# Signal and control equipment, sockets and plugs

2025

Explosion-protected electrical equipment

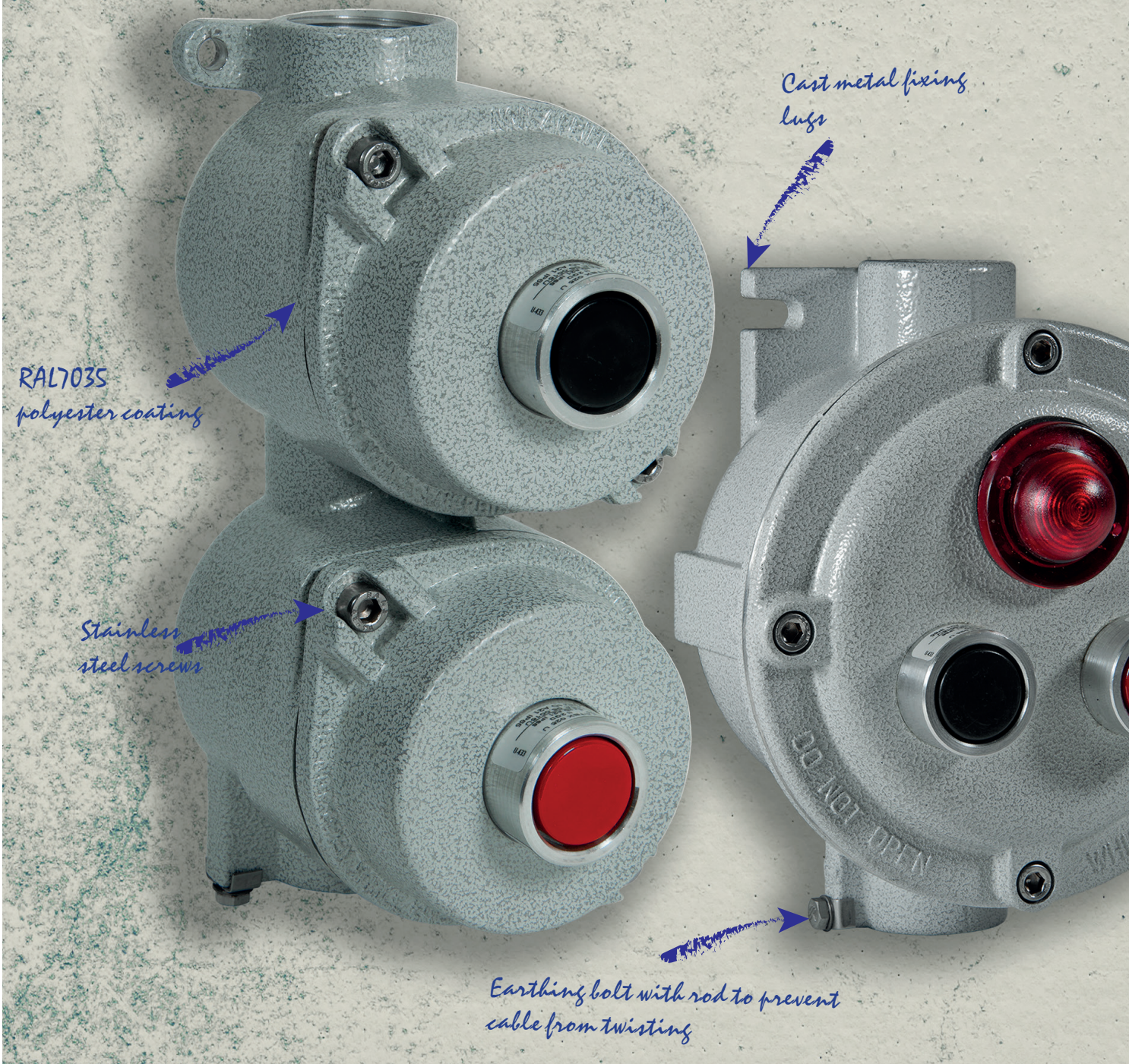
CORTEM GROUP

To be sure to be safe.

# CSC, EFSCO, EFDC, EMHA

## Command and control stations ‘Ex d’

- Group IIC
- Zone 1, 2, 21, 22
- Aluminium alloy, stainless steel or cast iron enclosures
- Category 2GD or M2



# CSC Series... Control and signalling station

The Ex d IIC stations and controllers are suitable for the control and signalling of devices installed both "onboard" the machine and remotely (e.g. on a field control column). They are easily installed using wall mount lugs and have threaded entries for connection by means of a cable gland or metal pipe.
Used specifically in offshore and onshore environments, the chemical, petrochemical and pharmaceutical industries, and all locations which require an explosion proof system.
The switches, circuit breakers and selectors which make up the CSC series are 16 A rotary type with a front control handle. Supplied with 1" Male to 3/4" Female reducer. They are recommended for controlling devices both on board machine and on wall mounted columns. The various available cable arrangements make devices in the CSC series versatile for any type of use.

Cortem Group labels its products with a non-removable adhesive label featuring a hologram and an alphanumerical univocal code, as a safety measure against the illegal sale of fakes so that all the products are guaranteed as original. Non-compliance with the International standards entails serious risks for the environment, especially for those working daily on the plants.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical plants


Onshore plants


Offshore plants


Petroleum loading/ unloading pontoons


Low temperatures


Mining operations

100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD/M2 | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex I M2 Ex db I Mb *(stainless steel and cast iron ONLY)* | | | |
| | CE 0722 Ex II 2 GD; Ex db IIC T...°C Gb; Ex tb IIIC T...°C Db | | | |
| **Certificate:** | ATEX CESI 01 ATEX 092 X | | | |
| | IEC Ex CES 17.0001X | For all IEC Ex and TR CU certification data, download the certificate from www.cortemgroup.com | | |
| | TR CU AVAILABLE | | | |
| **Standards:** | CENELEC EN 60079-0: 2012, EN 60079-0/A11: 2013, EN 60079-1: 2014 EN60079-31 2014 and European Directive 2014/34/EU<br>IEC 60079-0: 2011, IEC 60079-1: 2014, IEC 60079-31: 2013<br>RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | T6 (Ta +40°C) | T5 (Ta +55°C) | | |
| **Ambient Temp.:** | -20°C +55°C | Standard | | |
| | -50°C +55°C | Only for group II. The Group II monitoring and signalling units, equipped with polycarbonate signalling lenses, are limited to -40°C | | |
| **Degree of protection:** | IP66 | | | |

# CSC Series... Control and signalling station

## CROSS-SECTION VIEW

## MECHANICAL FEATURES OF ENCLOSURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Instrument casing:** | Borosilicate glass |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected by a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 1" complete with Male 1"- Female 3/4" adapter |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

## MECHANICAL FEATURES OF CONTROL AND SIGNALLING DEVICES

| | |
|---|---|
| **Pushbutton:** | Coloured nylon |
| **Illuminated pushbutton:** | Clear coloured polycarbonate |
| **Control levers:** | Coated aluminium alloy |
| **Badge:** | Anodised aluminium, white lettering on black background |
| **Internal bushing and pin:** | Stainless steel |
| **Gaskets:** | Acid and hydrocarbon resistant NBR |
| **Coating:** | Polyester RAL 7035 (Light grey), where applicable |
| **Station assembly:** | Screwed onto cover |
| **Contacts assembly:** | Snap action on an appropriate flange to ensure the quick connection of entire contacts block to the station |
| **External body lens:** | Impact and UV resistant polycarbonate lens, coloured or transparent |

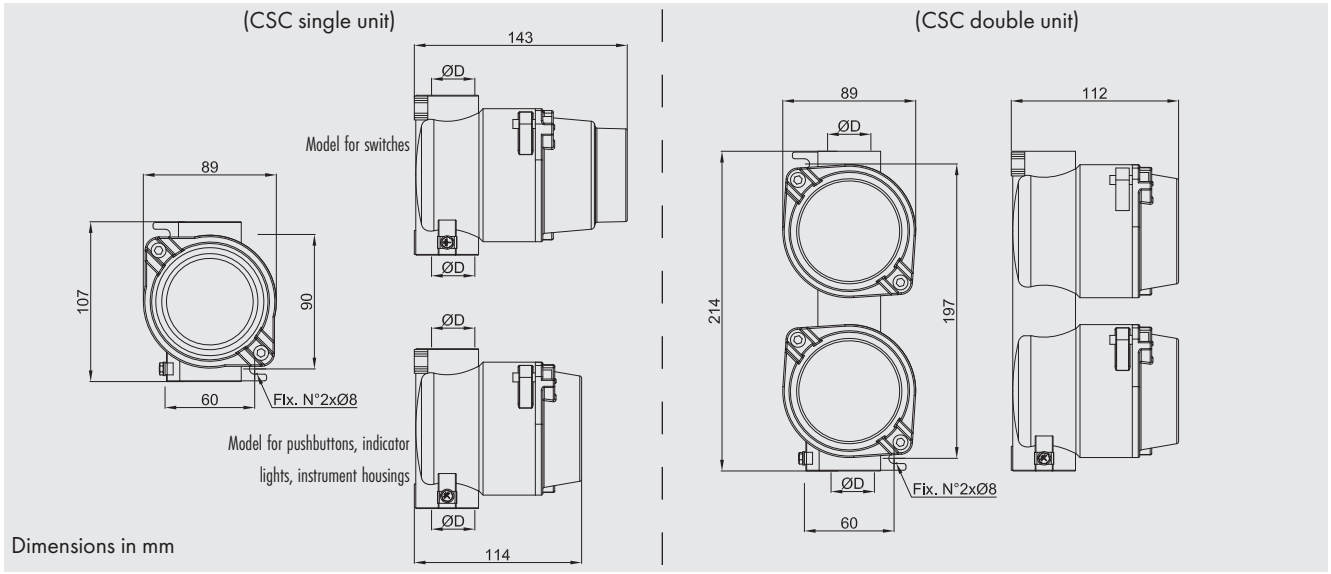
## ELECTRICAL FEATURES

| | |
|---|---|
| **Contacts for pushbuttons:** | Max. 10A 600 V |
| **Switches:** | 16A, 690 V |
| **Indicator lights:** | 24/250V, 3W |
| **Analogue instruments:** | 600V |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

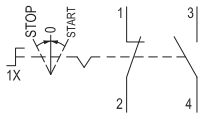
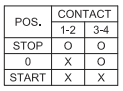
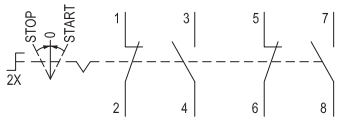
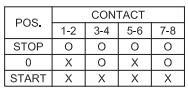
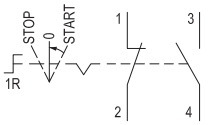
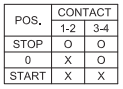
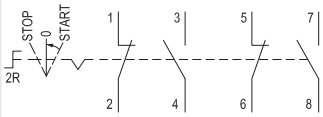
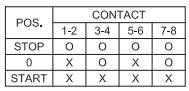
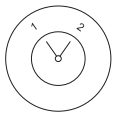
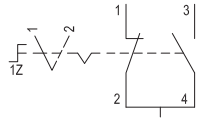
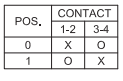
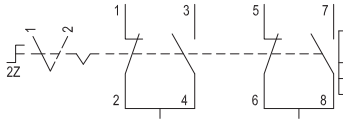
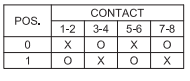
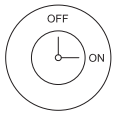
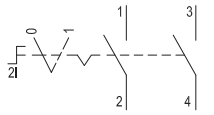
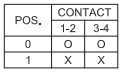
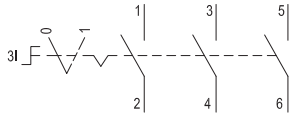
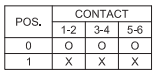
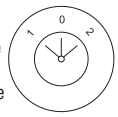
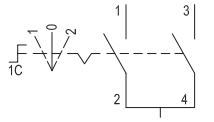
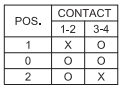
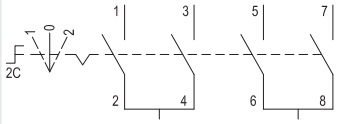
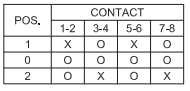
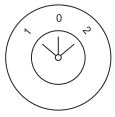
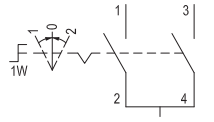
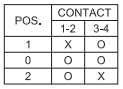
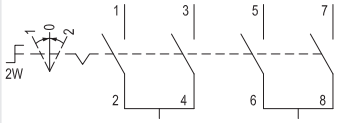
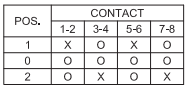
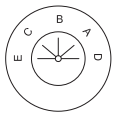
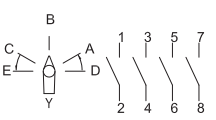
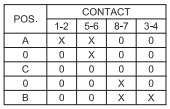
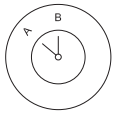
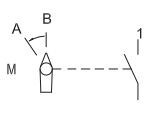
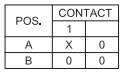
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Stainless steel or cast iron version available with minimum production batches. Contact your sales representative for more details. (sample code stainless steel CSC-D**IN,** cast iron sample code CSC-D**GJ**)
Cablegland / fittings
System protecting against accidental operation for mushroom-head push-buttons serie CSC-R (code **M-990**)

## DIMENSIONAL DRAWING

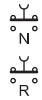
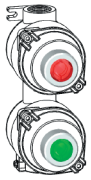
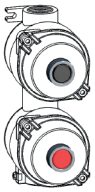



Dimensions in mm

## SELECTOR ARRANGEMENT

| Description | Badge | Single pole arrangement | Contacts | Single pole arrangement | Contacts | Codes |
|---|---|---|---|---|---|---|
| Motors "start-stop" control, with spring return to 0 from both STOP and START. |  |  |  |  |  | X |
| Motors "start-stop" control with spring return from START to 0, and in fixed STOP position can be padlocked. |  |  |  |  |  | R |
| Switch with two fixed-positions, suitable for "automatic-manual" service |  |  |  |  |  | Z |
| Switch |  |  |  |  |  | I |
| Three fixed position switch can be padlocked in the centre position. Versions: single pole - double pole - triple pole |  |  |  |  |  | C |
| Three position switch can be padlocked in centre position with spring return to 0 from positions 1 and 2. |  |  |  |  |  | W |
| 5 position reversing start switch. Lever with fixed C position and spring return to 0 from A and B |  |  |  | | | Y |
| "Start" motors control with lever spring return to position B |  |  |  | | | M |

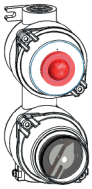
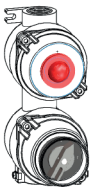
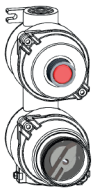
## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Single body: double pushbutton |  | 0.85 | **CSC-D** |
| | 1" NPT | | | | **CSC-DN** |
|  | 1" ISO 7/1 | Single body: illuminated pushbutton |  | 0.90 | **CSC-G** |
| | 1" NPT | | | | **CSC-GN** |
|  | 1" ISO 7/1 | Double body: double illuminated pushbutton |  | 1.60 | **CSC-GG** |
| | 1" NPT | | | | **CSC-GGN** |
|  | 1" ISO 7/1 | Single body: single signal lamp |  | 0.80 | **CSC-L** |
| | 1" NPT | | | | **CSC-LN** |
|  | 1" ISO 7/1 | Double body: double signal lamp |  | 1.57 | **CSC-LL** |
| | 1" NPT | | | | **CSC-LLN** |
|  | 1" ISO 7/1 | Single body: single pushbutton (1NA+1NC) |  | 0.74 | **CSC-P** |
| | 1" NPT | | | | **CSC-PN** |
| | 1" ISO 7/1 | Single body: single pushbutton 2NO+2NC | | 0.88 | **CSC-2P** |
| | 1" NPT | | | | **CSC-2PN** |
|  | 1" ISO 7/1 | Double body: pushbutton + indicator light |  | 1.63 | **CSC-PL** |
| | 1" NPT | | | | **CSC-PLN** |
|  | 1" ISO 7/1 | Double body: two pushbuttons |  | 1.69 | **CSC-PP** |
| | 1" NPT | | | | **CSC-PPN** |
|  | 1" ISO 7/1 | Single body: single maintained pushbutton (maintained) (1NA+1NC) |  | 0.90 | **CSC-B** |
| | 1" NPT | | | | **CSC-BN** |
| | 1" ISO 7/1 | Single body: single maintained pushbutton (maintained) (2NA+2NC) | | 0.92 | **CSC-2B** |
| | 1" NPT | | | | **CSC-2BN** |

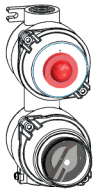
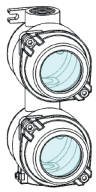
## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Single body: mushroom head pushbutton (1NO+ 1NC) | EM | 0.92 | CSC-F |
| | 1" NPT | | | | CSC-FN |
| | 1" ISO 7/1 | Single body: mushroom head pushbutton (2NO+ 2NC) | | 0.94 | CSC-2F |
| | 1" NPT | | | | CSC-2FN |
|  | 1" ISO 7/1 | Single body: 'twist to release' mushroom head pushbutton (1NO+ 1NC) | EMR | 0.92 | CSC-R |
| | 1" NPT | | | | CSC-RN |
| | 1" ISO 7/1 | Single body: 'twist to release' mushroom head pushbutton (2NA+2NC) | | 0.94 | CSC-2R |
| | 1" NPT | | | | CSC-2RN |
| **Selectors** | | | | | |
| | 1" ISO 7/1 | Single body: single pole selector | | 0.87 | CSC-1C |
| | 1" NPT | | | | CSC-1CN |
| | 1" ISO 7/1 | Single body: double pole selector | | 0.89 | CSC-2C |
| | 1" NPT | | | | CSC-2CN |
| | 1" ISO 7/1 | Single body: triple pole selector | | 0.91 | CSC-3C |
| | 1" NPT | | | | CSC-3CN |
| | 1" ISO 7/1 | Single body: single pole switch | | 0.87 | CSC-1I |
| | 1" NPT | | | | CSC-1IN |
| | 1" ISO 7/1 | Single body: double pole switch | | 0.89 | CSC-2I |
| | 1" NPT | | | | CSC-2IN |
| | 1" ISO 7/1 | Single body: triple pole switch | | 0.91 | CSC-3I |
| | 1" NPT | | | | CSC-3IN |
|  | 1" ISO 7/1 | Single body: run/stop selector | | 0.89 | CSC-1R |
| | 1" NPT | | | | CSC-1RN |
| | 1" ISO 7/1 | Single body: single pole selector | | 0.89 | CSC-1W |
| | 1" NPT | | | | CSC-1WN |
| | 1" ISO 7/1 | Single body: double pole selector | | 0.91 | CSC-2W |
| | 1" NPT | | | | CSC-2WN |
| | 1" ISO 7/1 | Single body: run/stop selector | | 0.89 | CSC-1X |
| | 1" NPT | | | | CSC-1XN |
| | 1" ISO 7/1 | Single body: reversing start switch | | 0.89 | CSC-1Y |
| | 1" NPT | | | | CSC-1YN |
| | 1" ISO 7/1 | Single body: single pole circuit breaker | | 0.89 | CSC-1Z |
| | 1" NPT | | | | CSC-1ZN |
| | 1" ISO 7/1 | Single body: double pole circuit breaker | | 0.89 | CSC-2Z |
| | 1" NPT | | | | CSC-2ZN |
| | 1" ISO 7/1 | Single body: triple pole circuit breaker | | 0.89 | CSC-3Z |
| | 1" NPT | | | | CSC-3ZN |

## CODE SELECTION TABLE

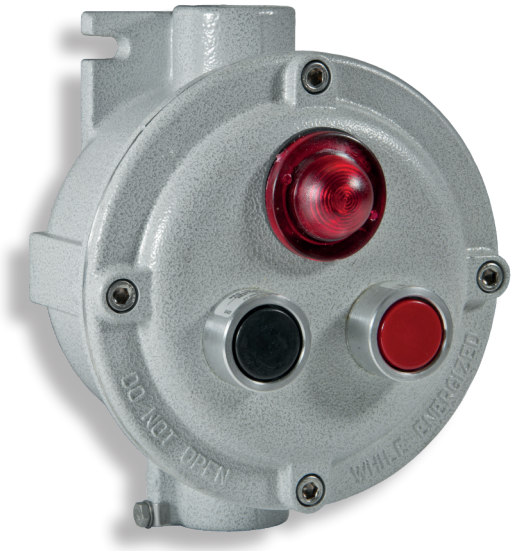
| Illustration | Entry ØD | Combinations Description | Weight Kg | Codes |
|---|---|---|---|---|
|  | 1" ISO 7/1 | Double body: single pole changeover switch + indicator light | 1.65 | CSC-1CL |
| | 1" NPT | | | CSC-1CLN |
| | 1" ISO 7/1 | Double body: double pole changeover switch + indicator light | 1.67 | CSC-2CL |
| | 1" NPT | | | CSC-2CLN |
| | 1" ISO 7/1 | Double body: triple pole changeover switch + indicator light | 1.69 | CSC-3CL |
| | 1" NPT | | | CSC-3CLN |
|  | 1" ISO 7/1 | Double body: pushbutton + single pole selector | 1.70 | CSC-P1C |
| | 1" NPT | | | CSC-P1CN |
| | 1" ISO 7/1 | Double body: pushbutton + double pole selector | 1.72 | CSC-P2C |
| | 1" NPT | | | CSC-P2CN |
| | 1" ISO 7/1 | Double body: pushbutton + triple pole selector | 1.74 | CSC-P3C |
| | 1" NPT | | | CSC-P3CN |
|  | 1" ISO 7/1 | Double body: single pole circuit breaker + indicator light | 1.65 | CSC-1ZL |
| | 1" NPT | | | CSC-1ZLN |
| | 1" ISO 7/1 | Double body: double pole circuit breaker + indicator light | 1.67 | CSC-2ZL |
| | 1" NPT | | | CSC-2ZLN |
| | 1" ISO 7/1 | Double body: triple pole circuit breaker + indicator light | 1.65 | CSC-3ZL |
| | 1" NPT | | | CSC-3ZLN |
|  | 1" ISO 7/1 | Double body: pushbutton + single pole circuit breaker | 1.70 | CSC-P1Z |
| | 1" NPT | | | CSC-P1ZN |
| | 1" ISO 7/1 | Double body: pushbutton + double pole circuit breaker | 1.72 | CSC-P2Z |
| | 1" NPT | | | CSC-P2ZN |
| | 1" ISO 7/1 | Double body: pushbutton + triple pole circuit breaker | 1.74 | CSC-P3Z |
| | 1" NPT | | | CSC-P3ZN |
|  | 1" ISO 7/1 | Double body: run/stop selector + single pole switch | 1.74 | CSC-1R1C |
| | 1" NPT | | | CSC-1R1CN |
| | 1" ISO 7/1 | Double body: run/stop selector + double pole switch | 1.76 | CSC-1R2C |
| | 1" NPT | | | CSC-1R2CN |
| | 1" ISO 7/1 | Double body: run/stop selector + triple pole switch | 1.78 | CSC-1R3C |
| | 1" NPT | | | CSC-1R3CN |
|  | 1" ISO 7/1 | Double body: run/stop selector + single pole circuit breaker | 1.73 | CSC-1R1Z |
| | 1" NPT | | | CSC-1R1ZN |
| | 1" ISO 7/1 | Double body: run/stop selector + double pole circuit breaker | 1.76 | CSC-1R2Z |
| | 1" NPT | | | CSC-1R2ZN |
| | 1" ISO 7/1 | Double body: run/stop selector + triple pole circuit breaker | 1.78 | CSC-1R3Z |
| | 1" NPT | | | CSC-1R3ZN |

## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Weight Kg | Codes |
|---|---|---|---|---|
|  | 1" ISO 7/1 | Double body: run/stop selector + single pole switch | 1.73 | CSC-1X1C |
| | 1" NPT | | | CSC-1X1CN |
| | 1" ISO 7/1 | Double body: run/stop selector + double pole changeover switch | 1.75 | CSC-1X2C |
| | 1" NPT | | | CSC-1X2CN |
| | 1" ISO 7/1 | Double body: run/stop selector + triple pole changeover switch | 1.73 | CSC-1X3C |
| | 1" NPT | | | CSC-1X3CN |
|  | 1" ISO 7/1 | Double body: run/stop selector + single pole circuit breaker | 1.73 | CSC-1X1Z |
| | 1" NPT | | | CSC-1X1ZN |
| | 1" ISO 7/1 | Double body: run/stop selector + double pole circuit breaker | 1.75 | CSC-1X2Z |
| | 1" NPT | | | CSC-1X2ZN |
| | 1" ISO 7/1 | Double body: run/stop selector + triple pole circuit breaker | 1.77 | CSC-1X3Z |
| | 1" NPT | | | CSC-1X3ZN |
|  | 1" ISO 7/1 | Double body: run/stop selector + indicator light | 1.67 | CSC-1RL |
| | 1" NPT | | | CSC-1RLN |
| | 1" ISO 7/1 | Double body: run/stop selector + indicator light | 1.66 | CSC-1XL |
| | 1" NPT | | | CSC-1XLN |
|  | 1" ISO 7/1 | Single body: instrument casing | 0.75 | CSC-H |
| | 1" NPT | | | CSC-HN |
|  | 1" ISO 7/1 | Double body: instrument casing | 1.50 | CSC-HH |
| | 1" NPT | | | CSC-HHN |
|  | 1" ISO 7/1 | Double body: run/stop selector + instrument casing | 1.67 | CSC-1RH |
| | 1" NPT | | | CSC-1RHN |
| | 1" ISO 7/1 | | | CSC-1XH |
| | 1" NPT | | | CSC-1XHN |
|  | 1" ISO 7/1 | Single body: Key operated handle with quick coupling for cam switch. Stainless steel bushing. | 0.95 | CSC-1ZK |
| | 1" NPT | | | CSC-1ZKN |
| | 1" ISO 7/1 | | | CSC-2ZK |
| | 1" NPT | | | CSC-2ZKN |
|  | 1" ISO 7/1 | Single body: break glass emergency pushbutton with hammer | 1.10 | CSCPEA2 |
| | 1" NPT | | | CSCPEA2N |

Note:
For non-standard arrangements, contact the Sales Office.

# EFDC Series... Control and signalling station




## CROSS-SECTION VIEW


## DESCRIPTION

EFDC series control and monitoring units are suitable for the control and signalling of devices, both on board the machine or remotely, and are used in the chemical, petrochemical and pharmaceutical industries, and any location which requires an explosion proof system. A feature of this station is the ability to mount up to four operators on the cover.

## MECHANICAL FEATURES OF ENCLOSURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected by a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 1" |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

## MECHANICAL FEATURES OF CONTROL AND SIGNALLING DEVICES

| | |
|---|---|
| **Pushbutton:** | Coloured nylon |
| **Illuminated pushbutton:** | Clear coloured polycarbonate |
| **Control lever:** | Aluminium alloy |
| **Badge:** | Anodised aluminium, white lettering on black background |
| **Outer body:** | Aluminium alloy |
| **Internal bushing and pin:** | Stainless steel |
| **Gaskets:** | Acid and hydrocarbon resistant NBR |
| **Station assembly:** | Screwed onto cover |
| **Contacts assembly:** | Snap action on an appropriate flange to ensure the quick connection of entire contacts block to the station |
| **External body lens:** | Impact and UV resistant polycarbonate lens, coloured or transparent |

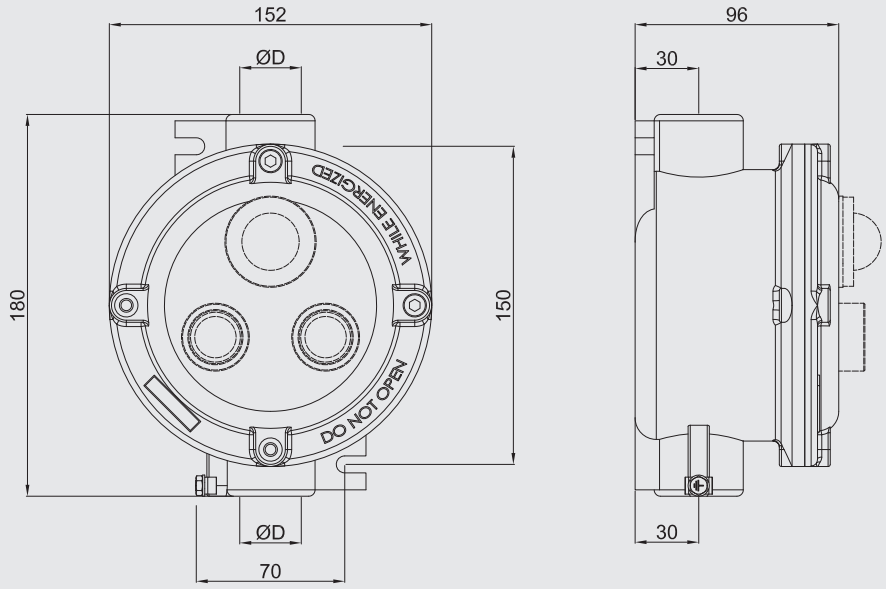
## ELECTRICAL FEATURES

| | |
|---|---|
| **Contacts for pushbuttons:** | Max. 10A 600 V |
| **Switches:** | 16A, 690 V |
| **Indicator lights:** | 24/250V, 3W |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

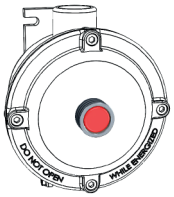
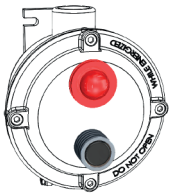
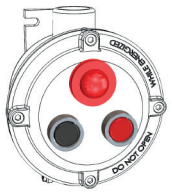
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Cablegland / fittings
System protecting against accidental operation for mushroom-head push-buttons serie EFDC-21EMR and EFDC-21EMC (code **M-990**)

## DIMENSIONAL DRAWING

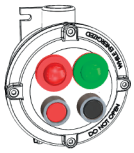
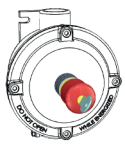



Dimensions in mm

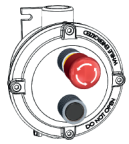
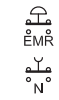
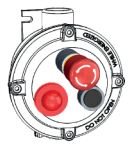
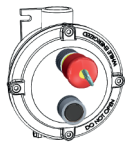
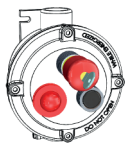
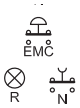
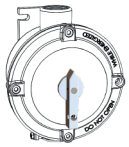
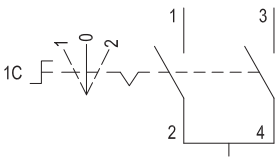
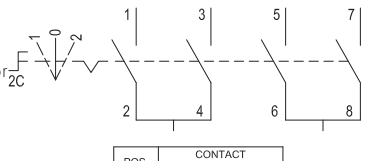
## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Single body: button | R | 1.4 | **EFDC-21** |
| | 1" NPT | | | | **EFDC-21N** |
| | 1" ISO 7/1 | Single body: indicator light | R | 1.4 | **EFDC-25** |
| | 1" NPT | | | | **EFDC-25N** |
|  | 1" ISO 7/1 | Single body: two buttons | N<br>R | 1.5 | **EFDC-22** |
| | 1" NPT | | | | **EFDC-22N** |
| | 1" ISO 7/1 | Single body: two indicator lights | R<br>V | 1.5 | **EFDC-24** |
| | 1" NPT | | | | **EFDC-24N** |
| | 1" ISO 7/1 | Single body: pushbutton with indicator light | R<br>N | 1.5 | **EFDC-23** |
| | 1" NPT | | | | **EFDC-23N** |
|  | 1" ISO 7/1 | Single body: three buttons | R<br>N N | 1.6 | **EFDC-27** |
| | 1" NPT | | | | **EFDC-27N** |
| | 1" ISO 7/1 | Single body: three indicator lights | V<br>R R | 1.6 | **EFDC-20** |
| | 1" NPT | | | | **EFDC-20N** |
| | 1" ISO 7/1 | Single body: two pushbuttons and an indicator light | R<br>N R | 1.6 | **EFDC-28** |
| | 1" NPT | | | | **EFDC-28N** |
| | 1" ISO 7/1 | Single body: pushbutton with two indicator lights | R<br>V N | 1.6 | **EFDC-29** |
| | 1" NPT | | | | **EFDC-29N** |

## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Single body: four pushbuttons |  | 1.8 | **EFDC-30** |
| | 1" NPT | | | | **EFDC-30N** |
| | 1" ISO 7/1 | Single body: four indicator lights |  | 1.8 | **EFDC-31** |
| | 1" NPT | | | | **EFDC-31N** |
| | 1" ISO 7/1 | Single body: three pushbuttons with an indicator light |  | 1.8 | **EFDC-32** |
| | 1" NPT | | | | **EFDC-32N** |
| | 1" ISO 7/1 | Single body: two pushbuttons with two indicator lights |  | 1.8 | **EFDC-33** |
| | 1" NPT | | | | **EFDC-33N** |
| | 1" ISO 7/1 | Single body: pushbutton with three indicator lights |  | 1.8 | **EFDC-34** |
| | 1" NPT | | | | **EFDC-34N** |
|  | 1" ISO 7/1 | Single body: emergency pushbutton station with protective glass and hammer |  | 1.4 | **EFDC-21EMV** |
| | 1" NPT | | | | **EFDC-21EMVN** |
|  | 1" ISO 7/1 | Single body: emergency pushbutton station |  | 1.4 | **EFDC-21EM** |
| | 1" NPT | | | | **EFDC-21EMN** |
|  | 1" ISO 7/1 | Emergency pushbutton station with 'twist to release' mushroom head pushbutton |  | 1.4 | **EFDC-21EMR** |
| | 1" NPT | | | | **EFDC-21EMRN** |
|  | 1" ISO 7/1 | Emergency pushbutton station with key release mushroom head pushbutton (when the button is pressed, turn the key to release) |  | 1.4 | **EFDC-21EMC** |
| | 1" NPT | | | | **EFDC-21EMCN** |

## CODE SELECTION TABLE

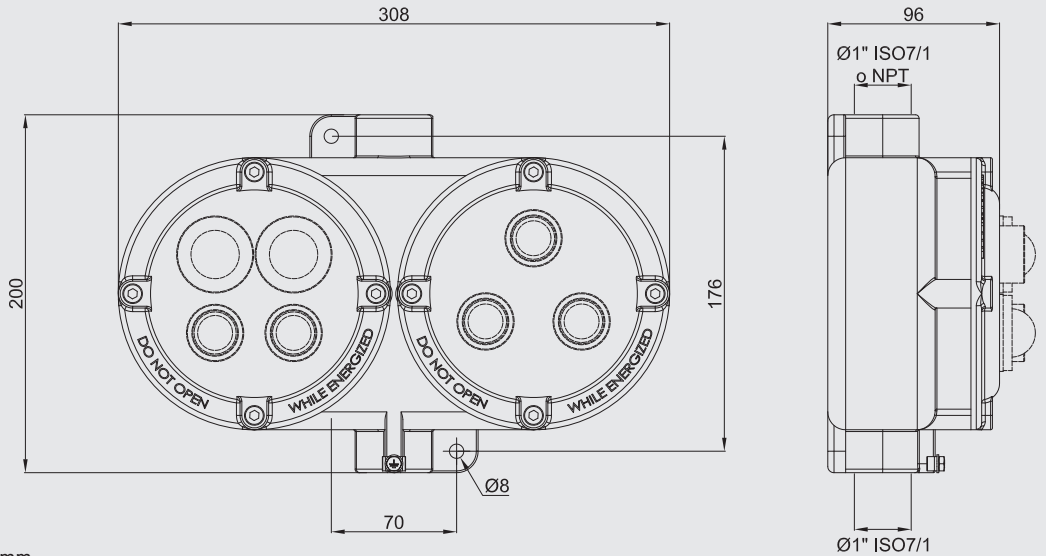
| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Emergency pushbutton station with 'twist to release' mushroom head pushbutton and pushbutton |  | 1.5 | **EFDC-21EMRV1** |
| | 1" NPT | | | | **EFDC-21EMRV1N** |
|  | 1" ISO 7/1 | Emergency pushbutton station with 'twist to release' mushroom head pushbutton, pushbutton and indicator light |  | 1.5 | **EFDC-21EMRV2** |
| | 1" NPT | | | | **EFDC-21EMRV2N** |
|  | 1" ISO 7/1 | Single body: emergency pushbutton station with mushroom head pushbutton and key reset |  | 1.4 | **EFDC-21EMCV1** |
| | 1" NPT | | | | **EFDC-21EMCV1N** |
|  | 1" ISO 7/1 | Single body: emergency pushbutton station with mushroom head pushbutton and key reset, pushbutton and indicator light |  | 1.4 | **EFDC-21EMCV2** |
| | 1" NPT | | | | **EFDC-21EMCV2N** |
|  | 1" ISO 7/1 | Single body: Single pole selector |  | 2.0 | **EFDC-1C** |
| | 1" NPT | | | | **EFDC-1CN** |
| | 1" ISO 7/1 | Single body: Double pole selector |  | 2.1 | **EFDC-2C** |
| | 1" NPT | | | | **EFDC-2CN** |

Note:
For non-standard arrangements, contact the Sales Office.

## DESCRIPTION

EFDC series control and signalling stations -.../... are double bodied enclosures and can contain up to eight devices. They are used for the remote control of devices such as distribution panels for lights, pumps, starter motors, etc.

## DIMENSIONAL DRAWING




Dimensions in mm

## CODE SELECTION TABLE

Use the code in the selection table of EFDC single body stations to compose the code for double body stations.

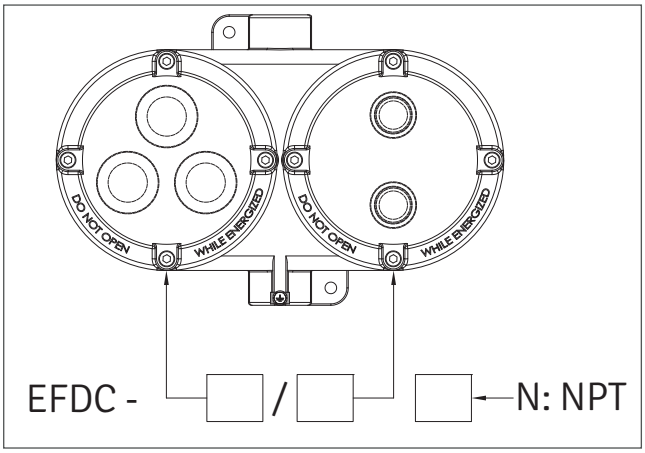
Example:

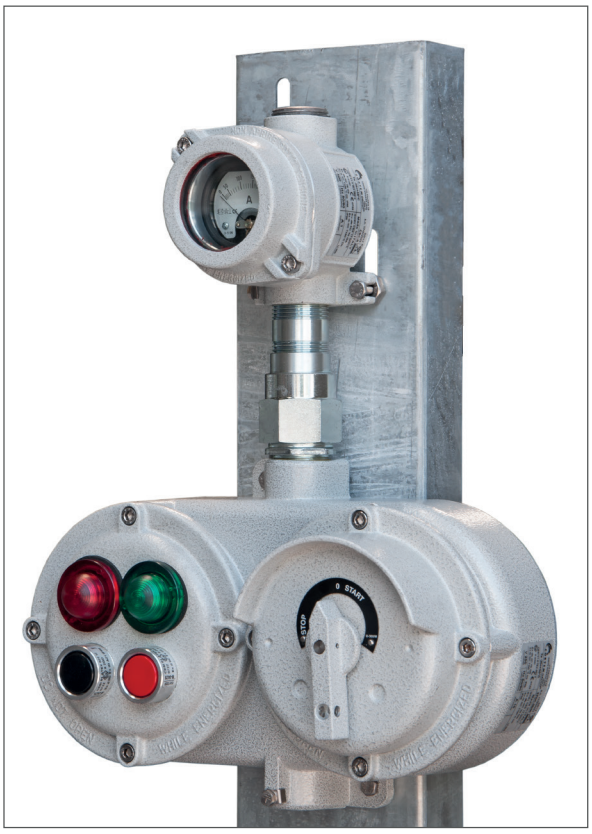
**EFDC-20/22**

Double body station with three indicator lights in the left-hand enclosure and two pushbuttons in the one to the right. Two 1" ISO7/1 fittings.

**EFDC-23/21N**

Double body station with pushbutton and indicator light in the left-hand enclosure and a pushbutton in the one to the right. Two 1" NPT fittings.

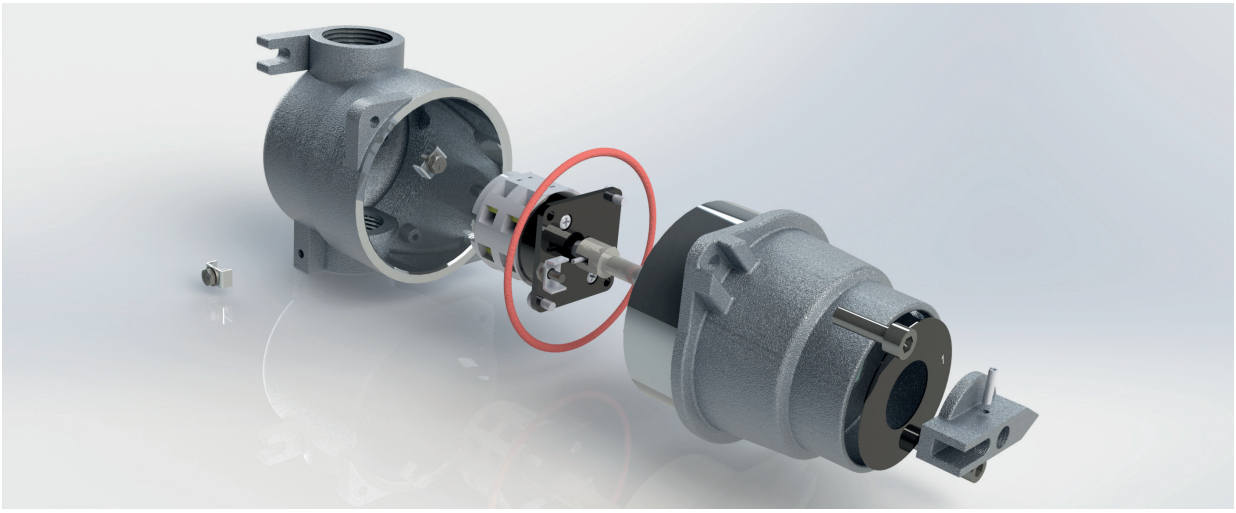


**EFDC33/2C** connected to an instrument casing **CSC-H** with ammeter.

# CSC Series... Switches, selectors and circuit breaker

## EXPLODED VIEW



## DESCRIPTION

The switches, circuit breakers and selectors which make up the CSC series are 16 A rotary type with a front control handle. Supplied with 1" Male to 3/4" Female reducer

## MECHANICAL FEATURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Control lever:** | Coated aluminium alloy |
| **Certification label:** | Adhesive affixed to external surface |
| **Badge:** | Anodised aluminium, white lettering on black background |
| **Internal bushing and pin:** | Stainless steel |
| **Control lever:** | Aluminium alloy |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected by a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 1" complete with Male 1"- Female 3/4" adapter |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

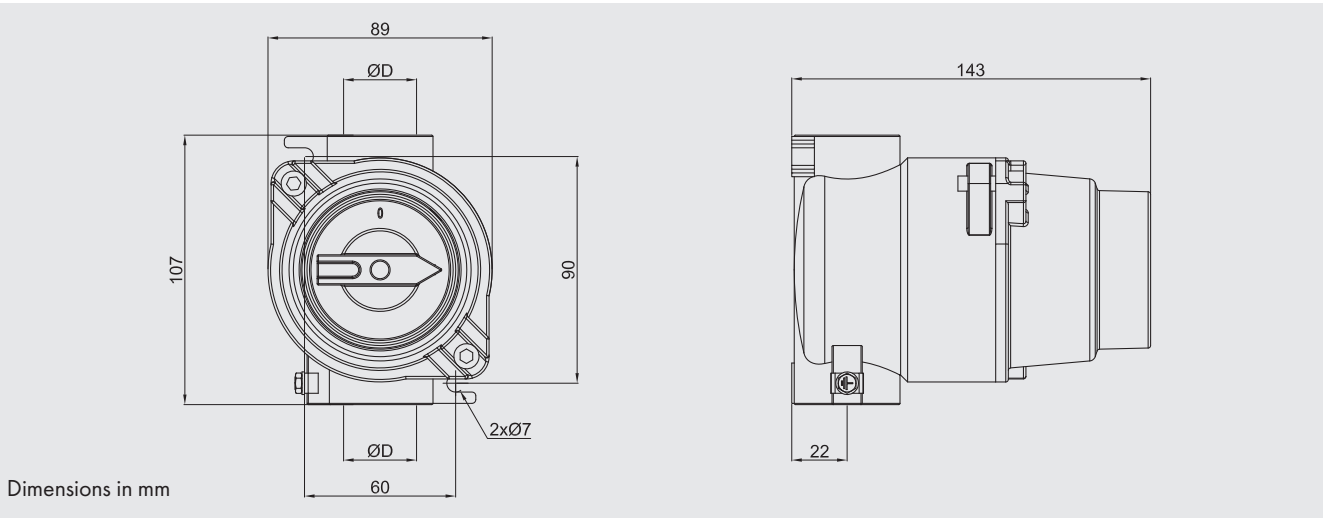
## ELECTRICAL FEATURES

| | |
|---|---|
| **Switches:** | 16A, 690 V |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

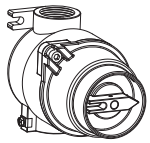
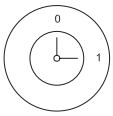
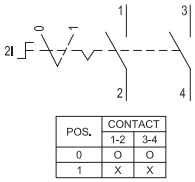
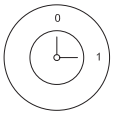
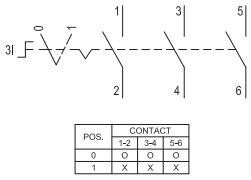
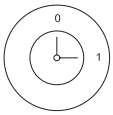
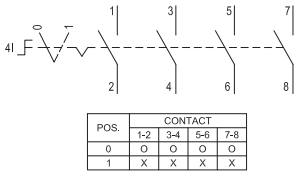
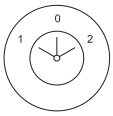
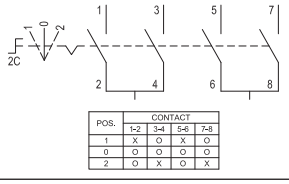
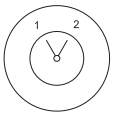
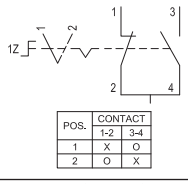
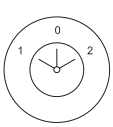
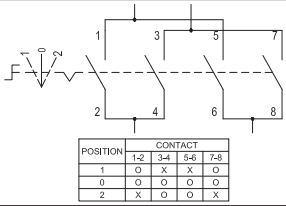
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Stainless steel or cast iron version available with minimum production batches. Contact your sales representative for more details. (sample code stainless steel CSC-216**IN,** cast iron sample code CSC-216**GJ**)
Cablegland / fittings

## DIMENSIONAL DRAWING

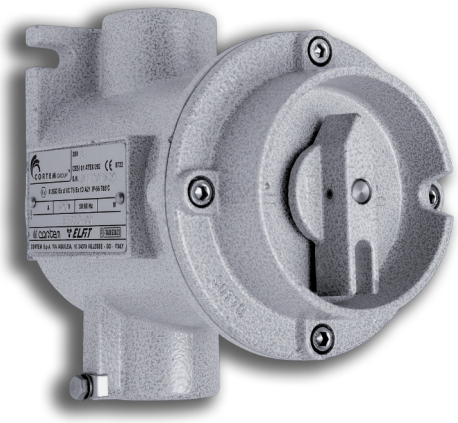



Dimensions in mm

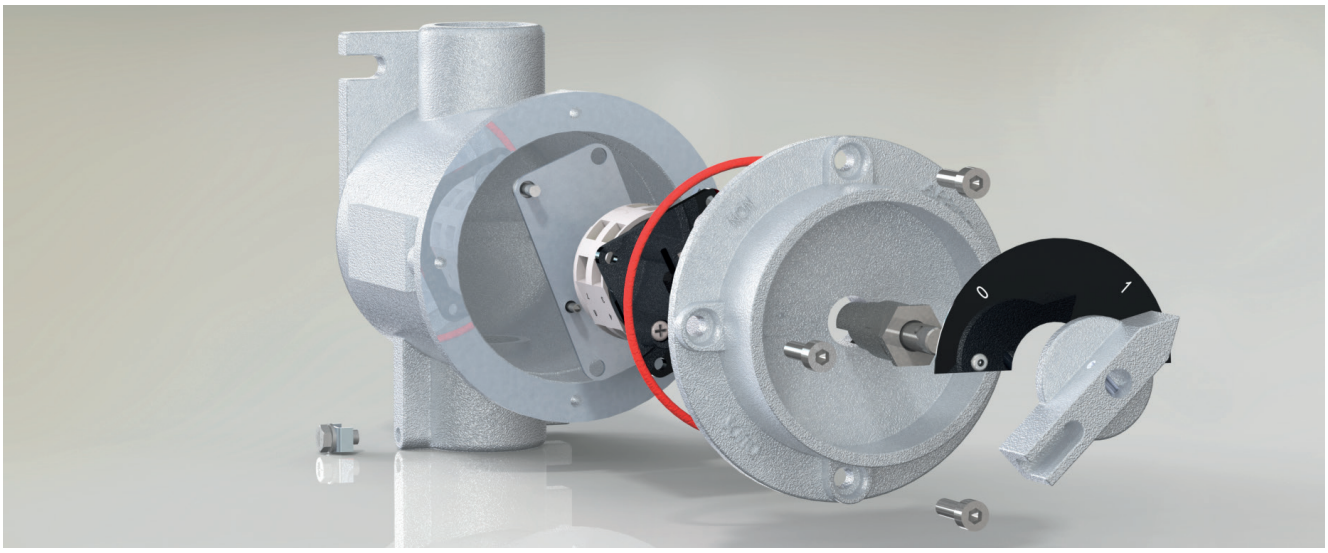
## SELECTION TABLE

| Illustration | Entry ØD (*) | Description | Badge | Arrangement | Capacity | Poles | Weight Kg | Code |
|---|---|---|---|---|---|---|---|---|
|  | 1" ISO 7/1 | Switch with 2 fixed positions '0-1' |  |  | 16 A | 2 | 0.95 | **CSC-216** |
| | 1" NPT | | | | | | | **CSC-216N** |
| | 1" ISO 7/1 | Switch with 2 fixed positions '0-1' |  |  | 16 A | 3 | 0.86 | **CSC-316** |
| | 1" NPT | | | | | | | **CSC-316N** |
| | 1" ISO 7/1 | Switch with 2 fixed positions '0-1' |  |  | 16 A | 4 | 0.85 | **CSC-416** |
| | 1" NPT | | | | | | | **CSC-416N** |
| | 1" ISO 7/1 | Switch with 3 fixed positions '1-0-2' |  |  | 16 A | 2 | 0.89 | **CSCC-216** |
| | 1" NPT | | | | | | | **CSCC-216N** |
| | 1" ISO 7/1 | Switch with 3 fixed positions '1-2' |  |  | 16 A | 2 | 0.89 | **CSCD-216** |
| | 1" NPT | | | | | | | **CSCD-216N** |
| | 1" ISO 7/1 | Inverter with 3 fixed positions '1-0-2' |  |  | 16 A | 2 | 0.89 | **CSCI-216** |
| | 1" NPT | | | | | | | **CSCI-216N** |

* Supplied with 1" Male to 3/4" Female reducer



## EXPLODED VIEW




The switches, circuit breakers and selectors which make up the EFSCO series are 25, 32, 40 and 63 A rotary type with a front control handle.

## MECHANICAL FEATURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Control lever:** | Coated aluminium alloy |
| **Certification label:** | Adhesive affixed to external surface |
| **Badge:** | Anodised aluminium, white lettering on black background |
| **Internal bushing and pin:** | Stainless steel |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected by a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

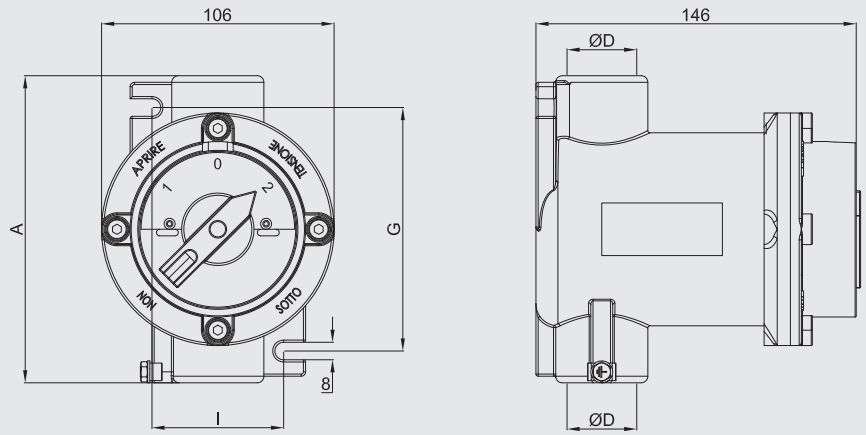
## ELECTRICAL FEATURES

| | |
|---|---|
| **Switches:** | 25 A to 63 A, 690 V |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

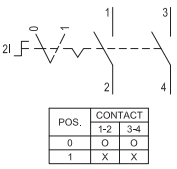
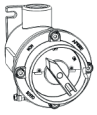
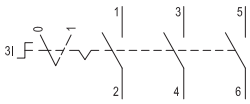
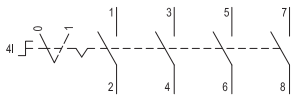
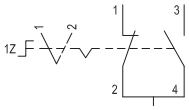
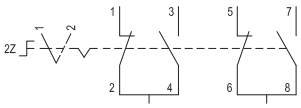
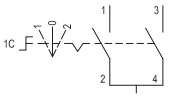
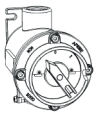
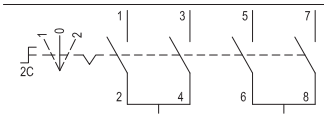
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Stainless steel version available with minimum production batches. Contact your sales representative for more details. (sample code stainless steel EFSCO-266**IN**)
Cablegland / fittings

## DIMENSIONAL DRAWING

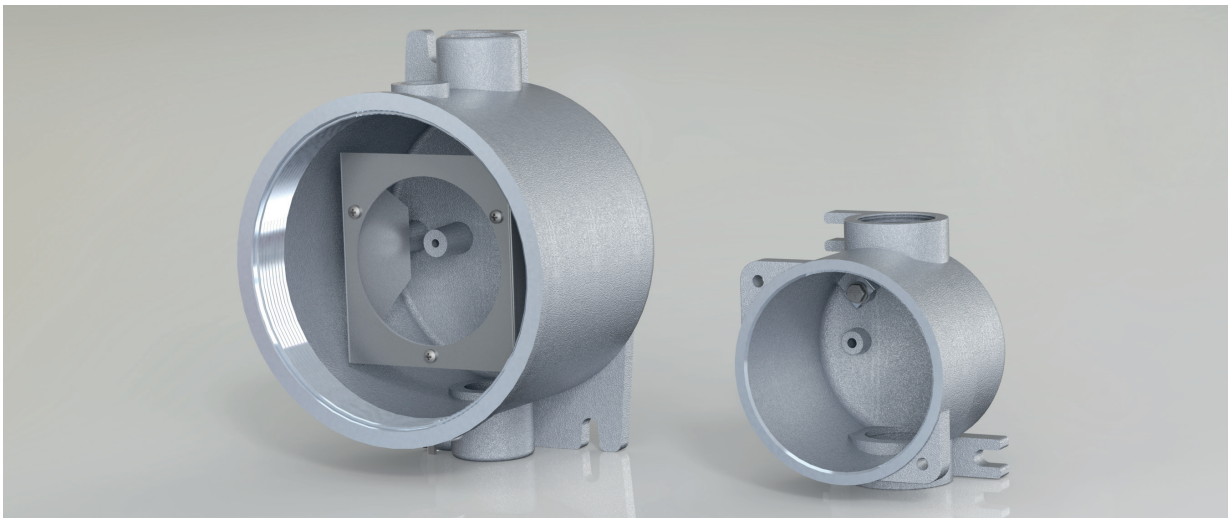



Dimensions in mm

## CODE SELECTION TABLE

| Illustration | Entry D ISO7/1 | A | G | I | Description | Arrangement | Capacity | Poles | Weight Kg | Code |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1" | 140 | 110 | 60 | Switch with 2 fixed positions '0-1' |  | 25 A | 2 | 1.14 | **EFSCO-22** |
| | 1" | 140 | 110 | 60 | | | 32 A | 2 | 1.20 | **EFSCO-32** |
| | 1" | 140 | 110 | 60 | | | 40 A | 2 | 1.35 | **EFSCO-42** |
| | 1 1/2" | 160 | 120 | 80 | | | 63 A | 2 | 1.35 | **EFSCO-62** |
|  | 1" | 140 | 110 | 60 | Switch with 2 fixed positions '0-1' |  | 25 A | 3 | 1.14 | **EFSCO-23** |
| | 1" | 140 | 110 | 60 | | | 32 A | 3 | 1.20 | **EFSCO-33** |
| | 1" | 140 | 110 | 60 | | | 40 A | 3 | 1.35 | **EFSCO-43** |
| | 1 1/2" | 160 | 120 | 80 | | | 63 A | 3 | 1.40 | **EFSCO-63** |
| | 1" | 140 | 110 | 60 | Switch with 2 fixed positions '0-1' |  | 25 A | 4 | 1.18 | **EFSCO-24** |
| | 1" | 140 | 110 | 60 | | | 32 A | 4 | 1.20 | **EFSCO-34** |
| | 1" | 140 | 110 | 60 | | | 40 A | 4 | 1.35 | **EFSCO-44** |
| | 1 1/2" | 160 | 120 | 80 | | | 63 A | 4 | 1.40 | **EFSCO-64** |
| | 1" | 140 | 110 | 60 | Circuit breaker with 2 fixed positions '1-2' |  | 25 A | 1 | 1.20 | **EFSCO-26** |
| | 1" | 140 | 110 | 60 | | | 32 A | 1 | 1.18 | **EFSCO-36** |
| | 1" | 140 | 110 | 60 | | | 40 A | 1 | 1.20 | **EFSCO-46** |
|  | 1" | 140 | 110 | 60 | | | 63 A | 1 | 1.40 | **EFSCO-66** |
| | 1" | 140 | 110 | 60 | |  | 25 A | 2 | 1.18 | **EFSCO-266** |
| | 1" | 140 | 110 | 60 | | | 32 A | 2 | 1.18 | **EFSCO-366** |
| | 1 1/2" | 160 | 120 | 80 | | | 40 A | 2 | 1.20 | **EFSCO-466** |
| | 1" | 140 | 110 | 60 | Switch with 3 fixed positions '1-0-2' |  | 25 A | 1 | 1.14 | **EFSCO-242** |
| | 1" | 140 | 110 | 60 | | | 32 A | 1 | 1.18 | **EFSCO-342** |
| | 1" | 140 | 110 | 60 | | | 40 A | 1 | 1.18 | **EFSCO-442** |
|  | 1" | 140 | 110 | 60 | | | 63 A | 1 | 1.40 | **EFSCO-642** |
| | 1" | 140 | 110 | 60 | |  | 25 A | 2 | 1.14 | **EFSCO-244** |
| | 1" | 140 | 110 | 60 | | | 32 A | 2 | 1.18 | **EFSCO-344** |
| | 1 1/2" | 160 | 120 | 80 | | | 40 A | 2 | 1.18 | **EFSCO-444** |

## CROSS-SECTION VIEW



## DESCRIPTION

EMHA-9 instrument housings are normally used to contain medium-sized analogue instruments such as ammeters and voltmeters.
CSC-H instrument housings are normally used to contain small-sized analogue instruments such as ammeters and voltmeters.

