CE

RoHS II
COMPLIANT

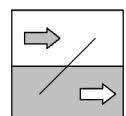**Data sheet**

EA15

Measuring value display
with 2.8" Touch LCD

1 Product and functional description

1.1 Use as intended

The EA15 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

- Universal measurement display in an industrial environment.

Important features

- 2.8" (7.2 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
- Mathematical functions like formulas or tables
- Optional data logger function with data storage on conventional Micro SD cards
- Configuration of all parameters and a measuring point protocol[1] are possible via an optionally available PC software

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[1] parameter profile that can be saved and loaded

1.2 Function diagram
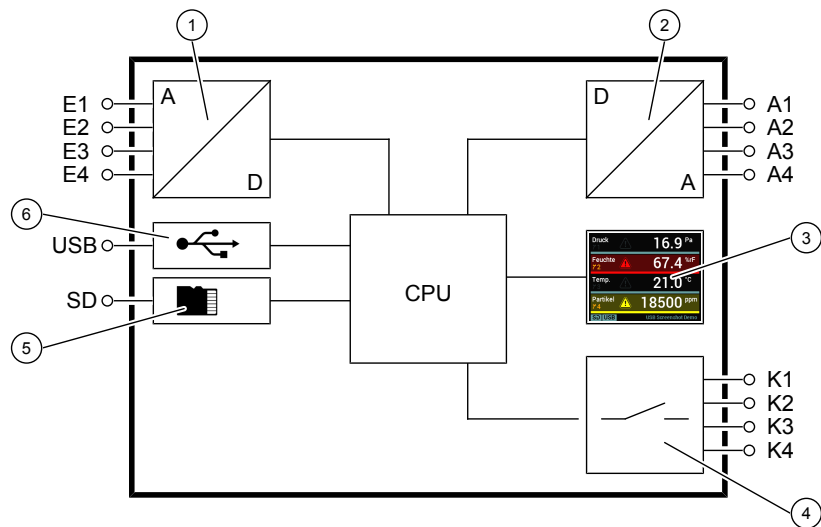

Illustration 1: Function diagram

1	Analogue inputs	2	Analogue outputs
3	Touch colour display	4	Switching outputs
5	Micro SD memory card	6	Micro USB interface

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 2.8" 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 input range after taking the signal limits into account (see Technical Data). The characteristic curve change can be made in a linear, rooted, tabular or mathematic form proportional to the displayed value.

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 this purpose. For instance, the USB stick can be used to export configurations easily 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 EA15 and never take into account the properties of the connected measuring transducer.

2.2 Input variables

Depending on the model, the measured value display unit EA15 has 2 or 4 analogue inputs for measuring transducers with output signals current or 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

2.3 Output parameters

2.3.1 Analogue outputs

Depending on the model, the measured value display unit EA15 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

Apparent ohmic resistance

Output signal: Current	$U_b = 12V$	$U_b = 24V$	$U_b = 32V$
0… 20 mA	$R_L < 500Ω$	$R_L < 700Ω$	$R_L < 1100Ω$
4…20 mA			

Output signal: Voltage	$U_b = 12 … 32\ V$
0…10V	$R_L > 1\ kΩ$

2.3.2 Switching outputs

Depending on the model, the measured value display unit EA15 has 2 or 4 analogue inputs 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
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

2.6 Display and operating interface

Characteristic value	Value
Display size	2.8"
LCD type	TN TFT
Resolution	320 x 240 Pixel
Touch	Resistive

2.7 Auxiliary energy

Supply EA15

Characteristic value	Value
Rated Voltage	24 V AC/DC
Admissible operating voltage	U_b = 12 … 32 V AC/DC
Power consumption	Max. 10W

Power supply measurement transducer

Supply voltage DC		Value
Output voltage		U_b – 1.5V
Max. output current	U_b = 12 … 32 V	500 mA
PTC		8 Ω

The power supply from the EA15 is secured by an internal PTC. The total power currents of the connected measuring transducers may not exceed the max. output current.

