

EXPROTEC

Mining electrical engineering

products catalogue

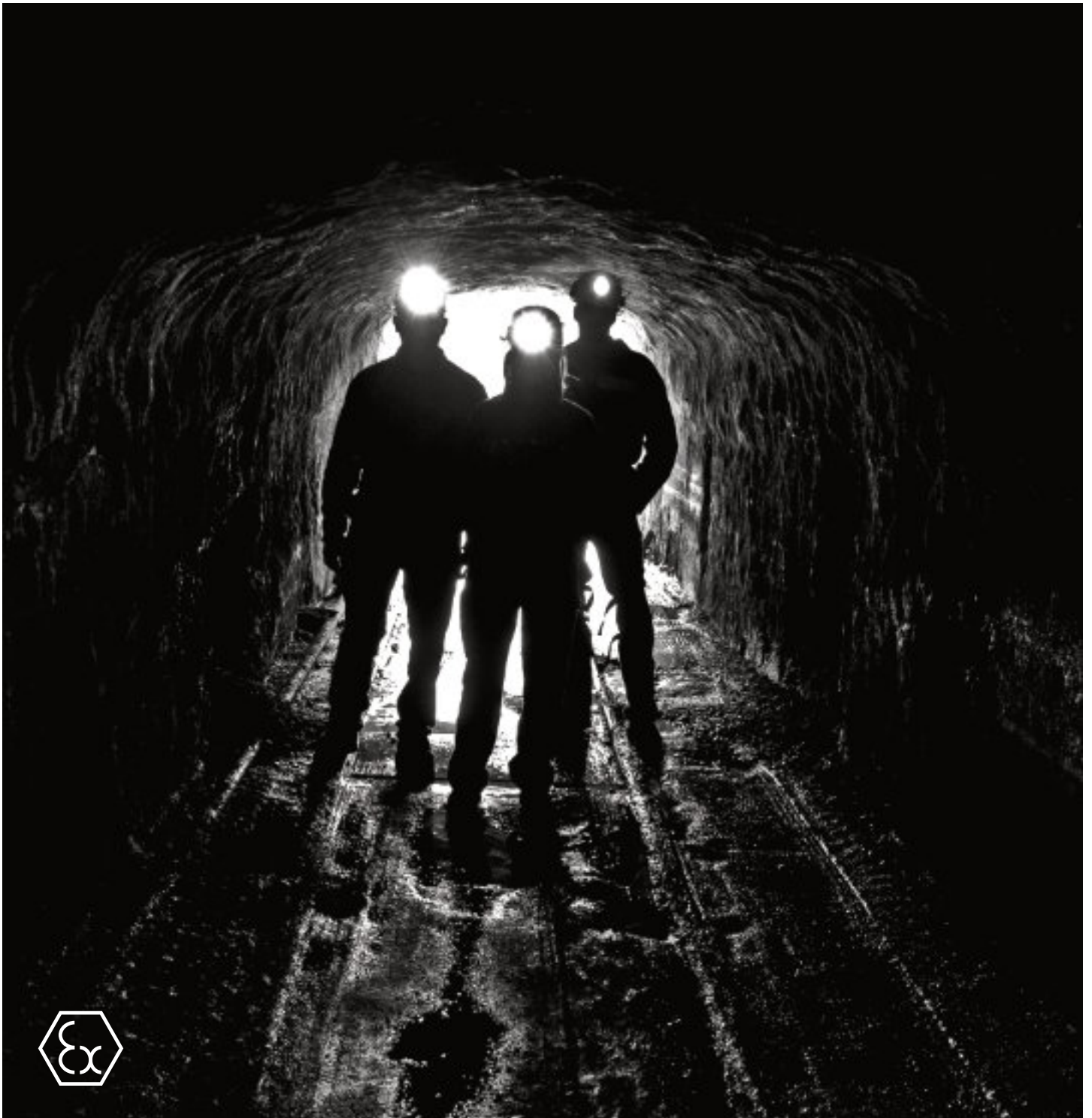


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Information

We reserve the right to introduce changes in the catalogue without notification. We are not liable for errors occurred during printing of this catalogue. Detailed information applying to presented products can be found in the service manuals.





Fireproof Contact Circuit Breaker type MSL-200-**-*

Description

The Fireproof Contact Circuit Breaker type MSL-200-**-* is designed for power supply, control and visualisation of electrical devices or drives located in hazardous areas at risk of gas and dust explosion. Depending on the needs, the device has built-in electrical components and sub-assemblies (contactors, transformers, power supplies, relays, control modules, instrumentation modules, barriers, separators, converters, PLC), explosion-proof or normal rating in accordance with the specific device installation requirements. Beacons, LED or LCD (HMI) displays are used to visualise operating conditions. The contact circuit breaker is built based on the enclosure type dSD 05.-...-...-, the main compartment (Ex d) is fitted with electrical equipment, while the connecting compartment(s) (Ex d or Exe) accommodates switches, terminals and terminal strips.

The outgoing feeders are controlled and monitored by means of:

- individual control and measuring modules,
- multifunction relay type PMB,
- multifunction relay type PMB-2,
- programmable integrated relay type PeZiN-01,

that are used to protect electrical systems and three-phase electric motors. The relays are equipped with a complete set of protection features (current, leakage, temperature, PE continuity control), control circuits and confirmation. Data transmission is carried out via intrinsically safe modules, Ethernet communication interfaces, RS485, RS422, RS232, CAN etc. suitable for transmission via copper wire and optical fibre cables.

Characteristics

- rated current up to 315 A,
- independently protected outgoing feeders,
- local or remote control,
- clear operating status visualisation,
- small overall dimensions,
- multiple variants of the main and connecting compartments,
- possibility for installing a disconnector in the incoming and outgoing compartments,
- easy access to switch internals.

Explosion protection

(depending on the components used)

- <Ex> I M2(M1) Ex db ib [ia Ma] I Mb
- <Ex> I M2(M1) Ex db ib mb op pr [ia ma op is Ma] I Mb
- <Ex> II 2(1)G Ex db ib [ia Ga] IIA T4 Gb
- <Ex> II 2(1)G Ex db eb ib mb op pr [ia ma op is Ga] IIA T4 Gb
- <Ex> II 2(1)D Ex tb ib [ia Da] IIIC T80C Db
- <Ex> II 2(1)D Ex db ib mb op pr [ia ma op is Da] IIIC T80C Db
- <Ex> PB Exd[ia][ib] I

Ambient temperature

-20°C ≤ Ta ≤ +40°C

Certificate

OBAC 07 ATEX 194X
TC BY/112 02.01. 103,00167

Rated values

Ingress protection rating
IP65

Rated insulation voltage
500 (690) V AC, 1000 (1140) V AC

Rated switching voltage
230/400/500/690/1000/1140 V AC

Rated current
50, 100, 200, 250, 315 A

Number of outgoing feeders

Number of circuits: 1
Number of main outgoing feeders: 1, 2, 3, 4
Number of auxiliary outgoing feeders: 0, 1, 2
Number of outgoing feeders for release units: 0, 1, 2

Auxiliary outgoing feeder

24/36/42/127/133/220/230 V AC / 200 (450) VA

Release unit (brakes) outgoing feeder

42//127/133/220/230 V AC / 1000 VA

Configuration of contactor operation

single-speed, two-speed, reversible, star-triangle, parallel, serial, automatic phase sequence change

Dimensions

Main compartment dimensions
(W x H x D) (500-200) X (400-200) x (350-200) mm
Connection compartment dimensions
(W x H x D) (460-160) X (320-140) x (300-150) mm
Disconnecter compartment dimensions
(W x H x D) (460-160) X (320-140) x (300-150) mm

Weight

approx. 200..250 kg

Ordering information

M S L - 2 0 0 - * * - * / *

	A	B	C	D
A	0 – circuit breaker without through power supply 1 – circuit breaker with through power supply with an additional letter: d – flameproof connection compartments e – reinforced connection compartments s – connection compartments with disconnector/interrupter			
B	* – number of main outgoing feeders with an additional letter: R – reversion of outgoing voltages by main disconnector			
C	Rated max. current 1 – 50 A 2 – 100 A 3 – 200 A 4 – 250 A 5 – 315 A	in addition to the rated current symbol in brackets: consecutive contactor number (outgoing feeder) – reversible R – current A – outgoing power kW		
D	Supply voltage: 230/400/500/660/1000/1140 V AC			



Compact Flameproof Station type MSL 610-*/BP

Description

The Compact Station type MSL 610-*/BP is a switching device designed for underground mining, to remotely control electric drives of mining machinery and equipment, powered by a three-phase alternating current network with an insulated star point of the transformer (IT network).

The increased degree of functional safety is achieved by means of a suitable connection combination for overload and short-circuit protection, leakage protection, protective conductor continuity control, receiver temperature (PTC), control and instrument relays and a disconnecter. The main compartment cover is equipped with a Quadrangular control panel with a sight glass to view all the parameters of the station operation on the internal LCD monitor. There is an emergency stop switch on the main compartment lid to disconnect the supply voltage from all loads powered by the station.

The device is equipped with a single power supply circuit, equipped with a hand-operated disconnecter. The outgoing feeders are controlled and monitored by means of:

- individual control and measuring modules,
- multifunction relay type PMB.

The equipment can comprise up to eight single main outgoing feeders, up to four lighting outgoing feeders supplied from a transformer up to 16 kVA and up to four auxiliary outgoing feeders. The power supply can be supplemented by a starter with a current corresponding to the maximum current of the disconnecter with a supplementary bypass contactor.

The device contains an integrated PLC, which is responsible for controlling and supervising the outgoing feeder. Data transmission is carried out via intrinsically safe modules, Ethernet communication interfaces, RS485, RS422, RS232, CAN etc. suitable for transmission via copper wire and optical fibre cables. The components used ensure reliable operation of the compact station in the underground mining, while meeting increased safety requirements.

Characteristics

- rated current up to 500 A (up to 800 A – version with power switch)
- up to eight independently protected outgoing feeders
- local or remote control
- clear operating status visualisation
- small overall dimensions
- easy access to station internals

Explosion protection

(depending on the components used)
 I M2 Ex db [ia Ma] [ib Mb] I Mb
 I M2 Ex db eb [ia Ma] [ib Mb] I Mb
 I M2 Ex db [ia Ma] [ib Mb] [op is Ma] I Mb
 I M2 Ex db eb [ia Ma] [ib Mb] [op is Ma] I Mb
 PB Exd[ia][ib]I
 PΠ Exde[ia][ib]I
 PB Ex d [ia Ma] [ib Mb] [op is Ma] I Mb X

Ambient temperature

-10°C ≤ Ta ≤ +40°C

Certificate

KOMAG 11 ATEX 132X
 TC BY/112 02.01. 103 00177
 TC RU C-PL.ME92.B.01062

Rated values

Ingress protection rating
 IP54 / IP65

Rated insulation voltage
 500 (690) V AC, 1000 (1140) V AC

Rated switching voltage
 230/400/500/690/1000/1140 V AC

Rated continuous current
 500 A
 800 A (power circuit breaker)

Number of outgoing feeders
 Number of circuits: 1
 Number of main outgoing feeders: 0, 1, 2, 3, 4, 5, 6, 7, 8
 Number of auxiliary outgoing feeders: 0, 1, 2, 3, 4
 Number of outgoing feeders for release units (brakes): 0, 1, 2, 3, 4

Auxiliary outgoing feeder
 24/36/42/127/133/220/230 V AC / 200 (450) VA

Transformer outgoing feeder
 24/36/42/127/133/220/230 V AC / 16 kVA

Release unit (brakes) outgoing feeder
 42/127/133/220/230 V AC / 5000 VA

Configuration of contactor operation
 single-speed, two-speed, reversible, star-triangle, parallel, serial, automatic phase sequence change

Dimensions
 (W x H x D) 1130x605x560 mm
 (W x H x D) 1245x605x560 mm (with grommets)
 (W x H x D) 1575x605x560 mm
 (W x H x D) 1815 x605x560 mm (with grommets)

Weight
 700..900 kg

Ordering information

M S L 6 1 0 - * * / B P
 A B

A	3 – lighting and motor power supply 4 – lighting power supply 5 – motor power supply (also applies to thyristor starter)
B	* – number of outgoing feeders 1..8 – lighting and motor power supply 1..4 – lighting power supply 1..8 – motor power supply (also applies to thyristor starter)
	BP – manufacturer



Compact Flameproof Station type MSL-1203.*** /BP

Description

The Compact Station type MSL 1203.*** /BP is a switching device designed for underground mining, to remotely control electric drives of mining machinery and equipment, powered by a three-phase alternating current network with an insulated star point of the transformer (IT network).

The increased degree of functional safety is achieved by means of a suitable connection path for overload and short-circuit protection, leakage protection, protective conductor continuity control, receiver temperature (PTC), control and instrument relays and interrupters. The main compartment cover is equipped with a Quadrangular control panel with a sight glass to view all the parameters of the station operation on the internal LCD monitor. There is an emergency stop switch on the main compartment lid to disconnect the supply voltage from all loads powered by the station. The device is equipped with galvanically separated three power circuits equipped with a hand-operated disconnecter switch.

The outgoing feeders are controlled and monitored by means of:

- individual control and measuring modules,
- multifunction relay type PMB.

The device can be equipped with main outgoing feeders, lighting outgoing feeders supplied from a transformer up to 6.3 kVA, a power transformer up to 75 kVA and auxiliary outgoing feeders. The power supply can be supplemented by a starter with a current corresponding to the maximum current of the disconnecter with a supplementary bypass contactor.

The device contains an integrated PLC, which is responsible for controlling and supervising the outgoing feeder. Data transmission is carried out via intrinsically safe modules, Ethernet communication interfaces, RS485, RS422, RS232, CAN etc. suitable for transmission via copper wire and optical fibre cables. The components used ensure reliable operation of the compact station in the underground mining, while meeting increased safety requirements.