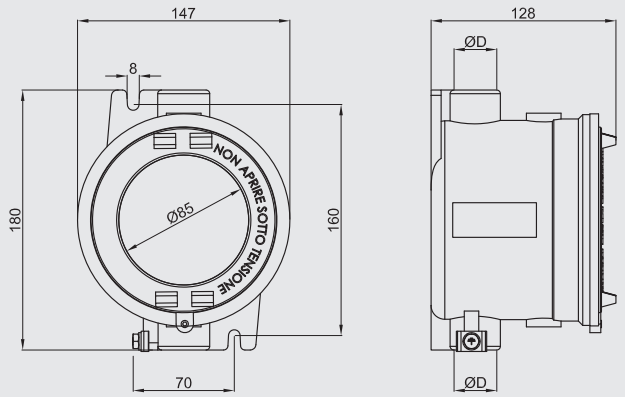
## MECHANICAL FEATURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Glass** | tempered and temperature resistant |
| **Internal frame:** | Aluminium |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected by a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 3/4" |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

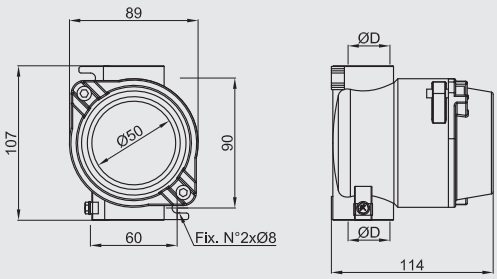
## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

Measuring instruments (Voltmeter - Ammeter)
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Stainless steel or cast iron version available with minimum production batches. Contact your sales representative for more details. (sample code stainless steel EMHA-9**IN,** cast iron sample code EMHA-9**GJ**)
Cablegland / fittings

## DIMENSIONAL DRAWING




Dimensions in mm



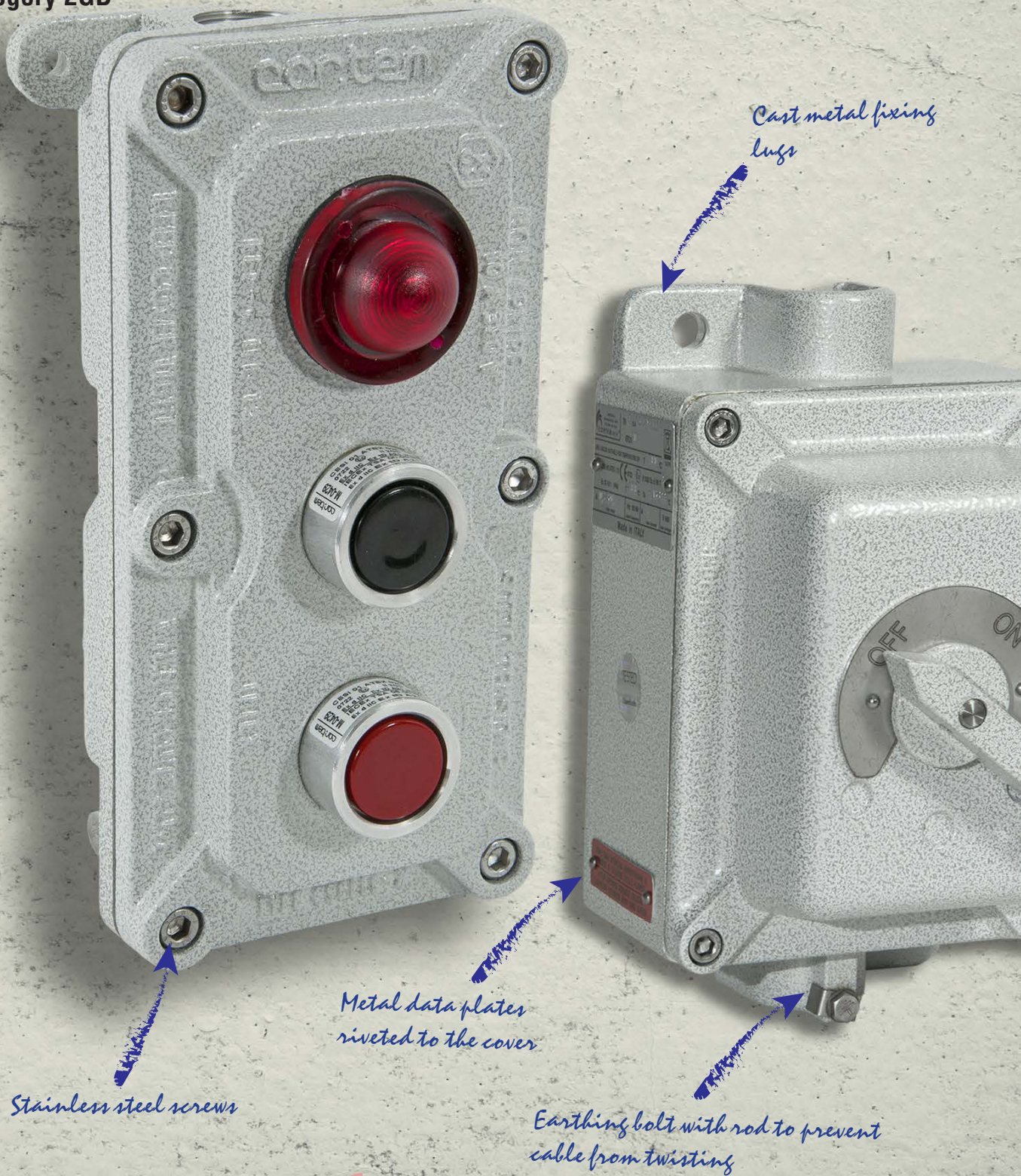

## CODE SELECTION TABLE

| Illustration | Entry ØD | Description | Weight Kg | Codes |
|---|---|---|---|---|
|  | 3/4" ISO7/1 | Instrument casing Ø85 mm | 1.88 | **EMHA-9** |
| | 3/4" NPT | | | **EMHA-9N** |
|  | 1" ISO 7/1 | Single body: instrument casing | 0.75 | **CSC-H** |
| | 1" NPT | | | **CSC-HN** |

# CSE, EFD

## Command and control stations

- Group IIB
- Zone 1, 2, 21, 22
- Aluminium alloy housings
- Category 2GD






CORTEM GROUP®

# CSE Series... Control and signalling station

The Ex d IIB stations and controllers are suitable for the control and signalling of devices installed both "on board" the machine and remotely (P.E on a field control column). They are easily installed using wall mount lugs and have threaded entries for connection by means of a cable gland or metal pipe.
Used specifically in offshore and onshore environments, the chemical, petrochemical and pharmaceutical industries, and all locations which require an explosion proof system.

Cortem Group labels its products with a non-removable adhesive label featuring a hologram and an alphanumerical univocal code, as a safety measure against the illegal sale of fakes so that all the products are guaranteed as original. Non-compliance with the International standards entails serious risks for the environment, especially for those working daily on the plants.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical plants


Onshore plants


Offshore plants


Petroleum loading/ unloading pontoons


Low temperatures


Mining operations

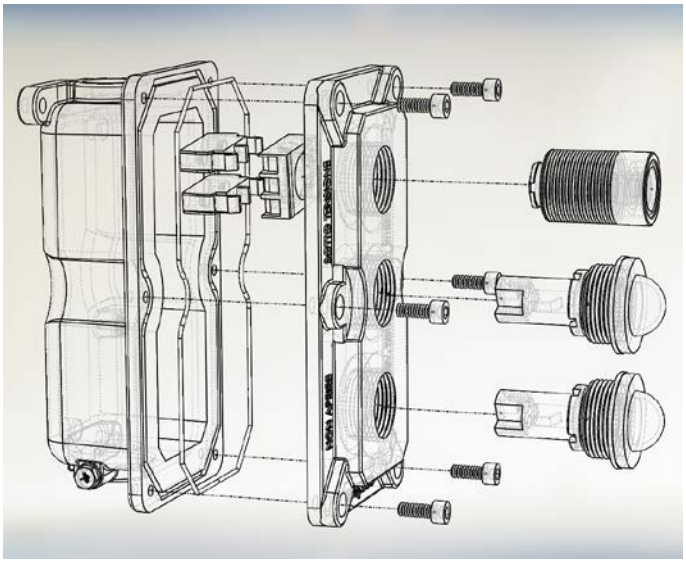
100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2 GD; Ex d IIB T6; Ex tD A21 T85°C | | | |
| | CE 0722 Ex II 2 GD; Ex d IIB T5; Ex tD A21 T100°C | | | |
| **Certificate:** | ATEX CESI 03 ATEX 172 | | | |
| | TR CU AVAILABLE | For all IEC Ex and TR CU certification data, download the certificate from www.cortemgroup.com | | |
| **Standards:** | CENELEC EN 60079-0: 2012, EN 60079-1:2007, EN 60079-31: 2009 and EUROPEAN DIRECTIVE 2014/34/EU<br>RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | T6 (Ta +40°C) | T5 (Ta +55°C) | | |
| **Temp. Temperature:** | -20 °C +55 °C | | | |
| | -20 °C +40 °C | | | |
| **Degree of protection:** | IP66 | | | |

# CSE Series... Control and signalling station

## EXPLODED VIEW



## MECHANICAL FEATURES OF ENCLOSURES

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal and external stainless steel |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 3/4" |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

## MECHANICAL FEATURES OF CONTROL AND SIGNALLING DEVICES

| | |
|---|---|
| **Pushbutton:** | Coloured nylon |
| **Illuminated pushbutton:** | Clear coloured polycarbonate |
| **Outer body:** | Aluminium |
| **Internal bushing and pin:** | Stainless steel |
| **Gaskets:** | Acid and hydrocarbon resistant NBR |
| **Station assembly:** | Screwed onto cover |
| **Contact assembly:** | snap action on a dedicated flange to ensure the quick connection of entire contacts block to the station |
| **External body lens:** | Impact and UV resistant polycarbonate lens, coloured or transparent |

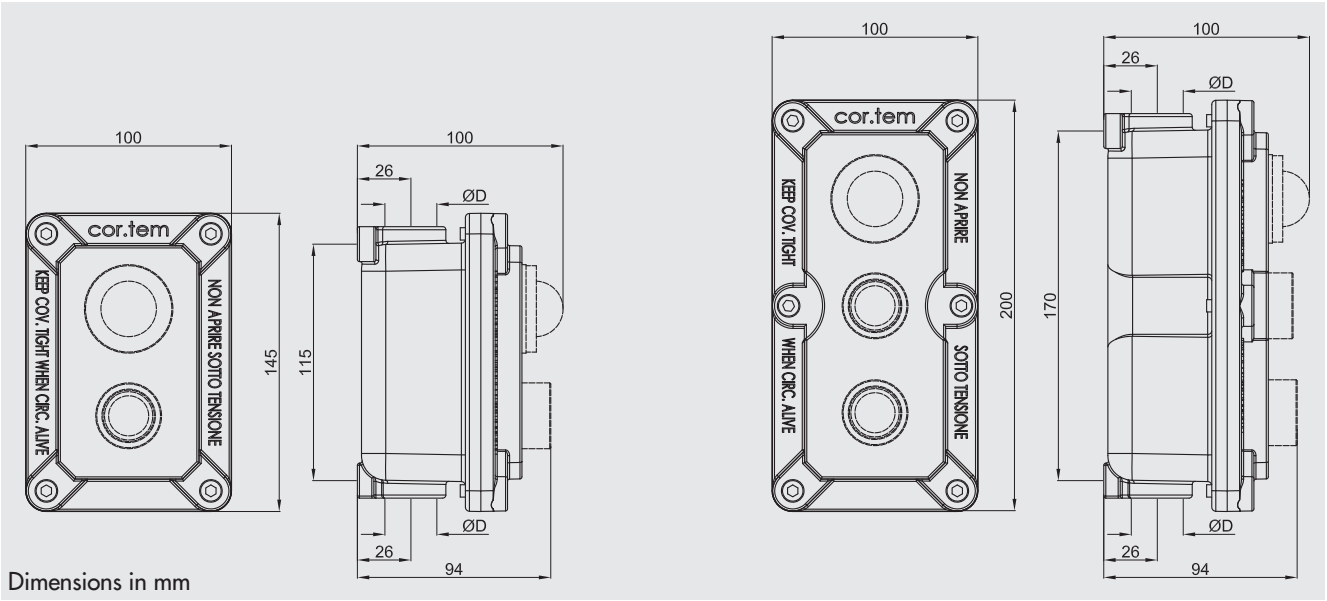
## ELECTRICAL FEATURES

| | |
|---|---|
| **Contacts for pushbuttons:** | Max. 25A 600 V |
| **Indicator lights:** | 24/250V, 3W |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

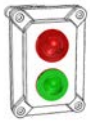
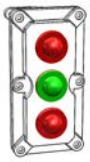
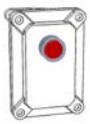
RAL 2004 (Pure orange) internal anti-condensation coating
External polyester coatings in various colours (specify RAL colour)
Cablegland / fittings

## DIMENSIONAL DRAWING

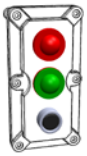
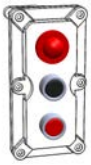
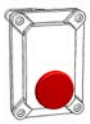



Dimensions in mm

## CODE SELECTION TABLE

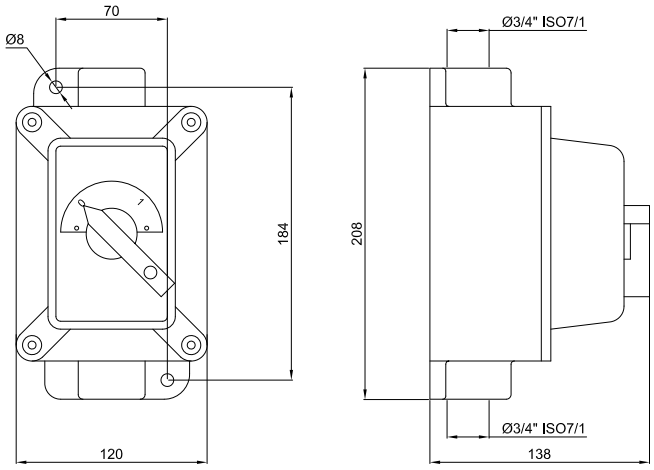
| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 3/4" ISO7/1<br>3/4" NPT | Unit with single indicator light | R | 1.01 | CSE-L<br>CSE-LN |
|  | 3/4" ISO7/1<br>3/4" NPT | Unit with double indicator light | R<br>V | 1.12 | CSE-LL<br>CSE-LLN |
|  | 3/4" ISO7/1<br>3/4" NPT | Unit with three indicator light | R<br>V<br>R | 1.53 | CSE-LLL<br>CSE-LLLN |
|  | 3/4" ISO7/1<br>3/4" NPT | Single pushbutton unit | R | 0.97 | CSE-P<br>CSE-PN |
|  | 3/4" ISO7/1<br>3/4" NPT | Unit with double pushbutton | N<br>R | 1.05 | CSE-PP<br>CSE-PPN |
|  | 3/4" ISO7/1<br>3/4" NPT | Three pushbutton unit | R<br>V<br>R | 1.42 | CSE-PPP<br>CSE-PPPN |

## SELECTION TABLE

| Illustration | Entry ØD | Description | Diagram | Weight Kg | Codes |
|---|---|---|---|---|---|
|  | 3/4" ISO7/1<br>3/4" NPT | Pushbutton unit and indicator light |   | 1.09 | CSE-PL<br>CSE-PLN |
|  | 3/4" ISO7/1<br>3/4" NPT | Pushbutton unit plus two indicator lights |   | 1.50 | CSE-PLL<br>CSE-PLLN |
|  | 3/4" ISO7/1<br>3/4" NPT | Unit with two pushbuttons plus indicator light |   | 1.60 | CSE-PPL<br>CSE-PPLN |
|  | 3/4" ISO7/1<br>3/4" NPT | Break glass emergency pushbutton |   | 1.50 | CSEPEA-2<br>CSEPEA-2N |
|  | 3/4" ISO7/1<br>3/4" NPT | Break glass emergency pushbutton with hammer |   | 1.55 | CSEPEA-2M<br>CSEPEA-2MN |
|  | 3/4" ISO7/1<br>3/4" NPT | Emergency mushroom head pushbutton |   | 1.00 | CSEPEP-2<br>CSEPEP-2N |

Note:
For non-standard arrangements, contact the Sales Office.


## DIMENSIONAL DRAWING




## DESCRIPTION

EFD3 series three pole, magnetothermic breakers are used for control (start - stop) and protection of three-phase motors.
Circuit breaker with adjustable magnetothermic protection and external control handle.

## MECHANICAL FEATURES

| | |
|---|---|
| **Body and lid:** | Rectangular casing constructed from low copper content aluminium alloy, complete with wall fastening lugs. |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Control levers:** | Coated aluminium alloy |
| **ON - OFF plate:** | Stainless steel |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and lid connected to each other with a 2.5 $mm^2$ wire |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Threaded entries:** | One upper and one lower Ø 3/4" |

**Resistenza alla corrosione:** The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test)

## CODE SELECTION TABLE

| Illustration | Rated current (A) | Temperature range (A) | Weight Kg | Codes |
|---|---|---|---|---|
|  | 0.25 | 0.16 0.25 | 2.25 | EFD3-02 |
| | 0.40 | 0.25 0.40 | 2.25 | EFD3-04 |
| | 0.60 | 0.40 0.60 | 2.52 | EFD3-06 |
| | 1.00 | 0.60 1.00 | 2.52 | EFD3-10 |
| | 1.60 | 1.00 1.60 | 2.52 | EFD3-16 |
| | 2.50 | 1.60 2.50 | 2.52 | EFD3-25 |
| | 4.00 | 2.50 4.00 | 2.52 | EFD3-40 |
| | 6.00 | 4.00 6.00 | 2.52 | EFD3-63 |
| | 10.00 | 6.00 10.00 | 2.52 | EFD3-100 |
| | 16.00 | 10.00 16.00 | 2.52 | EFD3-160 |
| | 20.00 | 16.00 20.00 | 2.52 | EFD3-200 |
| | 25.00 | 20.00 25.00 | 2.52 | EFD3-250 |

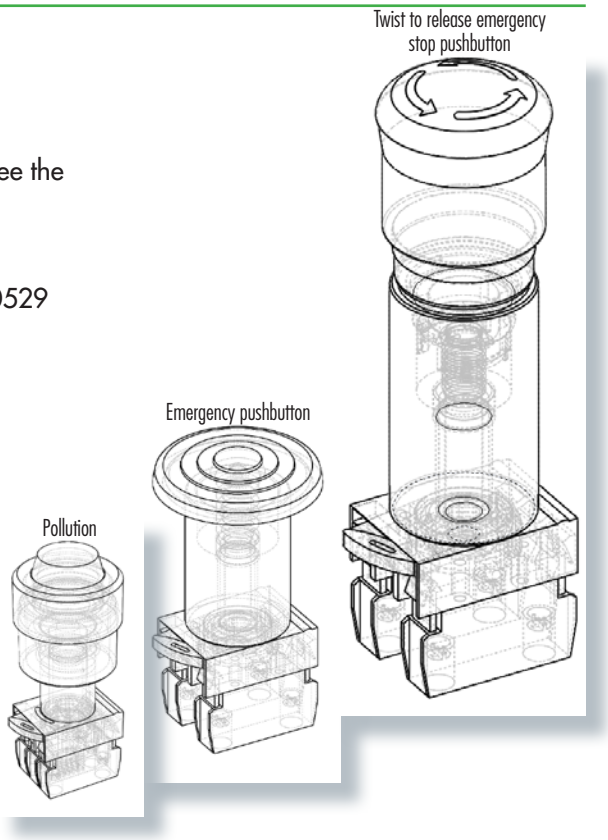
# Ex d control, monitoring and control devices

M-0 series control, monitoring and control devices are installed as accessories outside of 'Ex d' enclosures, panels and stations used in all industrial environments where there may be an explosive atmosphere classified as Zone 1, 2, 21, 22. The M-0 devices allow the electrical or mechanical equipment assembled inside the 'Ex d' enclosures to be opened or closed, and signalling of the operating status light. Device components are constructed from stainless steel to ensure maximum efficiency and durability in most environmental conditions.

# Contact block for pushbuttons

## ELECTRICAL FEATURES

**Rated voltage:** 600V
**Rated current:** 10A
**Lightning impulse withstand voltage:** 4 kV
**Ambient temperature:** For operating temperature range, see the control station folders
**Insulation class:** Group C conforming to VDE 0110
**Degree of protection of terminals:** IP2x conforming to CENELEC EN 60529
**Contact operation:**
– slow action
– self-cleaning (wiping action)
– NC contact forced opening
– double movable bridge
– four points of contact
– double break




**Contact resistance**
≤ 25 mΩ per IEC 255.7 category 3
**Short-circuit protection**
16A gG time-delay fuses (on request)
per IEC 269.1 and 269.3

**Electrical performance**
Rated thermal current Ith = 10 A

**Operational limits per IEC 947.5.1:**

| Category AC15 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EU voltage (V) | 24 | 48 | 60 | 110 | 220 | 380 | 500 | 600 |
| Current Ie (A) | 10 | 10 | 10 | 6 | 3 | 2 | 1.5 | 1.2 |
| **Category DC13** | | | | | | | | |
| EU voltage (V) | 24 | 48 | 60 | 110 | 220 | 300 | | |
| Current Ie (A) | 2.5 | 1.5 | 1 | 0.22 | 0.27 | 0.2 | | |

**Operational limits per IEC 947.5.1:**

| | |
|---|---|
| AC Heavy Duty | A600 |
| DC Standard Duty | Q300 |

## MECHANICAL FEATURES

**Outer body:** Aluminium
**Internal bushing:** Stainless steel
**Internal pin:** Stainless steel
**Gaskets:** Acid and hydrocarbon resistant NBR
**Pushbutton:** Coloured nylon
**Illuminated pushbutton:** Clear coloured polycarbonate
**Station assembly:** Screwed onto cover
**Contact assembly:** snap action on a dedicated flange to ensure the quick connection of entire contacts block to the station

## Contacts block for control handles

### ELECTRICAL FEATURES (Contacts block for control handles)

**Alternating current**

| Series | | | 10 | 16 | 20 | 32 | 40/63 |
|---|---|---|---|---|---|---|---|
| Rated voltage | $E_U$ VDE/IEC | V | 690 | 690 | 690 | 690 | 690 |
| Rated current | $I_{th}$ VDE/IEC | A | 20 | 25 | 32 | 45 | 63 |
| AC3 VDE/IEC, Direct squirrel cage induction motor start up and stop during operation | 220V-240V | kW | 2.2 | 4.5 | 5.5 | 7.5 | 15 |
| | 380V-440V | kW | 4.0 | 7.5 | 9.0 | 11.0 | 30 |
| | 660V-690V | kW | 4.0 | 7.5 | 11.0 | 15.0 | 30 |
| | 110 V | kW | 0.4 | 1.5 | 1.5 | 2.5 | 2.5 |
| | 220V-240V | kW | 0.75 | 2.5 | 4.5 | 4.0 | 6 |
| | 400 V | kW | 1.3 | 4.0 | 5.5 | 5.5 | 7.5 |

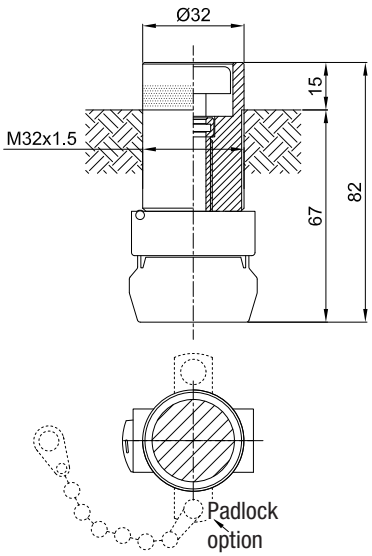
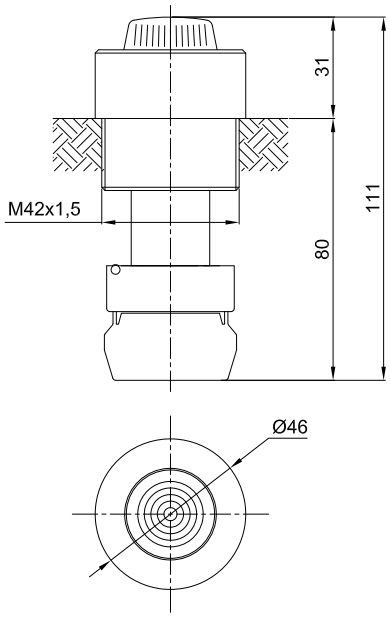
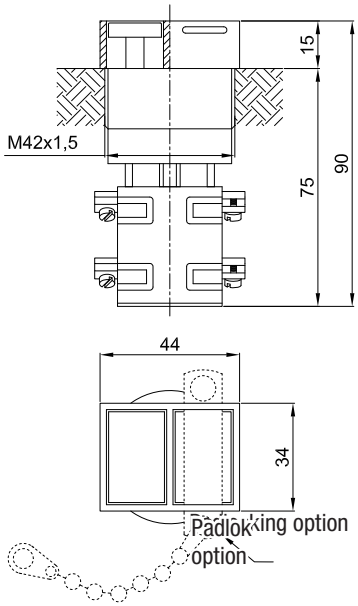
**Internal switch**

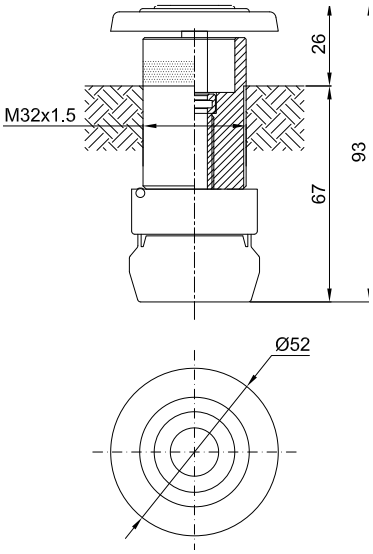
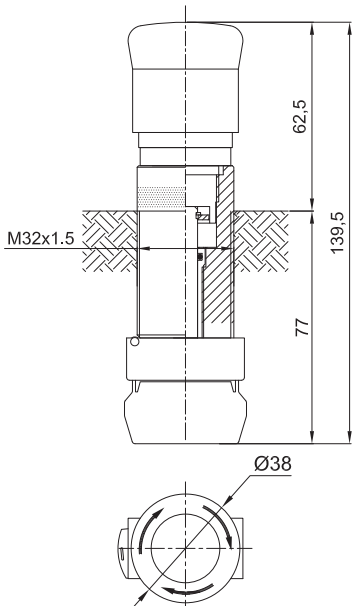
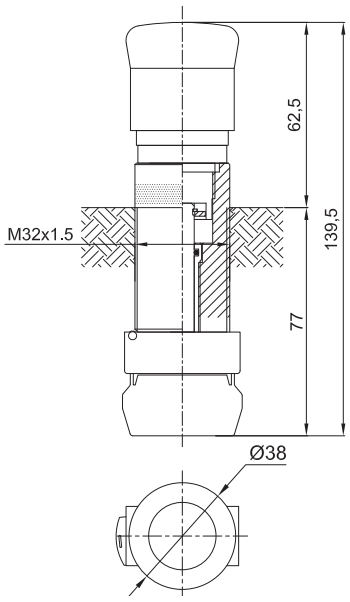
Rotating cam type, snap action cell made of explosion proof, thermoplastic material, steel shaft and tie rods, contacts covered with silver alloy and protected according to IP20 specification (rated insulation voltage = 690V), the terminal screws with matching cross head / screwdriver cannot be lost.

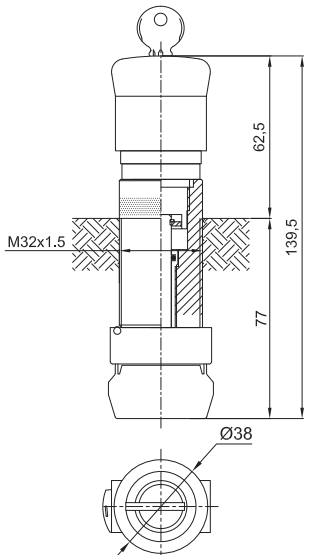
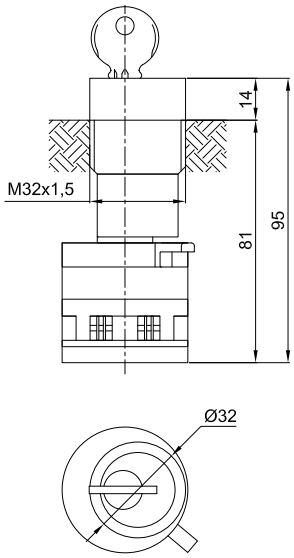
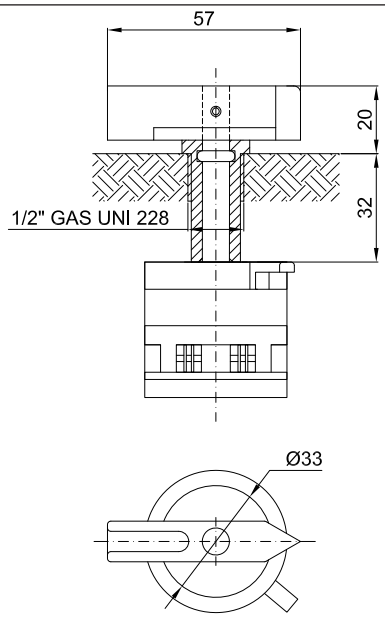
Conforms to the following standards: UL 508, CSA C22, IEC 947-1, IEC 947-3, DIN VDE0660 P.100/02.92, DIN VDE 0660 P.107/12.92, (CE-CSA-UL), European directive 2002/95/EG (ROHS), 2003/11/EG

### MECHANICAL FEATURES

**Internal bushing:** Stainless steel
**Internal pin:** Stainless steel
**Gaskets:** Acid and hydrocarbon resistant NBR
**Control handle levers:** Coated aluminium alloy
**Coating:** Polyester RAL 7035 (Light grey), where applicable

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |  | Normal pushbutton with standard 10A 600V 1NO+1NC contacts.<br>Button available in six different colours. | |
| | | BLUE **(B)** | **M-0429../B..** |
| | | WHITE **(BI)** | **M-0429../BI..** |
| | | YELLOW **(G)** | **M-0429../G..** |
| | | BLACK **(N)** | **M-0429../N..** |
| | | RED **(R)** | **M-0429../R..** |
| | | GREEN **(V)** | **M-0429../V..** |
| | | Insert **IN** for a stainless steel body<br>**L** suffix for padlock option | |
|  |  | Illuminated pushbutton with standard 10A 600V 1NO+1NC contacts.<br>(lamp on request)<br>Illuminated button available in five different colours. | |
| | | BLUE **(B)** | **M-0428../B** |
| | | WHITE **(I)** | **M-0428../I** |
| | | YELLOW **(G)** | **M-0428../G** |
| | | RED **(R)** | **M-0428../R** |
| | | GREEN **(V)** | **M-0428../V** |
| | | Insert **IN** for a stainless steel body | |
|  |  | Double pushbutton with standard 10A 600V contacts.<br>One red 1NO+1NC button and one black 1NO+1NC button. | |
| | | | **M-0427..** |
| | | Add suffix **L** for padlock option | |

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |  | Emergency mushroom head pushbutton with standard 10A 600V 1NO+1NC contacts. Comprises a red mushroom head push-button.<br>Add **IN** for a stainless steel body | **M-0430..** |
|  |  | Twist-to-release emergency stop push-button with standard 10A 600V 1NO+1NC contacts. Comprises a red button with twist mechanism for push-button release (turn to release when button is pressed)<br>Add **IN** for a stainless steel body | **M-0445..** |
|  |  | Pull-to-release emergency stop push-button with standard 10A 600V 1NO+1NC contacts. Comprises a red button with mechanism for push-button release (pull to release when button is pressed)<br>Add **IN** for a stainless steel body | **M-0447..** |

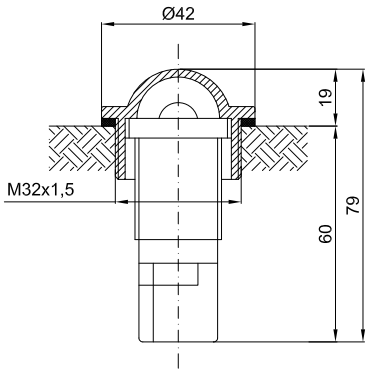
| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |  | Key-to-release emergency stop push-button with standard 10A 600V contacts.<br>Comprises a red button with key mechanism for push-button release (use key to release when button is pressed) | **M-0446..** |
| | | Add **IN** for a stainless steel body | |
|  |  | Key-to-release push-button with OFF setting and standard 10A 600V contacts (use key to release when button is pressed) | **M-093/CF** |
|  |  | Quick-connect handle for cam or rotary switch.<br>Fixed pin length.<br><br>Add **IN** for a stainless steel body | **M-0553..L** |

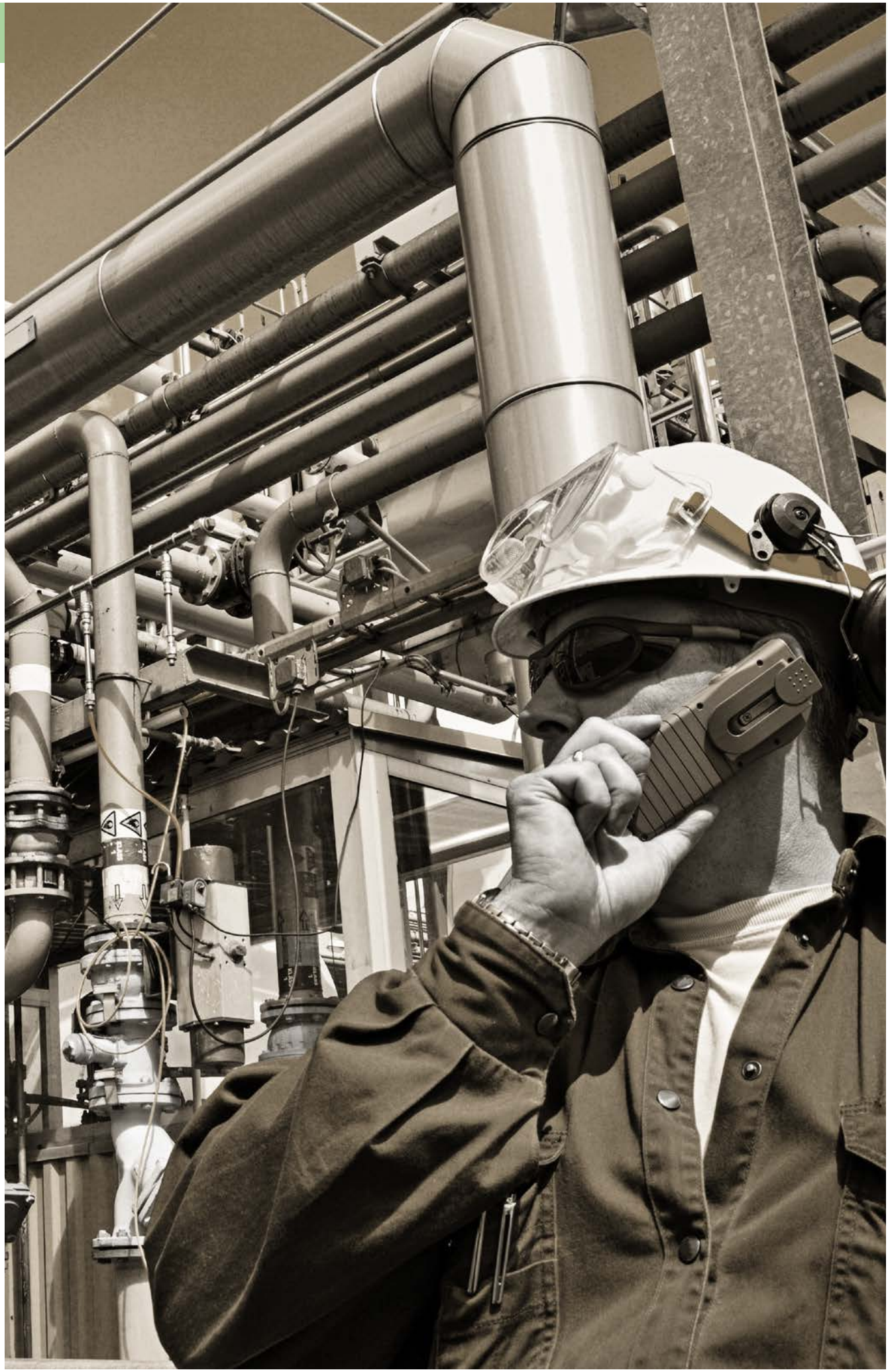
## MECHANICAL FEATURES OF CONTROL AND SIGNALLING DEVICES

**External body:** Impact and UV resistant, clear coloured polycarbonate
**Bushing (for M-0487):** Aluminium
**Gaskets:** Acid and hydrocarbon resistant NBR
**Device assembly:** Screwed onto cover

## ELECTRICAL FEATURES

**Rated voltage:** 12/240 VAC/DC
**Power:** max. 3W (signalling light)
**Frequency:** 50/60 Hz

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | | CODE |
|---|---|---|---|---|
|  |   | Indicator lights with lamps (on request*) from 3W, 12/240 VAC/DC<br>Illuminated lens available in five different colours. | | |
| | | Blue | | **M-0457/B** |
| | | Yellow | | **M-0457/G** |
| | | Red | | **M-0457/R** |
| | | Green | | **M-0457/V** |
| | | Colourless | | **M-0457/I** |
| | | * lamp | 12V: | **LAMPBA9S12V** |
| | | 24 V | | **LAMPBA9S24V** |
| | | 110 V | | **LAMPBA9S110V** |
| | | 240 V | | **LAMPBA9S240V** |



# CMD

## Command and control stations ‘Ex e’

- Group IIC
- Zone 1, 2, 21, 22
- Three casing sizes in reinforced polyester
- Standard or custom models
- Speed of delivery
- Designed to customer specifications
- Category 2GD

# Control and signalling station CMD

The CMD command and monitoring units, in fiberglass reinforced polyester, can be equipped with a complete series of switches and control, monitoring, and signalling devices. The innovative design has been studied to minimize the overall dimensions, while guaranteeing resistance, reliability, and simplicity of installation. They can be mounted both onboard machine and remotely for powering circuits such as light or motive power in any type of industrial application. The large number of components that can be installed allows a wide range of customizations to achieve the optimal solution for the operation of the system located in a hazardous area.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical facilities


Onshore facilities


Offshore facilities


Petroleum loading/unloading pontoons


Low temperatures


Fuel storage facilities


Agribusiness facilities

## CERTIFICATE DATA

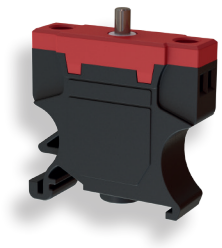
| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2 GD; Ex db eb IIC T6, T5, T4 Gb; Ex tb IIIC T85°C, T100°C, T135°C Db | | | |
| **Certificate:** | ATEX CML 21 ATEX 3848X | | | |
| | IECEx IECEx CML 21.0104X | For all IECEx certification data, download the certificate from www.cortemgroup.com | | |
| **Standards:** | CENELEC EN 60079-0: 2018, EN 60079-1: 2014, EN 60079-7: 2015, EN 60079-11: 2012, EN 60079-18: 2015, EN 60079-31: 2014 and European Directive 2014/34/EU. IEC 60079-0: 2018, IEC 60079-0: 2017, IEC 60079-7: 2015, IEC 60079-11: 2011, IEC 60079-18: 2014, IEC 60079-31: 2013 RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | 85°C (T6) | 100°C (T5) | 135°C (T4) | |
| **Temp. Temperature:** | -40°C +40°C | -40°C +55°C | -40°C +60°C | |
| **Degree of protection:** | IP66 | | | |

# Control and signalling station CMD

## MECHANICAL FEATURES

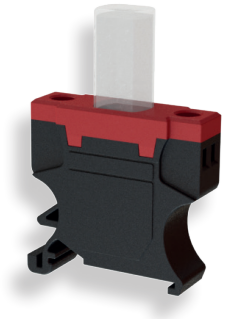
| | |
|---|---|
| **Body and lid:** | Black antistatic fibreglass reinforced polyester complete with fixing lugs |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the lid |
| **Certificate label:** | Adhesive |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body |
| **Cable gland:** | Polyamide series NAVP |

## CONTACTS ELECTRICAL FEATURES



**Code HL0101 (Contact)**

Rated voltage/current: 220-250 Vac/10A, 380Vac/10A, 415Vac/10A
24Vdc/0.4A, 60Vdc/0.9A, 110Vdc/1.6A, 220Vdc/0.25A
Connection: Max. 2.5 $mm^2$
Lightning impulse withstand voltage: 2 kV
Pollution degree: 3
Conditional short circuit current: 1 kA
Minimum force to achieve positive opening operation: 2 mm
Minimum force required to achieve positive
opening of all opening contacts: 5 N
Maximum travel (+ overtravel): 5 mm (2 mm)



**Code HL0102 (Indicator light)**

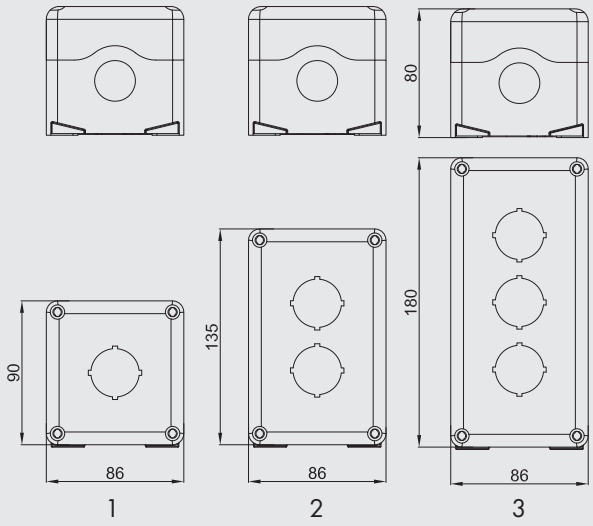
Rated voltage: 12-36 Vac/dc, 48-127 Vac/dc, 220-415 Vac, 220-250 Vdc
Power input: 36V/0.6W, 127V/1.3W, 415V/3.8W, 250V/1.8W
Connection: Max. 2.5 $mm^2$
Frequency: 50/60 Hz
Power consumption: Max. 1 W
Lifespan: $10^5$ hours
Lightning impulse withstand voltage: 2 kV
Pollution degree: 3
Conditional short circuit current: 1 kA

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

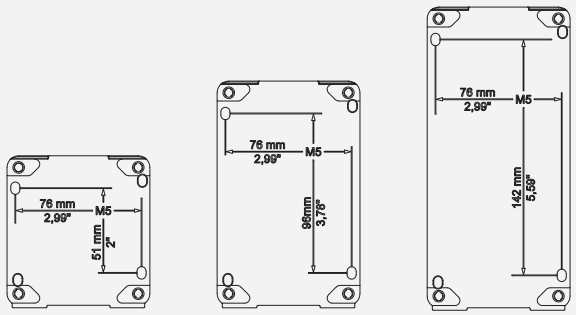
Brass continuity plate for earthing
Breather or drainage valve
Metal cable glands

## DIMENSIONAL DRAWING

Dimensions in mm

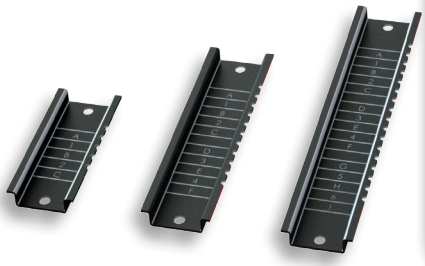


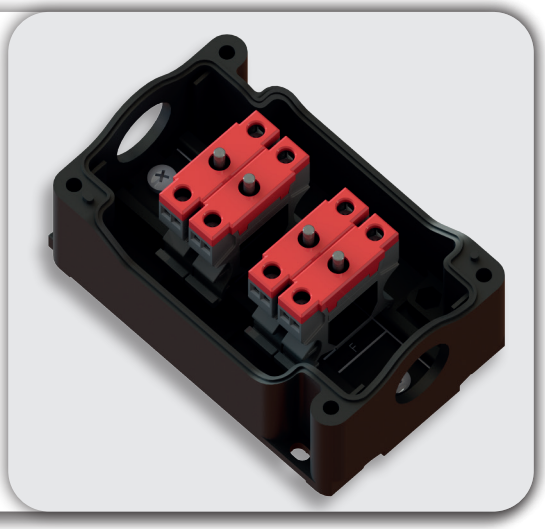

Fastening measurements

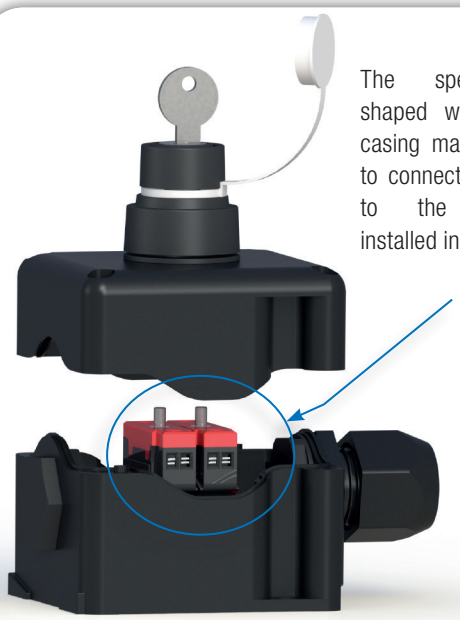



## PLUS

The DIN rails are always installed internally to enable the contacts to be mounted. The rails are complete with dividers and alphanumeric identifiers to enable easy allocation of contacts and simplify subsequent wiring.

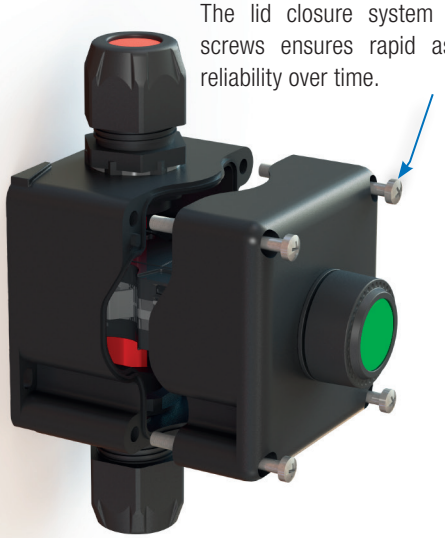






The special "U" shaped walls of the casing make it easier to connect the cables to the terminals installed inside.

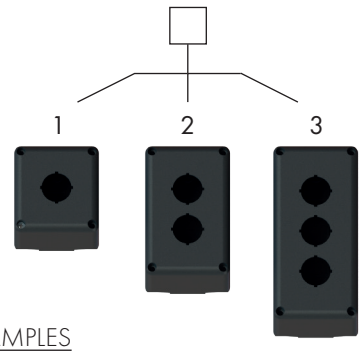
The lid closure system with captive screws ensures rapid assembly and reliability over time.



## CONTROL STATION ORDER CODES

Art. CMD-

Control station model




Body holes

| Position | Through holes Ø 20.5 | Through holes Ø 25.5 |
|---|---|---|
| | T | Y |
| | B | N |

Operator codes

OPERATOR + CONTACTS

Max. 3 operators

Note.
The control stations are supplied complete with NAVP series polyamide cable glands.

CODING EXAMPLES

CMD-1TV2

"Type 1" control station with one Ø 20.5 hole on the bottom and one green pushbutton with 1NC contact.

