



**TER**

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**PRODUCT  
OVERVIEW**

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Complete technical information are available in the product datasheets of the “General Catalog” and in the Download-Technical Documents section on [www.ter.it](http://www.ter.it).





**T**ER Tecno Elettrica Ravasi srl was established in Olgiate Molgora (Lecco), in 1962, by its founder, Sergio Blasi, willing to enter the field of switches and controls for industrial hoisting machines.

In the early 70s TER started a process of internationalization with the first export sales, and worked on increasing the diversification of its product range, entering the wind energy industry in the mid 80s.

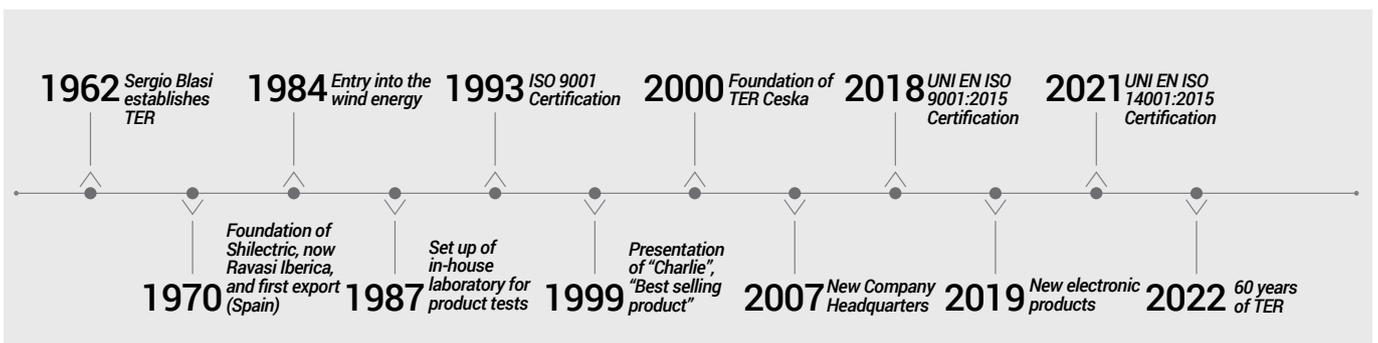
Over the years, TER focused on the creation of innovative, reliable products that could anticipate demands from the market, starting combining mechanical technology with electronics in some of its products.

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

At the beginning of 2018 TER's Quality Management System is updated according to the new UNI ISO 9001: 2015 standard and in 2021 it has been certified UNI EN ISO 14001: 2015, as a result of its continuous attention to the environment and environmental sustainability.

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

In 2022 TER celebrates its first sixty years of industrial history, looking at the future in continuous anticipation of new market challenges.



## MARKETING



**T**ER simplifies the control of the machines that carry its devices, designing reliable, ergonomic and intuitive safety products.

The increasingly central role given to the sales department is seen as a continuous relationship between TER and its customers.

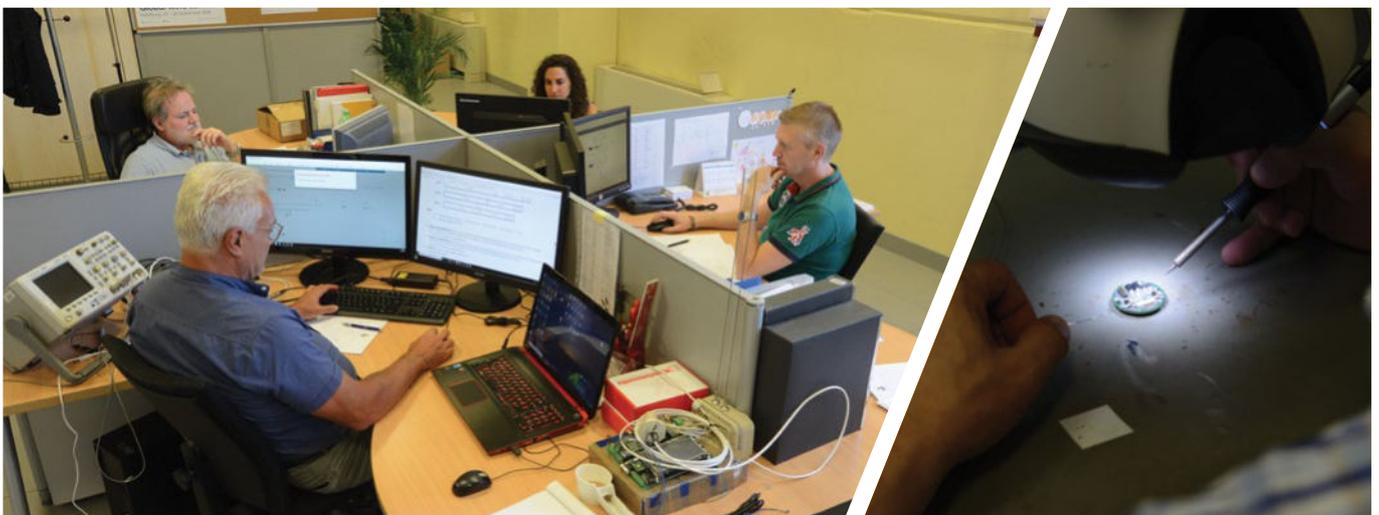
TER supports commercial relations with customers with a well-structured **back office** and the wealth of technical and sales documentation available on the company's **website**, which also includes a new **e-commerce** area and as of 2018 is also accessible at the new and easier **domain ter.it**. Since 2012, orders have been managed by means of **configurators**, also accessible through the web.



## TECHNOLOGY

**T**ER products are the result of capacity for innovation, experience and application of technological expertise. 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 with the opening of a plastic moulding plant. In the early 90s, TER introduced the use of 3D modelling in the design process and started a progressive integration in its products of electronics, which in the last two years has taken a more and more important role leading to the design of a new and innovative line of electronic products.



● PRODUCTION



Product families



Product configurations

**F**rom order reception in the Sales Department through to shipment, each step is organized by processes, in order to respect delivery times, ensure product traceability and carry out all the required conformity checks.

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.



● QUALITY ASSURANCE



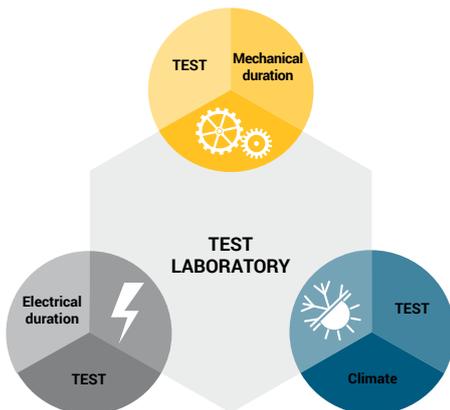
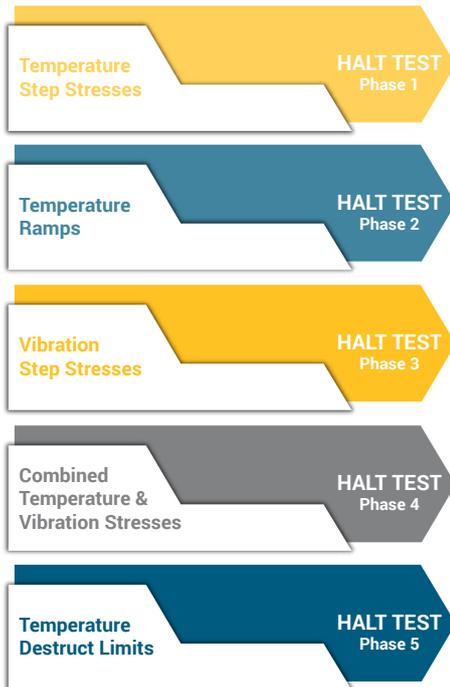
**T**ER's Quality Management System, ISO 9001 certified since 1993, is now based on processes according to UNI ISO 9001: 2015, ensuring coordination of all company activities.

In 2021 TER has been certified UNI EN ISO 14001 and it has implemented an environmental policy aimed at minimizing any significant impact by protecting the surrounding environment.

TER has obtained cULus product certification for the US and Canadian markets, EAC for the Russian market, and it has certified its products at the first safety integrity level (SIL 1) according to Standard IEC 61508.



## TEST LABORATORY



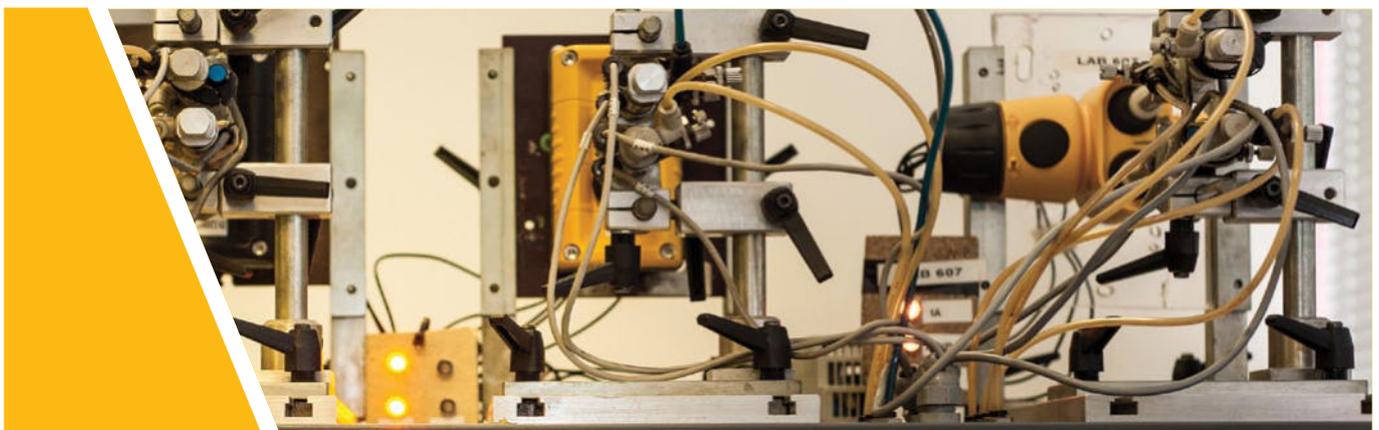
Since 1987, TER has been running an in-house Test Lab, designed to test the operating safety of the products and guarantee conformity with the different regulations that apply to the electromechanical industry.