In the case of an AC power supply, the supply voltage of the measuring transducer is generated by means of a one-way rectification. The maximum output current depends on the level of the power supply:

Supply voltage AC		Value
Output voltage		One-way rectification of U_b
Max. output current	U_b = 12 … 19 V	100 mA
	U_b = 19 … 32 V	200 mA
PTC		8 Ω

If the measuring transducer requires more power, this must be supplied via an external CE-conform power adapter.
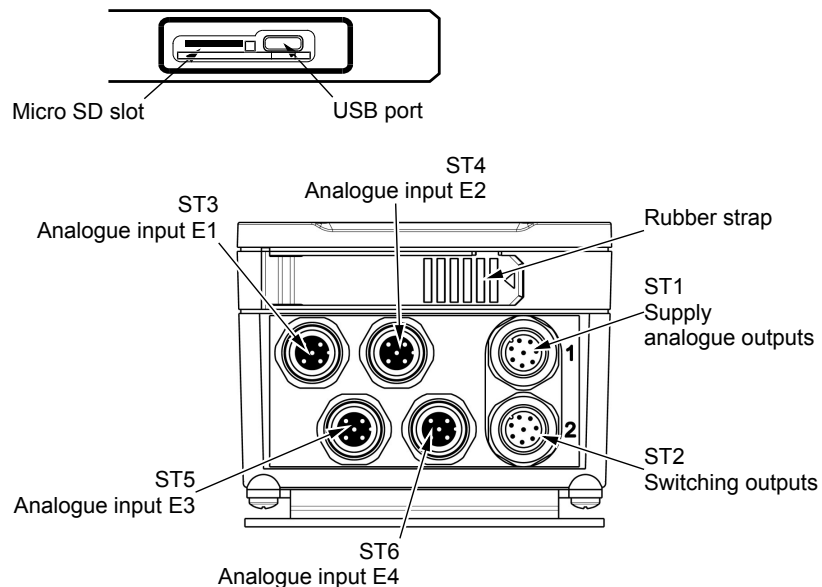
Electrical connection

Illustration 2: M12 plug

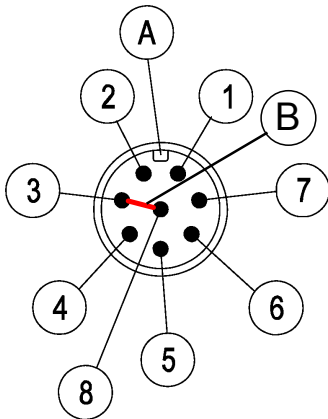Micro SD slot and USB jack are located behind the rubber strap.

Terminal assignment ST1

M12 flanged connector 8-pin

4 channel version

PIN	Signal	Name	Cable colour
1	+U_b	Supply (+)	white
2	+Sig A1	Analogue output 1 (+)	brown
3	-U_b	Supply (-)	green
4	+Sig A2	Analogue output 2 (+)	yellow
5	FE	Functional earth	grey
6	+Sig A3	Analogue output 3 (+)	pink
7	+Sig A4	Analogue output 4 (+)	blau
8	-Sig A	Analogue output (-)	red
A	*Type A*	*Plug code*	
B		*Bridge (-U_b and -Sig A are bridged internally.)*	

Illustration 3: M12 plug 8-pin +bridge

M12 flanged connector 5-pin

2 channel version

PIN	Signal	Name	Cable colour
1	+U_b	Supply (+)	brown
2	+Sig A1	Analogue output 1	white
3	-U_b /-Sig A	Supply / analogue output (-)	blau
4	+Sig A2	Analogue output 2	Black
5	FE	Functional earth	grey
A	*Type A*	*Plug code*	
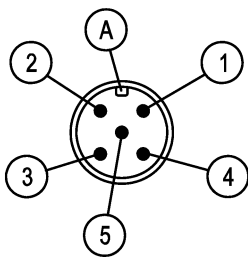
Illustration 4: M12 plug 5-pin