Characteristics

- three independent current circuits
- up to eight independently protected outgoing feeders
- local or remote control
- clear operating status visualisation
- small overall dimensions
- individual protection for each contactor, transformer or starter set
- easy access to the station internal equipment
- protection by disconnecting the power supply to the compact station when attempting to open the connection compartment or the auxiliary compartment

Explosion protection

Marking depending on the components used
 I M2 Ex d [ia Ma] [ib Mb] I Mb
 I M2 Ex d e [ia Ma] [ib Mb] I Mb
 I M2 Ex d [ia Ma] [ib Mb] [op is Ma] I Mb
 I M2 Ex d e [ia Ma] [ib Mb] [op is Ma] I Mb
 PB Exd[ia][ib]I
 PΠ Exde[ia][ib]I
 PB Ex d [ia Ma] [ib Mb] [op is Ma] I Mb X

Ambient temperature

-10°C ≤ Ta ≤ +40°C

Certificate

KOMAG 11 ATEX 99X
 TC BY/112 02.01. 103 00150
 TC RU C-PL.ME92.B.01062

Rated values

Ingress protection rating
 IP54 / IP65

Rated insulation voltage
 500 (690) V AC, 1000 (1140) V AC

Rated switching voltage
 230/400/500/690/1000/1140 V AC

Rated continuous current
 1200 A

Rated thermal current of the disconnect circuit (incoming feeder)
 up to 800 A

Rated outgoing feeder switching current
 50, 80, 100, 200, 400, 450 or 500 A

Number of outgoing feeders
 Number of circuits: 3 (6)
 Number of main outgoing feeders: limited by the maximum incoming feeder current

Auxiliary transformer power
 6,3 kVA

Transformer power
 75 kVA

Configuration of contactor operation
 single-speed, two-speed, reversible, star-triangle, parallel, serial, automatic phase sequence change

Dimensions
 (W x H x D) 1130x605x560 mm
 (W x H x D) 1245x605x560 mm (with grommets)
 (W x H x D) 1575x605x560 mm
 (W x H x D) 1815 x605x560 mm (with grommets)

Weight
 1200..2100 kg

Ordering information

M S L - 1 2 0 3 . * ... * / B P
 I VI

where:	1 – with single contactor outgoing feeders
circuit I, II, III, ... , VI	2 – with transformer outgoing feeders
with the following	3 – with release outgoing feeders
types of outgoing	4 – with reversible outgoing feeders
feeders:	5 – with double contactor outgoing feeders
	6 – with transformer outgoing feeders up to 6.3 kVA
	7 – with transformer outgoing feeders up to 75 kVA
	8 – with starter outgoing feeders

There may be different types of outgoing feeders in each circuit, in which case it should be part of the designation in brackets next to the basic designation. Example: MSL1203.1 (5). 1.7/BP is a station equipped with three circuits, of which circuit I has single and double contactor outgoing feeders, circuit II has single outgoing feeders and circuit III has transformer outgoing feeders 75 kVA.



Flameproof Transformer Set type ZTO-*/*

Description

Flameproof Transformer Set type ZTO-*/* is designed for supplying mining machines and equipment from three-phase or single-phase AC mains with insulated star point of the transformer, located in hazardous areas with a risk of gas and dust explosion.

The transformer set is built based on the enclosure type dSD 05.-.-.-., the main compartment (Ex d) is fitted with a transformer and electrical equipment, while the connection compartment(s) (Ex d or Ex e) accommodates terminals and terminal strips. The flameproof transformer set is equipped with a single manual disconnector, a three-phase transformer and two or four independent 230/133 V AC or 220/127 V AC outgoing feeders and a single 42 V AC auxiliary outgoing feeder. Inside there is a three-phase 3.5 kVA or 5 kVA transformer with H class insulation windings.

The outgoing feeders are controlled and monitored by means of individual control and measuring modules, that are used to protect electrical systems and three-phase electrical equipment. The relays are equipped with a complete set of protection features (current, leakage, temperature, PE continuity control), control circuits and confirmation. A LED display is used to visualise the operating states and the voltage values for the incoming feeders and the outgoing feeders.

The components used ensure the operating reliability of the flameproof transformer set in the underground mining while meeting safety requirements.

Characteristics

- independently protected outgoing feeders
- clear operating status visualisation
- small overall dimensions
- easy access to equipment internals

Explosion protection

Marking depending on the components used
 I M2 (M1) Ex d [ia,ib] I
 I M2 (M1) Ex de [ia,ib] I

Ambient temperature

-20°C ≤ Ta ≤ +40°C

Certificate

OBAC 07 ATEX 109

Rated values

Ingress protection rating
 IP54

Rated insulation voltage
 1000 (1140) V AC

Rated switching voltage
 ZTO-*/1 500/1000 V AC
 ZTO-*/2 660/1140 V AC
 ZTO-*/3 500/660/1000/1140 V AC

Transformer rated power
 ZTO-1/* 3,5 kVA
 ZTO-2/* 5,0 kVA

Number of disconnector paths
 1 path

Number of main outgoing feeders
 2 outgoing feeders

Maximum power output
 ZTO-1/* 3,5 kVA
 ZTO-2/* 5,0 kVA

Rated current of outgoing feeder
 ZTO-1/* 16A at 127 V AC
 ZTO-1/* 8.8A at 230 V AC
 ZTO-2/* 22.3A at 127 V AC
 ZTO-2/* 12.6 at 230 V AC

Auxiliary outgoing feeder
 1 outgoing feeder 42 V AC/200 (450) VA

Dimensions
 (W x H x D) 845x575x435 mm
 (W x H x D) 845x575x435 mm (with grommets)

Weight
 190 kg

Ordering information

Z T O - * / *
 A B

A	Rated power: 1 – 3,5 kVA 2 – 5 kVA
B	Supply voltage: 1 – 500/1000 V AC 2 – 660/1140 V AC 3 – 500/660/1000/1140 V AC



Mining Frequency Converter type VSD-630-1140/**

Description

The Mining Frequency Converter type VSD-630-1140/** is designed for power supply, control and visualisation of electrical motors or drives located in hazardous areas at risk of gas and dust explosion. The converter has a flameproof enclosure housing the control, monitoring, separating and visualising equipment. Connection compartments are flameproof. Specialised control modules, control relays, isolating relays, etc. are used as actuators. Beacons, LED or LCD displays are used for visualisation.

The frequency converter is used for stepless speed adjustment of asynchronous motors.

The converter can have one or two outgoing feeder for motors. In the case of multi-motor drives powered from various frequency converters, the adjustment system ensures the alignment of torques between motors powered by converters, one of which is a master in the control hierarchy.

The other converters are slave. The master converter outputs adjustment signals to slave converters, which adjust the torque of the powered motor so that it is equal to the torque of the motor powered by the master. The types of internal controllers used and their software can be used to reverse the master-slave hierarchy.

External communication is performed by an intrinsically safe serial or frequency transmission circuits – wired or fibre optic, with binary signals enabling or disabling local converter and emergency stop signals of the master converter with the slave converters. The emergency stop line has a certain level of functional safety integrity. Parameterisation and monitoring of the converter operation is carried out using the operator panel PSO.

Characteristics

- rated current of outgoing feeder up to 315 A
- independently protected outgoing feeders
- local or remote control
- clear operating status visualisation
- small overall dimensions
- multiple variants of the main and connecting compartments
- possibility for installing disconnectors in the incoming and outgoing compartments
- easy access to switch internals

Explosion protection

Marking depending on the components used
<Ex> I M2(M1) Ex d [ia op is Ma] I Mb

Ambient temperature

0°C ≤ Ta ≤ +40°C

Certificate

OBAC 10 ATEX 106X

Rated values

Ingress protection rating
IP65

Rated insulation voltage
1000 (1140) V AC

Rated switching voltage
1000/1140 V AC

Rated continuous current
630 A

Number of outgoing feeders

Number of circuits: 1
Number of main outgoing feeders: 0, 1, 2, 3, 4, 5, 6, 7, 8
Number of auxiliary outgoing feeders: 0, 1, 2, 3, 4
Number of outgoing feeders for release units (brakes): 0, 1, 2, 3, 4

Auxiliary outgoing feeder

24/36/42/127/133/220/230 V AC / 200 (450) VA

Transformer outgoing feeder

24/36/42/127/133/220/230 V AC / 6,3 kVA

Release unit (brakes) outgoing feeder

42/127/133/220/230 V AC / 5000 VA

Configuration of contactor operation

single-speed, two-speed, reversible, star-triangle, parallel, serial

Dimensions

(W x H x D) 2445x1140x1040 mm (with grommets)

Weight

3500 kg

Ordering information

V S D - 6 3 0 - 1 1 4 0 - * *

A B

AB

- 01 – single outgoing feeder, power up to 630 kW
- 02 – double outgoing feeder, power 2 x up to 315 kW
- 12 – double outgoing feeder, total power up to 630 kW
- 44 – four outgoing feeder with a total current of loads of 500 A



Mining Frequency Converter type VSD-200/690.***

Description

The Mining Frequency Converter type VSD-200/690.*** is a power supply and distribution device designed for hazardous areas at risk of methane and/or coal dust explosion in underground mining and surface parts of mines. It is designed for remote control of electric drives of mining machinery and equipment with adjustable speed, powered by a three-phase alternating current network with an insulated star point of the transformer (IT network). All units in the converter can be adjusted to the operating voltage value within the range from 500 V to 690 V.

The main compartment cover is equipped with a Quadrangular control panel with a sight glass to view all the parameters of the converter operation on an internal monitor. There is a safety switch on the wall of the main compartment to isolate the supply voltage from the converter and all the loads supplied by the frequency converter. Each frequency converter has an integrated, external water-to-air heat exchanger with closed coolant circulation.

The mining frequency converter type VSD-200/690.*** can supply power to up to two electric motors connected in parallel to the converter. The converter is equipped with separate overload and short-circuit protections for each motor, protective conductor continuity control systems for the rubber cable or the motor power cable, temperature control of windings and bearings. For motor(s) supplied with variable frequency voltage vector, the converter is also fitted with a motor encoder signal separator.

Characteristics

- enclosure in the form of large quadrangular compartments with an enhanced ingress protection rating up to IP65
- local or remote control
- individual protection for each outgoing feeder
- clear operating status visualisation
- protection by disconnecting the power supply to the converter when attempting to open the main compartment

Explosion protection

Marking
 I M2(M1) Ex d [ia ib] I Mb
 I M2(M1) Ex d e [ia ib] I Mb
 I M2(M1) Ex d [ia ib op is Ma] I Mb
 I M2(M1) Ex d e [ia ib op is Ma] I Mb

Ambient temperature

-10°C ≤ Ta ≤ +40°C

Certificate

TEST 13 ATEX 0033X

Rated values

Ingress protection rating
 IP 65

• Power supply circuit
 Rated voltage
 3 x 400 ÷ 690 V AC

Rated current
 up to 220 A

Rated power supply frequency
 50 Hz

• Output circuits
 Rated voltage
 3x up to 690 V AC

Rated current
 up to 220 A

Maximum rated power of the connected motor
 up to 200 kW

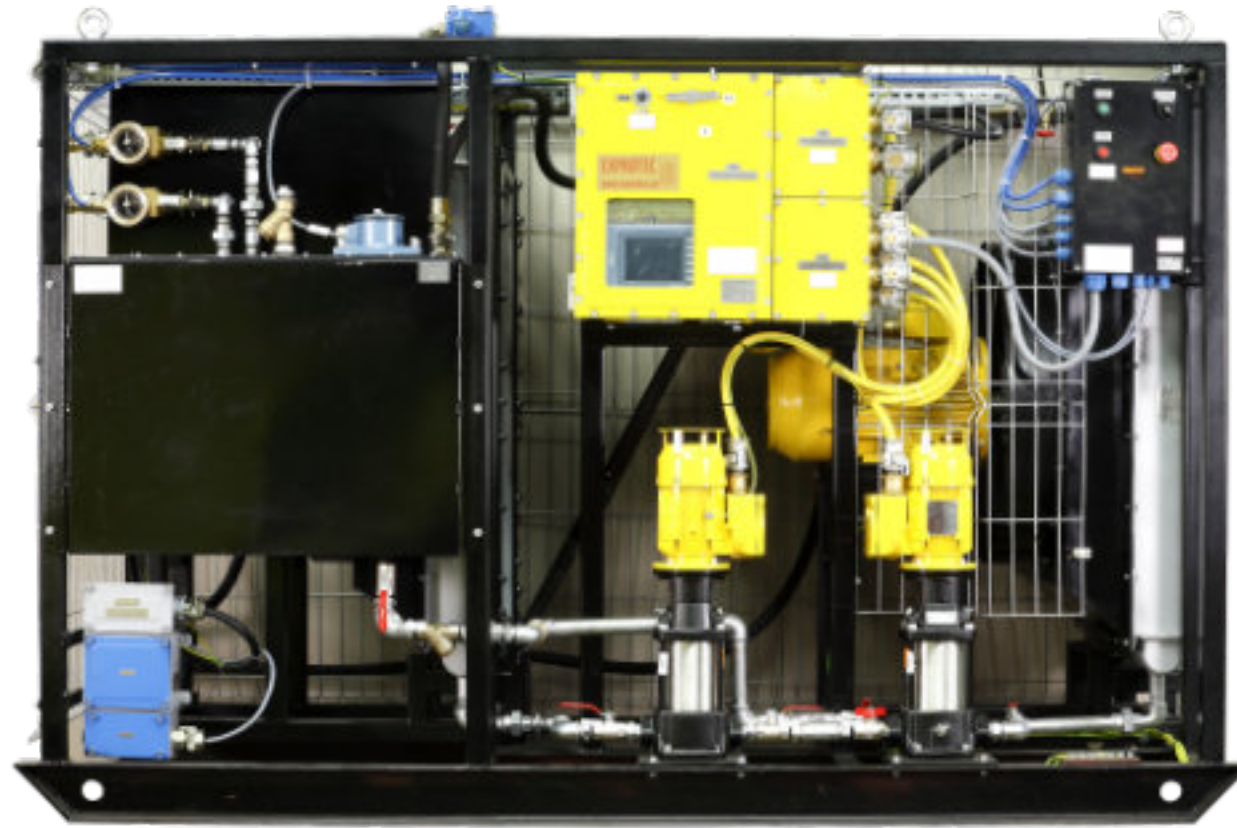
Rated output frequency of the converter
 0 to 200 Hz

Ordering information

V S D - 2 0 0 / 6 9 0 . * * *

A B C

AB	Number of outgoing feeders: 01 – one 02 – two (maximum power on each outgoing feeder not exceeding 0.5 of the converter rated power) 12 – two (total maximum power of outgoing feeders not exceeding the converter rated power)
C	Maximum rated current/power of the motor: 1 – 43 A/37 kW 2 – 54 A/45 kW 3 – 62 A/55 kW 4 – 84 A/75 kW 5 – 104 A/90 kW 6 – 125 A/100 kW 7 – 150 A/132 kW 8 – 180 A/160 kW 9 – 220 A/200 kW



Heat Exchanger type UC-W*-**

Description

The Heat Exchanger type UC-W*-** is designed for use in cooling systems of equipment and machinery using coolant (UC-WW-**- water/water or UC-WP-**- water/air). The heat exchanger UC-WW-**-** separates the external liquid (e.g. water of the mine fire-fighting system) from the internal liquid in the cooling system of equipment or machinery, protecting it from damage by clogging with dirt and/or an excessive pressure increase. The internal system of the UC-WP-**-** heat exchanger is filled with coolant (e.g. water, glycol, etc.) and heat from the cooling system is dissipated by the air flow generated by the fan(s).

