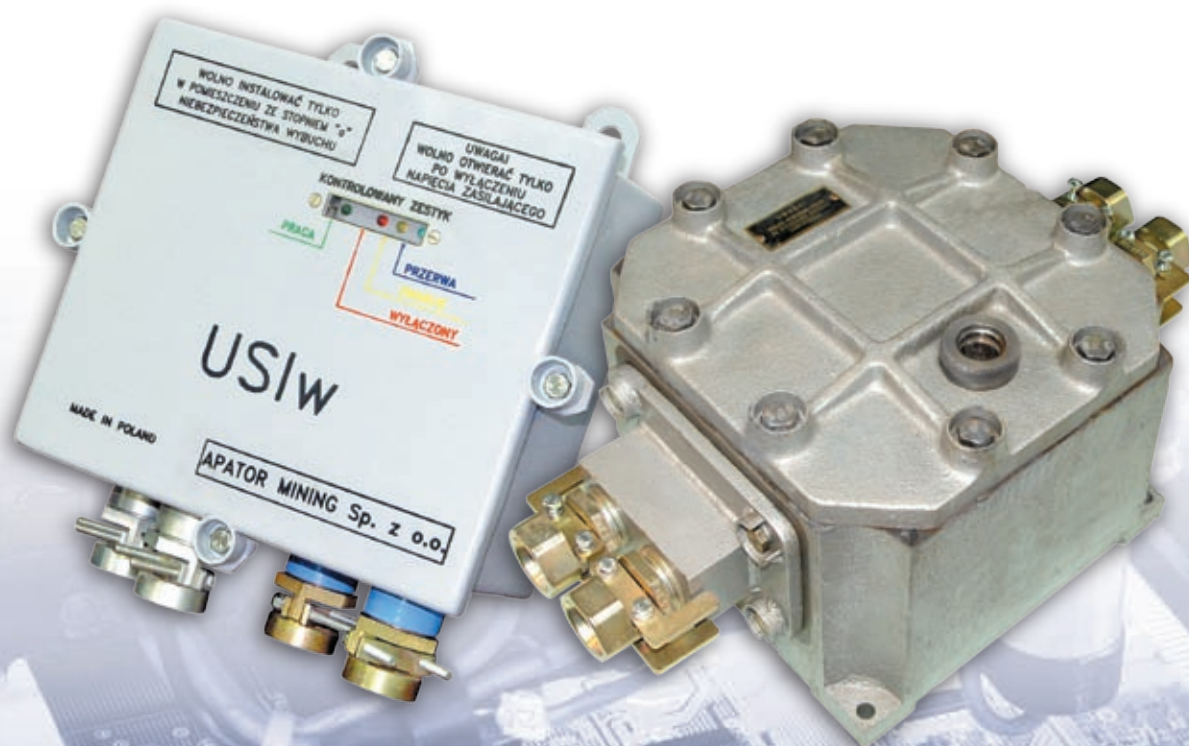




Control Device USIn-*, USIw-*, USIOn-*, USIOw-*



APPLICATION

USIO devices are designed to operate in underground mines attributed to class “a”, “b”, “c” of methane explosion hazard and to class “A” or “B” of coal dust explosion hazard. USI devices are designed to operate in underground mines attributed to class “a” of methane explosion hazard and to class “A” of coal dust explosion hazard. Spark-safe USI*-* control devices are produced with two types of housing:

- IP54 class protection (USIn-* and USIw-*),
- flameproof (USION-* and USIOW-*).

They are designed to remote control circuits with contact – especially when the controlled contact is placed in a room exposed to explosion hazard. The contacts of relays are adapted for operation in spark-safe and non-spark-safe circuits. The device controls position of the contact as well as short circuit or breach of line (when controlling a switching contact) and signalize current state of the circuit via LEDs.

USI*-* control device operates in two modes:

- 1D mode – the system monitors control line with operating contact with a diode,

- 2D mode – the system monitors control line with switching contact with two diodes.

