PRODUCT
OVERVIEW

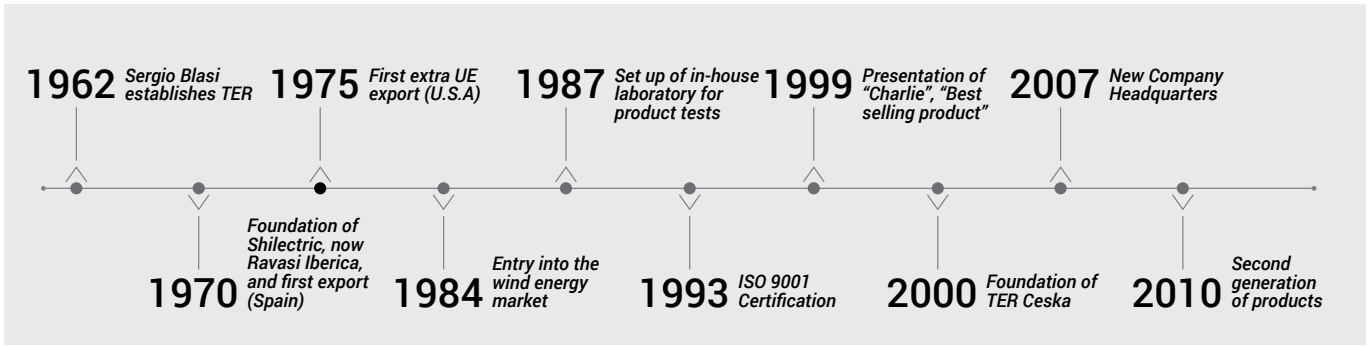
TER Tecno Elettrica Ravasi srl was established in Olgiate Molgora (Lecco), in 1962, by its founder, Sergio Blasi, willing to enter the field of switches and controls for industrial hoisting machines.

From 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, already in the mid 80s, the wind energy industry.

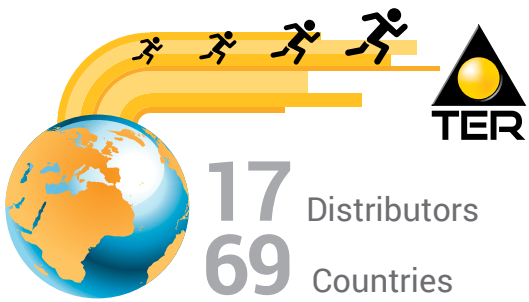
Over the years, TER focused on the creation of innovative, reliable products that could anticipate demands from the market, starting combining mechanical technology with electronics in some of its products.

In 1987, TER set up an in-house 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 2012 TER celebrated its first fifty years of industrial history.