These exchangers are designed in accordance with the good engineering practice with respect to their safety.

The heat exchanger type UC-W*-** can be provided in either of the two versions:

- Exchanger UC-WW-**-** where heat is exchanged between liquid and liquid (e.g. water/water)
- Exchanger UC-WP-**-** where heat is exchanged between liquid and air (e.g. water/air)

Two thermal systems can be distinguished in the exchanger: an external system to which heat is dissipated (liquid or air, respectively) and an internal system, which is the same in both types of units.

Characteristics

- two heat circuits
- cooling with liquid or air
- clear operating status visualisation

Explosion protection

Marking depending on the components used
 I M2 Ex de [ia,ib] I
 I M2 [Ex ia,ib] I

Ambient temperature

+4°C ≤ Ta ≤ +40°C

Certificate

OBAC 07 ATEX 257X

Rated values

Ingress protection rating
 IP55

Heat output
 2x25 kW

Maximum power input
 UC-WP - 2x6 kW
 UC-WW - 2x0,75 kW

Maximum liquid pressure in the internal system
 0,8 MPa

Maximum overall dimensions
 UC-WP-02/2.2 2530x1650x1100 mm
 UC-WW-25 1600x1500x600 mm

Weight
 UC-WP-02/2.2 800 kg
 UC-WW-25 300 kg

Operating position
 vertical (deviation from plumb ± 15°)

Ordering information

U C - W * - * *

A B C

A Medium:
WW – water-water
WP – water-air

BC Medium:
01 – 1 row of WP tubes
02 – 2 rows of WP tubes
03 – 3 rows of WP tubes
04 – 4 rows of WP tubes
25 – WW

Number of circuits Enter a number



Explosion protection

I M2 Ex db [ia ib] I Mb
 I M2 Ex db [ia, ib, op is Ma] I Mb
 PB Exd[iaib]I
 PB Exd[iaib]sl

Certificate

TEST 13 ATEX 0075 X
 TC BY/112 02.01. 103,00191

Rated values

Ingress protection rating
 IP 54

Rated power supply voltage
 Un1 (HV) from 3x3000 VAC to 3x6300 VAC

Rated voltage of outgoing feeders
 UN2 (LV) from 3x380 VAC to 3x1200 VAC

Rated power
 From 400 kVA to 1800 kVA

Overall dimensions
 From 3950x969x1470 mm (LxWxH)
 To 5250x969x1470 mm (LxWxH)

Operating temperature
 $-10^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$

Flameproof Transformer Station type IT3Su *(*/*)

Description

The Flameproof Transformer Station type IT3SU *(*/*) is designed to supply equipment with a rated voltage of 380 VAC to 1140 VAC and is suitable to supply frequency converters.

Transswitch type version:

- station can be delivered with more outgoing feeders on the low-voltage side,
- up to nine main outgoing feeders on the low-voltage side,
- possibility for installing auxiliary and control outgoing feeders,
- possibility for putting in main outgoing feeders in the form of retractable replaceable inserts,
- independent safety features for each main outgoing feeder.

Design

The enclosure of the transformer station IT3SU *(*/*) consists of five flameproof compartments:

- connection compartment with cables or rubber cables supplying the transformer station;
- high voltage (HV) compartment housing switchgear;
- transformer compartment;
- low voltage (LV) compartment housing switchgear and protection equipment;
- connection compartment housing outgoing feeder rubber cables and control cables.



Flameproof Switchgear type FCB-6/*/*2

Description

The Flameproof Switchgear type FCB-6/*/*2 is intended for use in workings of underground mines in non-hazardous or hazardous areas, classified as a, b or c level of methane explosion hazard and/or in workings classified as class A or B of coal dust explosion hazard. It is designed for the distribution of electricity in insulated "IT" networks 3x6 kV or 3x3, 3 kV or 3 kV.

The FCB-6/*/*2 switchgear is a fixed indoor switchgear system designed for both to be combined as multi-feeder switchgear and feeders intended for supplying individual isolated loads.

When combining feeders into multi-feeder switchgear, feeders placed side-by-side are connected with single-core flexible cables routed in metal sheaths. Customers may order the following switchgear versions:

- Incoming feeder identified by the symbol FCB-6/630/2
- Outgoing feeder (motor, cable, or transformer) identified by the symbol FCB-6/200/2.

The switchgear FCB-6/*/*2 is made up of four flameproof compartments:

- cable(s) (rubber cable) connection compartment for the power supply;
- disconnector and earth switch compartment;
- main compartment equipped with switchgear, measuring, protection and control equipment;
- connection compartment with cable(s) (rubber cables) supplying loads with power;

The main compartment equipment includes the following:

- single-phase auxiliary transformer;
- three current transformers;
- one earth fault transformer (the so-called Ferranti transformer);
- three three-coil voltage transformers;
- self-powered protection unit designed to protect against the effects of phase-to-phase fault, line-to-earth fault and overloads in medium voltage networks;
- vacuum circuit breaker;
- three single-phase surge arresters;
- separators for digital intrinsically safe and non-intrinsically safe control;
- three control switches;
- voltmeter;
- microprocessor controller with a panel to visualising the feeder status capable of recording and viewing events.

The FCB-6/*/*2 switchgear is designed for control:

- local;
- remote binary signals;
- digital with visualisation from the master dispatching system.

The method of controlling the switchboard is determined by the customer.

Explosion protection

I M2(M1) Ex d [ia ib] I Mb
PB Exd[ia][ib]

Certificate

TEST 16 ATEX 005X
TC BY/112 02.01. 103,00152

Rated values

Maximum insulation voltage U_m
7,2 kV

Rated voltage U_n
6 kV or 3.3 kV or 3 kV

Rated current I_n
maximum 630 A depending on the current transformer

Rated short-circuit making capacity I_w
16 kA

Rated short-circuit breaking capacity I_u
40 kA

Rated short-circuit duration
1 second

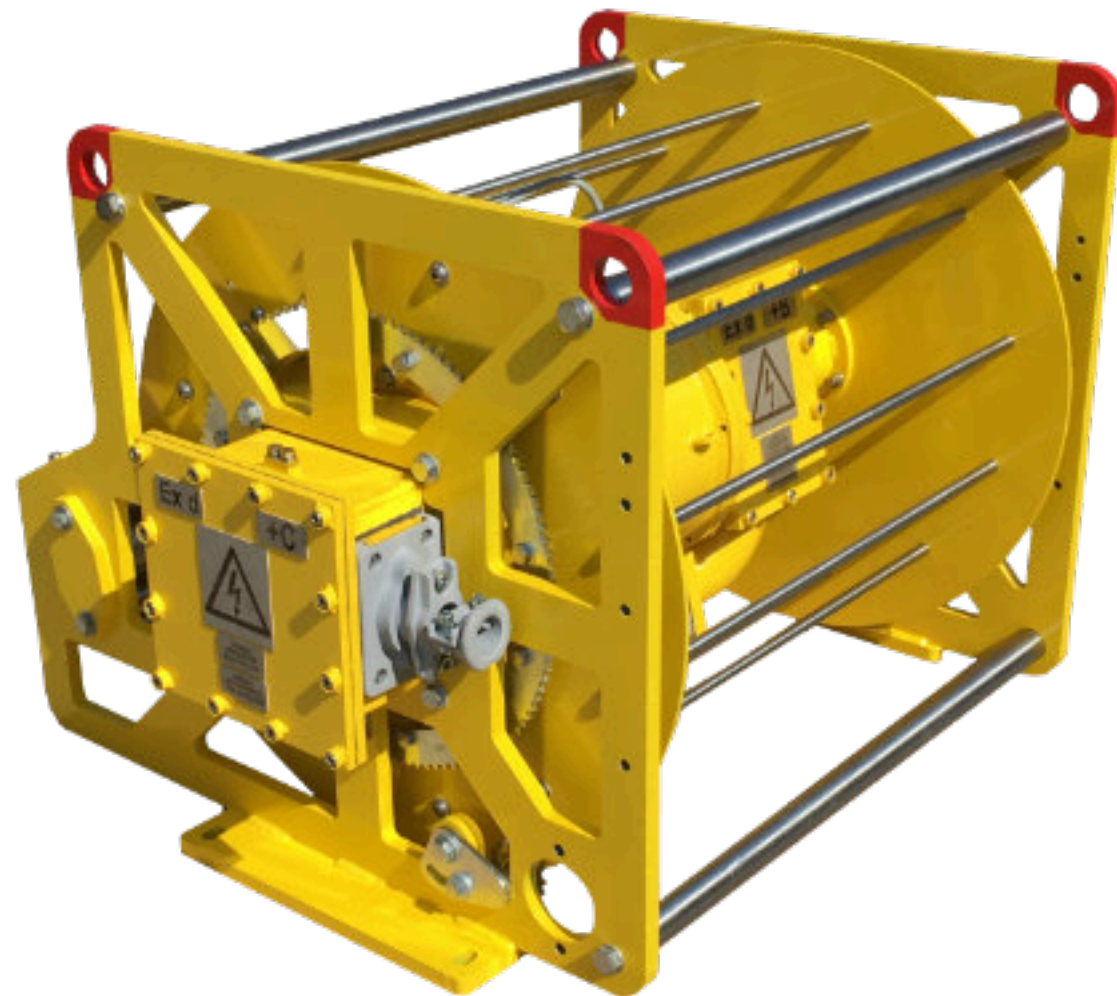
Serial link type
RS485 MODBUS RTU, PROFIBUS-DP

Ambient temperature
-5°C ÷ 40°C

Ingress protection rating
IP55

Weight
approx. 2200 kg

Dimensions WxHxD [mm]
1315x1570x1320



Cable Storage type ZK-*/*

Rotary Connector type ZO-160-**-*

Opis

The Cable Storage type ZK-*/* is designed for winding (unwinding) the power cable and its proper stacking on the drum when the machine is moving or stopped. The cable storage is partly completed machinery and cannot be used alone. The only intended purpose of the partly completed machinery is the incorporation into another machine or combination with another machine or partly completed machinery, or equipment in order to build a machine.

The Rotary Connector type ZO-160-** is explosion-proof and designed for the transmission of electricity through the brush system to rotating machine parts. The rotary connector consists of the main compartment and two connection compartments (Ex d rated). These connectors can be built into machinery and equipment operating in mine workings, surface installations of those mines where there is a risk of methane and/or coal dust explosion.

Thanks to its compact and solid design, it can be used in harsh operating conditions without the need for additional mechanical guards.

The cable store with a rotary connector can be built into:

- self-propelled mining machine
- suspended rail
- dinting machine

Cable Storage ZK-*/*

Rated values

Ambient temperature
-20°C ≤ Ta ≤ +40°C

Ingress protection rating
IP00

Dimensions
Main compartment dimensions (W x H x D) are 1019x730x973 mm

Weight
Approx. 360 kg (weight with rotary connector but without cable)

Rotary Connector ZO-160-**-*

Rated values

Ingress protection rating
IP65

Rated insulation voltage
500 (690) V AC, 1000 (1140) V AC

Maximum control voltage
42 V AC

Rated current
160 A

Dimensions
Main compartment dimensions (W x H x D) are 750x435x380 mm

Weight
Approx. 150 kg

Explosion protection

Marking
<Ex> I M2 Ex db I Mb

Ambient temperature
-20°C ≤ Ta ≤ +40°C

Certificate
OBAC 11 ATEX 212

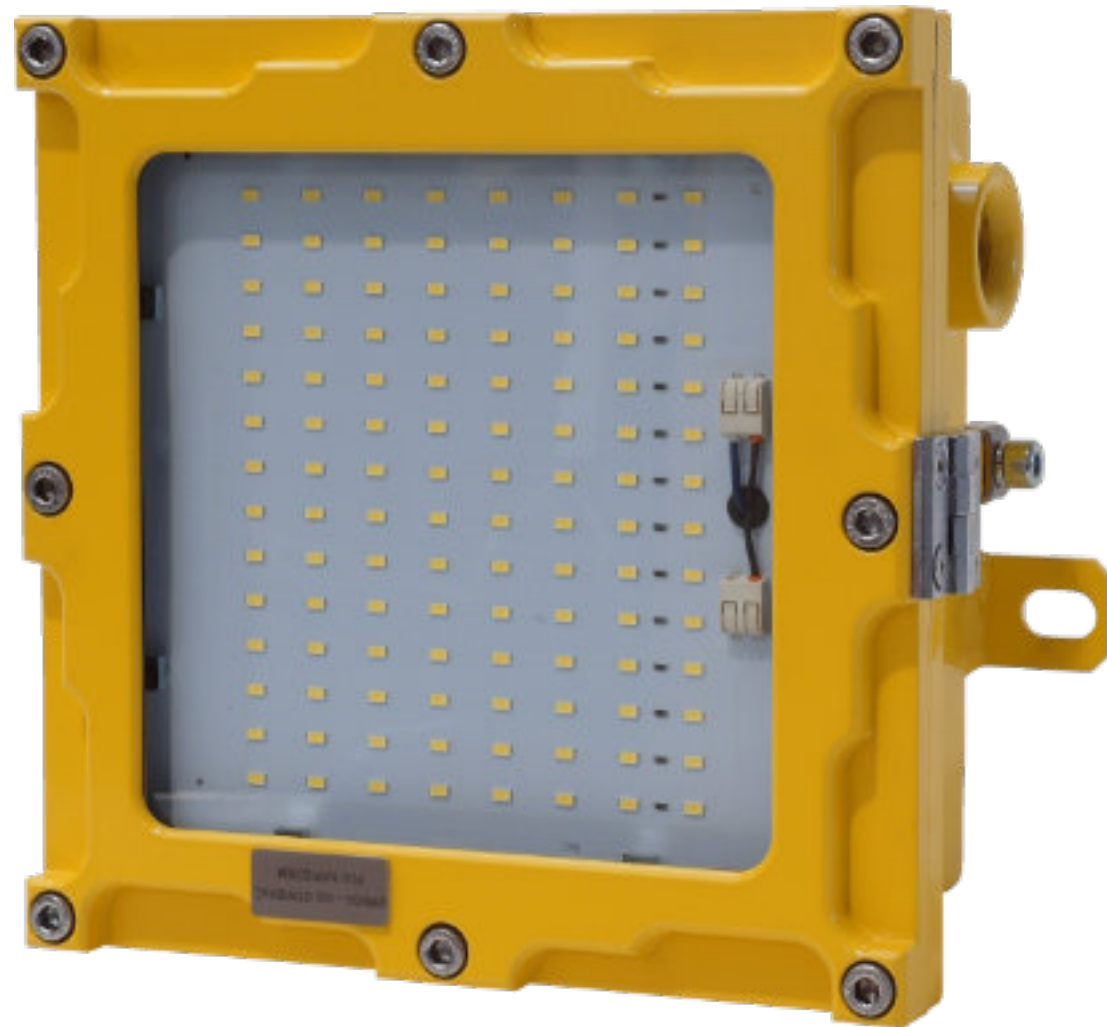
Ordering information

Z K - * / *

A	External power cable diameter (mm)
B	Length of wound cable (m)

Z O - 1 6 0 - * . *

C	Number of control cables: 1 – one cable 3 – three cables
D	Body version: None – version 1 2 – version 2



Flameproof Lamp type OLD-**/*

Description

The Flameproof LED Lamp type OLD-**/* with an intrinsically safe control circuit is designed to illuminate hazardous areas at risk from methane and/or coal dust explosion, classified in group I, including underground mines.

