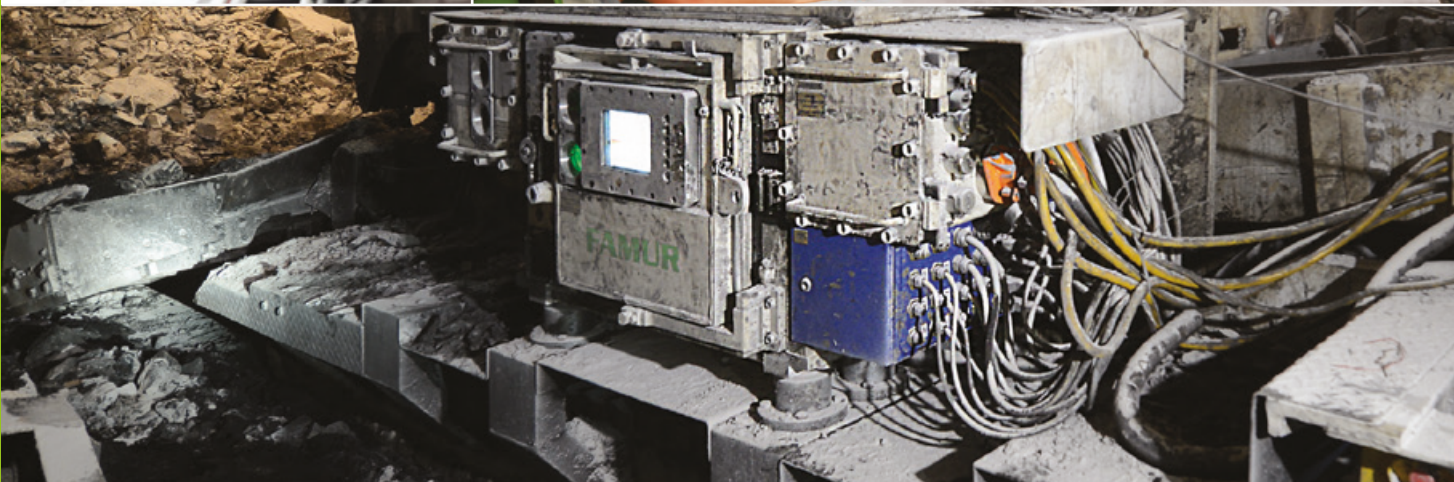


FAMUR

IT systems, electronics, power supply



IT SYSTEMS, ELECTRONICS, POWER SUPPLY

FAMUR Group has been designing and manufacturing electrical equipment of machines as well as their remote monitoring systems for many years. Through the long-time implementations of the machinery offers, the experience acquired in this field enabled their refinement and adequate adaptation for operating adjustment in particularly difficult conditions (high ambient temperature, intensive dustiness and high humidity). A vast range of products and many years of experience in designing allow us to offer comprehensive machine control or monitoring

systems, from design and development to the implementation at the customer's premises. Our offer includes power supply and control systems, control&supervision software and a wide range of services. We provide comprehensive IT solutions customized to the individual customer needs. We provide professional consultation and specialist support at each stage of cooperation, we support the process of implementation and provide warranty and post warranty service.



WE OFFER:

- software for monitoring, control and reporting of technological processes according to customer requirements - industry and mining sectors
- CCTV systems in explosion-proof construction – monitoring of excavations and machines
- E-mine solutions: data aggregation and transmission, diagnostic systems
- explosion-proof electronics
- explosion-proof electrical equipment boxes – mining machinery: shearer loaders, roadheaders
- control systems: shearer loaders, roadheaders, suspended monorail systems, scraper conveyors (follow-up chain tensioning system)
- frequency converters designed taking into consideration operating in potentially explosive atmospheres

Advantages given by implementation of our solutions:

- coherent supervisory system covering the entire technological process
- complete knowledge of available machinery and equipment
- enhanced safety
- optimising the equipment application
- increased production efficiency
- cost reduction