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

- Mechanical life
- Mechanical properties of the terminals
- 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

Some TER products have successfully undergone the HALT Test (Highly Accelerated Life Test).

Upon customer's request, Test Lab staff are available to carry out more complex, in-depth measurements.



## CONTROL STATIONS

Seven series of pendant or wall-mounted control stations used for auxiliary (Victor, Mike, Charlie, SPA, Alpha and NPA) or direct control (NPA-CP and Mike-D) of industrial machinery.

### FEATURES

- Emergency stop mushroom pushbutton complying with ISO13850.
- Positive opening NC contacts for safety functions ☹ (Victor, Mike)
- Mechanical or electrical interlock to prevent simultaneous operation of opposite functions.
- Insulation category: Class II.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards (auxiliary control): EN 60204-1, EN 60947-1, EN 60947-5-1, EN 60947-5-5 (Victor, Mike), EN 60529, ISO 13850.
- Conformity to CE Standards (direct control): EN 60204-1, EN 60947-1, EN 60947-3, EN 60529, ISO 13850.
- Conformity to cULus Standards (Victor, Mike): CSA-C22.2 No 14-13, UL 508.
- Regulations for the prevention of accidents BGV C 1 (only for Germany) (Victor, Mike).

## Victor

CE cUL<sub>us</sub> BGV C1



- Wall-mounted control station for **auxiliary control**.
- Available with magnetic mounting case.
- Configurations from 1 to 8 actuators.
- 1NO or 1NC switches, LEDs, potentiometers.
- Actuators in different colours: 1 or 2 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.
- 1 speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Mechanical life of pushbuttons: 10x10<sup>6</sup> operations.
- Cable entry: cable gland M20 or spiral cable gland M20 that can be mounted above, below or on the back of the enclosure.
- Overall dimensions (depending on the number of actuators):
  - min. 72.9 x 72.7 x 61.9 mm (HxLxW)
  - max. 302 x 72.7 x 61.9 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 10x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Mike

CE cUL<sub>us</sub> SIL1 BGV C1



- Pendant control station for **auxiliary control**.
- Configurations from 4 to 15 actuators.
- 1NO or 1NC switches, LEDs, potentiometers.
- Actuators in different colours: 1 or 2 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.
- 1 speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Mechanical life of pushbuttons: 10x10<sup>6</sup> operations.
- Protection for actuators mounted on the bottom of the control station.
- Innovative hanging system with hidden cables.
- Cable entry: rubber cable sleeve (Ø 8÷26 mm).
- Overall dimensions (depending on the number of actuators):
  - min. 261 x 72.7 x 59.5 mm (HxLxW)
  - max. 561 x 72.7 x 59.5 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 10x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Charlie



- Pendant control station for **auxiliary control**.
- Configurations from 2 to 3 actuators.
- 1NO or 1NC switches, 1 or 2 speed double switches with NO contacts.
- Threaded ring closing base and cover without using screws.
- Cable entry: cable gland M20 or spiral cable gland M20.
- Overall dimensions: 249 x 80 x 95 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## SPA



VERSION WITH DISPLAY



- Pendant control station for **auxiliary control**.
- Configurations from 2 to 28 actuators arranged on a double row.
- 1 or 2 speed switches with NO or NC contacts.
- Pushbuttons, selector switches and key-selector switches, pilot lights, impulse or latched mushroom pushbuttons with rotation release.
- Available on request with a high resolution color graphic display, suitable for displaying measurements and information about the system where the control station is installed.
- Cable entry: rubber cable sleeve (Ø 14÷26 mm).
- Overall dimensions (depending on the number of actuators):
  - min. 132 x 94 x 64 mm (HxLxW)
  - max. 600 x 94 x 64 mm (HxLxW)

### Switch specifications

- Utilization category: AC 15 / 1.9 A / 380 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Alpha



- Pendant control station for **auxiliary control**.
- 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.
- Pushbuttons, selector switches and key-selector switches in various operation configurations, pilot lights, latched mushrooms pushbuttons with rotation release or key-operated.
- Cable entry: rubber cable sleeve (Ø 14÷26 mm).
- Overall dimensions (depending on the number of actuators):
  - min. 222 x 75 x 60 mm (HxLxW)
  - max. 382 x 75 x 60 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.



- Pendant control station for **auxiliary control**.
- Configurations from 2 to 12 actuators.
- 1, 2 or 3 speed switches with NO and/or NC contacts.
- Cable entry:
  - 2÷6 buttons: rubber cable sleeve (Ø 10÷18 mm)
  - 8÷12 buttons: rubber cable sleeve (Ø 17÷26 mm).
- Cable sleeve can be angled up to 20° for comfortable working position.
- Overall dimensions (depending on the number of actuators):
  - min. 140 x 76 x 70 mm (HxLxW)
  - max. 560 x 90 x 70 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 15 / 1.9 A / 380 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.



- Pendant control station for **direct control**.
- Configurations available: 3 actuators (1 speed version) or 4 actuators (2 speed version).
- 1 speed pushbuttons, latched mushroom pushbuttons with rotation release.
- 1 speed two-pole switches and 1 speed three-pole switches for emergency mushroom pushbutton, for direct control.
- Mechanical life of pushbuttons: 10x10<sup>6</sup> operations.
- Innovative hanging system with hidden cables.
- Cable entry: rubber cable sleeve (Ø 8÷26 mm).
- Overall dimensions:
  - 3 actuators: 261 x 72.7 x 59.5 mm (HxLxW)
  - 4 actuators: 321 x 72.7 x 59.5 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 3 - AC 4 (AC 23B for PRSL1902PI) / 10 A / 400 Vac.
- Rated operational power: 3 kW.
- Rated thermal current: 20 A.
- Rated insulation voltage: 660 Vac.
- Connections: screw-type terminals.



- Pendant control station for **direct control**.
- Configurations from 2 to 8 actuators.
- 1 or 2 speed two-pole switches or 1 speed three-pole switches, with or without brake contact / auxiliary contact, for direct control.
- Cable entry:
  - 2÷6 buttons: rubber cable sleeve (Ø 10÷18 mm)
  - 8 buttons: rubber cable sleeve (Ø 17÷26 mm).
- Cable sleeve can be angled up to 20° for comfortable working position.
- Overall dimensions (depending on the number of actuators):
  - min. 140 x 76 x 70 mm (HxLxW)
  - max. 393 x 83 x 70 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 3 - AC 4 (AC 23B for PRSL508PI) / 10 A / 400 Vac.
- Rated operational power: 3 kW.
- Rated thermal current: 20 A.
- Rated insulation voltage: 660 Vac.
- Brake operating contact / auxiliary contact: 100 V, 0.7 A, L/R=100 ms.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

# JOYSTICKS

Three series of joysticks used to control industrial machinery.

## FEATURES

- Various types of handles and grips.
- Available with free movement, with “dead man” safety device (with mechanical interlock), or with NO pushbutton.
- Up to 5 or 6 speed for each direction, with cross or 360° movement.
- Configurations with switches or potentiometers.
- Available with Egon 36-AL single or redundant analog encoders with current or voltage output.

## DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards (Juliet): EN 60204-1, EN 60947-1, EN 60947-5-1.
- Conformity to CE Standards (Romeo, Hercules): EN 60204-1, EN 60947-1, EN 60947-5-1, EN 61000-6-2 (Romeo), EN 61000-6-3 (Romeo).

## Juliet



MAX.  
ASSEMBLED  
IN SPECIFIC  
ENCLOSURE

- Up to 5 speeds for each direction.
- Stepped or linear operation.
- Cross or 360° movement.
- Available with switch boards or potentiometers.
- Switches are assembled on pull-out or fixed terminal boards.
- Overall dimensions:
  - standard version: 150.1 x 83 x 83 mm (HxLxW)
  - version with potentiometers: 134.3 x 85.5 x 85.5 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 2 A / 48 Vac.
- Rated thermal current: 8 A.
- Rated insulation voltage: 1000 Vac.
- Mechanical life: 5x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Romeo



MAX.  
ASSEMBLED  
IN SPECIFIC  
ENCLOSURE

- Up to 6 speeds for each direction.
- Stepped or linear operation with spring return or maintained position.
- Cross or 360° movement.
- 3 different versions: with free movement, with “dead man” safety device (with mechanical interlock with or without NO/NC contact), with NO pushbutton for use as electrical interlock.
- 3 different handles, also available with pushbuttons and selector switches.
- Available with potentiometers.
- Insulation category: Class I.
- Mechanical life: 0.5x10<sup>6</sup> operations.
- Overall dimensions (depending on the handle):
  - min. 216 x 100 x 100 mm (HxLxW)
  - max. 281 x 100 x 100 mm (HxLxW)
  - max. length of Romeo with potentiometers: 129.3 mm.