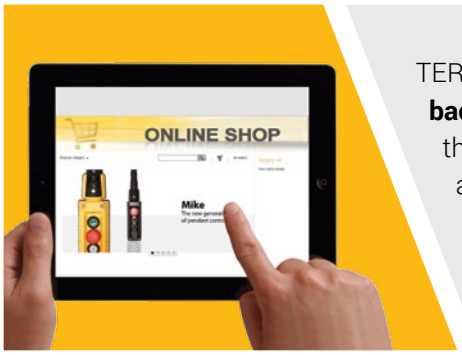


MARKETING

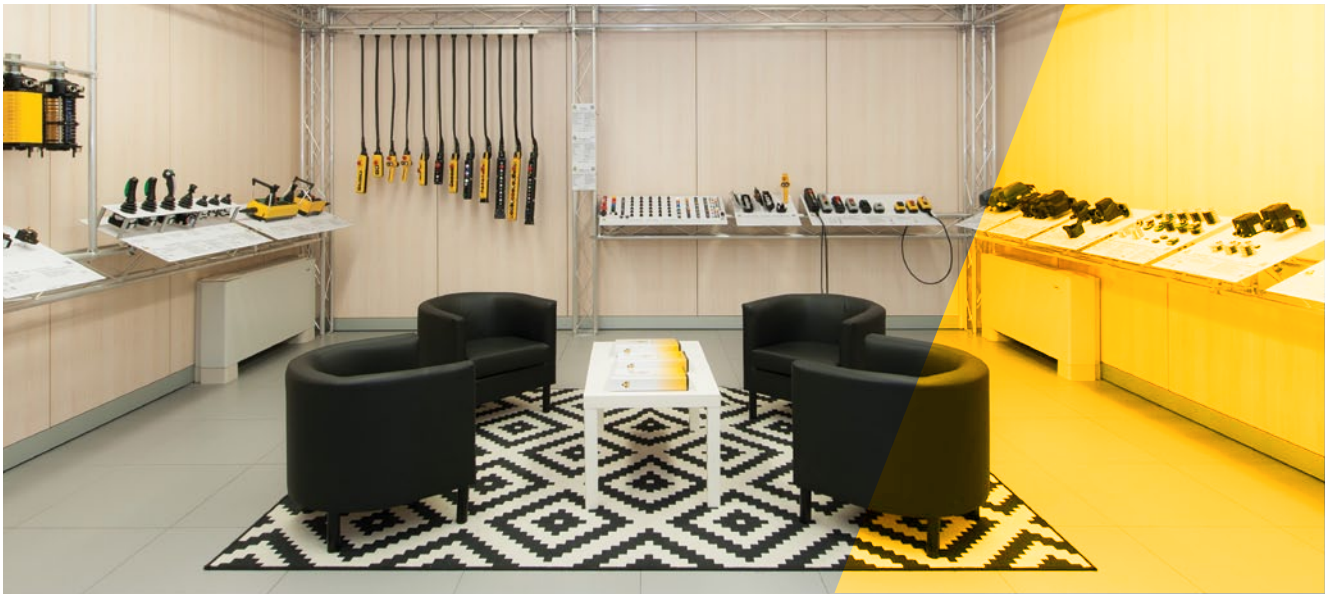


TER simplifies the control of the machines that carry its devices, designing reliable, ergonomic and intuitive safety products.

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 through the company's **website**, which also includes a new **e-commerce** area. Since 2012, orders have been managed by means of **configurators**, also accessible through the web.



TECHNOLOGY

TER 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 on 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 of electronics in its products.

PRODUCTION

7 **Product** families

33450 **Product** configurations

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.

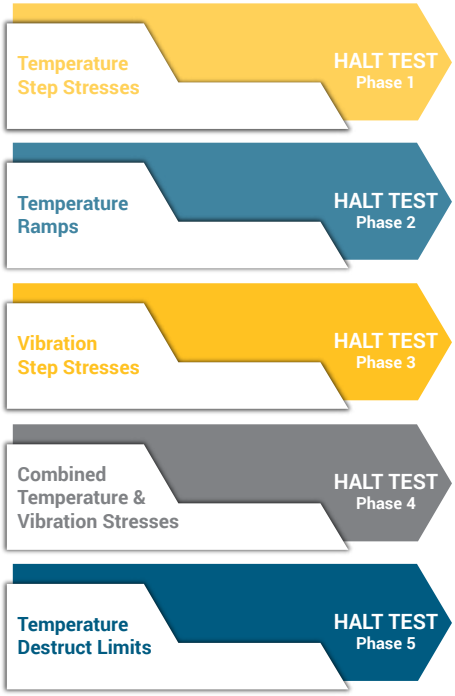
All TER products are "**Made in Italy**" and production has always been concentrated in Italy, to guarantee excellence of materials and greater controls on products and components.

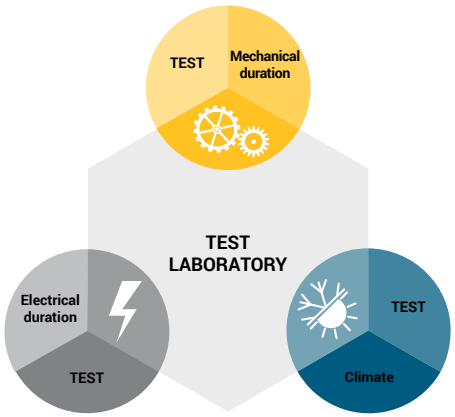
QUALITY ASSURANCE

TER, which obtained the UNI EN ISO 9001:2008 certification back in 1993, applies Quality Assurance parameters to the management of every company activity.

TER has obtained cULus product certification for the US and Canadian markets, EAC for the Russian market, it has certified its products at the first safety integrity level (SIL 1) according to Standard IEC61508.