FAMAC OPTI 5000 control system

E-MINE

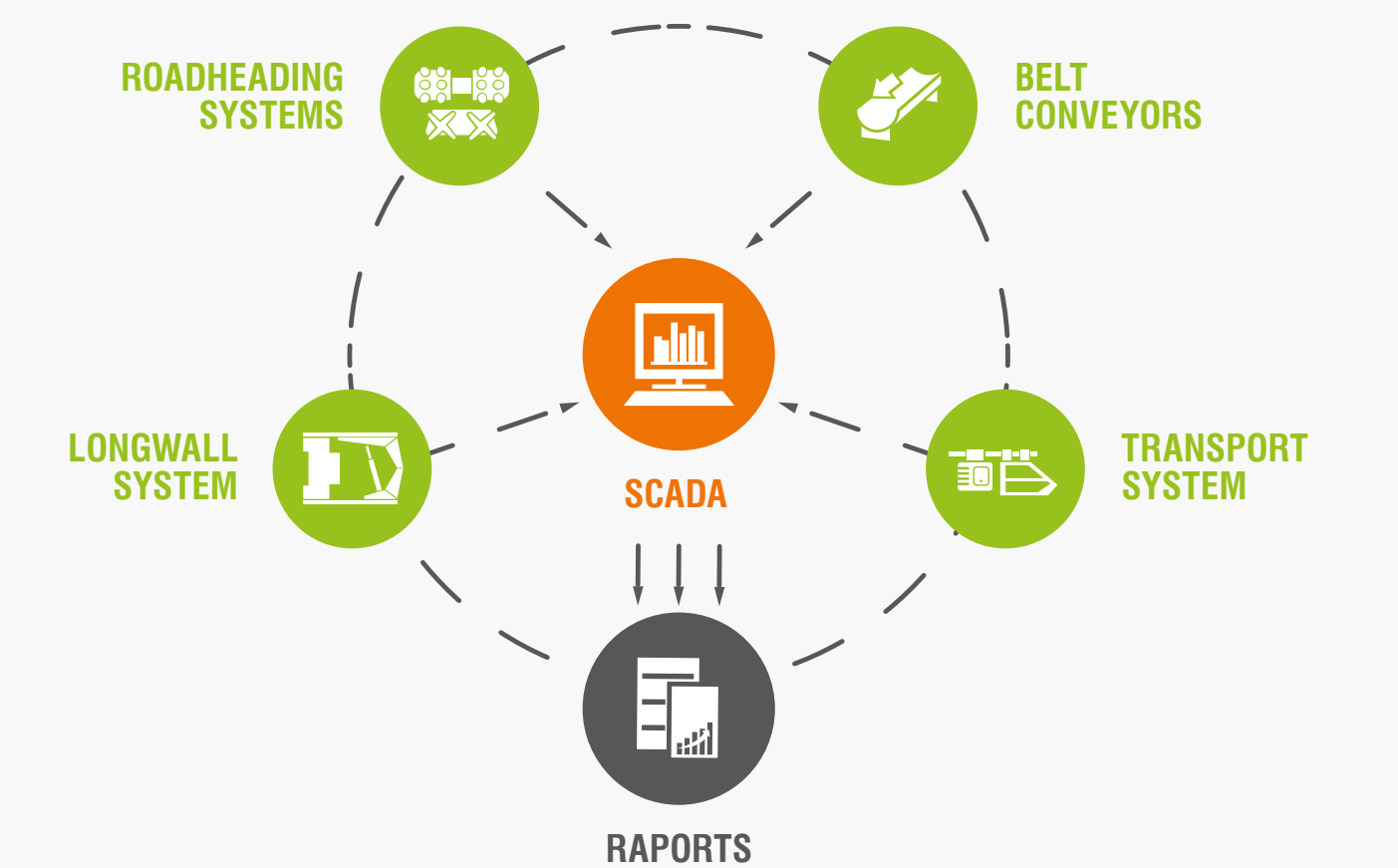
E-mine system is a modern approach to the mining industry. The main surveillance tool is the SCADA software consolidating many machines and autonomous systems into one coherent, high-efficient and reliable mining system. Effective management of the entire technological chain operation

requires the integration of data from multiple sources: machinery control systems, electrical equipment, troubleshooting (diagnostic) systems, communication and safety systems. It is possible to make right decisions only on the basis of complete data, processed and transmitted to relevant users.

E-mine is a set of IT and equipment solutions providing the following for the machines being monitored:

The e-mine components are complementary while being independent products:

- data aggregation
 - data transmission
 - visualisation
 - archiving
 - data analysis and generation of detailed reports integration
 - with the systems of other providers (manufacturers)
- SCADA software
 - teletransmission infrastructure
 - diagnostic systems: FAMAC RSPC II wireless pressure measurement system, FAMAC VIB IS intrinsically safe vibrodiagnostic system
 - CCTV systems
 - e-service



MPC III FLAME-PROOF COMPUTER

The **MPC III** underground computer is intended for aggregation, visualization and analysis of data from machinery and equipment operating in the coal mine undergrounds. Due to the multiplicity of separated communication interfaces, the MPC III constitutes also the data concentrator being the Ethernet network node.

TECHNICAL CHARACTERISTIC

- diagonal screen size 22"
- optionally the QWERTY keypad with trackball
- transmission via SHDSL telephone line
- integrated Ethernet switch with transmission via twisted pair cable or via siglemode or multimode fiber optic cable

TECHNICAL PARAMETER

Type	MPC III
Supply voltage	230 V AC, 110 V AC
Diagonal screen size	22" (widescreen 16:9)
Operating system	Windows 8
Communication	max. 2x SHDSL Ex max. 2 x Ethernet Ex, 10/100Base-Tx max. 2 x Ethernet Ex, 10/100Base-Fx max. 4 x RS485 Ex/ 2 x RS422 Ex max. 1 x MPLM (transmission from the shearer)
Computer operation	6 function keys QWERTY keypad + trackball (optionally) Touch screen (optionally)
Permissible ambient temperature	0-40 °C
IP degree	IP54
Weight	85,0 kg
Designation	CE 1453 Ex I M2 Ex d ia [ia] [op is] I Mb

EMDC DATA CONCENTRATOR

The **emDC** data concentrator is a device intended for data transmission from the mine underground to the surface. It is an underground telecommunication node enabling connection of multiple IT systems with such interfaces as: intrinsically safe serial transmission RS422 or RS485, intrinsically safe Ethernet. Data transmission is conducted via SHDSL modems. Additionally, it is possible to connect the emDC data concentrator to the underground fiberoptic network through the application of an intrinsically safe mediaconverter.