### Switch specifications

- Utilization category: AC 15.
- Operating electrical usage:
  - inductive load 48 Vac / 1 A, resistive load 48 Vac / 2 A
  - inductive load 125 Vac / 1 A, resistive load 125 Vac / 3 A
  - inductive load 250 Vac / 0.5 A, resistive load 250 Vac / 2 A
  - inductive load 30 Vac / 1 A, resistive load 30 Vac / 3 A.
- Rated thermal current: 8 A.
- Rated insulation voltage: 1000 Vac.
- Mechanical life: 5x10<sup>6</sup> operations.
- Connections: screw-type terminals.



MAX  
ASSEMBLED  
IN SPECIFIC  
ENCLOSURE

- Nylon fiberglass structural components and steel levers to ensure maximum resistance.
- Up to 5 speeds for each direction.
- Stepped or linear operation 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), with NO pushbutton for use as electrical interlock.
- 4 different handles, also available with pushbuttons and selector switches.
- Available with potentiometers.
- Available with Egon 36-AL single or redundant analog encoders with current or voltage output.
- Insulation category: Class I.
- Mechanical life: 5x10<sup>6</sup> operations.
- Overall dimensions (depending on the handle):
  - min. 216 x 103 x 103 mm (HxLxW)
  - max. 285 x 103 x 103 mm (HxLxW)
  - max. length of Hercules with potentiometers: 134.4 mm.



HERCULES - S



HERCULES-CK

### Hercules-S - Switch specifications

- Utilization category: AC 15.
- Operating electrical usage:
  - inductive load 48 Vac / 1 A, resistive load 48 Vac / 2 A
  - inductive load 125 Vac / 1 A, resistive load 125 Vac / 3 A
  - inductive load 250 Vac / 0.5 A, resistive load 250 Vac / 2 A
  - inductive load 30 Vac / 1 A, resistive load 30 Vac / 3 A.
- Rated thermal current: 8 A.
- Rated insulation voltage: 1000 Vac.
- Mechanical life: 5x10<sup>6</sup> operations.
- Connections: screw-type terminals.

### Hercules-CK - Switch specifications

- Utilization category: AC 15.
- Operating electrical usage: 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Connections: screw-type terminal.

### Specifications of Egon 36-AL analog encoders

- Power supply: 12...30 Vdc.
- Output:
  - analog current output 4 - 20 mA.
  - analog voltage output 1 ÷ 5 Vdc.
  - analog voltage output 2 ÷ 10 Vdc.
- Power consumption: 35 mA.
- Single turn resolution: 12 bit (4096 points per revolution).
- Input/output over-current and over-voltage protection.
- Accuracy: ± 0.5%.
- Linearity: ± 0.25%.
- Redundancy: 2 offset analog outputs.



HERCULES with EGON 36-AL

## JOYSTICK STATIONS

Two series of joystick stations used to control industrial machinery.

### FEATURES

- Wide range of actuators: pushbuttons, selector switches, key selector switches, pilot lights.
- Emergency stop mushroom pushbutton complying with ISO13850.
- Rubber cable sleeve for cable entry and screw-type terminal connections.
- Carrying strap and protections against accidental operation in case of impact.
- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN60204-1, EN60947-1, EN60947-5-1, EN 60529, ISO13850.

## Juliet-PK



- Designed for Juliet joysticks.
- 1NO or 1NC switches.
- Insulation category: Class II.
- Cable entry: rubber cable sleeve (Ø 14÷26 mm).
- Operating positions: any position.
- Overall dimensions: 187 x 265 x 197 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Hercules-PK



MIN.  
DEPENDENT  
ON THE JOYSTICK



MAX.  
DEPENDENT  
ON THE JOYSTICK

- Designed for Hercules joysticks.
- 1NO or 1NC switches, 1 or 2 speed double switches with NO contacts.
- Insulation category: Class II.
- Cable entry: rubber cable sleeve (Ø 14÷26 mm).
- Operating positions: any position.
- Overall dimensions: 265 x 590 x 150 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## ROTARY LIMIT SWITCHES

Five series of rotary limit switches used to control the movement of industrial machinery, measuring the rotation angle and/or the number of shaft revolutions.

One series of encoders suitable for reading the shaft position.

### FEATURES

- Revolution ratios ranging from 1:1 to 1:8100.
- Equipped with sets of cams/switches, potentiometers, encoders and absolute encoders Yankee.
- XL version with cover rise available for rotary limit switches Oscar and Top, suitable for mounting more cams, potentiometers, encoders and absolute encoders Yankee.
- Different revolution ratios on each limit switch output.
- Adjustment of cam activation point.
- Positive opening NC contacts for safety functions  $\ominus$ .
- Available with flanges, pinion gears and couplings.
- Available with anti-moisture plug.
- Plates with universal adapters to replace existing systems.
- Cable glands or dedicated connectors.

### MATERIALS

- Shafts made of stainless steel AISI 430F or high-resistance stainless steel AISI 303.
- Gears and driving bushes made of self-lubricating techno-polymers.
- Enclosures made of wear resistant techno-polymers or of salt spray resistant electrostatic varnished die-cast aluminium (limit switch Top).

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN 60204-1, EN 60204-32, EN 60947-1, EN 60947-5-1, EN 60529.
- Conformity to cULus Standards: CSA-C22.2 No 14-13, UL 508.
- Regulations for the prevention of accidents BGV C 1 (only for Germany).

## Base

CE cULus BGVC1



- Available either for auxiliary or direct control.
- Revolution ratios: from 1:15 to 1:1500.
- Number of outputs: 1.
- It can be equipped with 1 set of maximum 6 cams/switches.
- Snap action switches with 1NO+1NC contacts for auxiliary control.
- Bipolar switches with 2NC contacts for direct control.
- Insulation category: Class II.
- Cable entry: cable gland M16.
- Maximum rotation speed: 800 rev./min.
- Overall dimensions (depending on the configuration):
  - min 84.5 x 98 x 70 mm (HxLxW)
  - max 101.5 x 98 x 70 mm (HxLxW).

### Auxiliary control switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current PRSL0003XX - PRSL0011XX: 5 A.
- Rated thermal current PRSL0017XX - PRSL0195XX: 2.5 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life:  $1 \times 10^6$  operations.
- Connections: 6.3 mm Faston taps or screw-type terminals.

## Fox

CE cULus SIL1 BGVC1



- Revolution ratios: from 1:3 to 1:2870.
- Number of outputs: 1.
- It can be equipped with 1 cam set (with up to 5 switches) and potentiometers, encoders, absolute encoders Yankee.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: cable gland M20, M20+M16, M20+M20.
- Rotation speed:
  - revolution ratios  $\geq 1:16$ : max. 800 rpm.
  - revolution ratios  $< 1:16$ : max. 200 rpm.
  - revolution ratios = 1:50 and 1:100: max. 1500 rpm.
- Overall dimensions: 117 x 102 x 75 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life:  $10 \times 10^6$  operations.
- Connections: screw-type terminals.



XL VERSION



- Revolution ratios: from 1:1 to 1:1550.
- Number of outputs: 2 with same or different revolution ratios.
- It can be equipped with 2 cam sets (with up to 10 switches), potentiometers, encoders, absolute encoders Yankee and Egon 36-AL.
- **XL version** featuring cover rise suitable for 2 cam sets (with up to 12 switches), potentiometers, encoders, absolute encoders Yankee and Egon 36-AL.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: up to 8 cable glands (4 M20 and 4 M16).
- Maximum rotation speed:
  - 800 rev./min. (output 1 >1:22, output 2 >1:22 or =1:1)
  - 200 rev./min. (output 1 ≤1:22, output 2 ≤1:22 or =1:1).
- Overall dimensions:
  - standard version: 134.5 x 146.5 x 119 mm (HxLxW)
  - XL version: 158.3 x 146.5 x 119 mm (HxLxW).

**Switch specifications**

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 10x10<sup>6</sup> operations.
- Connections: screw-type terminals.



- Rotary limit switch Oscar with Increased Safety System "Lima".
- Rotation control of the limit switch shaft through a connection to a control unit or a PLC.
- Control redundancy guaranteed.
- Connection: screw-type terminal board - 8 PIN (4 for each sensor).

**Output technical specifications**

- Resolution: 5 impulse/rev.
- Power supply: 10-30 Vdc.
- Max. frequency: 66.6 Hz.
- Max. current consumption (no load): 12 mA (for each sensor).
- Voltage drop: < 2 Vdc.
- Output current: < 100 mA (for each sensor).
- Short-circuit protection.
- Reverse polarity protection.
- MTTF(d) PNP sensor: 533 years.
- MTTF(d) NPN sensor: 626 years.



XL VERSION



- Salt spray resistant.
- Revolution ratios: from 1:1 to 1:8100.
- Number of outputs: 3 with same or different revolution ratios.
- It can be equipped with 3 cam sets (with up to 15 switches), potentiometers, encoders, absolute encoders Yankee and Egon 36-AL.
- **XL version** featuring cover rise suitable for 3 cam sets (with up to 18 switches), potentiometers, encoders, absolute encoders Yankee and Egon 36-AL.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- Insulation category: Class I.
- Cable entry: up to 2 cable glands M20.
- Maximum rotation speed: 800 rpm.
- Overall dimensions:
  - standard version: 139 x 186 x 120 mm (HxLxW).
  - XL version: 169 x 186 x 120 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 10x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## Top with "Speed control system"



- "Speed control system": a speed detection system featuring 4 different relay switches.
- Salt spray resistant.
- Revolution ratios: from 1:1 to 1:8100.
- Number of outputs: 2 with same or different revolution ratios.
- It can be equipped with 1 cam set (with up to 6 switches), or 1 potentiometer, 1 encoder, 1 absolute encoder Yankee or Egon 36-AL.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- Insulation category: Class I.
- Cable entry: up to 2 cable glands M20.
- Maximum rotation speed: 800 rpm.
- Overall dimensions: 169 x 186 x 120 mm (HxLxW).

