO contact.
 - 1 switch PRSL1001PI with1NC contact.
 - 1 switch PRSL1001PI with1NC contact + 1 switch PRSL1001PI with1NC contact.

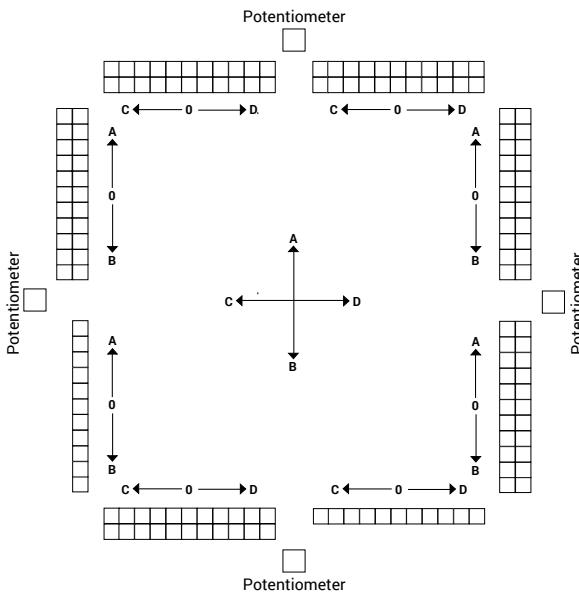
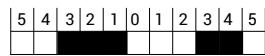
Joystick with potentiometers

Potentiometer

- PRVV9035PE 2.2 kΩ
 - PRVV9020PE 4.7 kΩ
 - PRVV9025PE 10 kΩ
 - Preset only

Instructions

Instructions
When necessary, write the number corresponding to the potentiometer or to the preset required. Fill in the contact scheme blackening the boxes corresponding to the positions where the cams close the contacts (each bar of 11 boxes correspond to a switch; the central box corresponds to the zero position of the joystick). In the example, the contact is closed in positions 1-2-3 to the left and 3-4 to the right.



Remarks

HERCULES-PK

Joystick station



Sturdy and reliable joystick station, suitable for industrial environments and harsh conditions. Materials, technical solutions and sizing of critical components are studied to guarantee mechanical resistance and long life.

FEATURES

- Designed for Hercules and Hercules-CK joysticks.
- Carry-on straps and aluminium handles provide for greater ease of use.
- The emergency stop mushroom pushbutton complies with standard EN 418 and is positioned in the middle for intuitive operation in case of danger.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Hercules-PK is classified min. IP43 – max. IP65, depending on the joystick.
- Extreme temperature resistance: -25°C to +70°C.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Wide range of actuators: pushbuttons, selector switches and key-selector switches, pilot lights.
- Single switches with NO or NC contacts and double switches with NO contacts, one or two speeds, with electrical interlock to prevent simultaneous operation of opposite functions.
- Available with customized labels and enclosures with different size holes.

CERTIFICATIONS

- CE marking.

Fill in the "request form" for accurate product configuration.

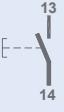
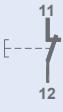
CERTIFICATIONS

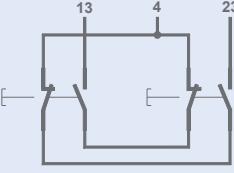
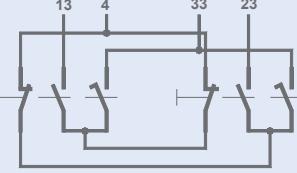
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
Grado di protezione IP	Min. IP 43 - max. IP 65 depending on the joystick
Insulation category	Class II
Cable entry	Cable sleeve (Ø 14÷26 mm)
Operating positions	Any position

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL1000PI	PRSL1001PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Switch type	Double break, slow action	Double break, slow action
Contacts	1NO	1NC
Scheme		
Markings and homologations	CE	cULus EAC

Code	PRSL1002PI	PRSL1003PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Switch type	Double switch, 1 speed	Double switch, 2 speeds
Contacts	2NO+common	3NO+common
Scheme		
Markings and homologations	  	

TECHNICAL SPECIFICATIONS OF THE LAMP HOLDERS

Code	PRSL1004PI
Maximum voltage	125 V
Maximum power	2.6 W
Lamp type	T5.5K 22 mm
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Tightening torque	0.6 Nm
Markings and homologations	

TECHNICAL SPECIFICATIONS OF THE SWITCHES (JOYSTICK HERCULES)

Code	PRVV0804PE
Utilisation category	AC 15
Operating electrical usages	Inductive load 48 Vac/1 A 125 Vac/1 A 250 Vac/0.5 A 30 Vdc/1 A
	Resistive load 48 Vac/2 A 125 Vac/3 A 250 Vac/2 A 30 Vdc/3 A
Rated thermal current	8 A
Rated insulation voltage	1000 Vac
Mechanical life	5x10 ⁶ operations
Connections	Screw-type terminals
Wires	0.2 mm ² - 2.5 mm ²
Tightening torque	0.5 Nm - 0.6 Nm
Switch type	Single break
Contacts	1NO+1NC
Scheme	
Markings and homologations	

TECHNICAL SPECIFICATIONS OF THE SWITCHES (JOYSTICK HERCULES-CK)

Code	PRSL0190XX	PRSL0191XX	PRSL1000PI	PRSL1001PI
Use	Hercules-CK		"Dead – man" safety device	
Utilisation category		AC 15		
Rated operational current		3 A		
Rated operational voltage		250 Vac		
Rated thermal current		10 A		
Rated insulation voltage	300 Vac		500 Vac	
Connections		Screw-type terminals		
Wires	2x0.5mm ² - 2x1.5 mm ² - 1x2.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 14-22 AWG)		1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.5 Nm		0.6 Nm	
Switch type		Double break, slow action		
Contacts	1NC + 1NC		1NO	1NC
Scheme				
Markings and homologations				

TECHNICAL SPECIFICATIONS OF THE BUTTONS (JOYSTICK HERCULES AND HERCULES-CK)

Code	PRVV5019PE	PRVV5020PE	PRVV5080PE
Color	Green	Black	Green
Contact rated current	Resistive load 32 Vac/400 mA Resistive load 50 Vdc/100 mA Resistive load 125 Vac/125 mA		Resistive load 28 Vdc/5 A Resistive load 125 Vac/125 mA
Contact resistance	50 mΩ		-
Mechanical life	1x10 ⁶ operations		1x10 ⁶ operations
Contacts	1NO		1NO
Markings and homologations	CE		CE

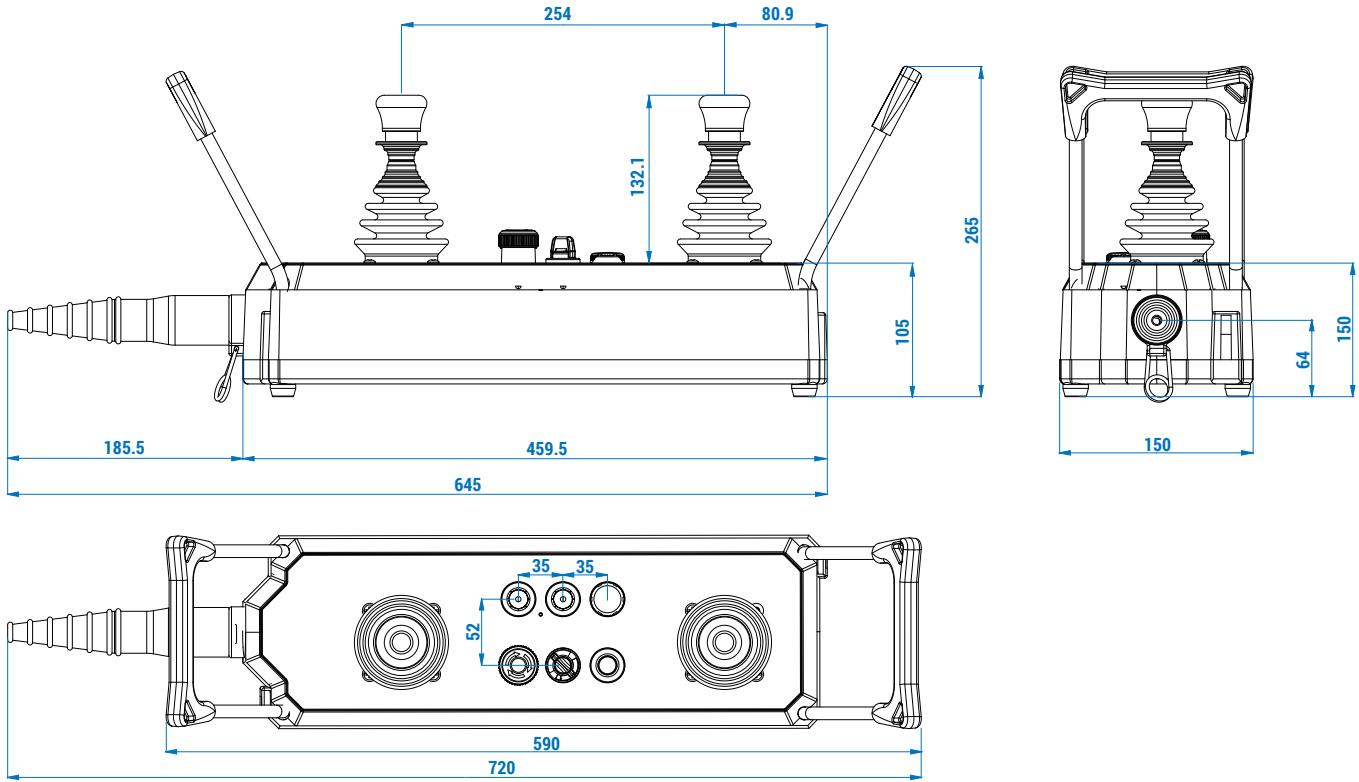
TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS (JOYSTICK HERCULES AND HERCULES-CK)

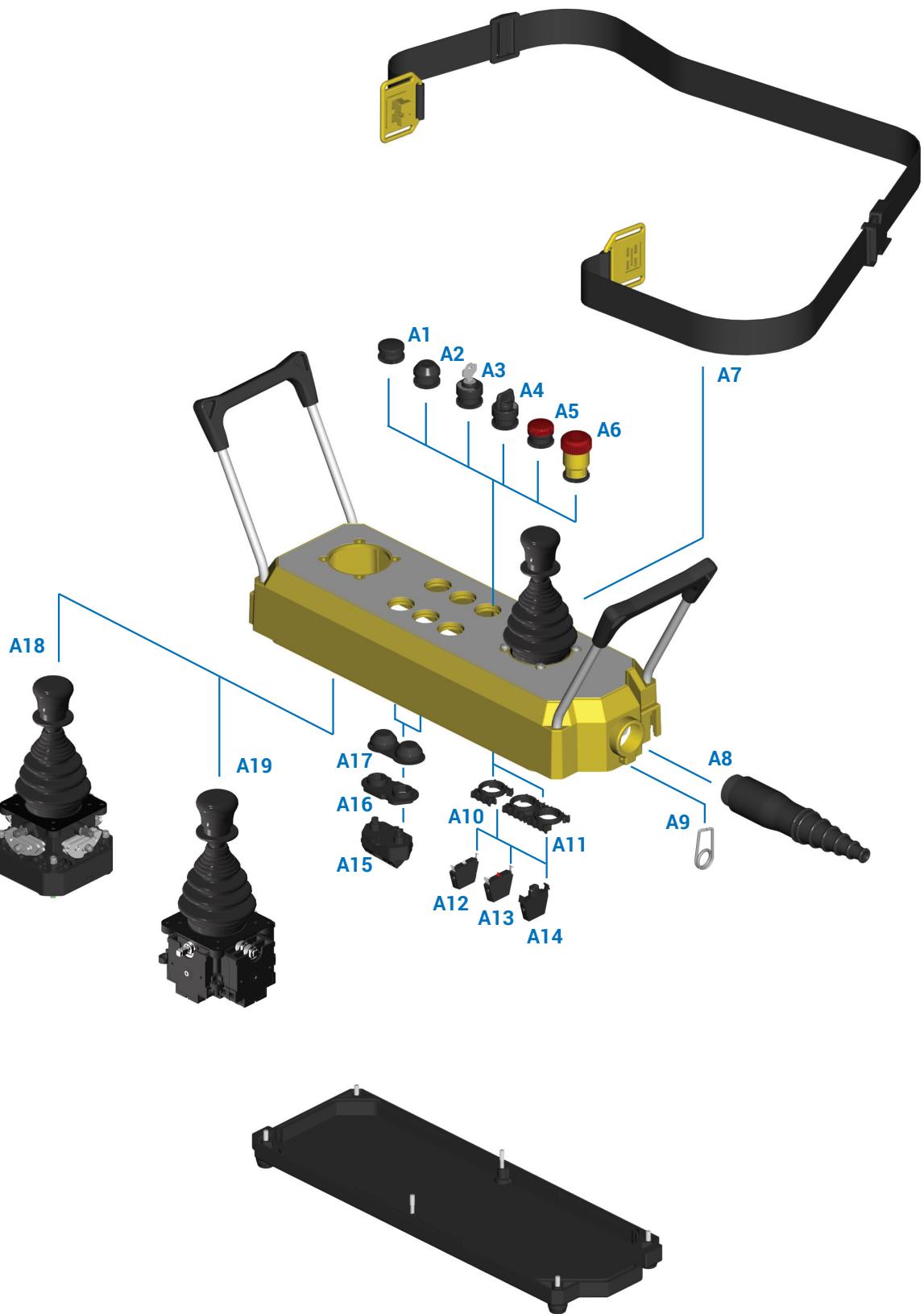
Code	PRVV9020PE	PRVV9025PE	PRVV9035PE
Ohmic value	4.7 kΩ	10 kΩ	2.2 kΩ
Independent linearity (over AEA -3°)	±0.25%		
Life time	3x10 ⁶ movements		
Operational ambient temperature	-55°C/+125°C		
Mechanical angle	360° continuous		
Actual Electrical Angle (AEA)	355°±5°		
Ohmic value tolerance	±5%		
Temperature drift	< 50 PPM/°C		
Dissipation	4 W		

TECHNICAL SPECIFICATIONS OF STEPLESS JOYSTICK (HERCULES)

Supply voltage	12 ÷ 48 Vac/dc
Proportional outputs	2 voltage outputs: 0 ÷ +10 Vdc 2 current outputs: 4 ÷ 20mA 2 PWM outputs: 0 ÷100% D.C. (freq=1KHz)
Resolution	10 bit
4 directional switches	Inductive load 48 Vac/1 A 125 Vac/1 A 250 Vac/0,5 A 30 Vdc/1 A
	Resistive load 48 Vac/2 A 125 Vac/3 A 250 Vac/2 A 30 Vdc/3 A
Connections	Screw-type terminals
Wires	0.2 mm ² - 2.5 mm ²
Tightening torque	0.5 Nm - 0.6 Nm

OVERALL DIMENSIONS (mm)

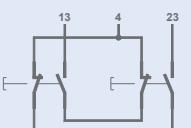
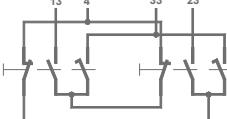




Refer to the following tables for descriptions of components: "Switches", "Actuators", "Pilot lights", "Selector switches", "Mushroom pushbuttons", "Joysticks" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A12		1NO switch		PRSL1000PI
A13		1NC switch		PRSL1001PI
A14		Lamp holder	-	PRSL1004PI
A15		1 speed, 2NO+common double switch		PRSL1002PI
		2 speeds, 3NO+common double switch		PRSL1003PI

Actuators

Ref.	Drawing	Description	Code
A1		Blanking plug	PRSL1023PI
A2		Single pushbutton	PRTS000001
A16		Holding plate for double pushbutton	PRSL8737PI
A17		Double pushbutton with rubber	PRTD000001

Pilot lights

Ref.	Drawing	Color	Code
A5		Red	PRSL1012PI
		Yellow	PRSL1013PI
		Green	PRSL1014PI

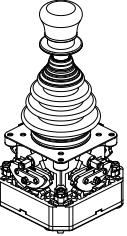
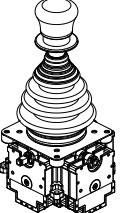
Selector switches

Ref.	Drawing	Positions	Spring return	Maintained positions	Pull-out position	Code
A3		0/1		X	0	PRSL1017PI
		0/1	X		0	PRSL1024PI
A4		0/1	X			PRSL1015PI
		0/1		X		PRSL1016PI
		1/0/2	X			PRSL1026PI
		1/0/2		X		PRSL1027PI

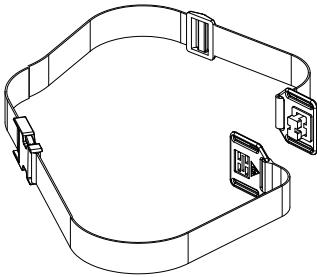
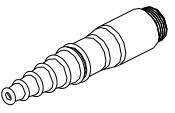
Mushroom pushbuttons

Ref.	Drawing	Description	Code
A6		Latched mushroom pushbutton for emergency stop	PRSL1009PI

Joysticks

Ref.	Drawing	Description	Code
A18		Hercules joystick, all versions available	F66 Refer to joystick Hercules documentation
A19		Hercules-CK joystick, all versions available	F66 Refer to joystick Hercules documentation

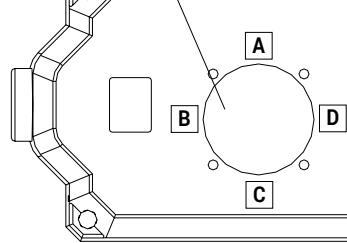
Accessories

Ref.	Drawing	Description	Code
A7		Shoulder strap	PRSL0161PE
A8		Cable sleeve	PRSL0145PE
A9		Hook	PRGA0001PE
A10		Holding plate for 3 switches	PRSL8739PI
A11		Holding plate for 3+3 switches	PRSL8736PI

HERCULES-PK - REQUEST FORM FOR JOYSTICK STATION

Left joystick

PF66



Right joystick

PF66



Control elements and switches

Control element	Switches
[M]	_____
[N]	_____
[O]	_____
[P]	_____
[Q]	_____
[R]	_____

Joystick label

Text
[A] _____
[B] _____
[C] _____
[D] _____
[E] _____
[F] _____
[G] _____
[H] _____

Control elements label

Symbol	Label color	Text
[M]	_____	_____
[N]	_____	_____
[O]	_____	_____
[P]	_____	_____
[Q]	_____	_____
[R]	_____	_____

Control elements

- | | | |
|------|------------|--|
| (1) | PRSL1009PI | Mushroom pushbutton |
| (2) | PRTS000001 | Single pushbutton |
| (3) | PRTD000001 | Double pushbutton |
| (4) | PRSL1023PI | Blanking plug |
| (5) | PRSL1012PI | Red pilot light |
| (6) | PRSL1013PI | Yellow pilot light |
| (7) | PRSL1014PI | Green pilot light |
| (8) | PRSL1015PI | Selector switch 0/1 spring return |
| (9) | PRSL1016PI | Selector switch 0/1 maintained positions |
| (10) | PRSL1026PI | Selector switch 1/0/2 spring return |
| (11) | PRSL1027PI | Selector switch 1/0/2 maintained positions |
| (12) | PRSL1017PI | Key selector switch 0/1 maintained positions |
| (13) | PRSL1024PI | Key selector switch 0/1 spring return |

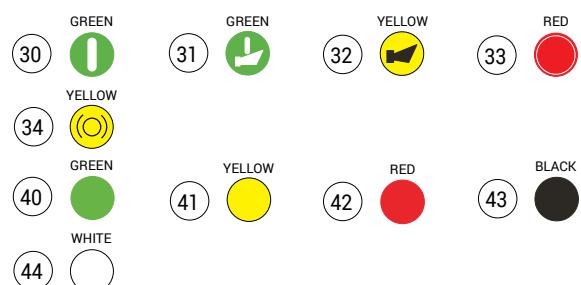
Single switches

- | | | |
|------|------------|-------------|
| (20) | PRSL1000PI | 1NO |
| (21) | PRSL1001PI | 1NC |
| (22) | PRSL1004PI | Lamp holder |

Double switches

- | | | |
|------|------------|----------|
| (23) | PRSL1002PI | 1 speed |
| (24) | PRSL1003PI | 2 speeds |

Symbols and colors of control element label



Position of cable sleeve

- Right
 Left

Instructions

- Write the code number of the left and right joysticks required.
- Write the number or the code corresponding to the control elements and switches (max 3) required in each position.
- Write the text required on the label for each position of the joystick.
- Write the symbol, the color and the text required on the label for each control element.
- Tick the appropriate box to show where the cable sleeve must be assembled.

REMARKS

ROTARY LIMIT SWITCHES

4





BASE

Rotary limit switch



Rotary limit switch used to control and measure the movement of industrial machines.
Its compact size makes it suitable for use in narrow spaces.

FEATURES

- It consists of a gear motor that transfers movement to the cams through a primary input reduction stage (worm gear and helical toothed gear) and one or more secondary output stages (pairs of straight toothed gears).
- Accurate adjustment of cams by means of screws.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Base is classified IP42, IP65 or IP66, IP67 and IP69K.
- NEMA protection degree: Base IP66, IP67 and IP69K is classified Type 3.
- Extreme temperature resistance: -40°C to +80°C.
- It features stainless steel AISI 430F transmission and gear driving shafts, self-lubricating technopolymer gears and driving bushes, technopolymer base and cover.
- Sintered bronze bushes are moulded into the base of the limit switch to optimize shaft rotation and prevent rubbing with plastic material.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Revolution ratios from 1:15 to 1:1500, achieved by combining different secondary output stages.
- Snap action switches with 1NO+1NC contacts.
- It can be equipped with a cam set with maximum 6 switches.
- Dedicated cable clamps or connectors.
- Available with anti-moisture plug fitted to the base by means of a lock nut, to improve transpiration for the limit switch while maintaining protection against water.
- Available with flanges, pinion gears and couplings.
- Available with direct control switches to enable direct action on the motor.

CERTIFICATIONS

- CE marking, cURus* marking and EAC certification.
- Complying with accident prevention regulation BGV C 1 (only for Germany).

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

* Not available on all versions.

POSSIBLE ASSEMBLIES

4

IP 42 with 2 switches



IP 66/IP 67/IP 69K, with 2 or 3 switches and flange



IP 66/IP 67/IP 69K, with 4 switches



With anti-moisture plug



CERTIFICATIONS

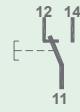
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear
	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment
	UL 508 Industrial Control Equipment
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
Markings and homologations	Version IP42 or IP65: Version IP 66/IP 67/IP 69K: *

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 42 IP 65 IP 66/IP 67/IP 69K
NEMA protection degree	Type 3 (version IP 66/IP 67/IP 69K)
Insulation category	Class II
Maximum rotation speed	800 rpm
Cable entry	Cable clamp M16
Shafts	Stainless steel AISI 430F

* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES FOR AUXILIARY CONTROL

Code	PRSL0003XX	PRSL0011XX	PRSL0017XX	PRSL0195XX
Utilisation category	AC 15 - B300		AC 15 - C300	
Rated operational voltage		250 Vac		
Rated operational current		3 A		
Rated thermal current	5 A		2.5 A	
Rated insulation voltage		300 Vac		
Mechanical life		1x10 ⁶ operations		
Connections	6.3 mm Faston taps	Screw-type terminals	Screw-type terminals	6.3 mm Faston taps
Wires	-	2x0.5mm ² , 2x1.5 mm ² , 1x2.5 mm ²	2x0.5mm ² , 2x1.5 mm ² , 1x2.5 mm ²	-
Tightening torque	-	0.5 Nm	0.5 Nm	-
Microswitch type		Single break, snap action		
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type 	1NO+1NC	1NO+1NC	1NO+1NC
Scheme				
Markings and homologations	  		 	

TECHNICAL SPECIFICATIONS OF THE SWITCHES FOR DIRECT CONTROL

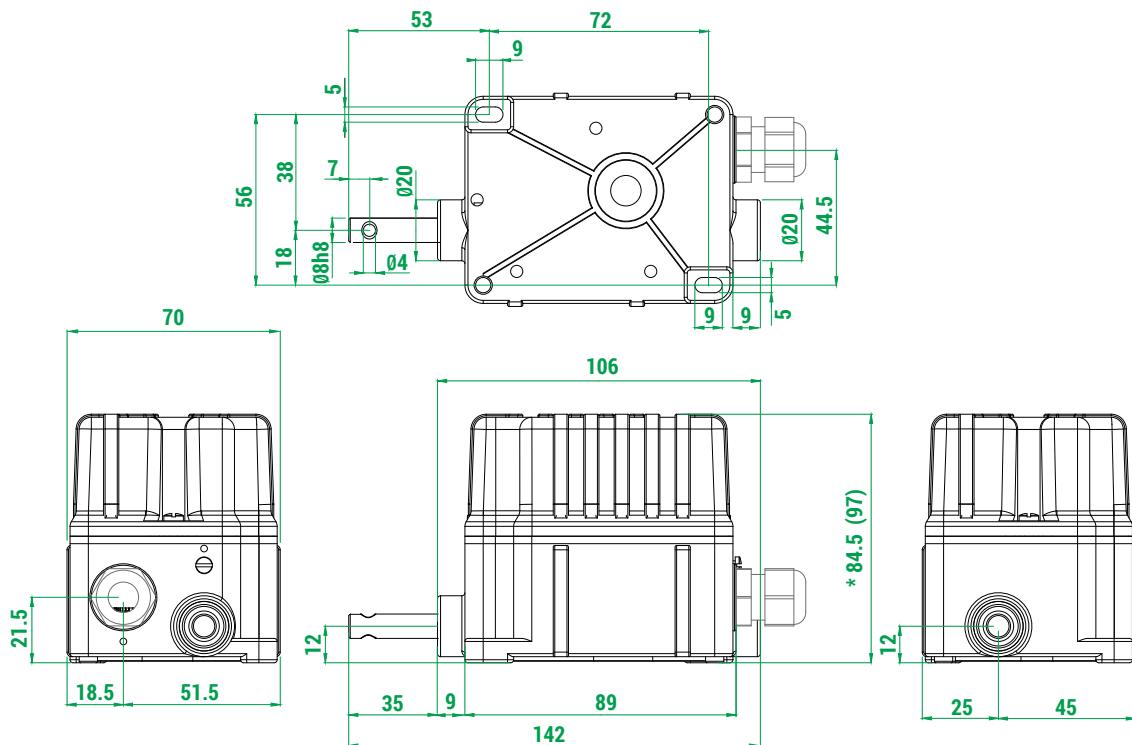
Code	PRSL0455PI
Utilisation category	AC 3
Rated operational current	400 Vac
Rated operational voltage	10 A
Rated thermal current	20 A
Rated insulation voltage	660 Vac
Mechanical life	1x10 ⁶ operations
Connections	Screw-type terminals
Wires	2x1.5 mm ² , 1x2.5 mm ²
Tightening torque	0.8 Nm
Microswitch type	Two-pole
Contacts	2NC
Scheme	
Markings and homologations	

OVERALL DIMENSIONS (mm)

Limit switches with sets of 5 or 6 switches PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX or with sets of 2 switches PRSL0455PI are available only with protection degree IP 66 / IP 67 / IP 69K and a special cover, or in the IP 00 version without cover. Both configurations are not cURus certified. Overall dimensions and code numbers are available on request.

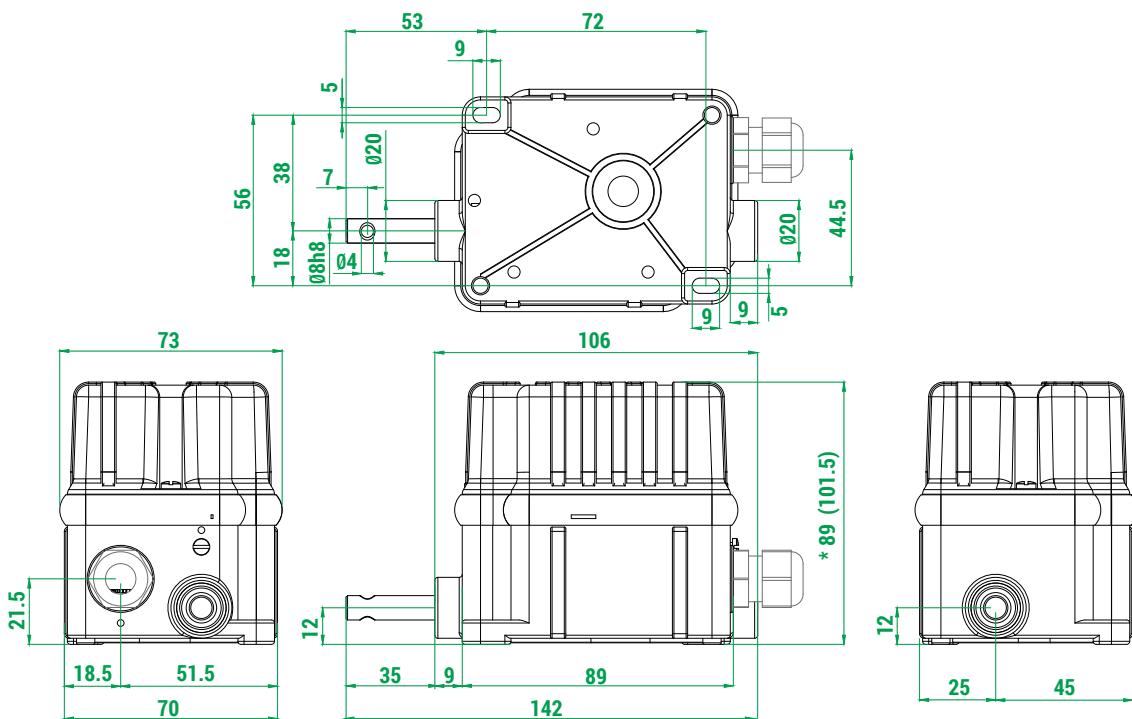
IP 42 or IP 65

- * 2 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
- () 3/4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.



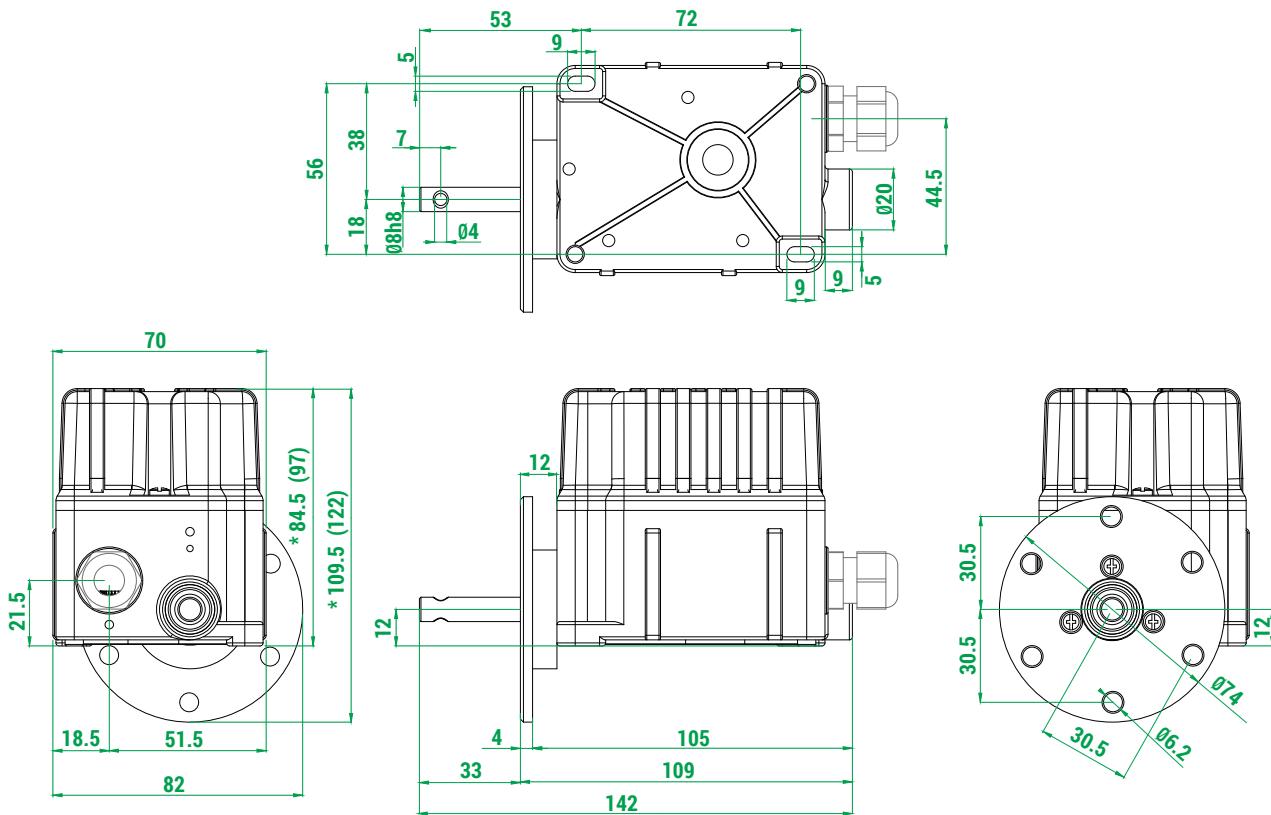
IP 66 / IP 67 / IP 69K

- * 2/3 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
- () 4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.

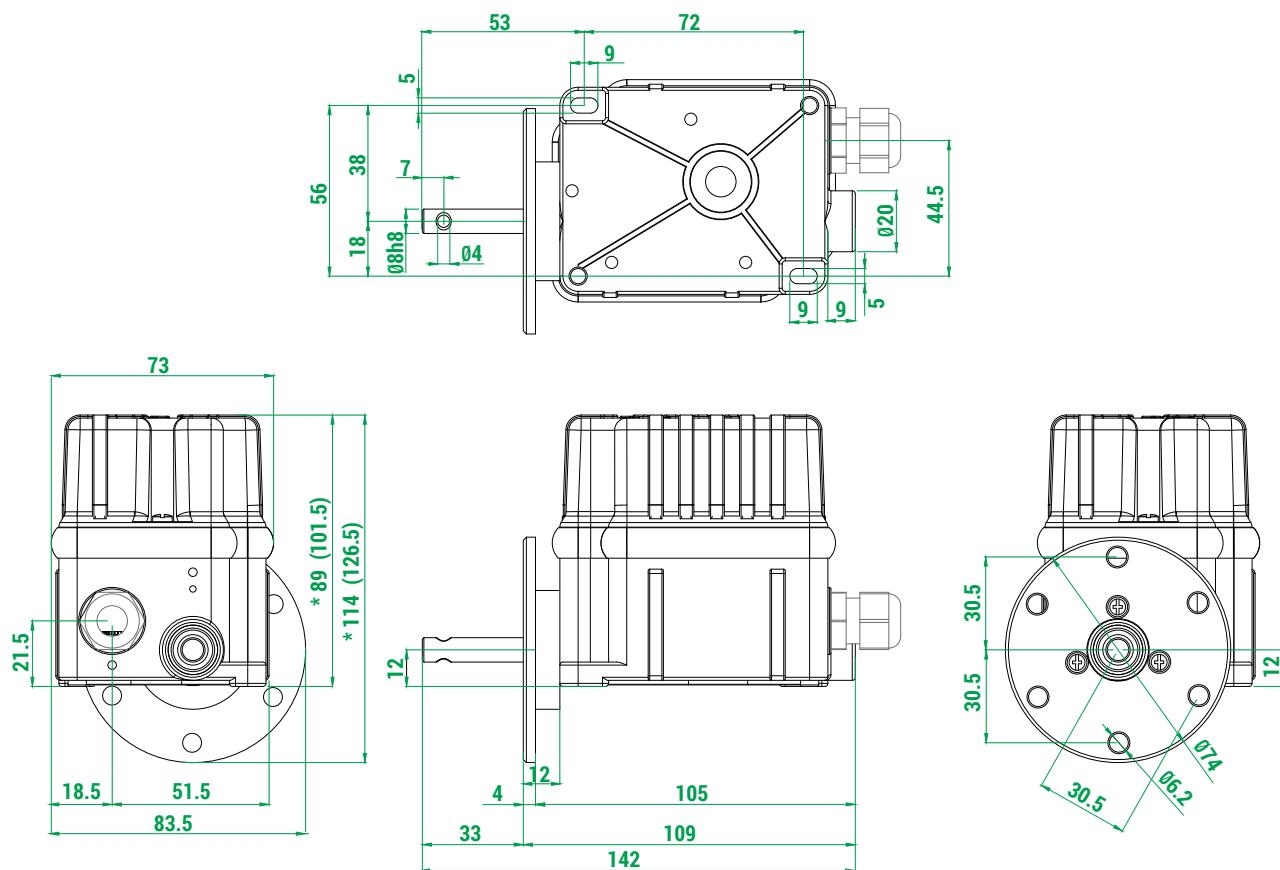


IP 42 or IP 65 with 12mm high flange

* 2 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
 () 3/4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.

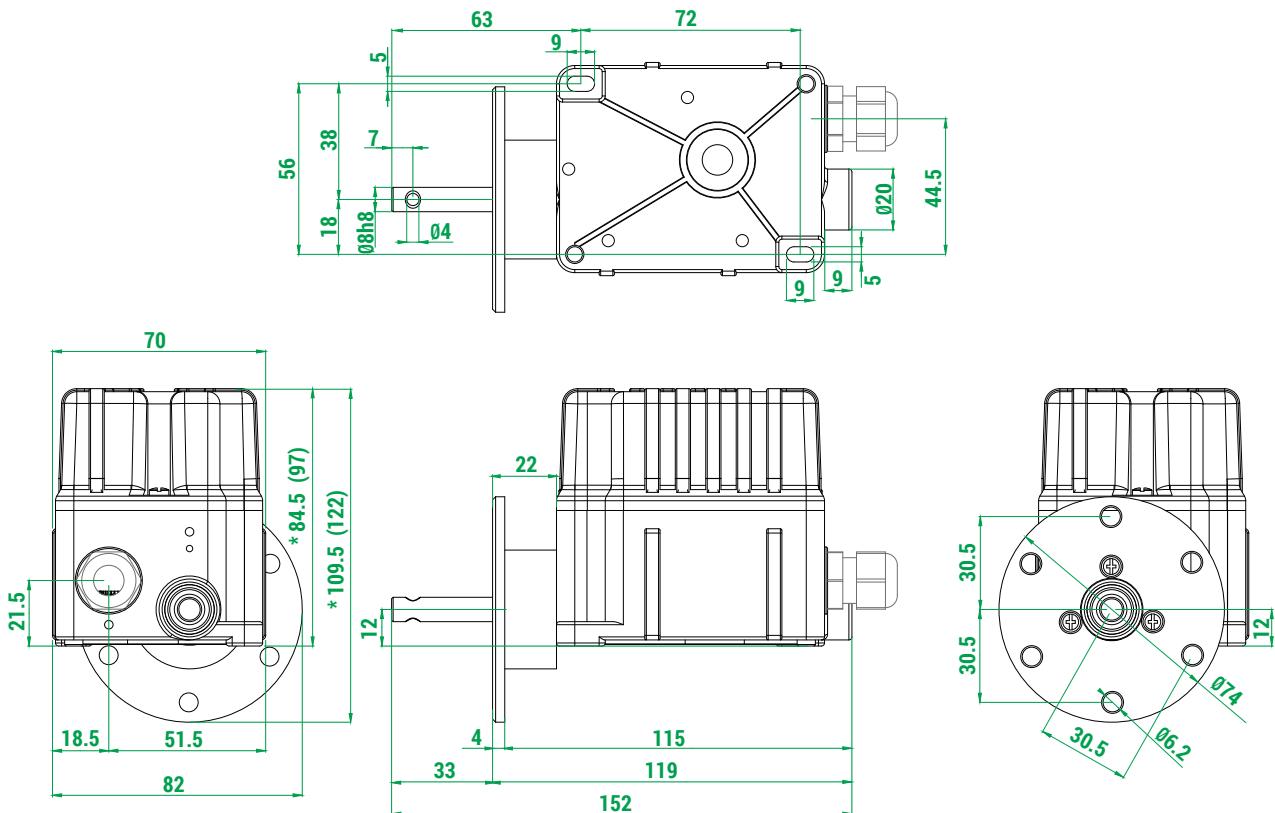
**IP 66 / IP 67 / IP 69K with 12 mm high flange**

* 2-3 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
 () 4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.

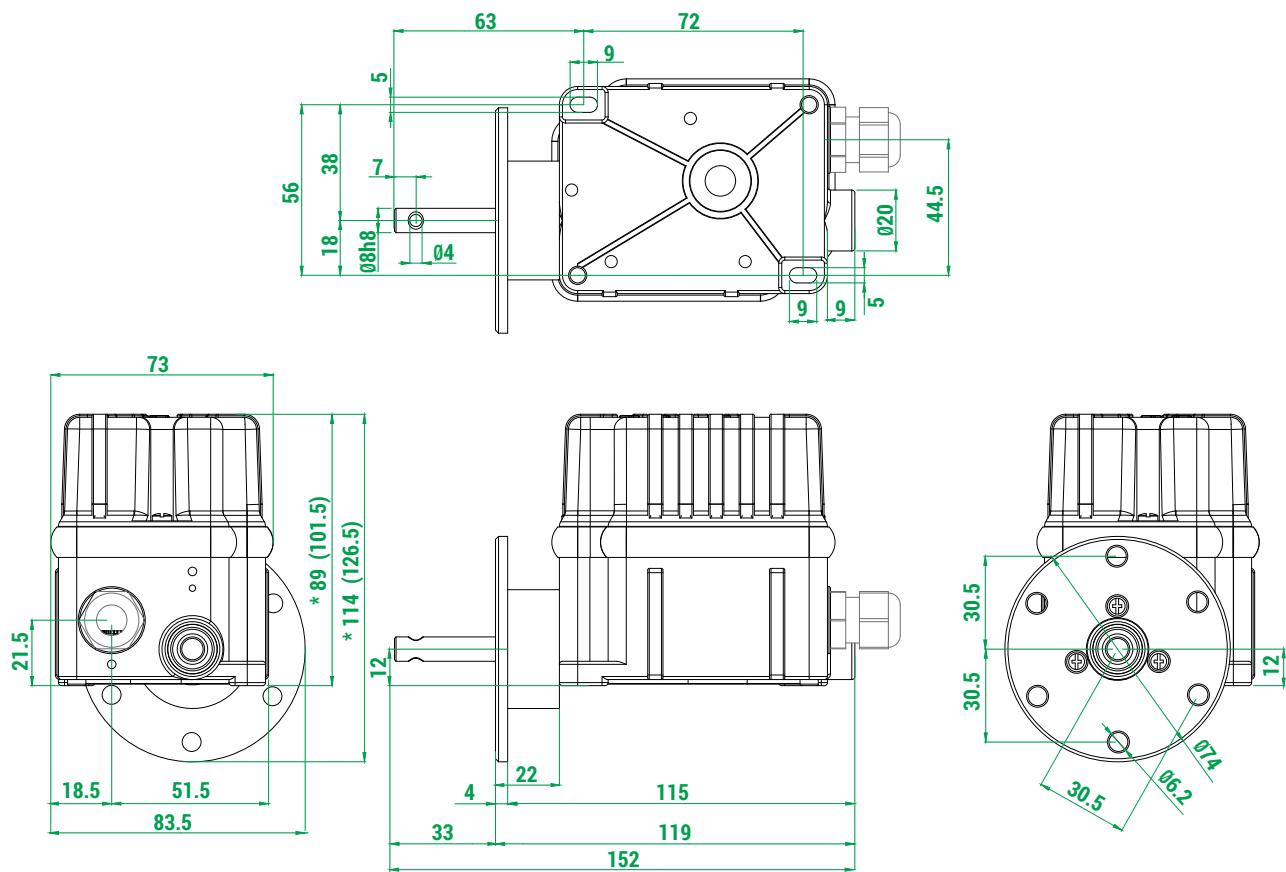


IP 42 or IP 65 with 22 mm high flange

* 2 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
 () 3/4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.

**IP 66 / IP 67 / IP 69K with 22 mm high flange**

* 2-3 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches or 1 PRSL0455PI switch.
 () 4 PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX switches.



STANDARD LIMIT SWITCHES

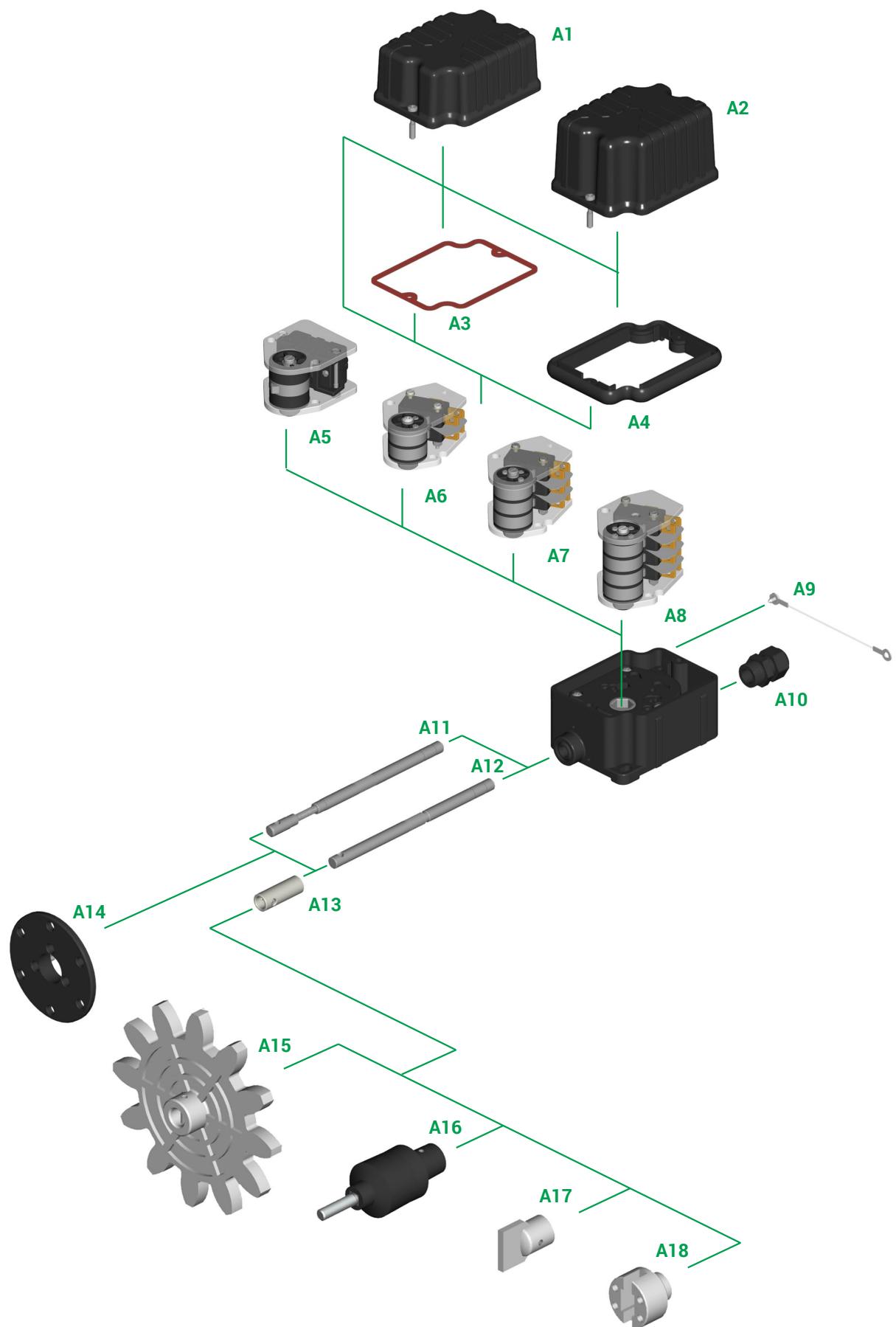
Standard limit switches are equipped with cams PRSL7140PI  and auxiliary control switches PRSL0003XX with 1NO+1NC contacts.



Rated revolution ratio	Real revolution ratio	No. of cams and switches	IP 42 CE 	IP 65 CE 	IP 66 / IP 67 / IP 69K CE  cULus 
			Code	Code	Code
1:15	1:15.82	2	PFA9142A0015001	PFA9165A0015003	PFA9067A0015001
		3	PFA9142A0015003	PFA9165A0015004	PFA9067A0015003
		4	PFA9142A0015002	PFA9165A0015005	PFA9067A0015002
1:20	1:20.37	2	PFA9142A0020001	PFA9165A0020001	PFA9067A0020001
		3	PFA9142A0020003	PFA9165A0020003	PFA9067A0020003
		4	PFA9142A0020002	PFA9165A0020002	PFA9067A0020002
1:25	1:25.96	2	PFA9142A0025001	PFA9165A0025004	PFA9067A0025001
		3	PFA9142A0025003	PFA9165A0025005	PFA9067A0025003
		4	PFA9142A0025002	PFA9165A0025006	PFA9067A0025002
1:50	1:50	2	PFA9142A0050001	PFA9165A0050002	PFA9067A0050001
		3	PFA9142A0050003	PFA9165A0050003	PFA9067A0050003
		4	PFA9142A0050002	PFA9165A0050004	PFA9067A0050002
1:75	1:75	2	PFA9142A0075001	PFA9165A0075001	PFA9067A0075001
		3	PFA9142A0075003	PFA9165A0075003	PFA9067A0075003
		4	PFA9142A0075002	PFA9165A0075002	PFA9067A0075002
1:100	1:103.57	2	PFA9142A0103001	PFA9165A0103001	PFA9067A0103001
		3	PFA9142A0103003	PFA9165A0103003	PFA9067A0103003
		4	PFA9142A0103002	PFA9165A0103002	PFA9067A0103002
1:150	1:158.02	2	PFA9142A0158001	PFA9165A0158001	PFA9067A0158001
		3	PFA9142A0158003	PFA9165A0158003	PFA9067A0158003
		4	PFA9142A0158002	PFA9165A0158002	PFA9067A0158002

ASSEMBLY DRAWING

4



Refer to the following tables for descriptions of components: "Standard cam sets" and "Accessories".

COMPONENTS

Standard cam sets

Ref.	Drawing	No. and type of cams	No. and type of switches	Code
A5		1 cam A	1 PRSL0455PI switch	PRFC0101PE
A6		2 cams A	2 PRSL0003XX switches	PRFC0008PEC
		2 cams C	2 PRSL0003XX switches	PRFC0009PEC
A7		3 cams A	3 PRSL0003XX switches	PRFC0004PEC
		3 cams C	3 PRSL0003XX switches	PRFC0006PEC
A8		4 cams A	4 PRSL0003XX switches	PRFC0202PEC
		4 cams C	4 PRSL0003XX switches	PRFC0198PEC

Other sets with 2/3/4/5 or 6 switches PRSL0003XX/PRSL0011XX/PRSL0017XX/PRSL0195XX or with 1 or 2 switches PRSL0455PI are available on request.

Cam reference chart

Cam		Switching angle	Code
A		1 point	20.5° ±0.5°
B		10 points	14.0° ±0.5°
C		60° sector	78.0° ±0.5°
E		180° sector	199.5° ±0.5°
H		335° sector	344.0° ±0.5°

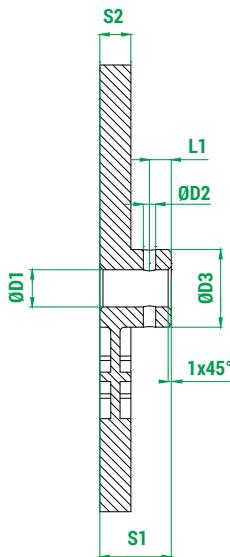
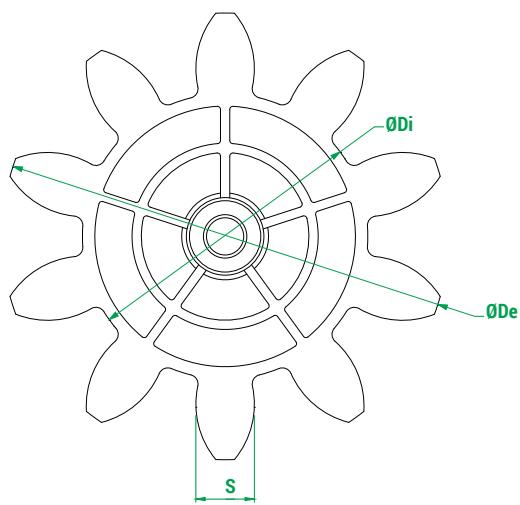
Accessories

Ref.	Drawing	Description	Code
A1		Cover with screws for Base IP 42 or IP 65 with 2 switches	PA090013
		Cover with screws per Base IP 66/IP 67/ IP 69K with 2/3 switches	PA090010
A2		Cover with screws for Base IP 42 or IP 65 or IP 66/IP 67/IP 69K with 3/4 switches	PA090011
A3		Gasket for Base IP 65	PRGU1085PE
A4		Tightening rubber for Base IP 66/IP 67/IP 69K	PRGU1200PE
A9		Cover holding wire + screw (bag with 10 pieces)	PRSL0358PI
A10		Cable clamp M16	PRPS0062PE

Accessories

Ref.	Drawing	Description	Code
A11		Flexible shaft	ALL1F00001
A12		Standard shaft	ALL1R00001
		Shaft for 22 mm high flange	ALL1R00121
A13		Bush Ø 8 to Ø 12 for pinion gear/coupling	PRT01075PE
A14		12 mm high flange	PRT04040PE
		22 mm high flange	PRSL8087PI
A15		Pinion gear	See pinion gear tables
A16		Coupling with pin	PRSL0981PI
A17		Male coupling with pin	PRSL0919PI
A18		Female coupling with pin	PRSL0920PI

Moulded pinion gears

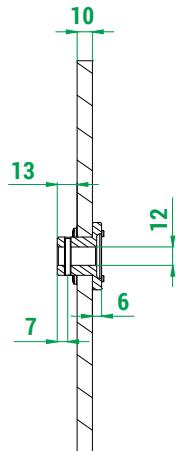
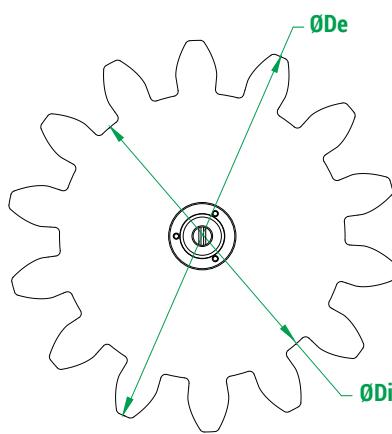


Legend	
Z	Number of teeth
M	Module
D _p	Primitive diameter
D _e	External diameter
D _i	Internal diameter
a	Addendum
d	Dedendum
Alpha	Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	S	Alpha	D ₁	D ₂	D ₃	S ₁	S ₂	L ₁
PRSL0971PI	8	2.50	20.00	25.00	14.15	2.50	2.93	3.93	20.00	8.00	2.50	14.00	18.00	8.00	4.00
PRSL0915PI	8	20.00	160.00	200.00	113.20	20.00	23.40	31.41	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0964PI	9	2.50	22.50	27.50	16.25	2.50	3.13	3.93	20.00	8.00	2.50	13.50	18.00	8.00	4.00
PRSL0963PI	9	3.50	31.50	38.50	23.40	3.50	4.10	4.71	20.00	8.00	2.50	14.00	18.00	8.00	4.00
PRSL0892PI	9	5.00	45.00	56.00	36.00	5.50	4.50	9.19	20.00	8.00	2.50	16.00	18.00	8.00	4.00
PRSL0968PI	10	3.00	30.00	36.00	23.00	3.00	3.51	4.71	20.00	8.00	2.50	14.00	18.00	8.00	4.00
PRSL0912PI	10	12.00	120.00	144.00	92.00	12.00	14.00	18.85	20.00	12.00	4.00	25.00	23.00	10.00	7.00
PRSL0913PI	10	14.00	140.00	168.00	107.24	14.00	16.38	21.99	20.00	12.00	4.00	24.60	23.00	10.00	7.00
PRSL0914PI	10	16.00	160.00	192.00	122.67	16.00	18.67	25.13	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0917PI	11	6.00	66.00	78.00	51.96	6.00	7.02	9.42	20.00	12.00	4.00	19.00	23.00	8.00	7.00
PRSL0916PI	12	5.00	60.00	70.00	48.30	5.00	5.83	7.85	20.00	12.00	4.00	20.00	23.00	8.00	7.00
PRSL0918PI	12	8.00	96.00	112.00	77.28	8.00	9.36	12.56	20.00	12.00	3.90	21.50	23.50	10.00	7.00
PRSL0911PI	12	10.00	120.00	140.00	96.67	10.00	11.67	15.71	20.00	12.00	4.00	25.00	23.50	10.00	7.00
PRSL0944PI	12	12.00	144.00	168.00	116.00	12.00	14.00	18.85	20.00	12.00	4.00	24.00	23.00	10.00	7.00

Measuring unit: mm.

Waterjet cut pinion gears



Legend

Z Number of teeth

M Module

D_p Primitive diameter

D_e External diameter

D_i Internal diameter

a Addendum

d Dedendum

Alpha Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	Alpha
PRSL0857PI	8	18.00	144.00	180.00	102.00	18.00	21.00	20.00
PRSL0855PI	8	24.00	192.00	240.00	136.00	24.00	28.00	20.00
PRSL0992PI	9	10.00	90.00	110.00	66.67	10.00	11.67	20.00
PRSL0879PI	9	16.00	144.00	176.00	106.67	16.00	18.67	20.00
PRSL0854PI	9	18.00	162.00	198.00	120.00	18.00	21.00	20.00
PRSL0871PI	9	20.00	180.00	220.00	133.33	20.00	23.33	20.00
PRSL0849PI	9	24.00	216.00	264.00	160.00	24.00	28.00	20.00
PRSL0846PI	10	10.00	100.00	120.00	76.67	10.00	11.67	20.00
PRSL0993PI	10	18.00	180.00	216.00	138.00	18.00	21.00	20.00
PRSL0970PI	10	22.00	220.00	264.00	168.52	22.00	25.74	20.00
PRSL0856PI	10	24.00	240.00	288.00	18.00	24.00	28.00	20.00
PRSL0861PI	11	12.00	132.00	156.00	104.00	12.00	14.00	20.00
PRSL0998PI	11	18.00	198.00	234.00	156.00	18.00	21.00	20.00
PRSL0997PI	11	20.00	220.00	260.00	173.36	20.00	23.32	20.00
PRSL0859PI	11	24.00	264.00	312.00	204.00	24.00	30.00	20.00
PRSL0863PI	12	14.00	168.00	196.00	133.00	14.00	17.50	20.00
PRSL0897PI	12	16.00	192.00	224.00	154.67	16.00	18.67	20.00
PRSL0972PI	12	18.00	216.00	252.00	173.88	18.00	21.06	20.00
PRSL0845PI	12	20.00	240.00	280.00	193.34	20.00	23.32	20.00
PRSL0878PI	12	24.00	288.00	336.00	232.00	24.00	28.00	20.00
PRSL0860PI	13	6.00	78.00	90.00	63.00	6.00	7.50	20.00
PRSL0853PI	13	12.00	156.00	178.59	126.00	11.29	15.00	20.00
PRSL0898PI	13	16.00	208.00	240.00	170.67	16.00	18.66	20.00
PRSL0862PI	14	10.00	140.00	169.00	125.00	15.00	7.50	20.00
PRSL0896PI	14	16.00	224.00	256.00	186.67	16.00	18.67	20.00
PRSL0999PI	14	18.00	252.00	288.00	210.00	18.00	21.00	20.00
PRSL0848PI	14	20.00	280.00	320.00	233.33	20.00	23.33	20.00
PRSL0858PI	15	18.00	270.00	306.00	228.00	18.00	21.00	20.00
PRSL0847PI	16	20.00	320.00	360.00	273.33	20.00	23.33	20.00
PRSL0973PI	17	10.00	170.00	190.00	145.00	10.00	12.50	22.89
PRSL0974PI	17	14.00	238.00	266.00	203.00	14.00	17.50	22.89
PRSL0851PI	20	6.00	120.00	132.00	105.00	6.00	7.50	22.89
PRSL0844PI	25	1.00	25.00	27.00	22.50	1.00	1.25	22.89

Measuring unit: mm.

BASE - REQUEST FORM FOR NON STANDARD LIMIT SWITCH

Instructions

(See next page for list of components and legends)

1 Version:

ATTENTION: Limit switches with sets of 5/6 switches PRSL0003XX/PRSL0011XX/ PRSL0017XX/PRSL0195XX or of 2 switches PRSL0455PI are available only with protection degree IP 66 / IP 67 / IP 69K and with a special cover, or in the IP 00 version without cover. These configurations are not CURUs certified.

Limit switches with switches PRSL0455PI are not EAC nor CURUs certified.

2 Standard cam set:

for non standard cam sets, fill in the scheme choosing the cams and the switches required. In case switch PRSL0455PI is required, it is possible to use max two switch.

Customized cams are available on request.

4 Version with anti-moisture plug:

tick when the anti-moisture plug is required.

ATTENTION: Limit switches with anti-moisture pluga are not CURUs certified.

5 Cover holding wire:

tick when the cover holding wire is required.

6 Revolution ratio:

write the required revolution ratio.

7 Shaft:

tick the shaft type required.

Customized shafts are available on request.

8 Coupling, flange, pinion gear:

tick the box when coupling, flange or pinion gear are required.

When a standard pinion gear is required, write the code number listed in the pinion gear tables in the catalogue.

When a special pinion gear is required, write the number of teeth, the module and the primitive diameter.

Version with anti-moisture plug

4

Cover holding wire

5

Revolution ratio

6

1:15

1:75

1:20

1:100

1:25

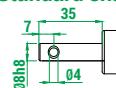
1:150

1:50

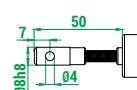
1:

Standard shaft

7



Flexible shaft



Male coupling

8

Female coupling

Coupling

12 mm high flange

22 mm high flange

Pinion gear

Pinion gear code _____

Customized pinion gear

No. of teeth _____

Module _____

Primitive diameter _____

Remarks

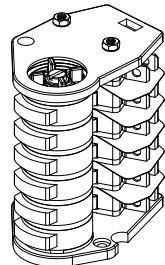
Standard cam set

2

Cam set code _____

Customized cam set

3



Cam code _____

Switch code _____

6 _____

5 _____

4 _____

3 _____

2 _____

1 _____

2 Legend - Standard cam sets

No. & type of switches	No. & type of cams	Code
1 x PRSL0455PI	1 cam A	PRFC0101PE
2 x PRSL0003XX	2 cams A	PRFC0008PEC
	2 cams C	PRFC0009PEC
3 x PRSL0003XX	3 cams A	PRFC0004PEC
	3 cams C	PRFC0006PEC
4 x PRSL0003XX	4 cams A	PRFC0202PEC
	4 cams C	PRFC0198PEC

3 Legend - Standard cams

Cam	Switching angle	Code
A	1 point	20,5° ±0,5° PRSL7140PI
B	10 points	14,0° ±0,5° PRSL7142PI
C	60° sector	78,0° ±0,5° PRSL7141PI
E	180° sector	199,5° ±0,5° PRSL7144PI
H	335° sector	344,0° ±0,5° PRSL7143PI

Legend - Switches

Type of switches	Auxiliary control					Direct control
	PRSL0003XX	PRSL0011XX	PRSL0017XX	PRSL0195XX	PRSL0455PI	
Utilisation category	AC 15 - B300	AC 15 - B300	AC 15 - C300	AC 15 - C300	AC 3	
Connections	6.3 mm Faston taps	Screw-type terminals	Screw-type terminals	6.3 mm Faston taps	Screw-type terminals	
Contacts	1NO+1NC 	1NO+1NC 	1NO+1NC 	1NO+1NC 	2NC 	

FOX

Rotary limit switch



Rotary limit switch used to control and measure the movement of industrial machines by reading the rotation angle and/or counting the number of revolutions of a shaft.

Fox is used on wind turbines to control the position of the nacelle or the pitch angle of the blades.

FEATURES

- It consists of a gear motor that transfers movement to the cams and the other movement detection devices through a primary input reduction stage (worm gear and helical toothed gear) and one or more secondary output stages (pairs of straight toothed gears).
- Accurate adjustment of cams by means of screws.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: up to 10 million operations.
- IP protection degree: Fox is classified IP66, IP67 and IP69K.
- NEMA protection degree: Fox is classified Type 4X*.
- Extreme temperature resistance: -40°C to +80°C.
- It features transmission and gear driving shafts made of stainless steel AISI 430F or AISI 303, worm gear transmission shaft rotating on ball bearings, self-lubricating technopolymer gears and driving bushes, technopolymer base and cover.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Revolution ratios from 1:3 to 1:2870, achieved by combining different secondary output stages.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- It can be equipped with a cam set (with up to 5 switches) and potentiometers, encoders, Yankee absolute encoders.
- Dedicated cable clamps or connectors.
- Available with anti-moisture plug fitted to the base by means of a lock nut, to improve transpiration for the limit switch while maintaining protection against water.
- Available with flanges, pinion gears and couplings.
- Plates with universal adapter to replace existing systems.

CERTIFICATIONS

- CE marking, cULus* marking and EAC certification.
- Fox is available, upon request, with the SIL1 certification (Safety Integrity Level 1), according to Standard IEC 61508.
- Complying with accident prevention regulation BGV C 1 (only for Germany).
- HALT TEST (Highly Accelerated Life Test) passed, simulating conditions largely exceeding standard operating conditions.

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

POSSIBLE ASSEMBLIES

With flange



With anti-moisture plug



4

CERTIFICATIONS

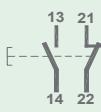
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear
	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment
	UL 508 Industrial Control Equipment
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical / electronic / programmable electronic safety-related systems
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
HALT TEST	Highly Accelerated Life Test, simulation of conditions largely exceeding the standard operating conditions (data available on request)
Markings and homologations	CE  * 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 66/IP 67/IP 69K
NEMA protection degree	Type 4X*
Insulation category	Class II
Maximum rotation speed	Revolution ratios ≥1:16: max. 800 rpm Revolution ratios <1:16: max. 200 rpm Revolution ratios =1:50 and 1:100: max. 1500 rpm
Cable entry	Cable clamp M20 Cable clamp M20+M16 Cable clamp M20+M20
Shafts	Stainless steel AISI 430F (version not cULus) Stainless steel AISI 303

* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0110XX	PRSL0111XX
Utilisation category	AC 15	
Rated operational voltage	250 Vac	
Rated operational current	3 A	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	10x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL (c)UL: use 60°C or 75°C copper (CU) conductors and stiff or flexible wire 14-22 AWG)	
Tightening torque	0.5 Nm	
Microswitch type	Double break, snap action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type \ominus)	1NC (All NC contacts are of the positive opening operation type \ominus)
Scheme		
Markings and homologations	  	

Switches PRSL0100XX available on request.