TECHNICAL CHARACTERISTIC

- conversion of serial transmission to the TCP/IP standard
- transmission via SHDSL telephone line (range to 8 km without repeater, speed up to 15 Mbps)
- integrated power supply of 12 V for intrinsically safe external devices

TECHNICAL PARAMETER

Type	emDC-*
Supply voltage	230 V AC, 110 V AC
Communication	max. 4 x SHDSL Ex max. 2 x Ethernet Ex, 10/100Base-Tx max. 4 x RS485 Ex/ 4 x RS422 Ex max. 1 x MPLM (transmission from the shearer)
Power supply of external devices	12 V Ex, 2 A
Permissible ambient temperature	0-40 °C
IP degree	IP54
Weight	CE Ex 50,0 kg
Designation	1453 I M2 Ex d [ia Ma] [ib Mb] I Mb

* option/variant

ISFE-5 ETHERNET SWITCH

The **ISFE-5** intrinsically safe switch enables communication in 10/100BaseTx/ 10/100BaseFx standard. The device enables communication both via fiber-optic cables (sigle or multimode) and via coppertwistedpair. The deviceisequippedwithfiveEther-net ports. The communication status at each port are presented by the LED diodes.

The intrinsically safe switch module provides „ia” explosion protection level.

TECHNICAL CHARACTERISTIC

- possible combinations of devices with different network interfaces
- two-way conversion between the copper interface and the fibre optic interface
- operation status signalling (LED diodes)
- optional transmission over single optical fiber (using BiDi SM transceivers)



TECHNICAL PARAMETER

Type	ISFE-5 Version 1	ISFE-5 Version 2
Supply voltage	12 V DC	
Interface types	4 x 10/100Base-FX 1 x 10/100Base-TX	1 x 10/100Base-FX 4 x 10/100Base-TX
Fiber optic interface types	SM - connector SC SM BiDi - connector SC MM - connector ST	
Permissible ambient temperature	0-60 °C	
IP degree	IP20	
Weight	0,6 kg	
Designation	CE 1453 Ex I M1 Ex ia op is I Ma	

RSEX-2 SERIAL TRANSMISSION SEPARATOR

The **RSEX-2** intrinsically safe separator is intended for gal-vanic separation of communication lines between non- intrin-sically safe devices and those intrinsically safe ones.

The separator module provides explosion protection at „ia” level. The device requires installation in a flameproof enclo-sure.

TECHNICAL CHARACTERISTIC

- galvanic separation of communication lines
- conversion of communication line medium (copper/fiber optic)
- operation status signalling (LED diodes)



TECHNICAL PARAMETER

Type	RSEX-2
Supply voltage	12 V DC ia + 12-24 V AC/DC
Communication (intrinsically safe side)	1 x RS485
Communication (non -intrinsically safe side)	1 x USB 2 x fiber optic (SMA)
Permissible ambient temperature	5-60 °C
IP degree	IP20
Weight	0,6 kg
Designation	CE 1453 Ex I (M1) [Ex ia op is Ma] I

FAMAC RSPC II

FAMAC RSPC II pressure monitoring system for hydraulic legs of powered roof supports. Pressure is measured by the IPS-2 wireless sensors mounted in the distribution block by means of a standard hydraulic connector STECKO 10. The pressure measurement indications are visible directly in the face on the IPI-2 sensors fitted to the support canopy by means of magnets as well as its precise numeric values are displayed on the IPRC-2 remote control. The pressure values are transmitted via radio from the last powered roof support

TECHNICAL CHARACTERISTIC

- no wiring between the sensors which results in increased failure-free operation of the system
- pressure measurement at a frequency of up to 1 second
- runtime of the system components without replacing the batteries - over 12 months
- resistance to failures of separate components replaced elements synchronize automatically with operating system
- quick assembling and installation of the system components
- system data archiving event in case of the MPC power shutdown lasting for several days

shield to the first one where this data is received by the IPI-Tm receiver. Then it is transmitted to the MPC underground computer located at the gateway. In the event of the power loss on the MPC computer, the IPI-Tm module acts as a data archiver, enabling recording historical data of pressure values even if the MPC shutdown lasts for several days. The MPC computer data can be transmitted to the surface system for data analysis to be performed on PCs, in a comfortable environment.