#### Electrical specifications

- Single turn resolution: 12 bit (4096 points per revolution), for internal process use.
- Linearity: ± 0.25%.
- Accuracy: ± 0.5%.
- Reverse polarity and short-circuit protection.

#### Input

- Vin 24 Vdc ±15% / 48 Vdc ±15%
- I<sub>max</sub> 80 mA.

#### Outputs

- 2 or 4 configurable relays 24/250 Vac, 3/5 A, NC or NO

#### Configuration

- By 4 key switches menu.

## GF4C



- Available either for auxiliary or direct control.
- Revolution ratios: from 1:1 to 1:969.
- Number of outputs: 2.
- It can be equipped with 2 cam sets (with up to 7 switches), potentiometers, encoders, absolute encoders Yankee.
- Snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact for auxiliary control.
- Bipolar switches with 2NC contacts for direct control.
- Insulation category: Class II.
- Cable entry: cable gland M20.
- Maximum rotation speed: 800 rpm.
- Overall dimensions: 118 x 133 x 100 mm (HxLxW).

#### Auxiliary control switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 10x10<sup>6</sup> operations.
- Connections: screw-type terminals.

## POSITION LIMIT SWITCHES

Five series of position limit switches designed for controlling winches, hoists and machine tools.

### FEATURES

- Cross limit switches with maintained positions.
- Limit switches with rods and roller with spring return movement.
- Limit switches with Heads in technopolymer, metal or aluminum featuring up to 39 different types of actuators for a variety of applications.
- Positive opening NC contacts for safety functions ☹ (Arke, 7551-7552, X-FSC, X-FRZ, Ino).

### MATERIALS

- Limit switches 7551-7552 are made of die-cast aluminium alloy to guarantee maximum resistance to violent impact, chemical aggression and rust; bushes are made of sinterized material.

- Series Arke, Tango, X-FSC, X-FRZ are made of wear resistant thermoplastic materials.
- Limit switches Ino have casing made of fiber-glass reinforced UL-V0 thermoplastic, zinc alloy (zama) or aluminum.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN 60947-1, EN 60947-5-1, EN 60529.
- Conformity to cULus Standards: CSA-C22.2 No 14-18, UL 508.

## Arke



MAX. WITH DEDICATED CABLE GLAND M20

- Cross rods with 4 maintained positions every 90°, 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.
- Insulation category: Class II.
- Cable entry: cable gland M20.
- Maximum impact speed: 3 m/s.
- Mechanical life: 1.5x10<sup>6</sup> operations.
- Overall dimensions (without rods): 129 x 81 x 69.5 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 6 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 2x10<sup>6</sup> operations @ 2 A/240 Vac.
- Connections: screw-type terminals.

## 7551-7552



MAX. WITH DEDICATED CABLE GLAND M20 (NOT SUPPLIED)

- Rods with 4 maintained positions every 90°.
- 4 snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- 3 outputs for cable clamps.
- Insulation category: Class I.
- Cable entry: M20.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without rods): 143 x 90 x 95 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.



- Rods with 4 maintained positions every 60°.
- Slow action switches with 1NC or 1NO contacts.
- Available with 2, 3 or 4 switches and different rod lengths.
- Insulation category: Class II.
- Cable entry: cable gland M20.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without rods): 112 x 70 x 103.3 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.



X-FSC

X-FRZ



MAX. WITH  
DEDICATED  
CABLE  
CLAMP M20

- X-FSC features cross rods with 3 or 4 maintained positions or T rods with 3 maintained position, movement every 90°.
- X-FRZ has a single rod or a rod with roller with 65° movements and spring return.
- 2 snap action switches with 1NO+1NC contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: cable gland M20.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without rods): 113 x 72 x 62 mm (HxLxW).

#### Switch specifications

- Utilization category: AC 15 / 3 A / 250 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.



- Four product families: Standard Ino, Double lever Ino, Wired Ino, Safety Ino.
- 10 different switches: snap action with 2NC or 1NO+1NC contacts, slow action simultaneous with 2NC or 2NO contacts, slow action break before make with 1NO+1NC, 1NO+2NC or 2NO+1NC contacts, slow action make before break with 1NO+1NC contacts, and slow action simultaneous with 3NC and 3NO contacts.
- Insulation category: Class I or Class II (depending on material casing).
- Cable entry: PG 13.5, 1/2" NPT, PG 11, M16 x 1.5, M20 x 1.5 (depending the version).
- Operation frequency: 3600 operations/hour max.
- 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.

#### Switch specifications

- Utilization category: AC15, DC13.
- Rated operational current:
  - Standard Ino and Safety Ino: 10 A / 24 Vac / 50/60 Hz / AC15  
6 A / 120 Vac / 50/60 Hz / AC15  
4 A / 400 Vac / 50/60 Hz / AC15 - 1.8 A  
6 A / 24 Vdc / DC13 - 2.8 A  
0.55 A / 125 Vdc / DC13  
0.4 A / 250 Vdc / DC13 - 0.27 A
  - Double lever Ino: 3 A / 250 Vac / AC15
  - Wired Ino: 3 A / 240 V / AC15  
2.8 A / 24 V / DC13  
0.55 A / 125V / DC13  
0.27A / 250V / DC13
- Rated thermal current: 10 A, 4 A (depending the version).
- Rated insulation voltage: 500 V, 400 V, 300 V, 250 V (depending the version).

## SLIP RING COLLECTORS

Four series of slip ring collectors where rings coupled with brushes are used to transfer current from a stationary unit to a rotating one.

### FEATURES

- Suitable for transferring current at 50/60 Hz frequency.
- Enclosures with small holes to allow air circulation (Slip ring collectors 10A/30A and 50A).
- Lower plates with holes to drain moisture (Slip ring collectors 10A/30A and 50A).
- Atex versions available.

### MATERIALS

- Shock-resistant thermoplastic protection to prevent accidental contacts with live parts (Slip ring collectors 10A/30A, 50A).
- Enclosure made of steel, stainless steel AISI 304 or 316L, aluminum, galvanized or epoxy powder varnished steel resistant to marine and aggressive environments (Slip ring collectors Pegasus).

- Phosphor bronze, graphite or metalgraphite (graphite with copper) brushes.
- Silver or gold signal rings (Slip ring collectors Pegasus).

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN 60204-1, EN 60309-1, EN 60529.

10A

CE



- 4 rings.
- Suitable for transmitting audio, RS485 (57.6 Kbaud max) or CAN (1 Mb max) signals.
- Available with driving slots.
- Available with coupling flange.
- Insulation category: Class I.
- Operating positions: any position.
- Overall dimensions:
  - without driving slots: 79.5 x 80.5 x 63 mm (HxLxW)
  - with driving slots: 107 x 80.5 x 63 mm (HxLxW).

### Electrical specifications

- Rated operational current: 20 A.
- Rated operational voltage: 400 Vac.
- Rated insulation voltage: 660 Vac.
- Max. rotation speed: 3 rpm.
- Connections: 6.3 mm Faston taps.

10A / 30A

CE



- Up to 40 rings coupled with brushes.
- Available with 30A line rings only or with 30A line rings and 10A auxiliary rings.
- Suitable for transmitting audio, RS485 (57.6 Kbaud max) or CAN (1 Mb max) signals.
- Insulation category: Class I.
- Cable entry: cable glands M20 - M25.
- Operating positions: any position.
- Overall dimensions (depending on the number and type of rings (HxLxW)):
  - 10A-30A: min. 178 x 195 x 135 mm - max. 178 x 483 x 135 mm
  - 30A: min. 178 x 179 x 135 mm - max. 178 x 451 x 135 mm.

### Electrical specifications

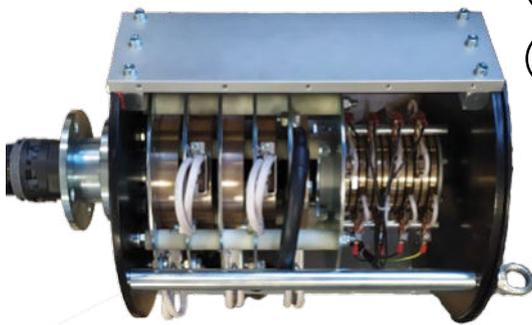
- Rated operational current: 10 A - 30 A.
- Rated operational voltage: 400 Vac.
- Rated insulation voltage: 660 Vac.
- Max. rotation speed:
  - 3 rpm. (phosphor bronze brushes)
  - 5 rpm (graphite brushes)
- Connections:
  - clamps with Ø 4 mm hole
  - clamps with M4 screw accepting eyelet terminals.



- Up to 16 50A line rings coupled with brushes.
- Insulation category: Class I.
- Cable entry: cable glands M20 - M25.
- Operating positions: any position.
- Overall dimensions (depending on the number of rings) (HxLxW):
  - min. 203 x 174 x 150 mm
  - max. 203 x 447 x 150 mm.

#### Electrical specifications

- Rated operational current: 50 A.
- Rated operational voltage: 400 Vac.
- Rated insulation voltage: 660 Vac.
- Max. rotation speed: 3 rpm.
- Connections: clamps with M6 screw accepting eyelet terminals.