Terminal assignment ST2

M12 flanged connector 8-pin

4 channel version

PIN	Signal	Name	Cable colour
1	K1.1	Relay 1	white
2	K1.2	Relay 1	brown
3	K2.1	Relay 2	green
4	K2.2	Relay 2	yellow
5	K3.1	Relay 3	grey
6	K3.2	Relay 3	pink
7	K4.1	Relay 4	blau
8	K4.2	Relay 4	red
A	*Type A*	*Plug code*	
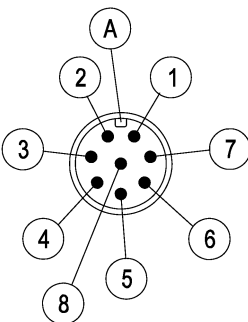
Illustration 5: M12 plug 8-pin

M12 flanged connector 4-pin
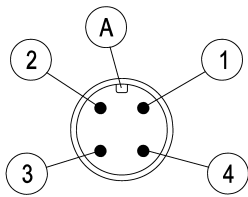
Illustration 6: M12 plug 4-pin

2 channel version

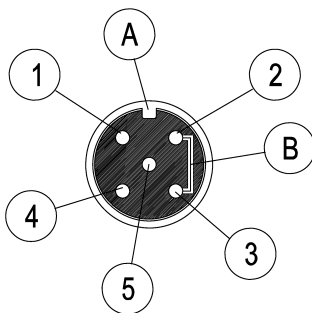| PIN	Signal	Name	Cable colour
1	K1.1	Relay 1	brown
2	K1.2	Relay 1	white
3	K2.1	Relay 2	blau
4	K2.2	Relay 2	Black
A	*Type A*	*Plug code*	

Terminal assignment analogue inputs ST3 - ST6

The occupation of the connection sockets for the external measuring transducers is the same for all inputs. The only difference is the respective **<No.>** of the analogue input.

M12 flange sleeve 5-pin

Illustration 7: M12 bush 5-pin +bridge

PIN	Signal	Name	Cable colour
1	$+U_T$	Transmitter supply (+)	brown
2	-Sig E**<Nr.>**	Analogue input (-)	white
3	$-U_T$	Transmitter supply (-)	blau
4	+Sig E**<No.>**	Analogue input **<No.>**	Black
5	FE	Functional earth	grey
A	*Type A*	*Plug code*	
B		*bridge*	

2.8 Application conditions

Characteristic value	Value
Permissible ambient temperature	-10 … +70 °C
Admissible storage temperature	-20 … +70 °C
Admissible media temperature	see data sheet of the connected measuring transducer
Enclosure protection class	IP 65 acc. to DIN EN 60529
EMC (204/108/EC)	EN 61326-1:2013 EN 61326-2-3:2013
RoHS (2011/65/EU)	EN 50581:2012

2.9 Construction design

Materials

Part	the material.
Housing	Polyamide PA 6.6
Rubber strap	EPDM
Sealings and gaskets	NBR
Wall mounting plate	Aluminum
Front film	Polyester

Please see the technical data about the connected measuring transducer for information about the materials that come into contact with the media.