TECHNICAL PARAMETER

Type	IPS-2	IPI-2 (optional)
Supply method	battery	
Communication	radio of 2,4 GHz	
Measurement range	0-100 MPa	
Measurement accuracy	0,1 MPa	
Measurement signalling	LED diodes (optional)	LED diodes
Pernmissible ambient temperature	15-40 °C	
IP degree	IP67	
Weight	0,7 kg	0,35 kg
Dimensions	Ø53 x 145 mm	100 x 100 x 65 mm
Designation	CE 1453 Ex I M1 Ex ia I Ma	

FAMAC VIB IS

The **FAMAC VIB IS** intrinsically safe vibrodiagnostic system based on the FDAM (fast data acquisition module) and the computer designed for the signal analysis purposes enable the processing and recording of vibrations in real time, as well as providing estimates of vibration signals.

TECHNICAL CHARACTERISTIC

- fully intrinsically safe system
- synchronous acquisition of measurements across all channels simultaneously
- network node function through six Ethernetports
- system operation in the Ethernet-based measurement system or in „stand-alone” mode remote configuration



TECHNICAL PARAMETER

Type	FAMAC VIB IS
Supply method	12 V DC
Vibration measurement channels	6 x IEPE (ICP ®)
Rotation tag channels	2 x NAMUR or 2 x Enkoder TTL
Measuring resolution	24-bit
Synchronous measurement	25 kHz
Temperature measurinh channels	12 x 1-Wire
Network communication	Ethernet (4 x 100Base-TX + 2 x 100Base-FX)
Serial communication	RS485 (MODBUS RTU)
Local data storage memory	standard of 64 GB (possible extension)
Permissible ambient temperature	0-50 °C
IP degree	IP55
Weight	1,8 kg (FDAM) + 2,2 kg (computer)
Designation	CE 1453 Ex I M1 Ex ia I Ma

RSEX-4

Intrinsically Safe separator RS485 / RS422, type **RSEX-4** is designed for galvanic isolation of RS485 / RS422 bus (for separation of intrinsically safe and non-intrinsically safe bus). This device must be installed outside an explosive zone or inside an explosion-proof enclosure.

CHARACTERISTICS OF THE DEVICE

- galvanic separation of RS485/RS422 bus
- intrinsically safe interfaces 2x RS485 or 1x RS422
- intrinsically safe RS485 / RS422 type device requires power supply only from non-intrinsically safe side
- configuration of the device with the elements located on the front panel (no need to open the case in order to change the operating parameters)
- selection of mode of operation RS485/RS422
- bus terminator selection (None, 120 Ω or 1.2k Ω)
- Selection of transmission speed (RS485 mode)
- signalling with LED diodes
- mounting on rail TS35/EN35



TECHNICAL PARAMETERS

Type	RSEX-4
Supply voltage	12..60 V DC 9..42 V AC
Power consumption	<1W
Interface	2x RS485 or 1x RS422
Working temperature	-20..+70°C
Protection index cover	IP20
Weight	140 ± 10 g
Dimensions (length x width x depth)	99 x 23 x 114 mm
Explosion proof mark	CE 1453 Ex I (M1) [Ex ia Ma] I II (1)G [Ex ia Ga] IIC II (1)D [Ex ia Da] IIIC

CAM-1 VIDEO CAMERA

The **CAM-1** is a flameproof video camera provided with the Ethernet interface.
The video camera is intended for operation in the following areas:

- „a”, „b” and „c” of methane explosion hazard,
- A and B of coal dust explosion hazard

TECHNICAL CHARACTERISTIC

- IR illuminator (sensitivity 0 lx)
- comprehensive network protocol support
- possible application of various focal lenses
- possible cascade connection
- transmission via fiber optic cables



TECHNICAL PARAMETER

Type	CAM-1
Supply voltage	127 - 230 V AC (-15% +10%)
Communication	Ethernet 100BaseFX
Field of view illumination	IR diodes
View angle	11 – 120° (fixed focal length)
Image resolution	640x480, 320x240
Power consumption	50 W
Permissible ambient temperature	0-40 °C
IP degree	IP54
Weight	20,0 kg
Designation	CE 1453 Ex I M2 Ex d e [op is] I Mb

FPPS-1 INTRINSICALLY SAFE POWER SUPPLY

The **FPPS-1**/* intrinsically safe power supply is a device intended to supply other electrical devices with intrinsically safe voltage of „ia” protection level.

