TEVE VARNOST ELEKTRONIKA

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IP/Ex CAMERA
type CAMEX-01-IP/FO

USER MANUALS

1.1 General description

Modern and efficient coal mining facilities utilize improved control methods and increased mechanization to achieve optimum productivity. The use of fiber optics for reliable communications to monitor, analyze and control the equipment and facilities during the mining process will increase safety and production efficiency.

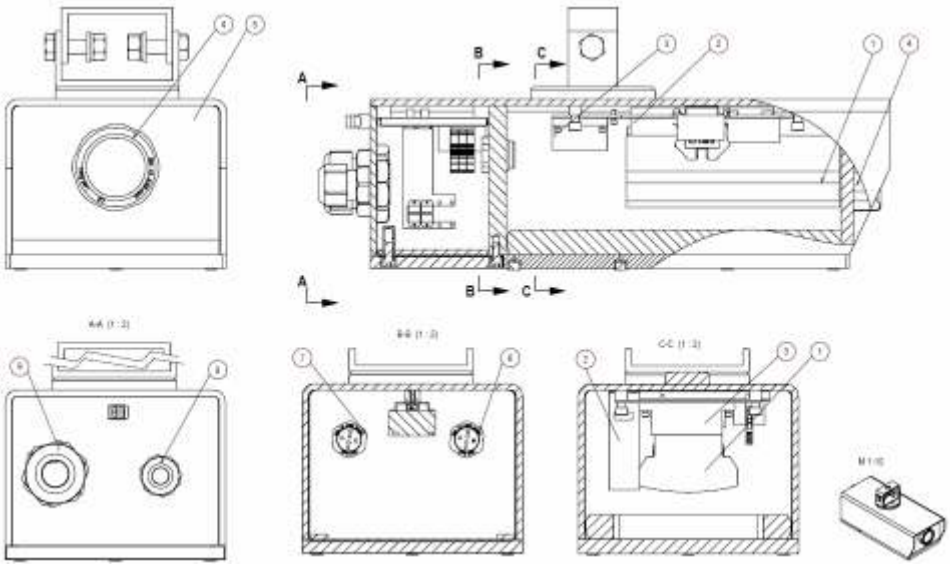
Miners are able to observe the operation and performance of the mining machinery adjusting controls as necessary without exposing themselves to the dangers of the immediate area being mined. It provides engineers and management real time and recorded process monitoring.

IP/Ex explosion proof camera type CAMEX-01-IP/FO is suitable for heavy working conditions such as underground coal mines. Inside enclosure is camera with 2MP resolution. Live image from the camera using optical connections is directly transferred to the control center for data processing. With using the appropriate optical cable the length of signal transmisition can be up to 15 km (using MPIX high resolution transfer).

1.2 Construction of the device

IP/Ex camera consists of:

1. IP camera Axsis Q1755
2. Ethernet / FO outlet
3. Power supply 230AC/12DC
4. Visor glass
5. Housing
6. Cable bushing
7. Optical cable bushing
8. Cable gland M28
9. Cable gland M36



1.3 Operation

The device is powered by 230VAC. Power supply module (AC / DC) serves to supply camera and Ethernet / fiber optic converter which operate on DC voltage of 12V. Captured image is in MPEG4 format via Ethernet connection to ETH / FO converter converts the optical signal SM Singlemode 1300nm wavelength. Through the appropriate optical cable from the device receiving stations and optical switchyard can be up to 15 km away.

1.4 Technical specification

- **Power supply:** 230 VAC (50Hz)
- **Max current consumption:** 100 mA
- **F/O outlet:** RX/TX, duplex E2000-APC connector – singlemode SM (100Mbit/s)
- **Working temperature range:** -20Cº to +40Cº
- **Mechanical protection:** IP54
- **Weight:** 23 kg
- **Overall dimensions:** (l x w x h) 420 x 178 x 135mm (w/o cable glands)
- **Explosion protection:**