- Available versions: up to 200 A, up to 400 A, up to 650 A.
- Power rings coupled with signal rings and customized to meet different requirements.
- Silver or gold signal rings.
- Cables entry: customized cable glands.
- Overall dimensions: depending on the number and dimensions of the rings or on amperage and voltage.

#### Electrical specifications

- Rated operational current: up to 650A.
- Rated operational voltage: up to 680 Vac.
- Rotation speed: up to 30 rpm.
- Suitable for transferring AC/DC current.

#### Transmission protocol specifications

- Data transmission protocol: Ethernet CAT 5, Profibus, Profinet, LAN, Can-BUS, Can-Open.
- Max. speed: 100 Mbit/s.

## CABLE AND HOSE REELS

Two versions of cable and hose reels, motor or spring driven, designed to supply control current, data and electric or fluidic power (compressed air, gases, oil hydraulics) to mobile units.

### FEATURES

- Powered by a three-phase torque electric motor (motor cable reels) or operated by Archimedes spiral springs (spring cable reels).
- Equipped with an electric slip ring collector designed to transfer current from a stationary point to rotating parts, transmitting power and both analogue and digital control signals.
- Atex versions available.
- Reels suitable for marine environment available.

### MATERIALS

- Stainless steel slip ring collector carrier. Die cast aluminum motor housing, painted aluminum or cast iron gearbox support. Spool made of painted shaped sheet metal or of hot painted drawn sheet metal (motor cable and hose reels) and spiral springs made of high quality spring steel (spring cable and hose reels).
- Bronze alloy power rings, brass auxiliary rings, gold or silver-plated signal rings and patented metal brushes.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2006/42/CE.
- Conformity to CE Standards: EN 60309-1-2, EN 60204-1, 60947-1-1.

## Apollo motor reels



- Motor cable and hose reels powered by a three-phase torque electric motor.
- Suitable for transferring current to mobile units by means of low voltage cables.
- They can be equipped with data transmission or power transmission slip ring collectors, featuring up to 42 power rings coupled with signal rings and customized to meet different requirements.
- Bronze alloy power rings, brass auxiliary rings, gold or silver-plated signal rings and patented metal brushes.
- Overall dimensions: depending on the slip ring collector dimensions, on voltage and amperage of the cables and on their length.

### Electrical specifications

- Rated operational current: 400 A max.
- Rated operational voltage: 690 Vac.
- Motor rated operational voltage: 230/400 Vac.
- Motor frequency: 50Hz.

Distributed by TER srl a socio unico. Designed by TER srl a socio unico and SPM Special Machines srl. Manufactured by SPM Special Machines srl.

## Apollo spring reels



- Spring cable and hose reels operated by Archimedes spiral springs.
- Suitable for transferring current to mobile units by means of low voltage cables.
- They can be equipped with data transmission or power transmission slip ring collectors, featuring up to 42 power rings coupled with signal rings and customized to meet different requirements.
- Bronze alloy power rings, brass auxiliary rings, gold or silver-plated signal rings and patented metal brushes.
- Archimedes spiral springs made of high quality spring steel.
- Overall dimensions: depending on the slip ring collector dimensions, on voltage and amperage of the cables and on their length.

### Electrical specifications

- Rated operational current: 250 A max.
- Rated operational voltage: 400 / 1000 Vac max.

Distributed by TER srl a socio unico. Designed by TER srl a socio unico and SPM Special Machines srl. Manufactured by SPM Special Machines srl.

## FOOTSWITCHES

Two series of footswitches used to control industrial machine tools.

### FEATURES

- Single or double footswitches with emergency stop mushroom pushbutton and mini-footswitches.
- Version for pneumatic valves.
- "Lock-release" device to keep the pedal in the ON position and safety device preventing the accidental use of the pedal.
- Emergency stop mushroom pushbutton complying with ISO13850 (6100/6200).

### MATERIALS

- Footswitches 6100/6200 are available either in thermoplastic material or in die-cast aluminium.

- Omicron is available with 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.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN 60204-1, EN 60947-1, EN 60529, ISO13850.

6100/6200



- Available in thermoplastic material or in die-cast aluminium.
- Available with standard protection cover or large cover for safety shoes.
- Snap or slow action switches with 1NO+1NC contacts, or slow action switches with 2NO+2NC contacts.
- Insulation category: Class I.
- Cable entry: cable gland M20.
- Overall dimensions simple footswitches:
  - 6100: standard cover 118 x 234 x 122 mm (HxLxW)
  - 6100: large cover 143 x 245 x 141 mm (HxLxW)
  - 6200: 130 x 231 x 130.5 mm (HxLxW).

### Switch specifications

- Utilization category:
  - AC 15 / 3 A / 250 Vac
  - AC 15 / 1.9 A / 380 Vac.
- Rated thermal current: 10A.
- Rated insulation voltage: 300 Vac / 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

Omicron



MINI-FOOTSWITCH



FOOTSWITCH WITH COVER

- Salt mist resistant (footswitch with cover).
- Available in different configurations featuring various operation modes, cover color (grey, yellow or red) and switches.
- 1 or 2 switches with 1NO+1NC slow or snap action contacts.
- Positive opening NC contacts for safety functions (not available for mini-footswitch configurations).
- Cable entry:
  - mini-footswitch: cable gland Ø 6, 8.5 max.
  - footswitch with cover: cable gland M20.
- Overall dimensions:
  - mini-footswitch: 35 x 101 x 75 mm (HxLxP).
  - footswitch with cover: 138 x 280 x 140 mm (HxLxP).

### Switch specifications

- Utilisation category: Footswitch with cover AC 15 - DC 13.
- Rated operational current:
  - mini-footswitch: 3 A / 250 Vac, 0.06 A / 230 Vdc
  - footswitch with cover: A600, Q600, 10 A / 24 Vac / AC15, 6 A / 240 Vac / AC 15, 4 A / 400 Vac / AC 15, 6 A / 24 Vdc / DC 13, 0.55 A / 125 Vdc / DC 13, 0.4 A / 250 Vdc / DC 13.
- Conventional free air thermal current  $\theta < 40^{\circ}\text{C}$ :
  - mini-footswitch: 15A
  - footswitch with cover: 10A.
- Rated insulation voltage:
  - mini-footswitch: 250 V
  - footswitch with cover: 690 V degree of pollution 3.
- Mechanical life:
  - mini-footswitch: 10x10<sup>6</sup> operations
  - footswitch with cover: 30x10<sup>6</sup> operations.

## ELECTRONIC DEVICES

One series of cable transducers for industrial applications needing measurement of linear displacements.

Three series of 100% electronic limit switches designed to record absolute positions.

One series of multiple position limit switches.

Four absolute encoders suitable for reading the shaft position and one HS incremental encoder.

### FEATURES

- Electronic control of linear and/or rotary movements and conversion into scaled electrical signals (Ermes).
- Analog and/or digital signal outputs.
- Safety devices featuring fully redundant control systems.

### MATERIALS

- Cable transducers Pandia feature wear-resistant technopolymer cases and stainless steel measuring wires.
- Electronic limit switches Atlante, Atlante EVO, Base EVO and

encoders Egon 36 and Egon 36-RS feature wear-resistant technopolymer cases.

- Multiple position limit switches 7551 EVO are made of die-cast aluminium alloy to guarantee maximum resistance to violent impact, chemical aggression and rust; bushes are made of sinterized material.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/30/UE, 2014/35/UE, 2006/42/CE.
- Conformity to CE Standards: EN 60204-1, EN 60947-1, EN 60947-5-1, EN 60204-32, EN 60529, EN 61326-2-3, EN 61326-1, EN 61326-3-1.

## Electronic cable transducer Pandia

CE (pending)



• **Cable transducer** suitable for industrial applications needing measurement of linear displacements.

- Measurement range: 3000 mm or 5000 mm.
- Measurement method: magnetic.
- Overall dimensions: 74.5 x 104 x 90 mm (HxLxW).

### Electrical specifications

- Linearity:  $\pm 0.5\%$ .
- Accuracy:  $\pm 0.25\%$ .
- Cable gland M16 for analog version with 4 relays.
- 2 connectors M12 - 5 PIN for redundant analog or digital version.
- 1 connector M12 - 5 PIN for digital version.

### Input

- $V_{in}$  12...30 Vdc.
- $I_{max}$  50 mA for normal version.
- $I_{max}$  80 mA for redundant version.

### Outputs

- Analog 4...20 mA for both normal/redundant versions.
- CAN bus for both normal/redundant versions.
- Up to 4 relays 1 A / 125 Vac for cam emulation.

### Configuration

- By 4 key switches menu for analog version.
- By CAN bus for digital version.

## Electronic limit switch Base EVO

CE



• **Compact electronic rotary limit switch.**

- Revolution ratios: 1:15, 1:20, 1:25, 1:50, 1:75, 1:100, 1:150.
- Equipped with relays emulating up to 4 cams.
- Up to 6 positions for each electronic cam, totally 24 setting positions per limit switch.
- Maximum precision and extremely low hysteresis.
- Safety line signaling possible "faults" to the system.
- Maximum rotation speed: 800 rpm.
- Overall dimensions: 89 x 98 x 70 mm (HxLxW)

### Electrical specifications

- Single turn resolution: 12 bit (4096 points per revolution), for internal process use.
- Linearity:  $\pm 0.25\%$ .
- Accuracy:  $\pm 0.5\%$ .
- Reverse polarity and short-circuit protection.

### Input

- $V_{in}$  24 Vdc  $\pm 15\%$  / 48 Vdc  $\pm 15\%$
- $I_{max}$  80 mA.

### Outputs

- 2 or 4 configurable relays 24/250 Vac, 3/5 A, NC or NO

### Configuration

- By 4 key switches menu.



