

Конвертер HART Loop (HLC)

Технические характеристики

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HART Loop Converter KFD2-HLC-Ex1.D.2W

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- HART field device input with transmitter power supply
- Usable as signal splitter (1 input and several outputs)
- 2 relay contact outputs (change-over contacts)
- 3 analog outputs 4 mA ... 20 mA
- Sink and source mode output
- Configurable by keypad



Function

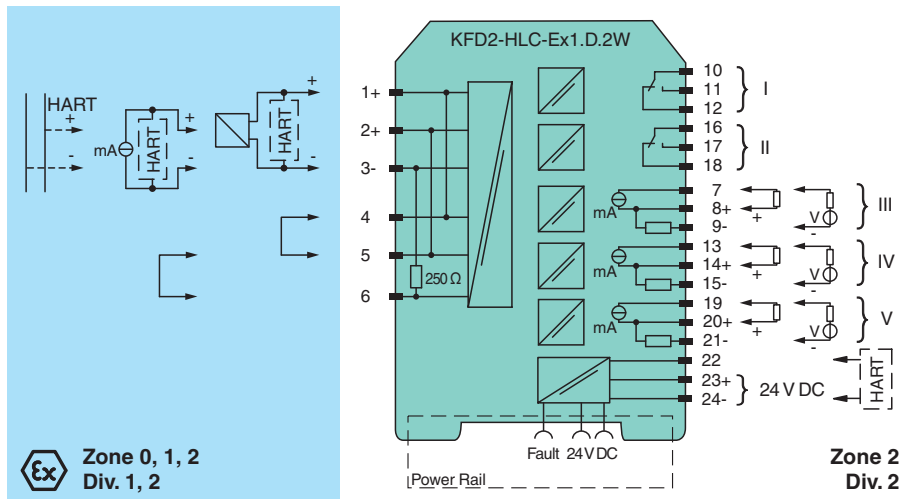
This isolated barrier is used for intrinsic safety applications. It is a HART loop converter that provides power to transmitters or can be connected to existing HART loops in parallel.

It is able to evaluate up to four HART variables (PV, SV, TV, QV). Of those four HART variables, the data contained in any three of them can be converted to three different 4 mA ... 20 mA current signals. These loop signals can be connected to display devices or analog inputs on the process control system/ control system.

In addition to the current outputs, two form C changeover relay contacts are available and can be programmed to operate at trip values from the HART variables.

The unit is easily programmed by the use of a keypad located on the front of the unit or with the PACTware™ configuration software.

Connection



Technical Data

General specifications		
Signal type		Analog input
Supply		
Connection		Power Rail or terminals 23+, 24-
Rated voltage	U _r	19 ... 30 V DC
Rated current	I _r	approx. 130 mA at 24 V DC
Power dissipation		2.5 W
Power consumption		3.1 W
HART signal channels (intrinsically safe)		

Technical Data

Conformity		HART field device input (revision 5 to 7)
Interface		
Programming interface		programming socket
Input		
Connection side		field side
Connection		terminals 1, 2, 3, 4, 5, 6
Open circuit voltage/short-circuit current		typ. 24 V / 28 mA
Input resistance		250 Ω , 5 % (terminals 2, 3 and with jumper on 5, 6)
Available voltage		≥ 15.5 V at 20 mA, short-circuit protected
Output		
Connection side		control side
Connection		output I: terminals 10, 11, 12, output II: terminals 16, 17, 18 output III: terminals 7, 8, 9, output IV: terminals 13, 14, 15, output V: terminals 19, 20, 21
Output I, II		
Output signal		relay and LED yellow
Mechanical life		10 ⁷ switching cycles
Energized/De-energized delay		approx. 20 ms / approx. 20 ms
Output III, IV, V		
Output signal		analog
Current range		4 ... 20 mA , (source or sink mode)
Load		max. 650 Ω , source mode
Voltage range		5 ... 30 V , sink mode from external supply
Fault signal		downscale I ≤ 2 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43) or hold measurement value
Other outputs		HART communicator on terminals 22, 24
Collective error message		Power Rail and LED red
Transfer characteristics		
Output III, IV, V		
Resolution		max. 2 μA
Accuracy		< 20 μA, 10 μA typ.
Influence of ambient temperature		< ± 2 μA/K
Duration of measurement/Response delay		HART message acquisition time plus 100 ms
Relay		programmable either for fault or trip value (with direction, hysteresis and delay)
Galvanic isolation		
Output I/II		functional insulation acc. to IEC 62103, rated insulation voltage 250 V _{eff}
Output I, II/other circuits		reinforced insulation acc. to IEC 62103, rated insulation voltage 300 V _{rms}
Output III/IV/V/power supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Indicators/settings		
Display elements		LEDs , display
Control elements		Control panel
Configuration		via operating buttons via PACTware
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Low voltage		
Directive 2014/35/EU		EN 61010-1:2010
Conformity		
Electromagnetic compatibility		NE 21:2006
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)