TECHNICAL CHARACTERISTIC

- two independent outputs
- nominal output voltage of 12 V
- current capacity of 1,5 A / 2,0 A
- possible pass-through supply connection of many power supplies

TECHNICAL PARAMETER

Type	FPPS-1/00	FPPS-1/11
Supply voltage	230 V±10% , 50 Hz	
Nominal current	0,4 A	
Maximum current capacity of terminals for pass-through connection of multiple power supplies	32 A	
Nominal output voltage	12V DC Ex	
Nominal output current	1,5 A	2 A
Intrinsically safe parameters of output 1	Uo=13,7 V; Io=1,5 A; Co=8 uF; Lo=90 uH	Uo=13,7 V; Io=2 A Co=8uF; Lo=30 uH
Intrinsically safe parameters of output 2	Uo=13,7 V; Io=1,5 A; Co=8 uF; Lo=90 uH	Uo=13,7 V; Io=2 A; Co=8 uF; Lo=30 uH
Control circuit parameters	Um=90 V	
Permissible ambient temperature	5-35 °C	
IP degree	IP54	
Weight	25,0 kg	
Designation	CE 1453 Ex I M2 Ex d [ia] I Mb	

* option/variant

F3-09Ex INTRINSICALLY SAFE POWER SUPPLY

The **F3-09Ex** intrinsically safe power supplies are provided with two independent, separated output circuits of 12V DC nominal voltage. There are three versions of the circuits available that differ in current capacity (1,5A; 2,0A; 3,0A). Operating status of each channel is indicated by LED diode and the control contact.

The F3-09Ex provides „ia” explosion protection level.

TECHNICAL CHARACTERISTIC

- two independent outputs
- nominal output voltage of 12 V
- current capacity of 1,5A / 2,0A / 3,0A
- operating status signalling by LED diodes
- operating status signalling by NO contact

TECHNICAL PARAMETER

Type	F3-09Ex - 1,5 A	F3-09Ex - 2,0 A	F3-09Ex - 3,0 A
Supply voltage	Un = 42 V AC 50 Hz / Um = 24 V DC		
Parameters of ex power supply outputs	Uo=13,7 V; Io=1,5 A; Co=8 uF; Lo=90 uH	Uo=13,7 V; Io=2 A; Co=8 uF; Lo=30 uH	Uo=13,7 V; Io=3 A; Co=6 uF; Lo=20 uH; Ui=30 VDC; Ii=0,6 A
Number of intrinsically safe outputs	2		
Permissible ambient temperature	0-70 °C		
IP degree	IP20		
Weight	1,6 kg		
Designation	CE 1453 Ex I (M1) [Ex ia Ma] I		

F3-01Ex INTRINSICALLY SAFE INPUT/OUTPUT MODULE

The **F3-01Ex** module through the RS485 interface enables access to the programmable input/output circuits. Each socket is provided with possibility of individual selection of the operating mode from among digital inputs/outputs or analog inputs. Compact structure and M12 connectors applied allow for installation of the device outside the machine without the need to protect the device itself against harsh environmental conditions. Programmability of each I/O enables applying one type of F3-01Ex module on different machines, for various needs. A multipurpose F3-01Ex I/O module provides „ia” explosion protection level.



TECHNICAL CHARACTERISTIC

- 13 configurable I/O channels
- intrinsically safe construction enabling installation in a potentially explosive area
- high resistance to mechanical vibrations and harsh environmental conditions

TECHNICAL PARAMETER

Type	F3-01Ex
Supply voltage	12 V DC
Communication	1 x RS485 Master 2 x RS485 Slave
I/O channels	13 x digital output (0-12 V), 13 x digital input (NAMUR, NO contact with diode), 13 x analog input (4-20 mA)
Permissible ambient temperature	0-70 °C
IP degree	IP55
Weight	2,2 kg
Designation	CE1453 Ex I M1 Ex ia I Ma

F3-20Ex INTRINSICALLY SAFE INPUT/OUTPUT MODULE

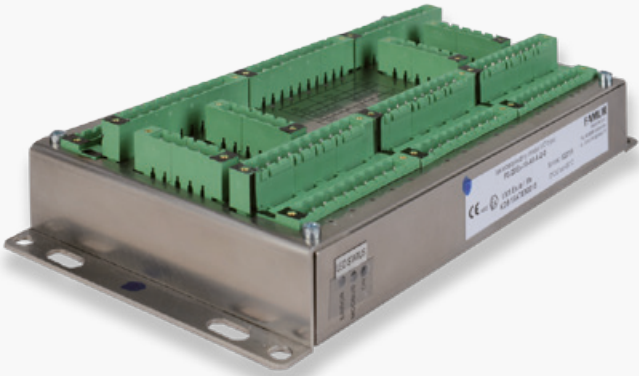
The **F3-20Ex** module through the RS485 interface enables access to the input/output circuits.

The device is available in two options:

- version A – fully intrinsically safe structure, with possible installation in a potentially explosive area
- version B – auxiliary device for installation beyond a potentially explosive area, provided with an additional intrinsically safe RS485 interface

TECHNICAL CHARACTERISTIC

- great number of I/O channels supported: 36 digital inputs, 36 digital outputs
- 3 (version A) or 4 (version B) RS485 ports – communication with the central controller and peripheral devices
- operating status signalling by LED diodes (status of I/O and RS485 ports)
- high resistance to mechanical vibrations and harsh environmental conditions



TECHNICAL PARAMETER

Type	F3-20Ex version A	F3-20Ex version B
Supply voltage	12 V DC	24 V DC
Communication	3 x RS485	4 x RS485
I/O channels	36 x digital input (NO contact with diode) 36 x digital output (0-12V/24, 50mA max)	
Permissible ambient temperature	0-80 °C	
IP degree	IP55	
Weight	2,1 kg	
Designation	CE1453 Ex I M1 Ex ia I Ma	CE1453 Ex I (M2) [Ex ib Mb] I

F3-24Ex ELECTROVALVE CONTROL MODULE

Intrinsically safe I/O module intended to control electrovalves. The electrovalves can be controlled in a two-mode or smooth way (i.e. proportional control). I/O ports can be also applied as general-purpose binary interfaces. Communication with the module is conducted via the RS485 bus. Compact stucture and M12 connectors applied allow for installation of the device outside the machine without necessity of additional protection against harsh environmental conditions.

