Analogue signal conditioning

Let's connect.

Version 2020

Weidmüller

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Analogue signal processing
Catalogue 4.1

Analogue signal processing

Simple and retrofittable – IoT-terminal

Page A.2

- Retrofit solution
- Narrow and compact tree design
- Cloud integration via MQTT
- Mobile communication with NB-IoT and LTE-M Cat.1

Network-compatible signal converters – ACT20C

Page B.2

- Separation and conversion of current or voltage signals
- Limit value monitoring, diagnosis, monitoring via Ethernet network
- PC configuration with FDT/DTM software

Intrinsically safe signal converters – ACT20X

Page C.2

- Analogue and binary signal interfaces to Ex Zone 0 / Division 1
- FDT/DTM software configurable
- 2 channel modules in 22.5 mm housing

Signal converters and monitoring components – ACT20P

Page D.2

- Separation and conversion of temperature and DC signals (3-way isolation, supply isolators and passive isolators)
- Strain gauge transmitter for reading from load cells
- High levels of galvanic isolation and accuracy

Space-saving signal converters – ACT20M

Page E.2

- Isolating and converting of temperature signals and DC signals (3-way isolation, supply isolators and passive isolators)
- Up to 2 channels with a width of 6 mm
- Power supply via the CH20M DIN rail bus

Signal converters in terminal format – MCZ

Page F.2

- Signal converter in terminal format
- Passive isolator, temperature/frequency converter and threshold monitoring
- Simple wiring with pluggable cross-connection channels

Compact standard signal isolators – PicoPak

Seite G.2

- Saves space in the panel thanks to the narrow 6 mm width
- Passive insulator, loop spliced at the input and output
- Increased operating temperature range -40°C ...+70°C

Signal & serial interface converters – WAVESERIES

Page H.2

- Separation and conversion of temperature and DC signals (3-way isolation, supply isolators and passive isolators)
- A large selection of standard signal- and measurement isolating transformers
- High level of galvanic isolation

Process value displays

Page I.2

- Large four-character LED display
- 1/8"-DIN-standard front-panel with IP 65 protection
- Integrated signal converter and trip amplifier

Configuration software

Seite J.2

- Supports FDT and FDT2
- Central data management
- Integrated safety
- Device configurator