TEST LABORATORY





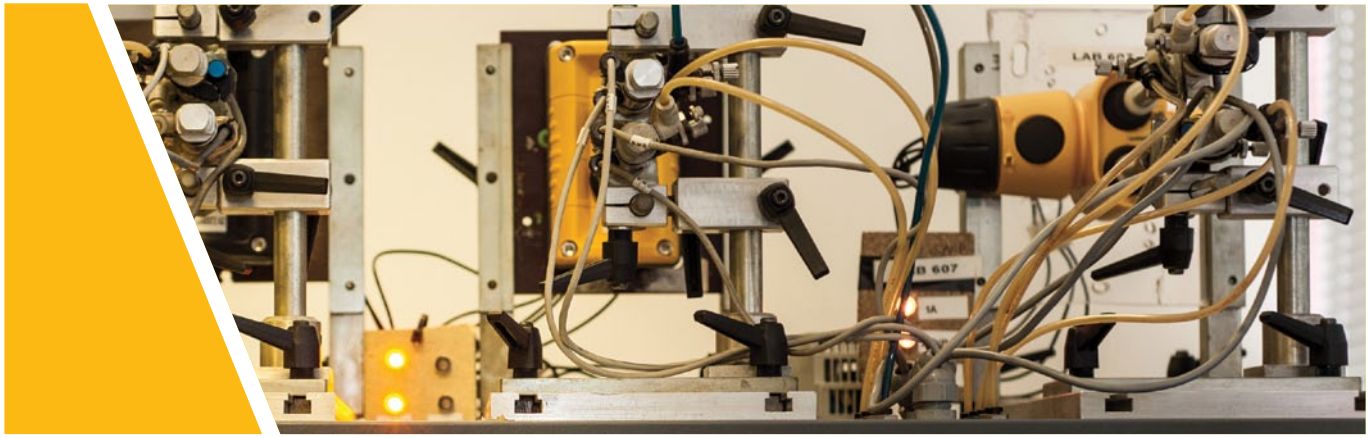
Since 1987, TER has been running an in-house Test Lab, designed to test the operating safety of the products and guarantee conformity with the different regulations that apply to the electromechanical industry.

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

Six series of pendant or wall-mounted control stations used for auxiliary or direct control of industrial machinery.

FEATURES

- Emergency stop mushroom pushbutton complying with ISO13850 (Victor, Mike) or EN 418 (Charlie, SPA, NPA, NPA-CP).
- Positive opening NC contacts for safety functions ⊖.
- 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 (Victor, Mike), EN 418 (Charlie, SPA, NPA).
- Conformity to CE Standards (direct control): EN 60204-1, EN 60947-1, EN 60947-3, EN 60529, EN 418.
- 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 cULus EAC SIL1 BGV C1

-40°C +80°C

IP65

OR

IP66

IP67

IP69K

HALT TEST

- 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: 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.
- 1 speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Mechanical life of pushbuttons: $10x10^6$ operations.
- Cable entry: cable clamps M20x1.5 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 85 x 302 mm (HxLxW).

Switch specifications

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

Mike

CE cULus EAC SIL1 BGV C1

-40°C +80°C

IP66

IP67

IP69K

- Pendant control station for auxiliary control.
- Configurations from 4 to 15 actuators.
- 1NO or 1NC switches, LEDs, potentiometers.
- 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.
- 1 speed pushbuttons and selector switches available in illuminated version in a range of colours.
- Mechanical life of pushbuttons: $10x10^6$ 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: $10x10^6$ operations.
- Connections: screw-type terminals.

Charlie

-25°C +70°C

IP65

- Pendant control station for auxiliary control.
- Configurations from 2 to 3 actuators.
- 1NO or 1NC switches, double switches with NO contacts, one or two speeds.
- Threaded ring closing base and cover, without using screws.
- Cable entry: cable clamp or spiral cable clamp 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: $1x10^6$ operations.
- Connections: screw-type terminals.

SPA

-25°C +70°C

IP65

- Pendant control station for auxiliary control.
- Configurations from 2 to 20 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.
- 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: $1x10^6$ operations.
- Connections: screw-type terminals.

NPA

-25°C +70°C

IP65

- 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: $1x10^6$ operations.
- Connections: screw-type terminals.

NPA - CP

-25°C +70°C

IP65

- 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, for direct control.
- 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. 393 x 83 x 70 mm (HxLxW).

Switch specifications

- Utilization category: AC 3 - AC 4 (AC 23B per PRSL508PI) / 10 A / 400 Vac.
- Rated operational power: 2.2kW.
- Rated thermal current: 20 A.
- Rated insulation voltage: 660 Vac.
- Brake operating contact: 100 V, 0.7 A, L/R=100 ms.
- Mechanical life: $1x10^6$ operations.
- Connections: screw-type terminals with self-lifting pads.

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 6 speed for each direction, with cross or 360° movement.
- Configurations with switches or potentiometers.
- Proportional stepless version with analog actuators and with current, voltage or PWM outputs.
- Positive opening NC contacts for safety functions ⊖.

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, EN 61000-6-3.

Juliet

-25°C +70°C

IP65

MAX ASSEMBLED IN SPECIFIC ENCLOSURE

- Up to 5 speed for each direction.
- Stepped or linear operation.
- Cross or 360° movement.
- Available with terminal 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: 60 Vac.
- Mechanical life: $5x10^6$ operations.
- Connections: screw-type terminals.

Romeo

-25°C +70°C

IP65

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), or with NO pushbutton to be used as electrical interlock.
- 3 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.
- Insulation category: Class I.
- Mechanical life: $0.5x10^6$ 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 for Romeo with potentiometers 129.3 mm.