The **F3-24Ex** module provides „ia” explosion protection level.



TECHNICAL CHARACTERISTIC

- control of proportional valves – 7 high-current outputs, 6 low-current outputs (H bridge)
- possible configuration of different mode of I/O channels: 13 digital inputs, 7 analog inputs
- operating status signalling by LED diodes (status of I/O and RS485 ports)
- Intrinsically safe construction enabling installation in a potentially explosive area
- high resistance to mechanical vibrations and harsh environmental conditions

TECHNICAL PARAMETER

Type	F3-24Ex
Supply voltage	12 V DC
Communication	2 x RS485
I/O channels	7 x two-state or proportional high-current outputs 6 x two-state or proportional low-current outputs (H bridge)
Permissible ambient temperature	0-70 °C
IP degree	IP55
Weight	2,2 kg
Designation	CE 1453 Ex I M1 Ex ia I Ma

F3-09Ex MOTOR PROTECTION MODULE

The **F3-07Ex*** module is intended to protect electric motors and transformers mainly for mining equipment and machinery. It can be applied in compact switches/ power stations/trans-former units, etc.
External intrinsically safe measurement circuits of thev F3-07Ex-* module are intended for operating on areas of „a”, „b” or „c” degree of methane explosion hazard and A or B class of coal dust explosion hazard.



TECHNICAL CHARACTERISTIC

- inputs/outputs: 3xDI, 3xDO
- measurement of 1-3 current phases by current transformers
- short-circuit protection, overload protection, thermal winding and bearing protection, current leakage protection, protection against assymetry and loss of one of phases, against dry running, against excessive startup duration, against too short intervals between successive startups
- shielding continuity control

TECHNICAL PARAMETER

Type	F3-07Ex-*
Supply voltage	24 V DC
Communication	RS485/OPTO (MODBUS RTU)
Range of measurement inputs for I/U transmitters	up to 28 V
Permissible ambient temperature	5-60 °C
IP degree	IP54
Weight	1,2 kg
Designation	CE 1453 Ex I (M1) [Ex ia op is Ma] I

* option/variant

FAMAC MRS RADIO CONTROL

The radio control system is composed of: the **MRS-CU** radio receiver and the battery-powered MRS-RU remote controller, or multiple RC's. This system is commonly applied in the control systems of longwall shearers manufactured by FAMUR.

RADIO RECEIVER CHARACTERISTIC

- machine control/operation from two remote controllers with possible assigning authorizations
- operating status signalling (LED diodes)
- RS485 interface (MODBUS RTU protocol)
- relay output (safety system independent of the control system)



PILOT CHARACTERISTIC

- membrane keypad with pictograms dedicated for a particular machine
- colour LCD display
- possible battery replacement in a possibly explosive atmosphere
- runtime without battery replacement not less than 8 hours

TECHNICAL PARAMETER

Type	Radio Receiver MRS-CU	Remote controller MRS-RU
Supply voltage	24 V DC	7,4 V DC (dedicated battery)
Communication	RS485 MODBUS RTU	
Radio parameters	band 433 Mhz radio signal power 20 mW	
Permissible ambient temperature	0-60 °C	0-40 °C
IP degree	IP54	
Weight	4,1 kg	1,0 kg (RC with battery)
Designation	CE 1453 Ex I M2 Ex d [ib] I Mb	CE 1453 Ex I M1 Ex ia I Ma

F3-28EX MANIPULATOR (JOYSTICK)

The **F3-28Ex** intrinsically safe manipulator is intended for smooth (analog) control operation of the machines. It's successfully applied for all machines where the smooth control of hydraulic systems or inverter drives is crucial (e.g. for roadheaders, suspended monorail systems, bolting machines, excavators, etc.). Through the RS-485 interface the joystick transmits information on shifting angle and directions as well as on status of buttons and touch sensors integrated on the joystick handle.

The joystick module provides „ia” explosion protection level. It is intended for operation in harsh environmental conditions.

TECHNICAL CHARACTERISTIC

- joystick shifting in two axes
- two buttons
- two touch buttons
- RS485 interface



TECHNICAL PARAMETER

Type	F3-28Ex
Supply voltage	12 V DC
Communication (intrinsically safe side)	RS485
Mapping of the joystick lever shifting	analog measurement of shifting angle
Permissible ambient temperature	0-70 °C
IP degree	IP55
Weight	3,0 kg
Designation	CE 1453 Ex I M1 Ex ia I Ma

CAM-I ANALOG CAMERA

The **CAM-I** intrinsically safe analog camera is intended to transmit the real-time image (view) from potentially explosive areas. The analog signal is being transmitted through a wire transmission medium.