Accessories

Page K.2

- Configuration adapter
- Power-feed modules
- Calibrators

Quick select – Analogue Signal Conditioning

Selection table

Order No.	Product	Input									Width
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed	
	Network-compatible current measuring transducers – ACT20C										
1510370000	ACT20C-GTW-100-MTCP-S	1								RJ45, Modbus TCP	22.5 mm
1510240000	ACT20C-CMT-10-AO-RC-S	1								0...5/10 A AC/DC	22.5 mm
1510420000	ACT20C-CMT-60-AO-RC-S	1								0...40/50/60 A AC/DC	22.5 mm
2044840000	ACT20C-CML-10-AO-RC-S	1								0...1/5/10 A AC/DC	22.5 mm
1510340000	ACT20C-LBT-10	0									20.6 mm
	Intrinsically safe signal converters – ACT20X										
	HART® transparent supply isolator										
8965430000	ACT20X-HAI-SAO-S	1	X	X						EX, HART® transparent	X 22.5 mm
2456140000	ACT20X-HAI-SAO-P	1	X	X						EX, HART® transparent	X 22.5 mm
8965440000	ACT20X-2HAI-2SAO-S	2	X	X						EX, HART® transparent	X 22.5 mm
2456150000	ACT20X-2HAI-2SAO-P	2	X	X						EX, HART® transparent	X 22.5 mm
	HART® transparent output driver										
8965450000	ACT20X-SAI-HAO-S	1		X						HART® transparent	22.5 mm
2456160000	ACT20X-SAI-HAO-P	1		X						HART® transparent	22.5 mm
8965460000	ACT20X-2SAI-2HAO-S	2		X						HART® transparent	22.5 mm
2456170000	ACT20X-2SAI-2HAO-P	2		X						HART® transparent	22.5 mm
	Temperature transducer										
8965470000	ACT20X-HTI-SAO-S	1	X	X			X	X		EX, temperature + mA	22.5 mm
2456180000	ACT20X-HTI-SAO-P	1	X	X			X	X		EX, temperature + mA	22.5 mm
8965480000	ACT20X-2HTI-2SAO-S	2	X	X			X	X		EX, temperature + mA	22.5 mm
2456190000	ACT20X-2HTI-2SAO-P	2	X	X			X	X		EX, temperature + mA	22.5 mm
	Pulse isolators with relay output										
8965340000	ACT20X-HDI-SDO-RNO-S	1								EX, Namur initiator, switching signal	X 22.5 mm
2456050000	ACT20X-HDI-SDO-RNO-P	1								EX, Namur initiator, switching signal	X 22.5 mm
8965350000	ACT20X-HDI-SDO-RNC-S	1								EX, Namur initiator, switching signal	X 22.5 mm
2456060000	ACT20X-HDI-SDO-RNC-P	1								EX, Namur initiator, switching signal	X 22.5 mm
8965370000	ACT20X-2HDI-2SDO-RNO-S	2								EX, Namur initiator, switching signal	X 22.5 mm
2456080000	ACT20X-2HDI-2SDO-RNO-P	2								EX, Namur initiator, switching signal	X 22.5 mm
8965380000	ACT20X-2HDI-2SDO-RNC-S	2								EX, Namur initiator, switching signal	X 22.5 mm
2456090000	ACT20X-2HDI-2SDO-RNC-P	2								EX, Namur initiator, switching signal	X 22.5 mm
	Pulse isolators with transistor output										
8965360000	ACT20X-HDI-SDO-S	1								EX, Namur initiator, switching signal	X 22.5 mm
2456070000	ACT20X-HDI-SDO-P	1								EX, Namur initiator, switching signal	X 22.5 mm
8965390000	ACT20X-2HDI-2SDO-S	2								EX, Namur initiator, switching signal	X 22.5 mm
2456100000	ACT20X-2HDI-2SDO-P	2								EX, Namur initiator, switching signal	X 22.5 mm
	Digital output										
8965400000	ACT20X-SDI-HDO-L-S	1								NPN / PNP switching signal	22.5 mm
2456100000	ACT20X-SDI-HDO-L-P	1								NPN / PNP switching signal	22.5 mm
8965420000	ACT20X-2SDI-2HDO-S	2								NPN / PNP switching signal	22.5 mm
2456120000	ACT20X-2SDI-2HDO-P	2								NPN / PNP switching signal	22.5 mm
8965410000	ACT20X-SDI-HDO-H-S	1								NPN / PNP switching signal	22.5 mm
2456120000	ACT20X-SDI-HDO-H-P	1								NPN / PNP switching signal	22.5 mm
	Universal measurement transducers										
8965490000	ACT20X-HUI-SAO-S	1	X	X	X	X	X	X		EX, temperature + mA + V	X 22.5 mm
2456200000	ACT20X-HUI-SAO-P	1	X	X	X	X	X	X		EX, temperature + mA + V	X 22.5 mm
1318220000	ACT20X-HUI-SAO-LP-S	1	X	X	X	X	X	X		EX, temperature + mA + V	12.5 mm

Output						Configuration	Auxiliary power		Isolation		Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage		Connection system	
0						Software	24 V DC	30 V	3-way	S	Modbus TCP Gateway
1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Current carrying conductor at the terminals
0											Electrical termination on mounting rail bus, ACT20C station
1		X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
1		X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
2		X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
2		X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
1		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
1		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
2		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
2		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
1	X	X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1	X	X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2	X	X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2	X	X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1					Transistor output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1					Transistor output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2					Transistor output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2					Transistor output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	ATEX approval, intrinsic safety ignition protection IIC
2					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	ATEX approval, intrinsic safety ignition protection IIC
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	ATEX approval, intrinsic safety ignition protection IIB
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	ATEX approval, intrinsic safety ignition protection IIB
1	X	X		X	Limit value relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1	X	X		X	Limit value relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1		X			-	Software	output loop	300 V	2-way	S	With ATEX approval, intrinsic safety

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Quick select – Analogue Signal Conditioning

