



Motor control and protection Universal Motor Controller UMC100-FBP

Universal motor controllers from ABB – the intelligent on-site solution.



Large industrial plants often contain several thousand motors in order to provide the necessary motion. Any unplanned or sudden motor stops can lead to faults in the process sequence, which can be a very cost-intensive matter. For this reason, reliable management of these motors is decisive for ensuring a controlled production sequence.

ABB'S new UMC100-FBP offers you the optimal solution.

UMC100-FBP is a flexible, modular and expandable motor management system for constant-speed low-voltage range motors.

Its most important tasks include motor protection, prevention of plant standstills and the reduction of down time. This is made possible by early information relating to possible motor problems which enables unplanned plant standstills to be avoided. Even if a motor trips, quick diagnosis of the cause of the fault serves to reduce downtime.

Typical areas of application include:

- The oil and gas industry
- The cement and paper industry
- The steel industry
- Mining
- The chemicals industry
- Water supply and distribution
- Power plant engineering
- The food and beverage industry

The tried and tested UMC22-FBP motor controller has already been used successfully worldwide to realise numerous extensive projects in these areas.

Less time and energy for planning, design and materials

The universal and modular structure of the UMC100-FBP impresses even during the planning and design stage. Time and effort needed for wiring is reduced considerably due to the fact that all of the required protection, monitoring and control functions are integrated into a single device. A single version for all current ranges and fieldbuses simplifies planning, inventory and servicing.

Simple integration in the tightest of spaces

Thanks to its compact design and integrated measurement system, the UMC100-FBP fits even the tightest of spaces. This is a huge advantage, especially for applications involving plug-in low-voltage switchgear with limited space or for retrofitting existing systems to accommodate a modern motor management system.

Optimally matched

The system's modular expandability enables optimal adaptation to the application. Even the basic UMC100-FBP device fulfils the requirements of most applications. All of the control functions required in the field are integrated and are simple to configure via parameters. Application-specific control functions can be realised with the programmable logic system. Expansion modules are available for complex applications with extensive I/O or special signals.

Open communication

The UMC100-FBP is equipped with an interface for connecting a communication adapter - the FieldBusPlug (FBP). Selection of the corresponding FieldBusPlugs enables the motor controller to communicate by means of the widespread standard fieldbuses Profibus DP, DeviceNet, Modbus or CANopen. UMC100-FBP can also be used without communication as a stand-alone with full functionality.

High plant availability

The UMC100-FBP continuously transmits comprehensive operational, service and diagnostic data from the motor to the control system. This means that faults can be detected early on and can be avoided by suitable measures, or their effects can be limited. This increases the plant's availability.

Rapid fault detection and rectification

A comprehensive diagnostic system facilitates fault localisation and rectification in the event of a fault. This means that downtime can be reduced to a minimum.

Electronic motor protection

The UMC100-FBP offers comprehensive, electronic motor protection. It operates fully independently and ensures that the motor is protected at all times, even if the control system or bus fails.

The precise electronic measurement system enables optimal utilisation of the motors. Constant trip behaviour is ensured by the high long-term stability of the tripping characteristics.



Highlights

UMC100-FBP in detail



Motor protection

- The UMC100-FBP offers comprehensive motor protection for three-phase AC motors
- Overload protection with adjustable tripping class 5, 10, 20, 30, 40 in accordance with EN/IEC 60947-4-1
- Adjustable motor protection in the event of blocked rotor
- Phase failure detection
- Asymmetric detection
- Phase sequence detection
- Thermistor motor protection with PTC
- Earth leakage detection for operation in IT networks
- Rated motor current 240 mA to 63 A with a single version, no accessories required
- Rated motor current > 63 A with external current transformer
- Independent motor protection, fully operational even without bus connection



Motor control

- Integration of the most important control functions as ready, easily parametrizable blocks
- Direct, reversing, star-delta starters
- Pole reversal / Dahlander pole-changing
- Actuator
- Inching
- Adjustable restart strategy (load shedding)