Technical Data

Mechanical specifications

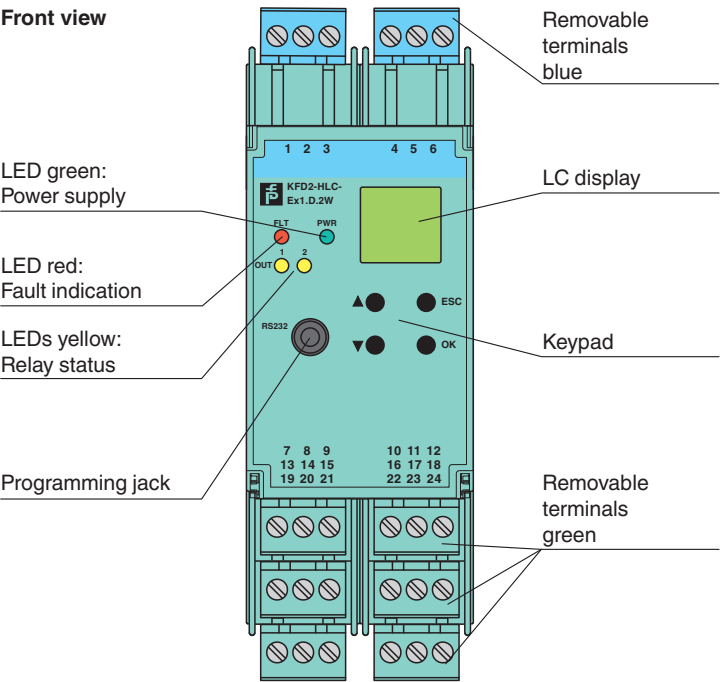
Degree of protection		IP20
Connection		screw terminals
Mass		300 g
Dimensions		40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001

Data for application in connection with hazardous areas

EU-type examination certificate		BASEEFA 07 ATEX 0174
Marking		Ⓔ II (1)G [Ex ia Ga] IIC Ⓔ II (1)D [Ex ia Da] IIIC
Supply		
Maximum safe voltage	U_m	253 V AC (Attention! The rated voltage can be lower.)
Equipment		terminals 1, 4/3 (with link between terminals 4 and 5)
Voltage	U_o	25.2 V
Current	I_o	104.9 mA
Power	P_o	0.661 W
Internal capacitance	C_i	1.1 nF
Internal inductance	L_i	0 mH
Equipment		terminals 2, 5/3
Voltage	U_i	< 28 V
Power	P_i	< 1.33 W
Voltage	U_o	1.1 V
Current	I_o	11.9 mA
Power	P_o	4 mW
Internal capacitance	C_i	0 μ F
Internal inductance	L_i	0 mH
Output I, II		terminals 10, 11, 12; 16, 17, 18 , non-intrinsically safe
Maximum safe voltage	U_m	253 V (Attention! U_m is no rated voltage.)
Contact loading		253 V AC/1 A/ $\cos \phi > 0.7$; 30 V DC/1 A resistive load (BASEEFA 07 ATEX 0174) 50 V AC/1 A/ $\cos \phi > 0.7$; 30 V DC/1 A resistive load (Pepperl+Fuchs self-declaration)
Output III, IV, V		terminals 7, 8, 9; 13, 14, 15; 19, 20, 21 , non-intrinsically safe
Maximum safe voltage	U_m	253 V (Attention! U_m is no rated voltage.)
Certificate		PF 07 CERT 1141 X
Marking		Ⓔ II 3G Ex nA nC IIC T4 Gc
Galvanic isolation		
Input/Other circuits		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
FM approval		
Control drawing		116-0129
IECEX approval		
IECEX certificate		IECEX BAS 07.0047
IECEX marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC

General information

Assembly



Matching System Components

	DTM HART Loop converter	Device type manager (DTM) for HART communication
	PACTware 5.0	FDT Framework
	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Accessories

	K-250R	Measuring resistor
	K-500R0%1	Measuring resistor

Accessories

	KF-ST-5GN	Terminal block for KF modules, 3-pin screw terminal, green
	KF-ST-5BU	Terminal block for KF modules, 3-pin screw terminal, blue
	KF-CP	Red coding pins, packaging unit: 20 x 6



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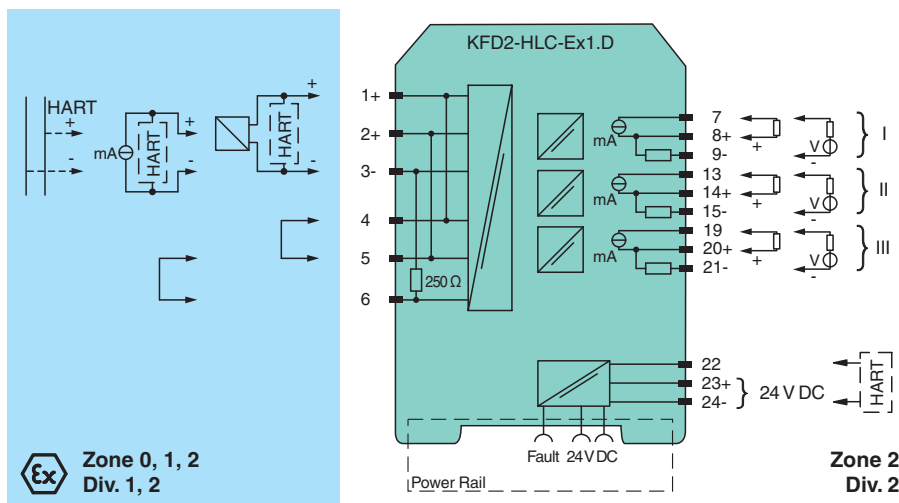
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The unit is easily programmed by the use of a keypad located on the front of the unit or with the PACTware™ configuration software.

Connection



Technical Data

General specifications		
Signal type		Analog input
Supply		
Connection		Power Rail or terminals 23+, 24-
Rated voltage	U _r	19 ... 30 V DC
Rated current	I _r	approx. 120 mA at 24 V DC
Power dissipation		2.3 W
Power consumption		2.9 W
HART signal channels (intrinsically safe)		
Conformity		HART field device input (revision 5 to 7)