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

Code of potentiometer with support	PA020001	PA020002
Ohmic value	10 k Ω	10 k Ω mechanical stop
Resolution	Infinite	
Independant linearity	$\pm 1\%$	
Life time	10x10 ⁶ movements	
Operational ambient temperature	-55°C/+105°C	
Continuos rotation (without stop)	360°	
Continuos rotation (with stop)	333° $\pm 5^\circ$	
Actual electrical angle	310° $\pm 5^\circ$	
Ohmic value tolerance	$\pm 20\%$	

Code of potentiometer with support	PA020003	PA020004	PA020005
Ohmic value	10 k Ω	10 k Ω	5 k Ω
Connections	4 turrets	3 turrets	4 turrets
Indipendent linearity (over AEA -3°)	$\leq \pm 1\%$	$\leq \pm 0.35\%$	$\leq \pm 1\%$
Life time	5x10 ⁶ movements		
Operational ambient temperature	-55°C/+125°C		
Mechanical angle	360° continuous		
Actual Electrical Angle (AEA)	340° $\pm 5^\circ$		
Ohmic value tolerance	Max $\pm 20\%$ at 20°C	Max $\pm 10\%$ at 20°C	Max $\pm 20\%$ at 20°C

TECHNICAL SPECIFICATIONS OF THE ENCODERS

Code with support	PA030001	PA030002
Resolution	36 pulses/rev.	150 pulses/rev.
Operational ambient temperature		-40°C/+85°C
Code		Incremental
Supply voltage	4.5 Vdc min. to 30 Vdc max. (35 mA max. - no load)	
Output voltage	Low: 500 mV max. at 10 mA High: (Vin - 0.6) at -10 mA (Vin - 1.3) at -25 mA	
Output current	25 mA max. load per output channel	
Output format	Two channel (A, B) quadrature with Index (Z)	
Phase sense	A leads B clockwise (CW) from the mounting end of the encoder	
Accuracy	+/- 0.8 arc-min.	
Outputs	Push pull	
Electrical protection	Protection against reverse polarity and output short-circuit	

CERTIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
Markings and homologations	CE cULus

GENERAL TECHNICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

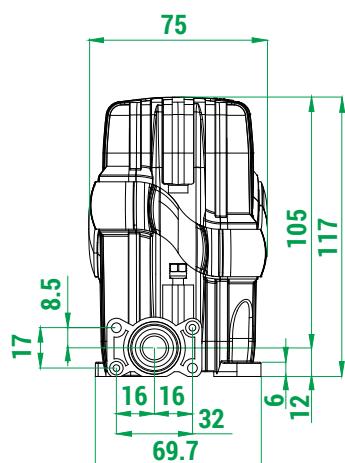
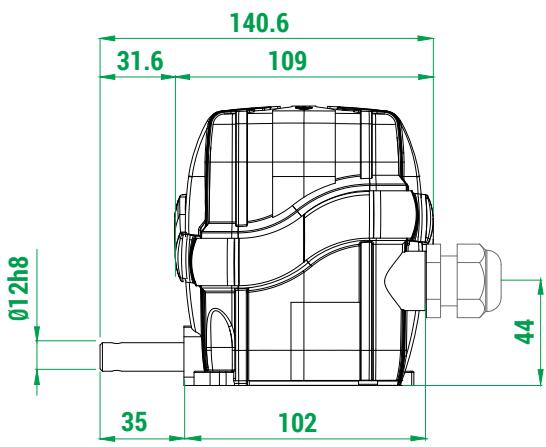
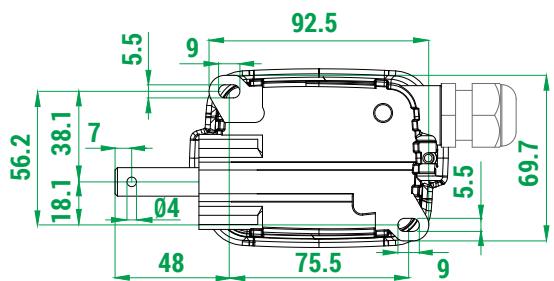
Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 20
Free rotation	360°
Maximum rotation speed	800 rpm

ELECTRICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

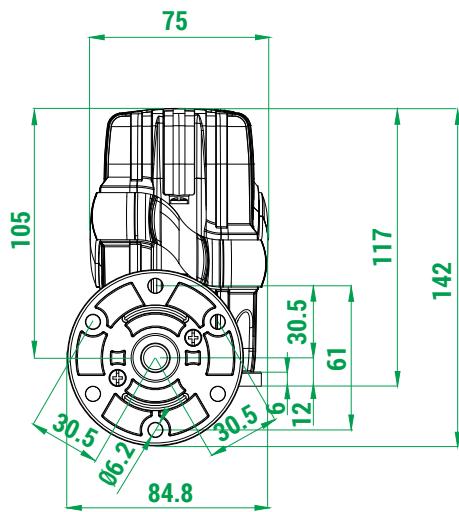
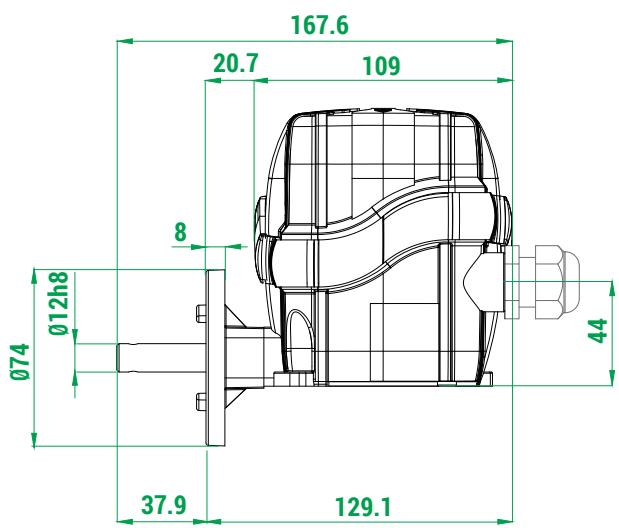
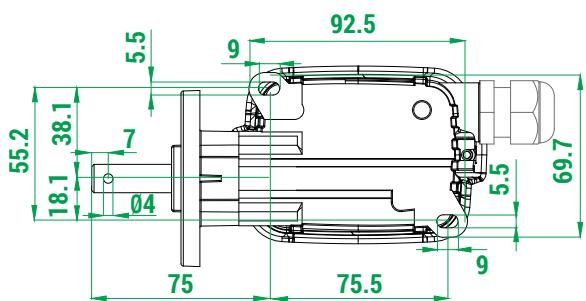
Code	PA01AA01	PA01AB01	PA01AC01
Analog output	Current 4 ÷ 20 mA	Voltage 0 ÷ 10 V	PWM 0 ÷ 100 %
Power supply		12 ÷ 48 Vdc/12 ÷ 48 Vac	
Protection against reverse polarity		Yes	
Absorption		50 mA	
Resolution		12 bit	
Linearity		+/- 0.5°	
Max. hysteresis		0.1°	
Zero Point setting		Through button/wire	
Signal increment direction		CW (standard)/CCW (on request)	
Connections		Terminal board	
Terminal wires		0.14 mm² - 1.5 mm²	
Terminal tightening torque		0.22 Nm - 0.25 Nm	

OVERALL DIMENSIONS (mm)

Standard



With flange

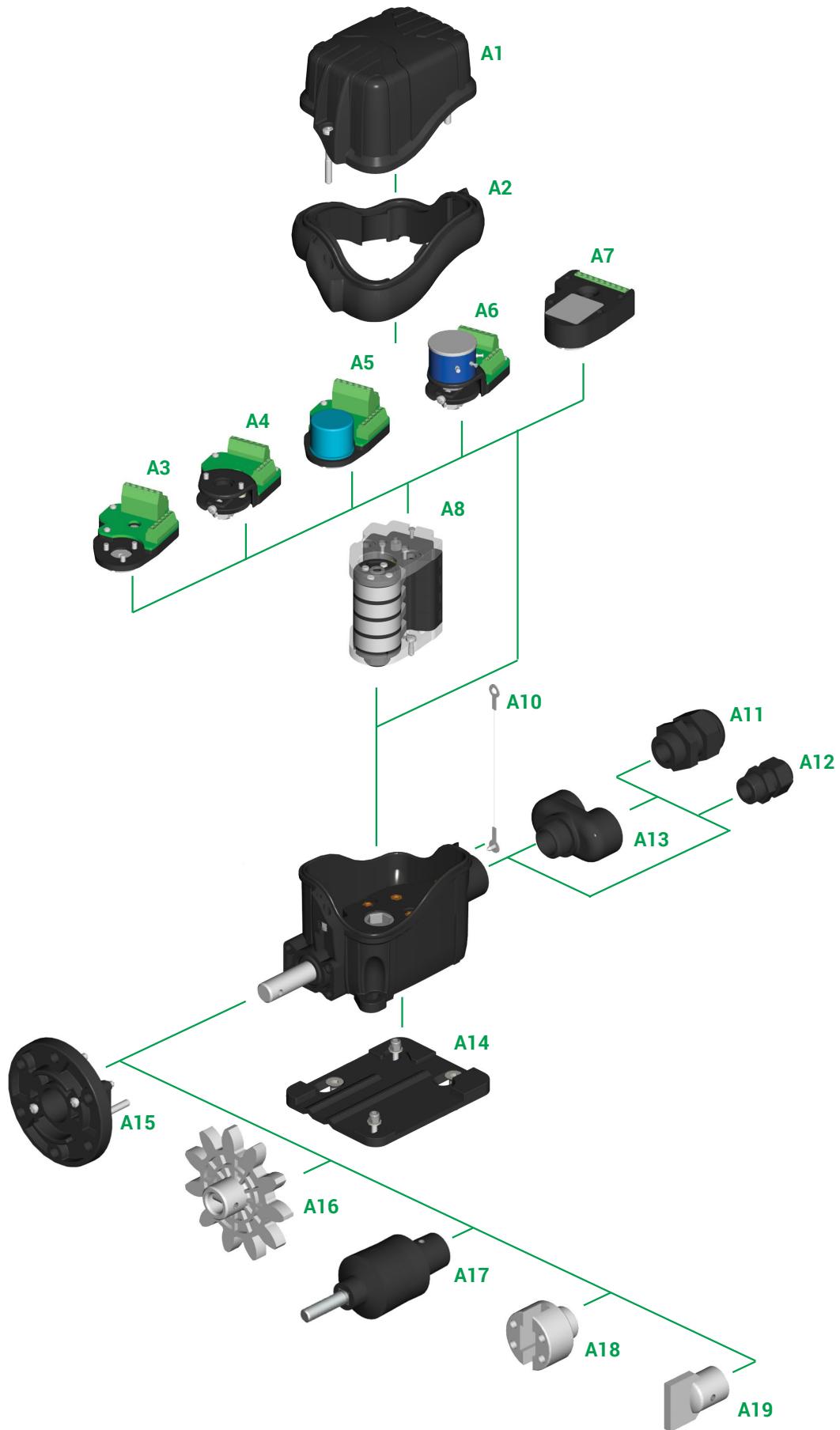


STANDARD LIMIT SWITCHES

Standard limit switches are equipped with cams PRSL7194PI  and shafts made of stainless steel AISI 430F. Standard limit switches are not cULus certified.

4

Rated revolution ratio	Real revolution ratio	No. of cams and switches	Switches	
			PRSL0110XX 1NO+1NC	PRSL0111XX 1NC
1:15	1:16	2	PFB9067L0016010	PFB9067L0016012
		3	PFB9067L0016011	PFB9067L0016013
		4	PFB9067L0016008	PFB9067L0016014
1:20	1:20.21	2	PFB9067L0020006	PFB9067L0020008
		3	PFB9067L0020007	PFB9067L0020009
		4	PFB9067L0020004	PFB9067L0020010
1:25	1:27.27	2	PFB9067L0027007	PFB9067L0027017
		3	PFB9067L0027016	PFB9067L0027018
		4	PFB9067L0027014	PFB9067L0027019
1:50	1:62	2	PFB9067L0062033	PFB9067L0062045
		3	PFB9067L0062044	PFB9067L0062046
		4	PFB9067L0062003	PFB9067L0062025
1:75	1:75.48	2	PFB9067L0075008	PFB9067L0075010
		3	PFB9067L0075009	PFB9067L0075004
		4	PFB9067L0075006	PFB9067L0075011
1:100	1:103.44	2	PFB9067L0103037	PFB9067L0103038
		3	PFB9067L0103049	PFB9067L0103027
		4	PFB9067L0103030	PFB9067L0103050
1:150	1:162.52	2	PFB9067L0162007	PFB9067L0162008
		3	PFB9067L0162006	PFB9067L0162009
		4	PFB9067L0162003	PFB9067L0162002
1:200	1:222.58	2	PFB9067L0222011	PFB9067L0222014
		3	PFB9067L0222013	PFB9067L0222015
		4	PFB9067L0222010	PFB9067L0222016
1:250	1:254.57	2	PFB9067L0254019	PFB9067L0254010
		3	PFB9067L0254020	PFB9067L0254021
		4	PFB9067L0254008	PFB9067L0254022

ASSEMBLY DRAWING

Refer to the following tables for descriptions of components: "Standard cam sets", "Potentiometers, encoders and sensors" and "Accessories".

COMPONENTS

Standard cam sets

4

Ref.	Drawing	No. and type of cams	No. and type of switches	Code
A8		2 cams A	2 PRSL0110XX switches	FCL20001
		2 cams A	2 PRSL0111XX switches	FCL20002
		Cams A+C	2 PRSL0110XX switches	FCL20003
		Cams A+C	2 PRSL0111XX switches	FCL20004
		2 cams C	2 PRSL0110XX switches	FCL20005
		2 cams C	2 PRSL0111XX switches	FCL20006
A8		Cams D+D+B+F	4 PRSL0110XX switches	FCL40001
		Cams D+D+B+F	4 PRSL0111XX switches	FCL40002
		4 cams A	4 PRSL0110XX switches	FCL40003
		4 cams A	4 PRSL0111XX switches	FCL40004
		Cams A+A+C+C	4 PRSL0110XX switches	FCL40005
		Cams A+A+C+C	4 PRSL0111XX switches	FCL40006
		4 cams C	4 PRSL0110XX switches	FCL40007
		4 cams C	4 PRSL0111XX switches	FCL40008
		Cams C+C+C+E	4 PRSL0110XX switches	FCL40009
		Cams C+C+C+E	4 PRSL0111XX switches	FCL40010
		Cams A+A+E+E	4 PRSL0110XX switches	FCL40011
		Cams A+A+E+E	4 PRSL0111XX switches	FCL40012

Other sets with 2/3/4 or 5 cams/switches are available on request.

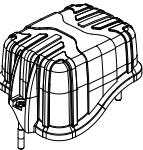
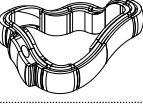
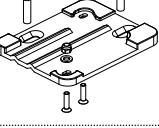
Cam reference chart

Cam		Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A		1 points	PRSL7194PI	PRSL7194PI	23.0° ±0.5°
B		10 point	PRSL7193PI	PRSL7193PI	23.0° ±0.5°
C		60° sector	PRSL7195PI	PRSL7195PI	86.0° ±0.5°
D		72° sector	PRSL7196PI	PRSL7196PI	97.5° ±0.5°
E		180° sector	PRSL7191PI	PRSL7191PI	203.0° ±0.5°
F		305° sector	PRSL7192PI	PRSL7192PI	327.0° ±0.5°

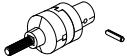
Potentiometers, encoders and sensors

Ref.	Drawing	Description	Code
A3		Support for encoder	PA030000
A4		Support for potentiometer	PA020000
A5		Encoder 36 pulses./rev. with support	PA030001
		Encoder 150 pulses./rev. with support	PA030002
A6		Potentiometer 10 kΩ with support	PA020001
		Potentiometer 10 kΩ mechanical stop with support	PA020002
		Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
		Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
		Potentiometer 5 kΩ ±10% with support	PA020005
A7		Absolute encoder Yankee - current output	PA01AA01
		Absolute encoder Yankee - voltage output	PA01AB01
		Absolute encoder Yankee - PWM output	PA01AC01

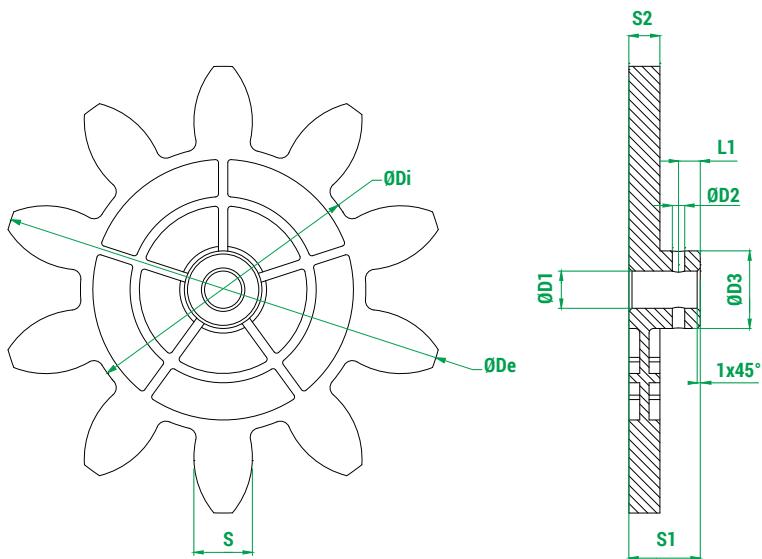
Accessories

Ref.	Drawing	Description	Code
A1		Cover with screws	PA090017
A2		Tightening rubber	PRGU1500PE
A10		Cover holding wire + screw (bag with 10 pieces)	PRSL0358PI
A11		Cable clamp M20	PRPS0064PE
A12		Cable clamp M16	PRPS0062PE
A13		Cable clamp holder with 2 outputs M20	PRSL9051PI
		Cable clamp holder with 2 outputs M20+M16	PRSL9052PI
A14		Fixing plate	PRSL0430PI
A15		Flange with screws and pins	PRSL0356PI

Accessories

Ref.	Drawing	Description	Code
A16		Pinion gear	See pinion gear tables
A17		Coupling with pin	PRSL0981PI
A18		Female coupling with pin	PRSL0920PI
A19		Male coupling with pin	PRSL0919PI

Moulded pinion gears



Legend

Z Number of teeth

M Module

D_p Primitive diameter

D_e External diameter

D_i Internal diameter

a Addendum

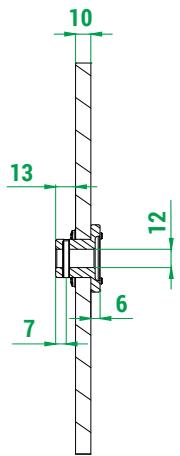
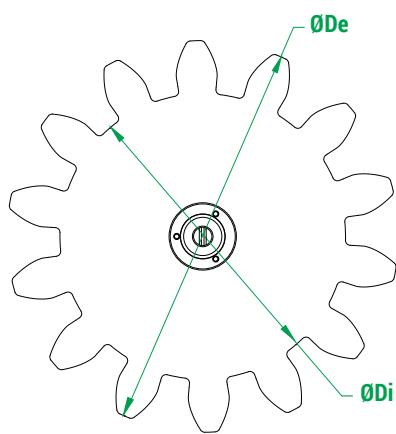
d Dedendum

Alpha Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	S	Alpha	D ₁	D ₂	D ₃	S ₁	S ₂	L ₁
PRSL0915PI	8	20.00	160.00	200.00	113.20	20.00	23.40	31.41	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0912PI	10	12.00	120.00	144.00	92.00	12.00	14.00	18.85	20.00	12.00	4.00	25.00	23.00	10.00	7.00
PRSL0913PI	10	14.00	140.00	168.00	107.24	14.00	16.38	21.99	20.00	12.00	4.00	24.60	23.00	10.00	7.00
PRSL0914PI	10	16.00	160.00	192.00	122.67	16.00	18.67	25.13	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0917PI	11	6.00	66.00	78.00	51.96	6.00	7.02	9.42	20.00	12.00	4.00	19.00	23.00	8.00	7.00
PRSL0916PI	12	5.00	60.00	70.00	48.30	5.00	5.83	7.85	20.00	12.00	4.00	20.00	23.00	8.00	7.00
PRSL0918PI	12	8.00	96.00	112.00	77.28	8.00	9.36	12.56	20.00	12.00	3.90	21.50	23.50	10.00	7.00
PRSL0911PI	12	10.00	120.00	140.00	96.67	10.00	11.67	15.71	20.00	12.00	4.00	25.00	23.50	10.00	7.00
PRSL0944PI	12	12.00	144.00	168.00	116.00	12.00	14.00	18.85	20.00	12.00	4.00	24.00	23.00	10.00	7.00

Measuring unit: mm.

Waterjet cut pinion gears



Legend

Z	Number of teeth
M	Module
D _p	Primitive diameter
D _e	External diameter
D _i	Internal diameter
a	Addendum
d	Dedendum
Alpha	Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	Alpha
PRSL0857PI	8	18.00	144.00	180.00	102.00	18.00	21.00	20.00
PRSL0855PI	8	24.00	192.00	240.00	136.00	24.00	28.00	20.00
PRSL0992PI	9	10.00	90.00	110.00	66.67	10.00	11.67	20.00
PRSL0879PI	9	16.00	144.00	176.00	106.67	16.00	18.67	20.00
PRSL0854PI	9	18.00	162.00	198.00	120.00	18.00	21.00	20.00
PRSL0871PI	9	20.00	180.00	220.00	133.33	20.00	23.33	20.00
PRSL0849PI	9	24.00	216.00	264.00	160.00	24.00	28.00	20.00
PRSL0846PI	10	10.00	100.00	120.00	76.67	10.00	11.67	20.00
PRSL0993PI	10	18.00	180.00	216.00	138.00	18.00	21.00	20.00
PRSL0970PI	10	22.00	220.00	264.00	168.52	22.00	25.74	20.00
PRSL0856PI	10	24.00	240.00	288.00	184.00	24.00	28.00	20.00
PRSL0861PI	11	12.00	132.00	156.00	104.00	12.00	14.00	20.00
PRSL0998PI	11	18.00	198.00	234.00	156.00	18.00	21.00	20.00
PRSL0997PI	11	20.00	220.00	260.00	173.36	20.00	23.32	20.00
PRSL0859PI	11	24.00	264.00	312.00	204.00	24.00	30.00	20.00
PRSL0863PI	12	14.00	168.00	196.00	133.00	14.00	17.50	20.00
PRSL0897PI	12	16.00	192.00	224.00	154.67	16.00	18.67	20.00
PRSL0972PI	12	18.00	216.00	252.00	173.88	18.00	21.06	20.00
PRSL0845PI	12	20.00	240.00	280.00	193.34	20.00	23.32	20.00
PRSL0878PI	12	24.00	288.00	336.00	232.00	24.00	28.00	20.00
PRSL0860PI	13	6.00	78.00	90.00	63.00	6.00	7.50	20.00
PRSL0853PI	13	12.00	156.00	178.59	126.00	11.29	15.00	20.00
PRSL0898PI	13	16.00	208.00	240.00	170.67	16.00	18.66	20.00
PRSL0862PI	14	10.00	140.00	169.00	125.00	15.00	7.50	20.00
PRSL0896PI	14	16.00	224.00	256.00	186.67	16.00	18.67	20.00
PRSL0999PI	14	18.00	252.00	288.00	210.00	18.00	21.00	20.00
PRSL0848PI	14	20.00	280.00	320.00	233.33	20.00	23.33	20.00
PRSL0858PI	15	18.00	270.00	306.00	228.00	18.00	21.00	20.00
PRSL0847PI	16	20.00	320.00	360.00	273.33	20.00	23.33	20.00
PRSL0973PI	17	10.00	170.00	190.00	145.00	10.00	12.50	22.89
PRSL0974PI	17	14.00	238.00	266.00	203.00	14.00	17.50	22.89
PRSL0851PI	20	6.00	120.00	132.00	105.00	6.00	7.50	22.89
PRSL0844PI	25	1.00	25.00	27.00	22.50	1.00	1.25	22.89

Measuring unit: mm.

FOX - REQUEST FORM FOR NON STANDARD LIMIT SWITCH

Instructions

(See next page for list of components and legends)

- 1 Version:** tick the required version.
- 2 SIL 1 certified:** tick the box if you require SIL 1 certified units.
- 3 Revolution ratio:** write the required revolution ratio.
- 4 Standard cam set:** write the code of the cam set required.
- 5 Customized cam set:** for non standard cam sets, fill in the scheme choosing the cams and the switches required. It is possible to assemble sets with 2, 3, 4 or 5 cams/switches.
Customized cams are available on request.
- 6 Potentiometer. encoder. Yankee:** write the code of the potentiometer, encoder or Yankee required.

ATTENTION: it is possible to mount a potentiometer or an encoder alone or together with a set of 2 or 3 cams/switches. Potentiometers PA020001 and PA020002 can be mounted only with sets of 2 cams/switches.

ATTENTION: Yankee may be mounted alone or together with a set of max. 4 cams/switches.
- 7 Cable clamp:** tick the cable clamp required.
- 8 Coupling, flange, pinion gear:** tick the box when coupling, flange or pinion gear are required.

When a standard pinion gear is required, write the code number listed in the pinion gear tables in the catalogue.

When a special pinion gear is required, write the number of teeth, the module and the primitive diameter.
- 9 Shaft:** tick the shaft type required.
Customized shafts are available on request.
- 10 Cover holding wire:** tick when the cover holding wire is required.

Version **1**

Version

Version

Version with anti-moisture plug

ATTENTION: Limit switches with shafts made of stainless steel AISI 430F are not cULus certified.

SIL1 certified **2**

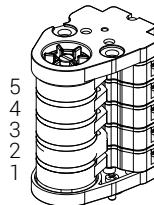
Revolution ratio **3**

- | | |
|--------------------------------|--|
| <input type="checkbox"/> 1:15 | <input type="checkbox"/> 1:150 |
| <input type="checkbox"/> 1:20 | <input type="checkbox"/> 1:200 |
| <input type="checkbox"/> 1:25 | <input type="checkbox"/> 1:250 |
| <input type="checkbox"/> 1:50 | <input type="checkbox"/> 1:300 |
| <input type="checkbox"/> 1:75 | <input type="checkbox"/> 1:450 |
| <input type="checkbox"/> 1:100 | <input type="checkbox"/> 1: <input type="text"/> |

Standard cam set **4**

Cam set code

Customized cam set **5**



Cam code

5

4

3

2

1

Switch code

Potentiometer. encoder. Yankee **6**

Code

Cable clamp **7**

M20

M20+M16

M20+M20

Male coupling **8**

Female coupling

Coupling

Flange

Pinion gear

Pinion gear code

Customized pinion gear

No. of teeth

Module

Primitive diameter

Standard shaft **9**



Stainless steel AISI 430F shaft

High resistance stainless steel AISI 303 shaft

Flexible shaft



Stainless steel AISI 430F shaft

High resistance stainless steel AISI 303 shaft

Cover holding wire **10**

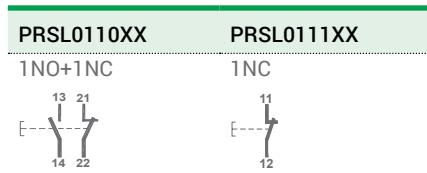
4 Legend - Standard cam sets

No. & type of switches	No. & type of cams	Code
2 x PRSL0110XX	2 cams A	FCL20001
	Cams A+C	FCL20003
	2 cams C	FCL20005
4 x PRSL0110XX	Cams D+D+B+F	FCL40001
	4 cams A	FCL40003
	Cams A+A+C+C	FCL40005
	4 cams C	FCL40007
	Cams C+C+C+E	FCL40009
	Cams A+A+E+E	FCL40011
	2 cams A	FCL20002
	Cams A+C	FCL20004
4 x PRSL0111XX	2 cams C	FCL20006
	Cams D+D+B+F	FCL40002
	4 cams A	FCL40004
	Cams A+A+C+C	FCL40006
	4 cams C	FCL40008
	Cams C+C+C+E	FCL40010
	Cams A+A+E+E	FCL40012

6 Legend - Potentiometers, encoders and Yankee

Description	Code
Potentiometer 10 kΩ with support	PA020001
Potentiometer 10 kΩ mechanical stop with support	PA020002
Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
Potentiometer 5 kΩ ±10% with support	PA020005
Encoder 36 pulses./rev. with support	PA030001
Encoder 150 pulses./rev. with support	PA030002
Yankee - current output	PA01AA01
Yankee - voltage output	PA01AB01
Yankee - PWM output	PA01AC01

5 Legend - Switches



5 Legend - Standard cams

Cam		Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A		1 point	PRSL7194PI	PRSL7194PI	23.0° ±0.5°
B		10 points	PRSL7193PI	PRSL7193PI	23.0° ±0.5°
C		60° sector	PRSL7195PI	PRSL7195PI	86.0° ±0.5°
D		72° sector	PRSL7196PI	PRSL7196PI	97.5° ±0.5°
E		180° sector	PRSL7191PI	PRSL7191PI	203.0° ±0.5°
F		305° sector	PRSL7192PI	PRSL7192PI	327.0° ±0.5°

REMARKS**4**

OSCAR

Rotary limit switch



FEATURES

- It consists of a gear motor that transfers movement to the cams and the other movement detection devices through a primary input reduction stage (worm gear and helical toothed gear) and one or more secondary output stages.
- Accurate adjustment of cams by means of screws.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: up to 10 million operations.
- IP protection degree: Oscar is classified IP66, IP67 and IP69K.
- NEMA protection degree: Oscar is classified Type 4X*.
- Extreme temperature resistance: -40°C to +80°C.
- It features transmission and gear driving shafts made of stainless steel AISI 430F or AISI 303, worm gear transmission shaft rotating on ball bearings, self-lubricating technopolymer gears and driving bushes, technopolymer base and cover.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Revolution ratios from 1:1 to 1:1550, achieved by combining different secondary output stages.
- Each of the two outputs can be set to a different revolution ratio to enable diversified control of the machine when special requirements need to be met.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1 NC contact.
- It can be equipped with 2 cam sets (with up to 10 switches), potentiometers and encoders (alone or on top of cam sets with up to 3 switches) and Yankee absolute encoders (on top of cam sets with up to 4 switches).
- XL version featuring cover rise available with 2 cam sets (with up to 12 switches), potentiometers and encoders (alone or on top of cam sets with up to 5 switches) and Yankee absolute encoders (on top of cam sets with up to 6 switches).

Rotary limit switch used to control and measure the movement of industrial machines or the position of the nacelle or pitch angle of wind turbines. Oscar offers the flexibility of two different outputs with different revolution ratios and the possibility of installing different movement detection devices.

- Dedicated cable clamps or connectors.
- Available with anti-moisture plug fitted to the base by means of a lock nut, to improve transpiration for the limit switch while maintaining protection against water.
- Available with flanges, pinion gears and couplings.
- Plates with universal adapter to replace existing systems.

INCREASED SAFETY SYSTEM "LIMA"

- Lima is designed to be integrated in equipment complying with the standard ISO 13849 on control system safety rules.
- Lima can be connected to a control unit or to a PLC to control the rotation of the limit switch shaft (thus of the equipments connected to it).
- Lima has two separate detection systems, without direct contact, using different technologies to ensure control redundancy.
- Lima allows the two detection systems to be wired by using two separate cables, through a 8-pin terminal board.

CERTIFICATIONS

- CE marking, cULus* marking and EAC* certification.
- Oscar is available, upon request, with the SIL1 certification (Safety Integrity Level 1), according to Standard IEC 61508.
- Complying with accident prevention regulation BGV C 1 (only for Germany).
- HALT TEST (Highly Accelerated Life Test) passed, simulating conditions largely exceeding standard operating conditions.

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

* Not available on all versions.

POSSIBLE ASSEMBLIES

With cover rise



With anti-moisture plug



CERTIFICATIONS

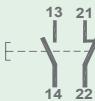
Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
HALT TEST	Highly Accelerated Life Test, simulation of conditions largely exceeding the standard operating conditions (data available on request)
Markings and homologations	* *

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 66/IP 67/IP 69K IP 66/IP 67 (version with cover rise)
NEMA protection degree	Type 4X*
Insulation category	Class II
Maximum rotation speed	800 rpm (Output 1 >1:22, Output 2 >1:22 or =1:1) 200 rpm (Output 1 ≤1:22, Output 2 ≤1:22 or =1:1)
Cable entry	Cable clamp M20 - M16 (8 max)
Shafts	Stainless steel AISI 430F (version not cULus) Stainless steel AISI 303

* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0110XX	PRSL0111XX
Utilisation category	AC 15	
Rated operational voltage	250 Vac	
Rated operational current	3 A	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	10x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL (c)UL: use 60°C or 75°C copper (CU) conductors and stiff or flexible wire 14-22 AWG)	
Tightening torque	0.5 Nm	
Microswitch type	Double break, snap action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	  	

Switches PRSL0100XX available on request.

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

Code of potentiometer with support	PA020001	PA020002
Ohmic value	10 kΩ	10 kΩ mechanical stop
Resolution	Infinite	
Independant linearity	±1%	
Life time	10x10 ⁶ movements	
Operational ambient temperature	-55°C/+105°C	
Continuos rotation (without stop)	360°	
Continuos rotation (with stop)	333° ±5°	
Actual electrical angle	310° ±5°	
Ohmic value tolerance	±20%	

Code of potentiometer with support	PA020003	PA020004	PA020005
Ohmic value	10 kΩ	10 kΩ	5 kΩ
Connections	4 turrets	3 turrets	4 turrets
Indipendent linearity (over AEA -3°)	≤ ±1%	≤ ±0.35%	≤ ±1%
Life time	5x10 ⁶ movements		
Operational ambient temperature	-55°C/+125°C		
Mechanical angle	360° continuous		
Actual Electrical Angle (AEA)	340°±5°		
Ohmic value tolerance	Max ± 20% at 20°C	Max ±10% at 20°C	Max ±20% at 20°C

Code of potentiometer with support	PA020006	PA020007	PA020008
Ohmic value	4,7 kΩ	10 kΩ	2.2 kΩ
Independant linearity (ref. AEA -3°)		±0.25%	
Life time		3x10 ⁶ movements	
Operational ambient temperature		-55°C/+125°C	
Mechanical angle		360° continuous	
Actual Electrical Angle (AEA)		355°±5°	
Ohmic value tolerance		±5%	
Temperature drift		< 50 PPM/°C	

Code of potentiometer with support	PA020009
Ohmic value	2 kΩ
Resolution	Better then 0.008°
Linearity	±0.075%
Independant linearity	±0.075%
Life time	100x10 ⁶ movements
Operational ambient temperature	-40°C/+100°C
Mechanical angle	360° continuous
Actual electrical travel	350° ±2°
Ohmic value tolerance	±20%

TECHNICAL SPECIFICATIONS OF THE ENCODERS

Code with support	PA030001	PA030002
Resolution	36 pulses/rev.	150 pulses/rev.
Operational ambient temperature		-40°C/+85°C
Code		Incremental
Supply voltage	4.5 Vdc min. to 30 Vdc max. (35 mA max. - no load)	
Output voltage	Low: 500 mV max. at 10 mA High: (Vin - 0.6) at -10 mA (Vin - 1.3) at -25 mA	
Output current	25 mA max. load per output channel	
Output format	Two channel (A, B) quadrature with Index (Z)	
Phase sense	A leads B clockwise (CW) from the mounting end of the encoder	
Accuracy	+/- 0.8 arc-min.	
Outputs	Push pull	
Electrical protection	Protection against reverse polarity and output short-circuit	

CERTIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
Markings and homologations	CE cULus

GENERAL TECHNICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 20
Free rotation	360°
Maximum rotation speed	800 rpm

ELECTRICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Code	PA01AA01	PA01AB01	PA01AC01
Analog output	Current 4 ÷ 20 mA	Voltage 0 ÷ 10 V	PWM 0 ÷ 100 %
Power supply		12 ÷ 48 Vdc/12 ÷ 48 Vac	
Protection against reverse polarity		Yes	
Absorption		50 mA	
Resolution		12 bit	
Linearity		+/-0.5°	
Max. hysteresis		0.1°	
Zero Point setting		Through button/wire	
Signal increment direction		CW (standard)/CCW (on request)	
Connections		Terminal board	
Terminal wires		0.14 mm² - 1.5 mm²	
Terminal tightening torque		0.22 Nm - 0.25 Nm	

CERTIFICATIONS OF OSCAR WITH INCREASED SAFETY SYSTEM "LIMA"

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
Markings and homologations	  (pending)

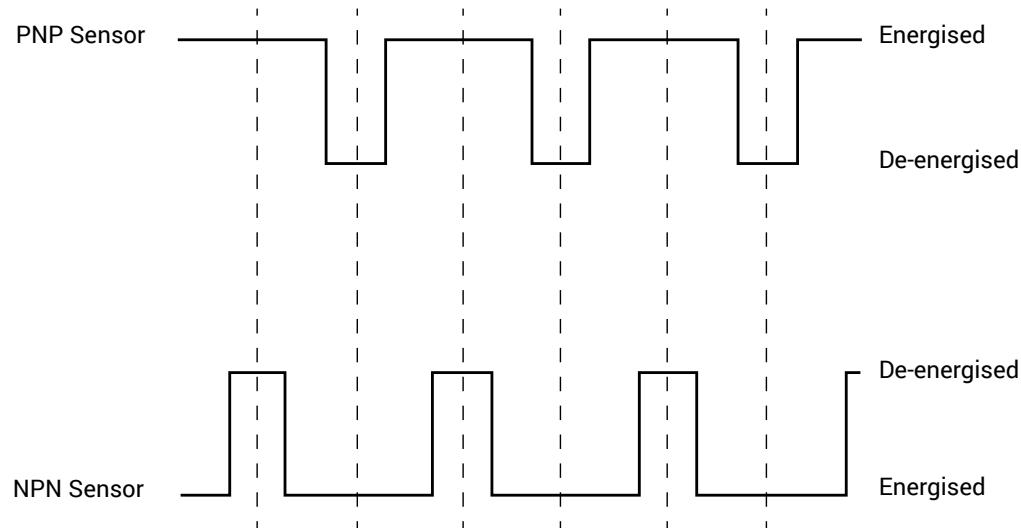
GENERAL TECHNICAL SPECIFICATIONS OF OSCAR WITH LIMA

Ambient temperature	Storage -25°C/+75°C Operational -25°C/+75°C
IP protection degree	IP 66/IP 67/IP 69K IP 66/IP 67 (version with cover rise)
NEMA protection degree	Type 4X
Insulation category	Class II
Maximum rotation speed	800 rpm (Output 1 >1:22, Output 2 >1:22 or =1:1) 200 rpm (Output 1 ≤1:22, Output 2 ≤1:22 or =1:1)
Cable entry	Cable clamp M20 - M16 (8 max)
Sensor connection	Self-lifting screw terminal board - 8 PIN (4 for each sensor)

OUTPUT TECHNICAL SPECIFICATIONS OF OSCAR WITH LIMA

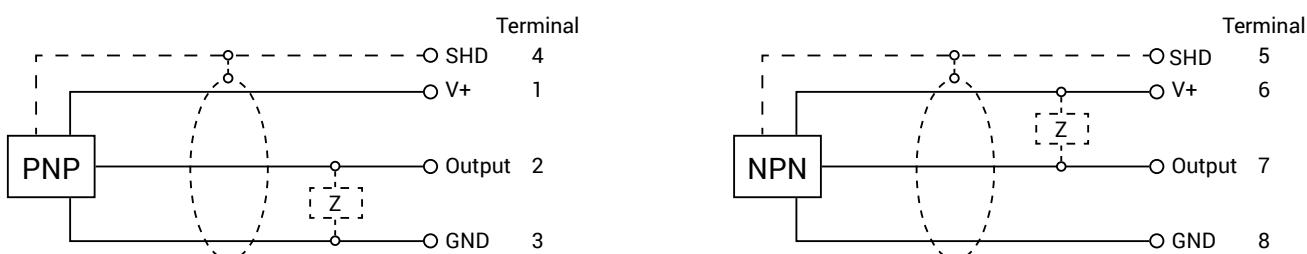
Resolution Signal	5 pulses/rev.
Supply amplitude Range	10-30 Vdc
Switching Frequency max.	66.6 Hz
Current Consumption max (no load)	12 mA (for each sensor)
Voltage Drop Vd	< 2 Vdc
Output Current	< 100 mA (for each sensor)
Short Circuit Protection	Yes
Reverse Polarity Protection	Yes
MTTF(d) PNP sensor	533 years
MTTF(d) NPN sensor	626 years

OUTPUT SIGNAL OF OSCAR WITH LIMA



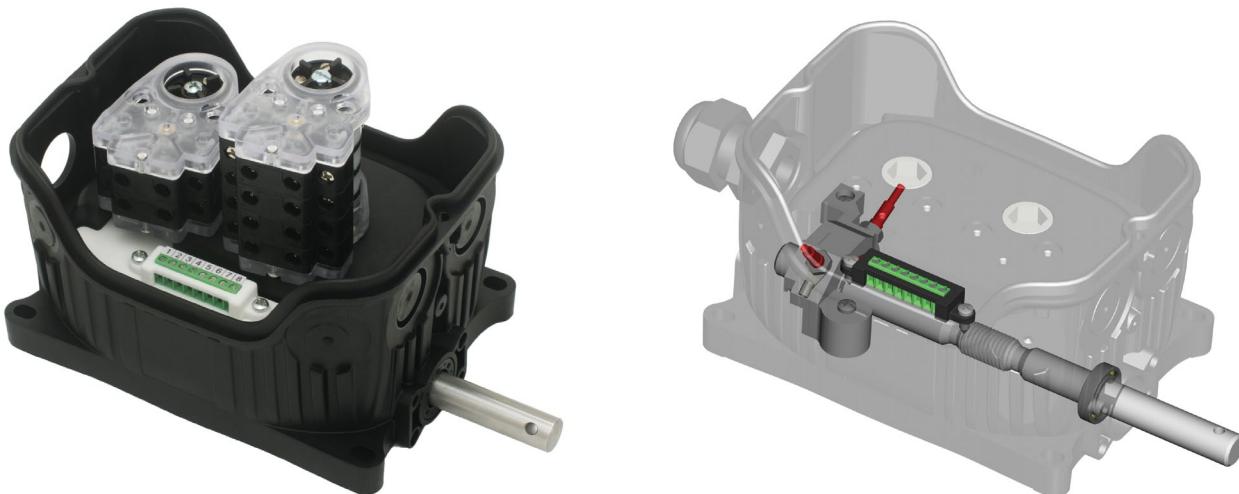
CONNECTION DIAGRAM OF LIMA

Sensor	Terminal	Function	Value
PNP	1	V+ sensor	10-30 Vdc
	2	Output sensor	PNP
	3	GND sensor	-
	4	SHD sensor	-
NPN	5	SHD sensor	-
	6	V+ sensor	10-30 Vdc
	7	Output sensor	NPN
	8	GND sensor	-



EXAMPLE OF USE OF OSCAR LIMIT SWITCH WITH INCREASED SAFETY SYSTEM "LIMA"

4



Oscar limit switch equipped with Lima can be used, just like standard limit switches, for material handling in construction plants (e.g. to control up/down lifting of winches), with the additional possibility to control the limit switch shaft rotation when using Lima connected to a special control unit designed to manage the following functions:

- **Load drop**

Type of function: inhibition.

Trigger event: the control system verifies that the limit switch shaft speed does not exceed the selected set point speed.

Reaction: brake prompt closure, preventing load to drop free.

Safety function: Lima generates a signal depending on the limit switch shaft speed; the control unit compares the measured speed with the selected set point value.

If the measured speed exceeds the set-point value by a selected threshold, the control unit stops the motor and activates the brake.

- **Standstill shaft**

Type of function: inhibition.

Trigger event: the limit switch shaft speed is greater than 0, but no valid speed command has been entered.

Reaction: brake prompt closure.

Safety function: the control system verifies that the limit switches shaft speed is equal to 0 when a valid speed set-point is not entered.

- **Shaft in motion**

Type of function: inhibition.

Trigger event: the measured limit switch shaft speed is 0, but a valid speed command has been entered.

Reaction: brake prompt closure.

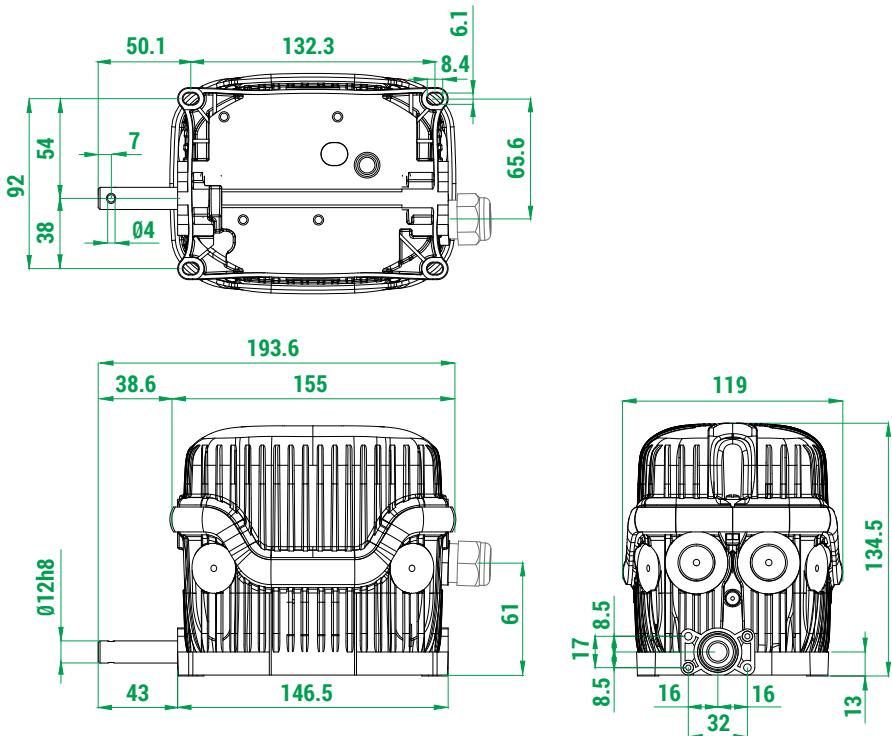
Safety function: the control system verifies that the limit switches shaft speed is greater than 0 when a valid speed set-point is entered.

This function is used to check that the limit switch shaft is coupled to the gear unit, therefore detecting any shaft or limit switch connection system break.

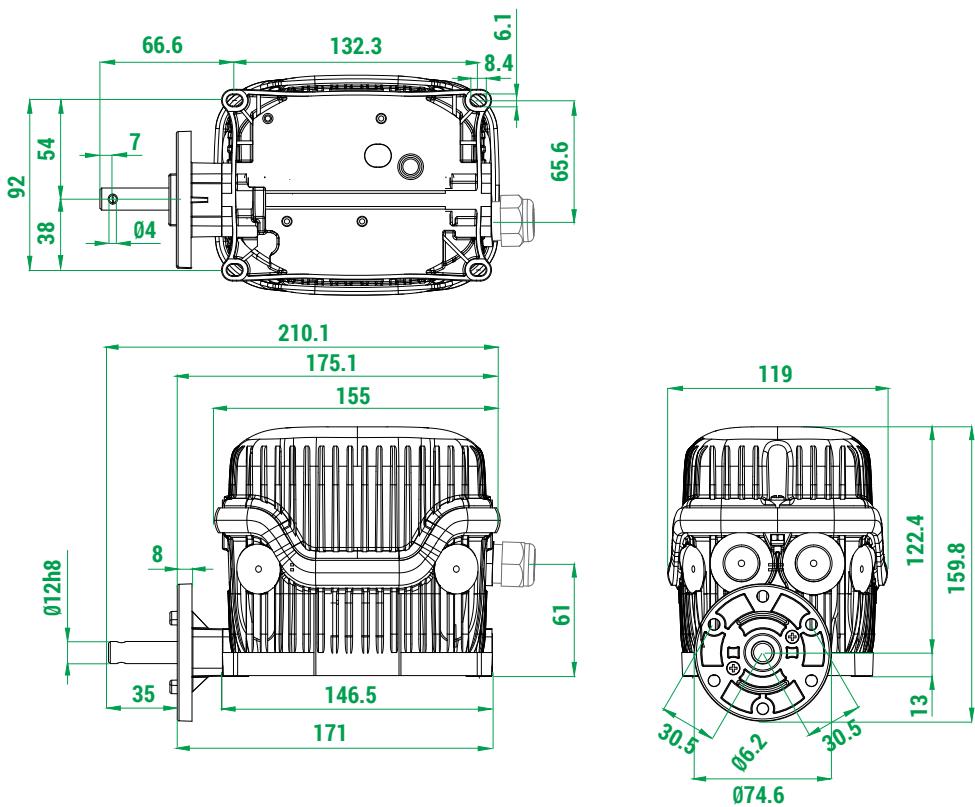
NOTE: The function of Lima is that of providing a signal depending on the limit switch shaft speed. The above example is intended to describe a possible application of the limit switch Oscar equipped with Lima.

OVERALL DIMENSIONS (mm)

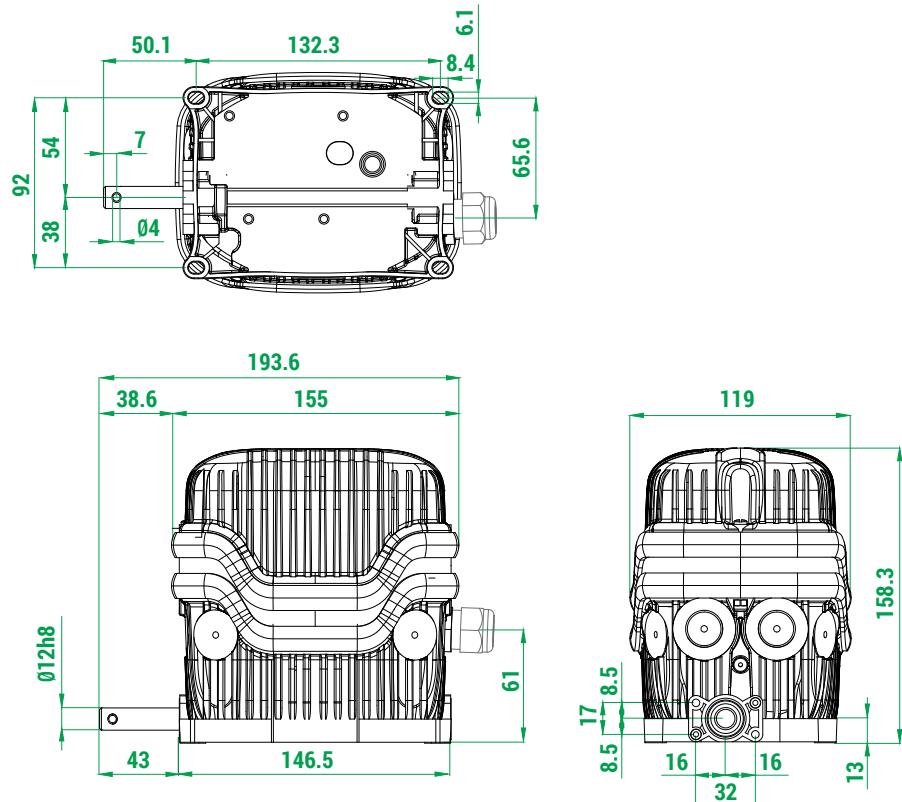
Standard



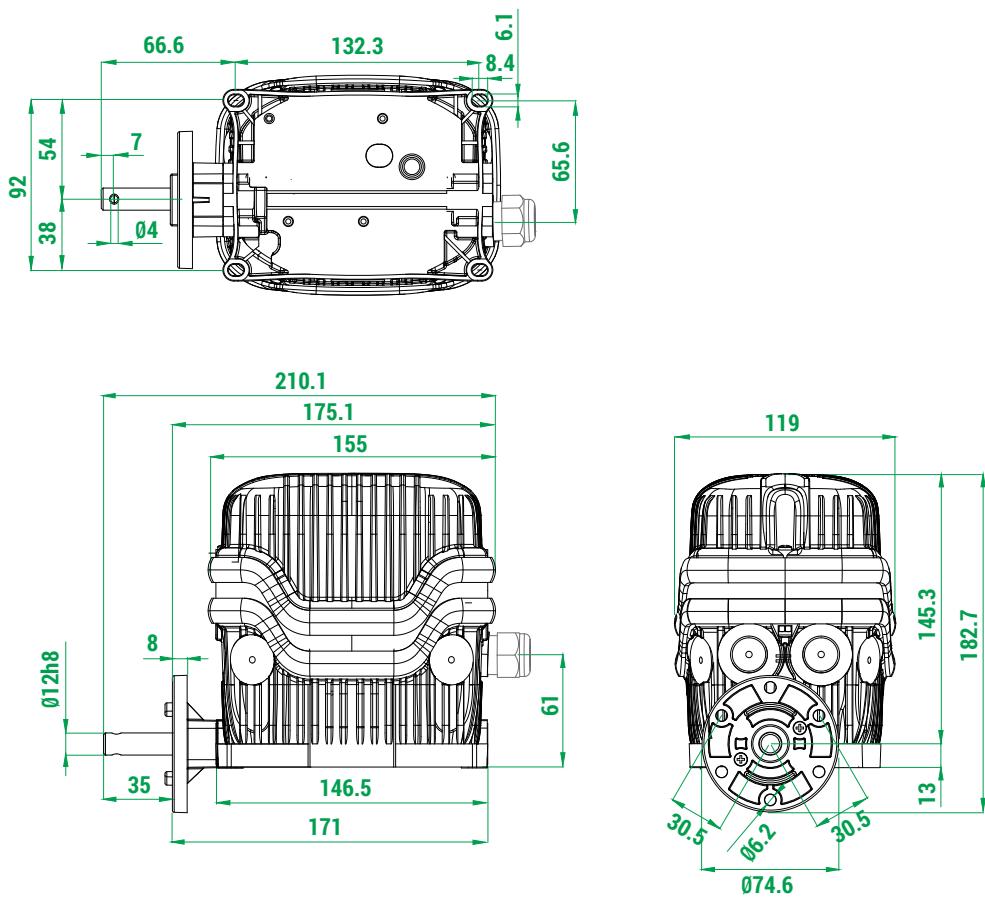
With flange



Oscar XL with cover rise



Oscar XL with cover rise and flange



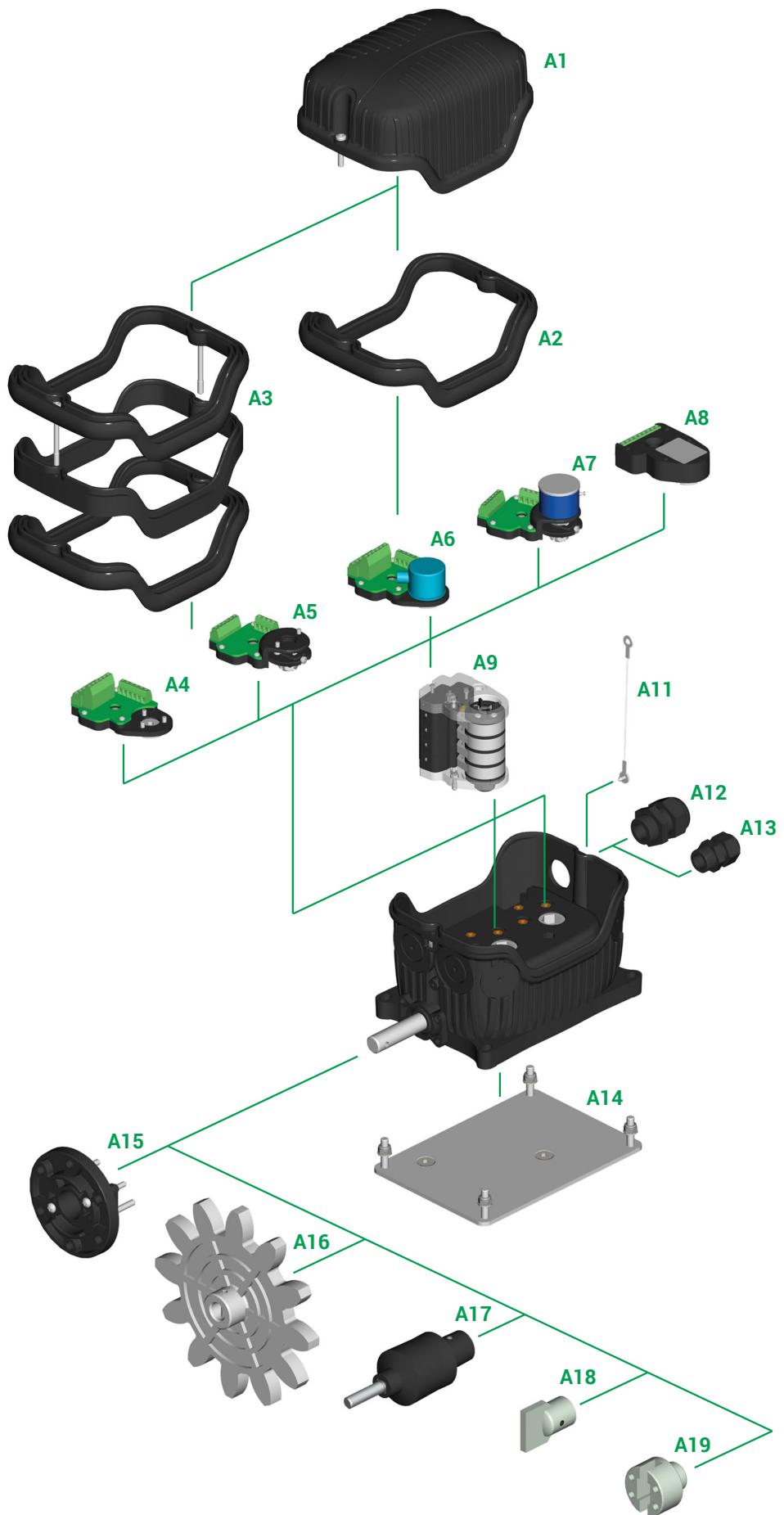
STANDARD LIMIT SWITCHES

Standard limit switches are equipped with cams PRSL7194PI  and shafts made of stainless steel AISI 430F. Standard limit switches are not cULus certified.

Output 1 rated revolution ratio	Real revolution ratio	Output 2 rated revolution ratio	No. of cams and switches	Switches	
				PRSL0110XX 1NO+1NC	PRSL0111XX 1NC
1:1	1:1	1:1	2	PFC9067L0001007	PFC9067L0001013
		1:1	4	PFC9067L0001008	PFC9067L0001012
		1:1	4+2	PFC9067L0001010	PFC9067L0001014
		1:1	4+4	PFC9067L0001011	PFC9067L0001015
1:5	1:5.83	1:5	2	PFC9067L0005007	PFC9067L0005008
		1:1	2	PFC9067L0005009	PFC9067L0005010
		1:5	4	PFC9067L0005011	PFC9067L0005012
		1:1	4	PFC9067L0005013	PFC9067L0005014
		1:5	4+2	PFC9067L0005015	PFC9067L0005016
		1:5	4+4	PFC9067L0005017	PFC9067L0005018
1:10	1:11.66	1:10	2	PFC9067L0011002	PFC9067L0011003
		1:1	2	PFC9067L0011004	PFC9067L0011005
		1:10	4	PFC9067L0011006	PFC9067L0011007
		1:1	4	PFC9067L0011008	PFC9067L0011009
		1:10	4+2	PFC9067L0011010	PFC9067L0011011
		1:10	4+4	PFC9067L0011012	PFC9067L0011013
1:15	1:17	1:15	2	PFC9067L0017005	PFC9067L0017006
		1:1	2	PFC9067L0017007	PFC9067L0017008
		1:15	4	PFC9067L0017009	PFC9067L0017010
		1:1	4	PFC9067L0017011	PFC9067L0017012
		1:15	4+2	PFC9067L0017013	PFC9067L0017014
		1:15	4+4	PFC9067L0017015	PFC9067L0017016
1:20	1:22.15	1:20	2	PFC9067L0022018	PFC9067L0022019
		1:1	2	PFC9067L0022020	PFC9067L0022022
		1:20	4	PFC9067L0022023	PFC9067L0022024
		1:1	4	PFC9067L0022026	PFC9067L0022021
		1:20	4+2	PFC9067L0022027	PFC9067L0022028
		1:20	4+4	PFC9067L0022029	PFC9067L0022030
1:25	1:31.00	1:25	2	PFC9067L0031032	PFC9067L0031033
		1:1	2	PFC9067L0031034	PFC9067L0031035
		1:25	4	PFC9067L0031031	PFC9067L0031036
		1:1	4	PFC9067L0031037	PFC9067L0031038
		1:25	4+2	PFC9067L0031039	PFC9067L0031040
		1:25	4+4	PFC9067L0031041	PFC9067L0031042
1:50	1:62	1:50	2	PFC9067L0062004	PFC9067L0062014
		1:1	2	PFC9067L0062012	PFC9067L0062015
		1:50	4	PFC9067L0062005	PFC9067L0062016
		1:1	4	PFC9067L0062013	PFC9067L0062017
		1:50	4+2	PFC9067L0062006	PFC9067L0062021
		1:50	4+4	PFC9067L0062007	PFC9067L0062022

Output 1 rated revolution ratio	Real revolution ratio	Output 2 rated revolution ratio	No. of cams and switches	Switches	
				PRSL0110XX 1NO+1NC	PRSL0111XX 1NC
1:70	1:73.63	1:70	2	PFC9067L0073004	PFC9067L0073009
		1:1	2	PFC9067L0073005	PFC9067L0073010
		1:70	4	PFC9067L0073003	PFC9067L0073011
		1:1	4	PFC9067L0073006	PFC9067L0073012
		1:70	4+2	PFC9067L0073007	PFC9067L0073013
		1:70	4+4	PFC9067L0073008	PFC9067L0073014
		1:100	2	PFC9067L0107014	PFC9067L0107025
		1:1	2	PFC9067L0107019	PFC9067L0107026
		1:100	4	PFC9067L0107015	PFC9067L0107004
		1:1	4	PFC9067L0107020	PFC9067L0107018
1:100	1:107	1:100	4+2	PFC9067L0107016	PFC9067L0107027
		1:100	4+4	PFC9067L0107017	PFC9067L0107028
		1:150	2	PFC9067L0156004	PFC9067L0156011
		1:1	2	PFC9067L0156007	PFC9067L0156012
		1:150	4	PFC9067L0156005	PFC9067L0156013
		1:1	4	PFC9067L0156008	PFC9067L0156014
		1:150	4+2	PFC9067L0156006	PFC9067L0156015
		1:150	4+4	PFC9067L0156009	PFC9067L0156016
		1:200	2	PFC9067L0214004	PFC9067L0214010
		1:1	2	PFC9067L0214006	PFC9067L0214011
1:200	1:214.20	1:200	4	PFC9067L0214005	PFC9067L0214002
		1:1	4	PFC9067L0214007	PFC9067L0214012
		1:200	4+2	PFC9067L0214008	PFC9067L0214013
		1:200	4+4	PFC9067L0214009	PFC9067L0214014
		1:250	2	PFC9067L0254004	PFC9067L0254014
		1:1	2	PFC9067L0254007	PFC9067L0254015
		1:250	4	PFC9067L0254005	PFC9067L0254016
		1:1	4	PFC9067L0254008	PFC9067L0254017
		1:250	4+2	PFC9067L0254009	PFC9067L0254018
		1:250	4+4	PFC9067L0254010	PFC9067L0254019
1:250	1:254.30	1:300	2	PFC9067L0313023	PFC9067L0313030
		1:1	2	PFC9067L0313025	PFC9067L0313031
		1:300	4	PFC9067L0313024	PFC9067L0313032
		1:1	4	PFC9067L0313026	PFC9067L0313033
		1:300	4+2	PFC9067L0313027	PFC9067L0313034
		1:300	4+4	PFC9067L0313028	PFC9067L0313035
		1:450	2	PFC9067L0471002	PFC9067L0471008
		1:1	2	PFC9067L0471003	PFC9067L0471009
		1:450	4	PFC9067L0471004	PFC9067L0471001
		1:1	4	PFC9067L0471005	PFC9067L0471010
1:450	1:471.20	1:450	4+2	PFC9067L0471006	PFC9067L0471011
		1:450	4+4	PFC9067L0471007	PFC9067L0471012

ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Standard cam sets", "Potentiometers, encoders and sensors" and "Accessories".

COMPONENTS

Standard cam sets

Ref.	Drawing	No. and type of cams	No. and type of switches	Code
A9		2 cams A	2 PRSL0110XX switches	FCL20001
		2 cams A	2 PRSL0111XX switches	FCL20002
		Cams A+C	2 PRSL0110XX switches	FCL20003
		Cams A+C	2 PRSL0111XX switches	FCL20004
		2 cams C	2 PRSL0110XX switches	FCL20005
		2 cams C	2 PRSL0111XX switches	FCL20006
		Cams D+D+B+F	4 PRSL0110XX switches	FCL40001
		Cams D+D+B+F	4 PRSL0111XX switches	FCL40002
		4 cams A	4 PRSL0110XX switches	FCL40003
		4 cams A	4 PRSL0111XX switches	FCL40004
		Cams A+A+C+C	4 PRSL0110XX switches	FCL40005
		Cams A+A+C+C	4 PRSL0111XX switches	FCL40006
		4 cams C	4 PRSL0110XX switches	FCL40007
		4 cams C	4 PRSL0111XX switches	FCL40008
		Cams C+C+C+E	4 PRSL0110XX switches	FCL40009
		Cams C+C+C+E	4 PRSL0111XX switches	FCL40010
		Cams A+A+E+E	4 PRSL0110XX switches	FCL40011
		Cams A+A+E+E	4 PRSL0111XX switches	FCL40012
		5 cams A	5 PRSL0110XX switches	FCL50006
		5 cams A	5 PRSL0111XX switches	FCL50005
		5 cams C	5 PRSL0110XX switches	FCL50001
		5 cams C	5 PRSL0111XX switches	FCL50010
		6 cams A	6 PRSL0110XX switches	FCL60003
		6 cams A	6 PRSL0111XX switches	FCL60006
		6 cams C	6 PRSL0110XX switches	FCL60001
		6 cams C	6 PRSL0111XX switches	FCL60010

Other sets with 2/3/4/5 or 6 cams/switches are available on request.

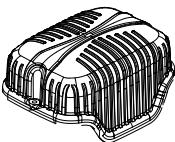
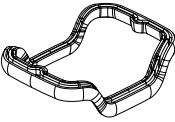
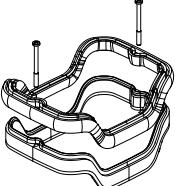
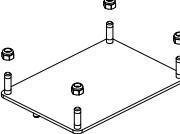
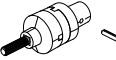
Cam reference chart

Cam		Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A		1 points	PRSL7194PI	PRSL7194PI	$23.0^\circ \pm 0.5^\circ$
B		10 point	PRSL7193PI	PRSL7193PI	$23.0^\circ \pm 0.5^\circ$
C		60° sector	PRSL7195PI	PRSL7195PI	$86.0^\circ \pm 0.5^\circ$
D		72° sector	PRSL7196PI	PRSL7196PI	$97.5^\circ \pm 0.5^\circ$
E		180° sector	PRSL7191PI	PRSL7191PI	$203.0^\circ \pm 0.5^\circ$
F		305° sector	PRSL7192PI	PRSL7192PI	$327.0^\circ \pm 0.5^\circ$

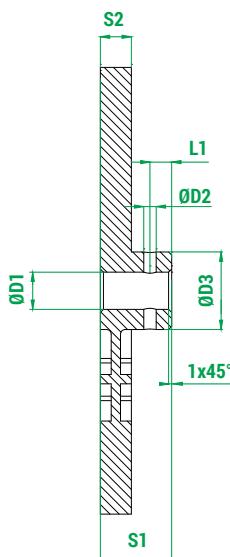
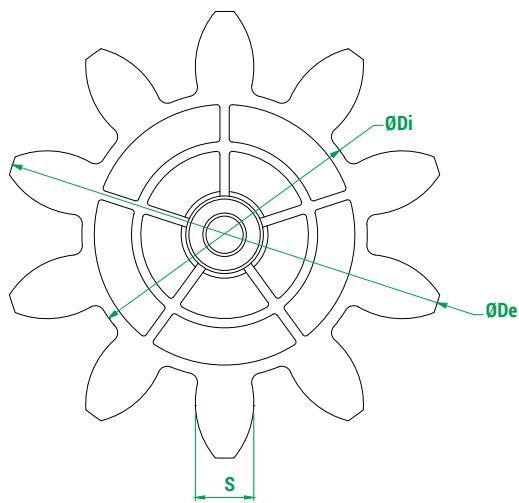
Potentiometers, encoders and sensors

Ref.	Drawing	Description	Code
A4		Support for encoder	PA030000
A5		Support for potentiometer	PA020000
A6		Encoder 36 pulses./rev. with support	PA030001
		Encoder 150 pulses./rev. with support	PA030002
A7		Potentiometer 10 kΩ with support	PA020001
		Potentiometer 10 kΩ mechanical stop with support	PA020002
		Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
		Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
		Potentiometer 5 kΩ ±10% with support	PA020005
		Potentiometer 4.7 kΩ with support	PA020006
		Potentiometer 10 kΩ with support	PA020007
		Potentiometer 2.2 kΩ with support	PA020008
		Potentiometer 2KΩ with support	PA020009
A8		Absolute encoder Yankee - current output	PA01AA01
		Absolute encoder Yankee - voltage output	PA01AB01
		Absolute encoder Yankee - PWM output	PA01AC01

Accessories

Ref.	Drawing	Description	Code
A1		Cover with screws	PA090016
A2		Tightening rubber	PRGU1510PE
A3		Cover rise with tightening rubber and screws	PRSL0703PI
A11		Cover holding wire + screw (bag with 10 pieces)	PRSL0358PI
A12		Cable clamp M20x1.5	PRPS0063PE
A13		Cable clamp M16	PRPS0062PE
A14		Fixing plate	PRSL0729PI
A15		Flange with screws and pins	PRSL0356PI
A16		Pinion gear	See pinion gear tables
A17		Coupling with pin	PRSL0981PI
A18		Male coupling with pin	PRSL0919PI
A19		Female coupling with pin	PRSL0920PI

Moulded pinion gears



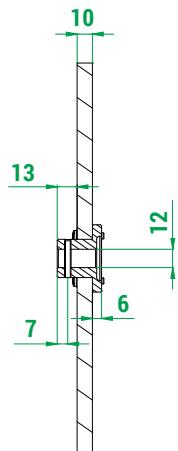
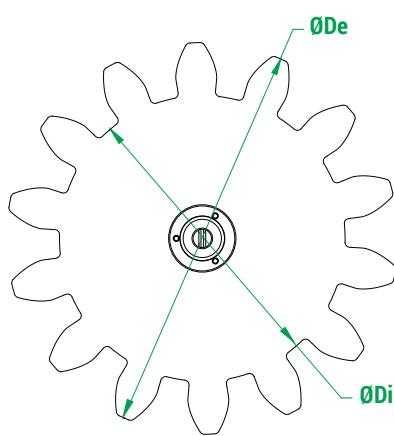
Legend

Z	Number of teeth
M	Module
D _p	Primitive diameter
D _e	External diameter
D _i	Internal diameter
a	Addendum
d	Dedendum
Alpha	Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	S	Alpha	D ₁	D ₂	D ₃	S ₁	S ₂	L ₁
PRSL0915PI	8	20.00	160.00	200.00	113.20	20.00	23.40	31.41	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0912PI	10	12.00	120.00	144.00	92.00	12.00	14.00	18.85	20.00	12.00	4.00	25.00	23.00	10.00	7.00
PRSL0913PI	10	14.00	140.00	168.00	107.24	14.00	16.38	21.99	20.00	12.00	4.00	24.60	23.00	10.00	7.00
PRSL0914PI	10	16.00	160.00	192.00	122.67	16.00	18.67	25.13	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0917PI	11	6.00	66.00	78.00	51.96	6.00	7.02	9.42	20.00	12.00	4.00	19.00	23.00	8.00	7.00
PRSL0916PI	12	5.00	60.00	70.00	48.30	5.00	5.83	7.85	20.00	12.00	4.00	20.00	23.00	8.00	7.00
PRSL0918PI	12	8.00	96.00	112.00	77.28	8.00	9.36	12.56	20.00	12.00	3.90	21.50	23.50	10.00	7.00
PRSL0911PI	12	10.00	120.00	140.00	96.67	10.00	11.67	15.71	20.00	12.00	4.00	25.00	23.50	10.00	7.00
PRSL0944PI	12	12.00	144.00	168.00	116.00	12.00	14.00	18.85	20.00	12.00	4.00	24.00	23.00	10.00	7.00

Measuring unit: mm.