Extended motor control

- Freely programmable for special, application-specific control functions
- Simple adaptation to specified control functions
- Comprehensive library
- Blocks for logic, counters, timing
- Access to all I/Os and internal signals

Control stations

- Individual configuration of control points
- Operation via DCS
- Local control
- Control panel





Motor status / communication

Quick and comprehensive access to all data via control station, fieldbus and / or laptop

Operating data

- Motor status
- Motor current
- Maximum starting current
- Run-up time
- Thermal load
- Time to trip
- Remaining cool down time

Service data

- Operation hours, number of starts and overload trips

Diagnostic data

- Comprehensive and detailed error messages and warnings
- Log for previous 16 errors



Open communication

Fieldbus-neutral basic device

- Freely selectable fieldbus system with FieldBusPlug
- Profibus DP, DeviceNet, Modbus, CANopen



Device hardware

Compact basic unit

- Integrated measurement system
- LEDs signalise the status of hardware and communications
- Device operation possible without bus system
- Remote parametric assignment possible via control system
- 6 digital inputs, PTC input and 4 outputs are integrated

Multifunctional expansion modules

Straightforward expansion, flexible installation

- 8 digital inputs AC or DC
- 4 relay outputs
- 1 analogue output

CEM11 earth leakage sensor

Summation current transformer for connecting to a digital input

- 4 models of 20 - 120 mm Ø
- For earth-leakage currents of 80 mA - 13.6 A

Control panel

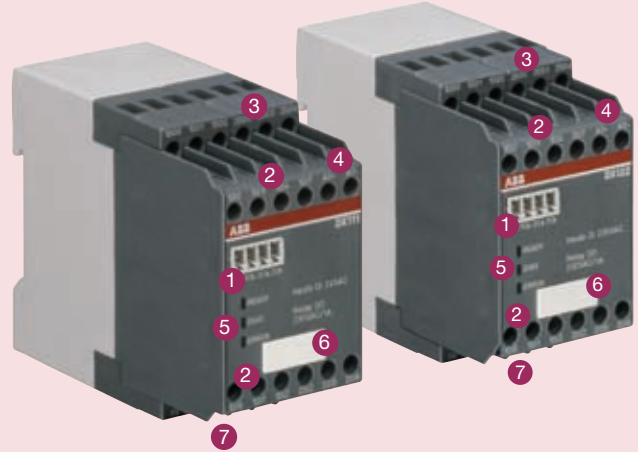
- Graphics-enabled display, backlit
- Multilingual
- Multi-coloured status display with LEDs
- Operation, parametric assignment, display, copy
- Freely configurable error messages

Device design



UMC100

- | | |
|------------------------------------|----------------------------------|
| 1 PTC resistance sensor | 5 Status LEDs |
| 2 Connection for expansion modules | 6 Connection for control station |
| 3 Outputs DO0 - DO2 | 7 Supply voltage |
| 4 Connection for FieldBusPlug | - output DO3 |
| | - inputs DI0 - DI5 |