USI*-* devices monitoring switching contact (2D operation mode) allow to distinct between the following modes of operation:

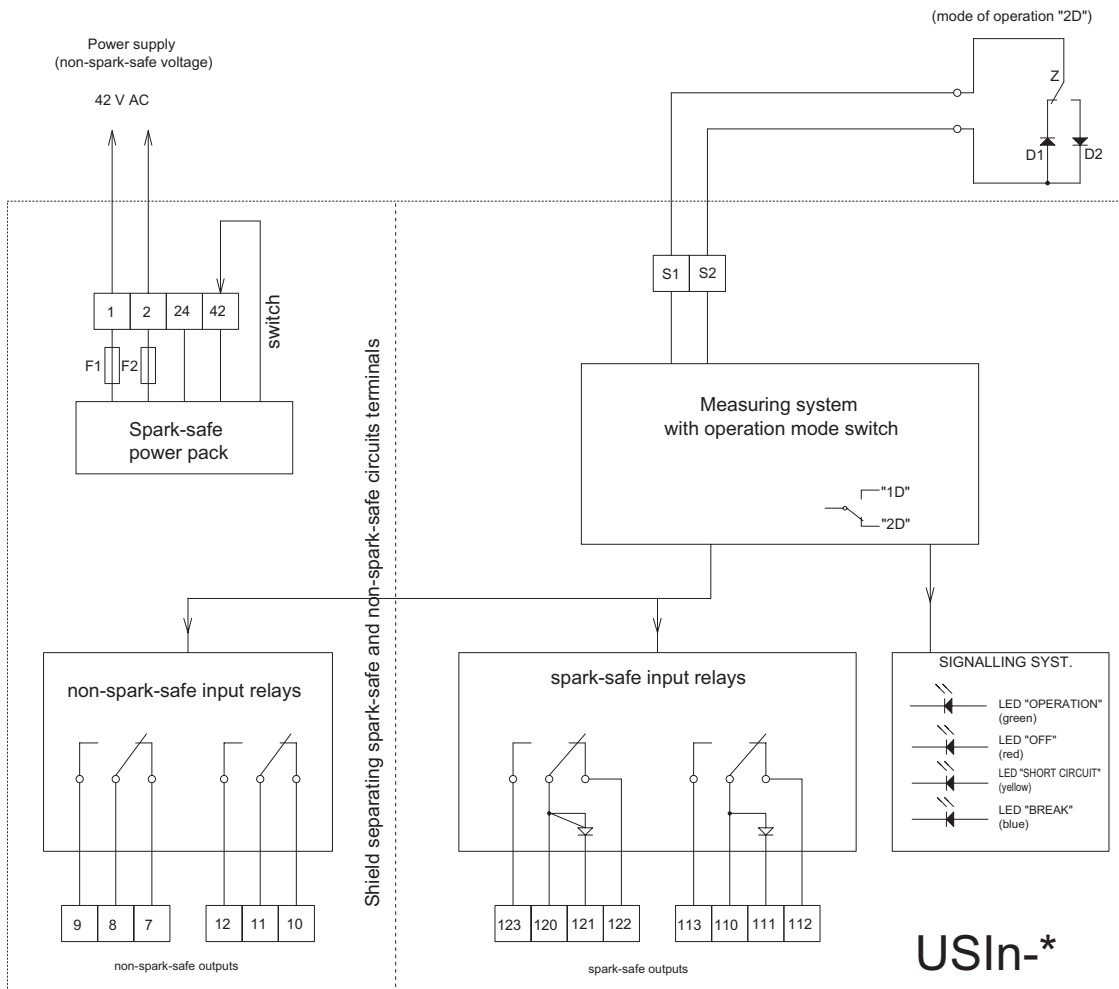
- short circuit of line,
- breach of line,
- contact activated,
- contact deactivated.

USI*-* devices monitoring break contact (1D operation mode) allow to distinct between the following modes of operation:

- short circuit of line,
- breach of line or contact deactivated,
- contact activated.

Unlike the previous one, this mode of operation does not provide information about a break in measuring line. In this case the red LED (“off”) is lit.

BLOCK DIAGRAM (2D mode)



The relays in the diagram are activated (LED “operation” is lit), the controlled switching contact is in “closed” position.