The small size makes the camera perfect to be installed in mobile machines and devices. An IR illuminator is available as an optional equipment (as a ring screwed on the tip of the camera body).



TECHNICAL CHARACTERISTIC

- CCD 1/3" image sensor
- horizontal resolution of 420-480 TVL
- 75/110 output impedance
- optional IR illuminator
- small size (diam. 35mm)

TECHNICAL PARAMETER

Type	CAM-I
Supply voltage	12 V DC
Communication	composite video/differential signal
Field of view illumination	IR diodes (optional)
Permissible ambient temperature	0-50 °C
IP degree	IP65
Weight	0,5 kg
Designation	CE 1453 Ex I M1 Ex ia I Ma

ET-09Ex ANALOG MONITOR

The **ET-09Ex** intrinsically safe analog monitor enables connection of two cameras. View from cameras can be switched by pressing the button at the front of the device. Through the RS485 intrinsically safe interface it is possible to transmit messages to be displayed on the screen.

The monitor is compatible with CAM-I cameras. The ET-09Ex monitor structure provides „ib" explosion protection level.



TECHNICAL CHARACTERISTIC

- possible connection of two cameras
- switching view by pressing a button
- 480x234 monitor resolution
- displaying messages transmitted by the RS485 interface
- power socket for additional illuminator

TECHNICAL PARAMETER

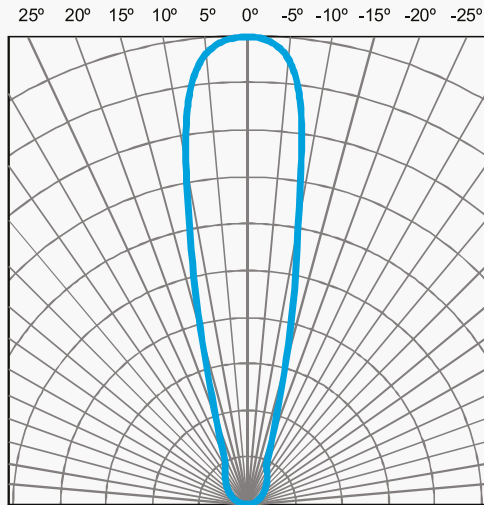
Type	ET-09Ex
Supply voltage	12 V DC
Communication (image)	2 x composite video/symmetrical
Communication (OSD messages)	1 x RS485
Permissible ambient temperature	0-40 °C
IP degree	IP55
Weight	2,1 kg
Designation	CE 1453 Ex ib I M2 Ex ib I Mb

F3-26Ex SPOTLIGHT (HEADLIGHT)

LED spotlight is intended to be applied for roadheaders, suspended monorail systems, floor-mounted rail systems and wherever a need for sectoral illumination of determined area occurs. The spotlight (headlight) is an intrinsically safe device to be applied in potentially explosive atmospheres.

TECHNICAL CHARACTERISTIC

- two lighting functions: typical white LED light and red light
- outer casing enabling rotation in horizontal and vertical plane
- spotlight anti-rotation protection
- two M12 sockets enabling connection of spotlights in series



Directional characteristics of the light emission

TECHNICAL PARAMETER

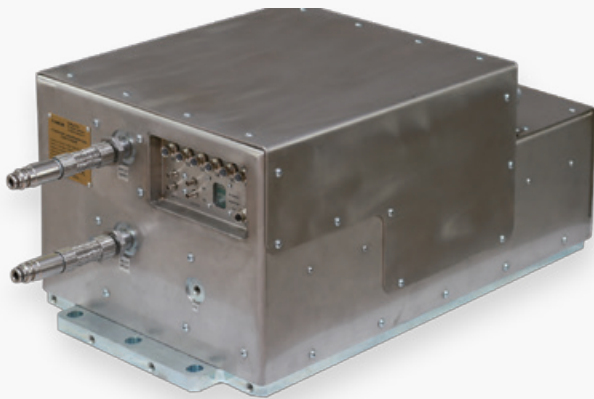
Type	F3-26Ex
Supply voltage	12 V DC
Source of light	LED
Light stream	1300 lm
Angle divergence of light beam	25 °
Power supply connection	M12 (5pin)
Permissible ambient temperature	0-70 °C
IP degree	IP67
Weight	4,6 kg
Designation	CE 1453 Ex ia I Ma

FVSD1X150 kW FREQUENCY CONVERTER

The **FVSD1x150 kW** is a 3-phase, 3-level frequency converter intended to power supply and control 3-phase cage motors. Power&electronic system typology applied inside the frequency converter enables 4-quadrant operation of the drive. The inverter is intended for installation in flameproof enclosure of the equipment exposed to significant mechanical vibrations and dust.