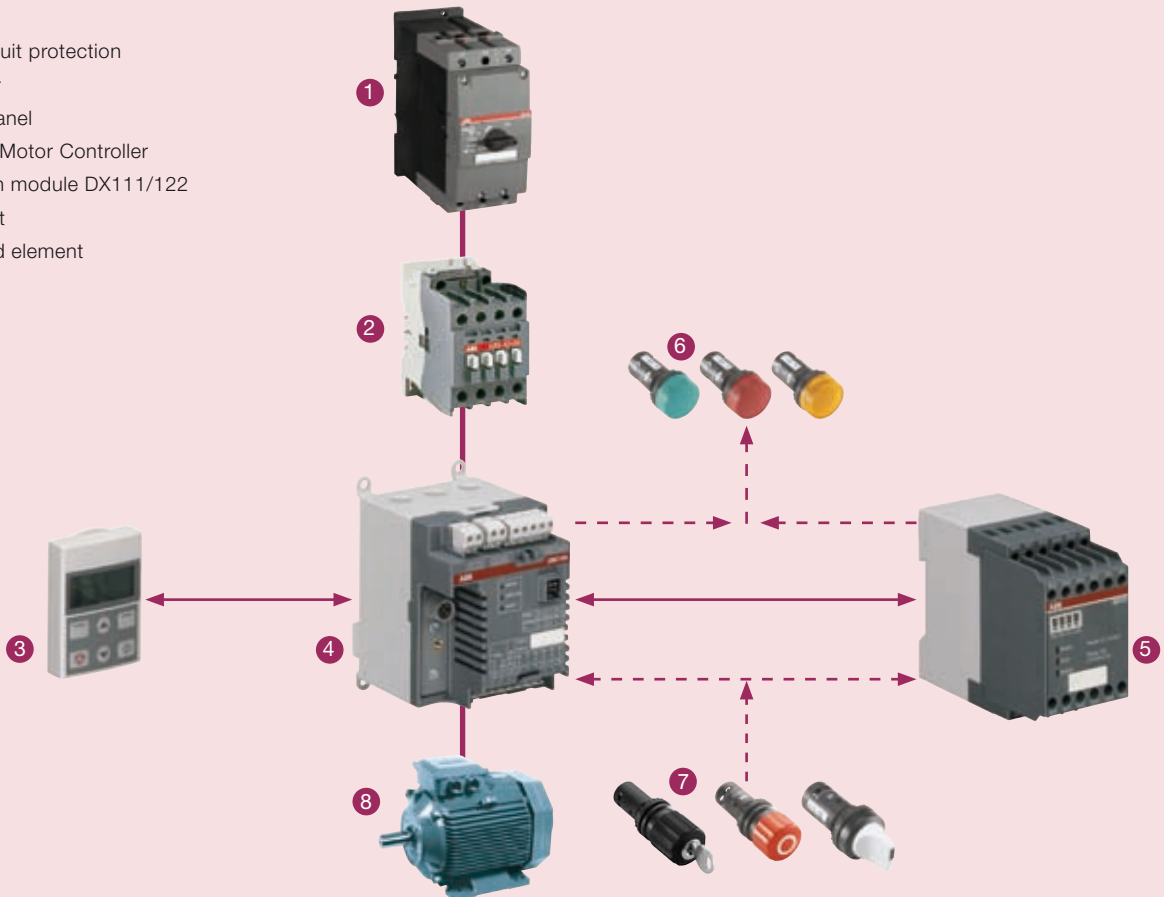


Expansion module DX111/122

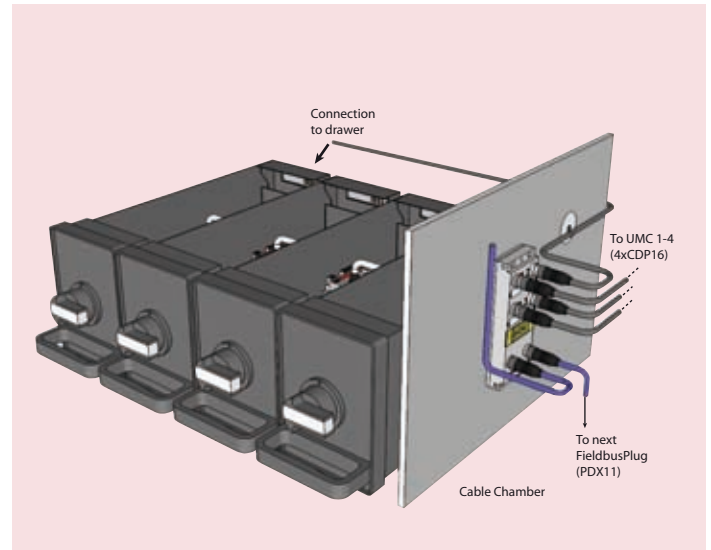
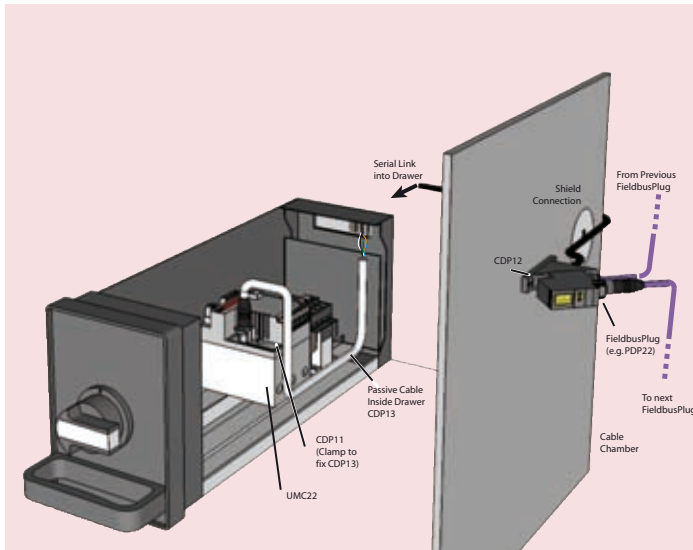
- | | |
|-----------------------------|------------------|
| 1 Communication to UMC100 | 5 Status LEDs |
| 2 Digital inputs DI0 - DI7 | 6 Legend plate |
| 3 Digital outputs DO0 - DO3 | 7 Supply voltage |
| 4 Analogue output AO | |

Application

- 1 Short-circuit protection
- 2 Contactor
- 3 Control panel
- 4 Universal Motor Controller
- 5 Expansion module DX111/122
- 6 Signal unit
- 7 Command element
- 8 Motor



Withdrawable applications



The UMC100-FBP is ideally suited for applications with drawers in Motor Control Centres. In doing so, the UMC100-FBP is positioned within the slot while the fieldbus connection is mounted externally. Communication is undertaken by means of a simple serial link.

This separation results in the following advantages:

- Fieldbus communication is undertaken directly from slave to slave without drop lines
- Maximum fieldbus performance and baud rate is guaranteed – without the need for special adaptation
- If one of the drawers is removed, the fieldbus slave continues to operate
- Accidental exchange of the plug-in modules is detected and signalled to the control system

The PDQ22-FBP version is available for applications with Profibus DP, in addition to the standard PDP22-FBP fieldbus connector. This offers the option of connecting up to four UMC100s to a Profibus DP node. This can be especially economical for devices which are aligned near each other. The connection between the PDQ22-FBP and the connected devices is realised with commercially available connection cables.