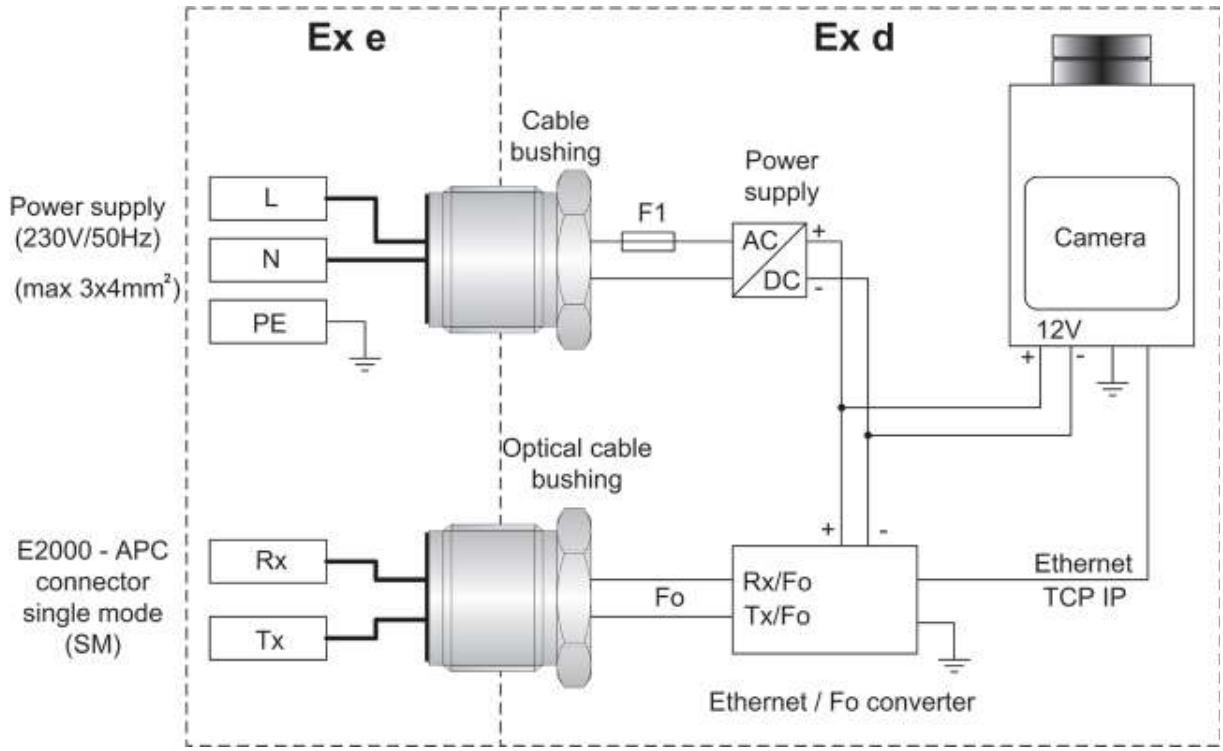
CE 1304 Ex I M2 Exde [op is] I Mb

1.5 Standards

IP/Ex CAMERA type CAMEX-01-IP/FO complies with the following standards

• **SIST EN 60079-0:2009**	Explosive atmospheres -- Part 0: Equipment - General requirements
• **SIST EN 60079-1:2007**	Explosive atmospheres -- Part 1: Equipment protection by flameproof enclosures d
• **SIST EN 60079-7:2007**	Explosive atmospheres -- Part 7: Equipment protection by increased safety e
• **SIST EN 60079-28:2007**	Explosive atmospheres. Protection of equipment and transmission systems using optical radiation

1.6 Wiring diagram and connection scheme



Warning

Work on the electrical system or equipment must be only carried out by a skilled electrician himself or by specially instructed personnel under the control and supervision of such an electrician and in accordance with applicable electrical engineering rules.

Specification of fuse F1: type 215P (5x20mm)T 250mA L 250V. (Littelfuse)

1.7 Optic Rx / Tx data

Optic characteristics – transmitter section (Tx):

Transmitter Section
(Ambient Operating Temperature, V_{CC} = 3.1 V to 3.6 V)

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes
Output Center Wavelength	λce	1261	-	1360		
Output Spectral Width (RMS)	$\Delta\lambda$	-	-	7.7	nm	
Average Optical Output Power	P_0	-15	-	-8	dBm	2

Optic characteristics – receiver section (Rx):

Receiver Section
(Ambient Operating Temperature, V_{CC} = 3.1 V to 5.25 V)

Parameter	Symbol	Minimum	Typical	Maximum	Units	Notes
Receiver Sensitivity	-	-	-	-31	dBm	6
Maximum Input Power	-	-7	-	-	dBm	6
Power Supply Current	I_{CC}	-	55	100	mA	7
Signal Detect - Deasserted	-	-45	-	-31	dBm	
Signal Detect - Hysteresis	-	0.5	-	4	dB	
Signal Detect Assert Time (off to on)	AS_Max	-	-	100	µs	
Signal Detect Deassert Time (on to off)	ANS_Max	-	-	350	µs	