- **Electronic multiturn magnetic absolute encoder** featuring integrated SSI interface.
- Maximum rotation speed: 6000 rpm.
- Overall dimensions: 109 x 194 x 75 mm (HxLxW).

**Electrical specifications**

- Number of turns: ≤ 4096 / 12 bit.
- Single turn resolution: 10 bit (1024 points per revolution).
- Linearity: ± 0.5%
- Accuracy: ± 0.5%.
- 8 PIN connector.

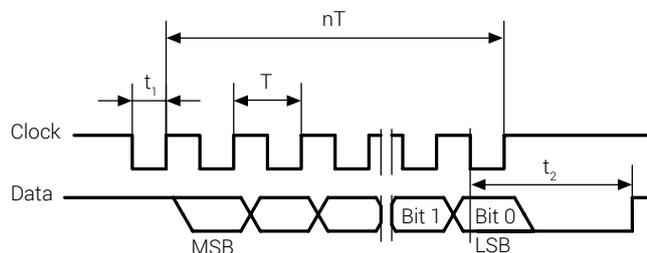
**Input**

- Vin 12...30 Vdc.
- Imax 60 mA.
- Zero terminal for zeroing position.
- DIR terminal for CW/CCW direction selection.

**Output**

- SSI RS422 differential data driver.
- Clock frequency: max. 2 Mhz.

T = 0.5...10 μs  
 t<sub>2</sub> ≤ 20 ± 2 μs  
 t<sub>1</sub> = 0.25...5 μs  
 f max. = 2 MHz



- **High resolution electronic multiturn magnetic absolute encoder** (28 bit overall resolution).
- Equipped with relays emulating up to 6 cams.
- Each emulated cam can have up to 5 activation positions that are fully software programmable.
- Maximum rotation speed: 800 rpm.
- Overall dimensions: 91 x 132.5 x 90 mm (HxLxW).

**Electrical specifications**

- Single turn resolution: 12 bit (4096 points per revolution).
- Multiturn resolution: 16 bit (65535 revolutions).
- Linearity: ± 0.25%.
- Accuracy: ± 0.5%.
- Reverse polarity and short-circuit protection.
- Backup autonomy: ~ 6 years.

**Input**

- Vin 24 Vdc ± 20%.
- Imax 240 mA.

**In/Out**

- Modbus RTU protocol over RS-485 bus.
- CAN bus (coming soon).

**Outputs**

- Up to 6 configurable relays 60/125V, 3/10A, NC or NO, 2 of which with safety function.

**Configuration**

- By PC configurator (Windows).
- By Modbus RTU protocol over RS-485 bus.
- By Bluetooth through mobile application (coming soon).



MAX. WITH  
DEDICATED  
CABLE GLAND  
M20

- **Multiple position limit switch** designed to ensure flawless operation in the most severe operating conditions.
- Rods with movement in 16 (standard) or 32 binary positions every 90°.
- The detected position is maintained even after an ON/OFF power cycle.
- Binary output code.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without rods): 143 x 90 x 95 mm (HxLxW).

### Electrical specifications

- Connections:
  - 5 meters cable
  - 18 PIN connector Amphenol CU-18PMMP-LC7001
- With or without safety line clean relay contacts.

### Input

- $V_{in}$  24 Vdc  $\pm$  20%.
- $I_{max}$  250 mA.
- Zero terminal for zeroing position.

### Outputs

- 4 (standard) or 5 binary output code relays 30 Vdc, 125 Vac, 250 Vac, 3A, NO or NC.
- 1 relay output that can be used as a diagnostic safety line for error detection.

### Configuration

- By 4 key switches menu.



- **Electronic magnetic technology position sensor.**
- For use on rotary limit switches Fox, Oscar and Top.
- Maximum rotation speed: 800 rpm.
- Overall dimensions: 19.1 x 43.3 x 55.9 mm (HxLxW).

### Electrical specifications

- Free rotation: 360° absolute single turn.
- Resolution: 10 bit (1024 points per revolution).
- Linearity:  $\pm$  0.25%.
- Accuracy:  $\pm$  0.5%.
- Connections: screw-type terminal board.
- Reverse polarity protection.

### Input

- $V_{in}$  12...48 Vdc / Vac.
- $I_{max}$  50 mA.
- Zero terminal for zeroing position.
- DIR terminal for CW/CCW direction selection.

### Output

- Analog output (one of the three available, depending on the version):
  - Voltage 0...10 V
  - Current 4...20 mA
  - PWM 0...100%



• **Single-turn redundant absolute angular transducer.**

- Suitable for reading the shaft position and converting it into a corresponding analog signal.
- Detection technology: magnetic sensor.
- Shaft position: range 0°...360°.
- Current or voltage calibrated output.
- Redundant double analog outputs.
- Possible changes of power supply do not affect the output signal.
- Immunity to interference.
- Overall dimensions: 64.5 x 42.7 x 53.2 mm (HxLxW).

**Electrical specifications**

- Single turn resolution: 12 bit (4096 points per revolution).
- Linearity:  $\pm 0.25\%$ .
- Accuracy:  $\pm 0.5\%$ .
- Input/output over-current and over-voltage protection.

**Input**

- Vin 12...30 Vdc.
- I<sub>max</sub> 35 mA for normal version.
- I<sub>max</sub> 55 mA for redundant version.

**Output**

- Analog output (one of the three available, depending on the version):
  - Voltage 1...5 V
  - Voltage 2...10 V
  - Current 4...20 mA



• **Multi-turn magnetic absolute encoder.**

- Suitable for counting shaft revolutions and working even without power supply.
- Detection technology: magnetic sensor.
- Overall dimensions: 64.5 x 42.7 x 53.2 mm (HxLxW).

**Electrical specifications**

- Multiturn resolution: 14 bit (16384 revolutions) / 16 bit (65535 revolutions).
- Single turn resolution: 10 bit (1024 points per revolution) / 12 bit (4096 points per revolution).
- Linearity:  $\pm 0.4\%$ .
- Accuracy:  $\pm 0.5\%$ .
- Input/output over-current protection.
- Over-voltage and reverse polarity protection.
- Backup autonomy: ~ 10 years.

**Input**

- Vin 12...30 Vdc / I<sub>max</sub> 20 mA

**Output**

- Modbus RTU protocol over RS-485 bus.
- RS-485 PTP basic protocol



### • Multi-turn magnetic angular encoder.

- Suitable for detecting the shaft position within a programmable range, converting it into an analog 4-20 mA or a CAN-bus signal.
- Detection technology: magnetic sensor.
- The current output acquires a value proportional to the number of revolutions (shaft rotations expressed in degrees) within the programmed range.
- Possible changes of power supply do not affect the output signal.
- Immunity to interference.
- Overall dimensions: H 74.6 Ø 56 mm.

### Electrical specifications

- Single-turn resolution: 12 bit (4096 points per revolution).
- Multi-turn resolution:  $\pm 15$  bit ( $\pm 32768$  revolutions).
- Analog output resolution: 14 bit (16384 points).
- Linearity:  $\pm 0.25\%$ .
- Accuracy:  $\pm 0.5\%$ .
- 1 male connector M12 - 8 PIN for digital version.
- Input/output over-current and over-voltage protection.
- Backup autonomy: 6 years.

### Input

- Vin 12...30 Vdc / I<sub>max</sub> 50 mA @ 24Vdc.

### Outputs

- Analog 4...20 mA.
- CAN-bus with proprietary application protocol.
- Output programmable range:  $\pm 32767$  revolutions (default 10 rev.).



### • High speed incremental encoder.

- Based on magnetic sensing method.
- Totally immune to interference in compliance with standard DIN EN 61000-6-2.
- Suitable for assembly on limit switches to control multi-revolution rotors.
- Overall dimensions: H 57.4 Ø 36 mm.

### Electrical specifications

- Pulses per revolution: 10...1024.
- Revolution reference signal: zero pulse, width 90°.
- Output signals: A 90° B, Z + inverted.

### Input

- Vin 10...30 Vdc / I<sub>max</sub> 25 mA (24 Vdc, without load)

### Outputs

- 5 VDC/5V (TTL compatible) normal or complementary output
- 10...30 VDC/push-pull short-circuit proof, normal or complementary output
- 10...30 VDC/5V normal or complementary output

## EXPLOSION PROOF SERIES

Two series of pendant control stations, two series of rotary or position limit switches, radio remote controls, slip ring collectors and cable reels designed for heavy industry in potentially explosive areas.

### FEATURES

- All materials and components used are wear resistant and guarantee protection of the unit against water and dust.

### DIRECTIVES AND STANDARDS

- Conformity to Atex Standards: EN 60079-0, EN 60079-1, EN 60079-31.
- Conformity to IECEx Standards: IEC 60079-0, IEC 60079-1, IEC 60079-31, IECEx EUT 19.0015 Standards (RCEX).

- Certifications: INERIS 13ATEX0020X (Limitex AG, Limitex AP, Mike-X), IECEx INE 13.0051 X (Limitex AG, Limitex AP, Mike-X), INERIS 12ATEX0085X (SPA Explosion Proof), IECEx INE12.0059X (SPA Explosion Proof), EUT 19 Atex 3493 (RCEX).

## Limitex AG

CE Ex IEC IECEx



- Rotary limit switch designed for potentially explosive areas.
- Revolution ratios: from 1:15 to 1:499.
- It can be equipped with a cam set with 2-3-4 switches.
- Snap action switches with 1NO+1NC contacts.
- Cable entry: 2 M20x1.5 / 2 M25x1.5 / 2 ½ NPT.
- Maximum rotation speed: 800 rev./min.
- Overall dimensions: 120 x 211.76 x 146 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: 6.3 mm Faston taps or screw-type terminals.