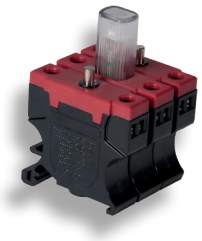
CMD-3NR9V91R

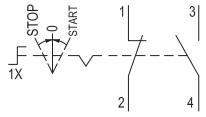
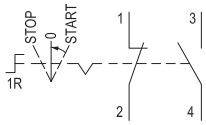
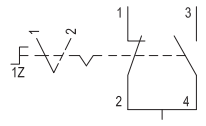
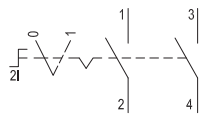
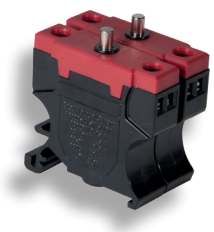
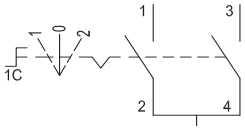
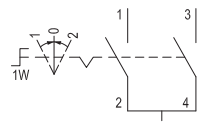
"Type 3" control station with one Ø 25.5 hole on the bottom and one on the top, a red LED indicator light, a 12-36Vac/dc green indicator light and a "start-stop" control, with spring return from START to 0, and fixed STOP position.

| OPERATOR - PUSH-BUTTON - | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR CODES |
|---|---|---|
|  | Black push-button without contacts | N |
| | Red push-button without contacts | R |
| | Green push-button without contacts | V |
| | Yellow push-button without contacts | G |
| | White push- button without contacts | I |
| | Contact assembly 1NO | 1 |
| | Contact assembly 1NC | 2 |
| | Contact assembly 1NO+1NC | 3 |
| | Contact assembly 2NO | 4 |
| | Contact assembly 2NC | 5 |

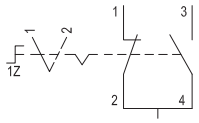
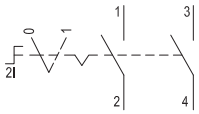
| OPERATOR - INDICATOR LIGHT - | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR CODES |
|---|---|---|
|  | Component for green indicator light | V |
| | Component for red indicator light | R |
| | Component for yellow indicator light | G |
| | Component for blue indicator light | B |
| | Component for colourless indicator light | I |
| | 12-36 Vac/dc LED indicator light | 9 |
| | 48-127 Vac/dc LED indicator light | 8 |
| | 220-415 Vac LED indicator light | 7 |
| | 220-250 Vdc LED indicator light | 6 |

## CONTROL STATION ORDER CODES

| OPERATOR<br>- ILLUMINATED PUSH-BUTTON - | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR CODES |
|---|---|---|
|  | Blue push-button without contacts | BL |
| | Red push-button without contacts | RL |
| | Green push-button without contacts | VL |
| | Yellow push-button without contacts | GL |
| | Transparente push- button without contacts | IL |
|  | Contact assembly 1NO | 1 |
| | Contact assembly 1NC | 2 |
| | Contact assembly 1NO+1NC | 3 |
| | Contact assembly 2NO | 4 |
| | Contact assembly 2NC | 5 |

| OPERATOR<br>- SELECTOR - | SINGLE POLE ARRANGEMENT | CONTACTS | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR + CONTACT CODES |
|---|---|---|---|---|
|  |  | POS. / CONTACT 1-2 3-4<br>STOP O O<br>0 X O<br>START X X | Motors "start-stop" control, with spring return to 0 from both STOP and START | 1X |
| |  | POS. / CONTACT 1-2 3-4<br>STOP O O<br>0 X O<br>START X X | Motors "start-stop" control with spring return from START to 0, and in fixed STOP position | 1R |
|  |  | POS. / CONTACT 1-2 3-4<br>0 X O<br>1 O X | Switch with two fixed-positions, suitable for "automatic-manual" service | 1Z |
| |  | POS. / CONTACT 1-2 3-4<br>0 O O<br>1 X X | Switch | 2I |
|  |  | POS. / CONTACT 1-2 3-4<br>1 X O<br>0 O O<br>2 O X | Three fixed position switch. | 1C |
| |  | POS. / CONTACT 1-2 3-4<br>1 X O<br>0 O O<br>2 O X | Three position switch with spring return to 0 from positions 1 and 2 | 1W |

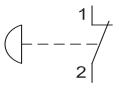
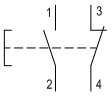
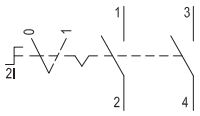
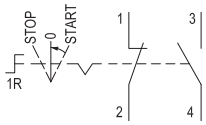
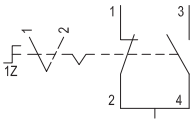
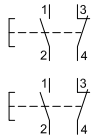
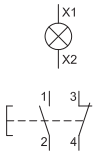
## CONTROL STATION ORDER CODES

| OPERATOR - KEY SELECTOR - | SINGLE POLE ARRANGEMENT | CONTACTS | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR CODES |
|---|---|---|---|---|
|  |  | POS. / CONTACT 1-2 3-4<br>0: X O<br>1: O X | Switch with two fixed-positions, suitable for "automatic-manual" service | D3 |
| |  | POS. / CONTACT 1-2 3-4<br>0: O O<br>1: X X | Switch | D4 |

| OPERATOR - EMERGENCY PUSH-BUTTON - | DESCRIPTION OF OPERATOR AND RELATIVE CONTACTS | OPERATOR CODES |
|---|---|---|
|  | Twist to release emergency stop push-button | F |
| | Key release emergency stop push-button | K |
| | Contact assembly 1NO | 1 |
| | Contact assembly 1NC | 2 |
| | Contact assembly 1NO+1NC | 3 |
| | Contact assembly 2NO | 4 |
| | Contact assembly 2NC | 5 |

| OPERATOR - AMMETER - | SCALE | MEASUREMENT RANGE | POWER CONSUMPTION | MAX. OVERLOAD CURRENT | OPERATOR CODES |
|---|---|---|---|---|---|
|  <br>Rated frequency: 45 ÷ 60 Hz<br>Accuracy class: 1.5<br>Casing material: Polycarbonate | 2 | 0~1A<br>0~5A, 10A | 0.33W<br>0.6W | 2A<br>20A | A-48DA(...-...) |
| | X/1A | 1A, 2.5A, 5A, 10A, 20A, 25A, 30A, 40A, 50A, 60A, 75A, 100A, 150A, 200A, 300A, 500A, 600A, 700A, 800A, 1000A | 0.5W | 25A | A-48WA(...-...) |
| | X/5A | | | | |

## TABLE OF STANDARD STOCK CONTROL STATIONS

| Illustration | Description | Diagram | Codes |
|---|---|---|---|
|  | Emergency mushroom head pushbutton with 1NO+1NC block (when pressed, rotate to release) Complete with NAVP20IXE cable gland (cable range 7-12 mm) |  | **CMD-1TF3** |
|  | One black 1NO+1NC pushbutton Complete with NAVP20IXE cable gland (cable range 7-12 mm) |  | **CMD-1TN3** |
|  | One red 220-415 VAC/DC indicator light |  | **CMD-1TR7** |
| | One colourless 220-415 VAC/DC indicator light | | **CMD-1TI7** |
| | One green 220-415 VAC/DC indicator light | | **CMD-1TV7** |
| | One blue 220-415 VAC/DC indicator light | Complete with NAVP20IXE cable gland (cable range 7-12 mm) | **CMD-1TB7** |
| | One yellow 220-415 VAC/DC indicator light | | **CMD-1TG7** |
|  | Double pole switch Complete with two NAVP25IXE cable glands (cable range 14-18 mm) |  | **CMD-1N2I** |
|  | Run/stop selector Complete with NAVP20IXE cable gland (cable range 7-12 mm) |  | **CMD-1T1R** |
| | Single pole switch Complete with NAVP20IXE cable gland (cable range 7-12 mm) |  | **CMD-1T1Z** |
|  | One green 1NO+1NC pushbutton and one red 1NO+1NC pushbutton Complete with NAVP25IXE cable gland (cable range 14-18 mm) |  | **CMD-2YV3R3** |
|  | Colourless 220-415 Vac/dc LED indicator light, one green 1NO+1NC pushbutton and one red 1NO+1NC pushbutton Complete with NAVP25IXE cable gland (cable range 14-18 mm) |  | **CMD-3YV7V3R3** |

# I, A

## Command and control stations ‘Ex e’

- Group IIC
- Zone 1, 2, 21, 22
- Aluminium, reinforced polyester or stainless steel enclosures
- Standard or custom products
- Speed of delivery, designed to customer specifications
- Category 2GD

# Control stations I and A



The control and monitoring units of series P, I and A... are manufactured from fibreglass reinforced polyester, stainless steel or aluminium, and are suitable for housing electrical command and signal devices. **The units are preconfigured according to the following diagrams and can be ordered using their respective product code.** They can be installed both on board the machine or remotely, and are used in the chemical, petrochemical and pharmaceutical industries. In addition to the following listed standards, Cortem Group offers a wide range of accessories and versions manufactured to customer specification.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. The failure to observe international standards involves serious hazards to the environment and, above all, personnel who work with the systems on a daily basis.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical plants


Onshore plants


Offshore plants


Petroleum loading/ unloading pontoons


Low temperatures


Mining operations

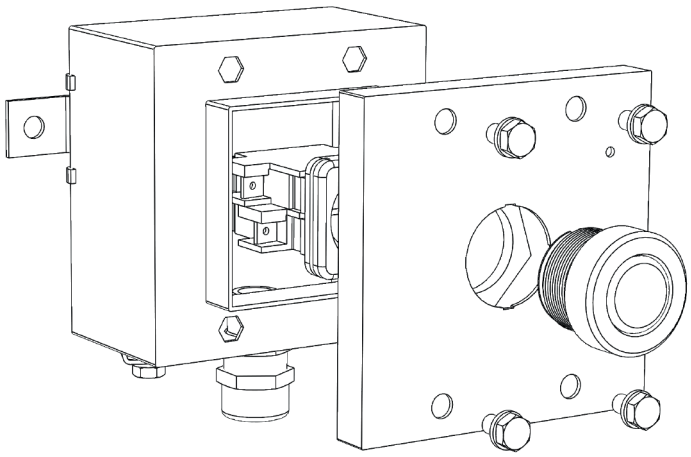
100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2 GD; Ex de IIC T6, T5 Gb; Ex tb IIIC T85°C Db | | | |
| **Certificate:** | ATEX CESI 03 ATEX 115 | | | |
| | IECEx IECEx CES 11.0032 | For all IEC Ex and TR CU certification data, download the certificate from www.cortemgroup.com | | |
| | TR CU AVAILABLE | | | |
| **Standards:** | CENELEC EN 60079-0: 2012, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-31: 2009 and EUROPEAN DIRECTIVE 2014/34/UE RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | T6 (Ta +40°C) | T5 (Ta +55°C) | | |
| **Ambient Temp.:** | -40°C +55°C | | | |
| | -40°C +40°C | | | |
| **Degree of protection:** | IP66 | | | |

# Control station type I (stainless steel)

## EXPLODED VIEW



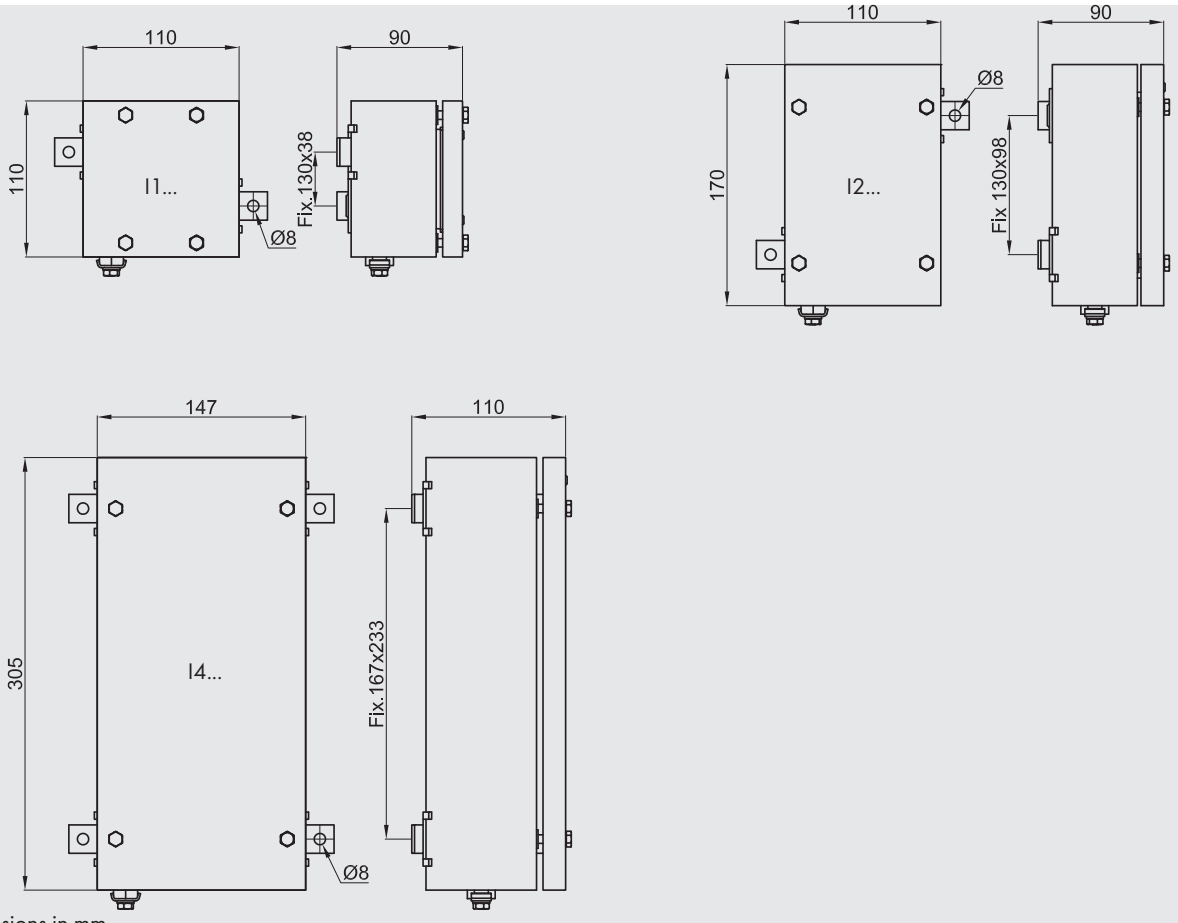
## MECHANICAL FEATURES

| | |
|---|---|
| **Body and cover:** | Stainless steel complete with feet for fastening |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Screws:** | Stainless steel |
| **Certificate plate:** | Riveted stainless steel |
| **Earth screw:** | Internal M5 on body and cover connected to each other with a 2.5 mm wire$^2$ |
| **Cable gland:** | Nickel-plated brass |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

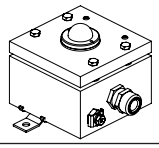
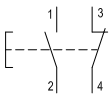
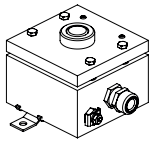
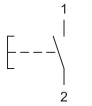
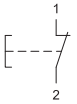
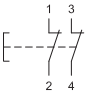
Safety measures and padlocks for stations
Safety measures against accidental contacts (padlockable)
Earthing rings for control units
Nameplates in various materials
Breather or drainage valve
Other contact types (see Ex e Control, monitoring and signalling stations folder)
Various possible configurations

## DIMENSIONAL DIAGRAM



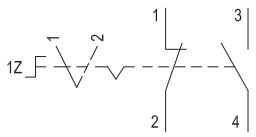
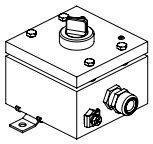
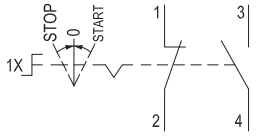
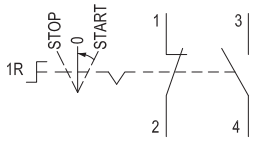
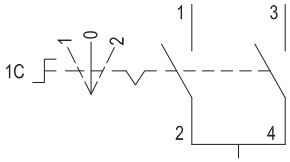
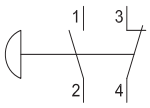
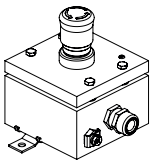
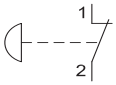
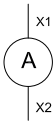
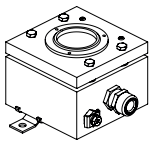
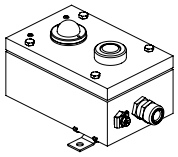
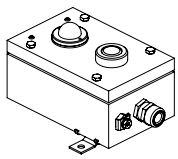

Dimensions in mm

## CODE SELECTION TABLE

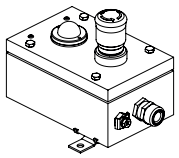
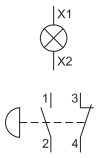
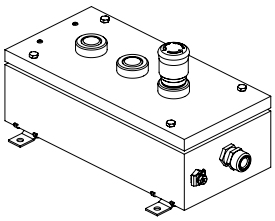
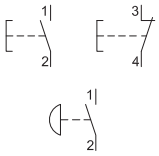
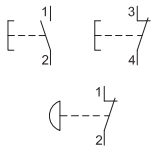
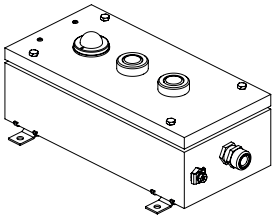
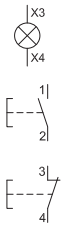
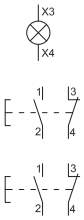
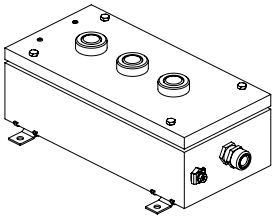
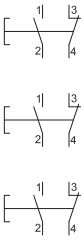
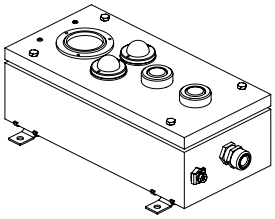
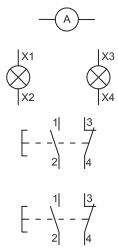
| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Indicator light**  | One red 24 VAC/DC indicator light |  | I1T01R9 |
| | One green 24 VAC/DC indicator light | | I1T01V9 |
| | One blue 24 VAC/DC indicator light | | I1T01B9 |
| | One yellow 24 VAC/DC indicator light | | I1T01G9 |
| | One colourless 24 VAC/DC indicator light | | I1T01I9 |
| **Button** | One red 1NO+1NC pushbutton |  | I1T01R3 |
| | One black 1NO+1NC pushbutton | | I1T01N3 |
| | One green 1NO+1NC pushbutton | | I1T01V3 |
|  | One red 1NO pushbutton |  | I1T01R1 |
| | One black 1NO pushbutton | | I1T01N1 |
| | One green 1NO pushbutton | | I1T01V1 |
| | One red 1NC pushbutton |  | I1T01R2 |
| | One black 1NC pushbutton | | I1T01N2 |
| | One green 1NC pushbutton | | I1T01V2 |
| | One red 2NO pushbutton |  | I1T01R4 |
| | One black 2NO pushbutton | | I1T01N4 |
| | One green 2NO pushbutton | | I1T01V4 |
| | One red 2NC pushbutton |  | I1T01R5 |
| | One black 2NC pushbutton | | I1T01N5 |
| | One green 2NC pushbutton | | I1T01V5 |

# Control station type I (stainless steel)

## CODE SELECTION TABLE

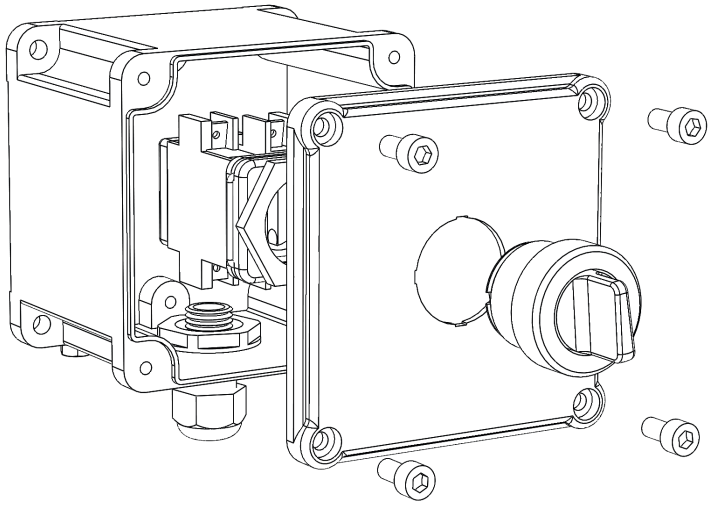
| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Selector** | Switch with two fixed-positions, suitable for "automatic-manual" 1NO+1NC service |  | **I1T011Z** |
|  | Motors "start-stop" control, with spring return to 0 from both STOP and START. |  | **I1T011X** |
| | Motors "start-stop" control with spring return from START to 0, and in fixed STOP position can be padlocked. |  | **I1T011R** |
| | Three fixed position switch can be padlocked in the centre position. Versions: single pole - double pole - triple pole. |  | **I1T011C** |
| **Button** | Emergency mushroom head pushbutton with 1NO+1NC block (when pressed, rotate to release) |  | **I1T01F3** |
|  | Emergency mushroom head pushbutton with 1NC block (when pressed, rotate to release) |  | **I1T01F2** |
| **Ammeter/voltmeter** | Ammeter (scale on request) |  | **I1T02A** |
|  | Voltmeter (scale on request) | | **I1T02V** |
| **Indicator light and pushbutton** | 24 VAC/DC red indicator light and one red 1NO+1NC pushbutton |  | **I2T07R9R3** |
| | 24 VAC/DC green indicator light and one green 1NO+1NC pushbutton |  | **I2T07V9V3** |
|  | 24 VAC/DC red indicator light and one red 1NC pushbutton |  | **I2T07R9R2** |
| | 24 VAC/DC green indicator light and one green 1NC pushbutton |  | **I2T07V9V2** |
| **Indicator light and pushbutton** | 24 VAC/DC red indicator light and one red 1NO pushbutton |  | **I2T07R9R1** |
|  | 24 VAC/DC green indicator light and one green 1NO pushbutton |  | **I2T07V9V1** |

## CODE SELECTION TABLE

| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Indicator light and emergency pushbutton**  | 24 VAC/DC red indicator light and emergency 1NO+1NC mushroom pushbutton |  | **I2T07R9F3** |
| | 24 VAC/DC green indicator light and 1NO+1NC emergency mushroom pushbutton | | **I2T07V9F3** |
| **Two pushbuttons and emergency pushbutton**  | One green 1NO and one red 1NC pushbutton, one mushroom head 1NO pushbutton |  | **I4T20V1R2F1** |
| | One green 1NO and one red 1NC pushbutton, one mushroom head 1NC pushbutton |  | **I4T20V1R2F2** |
| **Indicator light and two pushbuttons**  | 24 VAC/DC red LED indicator light,one green 1NO pushbutton and red 1NC pushbutton |  | **I4T20R9V1R2** |
| | 24 VAC/DC green LED indicator light,one green 1NO pushbutton and red 1NC pushbutton | | **I4T20V9V1R2** |
| | 24 VAC/DC red LED indicator light, one green 1NO+1NC pushbutton and red 1NO+1NC pushbutton |  | **I4T20R9V3R3** |
| | 24 VAC/DC green LED indicator light, one green 1NO+1NC pushbutton and red 1NO+1NC pushbutton | | **I4T20V9V3R3** |
| **Three buttons**  | One black 1NO+1NC pushbutton one red 1NO+1NC pushbutton green 1NO+1NC pushbutton |  | **I4T20N3R3V3** |
| **Ammeter, two indicator lights and two buttons**  | Ammeter, one red and one green 24 VAC/DC indicator light, red 1NO+1NC pushbutton, green 1NO+1NC pushbutton |  | **I4T32AR9V9R3V3** |

# Control station type A (aluminium)

## EXPLODED VIEW



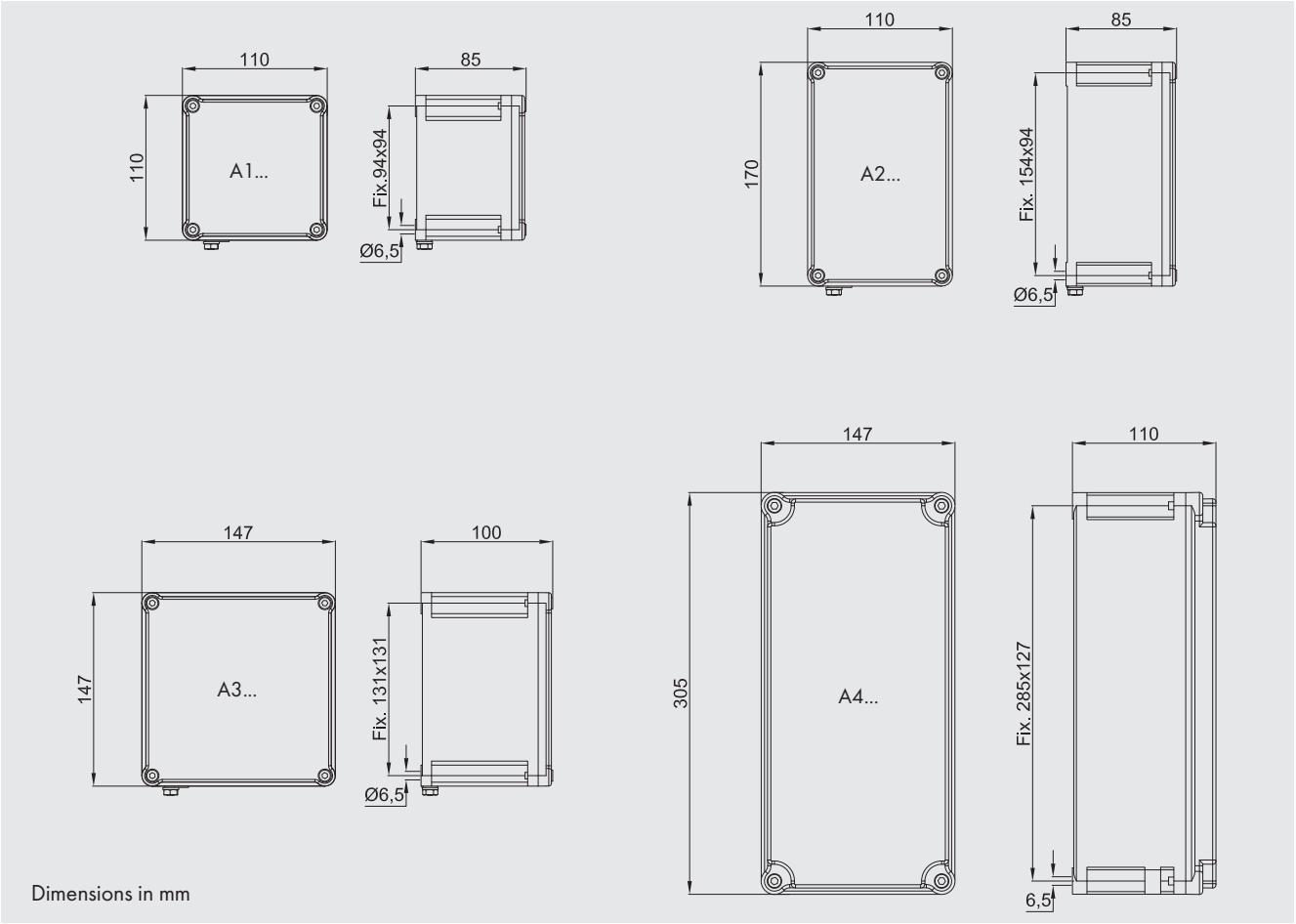
## MECHANICAL FEATURES

| | |
|---|---|
| **Body and cover:** | **Low copper content aluminium alloy.** |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the cover |
| **Certificate plate:** | Riveted aluminium |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal M5 on body and cover connected to each other with a 2.5 mm wire$^2$ |
| **Coating:** | RAL 7035 epoxy (Light grey) |
| **Cable gland:** | Polyamide type NAVP20IXE |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

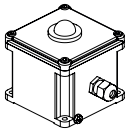
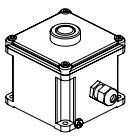
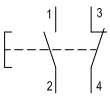
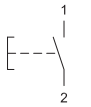
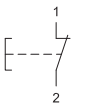
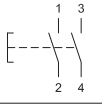
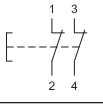
Safety measures and padlocks for stations
Safety measures against accidental contacts (padlockable)
Earthing rings for control units
Nameplates in various materials
Breather or drainage valve
Metal cable glands
Other contact types (see Ex e Control, monitoring and signalling stations folder)
Various possible configurations

## DIMENSIONAL DIAGRAM



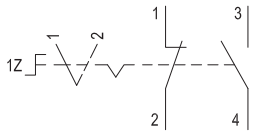
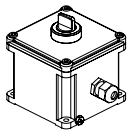
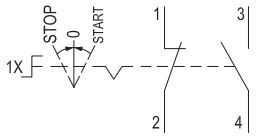
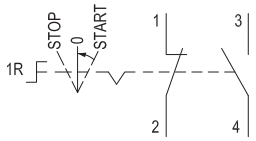
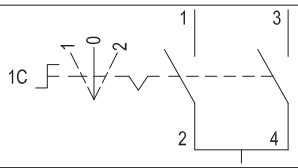
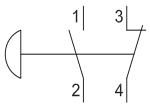
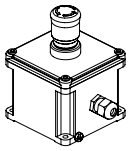
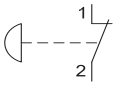
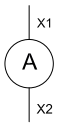
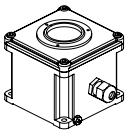
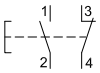
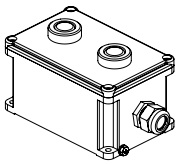
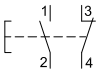
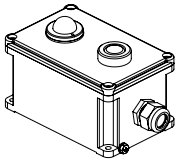

Dimensions in mm

## CODE SELECTION TABLE

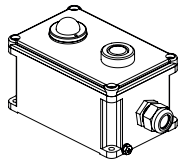
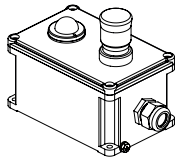
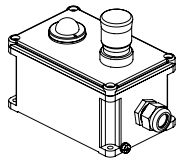
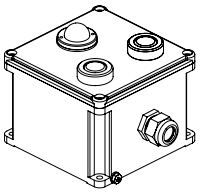
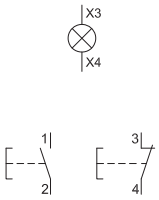
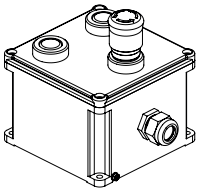
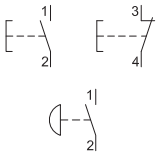
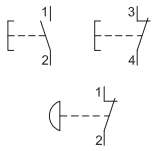
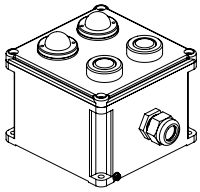
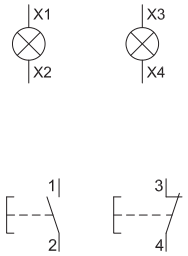
| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Indicator light**  | One red 24 VAC/DC indicator light |   | **A1T01R9** |
| | One green 24 VAC/DC indicator light | | **A1T01V9** |
| | One blue 24 VAC/DC indicator light | | **A1T01B9** |
| | One yellow 24 VAC/DC indicator light | | **A1T01G9** |
| | One colourless 24 VAC/DC indicator light | | **A1T01I9** |
| **Button**  | One red 1NO+1NC pushbutton |   | A1T01R3 |
| | One black 1NO+1NC pushbutton | | A1T01N3 |
| | One green 1NO+1NC pushbutton | | A1T01V3 |
| | One red 1NO pushbutton |   | A1T01R1 |
| | One black 1NO pushbutton | | A1T01N1 |
| | One green 1NO pushbutton | | A1T01V1 |
| | One red 1NC pushbutton |   | A1T01R2 |
| | One black 1NC pushbutton | | A1T01N2 |
| | One green 1NC pushbutton | | A1T01V2 |
| | One red 2NO pushbutton |   | A1T01R4 |
| | One black 2NO pushbutton | | A1T01N4 |
| | One green 2NO pushbutton | | A1T01V4 |
| | One red 2NC pushbutton |   | A1T01R5 |
| | One black 2NC pushbutton | | A1T01N5 |
| | One green 2NC pushbutton | | A1T01V5 |

# Control station type A (aluminium)

## CODE SELECTION TABLE

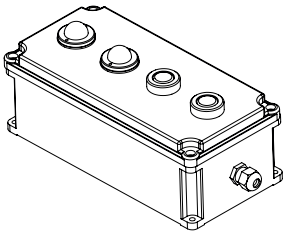
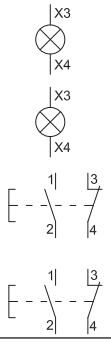
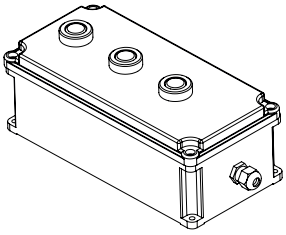
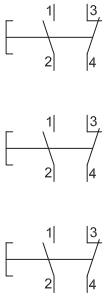
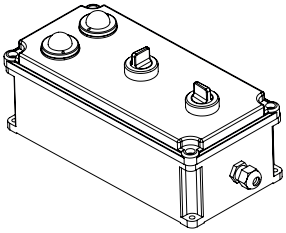
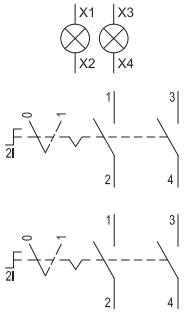
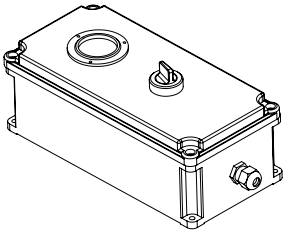
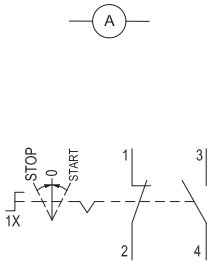
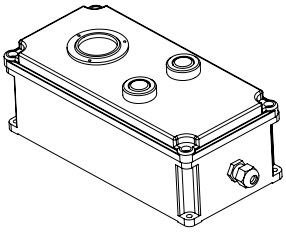
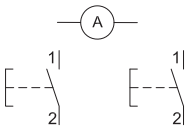
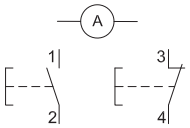
| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Selector** | Switch with two fixed-positions, suitable for "automatic-manual" 1NO+1NC service |   | **A1T011Z** |
|  | Motors "start-stop" control, with spring return to 0 from both STOP and START. |   | **A1T011X** |
| | Motors "start-stop" control with spring return from START to 0, and in fixed STOP position can be padlocked. |   | **A1T011R** |
| | Three fixed position switch can be padlocked in the centre position. Versions: single pole - double pole - triple pole. |   | **A1T011C** |
| **Button** | Emergency mushroom head pushbutton with 1NO+1NC block (when pressed, rotate to release) |   | **A1T01F3** |
|  | Emergency mushroom head pushbutton with 1NC block (when pressed, rotate to release) |   | **A1T01F2** |
| **Ammeter/voltmeter** | Ammeter (scale on request) |   | **A1T02A** |
|  | Voltmeter (scale on request) | | **A1T02V** |
| **Two buttons** | Red pushbutton + green pushbutton, 1NO+1NC contacts |   | **A2T07R3V3** |
|  | Black pushbutton + green pushbutton, 1NO+1NC contacts |   | **A2T07N3V3** |
| | Red pushbutton + green pushbutton, 1NO contacts |   | **A2T07R1V1** |
| | Black pushbutton + green pushbutton, 1NC contacts |   | **A2T07N1V1** |
| **Indicator light and pushbutton** | 24 VAC/DC red indicator light and one red 1NO+1NC pushbutton |   | **A2T07R9R3** |
|  | 24 VAC/DC green indicator light and one green 1NO+1NC pushbutton |   | **A2T07V9V3** |
| | 24 VAC/DC red indicator light and one red 1NC pushbutton |   | **A2T07R9R2** |
| | 24 VAC/DC green indicator light and one green 1NC pushbutton |   | **A2T07V9V2** |

## CODE SELECTION TABLE

| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Indicator light and pushbutton**  | 24 VAC/DC red indicator light and one red 1NO pushbutton |  | **A2T07R9R1** |
| | 24 VAC/DC green indicator light and one green 1NO pushbutton |  | **A2T07V9V1** |
| **Indicator light and emergency pushbutton**  | 24 VAC/DC red indicator light and emergency 1NO+1NC mushroom pushbutton |  | **A2T07R9F3** |
| | 24 VAC/DC green indicator light and 1NO+1NC emergency mushroom pushbutton |  | **A2T07V9F3** |
| **Pushbutton and emergency pushbutton**  | Green 1NO pushbutton and one 1NO emergency mushroom head pushbutton |  | **A2T07V1F1** |
| | Yellow 1NO pushbutton and one 1NO emergency mushroom head pushbutton |  | **A2T07G1F1** |
| | Green 1NO+1NC pushbutton and one 1NO+1NC emergency mushroom head pushbutton |  | **A2T07V3F3** |
| | Yellow 1NO+1NC pushbutton and one 1NO+1NC emergency mushroom head pushbutton |  | **A2T07G3F3** |
| **Indicator light and two pushbuttons**  | 24 VAC/DC green LED indicator light, one green 1NO pushbutton and red 1NC pushbutton |  | **A3T18V9V1R2** |
| **Two pushbuttons and Emergency pushbutton**  | One green 1NO and one red 1NC pushbutton, one mushroom head 1NO pushbutton |  | **A3T17V1R2F1** |
| | One green 1NO and one red 1NC pushbutton, one mushroom head 1NC pushbutton |  | **A3T17V1R2F2** |
| **Two indicator lights and two pushbuttons**  | 24 VAC/DC red and green LED indicator lights, one green 1NO pushbutton and red 1NC pushbutton |  | **A3T19V9R9V1R2** |

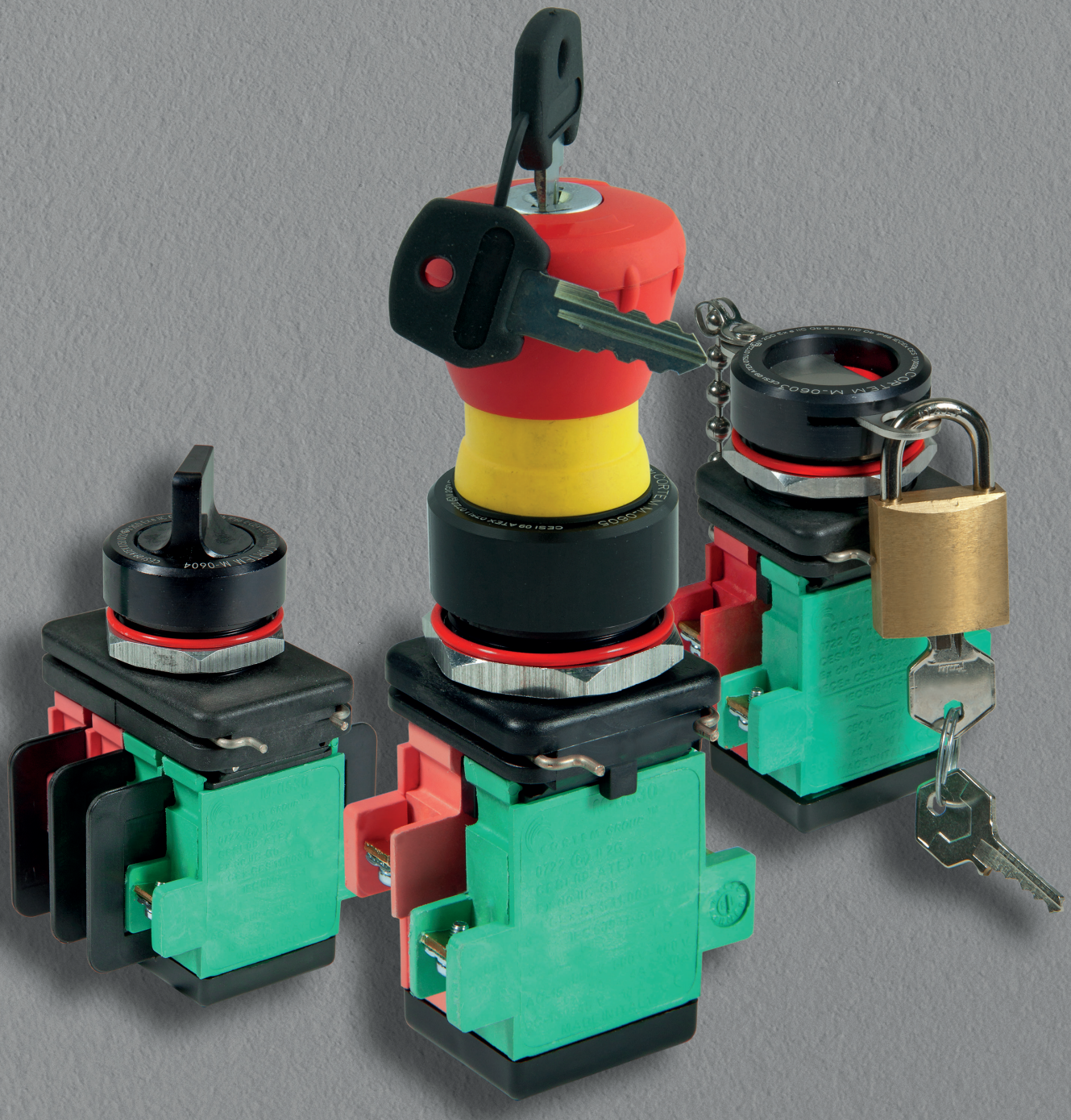
# Control station type A (aluminium)

## CODE SELECTION TABLE

| Illustration | Description | Diagram | Codes |
|---|---|---|---|
| **Two indicator lights and two pushbuttons**  | 24 VAC/DC red and green LED indicator lights, one green 1NO+1NC pushbutton and red 1NO+1NC pushbutton |   | **A4T25V9R9V3R3** |
| **Three buttons**  | Two green pushbuttons and one red 1NO+1NC |   | **A4T26V3R3V3** |
| **Two indicator lights and two selectors**  | 24 VAC/DC red and green LED indicator lights, two switches arrangement 2I |   | **A4T27R9V92I2I** |
| **Ammeter and selector**  | Ammeter 1 A, scale 3 - 5 In and "start-stop" motors control switch, with spring return to 0 from both STOP and START. |   | **A4T39A1X** |
| **Ammeter and two buttons**  | Ammeter 1 A, scale 3 - 5 In with red 1NO pushbutton and green 1NO pushbutton |   | **A4T40AR1V1** |
| | Ammeter 1 A, scale 3 - 5 In with red 1NO pushbutton and green 1NC pushbutton |   | **A4T40AR1V2** |

# Ex e control, monitoring and signalling devices

The M-0 control, monitoring and signalling stations are installed as accessories outside of 'Ex e' enclosures, panels and control stations used in all industrial environments where there may be an explosive atmosphere classified as Zone 1, 2, 21, 22. The M-0 devices allow the electrical or mechanical equipment assembled inside the 'Ex e' enclosures to be opened or closed, and the light signalling of the operating status. The components of the control stations are constructed from stainless steel to ensure maximum efficiency in almost any environmental conditions. The levers are constructed from aluminium, and the plastic pushbutton components ensure maximum durability over time, even in highly corrosive atmospheres. The M-0 control devices have an IP66 protection rating.

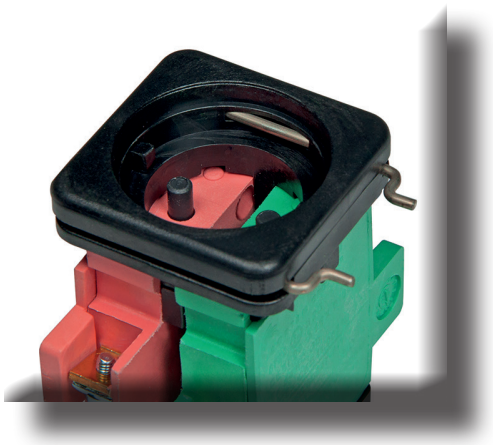


# Contact block for pushbuttons

## ELECTRICAL FEATURES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Rated voltage** | | | | | | | |
| 400 V | 500 V | 690 V | 400 V | 400 V | 400 V | 48 V | 230 V |
| **Category of use** | | | | | | | |
| AC-15 | AC-15 | AC-15 | AC-1 | AC-2 | AC-3 | DC-13 | DC-13 |
| **Rated current** | | | | | | | |
| 10 A | 4 A | 2 A | 16 A | 6 A | 2.4 A | 10 A | 0.5 A |

**Rated voltage:** max. 690 V
**Frequency:** 50/60 Hz
**Rated current:** 10 A
**Connection:** max. 2.5 $mm^2$
**Lightning impulse withstand voltage:** 4 kV
**Pollution degree:** 2
**Conditional short circuit current:** 1kA
**Maximum use of short circuit protection devices:** a gG 10A 500V fuse on each conductor
**Minimum travel for positive opening:** 3 mm
**Minimum force required to achieve positive opening of all opening contacts:** 5 N
**Maximum travel (+ overtravel):** 4.75 Hz
**Body:** Polyamide
**Contacts:** Brass
**Pins, springs and screws:** Stainless steel



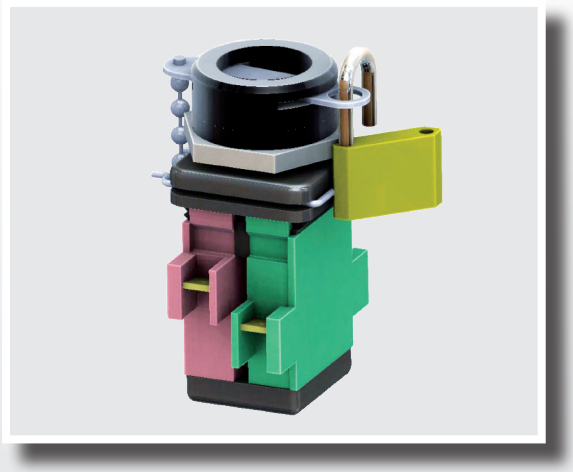
## Installation

The new slot-in adapter system makes light work of fitting contacts in control panels with walls up to 7 mm thick. In addition, with the mushroom head pushbutton having a smaller diameter thread (M32x1.5), the cover can accommodate more control and signalling devices than the previous version.

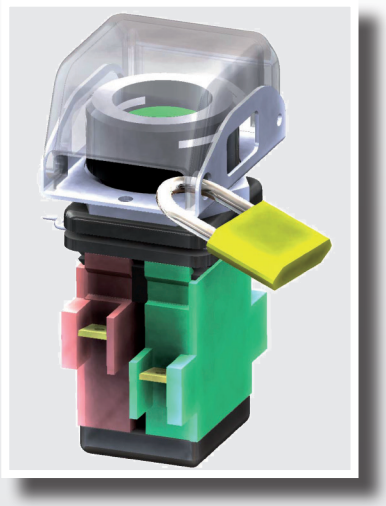
## SAFETY MEASURES AND PADLOCKS FOR STATIONS, ACCESSORIES AND SPECIAL REQUESTS

Selector padlock system
(codes **M-962** and **M-963**)

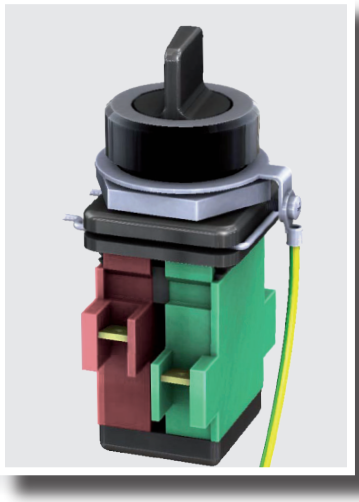

Pushbutton padlock system
(code M-0603/..**L**)



Padlockable protection
(code **M-0631**)



Earthing rings for the installation control units in polyester enclosures (code **A331IB**)

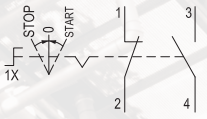
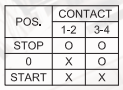
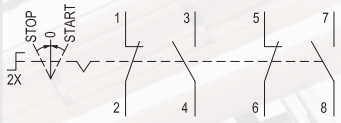
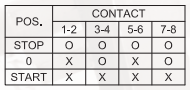
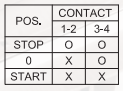
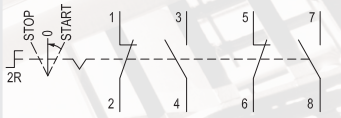
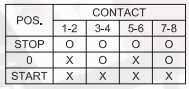
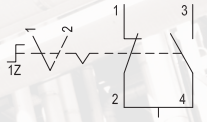
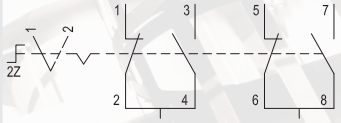
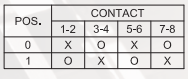
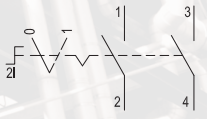
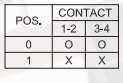
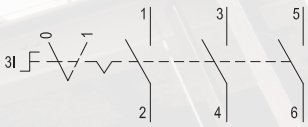
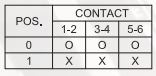
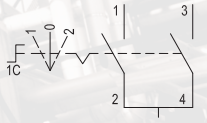
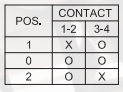
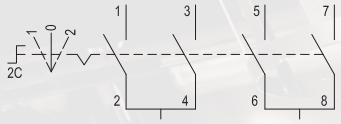
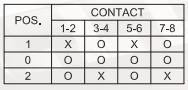
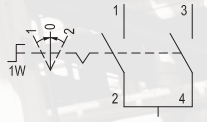
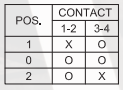
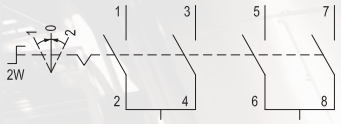
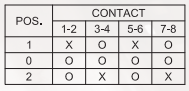
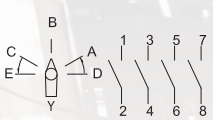
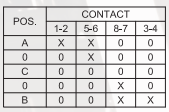
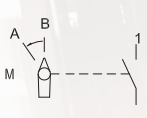
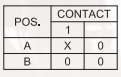


Black mushroom head pushbutton
(code M-0605/**N**)

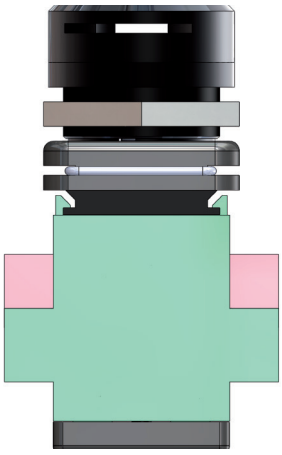
**Aluminium Cortem enclosure complete with:**
n°1 ammeter B-0140A
n°1 M-0612/3R230 red indicator light
n°1 green indicator light M-0612/3V230
n°2 M-0604/1Z selectors
n°1 NAV32IB type cable glands
n°11 CBD2 type connections
n°1 TE6O earth connection
n°1 B32-229 internal frame
External RAL7035 coating

**Stainless steel Cortem enclosure complete with:**
n°1 ammeter B-0140A
n°1 M-0605/K emergency pushbutton with key reset
n°1 M-0603/NL padlockable black pushbutton
n°1 M-0612/3G230 yellow indicator light
n°1 green indicator light M-0612/3V230
n°2 M-0604/1C selectors
n°6 NAV32IB type cable glands
n°1 B47-357 internal frame

## SELECTOR ARRANGEMENT

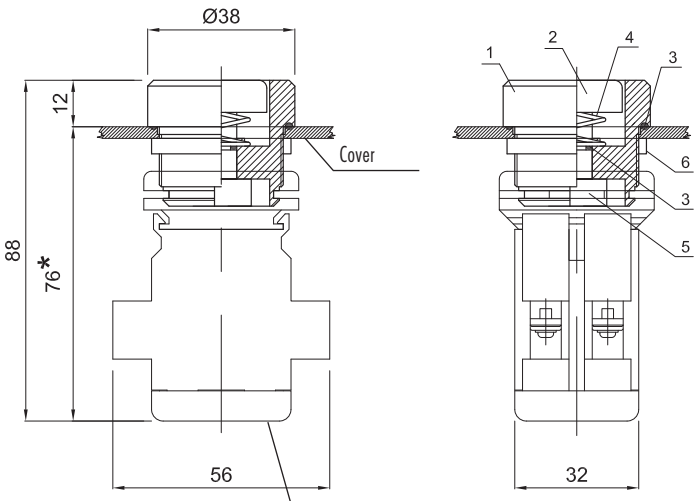
| Description | Badge | Single pole arrangement | Contacts | Single pole arrangement | Contacts | Codes |
|---|---|---|---|---|---|---|
| Motors "start-stop" control, with spring return to 0 from both STOP and START. |  |  |  |  |  | X |
| Motors "start-stop" control with spring return from START to 0, and in fixed STOP position can be padlocked. |  |  |  |  |  | R |
| Switch with two fixed-positions, suitable for "automatic-manual" service |  |  |  |  |  | Z |
| Switch |  |  |  |  |  | I |
| Three fixed position switch can be padlocked in the centre position. Versions: single pole - double pole - triple pole |  |  |  |  |  | C |
| Three position switch can be padlocked in centre position with spring return to 0 from positions 1 and 2. |  |  |  |  |  | W |
| 5 position reversing start switch. Lever with fixed C position and spring return to 0 from A and B |  |  |  | | | Y |
| "Start" motors control with lever spring return to position B |  |  |  | | | M |

## Pushbutton M-0603



Range of pushbuttons designed to permit the installation of an increased number of controls on the cover. Polyamide 6 caps available in various colours and in a lockable version. Plates, listing dimensions and with customised wording on the cover, can be affixed to all stations.

| ILLUSTRATION | CODE | DESCRIPTION | NOTES | MODULAR CODES |
|---|---|---|---|---|
| | **M-0603/N** | Black Ex e pushbutton without contacts | Add requested contact assembly | **N** |
| | **M-0603/NL** | Black Ex e pushbutton can be locked without contacts | Add requested contact assembly | **E** |
| | **M-0603/R** | Red Ex e pushbutton without contacts | Add requested contact assembly | **R** |
| | **M-0603/RL** | Red Ex e pushbutton without contacts, can be padlocked | Add requested contact assembly | **L** |
| | **M-0603/V** | Green Ex e pushbutton without contacts | Add requested contact assembly | **V** |
| | **M-0603/G** | Yellow Ex e pushbutton without contacts | Add requested contact assembly | **G** |
| | **M-0603/B** | Blue Ex e pushbutton without contacts | Add requested contact assembly | **B** |
| | **M-0603/BI** | White Ex e pushbutton without contacts | Add requested contact assembly | **I** |
| | **M-0606/10** | Contact assembly 1NO | | **1** |
| | **M-0606/01** | Contact assembly 1NC | | **2** |
| | **M-0606/11** | Contact assembly 1NO+1NC | | **3** |
| | **M-0606/20** | Contact assembly 2NO | | **4** |
| | **M-0606/02** | Contact assembly 2NC | | **5** |

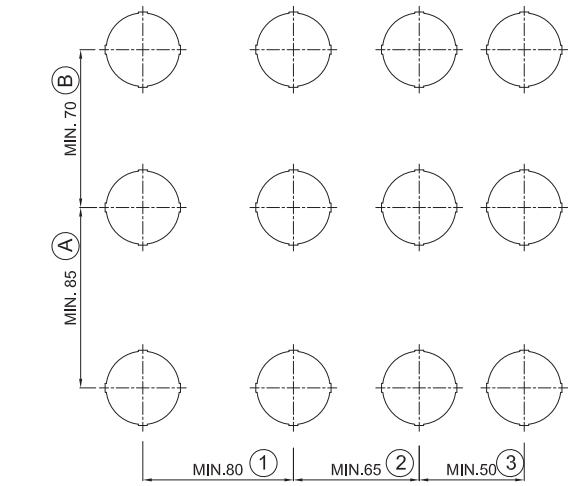


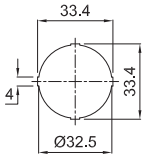

Front part of switch M-0603, comprised of:
1. body
2. coloured cap
3. o-ring
4. spring
5. moving part
6. locknut

Contact block type M-0530 and/or M-0531
Ex II 2G Ex de IIC version (CESI 09 ATEX 016U)

* with 4 raised contacts: 79 mm

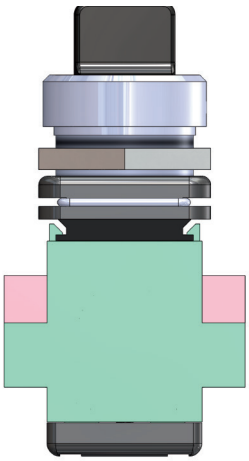
### Drilling arrangement (minimum distances)



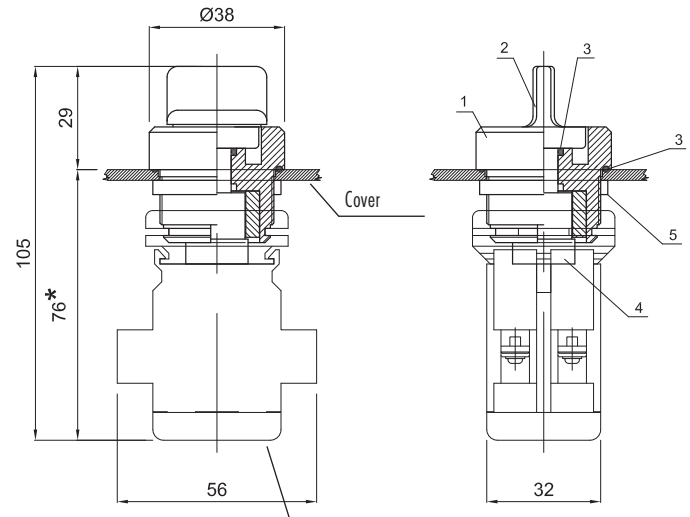




1) control unit with 4 contacts - control unit with 4 contacts
2) control unit with 4 contacts - control unit with 2 contacts
3) control unit with 2 contacts - control unit with 2 contacts
A) control unit with 4 contacts - control unit with 4 contacts
B) control unit with 2 contacts - control unit with 2 contacts

## Selector M-0604

| ILLUSTRATION | CODE | DESCRIPTION | MODULAR CODES | NOTES |
|---|---|---|---|---|
|  | **M-0604/X** | Selector Ex e arrangement X | **1X** | Selector complete with contacts |
| | **M-0604/R** | Selector Ex e arrangement R | **1R** | |
| | **M-0604/RSX** | Selector Ex e arrangement R left | **RS** | |
| | **M-0604/1Z** | Selector Ex e arrangement 1Z | **1Z** | |
| | **M-0604/2Z** | Selector Ex e arrangement 2Z | **2Z** | |
| | **M-0604/1I** | Selector Ex e arrangement 1I | **1I** | |
| | **M-0604/2I** | Selector Ex e arrangement 2I | **2I** | |
| | **M-0604/3I** | Selector Ex e arrangement 3I | **3I** | |
| | **M-0604/4I** | Selector Ex e arrangement 4I | **4I** | |
| | **M-0604/1C** | Selector Ex e arrangement 1C | **1C** | |
| | **M-0604/2C** | Selector Ex e arrangement 2C | **2C** | |
| | **M-0604/1W** | Selector Ex e arrangement 1W | **1W** | |
| | **M-0604/2W** | Selector Ex e arrangement 2W | **2W** | |
| | **M-0604/1M** | Selector Ex e arrangement 1M | **1M** | |
| | **M-0606/11** | Contact assembly 1NO+1NC | Replacement part for arrangements: X - R - 1Z - RSX | |
| | **M-0606/22** | Contact assembly 2NO+2NC | Replacement part for arrangements: 2Z | |
| | **M-0606/10** | Contact assembly 1NO | Replacement part for arrangements: 1I 1M | |
| | **M-0606/20** | Contact assembly 2NO | Replacement part for arrangements: 2I 2M 1C 1W | |
| | **M-0606/30** | Contact assembly 3NO | Replacement part for arrangements: 3I 3M | |
| | **M-0606/40** | Contact assembly 4NO | Replacement part for arrangements: 4I 4M 2C 2W | |

Selector complete with 2 or 4 contacts, available in different electrical arrangements for connection to the electrical enclosure and machine.
Can be padlocked and have earthing connection

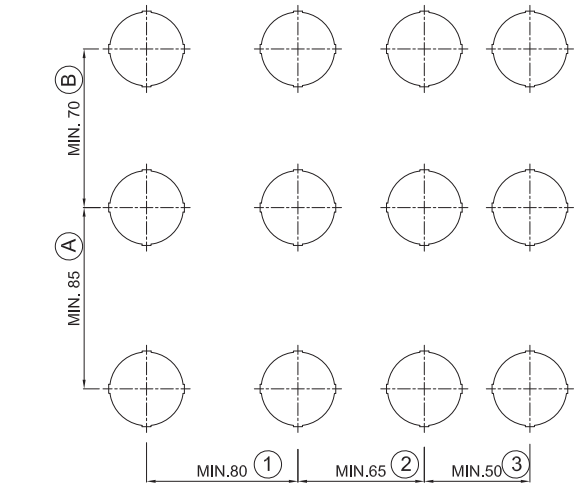


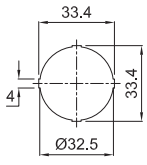

Front part of switch
M-0604, comprised of:
1. body
2. lever
3. o-ring
4. moving part
5. locknut

Contact block type M-0530 and/or M-0531
Ex II 2G Ex de IIC version (CESI 09 ATEX 016U)

* with 4 raised contacts: 79 mm

### Drilling arrangement (minimum distances)



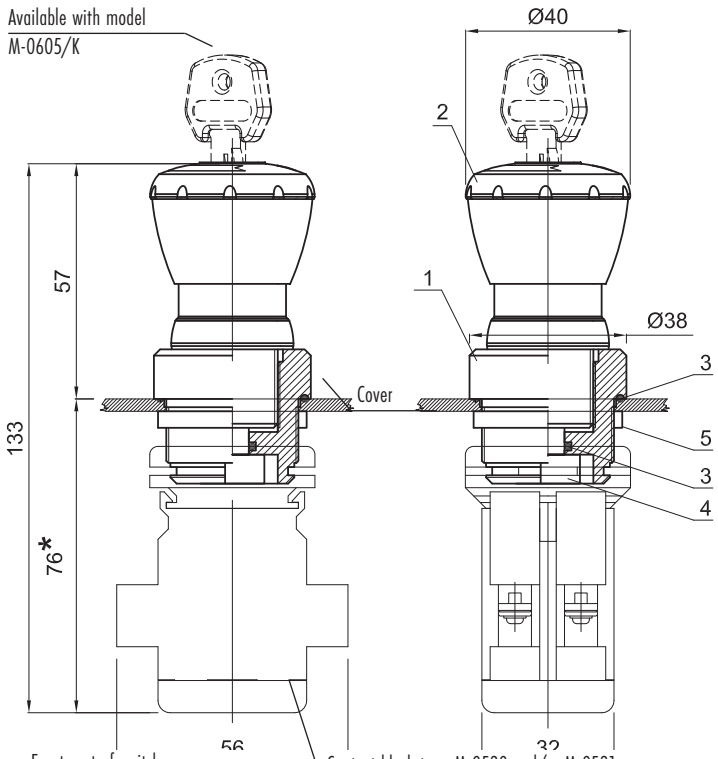




1) control unit with 4 contacts - control unit with 4 contacts
2) control unit with 4 contacts - control unit with 2 contacts
3) control unit with 2 contacts - control unit with 2 contacts
A) control unit with 4 contacts - control unit with 4 contacts
B) control unit with 2 contacts - control unit with 2 contacts

## Emergency pushbutton M-0605

The emergency pushbutton allows the operator to safely lock out the machine by pressing the key. With 2 keys provided with each order, the pushbutton of model M-0605/K can be locked.