The LED light source is fitted with a flameproof enclosure. The connection power supply terminals are reinforced type terminals. The connection terminals make it possible to connect supply cable wires and control wires as well as the rectifier diode closing the control circuit.

The power supply voltage of the LEDs can be disconnected by an additional switch located at the bottom of the enclosure. The lamp has one, two or three cable outlets enabling a straight-through power supply and/or branching the power supply voltage. A searchlight version is available.

Characteristics

- intrinsically safe control circuit
- available option with a supply voltage of 42-250V AC
- small overall dimensions
- luminous flux up to 2000 lm, 2500 lm, 3000 lm, 3500 lm
- also available as a searchlight
- long service life
- ingress protection rating IP65

Explosion protection

Marking
II 2GD Ex d mb [ia] IIA T4
I M2 Ex d [ia] I Mb

Ambient temperature

-20°C ≤ Ta ≤ +40°C

Certificate

OBAC 07 ATEX 197

Rated values

Ingress protection rating
IP65

Supply voltage

OLD- 1** 42 V AC
OLD- 2** 85-230 V AC
OLD- 3** 24 V AC/DC

Supply voltage frequency

50/60 Hz

Dimensions

250x250x100 mm

Weight

12 kg

Enclosure material

Steel body. Tempered glass window.

Ordering information

O L D - * * / *

	A	B	C
A	Supply voltage: 1 – 42 V AC 2 – 85-250 V AC 3 – 24 V AC/DC		
B	Type: O – Lamp R – Searchlight		
C	Power: 1 – Max 30 W (200 lm)		



Controller type BbCM- ****.****

Description

The Controller type BbCM – ****.**** is designed for control, SCADA visualisation, visual supervision of facilities and industrial automation devices including the transmission of signal via copper wire or fibre optic cables. Depending on the needs, the controller has built-in electrical components and sub-assemblies (barriers, separators, converters), explosion-proof or normal rating in accordance with the specific device installation requirements. The controller has a flameproof enclosure type dSD 05-...-... housing electrical equipment. Industrial processes are visualised with the use of HMI panels or 17" or 19" LCD monitors. PLCs, industrial grade computers, specialised control modules, control relays, isolating relays, etc. are used as control devices. The controller is interoperable with CCTV cameras via intrinsically safe video separators or optical fibre converters. The camera image is displayed on the LCD monitor. Data transmission is carried out via intrinsically safe modems, Ethernet communication interfaces, RS485, RS422, RS232 etc. suitable for transmission via copper wire or optical fibre cables.

Characteristics

- tailored to customer needs
- image preview from 16 cameras
- visualisation and process control
- interoperability with other controllers
- multiple types of data transmission

Explosion protection

Marking
 I M2(M1) Ex db eb [ia ib] I
 I M2 Ex db I
 II 2(1)G Ex db eb ib [ia Ga] IIA T6 T5
 II 2G Ex db IIA T6 T5
 II 2(1)D Ex tb ib [ia Da] IIIC T80C Db
 II 2D Ex tb IIIC T80C Db

Ambient temperature

-20°C ≤ Ta ≤ +40°C

Certificate

OBAC 06 ATEX 111

Rated values

Ingress protection rating
 IP65

Supply voltage
 230 or 42 V AC

Enclosure dimensions

(W x H x D) (340-720) x (200-500) x (200-310) mm

Weight

80..150 kg

Ordering information

B	b	C	M	A	*	*	*	*	.	*	*	*	*
					A	B	C	D	E	F	G	H	
A					A – with process refractometer (no refractometer – no letter)								
B					05 – flameproof enclosure dSD 05								
C					0 – without connection compartment d – flameproof connection compartment e – reinforced connection compartment								
D					K – coaxial cable transmission T – telecommunication cable transmission S – fibre optic cable transmission C – leaky feeder cable transmission X – special version								
E					0 – without intrinsically safe signals 1 – with intrinsically safe signals								
F					0 – without optical fibre signals 1 – with optical fibre signals								
G					0 – without interface 1 – with RS485 interface 2 – with RS232 interface 3 – with RS422 interface 4 – with TW-118B interface 5 – with Ethernet interface 6 – with CAN interface								
H					0 – without display 1 – 19" monitor 3 – HMI Panel 5 – 17" monitor								



Flameproof Camera type Bb CAM-01.*/*

Description

The Flameproof Camera type Bb CAM with intrinsically safe or fibre optic transmission circuits is intended for visual surveillance of facilities and premises with hazardous areas, at risk from explosive gases and dusts classified in the explosion group II C and the group I at risk from methane and/or coal dust.

The video camera with a power supply unit, an isolating barrier, converters and modulators is installed in the main compartment of the flameproof enclosure dSD 03/*. The power supply connection terminals and the video signal terminals or connectors are installed in the flameproof enclosure connection compartment or in the reinforced connection compartment.

There are used analogue or IP cameras. The camera parameters can be configured in accordance with customer requirements. Image resolution up to 2 Mpx with proper configuration and day-time/night-time operation.

The video signal can be transmitted with a coaxial, twisted pair, telecommunications cable (also with the existing cable used in mining telephony using free pairs of wires), leaky feeder, fibre optic and Ethernet cable. In addition to analogue cameras, digital megapixel cameras with local transmission or transmission to the mine surface can also be used with the optical fibre version.

Characteristics

- tailored to customer needs
- high-resolution colour camera
- small overall dimensions
- integrated internal Infrared illuminator
- multiple transmission types
- also available as an IP rated version or with a rangefinder

Explosion protection

Marking (depending on the components used)
 I M2(M1) Ex de [ia Ma] I Mb
 I M2(M1) Ex de [ia op is Ma] I Mb
 I M2(M1) Ex de [op is Ma] I Mb
 I M2(M1) Ex d [ia Ma] I Mb
 I M2(M1) Ex d [ia op is Ma] i Mb
 I M2(M1) Ex d [op is Ma] I Mb
 II 2(1) G Ex de [op is Ga] IIC Gb
 II 2(1) G Ex de [ia Ga] II Gb

Ambient temperature

-20°C to +40°C
 0°C to +40°C

Certificate

OBAC 06 ATEX 110

Rated values

Ingress protection rating
 IP65

Supply voltage
 230 or 42 V AC

Supply voltage frequency
 50/60 Hz AC

Camera field of view
 Depending on the lens type, 95.6° ÷ 22.1°

Dimensions
 164x164x260 (300, 360, 400 or 440) mm

Ordering information

B b C A M - 0 1 . * / *

A B

A	Transmission type: K – Coaxial cable T – Telecommunication cable S – Fibre optic cable C – Leaky feeder R – Radio E – Ethernet SK – Optical fibre and conductor TS – Thermal imaging camera with transmission X – Special version
B	Camera length: * – 440 mm 1 – 400 mm 2 – 360 mm 3 – 300 mm 4 – 260 mm



Safety Breaker type Ex ZS 75 xx xx/xx

Description

The Safety Breaker type Ex ZS 75 is designed for emergency stopping of machinery, equipment, belt conveyors and large industrial plant. Depending on the purpose, the safety switch can be used as an emergency stop switch, pull rope emergency stop switch, single-side or double-side or as a sensor monitoring for the belt "running in". The safety breaker can be activated by pulling the rope or pressing the emergency button.

The device is available in two versions:

- the first variant contains only passive switching elements of microswitches,
- the second variant, apart from passive switching elements, also contains a certified, intrinsically safe input module SBG exx (OBAC 08 ATEX 265U) being part of the intrinsically safe system type SBS 100 (OBAC 08 ATEX 267).

Cable grommets can be mounted on two opposite walls of the safety switch enclosure. Certified reinforced metal or plastic M25x1.5 or M20x1.5 grommets are used.

Characteristics

- small overall dimensions
- interoperable with belt conveyor automation systems
- multiple version types

Explosion protection

Marking
I M2 Ex db eb I Mb
I M1 Ex ia I Ma

Ambient temperature

-20°C ≤ Ta ≤ +60°C

Certificate

OBAC 09 ATEX 086X

Rated values

Ingress protection rating
IP65

- The first variant
Break contact switching voltage
250 V AC (230 V DC)

Contact rated current
AC-15: 6 A
DC-13: 0.25 A

Cross-section of connected cable
0.5 to 1.5 mm²

Range of choked cable diameters
6 to 14 mm or 14 to 18 mm

- The second variant

For detailed information, refer to the instruction manual.



Explosion protection

Marking
I M2 Ex d [ib] I Mb
II 2G Ex d [ib] IIA T4 Gb

Ambient temperature

-20°C to +60°C

Certificate

OBAC 08 ATEX 255

Rated values

Ingress protection rating
IP65

Power supply parameters (1,2)

$U_i = 12,8\text{ V}$
 C_i – negligible
 L_i – negligible

Dimensions

length: 170 mm, diameter: 130 mm

Weight

approx. 11 kg

Ordering information

O E - 1 *
A

A Version type:
I – incremental
A – absolute

Flameproof Encoder type OE-1.*

Description

Flameproof Encoders OE-1.* are designed to measure the rotation angle and/or rotational speed of equipment operating in group I hazardous areas (methane and/or coal dust explosion) as well as in group IIA hazardous areas. Thanks to its compact and solid design, it can be used in harsh operating conditions without the need for additional mechanical guards.

The angle measurement is carried out by means of an absolute encoder, the output signal of which clearly determines the angle of the measuring shaft with a possibility to determine the zero point of the encoder.

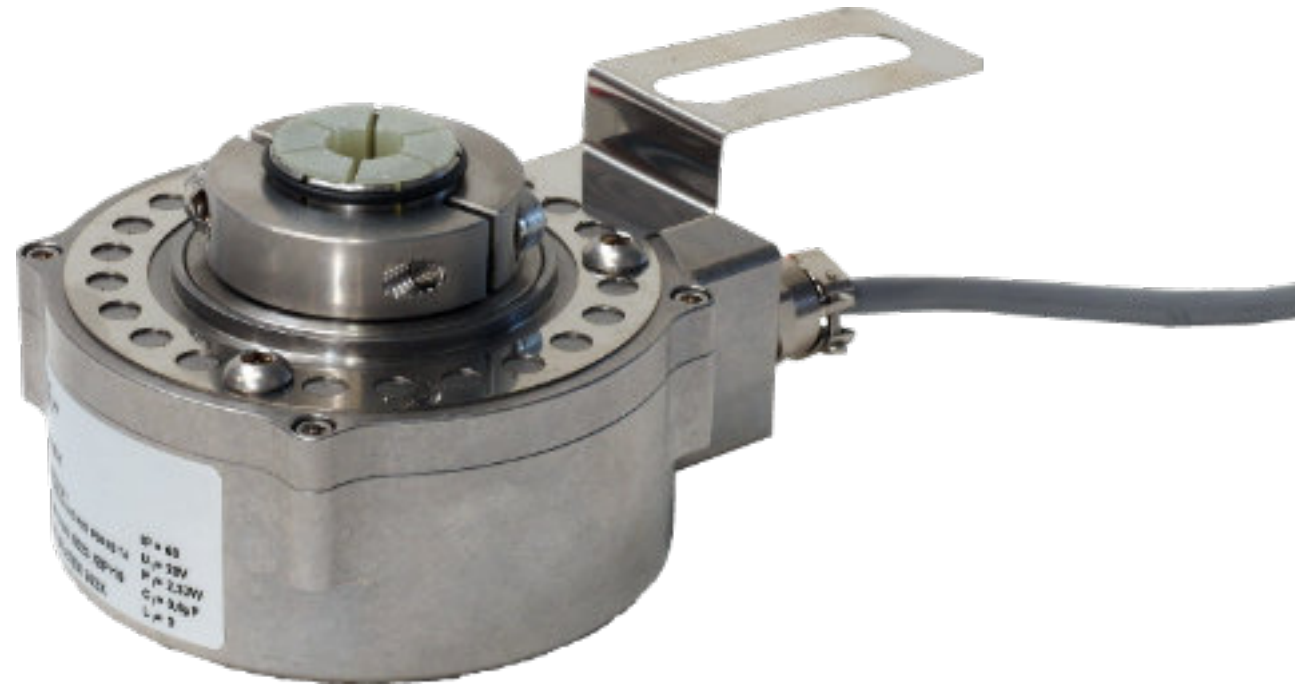
The rotational speed is measured by an incremental encoder having two phase-shifted pulse outputs to determine the speed and direction of the rotation.

The signal and power barrier enables the non-intrinsically safe encoder to be powered from an intrinsically safe voltage of 12 V (100 mA) and to isolate the output signals.

In the OE-1. A (absolute) version, the SSI signal is separated, conforming with the RS422 standard voltage levels. It is recommended to use quick barriers and a special SSI receiver module to receive the encoder signal. The maximum transmission distance is 100 m. The maximum cable length is 2 m, and it can be shortened as required by the customer. In both versions, the cable is terminated with the Wieland EX plug GOT GG 6 M20**** **.

Characteristics

- rotation angle measurement
- rotational speed measurement
- overall dimensions



Explosion protection

Marking
I M1 Ex ia I
II 1GD Ex ia tDA20 IP 66 IIB T4

Ambient temperature

-20°C to +70°C

Certificate

OBAC 09 ATEX 302X

Rated values

Ingress protection rating
IP66

Parameters of intrinsically safe outputs (2-3;2-4;2-5)

$I_o = 95,45 \text{ mA}$
 $U_o = 27,5 \text{ V}$
 $P_o = 0,66 \text{ W}$
 $C_o \text{ for I} = 3,55 \mu\text{F}$
 $L_o \text{ for I} = 51,22 \text{ mH}$
 $C_o \text{ for IIA} = 2,24 \mu\text{F}$
 $L_o \text{ for IIA} = 31,22 \text{ mH}$
 $C_o \text{ for IIB} = 0,672 \mu\text{F}$
 $L_o \text{ for IIB} = 15,61 \text{ mH}$

Power supply parameters (1-2)

$U_i = 28 \text{ V}$
 $P_i = 2,33 \text{ W}$
 $C_i = 0,6 \mu\text{F}$
 $L_i = 0 \text{ H}$

Number of incremental encoder pulses
up to 1024 pulses/rotation

Maximum rotational speed
up to 3600 rpm

Intrinsically Safe Incremental Encoder type IEI-1

Description

Intrinsically Safe Incremental Encoder type IEI-1 is designed to measure the rotation angle of equipment operating in group I hazardous areas (methane and/or coal dust explosion) as well as in group IIB hazardous areas. Thanks to its compact and solid design, it can be used in harsh operating conditions without the need for additional mechanical guards.