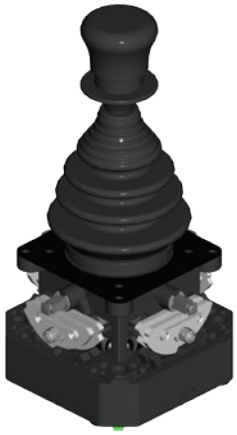
Switch specifications

- Utilization category: AC 15 / 2 A / 48 Vac.
- Other operating electrical usage:
  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: 60 Vac.
- Mechanical life: $5x10^6$ operations.
- Connections: screw-type terminals.

Stepless joystick specifications

- Supply voltage: 12 ÷ 48 Vac/dc.
- Proportional outputs:
  2 voltage outputs: 0 ÷ +10 Vdc
  2 current outputs: 4 ÷ 20 mA
  2 PWM outputs: 0 ÷100% D.C. (freq=1KHz).
- Resolution: 10 bit.
- 4 directional microswitches.
- Screw terminals: 2.5 mm^2 (max. section).

Hercules



-25°C +70°C

IP65

MAX ASSEMBLED IN SPECIFIC ENCLOSURE

- Structural components made of nylon fiberglass and steel levers to ensure maximum resistance.
- 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), 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.
- Insulation category: Class I.
- Mechanical life: $5x10^6$ operations.
- Overall dimensions (depending on the handle):
  min. 216 x 109 x 109 mm (HxLxW)
  max. 281 x 109 x 109 mm (HxLxW)
  max. length for Hercules with potentiometers 134.5 mm.

Switch specifications

- Utilization category: AC 15 / 2 A / 48 Vac.
- Other operating electrical usage:
  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: 60 Vac.
- Mechanical life: $5x10^6$ operations.
- Connections: screw-type terminals.

Stepless joystick specifications

- Supply voltage: 12 ÷ 48 Vac/dc.
- Proportional outputs:
  2 voltage outputs: 0 ÷ +10 Vdc
  2 current outputs: 4 ÷ 20 mA
  2 PWM outputs: 0 ÷100% D.C. (freq=1KHz).
- Resolution: 10 bit.
- 4 directional microswitches.
- Screw terminals: 2.5 mm^2 (max. section).

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 EN418.
- Positive opening NC contacts for safety functions ⊖.
- Cable sleeve for cable entry and screw-type terminals.
- Carrying strap and protections against accidental operation.
- 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, EN 418.

Juliet-PK

-25°C +70°C

IP65

- 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: $1x10^6$ operations.
- Connections: screw-type terminals.

Romeo-PK

-25°C +70°C

IP43

MIN DEPENDING ON THE JOYSTICK

IP65

MAX DEPENDING ON THE JOYSTICK

- Designed for Romeo joysticks.
- 1NO or 1NC switches, double switches with NO contacts, one or two speeds.
- 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: $1x10^6$ operations.
- Connections: screw-type terminals.

ROTARY LIMIT SWITCHES

Four 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 electronic limit switches designed to record absolute positions regardless of the mechanic of system and of its complexity.

FEATURES

- Revolution ratios ranging from 1:1 to 1:8100.
- Equipped with sets of cams/switches, potentiometers, encoders and absolute encoders.
- Different revolution ratios on each limit switch output.
- Regulation of cam activation point.
- Positive opening NC contacts for safety functions ⊖.
- Available with flanges, pinion gears and couplings.
- Available with anti-moisture plug allowing air circulation.
- Plates with universal adapter to replace existing systems.
- Cable clamps or dedicated connectors.

MATERIALS

- Shafts made of stainless steel AISI 430F or high-resistence stainless steel AISI 303.
- Gears and driving bushes made of self-lubricating techno-polymers.
- Enclosures made of wear resistant techno-polymers or made of saline fog 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 EAC BGV C1

-40°C +80°C

IP42

OR

IP65

OR

IP66

IP67

IP69K

- 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 change-over contacts.
- Insulation category: Class II.
- Cable entry: cable clamp 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).

Specifications of the microswitches for auxiliary control

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

Fox

CE cULus EAC SIL1 BGV C1

-40°C +80°C

IP66

IP67

IP69K

HALT TEST

- Revolution ratios: from 1:3 to 1:2870.
- Number of outputs: 1.
- It can be equipped with a cam set (with up to 5 switches) and potentiometers, encoders, Yankee absolute encoders.
- Snap action switches with 1NO+1NC change-over contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: cable clamp M20, M20+M16, M20+M20.
- Rotation speed: revolution ratios ≥1:16: max. 800 rev./min. revolution ratios <1:16: max. 200 rev./min.
- Overall dimensions: 117 x 102 x 75 mm (HxLxW).

Switch specifications

- Utilization category: max AC 15 / 3 A / 250 Vac. DC 13 / 0.5 A / 60 Vdc.
- Rated thermal current: 10 A max.
- Rated insulation voltage: 300 Vac max.
- Mechanical life: $10x10^6$ operations max.
- Connections: screw-type terminals.