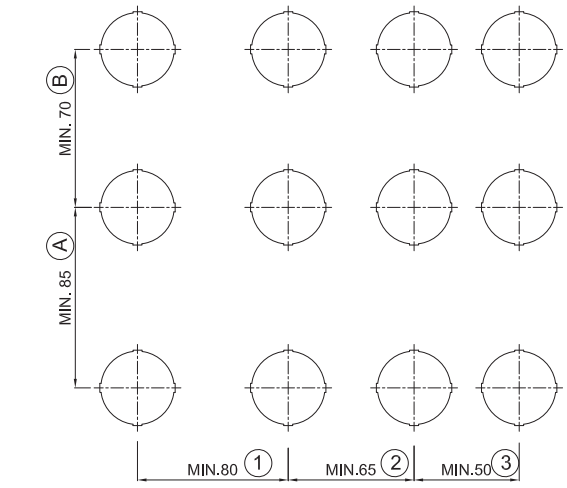
| CODE | DESCRIPTION | MODULAR CODES | NOTES |
|---|---|---|---|
| **M-0605** | Emergency Ex e pushbutton with reset, without contacts | **F** | Add requested contact assembly |
| **M-0605/K** | Emergency Ex e pushbutton with key reset, without contacts | **K** | |
| **M-0605/P** | Press and pull Ex e pushbutton without contacts | **P** | |
| **M-0606/10** | Contact assembly 1NO | **1** | |
| **M-0606/01** | Contact assembly 1NC | **2** | |
| **M-0606/11** | Contact assembly 1NO+1NC | **3** | |
| **M-0606/20** | Contact assembly 2NO | **4** | |
| **M-0606/02** | Contact assembly 2NC | **5** | |

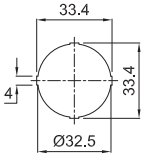



Front part of switch
M-0605, comprised of:
1. body
2. mushroom head pushbutton
3. o-ring
4. moving part
5. locknut

Contact block type M-0530 and/or M-0531
EX II 2G Ex de IIC version (CESI 09 ATEX 016U)

### Drilling layout (minimum distances)*



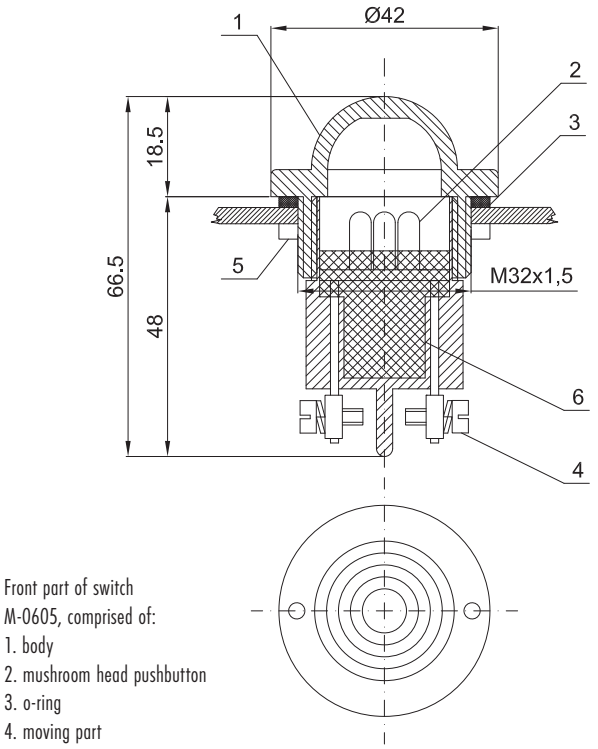

1) control unit with 4 contacts - control unit with 4 contacts
2) control unit with 4 contacts - control unit with 2 contacts
3) control unit with 2 contacts - control unit with 2 contacts
A) control unit with 4 contacts - control unit with 4 contacts
B) control unit with 2 contacts - control unit with 2 contacts

* Standard drilling layout.
Up to 2 contacts can be used per station with the M-0605 emergency pushbutton

## M-0612/3 multi-LED indicator light

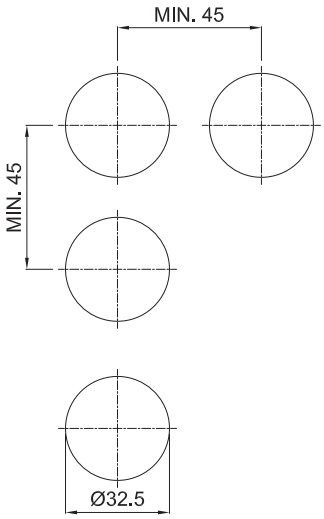
Multi-LED indicator lights available in various cap colours and different voltages. Easy to install and wire and long-lasting reliability with 50,000 hour lifespan LEDs

| CODE | DESCRIPTION | MODULAR CODES |
|---|---|---|
| **M-0612/3B110** | Blue 110 VAC/DC multi-LED indicator light | **B6** |
| **M-0612/3B12** | Blue 12 VAC/DC multi-LED indicator light | **B7** |
| **M-0612/3B230** | Blue 230 VAC multi-LED indicator light | **B8** |
| **M-0612/3B24** | Blue 24 VAC/DC multi-LED indicator light | **B9** |
| **M-0612/3G110** | Yellow 110 VAC/DC multi-LED indicator light | **G6** |
| **M-0612/3G12** | Yellow 12 VAC/DC multi-LED indicator light | **G7** |
| **M-0612/3G230** | Yellow 230 VAC multi-LED indicator light | **G8** |
| **M-0612/3G24** | Yellow 24 VAC/DC multi-LED indicator light | **G9** |
| **M-0612/3I110** | Colourless 110 VAC/DC multi-LED indicator light | **I6** |
| **M-0612/3I12** | Colourless 12 VAC/DC multi-LED indicator light | **I7** |
| **M-0612/3I230** | Colourless 230 VAC multi-LED indicator light | **I8** |
| **M-0612/3I24** | Colourless 24 VAC/DC multi-LED indicator light | **I9** |
| **M-0612/3R110** | Red 110 VAC/DC multi-LED indicator light | **R6** |
| **M-0612/3R12** | Red 12 VAC/DC multi-LED indicator light | **R7** |
| **M-0612/3R230** | Red 230 VAC multi-LED indicator light | **R8** |
| **M-0612/3R24** | Red 24 VAC/DC multi-LED indicator light | **R9** |
| **M-0612/3V110** | Green 110 VAC/DC multi-LED indicator light | **V6** |
| **M-0612/3V12** | Green 12 VAC/DC multi-LED indicator light | **V7** |
| **M-0612/3V230** | Green 230 VAC multi-LED indicator light | **V8** |
| **M-0612/3V24** | Green 24 VAC/DC multi-LED indicator light | **V9** |




Front part of switch
M-0605, comprised of:
1. body
2. mushroom head pushbutton
3. o-ring
4. moving part
5. locknut

### Drilling arrangement (minimum distances)



## Ammeter B-0140A, voltmeter B-0140V


| CODE | DESCRIPTION | NOTES | MODULAR CODES |
|---|---|---|---|
| **B-0140A** | Ammeter | * | **A** |
| **B-0140V** | Voltmeter | | **V** |

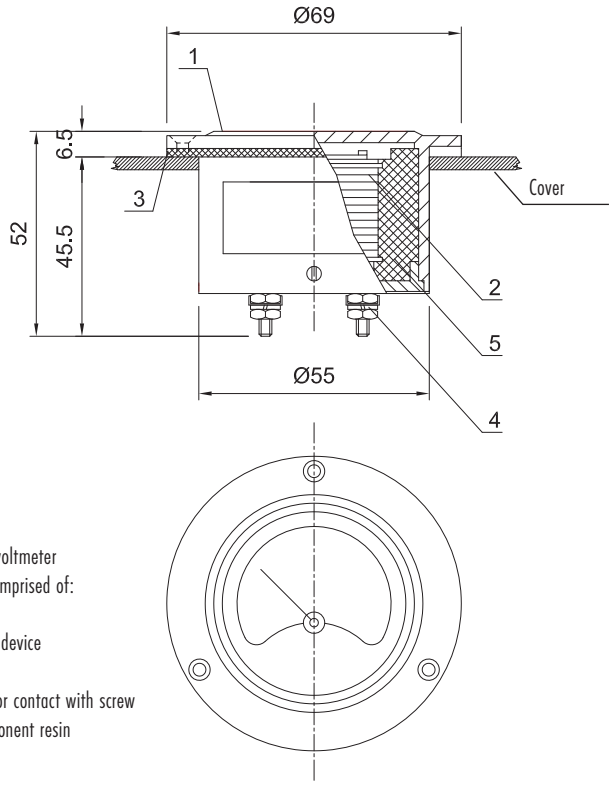
| | |
|---|---|
| Maximum voltage: | 600 V |
| Rated frequency: | 40 ÷ 60 Hz |
| Accuracy class: | 1.5 |
| Power dissipation: | 1.1 VA (B-0140A) |
| | 3.0 VA B-0140V |

| | | |
|---|---|---|
| Field of measure - Direct measurement: | 0 - 40mA | 0 - 0.1A |
| | 0 - 60 mA | 0 - 1.5 A |
| | 0 - 100 mA | 0 - 2.5 A |
| | 0 - 250 mA | 0 - 5 A |
| | 0 - 400 mA | 0 - 6 A |
| | 0 - 600 mA | 0 - 15 A |
| Field of measure - With current transformer: | 0 - 2.5mA | 0 - 50A |
| | 0 - 5 mA | 0 - 60 A |
| | 0 - 10 mA | 0 - 75 A |
| | 0 - 15 mA | 0 - 100 A |
| | 0 - 20 mA | 0 - 150 A |
| | 0 - 25 mA | 0 - 200 A |
| | 0 - 30 mA | 0 - 300 A |
| | 0 - 40 mA | 0 - 400 A |

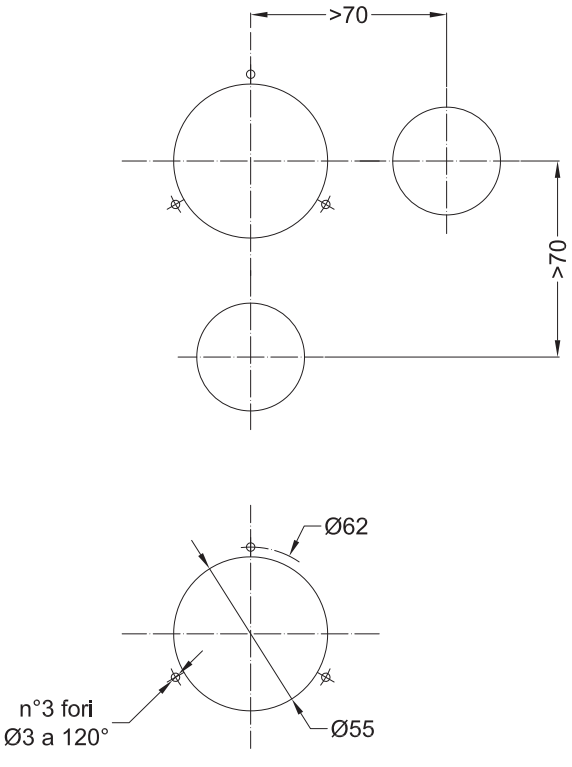
Cortem certified ammeters and voltmeters are suitable for measuring electrical quantities, when accuracy and precision are required. The internal plates with field-scale measurement are made to customer specification.

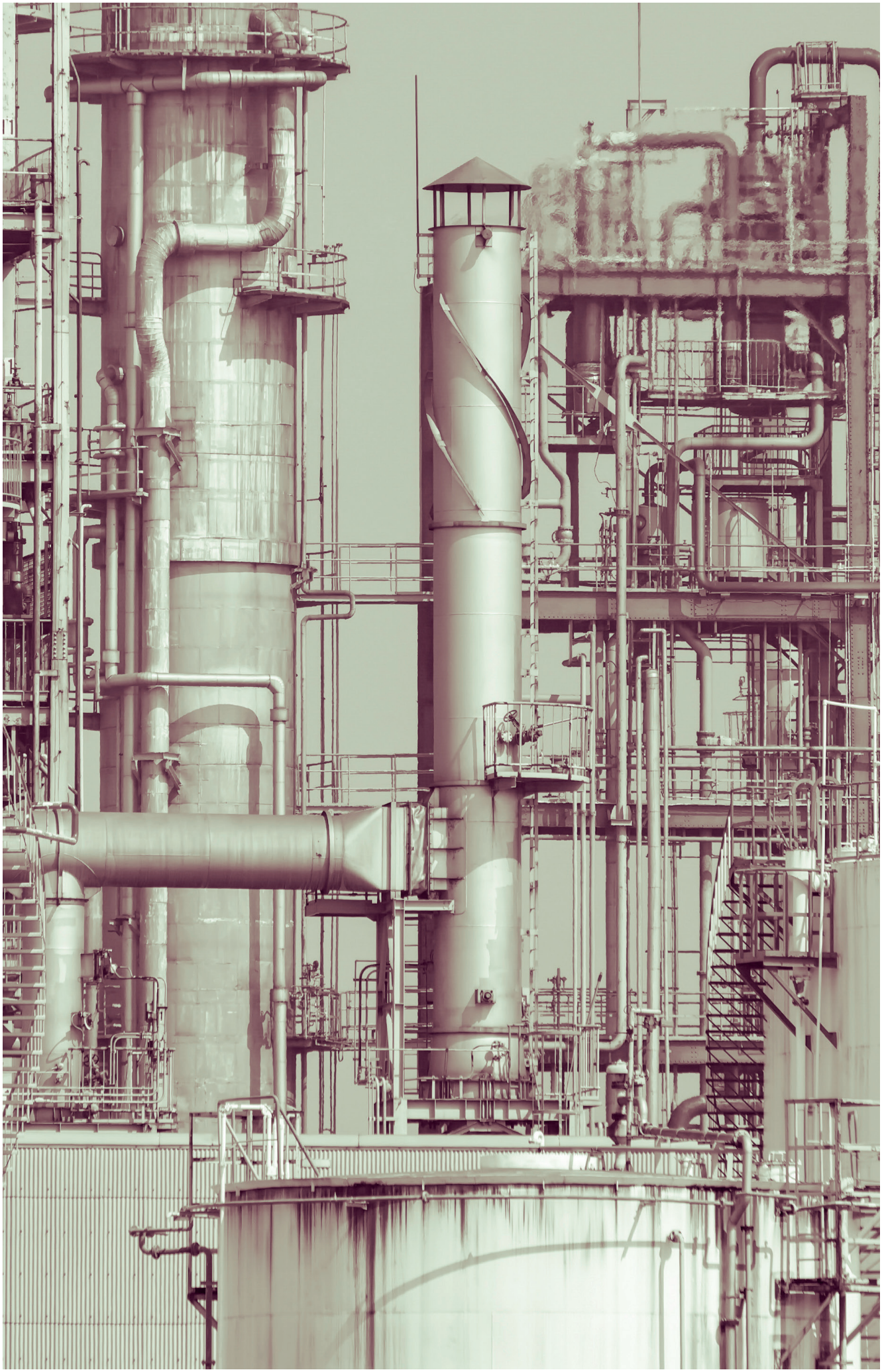
* For ammeter mod. B-0140A4 (4-20 mA) 1200 Ω impedance. If the driver is incompatible with this impedance, it is recommended to use the Cortem supplied transducer, mod. NI-DT1
The transducer must be installed in a safe zone.

### Drilling arrangement (minimum distances)



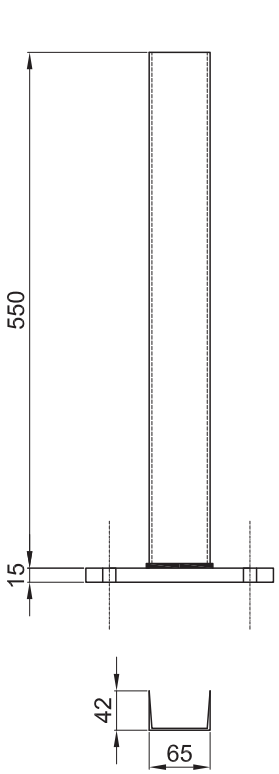

Ammeter/voltmeter
B-0140, comprised of:
1. body
2. internal device
3. gasket
4. connector contact with screw
5. bi-component resin

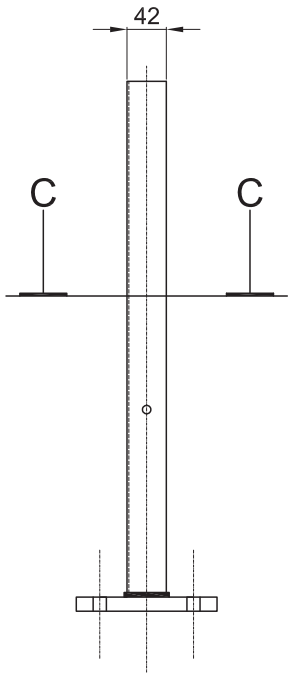




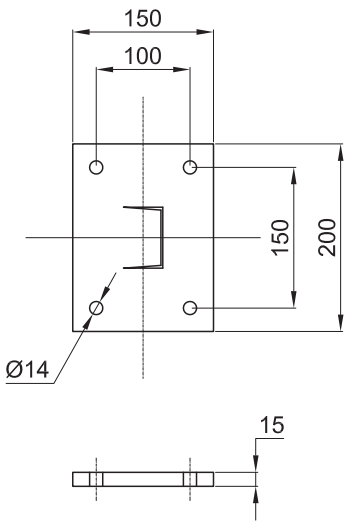
Supporting for lighting fixtures handrail mounted

Code: COLONNINA 01

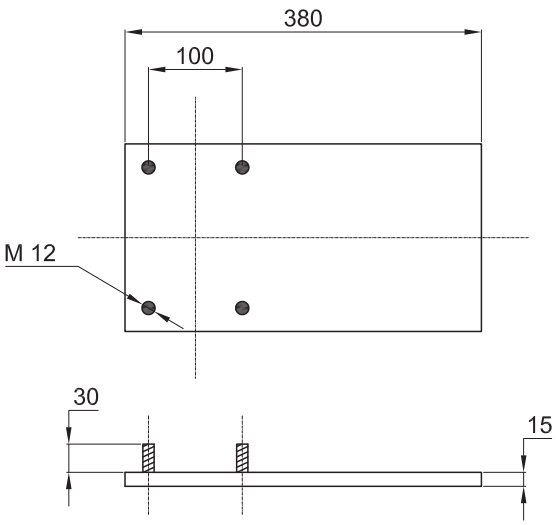



Sect. C - C



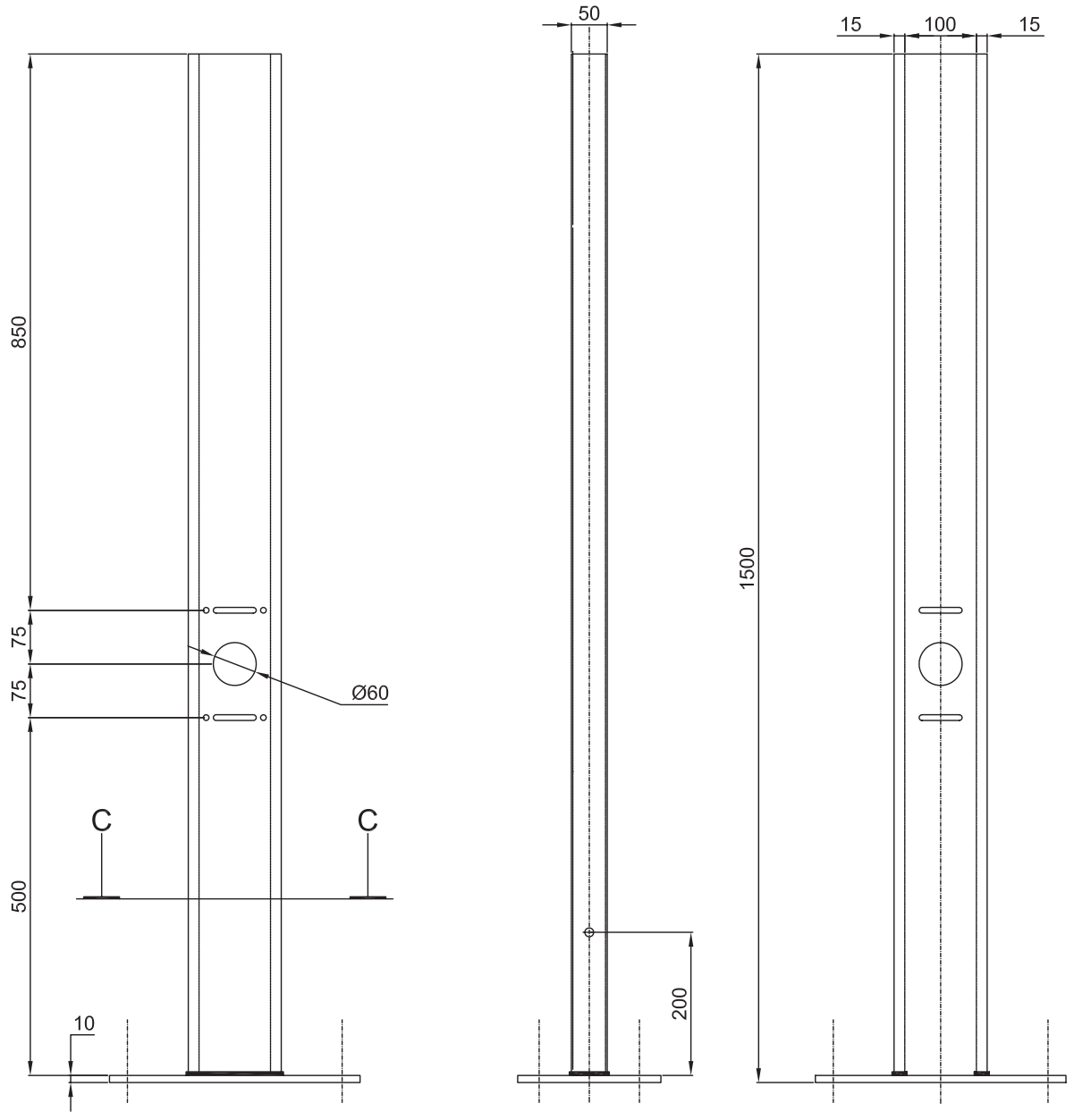

Bearing plate




Note:
- 2mm steel plate support. Hot dip galvanized. Zinc covering thickness to be 400 g/m² or 50 µm
- N°4 welded bolts M12 with relevant nut and elastic washer

Supporting for equipment on structure

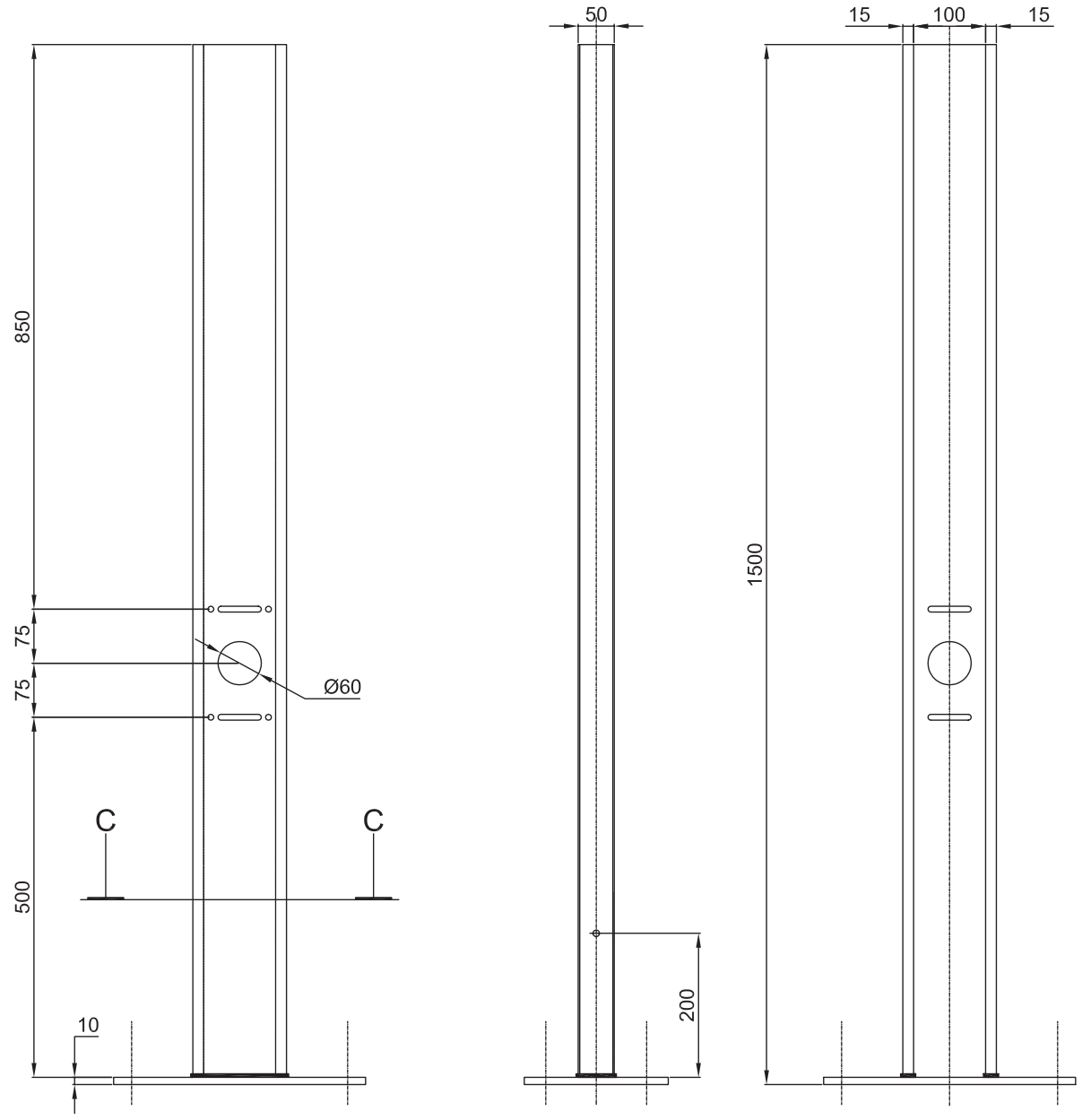
Code: COLONNINA 03



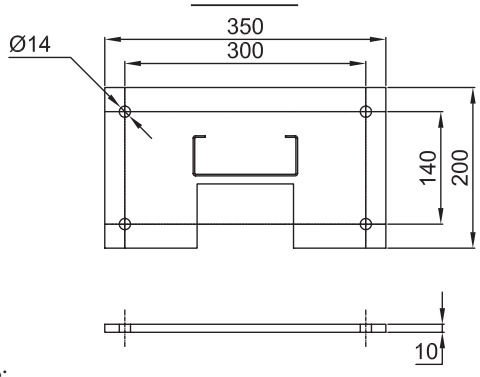

Note:
- 2mm steel plate support. Hot dip galvanized. Zinc covering thickness to be 400 g/m² or 50 µm
- N°4 welded bolts M12 with relevant nut and elastic washer

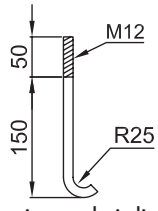
Supporting for equipment on structure on foundation block

Code: COLONNINA 04




Sect. C - C



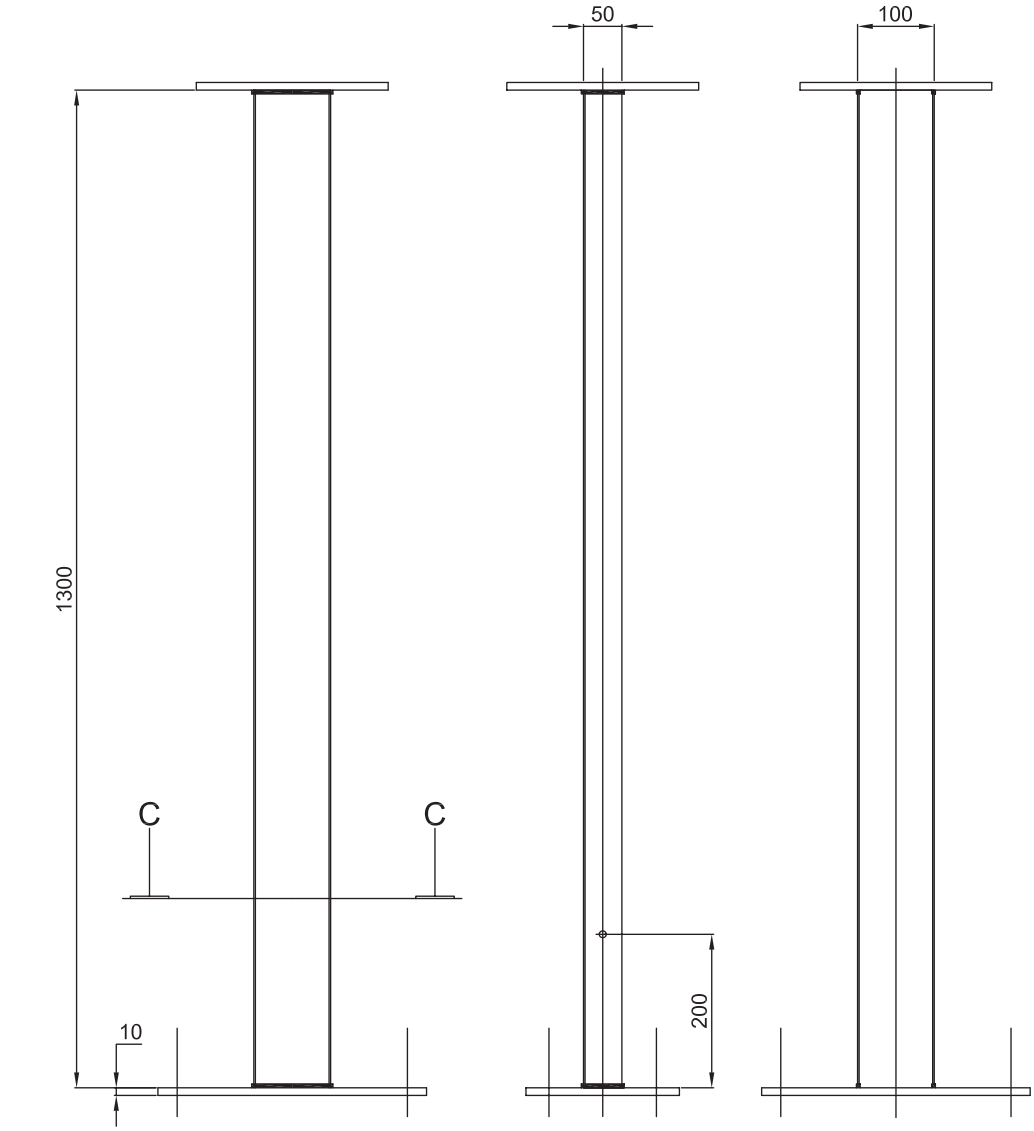



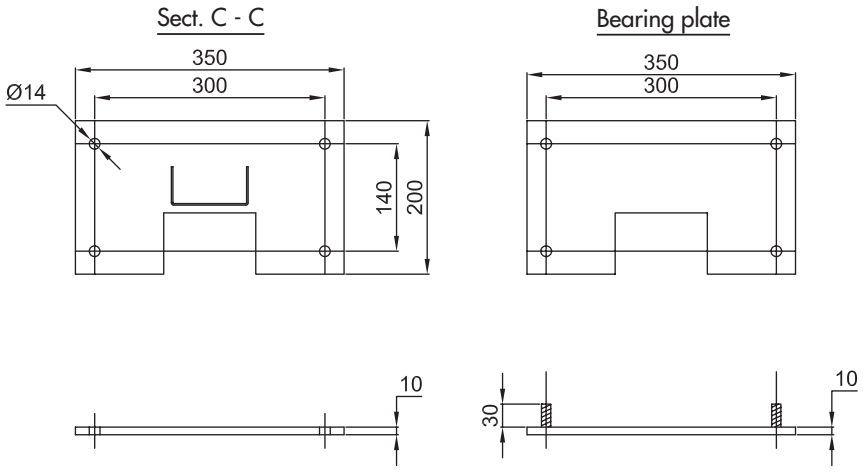

N.4 bulloni completi di dato e rondella elastiche

Note:
- 2mm steel plate support. Hot dip galvanized. Zinc covering thickness to be 400 g/m² or 50 µm

Supporto apparecchiature, installazione su struttura.

Code: COLONNINA 05



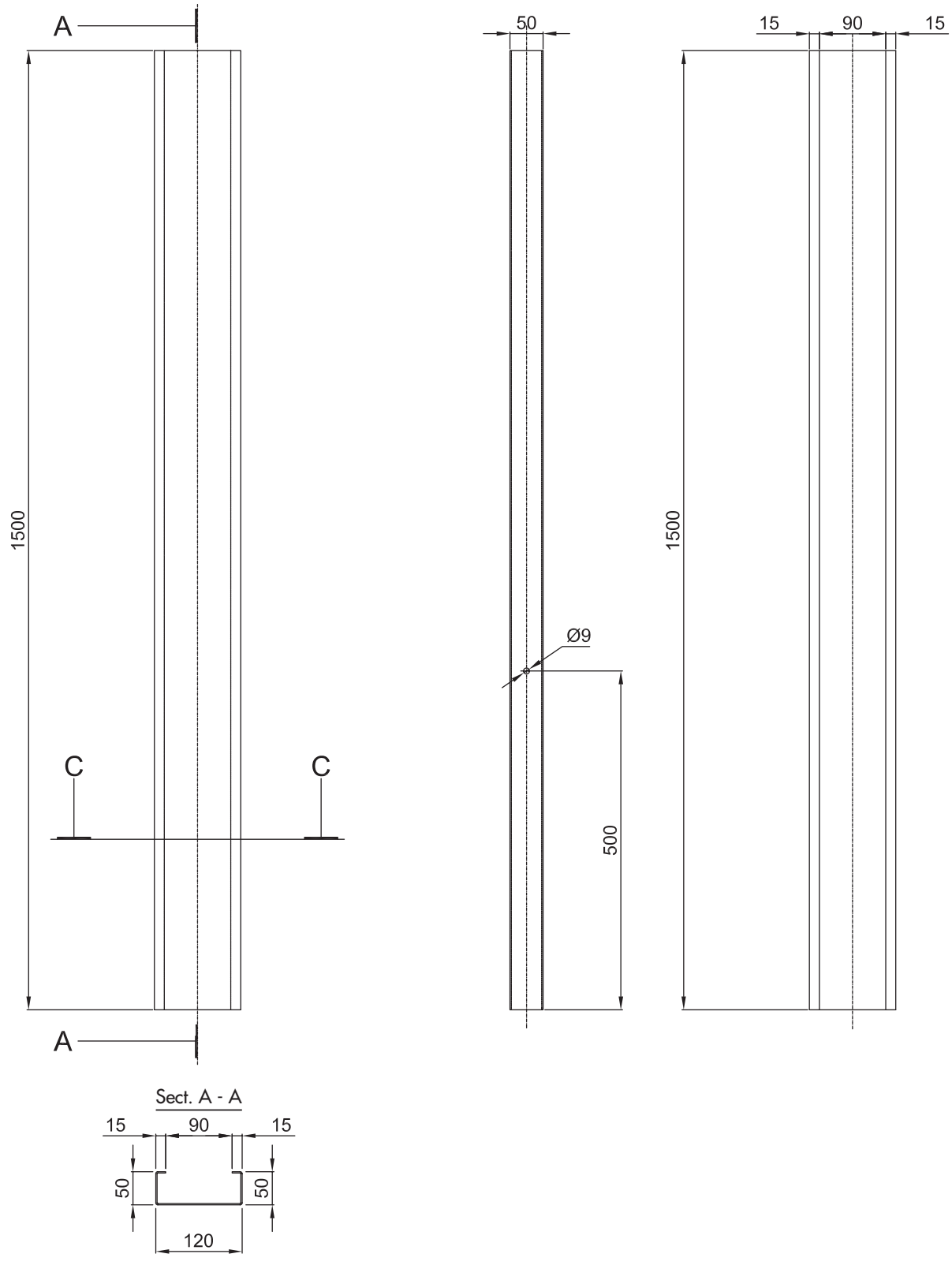




Note:
- 2mm steel plate support. Hot dip galvanized. Zinc covering thickness to be 400 g/m² or 50 µm
- N°4 welded bolts M12 with relevant nut and elastic washer

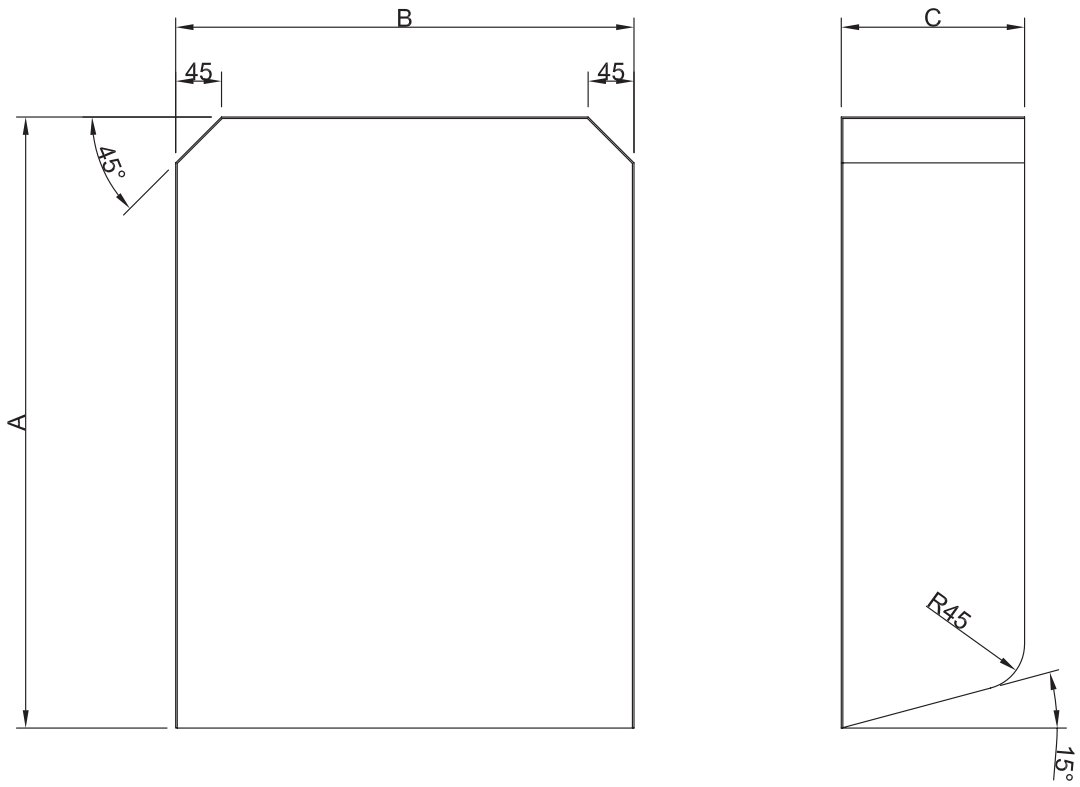
Supporting for equipment on foundation block

Code: COLONNINA 06




Note:
- Support in stainless steel AISI 316 L plate 15/10 hick

Protection cap for posts




| Code | Dimensions (mm) | | | Thickness |
|---|---|---|---|---|
| | A | B | C | |
| N1-300 | 600 | 200 | 180 | 20/10 |
| N2-300 | 600 | 450 | 180 | |
| N3-300 | 300 | 200 | 180 | |

Note:
- Material: Hot dip galvanized plate

# PYN, SPYN

## Sockets and plugs

- Group IIC
- Zone 1, 2, 21, 22
- Aluminium alloy
- Ergonomic
- Plugs can be used with industrial sockets
- Suitable for use in extreme temperatures

-60°C

Sockets and plugs designed for low temperatures

# Series PYN... SPYN... Sockets and plugs from 16 A to 125 A

The PYN, SPYN series of sockets and plugs consists of 16 A and 32 A models and 63 A and 125 A models designed with 'Ex db eb, Ex tb' and 'Ex eb, Ex tb' protection and tested for operation at low temperatures down to -60°C.
The 16A and 32A sockets are equipped with an interlocked disconnect switch with the plug positioned beneath. The rotary movement together with the closing/opening operations which occur inside a special explosion-proof chamber ensure the electrical circuit is only connected after the SPYN series plug has been correctly inserted into its seat and can only be removed once the electrical circuit has been disconnected. The 63A and 125A models are equipped with an automatic circuit breaker as they are designed to withstand high electric loads.
The range includes two pole sockets + earth (PE); three pole sockets + earth (PE) and three pole sockets + neutral + earth (PE), with current capacities of 16A and reduced overall dimensions, up to a maximum of 125A. Voltages range from 50V to a maximum of 690VAC, with a maximum frequency of 50/60Hz. All plug models can also be used in normal industrial sockets conforming to standard IEC/EN 60309-2, whereas all socket models are manufactured so that they cannot be used with industrial type plugs.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical plants


Onshore facilities


Offshore facilities


Petroleum loading/unloading pontoons


Low temperatures


Fuel storage facilities

100% produced by Cortem

## CERTIFICATE DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2 GD Ex db eb IIC T... Gb; Ex tb IIIC T...°C Db | | | Socket |
| | CE 0722 Ex II 2 GD Ex eb IIC T... Gb; Ex tb IIIC T...°C Db | | | Plug |
| **Certificate:** | ATEX IMQ 20 ATEX 049X | | | |
| | IEC Ex IMQ 21.0003X | For all IEC Ex certificate data, download the certificate from www.cortemgroup.com | | |
| **Standards:** | CENELEC EN 60079-0: 2018, EN 60079-1: 2014, EN 60079-7: 2017, EN 60079-31: 2014 and European Directive 2014/34/EU.<br>IEC 60079-0: 2017, IEC 60079-1: 2014, IEC 60079-7: 2017, IEC 60079-31: 2022<br>RoHS Directive 2002/95/EC. | | | |
| **Models:** | *16 A* | *32 A* | | |
| **Temperature class:** | T85°C (T6) | T100°C (T4) | | |
| **Temp. Temperature:** | -60°C +60°C | -60°C +60°C | | |
| **Models:** | *63 A* | *125 A* | | |
| **Temperature class:** | T85°C (T6) | T140°C (T3) | T134°C (T4) | |
| **Temp. Temperature:** | -60°C +60°C | -60°C +55°C | -60°C +49°C | |
| **Degree of protection:** | IP66 | | | |

PYN..., SPYN... 16 A

SPYN...,PYN... 32 A

PYN... 63 A, 125 A

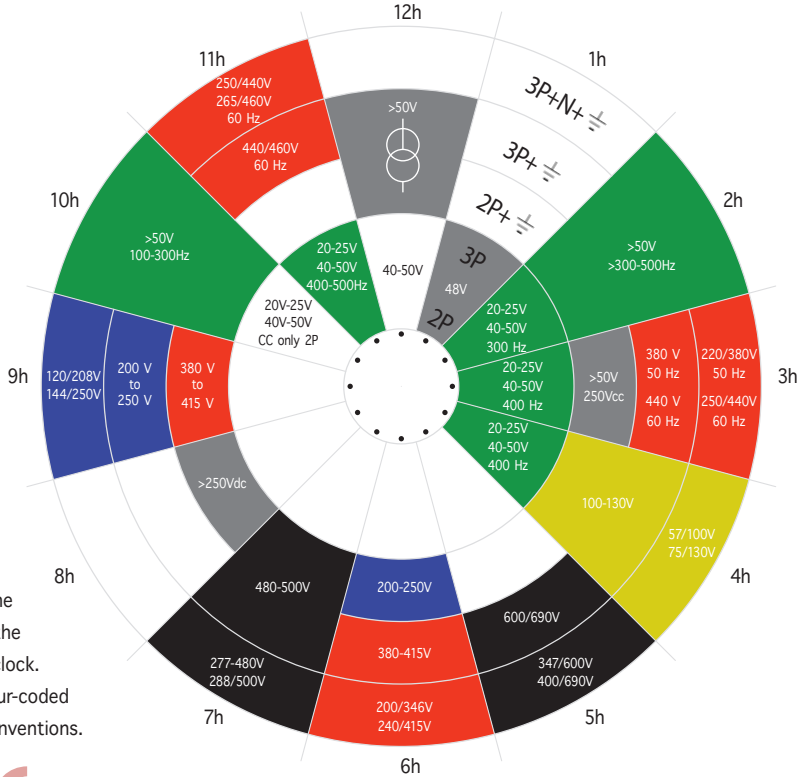
SPYN... 63 A e 125 A

## MECHANICAL FEATURES

| | |
|---|---|
| **Socket body:** | Low copper content aluminium alloy, complete with wall fastening lugs and plastic bayonet socket closure cap, with identifying colour and safety chain |
| **Lid:** | Screw fastened, aluminium alloy with low copper content. Used to access socket and make electrical connection |
| **Plug:** | Low copper content aluminium alloy, complete with colour coded plastic lock rings to identify the mains power supply voltage |
| **Pins:** | nickel-plated brass |
| **Gasket:** | Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid |
| **Certificate label:** | Adhesive affixed to external surface |
| **Screws, bolts and nuts:** | Stainless steel |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Resistenza alla corrosione:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

The **SPYN series** plugs can also be used with industrial solder type sockets. This possibility is also designed to allow the user to keep a limited stock of spare parts. In fact, the position of the phase and earth pins, together with the coloured lock rings which comply with the colour code required by IEC/EN 60309-2 for industrial sockets and plugs, identify them according to the power supply voltage and current used.

For a better understanding, we have included the earth pin (PE) positioning drawing and relative colours, in compliance with IEC/EN 60309-2, for voltages greater than 50V.




PIN POSITION

The hour position h is determined with the socket viewed from the front, observing the position of the earth contact in relation to the main reference point always positioned at 6 o'clock.

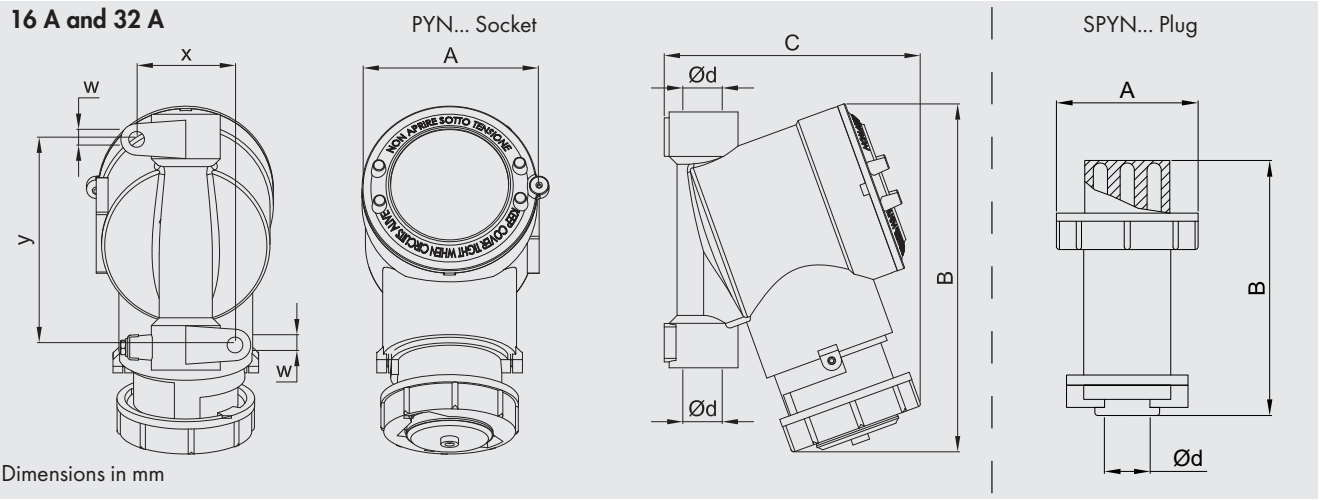
The different rated voltages are also given different colour-coded conventions.

## ELECTRICAL FEATURES

**Rated voltage:** Max. 690 V
**Rated frequency:** Max. 50/60 Hz
**Rated current:** 16 A, 32 A, 63 A and 125 A
**Cable entry:** no. 2 on the socket and no. 1 on the plug
**Max. cable cross-section:** for 16A: 4 mm² for 63 A: 10 - 16 mm²
for 32A: 6 mm² for 125 A: 35 - 50 mm²

## DIMENSIONAL DRAWING

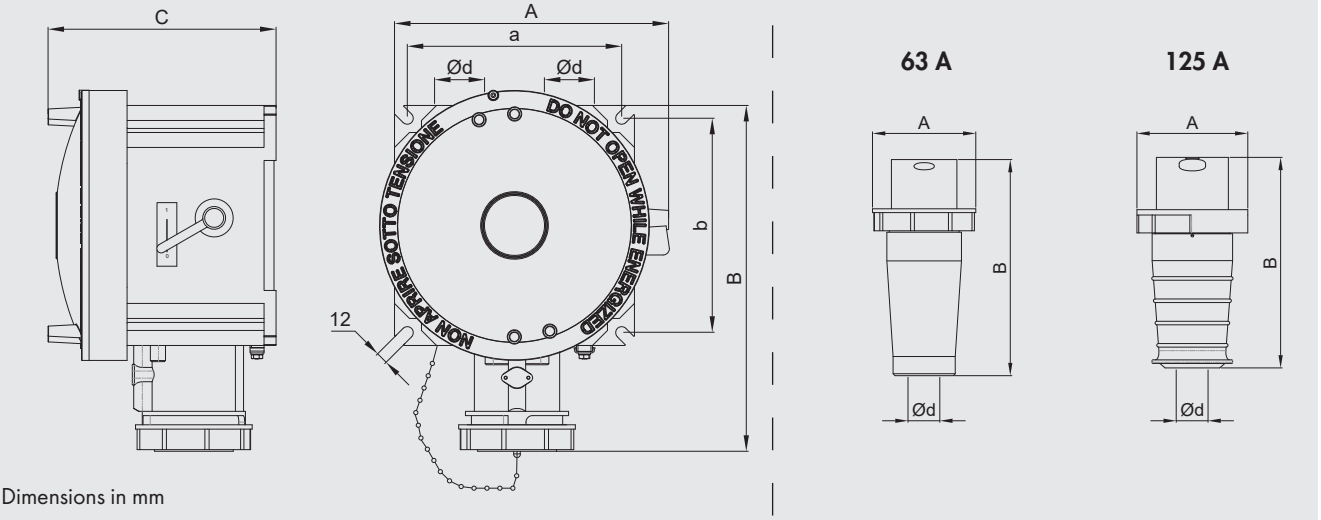
**16 A and 32 A**




Dimensions in mm

| MODEL | DIMENSIONS (mm) | | | | | | | WEIGHT (kg) |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | y | x | w | Ø d | |
| PYN..16.. | Ø 90 | 165 | 135 | 104 | 50 | 8 | 3/4" NPT | 1.7 |
| PYN..32.. | Ø 120 | 240 | 175 | 140 | 80 | 8 | 1" NPT | 2.1 |
| SPYN..16.. | Ø 66 | 116 | - | - | - | - | 3/4" NPT | 0.3 |
| SPYN..32.. | Ø 92 | 145 | - | - | - | - | 1" NPT | 0.6 |

**63 A and 125 A**




Dimensions in mm

| MODEL | DIMENSIONS (mm) | | | | | | WEIGHT (kg) |
|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | Ø d | |
| PYN..63.. | 280 | 337 | 210 | 213 | 213 | 1 1/2" NPT | 11 |
| PYN..125.. | 280 | 345 | 210 | 213 | 213 | 1 1/2" NPT | 11,4 |
| SPYN..63.. | 108 | 226 | - | - | - | ISO M32x1,5 | 1,2 |
| SPYN..125.. | 124 | 235 | - | - | - | ISO M40x1,5 | 1,5 |

## CODE SELECTION TABLE

| RATED CURRENT | NUMBER OF POLES | FREQUENCY Hz | RATED VOLTAGE Vac | ARRANGEMENT | WEIGHT (kg) | SOCKET CODE | PLUG CODE |
|---|---|---|---|---|---|---|---|
| 16 A | 2P + ⏚ | 50 / 60 | 20 / 25 |  5h | 1.70 | **PYN216V** | **SPYN216V** |
| | 2P + ⏚ | 50 / 60 | 100 / 130 |  4h | 1.70 | **PYN216G** | **SPYN216G** |
| | 2P + ⏚ | 50 / 60 | 200 / 250 |  6h | 1.70 | **PYN216B** | **SPYN216B** |
| | 2P + ⏚ | 50 / 60 | >50 to 250Vdc |  3h | 1.70 | **PYN216GR** | **SPYN216GR** |
| | 2P + ⏚ | 50 / 60 | 380 / 415 |  9h | 1.70 | **PYN216R** | **SPYN216R** |
| | 2P + ⏚ | 50 / 60 | 480 / 500 |  7h | 1.70 | **PYN216N** | **SPYN216N** |
| | 3P + ⏚ | 50 / 60 | 20 / 25 |  5h | 1.70 | **PYN316V** | **SPYN316V** |
| | 3P + ⏚ | 50 / 60 | 200 / 250 |  9h | 1.70 | **PYN316B** | **SPYN316B** |
| | 3P + ⏚ | 50 / 60 | 100 / 130 |  4h | 1.70 | **PYN316G** | **SPYN316G** |
| | 3P + ⏚ | 50 / 60 | 380 / 415 |  6h | 1.70 | **PYN316R** | **SPYN316R** |
| 32 A | 2P + ⏚ | 50 / 60 | 200 / 250 |  6h | 2.10 | **PYN232B** | **SPYN232B** |
| | 2P + ⏚ | 50 / 60 | 100 / 130 |  4h | 2.10 | **PYN232G** | **SPYN232G** |
| | 2P + ⏚ | 50 / 60 | 380 / 415 |  9h | 2.10 | **PYN232R** | **SPYN232R** |

Features comply with CEI EN 60309-1/60309-2

## CODE SELECTION TABLE

| RATED CURRENT | NUMBER OF POLES | FREQUENCY Hz | RATED VOLTAGE Vac | ARRANGEMENT | WEIGHT (kg) | SOCKET CODE | PLUG CODE |
|---|---|---|---|---|---|---|---|
| 32 A | 2P + ⏚ | 50 / 60 | 20 / 25 |  5h | 2.10 | PYN232V | SPYN232V |
| | 3P + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | PYN332B | SPYN332B |
| | 3P + ⏚ | 50 / 60 | 100 / 130 |  4h | 2.10 | PYN332G | SPYN332G |
| | 3P + ⏚ | 50 / 60 | 500 |  7h | 2.10 | PYN332N | SPYN332N |
| | 3P + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | PYN332R | SPYN332R |
| | 3P + ⏚ | 50 / 60 | 440 |  11h | 2.10 | PYN332RR | SPYN332RR |
| | 3P + ⏚ | 50 / 60 | 20 / 25 |  5h | 2.10 | PYN332V | SPYN332V |
| | 3P + N + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | PYN432B | SPYN432B |
| | 3P + N + ⏚ | 50 / 60 | 100 / 130 |  4h | 2.10 | PYN432G | SPYN432G |
| | 3P + N + ⏚ | 50 / 60 | 500 |  7h | 2.10 | PYN432N | SPYN432N |
| | 3P + N + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | PYN432R | SPYN432R |
| | 3P + N + ⏚ | 50 / 60 | 440 |  11h | 2.10 | PYN432RR | SPYN432RR |

Features comply with CEI EN 60309-1/60309-2

## CODE SELECTION TABLE

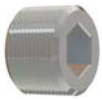
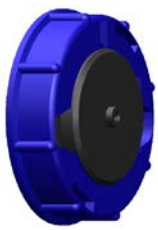
| RATED CURRENT | NUMBER OF POLES | FREQUENCY Hz | RATED VOLTAGE Vac | ARRANGEMENT | WEIGHT (kg) | SOCKET CODE | PLUG CODE |
|---|---|---|---|---|---|---|---|
| 63 A | 2P + ⏚ | 50 / 60 | 200 / 250 |  6h | 2.10 | **PYN263B** | **SPYN263B** |
| | 2P + ⏚ | 50 / 60 | 380 / 415 |  9h | 2.10 | **PYN263R** | **SPYN263R** |
| | 3P + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | **PYN363B** | **SPYN363B** |
| | 3P + ⏚ | 50 / 60 | 500 |  7h | 2.10 | **PYN363N** | **SPYN363N** |
| | 3P + ⏚ | 50 / 60 | 690 |  5h | 2.10 | **PYN363NN** | **SPYN363NN** |
| | 3P + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | **PYN363R** | **SPYN363R** |
| | 3P + ⏚ | 50 / 60 | 440 |  11h | 2.10 | **PYN363RR** | **SPYN363RR** |
| | 3P + N + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | **PYN463B** | **SPYN463B** |
| | 3P + N + ⏚ | 50 / 60 | 500 |  7h | 2.10 | **PYN463N** | **SPYN463N** |
| | 3P + N + ⏚ | 50 / 60 | 690 |  5h | 2.10 | **PYN463NN** | **SPYN463NN** |
| | 3P + N + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | **PYN463R** | **SPYN463R** |
| | 3P + N + ⏚ | 50 / 60 | 440 |  11h | 2.10 | **PYN463RR** | **SPYN463RR** |

Features comply with CEI EN 60309-1/60309-2

## CODE SELECTION TABLE

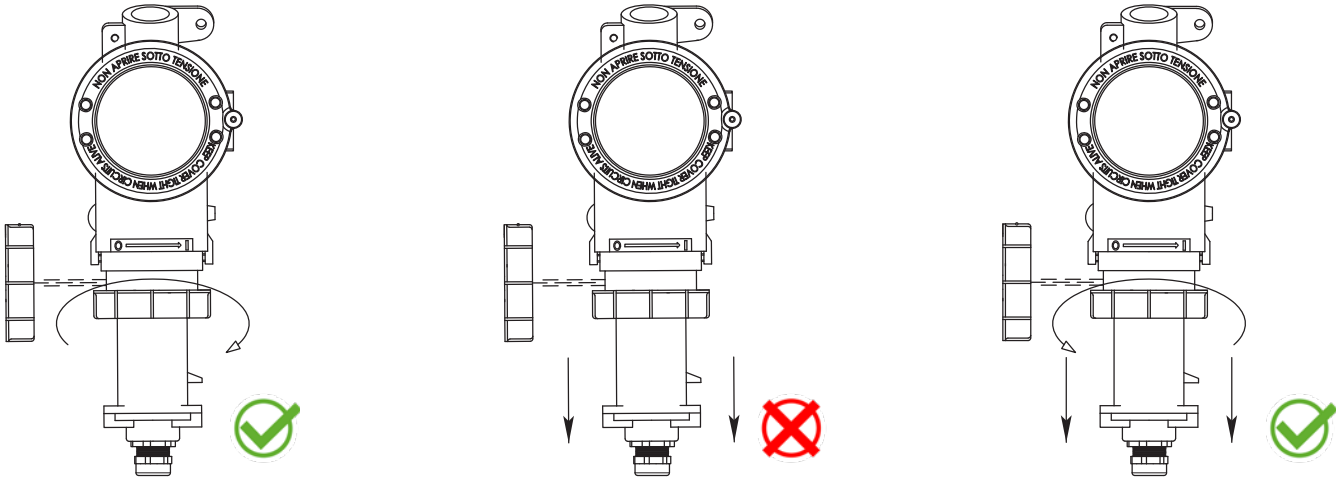
| RATED CURRENT | NUMBER OF POLES | FREQUENCY Hz | RATED VOLTAGE Vac | ARRANGEMENT | WEIGHT (kg) | SOCKET CODE | PLUG CODE |
|---|---|---|---|---|---|---|---|
| 125 A | 2P + ⏚ | 50 / 60 | 200 / 250 |  6h | 2.10 | **PYN2125B** | **SPYN2125B** |
| | 2P + ⏚ | 50 / 60 | 380 / 415 |  9h | 2.10 | **PYN2125R** | **SPYN2125R** |
| | 3P + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | **PYN3125B** | **SPYN3125B** |
| | 3P + ⏚ | 50 / 60 | 500 |  7h | 2.10 | **PYN3125N** | **SPYN3125N** |
| | 3P + ⏚ | 50 / 60 | 690 |  5h | 2.10 | **PYN3125NN** | **SPYN3125NN** |
| | 3P + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | **PYN3125R** | **SPYN3125R** |
| | 3P + ⏚ | 50 / 60 | 440 |  11h | 2.10 | **PYN3125RR** | **SPYN3125RR** |
| | 3P + N + ⏚ | 50 / 60 | 200 / 250 |  9h | 2.10 | **PYN4125B** | **SPYN4125B** |
| | 3P + N + ⏚ | 50 / 60 | 500 |  7h | 2.10 | **PYN4125N** | **SPYN4125N** |
| | 3P + N + ⏚ | 50 / 60 | 690 |  5h | 2.10 | **PYN4125NN** | **SPYN4125NN** |
| | 3P + N + ⏚ | 50 / 60 | 380 / 415 |  6h | 2.10 | **PYN4125R** | **SPYN4125R** |
| | 3P + N + ⏚ | 50 / 60 | 440 |  11h | 2.10 | **PYN4125RR** | **SPYN4125RR** |

Features comply with CEI EN 60309-1/60309-2

| ILLUSTRATION | DESCRIPTION | MODEL | FEATURES | CODE | LEGEND |
|---|---|---|---|---|---|
|  | Cable gland | 1 1/2" NPT<br>ISO M32<br>ISO M40 | Material:<br>nickel-plated brass | **NAV5SNB**<br>**NAV32IB**<br>**NAV40IB** | |
|  | Cap | 1 1/2" NPT<br>ISO M32<br>ISOM40 | Material:<br>nickel-plated brass | **PLG5NB**<br>**PLG3I**<br>**PLG4I** | |
|  | Coloured ring with bayonet connection | SPYN216... | The rated voltage or frequency of each plug is identified by its colour | **M16-523/1/...** | |
| | | SPYN316... | | **M16-751/1/...** | |
| | | SPYN232...<br>SPYN332... | | **M32-523/1/...** | |
| | | SPYN432... | | **M-766/1/...** | |
| | | SPYN263...<br>SPYN363...<br>SPYN463... | | **M-1014/...** | |
| | | SPYN2125...<br>SPYN3125...<br>SPYN4125... | | **M-1036/...** | |
|  | Coloured cap with bayonet connection and safety chain to prevent losing cap | PYN216... | The rated voltage or frequency of each plug is identified by its colour | **M-0384/1/...** | |
| | | PYN316... | | **M-0574/1/...** | |
| | | PYN232...<br>PYN332... | | **M-0385/1/...** | |
| | | PYN432... | | **M-0564/1/...** | |
| | | PYN263...<br>PYN363...<br>PYN463... | | **M-0681/...** | |
| | | PYN2125...<br>PYN3125...<br>PYN4125... | | **M-0682/...** | |

## SAFETY SYSTEM

The **16 A** and **32 A** sockets are equipped with an internal disconnect switch which, by turning the attached plug, closes/opens the contacts inside a special explosion-proof chamber, thus containing any explosions in the presence of gas. The electrical circuit is only connected after the SPYN series plug has been correctly inserted into its seat and it can only be removed once the electrical circuit has been disconnected.



