

Tecno El ettrica Ravasi

The Alpha Pendant Station is a control device for all industrial machinery. It operates as an auxiliary controller of electrical motors through a power interface, such as a contactor or PLC. Designed for heavy duty, Alpha is aimed specifically for the industrial market. It is available with 2 to 13 buttons arranged on a double row to allow for pairing of opposite functions and reducing overall dimensions. Alpha has an innovative design, where all graphic elements are linked to specific technical functions.

Size and shape, resulting from a thorough analysis of the ergonomic features of the product, combined with the research of a graphic style suitable for a modern industrial environment, make Alpha easy to operate. Alpha has been produced to facilitate wiring and maintenance, thus reducing time for the first installation and saving on costs.

> Symbols and lettering on the buttons are made of antireflection polycarbonate printed on the backside, which clear reading and prevent wear.

Alpha can be customised with labels and colours according to the customer's requirements.

The connector is used to connect a flexible cable to the equipment, thus providing technical and economical advantages such as easy maintenance/replacement of the equipment, time saving and availability of wired equipment ready for use.



The connector has 26 terminals to crimp that can be used for any function and application of the equipment it is connected to. The mechanic and electric specifications correspond to those of the equipment on which it is assembled and the connector is therefore suitable for any application required by the market. The high technical specifications of the connector components and the easy assembling of its parts ensure long life and reliability.

Ideal for all environmental and working conditions due to the extremely reduced overall dimensions and the antislip lines on the enclosure.

The space available for the conductors is dimensioned for a 48 x 1.5 mm<sup>2</sup> or  $30 \times 2.5$  mm<sup>2</sup> cable. All switches have terminals facing the cable clamp of the pendant station and screws on the opposite side to facilitate wiring. All electric connections use screw-type terminals.





The integrated suspension system keeps the pendant station at an angle of inclination which allows the best view of all control elements, allowing the operator to work in a natural and non-tiring position.

Materials and components are wear resistant and protect the equipment against water and dust.

The emergency stop mushroom pushbutton complies with the EN 418 standard and is equipped with positive opening nc switches.

Alpha is preset for the direct assembly of LCD Displays for various patterns of use, and of electronic cards that replace standard switches.



TECHNICAL	. SPECIFIC	ATIONS		
Conformity to Community Directives	73/23/CEE	93/68/CEE		
Conformity to Standards	EN 60204-1 EN 60529	EN 60947-1 EN418	EN 60947- EN50013	5-1 IEC536
Ambient temperature	Storage	-40°C/+70°C		
	Operational	-25°C/+70°C		
Protection degree	IP 65			
Insulation category	Class II			
Cable entry	Rubber cable	e sleeve (Ø14-	÷26 mm)	
Operating positions	Any position			
Homologations	CE			

## **TECHNICAL SPECIFICATIONS OF THE SWITCHES**

Utilisation category Rated operational current Rated operational voltage Rated thermal current Rated insulation voltage Mechanical life Terminal referencing Connections Homologations AC 15 3 A 250 V 10 A 500 V~ 0.5 x 10<sup>6</sup> operations According to EN 50013 Screw-type terminals CE - UL - (c)UL

# TECHNICAL SPECIFICATIONS OF THE CONNECTOR

Conformity to standards	DIN VDE 0627 IEC 60664-1
Number of poles	26
Ambient temperature	Storage -40 °C / +70 °C
	Operational -25 °C / +70 °C
Protection degree	IP 65 (connector assembled on the pendant station)
Operational voltage	250 V~
Operational current	10 A
Test voltage	2500 V~
Contact resistance	$\leq$ 3 m $\Omega$
Cable entry	Rubber cable sleeve (Ø 14/26 mm)
Connections	To crimp on 0.5÷2 mm <sup>2</sup> wire

## **OVERALL DIMENSIONS**





### Pendant station with cable sleeve

No. of	Weight	Overall dimensions (mm)						
buttons	(kg)	А	В	С	D	Е	F	G
4	0.470	382	75	169	220	60	78	97
8	0.720	460	75	169	302	60	78	97
12	0.890	537	75	169	382	60	78	97

