

# FA MCR-EX-FD-TUI-UI-2REL-UP - Digital display



2907781

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Ex i, Process indicator, multifunctional, in field housing for monitoring and displaying analog measurement data. Universal inputs enable the connection of current, voltage, RTDs, and TCs. 2 relay change-over contact outputs and 1 analog output.. HART

## Product description

Multifunctional Ex i process indicator in field housing for monitoring, displaying, and transmitting analog measurement data from the Ex area to the safe area.

Dual-conductor sensors can be powered with the integrated measuring transducer supply. Universal inputs permit connection of current, voltage, RTDs, and TCs. Limit values can be monitored and relays can be switched. The analog output allows you to transmit process signals. A color change in the event of a fault supports the detection of alarm conditions. 5-digit, 7-segment LC display, with backlight, 1 universal input, 2 relays, min./max. value memory, linearization table, digital status output (open collector)

## Commercial data

Item number	2907781
Packing unit	1 pc
Sales key	C430
Product key	DK1241
GTIN	4055626232157
Weight per piece (including packing)	1,430 g
Weight per piece (excluding packing)	1,430 g
Customs tariff number	90328900
Country of origin	DE

## Technical data

### Product properties

Product type	Digital displays
Product family	Field Analog
Configuration	Keyboard
	Software

### Insulation characteristics

Protection class	II
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### Insulation characteristics

Overvoltage category	II
Pollution degree	2

### System properties

#### Functionality

Configuration	Keyboard
	Software

### Electrical properties

Test voltage	2500 V
	2500 V
Test voltage output/power supply	2500 V
Test voltage input/output	500 V
Test voltage input/power supply	2500 V

### Electrical isolation Input/output/power supply

Electrical isolation	375 V
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### Supply

Supply voltage range	24 V AC/DC ... 230 V AC/DC (-20 % ... +10 %, 50 Hz ... 60 Hz)
Max. current consumption	30 mA
Power consumption	≤ 6.9 W

### Input data

#### Signal: Current

Description of the input	Universal input
Number of inputs	1
Input signal	Current
Current input signal	0 mA ... 20 mA +10 %
	4 mA ... 20 mA +10 %
Max. current input signal	< 150 mA
Available input sources	Current

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Input resistance current input	10 $\Omega$
Transmitter supply voltage	> 16 V (22 mA)
Transmitter supply voltage range	22.8 V ... 27.6 V (No-load)
Transmitter supply current	< 30 mA (Short-circuit and overload protection)
D/A converter resolution	16 bit

## Signal: Voltage

Description of the input	Universal input
Input signal	Voltage
Voltage input signal	0 V ... 10 V
	2 V ... 10 V
	0 V ... 5 V
	0 V ... 1 V
	1 V ... 5 V
	-1 V ... 1 V
	-10 V ... 10 V
	-30 V ... 30 V
Max. voltage input signal	$\pm 35$ V ( $\geq 1$ V)
	$\pm 12$ V ( $< 1$ V)
Available input sources	Voltage
Input resistance of voltage input	> 1 M $\Omega$

## Signal: Resistance

Description of the input	Universal input
Input signal	Resistor
Available input sources	Resistance: 30 $\Omega$ ... 3000 $\Omega$

## Measurement

Description of the input	Universal input
Configurable/programmable	Yes
Sensor types (RTD) that can be used	Pt, Ni, Cu sensors
Available input sources	Resistance thermometers
Temperature measuring range	-200 $^{\circ}$ C ... 1100 $^{\circ}$ C (Range depends on sensor type, adjustable)
Connection technology	2-, 3-, 4-conductor
Measuring rate	200 ms

## Measurement

Description of the input	Universal input
Configurable/programmable	Yes
Sensor types that can be used (TC)	J, K, T, N, B, S, R, U, L, C, D
Available input sources	Thermocouples
Temperature measuring range	-200 $^{\circ}$ C ... 2495 $^{\circ}$ C (Range depends on sensor type, adjustable)
Measuring rate	200 ms

## Output data

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## Switching: Relay

Contact switching type	2 changeover contacts
Minimum switching voltage	12 V
Maximum switching voltage	30 V DC (3 A) 230 V AC (3 A)
Min. switching current	10 mA
Max. switching current	3 A