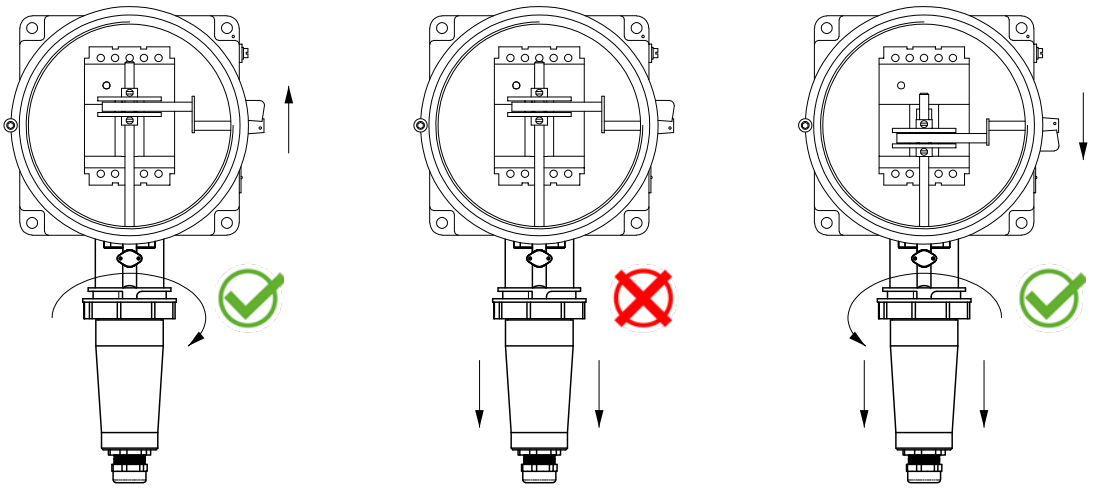

The plug cannot be removed from the socket if it has not first been turned anticlockwise to disconnect the internal electrical circuit.

The **63 A** and **125 A** sockets are equipped with a circuit breaker. Activating the switch via the external control handle triggers the closing/opening operations inside a special explosion-proof chamber, thus containing any explosions in the presence of gas. The electrical circuit is only connected after the SPYN series plug has been correctly inserted into its seat and it can only be removed once the electrical circuit has been disconnected.

Internal circuit breaker in "ON" position.

Internal circuit breaker in "ON" position.

Internal circuit breaker in "OFF" position.



The plug will not come out of the socket if the switch is in "ON" position (with the control handle facing upwards).

# YFC

## Limit switch

- Group IIC
- Zone 1, 2, 21, 22
- Aluminium alloy
- Easy installation, wiring and maintenance
- Durable and safe over time

# YFC Series Limit switch

YFC Series explosion-proof limit switches feature an actuator linked mechanically to the contacts. The series includes both position switches and switches for safety applications. They are available in ten basic versions, depending on the type of actuator used, or sixty versions, if snap-action or slow-action contacts are considered.
Thanks to the combination of various types of actuators, bodies and contacts, YFC limit switches are ideal for a wide range of applications and for seamless system operation.
Being corrosion- and vibration-resistant, their mechanical and electrical components are able to withstand the extreme mechanical and thermal stresses they are continuously subjected to. Designed for installation in potentially explosive atmospheres, in the presence of combustible gases (hydrogen and acetylene), vapour, mist and powders, zones 1 and 21, 2 and 22, they are also used in watertight industrial and civil applications.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**

Petroleum refineries | Chemical and petrochemical facilities | Onshore facilities | Offshore facilities | Petroleum loading/ unloading pontoons | Agribusiness facilities | Fuel storage facilities | 100% produced by Cortem

## CERTIFICATION DATA

| | | | | | |
|---|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | | |
| **Marking:** | CE 0722 Ex II 2 GD Ex d IIC T6 Ex d tD A21 T85°C IP66/67 | | | | |
| **Certificate:** | ATEX SIRA 07 ATEX 1316 | | | | |
| | IEC Ex IECEx SIR 07.0104 | For all IEC Ex and TR CU certification data, download the certificate from www.cortemgroup.com | | | |
| | TR CU AVAILABLE | | | | |
| **Standard:** | CENELEC EN 60079-0: 2006, EN 60079-1: 2004, EN 61241-0: 2006, EN 61241-1: 2004 and European Directive 2014/34/EU.<br>IEC 60079-0: 2004, IEC 60079-1: 2003, IEC 61241-0: 2004, IEC 61241-1: 2004<br>RoHS Directive 2002/95/EC. | | | | |
| **Temperature class:** | 85°C (T6) | | | | |
| **Ambient Temp.:** | -20°C +55°C | | | | |
| **Degree of protection:** | IP66/67 | | | | |

# YFC Series Limit switch

## MECHANICAL FEATURES

| | |
|---|---|
| **Body:** | Low copper content aluminium alloy, complete with wall fastening lugs |
| **Gaskets:** | Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the cover |
| **Certification label:** | Adhesive affixed to external surface |
| **Screws:** | Stainless steel |
| **Earth screw:** | Internal and external stainless steel |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Entry points:** | One entry point ISO M20x1.5 |
| **Mounting positions:** | All positions |
| **Consistency (measured following a million operations):** | 0.05 mm (at the point of closure) |
| **Minimum control speed:** | 0.06 m/s slow action<br>0.001 m/s snap action |
| **Corrosion Resistance:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test) |

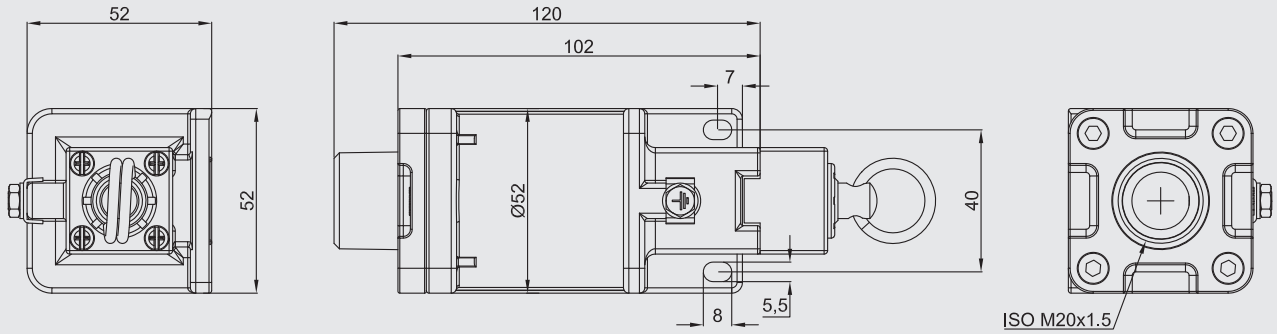
## ELECTRICAL FEATURES

| | |
|---|---|
| **Rated voltage:** | max. 500 Vac, 250 Vdc |
| **Rated frequency:** | max. 50/60 Hz |
| **Rated current:** | 24 Vac - 50/60 Hz: 10 A<br>120 Vac - 50/60 Hz: 6 A<br>230 Vac - 50/60 Hz: 3.1<br>240 Vac - 50/60 Hz: 3.1 A<br>400 Vac - 50/60 Hz: 1.8 A<br>24 Vdc: 2.8 A<br>125 Vdc: 0.55 A<br>250 Vdc: 0.27 A |
| **Connecting cable cross-section:** | 0.75 ... 2.5 $mm^2$ |

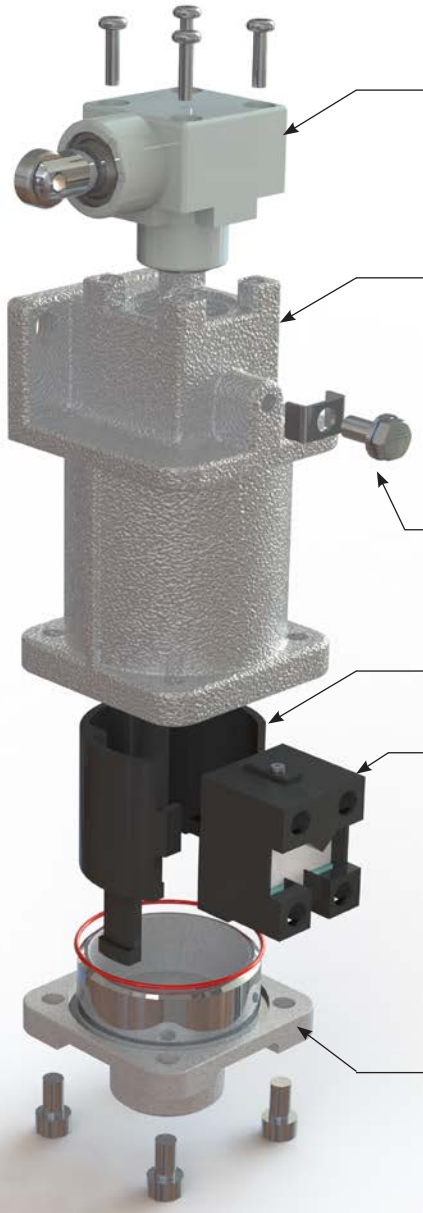
## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

Cable gland

## DIMENSIONAL DRAWING




Dimensions in mm



**Range of operating heads:**
- plain plunger
- roller plunger
- roller lever, fixed or adjustable

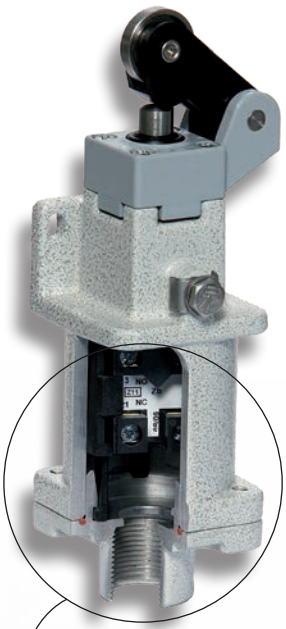
**Limit switch body:**
- aluminium
- RAL7035 coating
- fasten with two M5 screws

**M5 external earth screw**

**Contacts bracket**

**Contact block:**
- contacts configuration 1N.O.+1N.C., 2N.O., 2N.C.
- positive opening operation
- slow or snap action
- the two contacts are electrically separated

**Limit switch cover**



Example of an electrical connection with internal contacts. An NAV20SIB cable gland is used.

## TERMINOLOGY

**Positive opening operation**

A control switch, with one or more break-contact elements, has a positive opening operation when the switch actuator (C) ensures the full opening of the contacts. For the part of travel that separates the contacts, there must be a positive zone with no resilient elements (e.g.: springs) between the moving contacts and the point where the actuator force is applied. The positive opening operation does not deal with N.O. contacts.
Control switches with positive opening operation may be provided with snap-action or slow-action contact elements. To use several contacts on the same control switch with positive opening operation, they must be electrically separated from each other; if not, only one contact may be used.

**Snap action**

Snap action contacts are characterised by a release position that is distinct from the operating position. The opening (or closure) of snap-action contacts is independent of the switch actuator speed and contributes to regular electric performance, even for slow switch actuator speeds.

**Slow action**

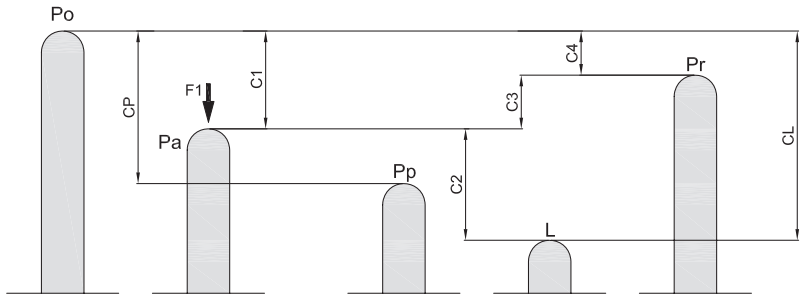
Slow-action contacts have a release position that is the same as the operating position. The switch actuator speed directly conditions the travel speed of contacts.

**Minimum actuation force / torque**

The minimum amount of force/torque that is to be applied to the switch actuator to produce a change in contact position.

**Minimum force/torque to achieve positive opening operation**

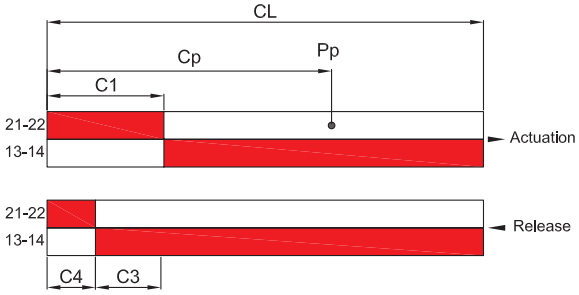
The minimum amount of force/torque that is to be applied to the switch actuator to ensure positive opening operation of the N.C. contact.



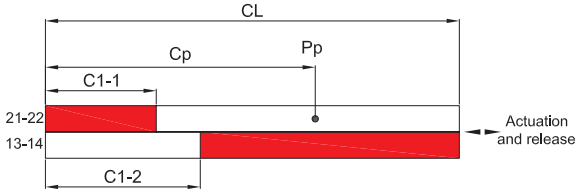

Measurements in mm

Measurements in degrees

**Travel for snap action contacts**




**Travel for non-overlapping slow-action contacts**




For slow-action contacts:
C3 = 0
C1-1 = pre-travel of contacts 21-22
C1-2 = pre-travel of contacts 13-14

**Po Free position**
Position of the switch actuator when no external force is exerted on it.

**Pa Operating position**
Position of the switch actuator, under the effect of force F1, when the contacts leave their initial free position.

**Pp Positive opening position**
Position of the switch actuator from which positive opening operation is ensured.

**L Max. travel position**
Maximum acceptable travel position of the switch actuator under the effect of a force F1.

**Pr Release position**
Position of the switch actuator when the contacts return to their initial free position.

**C1 Pre-travel**
Distance between the free position Po and the operating position Pa.

**Cp Positive opening travel**
Minimum travel of the switch actuator, from the free position Po, to ensure positive opening operation of the N.C. contacts.

**C2 Max. travel**
Distance between the operating position Pa and the max. travel position L.

**CL Max. travel**
Distance between the free position Po and the max. travel position L.

**C3 Differential travel (C1-C4)**
Travel difference between Pa and Pr.

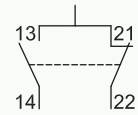
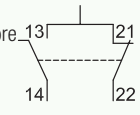
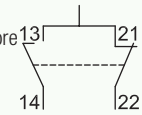
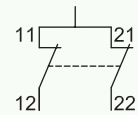
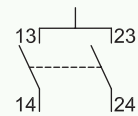
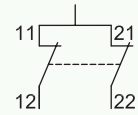
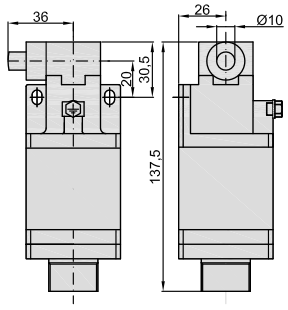
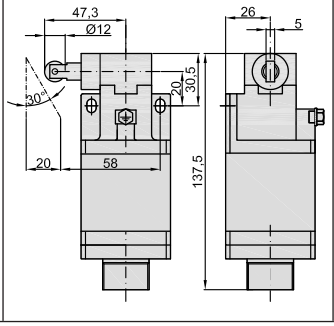
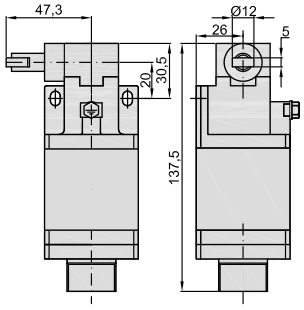
**C4 Release travel**
Distance between Pr and Po.

## Sample order code

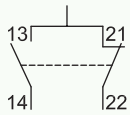
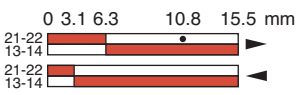
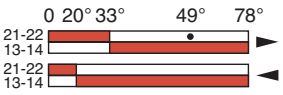
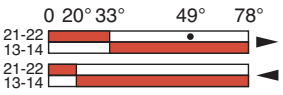
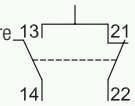
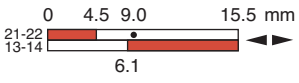
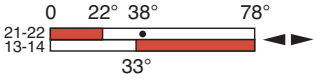
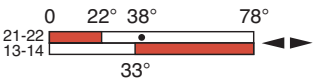
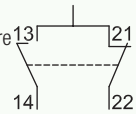
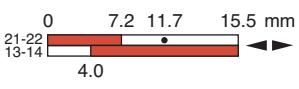
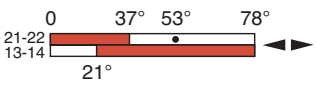
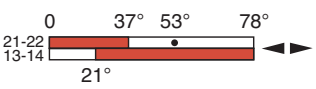
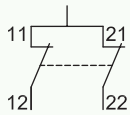
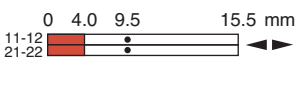
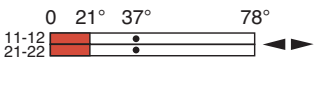
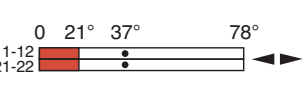
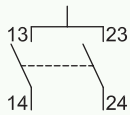
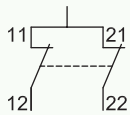
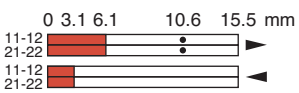
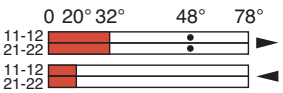
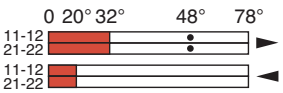
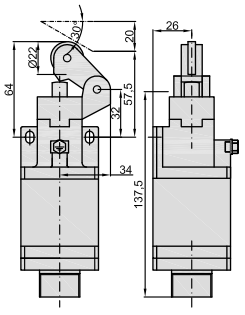
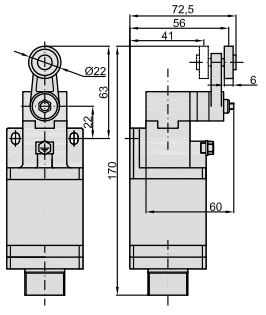
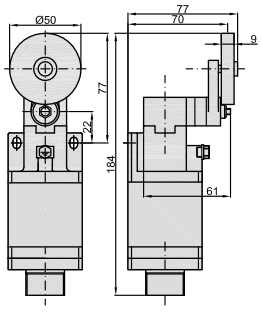
| YFC | - | E21 | Z11 |
|---|---|---|---|
| MODEL | | OPERATING HEAD TYPE | CONTACT TYPE |

Limit switch with stainless steel lateral plain plunger and snap-action contact (1N.O. + 1N.C.)

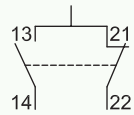
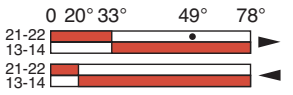
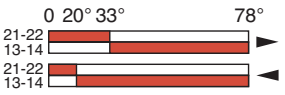
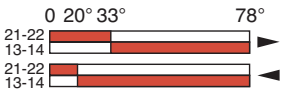
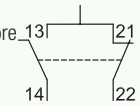
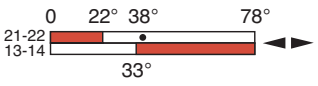
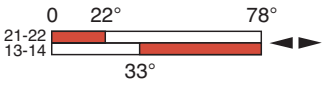
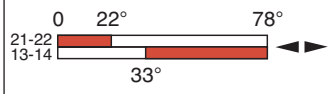
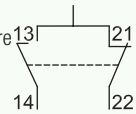
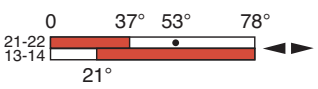
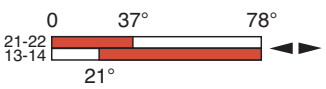
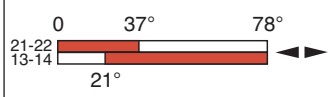
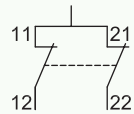
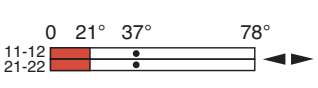
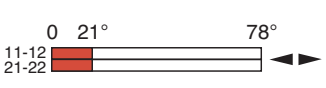
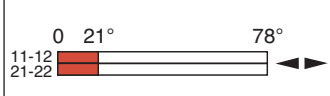
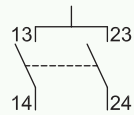
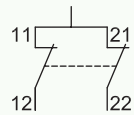
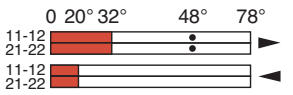
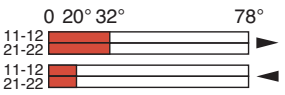
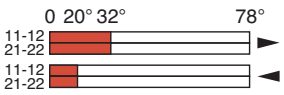
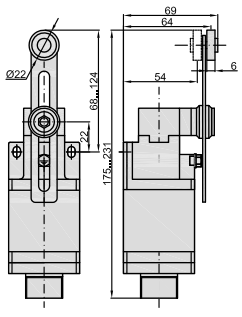
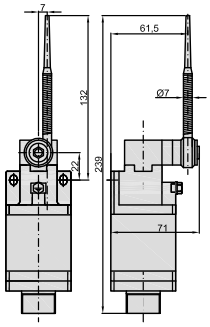
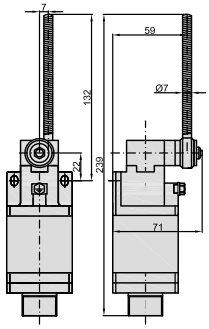
## CODE SELECTION TABLE

| OPERATING HEAD MODEL | E21<br>Stainless steel lateral plain plunger  | E22<br>Stainless steel lateral plunger with Ø12 vertical roller  | E23<br>Stainless steel lateral plunger with Ø12 horizontal roller  |
|---|---|---|---|
| Compliance / (positive opening operation N.C. contacts) | EN 50041 | EN 50041 | EN 50041 |
| Max. control speed [m/s] | 0.5 | 0.5 | 0.5 |
| Minimum actuation force [N] or torque [Nm] | 30 / 50 | 30 / 50 | 30 / 50 |
| **CONTACT TYPE** | | | |
| **Z11**<br>Snap-action contacts (1N.O.+1N.C.)  | YFC-E21Z11<br>0 2.0 3.2 4.8 6.0 mm<br>21-22 / 13-14<br>21-22 / 13-14 | YFC-E22Z11<br>0 3.7 5.9 8.8 10.2 mm<br>21-22 / 13-14<br>21-22 / 13-14 | YFC-E23Z11<br>0 3.7 5.9 8.8 10.2 mm<br>21-22 / 13-14<br>21-22 / 13-14 |
| **X11**<br>Slow action break before make (1N.O.+1N.C.)  | YFC-E21X11<br>0 2.3 3.9 6.0 mm<br>21-22 / 13-14<br>3.2 | YFC-E22X11<br>0 4.6 7.5 10.2 mm<br>21-22 / 13-14<br>6.0 | YFC-E23X11<br>0 4.6 7.5 10.2 mm<br>21-22 / 13-14<br>6.0 |
| **Y11**<br>Slow action make before break 1NO+1NC  | YFC-E21Y11<br>0 3.6 5.2 6.0 mm<br>21-22 / 13-14<br>2.2 | YFC-E22Y11<br>0 6.6 9.5 10.2 mm<br>21-22 / 13-14<br>4.3 | YFC-E23Y11<br>0 6.6 9.5 10.2 mm<br>21-22 / 13-14<br>4.3 |
| **W02**<br>Slow-action contacts (2N.C.)  | YFC-E21W02<br>0 2.2 3.8 6.0 mm<br>11-12 / 21-22 | YFC-E22W02<br>0 4.3 7.2 10.2 mm<br>11-12 / 21-22 | YFC-E23W02<br>0 4.3 7.2 10.2 mm<br>11-12 / 21-22 |
| **W20**<br>Slow-action contacts (2N.O.)  | YFC-E21W20<br>0 2.1 6.0 mm<br>13-14 / 23-24 | YFC-E22W20<br>0 4.1 10.2 mm<br>13-14 / 23-24 | YFC-E23W20<br>0 4.1 10.2 mm<br>13-14 / 23-24 |
| **Z02**<br>Snap action (2N.C.)  | YFC-E21Z02<br>0 2.0 3.1 4.7 6.0 mm<br>11-12 / 21-22<br>11-12 / 21-22 | YFC-E22Z02<br>0 3.7 5.7 8.6 10.2 mm<br>11-12 / 21-22<br>11-12 / 21-22 | YFC-E23Z02<br>0 3.7 5.7 8.6 10.2 mm<br>11-12 / 21-22<br>11-12 / 21-22 |
| **DIMENSIONS (mm)** |  |  |  |

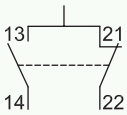
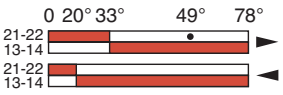
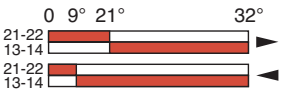
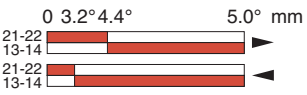
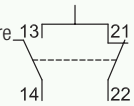
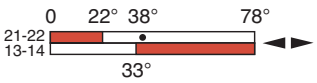
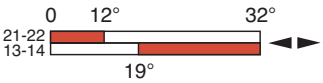
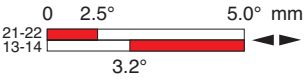
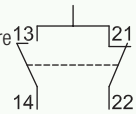
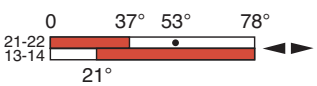
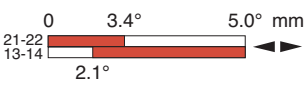
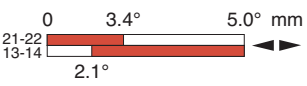
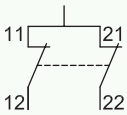
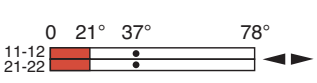
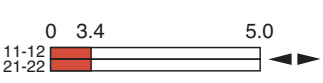
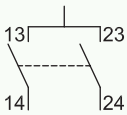
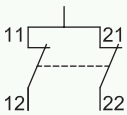
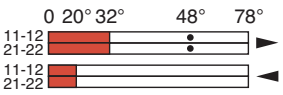
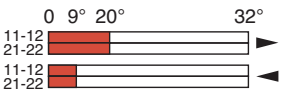
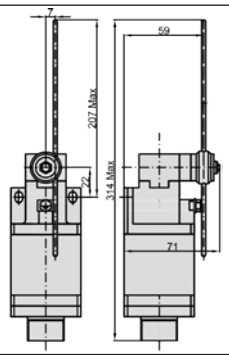
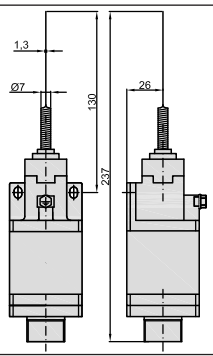
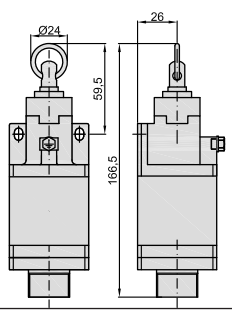
## CODE SELECTION TABLE

| OPERATING HEAD MODEL | **E3..**<br>One way lever Ø22<br>**E31**: nylon roller<br>**E32**: stainless steel roller<br>**E33**: steel bearing  | **E4..**<br>Lever with Ø22 roller<br>**E41**: nylon roller<br>**E42**: stainless steel roller<br>**E43**: steel bearing  | **E44**<br>Lever with Ø50 rubber roller  |
|---|---|---|---|
| Compliance / (positive opening operation N.C. contacts) | EN 50041 | EN 50041 | EN 50041 |
| Max. control speed [m/s] | 1.5 | 1.5 | 1.5 |
| Minimum actuation force [N] or torque [Nm] | 12 / 40 | 0.15 / 0.30 | 0.15 / 0.30 |
| **CONTACT TYPE** | | | |
| **Z11**<br>Snap-action contacts (1N.O.+1N.C.)  | YFC-E3.Z11  | YFC-E4.Z11  | YFC-E4.Z11  |
| **X11**<br>Slow action break before make (1N.O.+1N.C.)  | YFC-E3.X11  | YFC-E4.X11  | YFC-E4.X11  |
| **Y11**<br>Slow action make before break 1NO+1NC  | YFC-E3.Y11  | YFC-E4.Y11  | YFC-E4.Y11  |
| **W02**<br>Slow-action contacts (2N.C.)  | YFC-E3.W02  | YFC-E4.W02  | YFC-E4.W02  |
| **W20**<br>Slow-action contacts (2N.O.)  | YFC-E3.W20  | YFC-E22W20  | YFC-E4.W20  |
| **Z02**<br>Snap action (2N.C.)  | YFC-E3.Z02  | YFC-E4.Z02  | YFC-E4.Z02  |
| **DIMENSIONS (mm)** |  |  |  |

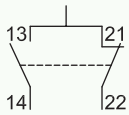
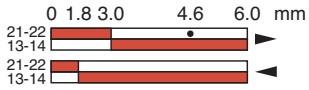
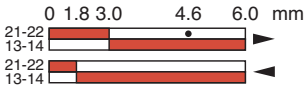
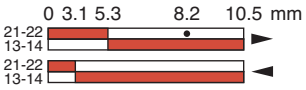
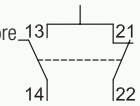
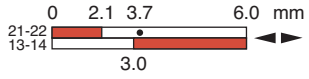
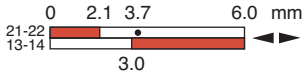
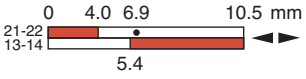
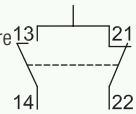
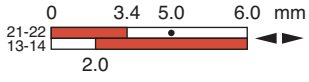
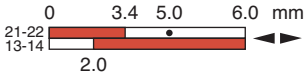
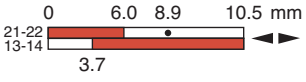
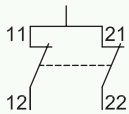
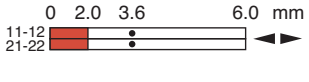
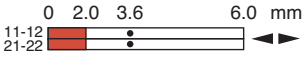
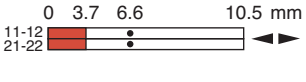
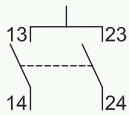
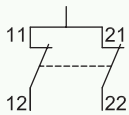
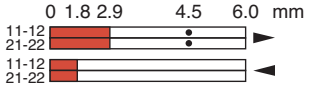
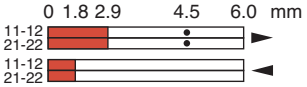
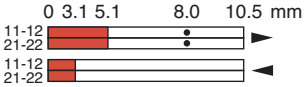
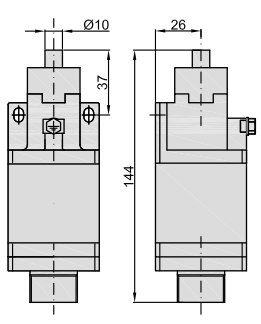
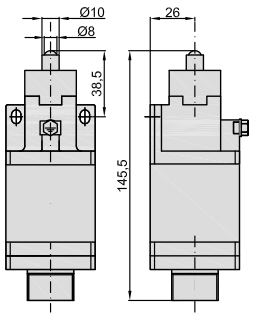
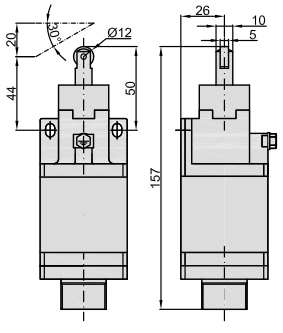
## CODE SELECTION TABLE

| **OPERATING HEAD MODEL** | **E5.**.<br>One way lever Ø22<br>**E51**: nylon roller<br>**E52**: stainless steel roller<br>**E53**: steel bearing  | **E61**<br>Nylon actuator with a stainless steel spring  | **E62**<br>Stainless steel spring actuator  |
|---|---|---|---|
| Compliance / (positive opening operation N.C. contacts) | EN 50041 | EN 50041 | EN 50041 |
| Max. control speed [m/s] | 1.5 | 1.5 | 1.5 |
| Minimum actuation force [N] or torque [Nm] | 0.15 / 0.30 | 0.15 / - | 0.15 / - |
| **CONTACT TYPE** | | | |
| **Z11**<br>Snap-action contacts (1N.O.+1N.C.)  | YFC-E5.Z11  | YFC-E61Z11  | YFC-E62Z11  |
| **X11**<br>Slow action break before make (1N.O.+1N.C.)  | YFC-E5.X11  | YFC-E61X11  | YFC-E62X11  |
| **Y11**<br>Slow action make before break 1NO+1NC  | YFC-E5.Y11  | YFC-E61Y11  | YFC-E62Y11  |
| **W02**<br>Slow-action contacts (2N.C.)  | YFC-E3.W02  | YFC-E61W02  | YFC-E62W02  |
| **W20**<br>Slow-action contacts (2N.O.)  | YFC-E5.W20  | YFC-E61W20  | YFC-E62W20  |
| **Z02**<br>Snap action (2N.C.)  | YFC-E5.Z02  | YFC-E61Z02  | YFC-E62Z02  |
| **DIMENSIONS (mm)** |  |  |  |

## CODE SELECTION TABLE

| OPERATING HEAD MODEL | **E7..**<br>Adjustable rod lever<br>**E71**: stainless steel rod Ø3<br>**E72**: nylon rod Ø6<br>**E73**: fibreglass rod Ø3<br>**E75**: metal rod 3x3  | **E91**<br>Multi-directional stainless steel spring actuator  | **E99**<br>Pull action with ring  |
|---|---|---|---|
| Compliance / (positive opening operation N.C. contacts) | EN 50041 | EN 50041 | EN 50041 |
| Max. control speed [m/s] | 1.5 | 1 | 0.5 |
| Minimum actuation force [N] or torque [Nm] | 0.15 / 0.30 | 0.18 / - | 25 / - |
| **CONTACT TYPE** | | | |
| **Z11**<br>Snap-action contacts (1N.O.+1N.C.)  | YFC-E7.Z11  | YFC-E91Z11  | YFC-E99Z11  |
| **X11**<br>Slow action break before make (1N.O.+1N.C.)  | YFC-E7.X11  | YFC-E91X11  | YFC-E99X11  |
| **Y11**<br>Slow action make before break 1NO+1NC  | YFC-E7.Y11  | YFC-E91Y11  | YFC-E99Y11  |
| **W02**<br>Slow-action contacts (2N.C.)  | YFC-E7.W02  | YFC-E91W02  | YFC-E99W02  |
| **W20**<br>Slow-action contacts (2N.O.)  | YFC-E7.W20  | YFC-E91W20  | YFC-E99W20  |
| **Z02**<br>Snap action (2N.C.)  | YFC-E7.Z02  | YFC-E91Z02  | |
| **DIMENSIONS (mm)** |  |  |  |

## CODE SELECTION TABLE

| OPERATING HEAD MODEL | E11 | E12 Stainless steel ball plunger | E13 Stainless steel roller plunger Ø12 |
|---|---|---|---|
| |  |  |  |
| Compliance / (positive opening operation N.C. contacts) | EN 50041 | EN 50041 | EN 50041 |
| Max. control speed [m/s] | 0.5 | 0.5 | 0.5 |
| Minimum actuation force or torque | 30 / 45 | 30 / 45 | 22 / 40 |
| **CONTACT TYPE** | | | |
| **Z11** Snap-action contacts (1N.O.+1N.C.)  | YFC-E11Z11  | YFC-E12Z11  | YFC-E13Z11  |
| **X11** Slow action break before make (1N.O.+1N.C.)  | YFC-E11X11  | YFC-E61X11  | YFC-E13X11  |
| **Y11** Slow action make before break 1NO+1NC  | YFC-E11Y11  | YFC-E61Y11  | YFC-E13Y11  |
| **W02** Slow-action contacts (2N.C.)  | YFC-E11W02  | YFC-E61W02  | YFC-E13W02  |
| **W20** Slow-action contacts (2N.O.)  | YFC-E11W20  | YFC-E61W20  | YFC-E13W20  |
| **Z02** Snap action (2N.C.)  | YFC-E11Z02  | YFC-E61Z02  | YFC-E13Z02  |
| **DIMENSIONS (mm)** |  |  |  |

# GRDC-4200

## Electronic capacitive earthing system 'Ex eb / tb'

- Zone 1, 2, 21, 22
- High quality electronic components
- Aluminium or polyester casing
- High resistance to corrosion and extreme weather
- Safe and reliable over time
- Marking with one or two earthing pliers




CORTEM GROUP®

# GRDC-4200 Capacitive electronic earthing system 'Ex eb / tb'

The GRDC-4200 is a capacitive-type electronic earthing system that ensures earthing of tankers, rail tankers and IBCs (intermediate bulk containers) when transporting flammable liquids such as fuels, chemicals, powders and granulates.
The system analyses the overall capacitance of the vehicle, to provide consent for load activation, only in the case of actual connection. Thanks to the electrical capacitance reading of the connected device, the GRDC-4200 can distinguish whether it has been connected to the tank or to another metal object (pipe, ladder, etc.), thereby increasing the level of reliability and safety and preventing possible misuse by the operator.
During the whole loading and unloading phase, the device checks that the earthing system remains equipotential via the connection of earthing pliers.
The GRDC-4200 consists of a Cortem Ex eb/tb casing containing ATEX/IECEx-certified earthing control logic, Cortem Ex eb/tb control and signalling devices such as selector switches and LED indicators, and one or more earthing pliers for connecting to tankers or other metal parts.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**

Petroleum refineries | Chemical and petrochemical facilities | Onshore facilities | Offshore facilities | Petroleum loading/ unloading pontoons | Agribusiness facilities | Fuel storage facilities | 100% produced by Cortem

## CERTIFICATE DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2GD - Ex db eb mb [ia Ga] IIC T... Gb - Ex tb [ia Da] IIIC T...°C Db | | | |
| **Certificate:** | ATEX CML 20 ATEX 3235X | | | |
| | IEC Ex IECEx CML 20.0144X | For all IEC Ex, UKEX certificate data, download the certificate from www.cortemgroup.com | | |
| | UKEX AVAILABLE | | | |
| **Standards:** | CENELEC EN 60079-0: 2018, EN 60079-1: 2014, EN 60079-7: 2015+A1:2018, EN 60079-11: 2012, EN 60079-18: 2015+A1:2017, EN 60079-31: 2014, EN 60529: 1991 and European Directive 2014/34/EU. IEC 60079-0: 2017, IEC 60079-1: 2014-06, IEC 60079-7: 2015, IEC 60079-11: 2011, IEC 60079-18: 2017, IEC 60079-31: 2013, IEC 60529: 2001. RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | 85°C (T6) | 85°C (T5) | 85°C (T4) | |
| **Ambient temperature:** | -40°C +40°C | -40°C +50°C | -40°C +60°C | |
| **Degree of protection:** | IP66 | | | |

# GRDC-4200 Capacitive electronic earthing system 'Ex eb / tb'

**GRDC-4200..**

**GRDC-4200..P ..**

## MECHANICAL FEATURES

***GRDC-4200..***

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy |
| **Resistant to knocks:** | IK10 |
| **Gasket:** | Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid |
| **Inputs:** | ISO M20 |
| **Certificate label:** | Adhesive |
| **Screws, bolts and nuts:** | Stainless steel, captive type |
| **Earthing screw:** | Stainless steel. Inside and outside the body, complete with anti-rotation brackets |
| **Mounting:** | Cast aluminium feet for M6 screws |
| **Coating:** | Polyester RAL 7035 (Light grey) |

**Resistenza alla corrosione**: The STANDARD of the aluminium alloy used by Cortem has passed the tests required by the Standard EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test)

***GRDC-4200..P..***

| | |
|---|---|
| **Body and lid:** | Black polyester resin with antistatic properties |
| **Resistant to knocks:** | IK10 |
| **Gasket:** | Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid |
| **Mounting:** | Polyester feet for M6 screws |
| **Certificate label:** | Adhesive |
| **Screws, bolts and nuts:** | Stainless steel, captive type |
| **Inputs:** | ISO M20 |

| | |
|---|---|
| **Pliers:** | Bipolar, casting with aluminium with handles in neoprene, jaws with steel tips, auto-releasing. 16 mm opening. |
| **Spiral cable:** | Yellow with trim in rubber resistant to oil and chemical substances. Suitable for extremely high mechanical stresses. Length 8 m (extended). |
| **Bracket for pliers:** | In stainless steel. |
| **Selector switch:** | In aluminium with black anodic oxidation. |
| **Indicator light:** | Green polycarbonate. |

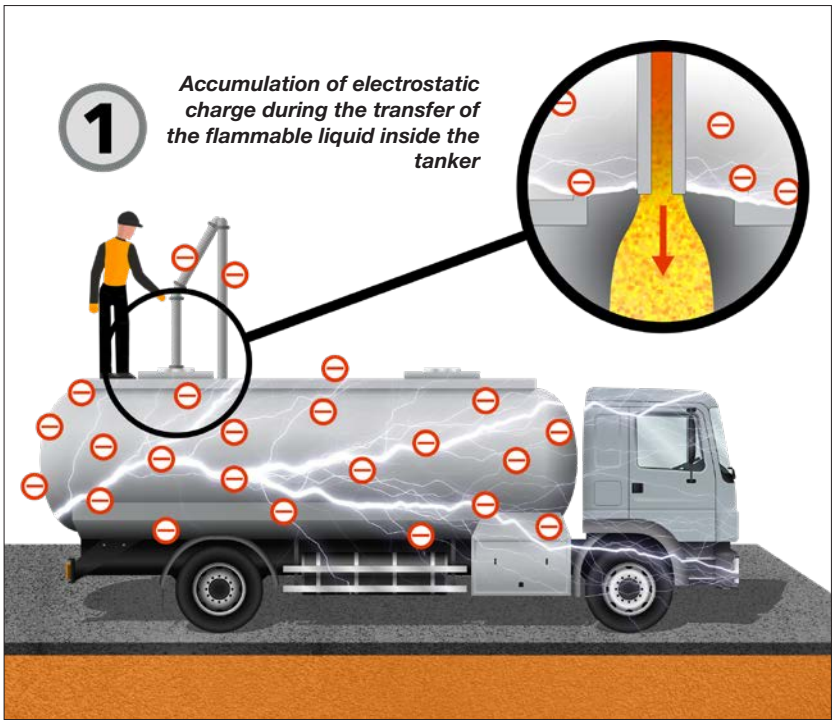
## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

Cable gland
Body and lid in stainless steel AISI 316L

# Operation of the capacitive earthing system in Ex environments

The GRDC earthing system is designed to prevent the accumulation of electrostatic charges generated during loading and unloading from transport vehicles containing flammable and explosive liquid (e.g. fuels) or solid (e.g. coal, flour) products.

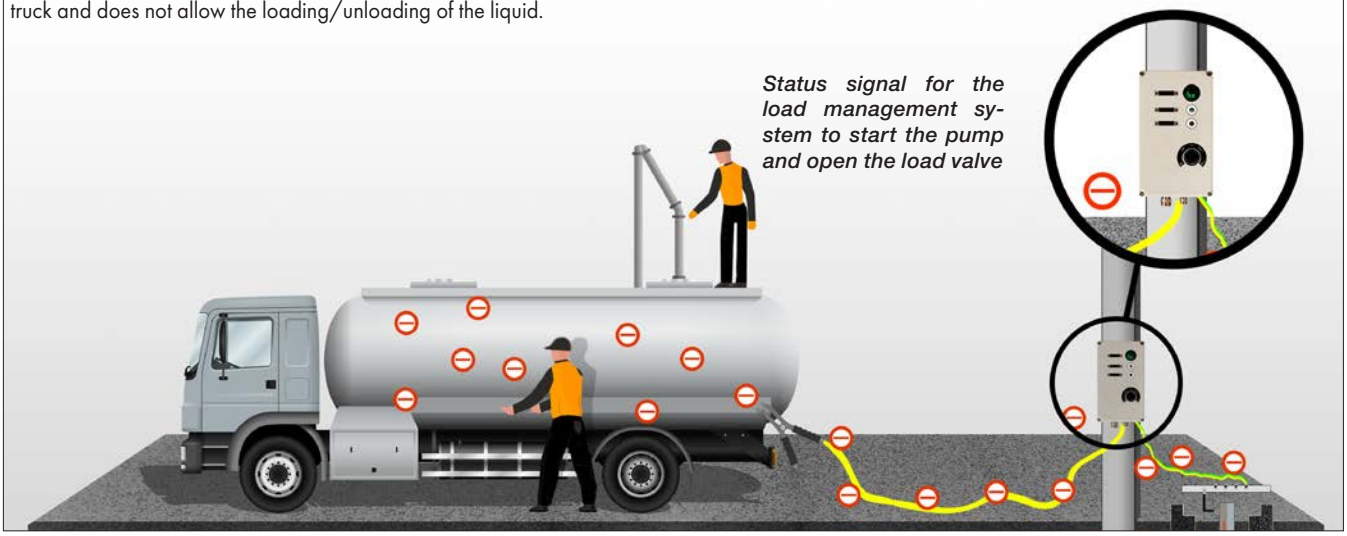
An earthing connection between the tanker truck and the earthing network of the system is not enough to prevent the generation of sparks. A series of safety measures must be taken to connect the two systems safely, ensuring the safety of people and the protection of property. These systems are commonly referred to as "earthing systems" and operate on the principle of equipotential bonding of metallic conducting and semiconducting objects present during loading or unloading of potentially explosive products.




This system, known as a capacitive earthing system, differs from the resistive type system (Cortem Product code GRDE) in terms of its ability to distinguish a tanker from a simple metal component (e.g. a tank cage, a container). This is necessary in order to ensure maximum safety, also in the event of a possible error or misuse by the operator who, by connecting the pliers to a simple metal part, can obtain consent from the resistive-type earthing system causing them to proceed with unsafe loading/unloading operations.

In fact, a resistive earthing system only checks that the pliers are connected to a component with good conductivity (low resistance) and that the resistance between ground and the component connected to the earthing pliers is below a certain limit.

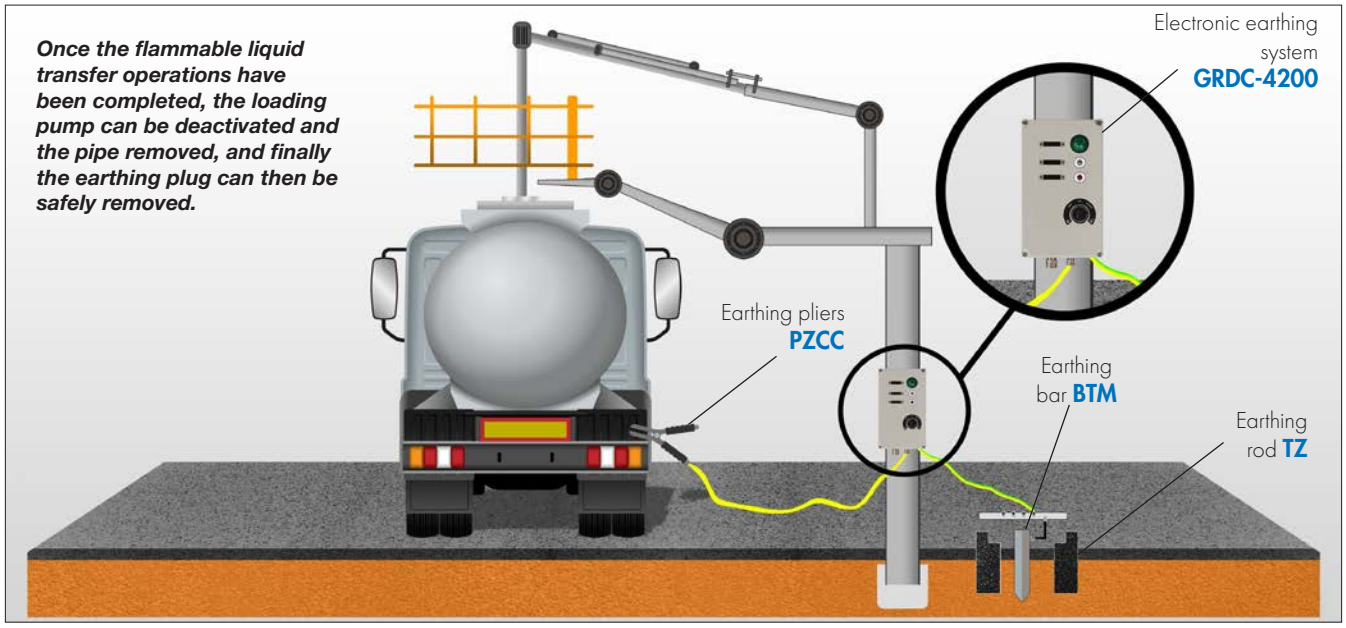
Therefore, with a capacitive earthing system, if an operator connects the pliers to a simple metal element it recognises that it is not connected to a tanker truck and does not allow the loading/unloading of the liquid.



# GRDC-4200 Capacitive electronic earthing system 'Ex eb / tb'

This system consists of a earthing control logic called PCBLCZ-4200 which, protected by the 'Ex mb' protection mode, not only monitors the parameters of the earth connection, but also has an intersectional safety barrier 'Ex ia' which ensures engagement of the pliers for safe earth connection.

Furthermore, thanks to this logic, in addition to enabling the connection to ground in order to remove electrostatic charges from the tanker truck, tanker, etc., the GRDC system can also be used to enable the switching on of the loading/unloading pump through the use of a double contact relay. This way, in the unfortunate event that the ground connection fails, the flammable liquid loading/unloading operation is immediately stopped in complete safety until the connection to ground is restored. The GRDC system can be supplied with one or two earthing pliers for simultaneous connection of several tankers.




## Operating guide

STEP 1

Switch on - Automatic check of the earth resistance connection

Set the selector switch from OFF to ON

- Positive result - yellow indicator light stops flashing after 5 seconds
- Negative result - continuous yellow indicator light flashes waiting for the earth connection to improve

STEP 2

Earthing pliers connection - Capacitive load control

After having connected the pliers to the tank:

- there is a capacitance to ground greater than the pre-set value, the white indicator light turns on giving the consent to STEP 3
- correct capacitive load to ground is not present (connect the pliers to a different metal object), white indicator light off, access to STEP 3 not permitted.

STEP 3

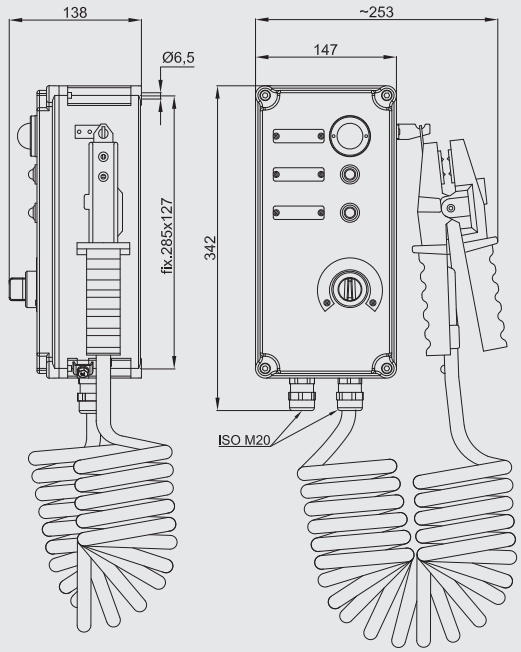
Electrostatic current discharge - Enabling or stopping the operation

- Once the correct earthing is verified, by turning and holding the switch in the START position for 2-3 seconds, the green indicator light turns on and the internal logic checks that the impedance value does not exceed 10Ω for the duration of the operation, thereby enabling or stopping the operation via a relay.