These encoders are designed in accordance with the good engineering practice with respect to their safety and meet the requirements of the standards PN-EN 60079-0 and PN-EN 60079-11.

Characteristics

- rotational speed measurement
- overall dimensions



Intrinsically Safe Temperature Sensor type ICT-*.**

Description

The Intrinsically Safe Temperature Sensor type ICT-*** is used to measure the temperature of gases, liquids and solids in equipment, tanks, pressure piping etc.

This sensor can be used in hazardous areas at risk of gas and dust explosions classified in group I (methane, coal dust) and in group II. The device is equipped with an analogue output of 4-20 mA.

Explosion protection

Marking
I M1 Ex ia I Ma
II 1G Ex ia IIC T6/T5/T4 Ga

Ambient temperature

for group I -20°C to +85°C
for group II -20°C to +40°C for T6-20°C to +50°C for T5-20°C to +60°C for T4

Certificate

OBAC 06 ATEX 290X

Rated values

Ingress protection rating
IP65

Measuring element
Pt100

Connector thread
M20x1.5

Permissible pressure
1 MPa – standard version
3 MPa – special version

Installation length L
5 or 10 or 15 or 20 cm or other

Minimum depth of immersion in the medium
25 mm

Outer thermowell material
acid-resistant steel 1H18N9

Maximum values of power supply circuit parameters, terminals 1 (+) and 2 (-)
 $U_i = 30 \text{ V DC}$
 $I_i = 100 \text{ mA}$
 $P_i = 750 \text{ mW}$

Internal inductance
negligible

Internal capacity
negligible

Sensor measuring circuit
Maximum electrical values to energise terminals 3, 4, 5, 6
 $U_o = 9.6 \text{ V DC}$
 $I_o = 4.5 \text{ mA}$
 $P_o = 11 \text{ mW}$

Maximum permissible value of internal inductance and capacitance
 $L_o = 4.5 \text{ MH}/C_o = 709 \text{ NF}$ – for IIb, IIC
 $L_o = 8.5 \text{ MH}/C_o = 1300 \text{ NF}$ – for IIb, IIC

Maximum probe length
500 mm



Flameproof Straight-Through Distribution Box type OSR

Description

The Flameproof Straight-Through Distribution Box type OSR ** is used for connecting and branching electrical circuits that are made with the use of rubber cables or cables. It is equipped with cable grommets and connection terminals. The box type OSR ** is designed for use in hazardous areas at risk from methane and/or coal dust (group I), as well as in hazardous areas at risk from dust and gases classified in group IIA. The enclosure of the junction box is a self-contained flameproof enclosure. Thanks to its compact and solid design, it can be used in harsh operating conditions without the need for additional mechanical guards.

Characteristics

- rated voltage up to 1140 V
- connection terminals up to 95 mm²
- ingress protection rating IP54

Explosion protection

Marking
I M2 Ex d [ja, ib, ic] I
II 2GD Ex d [ja, ib, ic] IIA T6

Ambient temperature

-20°C to +40°C

Certificate

OBAC 08 ATEX 257

Rated values

Ingress protection rating
IP54

Supply voltage

max. 1140 V

Dimensions

OSR 1.* 250+L* x 270 x 110 mm

OSR 2.* 250+L* x 270 x 150 mm

L* - length of the cable grommet

Ordering information

O S R * . * - * * / * *

A B C C D D

A Enclosure depth:
1 – 110 mm
2 – 150 mm

B Rated voltage:
1 – 250 V
2 – 500 V
3 – 690 V
4 – 1000 V
5 – 1140 V

Selection of terminals

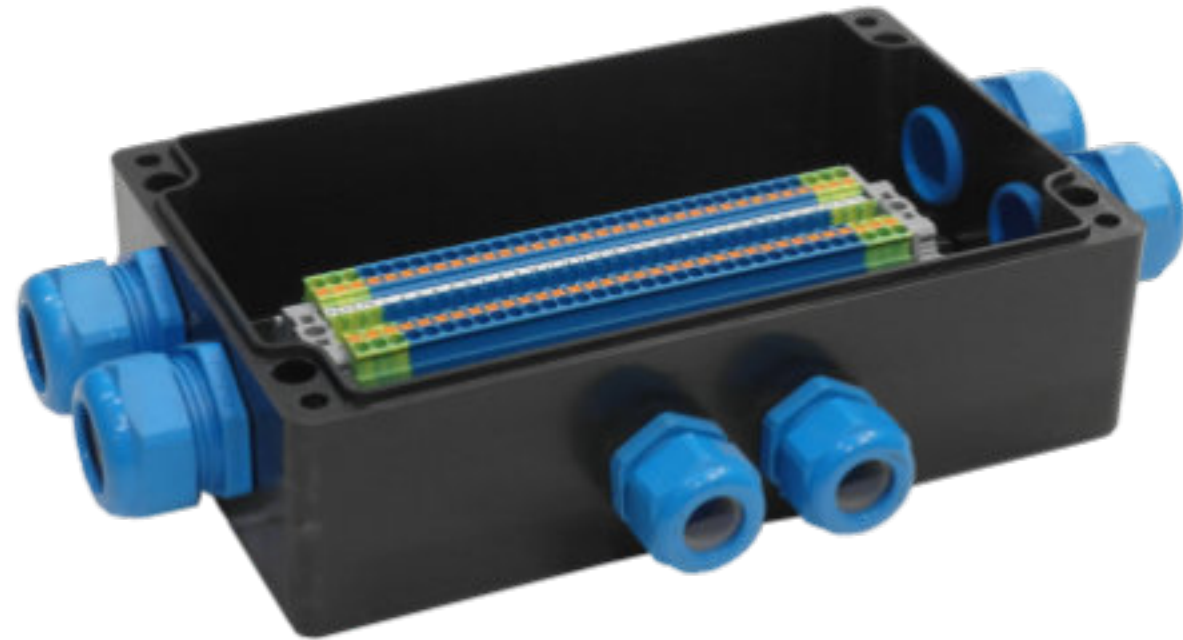
Box type	CC Terminal size (mm ²)	Maximum number of terminals (voltage up to 690 V)	DD Maximum number of terminals (voltage up to 1140 V)	Load current (A) of the current circuit
OSR 1.*	2,5	29	/	21
OSR 2.*	4	23	8	28
	6	17	/	36
	10	14	/	50
	16	11	8	66
OSR 2.*	35	9	6	109
	6	17	14	41
	50	7	/	137
	70	7	/	167
	95	6	/	200

Maximum number of cable grommets on a wall

Box type	M20x1,5 M25x1,5 M32x1,5	M36x1,5 M40x1,5	M50x1,5 M63x1,5
OSR 1	4	3	0
OSR 2	5	3	2

Cable grommet choking diameters

Provide external cable diameters in your inquiry or order.



Pass-Through Junction Box type 07-5105-..../....

Description

Pass-Through Junction Boxes type 07-5105-****/**** and 07-5105-****/****S are intended for connection of intrinsically safe ia/ib and optical op is communications systems, data transmission systems, control systems, video surveillance equipment, sensors etc. The boxes are used for connection and branching of cables and wires with the use of certified connection terminals. The enclosure type 07-5105-****/**** is made of black polyester reinforced with fibreglass, and the enclosure 5105-****/****S is made of stainless steel. All enclosures are Ex e rated.

Characteristics

- connecting and branching of power, control and signal cables and conductors
- connecting lighting systems, devices or sensors
- can be used in intrinsically safe circuits
- polyester enclosure providing mechanical strength of 7 Nm
- special lid closure thanks to the use of captive screws
- protection rating, at least IP 65

Explosion protection

Marking
 I M1 Ex ia I Ma
 I M1 Ex ia op is I Ma
 II 1G Ex ia IIC TX Ga
 II 1G Ex ia op is IIC TX Db
 II 2D Ex ia IIIC TX Db
 II 2D Ex ia op is IIIC TX Db
 PO Exial

Ambient temperature

-20°C..+40°C, -55°C..+40°C, -55°C..+55°C

Certificate

OBAC 05 ATEX 008
 TC BY/112 02.01. 103,00176

Rated values

Ingress protection rating
 IP65/IP66

The minimum wire cross-section
 10 mm²

Code: 07-51

The following table shows the maximum number of cable outputs that can be mounted on the box wall.

Box IP 07-5178-..../....

Box Ex i 07-5105-..../....

Box wall marking method											
Reorder number	wall	M 12x1.5 (2-6 mm)	M 16x1.5 (4-8 mm)	M 16x1.5 (5-10 mm)	M 20x1.5 (6.5-12 mm)	M 20x1.5 (10-14 mm)	M 25x1.5 (13-18 mm)	M 32x1.5 (18-25 mm)	M 40x1.5 (22-32 mm)	M 50x1.5 (32-38 mm)	M 63x1.5 (37-44 mm)
07-____-0800/7555	A/B C/D	4 1	2 1	2 -	2 -	1 -	1 -	- -	- -	- -	- -
07-____-1100/7555	A/B C/D	6 1	4 1	3 -	3 -	2 -	2 -	- -	- -	- -	- -
07-____-1600/7555	A/B C/D	12 1	6 1	5 -	4 -	4 -	3 -	- -	- -	- -	- -
07-____-1900/7555	A/B C/D	15 1	8 1	6 -	5 -	5 -	4 -	- -	- -	- -	- -
07-____-1221/2090	A/B C/D	13 4	9 4	5 2	5 2	4 2	3 1	2 1	1 1	1 -	- -
07-____-1221/2012	A/B C/D	13 4	9 4	5 2	5 2	4 2	3 1	2 1	1 1	1 -	- -
07-____-2201/2090	A/B C/D	28 4	18 4	12 2	11 2	10 2	5 1	3 1	3 1	2 -	- -
07-____-1601/6090	A/B C/D	18 8	14 8	8 5	8 4	6 4	4 2	2 2	2 1	1 -	- -
07-____-1601/6012	A/B C/D	18 8	14 8	8 5	8 4	6 4	4 2	2 2	1 1	1 -	- -
07-____-2601/6090	A/B C/D	33 8	26 8	17 5	14 4	12 4	7 2	4 2	3 1	3 -	- -
07-____-3601/6090	A/B C/D	48 8	38 8	24 5	20 4	18 4	10 2	6 2	5 1	4 -	- -
07-____-2552/5012	A/B C/D	53 12	34 12	23 10	20 8	18 8	9 4	7 3	4 2	3 2	2 2
07-____-2552/5016	A/B C/D	53 12	34 12	23 10	20 8	18 8	9 4	7 3	4 2	3 2	2 2
07-____-4002/5012	A/B C/D	88 12	58 12	38 10	35 8	30 8	17 4	13 3	6 2	5 2	4 2
07-____-4002/5016	A/B C/D	88 12	58 12	38 10	35 8	30 8	17 4	13 3	6 2	5 2	4 2
07-____-4004/0512	A/B C/D	88 26	58 20	38 16	35 14	30 10	17 6	13 4	6 2	5 4	4 3
07-____-4004/0516	A/B C/D	135 42	89 38	58 34	53 30	46 24	26 8	20 5	9 3	7 6	4 4
07-____-6002/5012	A/B C/D	130 12	84 12	56 10	52 8	46 8	24 4	18 3	10 2	6 2	4 2

NOTE – if you wish another type of cable grommet to be used, please contact us.



Explosion protection

Marking (depending on the components used)
 I M1 Ex ia I Ma
 I M2(M1) Ex db eb ib mb [ia Ma] I Mb
 II 1G Ex ia IIC TX Ga
 II 2(1)G Ex db eb ib mb [ia ma Ga] IIC TX Gb
 II 2(1)D Ex ib mb [ia ma Da] IIC TX Db
 II 2D Ex ia op is IIIC TX Db
 PO Exial
 PO Exiamal
 PΠ Exdeib[ia]I
 PΠ Exdeibmb[ia]aI
 PΠ ExdeibmbI

Ambient temperature

-20°C to +40°C -55°C to +70°C

Certificate

OBAC 04 ATEX 277
 TC BY/112 02.01. 103 00192

Rated values

Ingress protection rating
 IP65/IP66

Version material

07-3103 - polyester, with lid
 07-3113 - stainless steel 304, with door,
 07-3132 - stainless steel 316L, with lid,
 07-3136 - stainless steel 316L, with door.

Control Panel type 07-31...-...../.....

Description

Control Panel type 07-31**-****/**** is designed for controlling, monitoring or visualising the operation of machines and automation equipment. The product is suitable to connect intrinsically and non-intrinsically circuits of communications systems, data transmission systems, control systems, power, systems, video surveillance equipment, sensors etc. The boxes can also be used for connecting and branching of incoming and outgoing cables with the use of certified connection terminals. Depending on the needs, the panel has built-in electrical components and sub-assemblies, explosion-proof or normal rating in accordance with the specific device installation requirements. The boxes are made of black polyester reinforced with fibreglass or stainless steel. The panel enclosure is closed with a lid or a door. The desktop lid can also be fitted with a sight glass. All control panel compartments are Ex e rated.

Characteristics

- tailored to customer needs
- can be used in various control, signal and power circuits
- multiple equipment variants
- available in polyester or stainless steel enclosures



Multicore Bushing Insulators type *7-910*-****

Description

Multicore Bushing Insulators type *7-910*-**** are used to transfer electrical signals in explosion-proof enclosures. These may be connections between one flameproof compartment and another explosion proof compartment conforming with the standard PN-EN 60079-0 or between different flameproof enclosures.