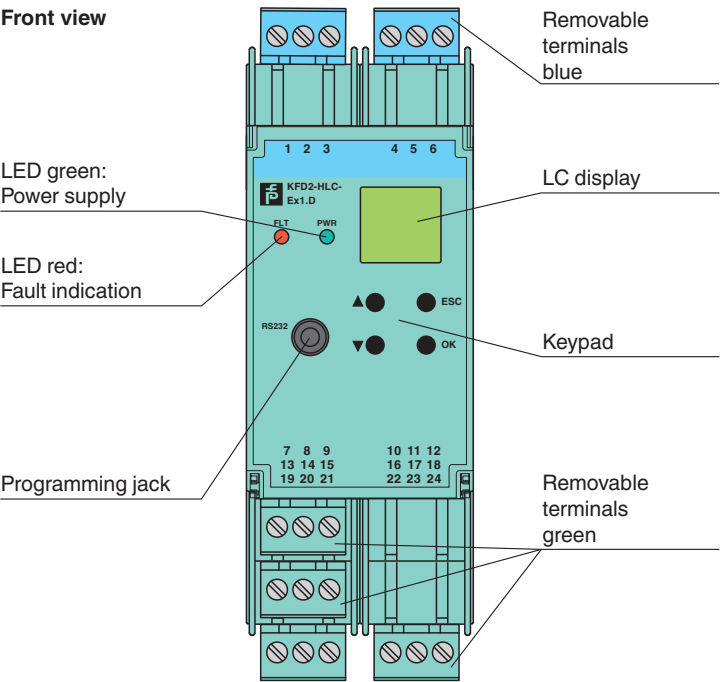
Technical Data

Interface		
Programming interface		programming socket
Input		
Connection side		field side
Connection		terminals 1, 2, 3, 4, 5, 6
Open circuit voltage/short-circuit current		typ. 24 V / 28 mA
Input resistance		250 Ω , 5 % (terminals 2, 3 and with jumper on 5, 6)
Available voltage		≥ 15.5 V at 20 mA, short-circuit protected
Output		
Connection side		control side
Connection		output I: terminals 7, 8, 9 , output II: terminals 13, 14, 15 , output III: terminals 19, 20, 21
Output signal		analog
Voltage range		5 ... 30 V , sink mode from external supply
Current range		4 ... 20 mA , (source or sink mode)
Load		max. 650 Ω , source mode
Fault signal		downscale I ≤ 2 mA, upscale I ≥ 21.5 mA (acc. NAMUR NE43) or hold measurement value
Other outputs		HART communicator on terminals 22, 24
Collective error message		Power Rail and LED red
Transfer characteristics		
Output I, II, III		
Resolution		max. 2 μ A
Accuracy		< 20 μ A, 10 μ A typ.
Influence of ambient temperature		$< \pm 2$ μ A/K
Duration of measurement/Response delay		HART message acquisition time plus 100 ms
Galvanic isolation		
Output I/II/III/power supply		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Indicators/settings		
Display elements		LEDs , display
Control elements		Control panel
Configuration		via operating buttons via PACTware
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Low voltage		
Directive 2014/35/EU		EN 61010-1:2010
Conformity		
Electromagnetic compatibility		NE 21:2006
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		300 g
Dimensions		40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-type examination certificate		BASEEFA 07 ATEX 0174
Marking		Ⓔ II (1)G [Ex ia Ga] IIC Ⓔ II (1)D [Ex ia Da] IIIC

Technical Data

Supply		
Maximum safe voltage	U_m	253 V AC (Attention! The rated voltage can be lower.)
Equipment		terminals 1, 4/3 (with link between terminals 4 and 5)
Voltage	U_o	25.2 V
Current	I_o	104.9 mA
Power	P_o	0.661 W
Internal capacitance	C_i	1.1 nF
Internal inductance	L_i	0 mH
Equipment		terminals 2, 5/3
Voltage	U_i	< 28 V
Power	P_i	< 1.33 W
Voltage	U_o	1.1 V
Current	I_o	11.9 mA
Power	P_o	4 mW
Internal capacitance	C_i	0 μ F
Internal inductance	L_i	0 mH
Output I, II, III		terminals 7, 8, 9; 13, 14, 15; 19, 20, 21 non-intrinsically safe
Maximum safe voltage	U_m	253 V (Attention! U_m is no rated voltage.)
Certificate		PF 07 CERT 1142 X
Marking		Ⓔ II 3G Ex nA IIC T4 Gc
Galvanic isolation		
Input/Other circuits		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
FM approval		
Control drawing		116-0129
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	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Accessories

	K-250R	Measuring resistor
	K-500R0%1	Measuring resistor

Accessories

	KF-ST-5GN	Terminal block for KF modules, 3-pin screw terminal, green
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	KF-CP	Red coding pins, packaging unit: 20 x 6

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