Selection table

Order No.	Product	Input									Width
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed	
	Signal converters and monitoring components – ACT20P										
	Signal converters										
7760054114	ACT20P-CI-CO-S	1	X	X						2-/3-wire transmitter, HART® transparent / X	12.5 mm
2489680000	ACT20P-CI-CO-P	1	X	X						2-/3-wire transmitter, HART® transparent / X	12.5 mm
7760054117	ACT20P-2CI-2CO-12-S	2	X	X						4-wire sensor, HART® transparent	12.5 mm
2489730000	ACT20P-2CI-2CO-12-P	2	X	X						4-wire sensor, HART® transparent	12.5 mm
1540010000	ACT20P-CI-VO-S	1	X	X						2-/3-/4-wire sensor / X	12.5 mm
2489740000	ACT20P-CI-VO-P	1	X	X						2-/3-/4-wire sensor / X	12.5 mm
7760054306	ACT20P-VM-AO-S	1								0...440 V AC, 0...660 V DC	22.5 mm
	Passive isolators										
7760054123	ACT20P-CI-CO-ILP-S	1	X	X						4-wire sensor / X	12.5 mm
7760054124	ACT20P-2CI-2CO-ILP-S	2	X	X						4-wire sensor / X	12.5 mm
7760054122	ACT20P-CI-2CO-OLP-S	1		X						4-wire sensor / X	12.5 mm
7760054118	ACT20P-CI1-CO-OLP-S	1	X							4-wire sensor / X	12.5 mm
7760054119	ACT20P-CI2-CO-OLP-S	1		X						4-wire sensor / X	12.5 mm
7760054121	ACT20P-VI-CO-OLP-S	1			X					4-wire sensor / X	12.5 mm
7760054120	ACT20P-VI1-CO-OLP-S	1				X				4-wire sensor / X	12.5 mm
7760054122	ACT20P-CI-2CO-OLP-S	1		X						4-wire sensor / X	12.5 mm
	Signal splitters										
7760054115	ACT20P-CI-2CO-S	1	X	X						2-/3-/4-wire sensor, HART® transparent / X	12.5 mm
2489710000	ACT20P-CI-2CO-P	1	X	X						2-/3-/4-wire sensor, HART® transparent / X	12.5 mm
	Temperature transducer										
7760054305	ACT20P-TMR-RTI-S	1						X		PT100	22.5 mm
2448100000	ACT20P-PRO-RTCI-AO-DO-S	1					X	X		RTD, SRTD, Pot, mV, resistance / X	12.5 mm
2448110000	ACT20P-PRO-RTCI-AO-DO-P	1					X	X		RTD, SRTD, Pot, mV, resistance / X	12.5 mm
7940045760	ACT20P-UI-2RCO-DC-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm
2456840000	ACT20P-UI-2RCO-DC-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm
1238910000	ACT20P-UI-2RCO-AC-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm
2495690000	ACT20P-UI-2RCO-AC-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm
	Measurement and monitoring relays										
7760054164	ACT20P-VMR-1PH-H-S	1								1 phase 0...400 V AC/DC	22.5 mm
7760054165	ACT20P-VMR-3PH-ILP-H-S	1								3 phases 180...500 V AC	22.5 mm
	Current measuring transducers										
2044850000	ACT20P-CML-10-AO-RC-S	1								0...1/5/10 A AC/DC	17.5 mm
2489910000	ACT20P-CML-10-AO-RC-P	1								0...1/5/10 A AC/DC	17.5 mm
1510470000	ACT20P-CMT-10-AO-RC-S	1								0...5/10 A AC/DC	22.5 mm
1510540000	ACT20P-CMT-30-AO-RC-S	1								0...20/25/30 A AC/DC	22.5 mm
1510440000	ACT20P-CMT-60-AO-RC-S	1								0...40/50/60 A AC/DC	22.5 mm
1510390000	ACT20P-CMT-60-RC-S	1								0...40/50/60 A AC/DC	22.5 mm
1510330000	ACT20P-CMT-10-AO-RC-P	1								0...5/10 A AC/DC	22.5 mm
1510320000	ACT20P-CMT-30-AO-RC-P	1								0...20/25/30 A AC/DC	22.5 mm
1510290000	ACT20P-CMT-60-AO-RC-P	1								0...40/50/60 A AC/DC	22.5 mm
1510280000	ACT20P-CMT-60-RC-P									0...40/50/60 A AC/DC	22.5 mm
	Bridge measuring transducers										
1067250000	ACT20P-BRIDGE-S	1								4-,6-wire strain gauge / X	22.5 mm
2456820000	ACT20P-BRIDGE-P	1								4-,6-wire strain gauge / X	22.5 mm
	Universal measurement transducers										
1481970000	ACT20P-PRO DCDC II-S	1	X	X	X	X				± 100 mA, ± 300 V DC / X	12.5 mm
1481960000	ACT20P-PRO DCDC II-P	1	X	X	X	X				± 100 mA, ± 300 V DC / X	12.5 mm
1453210000	ACT20P-UI-AO-DO-LP-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 28 V DC, ± 300 V DC, 300 V AC / X	12.5 mm
2456850000	ACT20P-UI-AO-DO-LP-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 28 V DC, ± 300 V DC, 300 V AC / X	12.5 mm
1477420000	ACT20P-AI-AO-DC-S	1	X	X	X	X				0...11 V, 0...22 mA / X	12.5 mm
2456860000	ACT20P-AI-AO-DC-P	1	X	X	X	X				0...11 V, 0...22 mA / X	12.5 mm