Pendant station with cable sleeve and connector

No. of Weight Overall dimensions (mm)					I	l			
buttons	(kg)	А	В	С	D	Е	F	G	
8	0.840	558	75	367	302	60	78	122	
12	1.050	635	75	267	382	60	78	122	

# Alpha Pendant Control Station



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	Drawing	CODE	DESCRIPTION
1		PRSL1018PI	Cover for suspension wire + screw (33) and support terminals (02+03)
4		PRGA0012PE	Hook
5		PRSL0145PE PRSL0146PE	Cable sleeve Silicone cable sleeve
10		PRSL1251PI	Female terminal holder +(06)+(07)+(08)+(09)+(11)
13		PRSL1252PI	Male terminal holder +(12)+(16)
17		PRSL1020PI	Cable clamp + screws (18)
19		PRSL1011PI	Emergency stop mushroom pushbutton + gasket (35) + threaded ring (39)
20	t Contraction	PRSL8739PI	Holding plate for 3 switches
21		PRTA2xxxPI See standard buttons	Button for double pushbutton
22		PRGO0020PE	Rubber for double pushbutton without buttons (21)
23		PRSL8737PI	Holding plate for rubber
24		PRSL1002PI PRSL1003PI	1 speed double switch 2 speed double switch
30		PRTA1xxxPI See standard buttons	Button for single pushbutton
31		PRSL1010PI	Single pushbutton + threaded ring (39) without button (30)
32		PRSL1023PI	Blanking plug + gasket (35) + threaded ring (39)

# Alpha Pendant Control Station

	Drawing	CODE	DESCRIPTION
34		PRSL1012PI PRSL1013PI PRSL1014PI	Red pilot light + gasket (35) Yellow pilot light + threaded ring (39) Green pilot light
36		PRSL1015PI PRSL1016PI PRSL1026PI PRSL1027PI	Spring return selector switch (on-off) Selector switch (on-off) + gasket (35) Spring return 3 position selector switch + threaded ring (39) 3 position selector switch
37		PRSL1017PI PRSL1024PI	Key selector switch (on-off) + gasket (35) Spring return key selector switch + threaded ring (39)
38		PRSL8735PI	Holding plate for 2+2 switches
40		PRSL1004PI	Lamp holder
41	C C C C C C C C C C C C C C C C C C C	PRSL8736PI	Holding plate for 3+3 switches
42		PRSL1000PI PRSL1001PI	1 no switch 1 nc switch
		Standard E	Buttons



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# FEATURES OF STANDARD PENDANT STATIONS

CONTROL ELEMENT	QUANTITY AND TYPE OF CONTACT	QUANTITY/SWITCH CODE
Emergency stop	1nc	1/ PRSL1001PI
Reset	1no	1/ PRSL1000PI
Alarm	1no	1/ PRSL1000PI
Reset/alarm	2no	2/ PRSL1000PI
1 speed opposite functions	1no+1no	1/ PRSL1002PI
2 speed opposite functions	1no+1no+1no	1/ PRSL1003PI

## **STANDARD PENDANT STATIONS**

Pendant stations code PF38xxxxxx are supplied with cable sleeves, while pendant stations code PF43xxxxxx feature wired connectors.





FEATURES OF THE SWITCHES

The single switches PRSL1000PI and PRSL1001PI have 1 no or 1 nc contact with two connecting terminals.

The double switch PRSL1002PI (1 speed) has:

• 1 no contact with 1 connecting terminal for each opposite function • 1 single terminal for both functions

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The double switch PRSL1003PI (2 speeds) has:

• 1 no contact with 1 connecting terminal for the first speed for each opposite function • 1 no contact with 1 connecting terminal for the second speed for both functions • 1 single terminal for both functions

All nc contacts are of the positive opening operation type. The switches have the following reference for internal wiring.

PRSL1000PI

# PRSL1001PI

PRSL1002PI

PRSL1003PI



# **CONNECTOR TERMINAL NUMBERING SCHEME**



Front

Rear

Female terminals





Front

Rear

## USE AND MAINTENANCE INSTRUCTIONS FOR PENDANT CONTROL STATION

Alpha Pendant Control Station is an electromechanical device for low voltage control circuits (EN 60947-1, EN 60947-5-1) to be used as electrical equipment on machines (EN 60204-1) in compliance with the fundamental requirements of the Low Voltage Directive 73/23/CEE and of the Machine Directive 89/392/CEE.