Waterjet cut pinion gears



Legend

Z Number of teeth

M Module

D_p Primitive diameter

D_e External diameter

D_i Internal diameter

a Addendum

d Dedendum

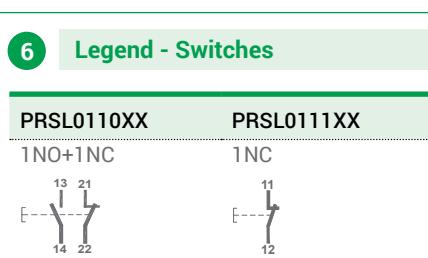
Alpha Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	Alpha
PRSL0857PI	8	18.00	144.00	180.00	102.00	18.00	21.00	20.00
PRSL0855PI	8	24.00	192.00	240.00	136.00	24.00	28.00	20.00
PRSL0992PI	9	10.00	90.00	110.00	66.67	10.00	11.67	20.00
PRSL0879PI	9	16.00	144.00	176.00	106.67	16.00	18.67	20.00
PRSL0854PI	9	18.00	162.00	198.00	120.00	18.00	21.00	20.00
PRSL0871PI	9	20.00	180.00	220.00	133.33	20.00	23.33	20.00
PRSL0849PI	9	24.00	216.00	264.00	160.00	24.00	28.00	20.00
PRSL0846PI	10	10.00	100.00	120.00	76.67	10.00	11.67	20.00
PRSL0993PI	10	18.00	180.00	216.00	138.00	18.00	21.00	20.00
PRSL0970PI	10	22.00	220.00	264.00	168.52	22.00	25.74	20.00
PRSL0856PI	10	24.00	240.00	288.00	184.00	24.00	28.00	20.00
PRSL0861PI	11	12.00	132.00	156.00	104.00	12.00	14.00	20.00
PRSL0998PI	11	18.00	198.00	234.00	156.00	18.00	21.00	20.00
PRSL0997PI	11	20.00	220.00	260.00	173.36	20.00	23.32	20.00
PRSL0859PI	11	24.00	264.00	312.00	204.00	24.00	30.00	20.00
PRSL0863PI	12	14.00	168.00	196.00	133.00	14.00	17.50	20.00
PRSL0897PI	12	16.00	192.00	224.00	154.67	16.00	18.67	20.00
PRSL0972PI	12	18.00	216.00	252.00	173.88	18.00	21.06	20.00
PRSL0845PI	12	20.00	240.00	280.00	193.34	20.00	23.32	20.00
PRSL0878PI	12	24.00	288.00	336.00	232.00	24.00	28.00	20.00
PRSL0860PI	13	6.00	78.00	90.00	63.00	6.00	7.50	20.00
PRSL0853PI	13	12.00	156.00	178.59	126.00	11.29	15.00	20.00
PRSL0898PI	13	16.00	208.00	240.00	170.67	16.00	18.66	20.00
PRSL0862PI	14	10.00	140.00	169.00	125.00	15.00	7.50	20.00
PRSL0896PI	14	16.00	224.00	256.00	186.67	16.00	18.67	20.00
PRSL0999PI	14	18.00	252.00	288.00	210.00	18.00	21.00	20.00
PRSL0848PI	14	20.00	280.00	320.00	233.33	20.00	23.33	20.00
PRSL0858PI	15	18.00	270.00	306.00	228.00	18.00	21.00	20.00
PRSL0847PI	16	20.00	320.00	360.00	273.33	20.00	23.33	20.00
PRSL0973PI	17	10.00	170.00	190.00	145.00	10.00	12.50	22.89
PRSL0974PI	17	14.00	238.00	266.00	203.00	14.00	17.50	22.89
PRSL0851PI	20	6.00	120.00	132.00	105.00	6.00	7.50	22.89
PRSL0844PI	25	1.00	25.00	27.00	22.50	1.00	1.25	22.89

Measuring unit: mm.

5 Legend - Standard cam sets		
No. & type of switches	No. & type of cams	Code
2 x PRSL0110XX	2 cams A	FCL20001
	Cams A+C	FCL20003
	2 cams C	FCL20005
4 x PRSL0110XX	Cams D+D+B+F	FCL40001
	4 cams A	FCL40003
	Cams A+A+C+C	FCL40005
	4 cams C	FCL40007
	Cams C+C+C+E	FCL40009
	Cams A+A+E+E	FCL40011
5 x PRSL0110XX	5 camme A	FCL50006
	5 camme C	FCL50001
6 x PRSL0110XX	6 camme A	FCL60003
	6 camme C	FCL60001
2 x PRSL0111XX	2 cams A	FCL20002
	Cams A+C	FCL20004
	2 cams C	FCL20006
	Cams D+D+B+F	FCL40002
	4 cams A	FCL40004
	Cams A+A+C+C	FCL40006
4 x PRSL0111XX	4 cams C	FCL40008
	Cams C+C+C+E	FCL40010
	Cams A+A+E+E	FCL40012
5 x PRSL0111XX	5 camme A	FCL50005
	5 camme C	FCL50010
6x PRSL0111XX	6 camme A	FCL60006
	6 camme C	FCL60010

7 Legend - Potentiometers, encoders and Yankee	
Description	Code
Potentiometer 10 kΩ with support	PA020001
Potentiometer 10 kΩ mechanical stop with support	PA020002
Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
Potentiometer 5 kΩ ±10% with support	PA020005
Potentiometer 4.7 kΩ with support	PA020006
Potentiometer 10 kΩ with support	PA020007
Potentiometer 2.2 kΩ with support	PA020008
Potentiometer 2KΩ with support	PA020009
Encoder 36 pulses./rev. with support	PA030001
Encoder 150 pulses./rev. with support	PA030002
Yankee - current output	PA01AA01
Yankee - voltage output	PA01AB01
Yankee - PWM output	PA01AC01



Cam	Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A 	1 point	21.5° ±0.5°	PRSL7194PI	23.0° ±0.5°
B 	10 points	21.5° ±0.5°	PRSL7193PI	23.0° ±0.5°
C 	60° sector	82.0° ±0.5°	PRSL7195PI	86.0° ±0.5°
D 	72° sector	94.0° ±0.5°	PRSL7196PI	97.5° ±0.5°
E 	180° sector	204.5° ±0.5°	PRSL7191PI	203.0° ±0.5°
F 	305° sector	328.5° ±0.5°	PRSL7192PI	327.0° ±0.5°

7 Configuration table

The following table shows possible configurations of Oscar and Oscar XL.

When it is not possible to mount a set of cams together with a potentiometer/encoder, the table shows «Not available».

When the standard cover PA090008 is not high enough to hold the elements mounted inside the limit switch, it is possible to use the cover rise PRSL0703PI (the table shows «Oscar XL»).

In all other cases it is possible to mount the sets of cams and potentiometer/encoder with the standard cover PA090008 (the table shows «Oscar»).

	Set of cams with 2 switches	Set of cams with 3 switches	Set of cams with 4 switches	Set of cams with 5 switches	Set of cams with 6 switches
Set of cams only	Oscar	Oscar	Oscar	Oscar	Oscar XL
Set of cams + Yankee1	Oscar	Oscar	Oscar	Oscar XL	Oscar XL
Set of cams + PA020001	Oscar	Oscar XL	Oscar XL	Not available	Not available
Set of cams + PA020002	Oscar	Oscar XL	Oscar XL	Not available	Not available
Set of cams + PA020003	Oscar	Oscar	Oscar XL	Oscar XL	Not available
Set of cams + PA020004	Oscar	Oscar	Oscar XL	Oscar XL	Not available
Set of cams + PA020005	Oscar	Oscar	Oscar XL	Oscar XL	Not available
Set of cams + PA020006	Oscar	Oscar XL	Oscar XL	Not available	Not available
Set of cams + PA020007	Oscar	Oscar XL	Oscar XL	Not available	Not available
Set of cams + PA020008	Oscar	Oscar XL	Oscar XL	Not available	Not available
Set of cams + PA030001	Oscar	Oscar	Oscar XL	Oscar XL	Not available
Set of cams + PA030002	Oscar	Oscar	Oscar XL	Oscar XL	Not available

TOP

Rotary limit switch



Rotary limit switch used to control and measure the movement of industrial machines or the position of the nacelle or pitch angle of wind turbines. Salt mist resistant and rich in options, Top is designed to meet the most demanding requirements.

FEATURES

- It consists of a gear motor that transfers movement to the cams and the other movement detection devices through a primary input reduction stage (worm gear and helical toothed gear) and one or more secondary output stages (pairs of straight toothed gears).
- Accurate adjustment of cams by means of screws.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: up to 10 million operations.
- IP protection degree: Top is classified IP66, IP67 and IP69K.
- NEMA protection degree: Top is classified Type 4X*.
- Extreme temperature resistance: -40°C to +80°C.
- Salt mist resistant.
- It features base and cover made of electrostatic varnished die-cast aluminum, transmission and gear driving shafts made of stainless steel AISI 303, worm gear transmission shaft rotating on ball bearings, self-lubricating technopolymer gears and driving bushes.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Revolution ratios from 1:1 to 1:8100, achieved by combining different secondary output stages.
- Each of the three outputs can be set to a different revolution ratio to enable diversified control of the machine when special requirements need to be met.

- Snap action switches with 1NO+1NC contacts or slow action switches with 1 NC contact.
- It can be equipped with 3 cam sets (with up to 15 switches), potentiometers and encoders (alone or on top of cam sets with up to 2 switches) and Yankee absolute encoders (on top of cam sets with up to 4 switches).
- XL version featuring cover rise available with 3 cam sets (with up to 18 switches), potentiometers and encoders (alone or on top of cam sets with up to 5 switches) and Yankee absolute encoders (on top of cam sets with up to 6 switches).
- Dedicated cable clamps or connectors.
- Available with anti-moisture plug fitted to the base by means of a lock nut, to improve transpiration for the limit switch while maintaining protection against water.
- Available with flanges, pinion gears and couplings.
- Plates with universal adapter to replace existing systems.

CERTIFICATIONS

- CE marking, cULus* marking and EAC certification.
- Top is available, upon request, with the SIL1 certification (Safety Integrity Level 1), according to Standard IEC 61508.
- Complying with accident prevention regulation BGV C 1 (only for Germany).

Use the online configurator (<https://configuratore.terworld.com>) or fill in the "request form" for accurate product configuration.

POSSIBLE ASSEMBLIES

Top XL with cover rise



With anti-moisture plug



CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
SIL1	IEC 61508:2010 Part 2-4-6-7 Functional safety of electrical/electronic/programmable electronic safety-related systems
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
Markings and homologations	CE * EAC

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 66/IP 67/IP 69K
NEMA protection degree	Type 4X*
Insulation category	Class I
Maximum rotation speed	800 rpm
Cable entry	Cable clamp M20
Shafts	Stainless steel AISI 303

* Not available on all versions.

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0110XX	PRSL0111XX
Utilisation category	AC 15	
Rated operational voltage	250 Vac	
Rated operational current	3 A	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	10x10 ⁶ operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL (c)UL: use 60°C or 75°C copper (CU) conductors and stiff or flexible wire 14-22 AWG)	
Tightening torque	0.5 Nm	
Microswitch type	Double break, snap action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	  	

Switches PRSL0100XX available on request.

TECHNICAL SPECIFICATIONS OF THE POTENTIOMETERS

Code of potentiometer with support	PA020001	PA020002
Ohmic value	10 kΩ	10 kΩ mechanical stop
Resolution	Infinite	
Independant linearity	±1%	
Life time	10x10 ⁶ movements	
Operational ambient temperature	-55°C/+105°C	
Continuos rotation (without stop)	360°	
Continuos rotation (with stop)	333° ±5°	
Actual electrical angle	310° ±5°	
Ohmic value tolerance	±20%	

Code of potentiometer with support	PA020003	PA020004	PA020005
Ohmic value	10 kΩ	10 kΩ	5 kΩ
Connections	4 turrets	3 turrets	4 turrets
Indipendent linearity (over AEA -3°)	≤ ±1%	≤ ±0.35%	≤ ±1%
Life time	5x10 ⁶ movements		
Operational ambient temperature	-55°C/+125°C		
Mechanical angle	360° continuous		
Actual Electrical Angle (AEA)	340°±5°		
Ohmic value tolerance	Max ±20% at 20°C	Max ±10% at 20°C	Max ±20% at 20°C

Code of potentiometer with support	PA020006	PA020007	PA020008
Ohmic value	4.7 kΩ	10 kΩ	2.2 kΩ
Independant linearity (ref. AEA -3°)		±0.25%	
Life time		3x10 ⁶ movements	
Operational ambient temperature		-55°C/+125°C	
Mechanical angle		360° continuous	
Actual Electrical Angle (AEA)		355°±5°	
Ohmic value tolerance		±5%	
Temperature drift		< 50 PPM/°C	

Code of potentiometer with support	PA020009
Ohmic value	2 kΩ
Resolution	Better then 0.008°
Linearity	±0.075%
Independant linearity	±0.075%
Life time	100x10 ⁶ movements
Operational ambient temperature	-40°C/+100°C
Mechanical angle	360° continuous
Actual electrical travel	350° ±2°
Ohmic value tolerance	±20%

TECHNICAL SPECIFICATIONS OF THE ENCODERS

Code with support	PA030001	PA030002
Resolution	36 pulses/rev.	150 pulses/rev.
Operational ambient temperature		-40°C/+85°C
Code		Incremental
Supply voltage	4.5 Vdc min. to 30 Vdc max. (35 mA max. - no load)	
Output voltage	Low: 500 mV max. at 10 mA High: (Vin - 0.6) at -10 mA (Vin - 1.3) at -25 mA	
Output current	25 mA max. load per output channel	
Output format	Two channel (A, B) quadrature with Index (Z)	
Phase sense	A leads B clockwise (CW) from the mounting end of the encoder	
Accuracy	+/- 0.8 arc-min.	
Outputs	Push pull	
Electrical protection	Protection against reverse polarity and output short-circuit	

CERTIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
Markings and homologations	CE cULus

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GENERAL TECHNICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 20
Free rotation	360°
Maximum rotation speed	800 rpm

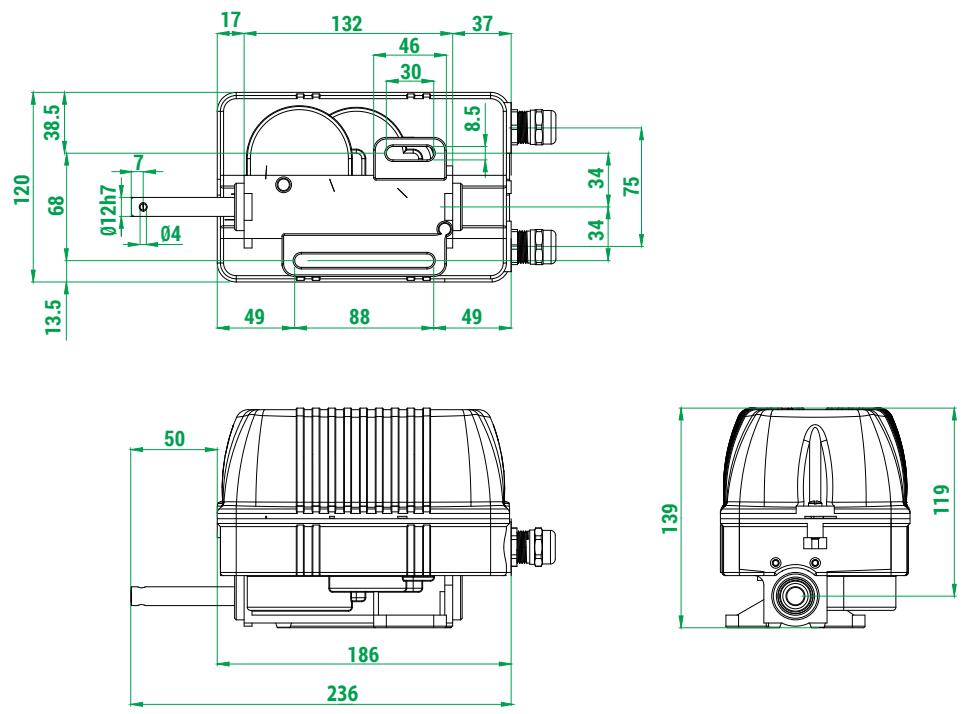
ELECTRICAL SPECIFICATIONS OF THE ABSOLUTE ENCODER YANKEE

Code	PA01AA01	PA01AB01	PA01AC01
Analog output	Current 4 ÷ 20 mA	Voltage 0 ÷ 10 V	PWM 0 ÷ 100 %
Power supply		12 ÷ 48 Vdc/12 ÷ 48 Vac	
Protection against reverse polarity		Yes	
Absorption		50 mA	
Resolution		12 bit	
Linearity		+/- 0.5°	
Max. hysteresis		0.1°	
Zero Point setting		Through button/wire	
Signal increment direction		CW (standard)/CCW (on request)	
Connections		Terminal board	
Terminal wires		0.14 mm² - 1.5 mm²	
Terminal tightening torque		0.22 Nm - 0.25 Nm	

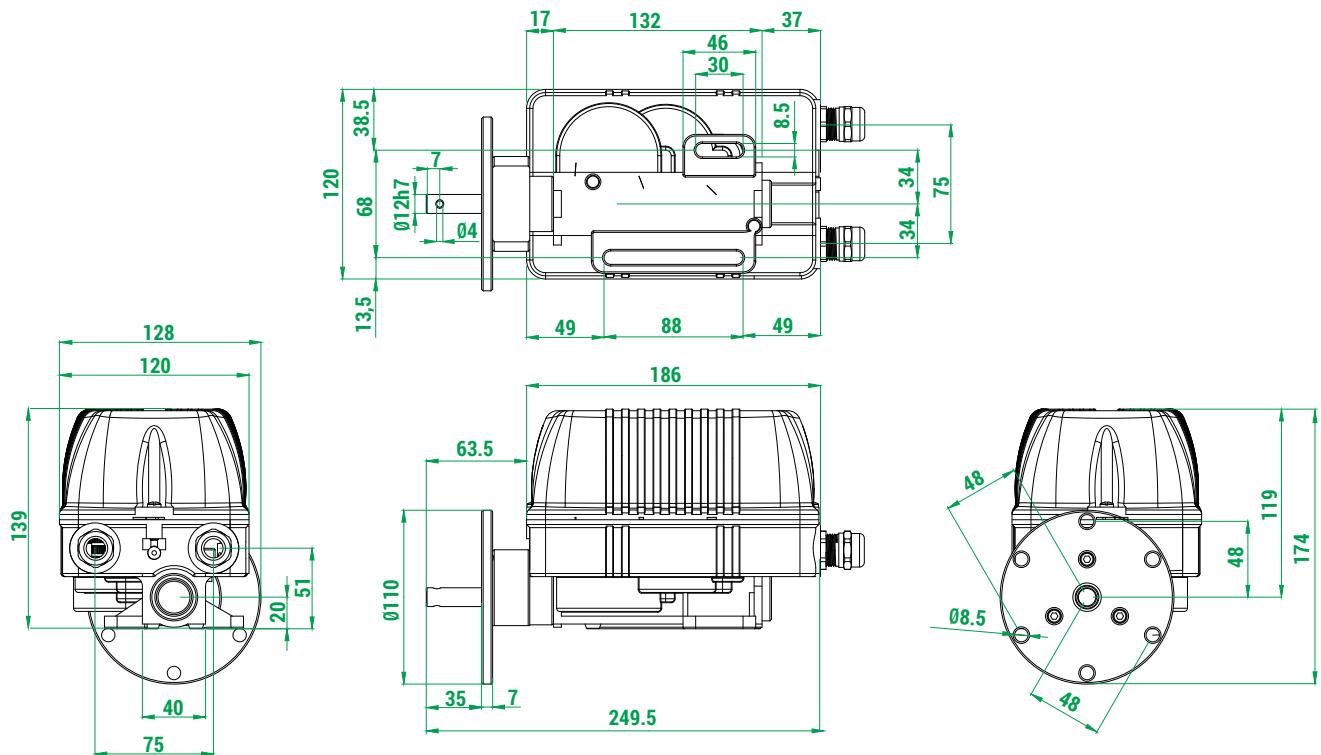
OVERALL DIMENSIONS (mm)

Standard

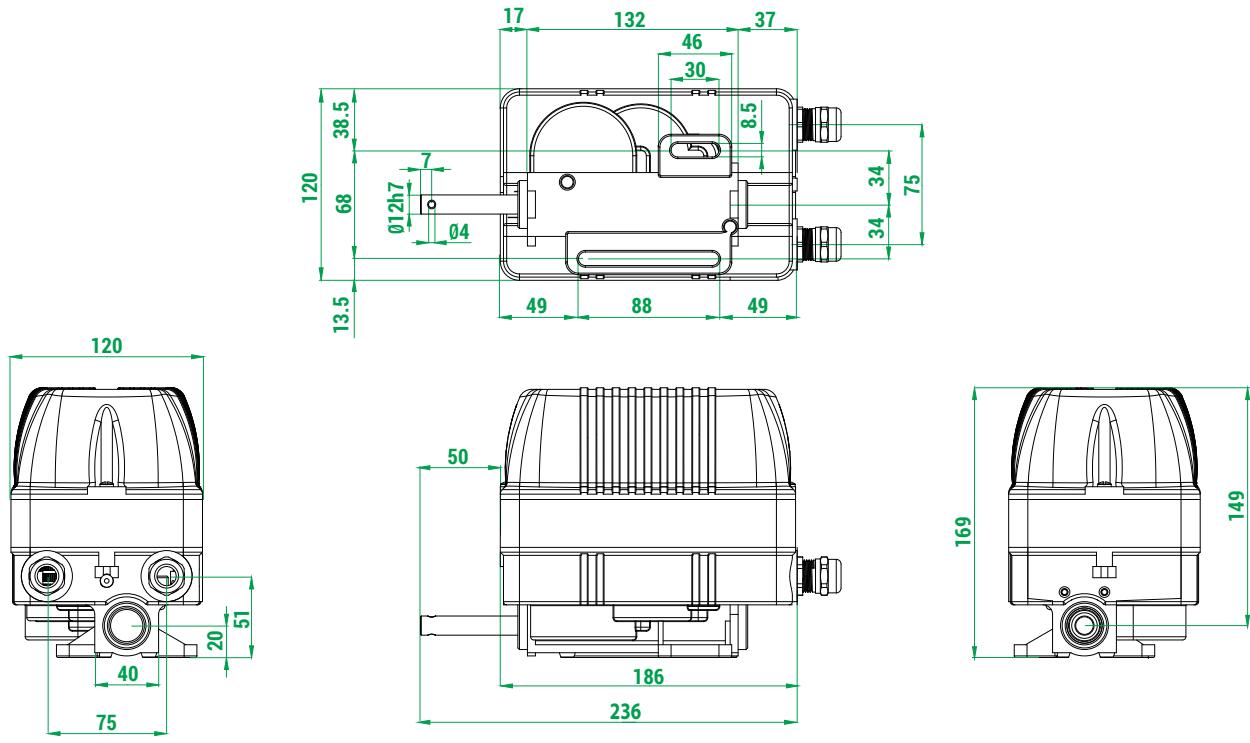
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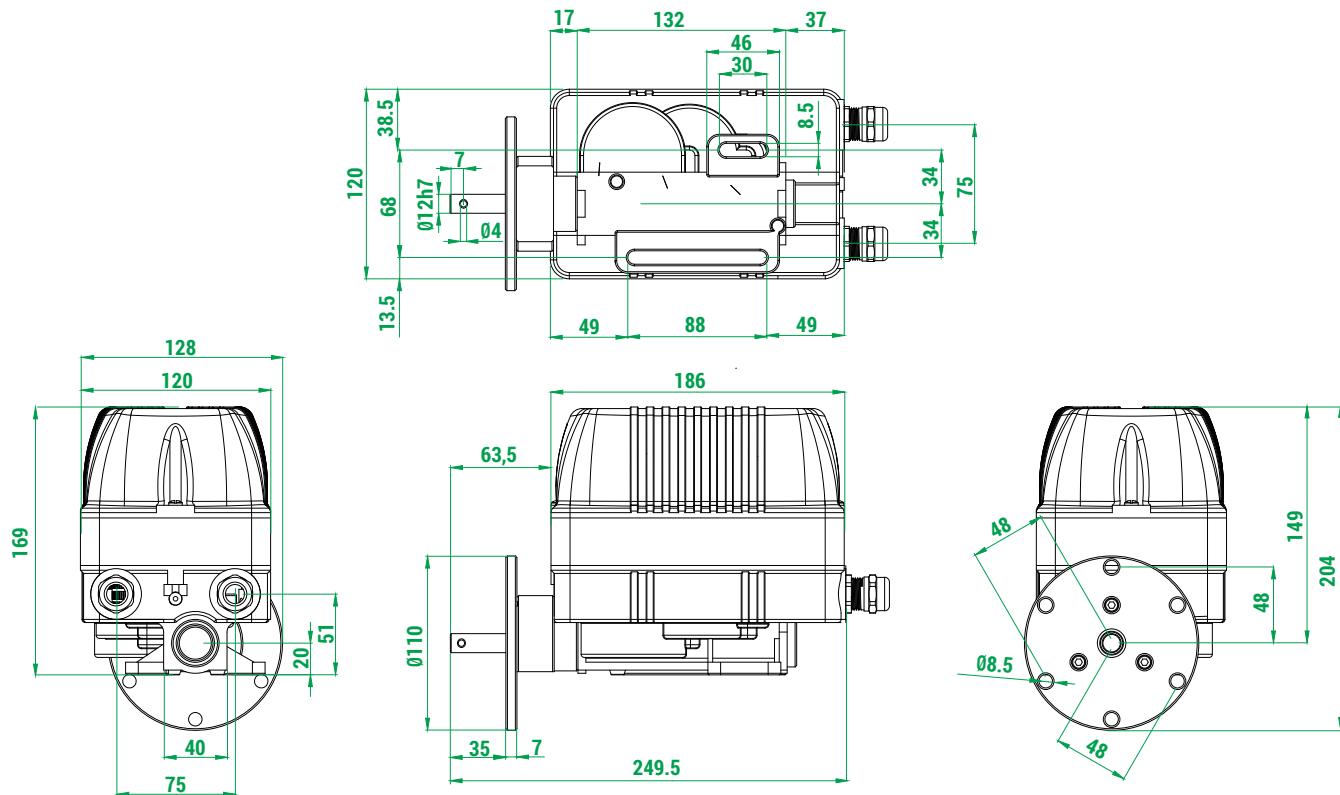
With flange



Top XL with cover rise



Top XL with cover rise and flange



STANDARD LIMIT SWITCHES

Standard limit switches are equipped with cams PRSL7194PI .

Standard limit switches are not cULus certified.

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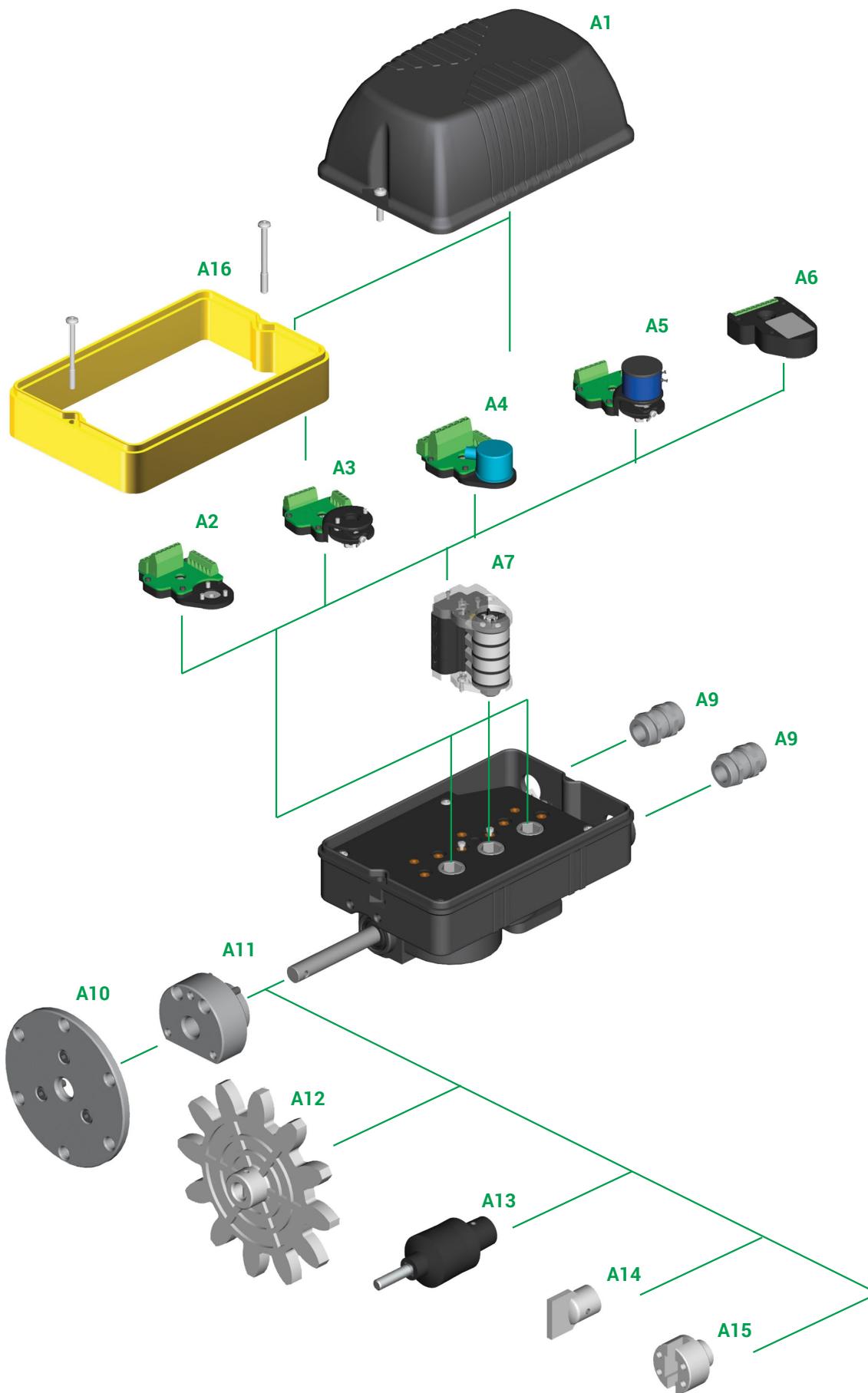
Rated revolution ratio	Real revolution ratio	No. of cams and switches	Switches	
			PRSL0110XX 1NO+1NC	PRSL0111XX 1NC
1:1	1:1	2	PFD9067L0001002	PFD9067L0001008
		4	PFD9067L0001003	PFD9067L0001009
		4+2	PFD9067L0001004	PFD9067L0001010
		4+4	PFD9067L0001005	PFD9067L0001011
		4+4+2	PFD9067L0001006	PFD9067L0001012
		4+4+4	PFD9067L0001007	PFD9067L0001013
		2	PFD9067L0005004	PFD9067L0005008
		4	PFD9067L0005005	PFD9067L0005009
		4+2	PFD9067L0005006	PFD9067L0005010
		4+4	PFD9067L0005002	PFD9067L0005011
1:5	1:5	4+4+2	PFD9067L0005007	PFD9067L0005012
		4+4+4	PFD9067L0005003	PFD9067L0005013
		2	PFD9067L0010008	PFD9067L0010012
		4	PFD9067L0010005	PFD9067L0010013
		4+2	PFD9067L0010004	PFD9067L0010014
		4+4	PFD9067L0010009	PFD9067L0010015
		4+4+2	PFD9067L0010010	PFD9067L0010016
		4+4+4	PFD9067L0010011	PFD9067L0010017
		2	PFD9067L0015003	PFD9067L0015009
		4	PFD9067L0015004	PFD9067L0015010
1:10	1:10	4+2	PFD9067L0015005	PFD9067L0015011
		4+4	PFD9067L0015006	PFD9067L0015012
		4+4+2	PFD9067L0015007	PFD9067L0015013
		4+4+4	PFD9067L0015008	PFD9067L0015014
		2	PFD9067L0020006	PFD9067L0020009
		4	PFD9067L0020002	PFD9067L0020010
		4+2	PFD9067L0020003	PFD9067L0020011
		4+4	PFD9067L0020007	PFD9067L0020012
		4+4+2	PFD9067L0020004	PFD9067L0020013
		4+4+4	PFD9067L0020008	PFD9067L0020014
1:20	1:20	2	PFD9067L0025009	PFD9067L0025012
		4	PFD9067L0025004	PFD9067L0025013
		4+2	PFD9067L0025005	PFD9067L0025014
		4+4	PFD9067L0025010	PFD9067L0025015
		4+4+2	PFD9067L0025006	PFD9067L0025016
		4+4+4	PFD9067L0025011	PFD9067L0025017
		2	PFD9067L0050009	PFD9067L0050013
		4	PFD9067L0050010	PFD9067L0050016
		4+2	PFD9067L0050011	PFD9067L0050017
		4+4	PFD9067L0050012	PFD9067L0050018
1:50	1:50	4+4+2	PFD9067L0050014	PFD9067L0050019
		4+4+4	PFD9067L0050015	PFD9067L0050020



Rated revolution ratio	Real revolution ratio	No. of cams and switches	Switches	
			PRSL0110XX 1NO+1NC	PRSL0111XX 1NC
1:75	1:75		Code	Code
			2 PFD9067L0075002	PFD9067L0075009
			4 PFD9067L0075004	PFD9067L0075003
			4+2 PFD9067L0075005	PFD9067L0075010
			4+4 PFD9067L0075006	PFD9067L0075011
			4+4+2 PFD9067L0075007	PFD9067L0075012
			4+4+4 PFD9067L0075008	PFD9067L0075013
			2 PFD9067L0100013	PFD9067L0100020
			4 PFD9067L0100015	PFD9067L0100021
			4+2 PFD9067L0100016	PFD9067L0100022
1:100	1:100		4+4 PFD9067L0100017	PFD9067L0100023
			4+4+2 PFD9067L0100018	PFD9067L0100024
			4+4+4 PFD9067L0100019	PFD9067L0100025
			2 PFD9067L0150007	PFD9067L0150012
			4 PFD9067L0150005	PFD9067L0150013
			4+2 PFD9067L0150008	PFD9067L0150014
			4+4 PFD9067L0150009	PFD9067L0150015
			4+4+2 PFD9067L0150010	PFD9067L0150016
			4+4+4 PFD9067L0150011	PFD9067L0150017
			2 PFD9067L0200004	PFD9067L0200009
1:150	1:150		4 PFD9067L0200005	PFD9067L0200010
			4+2 PFD9067L0200006	PFD9067L0200011
			4+4 PFD9067L0200002	PFD9067L0200012
			4+4+2 PFD9067L0200007	PFD9067L0200013
			4+4+4 PFD9067L0200008	PFD9067L0200014
			2 PFD9067L0250012	PFD9067L0250016
			4 PFD9067L0250013	PFD9067L0250010
			4+2 PFD9067L0250009	PFD9067L0250017
			4+4 PFD9067L0250001	PFD9067L0250028
			4+4+2 PFD9067L0250014	PFD9067L0250019
1:200	1:200		4+4+4 PFD9067L0250015	PFD9067L0250011
			2 PFD9067L0300004	PFD9067L0300010
			4 PFD9067L0300005	PFD9067L0300011
			4+2 PFD9067L0300006	PFD9067L0300012
			4+4 PFD9067L0300007	PFD9067L0300013
			4+4+2 PFD9067L0300008	PFD9067L0300014
			4+4+4 PFD9067L0300009	PFD9067L0300015
			2 PFD9067L0450001	PFD9067L0450008
			4 PFD9067L0450003	PFD9067L0450002
			4+2 PFD9067L0450004	PFD9067L0450009
1:250	1:250		4+4 PFD9067L0450005	PFD9067L0450010
			4+4+2 PFD9067L0450006	PFD9067L0450011
			4+4+4 PFD9067L0450007	PFD9067L0450012
			2 PFD9067L0450008	PFD9067L0450014
			4 PFD9067L0450009	PFD9067L0450015
1:300	1:300		4+4+4 PFD9067L0450016	PFD9067L0450011
			2 PFD9067L0450001	PFD9067L0450008
			4 PFD9067L0450003	PFD9067L0450002
			4+2 PFD9067L0450004	PFD9067L0450009
			4+4 PFD9067L0450005	PFD9067L0450010
			4+4+2 PFD9067L0450006	PFD9067L0450011
			4+4+4 PFD9067L0450007	PFD9067L0450012
			2 PFD9067L0450008	PFD9067L0450014
1:450	1:450		4 PFD9067L0450009	PFD9067L0450002
			4+2 PFD9067L0450005	PFD9067L0450010
			4+4 PFD9067L0450006	PFD9067L0450011
			4+4+2 PFD9067L0450007	PFD9067L0450012
			4+4+4 PFD9067L0450008	PFD9067L0450013

ASSEMBLY DRAWING

4



Refer to the following tables for descriptions of components: "Standard cam sets", "Potentiometers, encoders and sensors" and "Accessories".

COMPONENTS

Standard cam sets

Ref.	Drawing	No. and type of cams	No. and type of switches	Code
A7		2 cams A	2 PRSL0110XX switches	FCL20001
		2 cams A	2 PRSL0111XX switches	FCL20002
		Cams A+C	2 PRSL0110XX switches	FCL20003
		Cams A+C	2 PRSL0111XX switches	FCL20004
		2 cams C	2 PRSL0110XX switches	FCL20005
		2 cams C	2 PRSL0111XX switches	FCL20006
		Cams D+D+B+F	4 PRSL0110XX switches	FCL40001
		Cams D+D+B+F	4 PRSL0111XX switches	FCL40002
		4 cams A	4 PRSL0110XX switches	FCL40003
		4 cams A	4 PRSL0111XX switches	FCL40004
		Cams A+A+C+C	4 PRSL0110XX switches	FCL40005
		Cams A+A+C+C	4 PRSL0111XX switches	FCL40006
		4 cams C	4 PRSL0110XX switches	FCL40007
		4 cams C	4 PRSL0111XX switches	FCL40008
		Cams C+C+C+E	4 PRSL0110XX switches	FCL40009
		Cams C+C+C+E	4 PRSL0111XX switches	FCL40010
		Cams A+A+E+E	4 PRSL0110XX switches	FCL40011
		Cams A+A+E+E	4 PRSL0111XX switches	FCL40012

Other sets with 2/3/4/5 or 6 cams/switches are available on request.

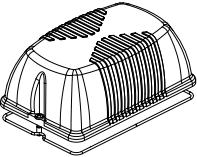
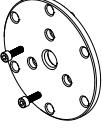
Cam reference chart

Cam		Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A		1 points	PRSL7194PI	PRSL7194PI	23.0° ±0.5°
B		10 point	PRSL7193PI	PRSL7193PI	23.0° ±0.5°
C		60° sector	PRSL7195PI	PRSL7195PI	86.0° ±0.5°
D		72° sector	PRSL7196PI	PRSL7196PI	97.5° ±0.5°
E		180° sector	PRSL7191PI	PRSL7191PI	203.0° ±0.5°
F		305° sector	PRSL7192PI	PRSL7192PI	327.0° ±0.5°

Potentiometers, encoders and sensors

Ref.	Drawing	Description	Code
A2		Support for encoder	PA030000
A3		Support for potentiometer	PA020000
A4		Encoder 36 pulses./rev. with support	PA030001
		Encoder 150 pulses./rev. with support	PA030002
		Potentiometer 10 kΩ with support	PA020001
		Potentiometer 10 kΩ mechanical stop with support	PA020002
		Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
		Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
A5		Potentiometer 5 kΩ ±10% with support	PA020005
		Potentiometer 4.7 kΩ with support	PA020006
		Potentiometer 10 kΩ with support	PA020007
		Potentiometer 2.2 kΩ with support	PA020008
		Potentiometer 2KΩ with support	PA020009
A6		Absolute encoder Yankee - current output	PA01AA01
		Absolute encoder Yankee - voltage output	PA01AB01
		Absolute encoder Yankee - PWM output	PA01AC01

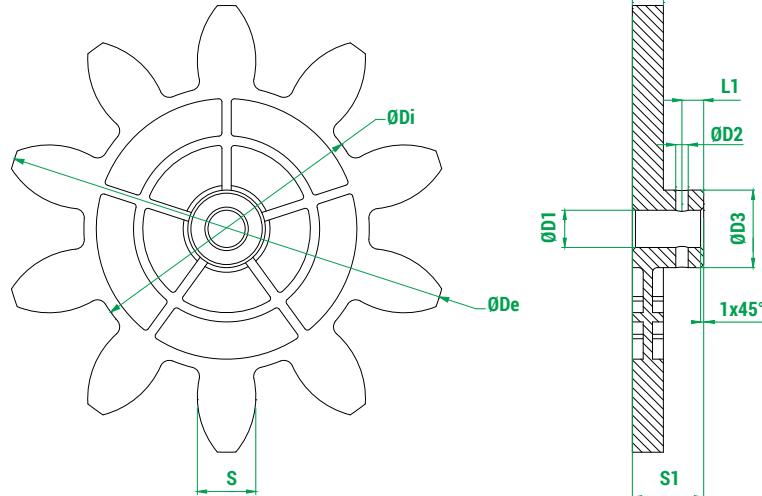
Accessories

Ref.	Drawing	Description	Code
A1		Cover with gasket, screws and earth cable	PA090018
A9		Cable clamp M20x1.5	PRPS1075PE
A10		Flange with screws	PRTR1300PE
A11		Flange support	PRT03018PE
A12		Pinion gear	See pinion gear tables
A13		Coupling with pin	PRSL0981PI

Accessories

Ref.	Drawing	Description	Code
A14		Male coupling with pin	PRSL0919PI
A15		Female coupling with pin	PRSL0920PI
A16		Cover rise with gasket, screws and earth cable	PRSL0707PI

Moulded pinion gears

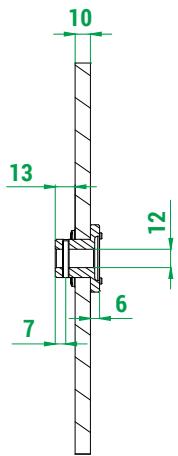
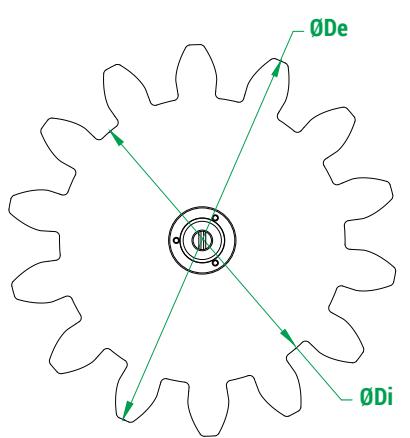


Legend	
Z	Number of teeth
M	Module
D _p	Primitive diameter
D _e	External diameter
D _i	Internal diameter
a	Addendum
d	Dedendum
Alpha	Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	S	Alpha	D ₁	D ₂	D ₃	S ₁	S ₂	L ₁
PRSL0915PI	8	20.00	160.00	200.00	113.20	20.00	23.40	31.41	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0912PI	10	12.00	120.00	144.00	92.00	12.00	14.00	18.85	20.00	12.00	4.00	25.00	23.00	10.00	7.00
PRSL0913PI	10	14.00	140.00	168.00	107.24	14.00	16.38	21.99	20.00	12.00	4.00	24.60	23.00	10.00	7.00
PRSL0914PI	10	16.00	160.00	192.00	122.67	16.00	18.67	25.13	20.00	12.00	4.00	24.00	23.00	10.00	7.00
PRSL0917PI	11	6.00	66.00	78.00	51.96	6.00	7.02	9.42	20.00	12.00	4.00	19.00	23.00	8.00	7.00
PRSL0916PI	12	5.00	60.00	70.00	48.30	5.00	5.83	7.85	20.00	12.00	4.00	20.00	23.00	8.00	7.00
PRSL0918PI	12	8.00	96.00	112.00	77.28	8.00	9.36	12.56	20.00	12.00	3.90	21.50	23.50	10.00	7.00
PRSL0911PI	12	10.00	120.00	140.00	96.67	10.00	11.67	15.71	20.00	12.00	4.00	25.00	23.50	10.00	7.00
PRSL0944PI	12	12.00	144.00	168.00	116.00	12.00	14.00	18.85	20.00	12.00	4.00	24.00	23.00	10.00	7.00

Measuring unit: mm.

Waterjet cut pinion gears



Legend

Z Number of teeth

M Module

D_p Primitive diameter

D_e External diameter

D_i Internal diameter

a Addendum

d Dedendum

Alpha Pressure angle

Code	Z	M	D _p	D _e	D _i	a	d	Alpha
PRSL0857PI	8	18.00	144.00	180.00	102.00	18.00	21.00	20.00
PRSL0855PI	8	24.00	192.00	240.00	136.00	24.00	28.00	20.00
PRSL0992PI	9	10.00	90.00	110.00	66.67	10.00	11.67	20.00
PRSL0879PI	9	16.00	144.00	176.00	106.67	16.00	18.67	20.00
PRSL0854PI	9	18.00	162.00	198.00	120.00	18.00	21.00	20.00
PRSL0871PI	9	20.00	180.00	220.00	133.33	20.00	23.33	20.00
PRSL0849PI	9	24.00	216.00	264.00	160.00	24.00	28.00	20.00
PRSL0846PI	10	10.00	100.00	120.00	76.67	10.00	11.67	20.00
PRSL0993PI	10	18.00	180.00	216.00	138.00	18.00	21.00	20.00
PRSL0970PI	10	22.00	220.00	264.00	168.52	22.00	25.74	20.00
PRSL0856PI	10	24.00	240.00	288.00	184.00	24.00	28.00	20.00
PRSL0861PI	11	12.00	132.00	156.00	104.00	12.00	14.00	20.00
PRSL0998PI	11	18.00	198.00	234.00	156.00	18.00	21.00	20.00
PRSL0997PI	11	20.00	220.00	260.00	173.36	20.00	23.32	20.00
PRSL0859PI	11	24.00	264.00	312.00	204.00	24.00	30.00	20.00
PRSL0863PI	12	14.00	168.00	196.00	133.00	14.00	17.50	20.00
PRSL0897PI	12	16.00	192.00	224.00	154.67	16.00	18.67	20.00
PRSL0972PI	12	18.00	216.00	252.00	173.88	18.00	21.06	20.00
PRSL0845PI	12	20.00	240.00	280.00	193.34	20.00	23.32	20.00
PRSL0878PI	12	24.00	288.00	336.00	232.00	24.00	28.00	20.00
PRSL0860PI	13	6.00	78.00	90.00	63.00	6.00	7.50	20.00
PRSL0853PI	13	12.00	156.00	178.59	126.00	11.29	15.00	20.00
PRSL0898PI	13	16.00	208.00	240.00	170.67	16.00	18.66	20.00
PRSL0862PI	14	10.00	140.00	169.00	125.00	15.00	7.50	20.00
PRSL0896PI	14	16.00	224.00	256.00	186.67	16.00	18.67	20.00
PRSL0999PI	14	18.00	252.00	288.00	210.00	18.00	21.00	20.00
PRSL0848PI	14	20.00	280.00	320.00	233.33	20.00	23.33	20.00
PRSL0858PI	15	18.00	270.00	306.00	228.00	18.00	21.00	20.00
PRSL0847PI	16	20.00	320.00	360.00	273.33	20.00	23.33	20.00
PRSL0973PI	17	10.00	170.00	190.00	145.00	10.00	12.50	22.89
PRSL0974PI	17	14.00	238.00	266.00	203.00	14.00	17.50	22.89
PRSL0851PI	20	6.00	120.00	132.00	105.00	6.00	7.50	22.89
PRSL0844PI	25	1.00	25.00	27.00	22.50	1.00	1.25	22.89

Unità di misura: mm.

TOP - REQUEST FORM FOR NON STANDARD LIMIT SWITCH

Instructions

(See next pages for list of components and legends)

- 1 Version:** tick the required version.
- 2 SIL 1 certified:** tick the box if you require SIL 1 certified units.
- 3 Revolution ratio:** write the required revolution ratio for each output.
- 4 Standard cam sets:** write the code of the cam set required for each output.
- 5 Customized cam sets:** for non standard cam sets, fill in the scheme choosing the cams and the switches required. It is possible to assemble sets with 2, 3, 4, 5 or 6 cams/switches. Customized cams are available on request.
- 6 Potentiometers, encoders, Yankee:** write the code of the potentiometer, encoder or Yankee required.
ATTENTION: potentiometer PA020009 can be mounted only alone, i.e. with NO sets of cams.
Please refer to the table on the next pages for all other possible configurations.
- 7 Shaft:** tick the shaft type required.
Customized shafts are available on request.
- 8 Coupling, flange, pinion gear:** tick the box when coupling, flange or pinion gear are required.
When a standard pinion gear is required, write the code number listed in the pinion gear tables in the catalogue.
When a special pinion gear is required, write the number of teeth, the module and the primitive diameter.

Version 1

Version CE EAC

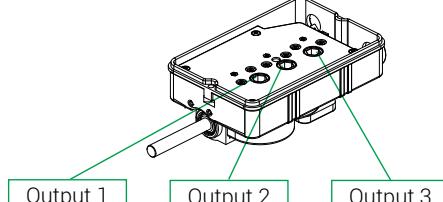
Version cULus CE EAC

Version with anti-moisture plug CE EAC

ATTENTION: Top XL with cover rise are not cULUs certified.

SIL 1 certified 2

ATTENTION: Top XL with cover rise are not SIL1 certified.



Revolution ratio 3

Output 1 2 3	Output 1 2 3	Output 1 2 3
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:1	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:50	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:300
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:5	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:75	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:450
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:10	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:100	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1: <input type="text"/>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:15	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:150	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1: <input type="text"/>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:20	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1:200	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1: <input type="text"/>
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Standard cam sets 4

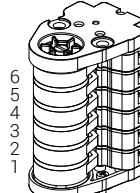
Cam set code _____

Output 1 _____

Output 2 _____

Output 3 _____

Customized cam sets 5



Output 1

Cam code _____

6 _____

5 _____

4 _____

3 _____

2 _____

1 _____

Switch code _____

Output 2

Cam code _____

6 _____

5 _____

4 _____

3 _____

2 _____

1 _____

Switch code _____

Output 3

Cam code _____

6 _____

5 _____

4 _____

3 _____

2 _____

1 _____

Switch code _____

Potentiometers, encoders, Yankee 6

Output 1

Output 2

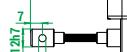
Output 3

Code _____

Standard shaft 7



Flexible shaft



Male coupling 8



Female coupling



Pinion gear

Pinion gear code _____

Customized pinion gear

No. of teeth _____

Module _____

Primitive diameter _____

4 Legend - Standard cam sets

No. & type of switches	No. & type of cams	Code
2 x PRSL0110XX	2 cams A	FCL20001
	Cams A+C	FCL20003
	2 cams C	FCL20005
4 x PRSL0110XX	Cams D+D+B+F	FCL40001
	4 cams A	FCL40003
	Cams A+A+C+C	FCL40005
	4 cams C	FCL40007
	Cams C+C+C+E	FCL40009
	Cams A+A+E+E	FCL40011
	2 cams A	FCL20002
	Cams A+C	FCL20004
	2 cams C	FCL20006
2 x PRSL0111XX	Cams D+D+B+F	FCL40002
	4 cams A	FCL40004
	Cams A+A+C+C	FCL40006
	4 cams C	FCL40008
	Cams C+C+C+E	FCL40010
	Cams A+A+E+E	FCL40012

6 Legend - Potentiometers, encoders and Yankee

Description	Code
Potentiometer 10 kΩ with support	PA020001
Potentiometer 10 kΩ mechanical stop with support	PA020002
Potentiometer 10 kΩ ±10% 4 pins with support	PA020003
Potentiometer 10 kΩ ±10% 3 pins with support	PA020004
Potentiometer 5 kΩ ±10% with support	PA020005
Potentiometer 4.7 kΩ with support	PA020006
Potentiometer 10 kΩ with support	PA020007
Potentiometer 2.2 kΩ with support	PA020008
Potentiometer 2KΩ with support	PA020009
Encoder 36 pulses./rev. with support	PA030001
Encoder 150 pulses./rev. with support	PA030002
Yankee - current output	PA01AA01
Yankee - voltage output	PA01AB01
Yankee - PWM output	PA01AC01

5 Legend - Switches

PRSL0110XX	PRSL0111XX
1NO+1NC	1NC
	

5 Legend - Standard cams

Cam	Code for PRSL0110XX switches	Switching angle with PRSL0110XX	Code for PRSL0111XX switches	Switching angle with PRSL0111XX
A 	1 point	21.5° ±0.5°	PRSL7194PI	23.0° ±0.5°
B 	10 points	21.5° ±0.5°	PRSL7193PI	23.0° ±0.5°
C 	60° sector	82.0° ±0.5°	PRSL7195PI	86.0° ±0.5°
D 	72° sector	94.0° ±0.5°	PRSL7196PI	97.5° ±0.5°
E 	180° sector	204.5° ±0.5°	PRSL7191PI	203.0° ±0.5°
F 	305° sector	328.5° ±0.5°	PRSL7192PI	327.0° ±0.5°

6 Configuration table

The following table shows possible configurations of Top and Top XL.

When it is not possible to mount a set of cams together with a potentiometer/encoder, the table shows «Not available.»

When the standard cover PA090018 is not high enough to hold the elements mounted inside the limit switch, it is possible to use the cover rise PRSL0707PI (the table shows «Top XL»).

In all other cases it is possible to mount the sets of cams and potentiometer/encoder with the standard cover PA090018 (the table shows «Top»).

	Set of cams with 2 switches	Set of cams with 3 switches	Set of cams with 4 switches	Set of cams with 5 switches	Set of cams with 6 switches
Set of cams only	Top	Top	Top	Top	Top XL
Set of cams + Yankee1	Top	Top	Top	Top XL	Top XL
Set of cams + PA020001	Top	Top XL	Top XL	Not available	Not available
Set of cams + PA020002	Top	Top XL	Top XL	Not available	Not available
Set of cams + PA020003	Top	Top XL	Top XL	Top XL	Not available
Set of cams + PA020004	Top	Top XL	Top XL	Top XL	Not available
Set of cams + PA020005	Top	Top XL	Top XL	Top XL	Not available
Set of cams + PA020006	Top	Top XL	Top XL	Not available	Not available
Set of cams + PA020007	Top	Top XL	Top XL	Not available	Not available
Set of cams + PA020008	Top	Top XL	Top XL	Not available	Not available
Set of cams + PA030001	Top	Top XL	Top XL	Top XL	Not available
Set of cams + PA030002	Top	Top XL	Top XL	Top XL	Not available

REMARKS

POSITION LIMIT SWITCHES

5



ARKE

Position limit switch



New position limit switch designed for controlling the movement of overhead travelling cranes, hoists and complex machine tools. Sturdy and reliable, Arke is particularly suitable for use in harsh operating conditions.

FEATURES

- Designed to guarantee excellent performance in the most challenging operating conditions.
- 2 fixing holes.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 2 million operations.
- IP protection degree: Arke is classified IP65, IP66, IP67 with dedicated cable clamp M20.
- Extreme temperature resistance: -40°C to +80°C.
- Aluminium rods with 6x8 mm section and enclosure and head in thermoplastic material.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Cross rods with 4 maintained positions every 90°, cross or T rods with 3 maintained position every 90°, single rod or rod with roller with 65° movements and spring return.
- 2 slow action switches with 1NC+1NC staggered contacts or 2 slow action switches with 1NO+1NC contacts.
- 3 outputs for cable clamps to reduce installation time and make wiring easier.

CERTIFICATIONS

- CE Marking.

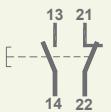
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

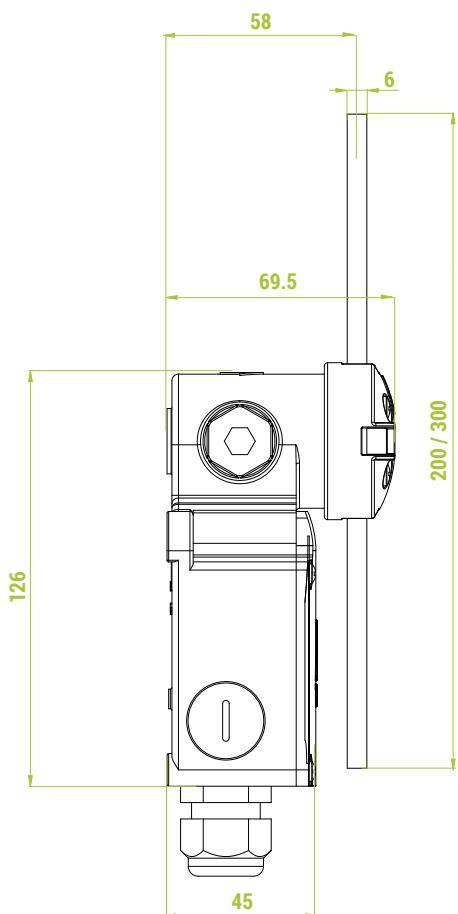
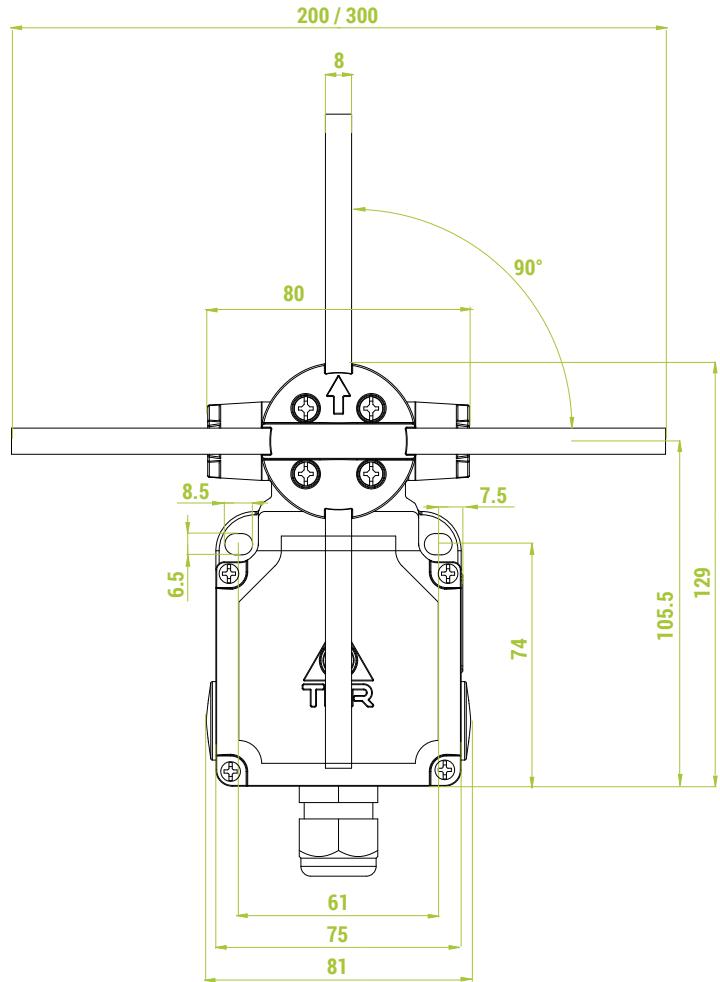
Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP65, IP66, IP67 with dedicated cable clamp M20
Insulation category	Class II
Maximum operation speed	1.5 m/s (standard) 3 m/s (on request)
Mechanical life	5x10 ⁶ operations
Cable entry	Cable clamp M20

TECHNICAL SPECIFICATIONS OF THE SWITCHES

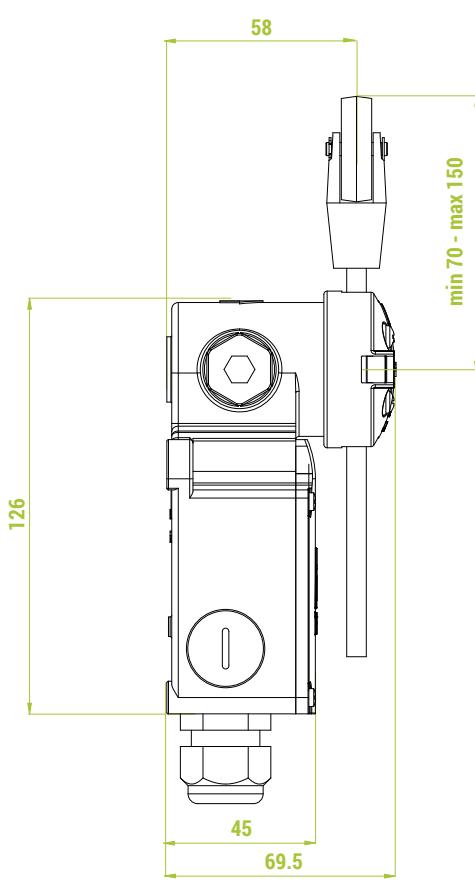
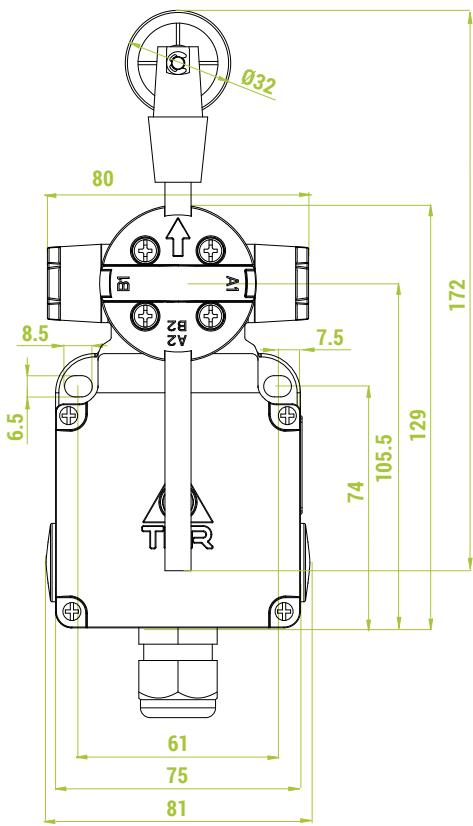
Code	PRSL1650XX	PRSL1652XX
Utilisation category	AC 15	
Rated operational current	6 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	2x10 ⁶ operations @ 2 A / 240 Vac	
Connections	Screw-type terminals	
Wires	1x1.5 mm ² , 2x2.5 mm ²	
Tightening torque	0.8 Nm	
Switch type	Double break, slow action	
Contacts	1NC+1NC staggered (All NC contacts are of the positive opening operation type )	1NO+1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	CE	

OVERALL DIMENSIONS (mm)

With cross rods



With rod and roller



STANDARD LIMIT SWITCHES

4 maintained positions

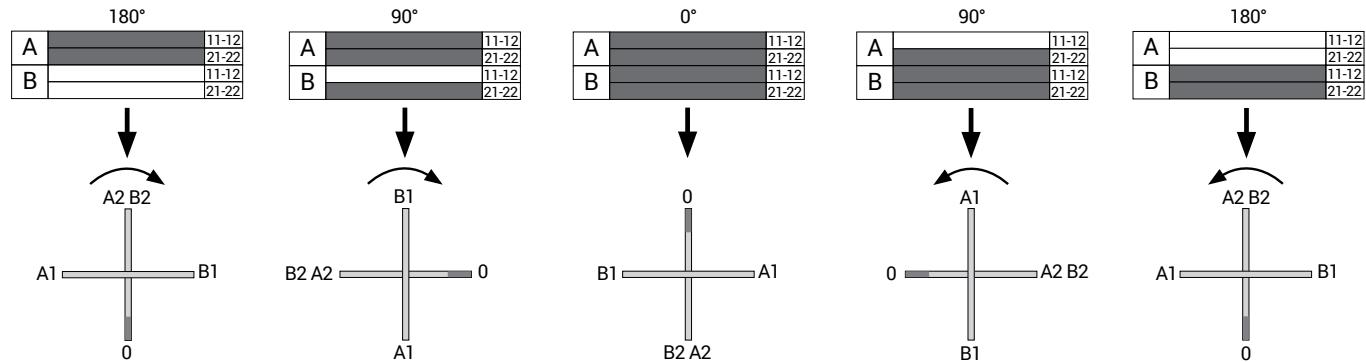
The limit switches are equipped with switches PRSL1650XX with 1NC+1NC staggered contacts

Other configurations are available on request.



5

Actuating travel



Description	Rods	Code
4 maintained positions - stop at 180° in each direction	Cross rods 2 x 200 mm	F201110001
4 maintained positions - free rotation	Cross rods 2 x 200 mm	F201120001

3 maintained positions

The limit switches are equipped with switches PRSL1652XX with 1NO+1NC contacts

Other configurations are available on request.



Actuating travel	Rods	Code
90°	90°	
0°	0°	
90°	90°	
	Cross rods 2 x 200 mm	F201110002
	T rods 1 x 200 mm 1 x 300 mm	F201110006

Spring return

The limit switches are equipped with switches PRSL1652XX with 1NO+1NC contacts

Other configurations are available on request.



Actuating travel	Rods	Code
65° 24° 0° 65° 3-4 65° 24° 65° 3-4	Rod with roller	F202210001

TANGO

Position limit switch



Cross position limit switches designed to control the movement of overhead travelling cranes, hoists and complex machine tools.
Tango has rods with maintained positions every 60°.