## Switching: Transistor

Output description	Open collector output
Number of outputs	1
Contact switching type	Transistor
Maximum switching voltage	28 V
Max. switching current	200 mA

## Signal: Current

Number of outputs	1
Configurable/programmable	Yes
Current output signal	0 mA ... 20 mA 4 mA ... 20 mA
Max. current output signal	< 22 mA
Load/output load current output	≤ 500 Ω (22 mA)
Ripple	< 10 mV <sub>PP</sub> (500 Ω)
D/A converter resolution	13 bit
Number of positions displayed	5
Display	7-segment LC display, with backlight, dot matrix for text/bar graph
Temperature coefficient, typical	0.01 %/K

## Signal: Voltage

Voltage output signal	0 V ... 10 V 2 V ... 10 V 0 V ... 5 V 1 V ... 5 V
Max. voltage output signal	< 11 V
Open-circuit voltage	24 V DC (+15 %/-5 %)
Short-circuit current	< 25 mA
Ripple	< 10 mV <sub>PP</sub> (1000 Ω)
D/A converter resolution	13 bit
Temperature coefficient, typical	0.01 %/K

## Connection data

### Input, output, status, relay

Connection method	Push-in connection
Stripping length	10 mm

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Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 14

## Supply

Connection method	Screw connection
Stripping length	10 mm
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 14
Tightening torque	0.6 Nm ... 0.6 Nm

## Ex data

Ex i circuits (EPL)	Ga
	Da

## Safety data

Note	Two-conductor measuring transducer supply (intrinsically safe)
Max. internal inductance $L_i$	75 $\mu$ H
Max. internal capacitance $C_i$	8 nF
Max. output voltage $U_o$	$\leq 27.3$ V
Max. output current $I_o$	$\leq 96.5$ mA
Max. output power $P_o$	$\leq 659$ mW
Ex ia IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	4 mH / 88 nF
Ex ia IIB: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	17 mH / 683 nF
Ex ia IIA: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	34 mH / 2280 nF

## Safety data

Note	Temperature inputs (intrinsically safe)
Max. internal inductance $L_i$	75 $\mu$ H
Max. internal capacitance $C_i$	8 nF
Max. output voltage $U_o$	$\leq 27.3$ V
Max. output current $I_o$	$\leq 22.1$ mA
Max. output power $P_o$	$\leq 151$ mW
Ex ia IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	500 $\mu$ H / 85 nF
Ex ia IIB: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 360 nF
Ex ia IIA: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	5 mH / 530 nF

## Safety data

Note	Current input (intrinsically safe)
Max. internal inductance $L_i$	75 $\mu$ H
Max. internal capacitance $C_i$	8 nF

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Max. output voltage $U_o$	$\leq 27.3$ V
Max. output current $I_o$	$\leq 5$ mA
Max. output power $P_o$	$\leq 34.2$ mW
Ex ia IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	500 mH / 88 nF
Ex ia IIB: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 380 nF
Ex ia IIA: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 540 nF

## Safety data

Note	Voltage input (intrinsically safe)
Max. internal inductance $L_i$	75 $\mu$ H
Max. internal capacitance $C_i$	8 nF
Max. output voltage $U_o$	$\leq 27.3$ V
Max. output current $I_o$	$\leq 5$ mA
Max. output power $P_o$	$\leq 34.2$ mW
Ex ia IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	500 mH / 88 nF
Ex ia IIB: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 380 nF
Ex ia IIA: Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 540 nF

## Interfaces

### Data: T-PORT

Connection method	4-pos. socket
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### Data: USB

Serial transmission speed	38400 baud
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### Data communication (bypass)

Protocols supported	HART
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## Dimensions

Width	199 mm
Height	160 mm
Depth	96 mm

## Material specifications

Color	light gray (RAL 7035)
Housing material	PBT GF30

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP67
Ambient temperature (operation)	-40 °C ... 50 °C (The readability of the display is no longer

	guaranteed at temperatures below -30 °C (-22 °F.)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	< 2000 m (Above sea level)
Climatic class	according to IEC 60654-1, class B2
Permissible humidity (operation)	condensation permitted

## Approvals

### CE

Certificate	CE-compliant
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### ATEX

Identification	⊕ II (1) G [Ex ia Ga] IIC
	⊕ II (1) D [Ex ia Da] IIIC
Certificate	PTB 15 ATEX 2011