Oscar

SIL1 BGV C1

-40°C +80°C
IP66
IP67
IP69K
HALT TEST

- 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 12 switches) and potentiometers, encoders, Yankee absolute encoders.
- Snap action switches with 1NO+1NC change-over contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: up to 8 cable clamps (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 (depending on the configuration):
  min 134,5 x 146,5 x 119 mm (HxLxW)
  max 158,3 x 146,5 x 119 mm (HxLxW).

Switch specifications

- Utilization category:
  max AC 15 / 3 A / 250 Vac.
  DC 13 / 0.5 A / 60 Vdc.
- Rated thermal current: 10 A max.
- Rated insulation voltage: 300 Vac max.
- Mechanical life: $10x10^6$ operations max.
- Connections: screw-type terminals.

Oscar with system “Lima”

SIL1 BGV C1 (pending)

-25°C +75°C
IP66
IP67
IP69K

- Rotary limit switch 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: self-lifting screw terminal board - 8 PIN (4 for each sensor).

Output technical specifications

- 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.
- Reverse Polarity Protection.
- MTTF(d) PNP sensor: 533 years.
- MTTF(d) NPN sensor: 626 years.

Top

SIL1 BGV C1

-40°C +80°C
IP66
IP67
IP69K
HALT TEST

- Saline fog 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) and potentiometers, encoders, Yankee absolute encoders.
- Snap action switches with 1NO+1NC change-over contacts or slow action switches with 1NC contact.
- Insulation category: Class I.
- Cable entry: up to 2 cable clamps M20.
- Maximum rotation speed: 800 rev./min.
- Overall dimensions: 139 x 186 x 120 mm (HxLxW).

Switch specifications

- Utilization category:
  max AC 15 / 3 A / 250 Vac.
  DC 13 / 0.5 A / 60 Vdc.
- Rated thermal current: 10 A max.
- Rated insulation voltage: 300 Vac max.
- Mechanical life: $10x10^6$ operations max.
- Connections: screw-type terminals.

Electronic limit switch Atlante

CE BGVC1

-40°C +80°C

IP65

OR

IP67

IP68

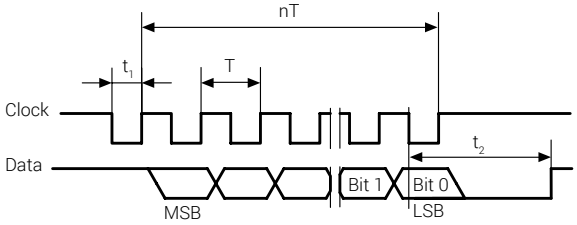
OPTIONAL

- Electronic multiturn magnetic absolute encoder featuring integrated SSI interface.
- Accuracy guaranteed by 1024 points per devolution.
- Maximum rotation speed: 6000 rpm.
- 8 PIN connector.
- Overall dimensions: 99.5 x 194 x 74.6 mm (HxLxW).

Electrical specifications

- Number of turns: ≤ 4096 / 12 Bit.
- Absolute accuracy: ± 0.5° (-40... +85 °C) tbc.
- Output stages: SSI data driver for RS422.
- SSI clock frequency: max. 2 Mhz.

Output signal SSI



T = 0.5...10 µs

t_2 ≤ 20 ± 2 µs

t_1 = 0.25...5 µs

f max. = 2 MHz

Absolute encoder Yankee

CE cULus

-40°C +80°C

IP20

- Electronic position sensor.
- For use on Fox, Oscar and Top rotary limit switches.
- Free rotation: 360°.
- Maximum rotation speed: 800 rev./min.
- Overall dimensions: 19.1 x 43.3 x 55.9 mm (HxLxW).

Electrical specifications

- Power supply: 12 ÷ 48 Vdc / 12 ÷ 48 Vac.
- Protection against polarity inversion.
- Absorption: 50 mA.
- Analog Output (one of the three available, depending on the version):
  Voltage 0÷10V
  Current 4÷20mA
  PWM 0÷100%
- 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.

POSITION LIMIT SWITCHES

Six 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 16 types of heads/actuators.
- Cable transducer with measurement range of 5000 mm.
- Positive opening NC contacts for safety functions ⊖.

MATERIALS

- Limit switches 7551-7552 are made of die-cast aluminium alloy to guarantee maximum restistance to violent impact, chemical aggression and rust; bushes are made of sinterized material.
- Series Tango, X-FSC, X-FRZ and Standard are made of wear resistant thermoplastic materials.
- Limit switches Din have die-cast aluminium enclosures and thermoplastic material heads.
- Cable transducers Pandia have sturdy cases in technopolymer and robust measuring ropes made of stainless steel.