Explosion protection

II 2G Ex db IIC Gb
II 2G Ex db IIB Gb
I M2 Ex db I Mb

Ambient temperature

50°C to +110°C

Certificate

OBAC 07 ATEX 278U

Rated values				
Voltage	Cable	Cross-section [mm ²]	Sleeve	Maximum ambient temperature
250 V	H05V-K/Radox, Heluterm	0,5 to 1,5	M16x1,5 to M42x1,5	+70°C/+110°C
690 V	H07V-K/Radox, Heluterm	0,75 to 185	M16x1,5 to M42x1,5	+70°C/+110°C
1000 V	NSGAF0U / Radox, Heluterm	1,5 to 185	M16x1,5 to M42x1,5	+90°C/+110°C
3000 V (6000 V)	NSGAF0U/ (N)HSGAFHX0, Radox	1,5 to 120	M16x1,5 to M42x1,5	+90°C/+110°C
Intrinsically safe version				
250 V	H05V-K, H07V-K/H05G-K, H07G-K	0,5 to 1,5	M16x1,5 to M42x1,5	+70°C/+110°C

Insulator type	Code N1	Voltage	Code N2	Wire cross-section [mm ²]	Code N3	Bushing size	Code N6	Explosion proof version	Code N8			
Copper wire	0	690 V	1	0,5	E	M16x1,5	D	II 2G Ex db IIC Gb II 2G Ex db IIB Gb I M2 Ex db I Mb	OB			
				0,75	F	M24x1,5						
				1	G	M24x1,5				2		
				1,5	H	M24x1,5						
		250 V	2	2,5	J	2,5	I			M33x1,5	3	
						4	K			M33x1,5		
						5	L			M36x1,5		4
						10	M			M36x1,5		
		1000 V	3	16	N	16	N			M38x1,5	5	
						25	P			M42x1,5		6
						35	Q			M42x1,5		
						50	R			M42x1,5		
		3000 V	4	70	S	70	S			M20x1,5	E	
						95	T			M20x1,5		
						120	U			M25x1,5		F
						150	L			M25x1,5		
		6000 V	5	285	R	285	R			M32x1,5	G	
						Others	X			M32x1,5		
						ribbed cross-sections	Z			M40x1,5		L

0	7	-	9	1	0	-	-	-	-	-	-	-	-	-	/	OB
N1						N2		N3	N4	N5	N6					N8

N4-N5 – Number of insulator cores

Insulator type	Code N1	Cable type	Code N2	Fibre diameter [µm]	Code N3	Thread size	Number of fibres	Body length [mm]	Code N6	Explosion proof version	Code N8	
Fibre optic	5	Fibre-optic cable	A	50/125	2	M16x1,5	1	25	D	II 2G Ex db IIC Gb II 2G Ex db IIB Gb I M2 Ex db I Mb	OB	
				62,5/125	3	M24x1,5	4	26				2
				9/125	4	M33x1,5	6	30				3
				9/125	4	M36x1,5	8	35				4
				200/230	6	M38x1,5	8	36				5
					6	M42x1,5	12	35	6			

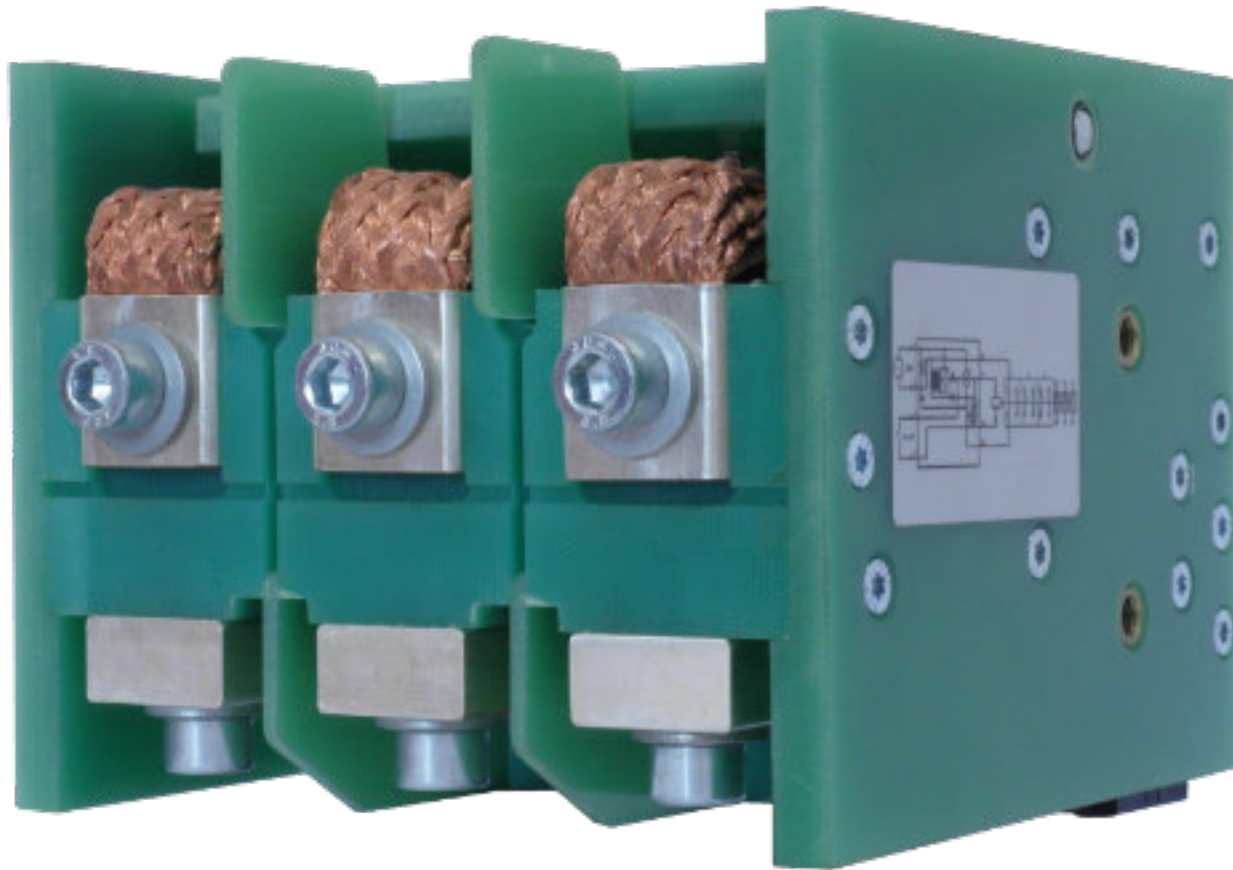
5	7	-	9	1	0	A	-	-	-	-	-	-	-	-	/	OB
N1						N2		N3	N4	N5	N6					N8

N4-N5 – Number of fibres in insulator (depending on thread size)

Insulator type	Code N1	Cable type	Code N2	Cable type	Code	Thread size	Code N6	Body length [mm]	Code N7	Explosion proof version	Code N8
Copper wire	0	Coaxial	8	RG-58/U	1	M33x1,5	3	40	4	II 2G Ex db IIC Gb II 2G Ex db IIB Gb I M2 Ex db I Mb	OB
					2	M36x1,5	4				
					3	M38x1,5	5				
					4	M42x1,5	6				
					5	M33x2	7				
					6	M36x2	8				
					9	M42x2	9	other	*		

0	7	-	9	1	0	8	-	0	1	-	-	-	-	-	/	Z	K	-	/	OB
N1						N2		N3	N4	N5	N6					N7				N8

N4-N5 – Number of insulator cores



Vacuum Contactor BP-VS-500

Description

The Vacuum Contactor BP-VS-500 is a three-pole electromagnetic contactor with the electromagnetic actuator. The switching equipment comprises three vacuum compartments, a power supply and a control system for the solenoid actuator, auxiliary contacts and screw terminals. The contactor is designed for switching on and off alternating current loads, namely:

- electric motors,
- transformers,
- choke coils,
- capacitor banks,
- resistance loads.

The vacuum contactor is designed for installation in electrical equipment cabinets and boxes intended for operation in harsh environmental conditions of the chemical and mining industries. The vacuum contactor is made of insulating material which ensures low weight and small dimensions. The open enclosure with an IP00 protection rating provides easy access and good ventilation of the vacuum compartments.

Characteristics

- high mechanical and switching strength
- minimum maintenance requirements throughout the service life
- compact design and small overall dimensions
- minimum power input when closed
- high safety for the environment

Rated values

Rated voltage Un
1200 V

Rated switching voltage Ue
up to 1140 V

Rated frequency
50/60 Hz

Rated current

- thermal current 500 A
- switching on 6,25 kA
- switching off 5 kA
- momentary (10s) 4,2 kA
- peak 20 kA

Operation category:
AC1, AC2, AC3, AC4

Mechanical strength
1x10⁶ cycles

Electrical strength
5x10⁵ cycles

Control circuits
Rated voltage:
230 V

Power input
3,1 VA

Closing time
≤45 ms

Opening time
≤25 ms

Auxiliary contacts
Rated voltage
230 V

Thermal current
3 A

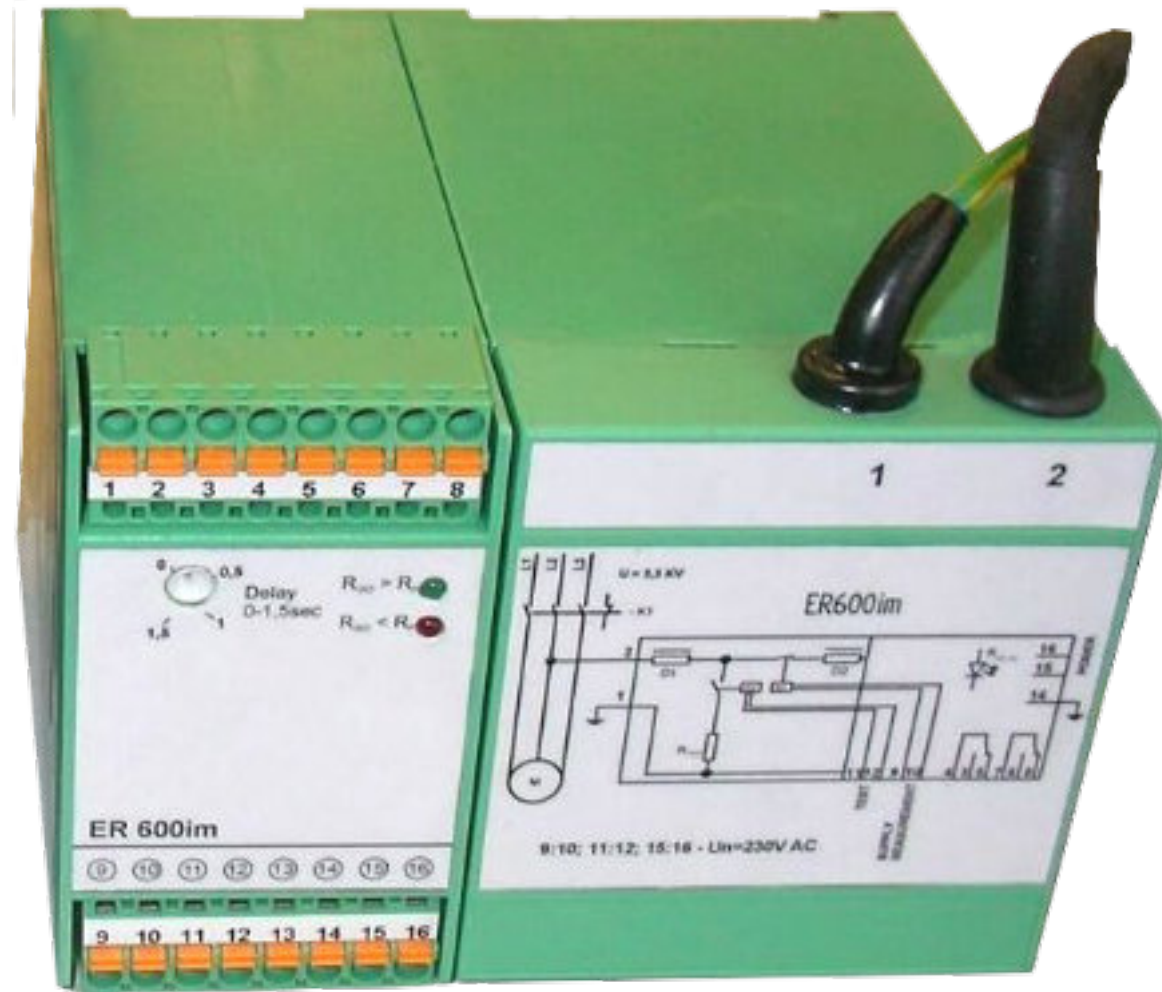
Operating environment
Contactor weight
7,2 kg

Ambient temperature
-20°C ÷ +70°C

Relative humidity
up to 95% at 20°C

Operating position:
Vertical or horizontal position of the vacuum compartment with a deviation of up to ±10°

Dimensions (HxWxD) in mm
175x164x140



Interlocking Current-Leakage Protection System type ER 600 im

Description

The ER 600im type protection is used to control isolation status in isolated medium-voltage power networks with an average voltage of 3.3 kV, as a blocking protection. The measuring circuit of the ER600im protection can interoperate with the controlled network only by means of the integrated set of ER600d chokes and has the following function:

Signalling when the insulation condition falls below the set reference value, the controlled release time relay is released, whose contacts signal tripping or prevent reclosing a circuit breaker or a contactor energising a controlled section of the network.

Explosion protection

Marking
I M2 [Ex ib] I Mb

Ambient temperature

-20°C to +70°C

Certificate

OBAC 11 ATEX 441U

Rated values

Ingress protection rating
IP20

Supply voltage

230 V or 42 V AC \pm 20%

Power input

1 VA

Test voltage

24 V DC \pm 5%

Rated voltage of controlled network

up to 3600 V AC,

Maximum output current of the measuring circuit

$I_o = 0.214$ mA

Internal inductance ER600d (U = 25.2 V)

$L_i = 5500$ H

Internal inductance ER600z (U = 25.2 V)

$L_i = 1930$ H

Internal capacity

C_i - negligible

Setting range for network 3.3 kV

220 k Ω \pm 20%

Tripping time

< 70 ms

Contacts

2 switching contacts

Switching voltage

max. 250 V AC/DC

Switching current

$I_{max} = 5$ A



Central-Interlocking Leakage Safety Device type ER 100ims

Description

The ER 100ims type protection is used to control isolation status in isolated low-voltage electrical networks. Depending on the method of connecting the protection to the controlled network, it may perform the following functions:

- Central-interlocking leakage safety device of the three-phase alternating voltage network. In this case, three ED 100i chokes connected at one end to the three phases of the network and at the other end connected at one point to form the "artificial zero" system to which the ER 100ims measuring relay of the protection is connected,
- Central-interlocking leakage safety device of the single-phase alternating voltage network. In this case, two ED 100i chokes connected at one end to the phases conductors of the network and at the other end connected at one point to which the ER 100ims measuring relay of the protection is connected,
- Blocking leakage protection of the three-phase and single-phase alternating voltage networks,

The measurement circuit of the measuring relay ER 100ims can only operate with the controlled network via the ED 100i, ED 100i.2p or ED 100i.3p chokes.

