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RoHS II
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Data sheet

EA16

Measured value display
Component for panel installation
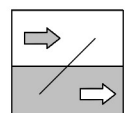
1 Product and functional description

1.1 Use as intended

The EA16 is a measuring value display unit for measuring transducers with output signals for current and voltage acc. to IEC 60381. Up to four measuring transducers in two or three-conductor versions can be connected.

Typical applications

- Measured value display in clean room

Important features

- 3.5" (8.9 cm) TFT Touch LCD colour display
- Configurable colour switching
- 2 or 4 channel mode with …
  - 2 or 4 configurable analogue inputs
    for uniform signals (0/4 … 20 mA, 0 … 10 V) acc. to IEC 60381
    (signal ranges ca be selected freely within the limits; see Technical Data)
  - 2 or 4 configurable analogue outputs
    with possibility of characteristic curve spread and reversal with any offset
  - 2 or 4 configurable switching outputs
    with potential-free relay contacts or semiconductor switches
- USB interface
- Optional Modbus RTU interface
- Optional data logger function with data storage on Micro SD card
- Configuration of all parameters and a measuring point protocol[1] are possible via PC software
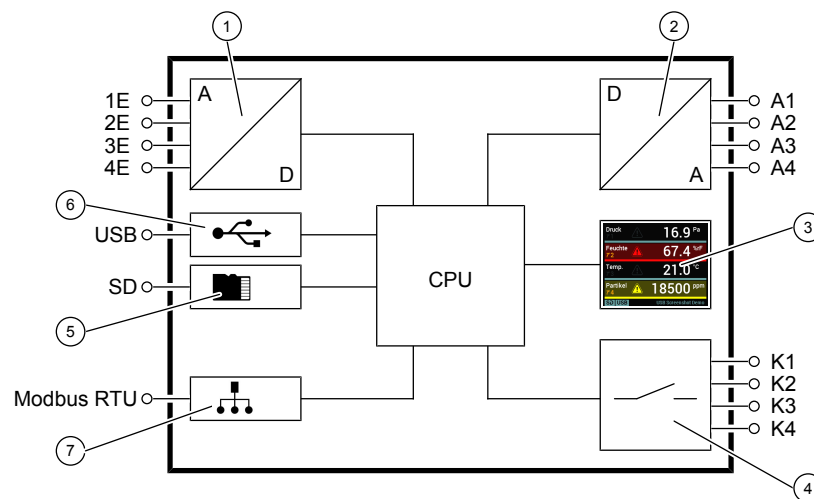
1.2 Function diagram

Fig. 1: Function diagram

1	Analogue inputs	2	Analogue outputs
3	Touch colour display	4	Switching outputs
5	Micro SD memory card	6	Micro USB interface
7	Modbus interface (option)		

[1] parameter profile

1.3 Design and mode of operation

The measuring signals of up to four connected measuring transducers can be analysed simultaneously by the microcontroller electronics. The configurable 3.5" touch display can display up to four measuring values at the same time. A configurable colour switch serves to present specific operating modes. Optionally, the device can be delivered with a data logger function.

The processed input signals are converted into the following output signals:

- 2 or 4 configurable switching outputs. Parameters, such as activation and deactivation points, switching function or delay, are available for this purpose. The switching states are displayed with symbols on the display.

- 2 or 4 analogue outputs with configurable output range. Every output signal can be set freely within the signal limits (see Technical Data). The characteristic curve change can be made in a linear, rooted, tabular or mathematic form proportional to the displayed value.

The unit also has a Modbus interface and can be connected to a Modbus RTU network as a slave. For more information about this topic, please reference the product user manual and the Modbus reference manual. (http://www.fischermesstechnik.de/en/downloads/manuals)

All parameters can also be set on the device via the touch display or (optionally) via a PC software. The measuring value display unit has a USB interface to which a USB stick can be connected. For instance, the USB stick can be used to allow simple configurations to be exported to other devices. The PC software also allows a measuring point protocol [2] .

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[2] parameter profile

2 Technical data

2.1 Generalities

The stated technical data only refer to the measuring value display unit EA16 and never take into account the properties of the connected measuring transducer.

The EA16 is designed as a component for panel installation and is only supplied fully assembled and wired. Please see the supplied electro-technology documents of the respective panel for information about the electrical connection.

2.2 Input variables

2.2.1 Analogue inputs A1 ... A4

Depending on the model, the measured value display unit EA16 has 2 or 4 analogue inputs for measuring transducers with output signals current of voltage acc. to IEC 60381.

Input range	Min. signal range	Resolution	Input resistance	Overload protection
0 … 20 mA	4 mA		≤ 30 Ω	PTC max. 32 DC/ 140 mA
4 … 20 mA	4 mA	12 Bit	≤ 30 Ω	PTC max. 32 DC/ 140 mA
0 … 10 V	2.5V		≥ 200 kΩ	max. 32 V

2.2.2 Digital inputs I/O1 ... I/O4

The number of inputs depends on the number of Flex I/O channels configured as an output. It is configured ex-works and must be stated on the order.