2.10 Dimensional drawings
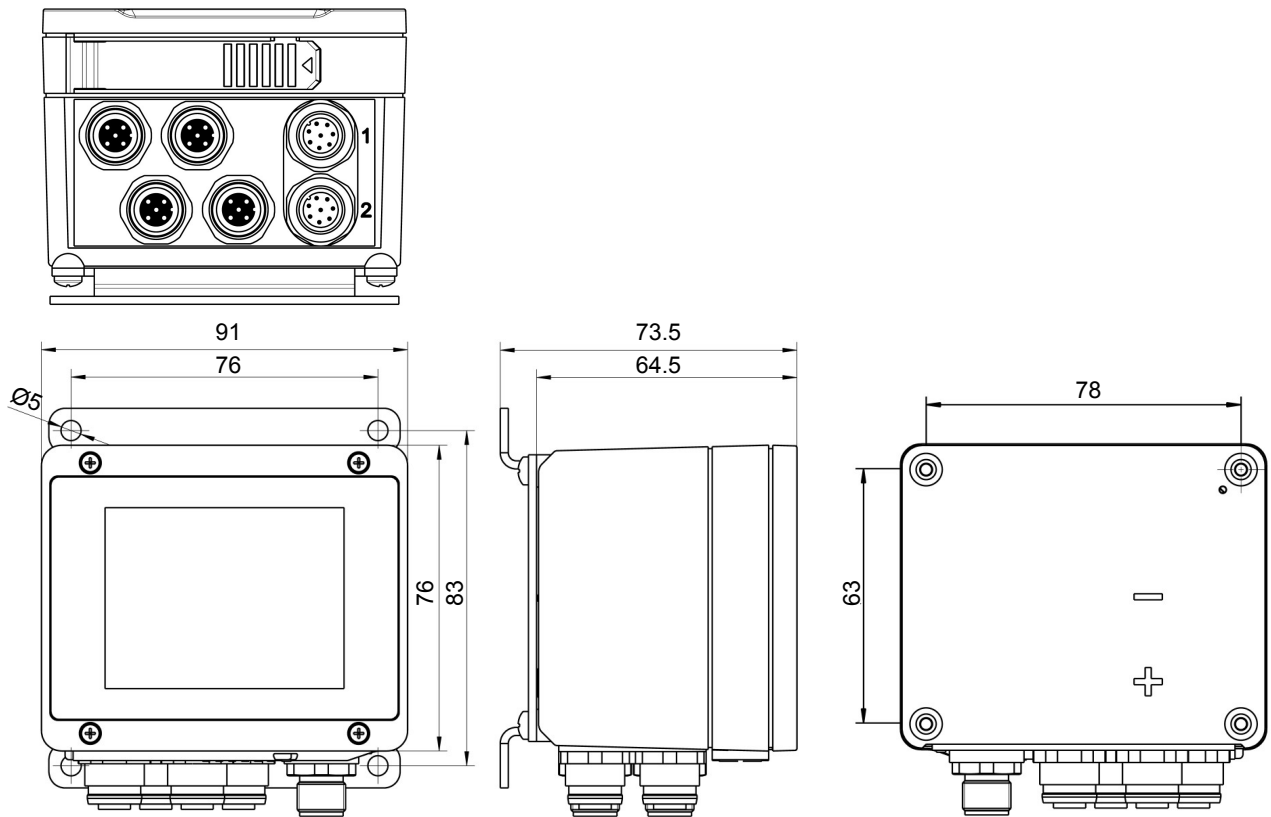
All dimensions in mm unless otherwise stated
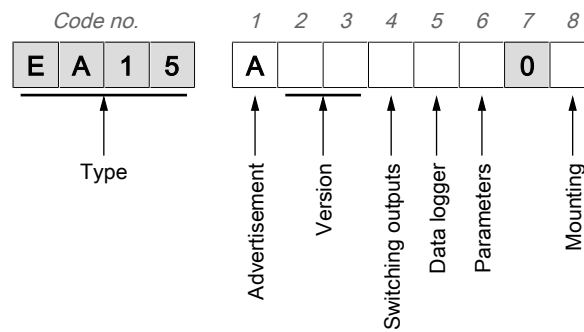

Illustration 8: Dimensional picture

3 Order Codes

Illustration 9: Order Codes

Display

[1]	← *Code no.*
A	2.8" TFT Touch LCD (horizontal)

Version

[2.3]	← *Code no.*	
20	2 channels	(2 inputs, 2 outputs, 2 switch outputs)
40	4 channels	(4 inputs, 4 outputs, 4 switch outputs)

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)

Parameters

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

Mounting

[8]	← *Code no.*
S	Standard (attachment boreholes on rear side)
W	Wall mounting

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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