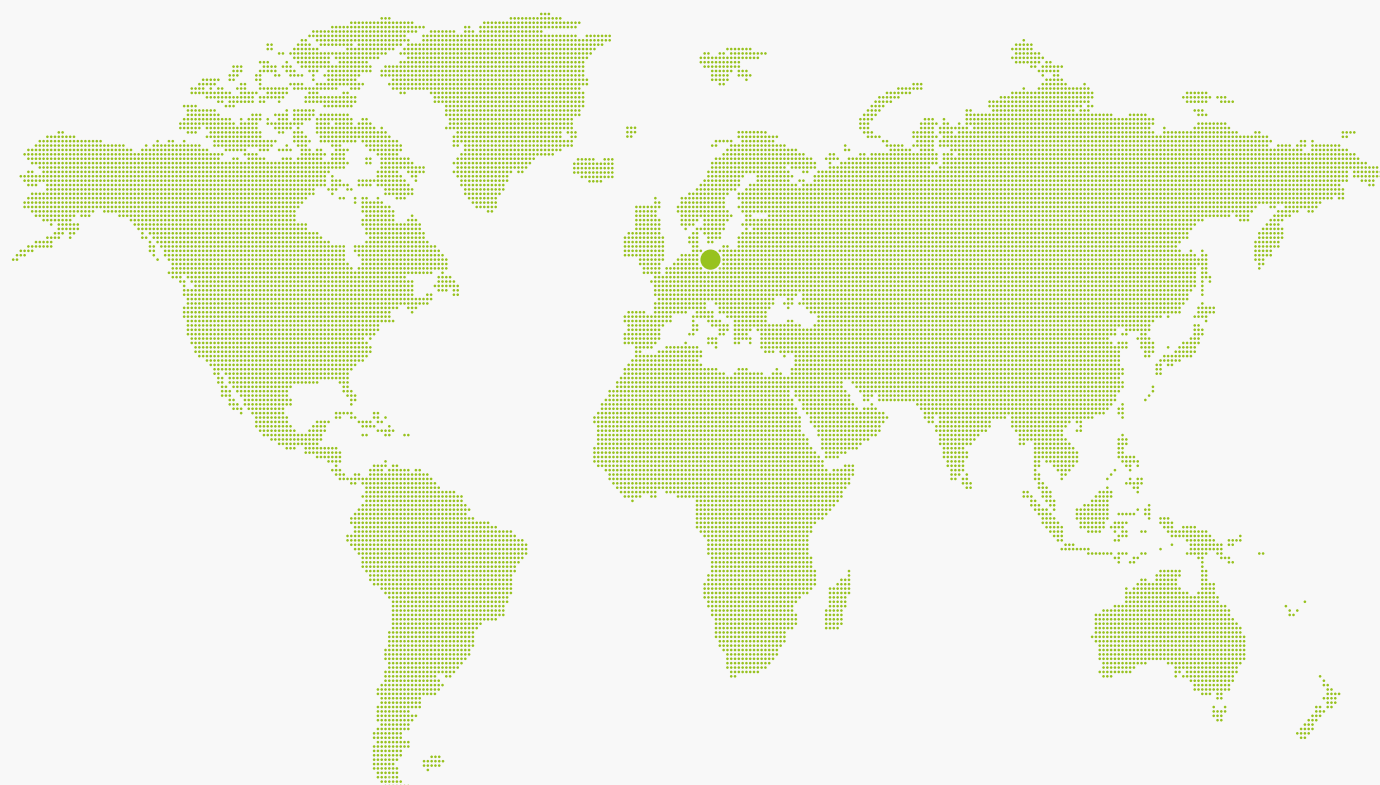
TECHNICAL CHARACTERISTIC

- supply voltage of up to 1200 V AC
- drive power: up to 150 kW
- 4Q operation of the drive
- water cooling
- resistance to mechanical vibrations and harsh environmental conditions



TECHNICAL PARAMETER

Type	FVSD1x150 kW
Supply voltage	1000 V/1140 V+10% -20% (max 1200 V)/ 50...60 Hz
Output voltage	0 ... 1000 V/1140 V/1200 V
Output frequency	0 ... 150 Hz
Output power	150 kW
Operating mode	u/f, SVC, VC
Drive operation	4Q
Keying frequency	2 ... 5 kHz, possible random carrier modulation
Communication	RS485/OPTO (MODBUS RTU)
Transmission speed	9600/19200/38400/57600/115200 bit/s
Setting rotational speed, torque	RS485 link/control panel/OPTO
Encoder input	yes
Integrated protections	short-circuit/overload/ overvoltage/undervoltage/thermic
Cooling method	water (20 l/min)
Permissible ambient temperature	5-70 °C
IP degree	IP20
Weight	80,0 kg
Designation	CE 1453



FAMUR

Armii Krajowej 51
40-698 Katowice, Poland

T +48 32 359 66 29, M +48 665 780 387, F +48 32 359 66 77

iez@famur.com

www.famur.com