FEATURES

- Modern design and overall dimensions studied to facilitate installation and maintenance operations.
- 4 fixing holes.
- Rods with 4 maintained positions every 60°.
- Mechanical life of switches: 1 million operations.
- Operation frequency: 3600 operations / hour max.
- IP protection degree: Tango is classified IP65.
- Extreme temperature resistance: -25°C to +70°C.
- Enclosure and head in thermoplastic material (nylon reinforced with fiberglass) and internal components in technopolymers to guarantee long life-cycle and constant performance.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Slow action switches with 1NC or 1NO contacts.
- Available with 2, 3 or 4 switches and different rod lengths.

CERTIFICATIONS

- CE marking and EAC certification.

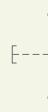
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 65
Insulation category	Class II
Operation frequency	3600 operations/hour max
Cable entry	Cable clamp M20

TECHNICAL SPECIFICATIONS OF THE SWITCHES

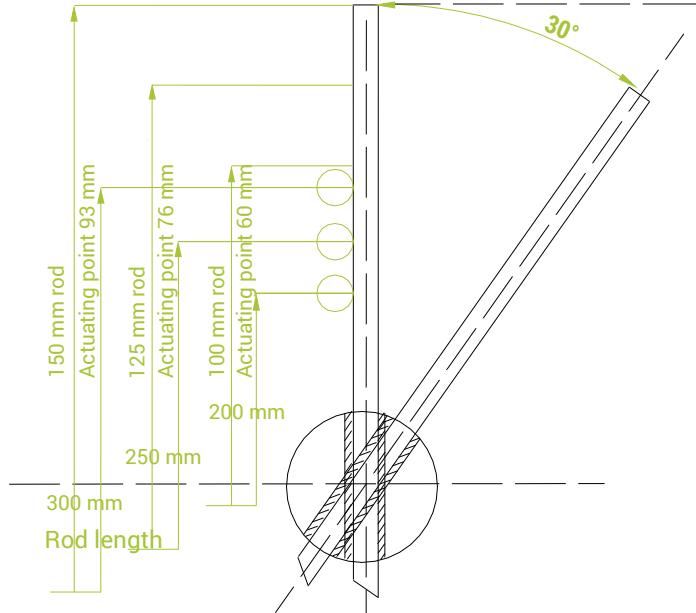
Code	PRSL1000PI	PRSL1001PI
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	500 Vac	
Mechanical life	1×10^6 operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.6 Nm	
Microswitch type	Double break, slow action	Double break, slow action
Contacts	1NO	1NC
Scheme		
Markings and homologations	CE  	

MAXIMUM ACTUATING DIMENSIONS

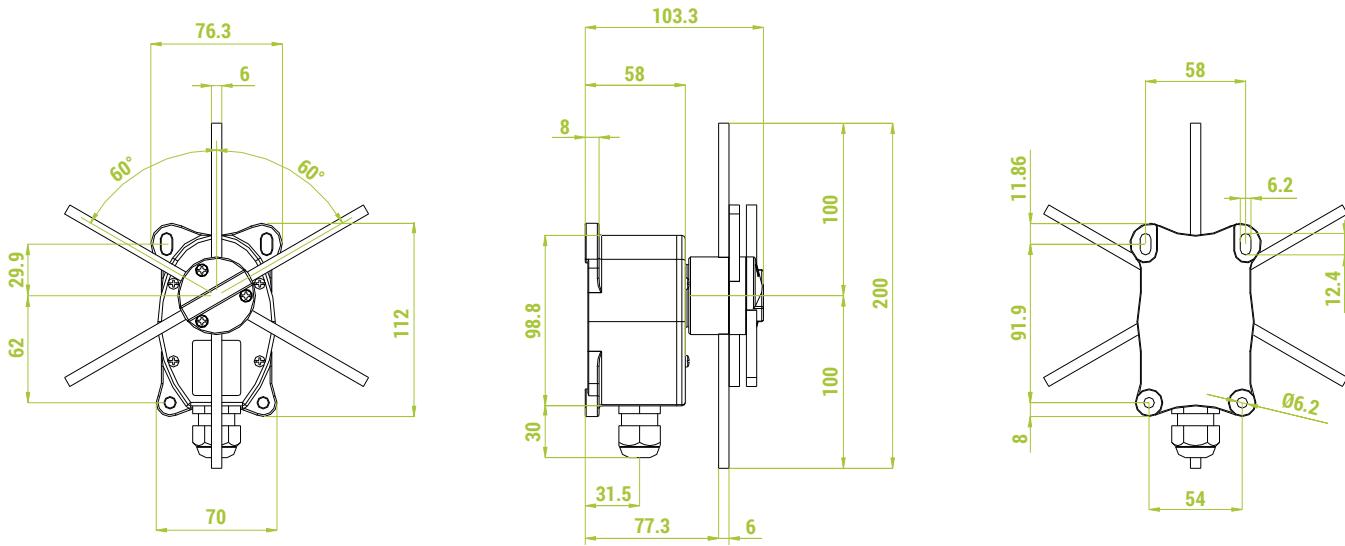
Rods with 4 maintained positions

- Pre-travel angle for rotation contact operation: 34°
- Maximum rotation angle for each maintained position: 60°
- Average angle for the mechanical tripping: 30°
- Maintained positions each: 60°

In order to ensure proper operations, the dimensions shall not be increased; anyhow, they can be decreased, taking into account that the closer the impact point is to the center of the head, the higher the impact and the mechanical wear of rod and shaft are.



OVERALL DIMENSIONS (mm)



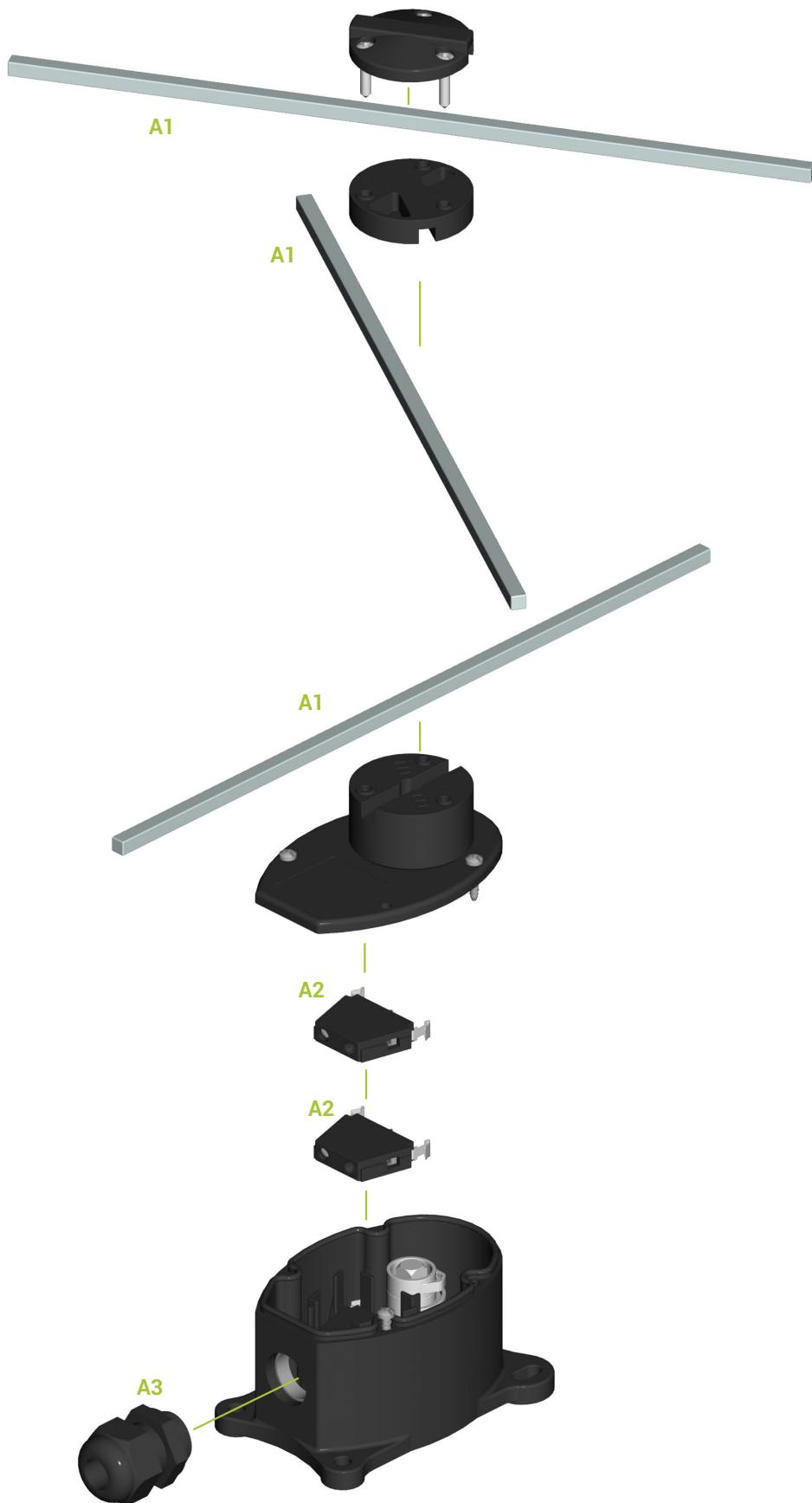
LIMIT SWITCHES

The limit switches are equipped with 1NC slow action switches PRSL1001PI



No. of switches PRSL1001PI	Actuating travel	Rod length	Code
2	11-12 [0° 34°]	300 mm	PF48020001
	11-12 [34° 0°]	250 mm	PF48020005
	11-12 [34° 0°]	200 mm	PF48020006
3	11-12 [94° 0°]	300 mm	PF48030001
	11-12 [0° 94°]		
	11-12 [34° 0° 34°]		
4	11-12 [0° 94°]	300 mm	PF48040001
	11-12 [0° 34°]	250 mm	PF48040006
	11-12 [94° 0°]	200 mm	PF48040007
	11-12 [34° 0°]		

ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Switches" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A2		1NO switch	 13 14	PRSL1000PI
		1NC switch	 11 12	PRSL1001PI

Accessories

Ref.	Drawing	Description	Code
A1		Rod 6x6x200 mm	PRT03006PE
		Rod 6x6x250 mm	PRT03011PE
		Rod 6x6x300 mm	PRT03012PE
A3		Cable clamp M20	PRPS0064PE

7551 - 7552

Position limit switch



Cross position limit switches designed to control the movement of overhead travelling cranes, hoists and complex machine tools.
The choice of materials and technical solutions adopted enable use in harsh operating conditions.

FEATURES

- Designed to guarantee excellent performance in the most challenging operating conditions.
- Rods with 4 maintained positions every 90°.
- 4 fixing holes.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- Operation frequency: 3600 operations/hour max.
- IP protection degree: 7551-7552 is classified IP66 with specific cable clamp M20.
- Extreme temperature resistance: -40°C to +70°C.
- It features die-cast aluminum alloy enclosure, with bushings made of sinterized material and head made of zama to resist any violent impact, chemical aggression and rust and reduce the need for routine maintenance operation on the head.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- 4 snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- 3 outputs for cable clamps to reduce installation time and make wiring easier.

CERTIFICATIONS

- CE marking and EAC certification.

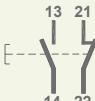
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
Conformity to CE Standards	EN 60947-1 Low-voltage switchgear and controlgear
	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE  

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -40°C/+70°C
IP protection degree	IP66 max. with specific cable clamp M20
Insulation category	Class I
Operation frequency	3600 operations/hour max
Cable entry	Cable clamp M20

TECHNICAL SPECIFICATIONS OF THE SWITCHES

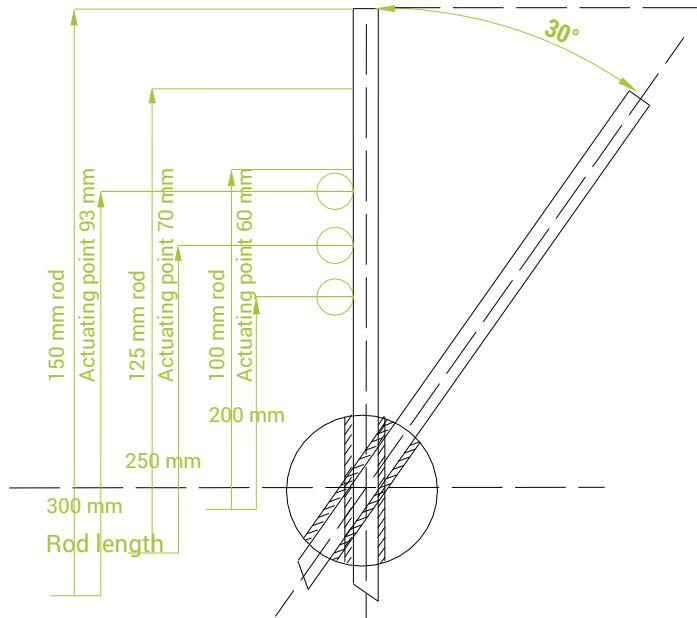
Code	PRSL0036XX	PRSL0037XX
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	1×10^6 operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.8 Nm	
Microswitch type	Double break, snap action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	CE  	

MAXIMUM ACTUATING DIMENSIONS

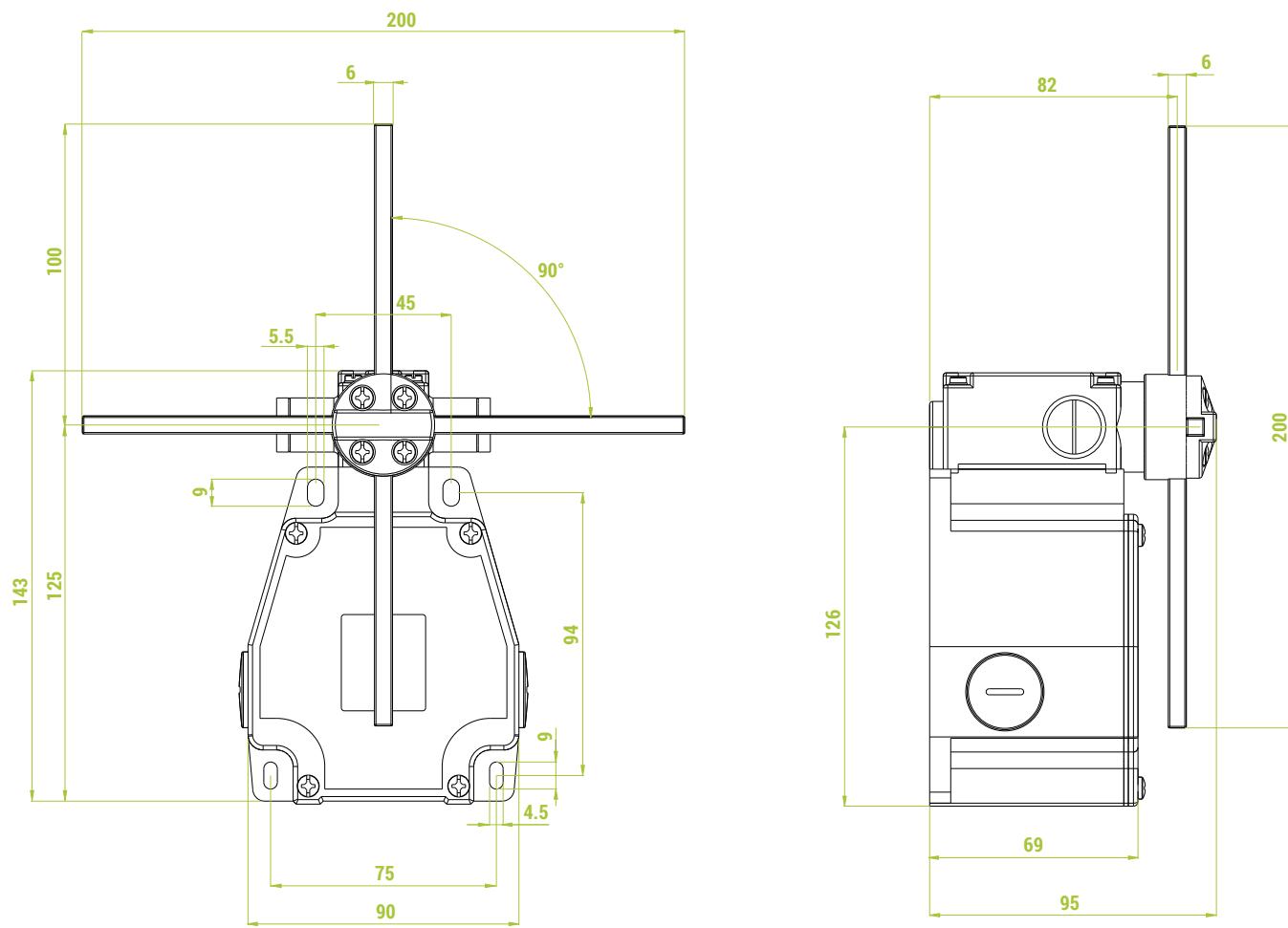
Rods with 4 maintained positions

- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°
- Maintained positions each: 90°

In order to ensure proper operations, the dimensions shall not be increased; anyhow, they can be decreased, taking into account that the closer the impact point is to the center of the head, the higher the impact and the mechanical wear of rod and shaft are.
IMPORTANT: the maximum impact speed is 1.35 m/s, referring to the ideal impact points showed in the drawing.



OVERALL DIMENSIONS (mm)



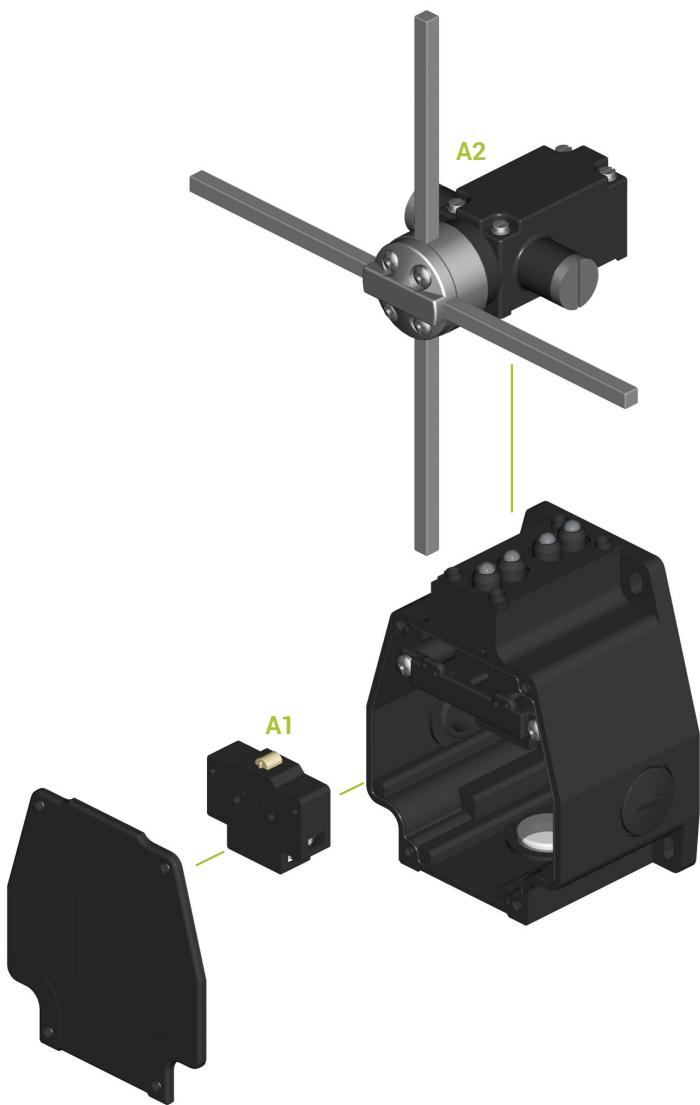
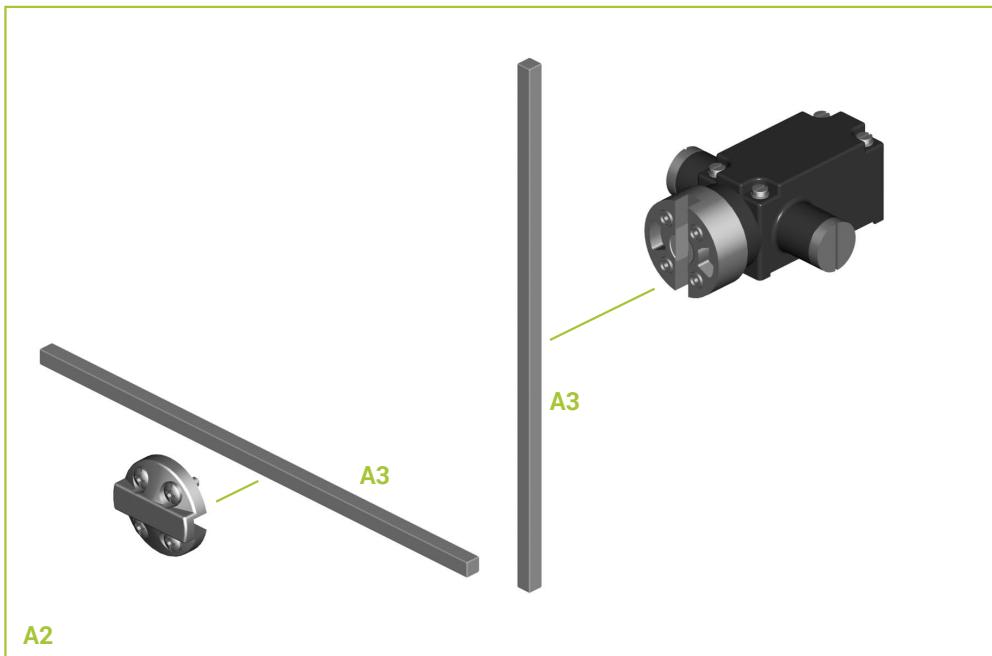
LIMIT SWITCHES

The limit switches are equipped with 1NO+1NC snap action switches PRSL0036XX



No. of switches PRSL0036XX	Actuating travel	Rod length	Code																																																
4	<table border="1"> <tr> <td>180°</td> <td>0°</td> <td>70°</td> <td>180°</td> </tr> <tr> <td>1-2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3-4</td> <td></td> <td></td> <td></td> </tr> </table> <table border="1"> <tr> <td>180°</td> <td>0°</td> <td>160°</td> <td></td> </tr> <tr> <td>1-2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3-4</td> <td></td> <td></td> <td></td> </tr> </table> <table border="1"> <tr> <td>180°</td> <td>70°</td> <td>0°</td> <td>180°</td> </tr> <tr> <td>1-2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3-4</td> <td></td> <td></td> <td></td> </tr> </table> <table border="1"> <tr> <td>160°</td> <td>0°</td> <td>180°</td> <td></td> </tr> <tr> <td>1-2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3-4</td> <td></td> <td></td> <td></td> </tr> </table>	180°	0°	70°	180°	1-2				3-4				180°	0°	160°		1-2				3-4				180°	70°	0°	180°	1-2				3-4				160°	0°	180°		1-2				3-4				200 mm	PF26755100
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ASSEMBLY DRAWING



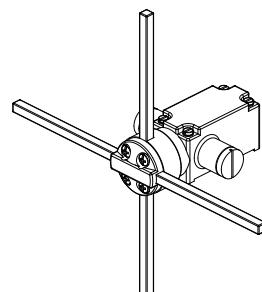
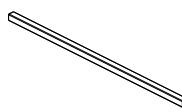
Refer to the following tables for descriptions of: "Switches" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A1		1NO+1NC snap action switch		PRSL0036XX
		1NC slow action switch		PRSL0037XX

Accessories

Ref.	Drawing	Description	Code
A2		Head for PF26755100	PF267551TE
		Head for PF26755200	PF267552TE
A3		Rod 6x6x200 mm	PRT03006PE

X-FSC / X-FRZ

Position limit switch



Position limit switches designed to control the movement of overhead travelling cranes, hoists and complex machine tools.
Heads with different types of rods and movements for specific applications.

FEATURES

- 2 fixing holes.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- Operation frequency: 3600 operations/hour max.
- IP protection degree: X-FSC and X-FRZ are classified IP65 with specific cable clamp M20.
- Extreme temperature resistance: -25°C to +70°C.
- Enclosure and head in thermoplastic material.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- 2 snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- X-FCS features cross rods in 3 or 4 maintained positions or T rods in 3 maintained positions, movement every 90°.
- X-FRZ has a single rod or a rod with roller with spring return movement every 65°.

CERTIFICATIONS

- CE marking and EAC certification.

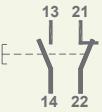
CERTIFICATIONS

Conformity to Community Directives	2006/95/CE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE 

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP65 max. with specific cable clamp M20
Insulation category	Class II
Operation frequency	3600 operations/hour max
Cable entry	Cable clamp M20

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0036XX	PRSL0037XX
Utilisation category	AC 15	
Rated operational current	3 A	
Rated operational voltage	250 Vac	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	1×10^6 operations	
Connections	Screw-type terminals	
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)	
Tightening torque	0.8 Nm	
Microswitch type	Double break, snap action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )	1NC (All NC contacts are of the positive opening operation type )
Scheme		
Markings and homologations	CE  	

MAXIMUM ACTUATING DIMENSIONS

T-type rod - Cross rod with 3 maintained positions

- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°

Rod - Rod and Roller

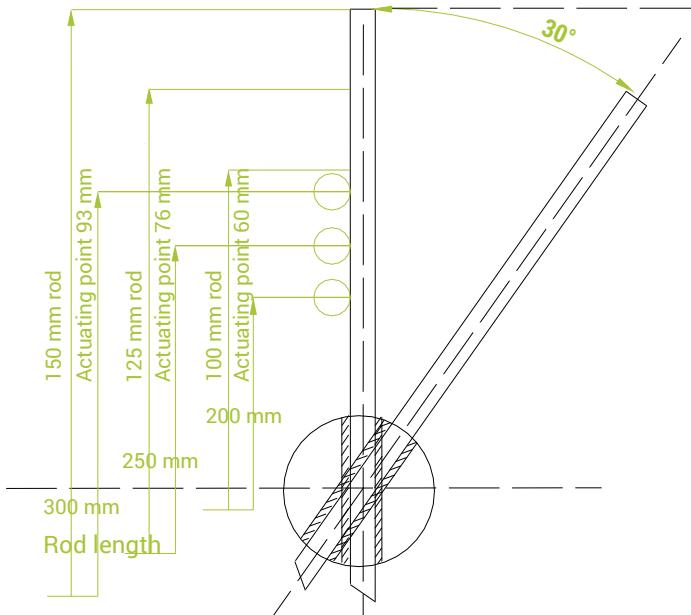
- Pre-travel angle for rotation contact operation: 24°
- Maximum rotation angle: 65°

Cross rod with 4 maintained positions

- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°
- Maintained positions each: 90°

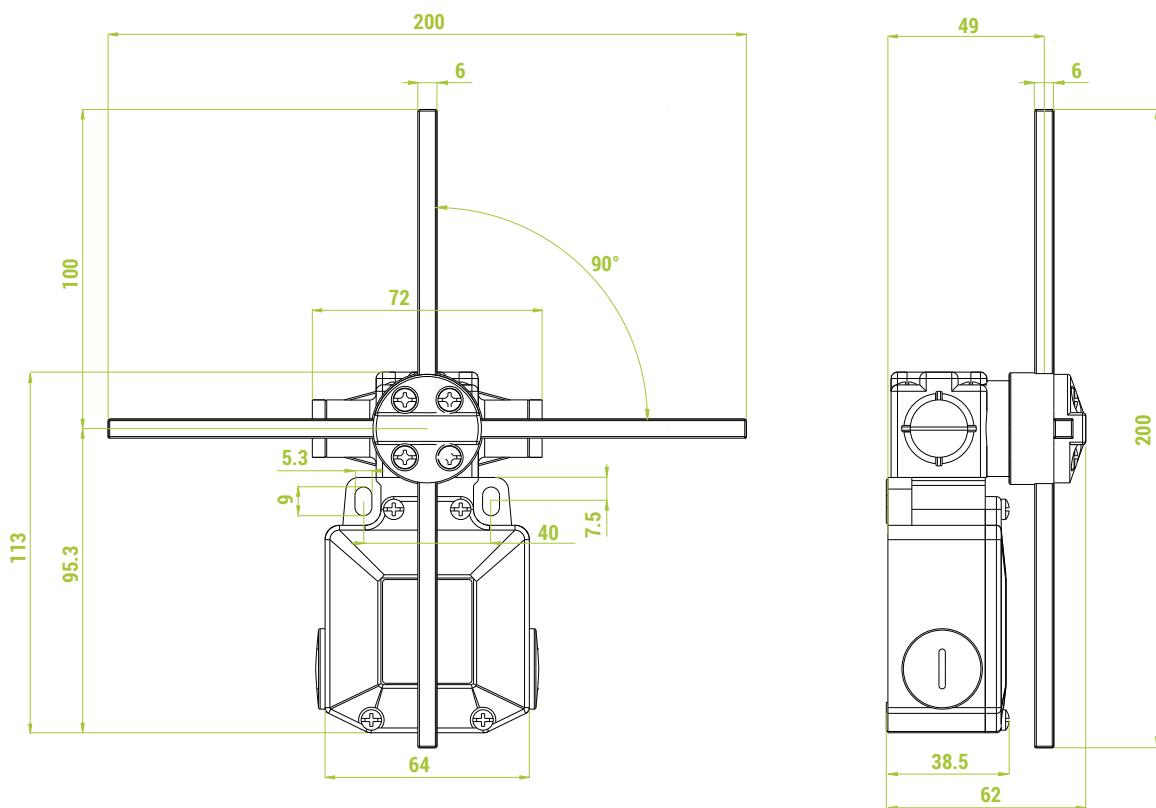
In order to ensure proper operations, the dimensions shall not be increased; anyhow, they can be decreased, taking into account that the closer the impact point is to the center of the head, the higher the impact and the mechanical wear of rod and shaft are.

IMPORTANT: the maximum impact speed is 1.35 m/s, referring to the ideal impact points showed in the drawing.

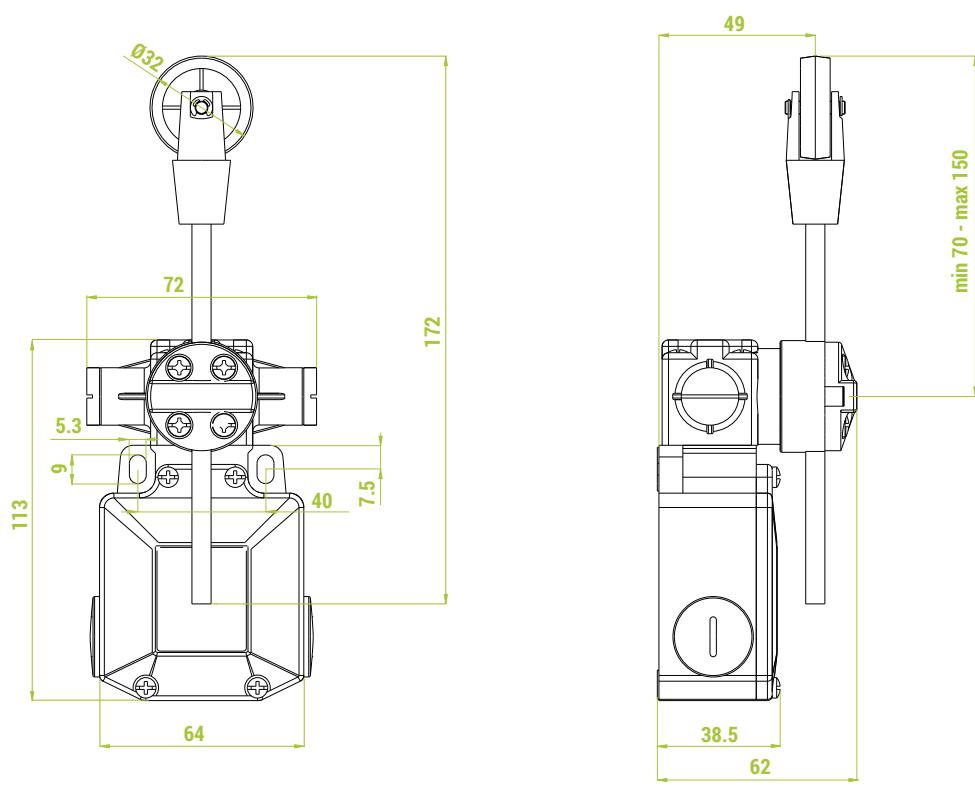


OVERALL DIMENSIONS (mm)

X-FSC



X-FRZ



LIMIT SWITCHES X-FSC

Limit switches X-FSC are equipped with 1NO+1NC snap action switches PRSL0036XX



Actuating travel	Positions	Rod	Code
	3 maintained	"T" type	PF33710100
	3 maintained	Cross	PF33710200
	3 maintained	"T" type	PF33711100
	3 maintained	Cross	PF33711200
	3 maintained	"T" type	PF33712100
	3 maintained	Cross	PF33712200
	3 maintained	"T" type	PF33713100
	3 maintained	Cross	PF33713200
	3 maintained	"T" type	PF33714100
	3 maintained	Cross	PF33714200
	3 maintained	"T" type	PF33715100
	3 maintained	Cross	PF33715200
	4 maintained	Cross	PF33750100
	4 maintained	Cross	PF33751100
	4 maintained	Cross	PF33752100

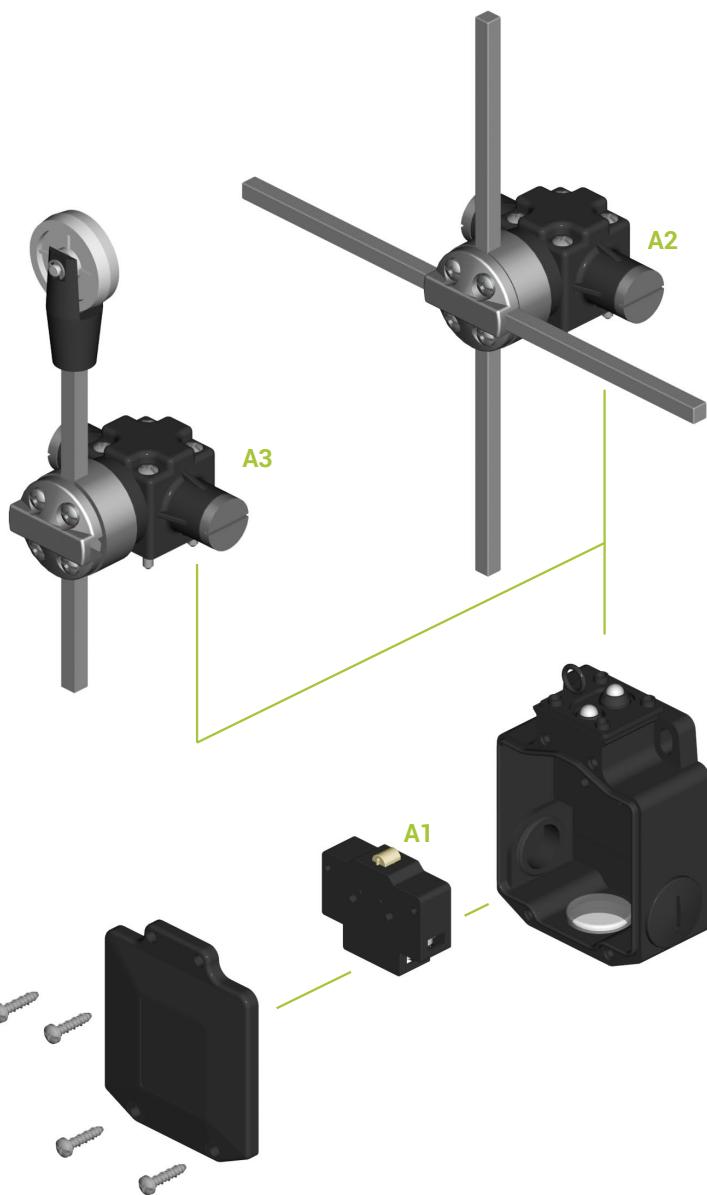
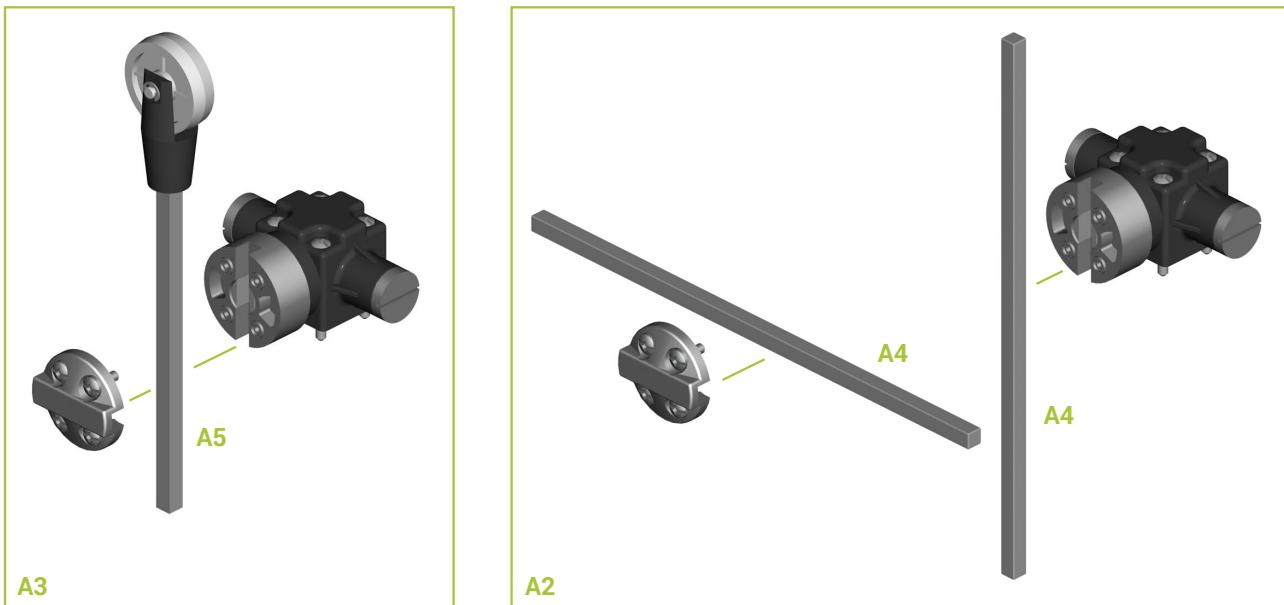
LIMIT SWITCHES X-FRZ

Limit switches X-FRZ are equipped with 1NO+1NC snap action switches PRSL0036XX.



Actuating travel	Positions	Rod	Code
	Spring return	Rod	PF33700100
	Spring return	Rod and roller	PF33700200
	Spring return	Rod	PF33701100
	Spring return	Rod and roller	PF33701200
	Spring return	Rod	PF33702100
	Spring return	Rod and roller	PF33702200
	Spring return	Rod	PF33703100
	Spring return	Rod and roller	PF33703200
	Spring return	Rod	PF33704100
	Spring return	Rod and roller	PF33704200
	Spring return	Rod	PF33705100
	Spring return	Rod and roller	PF33705200

ASSEMBLY DRAWING



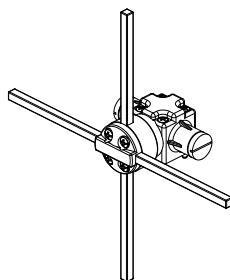
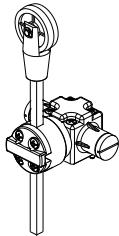
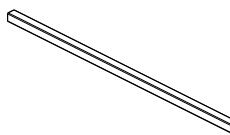
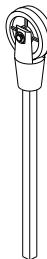
Refer to the following tables for descriptions of components: "Switches" and "Accessories".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
A1		1NO+1NC snap action switch		PRSL0036XX
		1NC slow action switch		PRSL0037XX

Accessories

Ref.	Drawing	Description	Code
A2		Head with cross rods	PF33_ _ _ _ TE Codes on request
A3		Head with rod and roller	PF33_ _ _ _ TE Codes on request
A4		Rod 6x6x200 mm	PRT03006PE
		Red rod 6x6x200 mm	PRT03007PE
		Rod 6x6x300 mm	PRT03012PE
A5		Rod 6x6x130 mm with roller	PRSL0850PI

INO

Position limit switch



FEATURES

- Casing made of fiber-glass reinforced UL-VO thermoplastic, zinc alloy (zama) or aluminum, featuring 2 or 4 fixing holes.
- Casing available in different width and with different cable entries: 30 mm with 1 cable entry, 35 mm wired, 40 mm with 1 cable entry, 50 mm with 2 or 3 cable entries and 60 mm with 3 cable entries.
- Electrically separated contacts and positive opening NC contacts for safety functions*.
- Mechanical life of switches: up to 30 million operations.
- Operation frequency: 3600 operations/hour max.
- IP protection degree: INO limit switches are classified IP65, IP66; only Wired INO limit switches with thermoplastic material or die-cast metal casings, sealed with epoxy plastic at the base where cable entries are, are classified IP67.
- Extreme temperature resistance: from -40°C to +70°C*.
- Equipped with metal, technopolymer or aluminum heads.
- All materials and components used are wear resistant and guarantee protection of the units against water and dust.

OPTIONS

- 10 different switches: snap action switches with 2NC or 1NO+1NC contacts, slow action simultaneous switches with 2NC or 2NO contacts, slow action break before make switches with 1NO+1NC, 1NO+2NC or 2NO+1NC contacts, slow action make before break switches with 1NO+1NC contacts, and slow action simultaneous switches with 3NC and 3NO contacts.
- Heads in technopolymer, metal or aluminum featuring up to 39 different types of actuators for a variety of applications.

PRODUCT FAMILIES

- Standard Ino (page 284).
- Double lever Ino (page 306).
- Wired Ino (page 309).
- Safety Ino (page 314).

CERTIFICATIONS

- CE marking, UL marking (pending).

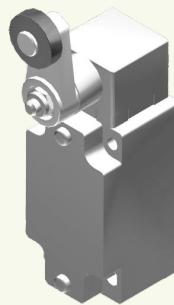
Fill in the "request form" (page 326, 327, 328) for accurate product configuration.

POSSIBLE CONFIGURATIONS - STANDARD INO

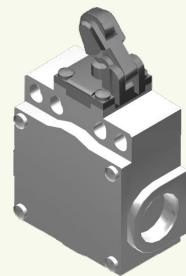
Series C01 30 mm - technopolymer



Series C04 40 mm - aluminum



Series C06 50 mm - metal



CERTIFICATIONS - STANDARD INO

Conformity to CE Standards

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices

EN 60947-1 Low-voltage switchgear and controlgear

EN 60529 Degrees of protection provided by enclosures

IEC 60068-2-78 Environmental Testing - Part 2-78: Tests - Test Cab: Damp heat, steady state

IEC 60068-2-11 Environmental Testing - Part 2: Tests - Test Ka: Salt Mist

IEC 60068-2-27 Environmental Testing - Part 2: Tests - Test Ea & guidance: Shock

IEC 60068-2-6 Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)

IEC 60536 Classification of Electrical and Electronic Equipment with Regard to Protection Against Electric Shock

Markings and homologations

(pending)

GENERAL TECHNICAL SPECIFICATIONS - STANDARD INO

Ambient temperature	Storage -30°C/+80°C Operational -25°C/+70°C (-40°C/+70°C on request)
IP protection degree	Technopolymer series IP65 Metal and aluminum series IP66*
Insulation category	Technopolymer series Class II Metal and aluminum series Class I
Shock resistance	50 g* (1/2 sinusoidal shock for 11 msec) without contact switching
Vibration resistance	25 g (10 ... 500 Hz) without contact switching > 100 µsec
Accuracy (after 1x10 ⁶ operations)	Technopolymer series 0.1 mm (at closing point) Metal and aluminum series 0.05 (at closing point)
Max. actuating speed	Slow action 0.06 m/s Snap action 0.001 m/s
Operating position	Any position
Casing	Series C01: width 30 mm in technopolymer with 1 cable entry Series C02: width 30 mm in metal with 1 cable entry Series C03: width 40 mm in technopolymer with 1 cable entry Series C04: width 40 mm in aluminum with 1 cable entry Series C05: width 50 mm in technopolymer with 2 cable entries Series C06: width 50 mm in metal with 3 cable entries Series C07: width 60 mm in aluminum with 3 cable entries
Cable entry	PG 13.5 1/2" NPT PG 11* M16 x 1.5* M20 x 1.5

* Not available on all versions.

ELECTRICAL SPECIFICATIONS - STANDARD INO

Utilisation category	AC15 - DC13
	10 A / 24 Vac / 50/60 Hz / AC15
	6 A / 120 Vac / 50/60 Hz / AC15
Rated operational current	4 A / 400 Vac / 50/60 Hz / AC15 - 1.8 A (for three-pole switches for Standard Ino with 40 mm and 60 mm casing)
	6 A / 24 Vdc / DC13 - 2.8 A (for three-pole switches for Standard Ino with 40 mm and 60 mm casing)
	0.55 A / 125 Vdc / DC13
	0.4 A / 250 Vdc / DC13 - 0.27 A (for three-pole switches for Standard Ino with 40 mm and 60 mm casing)
Rated insulation voltage	500 V (pollution degree 3), A600 Q600
	400 V, A300 Q300 (for three-pole switches for Standard Ino with 30 mm and 50 mm casing)
Rated voltage impulse	6 kV
Conventional free air thermal current $\theta < 40^\circ\text{C}$	10 A
Short-circuit protection $U_e < 500 \text{ Vac} - \text{fuse type gG (gl)}$	10 A
Switching frequency	3600 cycles/hour
Load factor	0.5
Contact resistance	25 mΩ
Mechanical life	Up to 30×10^6 operations, depending on configuration
Connections	Screws with cable clamp M3.5 (+,-) pozidriv 2 (M3 for three-pole contacts)
Terminal for protective conductor	Screws with cable clamp M3.5 (+,-) pozidriv 2 (only for Standard Ino with metal or aluminum casing)
Wires	1 or 2 x 0.75 ... 2.5 mm² (two-pole contacts), 1 or 2 x 0.34 ... 1.5 (three-pole contacts)

SWITCHES - STANDARD INO

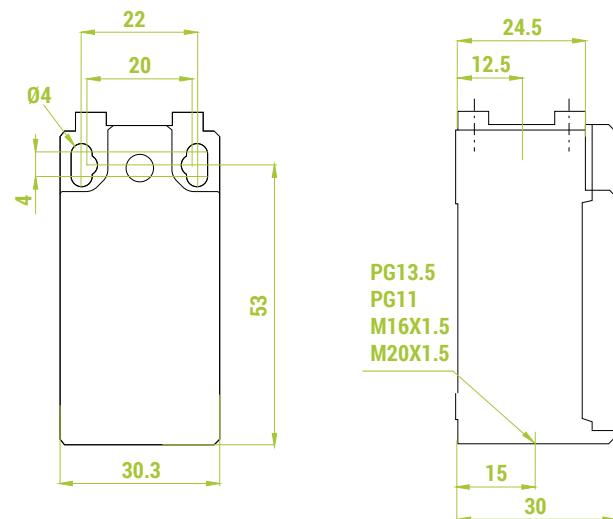
Switch type	Snap action	Snap action	Slow action Simultaneous	Slow action Simultaneous	Slow action Break before make
Contacts	2NC (All NC contacts are of the positive opening operation type \ominus) [*]	1NO+1NC (All NC contacts are of the positive opening operation type \oplus) [*]	2 NC (All NC contacts are of the positive opening operation type \ominus) [*]	2 NO	1NO+1NC (All NC contacts are of the positive opening operation type \ominus) [*]
Scheme					

Switch type	Slow action Make before break	Slow action Break before make	Slow action Break before make	Slow action Simultaneous	Slow action Simultaneous
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type \ominus) [*]	1NO+2NC (All NC contacts are of the positive opening operation type \oplus) [*]	2NO+1NC (All NC contacts are of the positive opening operation type \ominus) [*]	3 NC (All NC contacts are of the positive opening operation type \ominus) [*]	3NO
Scheme					

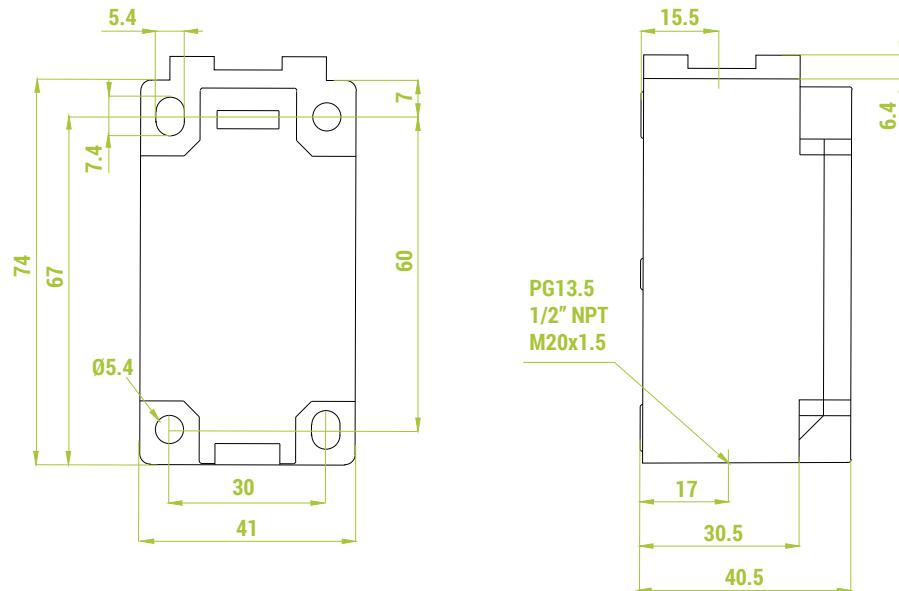
^{*}Not available for all operating heads.

OVERALL DIMENSIONS (mm) - STANDARD INO IN TECHNOPOLYMER

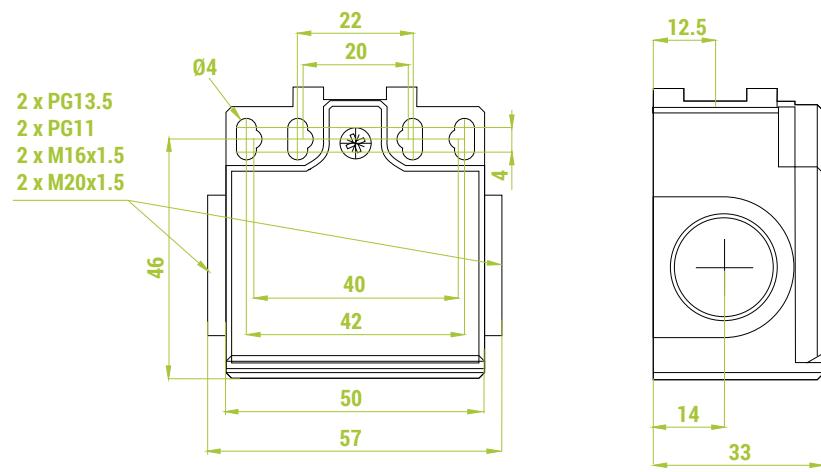
Series C01 with 30 mm casing



Series C03 with 40 mm casing

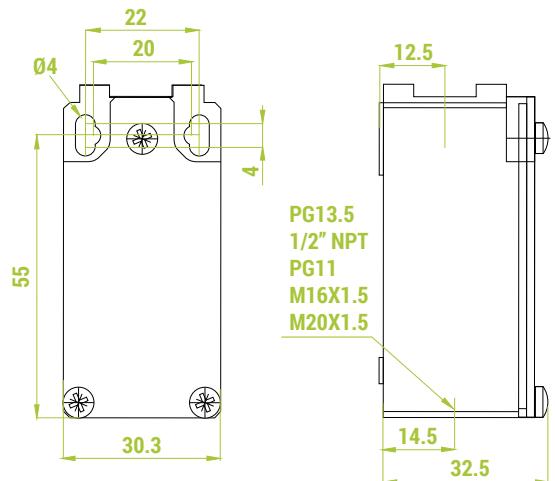


Series C05 with 50 mm casing

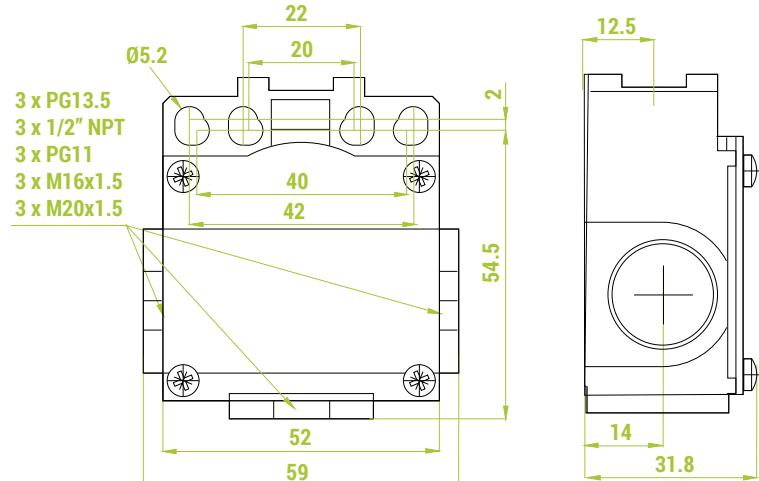


OVERALL DIMENSIONS (mm) - STANDARD INO IN METAL

Series C02 with 30 mm casing

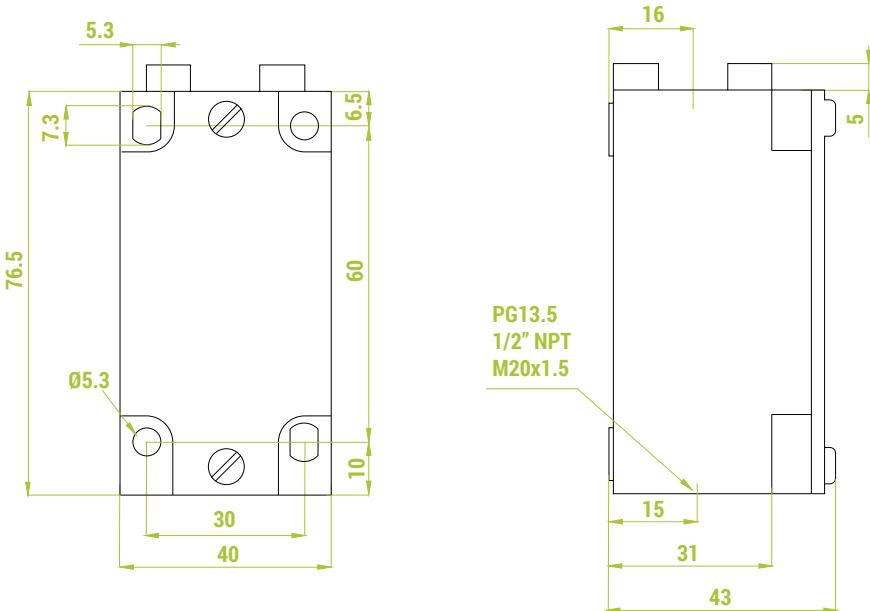


Series C06 with 50 mm casing

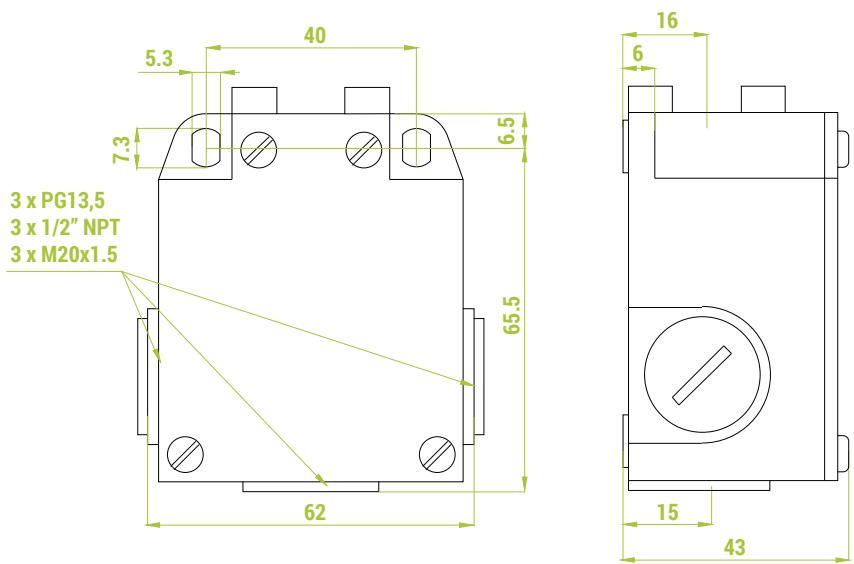


OVERALL DIMENSIONS (mm) - STANDARD INO IN ALUMINUM

Series C04 with 40 mm casing



Series C07 with 60 mm casing



HEADS FOR LIMIT SWITCHES STANDARD INO IN TECHNOPOLYMER WITH 30 mm CASING (SERIES C01), 50 mm CASING (SERIES C05) AND IN METAL WITH 30 mm CASING (SERIES C02) AND 50 mm CASING (SERIES C06)

	Plain plunger	Roller plunger	Plunger with dust protective cap	Plunger with fixing nuts
Code of technopolymer head	010: nylon plunger 011: steel plunger	012: steel roller 013: nylon roller	014	021: nuts M18x1 02101: nuts M12x1
For series C01, C05	For series C01, C05	For series C01, C05	For series C01, C02, C05, C06	For series C01, C02, C05, C06
Code of metal head	111: steel plunger	112: steel roller	/	/
For series C02, C06	For series C02, C06	For series C02, C06		
Max. actuating speed (m/s)	0.5	0.3	0.5	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	15 / 30 ↘	12 / 30 ↘	15 / 30 ↘	15 / 30 ↘
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Nylon roller lever	Nylon roller lever	Nylon roller lever on steel plunger with dust protective cap	Nylon roller lever on steel plunger with dust protective cap
Code of technopolymer head	030: on nylon plunger 031: on steel plunger	032: on steel plunger 034: on nylon plunger	035	036
Code of metal head	/	/	/	/
Max. actuating speed (m/s)	1.0	1.0	1.0	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	7 / 24 ↘	7 / 24 ↘	7 / 24 ↘	7 / 24 ↘
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Adjustable nylon roller lever on steel plunger	Ø18 mm roller lever	Ø50 mm rubber roller lever	Ø18 mm roller lever
Code of technopolymer head	038: without dust protective cap 039: with dust protective cap For series C01, C02, C05, C06	041: nylon roller 043: steel roller For series C01, C05	042	045: nylon roller 046: steel roller For series C01, C05
Code of metal head	/	141: nylon roller 143: steel roller For series C02, C06	142	145: nylon roller 146: steel roller For series C02, C06
Max. actuating speed (m/s)	1.0	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	7 / 24	0.10 / 0.32	0.10 / 0.32	0.10 / 0.32
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Ceramic rod lever	Adjustable lever with Ø18 mm roller	Adjustable toothed lever (step 2 mm) with Ø18 mm nylon roller	Adjustable lever with Ø50 mm rubber roller
Code of technopolymer head	048 For series C01, C05	051: nylon roller 053: steel roller For series C01, C05	05100 For series C01, C05	052 For series C01, C05
Code of metal head	/	151: nylon roller 153: steel roller For series C02, C06	/	151 For series C02, C06
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.10 / 0.32	0.10 / 0.32	0.10 / 0.32	0.10 / 0.32
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Adjustable toothed lever (step 2 mm) with Ø50 mm rubber roller	Adjustable lever with adjustable Ø50 mm rubber roller	Adjustable toothed lever (step 2 mm) with adjustable Ø50 mm rubber roller	Nylon actuator with stainless steel spring
Code of technopolymer head	05200 For series C01, C05	055 For series C01, C05	05500 For series C01, C05	061 For series C01, C05
Code of metal head	/	155 For series C02, C06	/	161 For series C02, C06
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.10 / 0.32 ↗	0.10 / 0.32 ↗	0.10 / 0.32 ↗	0.10 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Stainless steel spring actuator	Adjustable Ø3 mm rod	Adjustable Ø6 mm rod	Adjustable 3x3 square steel rod
Code of technopolymer head	062 For series C01, C05	071: stainless steel rod 072: fiber-glass rod For series C01, C05	073: nylon rod 074: fiber-glass rod For series C01, C05	075 For series C01, C05
Code of metal head	/	171: stainless steel rod 172: fiber-glass rod For series C02, C06	173: nylon rod 174: fiber-glass rod For series C02, C06	175 For series C02, C06
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.10 / -	0.10 / 0.32	0.10 / 0.32	0.10 / 0.32
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				

	Stainless steel spring multidirectional actuator	Multidirectional nylon actuator with stainless steel spring	Stainless steel spring multidirectional actuator	Pull action with ring
Code of technopolymer head	091	092	093	098
For series C01, C02, C05, C06	For series C01, C02, C05, C06	For series C01, C02, C05, C06	For series C01, C02, C05, C06	For series C01, C02, C05, C06
Code of metal head	/	/	/	/
Max. actuating speed (m/s)	1.0	1.0	1.0	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.12 / -	0.12 / -	0.12 / -	30 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				/
Switch code C3 slow action break before make 1NO+2NC				/
Switch code C5 slow action break before make 2NO+1NC				/
Switch code B7 slow action simultaneous 3NC				/

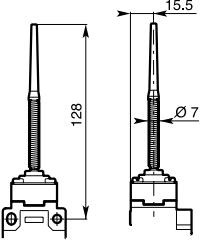
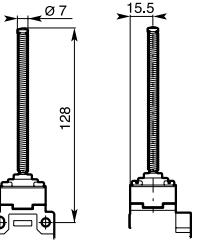
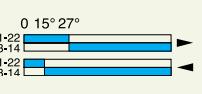
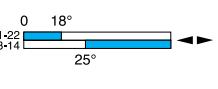
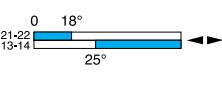
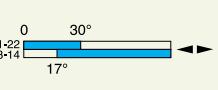
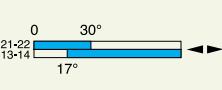
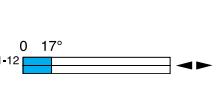
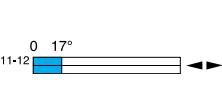
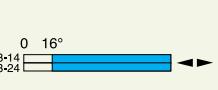
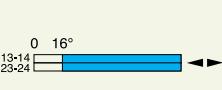
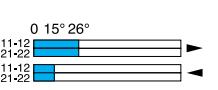
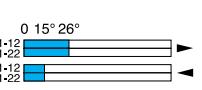
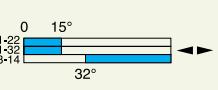
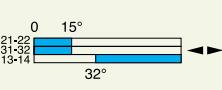
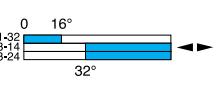
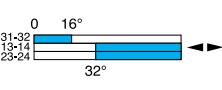
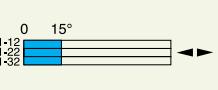
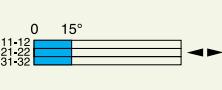
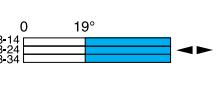
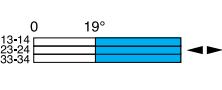
HEADS FOR LIMIT SWITCHES STANDARD INO IN TECHNOPOLYMER WITH 40 mm CASING (SERIES C03)

	Plain plunger	Ball plunger	Roller plunger	Plunger with dust protective cap
Code of technopolymer head	211 For series C03	212 For series C03	213 For series C03	214 For series C03
Max. actuating speed (m/s)	0.5	0.5	0.5	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	14 / 40 ↗	14 / 40 ↗	14 / 40 ↗	14 / 40 ↗
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

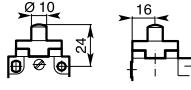
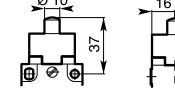
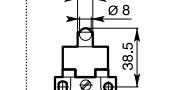
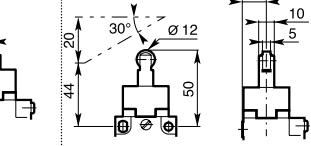
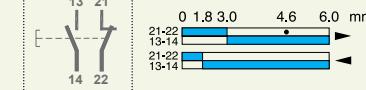
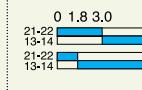
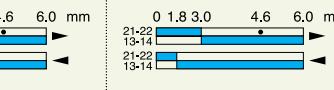
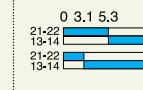
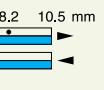
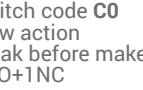
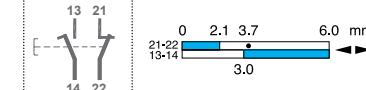
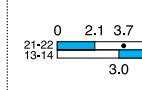
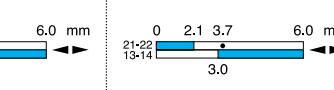
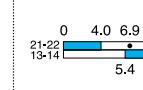
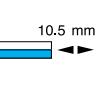
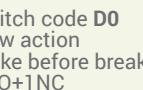
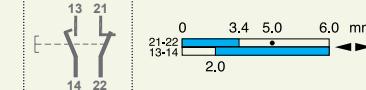
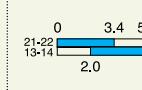
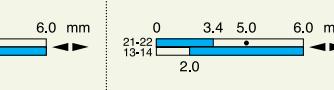
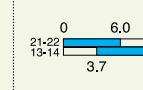
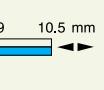
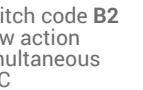
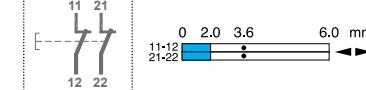
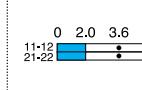
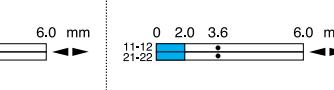
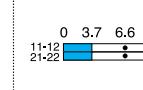
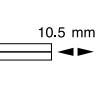
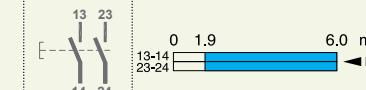
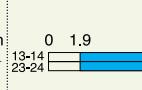
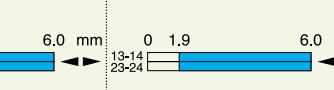
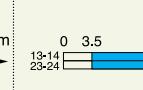
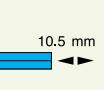
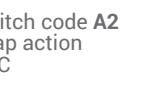
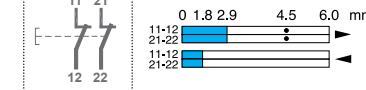
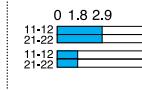
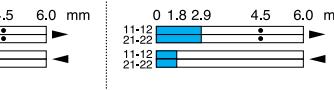
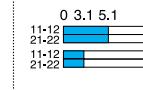
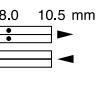
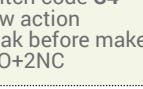
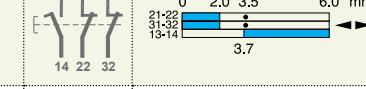
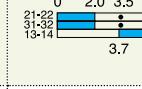
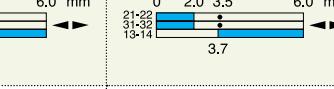
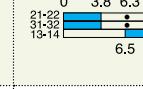
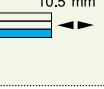
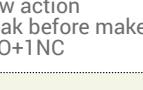
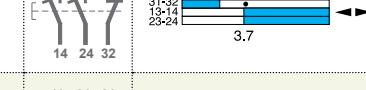
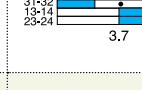
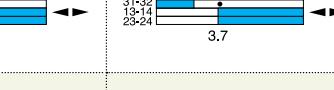
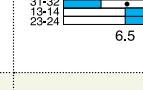
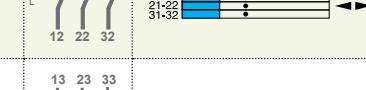
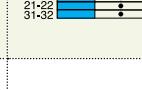
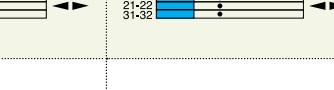
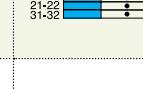
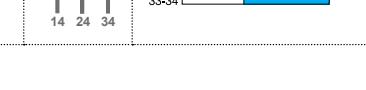
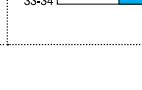
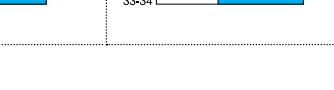
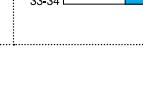
	Steel roller plunger with dust protective cap	One-way roller lever	One-way lever with dust protective cap	Ø22 mm roller lever
	219	231: Ø22 mm nylon roller 232: Ø22 mm stainless steel roller 233: Ø22 mm steel bearing	235: Ø22 mm nylon roller 236: Ø22 mm stainless steel roller 237: Ø22 mm steel bearing	241: nylon roller 242: stainless steel roller 243: steel bearing
Code of technopolymer head	For series C03	For series C03	For series C03	For series C03
Max. actuating speed (m/s)	0.5	1.0	1.0	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	14 / 40 ↗	8 / 30 ↗	8 / 30 ↗	0.15 / 0.30 ↗
Switch code A0 snap action 1NO+1NC	 0 2.4 4.6 7.5 10.5 mm 21-22 13-14 21-22 13-14	 0 3.8 6.8 11.3 17.0 mm 21-22 13-14 21-22 13-14	 0 3.8 6.8 11.3 17.0 mm 21-22 13-14 21-22 13-14	 0 19° 31° 47° 90° 21-22 13-14 21-22 13-14
Switch code C0 slow action break before make 1NO+1NC	 0 3.1 6.0 10.5 mm 21-22 13-14 21-22 13-14	 0 4.9 9.4 17.0 mm 21-22 13-14 21-22 13-14	 0 4.9 9.4 17.0 mm 21-22 13-14 21-22 13-14	 0 21° 37° 90° 21-22 13-14 21-22 13-14
Switch code D0 slow action make before break 1NO+1NC	 0 5.1 8.0 10.5 mm 21-22 13-14 21-22 13-14	 0 7.6 12.1 17.0 mm 21-22 13-14 21-22 13-14	 0 7.6 12.1 17.0 mm 21-22 13-14 21-22 13-14	 0 34° 50° 90° 21-22 13-14 21-22 13-14
Switch code B2 slow action simultaneous 2NC	 0 2.8 5.7 10.5 mm 21-22 11-12 21-22 11-12	 0 4.4 8.9 17.0 mm 21-22 11-12 21-22 11-12	 0 4.4 8.9 17.0 mm 21-22 11-12 21-22 11-12	 0 19° 35° 90° 21-22 11-12 21-22 11-12
Switch code B1 slow action simultaneous 2NO	 0 2.6 10.5 mm 21-22 13-14 21-22 13-14	 0 4.0 17.0 mm 21-22 13-14 21-22 13-14	 0 4.0 17.0 mm 21-22 13-14 21-22 13-14	 0 18° 90° 21-22 13-14 21-22 13-14
Switch code A2 snap action 2NC	 0 2.4 4.4 7.3 10.5 mm 21-22 11-12 21-22 11-12	 0 3.8 6.6 11.1 17.0 mm 21-22 11-12 21-22 11-12	 0 3.8 6.6 11.1 17.0 mm 21-22 11-12 21-22 11-12	 0 19° 30° 46° 90° 21-22 11-12 21-22 11-12
Switch code C4 slow action break before make 1NO+2NC	 0 2.8 5.3 10.5 mm 21-22 31-32 31-32 13-14	 0 3.7 7.5 17.0 mm 21-22 31-32 31-32 13-14	 0 3.7 7.5 17.0 mm 21-22 31-32 31-32 13-14	 0 16° 33° 90° 21-22 31-32 31-32 13-14
Switch code C6 slow action break before make 2NO+1NC	 0 2.9 5.4 10.5 mm 21-22 31-32 31-32 13-14	 0 4.0 7.6 17.0 mm 21-22 31-32 31-32 13-14	 0 4.0 7.6 17.0 mm 21-22 31-32 31-32 13-14	 0 17° 34° 90° 21-22 31-32 31-32 13-14
Switch code B8 slow action simultaneous 3NC	 0 2.8 5.3 10.5 mm 21-22 31-32 31-32 13-14	 0 3.7 7.5 17.0 mm 21-22 31-32 31-32 13-14	 0 3.7 7.5 17.0 mm 21-22 31-32 31-32 13-14	 0 16° 33° 90° 21-22 31-32 31-32 13-14
Switch code B9 slow action simultaneous 3NO	 0 3.3 10.5 mm 21-22 33-34 33-34 13-14	 0 4.8 17.0 mm 21-22 33-34 33-34 13-14	 0 4.8 17.0 mm 21-22 33-34 33-34 13-14	 0 21° 90° 21-22 33-34 33-34 13-14