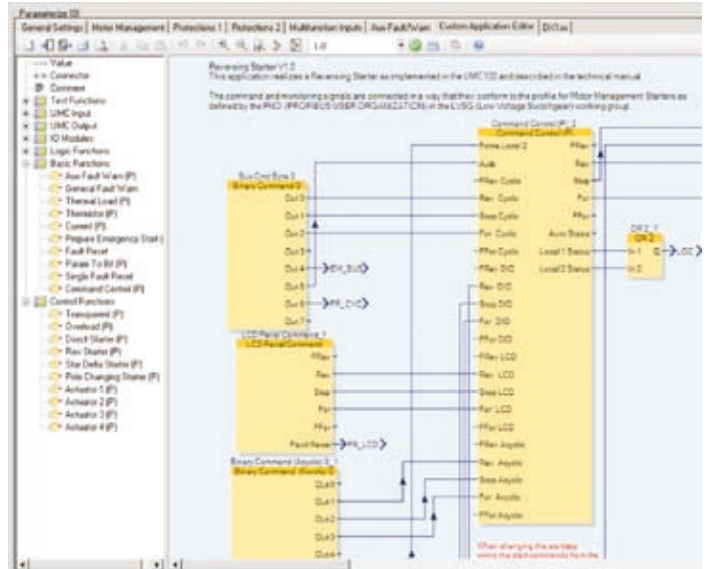
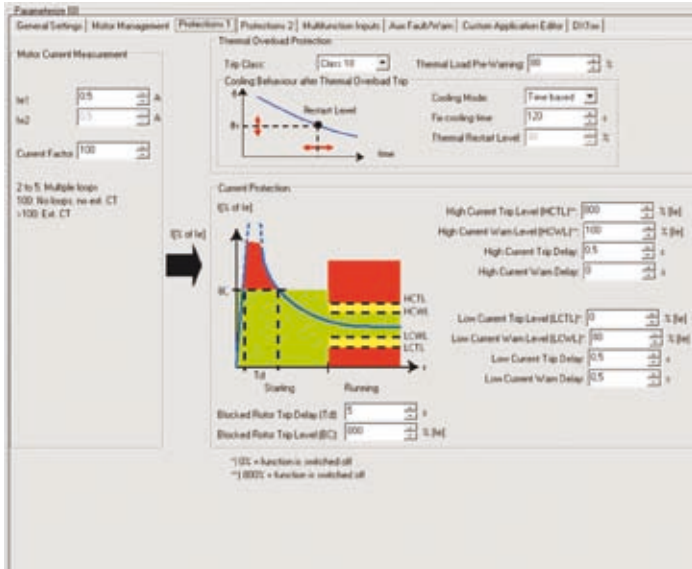
- All devices connected to a node can be configured and maintained independently from each other.
- Status indication for communication and each connected device
- Saving of slave addresses on fieldbus
- Reduction of infrastructure costs due to reduction of the number of slaves, i.e. more motors per fieldbus master, less repeaters

Retrofit

Due to its compact dimensions with an integrated measurement system, the UMC100 is extremely well-suited to updating and modernising existing switchgear.

- Programmable logic for optimal adaptation to the existing control concept
- Inputs for various voltages AC/DC
- Control of possible existing instruments
- Optionally with or without communication via fieldbus

Parameter assignment and programming



Parametric assignment

For most applications it is sufficient to select and parametrically assign one of the UMC100's standard integrated control functions. This is realised independently from the applicable control system and fieldbus system by means of GSD and EDS configuration files or even more conveniently via a DTM device (DTM/FDT technology). All of the parameters can be configured via the control station.