DIRECTIVES AND STANDARDS

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

Tango

-25°C +70°C

IP65

- 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 clamp 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: $1x10^6$ operations.
- Connections: screw-type terminals.

7551-7552

-40°C +70°C

IP66

MAX. WITH DEDICATED CABLE CLAMP M20

- Rods with 4 maintained positions every 90°.
- 4 snap action switches with 1NO+1NC change-over contacts or slow action switches with 1NC contact.
- 3 outputs for cable clamps.
- Insulation category: Class I.
- Cable entry: cable clamp 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: $1x10^6$ operations.
- Connections: screw-type terminals.

X-FSC / X-FRZ

-25°C +70°C

IP65

MAX. WITH DEDICATED CABLE CLAMP M20

- X-FCS features cross rods in 3 or 4 maintained positions or T rods in 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 change-over contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: cable clamp 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: $1x10^6$ operations.
- Connections: screw-type terminals.

Standard

-25°C +70°C

IP65

MAX. WITH DEDICATED CABLE CLAMP M20

- 15 different heads/actuators (with various levers, rods, plungers).
- 1 or 2 snap action switches with 1NO+1NC change-over contacts or slow action switches with 1NC contact.
- Insulation category: Class II.
- Cable entry: cable clamp M20.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without heads): 80 x 69.8 x 38.5 mm (HxLxW).

Switch specifications

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

Din

-25°C +70°C

IP66

MAX. WITH DEDICATED CABLE CLAMP M20

- 16 different heads/actuators (with various levers, rods, plungers).
- 1 snap or slow action switch with 1NO+1NC change-over contacts.
- Insulation category: Class I.
- Cable entry: cable clamp M20.
- Operation frequency: 3600 operations/hour max.
- Overall dimensions (without heads): 72.5 x 40 x 43 mm (HxLxW).

Switch specifications

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

Pandia

Available from September 2017

-40°C +80°C

IP65

- Cable transducer, suitable for industrial applications as solution for linear measurement.
- Safe wire return movement guaranteed by an internal coil spring around the drum's rotation axis.
- Cable entry: cable clamp M16.
- Measurement range: 5000 mm.
- Overall dimensions: 120 x 150 x 89 mm (HxLxP).

Switch specifications

- Utilization category: AC 15 / 2A / 125 Vac
  AC 15 / 1A / 230 Vac
  DC 13 / 0.5 A / 60 Vdc.
- Rated thermal current: 6 A.
- Rated insulation voltage: 250 Vac.
- Mechanical life: $1.5x10^6$ operations.
- Connections: screw-type terminal with self-lifting pad

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).

MATERIALS

- Shock-resistant thermoplastic protection to prevent accidental contacts with live parts (Slip ring collectors 10A, 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 Sao 300A-500A).
- Phosphor bronze, graphite or metalgraphite (graphite with copper) brushes.
- Silver or gold signal rigs (Slip ring collectors Sao 300A-500A).

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

-25°C +70°C

IP00

- 4 rings.
- Version with driving slots available.
- Available with coupling flange.
- Insulation category: Class I.
- Operating positions: any position.
- Overall dimensions:
  without driving slot 79.5 x 80.5 x 63 mm (HxLxW)
  with driving slot 107 x 80.5 x 63 mm (HxLxW).

Electrical specifications

- Rated operational current: 10 A.
- Rated operational voltage: 400 Vac.
- Rated insulation voltage: 660 Vac.
- Max. speed: 3 rev./min.
- Connections: 6.3 mm Faston taps.

10A - 30A

-25°C +70°C

IP22

- Up to 40 rings coupled with brushes.
- Available with 30A line rings only or with 30A line rings and 10A auxiliary rings.
- Insulation category: Class I.
- Cable entry: cable clamps 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. speed: 3 rev./min.
- Connections:
  clamps with Ø 4 mm hole
  clamps with M4 screw accepting eyelet terminals.

50A

-25°C +70°C

IP22

- Up to 16 50A line rings coupled with brushes.
- Insulation category: Class I.
- Cable entry: cable clamps 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. speed: 3 rev./min.
- Connections: clamps with M6 screw accepting eyelet terminals.

Sao 300A - 500A

-20°C +60°C

IP65

- Power rings coupled with signal rings and customized to meet different requirements.
- Silver or gold signal rings.
- Cables entry: customized cable glands.
- Rotation speed: up to 30 rpm.
- Overall dimensions (depending on the number and dimensions of the rings or on amperage and voltage):
  150A - 300A: Ø 320 mm x H 346 mm
  300A - 500A: Ø 360 mm x H 502 mm.

Electrical specifications

- Rated operational current: up to 500A.
- Rated operational voltage: up to 680 Vac.
- Suitable for transferring DC current.