By-pass function

The GRDC earthing system has an integrated by-pass system, which in the event of critical conditions, e.g. rain, snow and excessive humidity, is still able to allow vehicle loading/unloading. In these cases, recognition of a tanker truck, for example, may not be reliable since the capacitive values can no longer be measured accurately. The by-pass consists of holding the selector switch on START for at least 10 seconds, thereby excluding the capacitive reading. If the pliers have been properly connected to a metal component, the green indicator light will come on giving consent for the operation.

## DIMENSIONAL DRAWING

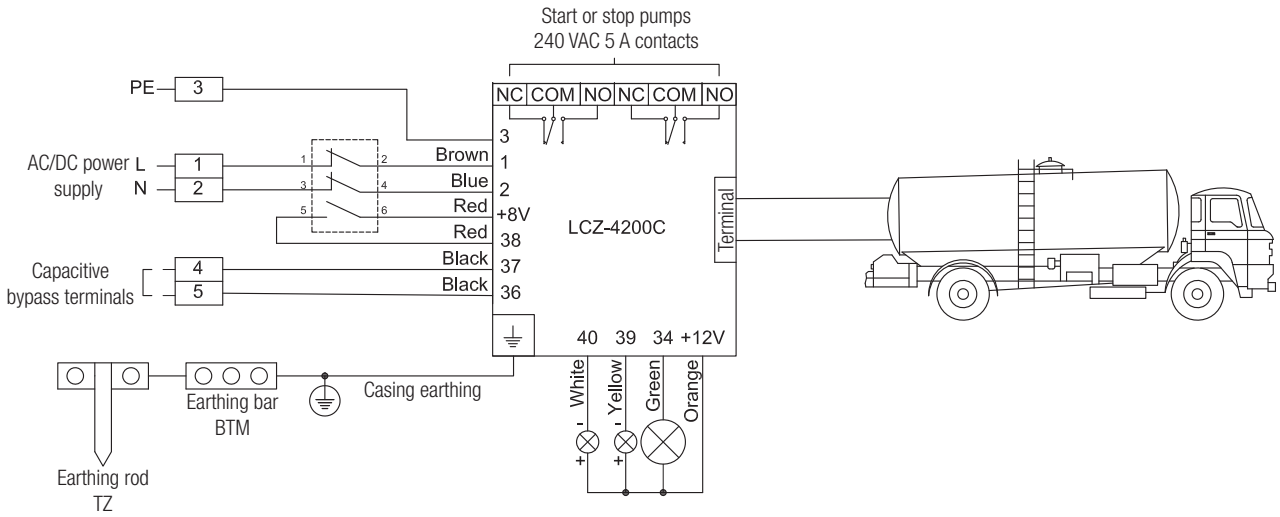



Dimensions in mm

## SELECTION TABLE

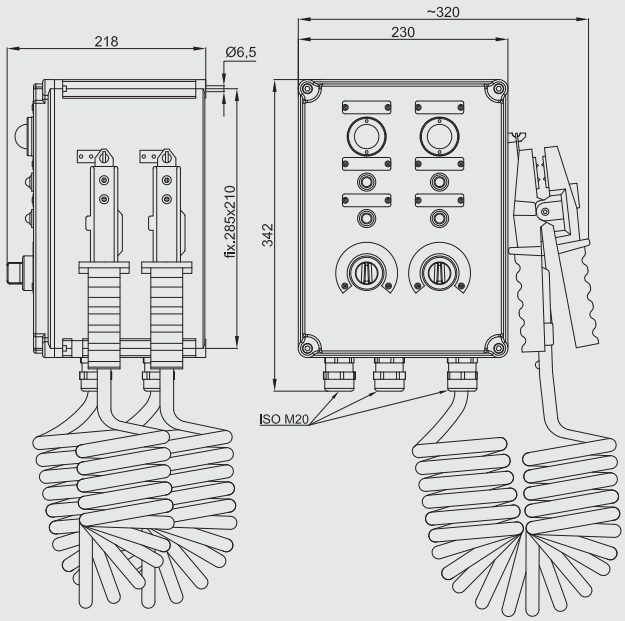
| Code | Housing material | Number of pliers | Power | Power supply | Rated frequency | Weight |
|---|---|---|---|---|---|---|
| **GRDC-4200** | Aluminium | One set of pliers | < 10W | 220-240 VAC | 50 - 60 Hz | 3.73 kg |
| **GRDC-4200-24** | | | | 12-24 VDC | 0 Hz | 3.73 kg |
| **GRDC-4200-110** | | | | 110 VAC | 50 - 60 Hz | 3.73 kg |
| **GRDC-4200-P** | Polyester | | | 220-240 VAC | 50 - 60 Hz | 3.28 kg |
| **GRDC-4200-P-24** | | | | 12-24 VDC | 0 Hz | 3.28 kg |
| **GRDC-4200-P-110** | | | | 110 VAC | 50 - 60 Hz | 3.28 kg |

## WIRING DIAGRAM



# GRDC-4200 Capacitive electronic earthing system 'Ex eb / tb'

## DIMENSIONAL DRAWING

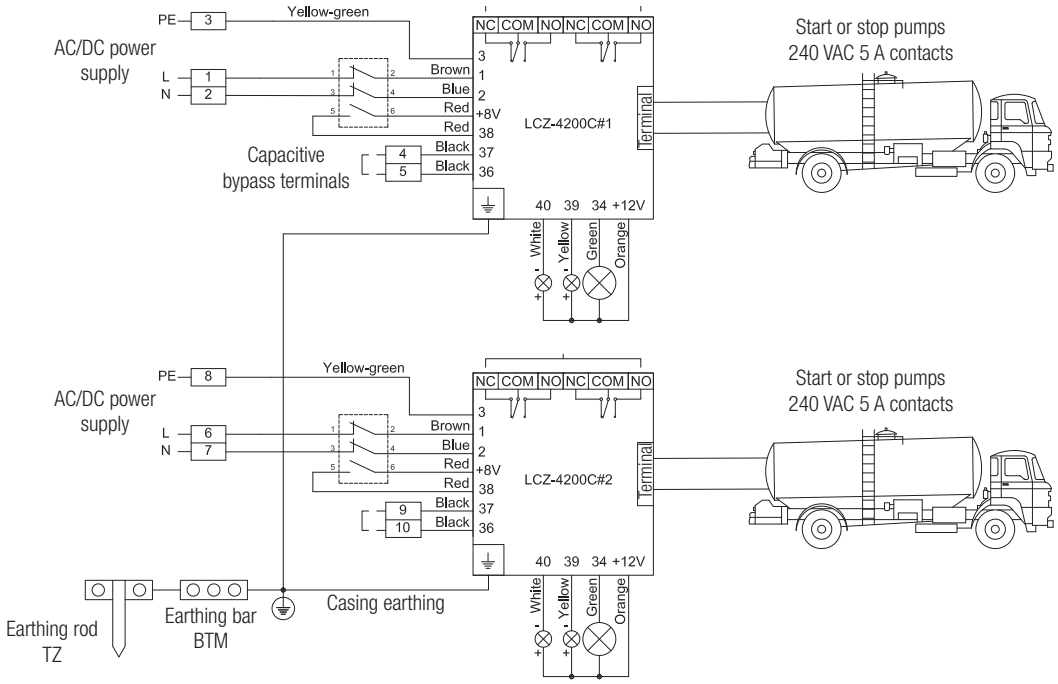



Dimensions in mm

## SELECTION TABLE

| Code | Housing material | Number of pliers | Power | Power supply | Rated frequency | Weight |
|---|---|---|---|---|---|---|
| **GRDC-4200-2** | Aluminium | Two pliers | < 20W | 220-240 VAC | 50 - 60 Hz | 6.93 kg |
| **GRDC-4200-2-24** | | | | 12-24 VDC | 0 Hz | 6.93 kg |
| **GRDC-4200-2-110** | | | | 110 VAC | 50 - 60 Hz | 6.93 kg |
| **GRDC-4200-2P** | Polyester | | | 220-240 VAC | 50 - 60 Hz | 6.13 kg |
| **GRDC-4200-2P-24** | | | | 12-24 VDC | 0 Hz | 6.13 kg |
| **GRDC-4200-2P-110** | | | | 110 VAC | 50 - 60 Hz | 6.13 kg |

## WIRING DIAGRAM



# GRDC-4200 Accessories upon request and spare parts

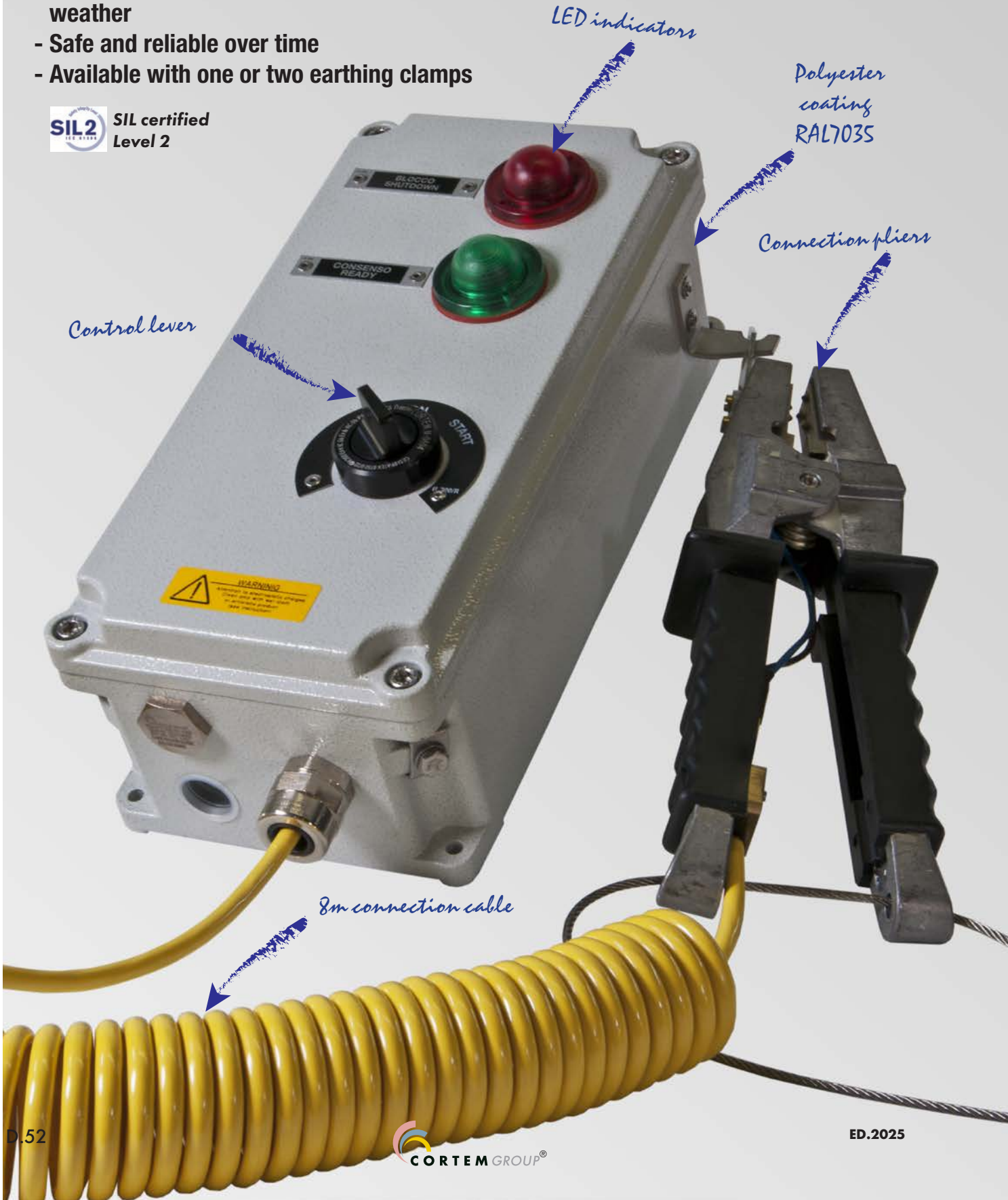
| ILLUSTRATION | DESCRIPTION | MODEL | CODE | LEGEND |
|---|---|---|---|---|
|  | Green 12 VAC/DC multi-LED indicator light | GRDC-.. | **M-0612/3V12** | RICAMBIO |
|  | Yellow multi-LED indicator light | GRDC-... | **M-0487/G** | RICAMBIO |
| | Colourless multi-LED indicator light | | **M-0487/I** | |
|  | Switch | GRDC... | **M-0604/3R** | RICAMBIO |
|  | Monitoring logic | GRDC-4200... | **LCZ-4200C** | RICAMBIO |
| | | GRDC-4200...24 | **LCZ-4200C/24** | |
| | | GRDC-4200...110 | **LCZ-4200C/110** | |
|  | Earthing pliers | GRDC... | **PZCC-4209** | RICAMBIO |
|  | Yellow cable<br>Length: 8 metres | GRDC... | **20CE063** | RICAMBIO |
|  | Cable gland<br>cable range 6.5 - 14 | GRDC... | **NAV20SIB** | ACCESSORIO RICAMBIO |

# GRDE-4200

## Electronic earthing system 'Ex eb / tb'

- Zone 1, 2, 21, 22
- High quality electronic components
- Aluminum or polyester junction box
- High resistance to corrosion and extreme weather
- Safe and reliable over time
- Available with one or two earthing clamps

SIL2 *SIL certified Level 2*






CORTEM GROUP®

# GRDE-4200 Electronic earthing system 'Ex eb / tb'

The GRDE-4200 electronic earthing system help to prevent fire and explosions in areas with hazardous levels of static electricity when trucks or trains load and unload liquids and dry materials.
During the entire loading and unloading phase, the device checks that the equipotentiality of the earthing system is maintained by using the connection of an earthing clamp.
In fact, the electronic system is equipped with a protection circuit that checks the resistance value and compares it to the set parameter and, if this value falls within the pre-set range, closes the electrical circuit between the two systems that are equipotential. Viceversa, it removes the operating consent from the loading pump and closes the loading valve.
The GRDE-4200 is composed by 'Ex eb/tb' Cortem enclosure, which contain the ATEX/IECEx certified grounding control logic LCZ-4200, and by Cortem 'Ex eb/ tb' control and signal devices such as selectors and alert LED lights. It can be provided with one or two earthing clamps for the connection to tank trucks or other metallic parts.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**


Petroleum refineries | Chemical and petrochemical facilities | Onshore facilities | Offshore facilities | Petroleum loading/unloading pontoons | Agribusiness facilities | Fuel storage facilities | 100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2GD - Ex db eb mb [ia Ga] IIC T.. Gb - Ex tb [ia Da] IIIC T..°C Da IP66 | | | |
| **Certificate:** | ATEX CML 20 ATEX 3235X | | | |
| | IEC Ex IECEx CML 20.0144X | For all IEC Ex, UKEX certification data, download the certificate from www.cortemgroup.com | | |
| | UKEX AVAILABLE | | | |
| **Standards:** | CENELEC EN 60079-0: 2018, EN 60079-1: 2014, EN 60079-7: 2015, EN 60079-11: 2012, EN 60079-18: 2015, EN 60079-31: 2014, EN 60529: 1991 and the European Directive 2014/34/UE. IEC 60079-0: 2017, IEC 60079-1: 2014-06 IEC 60079-7: 2015, IEC 60079-11: 2011, IEC 60079-18: 2017, IEC 60079-31: 2013, IEC 60529: 2001. RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | 85°C (T6) | 85°C (T5) | | |
| **Ambient Temperature:** | -40°C +50°C | -40°C +60°C | | |
| **Degree of protection:** | IP66 | | | |

# GRDE-4200 Electronic earthing system 'Ex eb / tb'

***GRDE-4200..***

***GRDE-4200..P ..***

## MECHANICAL FEATURES

***GRDE-4200..***

| | |
|---|---|
| **Body and lid:** | Low copper content aluminium alloy |
| **Impact protection rating:** | IK10 |
| **Gasket:** | Acid, hydrocarbon and high temperature-resistant silicone, located between body and lid |
| **Certification label:** | Aluminium plate riveted onto lid |
| **Bolts and screws:** | Stainless steel captive variety |
| **Earth screws:** | Stainless steel. On inside and outside of body complete with anti-rotation brackets |
| **Mounting:** | Cast aluminium feet for M6 screw |
| **Coating:** | Polyester RAL 7035 (Light grey) |
| **Corrosion Resistance:** | The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN 60068-2-30 (hot/humid cycles) and EN 60068-2-11 (salt mist tests) |

***GRDE-4200..P..***

| | |
|---|---|
| **Body and lid:** | Made from polyester resin in black with antistatic properties |
| **Impact protection rating:** | IK10 |
| **Gasket:** | Acid, hydrocarbon and high temperature-resistant silicone, located between body and lid |
| **Mounting:** | Polyester feet for M6 screws |
| **Certification label:** | Aluminium plate riveted into lid |
| **Bolts and screws:** | Stainless steel captive variety |

| | |
|---|---|
| **Plier:** | Bipolar, casting with aluminium with handles in neoprene, jaws with steel tips, auto-releasing. 16 mm opening. |
| **Spiral cable:** | Yellow with oil and chemical resistant rubber coating. Suitable for very high mechanical stresses. Length 8 meters (extended). |
| **Bracket for plier:** | In stainless steel. |
| **Selector lever:** | In aluminum with black anodic oxidation. |
| **Indicator light:** | In transparent colored polycarbonate. |

## SPECIAL REQUESTS

Cablegland
Model with body and lid in stainless steel AISI 316L

# The use of the grounding system in Ex environments

## Equipotential bonding of electrostatically charged metal masses

Everyone must have experienced an electrostatic shock at least once, on a cold, dry afternoon, when exiting a car and touching the door handle to close it. The static energy accumulated by being in a car isolated from the ground, discharges to the ground itself through our body when we come into contact with it if we are not isolated (wearing rubberised shoes).

Static electricity in the human body can reach 10-15 kV (kilovolts) and its discharge can reach 20-30 mJ (millijoules), which is well above the ignition limit of propane, gasoline vapours and fine dust particles.

In potentially explosive atmospheres, these phenomena occur while loading and/or unloading vehicles carrying flammable and explosive products. Hazardous environments that require an earthing system are, for example:

- loading/unloading tanker bays,

- jetties used for loading/unloading oil, methane or gas tankers

- silos used to transfer liquid or solid products.

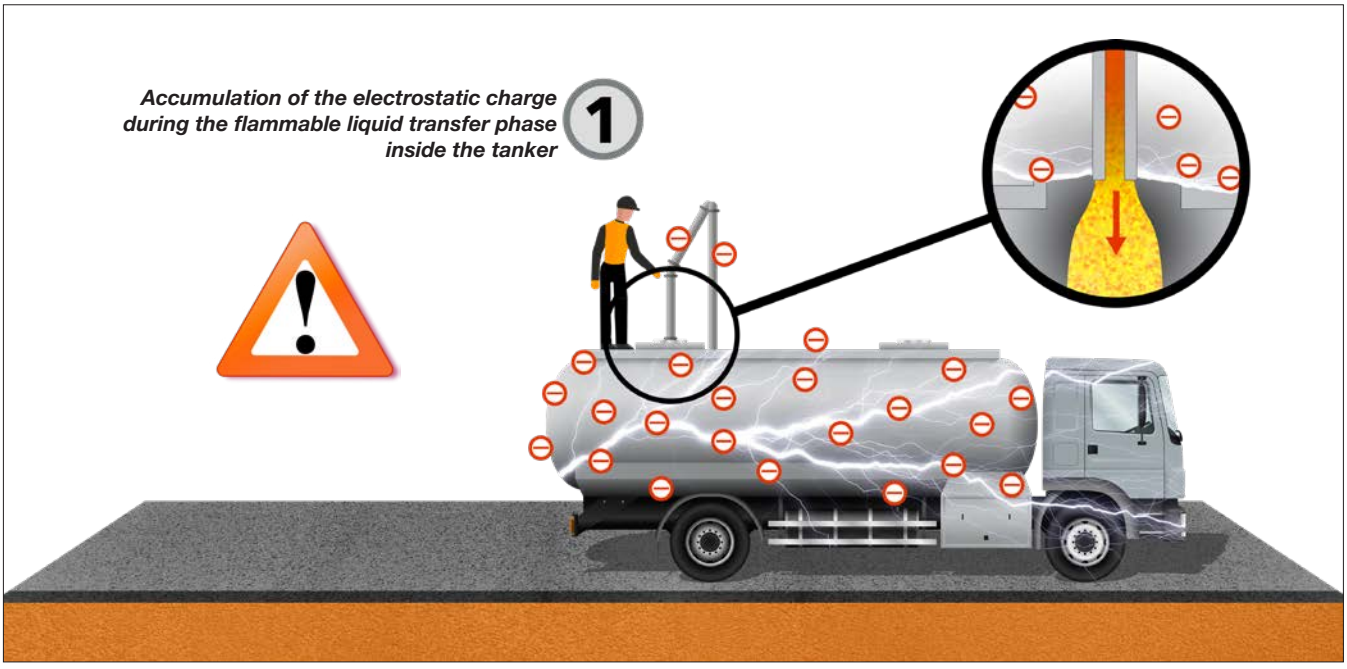
Filling, dispensing, transporting and tipping materials into vehicles or containers generates static electricity simply through the movement of the material being processed or handled.

The charge level is greater for poorly conductive solvents flowing through plastic pipes. Furthermore, a fast flow or large amounts of air bubbles flowing through the pipe can amplify the static electricity.

The flammable charge can ignite if the vehicle is not adequately earthed.

An earth connection between the tanker and the earth network of the plant is not enough to prevent sparks from being generated a number of safety measures must be adopted, which connect the two systems safely, guaranteeing the safety of people and the property. These systems are commonly referred to as "earthing systems" and function based on the principle of equipotential bonding of conductive and semi-conductive metal objects while loading or unloading potentially explosive products.

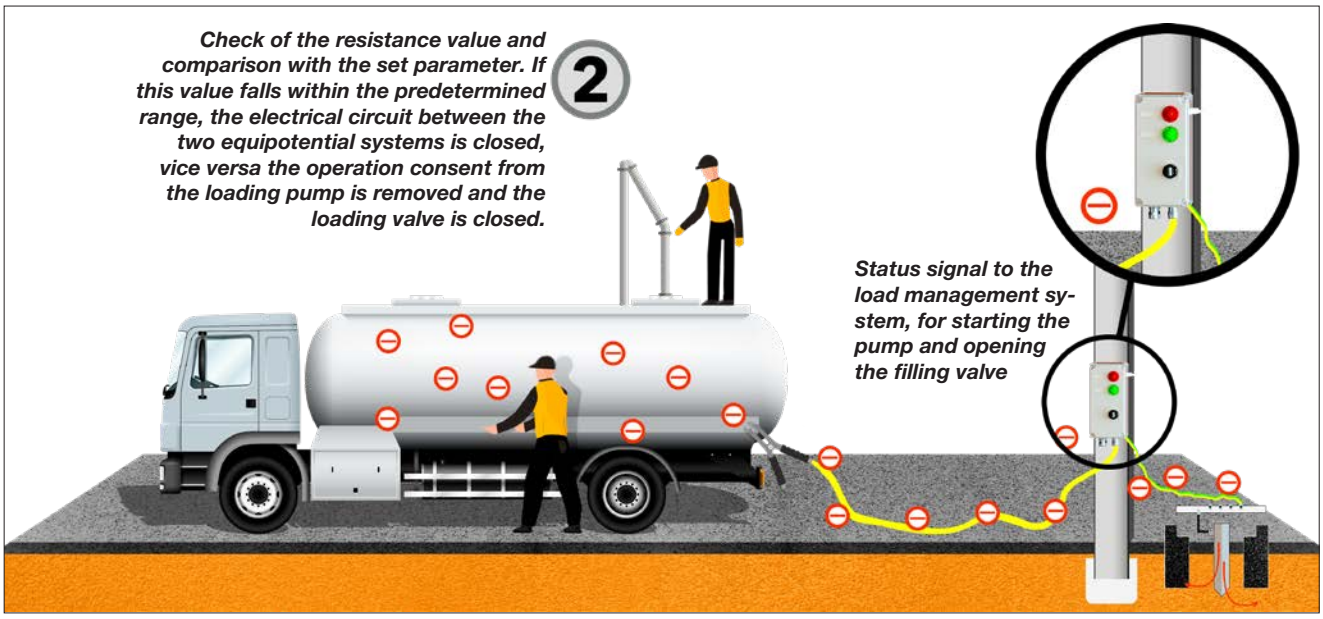
For this reason, the "earthing" systems must be implemented in such a way as to guarantee full plant functionality while protecting the safety of the operators assigned, in compliance with current regulations. The earthing system connects the object to the ground



and discharges any accumulated voltage, which is absorbed by the ground and neutralised.

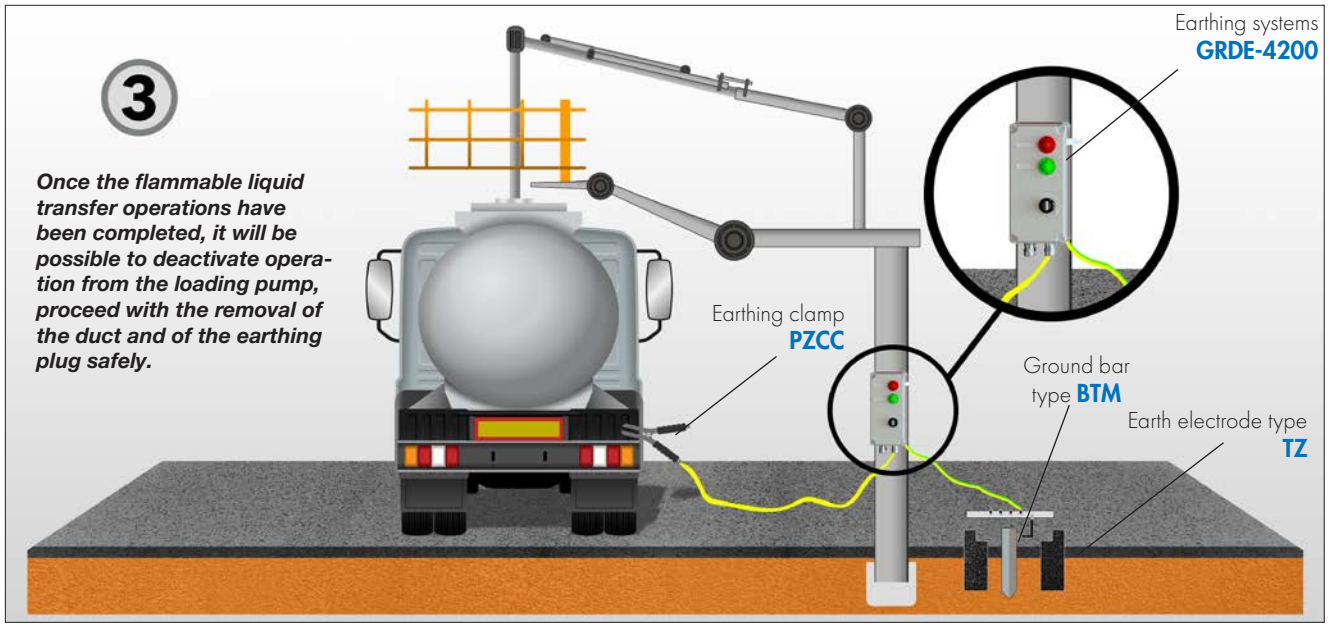
Cortem Group's GRDE series earthing device meets all the functionality and safety specifications set forth in the regulations for such operations and is designed to be installed in environments at risk of explosion due to the presence of flammable gas and/or dust.

In fact, this system consists of an earth control logic called LCZ-4200, which thanks to the 'Ex mb' protection, besides controlling the earth connection parameters, also has an 'Ex ia' intrinsic safety barrier that ensures the coupling of the clamp for the safe earth

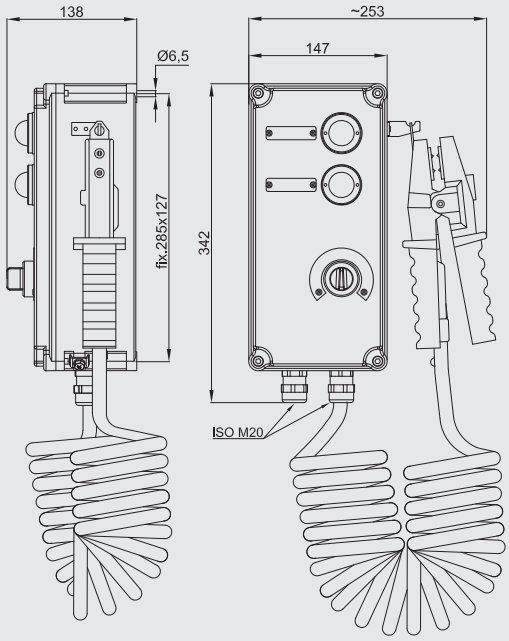



connection.

Moreover, thanks to this logic, besides enabling the earth connection so as to eliminate the electrostatic charges of the tanker, cistern, etc., the GRDE system can also be used to enable the loading/unloading pump to switch-on thanks to a double contact relay. In this way, in the unfortunate event that the earth connection fails, the loading/unloading of the flammable liquid is immediately blocked in complete safety until the earth connection is restored. The GRDE system can be supplied with one or two earthing clamps for the simultaneous connection of several tankers or other metal parts.



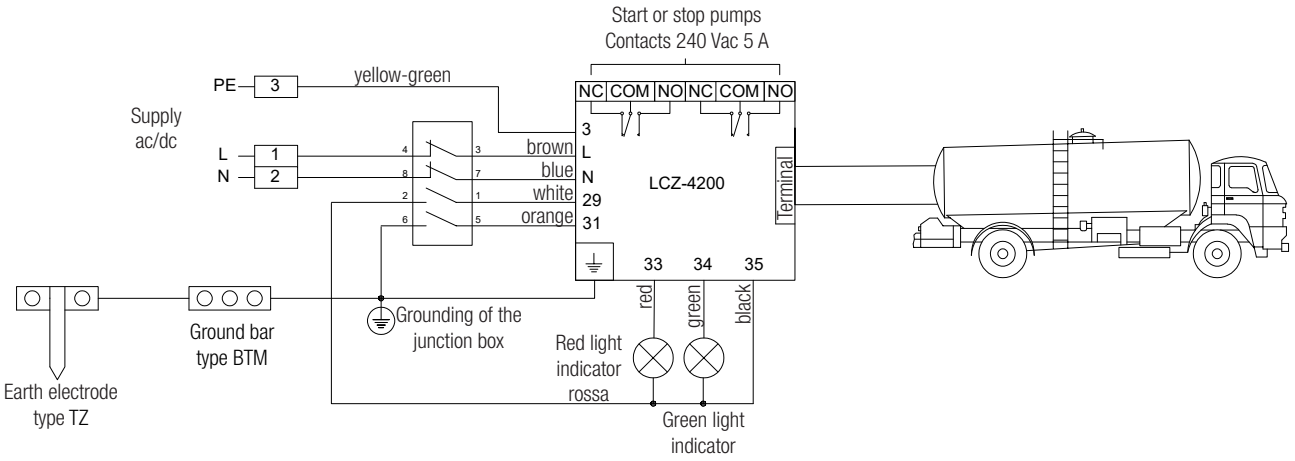
## DIMENSIONAL DRAWING



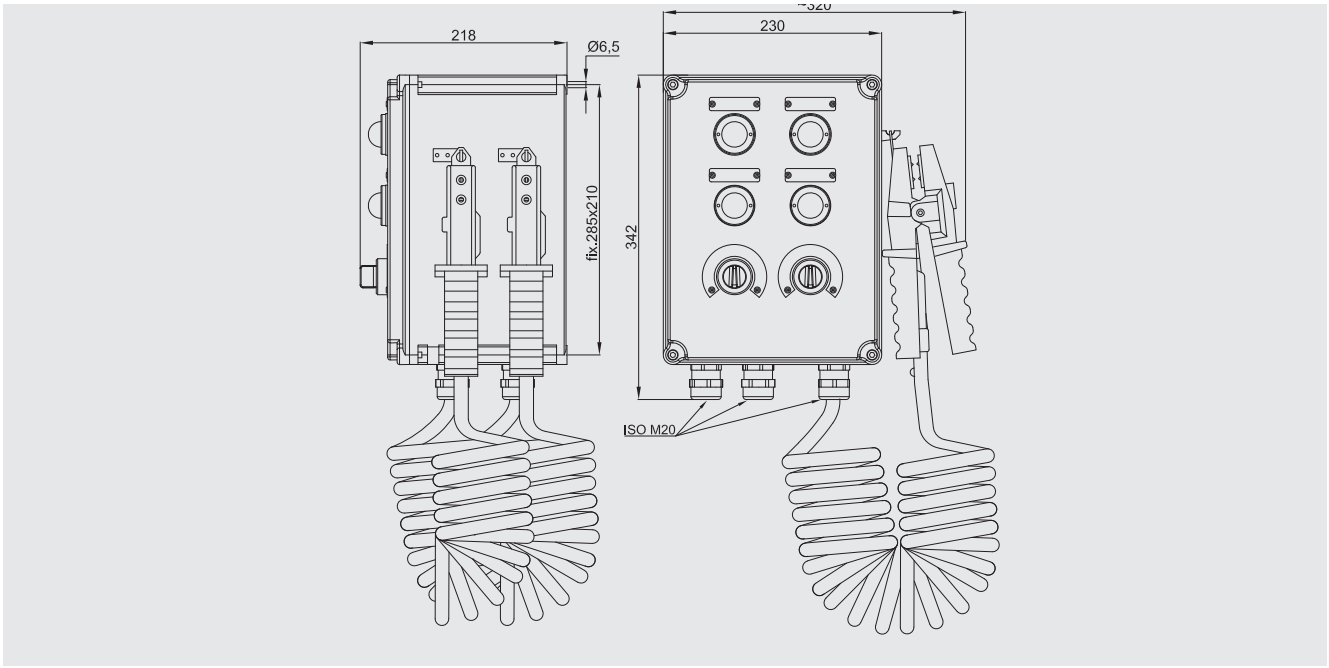

Dimensions in mm

## SELECTION TABLE

| Code | Material of the junction box | Number of pliers | Power supply | Rated frequency | Power consumption | Weight |
|---|---|---|---|---|---|---|
| **GRDE-4200** | Aluminium | One plier | 220-240 Vac | 50 - 60 Hz | 6 W | 3,25 Kg |
| **GRDE-4200-12** | | | 12 Vac/dc | 0 - 50 - 60 Hz | | 3,25 Kg |
| **GRDE-4200-24** | | | 24 Vac/dc | 0 - 50 - 60 Hz | | 3,25 Kg |
| **GRDE-4200-110** | | | 110 Vac | 50 - 60 Hz | | 3,25 Kg |
| **GRDE-4200-P** | Polyester | | 220-240 Vac | 50 - 60 Hz | | 2,80 Kg |
| **GRDE-4200-P-12** | | | 12 Vac/dc | 0 - 50 - 60 Hz | | 2,80 Kg |
| **GRDE-4200-P-24** | | | 24 Vac/dc | 0 - 50 - 60 Hz | | 2,80 Kg |
| **GRDE-4200-P-110** | | | 110 Vac | 50 - 60 Hz | | 2,80 Kg |

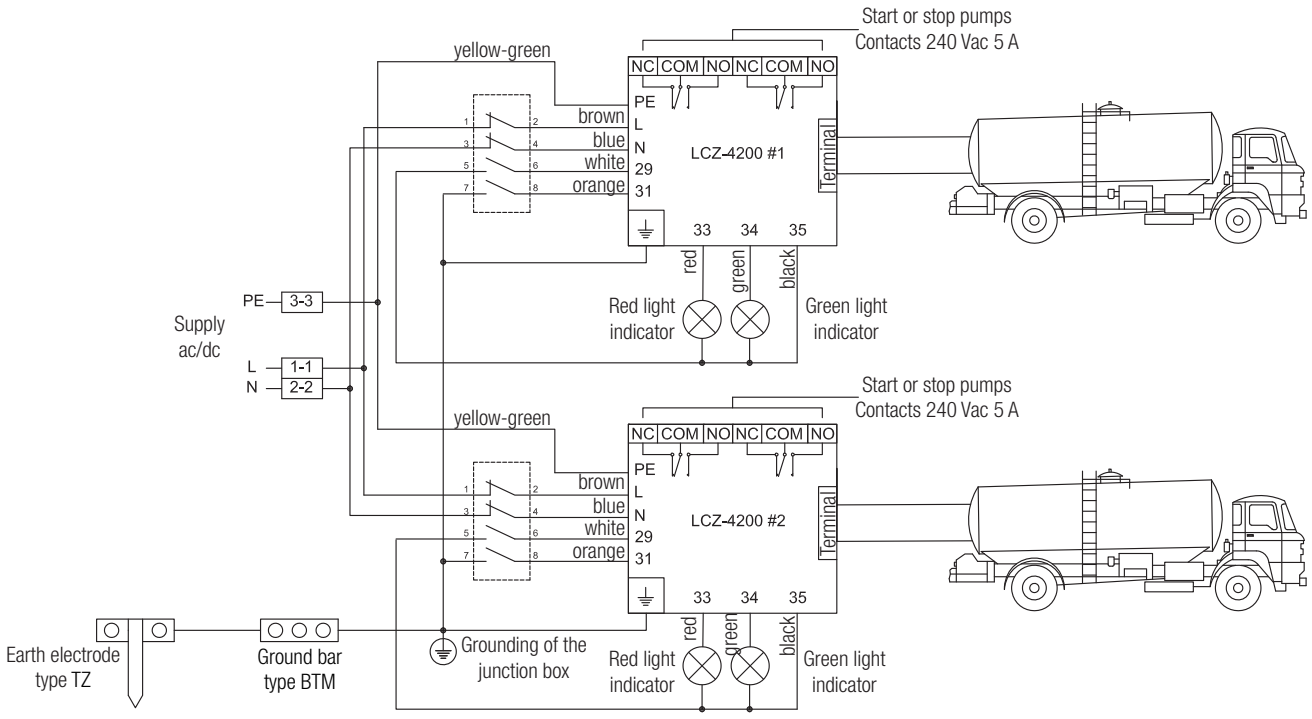


## DIMENSIONAL DRAWING




## SELECTION TABLE

| Code | Material of the junction box | Number of pliers | Power supply | Rated frequency | Power consumption | Weight |
|---|---|---|---|---|---|---|
| **GRDE-4200-2** | Aluminium | Two pliers | 220-240 Vac | 50 - 60 Hz | 12 W | 6,45 Kg |
| **GRDE-4200-2-12** | | | 12 Vac/dc | 0 - 50 - 60 Hz | | 6,45 Kg |
| **GRDE-4200-2-24** | | | 24 Vac/dc | 0 - 50 - 60 Hz | | 6,45 Kg |
| **GRDE-4200-2-110** | | | 110 Vac | 50 - 60 Hz | | 6,45 Kg |
| **GRDE-4200-2P** | Polyester | | 220-240 Vac | 50 - 60 Hz | | 5,65 Kg |
| **GRDE-4200-2P-12** | | | 12 Vac/dc | 0 - 50 - 60 Hz | | 5,65 Kg |
| **GRDE-4200-2P-24** | | | 24 Vac/dc | 0 - 50 - 60 Hz | | 5,65 Kg |
| **GRDE-4200-2P-110** | | | 110 Vac | 50 - 60 Hz | | 5,65 Kg |






CORTEM GROUP®

# GRDE-4200 Accessories upon request and spare parts

| ILLUSTRATION | DESCRIPTION | MODEL | CODE | KEY |
|---|---|---|---|---|
|  | Red multi-LED indicator 12 Vca/cc | GRDE-4200.. | **M-0612/3R12** | RICAMBIO |
| | Green multi-LED indicator 12 Vca/cc | | **M-0612/3V12** | |
|  | Special switch | GRDE... | **M-0604/2R** | RICAMBIO |
|  | Monitoring logic | GRDE-4200... | **LCZ-4200** | RICAMBIO |
| | | GRDE-4200...12 | **LCZ-4200/12** | |
| | | GRDE-4200...24 | **LCZ-4200/24** | |
| | | GRDE-4200...110 | **LCZ-4200/110** | |
|  | Earthing pliers | GRDE... | **PZCC-4209** | RICAMBIO |
|  | Yellow cable<br>Length: 8 metres | GRDE... | **20CE063** | RICAMBIO |
|  | Cable gland<br>range cable 6,5÷14 | GRDE... | **NAV20IB** | ACCESSORY SPARE PART |

# GRD-4200

## Electronic earthing system

- Zone 1, 2, 21, 22
- High quality electronic components
- High resistance to corrosion and extreme weather
- Safe and reliable over time

SIL certified
Level 2




CORTEM GROUP®

# GRD-4200 Electronic earthing system

The GRD-4200 series electronic earthing system ensures grounding of tankers and tank trucks during the transfer of flammable liquids, preventing the formation of electrostatic charges.
During the entire loading and unloading phase, the device checks that the equipotentiality of the earthing system is maintained.
In fact, the electronic system is equipped with a protection circuit that checks the resistance value and compares it to the set parameter and, if this value falls within the preset range, closes the electrical circuit between the two systems that are equipotential. Vice versa, it removes the operating consent from the loading pump and closes the loading valve.
The GRD-4200 electronic earthing system has obtained SIL (Safety Integrity Level) Level 2 certification in compliance with IEC-61508 and EN-50495 standards, which guarantees that the system is able to perform its safety function.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**


Petroleum refineries


Chemical and petrochemical facilities


Onshore facilities


Offshore facilities


Petroleum loading/unloading pontoons


Agribusiness facilities

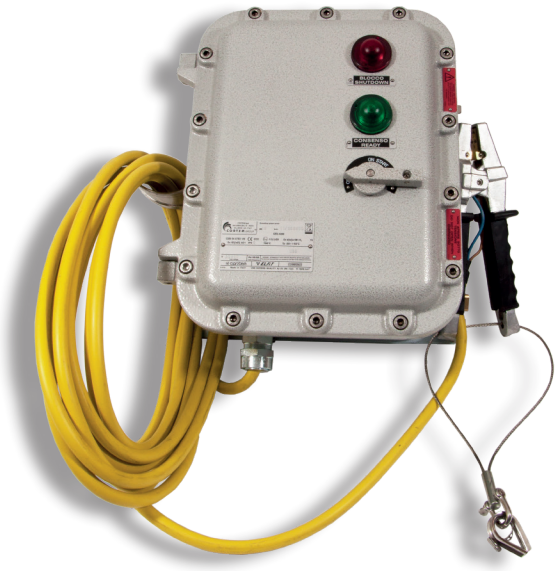

Fuel storage facilities

100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2(1) G - Ex d [ia Ga] ia IIB+$H_2$ T6 Gb | | | |
| | CE 0722 Ex II 2(1) D - Ex tb [ia Da] ia IIIC T85°C Db | | | |
| **Certificate:** | ATEX CESI 04 ATEX 129 | | | |
| | IEC Ex IECEx CES 14.0035X | For all IEC Ex certification data, download the certificate from www.cortemgroup.com | | |
| **Standards:** | CENELEC EN 60079-0: 2012, EN 60079-1: 2007, EN 60079-11: 2012, EN 60079-31:2009 and the European Directive 2014/34/UE.<br>IEC 60079-0: 2011, IEC 60079-1: 2007, IEC 60079-11: 2011, IEC 60079-31: 2008<br>RoHS Directive 2002/95/EC. | | | |
| **Temperature class:** | 85°C (T6) | | | |
| **Ambient Temperature:** | -20°C +55°C | | | |
| **Degree of protection:** | IP66 | | | |

# GRD-4200 Electronic earthing system



## MECHANICAL FEATURES

**Body and lid:** Low copper content aluminium alloy
**Gasket:** Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid
**Certificate label:** Riveted aluminium on lid
**Screws, bolts and nuts:** Stainless steel
**Earthing screw:** Stainless steel M6. Inside and outside the body and on the lid, complete with anti-rotation brackets
**Fastening brackets:** Electrolytically galvanized steel
**Lever on lid:** In coated aluminium
**Warning lights:** Impact and UV resistant polycarbonate
**Coating:** Polyester RAL 7035 (Light grey)

**Resistenza alla corrosione:** The STANDARD of the aluminium alloy used by Cortem has passed the tests required by standards EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test)

**Inputs:** 2 threaded holes 3/4" NPT. Complete with a PLG2N plug
**Cable gland:** For non-armored cable, internally sealed, thread 3/4" NPT
**Cable:** Yellow with trim in rubber resistant to oil and chemical substances. Suitable for extremely high mechanical stresses. Length 8 m.
**Plier:** Bipolar, casting with aluminium with handles in neoprene, jaws with steel tips, auto-releasing. 16 mm opening.
**Bracket for plier:** In stainless steel.

## ELECTRICAL FEATURES

**Rated voltage:** 230 Vac o 110 Vac o 24 Vac dc
**Rated frequency:** max. 50/60 Hz

| GRD-4200 | | |
|---|---|---|
| Status: | Block | Consent |
| Current draw: | 12 mA | 24 mA |
| Power: | 1.64 W | 4.32 W |
| Power factor: | 0.57 | 0.82 |

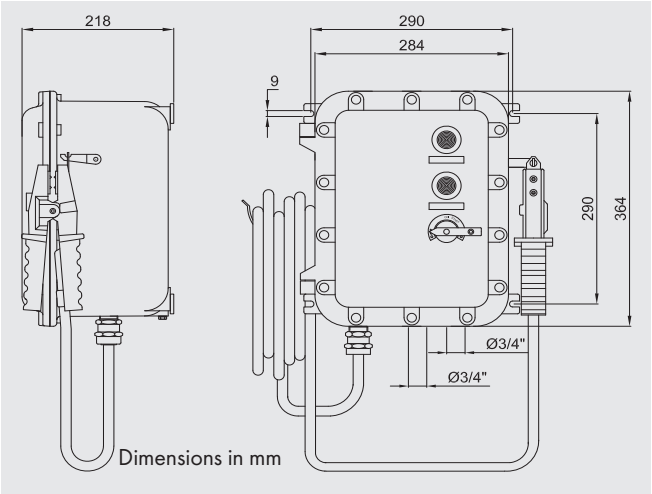
| GRD-4200/110 | | |
|---|---|---|
| Status: | Block | Consent |
| Current draw: | 22 mA | 45 mA |
| Power: | 1.52 W | 4.18 W |
| Power factor: | 0.62 | 0.84 |

| GRD-4200/24 | | | | |
|---|---|---|---|---|
| Status: | Block | | Consent | |
| Voltage: | 24 Vac | 24 Vdc | 24 Vac | 24 Vdc |
| Current draw: | 64 mA | 24 mA | 64 mA | 24 mA |
| Power: | 1.64 W | 4.32 W | 1.64 W | 4.32 W |
| Power factor: | 0.57 | 0.82 | 0.57 | 0.82 |

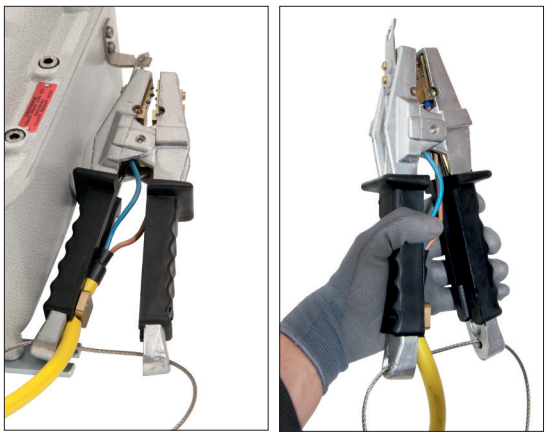
## ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

Cable gland
Pliers PMT-B2

## DIMENSIONAL DRAWING



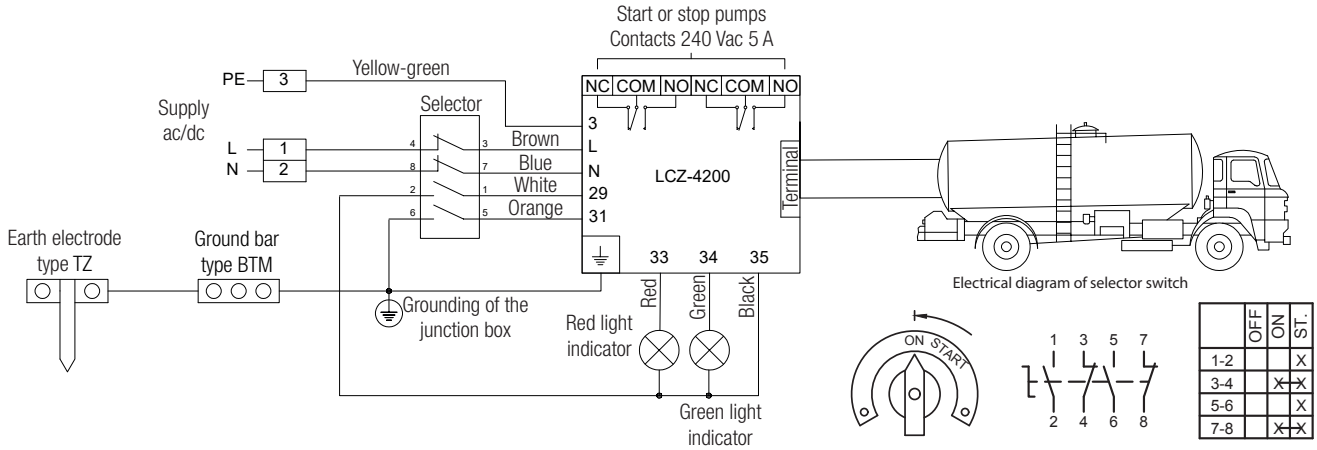

Detail of connection pliers

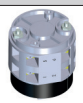
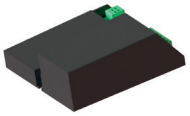
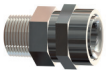


## SELECTION TABLE

| Code | Power supply | Rated frequency | Weight Kg |
|---|---|---|---|
| **GRD-4200** | 230 Vac | 50 - 60 Hz | 20 |
| **GRD-4200/110** | 110 Vac | 50 - 60 Hz | 20 |
| **GRD-4200/24** | 24 Vac dc | 0 / 50 - 60 Hz | 20 |

## ELECTRICAL WIRING




| ILLUSTRATION | DESCRIPTION | MODEL | CODE | LEGEND |
|---|---|---|---|---|
|  | Special switch | GRD... | **SEA10X2/12EZ16R** | RICAMBIO |
|  | Monitoring logic | GRD-4200 | **LCZ-4200** | RICAMBIO |
| | | GRD-4200/110 | **LCZ-4200/110** | |
| | | GRD-4200/24 | **LCZ-4200/24** | |
|  | Earthing pliers | GRD... | **PZCC-4209** | RICAMBIO |
|  | Yellow cable<br>Length: 8 metres | GRD... | **NSSHOU-02X2,5** | RICAMBIO |
|  | Barrier cable gland | GRD... | **NAVB2NB** | ACCESSORIO RICAMBIO |

# PMT

## Earthing pliers

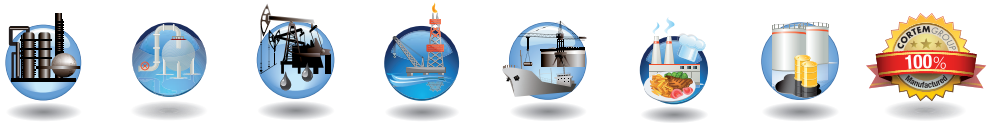
- Group IIC
- Zone 1, 2, 21, 22
- Robust and easy to handle
- High resistance to corrosion and extreme weather
- Safe and reliable over time

# PMT Earthing pliers

The PMT pliers are used to connect tankers and tank trucks to ground during loading and unloading operations. The ground contact occurs inside the body of the pliers in an Ex d chamber, only after the pliers have been connected to the local earthing system.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.