Quantity	Max. 4
Input voltage	5 … 32 V DC
Switching threshold	ON: 3.9V OFF: 2.6 V
	Tolerance ±10%

2.3 Output parameters

2.3.1 Analogue outputs A1 ... A4

Depending on the model, the measured value display unit EA16 has 2 or 4 analogue inputs with programmable uniform signals acc. to IEC 60381.

Output signal	Min. signal range	Resolution	Signal range
0 … 20 mA	4 mA		0.0 … 21.5 mA
4 … 20 mA	4 mA	12 Bit	0.0 … 21.5 mA
0 … 10 V	2.5V		0.0 … 10.5 V

2.3.2 Digital outputs I/O1 ... I/O4

The number of outputs depends on the number of Flex I/O channels configured as an input. It is configured ex-works and, like the level of output voltage, it must be stated on the order.

Quantity	Max. 4		
Output type	PNP		
Output voltage	5V	12 V	24 V
Output current	20 mA	50 mA	100 mA

2.3.3 Switching outputs K1 ... k4

Depending on the model, the measured value display unit EA16 has none, 2 or 4 switch outputs with a programmable switching function. Optionally, the unit can be supplied with potential-free relay contacts or potential-free semiconductors (MOSFET).

Programmable switching function

Make contact (NO)
Break contact (NC)

Relay contacts

	AC	DC
Max. switching voltage	32V	32V
Max. switching current	2A	2A
Max. switching output	64 VA	64 W

Semiconductor contacts

		AC	DC
Allowed switching voltage		3 … 32 V	3 … 32 V
Max. switching current	Peak	1A	1A
	Continuous current	0.25A	0.25A
Max. switching output		8 VA	8 W
Forward resistance R_{on}		≤ 1 Ω	≤ 1 Ω

2.4 Measurement accuracy

Characteristic value	Unit	Value
Max. characteristic curve deviation [+]	% FS	0.10
Typ. characteristic curve deviation [+]	% FS	< 0.05
Max. temperature coefficient range [x]	% FS/10K	0.10

Characteristic value	Unit	Value
Typ. temperature coefficient range [x)]	% FS/10K	< 0.025
Max. temperature coefficient zero-point [x)]	% FS/10K	0.10
Typ. temperature coefficient zero-point [x)]	% FS/10K	< 0.025

[+)] Characteristic curve deviation (non-linearity and hysteresis) at 25°C and rated voltage input range with linear, not spread characteristic curve.

[x)] In relation to the input range with a linear, not spread, characteristic curve.

2.5 Digital interfaces

Type	
USB interface	Micro USB 2.0
SD card slot	Micro SD up to 32 GB
Field bus interface (option)	Modbus RTU
Digital 2-wire interface (option)	FF62 Temperature and moisture sensor

2.6 Display and operating interface

Characteristic value	Value
Display size	3.5"
LCD type	TN TFT
Resolution	320 x 240 Pixel
Touch	Resistive

2.7 Auxiliary energy

Characteristic value	DC	AC
Rated Voltage	24 V DC	24 V AC 50/60Hz
Admissible operating voltage	U_b = 18 … 32 V DC	24 V AC ± 20% 50/60Hz
Power consumption	Max. 11 W	Max. 22 VA
	Type 3 … 5 W	Type 6 … 10 VA

2.8 Application conditions

Characteristic value	Value
Permissible ambient temperature	-5 … +50 °C
Admissible storage temperature	-10 … +70 °C
Admissible media temperature	see data sheet of the connected measuring transducer
Enclosure protection class	see the electro-technology documents panel (RT#####)
EMC (204/108/EC)	EN 61326-1:2013 EN 61326-2-3:2013
RoHS (2011/65/EU)	EN 50581:2012

2.9 Construction design

Please see the electro-technology documents for information about the panel (RT#####).

3 Order Codes
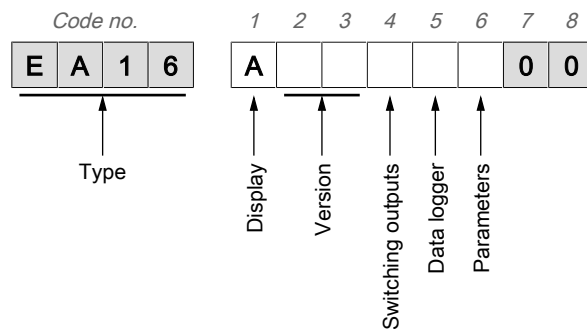
Display

[1]	← Code no.
A	3.5" TFT Touch LCD (horizontal)

Version

[2.3]	← Code no.	
20	2 channels	(2 inputs, 2 outputs, 2 switch outputs)
2M	2 channel Modbus	(2 inputs, 2 outputs, 2 switch outputs) + Modbus interface
40	4 channels	(4 inputs, 4 outputs, 4 switch outputs)
4M	4 channel Modbus	(4 inputs, 4 outputs, 4 switch outputs) + Modbus interface

Switching outputs

[4]	← Code no.
0	without
R	with relay contacts
H	with semiconductor switches

Data logger

[5]	← Code no.
0	No
1	yes (32 GB Micro SD card)

Parameterization

[6]	← Code no.
S	Standard configuration
K	Customer-specific configuration

3.1 Information about the document

This document contains all technical data about the device. Great care was taken when compiling the texts and illustrations; Nevertheless, errors cannot be ruled out.

Subject to technical amendments.

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