Output						Configuration	Auxiliary power	Rated voltage	Isolation	Connection system	Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous						
1	X	X				-	24 V DC	300 V	3-way	S	HART® transparent
1	X	X				-	24 V DC	300 V	3-way	P	HART® transparent
2	X	X				-	24 V DC	300 V	3-way	S	HART® transparent
2	X	X				-	24 V DC	300 V	3-way	P	HART® transparent
1			X			-	24 V DC	300 V	3-way	S	
1			X			-	24 V DC	300 V	3-way	P	
1	X	X	X			Software	24...240 V UC	600 V	3-way	S	
1	X	X				-	input loop	300 V	2-way	S	
2	X	X				-	input loop	300 V	4-way	S	
2		X				-	output loop	300 V	3-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
2		X				-	output loop	300 V	4-way	S	
2	X	X				-	24 V DC	300 V	4-way	S	HART® transparent
2	X	X				-	24 V DC	300 V	4-way	P	HART® transparent
2				X	2 x relay outputs (limit value)	Software, Display	20...264 V UC	300 V	5-way	S	
1	X	X	X		analogue and NPN output, Limit value	Display, Button	24...240 V UC	300 V	3-way	S	
1	X	X	X		analogue and NPN output, Limit value	Display, Button	24...240 V UC	300 V	5-way	P	
1				X	2 x Limit value relay output	Software, Display	9...60 V DC	300 V	5-way	S	
1				X	2 x Limit value relay output	Software, Display	9...60 V DC	300 V	5-way	P	
1				X	2 x Limit value relay output	Software, Display	90...264 V AC	300 V	5-way	S	
1				X	2 x Limit value relay output	Software, Display	90...264 V AC	300 V	5-way	P	
2				X	2 x Limit value relay output	DIP switch, potentiometer	20...240 V UC	300 V	5-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	Input loop	600 V	5-way	S	
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Power cable can be connected to the terminals
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Power cable can be connected to the terminals
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1				X	Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1				X	Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	P	Through hole current converter
1	X	X	X		Reset button (TARE)	DIP switch, button	10...60 V DC	300 V	3-way	S	
1	X	X	X		Reset button (TARE)	DIP switch, button	10...60 V DC	300 V	3-way	P	
1	X	X	X		± 10 V, ± 20 mA	Display, DIP switch, button	24 V - 230 V AC/DC	600 V	3-way	S	aktiv or passiv output
1	X	X	X		± 10 V, ± 20 mA	Display, DIP switch, button	24 V - 230 V AC/DC	600 V	3-way	P	aktiv or passiv output
1		X			NPN output, Limit value	Software	output loop	300 V	3-way	S	Output Loop powered
1		X			NPN output, Limit value	Software	output loop	300 V	3-way	P	Output Loop powered
1	X	X	X		0...11V, 0...22mA	DIP switch, button, LED	12...60 V DC	300 V	3-way	S	
1	X	X	X		0...11V, 0...22mA	DIP switch, button, LED	12...60 V DC	300 V	3-way	P	

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Quick select – Analogue Signal Conditioning