Asset Vision Basic and DTM

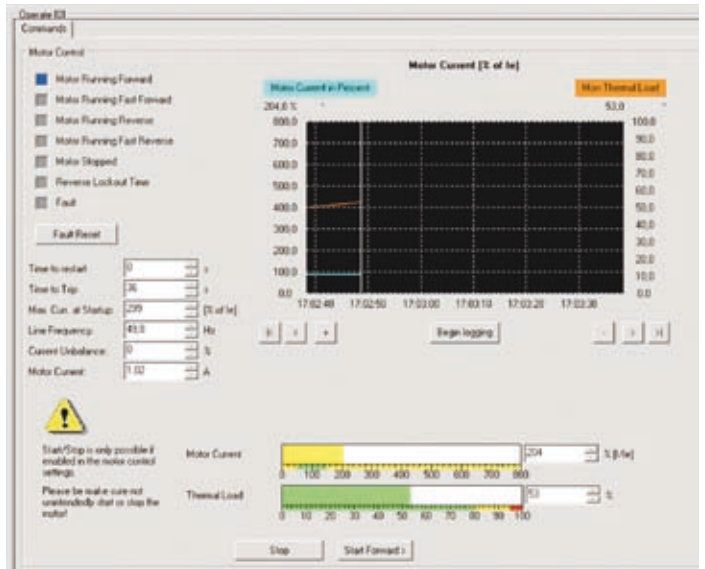
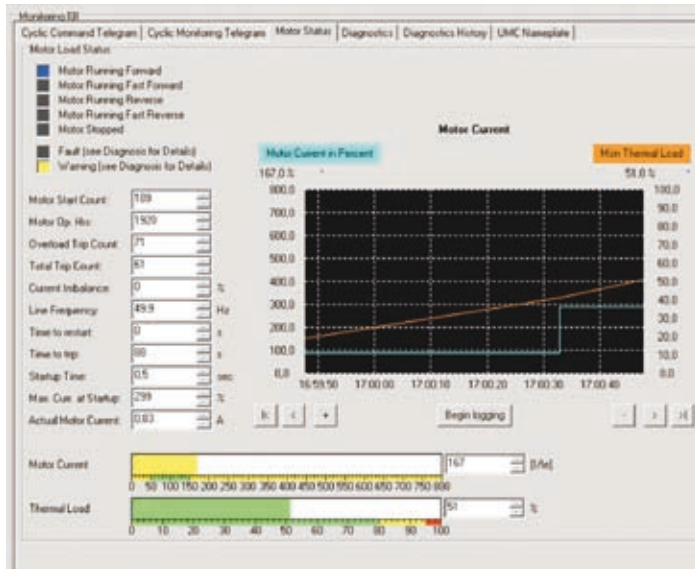
ABB Asset Vision Basic as FDT frame application, together with the DTM (Device Type Manager) are comprehensive tools for straightforward parameter assignment and programming of the UMC100 as well as all devices equipped with DTM. It enables creation of configurations, up/downloading, reading out of diagnostic data, and - if configured - even control of the UMC100 - either centrally via the control system, via the fieldbus or directly on-site at the switching cabinet.

The clear interface facilitates simple configuration of all parameters and error texts required for the control station. In doing so, the graphical display supports you with prompts and by checking the data.

Programming

For special applications, it is possible to create an optimally adapted control function with the help of the editor integrated into the DTM. A comprehensive library of function blocks is available to you for this purpose. It is possible to access all of the existing variables in the UMC100 and the expansion modules. Comments can be inserted arbitrarily. All of the control functions integrated into the UMC100 are available as templates and can be easily adapted to requirements. It is possible to create your own library of special control functions by means of importing / exporting these templates.

Diagnostics and operation



Diagnostics and operation

Comprehensive and clear diagnostics help to avoid faults and make it possible to rectify them quickly in the event of errors.

Quick display of all data:

- Operating data
 - Motor status and current, thermal load
 - Status of all I/O signals
- Diagnostic data
 - Errors, warnings
- Service data
 - Operation hours
 - Number of starts
 - Number of overload trips

The display of cyclic communication frames facilitates diagnosis during commissioning.

Control panel

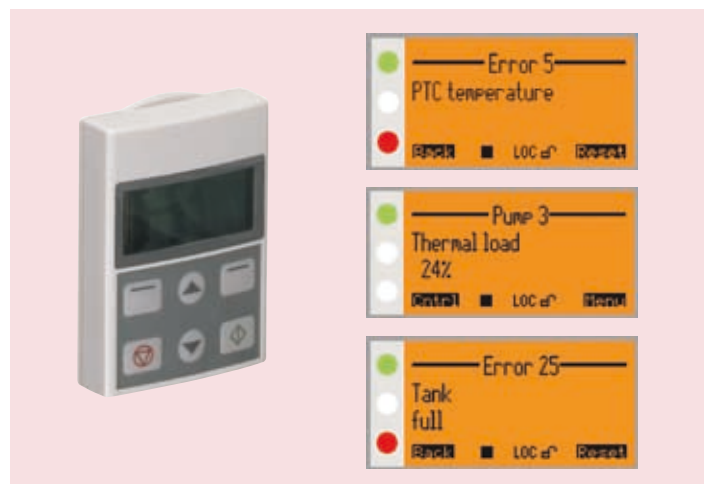
The control panel enables the display of all data on-site. Errors and warnings are displayed as clear text in the configured language. Individual texts can be assigned to external errors. All parameters can be set, changed, and protected by a password if required.