The following functions are fulfilled in these applications:

- Signalling and/or tripping when the insulation condition falls below the set reference value, the controlled release time relay is released, whose contacts signal tripping and/or disconnects a circuit breaker or a contactor,
- Measurement and indication of insulation condition, where an intrinsically safe analogue output can be connected to an intrinsically safe voltage indicator (0÷10V) scaled to the reading of insulation resistance, e.g. ER 100ws and/or an intrinsically safe voltage converter to another analogue signal to transmit this information to other control and monitoring systems,

The non-intrinsically safe circuit consists of contacts and a relay coil as well as a power supply for the protection. The analogue output can be connected to intrinsically safe circuits of the ia rated protection (e.g. ER 100ws or to an intrinsically safe signal separator), and its measuring circuit sends an intrinsically safe signal ia through a system of ED 100i chokes to the controlled network. The device in the front part is equipped with a switch to select whether the tripping status after the occurrence of earth fault is to be reset manually or automatically.

Explosion protection

ER 100ims marking
I (M1) [Ex ia Ma] I
ER 100ws marking
I M1 Ex ia Ma I

Ambient temperature

-20°C to +70°C

Certificate

OBAC 06 ATEX 059U

Rated values

Ingress protection rating
IP20

Supply voltage
42 V AC ±20% , 24V ±20% DC

Power input
1 VA

Test voltage
18 V DC ±5%

Rated voltage of controlled network
up to 1140 V AC 50Hz

Maximum output current of the measuring circuit
 $I_o = 0.42 \text{ mA}$

Internal inductance
 $L_i = 404 \text{ H}$

Internal capacity
 $C_i - \text{negligible}$

Settings range
 $2 \div 100 \text{ k}\Omega$

Tripping time
<100ms

Contacts
2 switching contacts

Switching voltage
max. 250 V

Switching current
 $I_{max} 5 \text{ A}$

Mains voltage for chokes:
ED 100i: up to 1140 V AC 50 Hz
(central and blocking protection)
ED 100i.2p: up to 1140 V AC 50 Hz
(blocking protection)
up to 500 V AC 50 Hz
(central protection)
ED 100i.3p: up to 1140 V AC 50 Hz
(blocking protection)
up to 500 V AC 50 Hz
(central protection)

**Rated values**

Ingress protection rating
IP20

Ambient temperature
-20°C to +70°C

Supply voltage
24 V DC/42 V AC

Rated current setting range for 5 mV/A1 converter
0.5... 630 A

Rated current setting range for 5 mV/A1 converter
1.0 ... 1000

Rated current setting range for 5 mV/A1 converter
2.5... 2500

Setting range for rated current

0.10 A ÷ 2 A	with 0.01 A step
2.0 A ÷ 10 A	with 0.05 A step
10 A ÷ 25 A	with 0.1 A step
25 A ÷ 100 A	with 0.5 A step
100 A ÷ 250 A	with 1 A step
250 A ÷ 1000 A	with 5 A step
1000 A ÷ 2500 A	with 10 A step
(remotely freely with 0.01 A step)	

Access password
combinations 00000000 ÷ 99999999

User interface language
Polish, English, German, Spanish, Czech, Russian, Turkish

Dimensions [mm]
90 x 65 x 110mm

Short-Circuit Overload Protection of Three-Phase Outgoing Feeder type OSC3

Description

Overload protection of three-phase outgoing feeders type OSC3 is used to protect the motors against the effects of overload, short circuit and supply current phase imbalance.

The protection works with external current-voltage converters. It has a wide range of settings, depending on the converters used. It is also possible to use current transformers, because after shorting them with a low resistance it is possible to express the signal in [mV/A]. Communication with the user is via text messages displayed on the display. Buttons are provided to navigate the device menu.

The protection has LEDs indicating the operating status of the device. Remote access to the device is via the RS-485 interface using the Modbus RTU protocol. As standard, the device is fitted with one digital input I0, which is intended as an external input for clearing messages appearing on the display (equivalent to the "RESET" button). The device may be optionally fitted with a larger number of general-purpose inputs whose logical status is indicated on the display and can be read remotely.

Characteristics

- any transformer setting
- selection of overload characteristics class
- MODBUS communication as standard

**Rated values**

Ingress protection rating
IP 20

Ambient temperature
-20°C to +70°C

Dimensions
45x101x120 mm

Supply voltage
 $U_n = 24 \div 42 \text{ VAC/DC}$

Maximum line-to-line voltage
1140 V

Nominal current setting range
0.1 ÷ 24 A
0.1 A ÷ 2 A, 0.01 A increment
2 A ÷ 10 A, 0.05 A increment
10 A ÷ 24 A, 0.1 A increment

Setting range of the short-circuit element
 $I_r/I_n = 2 \div 12$

Maximum cable diameter
2.5/4 mm (stranded core/wire)

Communication
Modbus RTU

Access password
combinations 00000000 ÷ 99999999

User interface language
Polish, English, German, Spanish, Czech, Russian, Turkish

Motor Overcurrent Protection type ZNS

Description

The ZNS type protection is used to protect three-phase outgoing feeders against the effects of overloading, short circuits and the supply current phase imbalance, including equipment (motors) operating in hazardous areas. If the imbalance element is switched off, it is also possible to apply the protection to single-phase circuits.

Communication with the user is via text messages displayed on the display. Buttons are provided to navigate the device menu. The protection has LEDs indicating the operating status of the device. It is equipped with 3 actuating relays.

The device has an input that is used to reset messages appearing on the display. The status of the resetting input and relays is indicated on the display.



Temperature Protection type TMA100Am

Description

The temperature protection type TMA100Am is an intrinsically safe device designed to protect equipment against excessive temperature increase. It uses PTC temperature sensors built into the devices.

The temperature protection type TMA100Am is designed in accordance with the good engineering practice with respect to their safety and meets the requirements of the standards PN-EN 60079-0 and PN-EN 60079-11.

The temperature protection type TMA100Am is designed to operate in an additional Exd rated flameproof enclosure or in a non-hazardous area, in an IP 54(65) rated enclosure, while the intrinsically safe circuits of the protection level can be used in hazardous areas at risk from gas and dust explosion.

Explosion protection

Marking
I (M1) [Ex ia Ma] I
II (1)G [Ex ia Ga] IIC
II (1)D [Ex ia Da] IIIC

Ambient temperature

-20°C to +70°C

Certificate

OBAC 10 ATEX 081X

Rated values

Ingress protection rating
IP20

Parameters of intrinsically safe circuits

Terminals 14, 15, 16

Ex ia	I	IIA	IIB	IIC	IIIC
I_0	0,85 mA	0,85 mA	0,85 mA	0,85 mA	0,85 mA
U_0	8,61 V	8,61 V	8,61 V	8,61 V	8,61 V
P_0	1,9 mW	1,9 mW	1,9 mW	1,9 mW	1,9 mW
C_0	1000 μ F	1000 μ F	50 μ F	5,9 μ F	50 μ F
L_0	640 H	390 H	195 H	49 H	195 H

Terminals 13, 15

Ex ia	I	IIA	IIB	IIC	IIIC
I_0	16,8 mA	16,8 mA	16,8 mA	16,8 mA	16,8 mA
U_0	8,61 V	8,61 V	8,61 V	8,61 V	8,61 V
P_0	37,8 mW	37,8 mW	37,8 mW	37,8 mW	37,8 mW
C_0	1000 μ F	1000 μ F	50 μ F	5,9 μ F	50 μ F
L_0	1,6 H	1,0 H	0,5 H	0,12 H	0,5 H

Parameters of non-intrinsically safe circuits

At output terminals: 1, 2, 5, 6, 7, 8

$U_{max} = 250$ V

$I_{max} = 1$ A

$P_{max} = 25$ W

At input terminals (supply): 3, 4

$U = 24 \div 42$ VAC/DC

$I_{max} = 0,06$ A



Relay Control Module type PMS-*/**/*

Description

The Relay Control Module type PMS-*/**/* consists of three separate devices. Each of the modules can operate independently, or they can be interconnected with each other.

The actuating relay module PMS-0/**/* can be powered from a non-intrinsically safe or an intrinsically power supply. Measuring module: PMS-1/**/*, PMS-2/**/*, PMS-3/**/*, PMS-9/**/*, have two intrinsically safe measurement channels, and PMS-5/**/*, PMS-6/**/*, PMS-7/**/*, PMS-8/**/*, have four channels. These modules differ in the permissible measurement line resistance. Intrinsically safe measuring inputs with the protection rating of ia are controlled by a rectifier diode e.g. 1N4007. Each (measurement) input circuit is controlled by a short circuit, a break and a current flow direction.

Depending on the user's needs, the relay control module can be used for galvanic separation of intrinsically safe and/or non-intrinsically safe circuits.

The dual-channel measuring module of the relay control module has a SIL-3 safety integrity level.

The actuating module of the relay control module has a SIL-2 or SIL-3 safety integrity level. The 4-channel measuring module has a SIL-1 integrity level.

The relay control module is designed in accordance with the good engineering practice with respect to their safety and meet the requirements of the standards PN-EN 60079-0; PN-EN 60079-11; IEC 61508; PN-EN ISO 13849-1; PN-EN 62061.

Explosion protection

Marking
I (M1) [Ex ia Ma] I
II (1)G [Ex ia Ga] IIC
II (1)D [Ex ia Da] IIIC

Ambient temperature

-20°C to +70°C

Certificate

OBAC 08 ATEX 268U

Ordering information

P M S - * / * / *
A B C

A

Version:

- 0 – Actuating relay module (without the measuring module); Number of channels: 0
- 1 – Measuring module up to 600 Ω (with diode) $U_o=5,36 V$; Number of channels: 2
- 2 – Measuring module up to 100 Ω (with diode) $U_o=5,36 V$; Number of channels: 2
- 3 – Measuring module up to 50 Ω (with diode) $U_o=5,36 V$; Number of channels: 2
- 4 – Measuring module up to 600 Ω (with diode) $U_o=15,75 V$; Number of channels: 2
- 5 – Measuring module up to 600 Ω (with diode) $U_o=5,36 V$; Number of channels: 4
- 6 – Measuring module up to 600 Ω (with diode) $U_o=5,36 V$; Wersja specjalna; Number of channels: 4
- 7 – Measuring module up to 100 Ω (with diode) $U_o=5,36 V$; Number of channels: 4
- 8 – Measuring module up to 50 Ω (with diode) $U_o=5,36 V$; Number of channels: 4
- 9 – Measuring module up to XΩ (with diode) $U_o=5,36 V$; Number of channels: 2
- 10 – Measuring module up to XΩ (with diode) $U_o=5,36 V$; Number of channels: 4

B

Voltage:

- 1* – 12 V DC
- 2 – 24 V AC/DC
- 3** – 42 V AC/DC
- 4** – 24÷42V AC/DC

C

Version:

- 1* – \bar{T}/\bar{T}
- 2 – \bar{T}/i
- 3 – i/\bar{T}
- 4* – i/i

* only applicable to PMS-0/**/*
** not applicable to PMS-0/**/*

Rated values

Ingress protection rating
IP20

• PMS-0/**/*

Supply voltage
12 V, 24 V DC $\pm 10\%$

Power input
max. 1,5 V

Tripping time
10 ms

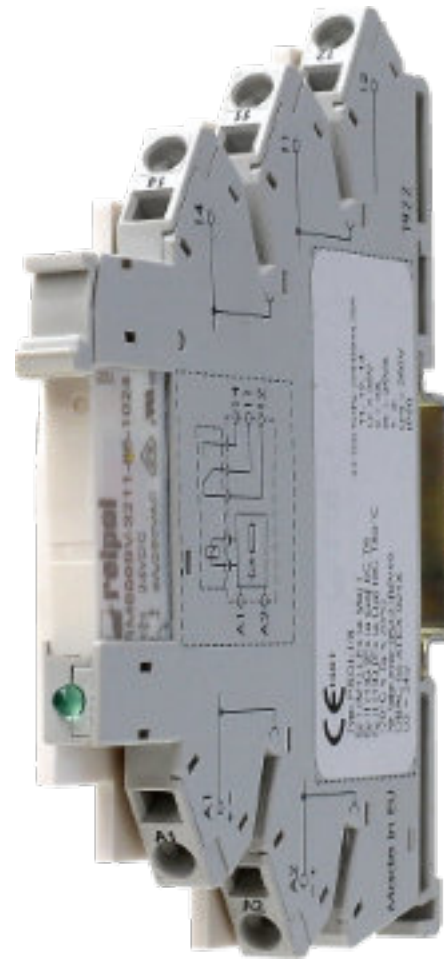
• PMS-1(2, 3, 5, 6, 7, 8, 9, 10)/**/*

Supply voltage
24V, 42V AC/DC $\pm 20\%$

Power input
max. 3 V

Test voltage
5 V Vp-p $\pm 5\%$

Input circuit control
diode 1N4001... 7



Intrinsically Safe and Non-Intrinsically Safe Circuits Relay Separator type PSOI-*/*

Description

The relay separator of intrinsically safe circuits is designed to separate non-intrinsically safe and intrinsically safe circuits. In the non-intrinsically safe circuit, there is a relay coil of the PSOI-*/* separator, while its contact can be switched to intrinsically safe circuits of protection rating ia or ib.

The relay separator of intrinsically safe and non-intrinsically safe circuits PSOI-*/* thus provides information from non-intrinsically safe control circuits to intrinsically safe or non-intrinsically safe circuits of automation systems.

Explosion protection

Marking
 I (M1) [Ex ia Ma] I
 II (1)G [Ex ia Ga] IIC T6
 II(1)D [Ex ia Da] IIIC T85°C

Ambient temperature

-40°C to + 55°C or -40°C to + 70°C

Certificate

OBAC 05 ATEX 021X

Ordering information

P S O I - * *

A

Contact type:
 1 – Changeover contact
 2 – Normally open contact with diode
 3 – Normally open contact with the NAMUR system
 4 – Normally open contact

B

Coil voltage:
 1 – 12 V AC/DC
 2 – 24 V AC/DC
 3 – 42/48 V AC/DC
 4 – 60 V AC/DC
 5 – 110...125 V AC/DC
 6 – 220...240 V AC/DC
 7 – 12 V DC
 8 – 24 V DC
 9 – 24 V AC/DC
 10 – 42/48 V AC/DC
 11 – 230 V AC

Rated values

Ingress protection rating
 IP20

• Intrinsically safe contacts

Contact material
 Au

Load current – switching
 3/0.6 A

Circuit switching voltage intrinsically safe AC/DC
 30 V

Rated AC switching power
 25 VA

Max. switching power AC (250 V)
 25 VA

Minimum switching current
 12/5 V/mA

• Relay coil

Control voltages AC (50/60 Hz)/DC
 12–24–42/48–60–110...125–230..240 V

Voltage range AC (50/60 Hz)
 (0.8... 1.1) Un

DC voltage range
 (0.7...1.2)Un

• Mechanical data

Mechanical strength
 10 x 106

Electrical Strength – switching
 60 x 104

Switching time
 7/11 ms

Insulation strength EN 61810-5
 4 kV / 3

Open contact insulation strength (AC/DC)
 1000 V



Multifunction Relay type PMB-2

Description

The multifunction relay type PMB-2 is designed for protection and control functions of two three-phase outgoing feeders/three-phase loads.