**Sectors of application:**



Petroleum refineries | Chemical and petrochemical facilities | Onshore facilities | Offshore facilities | Petroleum loading/unloading pontoons | Agribusiness facilities | Fuel storage facilities | 100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2GD | | |
| **Installation:** EN 60079.14 | zone 1 - zone 2 (Gas) | zone 21 - zone 22 (Dust) | | |
| **Marking:** | CE 0722 Ex II 2GD - Ex d IIC T6 Ex tD A21 IP65 T85°C | | | |
| **Certificate:** | ATEX CESI 03 ATEX 201 | | | |
| **Standards:** | CENELEC EN 60079-0: 2006, EN 60079-1: 2004, EN 61241-0: 2006, EN61241-1: 2004 and European Directive 2014/34/EU. | | | |
| **Temperature class:** | 85°C (T6) | | | |
| **Ambient Temperature:** | -20°C +55°C | | | |
| **Degree of protection:** | IP65 | | | |

# PMT Earthing pliers

## MECHANICAL FEATURES

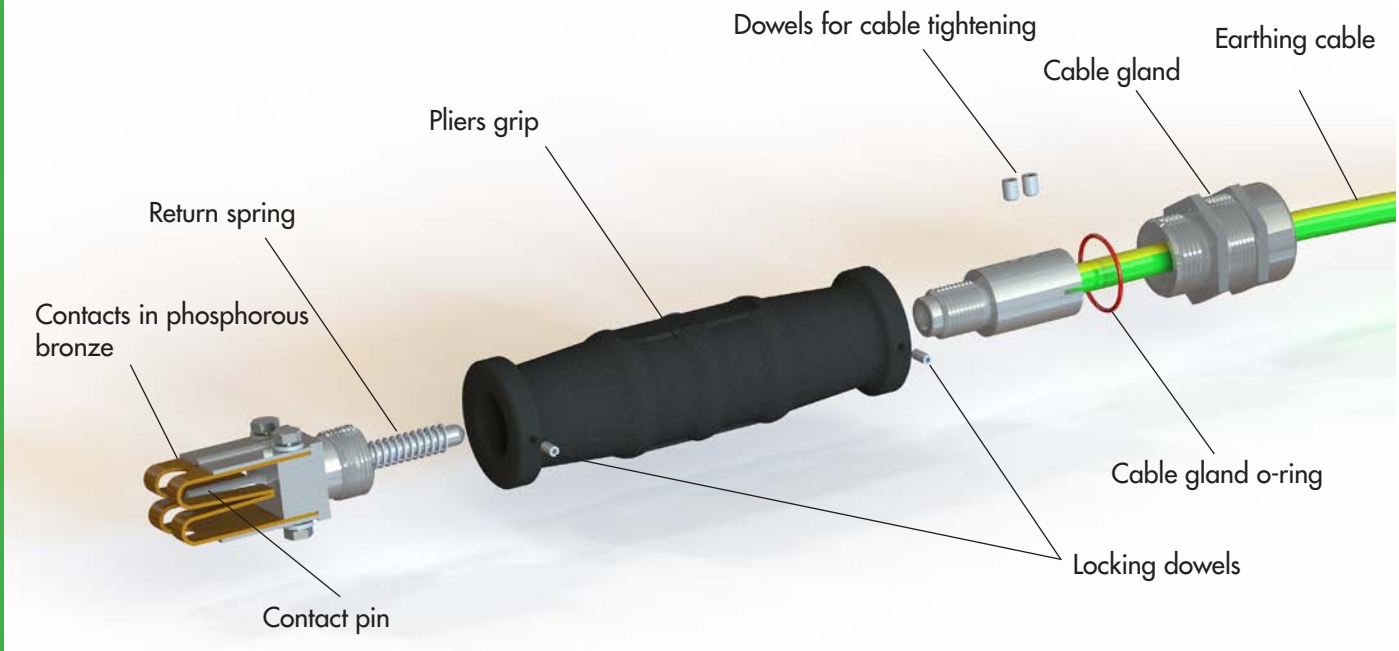
**Grip:** In black non-slip rubber
**External contact elements:** In phosphorous bronze
**Certificate label:** Riveted aluminium on the grip
**Screws, bolts and nuts:** Stainless steel
**Cable gland:** For non-armored cable, thread ISO M32

## ELECTRICAL FEATURES

**Isolating voltage:** 3 kV
**Rated current:** 20 A

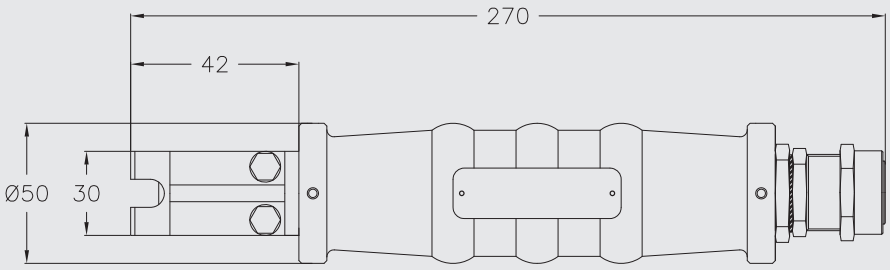
## SELECTION TABLE

| Code | Cable range | Connection plate thickness | Weight Kg |
|---|---|---|---|
| **PMT-B2** | Ø 11 - 14 | 4 - 7 | 0.8 |

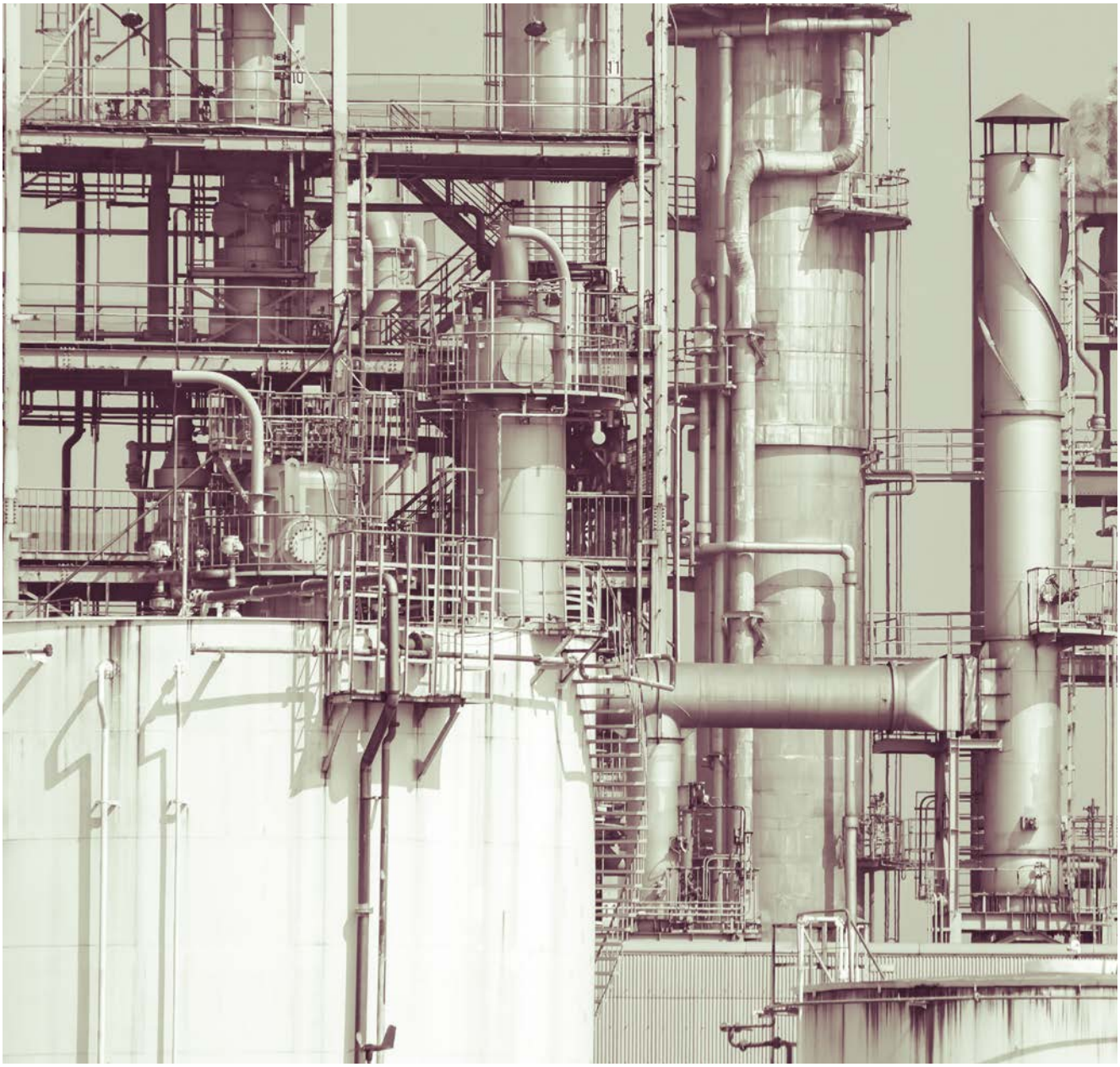


# PMT Earthing pliers

## DIMENSIONAL DRAWING

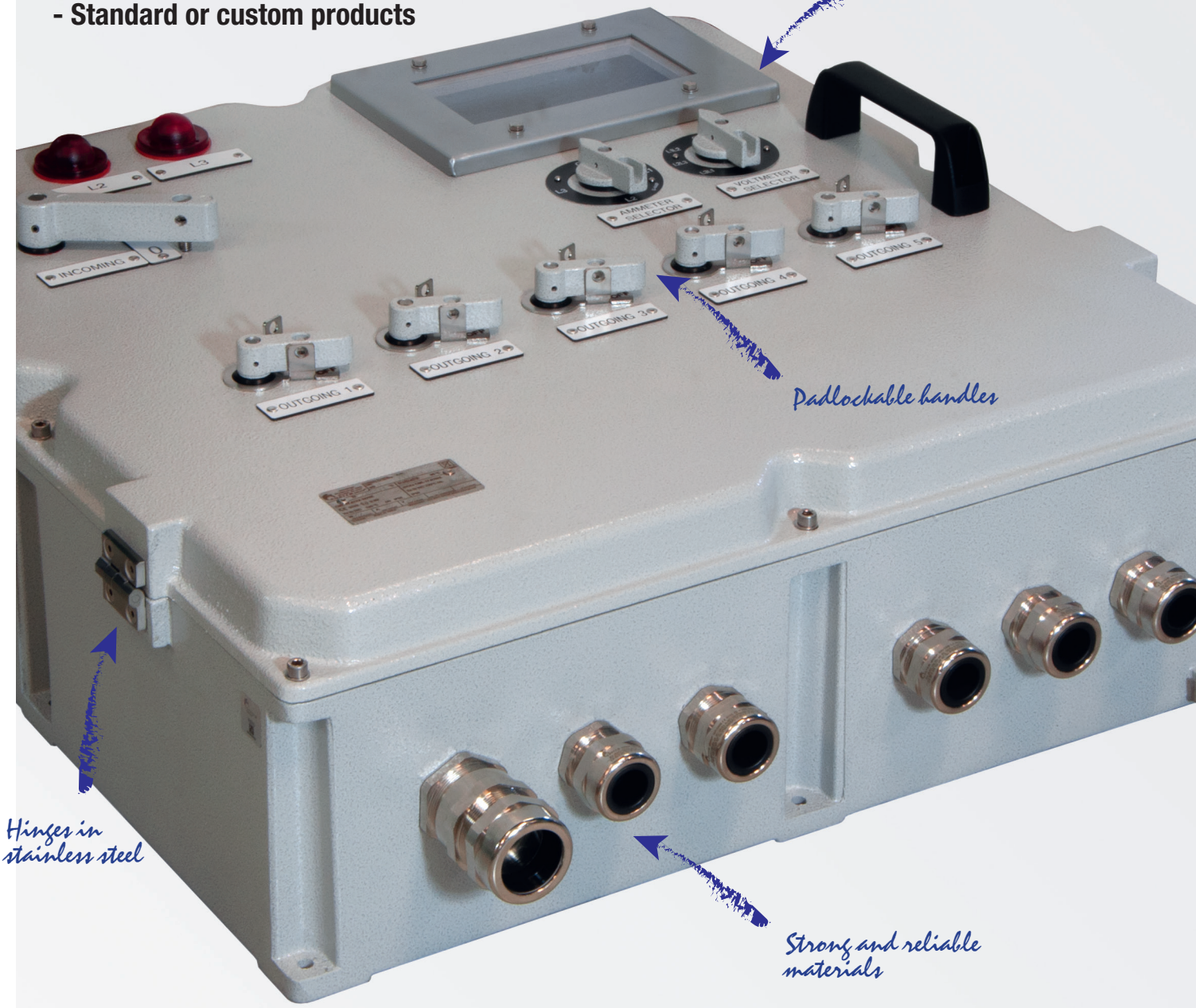



Dimensions in mm

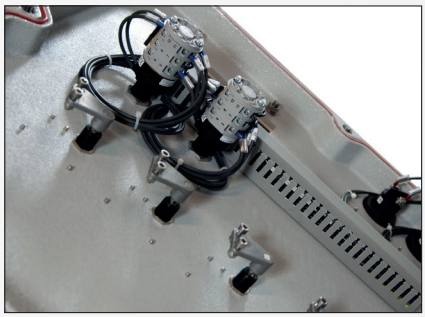


# Junction boxes for control, monitoring and control panel 'Ex tb'

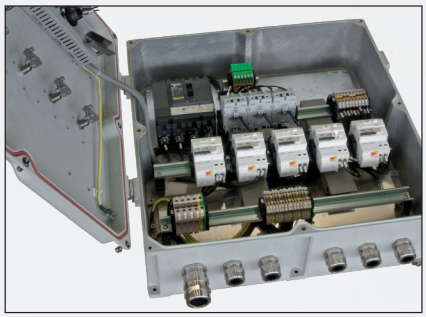
- Zone 21, 22
- Category 2D
- Aluminium, reinforced polyester or stainless steel enclosures
- Standard or custom products




Quick-hook switches



Built-in /magnetothermal circuit breakers



# Junction boxes for monitoring and control panel 'Ex tb'

The control, monitoring and signaling units SA, SA/P, CTB include a series of enclosures with "Ex tb" protection available in aluminum, polyester or stainless steel and in different measures.
According to the size and the material chosen, there are three maximum dissipation limits that correspond to each of the three maximum optional ambient temperatures: + 40° C, + 55° C and + 60° C.
Several IECEx/ATEX certified devices can be mounted on the enclosure faces and a glass or polycarbonate window can also be fixed to the lid. Various electronic devices can be installed internally with a total power dissipation within the limits defined for each housing such as terminals, analog and digital instruments, control and measurement devices, circuit breakers and IECEx / ATEX certified battery packs.
SA/SS series stainless steel command and control junction boxes may be provided for 'Ex tb' panels on request.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. The failure to observe international standards involves serious hazards to the environment and, above all, personnel who work with the systems on a daily basis.


**Sectors of application:**

Petroleum refineries | Chemical and petrochemical plants | Onshore plants | Offshore plants | Petroleum loading/ unloading pontoons | Low temperatures | Mining operations | 100% produced by Cortem

## CERTIFICATION DATA

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group II | Category 2D | | |
| **Installation:** EN 60079.14 | zone 21 - zone 22 (Dust) | | | |
| **Marking:** | CE 0722 Ex II 2D Ex tb IIIC T80°C Db IP66 | | | |
| **Certification:** | ATEX CML 17 ATEX 3307X | | | |
| | IEC Ex CML 17.0162X | All IEC Ex certification data can be downloaded from www.cortemgroup.com | | |
| **Standards:** | CENELEC EN 60079-0: 2012+A11:2013, EN 60079-31: 2014 and EUROPEAN DIRECTIVE 2014/34/UE<br>IEC 60079-0: 2011, IEC 60079-31: 2013 | | | |
| **Temperature class:** | T80°C; T100°C; T135°C | | | |
| **Ambient temperature:** | -40°C +40°C<br>-40°C +55°C<br>-40°C +60°C | When Cortem ammeters and/or voltmeters are installed on the cover, the enclosures shall be marked with a maximum ambient temperature no higher than +40°C.<br>For details see max power dissipation table | | |
| **Degree of protection:** | IP66 | | | |

# Junction boxes for monitoring and control panel 'Ex tb' SA

## ALLUMINIUM CONTROL HOUSINGS SA-SAG SERIES

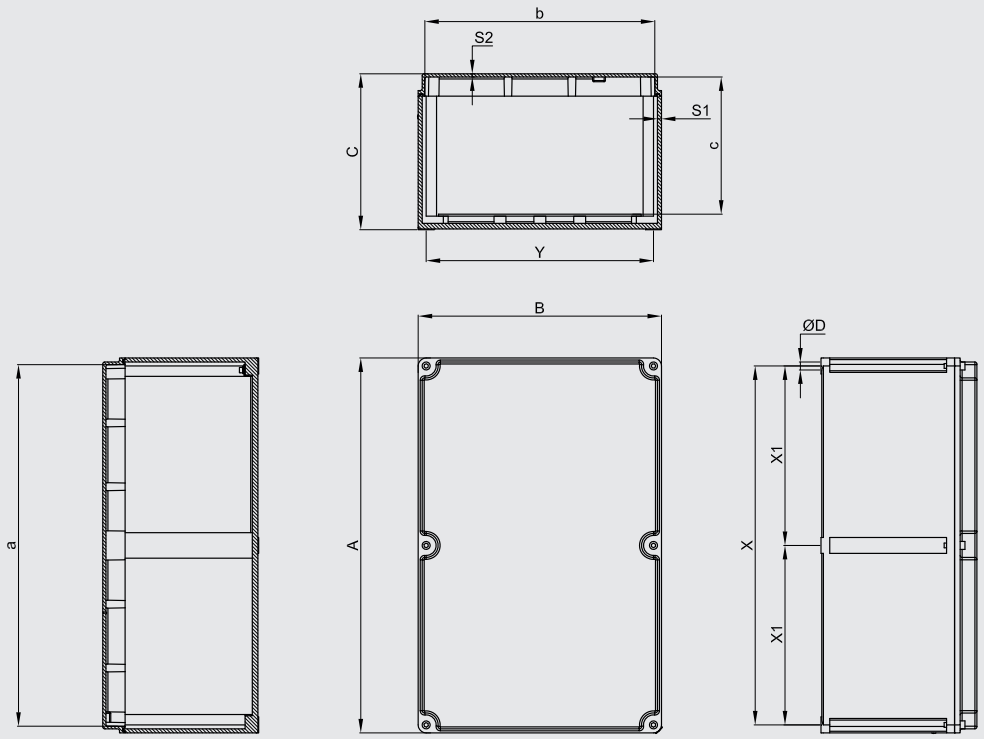

## MECHANICAL FEATURES

**Body and lid:** Low copper content aluminium alloy
**Gaskets:** Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the lid
**Certificate plate:** Aluminium label riveted
**Screws:** Stainless steel
**Earth screw:** Stainless steel. On inside and outside of body complete with anti-rotation brackets
**Mounting:** Cast aluminium lugs for M6 screw
**Coating:** Polyester Ral 7035 (light grey)

## MAX POWER DISSIPATION

| Junction box | Power (W) - for T80°C | | | Power (W) - for T100°C | | |
|---|---|---|---|---|---|---|
| | T.a. +40°C | T.a. +55°C | T.a. +60°C | T.a. +40°C | T.a. +55°C | T.a. +60°C |
| SA111108 | 25,1 | 14.2 | 10.9 | | | |
| SAG111108 | 21,8 | 13,1 | 10,1 | 32,4 | | |
| SA171108 | 21,8 | 13,1 | 10,1 | 32,4 | | |
| SAG171108 | 21,8 | 13,1 | 10,1 | 32,4 | | |
| SA141410 | 37,3 | 21,6 | 16,2 | 55,3 | | |
| SAG141410 | 38,3 | 22,1 | 16,3 | 57,0 | | |
| SA202012 | 37,3 | 21,6 | 16,2 | 55,3 | | |
| SA301410 | 37,3 | 21,6 | 16,2 | 55,3 | | |
| SAG301410 | 37,3 | 21,6 | 16,2 | 55,3 | | |
| SA302310 | 55,6 | 34,4 | 27,9 | 83,0 | 62,3 | |
| SAG302310 | 52,0 | 30,7 | 24,4 | 77,3 | 57,8 | 52,0 |
| SA302318 | 55,6 | 34,4 | 27,9 | 83,0 | 62,3 | |
| SAG302318 | 52,0 | 30,7 | 24,4 | 77,3 | 57,8 | 52,0 |
| SA473018 | 100,8 | 59,1 | 47,0 | 154,2 | 114,2 | |
| SAG473018 | 100,8 | 59,1 | 47,0 | 154,2 | 114,2 | |
| SAG623018 | 124,6 | 75.9 | 60.7 | 190,2 | 141,0 | |
| SAG606018 | 100,8 | 59,1 | 47,0 | 154,2 | 114,2 | |

## DIMENSIONAL DRAWING




Dimensions in mm

## SELECTION CHART

| Code | External dimensions | | | Inner dimensions | | | | | Mounting | | | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | c | S1 | S2 | X | Y | X1 | ØD | Kg |
| **SA111108** | 110 | 110 | 83 | 104 | 104 | 64 | 3 | 2,5 | 94 | 94 | - | 6,5 | 0,50 |
| **SAG111108** | 110 | 110 | 83 | 96 | 96 | 64 | 7 | 2,5 | 94 | 94 | - | 6,5 | 0,75 |
| **SA171108** | 170 | 110 | 83 | 164 | 104 | 65 | 3 | 2,5 | 154 | 94 | - | 6,5 | 0,80 |
| **SAG171108** | 170 | 110 | 83 | 156 | 96 | 65 | 7 | 2,5 | 154 | 94 | - | 6,5 | 1,55 |
| **SA141410** | 147 | 147 | 100 | 141 | 141 | 80 | 3 | 2,5 | 131 | 131 | - | 6,5 | 0,80 |
| **SAG141410** | 147 | 147 | 100 | 133 | 133 | 80 | 7 | 2,5 | 131 | 131 | - | 6,5 | 1,40 |
| **SA202012** | 200 | 200 | 120 | 192 | 192 | 98 | 4 | 3 | 180 | 180 | - | 6,5 | 1,70 |
| **SA301410** | 305 | 147 | 110 | 296 | 138 | 90 | 4,5 | 3 | 285 | 127 | - | 6,5 | 2,00 |
| **SAG301410** | 305 | 147 | 96 | 291 | 133 | 75 | 7 | 4 | 285 | 127 | - | 6,5 | 2,70 |
| **SA302310** | 305 | 230 | 110 | 296 | 221 | 90 | 4,5 | 3 | 285 | 210 | - | 6,5 | 2,80 |
| **SAG302310** | 305 | 230 | 100 | 291 | 216 | 75 | 7 | 4 | 285 | 210 | - | 6,5 | 3,40 |
| **SA302318** | 305 | 230 | 190 | 296 | 221 | 165 | 4,5 | 3 | 285 | 210 | - | 6,5 | 3,50 |
| **SAG302318** | 305 | 230 | 180 | 291 | 216 | 155 | 7 | 4 | 285 | 210 | - | 6,5 | 5,30 |
| **SA473018** | 475 | 305 | 195 | 465 | 295 | 174 | 5 | 4 | 450 | 285 | 225 | 6,5 | 6,50 |
| **SAG473018** | 475 | 305 | 195 | 461 | 294 | 174 | 7 | 4 | 450 | 285 | 225 | 6,5 | 8,90 |
| **SAG623018** | 625 | 305 | 195 | 613 | 293 | 174 | 6 | 5 | 605 | 285 | 302,5 | 6,5 | 11,3 |
| **SAG606018** | 600 | 600 | 205 | 584 | 584 | 177 | 10÷13 | 5 | 580 | 580 | 290 | 8 | 27,0 |

## BODY DRILLING DATA

THREAD COMPARISON CHART

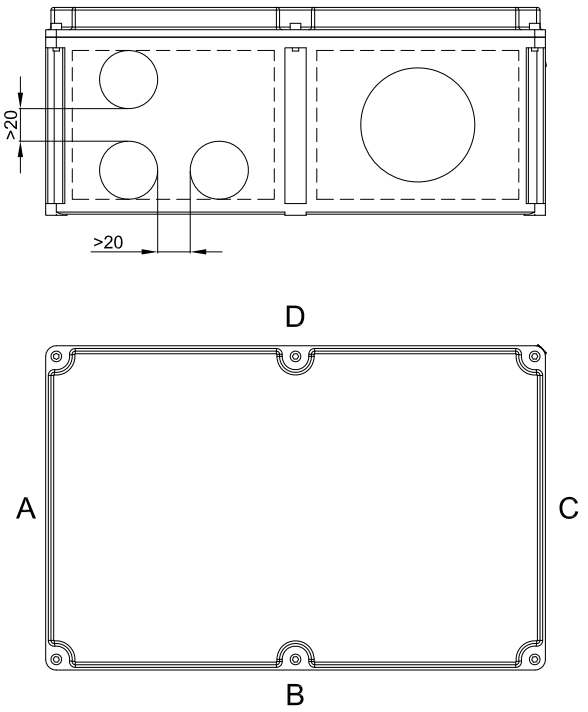
| D<br>Thread diameter | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ISO228 | 3/8" | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" | 2 1/2" | 3" |
| Through hole | Ø17 | Ø22 | Ø27.5 | Ø34 | Ø43 | Ø48.5 | Ø60.5 | Ø76 | Ø89 |

| D<br>Thread diameter | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ISO 261/965 | 16x1,5 | 20x1.5 | 25x1.5 | 32x1.5 | 40x1.5 | 50x1.5 | 63x1.5 | 75x1.5 | 90x1.5 |
| Through hole | Ø17 | Ø20.5 | Ø25.5 | Ø32.5 | Ø40.5 | Ø50.5 | Ø63.5 | Ø75.5 | Ø85.5 |

| D<br>Thread diameter | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ANSI B.20.1 NPSM | 3/8" | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" | 2 1/2" | 3" |
| Through hole | Ø17.5 | Ø22 | Ø27.5 | Ø34 | Ø43 | Ø48.5 | Ø60.5 | Ø76 | Ø89 |

As required by the current standard, holes can be drilled by Cortem or by authorized partners who hold a production notification in accordance with ATEX Directive .

| TYPE OF ENCLOSURE | HOLE DRILLING IN BODY | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sides A and C | | | | | | | | | Sides B and D | | | | | | | | | |
| | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | | | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | | |
| | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SA/SAG111108 | 58x55 | 3 | 2 | 1 | 1 | - | - | - | - | - | 58x55 | Square box | | | | | | | | |
| SA/SAG171108 | 68x55 | 3 | 2 | 1 | 1 | - | - | - | - | - | 128x55 | 5 | 5 | 3 | 2 | 2 | 2 | - | - | - |
| SA/SAG141410 | 100x65 | 6 | 6 | 3 | 2 | 1 | - | - | - | - | 100x65 | Square box | | | | | | | | |
| SA202012 | 145x75 | 8 | 7 | 6 | 3 | 2 | 1 | - | - | - | 145x75 | Square box | | | | | | | | |
| SA/SAG301410 | 90x65 | 6 | 4 | 3 | 1 | 1 | 1 | - | - | - | 250x65 | 14 | 12 | 9 | 5 | 4 | 3 | - | - | - |
| SA/SAG302310 | 180x65 | 10 | 10 | 7 | 3 | 3 | 2 | - | - | - | 255x65 | 14 | 12 | 9 | 5 | 4 | 3 | - | - | - |
| SA/SAG302318 | 180x140 | 18 | 18 | 12 | 9 | 6 | 4 | 2 | 1 | 1 | 258x140 | 24 | 24 | 18 | 14 | 8 | 6 | 3 | 2 | 2 |
| SA/SAG473018 | 258x140 | 24 | 24 | 18 | 14 | 8 | 6 | 3 | 2 | 1 | 380x140 | 36 | 36 | 24 | 18 | 12 | 12 | 4 | 4 | 2 |
| SAG623018 | 250x140 | 24 | 24 | 18 | 14 | 8 | 6 | 3 | 3 | 2 | 525x140 | 48 | 48 | 36 | 28 | 16 | 12 | 6 | 4 | 4 |
| SAG606018 | 420x130 | 40 | 40 | 30 | 25 | 12 | 12 | 4 | 4 | 4 | 420x130 | 35 | 35 | 26 | 16 | 10 | 10 | 4 | 4 | 4 |

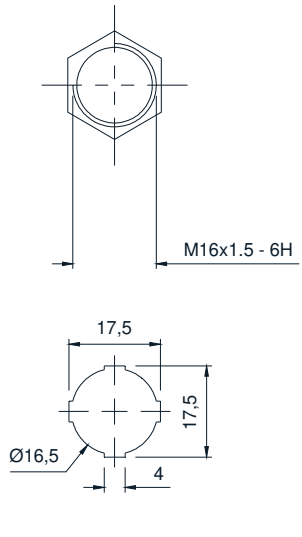


## LID DRILLING DATA

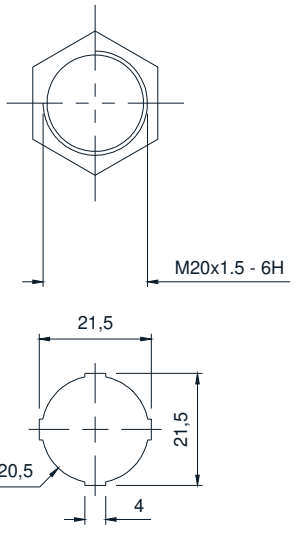
| TYPE OF ENCLOSURE | Drilling area mm |
|---|---|
| SA/SAG111108 | 90x90 |
| SA/SAG171108 | 90x150 |
| SA/SAG141410 | 127x127 |
| SA202012 | 180x180 |
| SA/SAG301410 | 127x285 |
| SA/SAG302310 | 210x285 |
| SA/SAG302318 | 210x285 |
| SA/SAG473018 | 285x450 |
| SAG623018 | 280x595 |
| SAG606018 | 505x505 |

### TYPE OF HOLES

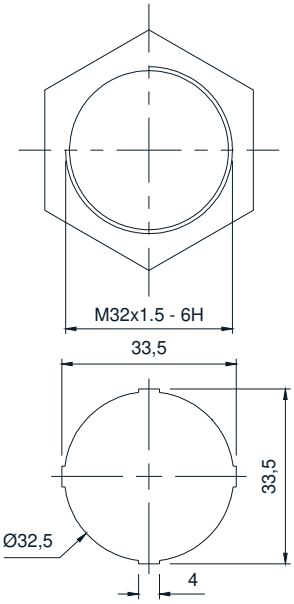
For handles
M-0634/11 M-0634/12
M-0634/13 M-0634/14
M-0634/03 M-0634/06
M-0634/07 M-0634/09



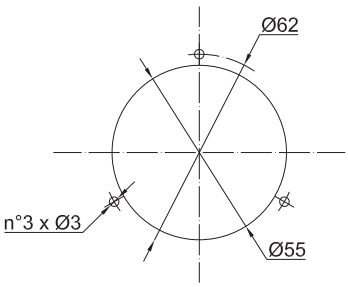

For handles
M-0634/10
M-0634/10L
M-0634/01



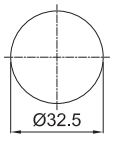

For handles
M-0639 M-0638
M-0637 M-0635
M-0636




For ammeters and voltmeters




For indicator light



# Junction boxes for monitoring and control panel 'Ex tb' SA/P

## POLYESTER CONTROL HOUSINGS SA/P SERIES

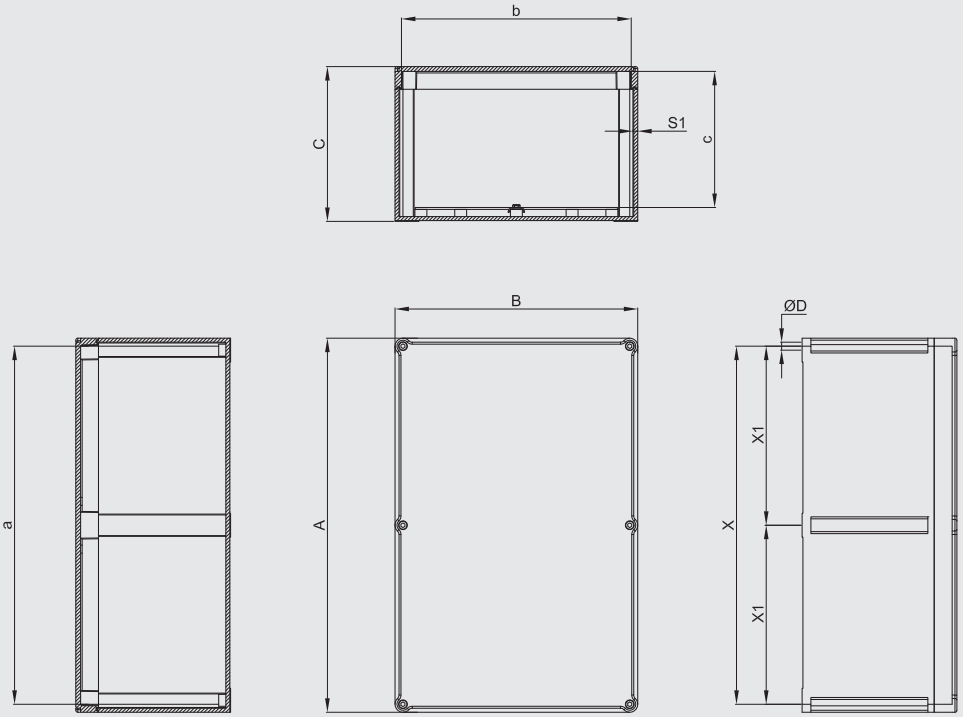
## MECHANICAL FEATURES

**Body and lid:** Black polyester resin with antistatic properties
**Gaskets:** Acid, hydrocarbon and high temperature resistant silicon positioned between the body and the lid
**Mounting:** Polyester lugs for M6 screws
**Certificate plate:** In aluminum riveted
**Screws:** Stainless steel captive variety

## MAX POWER DISSIPATED

| Junction box | Power (W) - for T80°C | | |
|---|---|---|---|
| | T.a. +40°C | T.a. +55°C | T.a. +60°C |
| SA090907/P | 7,7 | 4,7 | 3,7 |
| SA111108/P | 10,9 | 6,6 | 5,3 |
| SA171108/P | 14,3 | 8,5 | 6,6 |
| SA141410/P | 19,7 | 11,5 | 8,9 |
| SA301410/P | 26,9 | 15,3 | 11,9 |
| SA302310/P | 26,0 | 15,6 | 12,0 |
| SA302318/P | 50,2 | 30,0 | 19,5 |
| SA473018/P | 63,7 | 38,7 | 29,7 |
| SA623018/P | 58,1 | 34,4 | 26,9 |

## DIMENSIONAL DRAWINGS




Dimensions in mm

## SELECTION CHART

| Code | External dimensions | | | Inner dimensions | | | | Fixing | | | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | a | b | c | S1 | X | Y | X1 | ØD | Kg |
| **SA111108/P** | 110 | 110 | 83 | 104 | 104 | 65 | 3 | 94 | 94 | - | 6,5 | 0,40 |
| **SA171108/P** | 170 | 110 | 83 | 164 | 104 | 65 | 3 | 154 | 94 | - | 6,5 | 0,80 |
| **SA141410/P** | 147 | 147 | 100 | 135 | 135 | 79 | 3 | 131 | 131 | - | 6,5 | 1,00 |
| **SA301410/P** | 305 | 147 | 110 | 296 | 138 | 90 | 4,5 | 285 | 127 | - | 6,5 | 1,90 |
| **SA302310/P** | 305 | 230 | 110 | 296 | 221 | 90 | 4,5 | 285 | 210 | - | 6,5 | 2,50 |
| **SA302318/P** | 305 | 230 | 190 | 296 | 221 | 165 | 4,5 | 285 | 210 | - | 6,5 | 3,10 |
| **SA473018/P** | 470 | 305 | 195 | 460 | 295 | 175 | 5 | 450 | 285 | 225 | 6,5 | 4,70 |
| **SA623018/P** | 620 | 305 | 185 | 608 | 293 | 160 | 5 | 560 | 285 | 260-300 | 8 | 6,30 |

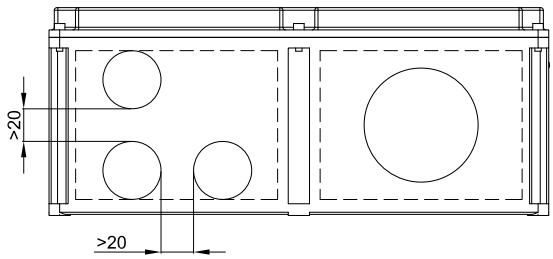
## BODY DRILLING DATA

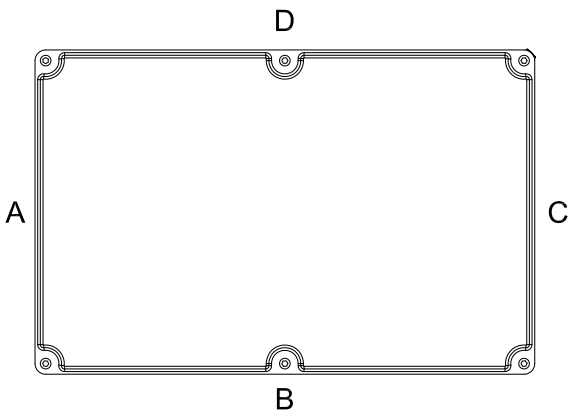
THREAD COMPARISON CHART

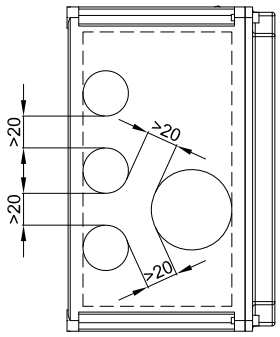
| D<br>Thread diameter | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| ISO 261/965 | 20x1.5 | 25x1.5 | 32x1.5 | 40x1.5 | 50x1.5 | 63x1.5 | 75x1.5 | 85x2 |
| Through hole | Ø20.5 | Ø25.5 | Ø32.5 | Ø40.5 | Ø50.5 | Ø63.5 | Ø75.5 | Ø85.5 |

As required by the current standard, holes can be drilled by Cortem or by authorized partners who hold a production notification in accordance with ATEX Directive .

| TYPE OF ENCLOSURE | HOLE DRILLING IN BODY | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sides A and C | | | | | | | | Sides B and D | | | | | | | |
| | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SA111108/P | 58x55 | 2 | 2 | 1 | 1 | 1 | - | - | - | 58x55 | Square box | | | | | | | |
| SA171108/P | 68x55 | 2 | 2 | 1 | 1 | 1 | - | - | - | 128x55 | 5 | 3 | 2 | 2 | 2 | - | - | - |
| SA141410/P | 100x65 | 6 | 3 | 2 | 1 | 1 | 1 | - | - | 100x65 | Square box | | | | | | | |
| SA301410/P | 100x65 | 6 | 3 | 2 | 1 | 1 | 1 | - | - | 255x65 | 12 | 11 | 5 | 4 | 4 | 3 | - | - |
| SA302310/P | 180x65 | 8 | 7 | 5 | 3 | 2 | 2 | - | - | 260x65 | 12 | 11 | 5 | 4 | 4 | 3 | - | - |
| SA302318/P | 180x140 | 16 | 14 | 9 | 8 | 5 | 4 | 2 | 2 | 258x140 | 24 | 22 | 14 | 11 | 8 | 6 | 3 | 2 |
| SA473018/P | 258x140 | 24 | 18 | 14 | 8 | 8 | 6 | 3 | 2 | 380x140 | 36 | 24 | 18 | 12 | 12 | 8 | 6 | 2 |
| SA623018/P | 248x117 | 18 | 15 | 10 | 8 | 6 | 3 | 2 | 2 | 434x117 | 32 | 26 | 16 | 14 | 12 | 6 | 4 | 4 |



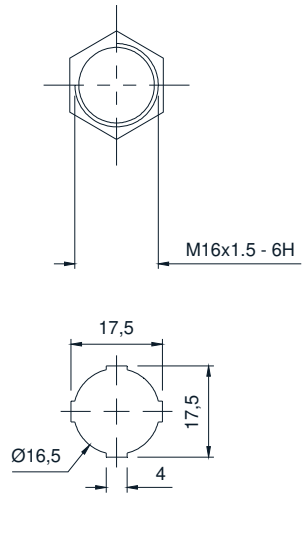



## LID DRILLING DATA

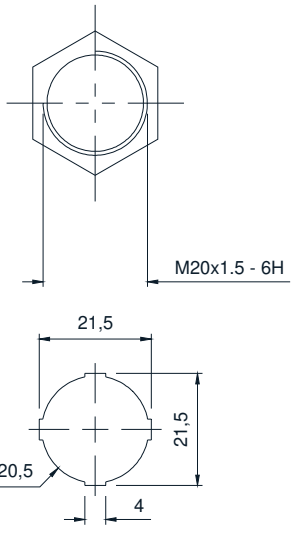
| TYPE OF ENCLOSURE | Drilling area mm |
|---|---|
| SA111108/P | 90x90 |
| SA171108/P | 90x150 |
| SA141410/P | 127x127 |
| SA301410/P | 127x285 |
| SA302310/P | 210x285 |
| SA302318/P | 210x285 |
| SA473018/P | 285x450 |
| SA623018/P | 596x280 |

### TYPE OF HOLES

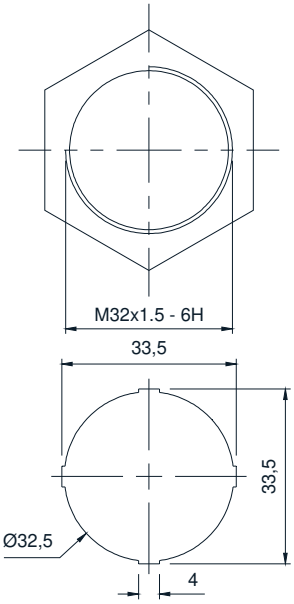
For handles
M-0634/11 M-0634/12
M-0634/13 M-0634/14
M-0634/03 M-0634/06
M-0634/07 M-0634/09



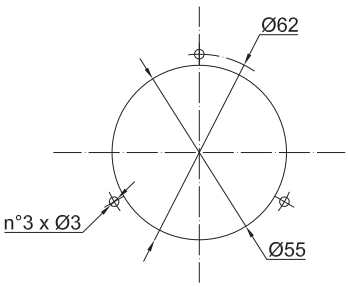

For handles
M-0634/10
M-0634/10L
M-0634/01



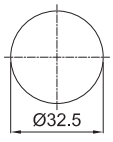

For handles
M-0639 M-0638
M-0637 M-0635
M-0636




For ammeters and voltmeters




For indicator light



# Junction boxes for monitoring and control panel 'Ex tb' CTB

## STAINLESS STEEL CONTROL HOUSINGS CTB SERIES

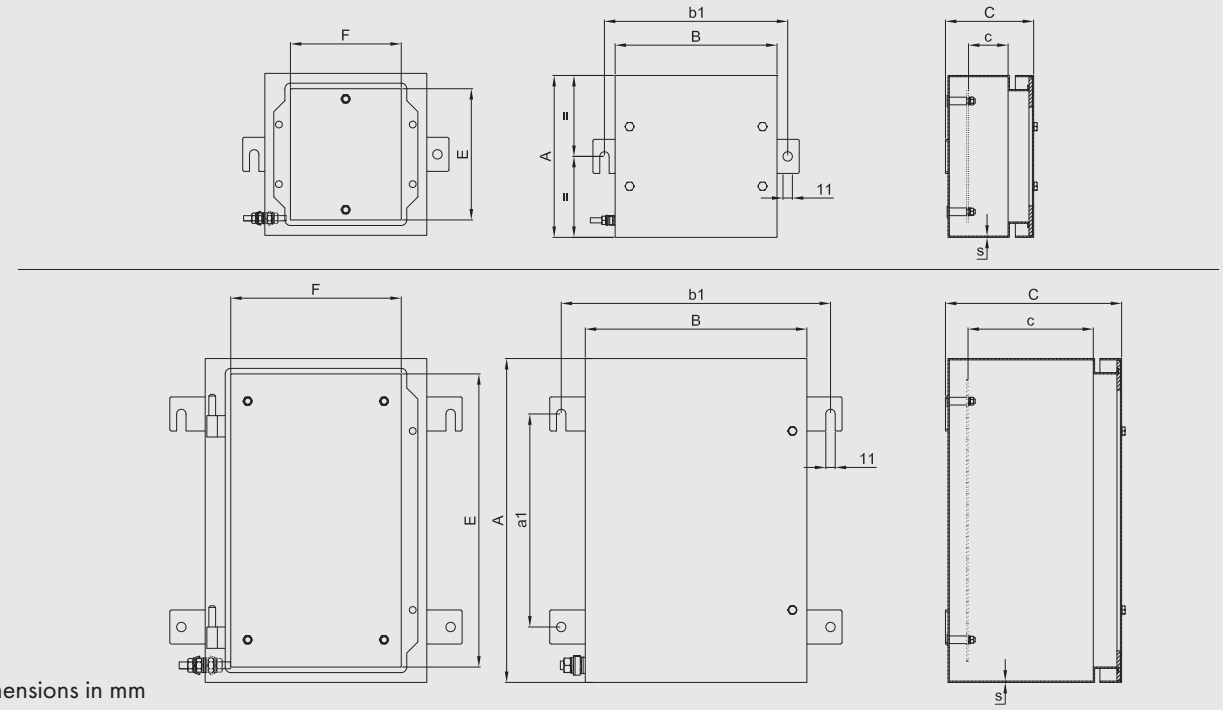
## MECHANICAL FEATURES

**Body and lid:** Stainless steel AISI 316L
**Hinges:** Stainless steel AISI 316L
**Gaskets:** Resistant to acids, hydrocarbons and high temperatures, located between body and lid. Ensures consistent protection to IP66 during use
**Certificate plate:** Stainless steel riveted
**Removable gland plates:** Stainless steel thickness 30/10
**Bolts and Screws:** Stainless steel captive variety
**Earth screws:** Brass. On inside and outside of body complete with anti-rotation brackets
**Mounting:** Welded AISI 316L stainless steel lugs

## MAX POWER DISSIPATION

| Junction box | Power (W) - for T80°C | | | Power (W) - for T100°C | | | Power (W) - for T135°C | | |
|---|---|---|---|---|---|---|---|---|---|
| | T.a. +40°C | T.a. +55°C | T.a. +60°C | T.a. +40°C | T.a. +55°C | T.a. +60°C | T.a. +40°C | T.a. +55°C | T.a. +60°C |
| CSTB121208 | 8,9 | 6,0 | 5,0 | 13,5 | 9,9 | 8,9 | 21,3 | 18,0 | 16,8 |
| CSTB151509 | 8,9 | 6,0 | 5,0 | 13,5 | 9,9 | 8,9 | 21,3 | 18,0 | 16,8 |
| CSTB191910 | 8,9 | 6,0 | 5,0 | 13,5 | 9,9 | 8,9 | 21,3 | 18,0 | 16,8 |
| CTB221513 | 8,9 | 6,0 | 5,0 | 13,5 | 9,9 | 8,9 | 21,3 | 18,0 | 16,8 |
| CTB262616 | 18,6 | 10,4 | 8,1 | 30,3 | 21,4 | 18,6 | 48,9 | 40,9 | 38,2 |
| CTB262620 | 18,6 | 10,4 | 8,1 | 30,3 | 21,4 | 18,6 | 48,9 | 40,9 | 38,2 |
| CTB303016 | 18,6 | 10,4 | 8,1 | 30,3 | 21,4 | 18,6 | 48,9 | 40,9 | 38,2 |
| CTB303020 | 18,6 | 10,4 | 8,1 | 30,3 | 21,4 | 18,6 | 48,9 | 40,9 | 38,2 |
| CTB382616 | 18,6 | 10,4 | 8,1 | 30,3 | 21,4 | 18,6 | 48,9 | 40,9 | 38,2 |
| CTB382620 | 20,5 | 10,0 | 5,0 | 32,0 | 23,3 | 20,5 | 51,3 | 43,1 | 40,4 |
| CTB453816 | 25,0 | 12,5 | 6,0 | 39,0 | 28,4 | 25,0 | 62,6 | 52,5 | 49,3 |
| CTB453820 | 34,0 | 17,0 | 6,0 | 53,1 | 38,7 | 34,0 | 85,1 | 71,4 | 67,1 |
| CTB484816 | 31,0 | 15,5 | 6,5 | 48,4 | 35,2 | 31,0 | 77,6 | 65,1 | 61,2 |
| CTB484820 | 43,0 | 21,5 | 6,5 | 67,1 | 48,9 | 43,0 | 107,6 | 90,3 | 84,8 |
| CTB503516 | 26,0 | 13,0 | 6,0 | 40,6 | 29,6 | 26,0 | 65,1 | 54,6 | 51,3 |
| CTB503520 | 35,0 | 17,5 | 6,0 | 54,7 | 39,8 | 35,0 | 87,6 | 73,5 | 69,0 |
| CTB624516 | 38,0 | 19,0 | 7,0 | 59,3 | 43,2 | 38,0 | 95,1 | 79,8 | 75,0 |
| CTB624520 | 55,0 | 27,5 | 7,5 | 85,9 | 62,5 | 55,0 | 137,7 | 115,6 | 108,5 |
| CTB745520 | 77,0 | 37,5 | 8,5 | 120,2 | 87,5 | 77,0 | 192,8 | 161,8 | 151,9 |
| CTB765020 | 77,0 | 37,5 | 8,5 | 120,2 | 87,5 | 77,0 | 192,8 | 161,8 | 151,9 |
| CTB808030 | 77,0 | 37,5 | 8,5 | 120,2 | 87,5 | 77,0 | 192,8 | 161,8 | 151,9 |
| CTB866420 | 99,0 | 49,5 | 9,0 | 154,6 | 112,6 | 99,0 | 247,8 | 208,0 | 195,3 |
| CTB916120 | 103,0 | 51,5 | 9,0 | 160,8 | 117,1 | 103,0 | 257,9 | 216,4 | 203,2 |
| CTB916130 | 103,0 | 51,5 | 9,0 | 160,8 | 117,1 | 103,0 | 257,9 | 216,4 | 203,2 |
| CTB987420 | 125,0 | 62,5 | 9,0 | 195,2 | 142,1 | 125,0 | 312,9 | 262,6 | 246,6 |

## DIMENSIONAL DRAWING




Dimensions in mm

## SELECTION CHART

| Code | External dimensions | | | | Inner dimensions | | | Fixing | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | E | F | c | s | a1 | b1 |
| CTB221513 | 229 | 152 | 130 | 169 | 92 | 75 | 1,5 | 152 | 208 |
| CTB262616 | 260 | 260 | 160 | 224 | 200 | 100 | 1,5 | 170 | 316 |
| CTB262620 | 260 | 260 | 205 | 224 | 200 | 145 | 1,5 | 170 | 316 |
| CTB303016 | 306 | 306 | 160 | 270 | 246 | 100 | 1,5 | 203 | 361 |
| CTB303020 | 306 | 306 | 205 | 270 | 246 | 145 | 1,5 | 203 | 361 |
| CTB382616 | 380 | 260 | 160 | 344 | 200 | 100 | 1,5 | 250 | 316 |
| CTB382620 | 380 | 260 | 205 | 344 | 200 | 145 | 1,5 | 250 | 316 |
| CTB453816 | 450 | 380 | 160 | 414 | 322 | 100 | 1,5 | 305 | 437 |
| CTB453820 | 450 | 380 | 205 | 414 | 322 | 145 | 1,5 | 305 | 437 |
| CTB484816 | 480 | 480 | 160 | 444 | 420 | 100 | 1,5 | 327 | 535 |
| CTB484820 | 480 | 480 | 205 | 444 | 420 | 145 | 1,5 | 327 | 535 |
| CTB503516 | 500 | 350 | 160 | 464 | 290 | 100 | 1,5 | 350 | 406 |
| CTB503520 | 500 | 350 | 205 | 464 | 290 | 145 | 1,5 | 350 | 406 |
| CTB624516 | 620 | 450 | 160 | 584 | 390 | 100 | 2 | 450 | 506 |
| CTB624520 | 620 | 450 | 205 | 584 | 390 | 145 | 2 | 450 | 506 |
| CTB745520 | 740 | 550 | 205 | 704 | 490 | 145 | 2 | 540 | 606 |
| CTB765020 | 762 | 508 | 205 | 726 | 448 | 145 | 2 | 508 | 564 |
| CTB808030 | 800 | 800 | 305 | 725 | 725 | 245 | 2 | 510 | 855 |
| CTB866420 | 860 | 640 | 205 | 824 | 580 | 145 | 2 | 696 | 570 |
| CTB916120 | 914 | 610 | 205 | 878 | 550 | 145 | 2 | 666 | 559 |
| CTB916130 | 914 | 610 | 305 | 878 | 550 | 245 | 2 | 666 | 559 |
| CTB987420 | 980 | 740 | 205 | 944 | 680 | 145 | 2 | 700 | 769 |

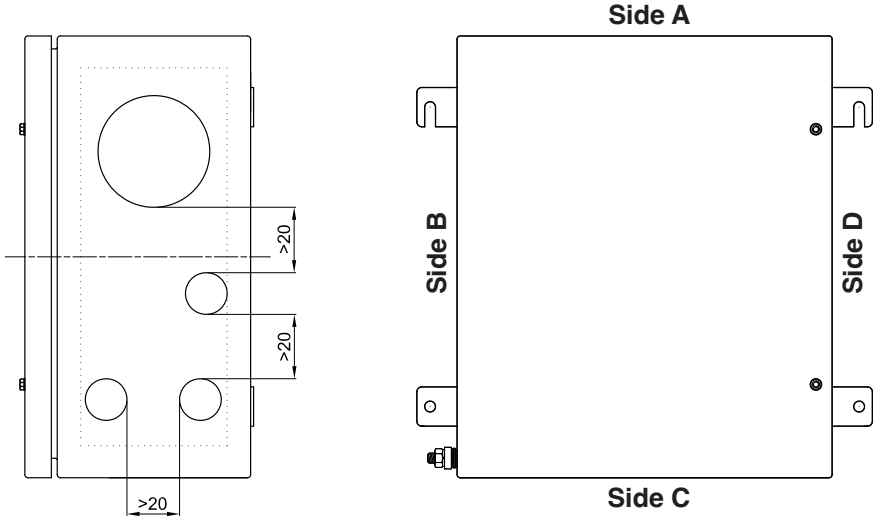
## BODY DRILLING DATA

THREAD COMPARISON CHART

| D<br>Thread diameter | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| ISO 261/965 | 16x1.5 | 20x1.5 | 25x1.5 | 32x1.5 | 40x1.5 | 50x1.5 | 63x1.5 | 75x1.5 | 90x1.5 |
| Through hole | Ø17 | Ø20.5 | Ø25.5 | Ø32.5 | Ø40.5 | Ø50.5 | Ø63.5 | Ø75.5 | Ø90.5 |

As required by the current standard, holes can be drilled by Cortem or by authorized partners who hold a production notification in accordance with ATEX Directive .

| TYPE OF ENCLOSURE | HOLE DRILLING IN BODY | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sides A and C | | | | | | | | | | Sides B and D | | | | | | | | |
| | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | | | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | |
| | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| CTB221513 | 105x55 | 5 | 5 | 2 | 2 | 1 | - | - | - | - | 165x55 | 8 | 8 | 3 | 3 | 3 | - | - | - | - |
| CTB262616 | 195x80 | 10 | 10 | 7 | 4 | 3 | 3 | 2 | - | - | 210x80 | 10 | 10 | 8 | 4 | 3 | 3 | 2 | - | - |
| CTB262620 | 215x125 | 15 | 15 | 14 | 8 | 6 | 3 | 2 | 2 | 1 | 195x125 | 15 | 15 | 12 | 6 | 6 | 3 | 2 | 2 | 1 |
| CTB303016 | 260x80 | 12 | 12 | 10 | 9 | 8 | 3 | 2 | 2 | - | 245x80 | 12 | 12 | 10 | 9 | 8 | 3 | 2 | 2 | - |
| CTB303020 | 260x125 | 18 | 18 | 17 | 10 | 8 | 6 | 3 | 2 | 2 | 245x125 | 18 | 18 | 15 | 10 | 8 | 6 | 3 | 2 | 2 |
| CTB382616 | 215x80 | 10 | 10 | 10 | 7 | 3 | 3 | 2 | 2 | - | 315x80 | 16 | 16 | 14 | 11 | 5 | 4 | 3 | 3 | - |
| CTB382620 | 215x125 | 15 | 15 | 12 | 8 | 6 | 6 | 2 | 2 | 1 | 315x125 | 24 | 24 | 21 | 12 | 10 | 8 | 3 | 3 | 2 |
| CTB453816 | 335x80 | 16 | 16 | 14 | 6 | 5 | 4 | 3 | 2 | - | 385x80 | 20 | 20 | 16 | 7 | 6 | 5 | 4 | 3 | - |
| CTB453820 | 335x125 | 24 | 24 | 21 | 12 | 10 | 8 | 3 | 3 | 2 | 335x125 | 30 | 30 | 24 | 14 | 12 | 10 | 4 | 3 | 3 |
| CTB484816 | 435x80 | 22 | 22 | 18 | 8 | 7 | 6 | 4 | 3 | - | 405x80 | 20 | 20 | 18 | 8 | 6 | 5 | 4 | 3 | - |
| CTB484820 | 435x125 | 32 | 32 | 26 | 16 | 13 | 11 | 4 | 3 | 3 | 405x125 | 30 | 30 | 26 | 14 | 12 | 10 | 4 | 3 | 3 |
| CTB503516 | 305x80 | 14 | 14 | 12 | 5 | 4 | 4 | 3 | 2 | - | 440x80 | 22 | 22 | 19 | 8 | 7 | 6 | 4 | 4 | - |
| CTB503520 | 305x125 | 21 | 21 | 18 | 12 | 10 | 7 | 3 | 2 | 2 | 440x125 | 33 | 33 | 27 | 16 | 14 | 11 | 4 | 4 | 3 |
| CTB624516 | 405x80 | 20 | 20 | 18 | 7 | 6 | 5 | 4 | 3 | - | 555x80 | 28 | 28 | 24 | 10 | 9 | 7 | 6 | 5 | - |
| CTB624520 | 405x125 | 30 | 30 | 26 | 14 | 12 | 10 | 4 | 3 | 2 | 550x125 | 39 | 39 | 36 | 20 | 18 | 15 | 6 | 5 | 3 |
| CTB745520 | 505x125 | 36 | 36 | 32 | 16 | 16 | 13 | 5 | 4 | 3 | 670x125 | 50 | 50 | 42 | 24 | 21 | 17 | 7 | 6 | 4 |
| CTB765020 | 465x125 | 33 | 33 | 29 | 18 | 14 | 11 | 5 | 4 | 3 | 690x125 | 50 | 50 | 44 | 26 | 22 | 18 | 7 | 6 | 4 |
| CTB866420 | 595x125 | 44 | 44 | 38 | 22 | 18 | 15 | 6 | 5 | 4 | 780x125 | 57 | 57 | 51 | 28 | 24 | 20 | 8 | 6 | 5 |
| CTB916120 | 565x125 | 41 | 41 | 35 | 20 | 18 | 14 | 6 | 5 | 3 | 830x125 | 60 | 60 | 53 | 30 | 26 | 22 | 9 | 7 | 5 |
| CTB916130 | 565X224 | 65 | 65 | 60 | 40 | 27 | 21 | 12 | 9 | 3 | 833x228 | 80 | 80 | 75 | 48 | 33 | 27 | 14 | 12 | 5 |
| CTB987420 | 700x125 | 50 | 50 | 44 | 26 | 22 | 18 | 7 | 6 | 4 | 840x125 | 63 | 63 | 59 | 34 | 28 | 24 | 9 | 8 | 6 |

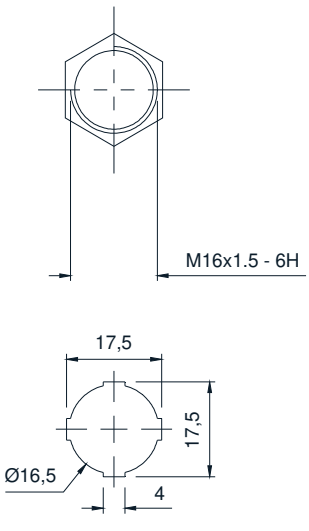


## LID DRILLING DATA

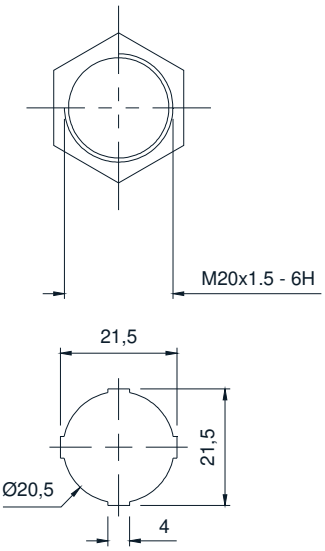
| TYPE ENCLOSURES | Drilling area mm |
|---|---|
| CTB221513 | 150x75 |
| CTB262616 | 180x180 |
| CTB262620 | 180x180 |
| CTB303016 | 225x225 |
| CTB303020 | 225x225 |
| CTB382616 | 300x180 |
| CTB382620 | 300x180 |
| CTB453816 | 370x300 |
| CTB453820 | 370x300 |
| CTB484816 | 400x400 |
| CTB484820 | 400x400 |
| CTB503516 | 420x270 |
| CTB503520 | 420x270 |
| CTB624516 | 540x370 |
| CTB624520 | 540x370 |
| CTB745520 | 660x470 |
| CTB765020 | 680x425 |
| CTB866420 | 780x560 |
| CTB916120 | 835x530 |
| CTB916130 | 835x530 |
| CTB987420 | 900x660 |
| CTB808030 | 720x720 |