### UL, USA/Canada

Identification	UL 61010 Recognized
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### FM

Identification	AIS / I / 1 / ABCDEFG
	[I/0] AEx [ia] IIC
	ANI / I, II, III / 2 / ABCDEFG

### CSA

Identification	Associated Apparatus
	Class I, Zone 0, IIC
	Class I, Groups A, B, C, D
	Class II, Groups E, F, G
	Class III

## EMC data

Noise immunity	IEC 61326 / NAMUR NE 21
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### Noise emission

Standards/regulations	IEC 61326, class A
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## Mounting

Mounting type	Panel mounting
	Tube mounting
Mounting position	Max. viewing angle range +/- 45° from the centre line of the display in every direction

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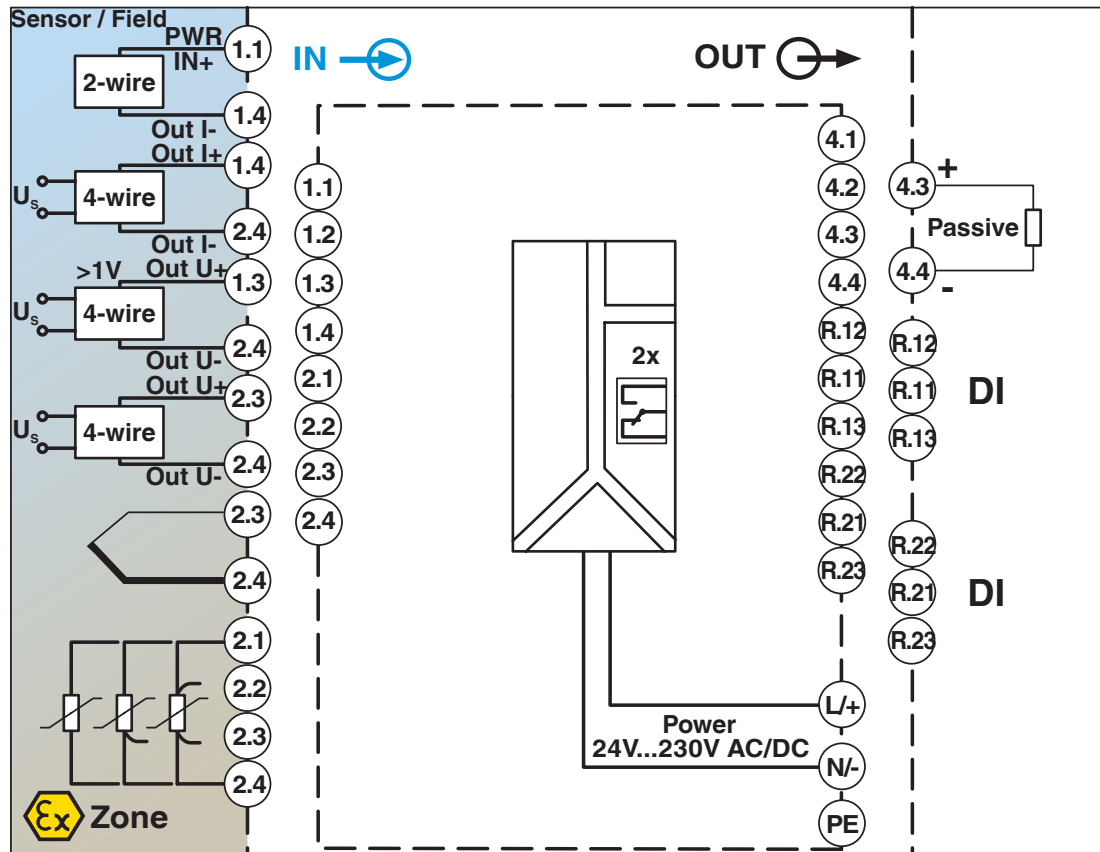


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## Drawings

Block diagram



Block diagram FA MCR-EX-FD-TUI-UI-2REL-UP

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## Classifications

### ECLASS

ECLASS-13.0

27210301

### ETIM

ETIM 9.0

EC011349

### UNSPSC

UNSPSC 21.0

39121000

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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	No substance above 0.1 wt%
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