Selection table

Order No.	Product	Input									Width
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed	
	Space-saving signal converters – ACT20M										
	Signal converters										
1175980000	ACT20M-CI-CO-S	1	X	X						4-wire sensor	6.1 mm
1176000000	ACT20M-AI-AO-S	1	X	X	X	X				2-;4-wire sensor X	6.1 mm
1176010000	ACT20M-AI-AO-E-S	1	X	X	X	X				4-wire sensor	6.1 mm
1375450000	ACT20M-BAI-AO-S	1								-10(20)...+10(20) mA, -5(10)...+5(10) V	6.1 mm
	Passive isolators										
1176070000	ACT20M-CI-CO-ILP-S	1	X	X						4-wire sensor	6.1 mm
1176080000	ACT20M-2CI-2CO-ILP-S	2	X	X						4-wire sensor	6.1 mm
1176040000	ACT20M-CI-CO-OLP-S	1		X						2-wire transmitter X	6.1 mm
1176050000	ACT20M-2CI-2CO-OLP-S	2		X						2-wire transmitter X	6.1 mm
	Signal splitters										
1175990000	ACT20M-CI-2CO-S	1	X	X						4-wire sensor	6.1 mm
1176020000	ACT20M-AI-2SAO-S	1	X	X	X	X				2-;4-wire sensor X	6.1 mm
1375470000	ACT20M-BAI-2AO-S	1								-10(20)...+10(20) mA, -5(10)...+5(10) V	6.1 mm
	Temperature transducer										
1435590000	ACT20M-RTCI-CO-OLP-S	1					X	X		PT100 Type: J,K	6.1 mm
1435610000	ACT20M-RTI-CO-EOLP-S	1						X		PT100	6.1 mm
1375510000	ACT20M-RTI-AO-S	1						X		PT100	6.1 mm
1375520000	ACT20M-RTI-AO-E-S	1						X		PT100	6.1 mm
1375480000	ACT20M-TCI-AO-S	1					X			Type J,K	6.1 mm
1375500000	ACT20M-TCI-AO-E-S	1					X			Type J,K	6.1 mm
	Universal measurement transducers										
1176030000	ACT20M-UI-AO-S	1	X	X	X	X	X	X		PT50/100/250/300/400/1000, Ni50/100/1000 Type: B / C / E / J / K / L / N / R / S / T X	6.1 mm
	Signal converters in terminal format – MCZ										
	Frequency signal converters										
8461470000	MCZ VFC 0-10V	1			X					4-wire sensor	6 mm
8461480000	MCZ CFC 0-20MA	1	X							4-wire sensor	6 mm
8461490000	MCZ CFC 4-20MA	1		X						4-wire sensor	6 mm
	Limit monitoring										
8260280000	MCZ SC 0-10V	1			X					4-wire sensor	6 mm
8227350000	MCZ SC 0-20MA	1	X							4-wire sensor	6 mm
	Passive isolators										
8411190000	MCZ CCC 0-20mA/0-20mA	1	X							4-wire sensor	6 mm
	Temperature transducer										
8425720000	MCZ PT100/3 CLP 0...100C	1						X		Measuring range 0...100°C	6.1 mm
8483680000	MCZ PT100/3 CLP 0...120C	1						X		Measuring range 0...120°C	6.1 mm
8604420000	MCZ PT100/3 CLP 0...150C	1						X		Measuring range 0...150°C	6.1 mm
8473010000	MCZ PT100/3 CLP 0...200C	1						X		Measuring range 0...200°C	6.1 mm
8473020000	MCZ PT100/3 CLP 0...300C	1						X		Measuring range 0...300°C	6.1 mm
8473000000	MCZ PT100/3 CLP -50C...+150C	1						X		Measuring range -50...150°C	6.1 mm
8604430000	MCZ PT100/3 CLP -40C...100C	1						X		Measuring range -40...100°C	6.1 mm
	Compact standard signal isolators – PicoPak										
2517450000	PICOPAK-CI-CO-LP-S	1		X						4-wire sensor	6.1 mm
2501110000	PICOPAK-CI-CO-LP-P	1		X						4-wire sensor	6.1 mm

Output						Configuration	Auxiliary power		Isolation	Connection system	Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage			
1	X	X					24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X					input loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2	X	X					input loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
1		X					output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2		X					output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2	X	X				DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
2	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
2	X	X	X		-10(20)...+10(20) mA	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1		X			20...4 mA	DIP switch	output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
1		X			20...4 mA	DIP switch	output loop		-	S	ATEX approval Zone 2, Passive converter
1	X	X	X		0(1)...5 V	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X			0(1)...5 V	DIP switch	24 V DC		-	S	ATEX approval Zone 2
1	X	X	X		interne CJC, externe CJC	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X	X		interne CJC, externe CJC	DIP switch	24 V DC		-	S	ATEX approval Zone 2
1	X	X	X			Software	24 V DC	300 V	3-way	S	ATEX approval Zone 2
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
2					NPN output, Limit value	Potentiometer	24 V DC			Z	
2					NPN output, Limit value	Potentiometer	24 V DC			Z	
1	X						input loop	100 V	2-way	Z	Passive isolator ILP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X				Potentiometer	output loop	300 V	2-way	S	Passive converter, ATEX approval Zone 2, UL certified
1		X				Potentiometer	output loop	300 V	2-way	P	Passive converter, ATEX approval Zone 2, UL certified