The protection works with external current-voltage converters. It has a wide range of settings, depending on the converters used. It is also possible to use current transformers, because after shorting them with a low resistance it is possible to express the signal in mV/A. The relay also has an emergency switch circuit (safety switch) and is additionally equipped with leakage protection for a third load.

The relay has LEDs indicating the operating status of the device. Remote access to the device is via the RS-485 interface using the Modbus RTU protocol. As standard, the device is fitted with one digital input RST, which is intended as an external input for clearing messages appearing on the display (equivalent to the "RESET" button). The device may be optionally fitted with a larger number of general-purpose inputs whose logical status is indicated on the display and can be read remotely. PMB-2 is also designed to protect outgoing feeders and motors operating in hazardous areas. Output circuits of PMB-2 protection enable operation in hazardous areas and are designed for use in areas classified as class a, b or c of methane explosion hazard and class A or B of coal dust explosion hazard.

Communication with the user is via text messages displayed on the display. Buttons are provided to navigate the device menu.

Functions implemented by the device:

- current protection (overload, short circuit, imbalance, stall of a motor, pump dry run protection),
- leakage blocking/central blocking protection,
- motor temperature protection,
- protection against loss of continuity of the PE protective wire or an excessive increase of its resistance,
- warning signal before switching on equipment,
- outgoing feeder remote and local control,
- remote or local control of actuators,
- contactor control,
- display of operating status and messages,
- transmission of information to other control and monitoring systems.
- communication via MODBUS RTU.

The relay type PMB-2 can be used in the following devices:

- contactor type switches,
- compact stations,
- transformer units,
- transformer/switching stations,
- other switchgear of a 3-phase alternating current network with a voltage of up to 1140 V AC 50 Hz installed in the workings of mining plants or other industrial facilities.

Explosion protection

I (M1) [Ex ia Ma] I

Certificate

OBAC 17 ATEX 0391U

Rated values

Ingress protection rating
IP30 /IP00

Ambient temperature
-20°C to +70°C

Supply voltage
24 V DC/42 V AC

User interface language
Polish, English, German, Spanish, Czech, Russian, Turkish

Dimensions [mm]
141.9 x 128.4 x 144.5

**Explosion protection**

I M1 Ex ia o pis I Ma

Certificate

JSHP 18 ATEX 0019X

Rated values**Ingress protection rating**
IP 54**Dimensions**
123.5 x 47.9 x 24.3 mm**Parameters of intrinsically safe circuits****Power supply**
Two DURACELL MN2400 LR03 batteries

Intrinsically Safe Infrared Remote Control type IPP-*

Description

The Intrinsically Safe Infrared Remote Control type IPP-1 is designed to communicate with a master device via infrared wireless transmission. The device has an IP54 rated enclosure.

Intrinsically Safe Infrared Remote Control type IPP-* as an intrinsically safe device is designed for use in hazardous areas such as methane and/or coal dust. IPP-* is equipped with an IR transmitting diode with a protection rating of op is. The version is intended for interoperation with PMB-2, the buttons on the pilot front have the same functions as the buttons on the PMB-2 relay.



Explosion protection

I (M1) [Ex ia Ma] I
II (1)G [Ex ia Ga] IIC

Ambient temperature

-20°C to + 70°C

Certificate

TEST 14 ATEX 0070U

Rated values

Ingress protection rating
IP 20

Dimensions

22,5x100x112 mm

Parameters of intrinsically safe circuits

$U_i = 13\text{ V}$
 $I_i = 195\text{ mA}$
 $C_i = 5\text{ }\mu\text{F}$
 $L_i = 0$
 $U_o = 3,7\text{ V}$
 $I_o = 130\text{ mA}$
 $P_o = 125\text{ mW}$
 L_o, C_o – according to operating instructions
 $U_m = 250\text{ V}$

Supply voltage

$U_n = 24\div 42\text{ VAC/DC}$

Intrinsically Safe Signal Separator type ISS-1

Description

The Intrinsically Safe Signal Separator type ISS-1 is designed for the separation of intrinsically safe signals RS422/RS485/HTL (5V) from non-intrinsically safe signals RS-232, RS-422, RS-485 or HTL (5V). The transmission rate can be changed with the use of a switch from 1.2 kbps to 1.5 Mbps. Termination impedance can be enabled in the same manner.

The intrinsically safe signal separator ISS-1 is fitted with the enclosure type ME 22,5 that provides IP20 protection. The enclosure is designed for installation on the TS35 rail. The ISS-1 is fitted with a single-channel intrinsically safe serial Interface RS-422 or RS-485 with a protection rating of ia.

The intrinsically safe signal separator type ISS-1 as an accompanying device is intended for installation in a main compartment of mining equipment, underground in mines in hazardous areas at risk of methane and/or coal dust explosion and in hazardous areas at risk of a gas explosion. The device has transmission channels with the protection rating of ia, which can be used in hazardous areas without having to be disabled in the event of an increase in methane concentration above the permissible limits.



Explosion protection

I (M1) [Ex ia Ma] I
 II (1)G [Ex ia Ga] IIC
 II(1)D [Ex ia Da] IIIC

Ambient temperature

-20°C to +70°C

Certificate

TEST 14 ATEX 0037U

Rated values

Ingress protection rating
 IP 20

Dimensions

113.6x99x22.6 mm

Measuring range of resistance

19 Ω < Re_z < 1900 Ω

Supported types of temperature sensors

Pt100, Pt200, Pt300, Pt500, Pt1000

Parameters of intrinsically safe circuits

U_o = 4.52 V

I_o = 16.2 mA

P_o = 18.3 mW

L_o, C_o – according to operating instructions

U_m = 250 V

Supply voltage

U_n = 24÷42 VAC/DC

Intrinsically Safe Signal Separator type ISS-2

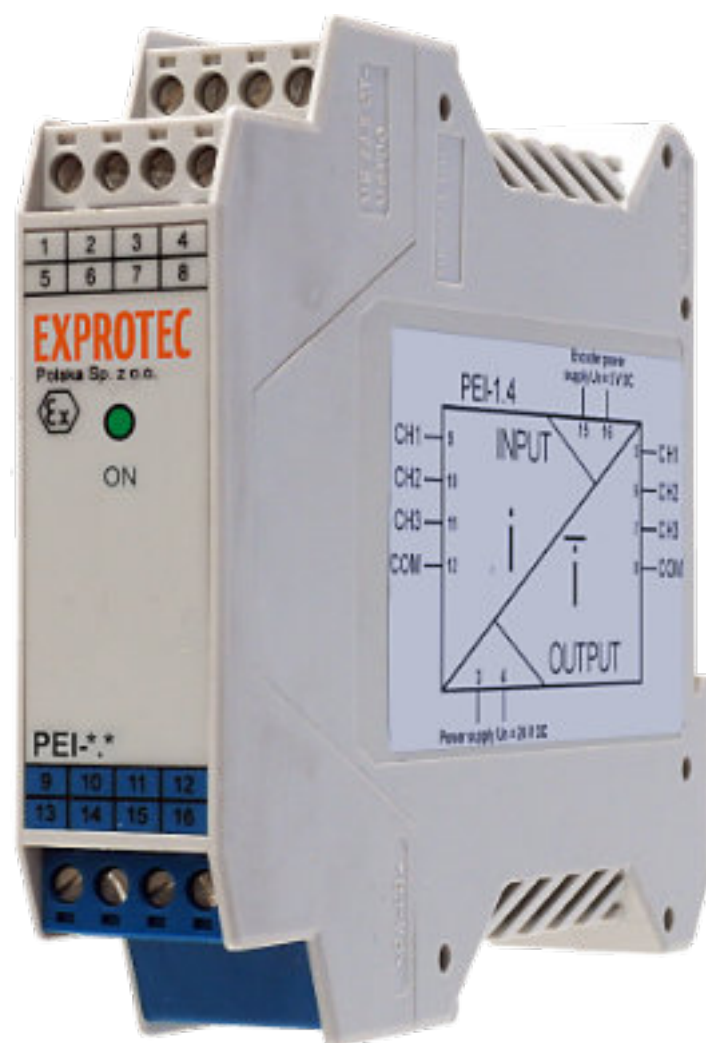
Description

The Intrinsically Safe ISS-2 Signal Separator is designed to measure the resistance of a temperature sensor installed in a hazardous area. The ISS-2 is fitted with two intrinsically safe measurement channels with the protection rating of ia.

On the non-intrinsically safe side, the separator has two analogue outputs, 0-10 V or 4-20 mA respectively. The separator can also be accessed remotely to read measurement and configuration data via Modbus protocol in the RTU mode using the physical interface RS-485 and two digital outputs.

The intrinsically safe signal separator ISS-2 is fitted with the enclosure type ME-MAX 22.5 which provides IP20 protection. The enclosure is designed for installation on the TS35 rail.

The intrinsically safe signal separator type ISS-2 as an accompanying device is intended for installation in a main compartment of mining equipment, underground in mines in hazardous areas at risk of methane and/or coal dust explosion and in hazardous areas at risk of a gas explosion. The device has transmission channels with the protection rating of ia, which can be used in hazardous areas without having to be disabled in the event of an increase in methane concentration above the permissible limits.



Intrinsically Safe Encoder Transducer type PEI-**

Description

The Intrinsically Safe Encoder Transducer type PEI-** is designed to energise intrinsically safe incremental encoders and separate the signal from the encoder. The intrinsically safe encoder transducer type PEI-** is an intrinsically safe device with a protection rating of ia, providing galvanic separation between the intrinsically safe encoder and the non-intrinsically safe power and decoding part.

PEI-** consists of:

- supply system with a high-frequency converter for galvanic separation (4kV) and diode barrier to achieve the protection level of ia,
- three transmission channels with galvanic separation between intrinsically safe and non-intrinsically safe parts.

Characteristics

- energises incremental encoders with intrinsically safe voltage
- separation of signals from the encoder
- can be used as an intrinsically safe power supply and a signal separator

Explosion protection

Marking
I M2 [Ex ia Ma] I
II 2G [Ex ia Ga] IIB T4

Ambient temperature

-20°C to +70°C

Certificate

OBAC 09 ATEX 408U

Rated values

Ingress protection rating
IP20

For detailed information, refer to the instruction manual.

Ordering information

P E I - * . *
A B

A	Supply voltage: 1 – 24 V DC 2 – 42 V AC
B	Version: 1 – OC (open transistor collector), $U_o = 12,6 V$ 2 – TTL (outputs 5 V, max. 1 mA), $U_o = 12,6 V$ 3 – HTL (output up to 30 V max. 5 mA), $U_o = 12,6 V$ 4 – OC (open transistor collector), $U_o = 5,36 V$ 5 – TTL (outputs 5 V, max. 1 mA), $U_o = 5,36 V$ 6 – HTL (output U_p to 30v max. 5mA), $U_o = 5,36 V$ 7 – Push-Pull (output 5, 12, 24V), $U_o = 12,6 V$ 8 – Push-Pull (output 5, 12, 24V), $U_o = 5,36 V$ 9 – Intrinsically safe power supply unit $U_o = 12,6 V$ 10 – Intrinsically safe power supply unit $U_o = 5,36 V$



Explosion protection

Marking
I (M1) [Ex ia Ma] I
II (1)G [Ex ia Ga] IIA T4

Ambient temperature

-40°C to +70°C

Certificate

OBAC 06 ATEX 074U

Rated values

Ingress protection rating
IP20

Supply voltage

None – passive device

Maximum continuous current

50 mA

Ordering information

S S W - * / *
A B

A	Type: 1 – Video signal separator up to 200 MHz 2 – Video signal separator up to 900 MHz 3 – Special version 4 – Signal separator xDSL
B	Version: 1 – Enclosure EMG 2 – Encapsulated with cable connectors 3 – Encapsulated with BNC connectors 4 – Special version 5 – Enclosure ME 22,5 UT

Video Signal Separator type SSW-*/*

Description

The Video Signal Separator is designed for separation between high frequency non-intrinsically safe and intrinsically safe video circuits. The separator type SSW-*/* can be connected to intrinsically safe level circuits of ia or ib protection rating.

The video signal separator type SSW-*/* is available in three different enclosure options:

- Enclosure type EMG 15 with connection terminals for installation on the TS35 rail
- Injection moulded enclosure made of ABS plastic or metal, encapsulated with cable connections
- Injection moulded enclosure made of ABS plastic or metal, encapsulated with BNC connectors.
- Enclosure type ME 22.5 UT with ME 22.5 OT-MSTBO cover and connection terminals for installation on the TS35 rail.



LED Display type WDI*/*/*

Description

The LED Display is intended for installation in connection compartments of equipment, designed to be used underground in mines in hazardous areas at risk of methane and/or coal dust explosion and in hazardous areas at risk of gas and/or dust explosion. Additional measuring attachments for AC voltage measurement are designed to be used with the display. The display enclosure has a protection rating of IP65.

The LED Display is divided into two functionally independent parts that are not galvanically interconnected. The first part of the display consists of a measuring module which has 4 measuring inputs.

As standard, two out of four measurement inputs are designed to interoperate with matching measurement modules, and the result is displayed in a digital form, while the other two inputs operate in the 0÷10 V standard with an extension to AC voltage of 50/60 Hz frequency, and the result is presented as a diode line indication.

The second part of the display consists of 22 signal LEDs. The signalling is carried out by means of an appropriate voltage input within the permissible operating voltage range of the unit.

Explosion protection

Marking
I (M2) Ex ib mb I Mb
II (2G) Ex ib mb IIB T4 Gb

Ambient temperature

-20°C to +70°C

Certificate

12 ATEX 0153X

Rated values

Ingress protection rating
IP65

Supply voltage
24V ± 42V AC/DC

Ordering information

W D I * / * / *

A B C

A	Input type: 01 – Inputs designed for measuring matching elements WD-1000 and WD-230 02 – Inputs designed for voltage measurement up to 7200 V AC using step-down transformers
B	Display: 7 – 7-segment L – LCD 7D – 7-segment display with available signal LEDs LD – display with available signal LEDs
C	Grommets: None – Grommets on the right side of the display L – Grommets on the left side of the display T – Grommets on the back of the display

EXPROTEC

EXPROTEC Sp. z o.o.

ul. Graniczna 26A

43-100 Tychy, Poland

Tel.: +48 32 326 44 00

Mail: biuro@exprotec.pl

www.exprotec.pl

Please contact us