TECHNICAL DATA

Nominal data	USIn-*, USIw-*,	USION-*,USIOw-*
Nominal supply voltage	24 V or 42 V	100 ÷ 110 V 127 ÷ 133 V 220 ÷ 230 V
Admissible range of supply voltage changes	19,2 ÷ 28,8 V 33,6 ÷ 50,4 V	80 ÷ 126,5 V 101,6 ÷ 159,6 V 176 ÷ 276 V
Maximum power consumption	13VA	
Data on non-spark-safe relays for output circuits: Number of contacts Long-lasting load capacity	2 (switching) 5 A 250 V (USIO – 8 A) for AC 0,4 A 250V (USIO – 0,64 A) for DC	
Data on spark-safe output circuits: Number of contacts Maximum voltage amplitude of each of spark-safe circuits	2 (switching) 30 V	
Permissible diameters of introduced conductors	11 ÷ 20 mm (USIO - 14 ÷ 21 mm)	
Maximum cross-section of conductors in terminal strip	4 mm ²	
External dimensions	272x266x111 mm (USIO - 445x278x205 mm)	
Weight	4,6 kg (USIO – 35 kg)	
Protection class of housing	IP54 acc.to PN-EN 60529:2003	

Parameters of circuit with controlled contact in USIn-1, USIw-1, USION-1, USIOw-1	
Maximum permissible serial resistance of input circuit (line)	400 Ω
Minimum permissible shunt resistance of input circuit (line)	2 kΩ

Parameters of circuit with controlled contact in USIn-2, USIw-2, USION-2, USIOw-2	
Maximum permissible serial resistance of input circuit (line)	2 kΩ
Minimum permissible shunt resistance of input circuit (line)	10 kΩ

Spark-safety parameters

Terminals [120-121-122-123] and [110-111-112-113]:	U _i =70V, I _i =5A, L _i ~0, C _i ~0, ΣU _i =70V,
Terminals [S1-S2]:	U _o =18V, I _o =29mA, P _o =0,13W, L _o =300mH, C _o =6μF
Terminals [7-8-9], [10-11-12], [1-2]:	U _m =250V

Conformity with standards

USI*-* devices are manufactured in accordance with the requirements of standards:

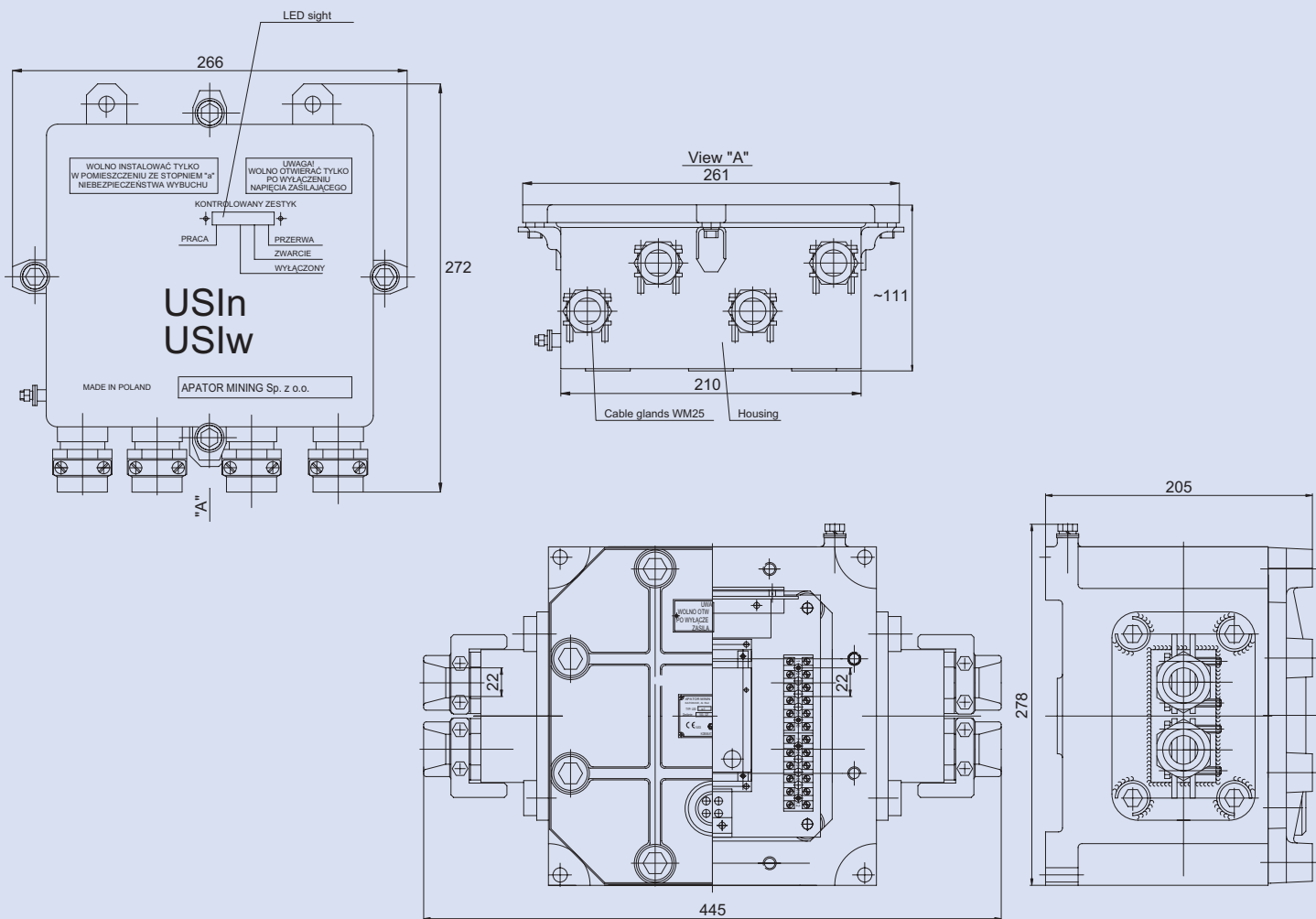
PN-EN 50014:2004,

PN-EN 50020:2005,

PN-EN 50018:2005 (concerns USIO*),

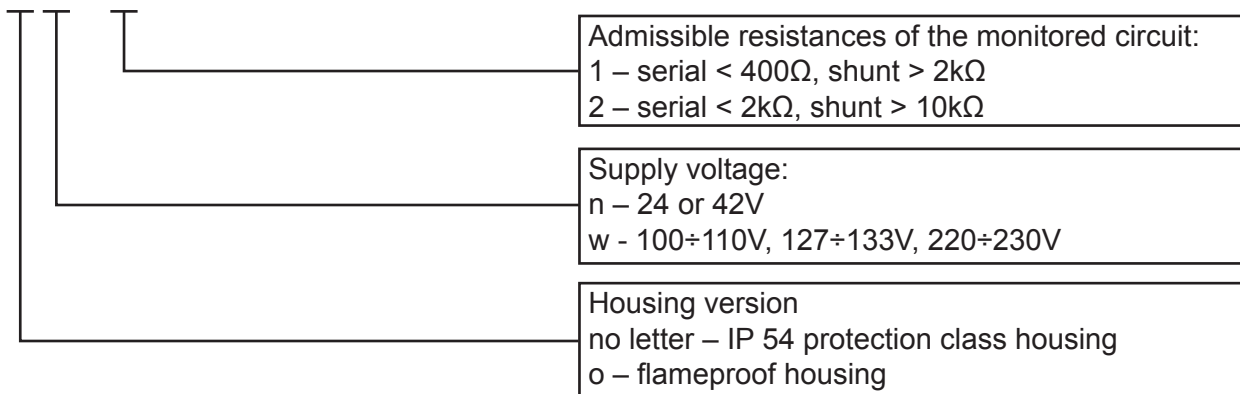
PN-G 50003 (concerns USIn-1, USIw-1, USION-1, USIOw-1).

Dimensions diagram



Type markings:

USION – 1



Marking of devices:	USIn-*, USIw-*	USION-*, USIOW-*
	CE 1453 Ex I (M1) EEx [ia] I	CE 1453 Ex I M2 (M1) EExd [ia] I
Certificate number:	KDB05ATEX177	KDB06ATEX211

Information card no.: 16/2006/02



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