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Quick select – Analogue Signal Conditioning

Selection table

Order No.	Product	Input									Width
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed	
	Signal & serial interface converters – WAVESERIES										
	Universal measurement transducers										
8939670000	WAS6 TTA	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm
8939680000	WAZ6 TTA	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm
8964310000	WAS6 TTA EX	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm
8964320000	WAZ6 TTA EX	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm
	Current measuring transducers										
8528650000	WAS1 CMA LP 1/5/10A ac	1								0...1/5/10 A AC	22.5 mm
8528660000	WAZ1 CMA LP 1/5/10A ac	1								0...1/5/10 A AC	22.5 mm
8975590000	WAS1 CMA LP 1/5/10A EX	1								0...1/5/10 A AC	22.5 mm
	Serial interface converters										
8615700000	WDS2 RS232/RS485/422	1								RS232/RS485/422	22.5 mm
8615690000	WDS2 RS232/TTY	1								RS232/TTY	22.5 mm
	Limit & current monitoring										
8543820000	WAS5 DC/Alarm	1	X	X	X					4-wire sensor	17.5 mm
8543880000	WAZ5 DC/Alarm	1	X	X	X					4-wire sensor	17.5 mm
8742610000	PAS CMR 0,5...2,5 A DC									Input range 7.5 A	15.3 mm
8742620000	PAS CMR 2,0...5,0 A DC									Input range 15 A	15.3 mm
8742630000	PAS CMR 4,5...10 A DC									Input range 30 A	15.3 mm
	Process value displays										
7940012323	PTX800D RO/AO	1								NAMUR, PNP/NPN, TTL-Logic, 0...10 Hz	97 mm
7940011133	PTX800D	1								NAMUR, PNP/NPN, TTL-Logic, 0...10 Hz	97 mm
7940014374	PTX800A 4-20MA/RO/AO	1								-24...+24 mA / -11...+11 V	97 mm
7940010243	PTX800A 4-20MA	1								-24...+24 mA / -11...+11 V	97 mm
7940018957	PMX420PLUS	1	X	X	X	X					97 mm
7940018956	PMX420	1	X	X	X	X			0		97 mm
7940011979	PMX400HZX RO/AO	1				0			X	NAMUR, PNP/NPN, TTL-Logic	97 mm
7940015595	PMX400HZX	1							X	NAMUR, PNP/NPN, TTL-Logic	97 mm
7940011570	DI350 0-10V/0-100.0	1			X						97 mm
7940010185	DI350 4-20MA/0-100.0	1		X							97 mm
7940010236	LPD450F 4-20MA	1		X							140 mm
7940010163	LPD350 4-20MA/0-100.0	1		X							97 mm
	Accessories										
8965500000	ACT20-FEED-IN-PRO-S	1								24 V + 24 V redundancy	22.5 mm
2456870000	ACT20-FEED-IN-PRO-P	1								24 V + 24 V redundancy	22.5 mm
1282490000	ACT20-FEED-IN-BASIC-S	1								24 V	6.1 mm
8978580000	CBX200 USB	1								Chinch plug	