### TYPE OF HOLES

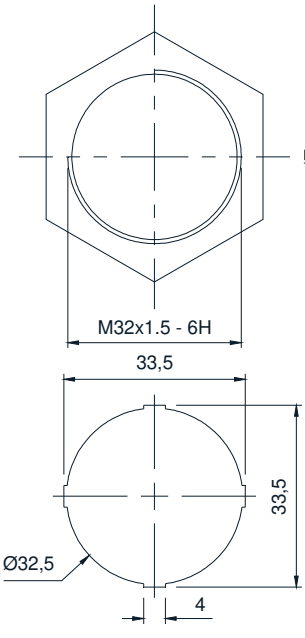
For handles
M-0634/11 M-0634/12
M-0634/13 M-0634/14
M-0634/03 M-0634/06
M-0634/07 M-0634/09



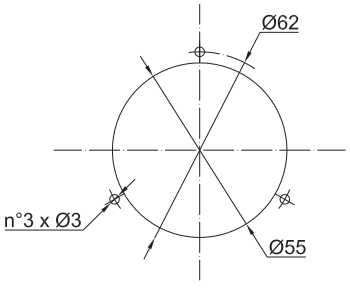

For handles
M-0634/10
M-0634/10L
M-0634/01



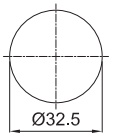

For handles
M-0639 M-0638
M-0637 M-0635
M-0636




For ammeters and voltmeters

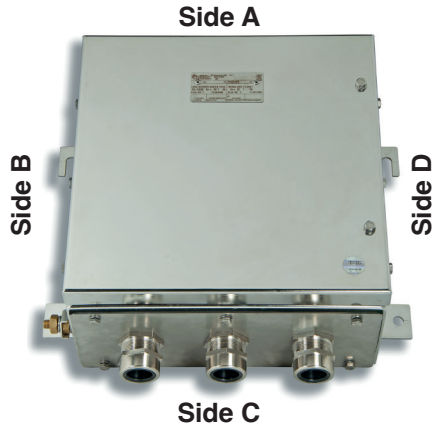


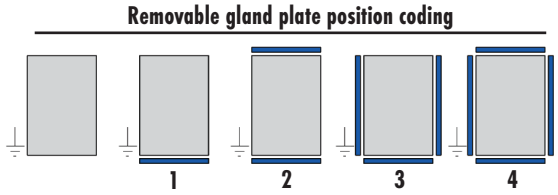

For indicator light



# Junction boxes for monitoring and control panel 'Ex tb' CTB

## REMOVABLE GLAND PLATES ON CTB SERIES STAINLESS STEEL BOXES



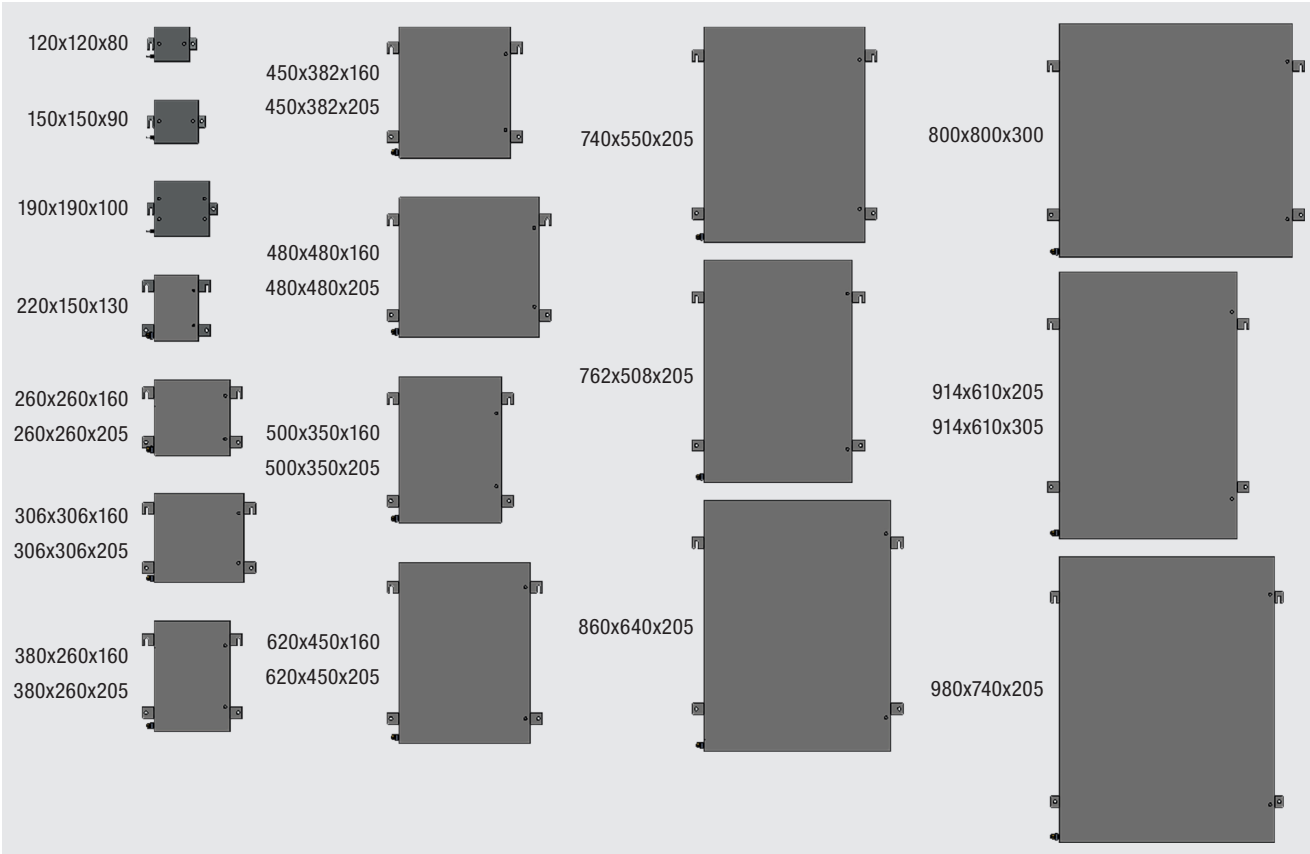

### Ordering code examples

**1) CTB50351653**
500x350x160 stainless steel box with 3 removable gland plates

**2) CTB624520S4**
620x450x205 stainless steel box with 4 removable gland plates

| Code | Removable gland plate dimensions | | | |
|---|---|---|---|---|
| | Side A | Side B | Side C | Side D |
| CTB221513S.. | 144x94 | 144x94 | 144x94 | 144x94 |
| CTB262616S.. | 254x120 | 154x120 | 254x120 | 154x120 |
| CTB262620S.. | 254x164 | 154x164 | 254x164 | 154x164 |
| CTB303016S.. | 298x120 | 254x120 | 298x120 | 254x120 |
| CTB303020S.. | 298x164 | 254x164 | 298x164 | 254x164 |
| CTB382616S.. | 254x120 | 298x120 | 254x120 | 298x120 |
| CTB382620S.. | 254x164 | 298x164 | 254x164 | 298x164 |
| CTB453816S.. | 374x120 | 374x120 | 374x120 | 374x120 |
| CTB453820S.. | 374x164 | 374x164 | 374x164 | 374x164 |
| CTB484816S.. | 474x120 | 444x120 | 474x120 | 444x120 |
| CTB484820S.. | 474x164 | 444x164 | 474x164 | 444x164 |
| CTB503516S.. | 344x120 | 444x120 | 344x120 | 444x120 |
| CTB503520S.. | 344x164 | 444x164 | 344x164 | 444x164 |
| CTB624516S.. | 444x120 | 544x120 | 444x120 | 544x120 |
| CTB624520S.. | 444x164 | 544x164 | 444x164 | 544x164 |
| CTB745520S.. | 544x164 | 634x164 | 544x164 | 634x164 |
| CTB765020S.. | 504x164 | 594x124 | 504x164 | 594x124 |
| CTB808030S.. | 634x214 | 634x214 | 634x214 | 634x214 |
| CTB866420S.. | 634x164 | 740x164 | 634x164 | 740x164 |
| CTB916120S.. | 604x164 | 740x164 | 604x164 | 740x164 |
| CTB916130S.. | 604x264 | 740x264 | 604x264 | 740x264 |
| CTB987420S.. | 634x164 | 444x164 (x2) | 634x164 | 444x164 (x2) |

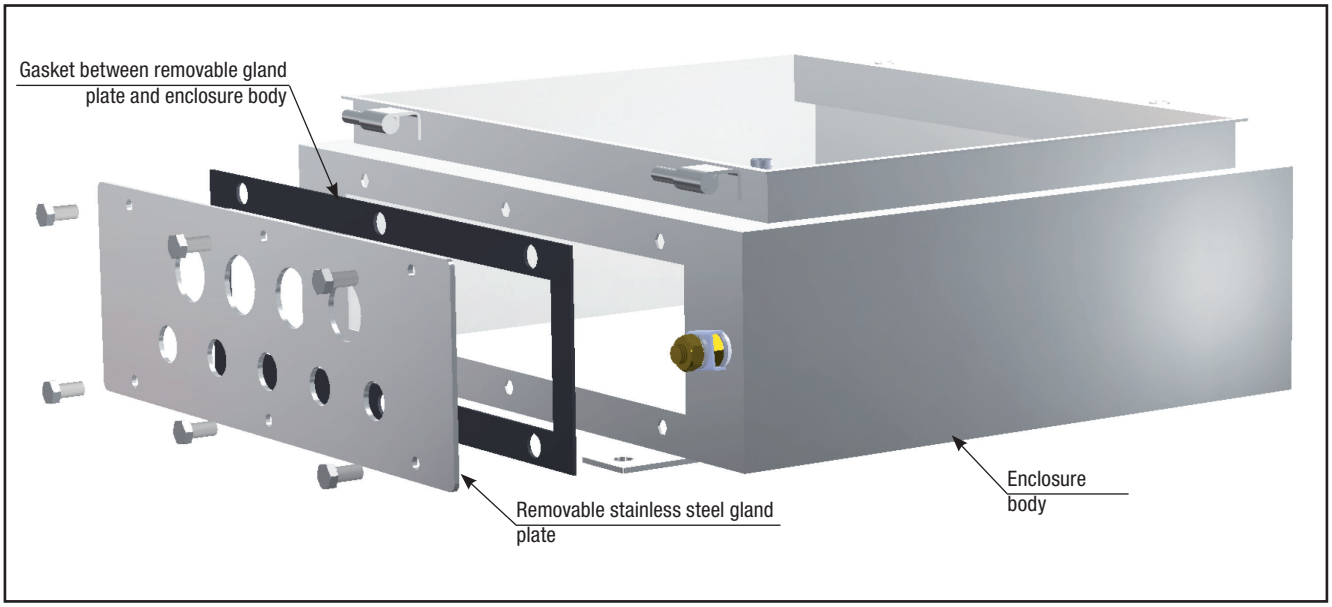
## OVERVIEW OF SIZES






CORTEM GROUP®

Example of enclosure body featuring removable gland plate on just one side.



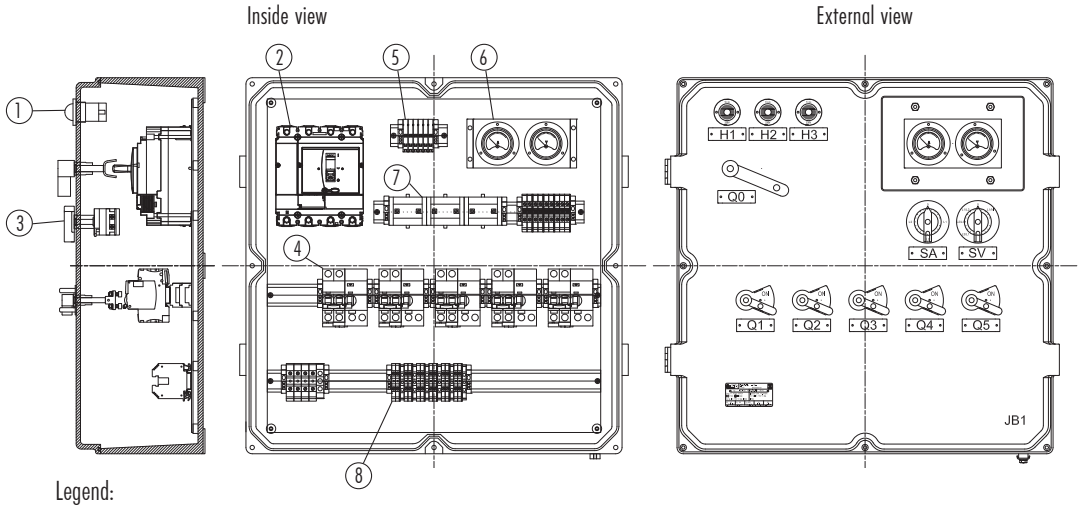

| TYPE OF ENCLOSURE | HOLE DRILLING IN REMOVABLE GLAND PLATES | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sides A and C | | | | | | | | | Sides B and D | | | | | | | |
| | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | | | Drilling area mm | MAXIMUM QUANTITY PER HOLE TYPE | | | | | | |
| | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 01 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| CTB221513 | 98x54 | 3 | 3 | 2 | 1 | 1 | 1 | - | - | 104x54 | 3 | 3 | 2 | 1 | 1 | 1 | - | - |
| CTB262616 | 214x80 | 10 | 10 | 8 | 4 | 3 | 2 | - | - | 114x80 | 6 | 6 | 3 | 2 | 1 | 1 | - | - |
| CTB262620 | 214x124 | 15 | 15 | 12 | 8 | 6 | 3 | - | - | 114x124 | 9 | 9 | 6 | 4 | 2 | 1 | - | - |
| CTB303016 | 258x80 | 12 | 12 | 10 | 4 | 4 | 3 | 2 | - | 214x80 | 10 | 10 | 8 | 4 | 3 | 3 | 2 | - |
| CTB303020 | 258x124 | 18 | 18 | 13 | 8 | 4 | 3 | - | - | 214x124 | 15 | 15 | 10 | 8 | 3 | 2 | - | - |
| CTB382616 | 214x80 | 10 | 10 | 8 | 4 | 3 | 3 | - | - | 258x80 | 12 | 12 | 9 | 4 | 3 | 3 | - | - |
| CTB382620 | 214x124 | 15 | 15 | 12 | 8 | 6 | 4 | - | - | 258x124 | 18 | 18 | 15 | 8 | 5 | 3 | - | - |
| CTB453816 | 334x80 | 16 | 16 | 14 | 6 | 5 | 4 | 3 | - | 334x80 | 16 | 16 | 14 | 6 | 5 | 4 | 3 | - |
| CTB453820 | 334x124 | 24 | 24 | 20 | 12 | 8 | 4 | 3 | - | 334x124 | 24 | 24 | 20 | 12 | 8 | 4 | 3 | - |
| CTB484816 | 434x80 | 22 | 22 | 18 | 7 | 5 | 5 | 4 | - | 404x80 | 20 | 18 | 14 | 6 | 5 | 4 | 3 | - |
| CTB484820 | 434x124 | 32 | 32 | 24 | 14 | 12 | 5 | 4 | - | 404x124 | 29 | 27 | 21 | 12 | 8 | 4 | 3 | - |
| CTB503516 | 304x80 | 14 | 14 | 12 | 5 | 4 | 4 | 3 | - | 404x80 | 19 | 16 | 12 | 5 | 4 | 4 | 3 | - |
| CTB503520 | 304x124 | 21 | 21 | 17 | 10 | 8 | 4 | 3 | 2 | 404x124 | 29 | 24 | 18 | 10 | 8 | 4 | 3 | 2 |
| CTB624516 | 404x80 | 19 | 19 | 16 | 7 | 6 | 5 | 4 | - | 504x80 | 24 | 22 | 16 | 7 | 6 | 5 | 4 | - |
| CTB624520 | 404x124 | 29 | 29 | 23 | 14 | 10 | 5 | 4 | 3 | 504x124 | 36 | 33 | 24 | 14 | 12 | 5 | 4 | 3 |
| CTB745520 | 504x124 | 36 | 36 | 30 | 16 | 13 | 7 | 5 | 4 | 594x124 | 42 | 42 | 30 | 18 | 14 | 7 | 5 | 4 |
| CTB765020 | 464x124 | 33 | 33 | 16 | 14 | 10 | 5 | 4 | 3 | 594x124 | 42 | 42 | 22 | 22 | 16 | 8 | 5 | 5 |
| CTB866420 | 594x124 | 44 | 44 | 36 | 20 | 16 | 8 | 6 | 5 | 700x124 | 51 | 48 | 36 | 20 | 16 | 8 | 6 | 4 |
| CTB916120 | 564x124 | 41 | 41 | 22 | 16 | 8 | 8 | 4 | 4 | 700x124 | 51 | 48 | 22 | 22 | 8 | 8 | 5 | 5 |
| CTB916130 | 564x224 | 65 | 65 | 60 | 40 | 27 | 21 | 12 | 9 | 700x224 | 80 | 80 | 75 | 48 | 33 | 27 | 14 | 12 |
| CTB987420 | 594x124 | 44 | 44 | 36 | 20 | 16 | 8 | 6 | 4 | 404x124 (x2) | 58 | 58 | 48 | 28 | 20 | 10 | 8 | 6 |

## ELECTRICAL FEATURES

The command, control and signalling units SA, SA/P and CTB series junction boxes could mount certificated signal, control and command operators and maneuver on the lid while, internally, could mount analogic and digital instruments, electronic reactors/inverters, PLC, multiplexers, amplifier, measuring and control devices, automatic switches, fuses, relays, electronic control devices, contactors, timers, twilight relays capacitors, transformers, resistors, terminals, reactors, soft starter, heater, sensor boards, amperometer, battery pack.

**Rated voltage max.:** 1000 Vac/dc
**Rated current max.:** 312 A
**Rated frequency:** 50/60 Hz
**Terminal section:** da 1,5 mm² a 300 mm²

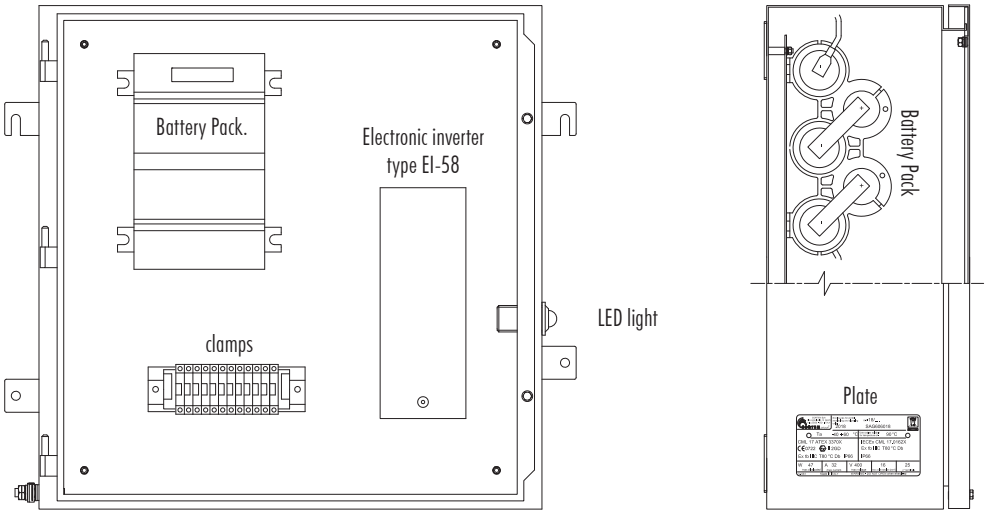
EXAMPLE OF TYPICAL DISPOSAL OF INTERNAL AND EXTERNAL ACCESSORIES




Legend:

1. Indicator lights M-0612 / 3R230
2. Maneuver M-0634/01 with 100A - 4 poles circuit breaker and thermal magnetic trip unit
3. M-0634/10 maneuvers with switches
4. M-0434 / V maneuvers with 2P 10A magneto-thermal switches and differential blocks
5. Fuses 5x20 2A
6. B-0140A ammeter and B-0140V voltmeter
7. 40 / 1A current transformers
8. Terminals section 4mm²

EXAMPLE OF ASSEMBLING OF CORTEM G-0309 SERIES BATTERY UNIT




Special conditions for the use of the battery pack G-0309 .. and for the ammeter or voltmeter B-0140 ..:

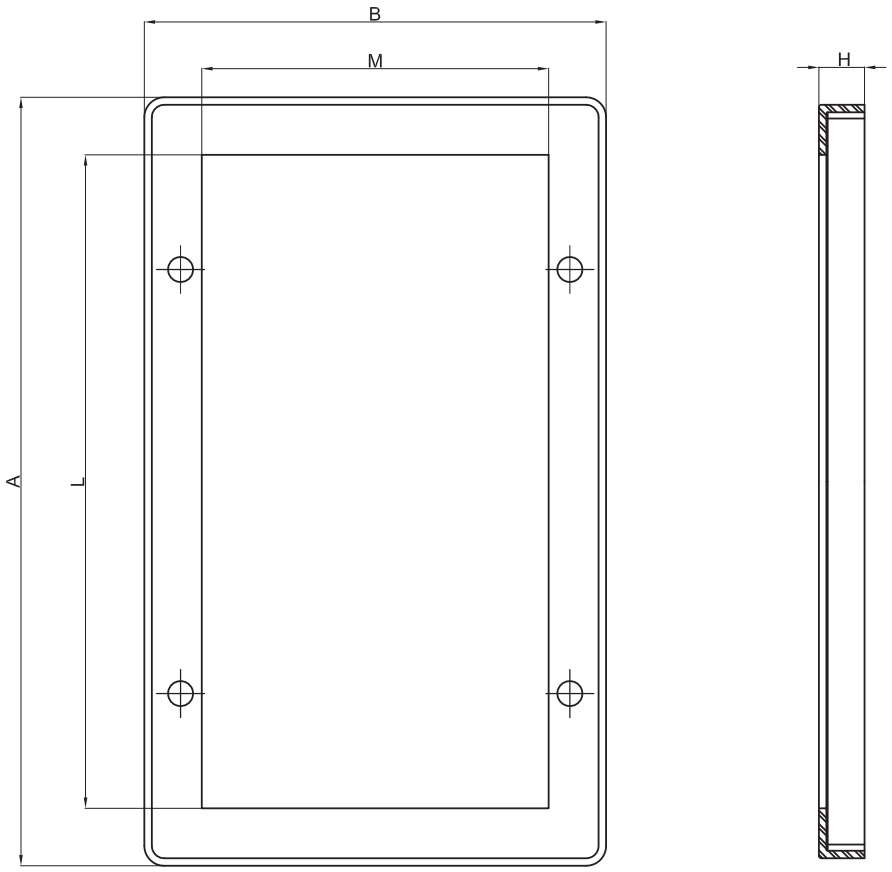
- when the battery is installed (IECEx CES 13.0006U and CESI 00ATEX032U certificates), the maximum dissipated power must be reduced by 12.5% and the equipment must be marked with a minimum temperature not lower than -20° C;
- when the ammeter and/or the voltmeter (IECEx CES 12.0022U and CESI 04ATEX128U certificates) are installed, the equipment must be marked with a maximum temperature not higher than +40° C and the maximum power dissipated for an ambient with temperature +40° C is reduced by 31.25%.

.

## ENCLOSURES WITH TRANSPARENT GLASS OR POLYCARBONATE ON THE LID

According to customer's request, standard windows are available for the different type of enclosures for uses such as visualization of analog or digital instruments or indicators.

### DIMENSIONAL DRAWING BOXES WITH WINDOWS

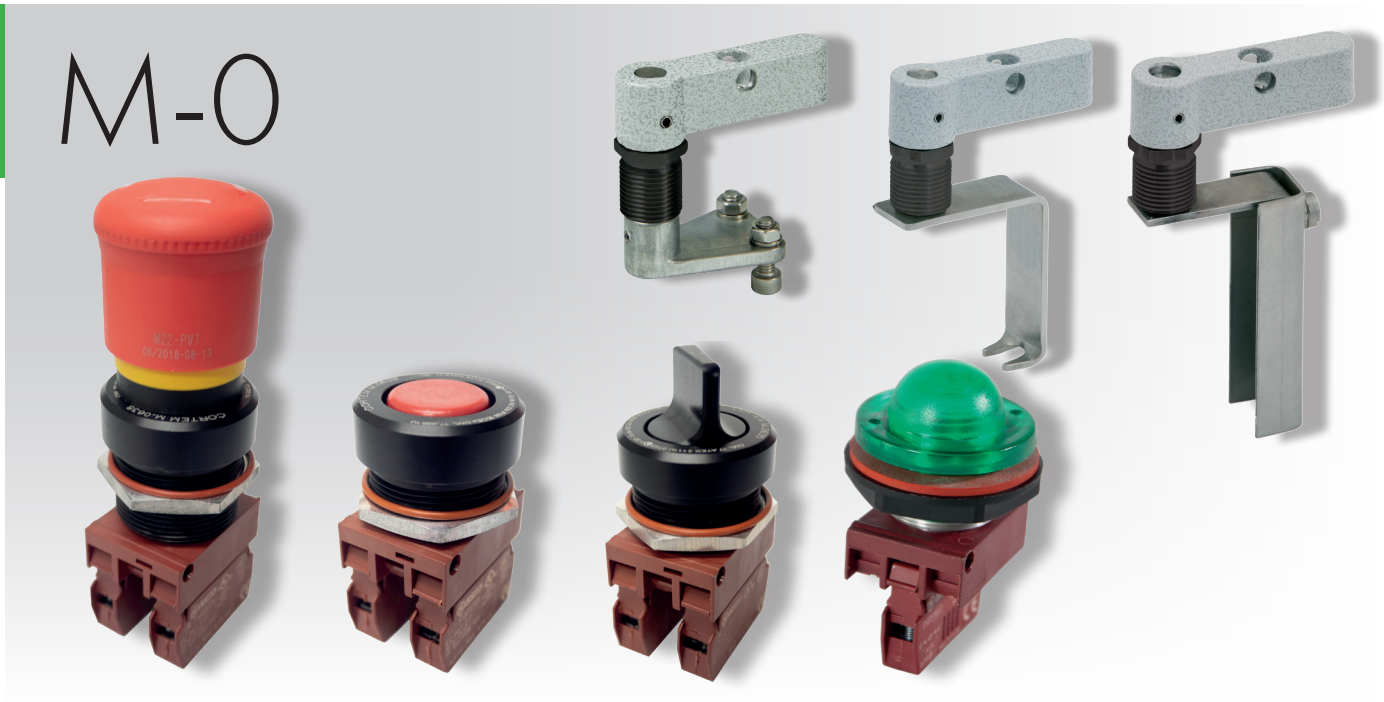



## SELECTION TABLE

| Transparent | Gasket | Ring | Material | Dimensiones H | A | B | L | M |
|---|---|---|---|---|---|---|---|---|
| K12-373P | B12-446 | K12-372P | polycarbonate | 9 | 118 | 118 | 45 | 45 |
| K151-373P | B151-446 | K151-372P | polycarbonate | 9 | 149 | 118 | 76 | 45 |
| K15-373P | B15-446 | K15-372P | polycarbonate | 9 | 149 | 149 | 76 | 76 |
| K191-373P | B191-446 | K191-372P | polycarbonate | 9 | 189 | 149 | 116 | 76 |
| K19-373P | B19-446 | K19-372P | polycarbonate | 9 | 189 | 189 | 116 | 116 |
| K22-373P | B22-446 | K22-372P | polycarbonate | 9 | 228 | 151 | 155 | 78 |
| K26-373P | B26-446 | K26-372P | polycarbonate | 9 | 257 | 257 | 184 | 184 |
| K12-373V | B12-446 | K12-372V | glass | 12 | 118 | 118 | 45 | 45 |
| K151-373V | B151-446 | K151-372V | glass | 12 | 149 | 118 | 76 | 45 |
| K15-373V | B15-446 | K15-372V | glass | 12 | 149 | 149 | 76 | 76 |
| K191-373V | B191-446 | K191-372V | glass | 12 | 189 | 149 | 116 | 76 |
| K19-373V | B19-446 | K19-372V | glass | 12 | 189 | 189 | 116 | 116 |
| K22-373V | B22-446 | K22-372V | glass | 12 | 228 | 151 | 155 | 78 |
| K26-373V | B26-446 | K26-372V | glass | 12 | 257 | 257 | 184 | 184 |

# M-0... control, monitoring and signalling devices

## M-0



M-0 series control, monitoring and signalling devices are installed as external accessories on Cortem 'Ex d' enclosures used in any industrial environment where an explosive atmosphere may be present, classified as Zone 1, 2, 21, 22. M-0 control devices can be used to close or open electrical or mechanical devices fitted inside the 'Ex d' enclosures while the signalling devices feature lights to indicate their operating status. The control and signalling device components are made from stainless steel to deliver unbeatable efficiency under any environmental conditions. Levers are made from aluminium while the plastic parts on push-buttons are designed to provide lengthy service life even when used in a highly corrosive atmosphere. M-0 control and signalling devices have an IP66 protection degree.

### CERTIFICATION DATA FOR CONTROL DEVICES

| | | | | |
|---|---|---|---|---|
| **Classification:** | Group 2 | Category 2D | | |
| **Installation:** EN 60079.14 | zone 21 - zone 22 (Dust) | | | |
| **Marking:** | CE 0722 Ex II 2D Ex tb IIIC Db IP66 | | | |
| **Certification:** | ATEX CML 17 ATEX 3111U | | All IEC Ex certification data can be downloaded from www.cortemgroup.com | |
| | IEC Ex CML 17.0051U | | | |
| **Standards:** | CENELEC EN 60079-0: 2012+A11:2013, EN 60079-31:2014 and EUROPEAN DIRECTIVE 2014/34/UE<br>IEC 60079-0: 2011, IEC 60079-31: 2013 | | | |
| **Degree of protection:** | IP66 | | | |

## MECHANICAL FEATURES OF CONTROL DEVICES

**Outer body:** Aluminium
**Internal bush:** Stainless steel
**Internal pin:** Stainless steel
**Gaskets:** Acid/hydrocarbon-resistant silicone
**Push-button:** Coloured nylon
**Illuminated push-button:** Clear coloured polycarbonate
**Handle levers:** Aluminium
**Coating:** Polyester coating RAL 7035 (Light grey), where this is an option
**Device mounting:** Screws into lid
**Contact mounting:** Snaps onto special flange, which assures quick connection of the whole contact block to the device or boxed type installed on DIN rails directly on the internal frame

## ELECTRICAL FEATURES (Contact block for push-buttons)

**Rated voltage:** 600V
**Rated current:** 10A
**Impulse withstand voltage:** 4kV

**Insulation category:** Group C as per VDE 0110

**Degree of protection of terminals:** IP2x as per CENELEC EN 60529

**Contact operation:**
- slow acting
- self-cleaning (wiping action)
- NC contact forced opening
- double movable bridge
- four points of contact
- double break

**Contact resistance**
≤ 25 mΩ as per IEC 255.7 category 3

**Short-circuit protection**
16A gG time-delay fuses as per IEC 269.1 and 269.3

***Electrical performance***
Rated thermal current Ith = 10 A

**Operational limits as per IEC 947.5.1:**

| **Category AC15** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Voltage Ue (V) | 24 | 48 | 60 | 110 | 220 | 380 | 500 | 600 |
| Current Ie (A) | 10 | 10 | 10 | 6 | 3 | 2 | 1.5 | 1.2 |
| **Category DC13** | | | | | | | | |
| Voltage Ue (V) | 24 | 48 | 60 | 110 | 220 | 300 | | |
| Current Ie (A) | 2.5 | 1.5 | 1 | 0.22 | 0.27 | 0.2 | | |

**Operational limits as per IEC 947.5.1:**

| | |
|---|---|
| AC Heavy Duty | (A600) |
| DC Standard Duty | (Q300) |

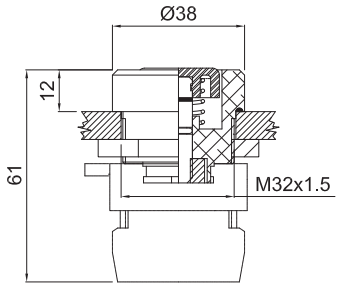
## ELECTRICAL FEATURES (CONTACT BLOCK FOR M-0553.. HANDLES)

**Alternating current**

| Series | | | 10 | 16 | 20 | 32 | 40/63 |
|---|---|---|---|---|---|---|---|
| Rated voltage | $U_e$ VDE/IEC | V | 690 | 690 | 690 | 690 | 690 |
| Rated current | $I_{th}$ VDE/IEC | A | 20 | 25 | 32 | 45 | 63 |
| AC3 VDE/IEC, Direct starting of squirrel cage motor, stop during operation | 220V-240V | kW | 2.2 | 4.5 | 5.5 | 7.5 | 15 |
| | 380V-440V | kW | 4.0 | 7.5 | 9.0 | 11.0 | 30 |
| | 660V-690V | kW | 4.0 | 7.5 | 11.0 | 15.0 | 30 |
| | 110V | kW | 0.4 | 1.5 | 1.5 | 2.5 | 2.5 |
| | 220V-240V | kW | 0.75 | 2.5 | 4.5 | 4.0 | 6 |
| | 400V | kW | 1.3 | 4.0 | 5.5 | 5.5 | 7.5 |

# M-0... control, monitoring and signalling devices

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|

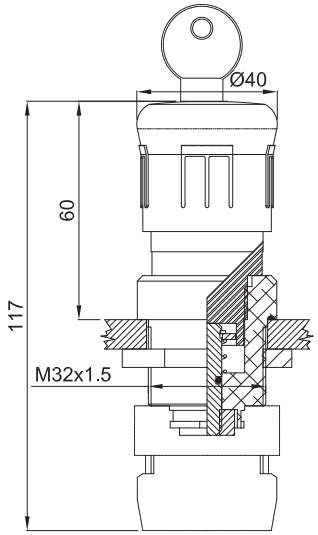



Normal push-button with standard 10A 600V
1NO+1NC contacts.
Button comes in choice of six colours.

| | |
|---|---|
| Blue **(B)** | **M-0639../B..** |
| White**(BI)** | **M-0639../BI..** |
| Yellow **(G)** | **M-0639../G..** |
| Black **(N)** | **M-0639../N..** |
| Red **(R)** | **M-0639../R..** |
| Green **(V)** | **M-0639../V..** |

Add IN for stainless steel body

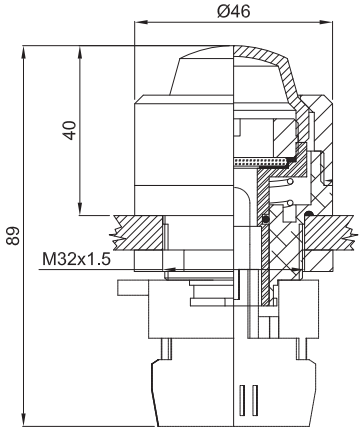
**Note:**
**For the padlockable push-button add**
**CODE + L (e.g. M- 0639/RL)**




Normal push-button with standard 10A 600V
1NO+1NC contacts.

| | |
|---|---|
| Emergency stop pushbutton with release | **M-0638** |
| Black push-pull, stop push-button | **M-0638../N** |
| Emergency stop pushbutton with key release | **M-0638../K** |
| Push-pull, stop pushbutton | **M-0638../P** |

Add IN for stainless steel body

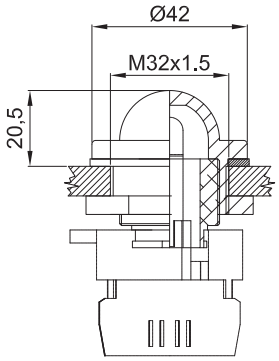



Illuminated push-button with standard 10A 600V
1NO+1NC contacts. (lamps on request)
Illuminated button comes in choice of five colours.

| | |
|---|---|
| Blue | **M-0637../B** |
| White | **M-0637../I** |
| Yellow | **M-0637../G** |
| Red | **M-0637../R** |
| Green | **M-0637../V** |

Add IN for stainless steel body

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|

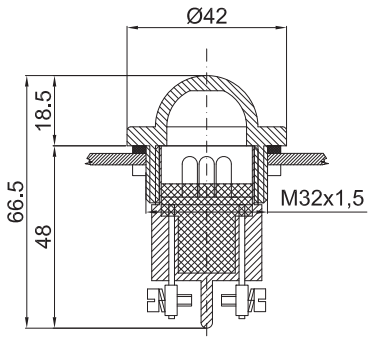



Indicator light with 3W lamps (on request*), 12/240 Vac/dc.
Lens comes in choice of five colours.

| | |
|---|---|
| Blue | **M-0636/B** |
| Yellow | **M-0636/G** |
| White | **M-0636/I** |
| Red | **M-0636/R** |
| Green | **M-0636/V** |

* lamp

| | |
|---|---|
| 12V: | **LAMPBA9S12V** |
| 24V: | **LAMPBA9S24V** |
| 110V: | **LAMPBA9S110V** |
| 240V: | **LAMPBA9S240V** |

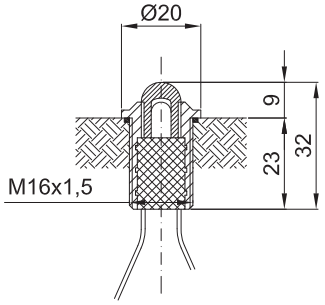



Multi-LED indicators come with lenses in different colours. Reliability with a LED service life of 50,000 hours.

| | |
|---|---|
| Blue | **M-0612/3B..** |
| Yellow | **M-0612/3G..** |
| Colourless | **M-0612/3I..** |
| Red | **M-0612/3R..** |
| Green | **M-0612/3V..** |

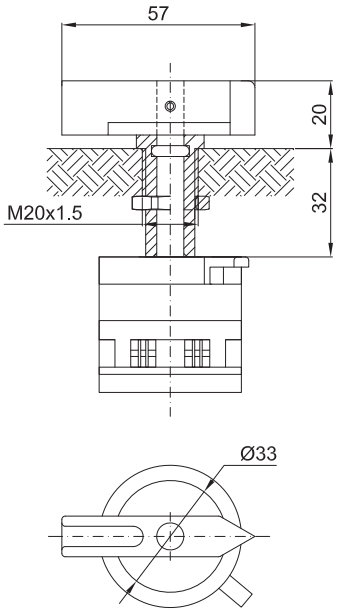
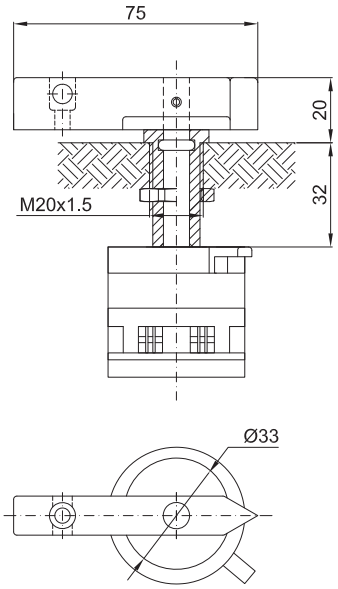
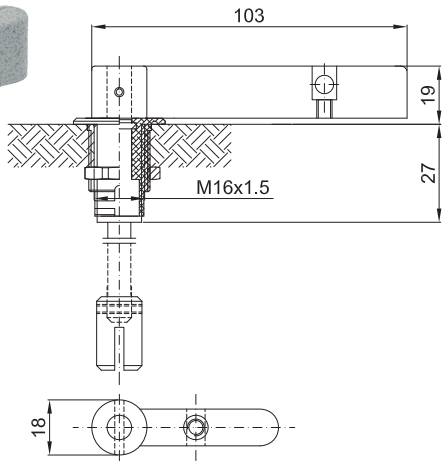
**Can be ordered in 4 possible voltages:**

| | | |
|---|---|---|
| **110 Vac/dc** | = | **M-0612/..110** |
| **12 Vac/dc** | = | **M-0612/..12** |
| **230 Vac** | = | **M-0612/..230** |
| **24 Vac/dc** | = | **M-0612/..24** |

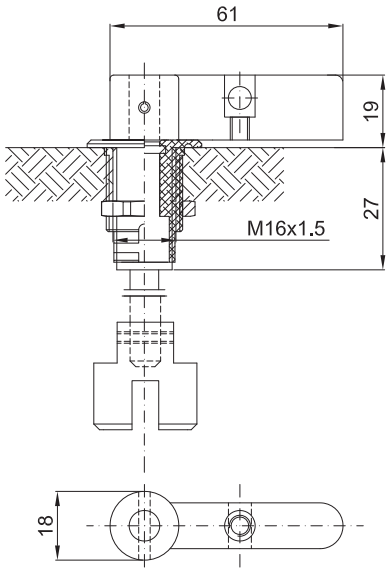



Indicator light with one high-brightness LED, for a consumption of 20 mA and estimated life of around 50,000 hours.
LED in 5 colours available.
Complete with locknut.

| Color | If (mA) | Vf Tip. (V) | Vf max. (V) | |
|---|---|---|---|---|
| Red | 20 | 2.1 | 2.6 | **M-0487** |
| Yellow | 20 | 2.1 | 2.4 | **M-0487/G** |
| Clear | 20 | 3.2 | 4.0 | **M-0487/I** |
| Green | 20 | 3.2 | 4.0 | **M-0487/V** |
| Bicolor | 20 | 2.0 | 2.5 | **M-0487/1** |

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |  | Quick-connect handle for cam or rotary switch.<br>Fixed pin length.<br>Complete with locknut.<br><br>Add suffix **IN** for stainless steel body and handle<br><br>**Note:**<br>**contact block is supplied on request. Please contact our sales department if you need advice** | **M-0634/10..** |
|  |  | Quick-connect padlockable handle for cam or rotary switch.<br>Fixed pin length. Complete with locknut.<br><br>Add suffix **IN** for stainless steel body and handle<br><br>**Note:**<br>**contact block is supplied on request. Please contact our sales department if you need advice** | **M-0634/10L..** |
|  |  | Padlockable handle for cam switch.<br>Complete with locknut.<br><br>Fixed pin length<br>Variable pin length<br><br>Add **IN** for stainless steel body and handle | **M-0634../11F**<br>**M-0634../11V** |

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|

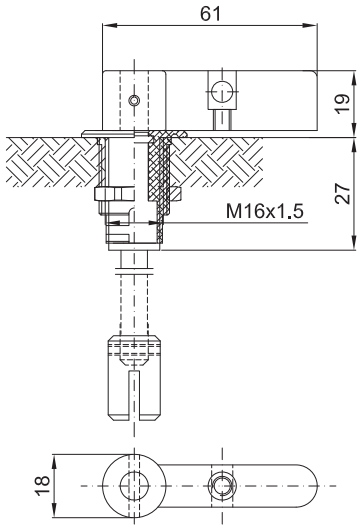



Padlockable handle for special switches. (3RV motor protectors). Complete with locknut.

Variable pin length **M-0634.. /12V**

Fixed pin length **M-0634.. /12F**

Add **IN** for stainless steel body and handle

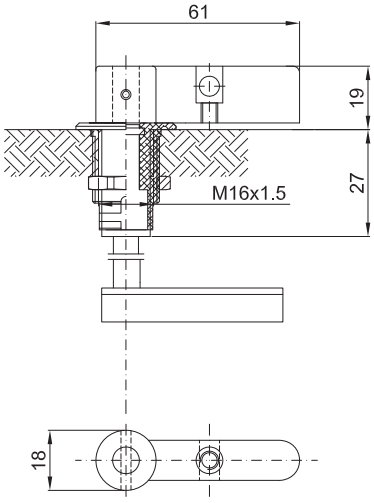



Padlockable handle for switches with Ø6 shaft. Complete with locknut.

Variable pin length **M-0634../13V**

Fixed pin length **M-0634../13F**

Add **IN** for stainless steel body and handle

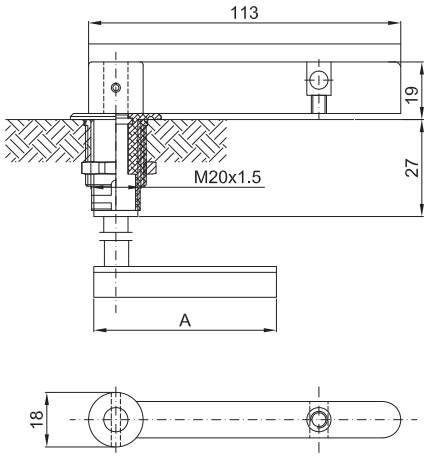
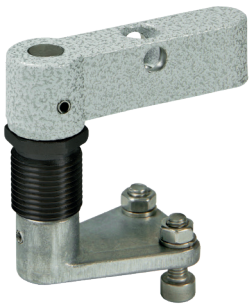
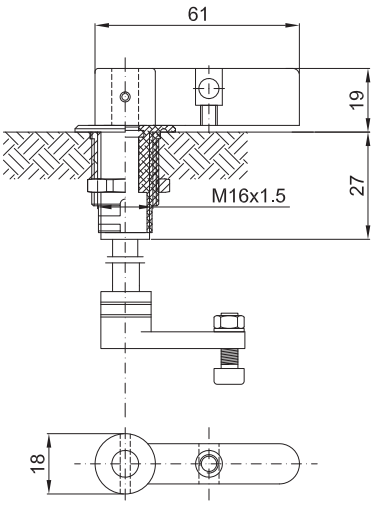
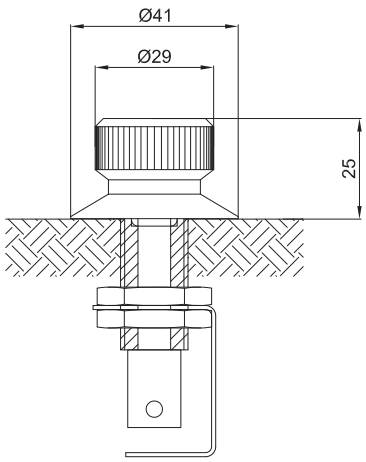


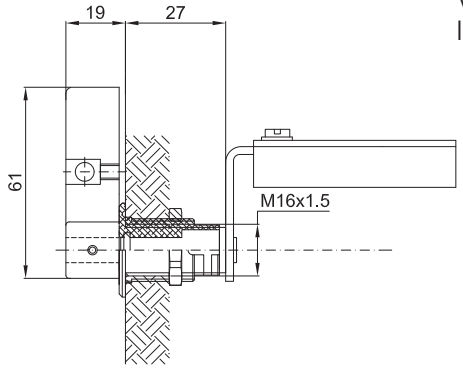
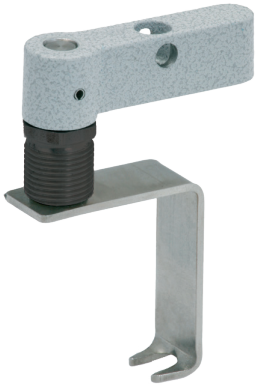
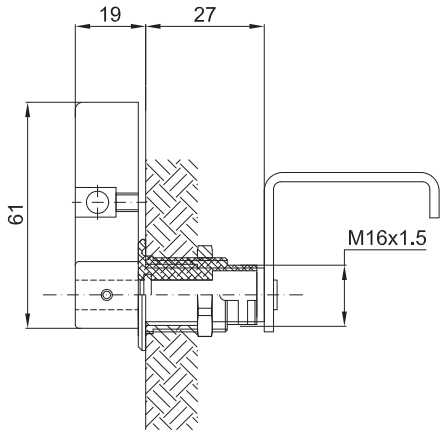

Padlockable handle for enclosed circuit breakers. Complete with locknut.

Variable pin length (size to order) **M-0634../14V**

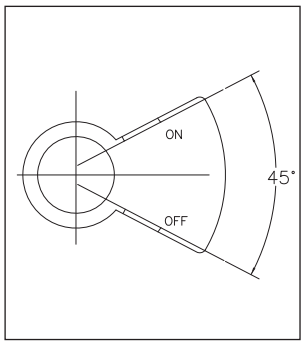
Fixed pin length **M-0634../14F**

Add **IN** for stainless steel body and handle

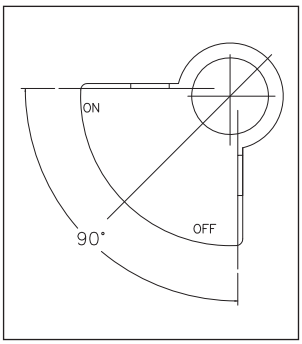
| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |  | Padlockable handle for heavy-duty series enclosed circuit breakers. Complete with locknut.<br>Variable pin length<br>Fixed pin length<br>Add **IN** for stainless steel body and handle | <br>**M-0634../01V**<br>**M-0634../01F** |
|  |  | Padlockable handle for modular circuit breakers. Complete with locknut.<br>Fixed pin length<br>Variable pin length<br>Add **IN** for stainless steel body and handle | <br>**M-0634../03F**<br>**M-0634../03V** |
|  |  | Knob for potentiometers with Ø6 shaft | **M-0634/06** |

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|
|  |   | Handle for enclosed circuit breakers. Wall mounting. Complete with locknut. | **M-0634/07** |
|  |   | Handle for modular circuit breakers.Wall mounting. Complete with locknut. | **M-0634/09** |

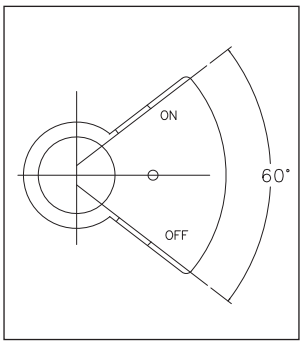
## Type of handle padlocking devices



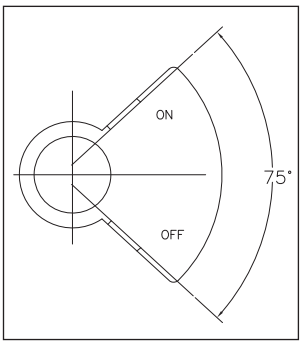

Code **M-698/5**




Code **M-698/6**

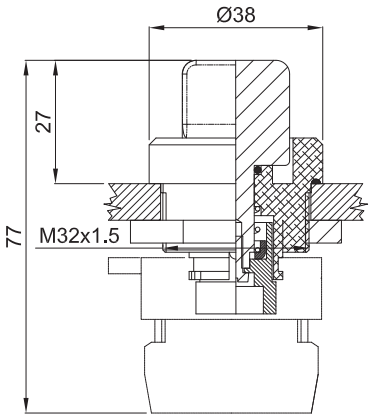



Code **M-698/7**



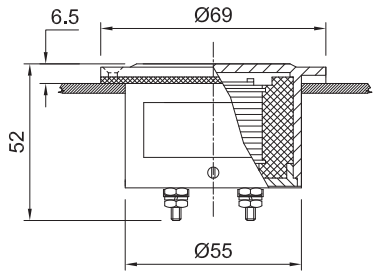

Code **M-698/8**

| ILLUSTRATION | DIMENSIONS mm | DESCRIPTION | CODE |
|---|---|---|---|




Selector with 0A 600V 1NO+1NC contacts.

| | |
|---|---|
| Selector R arrangement | **M-0635/R** |
| Left selector RSX arrangement | **M-0635/RSX** |
| Selector X arrangement | **M-0635/X** |
| Selector 1C arrangement | **M-0635/1C** |
| Selector 1I arrangement | **M-0635/1I** |
| Selector 1M arrangement | **M-0635/1M** |
| Selector 1W arrangement | **M-0635/1W** |
| Selector 1Z arrangement | **M-0635/1Z** |
| Selector 2C arrangement | **M-0635/2C** |
| Selector 2I arrangement | **M-0635/2I** |
| Selector 2W arrangement | **M-0635/2W** |
| Selector 2Z arrangement | **M-0635/2Z** |
| Selector 3I arrangement | **M-0635/3I** |
| Selector 4I arrangement | **M-0635/4I** |



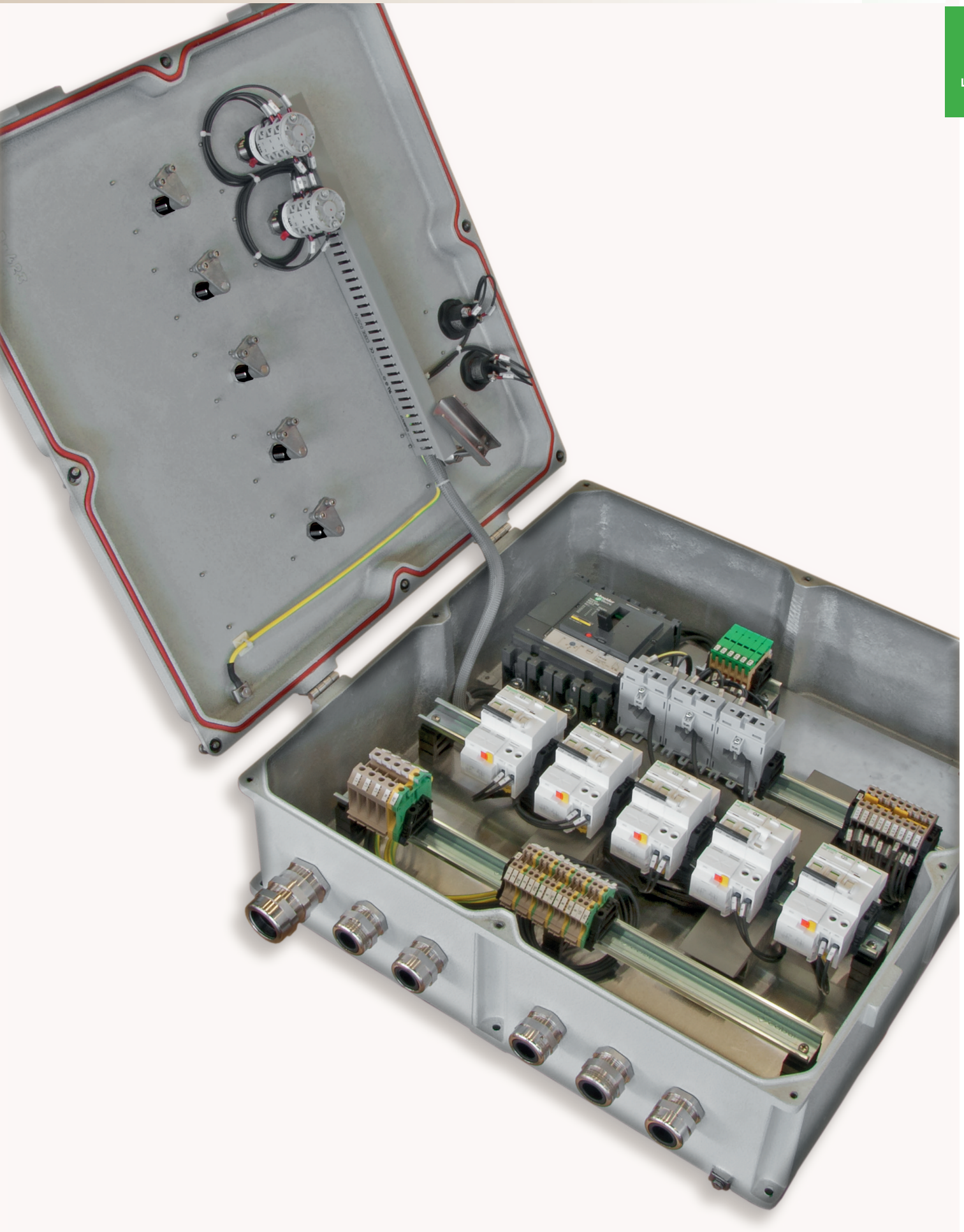

The Cortem certified ammeter and voltmeter are suitable for measuring electrical values when the situation demands the utmost accuracy. The internal faces featuring the measuring range scale are produced to the customer's specifications.

| | |
|---|---|
| Ammeter | **B-0140A** |
| voltmeter | **B-0140V** |

| | |
|---|---|
| Maximum voltage: | 600 V |
| Nominal frequency: | 40 ÷ 60 Hz |
| Precision class: | 1.5 |
| Dissipated power: | 1.1 VA (B-0140A)<br>3.0 VA (B-0140V) |

| | | |
|---|---|---|
| Measurement range - Direct measurement: | 0 ÷ 40 mA | 0 ÷ 0.1 A |
| | 0 ÷ 60 mA | 0 ÷ 1.5 A |
| | 0 ÷ 100 mA | 0 ÷ 2.5 A |
| | 0 ÷ 250 mA | 0 ÷ 5 A |
| | 0 ÷ 400 mA | 0 ÷ 6 A |
| | 0 ÷ 600 mA | 0 ÷ 15 A |

| | | |
|---|---|---|
| Measuring range - With current transformer: | 0 ÷ 2.5 mA | 0 ÷ 50 A |
| | 0 ÷ 5 mA | 0 ÷ 60 A |
| | 0 ÷ 10 mA | 0 ÷ 75 A |
| | 0 ÷ 15 mA | 0 ÷ 100 A |
| | 0 ÷ 20 mA | 0 ÷ 150 A |
| | 0 ÷ 25 mA | 0 ÷ 200 A |
| | 0 ÷ 30 mA | 0 ÷ 300 A |
| | 0 ÷ 40 mA | 0 ÷ 400 A |



**Product modifications and warranty**

Cortem Group reserves the right, at its sole discretion, to make any modifications (at any time and without notice) in order to improve the functionality and performance of its products or meet technical and manufacturing requirements. The measurements and drawings of the products and their parts are indicative only and not binding, because they can be modified without notice.

The latest updated information, data and certificates of our products are available on www.cortemgroup.com web site.

All Cortem Group products are covered by warranty for a period of twelve months from the delivery date. For more information, refer to the “General Terms and Conditions of Sale” on www.cortemgroup.com web site.

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