The pendant station is designed for industrial use and also for use under particularly severe climatic conditions (operational temperature from -25 °C to +70 °C, suitable for use in tropical environment). The equipment is not suitable for use in environments with potentially explosive atmosphere, corrosive agents or a high percentage of sodium chloride (saline fog). Oils, acids or solvents may damage the equipment.

The switches (24, 42) are designed for auxiliary control of contactors or electromagnetic loads (utilisation category AC-15 according to EN 60947-5-1). Do not connect more than one phase to each switch (24, 42). Do not oil or grease the control elements (19, 21, 31, 36, 37) or the switches (24, 42).

The installation of the pendant station shall be carried out by an expert and trained personnel. Wiring shall be properly done according to the current instructions.

Prior to the installation and the maintenance of the pendant station, the main power of the machinery shall be turned off.

- Steps for the proper installation of the pendant station
- remove the screws on the enclosure (27) to open the pendant station
- cut the variable section rubber cable sleeve (05) and insert the cable tight enough to guarantee protection against water and/or dust.
- fix the cable to the cable sleeve (05) using a cable tie (not supplied).
- strip the cable to a length suitable for wiring the switches (24, 42)
- tape the stripped part of the cable
- fix the cable inside the pendant station using the cable clamp (17)

- connect all the switches (24, 42) according to the contact scheme printed on the switches (tighten the wires into the terminals with a torque equal to 0.6 Nm; tightening torque of the switch terminals equal to 2x1.5mm<sup>2</sup> – 1x2.5 mm<sup>2</sup>)
- close the pendant station checking the proper positioning of the rubber (26) in the cover (27)
- Additional steps for the installation of self-supporting cables
- remove the small cover (01) screwed on the cover of the pendant station
  put the terminals (03) into their seats and insert the suspension wires of the self-supporting cable
- pull the suspension wires to obtain the right inclination of the pendant station and screw the wires into the terminals (03)
- close the small cover (01) and put the exceeding suspension wires in the seats next to the terminals (03)

#### Periodic maintenance steps

- check the proper tightening of the screws (29) of the enclosure (15, 27)
- check the proper tightening of the switch (24, 42) terminal screws
- check the wiring conditions (in particular where wires clamp into the switches)
  check the conditions of the rubber (26) fit into the enclosure (27), of the rubber of the control elements (22, 31) and of the cable sleeve (05)
- check that the plastic enclosure (15, 27) of the pendant station is not broken

In case any component of the pendant station is modified, the validity of the markings and the guarantee on the equipment are annulled. Should any component need replacement, use original spare parts only.

TER declines all responsibility for damages caused by the improper use or installation of the equipment.

## USE AND MAINTENANCE INSTRUCTIONS FOR CONNECTOR

The Connector is an electromechanical device used for connecting a flexible cable to an equipment.

The connector is designed for industrial use and also for use under particularly severe climatic conditions (operational temperature from  $-25^{\circ}$ C to  $+70^{\circ}$ C, suitable for use in tropical environment). It is not suitable for use in environments with potentially explosive atmosphere, corrosive agents or a high percentage of sodium chloride (saline fog). Oils, acids or solvents may damage the equipment.

The connector must be assembled on an ALPHA pendant control station and it is therefore suitable for auxiliary circuits controlling contactors or electromagnetic loads. Do not oil or grease plastic enclosures (06, 07, 08, 10, 13) or contact terminals (09, 16).

Do not plug, nor unplug the connector when it is on load.

Turn off the power before operating on the connector.

The installation of the connector shall be carried out by expert and trained personnel. Wiring shall be properly done according to the current instructions.

Prior to the installation and the maintenance of the connector, the main power of the machinery shall be turned off.

#### Steps for the proper installation of the connector

Crimpage of the male terminal (16) or female terminal (09) on the wires

- strip the wire 4 mm long (use wires with section 0.5 mm2 thru 2 mm2)
- put the stripped part of the wire into the terminal seat (09, 16)
- close the wings of the terminal (09, 16) around the stripped part of the wire and around the wire protective sheath; use common pliers with small noses and do not grip too tight
- crimp the terminal (09, 16) on the wire using the appropriate tool (it is advisable to use Cembre pliers, Crimpstar series, HF model).