Operation

The DTM can also be used to operate the motor if it is configured to do so.

- Start forwards / backwards
- Stop
- Error reset

In addition, the most important operating values are displayed in the same window.



UMC100 System overview



Basic device UMC100-FBP

Main power	
Voltage	max 1000 V AC
Frequency	45 to 65 Hz
Rated motor current	0.24 to 63 A, without accessories Greater currents with transformer
Transformer diameter	11 mm (max 25 mm ²)
Tripping classes	5, 10, 20, 30, 40 in accordance with EN/IEC 60947-4-1
Short-circuit protection	Separate fuse on network side
Control unit	
Supply voltage	24 V DC
Reverse polarity protection	yes
Inputs	6 digital inputs 24 V DC 1 PTC input
Outputs	3 relay outputs relay 1 digital output transistor
Interfaces	1 for ABB FieldBusPlug 1 for UMC100-PAN control station 1 for expansion module
Parametric assignment	via fieldbus, control station and / or software
Addressing	Control station or addressing set
LEDs	3 LEDs: green, yellow, red
Environment and mechanical data	
Fastening	on DIN busbar (EN50022-35) or with 4 screws x M4
Dimensions (W x H x D)	70 x 105 x 110 mm (incl. FieldBusPlug and control panel)
weight	0.39 kg
Terminal cross-section	max. 2.5 mm ² or 2 x 1.5 mm ²

Expansion modules DX111 / DX122

A DX111/122 expansion module can be connected per UMC100-FBP via a simple two-wire line
Application also possible via simple parametric assignment (without programming), e.g. for error messages and warnings

Supply voltage		24 V DC
Inputs	DX111	8 digital inputs 24 V DC
	DX122	8 digital inputs 110/230 V AC
Outputs	4 relay outputs relay	
	1 analogue output, 0/4 to 20 mA / 0 to 10 V configurable	
Fastening		on DIN busbar (EN50022-35)
Dimensions (W x H x D)		45 x 77 x 100 mm (without terminal block)





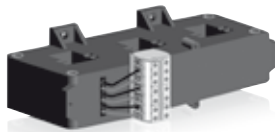
Control panel UMC100-PAN

Installation on the device or on the switching cabinet door

Graphics-enabled and backlit display, 3 LEDs for status indication

Freely configurable error messages

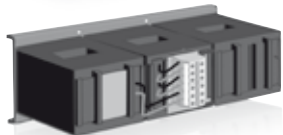
Multilingual: German, English, French, Italian, Portuguese, Spanish



Current transformer KORC

Only required for rated motor currents >63 A

Linear transformer, 3-phase with terminal block, designed for connecting leads Cu 2.5 mm²



CEM11 earth leakage sensor

Summation current transformer for connecting to a digital input

Mounting with bracket on DIN busbar or wall

Models

CEM11-FBP.20	80 – 1,700 mA	20 mm Ø
CEM11-FBP.35	100 – 3,400 mA	35 mm Ø
CEM11-FBP.60	120 – 6,800 mA	60 mm Ø
CEM11-FBP.120	300 – 13,600 mA	120 mm Ø



Fieldbus connector FBP

For communication with fieldbus systems, supply with 24 V DC via fieldbus cable

Installation on the UMC100, for plug-in systems, the fieldbus connector is mounted externally

Assembled connectors with various cable lengths. M12 connection technology for secure contacting

Extensive range of accessories available

Models

PDP22-FBP	Profibus DP V0/V1
DNP21-FBP	DeviceNet
MRP21-FBP	Modbus RTU
COP21-FBP	CANopen
PDQ22-FBP	Profibus DP V0/V1 (for the connection of 1 to 4 UMC100s)

Contact

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