### Certifications for group I, IIA, IIB with the marks

- 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 IP 66 (ATEX) / Ex tb IIC T85°C Db IP 66 (IECEx)
- DUST&GAS: II2GD / Ex d IIB or IIC T6 Gb / Ex tb IIC T85°C Db IP 66

Manufactured by COEL Motori srl – Distributed by TER srl a socio unico.

## Limitex AP

CE Ex IEC IECEx



- Position limit switch designed for potentially explosive areas.
- Cross rods with to 3 or 4 maintained positions every 90°.
- 2 or 4 snap action switches with 1NO+1NC contacts.
- Cable entry: 2 M20x1.5 / 2 M25x1.5 / 2 ½ NPT.
- Operation frequency: 3600 operations / hour max
- Overall dimensions: 122.9 x 157 x 133.8 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 3 A / 250Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 300 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.
- Connections: screw-type terminals.

### Certifications for group I, IIA, IIB with the marks

- 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 IP 66 (IECEx)
- DUST&GAS: II2GD / Ex d IIB or IIC T6 Gb / Ex tb IIC T85°C Db IP 66

Manufactured by COEL Motori srl – Distributed by TER srl a socio unico.



- Pendant control station for auxiliary control designed for potentially explosive areas.
- Configurations from 2 to 12 actuators arranged on a double row.
- 1 or 2 speed switches with NO or NC contacts
- Overall dimensions (depending on the number of actuators):
  - min. 320 x 135 x 99 mm (HxLxW)
  - max. 424 x 135 x 99 mm (HxLxW).

### Switch specifications

- Utilization category: AC 15 / 1.9 A / 380 Vac.
- Rated thermal current: 10 A.
- Rated insulation voltage: 500 Vac.
- Mechanical life: 1x10<sup>6</sup> operations.

### Certifications for group I, IIA, IIB with the marks

- DUST&GAS: Ex d IIB or IIC T6 Gb
- Ex tb IIIC T85°C Db IP 66

Manufactured by ARIET Di T. Cereda – Distributed by TER srl a socio unico.



- Pendant control station for auxiliary control designed for potentially explosive areas.
- Configurations from 4 to 16 actuators.
- 2 speed pushbuttons and key-selector switches in various operation configurations.
- 2 speed switches with NO or NC contacts.
- Bridge connections (upon request) to reduce wiring time.
- Available with thermal protectors and resistances functioning as anti-moisture heater.
- Overall dimensions (depending on the number of actuators):
  - min. 243 x 107x 129 mm (HxLxW)
  - max. 483 x 254 x 129 mm (HxLxW).

### Switch specifications

- Utilization category:
  - max. 250 Vdc / 1.1 A
  - max. 240 Vac / 3 A
- Rated frequency: 50/60 Hz.
- Wires: min. 0.75 mm<sup>2</sup> – max. 2 mm<sup>2</sup> (ATEX and IEC Ex).

### Certifications for group I, IIA, IIB with the marks

- Ex II 2G Ex db IIC T6 Gb (ATEX).
- Ex II 2D Ex tb IIIC T90°C Db (ATEX).
- Ex db IIC T6 Gb (IECEX).
- Ex tb IIIC T90°C Db (IECEX).

Manufactured by COEL Motori srl – Distributed by TER srl a socio unico.



- Slip ring collectors designed for potentially explosive areas.
- Suitable for combination of power and signal applications (Profinet, Profibus, CAN bus).
- High degree of customization thanks to fully modular construction system.
- Overall dimensions: depending on the slip ring collector dimensions, on voltage and amperage of the cables and their length.

### Certifications

- Atex Directive 2014/34/UE.
- Conformity to Atex Standards EN 60079-0:2012, EN 60079-1:2014, EN 60079-14.
- Certification CY 19 Atex 0206266 X-type, CY 19 Atex 0206265 X-type.
- II 2G Ex db IIB T5 Gb Tamb (-40+60°C) marking.
- COC IECEx SCHEME.

Distributed by TER srl a socio unico. Designed by TER srl a socio unico and SPM Special Machines srl. Manufactured by SPM Special Machines srl.



- Motor and spring driven cable reels designed for potentially explosive areas.
- Suitable for combination of power and signal applications (Profinet, Profibus, CAN bus).
- High degree of customization thanks to fully modular construction system.
- Overall dimensions: depending on the slip ring collector dimensions, on voltage and amperage of the cables and their length.

### Certifications

- Atex Directive 2014/34/UE, Annex VIII.
- Certification CY 19 Atex 0206266 X-type, CY 19 Atex 0206266 X-type, Notification register of the technical file at O.N.
- Conformity to Atex Standards EN 60079-0:2012, EN 60079-1:2014, EN 60079-14, EN 80079-36, EN 80079-37.
- COC IECEx SCHEME.

Distributed by TER srl a socio unico. Designed by TER srl a socio unico and SPM Special Machines srl. Manufactured by SPM Special Machines srl.

## RADIO REMOTE CONTROLS

Five series of radio remote controls, with hand-held or belly-box transmitters, suitable for controlling industrial machinery, construction and forestry lifting machines.

### FEATURES

- Quick and easy installation.
- It is possible to change the frequency, to program automatic switch-off functions, to enable low power start-up, to program the auxiliary button functions.
- High degree of personalization: wide range of selectors, buttons, switches, potentiometers, dual and mono-axis joysticks (also Z axis).

### MATERIALS

- Tough nylon casing for protection against shocks and scraping, resistant to acids, oils and chemical agents.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2006/42/CE (RCIM, RCIW, RCK, RCM), 2014/53/EU (RCIM, RCIW, RCK, RCL, RCM), 2014/30/UE (RCIM, RCIW, RCK, RCM), 2011/65/EU (RCL), 2004/104/EEC (RCL).
- Performance Level Performance Level Category 3 PL d (RCK, RCM) and Performance Level Category 4 PL e (RCIW, RCIM).

## RCK



### Specifications of transmitter unit

- Available in configurations from 2 to 12 buttons, 1 or 2 speeds, Start button and EMO mushroom (Stop) or in configurations from 2 to 8 buttons, 1 or 2 speeds, a potentiometer to adjust the output from 0 to 10 volts, Start button and EMO mushroom (Stop).
- Response time: 50 ms.
- Frequency band: 315 / 418 / 429 / 433 / 447 / 470 / 915 MHz / 2.4 GHz.
- Maximum operating distance: 100 m (free field).
- Battery: LR6 (AA) 1.5V / NiMH (AA) 1.2V x 2.
- Overall dimensions:
  - min. 193 x 57 x 51 mm (HxLxW).
  - max. 242 x 57 x 51 mm (HxLxW).

### Specifications of receiver unit

- Relays: 2 stop + max. 19 function (1 NO 5 A 250 Vca).
- Power supply: 12-24 Vdc / 24/264 Vac/dc / 24/48 Vac/dc / 90/460 Vac/dc / 12 Vdc (optional).
- Frequency: 433.0525 ÷ 434.7775 MHz / 434.040 ÷ 434.790 MHz.

Manufactured by Juuko Srl - Distributed by TER Tecno Elettrica Ravasi Srl.

## RCL



### Specifications of transmitter unit

- Available in configurations from 2 to 20 buttons featuring up to 40 programmable functions (version with Shift option), ON and OFF button.
- Versions with 2, 4 or 6 functions, featuring stainless steel faceplate with vandal proof security buttons, available on request to work in the harshest of environments.
- Maximum operating distance: 60 m (300 m optional).
- Battery: 2 x 1.5 V (AAA) / 1 x 9 V (PP9) / 4 x 1.5 V (AAA).
- Overall dimensions:
  - min. 72.4 x 63.5 x 25.5 mm (HxLxW).
  - max. 285 x 82 x 35.6 mm (HxLxW).

### Specifications of receiver unit

- Functions: 20 max.
- Relays: 7.5 A or 10 A rated Mosfet.
- Power supply: 12/24V DC (Nominal).
- Frequency: 433.050 ÷ 434.790 MHz.

Manufactured by Lodar - Distributed by TER Tecno Elettrica Ravasi Srl.



#### Specifications of transmitter unit

- Available in configurations with 2 biaxial joysticks, Start button and EMO mushroom (Stop), 1 AUX button or 2 selectors and 2 buttons.
- Number of available ON/OFF command: max. 20 + Start & EMO.
- Response time: 50 ms.
- Frequency band: 418 / 429 / 433 / 447 / 470 / 915 Mhz / 2.4 GHz.
- Maximum operating distance: 100 m (free field).
- Battery: LR6 (AA) 1.5 V / NiMH (AA) 1.2 V x 4.
- Overall dimensions: 139 x 200 x 141.3 mm (HxLxW).

#### Specifications of receiver unit

- Relays: 2 stop + max. 20 function (1 NO 5 A 250 Vca).
- Power supply: 24/264 Vac/dc / 24/48 Vac/dc / 12 Vdc (optional).
- Frequency: 433.0525 ÷ 434.7775 MHz / 434.040 ÷ 434.790 MHz.

Manufactured by Juuko Srl - Distributed by TER Tecno Elettrica Ravasi Srl.

## ANEMOMETERS

Two series of wind speed sensors and anemoscopes for industrial applications which require reliability and verballity.

### FEATURES

- Quick and easy installation.
- Suitable for measurement in frequency (pulse), voltage (5 or 10 Vdc scale), in current (4-20mA).
- Wi-fi versions available.

### MATERIALS

- Body of the rotor in impact resistant nylon (Paka) and in anodized aluminium or electropolished stainless steel AISI 316 (Vayu).