Assembly of the male terminals (16) or female terminals (09) into their terminal holders (13, 10)

- put the terminal (09, 16) with crimped wire into its terminal holder (male (13), female (10))
  put the male terminals (16) into the male terminal holder (13) assembled on the pendant station; put the female terminals (09) into the female terminal holder (10) assembled on the connecting cable
- put the terminal into the rear of its terminal holder (10, 13)
- push the terminals (09, 16) into their terminal holder (10, 13) until they are fully hooked; pay attention not to damage the wires crimped on the terminals (09, 16)
   the partial numbering of the holes is moulded on the terminal holders (10, 13); the
- complete numbering is shown in the connector terminal numbering scheme.

Assembly of the male terminal holder (13) on the pendant station

• screw the male terminal holder (13) on the pendant station

- check that the two O-rings (12) are properly positioned on the male terminal holder (13)
- the male terminal holder (13) must be screwed thoroughly on the pendant station; it is properly screwed when the notches on the male terminal holder (13) match the centre of the pendant station
- if the male terminal holder (13) is wired, pay attention when assembling, in order to prevent the wires from twisting when screwing the male terminal holder (13).

Assembly of the female terminal holder (10) on the cable

- cut the variable section rubber cable sleeve (05) and insert the cable tight enough to guarantee protection against water and/or dust (leave 20 cm of cable out of the cable sleeve (05)
- put the tightening ring (06) on the cable, touching the cable sleeve (05)
- after assembling the clamping ring (07), put the cable sleeve holder (08) on the cable
   screw the cable sleeve holder (08) on the cable sleeve (05) without tightening it, so
- that the cable can slide insidestrip the cable about 32 mm long
- tape the stripped part of the cable
- crimp the terminal (09) on the wire
- assemble the terminals (09) into the female terminal holder (10)
- use the screws (11) to assemble the wired female terminal holder (10) and the cable sleeve holder (08); the groove on the side of the female terminal holder (10) must match the corresponding guide on the cable sleeve holder (08)
- turn the cable sleeve (05) to tighten it on the cable sleeve holder (08), avoiding twisting the cable
- fix the cable to the cable sleeve (05) using a cable tie (not supplied)

Final assembly of the connector

- turn off the main power supply of the machinery
- insert the connector assembled on the cable (connector with female terminals) into the connector assembled on the pendant station (connector with male terminals); the right coupling position is forced by the shape of the two plastic parts of the connectors
- screw and tighten the clamping ring (07) on the connector assembled on the pendant station

Removal/replacement of male terminals (16) or female terminals (09) from their terminal holders (13, 10):

- insert the knockout into the male terminal (16) or female terminal (09) to replace; insert the knockout into the front part of the male or female terminal holder
- push the knockout while pulling the wire The male or female terminal (16, 09) pulled out is not suitable for future use and it must be replaced

Periodic maintenance steps

- check the proper tightening of the clamping ring (07)
- check the proper tightening of cable sleeve (05) and cable sleeve holder (08)
- check the conditions of male terminals (16) and female terminals (09)
- check the conditions of the cable sleeve (05)
- check that the plastic enclosure of the connector (06, 07, 08, 10, 13) is not broken

In case any component of the connector is modified, the validity of the markings and the guarantee on the equipment are annulled. Should any component need replacement, use original spare parts only.

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# Request form for non standard pendant stations



Switches		
Single		Double
1 PRSL1000PI	1no	1 PRSL1002PI 1 speed
2 PRSL1001PI	1nc	2 PRSL1003PI 2 speed
3 PRSL1004PI	Lamp holder	

### Instructions

- Write the number corresponding to the control element required (broken line box). When buttons are required and when necessary, mark the direction of the arrow into the corresponding circle.
- Write the number corresponding to the single or double switches.
- Mark the appropriate box to show where the cable sleeve or the connector must be assembled (top or bottom). In case a connector is required, enclose the wiring diagram.







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