Transmission protocol specifications

- Data transmission protocol: Ethernet CAT 5, Profibus, Profinet, LAN, Can-BUS, Can-Open.
- Max. speed: 1 Gbit/s.

Manufactured by DR Italia srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

FOOTSWITCHES

Two series of footswitches used to control industrial machine tools.

FEATURES

- Single or double footswitches with emergency stop pushbutton.
- Version for pneumatic valves.
- Available with standard cover or large cover suitable for safety shoes.
- "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 EN418.
- Positive opening NC contacts for safety functions ⊖.

MATERIALS

- Footswitches 6200 are made of thermoplastic materials,
- Footswitches 6100 are available either in thermoplastic material or in die-cast aluminium.

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, EN 418.

6100

CE

-25°C +70°C

IP53

- Available in thermoplastic material or in die-cast aluminium.
- Available with standard protection cover or large cover for safety shoes.
- Special footswitch design for pneumatic valve with fixing plate.
- Snap or slow action switches with 1NO+1NC contacts, or slow action switches with 2NO+2NC contacts.
- Insulation category: Class I.
- Cable entry: cable clamps M20.
- Overall dimensions simple footswitches: standard cover 118 x 234 x 122 mm (HxLxW) large cover 143 x 245 x 141 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: $1x10^6$ operations.
- Connections: screw-type terminals.

6200

CE

-25°C +70°C

IP53

- Snap or slow action switches with 1NO+1NC contacts, or slow action switches with 2NO+2NC contacts.
- Insulation category: Class I.
- Cable entry: cable clamps M20.
- Overall dimensions simple footswitches: 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: $1x10^6$ operations.
- Connections: screw-type terminals.

RADIO REMOTE CONTROL

Four radio remote controls, with handheld or belly-box transmitters, suitable for controlling industrial machine tools or 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.
- Receivers available for mounting inside the electric panel (RX DIN) and in an IP65 watertight case for outdoor installation.
- Supplied with a sturdy and reliable waterproof antenna or with an internal antenna.
- Directional and high-gain antennas also available.

MATERIALS

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

DIRECTIVES AND STANDARDS

- Conformity to Community Directives:
  R&TTE 99/05/CE, LVD (2006/95/CE).
- Conformity to CE Standards:
  EN 301 489-3, EN 300 220-2, EN 60950-1, EN 60204-32, EN 13557, EN 61000-6-2, EN ISO 13849-1:2006.
- Performance Level (T3 - T5 - T7, Brick, Pail):
  Category 3 PL d / Category 2 PL c.
- Performance Level (Genesis):
  Category 4 PL e / Category 3 PL d.

T3 - T5 - T7

CE

-20°C +70°C

IP65

Specifications of transmitter unit

- Configurations from 3 to 7 actuators plus Start and Stop.
- Frequency:
  869.700 – 870.000 MHz, 11 channels, 25 KHz
  433.050 – 434.790 MHz, 60 channels, 25 KHz
  2.4 GHz, 40 channels, 2 MHz.
- Output power: from 1 to 10 mW.
- Response time: 50 ms.
- Active Emergency/Stop response time: 50 ms.
- Passive Emergency response time: 1 s.
- Operating range: 100 m.
- Stop control classification: Cat 3 PL-D
- Battery: Li-ion 3.6V
- Battery life: up to 1200 hours. (20°C).
- Overall dimensions: 174 x 85 x 37 mm (HxLxW).

Specifications of receiver unit

- Control relay contact rating: 4 A /115 Vac
- Stop relay contact rating: 4 A /115 Vac
- Power supply: 12-24 Vdc 1.0 A / 24-115 Vac 0.4 A / 230 Vac 0.2 A.

Manufactured by REMdevice srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

Brick

CE

-20°C +70°C

IP65

Specifications of transmitter unit

- Configurations from 9 to 12 actuators plus Start and Stop.
- Frequency:
  869.700 – 870.000 MHz, 11 channels, 25 KHz
  433.050 – 434.790 MHz, 59 channels, 25 KHz.
- Output power: from 1 to 10 mW.
- Response time: 45 ms.
- Active Emergency/Stop response time: 45 ms.
- Passive Emergency response time: 1 s.
- Operating range: about 100 m.
- Stop control classification: Cat 3 PL-D.
- Battery: integrated 3x1 x 1.2 V - 1800 mA.
- Battery life: ≈ 35 hours. (20°C).
- Overall dimensions: 210 x 80 x 40 mm (HxLxW).

Specifications of receiver unit

- Control relay contact rating: 4 A /115 Vac
- Stop relay contact rating: 4 A /115 Vac
- Power supply: 12-24 Vdc 1.0 A / 24-115 Vac 0.4 A / 230 Vac 0.2 A.