	Lever with Ø50 mm rubber roller	Adjustable lever with Ø22 mm roller	Adjustable lever with Ø50 mm rubber roller	Nylon actuator with stainless steel spring
Code of technopolymer head	244	251: nylon roller 252: stainless steel roller 253: steel bearing	254	261
For series C03	For series C03	For series C03	For series C03	For series C03
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.15 / 0.30	0.15 / 0.30	0.15 / 0.30	0.15 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

	Stainless steel spring actuator	Adjustable rod	Adjustable Ø6 mm rod	Stainless steel spring multidirectional actuator
Code of technopolymer head	262	271: Ø3 mm stainless steel rod 273: Ø3 mm fiber-glass rod 275: 3x3 mm metal rod	272: nylon rod 274: fiber-glass rod	291
For series C03	For series C03	For series C03	For series C03	For series C03
Max. actuating speed (m/s)	1.5	1.5	1.5	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	0.15 / -	0.15 / 0.30 ↗	0.15 / 0.30 ↗	0.18 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

	Multidirectional nylon actuator with stainless steel spring	Stainless steel spring multidirectional actuator
		
Code of technopolymer head	292	293
	For series C03	For series C03
Max. actuating speed (m/s)	1.0	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	0.18 / -	0.18 / -
Switch code A0 snap action 1NO+1NC	 <p>0 15° 27° 21-22 13-14 21-22 13-14</p>	 <p>0 15° 27° 21-22 13-14 21-22 13-14</p>
Switch code C0 slow action break before make 1NO+1NC	 <p>0 18° 25° 21-22 13-14</p>	 <p>0 18° 25° 21-22 13-14</p>
Switch code D0 slow action make before break 1NO+1NC	 <p>0 30° 17° 21-22 13-14</p>	 <p>0 30° 17° 21-22 13-14</p>
Switch code B2 slow action simultaneous 2NC	 <p>0 17° 11-12 21-22</p>	 <p>0 17° 11-12 21-22</p>
Switch code B1 slow action simultaneous 2NO	 <p>0 16° 13-14 23-24</p>	 <p>0 16° 13-14 23-24</p>
Switch code A2 snap action 2NC	 <p>0 15° 26° 11-12 21-22 11-12 21-22</p>	 <p>0 15° 26° 11-12 21-22 11-12 21-22</p>
Switch code C4 slow action break before make 1NO+2NC	 <p>0 15° 32° 21-32 13-14</p>	 <p>0 15° 32° 21-32 13-14</p>
Switch code C6 slow action break before make 2NO+1NC	 <p>0 16° 32° 31-32 13-14 23-24</p>	 <p>0 16° 32° 31-32 13-14 23-24</p>
Switch code B8 slow action simultaneous 3NC	 <p>0 15° 31-32 21-22 11-12</p>	 <p>0 15° 31-32 21-22 11-12</p>
Switch code B9 slow action simultaneous 3NO	 <p>0 19° 33-34 23-24 13-14</p>	 <p>0 19° 33-34 23-24 13-14</p>

HEADS FOR LIMIT SWITCHES STANDARD INO IN ALUMINUM WITH 40 mm CASING (SERIES C04) AND 60 mm CASING (SERIES C07)

	Plain plunger	Stainless steel plunger	Stainless steel plunger with ball	Stainless steel plunger with Ø12 mm roller
				
Code of technopolymer head	311	/	/	/
For series C04, C07				
Code of metal head	/	/	/	413
For series C04, C07				
Code of aluminum head	/	511	512	513
For series C04, C07		For series C04, C07	For series C04, C07	For series C04, C07
Max. actuating speed (m/s)	0.5	0.5	0.5	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	30 / 45 ↗	30 / 45 ↗	30 / 45 ↗	22 / 40 ↗
Switch code A0 snap action 1NO+1NC	 	 	 	
Switch code C0 slow action break before make 1NO+1NC	 	 	 	
Switch code D0 slow action make before break 1NO+1NC	 	 	 	
Switch code B2 slow action simultaneous 2NC	 	 	 	
Switch code B1 slow action simultaneous 2NO	 	 	 	
Switch code A2 snap action 2NC	 	 	 	
Switch code C4 slow action break before make 1NO+2NC	 	 	 	
Switch code C6 slow action break before make 2NO+1NC	 	 	 	
Switch code B8 slow action simultaneous 3NC	 	 	 	
Switch code B9 slow action simultaneous 3NO	 	 	 	

	Plunger with dust protective cap	Plunger with Ø12 mm steel roller and dust protective cap	Stainless steel lateral plunger	Stainless steel lateral plunger with Ø12 mm vertical roller
Code of technopolymer head	/	/	/	/
Code of metal head	414 For series C04, C07	419 For series C04, C07	/	/
Code of aluminum head	/	/	521 For series C04, C07	522 For series C04, C07
Max. actuating speed (m/s)	0.5	0.5	0.5	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	30 / 45 ↗	22 / 40 ↗	30 / 50 ↗	30 / 50 ↗
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

	Stainless steel lateral plunger with Ø12 mm horizontal roller	One way lever	Ø22 mm roller lever	Ø50 mm rubber roller lever
Code of technopolymer head	/	/	/	/
Code of metal head	/	/	441: nylon roller 442: stainless steel roller 443: steel bearing For series C04, C07	444 For series C04, C07
Code of aluminum head	523 For series C04, C07	531: Ø22 mm nylon roller 532: Ø22 mm stainless steel roller 533: Ø22 mm steel bearing For series C04, C07	541: nylon roller 542: stainless steel roller 543: steel bearing For series C04, C07	544 For series C04, C07
Max. actuating speed (m/s)	0.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	30 / 50 ↗	12 / 40 ↗	0.15 / 0.30 ↗	0.15 / 0.30 ↗
Switch code A0 snap action 1NO+1NC	 	 	 	
Switch code C0 slow action break before make 1NO+1NC	 	 	 	
Switch code D0 slow action make before break 1NO+1NC	 	 	 	
Switch code B2 slow action simultaneous 2NC	 	 	 	
Switch code B1 slow action simultaneous 2NO	 	 	 	
Switch code A2 snap action 2NC	 	 	 	
Switch code C4 slow action break before make 1NO+2NC	 	 	 	
Switch code C6 slow action break before make 2NO+1NC	 	 	 	
Switch code B8 slow action simultaneous 3NC	 	 	 	
Switch code B9 slow action simultaneous 3NO	 	 	 	

	Adjustable Ø22 mm roller lever	Adjustable Ø50 mm rubber roller lever	Nylon actuator with stainless steel spring	Stainless steel spring actuator
Code of technopolymer head	/	/	/	/
Code of metal head	451: nylon roller 452: stainless steel roller 453: steel bearing	454	461	462
	For series C04, C07	For series C04, C07	For series C04, C07	For series C04, C07
Code of aluminum head	551: nylon roller 552: stainless steel roller 553: steel bearing	554	561	562
	For series C04, C07	For series C04, C07	For series C04, C07	For series C04, C07
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.15 / 0.30 ↗	0.15 / 0.30 ↗	0.15 / -	0.15 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

	Adjustable rod	Adjustable Ø6 mm rod	Stainless steel spring multidirectional actuator	Multidirectional nylon actuator with stainless steel spring
Code of technopolymer head	/	/	/	392 For series C04, C07
Code of metal head	471: Ø3 mm stainless steel rod 473: Ø3 mm fiber-glass rod 475: 3x3 mm metal rod For series C04, C07	472: nylon rod 474: fiber-glass rod For series C04, C07	/	/
Code of aluminum head	571: Ø3 mm stainless steel rod 573: Ø3 mm fiber-glass rod 575: 3x3 mm metal rod For series C04, C07	572: nylon rod 574: fiber-glass rod For series C04, C07	591 For series C04, C07	/
Max. actuating speed (m/s)	1.5	1.5	1.0	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	0.15 / 0.30	0.15 / 0.30	0.18 / -	0.18 / -
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code B1 slow action simultaneous 2NO				
Switch code A2 snap action 2NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				
Switch code B9 slow action simultaneous 3NO				

	Multidirectional nylon actuator with stainless steel spring	Stainless steel spring multidirectional actuator	Stainless steel spring multidirectional actuator	Pull action with ring	
Code of technopolymer head	/	393 For series C04, C07	/	/	
Code of metal head	/	/	/	/	
Code of aluminum head	592 For series C04, C07	/	593 For series C04, C07	599 For series C04, C07	
Max. actuating speed (m/s)	1.0	1.0	1.0	0.5	
Min. actuating force (N) or torque (Nm) / for positive opening	0.18 / -	0.18 / -	0.18 / -	25 / -	
Switch code A0 snap action 1NO+1NC	 0 9° 21° 21-22 13-14 21-22 13-14	 0 9° 21° 21-22 13-14 21-22 13-14	 0 9° 21° 21-22 13-14 21-22 13-14	 0 9° 21° 21-22 13-14 21-22 13-14	 0 3.2 4.4 21-22 13-14 21-22 13-14 5.0 mm
Switch code C0 slow action break before make 1NO+1NC	 0 12° 21-22 13-14 19°	 0 12° 21-22 13-14 19°	 0 12° 21-22 13-14 19°	 0 12° 21-22 13-14 19°	 0 2.5 21-22 13-14 3.2 5.0 mm
Switch code D0 slow action make before break 1NO+1NC	 0 23° 21-22 13-14 11°	 0 23° 21-22 13-14 11°	 0 23° 21-22 13-14 11°	 0 3.4 21-22 13-14 2.1 5.0 mm	
Switch code B2 slow action simultaneous 2NC	 0 11° 21-22 13-14	 0 11° 21-22 13-14	 0 11° 21-22 13-14	 0 3.4 21-22 13-14 5.0 mm	
Switch code B1 slow action simultaneous 2NO	 0 10° 23-24 13-14	 0 10° 23-24 13-14	 0 10° 23-24 13-14	 0 3.6 23-24 13-14 5.0 mm	
Switch code A2 snap action 2NC	 0 9° 20° 21-22 13-14 21-22 13-14	 0 9° 20° 21-22 13-14 21-22 13-14	 0 9° 20° 21-22 13-14 21-22 13-14	/	
Switch code C4 slow action break before make 1NO+2NC	 0 12° 21-22 13-14 27°	 0 12° 31-32 13-14 27°	 0 12° 31-32 13-14 27°	 0 1.6 31-32 13-14 2.9 5.0 mm	
Switch code C6 slow action break before make 2NO+1NC	 0 13° 31-32 23-24 27°	 0 13° 31-32 23-24 27°	 0 13° 31-32 23-24 27°	 0 1.5 31-32 23-24 3.0 5.0 mm	
Switch code B8 slow action simultaneous 3NC	 0 12° 21-22 31-32	 0 12° 21-22 31-32	 0 12° 21-22 31-32	 0 3.3 21-22 31-32 5.0 mm	
Switch code B9 slow action simultaneous 3NO	 0 16° 23-24 33-34	 0 16° 23-24 33-34	 0 16° 23-24 33-34	 0 2.7 23-24 33-34 5.0 mm	

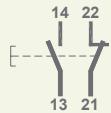
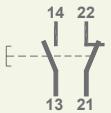
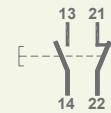
CERTIFICATIONS - DOUBLE LEVER INO

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE EAC

GENERAL TECHNICAL SPECIFICATION - DOUBLE LEVER INO

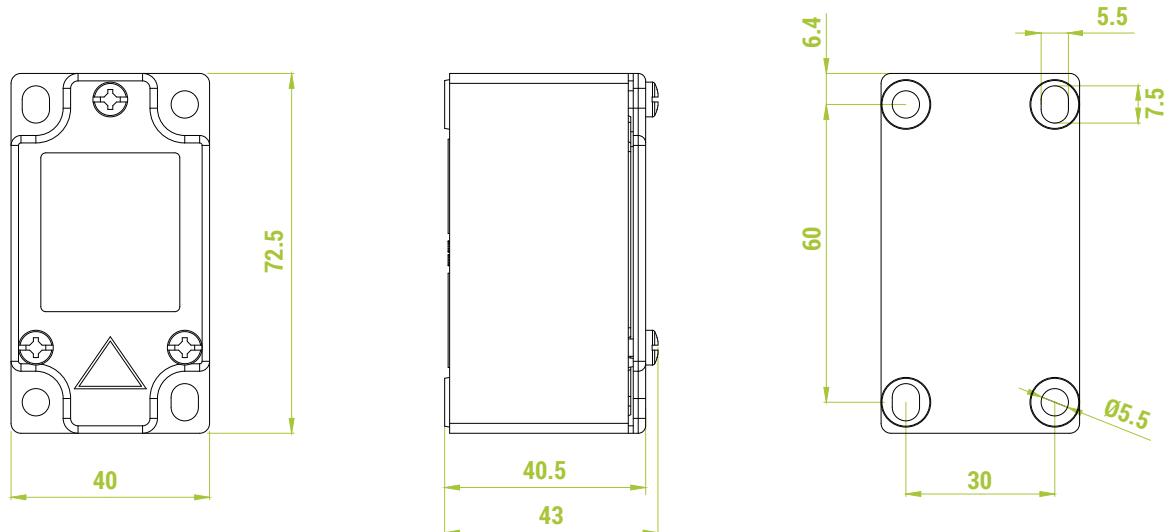
Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	Series in technopolymer IP65 max. with specific cable clamp M20 Series in aluminum IP66 max. with specific cable clamp M20
Insulation category	Series in technopolymer Class II Series in aluminum Class I
Operation frequency	3600 operations/hour max
Cable entry	Cable clamp M20
Operating position	Any position
Casing	Series PF25: width 40 mm in aluminum with 1 cable entry Series PF33: width 64 mm in technopolymer with 3 cable entries

TECHNICAL SPECIFICATIONS OF THE SWITCHES - DOUBLE LEVER INO

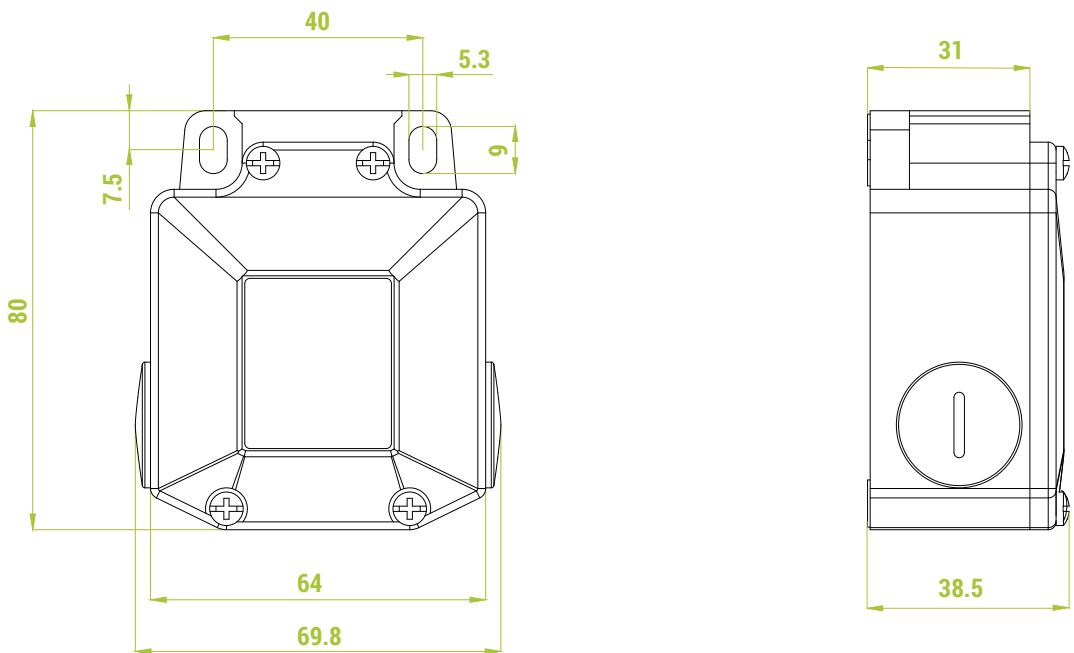
Code	PRSL0025XX	PRSL0031XX	PRSL0036XX	PRSL0037XX	
Utilisation category	AC 15				
Rated operational current	3 A				
Rated operational voltage	250 Vac				
Rated thermal current	10 A				
Rated insulation voltage	300 Vac				
Mechanical life	1x10 ⁶ operations				
Connections	Screw-type terminals				
Wires	1x2.5 mm ² , 2x1.5 mm ²		1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)		
Tightening torque	0.8 Nm				
Switch type	Double break, snap action	Double break, slow action	Double break, snap action	Double break, slow action	
Contacts	1NO+1NC	1NO+1NC	1NO+1NC (All NC contacts are of the positive opening operation type )	1NC (All NC contacts are of the positive opening operation type )	
Scheme					
Markings and homologations	CE EAC		CE cULus EAC		

OVERALL DIMENSIONS (mm) - DOUBLE LEVER INO

Series PF25 with 40 mm casing



Series PF33 with 64 mm casing



CODES FOR LIMIT SWITCHES - DOUBLE LEVER INO

	Double lever		Limit switch code
1 switch PRSL0025XX snap action 1NO+1NC			Series PF25 Code PF25768100
1 switch PRSL0031XX slow action 1NO+1NC			Series PF25 Code PF25768300
1 switch PRSL0036XX snap action 1NO+1NC			Series PF33 Code PF33787100
2 switches PRSL0036XX snap action 1NO+1NC			Series PF33 Code PF33787200
2 switches PRSL0036XX snap action 1NO+1NC			Series PF33 Code PF33787400
2 switches PRSL0037XX slow action 1NC			Series PF33 Code PF33787700

POSSIBLE ASSEMBLIES - WIRED INO

Series C21 30 mm - metal - with connector AMP



Series C22 35 mm - technopolymer - with connector M12



CERTIFICATIONS - WIRED INO

Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures IEC 60536 Classification of Electrical and Electronic Equipment with Regard to Protection Against Electric Shock
Markings and homologations	CE (pending)

GENERAL TECHNICAL SPECIFICATIONS - WIRED INO

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP67
Insulation category	Technopolymer series Class II Metal series Class I
Switching frequency	3600 cycles/hour
Mechanical life	10 x 10 ⁶ operations
Casing	Series C20: width 30 mm in technopolymer Series C21: width 30 mm in metal Series C22: width 35 mm in technopolymer Series C23: width 35 mm in metal
Wires	Series C20 and C22: 4 x 0.75 mm ² PVC Series C21 and C23: 5 x 0.75 mm ² PVC Cable length from 1 m (standard) to 12 m Halogen free PUR cable from 1 m to 12 m
Options	Dynamic PUR cable from 1 m to 12 m Connector M12 Connector AMP

* not available on all versions.

ELECTRICAL SPECIFICATIONS - WIRED INO

Series	C20, C22 with PCV cable	C21, C23 with PCV cable	C20, C22 with PUR cable	C21, C23 with PUR cable	C20, C21, C22, C23 with connector M12	C20, C21, C22, C23 with connector AMP
Cable specifications	Cable 4xAWG18 PVC style 2517	Cable 5xAWG18 PVC style 2517	Cable 4xAWG18 PUR style 20668	Cable 5xAWG18 PUR style 20668	-	-
Min. bend radius	49 mm	57 mm	49 mm	57 mm	-	-
Rated insulation voltage	400 V			300 V		250 V
Rated voltage impulse			4 kV			2,5 kV
Thermal current		10 A			4 A	10 A
Short-circuit protection		10 A 500 V type gG			4 A 500 V type gG	10 A 500 V type gG
		10 A / 24 V / AC15			4 A / 24 V / AC15	10 A / 24 V / AC15
		6 A / 120 V / AC15			4 A / 120 V / AC15	6 A / 120 V / AC15
Rated operational current			3 A / 240 V / AC15			
			2.8 A / 24 V / DC13			
			0.55 A / 125V / DC13			
			0.27A / 250V / DC13			

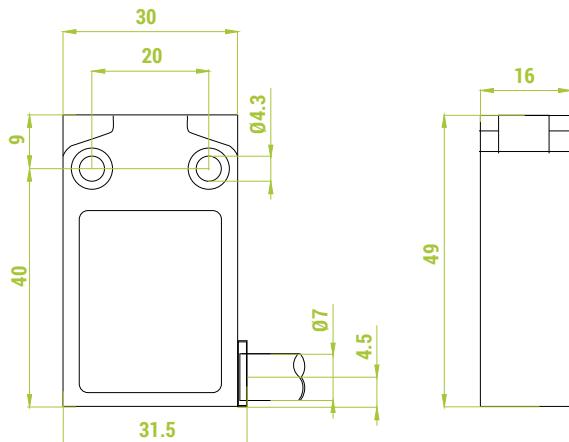
SWITCHES - WIRED INO

Switch type	Snap action	Slow action Break before make
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )*	1NO+1NC (All NC contacts are of the positive opening operation type )*
Scheme		

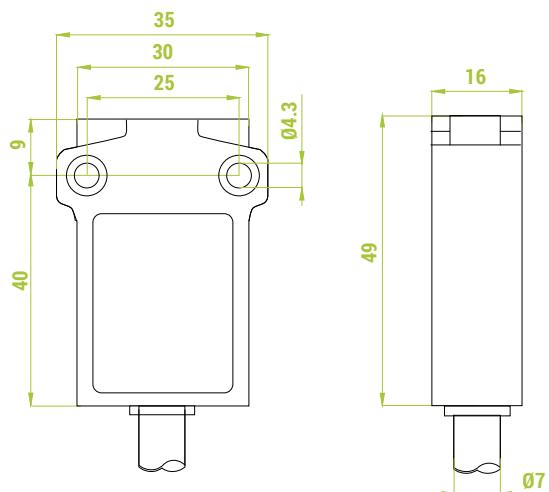
* Not available for all operating heads.

OVERALL DIMENSIONS (mm) - WIRED INO

Series C20 with 30 mm technopolymer casing
Series C21 with 30 mm metal casing



Series C22 with 35 mm technopolymer casing
Series C23 with 35 mm metal casing



HEADS FOR LIMIT SWITCHES WIRED IN

	Plain plunger	Roller plunger	Cross roller plunger	Plunger with dust protective cap
Code of head	611	612: metal roller 613: nylon roller	614: metal roller 615: nylon roller	616
For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23
Max. actuating speed (m/s)	0.5	0.1	0.1	0.5
Min. actuating force (N) or torque (Nm) / for positive opening	15 / 30 ↘	10 / 30 ↘	10 / 30 ↘	15 / 30 ↘
Switch code E0 snap action 1NO+1NC				
Switch code F0 slow action break before make 1NO+1NC				

	Roller plunger with dust protective cap	Bevel plunger	Plain plunger with fixing nuts	Roller plunger with fixing nuts
Code of head	617	618	621	622: metal roller 623: nylon roller
For series C21, C23	For series C21, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23
Max. actuating speed (m/s)	0.1	0.5	0.5	0.1
Min. actuating force (N) or torque (Nm) / for positive opening	10 / 30 ↘	10 / 30 ↘	15 / 30 ↘	10 / 30 ↘
Switch code E0 snap action 1NO+1NC				
Switch code F0 slow action break before make 1NO+1NC				

	Cross roller plunger with fixing nuts	Nylon roller lever	Nylon roller lever	Adjustable nylon roller lever
	624: metal roller 625: nylon roller	631	632	638
Code of head	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C22	For series C20, C21, C22, C23
Max. actuating speed (m/s)	0.1	1.0	1.0	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	10 / 30 ↘	7 / 24 ↘	7 / 24 ↘	7 / 24 ↘
Switch code E0 snap action 1NO+1NC				
Switch code F0 slow action break before make 1NO+1NC				

	Ø14 mm roller lever	Ø18 mm nylon roller lever	Ø18 mm metal roller lever	Adjustable lever with Ø18 mm roller
	641: nylon roller 642: metal roller 643: ball bearing	645	646	651
Code of head	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C21, C23	For series C20, C21, C22, C23
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.08 / 0.28 ↘	0.08 / 0.28 ↘	0.08 / 0.28 ↘	0.08 / 0.28 ↘
Switch code E0 snap action 1NO+1NC				
Switch code F0 slow action break before make 1NO+1NC				

	Adjustable toothed lever (step 2 mm) with Ø18 mm nylon roller	Adjustable lever with Ø18 mm metal roller	Nylon actuator with stainless steel spring	Adjustable rod
Code of head	65100	653	661	671: Ø3 mm stainless steel rod 672: Ø3 mm fiber-glass rod 675: 3x3 mm metal rod
For series C20, C21, C22, C23	For series C21, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23	
Max. actuating speed (m/s)	1.5	1.5	1.5	1.5
Min. actuating force (N) or torque (Nm) / for positive opening	0.08 / 0.28	0.08 / 0.28	0.08 / -	0.08 / 0.28
Switch code E0 snap action 1NO+1NC				
Switch code F0 slow action break before make 1NO+1NC				

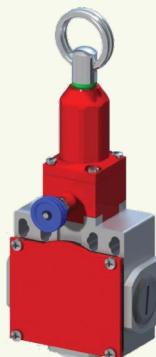
	Adjustable Ø6 mm rod	Multidirectional nylon actuator with stainless steel spring	Multidirectional actuator with stainless steel spring
Code of head	673: nylon rod 674: fiber-glass rod	692	693
For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23	For series C20, C21, C22, C23
Max. actuating speed (m/s)	1.5	0.1	1.0
Min. actuating force (N) or torque (Nm) / for positive opening	0.08 / 0.28	10 / 30	0.10 / -
Switch code E0 snap action 1NO+1NC			
Switch code F0 slow action break before make 1NO+1NC		/	/

POSSIBLE CONFIGURATIONS - SAFETY INO

Series C51 - with separate actuator



Series C55 - with rope



Series C01 - with reset button



CERTIFICATIONS - SAFETY INO

Conformity to CE Standards

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
EN 60947-1 Low-voltage switchgear and controlgear
EN 60529 Degrees of protection provided by enclosures
IEC 61140 Protection against electric shock - Common aspects for installation and equipment
EN ISO 14119 Safety of machinery - Interlocking devices associated with guards - Principles for design and selection (Available only for separate actuator and hinge mount limit switches)
EN 60947-5-5 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function (Available only for limit switches with rope and reset)

Markings and homologations

CE (pending)

GENERAL TECHNICAL SPECIFICATIONS - SAFETY INO

Ambient temperature

Storage -30°C/+80°C

Operational -25°C/+70°C

IP protection degree

Technopolymer series IP65

Metal and aluminum series IP66

Insulation category

Technopolymer series Class II

Metal and aluminum series Class I

Mechanical life

1 x 10⁶ operations

With wire head 500,000 operations

Operating position

Any position

Series C50: width 30 mm in technopolymer with 1 cable entry

Series C51: width 30 mm in metal with 1 cable entry

Series C52: width 40 mm in technopolymer with 1 cable entry

Series C53: width 40 mm in aluminum with 1 cable entry

Series C54: width 50 mm in technopolymer with 2 cable entries

Series C55: width 50 mm in metal with 3 cable entries

Involutro

Series C56: width 50 mm in technopolymer with 3 cable entries

Series C57: width 60 mm in aluminum with 3 cable entries

Series C01: with manual reset button, width 30 mm in technopolymer with 1 cable entry

Series C02: with manual reset button, width 30 mm in metal with 1 cable entry

Series C05: with manual reset button, width 50 mm in technopolymer with 2 cable entries

Series C06: with manual reset button, width 50 mm in metal with 3 cable entries

PG 13.5

1/2" NPT

PG 11*

M16 x 1.5*

M20 x 1.5

Cable entry

* Not available on all versions.

ELECTRICAL SPECIFICATION - SAFETY INO

Utilisation category	AC15 - DC13
	10 A / 24 Vac / 50/60 Hz / AC15
	6 A / 120 Vac / 50/60 Hz / AC15
Rated operational current	4 A / 400 Vac / 50/60 Hz / AC15 - 1.8 A (for three-pole switches for Safety Ino with 40 mm and 60 mm casing)
	6 A / 24 Vdc / DC13 - 2.8 A (for three-pole switches for Safety Ino with 40 mm and 60 mm casing)
	0.55 A / 125 Vdc / DC13
	0.4 A / 250 Vdc / DC13 - 0.27 A (for three-pole switches for Safety Ino with 40 mm and 60 mm casing)
Rated insulation voltage	500 V (pollution degree 3), A600 Q600
	400 V, A300 Q300 (for three-pole switches for Safety Ino with 30 mm and 50 mm casing)
Rated voltage impulse	6 kV
Conventional free air thermal current $\theta < 40^\circ\text{C}$	10 A
Short-circuit protection U_e < 500 Vac - fuse type gG (gl)	10 A
Switching frequency	3600 cycles/hour
Load factor	0.5
Contact resistance	25 mΩ
Connections	Screw with cable clamp M3.5 (+,-) pozidriv 2 (M3 for three-pole contacts)
Terminal for protective conductor	Screw with cable clamp M3.5 (+,-) pozidriv 2 (only for Safety Ino with metal or aluminum casing)
Wires	1 o 2 x 0.75 ... 2.5 mm² (two-pole contacts), 1 o 2 x 0.34 ... 1.5 (three-pole contacts)

SWITCHES - SAFETY INO

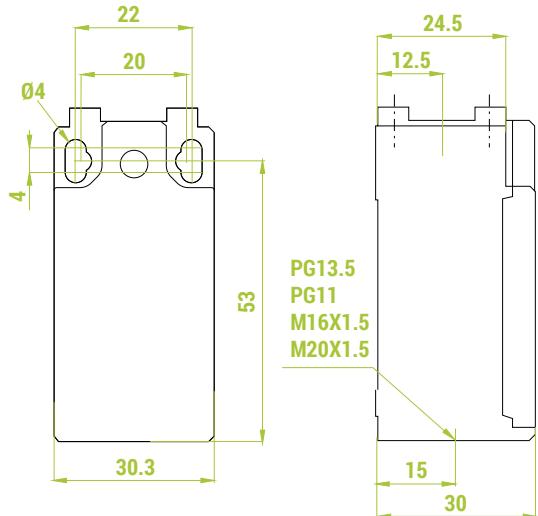
Switch type	Snap action	Snap action	Slow action Simultaneous	Slow action Break before make
Contacts	2NC (All NC contacts are of the positive opening operation type )	1NO+1NC (All NC contacts are of the positive opening operation type )	2 NC (All NC contacts are of the positive opening operation type )	1NO+1NC (All NC contacts are of the positive opening operation type )
Scheme				

Switch type	Slow action Make before break	Slow action Break before make	Slow action Break before make	Slow action Simultaneous
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type )	1NO+2NC (All NC contacts are of the positive opening operation type )	2NO+1NC (All NC contacts are of the positive opening operation type )	3 NC (All NC contacts are of the positive opening operation type )
Scheme				

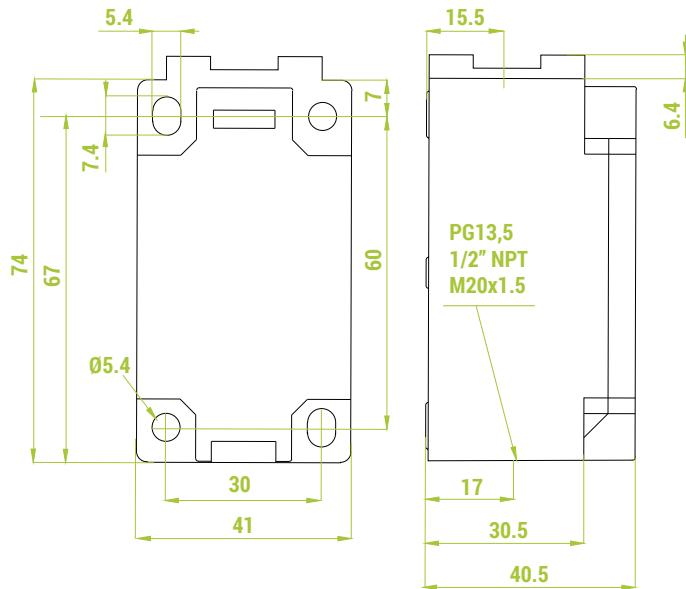
OVERALL DIMENSIONS (mm) - SAFETY INO IN TECHNOPOLYMER

Series C50 with 30 mm casing

Series C01 with manual reset button and 30 mm casing

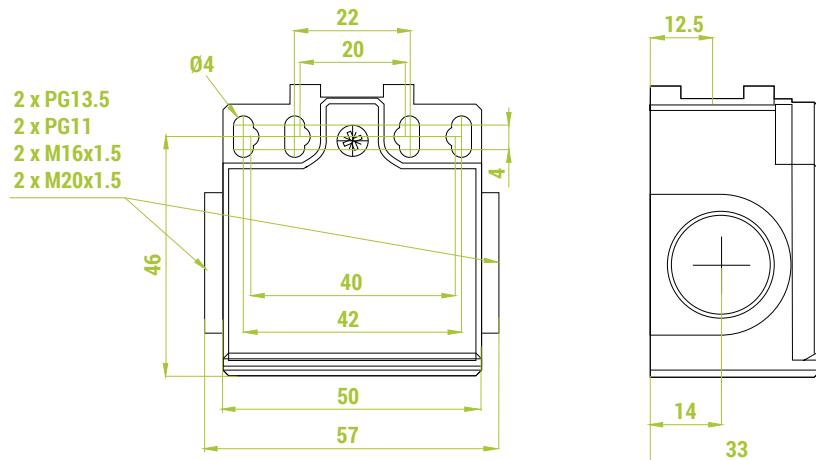


Series C52 with 40 mm casing

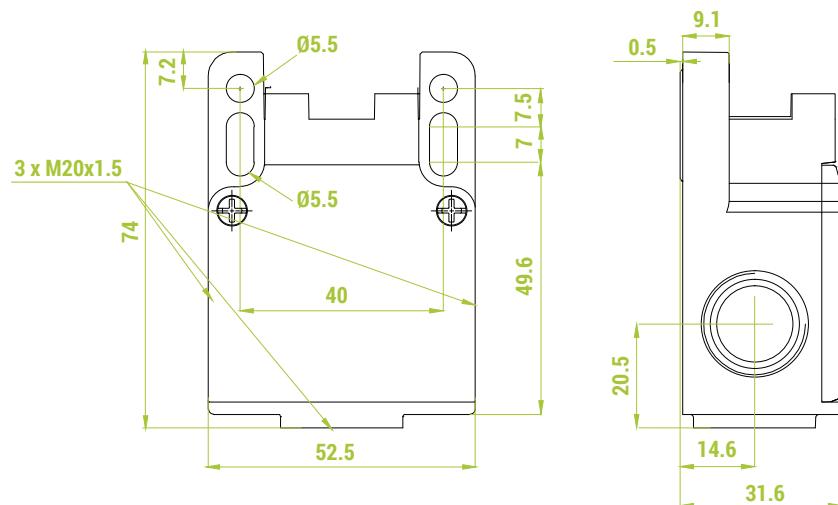


Series C54 with 50 mm casing and two cable entries

Series C05 with manual reset button and 50 mm casing



Series C56 with 50 mm casing and three cable entries



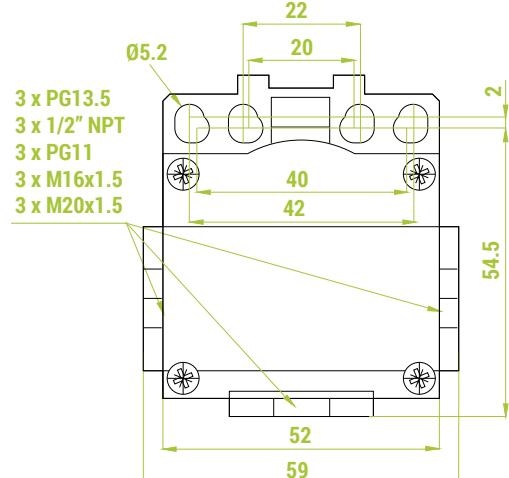
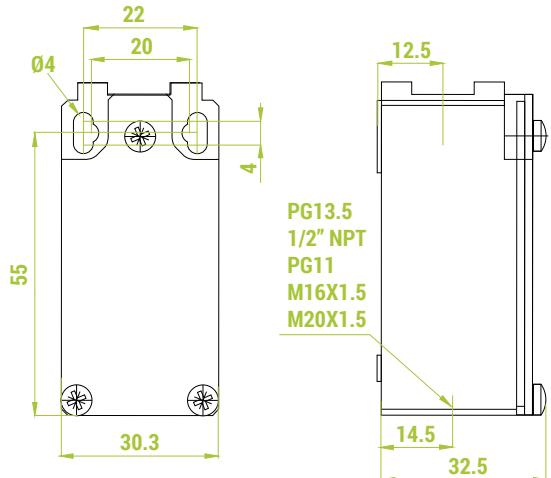
OVERALL DIMENSIONS (mm) - SAFETY INO IN METAL

Series C51 with 30 mm casing

Series C02 with manual reset button and 30 mm casing

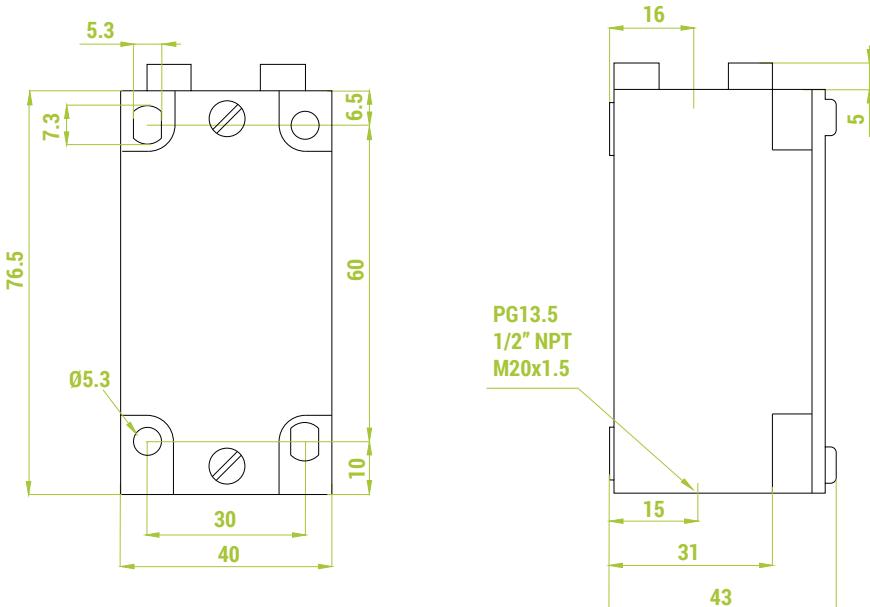
Series C55 with 50 mm casing

Series C06 with manual reset button and 50 mm casing

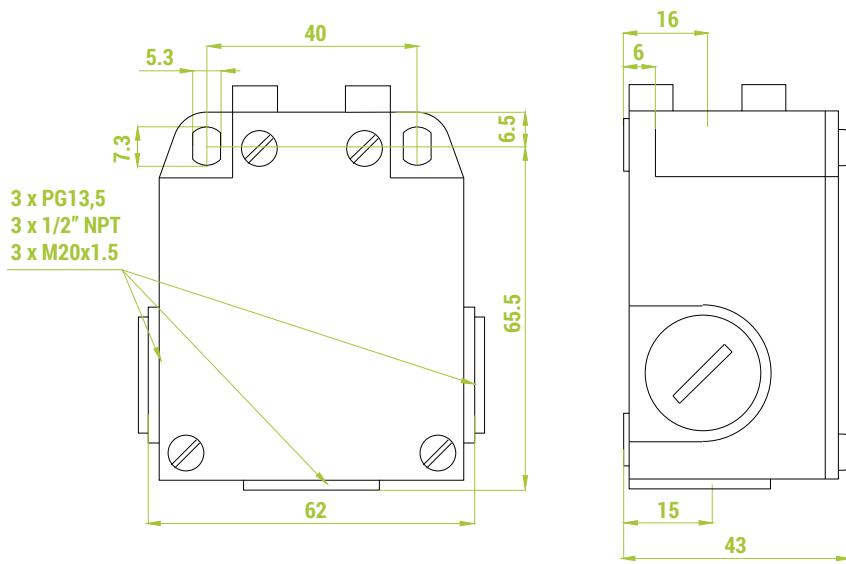


OVERALL DIMENSIONS (mm) - SAFETY INO IN ALUMINUM

Series C53 with 40 mm casing



Series C57 with 60 mm casing



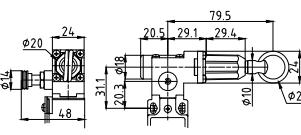
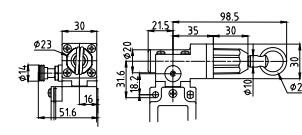
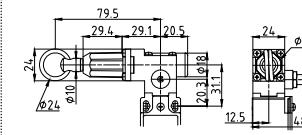
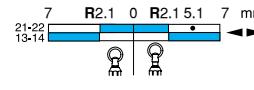
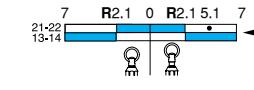
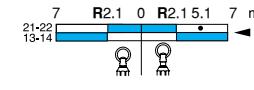
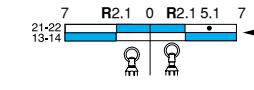
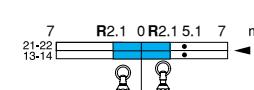
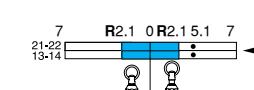
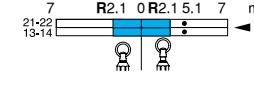
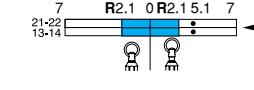
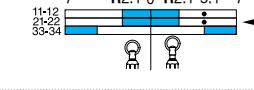
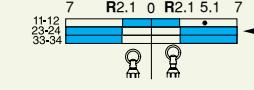
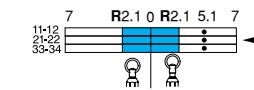
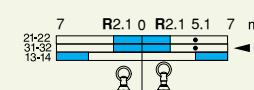
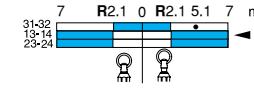
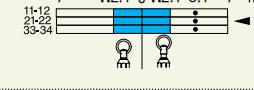
HEADS FOR LIMIT SWITCHES SAFETY INO

5

	Adjustable head 90° with separate actuator			
Code of head	710 For series C50, C51, C54, C55	73000 For series C52	74000 For series C53, C57	75000 For series C56
Min. actuating force (N) or torque (Nm) min. / for positive opening	15 N / 30 N ↘	15 N / 30 N ↘	15 N / 30 N ↘	60 N / 90 N ↘
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				

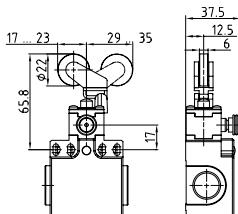
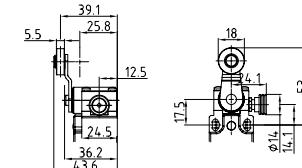
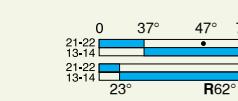
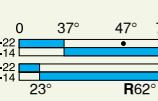
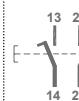
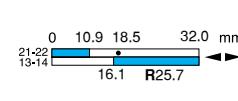
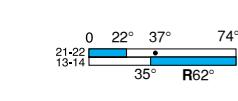
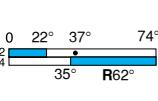
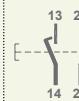
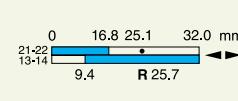
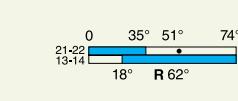
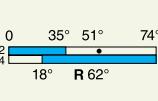
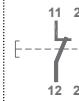
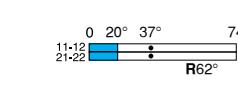
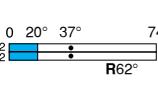
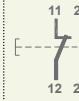
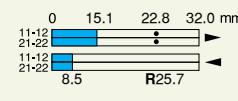
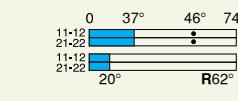
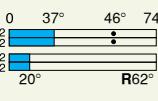
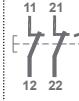
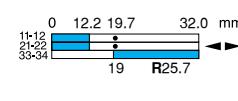
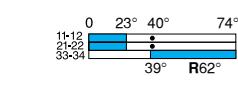
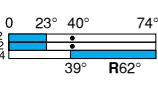
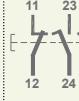
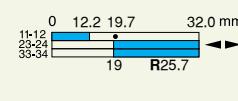
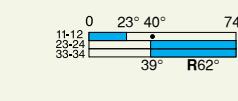
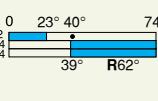
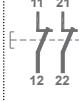
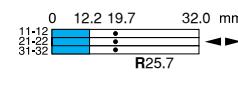
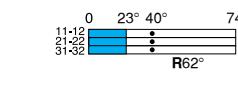
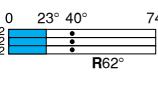
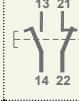
	Fully turnable head with separate actuator	Zinc plated steel shaft for hinge mount	Stainless steel shaft for hinge mount	Zinc plated steel lever for hinge mount
Code of head	780	771	772	761
For series C50, C51, C54, C55	For series C50, C51, C54, C55	For series C50, C51, C54, C55	For series C50, C51, C54, C55	For series C50, C51, C54, C55
Min. actuating force (N) or torque (Nm) / for positive opening	15 N / 30 N ↘	0.12 Nm / 0.60 Nm ↘	0.12 Nm / 0.60 Nm ↘	0.12 Nm / 0.60 Nm ↘
Switch code A0 snap action 1NO+1NC				
Switch code C0 slow action break before make 1NO+1NC				
Switch code D0 slow action make before break 1NO+1NC				
Switch code B2 slow action simultaneous 2NC				
Switch code A2 snap action 2NC				
Switch code C3 slow action break before make 1NO+2NC				
Switch code C5 slow action break before make 2NO+1NC				
Switch code B7 slow action simultaneous 3NC				
Switch code C4 slow action break before make 1NO+2NC				
Switch code C6 slow action break before make 2NO+1NC				
Switch code B8 slow action simultaneous 3NC				

	Pull wire without reset for simple stop	Pull wire without reset for simple stop	Pull wire without reset for simple stop	Pull wire without reset for simple stop	
Code of head	79000 For series C51, C55	79100 For series C53, C57	796 For series C51, C55	797 For series C53, C57	
Min. actuating force (N) or torque (Nm) / for positive opening	Initial 65 N, final 85 N / 95 N ↘	Initial 150 N, final 215 N / 230 N ↘	Initial 60 N, final 80 N / 90 N ↘	Initial 120 N, final 160 N / 170 N ↘	
Switch code A0 snap action 1NO+1NC		/	/	/	
Switch code C0 slow action break before make 1NO+1NC		7 1.3 0 1.6 2.7 7 mm 21-22 13-14 2.6 2.5 3.1 3.1	7 1.9 0 2.2 3.3 7 mm 21-22 13-14 3.1 3.1	5.6 1.3 0 1.6 2.7 4 mm 21-22 13-14 2.6 2.5 3.1 3.1	6 1.9 0 2.2 3.3 5.6 mm 21-22 13-14 3.1 3.1
Switch code D0 slow action make before break 1NO+1NC		/	/	/	
Switch code B2 slow action simultaneous 2NC		7 1.3 0 1.5 2.6 7 mm 21-22 13-14 2.6 2.5 3.1 3.1	7 1.7 0 1.9 3 7 mm 21-22 13-14 2.6 2.5 3.1 3.1	5.6 1.3 0 1.5 2.6 4 mm 21-22 13-14 2.6 2.5 3.1 3.1	6 1.7 0 1.9 3 5.6 mm 21-22 13-14 2.6 2.5 3.1 3.1
Switch code A2 snap action 2NC		/	/	/	
Switch code C3 slow action break before make 1NO+2NC		7 1.5 0 1.5 2.6 7 mm 21-22 33-34 2.9 2.4	/	5.6 1.5 0 1.5 2.6 4 mm 21-22 33-34 2.9 2.4	/
Switch code C5 slow action break before make 2NO+1NC		7 1.5 0 1.5 2.6 7 mm 21-22 33-34 2.9 2.4	/	5.6 1.5 0 1.5 2.6 4 mm 21-22 33-34 2.9 2.4	/
Switch code B7 slow action simultaneous 3NC		7 1.4 0 1.5 2.6 7 mm 21-22 33-34 2.6 2.5 3.1 3.1	/	5.6 1.4 0 1.5 2.6 4 mm 21-22 33-34 2.6 2.5 3.1 3.1	/
Switch code C4 slow action break before make 1NO+2NC		/	7 1.8 0 1.9 3 7 mm 21-22 33-34 3.5 3.2	/	6 1.8 0 1.9 3 5.6 mm 21-22 33-34 3.5 3.2
Switch code C6 slow action break before make 2NO+1NC		/	7 1.7 0 2.1 3.2 7 mm 21-22 33-34 3.2 3.2	/	6 1.7 0 2.1 3.2 5.6 mm 21-22 33-34 3.2 3.2
Switch code B8 slow action simultaneous 3NC		/	7 1.7 0 2.1 3.2 7 mm 21-22 33-34 3.2 3.2	/	6 1.7 0 2.1 3.2 5.6 mm 21-22 33-34 3.2 3.2

	Pull wire with reset for emergency stop	Pull wire with reset for emergency stop	Pull wire with reset for emergency stop
			
Code of head	79200 For series C51, C55	79400 For series C53, C57	79300 For series C51, C55
Min. actuating force (N) or torque (Nm) / for positive opening	Initial 65 N, final 85 N / 95 N ⊕	Initial 150 N, final 215 N / 230 N ⊕	Initial 65 N, final 85 N / 95 N ⊕
Switch code A0 snap action 1NO+1NC	 /	 /	 /
Switch code C0 slow action break before make 1NO+1NC	 /	 /	 /
Switch code D0 slow action make before break 1NO+1NC	 /	 /	 /
Switch code B2 slow action simultaneous 2NC	 /	 /	 /
Switch code A2 snap action 2NC	 /	 /	 /
Switch code C3 slow action break before make 1NO+2NC	 /	 /	 /
Switch code C5 slow action break before make 2NO+1NC	 /	 /	 /
Switch code B7 slow action simultaneous 3NC	 /	 /	 /
Switch code C4 slow action break before make 1NO+2NC	 /	 /	 /
Switch code C6 slow action break before make 2NO+1NC	 /	 /	 /
Switch code B8 slow action simultaneous 3NC	 /	 /	 /

	Pull wire with reset for emergency stop	Pull wire with reset for emergency stop	Pull wire with reset for emergency stop
	79500	79800	79900
Code of head	For series C53, C57	For series C51, C55	For series C53, C57
Min. actuating force (N) or torque (Nm) / for positive opening	Initial 150 N, final 215 N / 230 N ↘	Initial 60 N, final 80 N / 90 N ↘	Initial 120 N, final 160 N / 170 N ↘
Switch code A0 snap action 1NO+1NC		/	/
Switch code C0 slow action break before make 1NO+1NC			
Switch code D0 slow action make before break 1NO+1NC		/	/
Switch code B2 slow action simultaneous 2NC			
Switch code A2 snap action 2NC		/	/
Switch code C3 slow action break before make 1NO+2NC			/
Switch code C5 slow action break before make 2NO+1NC			/
Switch code B7 slow action simultaneous 3NC			/
Switch code C4 slow action break before make 1NO+2NC		/	
Switch code C6 slow action break before make 2NO+1NC			/
Switch code B8 slow action simultaneous 3NC		/	

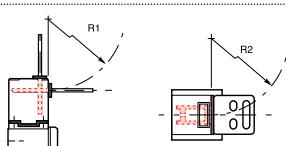
	Steel plunger with reset	Steel plunger with nylon roller with reset	Steel plunger with nylon roller with reset	Steel plunger with nylon roller with reset
Code of head	811	813	831	832
For series C01, C02, C05, C06	For series C01, C02, C05, C06	For series C01, C02, C05, C06	For series C01, C02	
Min. actuating force (N) or torque (Nm) / for positive opening	15 N / 30 N ⊖	12 N / 30 N ⊖	7 N / 24 N ⊖	7 N / 24 N ⊖
Switch code A0 snap action 1NO+1NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code C0 slow action break before make 1NO+1NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code D0 slow action make before break 1NO+1NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code B2 slow action simultaneous 2NC	 	 	 	
Switch code A2 snap action 2NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code C3 slow action break before make 1NO+2NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code C5 slow action break before make 2NO+1NC	 R 4.2	 R 8.0	 R 16.5	 R 16.5
Switch code B7 slow action simultaneous 3NC	 	 	 	
Switch code C4 slow action break before make 1NO+2NC	 	 	 	
Switch code C6 slow action break before make 2NO+1NC	 	 	 	
Switch code B8 slow action simultaneous 3NC	 	 	 	

	Steel plunger with nylon roller with reset	Lever with nylon roller with reset
		
Code of head	838 For series C05, C06	841 For series C01, C02, C05, C06
Min. actuating force (N) or torque (Nm) / for positive opening	7 N / 24 N ↘	0.10 Nm / 0.32 Nm ↘
Switch code A0 snap action 1NO+1NC	 	 
Switch code C0 slow action break before make 1NO+1NC	 	 
Switch code D0 slow action make before break 1NO+1NC	 	 
Switch code B2 slow action simultaneous 2NC	 	 
Switch code A2 snap action 2NC	 	 
Switch code C3 slow action break before make 1NO+2NC	 	 
Switch code C5 slow action break before make 2NO+1NC	 	 
Switch code B7 slow action simultaneous 3NC	 	 
Switch code C4 slow action break before make 1NO+2NC	 /	/
Switch code C6 slow action break before make 2NO+1NC	 /	/
Switch code B8 slow action simultaneous 3NC	 /	/

OPERATING KEYS FOR LIMIT SWITCHES SAFETY INO WITH SEPARATE ACTUATOR

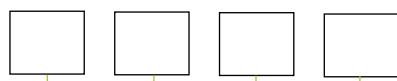
Dimensions (mm)	Code*	Head	Min. value R1	Min. value R2
Bent key 	H3	For heads 710 and 780	400 mm	400 mm
Flat key 	H4	For heads 710 and 780	400 mm	400 mm
Bent key 	H5	For heads 710 and 780	400 mm	400 mm
Flat key 	H6	For heads 710 and 780	400 mm	400 mm
Shock absorbing bent key 	H7	For heads 710 and 780	250 mm	350 mm
Shock absorbing flat key 	H8	For heads 710 and 780	350 mm	350 mm
Adjustable joint key 	H9	For heads 710 and 780	180 mm	200 mm
Bent key 	J5	For heads 73000, 74000 and 75000	400 mm	400 mm
Flat key 	J6	For heads 73000, 74000 and 75000	400 mm	400 mm
Adjustable joint key 	J9	For heads 73000, 74000 and 75000	180 mm	200 mm

Legend



* Keys are to be ordered separately from the limit switch.

STANDARD INO - REQUEST FORM FOR LIMIT SWITCH



Casing

Series	Material	Width	No. cable entries
C01	Technopolymer	30 mm	1
C02	Metal	30 mm	1
C03	Technopolymer	40 mm	1
C04	Aluminum	40 mm	1
C05	Technopolymer	50 mm	2
C06	Metal	50 mm	3
C07	Aluminum	60 mm	3

Type of cable entry

- 1** = for cable clamp thread PG13.5.
- 2** = for cable clamp thread 1/2" NPT.
(On series C01 and C05 the thread results from a plastic adapter).
- 3** = for cable clamp thread PG11.
(Available only for series C01, C02, C05, C06).
- 4** = for cable clamp thread M16 x 1.5.
(Available only for series C01, C02, C05, C06).
- 5** = for cable clamp thread M20 x 1.5.

Switches

- A0** = snap action 1NO+1NC.
- C0** = slow action - break before make 1NO+1NC.
- D0** = slow action - make before break 1NO+1NC.
- B2** = slow action - simultaneous 2NC.
- B1** = slow action - simultaneous 2NO.
- A2** = snap action 2NC.
- C3** = slow action - break before make 1NO+2NC.
(Available for series C01, C02, C05 and C06).
- C4** = slow action - break before make 1NO+2NC.
(Available for series C03, C04 and C07).
- C5** = slow action - break before make 2NO+1NC.
(Available for series C01, C02, C05 and C06).
- C6** = slow action - break before make 2NO+1NC.
(Available for series C03, C04 and C07).
- B7** = slow action - simultaneous 3NC.
(Available for series C01, C02, C05 and C06).
- B8** = slow action - simultaneous 3NC.
(Available for series C03, C04 and C07).
- B9** = slow action simultaneous 3NO.
(Available for series C03, C04 and C07).

Operating heads

- 010 - 599** = operating heads
- For series **C01**, **C02**, **C05** and **C06** refer to tables from page 288 to page 294.
- For series **C03** refer to tables from page 295 to page 299.
- For series **C04** and **C07** refer to tables from page 300 to page 305.

Limit switch Standard Ino is also available for operational temperature -40°C/+70°C on request.

Instructions

Fill in the boxes with the numbers corresponding to the specifications required, thus obtaining the limit switch code, as shown in the example below.

C02	5	038	A0
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WIRED INO - REQUEST FORM FOR LIMIT SWITCH

Casing	Series	Material	Width								
C20	Technopolymer	30 mm									
C21	Metal	30 mm									
C22	Technopolymer	35 mm									
C23	Metal	35 mm									

Connections	Direction of electric connection
U = standard with PVC cable.	Series C20 and C21
W = connector M12.	R = right (standard)
X = connector AMP.	C = center
Y = dynamic PUR cable.	L = left
Z = halogen free PUR cable.	

Operating heads	PVC cable length
611 - 693 = operating heads	01 = standard 1m.
Refer to tables from page 311 to page 313.	02 = 2 m.

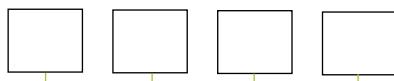
Switches	03 = 3 m.
E0 = snap action 1NO+1NC.	04 = 4 m.
F0 = slow action - break before make	05 = 5 m.
	06 = 6 m.

Instructions

Fill in the boxes with the numbers corresponding to the specifications required, thus obtaining the limit switch code, as shown in the example below.

C20 **W** **612** **E0** **01** **R**

SAFETY INO - REQUEST FORM FOR LIMIT SWITCH

**Casing**

Series	Material	Width	No. cable entries
C50	Technopolymer	30 mm	1
C51	Metal	30 mm	1
C52	Technopolymer	40 mm	1
C53	Aluminum	40 mm	1
C54	Technopolymer	50 mm	2
C55	Metal	50 mm	3
C56	Technopolymer	50 mm	3
C57	Aluminum	60 mm	3
With manual reset			
C01	Technopolymer	30 mm	1
C02	Metal	30 mm	1
C05	Technopolymer	50 mm	2
C06	Metal	50 mm	3

Type of cable entry

- 1** = for cable clamp thread PG13.5.
(Not available for series C56).
- 2** = for cable clamp thread 1/2" NPT.
(Not available for series C56).
(On series C50, C54, C01 and C05 the thread results from a plastic adapter).
- 3** = for cable clamp thread PG11.
(Available only for series C50, C51, C54, C55, C01, C02, C05, C06).
- 4** = for cable clamp thread M16 x 1.5.
(Available only for series C50, C51, C54, C55, C01, C02, C05, C06).
- 5** = for cable clamp thread M20 x 1.5.

Switches

- A0** = snap action 1NO+1NC.
- C0** = slow action - break before make 1NO+1NC.
- D0** = slow action - make before break 1NO+1NC.
- B2** = slow action - simultaneous 2NC.
- A2** = snap action 2NC.
- C3** = slow action - break before make 1NO+2NC.
(Available for series C01, C02, C05 and C06).
- C4** = slow action - break before make 1NO+2NC.
(Available for series C03, C04 and C07).
- C5** = slow action - break before make 2NO+1NC.
(Available for series C01, C02, C05 and C06).
- C6** = slow action - break before make 2NO+1NC.
(Available for series C03, C04 and C07).
- B7** = slow action - simultaneous 3NC.
(Available for series C01, C02, C05 and C06).
- B8** = slow action - simultaneous 3NC.
(Available for series C03, C04 and C07).

Operating heads

- 710 - 841** = operating heads
For series from **C50** to **C57** refer to tables from page 318 to page 322.
For manual reset series **C01**, **C02**, **C05** and **C06** refer to tables from page 323 to page 324.

Instructions

Fill in the boxes with the numbers corresponding to the specifications required, thus obtaining the limit switch code, as shown in the example below.

C50	5	771	B8
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REMARKS



SLIP RING COLLECTORS

6





10A

Slip ring collector

10A

6



Slip ring collector, consisting of rings coupled with brushes, designed for small jib cranes. Compact sized and equipped with 4 rings.

FEATURES

- Suitable for transmitting current with 50/60 Hz supply frequency.
- Extreme temperature resistance: -25°C to +70°C.

OPTIONS

- Available with driving slots.
- Available with coupling flange.

CERTIFICATIONS

- CE marking and EAC certification.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60309-1 Plugs, socket-outlets and couplers for industrial purposes - General requirements EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE EAC

GENERAL TECHNICAL SPECIFICATIONS

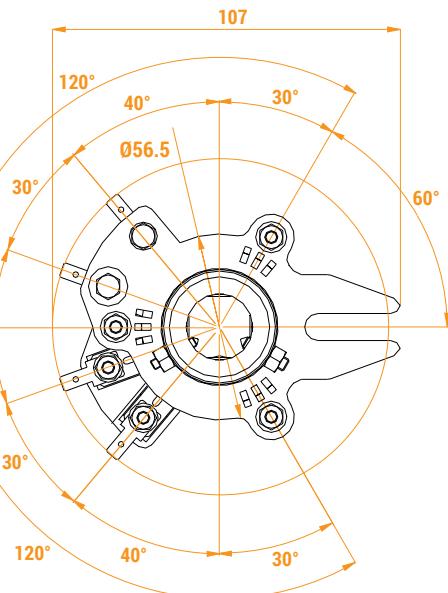
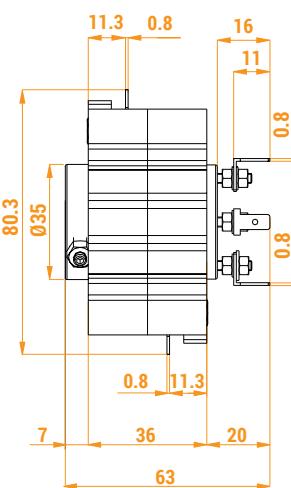
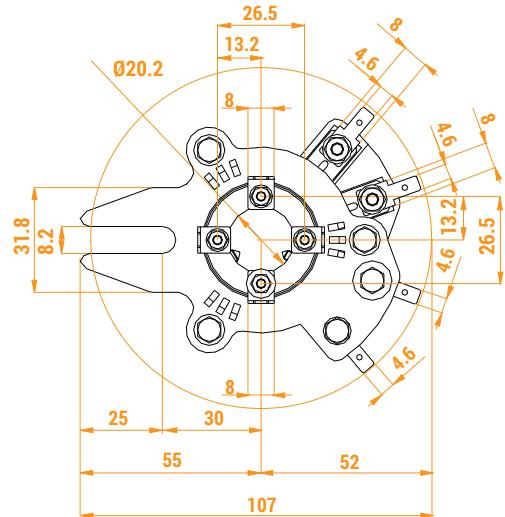
Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 00
Insulation category	Class I
Operating positions	Any position

ELECTRICAL SPECIFICATIONS

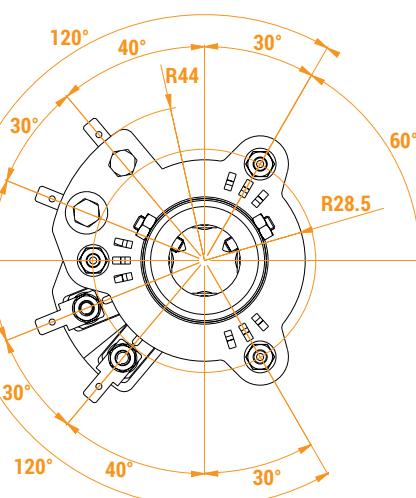
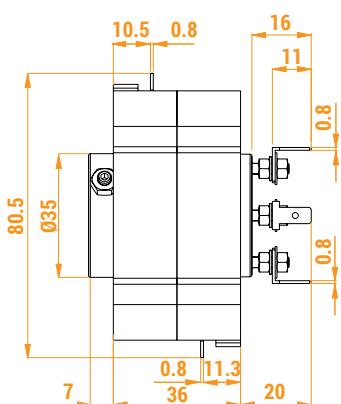
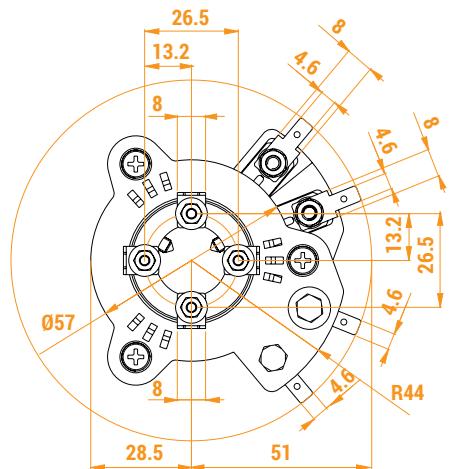
Rated operational current	10 A
Rated operational voltage	400 Vac
Rated insulation voltage	660 Vac
Max. speed	3 rev./min.
Connections	Faston 6.3 mm

OVERALL DIMENSIONS (mm)

With driving slot



Without driving slot



SLIP RING COLLECTORS

Description	Code
Slip ring collector with driving slot	PF21270100
Slip ring collector without driving slot	PF21270200
Slip ring collector with Ø 40x30 mm flange	PF21270101

REMARKS

10A/30A

Slip ring collector



Slip ring collector consisting of rings coupled with brushes, designed to allow current to pass from a fixed to a rotating part and used to supply crane motors and cable winders.