### DIRECTIVES AND STANDARDS

- Conformity to CE Standards: EN 61000-6-2:2001, EN 55022:2001, Class B.

## PAKA



- Different configurations available:
  - with pulses output proportional to the wind speed given by a reed switch, also available with heater.
  - with 4-20ma or 0-10 V analogue output, proportional to the wind speed with a full scale of 120 km/h and 180 km/h, also available with heater.
  - with up to 95 Km / h configurable reed contact relay output, which turns on at pre-configured speed limit by means of a trimmer.
  - digital output, with RS485 MODBUS, NPN or PNP signal, also available with heater.
  - wireless RF wind speed sensor compliant with 802.15.4 standard, 2.4 GHz, operating with no-risk of interference / interaction even in presence of several devices in the same area.
  - with light and sound integrated alarms, designed according to ITC MIE- AEM-2 requirements.
- Digital output wind sensors with RS485 MODBUS, NPN or PNP signal, also available with heater.
- Wide range of compatible displays for reading data.

Distributed by TER Tecno Elettrica Ravasi Srl.

## VAYU



- Cups wind speed sensors with pulse frequency or mA or V analogue output, featuring machined aluminum or AISI 316 stainless steel body of the rotor.
- Cups wind speed sensors with heater, featuring machined aluminum or AISI 316 stainless steel body of the rotor. With frequency pulse output, 0-5 Vdc / 0-10 Vdc, 1-5 Vdc / 2-10 Vdc analogue output or 0-20 mA / 4-20 mA current output.
- Advanced wind vane anemoscope, made of aluminum or AISI 316 stainless steel, featuring a 4-20 mA analogue output and magnetic sensor.
- Wide range of compatible displays for reading data.

Distributed by TER Tecno Elettrica Ravasi Srl.

## SIGNAL LAMPS

Twelve series of Signal Lamps used in many industrial and automotive markets.

One serie of Industrial signal lights for tower and harbour cranes.

### FEATURES

- The Signal Lamps have ABS or metal housings providing great resistance to impacts and vibrations and polycarbonate or tempered glass for a better and powerful light transmission and diffusion.
- They mount SMD or POWER LEDs with a life duration up to 50.000 / 100.000 hours.
- They are available with different light colours (red, green, yellow, blue, white), with steady, flashing, strobing, rotary, steady and line light as light modes.

### DIRECTIVES AND STANDARDS

- Conformity to Community Directives: 2014/35/UE.
- Conformity to CE Standards: EN 60598-1, EN 60529-1.

## STACK LIGHTS

CE RoHS EAC



- Stack lights from 1 to 5 colours for the status indication and process control.
- Polycarbonate lens and ABS housing.
- LED module type: SMD (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 24 V/DC
  - 40-250 V AC/DC
  - 220 V AC.
- Sound: 2 melodies.
- Volume: 103 - 116 dB.
- Mounting types: surface & wall.
- Overall dimensions:
  - min. 155.5 x 85 x 85 mm (HxLxW)
  - max. 395.5 x 85 x 85 mm (HxLxW).

## MULTICOLOUR RGB WARNING LIGHTS

CE RoHS EAC



- High-quality and energy efficient indicators providing different colour options by mixing the primary colours.
- **12 versions available.**
- Suitable to be connected to a PLC.
- Polycarbonate lens and ABS housing.
- LED module type: SMD (life duration 50.000 hs).
- Light colours:
  - Red, green, yellow, blue
  - Up to 7 different colours with RGB LED technology.
- Light modes: steady, flashing, strobing.
- Voltage options:
  - 12-24 V AC/DC
  - 40-250 V AC/DC
- Sound: 16 melodies.
- Volume: 70 - 130 dB.
- Mounting types: surface, wall and M22 nut connection.

## UNIVERSAL SIGNAL BEACONS

CE RoHS EAC E37\*



- Multifunctional signals featuring the possibility to cover several functions through a single beacon.
- **13 versions available**, also with solar power, battery, or with cigarette lighter plug.
- Also available with magnetic base and sensor.
- Polycarbonate lens 70 mm, 90 mm, 100 mm and 125 mm diameter and ABS housing.
- LED module type: SMD or 3 W power (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 85-250 V AC/DC
  - 220 V AC.
- Sound: 10 melodies.
- Volume: 85 - 110 dB
- Mounting types: surface, wall and M22 nut connection.

\* Not available on all versions.

## LED WARNING HORNS

CE RoHS EAC



- Multi-sound with multi-light LED horns.
- **7 versions available.**
- Polycarbonate lens with 70 mm diameter and ABS housing.
- LED module type: SMD (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 40-250 V AC/DC
  - 24 V AC/DC
  - 220 V AC.
- Sound: 16 melodies.
- Volume: 124 - 130 dB.
- Mounting types: wall.

## BEACON HORNS

CE RoHS EAC



- Multi-sound with multi-light LED horns.
- **7 versions available.**
- Polycarbonate lens with 70 mm diameter and ABS housing.
- LED module type: SMD (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 40-250 V AC/DC
  - 24 V AC/DC
  - 220 V AC.
- Sound: 16 melodies.
- Volume: 124 - 130 dB.
- Mounting types: wall.

## ELECTRONIC SIRENS

CE RoHS EAC



- Sirens for providing sound signals in case of emergency or warning.
- **8 versions available.**
- ABS housing.
- Voltage options:
  - 12-24 V AC/DC
  - 40-250 V AC/DC
  - 24 V AC/DC
  - 12 V DC
  - 220 V AC.
- Sound options: 16 / 7 / 2 / 1 melodies.
- Sound: 7 different melodies for 7 ignition inputs.
- Volume: 92 - 130 dB.
- Mounting types: surface, wall and M22 nut connection.

## OBSTRUCTION LIGHTS

CE RoHS EAC



- Low-intensity Type B Obstruction Lights manufactured in compliance with ICAO (Annex 14) Standards.
- Able to turn on and off depending on the light.
- NO and NC relay outputs.
- **7 versions available**, also wireless, with mounting base, and with solar panel.
- Polycarbonate lens with 100 mm, 125 mm diameter and ABS and metal housing.
- LED module type: SMD (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing.
- Voltage options:
  - 12 V DC
  - 24 V DC
  - 48 V DC
  - 85-250 V AC/DC.
- Visibility: 360° at 10 Km.
- Mounting types: surface & wall.

## HEAVY DUTY WARNING LIGHTS

CE RoHS EAC



- Matching of industrial illuminated sirens, warning lamps and electronic sirens.
- 7 versions available, also with anti-shock protection cage.
- Polycarbonate lens with 125 mm diameter and ABS or metal housing.
- LED module type: 3 W Power (life duration 50.000 hs).
- Light colours: red, green, yellow, blue, white.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 12-30 V AC/DC
  - 48 V DC
  - 80-250 V AC/DC
- Sound options: 7 / 10 melodies.
- Volume: 90 - 133 dB.
- Mounting types: surface & wall.

## CRANE & FORKLIFT SAFETY LIGHTS

CE RoHS EAC



- Safety lights for cranes and forklifts
- **7 versions available.**
- Polycarbonate, tempered glass lens and metal housing.
- LED module type: Power (life duration 50.000 hs).
- Light colours: red, blue, white.
- Light modes: steady, steady point light, steady line light.
- Voltage options:
  - 12-30 V DC
  - 10-30 V DC
  - 10-48 V DC
  - 10-60 V DC
  - 10-80 V DC.
- Mounting types: machinery, forklift, crane mount.

## MACHINE TOOL LIGHTS

CE RoHS EAC



- Machine lights for localized lighting of the inside of the machine.
- Tempered glass lens and aluminum housing.
- LED module type: Power (life duration 100.000 hs).
- Light colours: white.
- Voltage options:
  - 24 V AC/DC.
- Mounting types: machinery.
- Overall dimensions: 280 x 113 x 126 mm (HxLxW).

## MOTOR SIRENS



- Motor sirens featuring powerful low-frequency sound.
- **8 versions available.**
- Metal housing.
- Voltage options:
  - 24 V DC
  - 220 V AC
- Volume: 105 - 130 dB.
- Frequency: 50 / 60 Hz.
- Max. duration of use: 3 min.

## ALARM SIRENS



- Alarm sirens featuring powerful low-frequency sound.
- **4 versions available, with LED and for fire alarm.**
- ABS housing.
- Voltage options:
  - 24 V DC
  - 220 V AC
- Volume: 90 - 100 dB.
- Light modes: flashing.

## INDUSTRIAL SIGNAL LIGHT



- Sturdy industrial signal light suitable for tower and harbour cranes.
- It features two to four Universal Signal Beacons and a Wall-Mounted Siren.
- Polycarbonate lens 90 mm diameter and ABS housing on an aluminium plate.
- Featuring customizable plate and configuration.
- LED module type: 5 x 3 W Power LED (life duration 50.000 hs).
- Light colours: white, red, yellow, green.
- Light modes: steady, flashing, strobing, rotary.
- Voltage options:
  - 12-24 V AC/DC
  - 85-250 V AC/DC
- Sound: 2 melodies (continuous or intermittent sound).
- Volume: 121 dB (10 cm) - 100 dB (100 cm)
- Connections: M12 male connector - 5 PIN or M12 male connector - 8 PIN for signal light with 4 lights and siren.





**TER Tecno Elettrica Ravasi Srl** a socio unico  
Via Garibaldi 29/31 - 23885 Calco (LC) - Italy  
Tel. +39 039 99.11.011 - Fax +39 039 99.10.445  
info@ter.it

**[www.ter.it](http://www.ter.it)**