Manufactured by REMdevice srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

Pail

-20°C +70°C

IP65

Specifications of transmitter unit

- Frequency:
  869.700 – 870.000 MHz, 11 channels, 25 KHz
  433.050 – 434.790 MHz, 59 channels, 25 KHz.
- Output power: from 1 to 10 mW.
- Response time: 45 ms.
- Active Emergency/Stop response time: 45 ms.
- Passive Emergency response time: 1 s.
- Operating range: about 100 m.
- Stop control classification: Cat 3 PL-D.
- Battery: integrated 3x1 x 1.2 V - 1800 mA.
- Battery life: ≈ 35 hours. (20°C).
- Overall dimensions: 200 x 130 x 135mm (HxLxW).

Specifications of receiver unit

- Control relay contact rating: 4 A /115 Vac
- Stop relay contact rating: 4 A /115 Vac
- Power supply: 12-24 Vdc 1.0 A / 24-115 Vac 0.4 A / 230 Vac 0.2 A.

Manufactured by REMdevice srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

Genesis

-20°C +70°C

IP65

Specifications of transmitter unit

- Multiband working frequency Full-Duplex, 72 channels - ISM band.
- Output power: from 1 to 10 mW.
- Response time: from 20 ms to 80 ms depending on configuration.
- Active Emergency/Stop response time: from 20 ms to 80 ms depending on configuration.
- Passive Emergency response time: 1 s.
- Operating range: 100 m.
- Stop control classification:
  Cat 4 PL-E (ISO 13849-1) and SIL 3 (EN 62061).
- Joystick controls (UMFS) classification: Cat 3 PL-D and SIL 2.
- Overall dimensions: 310 x 193 x 163 mm (HxLxW).
- Battery:
  integrated 3x1 x 1.2 V = battery life 30 hours.
  external LI-ION 7.4 V = battery life 20 hours.
- Overall dimensions: 310 x 193 x 163 mm (HxLxW).

Specifications of receiver unit

- Control relay contact rating: 4 A (DC1/AC1) /115 Vac.
- Stop relay contact rating: 4 A (DC1/AC1) /115 Vac.
- Safety relay contact rating: 8 A (DC1/AC1) /115 Vac
- Power supply: 12-24 Vdc 1.0 A / 24-115 Vac 0.4 A / 230 Vac 0.2 A.

Manufactured by REMdevice srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

ATEX SERIES

Two series of pendant control stations, two series of rotary or position limit switches, one series of slip ring collectors, designed for heavy industry in potentially explosive areas.

FEATURES

- Positive opening NC contacts for safety functions ⊖.
- 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.
- 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).

Limitex AG

CE Ex IEC IECEx

-40°C +60°C

IP66

- 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 change-over contacts.
- Cable entry: 2 cable clamps M20x1.5 / 2 cable clamps M25x1.5 / 2 cable clamps 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: $1x10^6$ operations.
- Connections: 6.3 mm Faston taps or screw-type terminals.

Certification 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 IP66 (IECEx)
- DUST&GAS: II2GD
  Ex d IIB or IIC T6 Gb
  Ex tb IIC T85°C Db IP66

Manufactured by COEL Motori srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

Limitex AP

CE Ex IEC IECEx

-40°C +60°C

IP66

- Position limit switch designed for potentially explosive areas.
- Cross rods move to 3 or 4 maintained positions, with movement every 90°.
- 2 or 4 snap action switches with 1NO+1NC change-over contacts.
- Cable entry: 2 cable clamps M20x1.5 / 2 cable clamps M25x1.5 / 2 cable clamps 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: $1x10^6$ operations.
- Connections: screw-type terminals.

Certification 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 IP66 (IECEx)
- DUST&GAS: II2GD
  Ex d IIB or IIC T6 Gb
  Ex tb IIC T85°C Db IP66

Manufactured by COEL Motori srl – Distributed by T.E.R. Tecno Elettrica Ravasi srl

SPA Explosion Proof

CE Ex IEC IECEx

-50°C +55°C

IP66

- 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 133 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: $1x10^6$ operations.

Certification for group I, IIA, IIB with the marks

- DUST&GAS: Ex d IIB or IIC T6 Gb
  Ex tb IIIC T85°C Db IP66

Manufactured by ARIET Di T. Cereda – Distributed by T.E.R. Tecno Elettrica Ravasi srl

Mike-X

CE Ex IEC IECEx

-20°C +60°C

IP65

- Pendant control station for auxiliary control designed for potentially explosive areas.
- Configurations from 4 to 16 actuators.
- Two speed pushbuttons and key-selector switches in various operations configurations.
- Two speed switches with NO or NC contacts.
- Bridge connections (on request) to reduce wiring time.
- Versions with thermal protectors and resistances 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^2 – max. 2 mm^2 (ATEX and IEC Ex).

Certification 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 T.E.R. Tecno Elettrica Ravasi srl

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