FEATURES

- Suitable for transmitting current with 50/60 Hz frequency.
- The enclosure has small downward holes for air circulation and to prevent problems due to moisture.
- The lower support plate is provided with three holes to drain any moisture that may form inside the unit.
- The enclosure is made of shock-resistant thermoplastic material to prevent contact with live electrical parts.
- IP protection degree: collector 10A/30A is classified IP22.
- Extreme temperature resistance: -25°C to +70°C.

OPTIONS

- Up to 40 rings coupled with brushes.
- Available with 30A line rings only or with 30A line rings and 10A auxiliary rings.
- Fitted with phosphor bronze or graphite brushes.

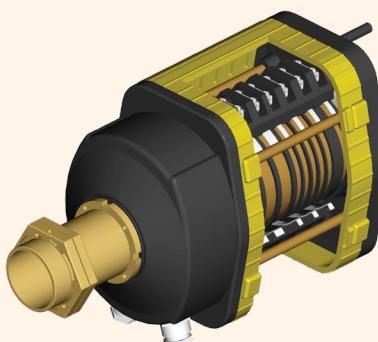
CERTIFICATIONS

- CE marking and EAC certification.

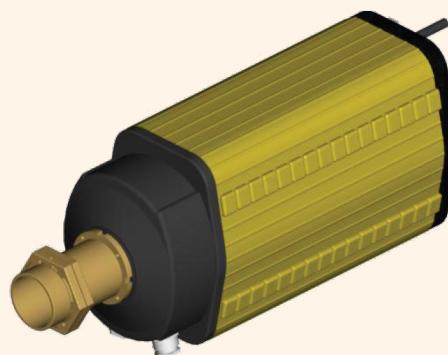
Fill in the "request form" for accurate product configuration.

POSSIBLE ASSEMBLIES

Standard (section view)



Standard 16 rings



6

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60309-1 Plugs, socket-outlets and couplers for industrial purposes - General requirements EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

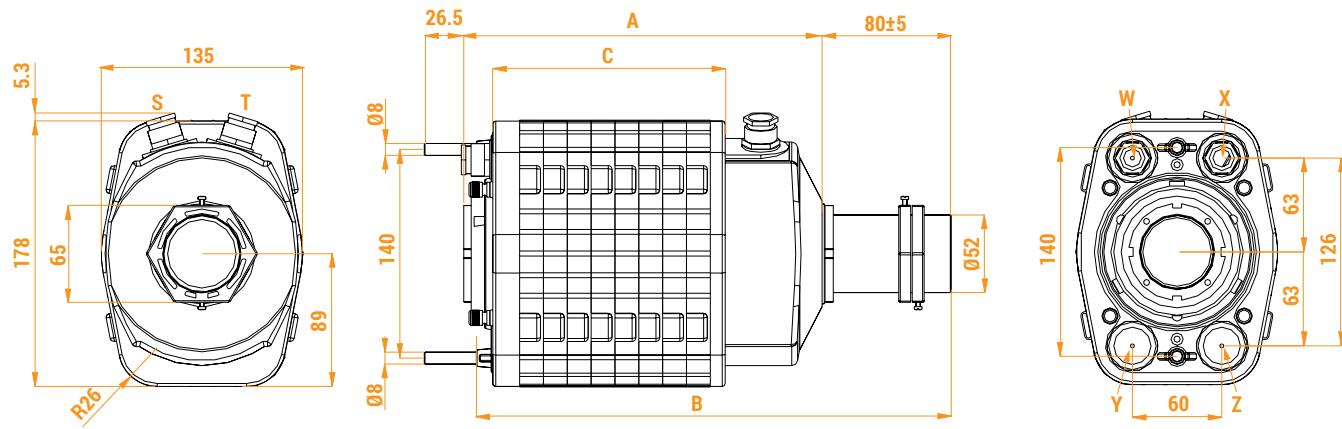
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 22
Insulation category	Class I
Operating positions	Any position
Cable entry	Cable clamps M20 Cable clamps M25

ELECTRICAL SPECIFICATIONS

Rated operational current	10 A - 30 A
Rated operational voltage	400 Vac
Rated insulation voltage	660 Vac
Max. speed	3 rev./min.
Connections	Terminals with Ø 4 mm hole Terminals with M4 screw accepting ring connectors

STANDARD SLIP RING COLLECTORS AND OVERALL DIMENSIONS (mm)



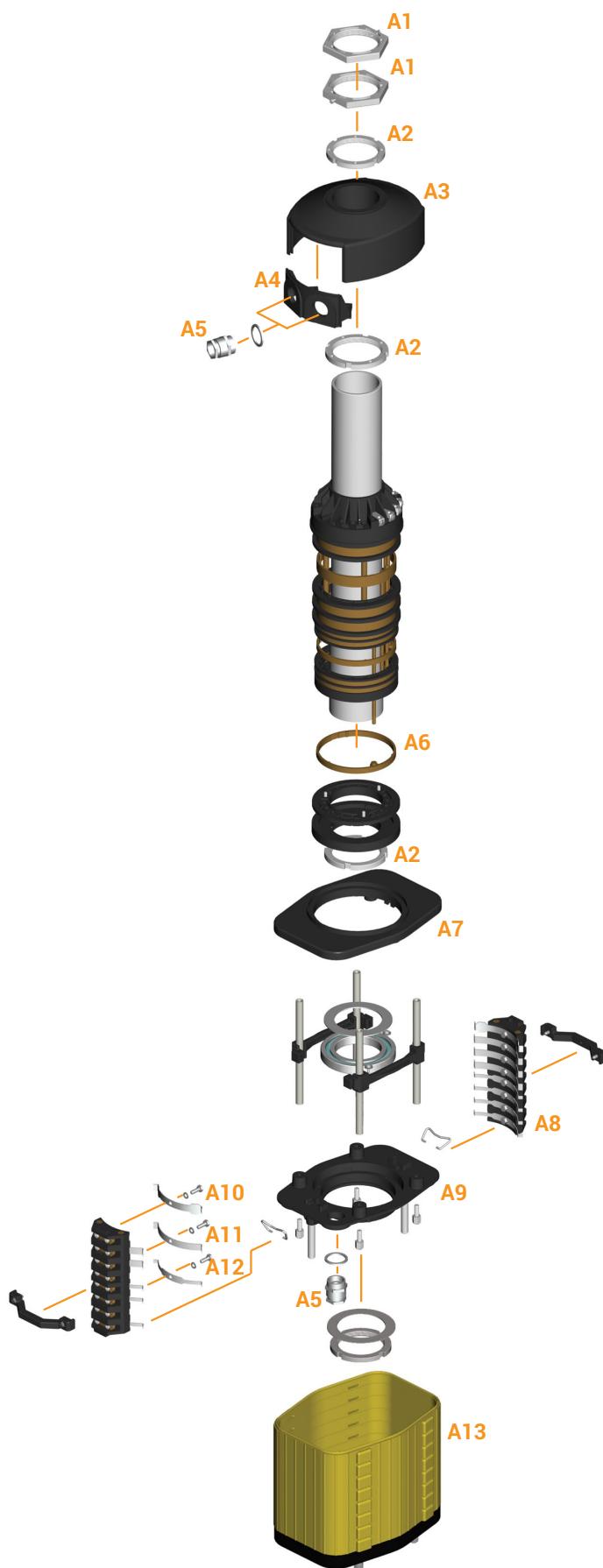
10A and 30A rings

No. of rings 10A	No. rings 30A	Cable clamps type and position						Code	Dimensions (mm)		
		S	T	W	X	Y	Z		A	B	C
1	4	M20	-	M20	-	-	-	PF2305B001	195	265	108
2	4	M20	-	M20	-	-	-	PF2306B003	211	281	124
3	4	M20	M20	M20	-	-	-	PF2307B002	211	281	124
4	4	M20	M20	M20	-	-	-	PF2308B001	227	297	140
5	4	M20	M20	M20	-	-	-	PF2309B001	227	297	140
6	4	M20	M20	M20	-	-	-	PF2310B001	243	313	156
7	4	M20	M20	M20	-	-	-	PF2311B001	243	313	156
8	4	M20	M20	M20	-	-	-	PF2312B001	259	329	172
9	4	M20	M20	M20	-	-	-	PF2313B002	259	329	172
10	4	M20	M20	M20	-	-	-	PF2314B001	275	345	188
11	4	M20	M20	M20	-	-	-	PF2315B002	275	345	188
12	4	M20	M20	M20	-	-	-	PF2316B001	291	361	204
Max No. of rings: 40									483	553	396

30A rings

No. of rings 30A	Cable clamps type and position						Code	Dimensions (mm)			
	S	T	W	X	Y	Z		A	B	C	
3	M20	-	M20	-	-	-	PF2303B001	179	249	92	
4	M20	-	M20	-	-	-	PF2304B001	195	265	108	
5	M20	-	M20	-	-	-	PF2305B002	211	281	124	
6	M20	-	M20	-	-	-	PF2306B002	227	297	140	
7	M20	M20	M20	M20	-	-	PF2307B001	243	313	156	
8	M20	M20	M20	M20	-	-	PF2308B003	259	329	172	
9	M20	M20	M20	M20	-	-	PF2309B002	275	345	188	
10	M20	M20	M20	M20	-	-	PF2310B003	291	361	204	
11	M20	M20	M20	M20	-	-	PF2311B002	307	377	220	
12	M20	M20	M20	M20	-	-	PF2312B002	323	393	236	
13	M20	M20	M20	M20	-	-	PF2313B003	339	409	252	
14	M20	M20	M20	M20	-	-	PF2314B003	355	425	268	
15	M20	M20	M20	M20	-	-	PF2315B005	371	441	284	
16	M20	M20	M20	M20	-	-	PF2316B004	387	457	300	
Max No. of rings: 20									451	521	364

ASSEMBLY DRAWING



Refer to the following tables for descriptions of components: "Brushes and rings", "Cable clamps" and "Accessories".

COMPONENTS

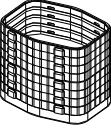
Brushes and rings

Ref.	Drawing	Description	Code
A6		Auxiliary ring 10A	PRSL4060PE
		Line ring 30A	PRSL4064PE
A8		Brush-holder with brushes	Codes on request
A10		Earth brush	PRSL4062PI
A11		Line brush	PRSL4058PI
A12		Auxiliary phosphor bronze brush	PRSL4061PI
		Auxiliary graphite brush (2 brushes used as line brush)	PRVV9075PE

Cable clamps

Ref.	Drawing	Description	Code
A4		Cable clamp support	PRSL9060PI
A5		Cable clamp M20	PRPS1075PE
		Cable clamp M25	PRPS1076PE

Accessories

Ref.	Drawing	Description	Code
A1		Nut	PRSL4010PE
A2		Ring - pitch 1.5	PRSL4001PE
A3		Cover - 1 hole	PRSL5665PI
		Cover - 2 holes	PRSL5670PI
A7		Upper plate	PRSL4056PE
A9		Lower plate	PRSL4055PE
A13		Protection	Codes on request

10A/30A - REQUEST FORM FOR NON STANDARD SLIP RING COLLECTOR

Rings

No. of 30A rings _____

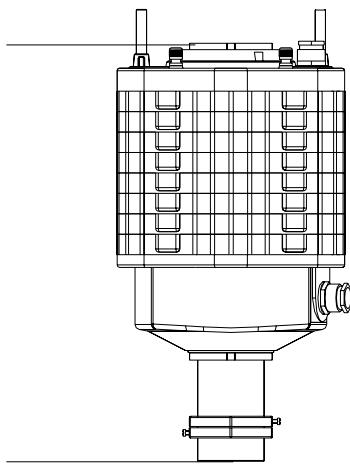
No. of 10A rings _____

Brushes

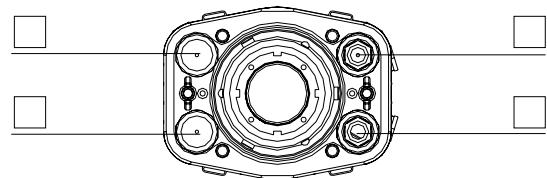
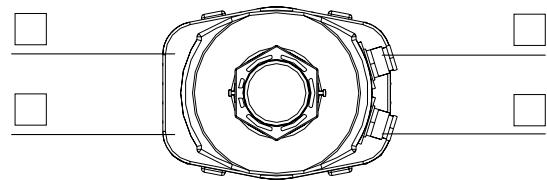
Graphite

Phosphor bronze

Tube length



Cable clamps



1 M20

2 M25

Instructions

- Write the number of 30A and 10A rings and the type of brushes required.
 - Write the input and output length of the tube required, when different from the length showed in the overall dimensions.
 - Write the type of cable clamps required on the upper cover and on the lower plate.

Remarks

50A

Slip ring collector



Slip ring collector consisting of rings coupled with brushes, designed to allow current to pass from a fixed to a rotating part and used to supply crane motors and cable winders.

FEATURES

- Suitable for transmitting current with 50/60 Hz supply frequency.
- The enclosure has small downward holes for air circulation and to prevent problems due to moisture.
- The lower support plate is provided with three holes to drain any moisture that may form inside the unit.
- The enclosure is made of shock-resistant thermoplastic material to prevent contact with live electrical parts.
- Fitted with phosphor bronze brushes.
- IP protection degree: collector 50A is classified IP22.
- Extreme temperature resistance: -25°C to +70°C.

OPTIONS

- Up to sixteen 50A line rings coupled with brushes.

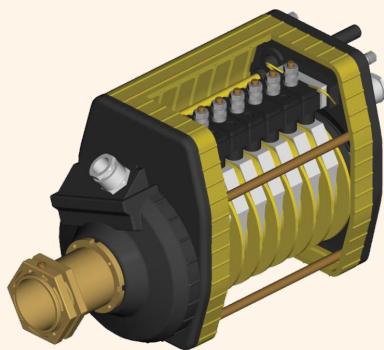
CERTIFICATIONS

- CE marking and EAC certification.

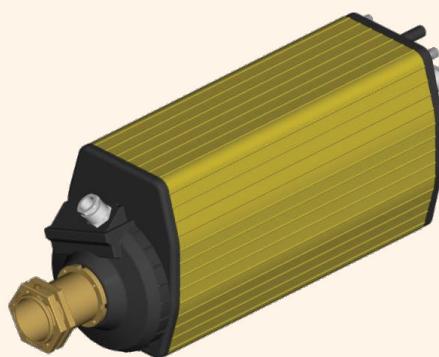
Fill in the "request form" for accurate product configuration.

POSSIBLE ASSEMBLIES

Standard (section view)



Standard 16 rings



6

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60309-1 Plugs, socket-outlets and couplers for industrial purposes - General requirements EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE EAC

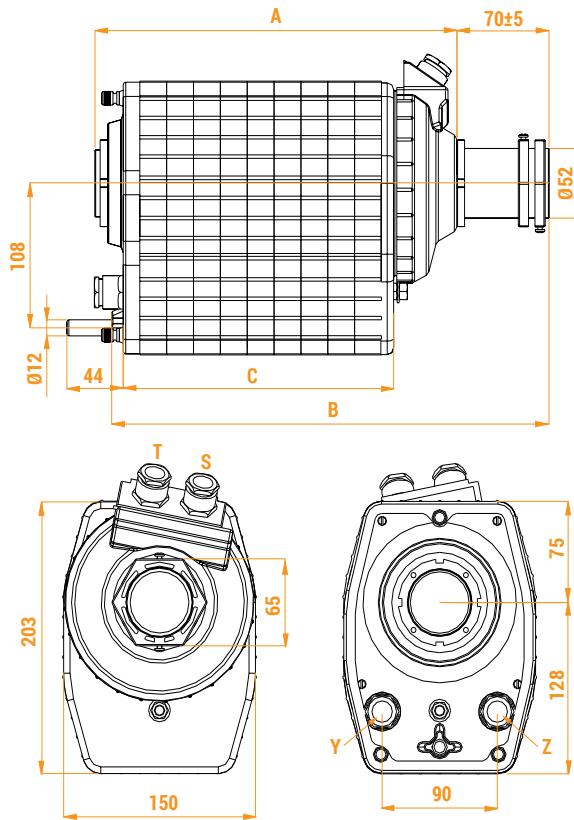
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 22
Insulation category	Class I
Operating positions	Any position
Cable entry	Cable clamps M20 Cable clamps M25

ELECTRICAL SPECIFICATIONS

Rated operational current	50 A
Rated operational voltage	400 Vac
Rated insulation voltage	660 Vac
Max. speed	3 rev./min.
Connections	Terminals with M6 screw accepting ring connectors

STANDARD SLIP RING COLECTORS AND OVERALL DIMENSIONS (mm)

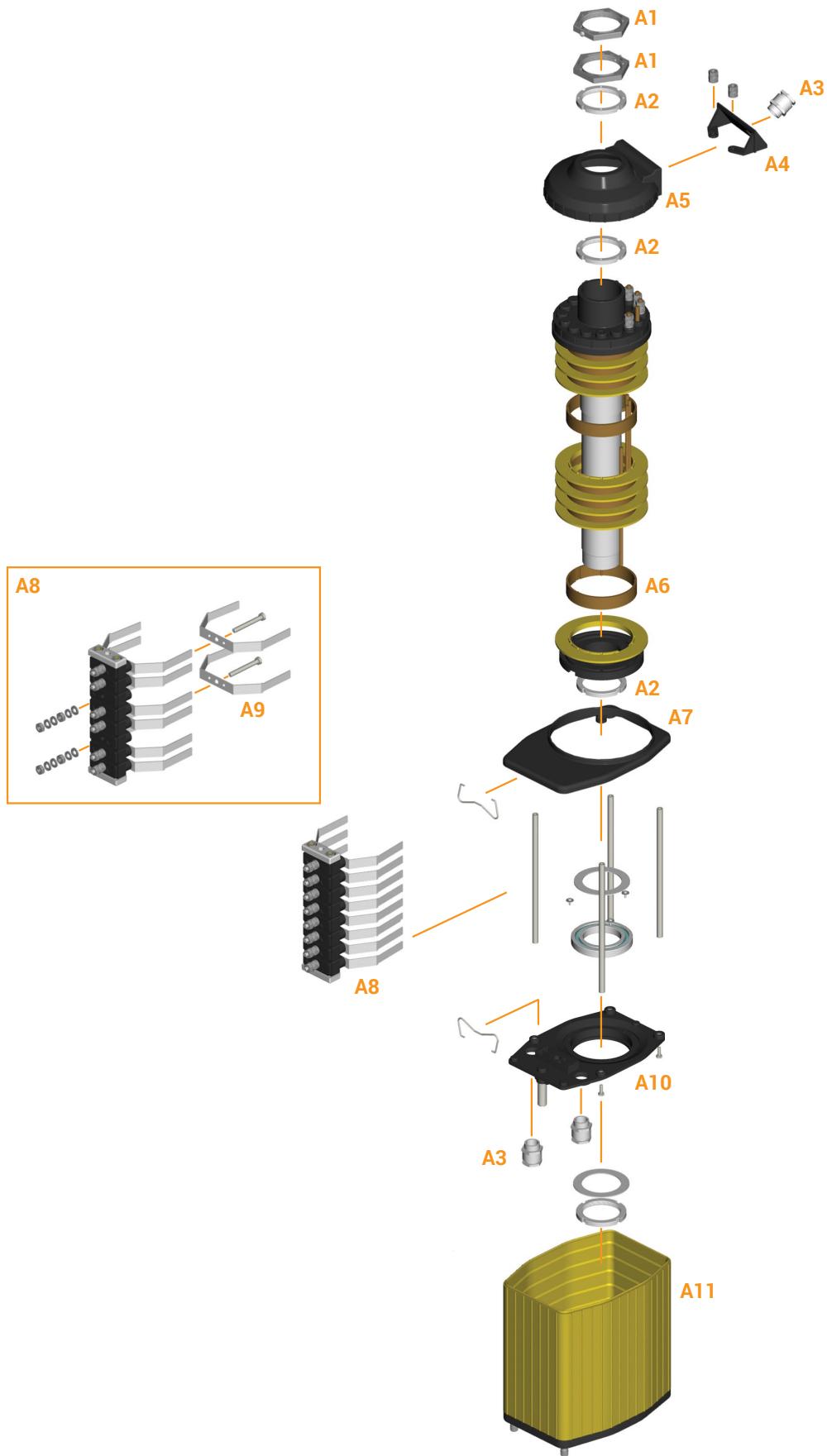


No. of rings 50A	Cable clamps type and position				Code	Dimensions (mm)		
	S	T	Y	Z		A	B	C
3	M20	-	-	M20	PF2203P001	174	249	106
4	M20	-	-	M20	PF2204P001	195	270	127
5	M20	-	-	M20	PF2205P001	216	291	148
6	M20	-	-	M20	PF2206P001	237	312	169
7	M20	M20	M20	M20	PF2207P001	258	333	190
8	M20	M20	M20	M20	PF2208P001	279	354	211
9	M20	M20	M20	M20	PF2209P003	300	375	232
10	M20	M20	M20	M20	PF2210P001	321	396	253
11	M20	M20	M20	M20	PF2211P002	342	417	274
12	M20	M20	M20	M20	PF2212P001	363	438	295
13	M20	M20	M20	M20	PF2213P001	384	459	316
14	M20	M20	M20	M20	PF2214P001	405	480	337
15	M20	M20	M20	M20	PF2215P001	426	501	358
16	M20	M20	M20	M20	PF2216P001	447	522	379

Max No. of rings: 16.

ASSEMBLY DRAWING

6



Refer to the following tables for descriptions of components: "Brushes and rings", "Cable clamps" and "Accessories".

COMPONENTS

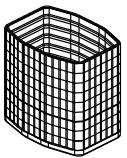
Brushes and rings

Ref.	Drawing	Description	Code
A6		Brass ring Ø 92mm	PRSL4015PE
A9		Phosphor bronze brush	PRSL4018PI
A8		Brush-holder with brushes	Codes on request

Cable clamps

Ref.	Drawing	Description	Code
A3		Cable clamp M20	PRPS1075PE
		Cable clamp M25	PRPS1076PE
A4		Cable clamp support	PRSL9066PI

Accessories

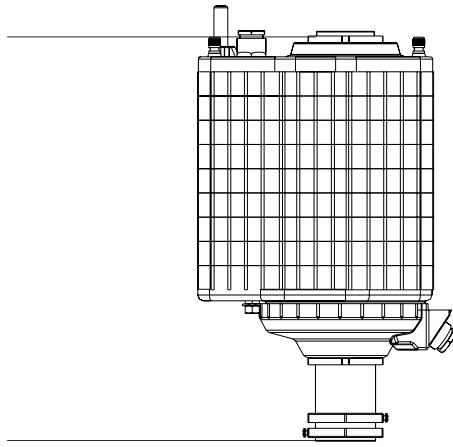
Ref.	Drawing	Description	Code
A1		Nut	PRSL4010PE
A2		Ring - pitch 1.5	PRSL4001PE
A5		Cover	PRSL5680PI
A7		Upper plate	PRSL5685PI
A10		Bearing holder lower plate	PRSL5690PI
A11		Protection	Codes on request

50A - REQUEST FORM FOR NON STANDARD SLIP RING COLLECTOR

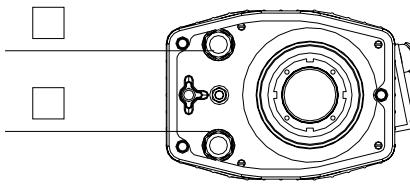
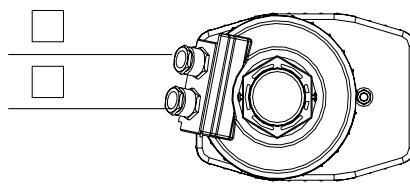
Rings

No. of 50A rings (max 16) _____

Tube length



Cable clamps



- M20
 - M25

Instructions

- Write the number of 50A rings required.
 - Write the input and output length of the tube required, when different from the length showed in the overall dimensions.
 - Write the type of cable clamps required on the upper cover and on the lower plate.

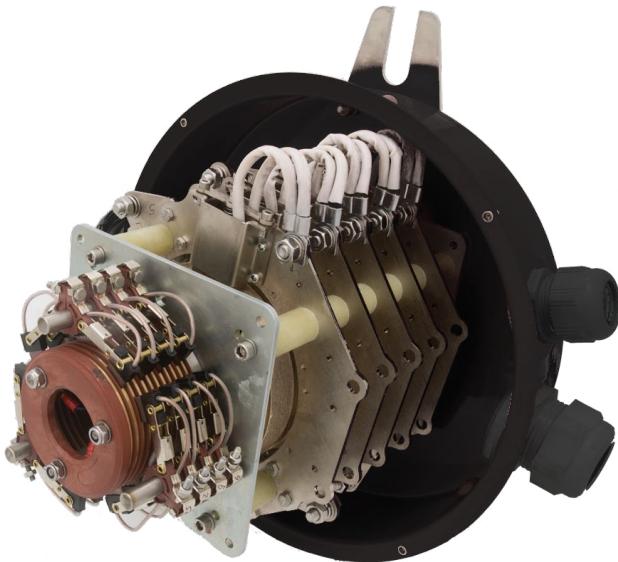
Remarks

300A/500A

Slip ring collector

6

300A/500A



Slip ring collector consisting of power rings coupled with signal rings, designed to transfer electric current from a stationary supply point to a rotating structure, transmitting power and control signals, both analogue and digital.

FEATURES

- Suitable for transferring DC current for data and control applications.
- It supports the major high speed data transmission protocols: Ethernet CAT5, Profibus, Profinet, LAN, Can-BUS, Can-Open.
- Silver or golden signal rings.
- High quality materials and components guarantee reliability and durability.
- IP protection degree: collector 300A/500A is classified IP65.
- Extreme temperature resistance: -20°C to +60°C.

OPTIONS

- High degree of customization thanks to fully modular construction system.

CERTIFICATIONS

- CE marking.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
Conformity to CE Standards	EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60309-1 Plugs, socket-outlets and couplers for industrial purposes - General requirements EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -20°C/+60°C Operational -20°C/+60°C
IP protection degree	IP 65
Insulation category	Class I
Operating positions	Any position

ELECTRICAL SPECIFICATIONS

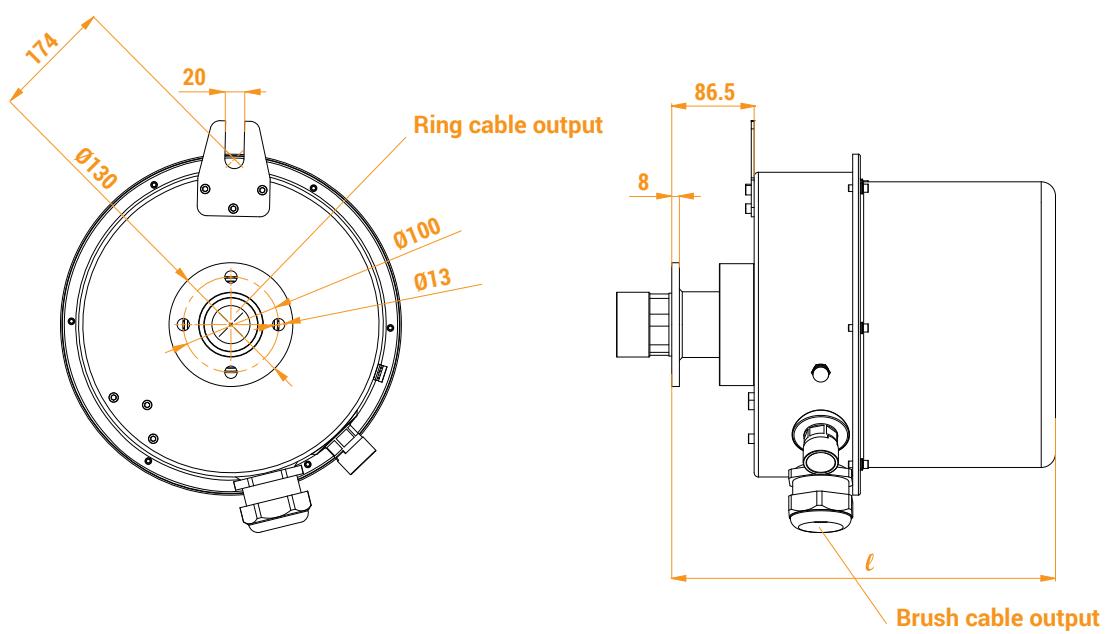
Rated operational current	Up to 500 A
Rated operational voltage	Up to 680 Vac
Maximum speed	30 rev./min.
Suitable for transferring DC current	Yes

TRANSMISSION PROTOCOL SPECIFICATIONS

Data transmission protocol	Ethernet CAT 5 ProfiBus ProfiNet LAN CAN-Bus CANOpen
Maximum speed	100 Mbit/s

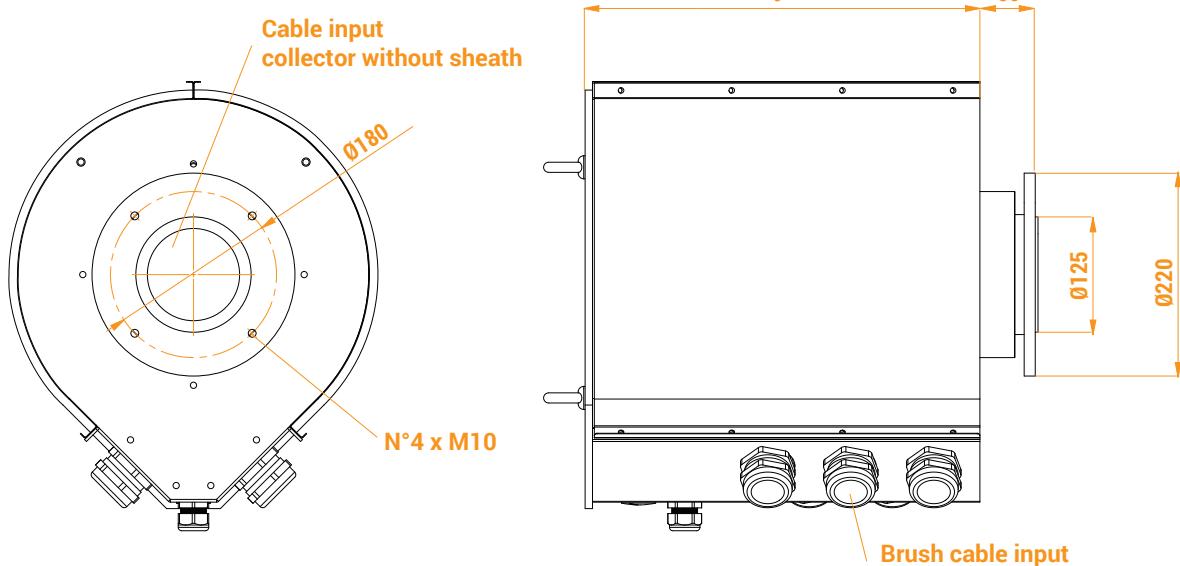
OVERALL DIMENSIONS (mm)

300A



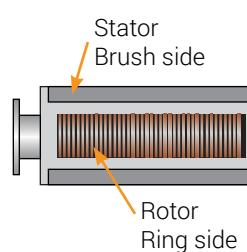
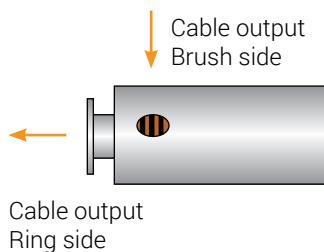
l = length varying depending on the number of rings

500A

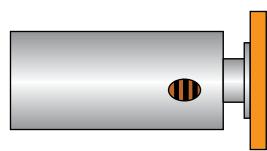


l = length varying depending on the number of rings

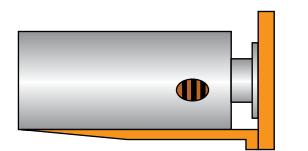
300A/500A - REQUEST FORM FOR SLIP RING COLLECTOR



Type of installation



Horizontal - Free



Horizontal - With support



Vertical



Vertical - Suspended

Specifications required

Rotating part _____

Rotation speed _____

Continuous rotation

Intermittent rotation

Works from a standstill

Operational voltage _____

Inner free diameter _____

Duty cycle _____

IP protection degree _____

Ambient temperature (°C) _____

Operational ambient temperature _____

Supplied with cable Yes No

Connections with terminal board Yes No

Ring cable lenght (m) _____

Brush cable lenght (m) _____

	No. of connections	Operating current (A)	Voltage supply (V)	Cable type	Cable section	Duty cycle
Ground						
Power						
Power						
Power						
Power						
Signal						
Signal						
Signal						
Signal						

Remarks

REMARKS

7

FOOTSWITCHES



6100/6200

Footswitch



Footswitch for auxiliary control of industrial machines. It acts on the machine motor through a power interface, such as a contactor.

FEATURES

- The emergency stop mushroom pushbutton complies with standard EN 418.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- IP protection degree: footswitch 6100/6200 is classified IP53.
- Extreme temperature resistance: -25°C to +70°C.
- Made of plastic material or die-cast aluminium.
- Materials and components are shock and wear resistant.

OPTIONS

- Available with standard protection cover or large cover for safety shoes (6100 version).
- Single or double footswitches fixed on a metal plate, with emergency mushroom pushbutton.
- Special footswitch design for pneumatic valve with fixing plate (6100 version).
- It may be fitted with "lock-release" device used for keeping the pedal pressed or with safety device to prevent accidental operation.
- Snap or slow action switches with 1NO+1NC contacts, or slow action switches with 2NO+2NC contacts.

CERTIFICATIONS

- CE marking.

Fill in the "request form" for accurate product configuration.

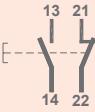
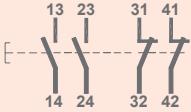
CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
	EN 418 Safety of machinery - Emergency stop equipment, functional
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+70°C Operational -25°C/+70°C
IP protection degree	IP 53
Insulation category	Class I
Cable entry	Cable clamps M20

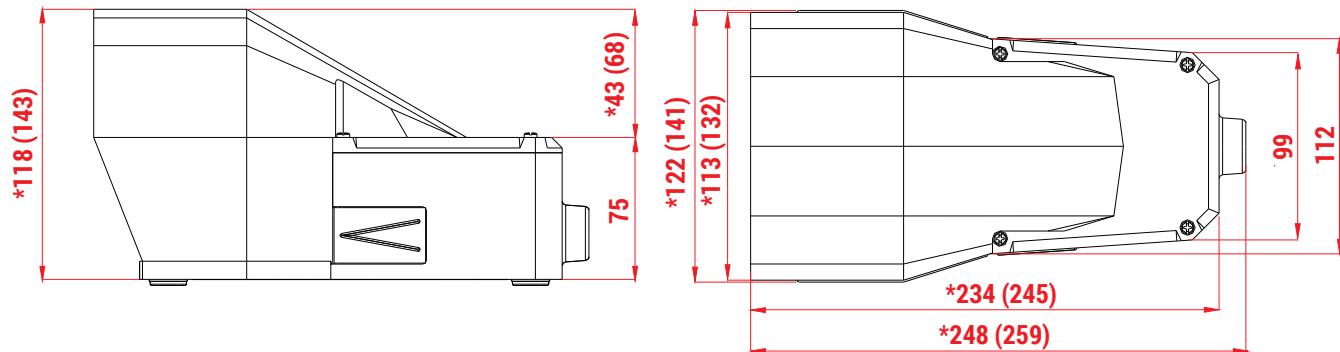
TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0036XX	PRSL0045PI	PRSL0047PI
Utilisation category	AC15	AC 15	
Rated operational current	3 A	1,9 A	
Rated operational voltage	250 Vac	380 Vac	
Rated thermal current	10 A	10 A	
Rated insulation voltage	300 Vac	500 Vac	
Mechanical life	1×10^6 operations		
Connections	Screw-type terminals		
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)		
Tightening torque	0.8 Nm		
Microswitch type	Double break, snap action	Double break, slow action	Double break, slow action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type 	1NO+1NC	2NO+2NC
Scheme			
Markings and homologations	CE  	CE 	

FOOTSWITCH 6100 - OVERALL DIMENSIONS (mm)

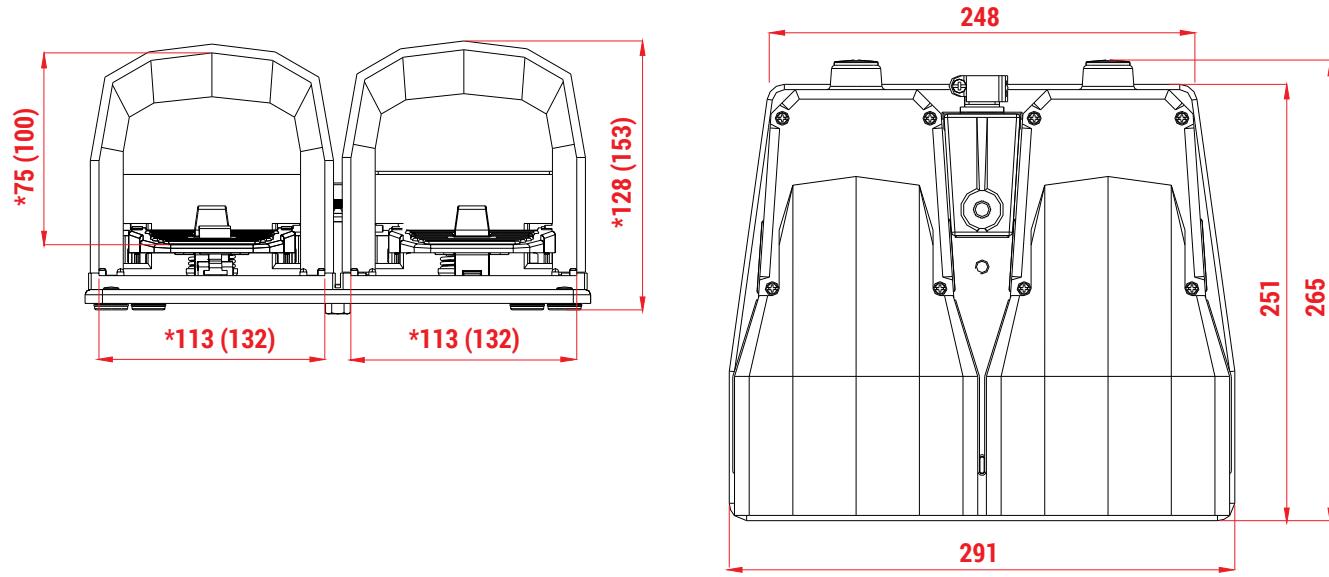
Simple

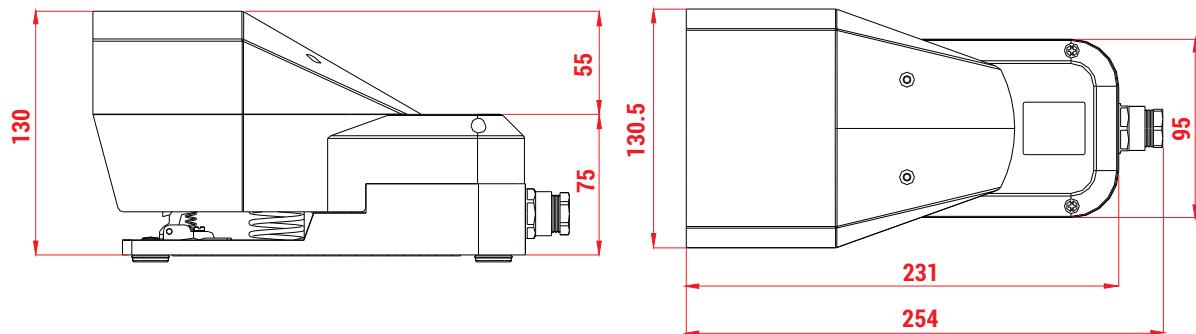
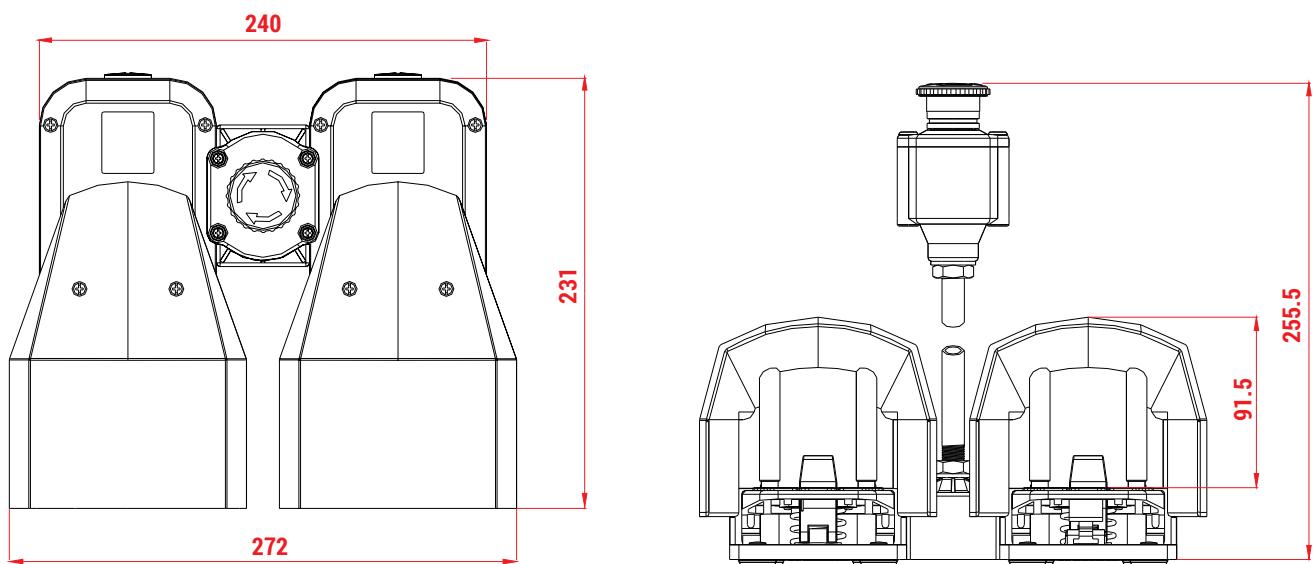
* with standard protection
() with large protection



Double

* with standard protection
() with large protection



FOOTSWITCH 6200 - OVERALL DIMENSIONS (mm)**Simple****Double**

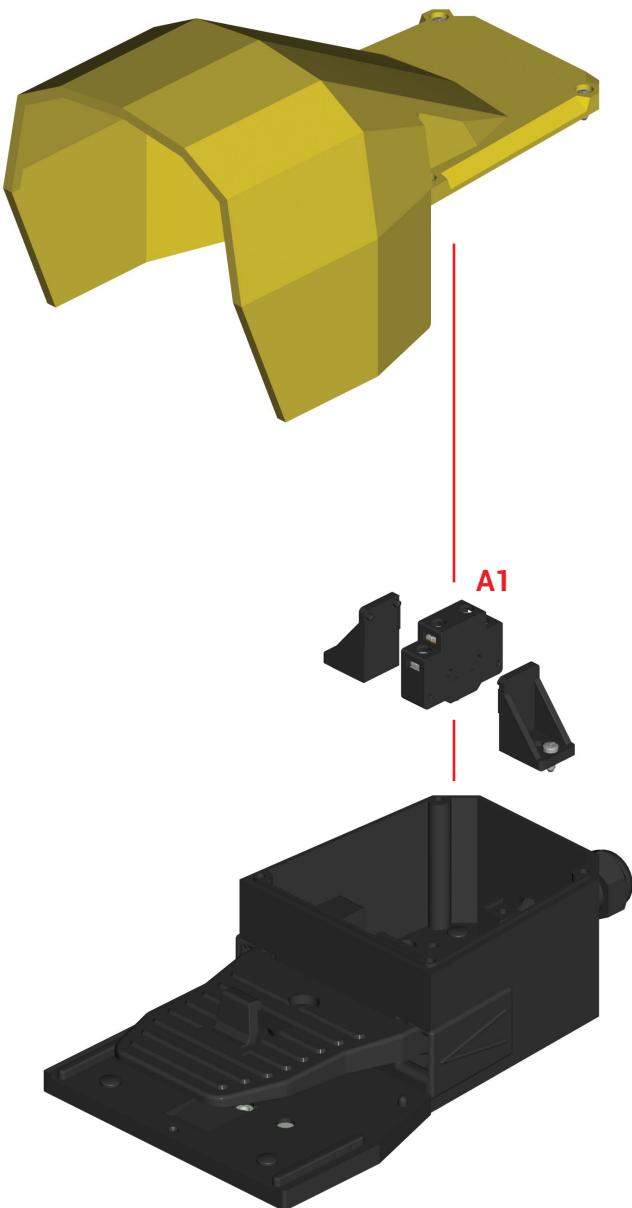
STANDARD 6100 FOOTSWITCHES

Material	Footswitch type		Protection		No. of switches			Code	
	Simple	Double	For valves	Standard	Large	PRSL0036XX 1NO+1NC snap action	PRSL0045PI 1NO+1NC slow action	PRSL0047PI 2NO+2NC slow action	
Plastic	X			X	1				PF04612100
	X			X	2				PF04612200
	X			X	3				PF04612300
	X			X		1			PF04612500
	X			X			1		PF04612600
	X			X		1	1		PF04612700
	X			X			2		PF04612800
		X		X	2				PF04613100
		X		X	4				PF04613200
		X		X		2			PF04613300
		X		X			2		PF04613400
		X		X			4		PF04613500
	X	X	X						PF04814100
	X	X		X					PF04814600
	X			X	1				PF04615100
	X			X	2				PF04615200
	X			X	3				PF04615300
Aluminium	X			X		1			PF04615500
	X			X			1		PF04615600
	X			X		1	1		PF04615700
	X			X			2		PF04615800
		X		X	2				PF04616100
		X		X	4				PF04616200
		X		X		2			PF04616300
		X		X			2		PF04616400
		X		X			4		PF04616500
	X			X	1				PF04617100
	X			X	2				PF04617200
	X			X	3				PF04617300
	X			X		1			PF04617500
	X			X			1		PF04617600
	X			X		1	1		PF04617700
	X			X			2		PF04617800
		X		X	2				PF04618100
		X		X	4				PF04618200
		X		X		2			PF04618300
		X		X			2		PF04618400
		X		X			4		PF04618500

STANDARD 6200 FOOTSWITCHES

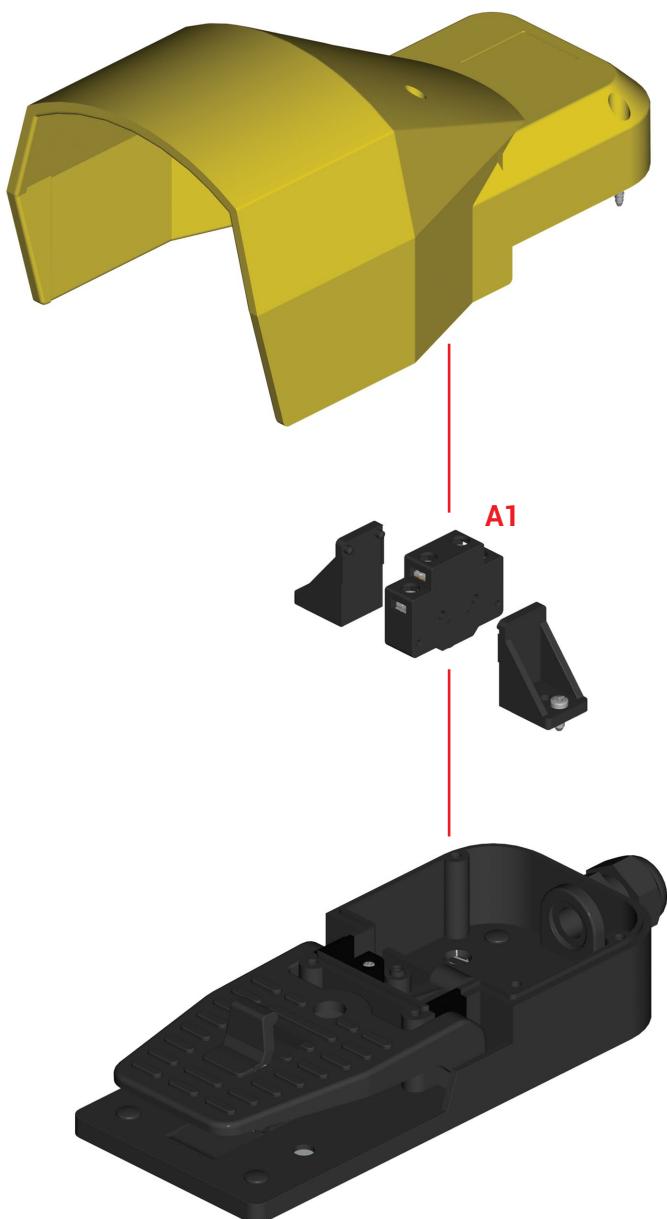
Footswitch type	No. of switches		
Simple	PRSL0036XX 1NO+1NC snap action	PRSL0045PI 1NO+1NC slow action	PRSL0047PI 2NO+2NC slow action
Double			
X	1		PF18620010
X	2		PF18620025
X		1	PF18620037
X		1	PF18620050
X	2		PF18620053
X	4		PF18620054
X		2	PF18620055
X		2	PF18620056

6100 FOOTSWITCH - ASSEMBLY DRAWING



Refer to the following table for descriptions of components: "Switches".

6200 FOOTSWITCH - ASSEMBLY DRAWING



Refer to the following table for descriptions of components: "Switches".

COMPONENTS

Switches

Ref.	Drawing	Description	Scheme	Code
		1NO+1NC snap action switch		PRSL0036XX
A1		1NO+1NC slow action switch		PRSL0045PI
		2NO+2NC slow action switch		PRSL0047PI

6100/6200 - REQUEST FORM FOR NON STANDARD FOOTSWITCH

Footswitch type

- 6100 Simple
 - 6100 Double
 - 6200 Simple
 - 6200 Double

Protection for 6100 footswitch*

- Standard aluminium
 - Large aluminium
 - Large plastic

* 6200 footswitch is always equipped with standard plastic protection.

Switches

- 1NO+1NC snap action
 - 1NO+1NC slow action
 - 2NO+2NC slow action

Pedal

- With safety device
 - Without safety device
 - With lock-release device

Instructions

- Tick the box corresponding to the type of footswitch required.
 - Tick the boxes corresponding to the type of protection required (only for 6100 footswitch).
 - Write the number and type of switches required (max. 3 snap action switches and max. 2 slow action switches). It is not possible to assemble both snap and slow action switches on the same footswitch.
 - Tick the box corresponding to the type of pedal required.

Remarks

OMICRON

Footswitch



Footswitch for auxiliary control of machinery such as shearing, bending, wrapping machines, lathes, riveters and machine tools.

FEATURES

- Positive opening NC contacts for safety functions (not available for mini-footswitch configurations).
- Mechanical life of switches: up to max. 30 million operations.
- IP protection degree: footswitch Omicron is classified IP40 (mini-footswitch configuration) and IP65.
- Extreme temperature resistance: from -25°C to +70°C.
- Salt mist resistant.
- Base, cover and pedal made of shock resistant ABS material or of self-extinguishing polycarbonate/ABS-V0, or cover made of die-cast aluminium and base and pedal made of self-extinguishing polycarbonate/ABS-V0.
- Materials and components are shock and wear resistant.

OPTIONS

- Available in different configurations featuring various operation modes, cover color (grey, yellow or red) and switches.
- Available in five different lever operation modes: with free movement, with lever locked in neutral position or latched in low position, with free movement featuring two-stage actuating force, and with lever locked in neutral position with two-stage actuating force.
- Single or double footswitches and mini-footswitches available.
- 1 or 2 switches with 1NO+1NC slow or snap action contacts.

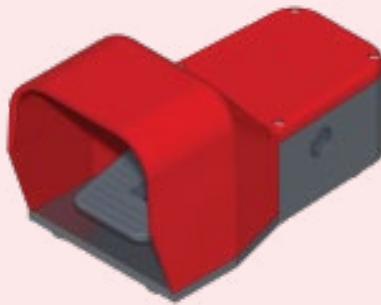
CERTIFICATIONS

- CE and UL marking (pending).

Fill in the "request form" for accurate product configuration.

POSSIBLE ASSEMBLIES

Omicron footswitch with red aluminium cover



Omicron mini-footswitch with grey cover



CERTIFICATIONS

Conformity to CE Standards

EN 60947-1 Low-voltage switchgear and controlgear

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices

EN 60529 Degrees of protection provided by enclosures

IEC 61058-1 Switches for appliances - Part 1: General requirements
(for mini-footswitch)IEC 60068-2-78 Environmental Testing - Part 2-78: Tests - Test Cab: Damp heat, steady state
(for footswitch with cover)IEC 60068-2-11 Environmental Testing - Part 2: Tests - Test Ka: Salt Mist
(for footswitch with cover)IEC 60068-2-27 Environmental Testing - Part 2: Tests - Test Ea & guidance: Shock
(for footswitch with cover)

Markings and homologations

Mini-footswitch

Footswitch with cover (pending)

GENERAL TECHNICAL SPECIFICATIONS

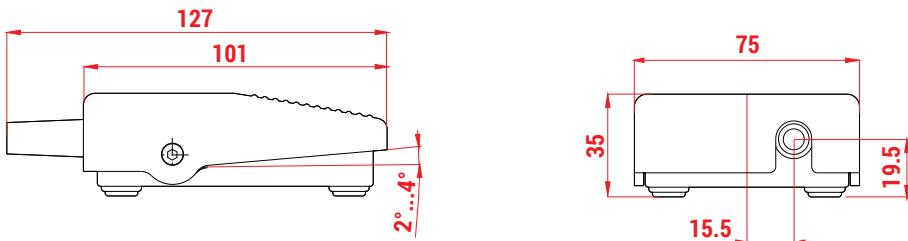
Footswitch type	Mini-footswitch	Footswitch with cover
Ambient temperature		Storage -30°C/+80°C Operational -25°C/+70°C
Climatic resistance	-	Saline fog
Shock resistance	-	50g (1/2 sinusoidal shock for 11 ms) no change in contact position
IP protection degree	IP 40	IP 65
Operating torque	1.2 Nm	0.25 Nm
Operating angle	from 2° to 4°	15°
Cable entry	Cable clamp Ø 6, 8.5 max.	Cable clamp M20

ELECTRICAL SPECIFICATIONS

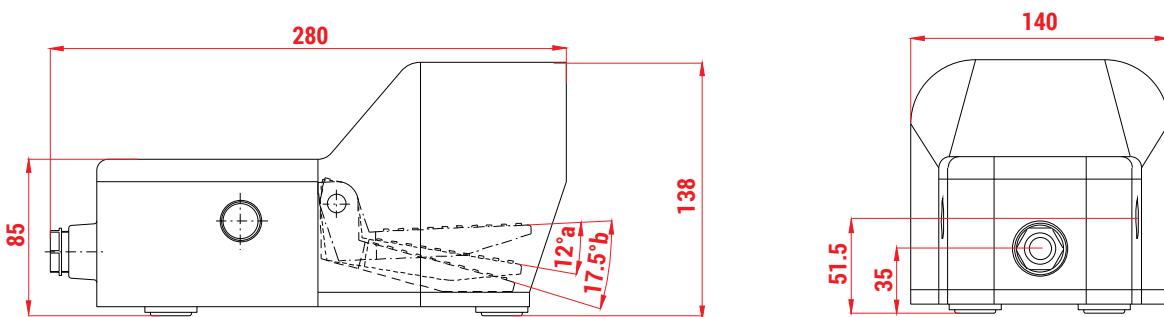
Footswitch type	Mini-footswitch	Footswitch with cover
Utilisation category	-	AC15 - DC13
	3 A / 250 Vac	A600 (according to UL508 and CSA C22-2 n.14)
	0.06 A / 230 Vdc	Q600 (according to UL508 and CSA C22-2 n.14)
	-	10 A / 24 Vac / AC15
Rated operational current	-	6 A / 240 Vac / AC15
	-	4 A / 400 Vac / AC15
	-	6 A / 24 Vdc / DC13
	-	0.55 A / 125 Vdc / DC13
	-	0.4 A / 250 Vdc / DC13
Rated insulation voltage	250 V	690 V degree of pollution 3
Rated voltage impulse	1 kV	6 kV
Conventional free air thermal current θ < 40°C	15 A	10 A
Short-circuit protection U _e < 500 Vac - fuse type gG (gl)	10 A	10 A
Contact resistance	30 mΩ	25 mΩ
Mechanical life	10x10 ⁶ operations	30x10 ⁶ operations
Connections	Screws M3 x 0.5 (Philips head no. 1 and washer)	Screws with cable clamp M3.5 (+,-) pozidriv 2
Wires	-	1 o 2 x 0.75 ... 2.5 mm ²
Switch type	Change-over	Snap action
	-	Slow action
Contacts	1NO / 1NC	1NO+1NC (All NC contacts are of the positive opening operation type \ominus)
Scheme		

OVERALL DIMENSIONS (mm)

Omicron mini-footswitch



Omicron footswitch with cover



OMICRON - REQUEST FORM FOR FOOTSWITCH

Omicron mini-footswitch

<input type="text" value="D3"/>	<input type="text"/>	<input type="text"/>	Cover color 1 = yellow 2 = grey 3 = black 4 = red	
Base color 1 = grey 2 = black				

Instructions

Write into the boxes the numbers corresponding to the characteristics required and obtain the footswitch code (see example).

<input type="text" value="D3"/>	<input type="text" value="2"/>	<input type="text" value="1"/>
---------------------------------	--------------------------------	--------------------------------

Omicron footswitch with cover

<input type="text" value="D"/>	<input type="text"/>	<input type="text" value="2"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Cover material - = Shock resistant ABS (standard) V0 = Self-extinguishing polycarbonate/ABS V0-M = Self-extinguishing polycarbonate/ ABS base and aluminium cover			
Footswitch type 1 = simple 2 = double										
Devices 1 = free movement of the lever (There is no particular device preventing the lever from being actuated freely). 2 = lever moving after unlocking the safety device (The pedal can be actuated only after disactivating the mechanical safety device, after fully inserting the foot, thus preventing any accidental actuation). 3 = latching device to maintain the lever in lowered position (By lowering the lever the contacts are switched on, the lever remains locked and the contacts activated). 4 = free movement of the lever with two-stage actuating force (By applying a light pressure on the lever, the first contact will be activated while the second one remains deactivated. A greater pressure on the lever will switch on also the second contact). 5 = lever moving after unlocking the safety device with two-stage actuating force (Same as above, but the pedal can be actuated only by completely inserting the foot to deactivate the mechanical safety device).							Switches 1 = 1 NO+NC snap action switch 2 = 1 NO+NC slow action switch 3 = 2 NO+NC snap action switches 4 = 2 NO+NC slow action switches			
									Cover color 1 = yellow 2 = grey 3 = yellow + grey (double footswitch) 4 = red 5 = red half cover 7 = yellow half cover 8 = grey half cover	

Instructions

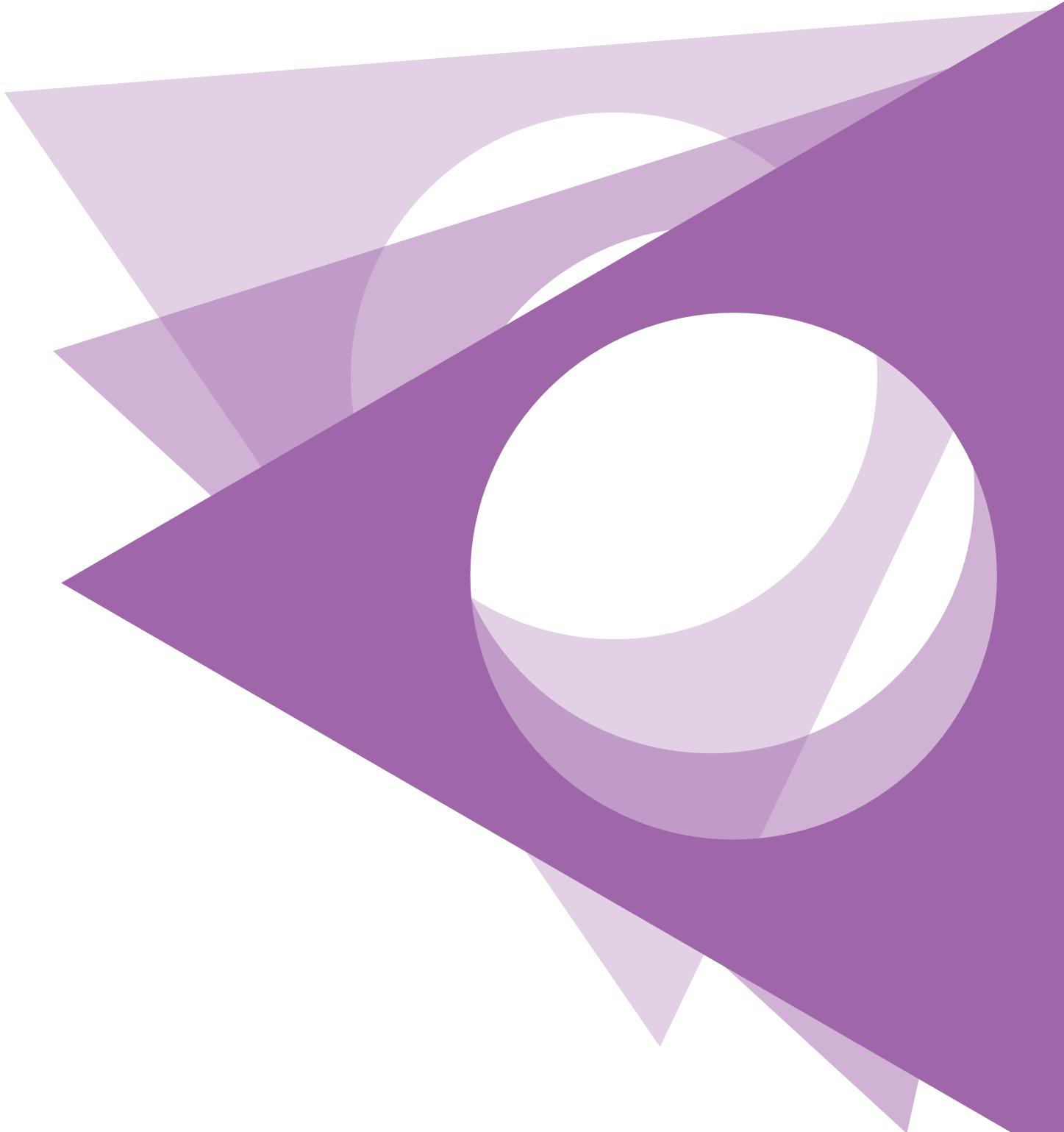
Write into the boxes the numbers corresponding to the characteristics required and obtain the footswitch code (see example).

<input type="text" value="D"/>	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="1"/>	<input type="text" value="V0"/>
--------------------------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------	---------------------------------

REMARKS

ELECTRONIC DEVICES

8



PANDIA

Cable transducer



Cable transducer, suitable for industrial applications needing measurement of linear positions. Sturdy, reliable, featuring a compact-sized design, it is studied to offer a variety of mounting solutions, even for small spaces.

FEATURES

- Available with lockable vents and water drain holes.
- 4 function keys for set up.
- IP protection degree: Pandia is classified IP65, IP67, IP69K.
- Extreme temperature resistance: from -25°C to +80°C.
- Featuring a sturdy case in technopolymer and equipped with a robust measuring wire (made of stainless steel), the cable transducer Pandia guarantees an exceptionally long, maintenance-free service life even in harsh conditions.
- All materials and components used are wear resistant and guarantee protections against water and dust.

OPTIONS

- Available in two versions with measuring wire ranging up to 3 m or 5 m.
- Available with **4-20 mA** analogue interface with cable clamp, or **SSI** digital interface with connector, or **CAN** with connector.
- A redundant version with analogue or digital output is also available.
- 4 configurable relay outputs.
- Different connector output positions available.

CERTIFICATIONS

- CE marking.

Fill in the "request form" to configure properly the product.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

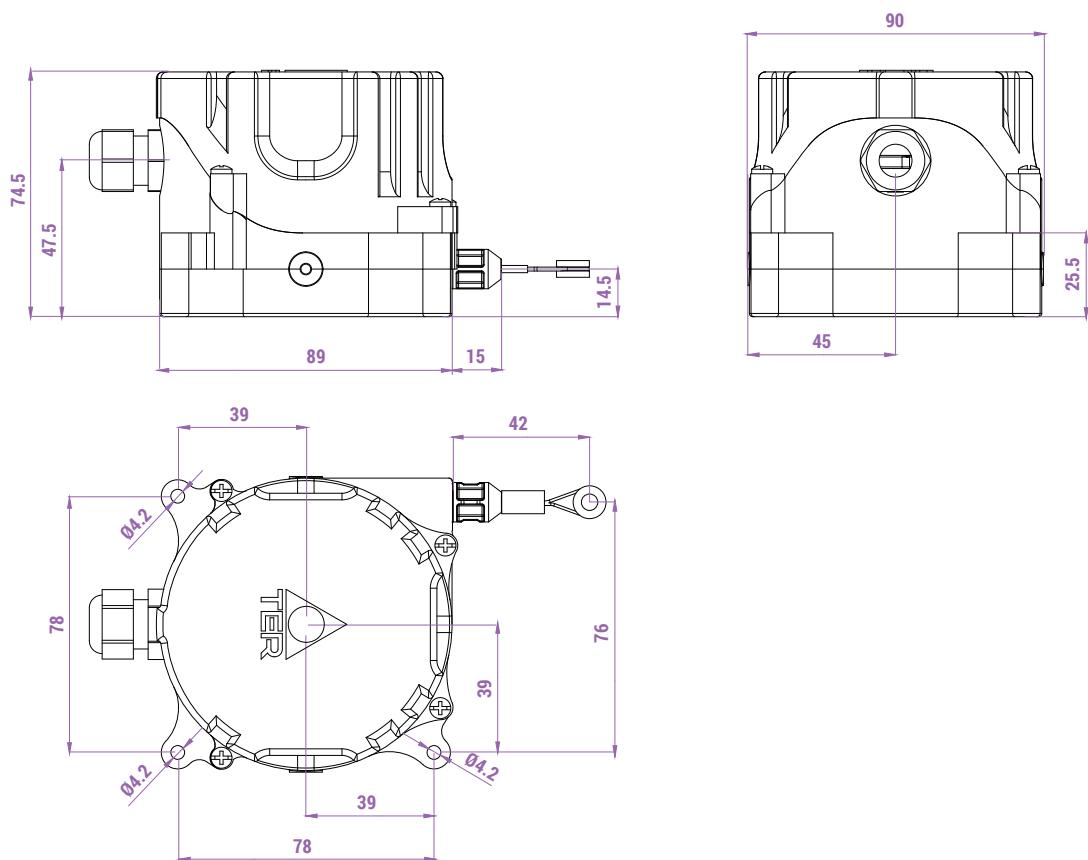
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -25°C/+80°C Operational -25°C/+80°C
IP protection degree	IP 65, IP 67, IP 69K
Measuring range	3000 mm 5000 mm
Pull-out force	5.5 N max
Sensing method	Magnetic
Max. speed	3 m/s
Weight	420 g

ELECTRICAL SPECIFICATIONS

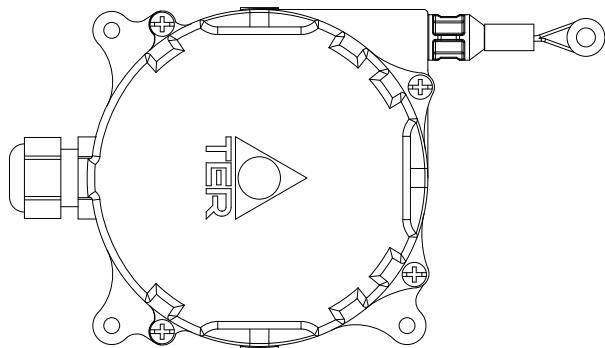
Interfaces	Analogue 4 - 20 mA	Digital SSI	Digital CAN
Power supply		9 - 48 Vdc	
Resolution		< 2 mm	
Accuracy		< 10 mm	
Code	/	Binary	Binary
Relay output	No 4 relays 1 A / 125 Vac	/	/
Connections	Cable clamp M16	Connector M12 8 PIN	Connector M12 8 PIN

OVERALL DIMENSIONS (mm)

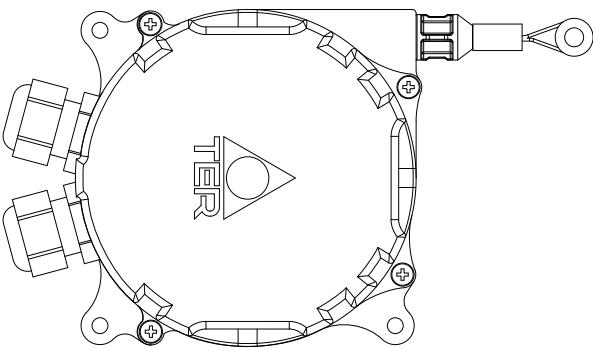


CABLE CLAMP OUTPUT POSITION (ANALOGUE INTERFACE)

Non-redundant Pandia

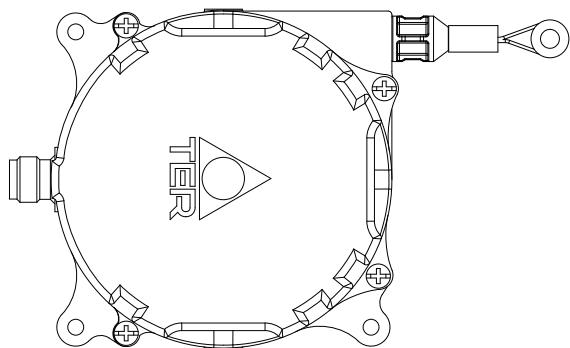


Redundant Pandia

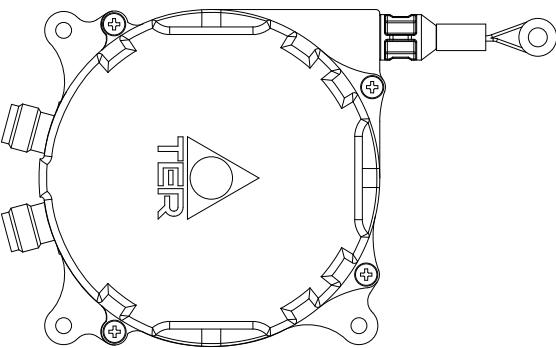


CONNECTOR OUTPUT POSITION (DIGITAL INTERFACE)

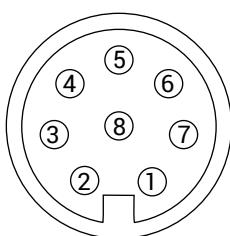
Non-redundant Pandia



Redundant Pandia



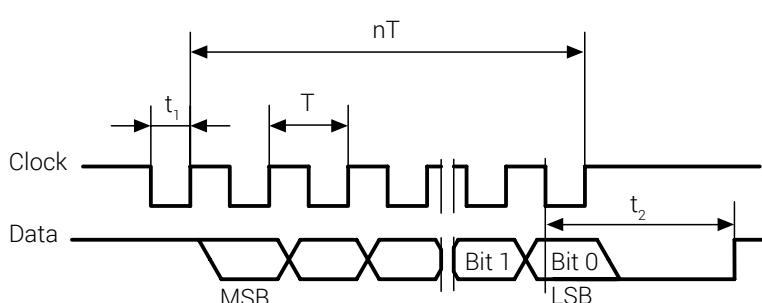
FEMALE CONNECTOR ASSIGNMENT (DIGITAL INTERFACE)



Female connector (optional)
(rear view)

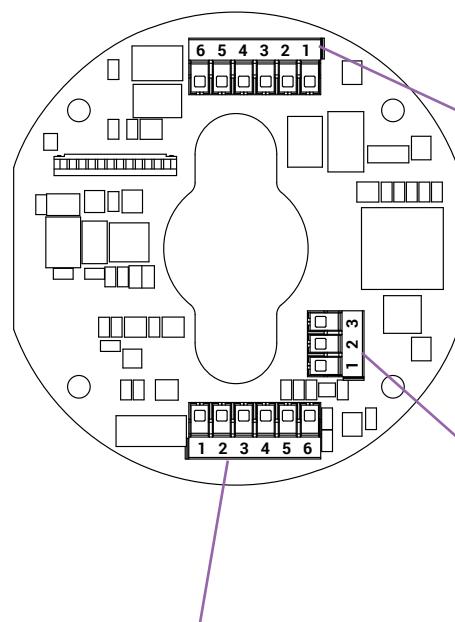
Pin	Signal	Description
1	+Vs	Supply voltage
2	DIR	Input direction
3	Data+	Data signal
4	Data-	Data signal
5	Clock-	Clock signal
6	Clock+	Clock signal
7	SET	Zero setting
8	0 V	Supply voltage

SSI SIGNAL OUTPUT



$T = 0.5 \dots 10 \mu\text{s}$
 $t_2 \leq 20 \pm 2 \mu\text{s}$
 $t_1 = 0.25 \dots 5 \mu\text{s}$
 $f_{\text{max.}} = 2 \text{ MHz}$

CONNECTION PIN-OUT



POS	Relays	Description
1	Relay 3	NO
2	Relay 3	COM
3	Relay 3	NC
4	Relay 4	NO
5	Relay 4	COM
6	Relay 4	NC

POS	Relays	Description
1	Relay 1	NO
2	Relay 1	COM
3	Relay 1	NC
4	Relay 2	NO
5	Relay 2	COM
6	Relay 2	NC

POS	Description
1	9 - 48 Vac
2	I OUT 4 - 20 mA
3	GND

PANDIA - REQUEST FORM FOR CABLE TRANSDUCER

Type

- Non-redundant Pandia
 Redundant Pandia

Output

- Analogue 4 - 20 mA
 Digital SSI*
 Digital CAN

* Available only for non-redundant version.

Wire hooking ring diameter

- 10 mm
 15 mm

Instructions

- Tick the box corresponding to the type of transducer required.
- Tick the box corresponding to the type of output required.
- Tick the box corresponding to the wire measuring range required.
- Tick the box corresponding to the type of wire hooking ring required.

Wire measuring range

- 3000 mm
 5000 mm

EGON

Analogue and digital encoder



Single-turn **redundant** angular transducer, which measures and converts mechanical rotations into a scaled electrical signal, suitable for motion control systems to enable angular movement and positioning of a moving machine component. It is used in a variety of industrial sectors, from automation to robotics, from medical to marine, from entertainment to automotive.

FEATURES

- Egon is a magnetic angular sensor, which reads the shaft position within the range 0°... 360° and converts it into the corresponding analogue signal 4-20 mA.
- The resulting analogue output acts as a traditional potentiometer, featuring immunity to interference, usage of long cables without causing instability, current or voltage calibrated output, possibility of changes of the power supply without affecting the output signal and usage of the output as percentage on the revolution or as angle.
- Compact and flexible, it is designed for easy assembly and wiring together with standard sets of cams, as an alternative to the use of potentiometric transducers.
- Single turn measuring resolution guaranteed by 4096 points per revolution (12 bit).
- IP protection degree: Egon is classified IP65, IP67 and IP69K (pending).
- Extreme temperature resistance: from -25°C to +80°C.
- Featuring technopolymer housing and stainless steel AISI 303 shaft.
- High quality materials and components guarantee long mechanical life, precision and repeat accuracy even in extreme conditions.

OPTIONS

- Suitable for installation on Fox, Oscar and Top rotary limit switches to control multi-revolutions rotors.
- Available with 4-20 mA analogue interface with cable clamp, or with CANbus digital interface with connector.
- Available in configurations with shaft or with contactless magnet and bush.
- High level of safety guaranteed by the double stage redundant scheme.
- Featuring protection against input over-current and input and output over-voltage.
- Available with clamping flange, interface female connector and adapter coupling (\varnothing 6-6, \varnothing 6-8, \varnothing 6-10).

CERTIFICATIONS

- CE marking.

Fill in the "request form" to configure properly the product.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive (LVD) 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -25°C/+80°C Operational -25°C/+80°C
IP protection degree	IP65, IP67, IP69K (pending)
Rated rotation speed	800 rev./min
Maximum rotation speed	1500 rev./min
Mechanical life	Egon-RS with shaft > 30x10 ⁶ revolutions Egon-RS contactless ∞
Shaft diameter	6 mm
Connections	Male connector M8 4 PIN Cable Cable with male connector M12 5 PIN

ELECTRICAL SPECIFICATIONS

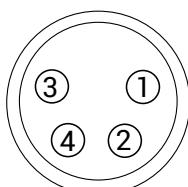
Power supply	9 ... 36 Vdc
Output	Analogue 4 - 20 mA Digital CAN-bus
Consumption	35 mA
Single-turn resolution	12 bit (4096 points per revolution)
Protection against input over-current	Yes
Protection against input and output over-voltage	Yes
Accuracy	+/- 0.35°
Linearity	+/- 0.25°
Redundancy	2 offset outputs (analogue)

MALE CONNECTOR SPECIFICATIONS

Number of PINs	4	5 (Code A)
Insulation resistance		$\geq 100 \text{ M}\Omega$
Wires		4.5 - 6.5 mm
Contacts		CuZn gold plated
Mating	M8 4 PIN female connectors (Amphenol 8P-04AFFM-SL7A01)	M12 5 PIN Code A female connectors (Amphenol LTW12-05BFFA-SL8001)

MALE CONNECTOR ASSIGNMENT

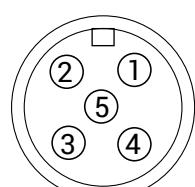
4 PINs connector



Male connector
(front view)

PIN	Signal
1	9 - 36 Vdc
2	IOut 1 / CAN-L
3	IOut 2 / CAN-H
4	GND

5 PINs connector (cable output)

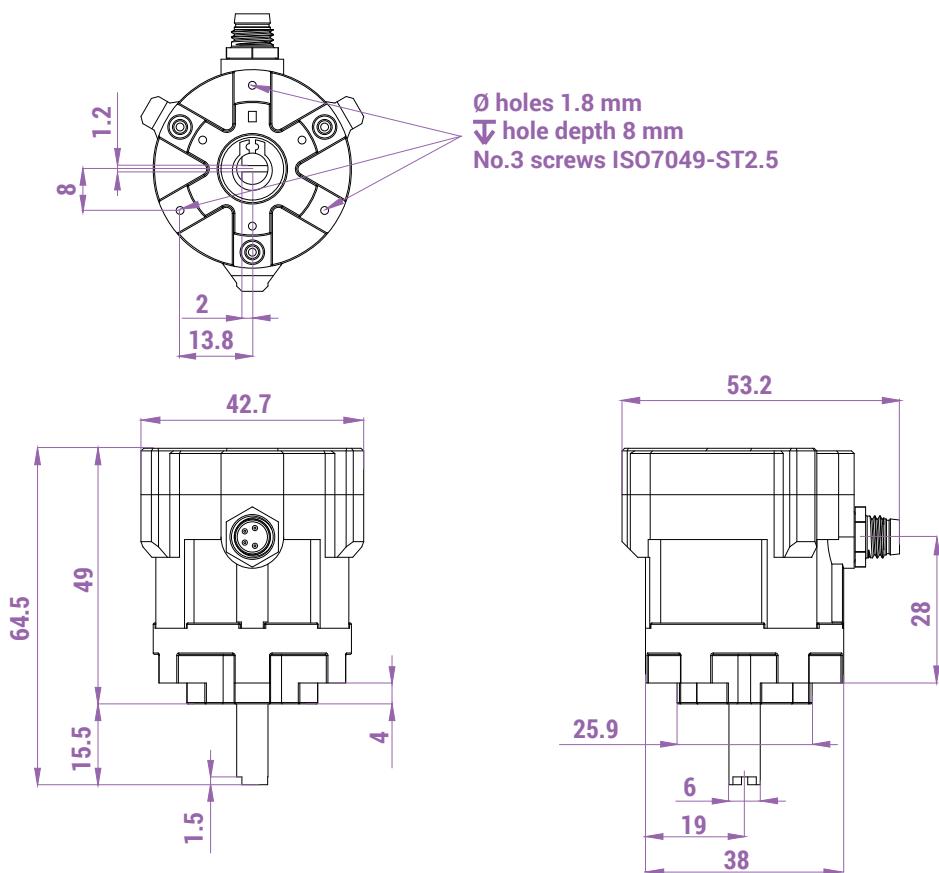


Male connector
(front view)

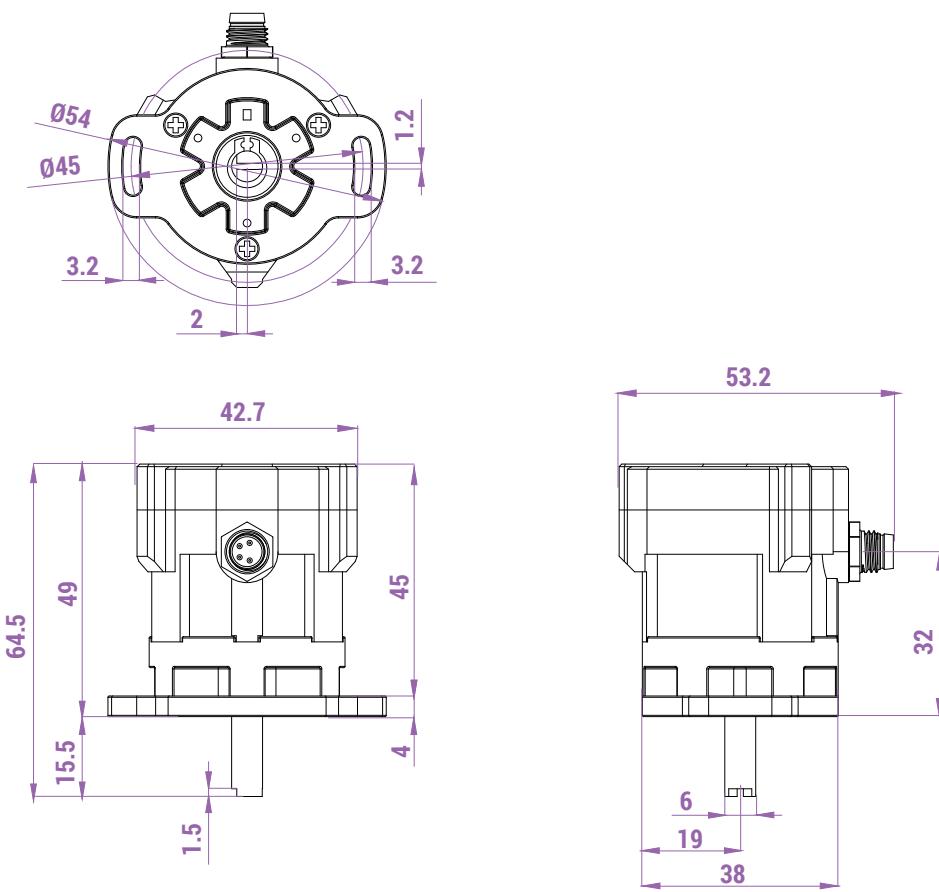
PIN	Signal
1	9 - 36 Vdc
2	IOut 1 / CAN-L
3	IOut 2 / CAN-H
4	GND
5	/

OVERALL DIMENSIONS (mm)

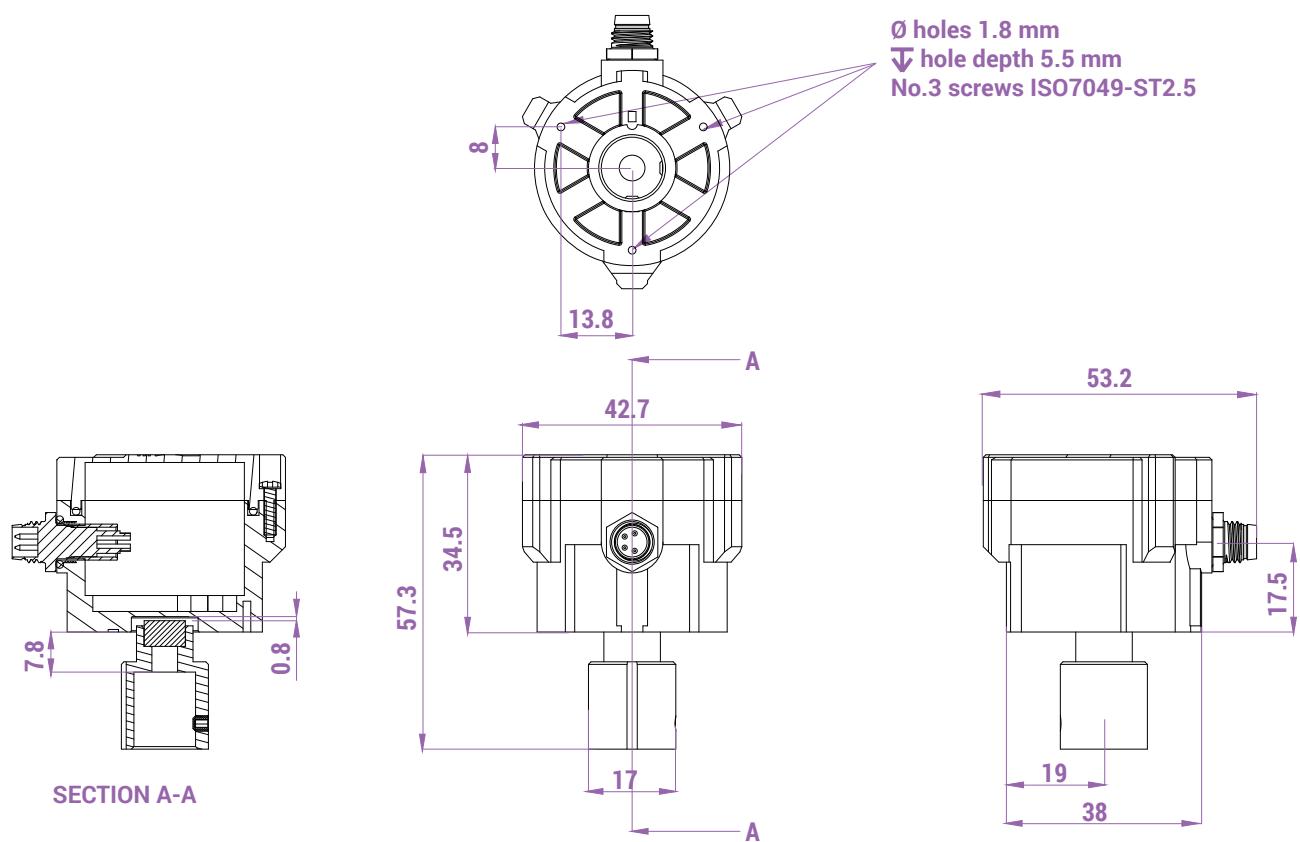
With shaft



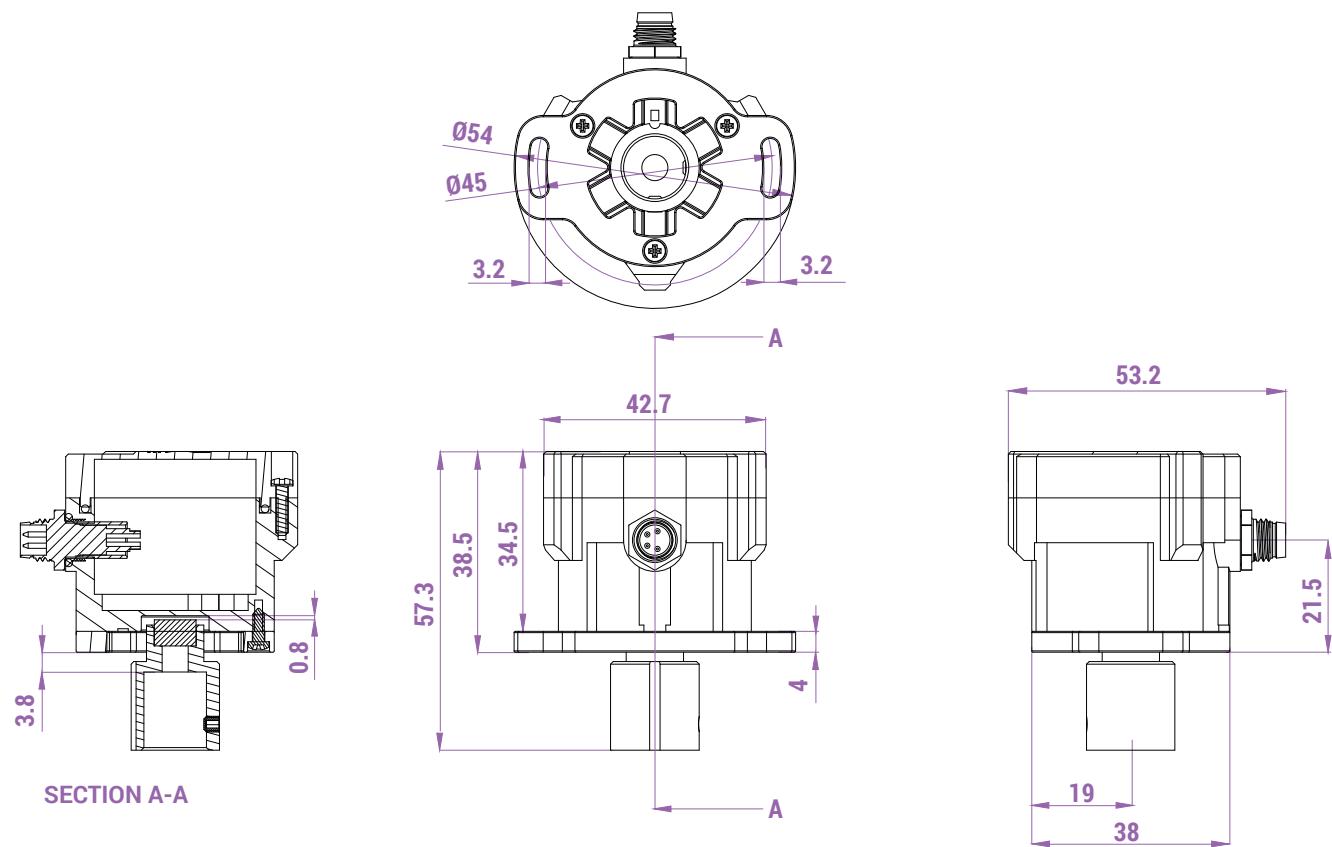
With shaft and flange



Contactless version



Contactless version with flange



EGON - REQUEST FORM FOR ENCODER

Type

- Non redundant with analogue output 4 - 20 mA
 - Redundant with analogue output 4 - 20 mA
 - Non redundant with digital output CANbus

Version

- With shaft Ø6 mm
 - Contactless

Connections

- Male connector 4 PIN
 - Cable
 - Cable with male connector 5 PIN

Cable length

meters

A small black square icon representing a flange.

Flange

Adapter coupling

- Ø 6-6
 Ø 6-8
 Ø 6-10

Instructions

- Tick the box corresponding to the type of encoder required.
 - Tick the box corresponding to the version required.
 - Tick the box corresponding to connection required. When the «cable» or «cable with connector» is required, write the length of the cable (in meters)
ATTENTION: The length must be an integer number.
 - Tick the box if the flange is required.
 - Tick the preferred box if the adapter coupling is required.

Remarks

REMARKS

EGON-RS

Absolute encoder RS



Digital absolute encoder featuring magnetic technology and suitable for reading and transmitting the shaft position to an external system via the RS-485 differential Half-Duplex output. It is used in a variety of industrial sectors, from automation to industrial handling machines and intralogistics.

FEATURES

- Egon-RS is a magnetic multiturn encoder, suitable for counting the shaft revolutions, working even without power supply through a battery backup, active when the encoder reads a shaft revolution.
- Compact and flexible, it is designed for easy assembly and wiring together with standard sets of cams.
- Very low power consumption guarantees highest efficiency.
- Single turn measuring resolution guaranteed by 1024 points per revolution (10 bit version) or by 4096 points per revolution (12 bit version).
- IP protection degree: Egon-RS is classified IP65, IP67 and IP69K (pending).
- Extreme temperature resistance: from -25°C to +80°C.
- Featuring technopolymer housing and stainless steel AISI 303 shaft.
- High quality materials and components guarantee long mechanical life, precision and repeat accuracy even in extreme conditions.

OPTIONS

- Suitable for installation on Fox, Oscar and Top rotary limit switches to control multi-revolutions rotors.
- Available in configurations with shaft or with contactless magnet and bush.
- Featuring sturdy RS-485 differential Half-Duplex output suitable for transmitting through native protocol.
- Featuring protection against input over-current and against over-voltage and reverse polarity.
- Available with clamping flange, interface female connector and adapter coupling (\varnothing 6-6, \varnothing 6-8, \varnothing 6-10).

CERTIFICATIONS

- CE marking.

Fill in the "request form" to configure properly the product.

CERTIFICATIONS

Conformity to Community Directives	2014/35/UE Low Voltage Directive (LVD) 2006/42/CE Machinery Directive
	EN 60204-1 Safety of machinery - Electrical equipment of machines
	EN 60947-1 Low-voltage switchgear and controlgear
Conformity to CE Standards	EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices
	EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -25°C/+80°C Operational -25°C/+80°C
IP protection degree	IP65, IP67, IP69K (pending)
Rated rotation speed	800 rev./min
Maximum rotation speed	1500 rev./min
Mechanical life	Egon-RS with shaft > 30x10 ⁶ revolutions Egon-RS contactless ∞
Shaft diameter	6 mm
Connections	Male connector M8 4 PIN Cable Cable with male connector M12 5 PIN

ELECTRICAL SPECIFICATIONS

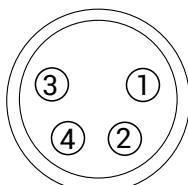
Power supply	9 ... 36 Vdc
Output	Differential Half-Duplex RS-485 suitable for transmission through native protocol
Consumption	~20mA
Single-turn resolution	10 bit (1024 points per revolution) 12 bit (4096 points per revolution)
Multi-turn resolution	14 bit (16384 revolutions) 16 bit (65535 revolutions)
Back-up time	~5 years non-stop
Protection against input over-current	Yes
Protection against over-voltage and reverse polarity	Yes
Accuracy	+/- 0.35°

MALE CONNECTOR SPECIFICATIONS

Number of PINS	4	5 (Code A)
Insulation resistance	$\geq 100 \text{ M}\Omega$	
Wires	4.5 - 6.5 mm	
Contacts	CuZn gold plated	
Mating	M8 4 PIN female connectors (Amphenol 8P-04AFFM-SL7A01)	M12 5 PIN Code A female connectors (Amphenol LTW12-05BFFA-SL8001)

MALE CONNECTOR ASSIGNMENT

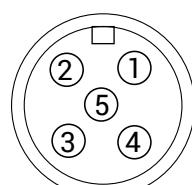
4 PIN connector



Male connector
(front view)

PIN	Signal
1	12 - 30 Vdc
2	RS-485 B
3	RS-485 A
4	GND

5 PIN connector (with cable)

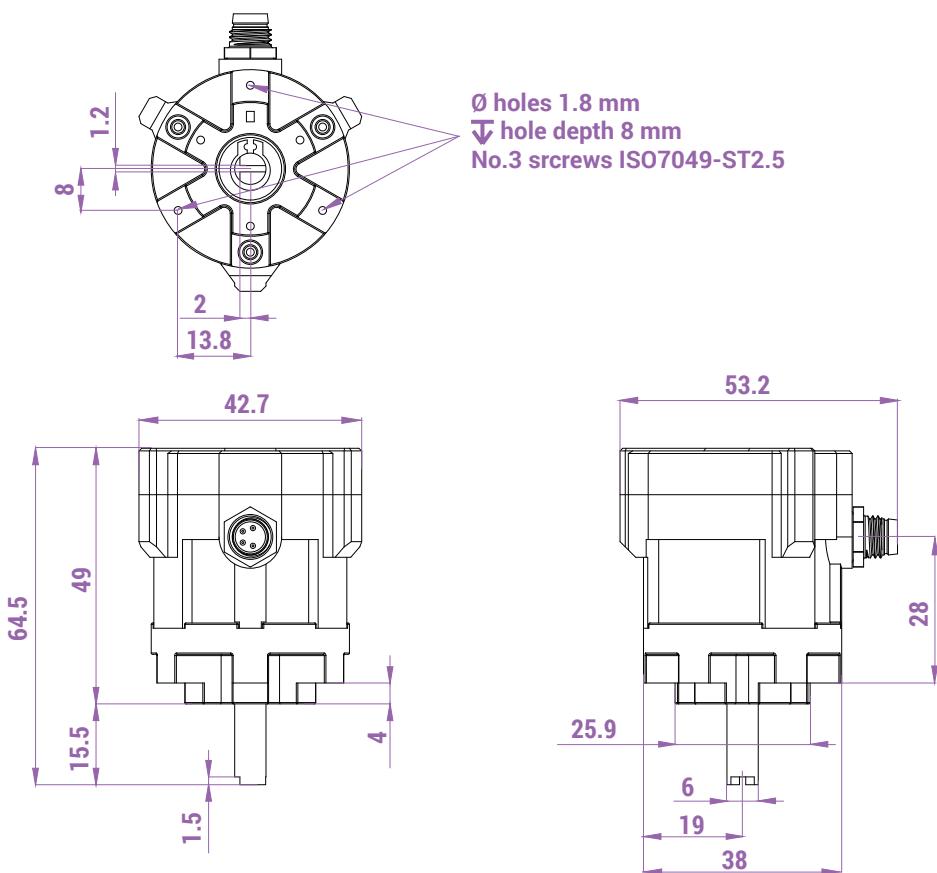


Male connector
(front view)

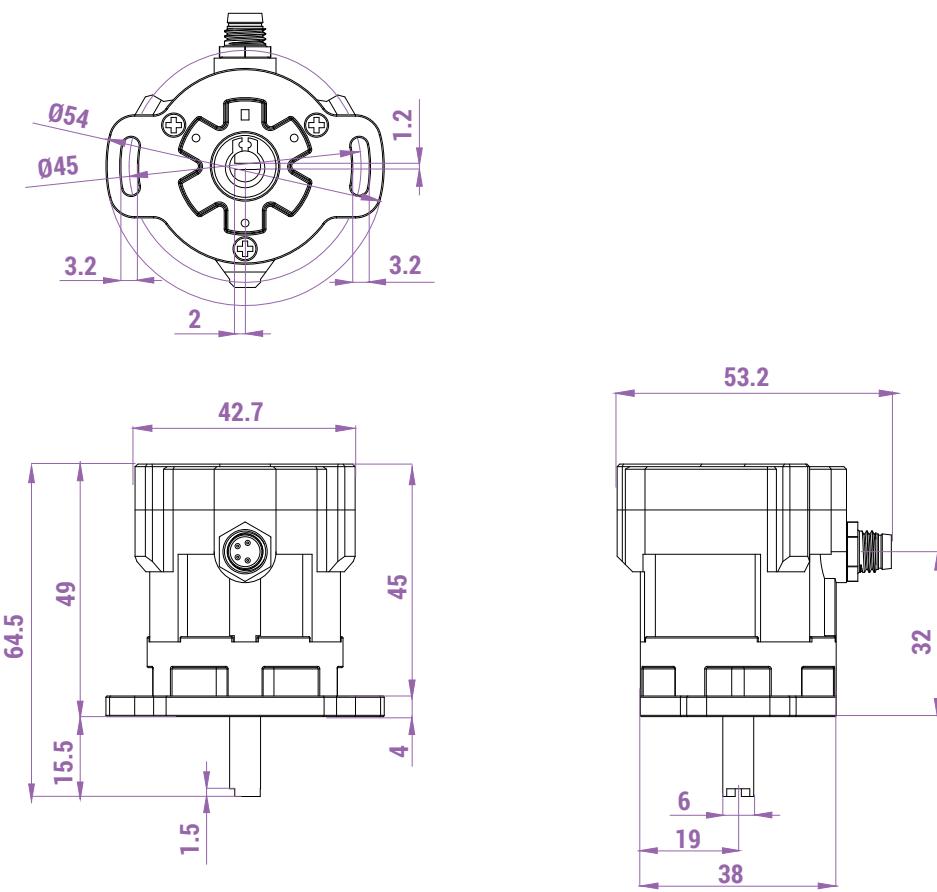
PIN	Signal
1	12 - 30 Vdc
2	RS-485 B
3	RS-485 A
4	GND
5	/

OVERALL DIMENSIONS (mm)

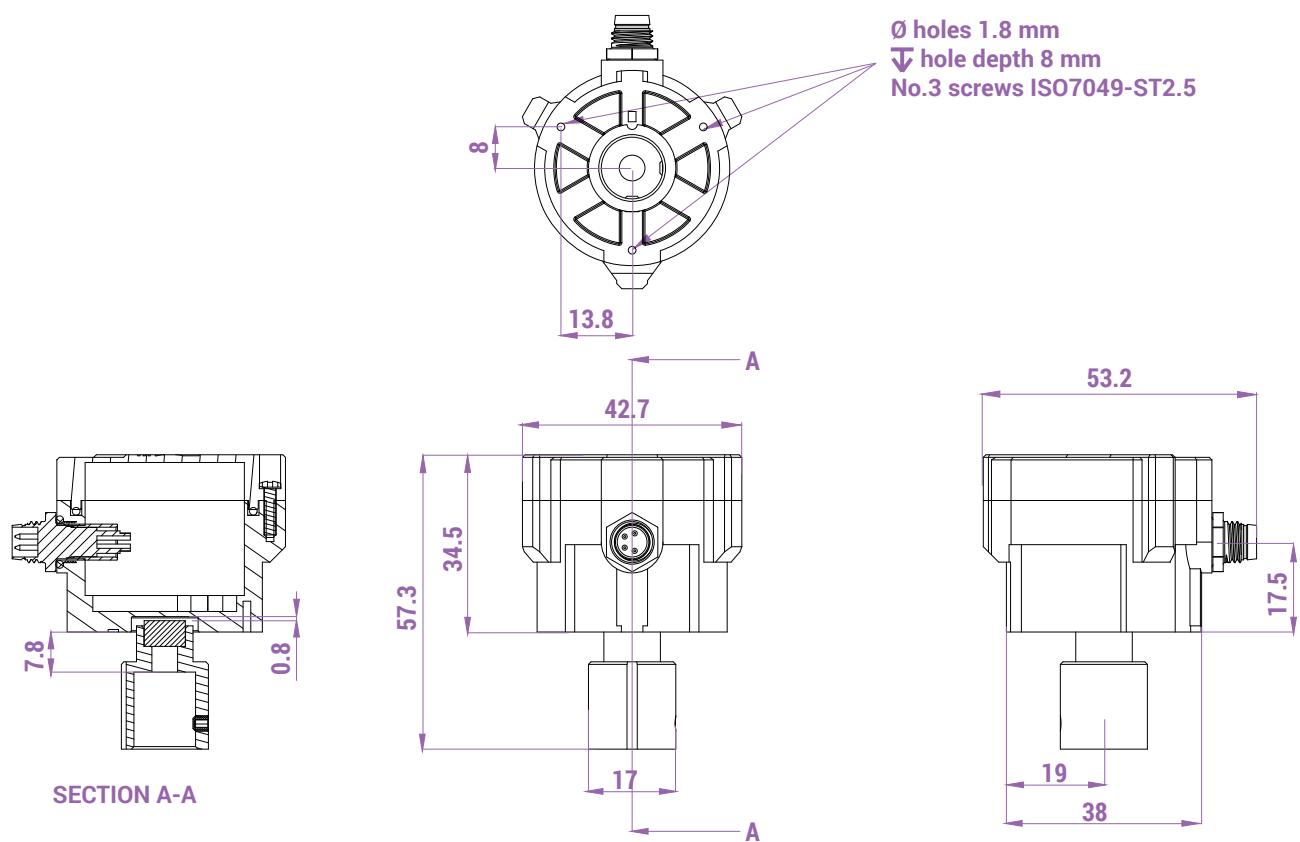
With shaft



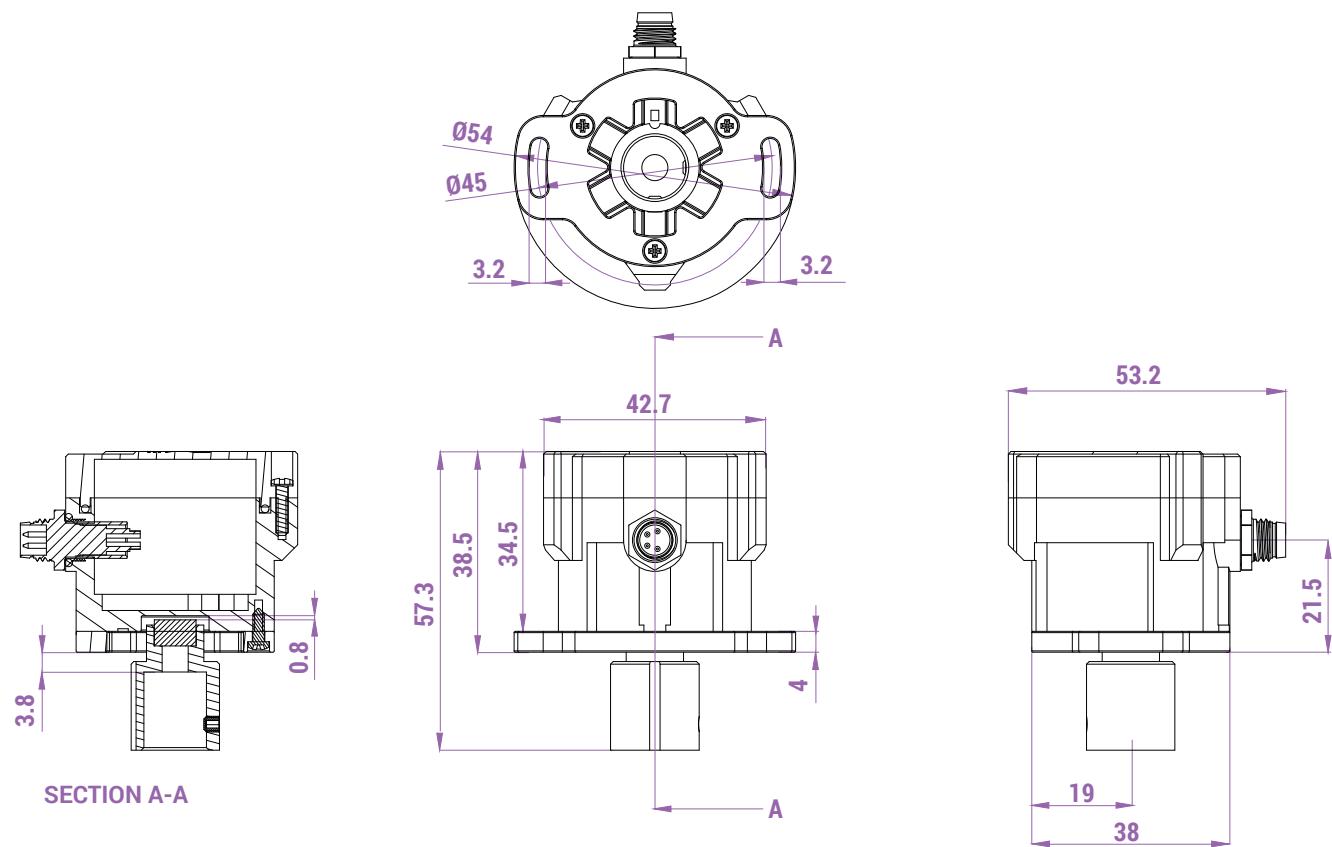
With shaft and flange



Contactless version



Contactless version with flange



EGON-RS - REQUEST FORM FOR ABSOLUTE ENCODER RS

Version

- With shaft Ø6 mm
 - Contactless

Connections

- Male connector 4 PIN
 - Cable
 - Cabo com conector macho 5 PIN

Cable length

_____ meters

- ## Flange

Adapter coupling

- Ø 6-6
 Ø 6-8
 Ø 6-10

Instructions

- Tick the box corresponding to the version required.
 - Tick the box corresponding to connection required. When the «cable» or «cable with connector» is required, write the length of the cable (in meters)
ATTENTION: The length must be an integer number.
 - Tick the box if the flange is required.
 - Tick the preferred box if the adapter coupling is required.

Remarks

REMARKS

YANKEE

Absolute encoder



Electronic position sensor that interfaces with rotation elements and returns a signal according to the angular position.

FEATURES

- Used in a variety of industrial sectors, from hoisting to automation, to meet any need in terms of registration and identification of modern production machines, wherever controls are needed, regardless of the nature of the mechanic system and of its complexity, and whenever reducing and unifying the system of angular positioning sensors is necessary.
- Designed for easy assembly and wiring together with standard sets of cams.
- Measuring accuracy guaranteed by 4096 points per revolution.
- IP protection degree: Yankee is classified IP20.
- Extreme temperature resistance: from -40°C to +80°C.
- Made with high quality materials and components to guarantee long mechanical life, precision and repeat accuracy even in extreme conditions.

OPTIONS

- Suitable for installation on Fox, Oscar and Top rotary limit switches to control multi-revolutions rotors.
- Every position of the shaft is associated with an analogue signal in voltage, in current or PWM.

CERTIFICATIONS

- CE marking, cULus marking.

CERTIFICATIONS

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
Conformity to cULus Standards	CSA-C22.2 No 14-13 Industrial Control Equipment UL 508 Industrial Control Equipment
Markings and homologations	CE 

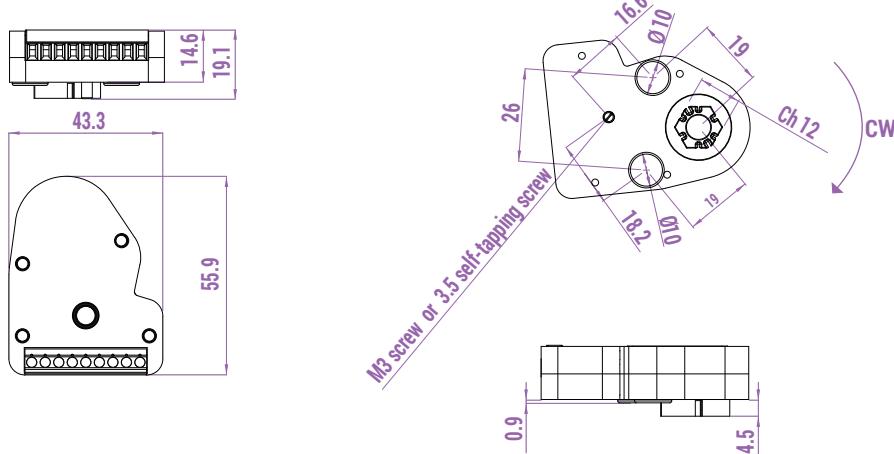
GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -40°C/+80°C Operational -40°C/+80°C
IP protection degree	IP 20
Free rotation	360°
Max. rotation speed	800 rpm

ELECTRICAL SPECIFICATIONS

Code	PA01AA01	PA01AB01	PA01AC01
Analogue output	Current 4 ÷ 20 mA	Voltage 0 ÷ 10 V	PWM 0 ÷ 100 %
Power supply		12 ÷ 48 Vdc/12 ÷ 48 Vac	
Protection against polarity inversion		Yes	
Absorption		50 mA	
Resolution		12 bit	
Linearity		+/- 0.5°	
Max. hysteresis		0.1°	
Zero Point setting		Through button/wire	
Signal increment direction		CW (standard)/CCW (on request)	
Connections		Terminal board	
Terminal wires		0.14 mm² - 1.5 mm²	
Terminal tightening torque		0.22 Nm - 0.25 Nm	

OVERALL DIMENSIONS (mm)



STANDARD ENCODERS

Description	Code
Yankee - current output	PA01AA01
Yankee - voltage output	PA01AB01
Yankee - PWM output	PA01AC01

ATLANTE

Electronic limit switch



Sturdy **electronic multturn magnetic absolute encoder** that interfaces with rotating elements and returns a signal according to the angular position.

FEATURES

- Used in a variety of industrial sectors, from lifting to automation. Designed to record absolute positions regardless of the mechanic of the system and of its complexity.
- Featuring integrated SSI interface.
- Designed for easy wiring.
- Accuracy guaranteed by 1024 points per revolution.
- IP protection degree: Atlante is classified IP65, IP67 and IP69K.
- Extreme temperature resistance: from -25°C to +80°C.
- Made with high quality materials and components to guarantee long mechanical life, precision and repeat accuracy even in extreme conditions.

OPTIONS

- Equipped with flange or, on request, with pinion gear and flange mounted on the side.

CERTIFICATIONS

- CE marking.
- Complying with accident prevention regulation BGV C 1 (only for Germany).

INTERNAL VIEW AND POSSIBLE ASSEMBLIES



CERTIFICATIONS

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -25°C/+80°C Operational -25°C/+80°C
IP protection degree	IP 65, IP67, IP69K
Insulation category	Class II
Maximum rotation speed	6000 rpm
Connections	Male connector 8 PIN M12

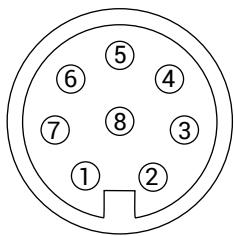
ELECTRICAL SPECIFICATIONS

Power supply	4.5 ... 30 Vdc
Consumption without load	Typ. 80 mA (5 Vdc)
Initializing time	Typ. 170 ms after power on
Interface	SSI
Points per revolution	≤ 1024 / 10 bit
Number of revolutions	≤ 4096 / 12 bit
Accuracy	± 0.4° (20 ± 15 °C) tbc ± 0.5° (-40... +85 °C) tbc
Code	Binary
Code sequence	CW default, programmable
Inputs	SSI clock: Line receiver RS422 - Zero setting input, direction input
Output stage	SSI data driver for RS422
SSI clock frequency	Max. 2 MHz
Zero setting	High-impulse duration: ≥ 100 ms

MALE CONNECTOR SPECIFICATIONS

Number of PINs	8
Insulation resistance	≥100 MΩ
Maximum voltage	0.8 kV
Wires	24 - 20 AWG
Contacts	CuZn
Mating	Connector, 8 PIN, female connector M12, A-coded (Phoenix Contact 1513347)

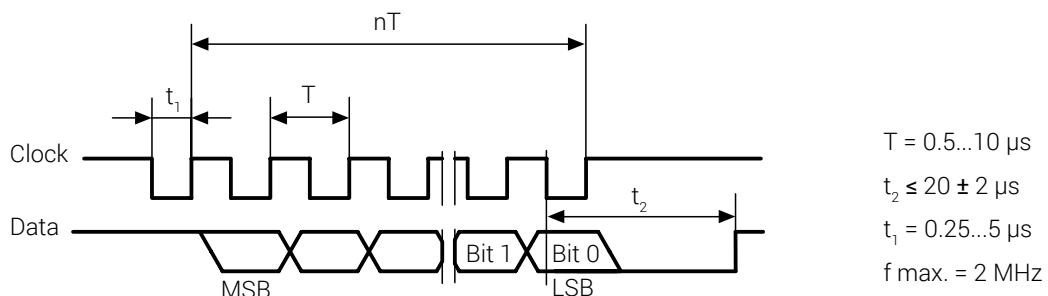
MALE CONNECTOR ASSIGNMENT



Male connector
(rear view)

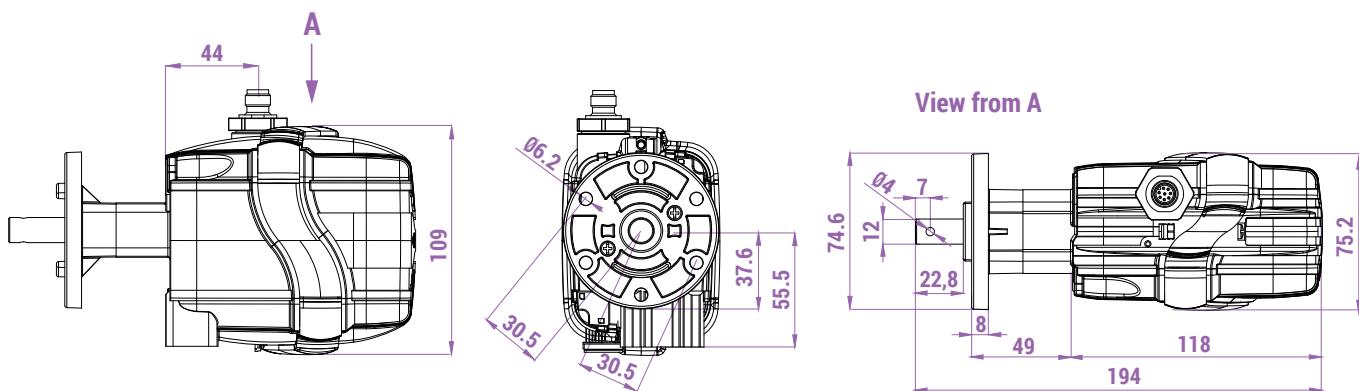
Pin	Signal	Description
1	+Vs	Supply voltage
2	DIR	Input direction
3	Data+	Data signal
4	Data-	Data signal
5	Clock-	Clock signal
6	Clock+	Clock signal
7	SET	Zero setting
8	0 V	Supply voltage

SSI SIGNAL OUTPUT

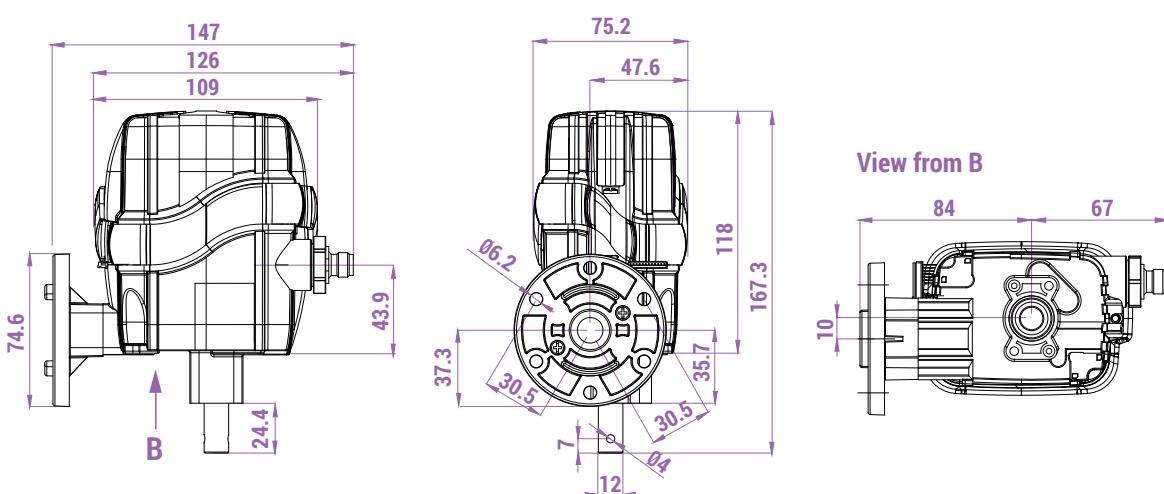


OVERALL DIMENSIONS (mm)

Standard Atlante



Atlante with lateral flange



ASSEMBLY DRAWING



Refer to the following table for description of components: "Accessories".

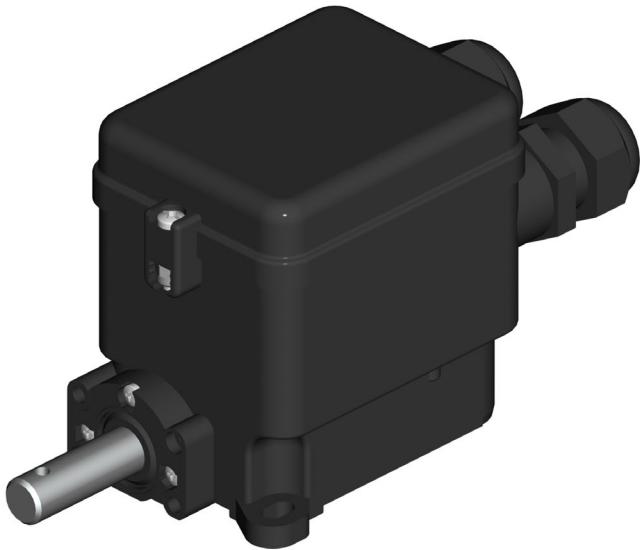
COMPONENTS

Accessories

Ref.	Drawing	Description	Code
A1		Cover with screws	PA090017
A2		Tightening rubber	PRGU1500PE
A3		Female connector (not included, available on demand)	PRVV9505PE

ATLANTE EVO

Electronic limit switch



Compact electronic limit switch, equipped with SoftCAM module emulating up to 6 cams. It is used in a variety of industrial sectors, from automation to industrial handling machines and intralogistics.

FEATURES

- Atlante Evo is an high resolution multi-turn absolute magnetic encoder (28 bit overall resolution), equipped with SoftCAM module, emulating up to 6 cams.
- Configuration through PC interface.
- Single turn measuring resolution guaranteed by 4096 points per revolution (12 bit) with accuracy lower than +/- 0,35°.
- Multiturn resolution: 16 bit (65535 revolutions).
- IP protection degree: Atlante Evo is classified IP65 and IP67.
- Extreme temperature resistance: from -25°C to +80°C.
- Featuring technopolymer housing (nylon fiber-glass) and non-magnetic stainless steel AISI 303 shaft.
- High quality materials and components guarantee long mechanical life, precision and repeat accuracy even in extreme conditions.

OPTIONS

- It is fully compatible and it can be integrated in systems mounting rotary limit switch Fox.
- Equipped with 6 configurable relays 60/250 V, 3/10 A, NC or NO, two of which with safety function.
- Featuring Bus standard RS-485 output.
- Featuring protection against polarity reversal and short circuit.
- Dedicated cable clamps or connectors.
- Available with flanges, pinion gears and couplings.
- Plates with universal adapters to replace existing systems.

CERTIFICATIONS

- CE marking.
- Complying with accident prevention regulation BGV C1 (only for Germany).

Fill in the "request form" to configure properly the product.

CERTIFICATIONS

Conformity to Community Directives	2014/30/UE Electromagnetic Compatibility (EMC) Directive 2006/42/CE Machinery Directive 2014/35/UE Low Voltage Directive (LVD)
Conformity to CE Standards	EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements EN 60529 Degrees of protection provided by enclosures
BGV C 1	Regulations for the prevention of accidents BGV C 1 (only for Germany)
Markings and homologations	CE

GENERAL TECHNICAL SPECIFICATIONS

Ambient temperature	Storage -25°C/+80°C Operational -25°C/+80°C
IP protection degree	IP 65, IP67
Insulation category	Class II
Maximum rotation speed	1500 rpm
Connections	2 cable clamps M20 Male connector M12 8 PIN

ELECTRICAL SPECIFICATIONS

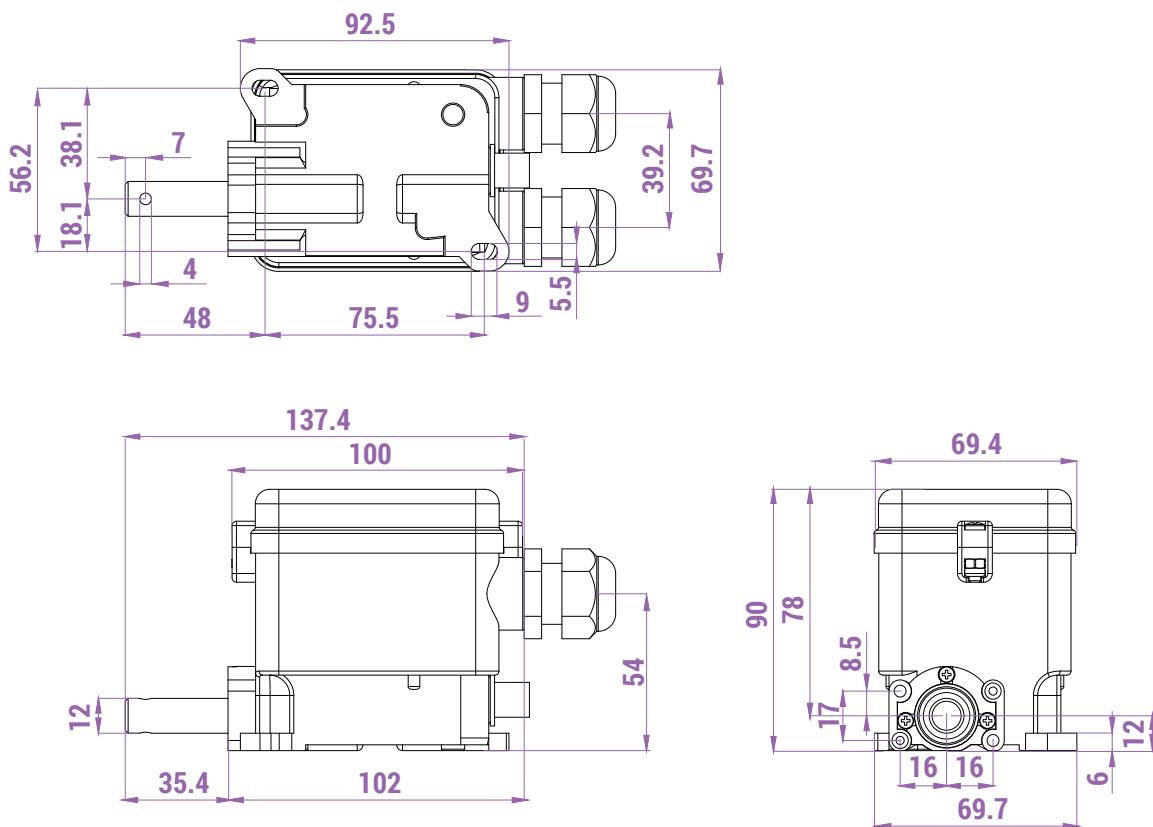
Power supply	9 ... 36 Vdc
Consumption	180 mA max
Interface	Bus RS-485
Single-turn resolution	12 bit (4096 points per revolution)
Multi-turn resolution	16 bit (65535 revolutions)
Accuracy	+/- 0,35°
Protection against over-voltage and reverse polarity	Yes
Relays	6 configurable relays 60/250 V, 3/10 A, NC or NO, two of which with safety function

MALE CONNECTOR SPECIFICATIONS

Number of PINs	8
Insulation resistance	500 V
Maximum voltage	24 V



OVERALL DIMENSIONS (mm)



ATLANTE EVO - REQUEST FORM FOR ELECTRONIC LIMIT SWITCH

Type

- With 4 relays emulating cam functions.
 - With 4 relays emulating cam functions + 2 relays with safety function.

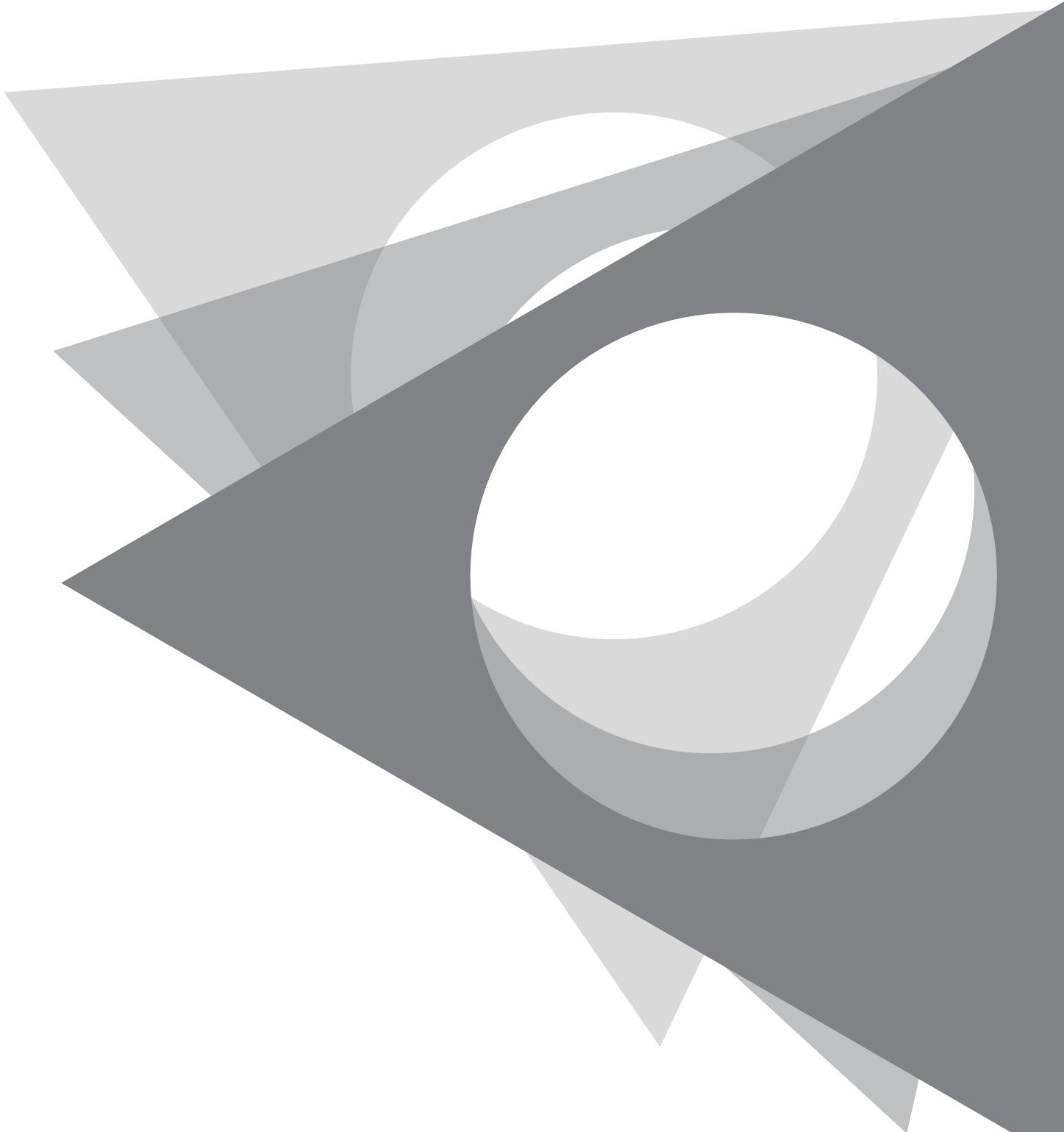
Remarks

REMARKS



ATEX SERIES

9



LIMITEX AG

HAZARDOUS AREAS

Rotary limit switch



Explosion proof rotary limit switch. Rugged and reliable, Limitex AG is used to control the movement of industrial machinery in potentially explosive areas.

FEATURES

- It consists of a gear motor that transfers movement to the cams through a primary input reduction stage (worm gear and helical toothed gear) and one or more secondary output stages (pairs of straight toothed gears).
- Accurate adjustment of cams by means of screws.
- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- IP protection degree: Limitex AG is classified IP66.
- Extreme temperature resistance: -50°C to +60°C.
- It features external enclosure made of G20 cast iron, stainless steel transmission and gear driving shafts, self-lubricating technopolymer gears and driving bushes.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- Revolution ratios from 1:15 to 1:499, achieved by combining different secondary output stages.
- Snap action switches with 1NO+1NC contacts.
- It can be equipped with a cam set with 2, 3 or 4 switches.
- Available with flange for direct coupling to the motor.
- Available with direct control switches to enable direct action on the motor.

CERTIFICATIONS

- CE marking.
- Atex certification EN 60079-0:2009, EN 60079-1:2007, EN 60079-31:2009.
- Conformity to Standards IECEx IEC 60079-0:2011, IEC 60079-1:2007-04 and IEC 60079-31:2008.

Fill in the "request form" for accurate product configuration.

CERTIFICATIONS

Conformity to Atex Standards	EN 60079-0:2009 Explosive atmospheres - Equipment - General requirements EN 60079-1:2007 Explosive atmospheres - Equipment protection by flameproof enclosures "d" EN 60079-31:2009 Explosive atmospheres - Equipment dust ignition protection by enclosure "t" IEC 60079-0:2011 Explosive atmospheres - Equipment - General requirements
Conformity to IECEx Standards	IEC 60079-1:2007-04 Explosive atmospheres - Equipment protection by flameproof enclosures "d" IEC 60079-31:2008: Explosive atmospheres - Equipment dust ignition protection by enclosure "t"
Atex Certification	INERIS 13ATEX0020X
IECEx Certification	IECEx INE 13.0051X MINING: I M2 Ex d I Mb (ATEX) Ex d I Mb (IECEx) GAS Zone 1 and 2: II2G Ex d IIB T6 Gb or Ex d IIC T6 Gb (ATEX) Ex d IIB T6 or Ex d IIC T6 Gb (IECEx) DUST Zone 21 and 22: II2D Ex tb IIIC T85°C Db IP66 (ATEX) Ex tb IIC T85°C Db IP66 (IECEx) GAS & DUST: II2GD Ex d IIB or IIC T6 Gb Ex tb IIC T85°C Db IP66
Certification for equipment Group I, IIA, IIB and IIC with the following marks*	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE  IEC IECEx

GENERAL SAFETY SPECIFICATIONS

Maximum supply voltage	300 Vac
Maximum current intensity	3 A
Maximum dissipated power	2 Watt
Rated frequency	50 / 60 Hz

GENERAL TECHNICAL SPECIFICATIONS

Operational ambient temperature	-50°C/+60°C
IP protection degree	IP 66
Maximum rotation speed	800 rev./min.
	No. 2 M20x1.5 (standard)
Cable entry	No. 2 M25x1.5 (available on request)
	No. 2 ½ NPT (available on request)

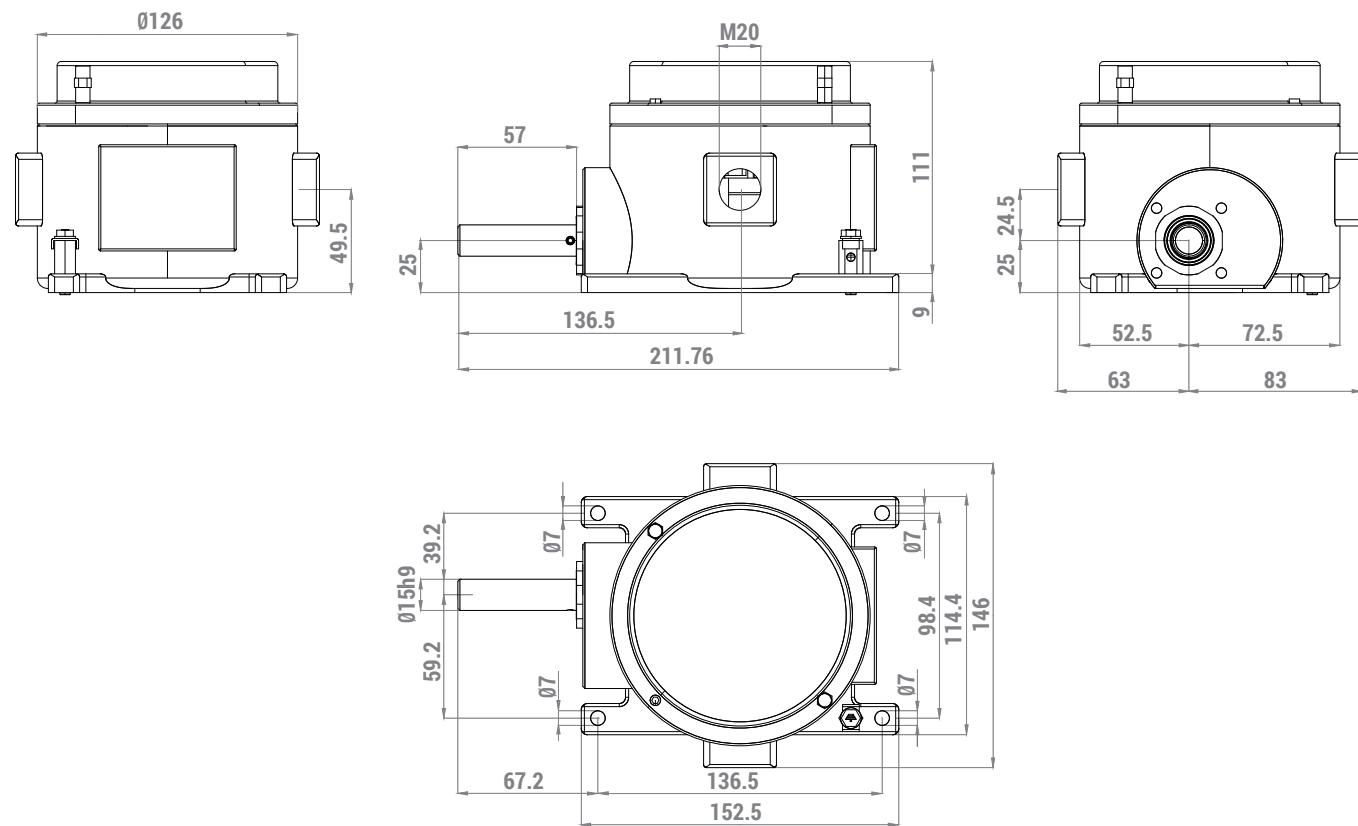
* The user is responsible for choosing the proper protection type, group and maximum case temperature of the limit switch to be installed. The user is also responsible for the correct installation, connection to the electrical network and use and maintenance of all electrical devices.



TECHNICAL SPECIFICATIONS OF THE SWITCHES

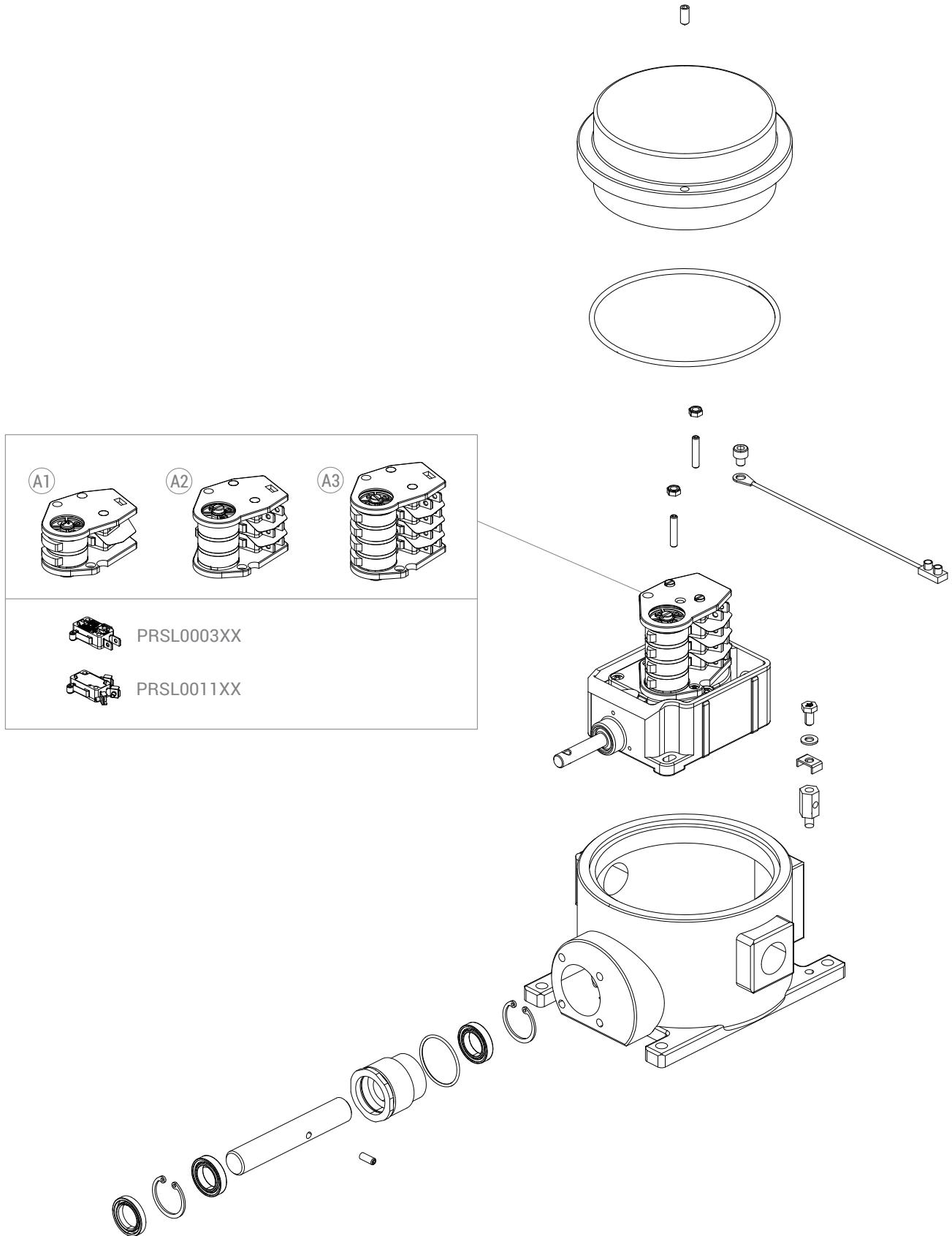
Code	PRSL0003XX	PRSL0011XX
Utilisation category	AC 15	
Rated operational voltage	250 Vac	
Rated operational current	3 A	
Rated thermal current	10 A	
Rated insulation voltage	300 Vac	
Mechanical life	1×10^6 operations	
Connections	6.3 mm Faston taps	Screw-type terminals
Wires	-	2x0.5mm ² , 2x1.5 mm ² , 1x2.5 mm ²
Tightening torque	-	0.5 Nm
Microswitch type	Single break, snap action	
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type 	1NO+1NC
Scheme		

OVERALL DIMENSIONS (mm)



ASSEMBLY DRAWING

9



Refer to the following table for descriptions of components: "Standard cam sets".

COMPONENTS

Standard cam sets

Ref.	Drawing	No. and type of cams	No. and type of switches	Code
A1		2 cams A	2 PRSL0003XX switches	PRFC0008PEC
		2 cams C	2 PRSL0003XX switches	PRFC0009PEC
A2		3 cams A	3 PRSL0003XX switches	PRFC0004PEC
		3 cams C	3 PRSL0003XX switches	PRFC0006PEC
A3		4 cams A	4 PRSL0003XX switches	PRFC0202PEC
		4 cams C	4 PRSL0003XX switches	PRFC0198PEC

Other sets with 2, 3 or 4 switches are available on request.

Cam reference chart

Cam		Switching angle	Code
A		1 point	20.5° ±0.5°
B		10 points	14.0° ±0.5°
C		60° sector	78.0° ±0.5°
E		180° sector	199.5° ±0.5°
H		335° sector	344.0° ±0.5°

LIMITEX AG - REQUEST FORM FOR LIMIT SWITCH

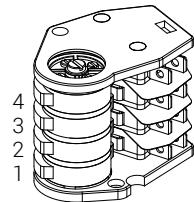
Instructions

- 1 Standard cam set:** write the code of the cam set required.
- 2 Customized cam set:** for non standard cam sets, fill in the scheme choosing the cams and the switches required.
Customized cams are available on request.
- 3 Revolution ratio:** write the required revolution ratio.
- 4 Cable entry:** tick the cable entry required.

Standard cam set 1

Cam set code

Customized cam set 2



Cam code

4 _____
3 _____
2 _____
1 _____

Switch code

4 _____
3 _____
2 _____
1 _____

Revolution ratio 3

- | | |
|-------------------------------|-----------------------------------|
| <input type="checkbox"/> 1:15 | <input type="checkbox"/> 1:75 |
| <input type="checkbox"/> 1:20 | <input type="checkbox"/> 1:100 |
| <input type="checkbox"/> 1:25 | <input type="checkbox"/> 1:150 |
| <input type="checkbox"/> 1:50 | <input type="checkbox"/> 1: _____ |

Cable entry 4

- No. 2 M20x1,5 (standard)
- No. 2 M25x1,5 (available on request)
- No. 2 ½ NPT (available on request)

Remarks

1 Legend - Standard cam sets

No. & type of switches	No. & type of cams	Code
2 x PRSL0003XX	2 cams A	PRFC0008PEC
	2 cams C	PRFC0009PEC
3 x PRSL0003XX	3 cams A	PRFC0004PEC
	3 cams C	PRFC0006PEC
4 x PRSL0003XX	4 cams A	PRFC0202PEC
	4 cams C	PRFC0198PEC

2 Legend - Standard cams

Cam	Switching angle	Code
A	1 point	20,5° ±0,5° PRSL7140PI
B	10 points	14,0° ±0,5° PRSL7142PI
C	60° sector	78,0° ±0,5° PRSL7141PI
E	180° sector	199,5° ±0,5° PRSL7144PI
H	335° sector	344,0° ±0,5° PRSL7143PI

Legend - Switches

PRSL0003XX	PRSL0011XX
1NO+1NC 	1NO+1NC

LIMITEX AP

HAZARDOUS AREAS

Position limit switch



FEATURES

- Positive opening NC contacts for safety functions.
- Mechanical life of switches: 1 million operations.
- Operation frequency: 3600 operations/hour max.
- IP protection degree: Limitex AP is classified IP66.
- Extreme temperature resistance: -50°C to +60°C.
- It features rugged external enclosure made of G20 cast iron and cross rod support made of zinc alloy. Internal components are made of materials which guarantee long mechanical life and continuous performance.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

OPTIONS

- 2 or 4 snap action switches with 1NO+1NC contacts.
- Cross rods with 3 or 4 maintained positions every 90°.
- Modular adapter with fixing points.

CERTIFICATIONS

- CE marking.
- Atex certification EN 60079-0:2009, EN 60079-1:2007, EN 60079-31:2009.
- Conformity to Standards IECEx IEC 60079-0:2011, IEC 60079-1:2007-04 and IEC 60079-31:2008.

CERTIFICATIONS

Conformity to Atex Standards	EN 60079-0:2009 Explosive atmospheres - Equipment - General requirements EN 60079-1:2007 Explosive atmospheres - Equipment protection by flameproof enclosures "d" EN 60079-31:2009 Explosive atmospheres - Equipment dust ignition protection by enclosure "t" IEC 60079-0:2011 Explosive atmospheres - Equipment - General requirements
Conformity to IECEx Standards	IEC 60079-1:2007-04 Explosive atmospheres - Equipment protection by flameproof enclosures "d" IEC 60079-31:2008: Explosive atmospheres - Equipment dust ignition protection by enclosure "t"
Atex Certification	INERIS 13ATEX0020X
IECEx Certification	IECEx INE 13.0051X MINING: I M2 Ex d I Mb (ATEX) Ex d I Mb (IECEx) GAS Zone 1 and 2: II2G Ex d IIB T6 Gb or Ex d IIC T6 Gb (ATEX) Ex d IIB T6 or Ex d IIC T6 Gb (IECEx) DUST Zone 21 and 22: II2D Ex tb IIIC T85°C Db IP66 (ATEX) Ex tb IIC T85°C Db IP66 (IECEx) GAS & DUST: II2GD Ex d IIB or IIC T6 Gb Ex tb IIC T85°C Db IP66
Certification for group I, IIA, IIB and IIC with the marks*	2014/35/UE Low Voltage Directive 2006/42/CE Machinery Directive EN 60204-1 Safety of machinery - Electrical equipment of machines EN 60947-1 Low-voltage switchgear and controlgear EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices EN 60529 Degrees of protection provided by enclosures
Markings and homologations	CE Ex IEC IECEx

GENERAL SAFETY SPECIFICATIONS

Maximum supply voltage	250 Vac
Maximum current intensity	3 A
Maximum dissipated power	2 Watt
Rated frequency	50 / 60 Hz

GENERAL TECHNICAL SPECIFICATIONS

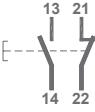
Operational ambient temperature	-50°C/+60°C
IP protection degree	IP 66
Operation frequency	3600 operations/hour max No. 2 M20x1.5 (standard)
Cable entry	No. 2 M25x1.5 (available on request) No. 2 ½ NPT (available on request)



* The user is responsible for choosing the proper protection type, group and maximum case temperature of the limit switch to be installed. The user is also responsible for the correct installation, connection to the electrical network and use and maintenance of all electrical devices.

LIMITEX AP WITH 2 SWITCHES

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Utilisation category	AC 15
Rated operational current	3 A
Rated operational voltage	250 Vac
Rated thermal current	10 A
Rated insulation voltage	300 Vac
Mechanical life	1x10 ⁶ operations
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ² (UL - (c)UL: use 60°C or 75°C copper (CU) conductor and wire 16-18 AWG)
Tightening torque	0.8 Nm
Microswitch type	Double break, snap action
Contacts	1NO+1NC (All NC contacts are of the positive opening operation type 
Scheme	 <pre> graph TD 13 --- 21 14 --- 22 13 --- 14 21 --- 22 </pre>

LIMITEX AP WITH 2 SWITCHES - MAXIMUM ACTUATING DIMENSIONS

T-type rod - Cross rod with 3 maintained positions

- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°

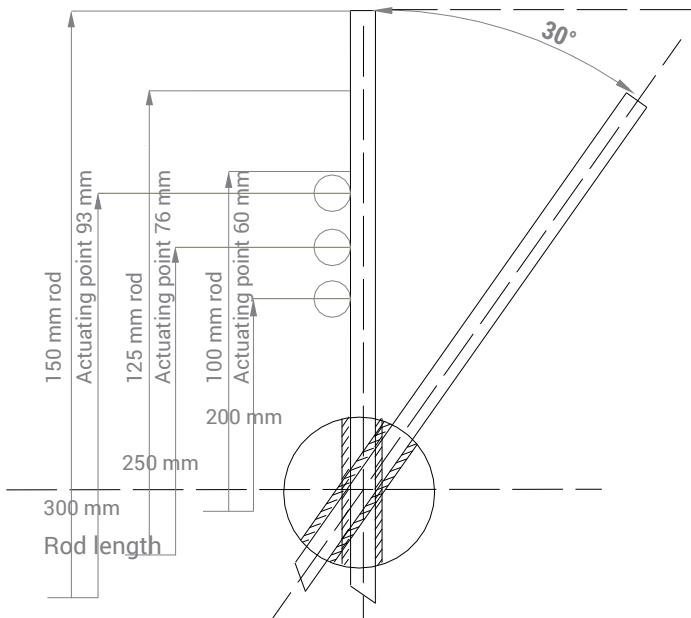
Rod - Rod and Roller

- Pre-travel angle for rotation contact operation: 24°
- Maximum rotation angle: 65°

Cross rod with 4 maintained positions

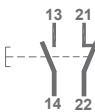
- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°
- Maintained positions each: 90°

In order to ensure proper operations, the dimensions shall not be increased; anyhow, they can be decreased, taking into account that the closer the impact point is to the center of the head, the higher the impact and the mechanical wear of rod and shaft are.
IMPORTANT: the maximum impact speed is 1.35 m/s, referring to the ideal impact points showed in the drawing.

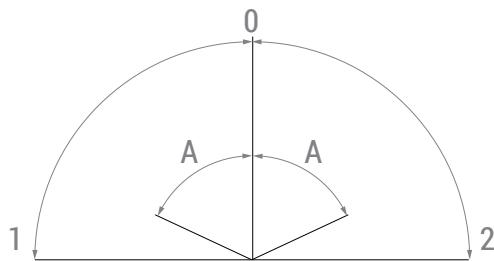


LIMITEX AP WITH 4 SWITCHES

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Rated operational current	16 A at 250 Vac
Rated operational voltage	500 Vac
Rated thermal current	10 A
Rated insulation voltage	300 Vac
Mechanical life	10x10 ⁶ operations
Connections	Screw-type terminals
Wires	1x2.5 mm ² , 2x1.5 mm ²
Microswitch type	Snap action
Contacts	1NO+1NC
Scheme	

LIMITEX AP WITH 4 SWITCHES - OPERATION ANGLES



0 - Reset position

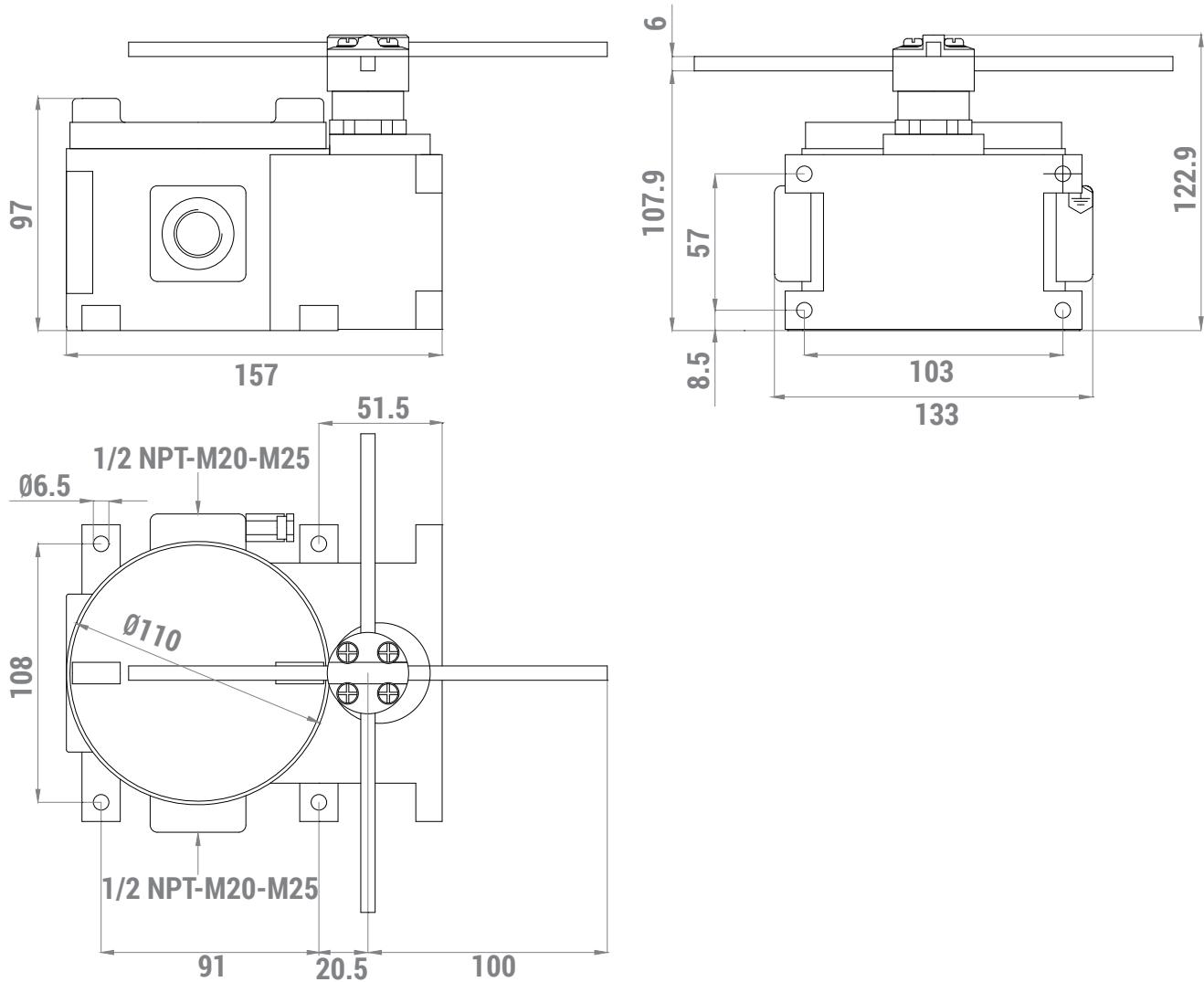
A - Angle for switch operation: 65°

1 - Maximum operation angle to the left: 90°

2 - Maximum operation angle to the right: 90°

The limit switch rods have no rotation limit stop (they can rotate free around 360°).

OVERALL DIMENSIONS (mm)



LIMIT SWITCHES LIMITEX AP WITH 2 SWITCHES

Standard limit switches are equipped with 200 mm rods and 1NO+1NC snap action switches



Actuating travel	Positions	Rod	Code
90° 49° 0° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33710100
90° 49° 0° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33710200
90° 49° 0° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33711100
90° 49° 0° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33711200
90° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33712100
90° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33712200
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33713100
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33713200
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33714100
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33714200
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	"T" type	EX33715100
90° 49° 0° 49° 90° 1-2 3-4 90° 49° 90° 90° 1-2 3-4	3 maintained	Cross	EX33715200
0° 49° 139° 229° 319° 360° 1-2 3-4 0° 49° 139° 229° 319° 360° 1-2 3-4	4 maintained	Cross	EX33750100
0° 49° 319° 360° 1-2 3-4 0° 139° 229° 360° 1-2 3-4	4 maintained	Cross	EX33751100
0° 139° 229° 360° 1-2 3-4 0° 49° 319° 360° 1-2 3-4	4 maintained	Cross	EX33752100

LIMIT SWITCHES LIMITEX AP WITH 4 SWITCHES

Standard limit switches are equipped with 200 mm rods and 1NO+1NC snap action switches



Actuating travel	Code
180° 0° 70° 180° 1-2 3-4 180° 0° 160° 1-2 3-4 180° 70° 0° 180° 1-2 3-4 160° 0° 180° 1-2 3-4	EX26755100
70° 0° 90° 1-2 3-4 70° 0° 90° 1-2 3-4 90° 0° 70° 1-2 3-4 90° 0° 70° 1-2 3-4	EX26755200



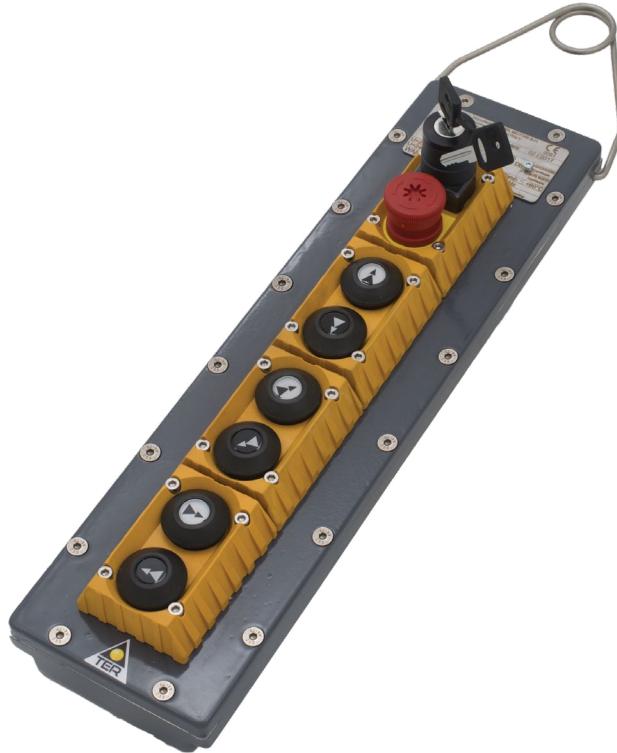
MIKE-X

HAZARDOUS AREAS

Pendant control station



9



Explosion proof pendant control station for auxiliary control. Rugged, sturdy and easy to handle, Mike-X is designed for heavy industry in potentially explosive areas.

FEATURES

- Pendant control station for use in industrial areas and hazardous locations for ATEX and IECEx zones 1, 2, 21, 22.
- Reduced installation and wiring time and costs: the optimized internal space enables easy and quick wiring.
- IP protection degree: Mike-X is classified IP65.
- Extreme temperature resistance: -20°C to +60°C.
- It features solid but light weight body made of powder epoxy painted aluminum or stainless steel AISI 316 (optional), resistant to temperature changes.
- All materials and components used are shock and wear resistant and guarantee protection of the unit against water, dust and oils.

OPTIONS

- Available in configurations from 4 to 16 actuators.
- 2 speed switches with NO contacts or 1 speed switches with NC contacts.
- Mechanical interlock to prevent simultaneous operation of opposite functions.
- Connecting bridges to reduce wiring time.
- It can be equipped with thermal protectors and resistances as anti-condensation heaters (max. power 24W).

CERTIFICATIONS

- CE marking.
- Conformity to ATEX Standards EN 60079-0:2012, EN 60079-1:2014, EN 60079-31:2014.
- Conformity to IECEx Standards IEC 60079-0:2012, IEC 60079-1:2014, IEC 60079-31:2013.

Fill in the "request form" to configure properly the product.

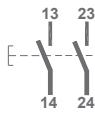
CERTIFICATIONS

Conformity to Atex Standards	EN 60079-0:2012 Explosive atmospheres – Equipment – General requirements EN 60079-1:2014 Explosive atmospheres – Equipment protection by flameproof enclosures “d” EN 60079-31:2014 Explosive atmospheres – Equipment dust ignition protection by enclosures “t”
Conformity to IECEx Standards	IEC 60079-0:2012 Explosive atmospheres – Equipment – General requirements IEC 60079-1:2014 Explosive atmospheres – Equipment protection by flameproof enclosures “d” IEC 60079-31:2013 Explosive atmospheres – Equipment dust ignition protection by enclosures “t”
Atex Certification	ITS16ATEX101535X
IECEx Certification	ITS 16.0070X
Atex Protection Type	II 2 G Ex db IIC T6 Gb II 2 D Ex tb IIIC T85°C Db Tamb: -20°C to +60°C
IECEx Protection Type	Ex db IIC T6 Gb Ex tb IIIC T85°C Db Tamb: -20°C to +60°C
Markings and homologations	CE  IEC IECEx

GENERAL TECHNICAL SPECIFICATIONS

Operational ambient temperature	-20°C/+60°C
IP protection degree	IP 65
Cable entry*	M25 x 1.5 M32 x 1.5

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Rated operational current	Max 250 Vdc / 1.1 A Max 240 Vac / 3 A
Rated frequency	50/60 Hz
Wires	Min 0.75 mm ² - Max 2 mm ² (ATEX and IEC Ex)
Anti-moisture heater (optional)	Maximum power 24W
Tipo interruttore	Double break
Contacts	2 NO 1 NC
Scheme	
Markings and homologations	CE

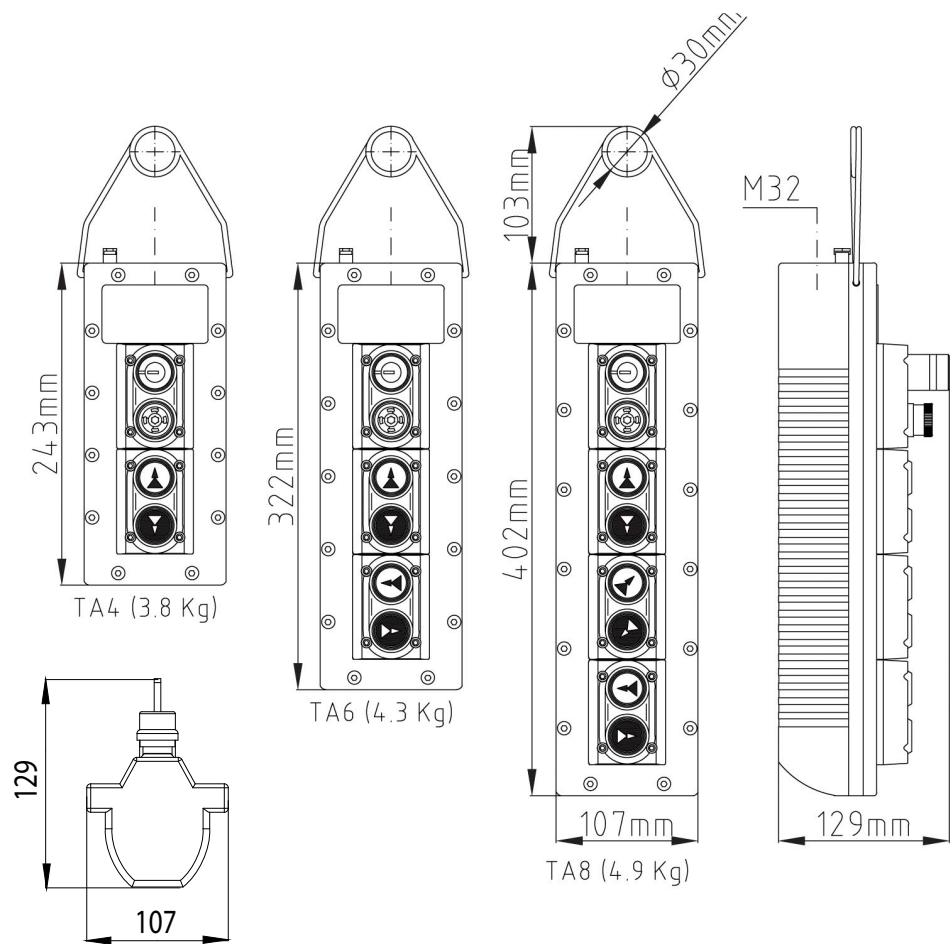
OPTIONAL

Anti-condensation heater
Stainless steel AISI 316 version

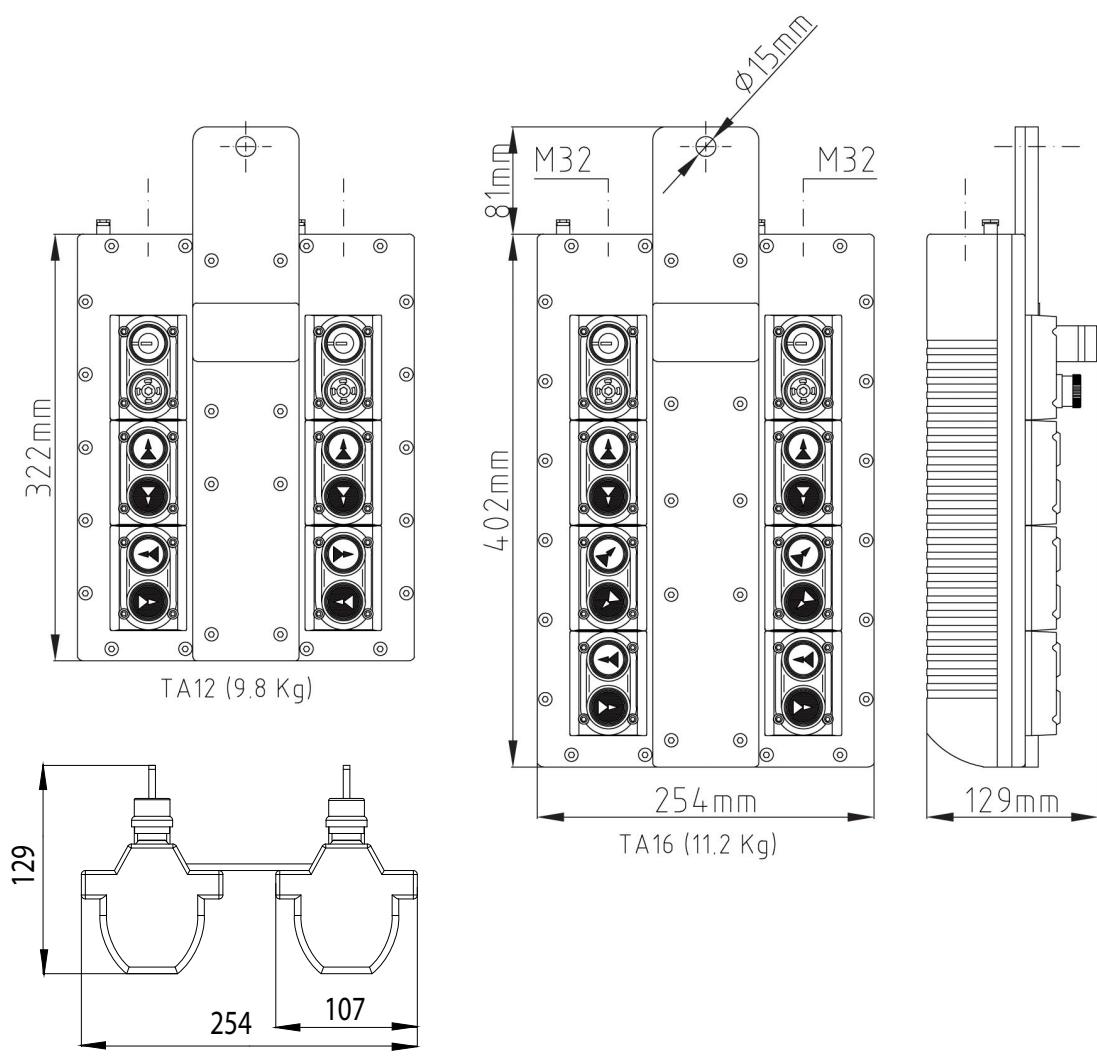
* Threading must guarantee minimum 5 complete threads.
All the devices for cable entry (conduits, cable clamps, adapters) must be certified with minimum certification level as per valid certification of the pendant station.

OVERALL DIMENSIONS (mm)

Simple



Double



MIKE-X - REQUEST FORM FOR CONTROL STATION

Protection

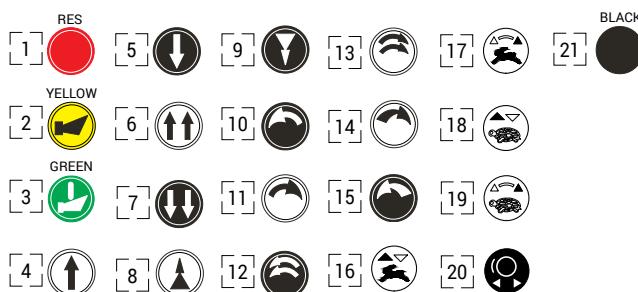
ATEX II 2 G Ex db IIC T6 Gb
II 2 D Ex tb IIIC T85°C Db
IECEx Ex db IIC T6 Gb
Ex tb IIIC T85°C Db

Tick the box to accept the type of protection provided

Pendant control station

- 4 - 8 actuators: simple control station
 12 - 16 actuators: double control station

Control elements - Symbols



Cable entry

- M25 x 1,5 M32 x 1,5

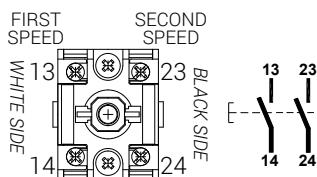
Optional

- Anti-condensation heater
 Stainless steel AISI 316 version

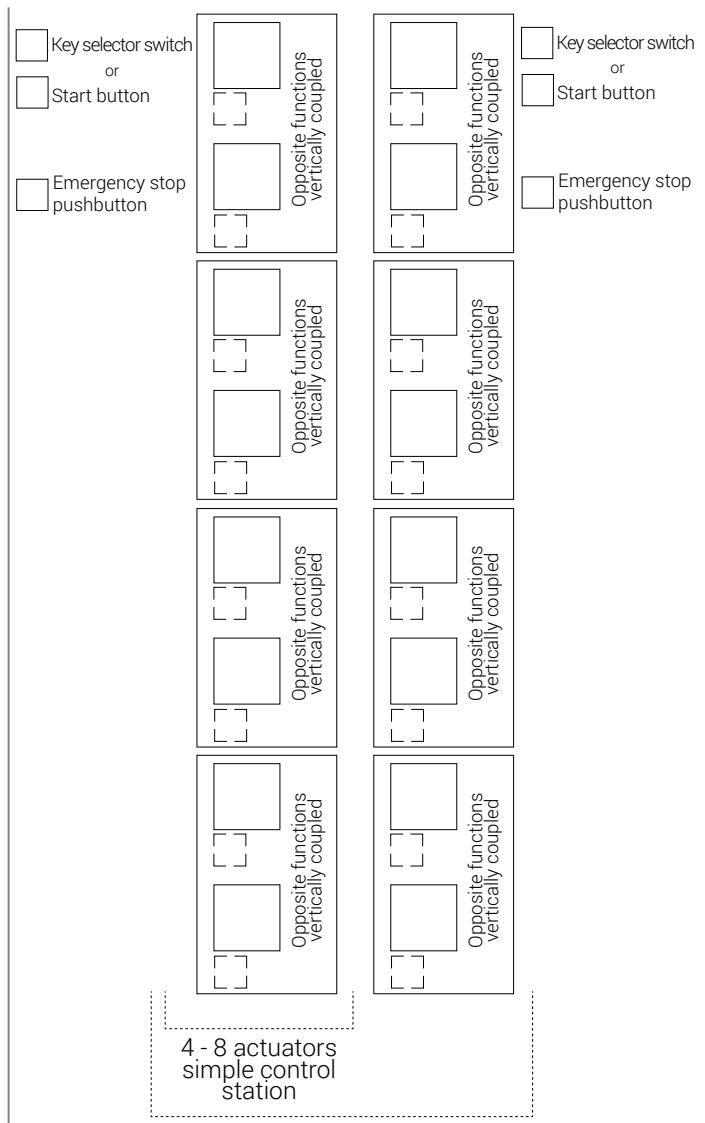
Instructions

- Tick the box to accept the type of protection provided.
 - Tick the box corresponding to the pendant control station required: 4 - 8 actuators (simple control station), 12 - 16 actuators (double control station).
 - Write the number corresponding to the control element required (broken line box). When buttons are required, mark the direction of the arrow into the corresponding square box.
- If the key selector switch or the green start button and the emergency stop pushbutton are needed, tick the box corresponding to the position where they are required. Complete both columns if you need a doble row pendant control station.
- **Attention: opposite functions (eg.: up - down) are vertically coupled in columns.**
 - Tick the box corresponding to the optional required.
 - Tick the box corresponding to type of cable entry required.

2NO switches for pushbuttons



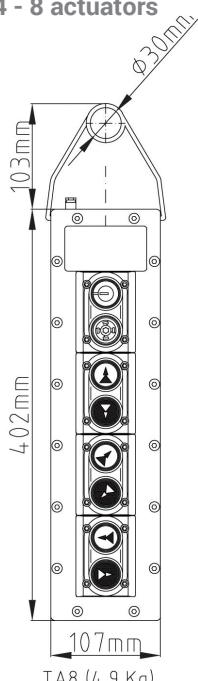
ATTENTION:
all pushbuttons are equipped with 2 speed switches. If you require 1 speed, wire only the contact on the white side.



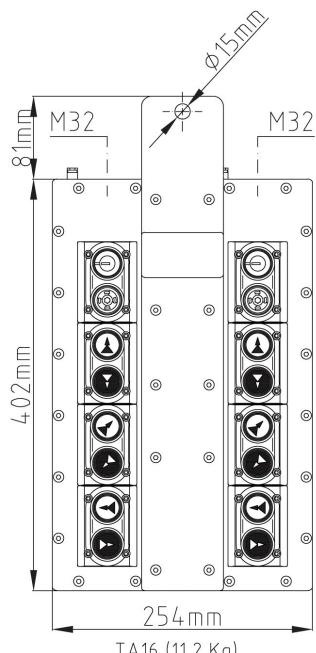
4 - 8 actuators
simple control station

12 - 16 actuators
double control station

Simple control station
4 - 8 actuators



Double control station
12 - 16 actuators

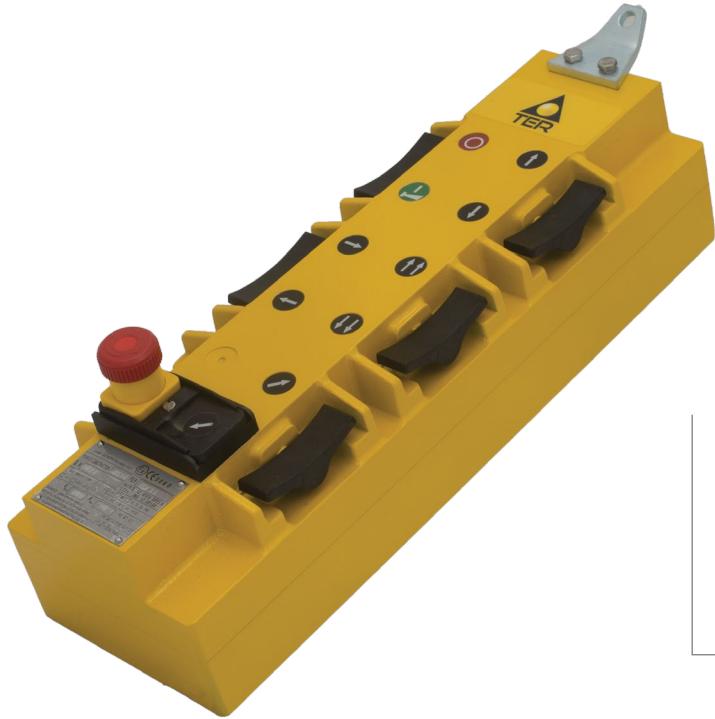




SPA EXPLOSION PROOF HAZARDOUS AREAS Pendant control station



9



Explosion proof pendant control station for auxiliary control. Rugged, sturdy and reliable, SPA Explosion Proof is designed for heavy industry in potentially explosive areas.

FEATURES

- Enclosures with actuators placed on a double row to enable grouping of a large number of functions in a single control.
- The emergency stop mushroom pushbutton complies with standard EN418.
- Mechanical life of switches: 1 million operations.
- IP protection degree: SPA Explosion Proof is classified IP66.
- Extreme temperature resistance: -50°C to +55°C.
- It features solid but light weight body made of aluminum, or stainless steel AISI 316 or chrome-plated cast-iron (optional versions), resistant to temperature changes and corrosive environments.

OPTIONS

- Available in configurations from 2 to 12 actuators, arranged on a double row.
- 1 or 2 speed switches with NO or NC contacts.
- Mechanical interlock to prevent simultaneous operation of opposite functions.

CERTIFICATIONS

- CE marking.
- Atex certification EN 60079-0: 2012+A1: 2013, EN 60079-1 Ed.7: 2014, EN 60079-31:2014.
- Conformity to Standards IECEx IEC 60079-0: 2011, IEC 60079-1: 2014, IEC 60079-31: 2014.

Fill in the "request form" to configure properly the product.

CERTIFICATIONS

	EN 60079-0:2012 + A1:2013 Explosive atmospheres - Equipment - General requirements
Conformity to Atex Standards	EN 60079-1 Ed.7 :2014 Explosive atmospheres - Equipment protection by flameproof enclosures 'd'
	EN 60079-31:2014 Explosive atmospheres - Equipment dust ignition protection by enclosure "t"
	IEC 60079-0:2011 Explosive atmospheres - Equipment - General requirements
Conformity to IECEx Standards	IEC 60079-1:2014 Explosive atmospheres - Equipment protection by flameproof enclosures 'd'
	IEC 60079-31:2014: Explosive atmospheres - Equipment dust ignition protection by enclosure "t"
Atex Certification	INERIS 12ATEX0085X
IECEx Certification	IECEx INE 12.0059X
Type of protection	Ex d IIIB/IIC T6 Gb Ex tb IIIC T85°C Db IP66
	2014/34/EU (ATEX)
Conformity to Community Directives	2014/30/EU Electromagnetic Compatibility 2006/42/CE Machinery Directive 2014/35/EU Low Voltage Directive
Markings and homologations	CE 0080 Ex II 2 G II 2 D IEC IECEx

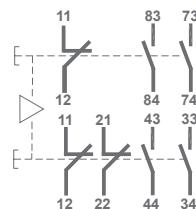
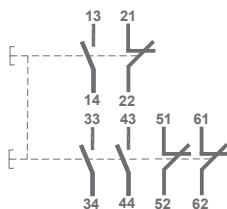
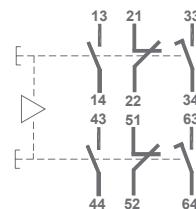
GENERAL TECHNICAL SPECIFICATIONS

Operational ambient temperature	-50°C/+55°C
IP protection degree	IP 66
Operating positions	Any position

TECHNICAL SPECIFICATIONS OF THE SWITCHES

Code	PRSL0075XX	PRSL0076XX	PRSL0090XX
Utilisation category		AC 15	
Rated operational current		1.9 A	
Rated operational voltage		380 Vac	
Rated thermal current		10 A	
Rated insulation voltage		500 Vac	
Mechanical life		1x10 ⁶ operations	
Switch type	Double switch, two speeds	Double switch, one speed	Double switch, two speeds
Contacts	1NO+1NC+1NO/1NO+1NC+1NO	1NO+1NC/2NO+2NC	1NC+2NO/2NC+2NO

Scheme

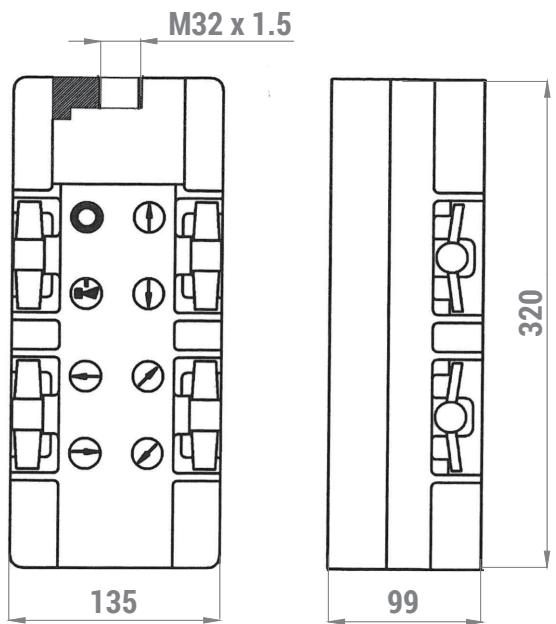


Markings and homologations

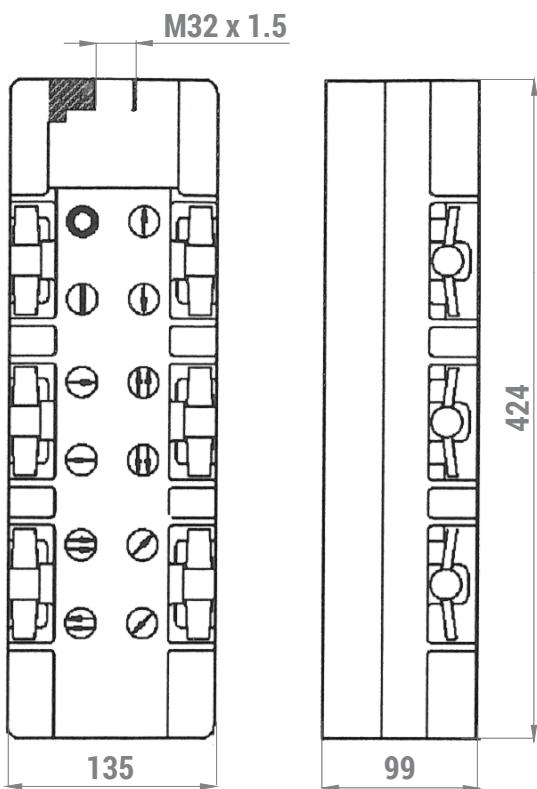


OVERALL DIMENSIONS (mm)

2 - 8 actuators



10 - 12 actuators



SPA EXPLOSION PROOF - REQUEST FORM FOR CONTROL STATION

Protection

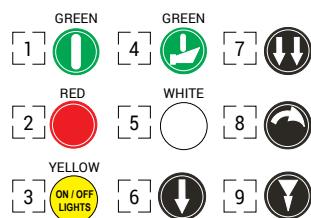
Tick the box to choose the type of protection required.

- Ex II 2 G II 2 D
 Ex d IIB T6 Gb or Ex d IIC T6 Gb
 Ex tb IIIC T85°C Db IP66
 Enclosure group II B

- Ex II 2 G II 2 D
 Ex d IIB T6 Gb or Ex d IIC T6 Gb
 Ex tb IIIC T85°C Db IP66
 Enclosure group II C

Control elements

1 speed switch



2 speed switch



30 Emergency stop mushroom pushbutton

Options

- Enclosure in stainless steel AISI 316
 Enclosure in chrome-plated cast-iron

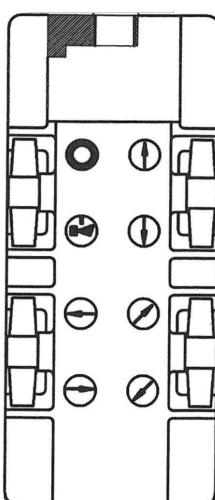
Instructions

- Choose the type of protection required by ticking the correspondent box.
- Fill in the control station scheme for the number of control elements required (2, 4, 6, 8, 10 or 12 actuators).
- Write the number corresponding to the control element required (broken line box). When buttons are required mark the direction of the arrow into the corresponding box.
- **Attention: opposite functions (eg.: up – down) are vertically coupled in columns.**
- When one function is the emergency stop mushroom pushbutton, then the opposite switch/function is not used.**
- Tick the box corresponding to the optional required.

Attention: 1 or 2 speeds switches provided depending on the control elements chosen.

Remarks

<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled	<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled
<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled	<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled
<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled	<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled
<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled	<input type="checkbox"/>	<input type="checkbox"/>	Opposite functions vertically coupled



APPENDIX - REGULATIONS

In the modern industrial sector, safety is an issue of fundamental importance and relevance for companies all over the world.

Technological progress and the growing level of production automation make it necessary to devote more space and greater importance to the legal aspects of safety and its technical and legal implications.

To give substance to the focus on safety, TER designs and makes its products to comply with all the directives, requirements, recommendations and laws applicable in the industry and systematically subjects them to accurate, in-depth lab tests to check their conformity.

Directives and Regulations

2014/35/UE: Low voltage directive

The aim of the directive is to harmonize the provisions of Member States relating to safety and to potential health hazards of electric and electronic equipment operating within the rated voltage limits of 50 to 1000 V for alternating current and 75 to 1500 V for direct current, with the aim of ensuring that devices are not placed on the market if they can jeopardize the safety of people, pets or property.

2006/42/CE: Machinery directive

The Directive aims to ensure free circulation of machines and their accessories, while at the same time setting out essential requirements for the health and safety of workers and consumers.

EN 60204-1 Safety of machinery - Electrical equipment of machines

The Standard provides requirements and recommendations relating to the electrical equipment of machines so as to promote safety of persons and property, consistency of control response, ease of maintenance. It applies to the application of electrical, electronic and electronic programmable equipment and systems to machines working together in a co-ordinated manner. The equipment covered by this standard commences at the point of connection of the supply to the electrical equipment of the machine.

Part 1 of Standard 60204 is applicable to the electrical equipment or parts of the electrical equipment that operate with nominal supply voltages not exceeding 1000 V for alternating current and not exceeding 1500 V for direct current, and with nominal frequencies not exceeding 200 Hz. It does not cover all the requirements (e.g. guarding, interlocking, or control) that are needed or required by other standards or regulations in order to safeguard persons from hazards other than electrical hazards.

EN 60204-32 Safety of machinery - Electrical equipment of machines - Requirements for hoisting machines

Part 32 of Standard 60204 applies to the application of electrical and electronic equipment and systems to hoisting machines not exceeding 1000 V for alternating current or 1500 V for direct current between lines and with nominal frequencies not exceeding 200 Hz.

For the purposes of this standard, hoisting machines include cranes of all types, winches of all types, and storage and retrieval machines. The Standard does not cover machines for lifting and transporting people.

The second edition is adapted to the changes introduced in Part 1 published in 2006 and amends the paragraph on wireless controls.

EN 60947-1 Low-voltage switchgear and controlgear

The purpose of Part 1 of Standard 60947 to harmonize all rules and requirements of a general nature applicable to low-voltage switchgear and controlgear in order to obtain uniformity of requirements and tests throughout the corresponding range of equipment and to avoid the need for testing to different standards.

The Standard sets out general rules and requirements which are common to low-voltage equipment including, for example, definitions, characteristics, information, normal service, mounting and transport conditions, constructional and performance requirements, verification of characteristics and performance.

This standard applies, when required by the relevant product standard, to switchgear and controlgear intended to be connected to circuits, the rated voltage of which does not exceed 1000 V for alternating current or 1500 V for direct current.

EN 60947-3 Low-voltage switchgear and controlgear - Switches, disconnectors, switch-disconnectors and fuse-combination units

Part 3 of Standard 60947 applies to switches, disconnectors, switch-disconnectors and fuse-combination units to be used in distribution circuits and motor circuits of which the rated voltage does not exceed 1000 V for alternating current or 1500 V for direct current.

The Standard does not apply to equipment coming within the scope of EN/IEC 60947-2, EN/IEC 60947-4-1 and EN/IEC 60947-5-1; however, when switches and fuse-combination units coming into the scope of this Standard are normally used to start, accelerate and/or stop an individual motor they shall also comply with the additional requirements given in Annex A. The requirements for single-pole-operated three-pole switches are included in Annex C. Auxiliary switches fitted to equipment within the scope of this Standard shall comply with the requirements of EN/IEC 60947-5-1.

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices

Part 5-1 of Standard 60947 applies to control circuit devices and switching elements intended for controlling, signalling, interlocking, etc., of switchgear and controlgear. It applies to control circuit devices having a rated voltage not exceeding 1000 V for alternate current or 600 V for direct current.

EN 60947-5-5 Low-voltage equipment - Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function

Part 5-5 of Standard 60947 provides detailed specifications relating to the electrical and mechanical construction of emergency stop devices with mechanical latching function and to their testing. This standard is applicable to electrical control circuit devices and switching elements which are used to initiate an emergency stop signal. This standard does not apply to emergency stop devices for non-electrical control circuit, nor to those without mechanical latching function.

EN 60529 Degrees of protection provided by enclosures

This Standard describes a system for classifying the degrees of protection provided by the enclosures of electrical equipment with a rated voltage not exceeding 72.5 kV.

The object of this Standard is to give definitions for degrees of protection provided by enclosures of electrical equipment, designations for these degrees of protection, requirements for each designation and tests to be performed.

EN 418

Standard EN 418 concern Safety of Machinery and functional aspects. The Standard sets out principles for the design of emergency stop devices on machines.

ISO 13850 Safety of Machinery - Emergency stop - Principles for design

The Standard specifies functional requirements and design principles for the emergency stop function on machinery, independent of the type of energy used.

Regulation for prevention of injury BGV C 1 (only for Germany)

The Regulation describes how the protection objectives set out by the accident prevention standards can be achieved. This regulation does not exclude other equally safe solutions, required by other member states of the European Union.

CAN/CSA-C22.2 No 14-13 - Industrial control equipment

CSA C22.2 No. 14 is one of a series of standards under Part II of the Canadian Electrical Code. This standard applies to control and protective devices, and accessory devices, rated at not more than 1500 V, for starting, stopping, regulating, controlling, or protecting electric motors, generators, heating apparatus, or other equipment used to control an industrial process that is intended to be installed and used in non-hazardous locations in accordance with the rules of the CE Code, Part I.

UL 508 - Industrial control equipment

These requirements cover industrial control devices, and devices accessory there to, for starting, stopping, regulating, controlling, or protecting electric motors. These requirements also cover industrial control devices or systems that store or process information and are provided with an output motor control function(s). This equipment is for use in ordinary locations in accordance with the National Electrical Code, NFPA 70.

Test

Mechanical duration test

The test checks the efficiency of a component during operation and under given conditions of use.

Test on mechanical properties of terminals

- Sturdiness test
- Damage test
- Pull test
- Checking access to conductors

All the parts of the terminals that ensure contact and that convey current shall be metal with adequate mechanical strength. Terminal connections must be such that the conductors can be connected by means of screws, springs or other equivalent means to guarantee that the necessary contact strength is maintained. The terminals must be constructed so that they may be fixed between metal surfaces in a way that will prevent significant damage to the conductor or to the terminal. The terminals must not allow the conductors to move or change their mutual position in a way that would affect the operation of the equipment and they must ensure that the insulation voltage does not drop below the rated values.

The above tests are carried out to verify the requirements indicated.

IP code protection degree

Standard 60529 classifies and evaluates the degree of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72.5 kV, ingress of solid foreign objects (such as body parts and dust) and liquids. The Standard describes the various tests which the electrical equipment must pass depending on the IP degree.

Second digit	Description
0	Non protected
1	Protected against vertically falling water drops
2	Protected against vertically falling water drops when enclosure tilted up to 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against powerful water jets
7	Protected against the effects of temporary immersion in water
8	Protected against the effects of continuous immersion in water
9 - K	Protected against high-pressure, high-temperature water jets

IP degree	Description
IP44	The access probe of 1.0 mm ø shall not penetrate and the object probe of 1.00 mm ø shall not penetrate at all. Water splashed against the enclosure from any direction shall have no harmful effects.
IP54	The access probe of 1.0 mm ø shall not penetrate and ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety. Water splashed against the enclosure from any direction shall have no harmful effects.
IP55	The access probe of 1.0 mm ø shall not penetrate and ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety. Water projected in jets against the enclosure from any direction shall have no harmful effects.
IP65	The access probe of 1.0 mm ø shall not penetrate and no ingress of dust. Water projected in jets against the enclosure from any direction shall have no harmful effects.
IP66	The access probe of 1.0 mm ø shall not penetrate and no ingress of dust. Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
IP67	The access probe of 1.0 mm ø shall not penetrate and no ingress of dust. Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time.
IP68	The access probe of 1.0 mm ø shall not penetrate and no ingress of dust. Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7.
IP69 - K	The access probe of 1.0 mm ø shall not penetrate and no ingress of dust. Protection against high-pressure, high-temperature water jets.

First digit	Description
0	Non protected
1	Protected against access to hazardous parts with the back of a hand and against solid foreign objects of 50 mm ø and greater
2	Protected against access to hazardous parts with a finger and against solid foreign objects of 12.5 mm ø and greater
3	Protected against access to hazardous parts with a tool and against solid foreign objects of 2,5 mm ø and greater
4	Protected against access to hazardous parts with a wire and against solid foreign objects of 1 mm ø and greater
5	Protected against access to hazardous parts with a wire and dust-protected
6	Protected against access to hazardous parts with a wire and dust-tight



IK Code protection degree

Standard 62262 describes a system (IK code) for classifying the degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (rated voltage of the protected equipment not exceeding 72.5 kV).

Code IK	E (J)
00	Non protected
01	0.14
02	0.2
03	0.35
04	0.5
05	0.7
06	1
07	2
08	5
09	10
10	20

H.A.L.T. "HIGHLY ACCELERATED LIFE TEST"

HALT is a ruggedness margin discovery process, which reveals the main causes of product failures.

During the test, the product is subjected to gradually higher stress levels brought on by vibration and by rapid temperature and humidity transitions with the aim of uncovering the main causes of failure and the real operating limits of the product.

The HALT process subjects the product to stresses well beyond the expected operating conditions, until broken or jammed.

Electrical duration test

The tests checks the electrical efficiency of a component during operation and under given conditions of use.

Making and breaking capacity test under normal and abnormal conditions

Breaking capacity: the test determines the value of presumed current that a switch or fuse is able to break at a set voltage and in given operation conditions.

Making capacity: the test determines the value of presumed current that a switch or fuse is able to make at a specified voltage and in given operation conditions.

Short-circuit test

The test is designed to check the resistance of a device to given short-circuit conditions.

Storage and/or operational temperature test:

- Testing efficiency in cold environment
- Testing efficiency in dry hot environment
- Testing efficiency in humid hot environment
- Testing uniformity of behaviour with temperature changes
- Testing efficiency in cyclic humid hot environment

The tests are designed to check fitness for operation and storage of a device in given environmental condition.

Special regulations for potentially explosive areas

Definition of potentially explosive areas

Hazardous areas are places where, under certain conditions, explosive atmospheres may form. An explosive atmosphere is a mixture of air and gases, vapours, fumes or combustible dust, whose combustion spreads rapidly (explosion) after ignition at atmospheric pressure.

Users are responsible for carrying out a classification of hazardous areas, as set out in European Directive 1999/92/EC. International standards IEC 61241-10 provide criteria for the classification of hazardous areas depending on their chemical nature, physical characteristics and quantity of substances used, as well as on the frequency and length of time when an explosive mixture may occur.

Zones with presence of gas

When the hazard is due to the presence of gas, vapours or mists of flammable substances, European directive 1999/92/EC provides classification into three zones, namely:

Zone 0 - Areas in which an explosive atmosphere is present continuously or for long periods of time.

Zone 1 - Areas in which an explosive atmosphere is likely to occur under normal conditions.

Zone 2 - Areas in which an explosive atmosphere is not likely to occur and, if it does, it is only for a short period on time.

Zones with presence of combustible dusts

When the hazard is due to the presence of combustible dusts, European directive 1999/92/EC provides classification into three zones, namely:

Zone 20 - Areas in which an explosive atmosphere is present continuously or for long periods of time.

Zone 21 - Areas in which an explosive atmosphere is likely to occur under normal conditions.

Zone 22 - Areas in which an explosive atmosphere is not likely to occur and, if it does, it is only for a short period on time.

Equipment classification

European directive ATEX 94/9/EC divides equipment into three categories, with different levels of protection, depending on the level of protection ensured.

LEVEL OF PROTECTION ensured by the equipment	MINING		SURFACE	
	Category	GAS Category	(POWER) FUEL Category	
Very high	M1	1G	1D	
High	M2	2G	2D	
Normal	Not envisaged	3G	3D	

Higher category equipment, with even further protection, can also be installed instead of lower category equipment.

Enclosure groups

Regulations divide electrical equipment into two enclosure groups.

Group I: electrical equipment designed for installation in mines or tunnels, with presence of firedamp or coal dust.

Group II: electrical equipment designed for installation in surface plants, with presence of other explosive atmospheres.

Enclosures for surface equipment, with "d" protection type (explosion proof) are then divided into three subgroups, depending on the flammable substances for which they are suitable: **Group IIA**, **Group IIB**, **Group IIC**. A motor belonging to a given enclosure group is also suitable for lower enclosure groups: a group IIB motor is also suitable for group IIA and a group IIC motor is also suitable for groups IIA and IIB.

Temperature classes for atmospheres with gas

Electrical equipment is classified into 6 temperature classes according to its maximum surface temperature. Maximum surface temperature is the highest temperature reached during operation, under rated conditions, on any surface point of the electrical equipment.

Area of use with presence of GAS	Area of use with presence of COMBUSTIBLE DUSTS	Hazard level of ZONE of use
Zone 1	Zone 20	Explosive atmosphere CONTINUOUSLY PRESENT
Zone 2	Zone 21	Explosive atmosphere LIKELY
Zone 3	Zone 22	Explosive atmosphere NOT LIKELY



Ignition temperature of the explosive mixture [°C]	Temperature class	Maximum surface temperature of the electrical equipment with 40°C ambient temperature [°C] [°F]	
		[°C]	[°F]
More than 450	T1	450	842
From 300 to 450	T2	300	572
From 200 to 300	T3	200	392
From 135 to 200	T4	130	275
From 100 to 135	T5	100	212
From 85 to 100	T6	85	185

Ignition temperature and enclosure groups for gases and vapours

Flammable gases and vapours are divided into temperature classes and enclosure groups according to their ignition temperature and to the pressure that develops in case of explosion. Markings on electrical equipment with the symbols for mode of protection, enclosure group and temperature class indicate the area where such equipment can be installed.

Group	Temperature class		
	T1	T2	T3
I	Methane (firedamp)		
IIA	Ethyl acetate Methyl acetate Acetone Acetic acid Methanol Ammonia Benzene Benzol Butanol Methylene chloride Vinyl chloride Ethane Methane Methanol Carbon monoxide Naphthalene Propane Toluene Xylene	Butyl acetate Propyl acetate Amyl alcohol Ethyl alcohol Isobutyl alcohol N-butyl alcohol Acetic anhydride Cyclohexanone Liquid gas Natural gas Mono-amyl acetate N-Butane	Cyclohexane Cyclohexanol Decane Heptane Hexane Gas oil Kerosene Diesel fuel Pentane Petroleum*
IIB	Coke-oven gas Water gas	1,3 - butadiene Ethylene Ethylbenzene Ethylene oxide	Hydrogen Sulphide Isoprene Petroleum*
IIC	Hydrogen		Acetylene
Group	Temperature class		
	T4	T5	T6
I			
IIA	Acetaldehyde Ether		
IIB	Ethyl ether		
IIC	Ethyl nitrate Carbon disulphide		

* according to chemical composition

Temperature for atmospheres with combustible dusts

When providing protection against flammable dusts, whether in the form of dust cloud or dust layer, their ignition temperature must be taken into account. The surface temperature of the enclosure, indicated on the motor plate, must be below that of the reference ignition temperature.

The reference temperature is the lowest of the two values calculated as follows:

$$TS1 = 2/3 \text{ Tcl}$$

(Tcl = ignition temperature of the dust cloud)

$$TS2 = T5mm - 75K$$

(T5mm = ignition temperature of a 5 mm layer of dust)

Tamm = the lowest of TS1 and TS2.

Dust ignition temperature	Cloud Tcl	Layer T5mm
Safety temperature	TS1 = 2/3 Tcl	TS2 = T5mm - 75K
Maximum surface temperature	Tamm = the lowest of TS1 and TS2	
Motor surface temperature ≤ Tamm		

	Cloud [°C]	Layer [°C]
Aluminium	590	>450
Coal dust	380	225
Flour	490	340
Wheat dust	510	300
Methylcellulose	420	320
Phenolic resins	530	>450
Polyethylene	420	Fusion
PVC	700	>450
Soot	810	570
Starch	460	435
Sugar	490	460

Selecting safety electrical equipment in the presence of gases and in the presence of combustible dusts

The connection between hazardous zones and the category of the equipment to be used is defined by Directive 1999/92/EC. The specific construction standards for modes of protection (e.g. Ex d) also define the category obtained when they are applied (e.g. 2G).

Explosive Atmosphere	Hazardous Zone	Protection provided by the equipment	Motor category	Mode of protection
Continuous	0	Very high	1G	IEC EN 60079-26
Likely	1	High	2G	Ex d Ex de Ex e
Unlikely	2	Normal	3G	Ex nA

Explosive Atmosphere	Hazardous Zone	Protection provided by the equipment	Motor category	Mode of protection
Continuous	20	Very high	1D	Currently not envisaged
Likely	21	High	2D	Ex tD - A21 - IP6x
Unlikely	22 Conductive dusts	Normal	3D	Ex tD - A21 - IP6x
Unlikely	22 Non-conductive dusts	Normal	3D	Ex tD - A22 - IP5x

Higher category equipment, with even further protection, can also be installed instead of lower category equipment.

Certification and approved laboratories

LIMITEX limit switches comply with Directive 94/9/EC ATEX and have been approved by a body notified by the European Commission in accordance with the criteria defined by the ATEX directive. They are classified on the basis of the hazardous atmosphere present in the place of installation. Selection of the type of protection must be based on the installation zone. The hazardousness of the zone is determined by the type of atmosphere present.

The user is responsible for defining the type of protection, the enclosure group and the maximum surface temperature of the limit switch to be installed.

The user is also responsible for correct installation, connection to mains, use and maintenance of the motor.

ATEX reference standards

INERIS 13ATEX0020X certificate

EN 60079-0: 2009 Electrical apparatus for potentially explosive areas. General rules.

EN 60079-1: 2007 Electrical apparatus for potentially explosive areas. "d" explosion-proof enclosures.

EN 60079-3: 2009 Equipment protected by "t" enclosures for use in the presence of combustible dusts.

IECEx INE 13.0051X certificate

IEC 60079-0: 2011 Electrical apparatus for potentially explosive areas. General rules.

IEC 60079-1: 2007-04 Electrical apparatus for potentially explosive areas. "d" explosion-proof enclosures.

IEC 60079-31: 2008 Equipment protected by "t" enclosures for use in the presence of combustible dusts.



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