Output						Configuration	Auxiliary power		Isolation	Connection system	Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage			
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	S	
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	Z	
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	S	ATEX approval Zone 2
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V		Z	ATEX approval Zone 2
1		X				DIP switch	output loop	300 V	2-way	S	
1		X				DIP switch	output loop	300 V	2-way	Z	
1		X				DIP switch	output loop	300 V	2-way	S	ATEX approval Zone 2
1					RS232/RS485/422	DIP switch	24 V DC		3-way	S	
1					RS232/TTY	DIP switch	24 V DC		3-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	Z	
1				X	Reed contact activated from 0.5 A DC	-	-	-	2-way	S	
1				X	Reed contact activated from 2 A DC	-	-	-	2-way	S	
1				X	Reed contact activated from 4,5 A DC	-	-	-	2-way	S	
1	X	X	X	X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
1				X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
1	X	X	X	X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
1				X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
				X	4 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
					Display with 4 Digits	Buttons on the device	18...50 V DC	300 V	3-way	S	
1	X	X	X	X	2 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
1				X	2 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
					Display with 4,5 Digits 0...100%	Buttons on the device	24 V DC	300 V	3-way	S	
					Display with 4,5 Digits 0...100%	Buttons on the device	24 V DC	300 V	3-way	S	
					Display with 4,5 Digits 0...100%	Buttons on the device	loop powered			S	
					Display with 4,5 Digits 0...100%	Buttons on the device	loop powered			S	
1				X	24 V for CH20M bus systems + redundancy		24 V DC			S	
1				X	24 V for CH20M bus systems + redundancy		24 V DC			P	
1					24 V for CH20M bus systems		24 V DC			S	
1						Software	-			RJ45	Interface adapter for configuration

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Simple and retrofittable – IoT-terminal

Lay the foundations for generating added value from data

Industrial IoT – simple and compact with the IoT-terminal

The IoT-terminal enables the monitoring of physically separated systems with IoT solutions. It also makes it easier to retrofit industrial IoT on existing systems. But the Weidmüller IoT-terminal also offers a cost-effective solution for integrating all system components into the automation system.

The IoT-terminal is an open, secure and quickly integrated solution for industrial IoT. It captures data, transfers data to cloud services while also allowing for active data-driven interactions. The Weidmüller IoT-terminal is based on proven IT technologies in a cost-optimised design. It also makes it easier to retrofit industrial IoT on existing systems.

Your particular benefits for IoT:

- Retrofit solution
- Narrow and compact tree design
- Cloud integration via MQTT
- Mobile communication with NB-IoT and LTE-M Cat. 1
- Suitable for various applications

Mobile communication
The data is communicated via NB-IoT and LTE-M Cat.1 mobile radio. These are 3GPP telecommunications standards that are optimised for cost-effective, energy-saving, low-rate and high-density IoT services.

BLE Interface for Smartphones
An intuitive smartphone app supports the user during the entire setup and maintenance process.

Cloud integration
Communication to the Weidmüller cloud platform is performed via MQTT.

IoT-terminal

- Retrofitting of Industrial IoT for existing systems
- Proven IT technologies, cost-optimal design
- Monitoring of spatially-seperated systems with IoT solutions
- Integration of all system parts in automation
- Optimised for a wide range of industrial applications

IT20-ATDIORO-NB-P

Technical data

Supply	
Supply voltage at DC, min.	9.6 V
Supply voltage at DC, max.	31.2 V
Communication	
Wireless module	Cat-M1, Cat-NB1, EDGE, GPRS
SIM-Card slot type	NANO-SIM
Input	
Number of channels analogue input - RTD	4
Sensor connection analogue input - RTD	2-wire, 3-wire, 4-wire
Type analogue input - RTD	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni 200, Ni500, Ni1000, Cu10, 40Ω, 80Ω, 150Ω, 300Ω, 500Ω,1kΩ, 2kΩ,4kΩ
Number of channels analogue input - TC	4
Sensor connection analogue input - TC	2-wire
Type analogue input - TC	J, K, T, B, N, E, R, S, L, U, mV
Number of channels analogue input - V | mA	2
Sensor connection analogue input -V | mA	2-wire
Resolution analogue input voltage -V | mA	16 Bit
Number of channels digital input	4
Sensor connection digital input	2-wire
Input delay adjustable	0s...40s
RS-485 2-wire	Data+, Data-, GND
Output	
Number of channels digital output	4
Type	P-switching
Number of channels relay output	2

Note

Ordering data

Type	Qty.	Order No.
IT20-ATDIORO-NB-P		**2740080000**

Note

Accessories

Note

Network-compatible current measuring transducers – ACT20C

ACT20C signal conditioner with Ethernet interface

Comprehensive process transparency is provided by the transfer of diagnostics information, signals and data

To be able to control systems and processes optimally, you require a constant flow of information on the current states of individual applications, devices and functions.

Our ACT20C signal conditioner not only monitors the signal conversion, but also communicates precise information on device status, signals and data directly to connected computer and control systems.

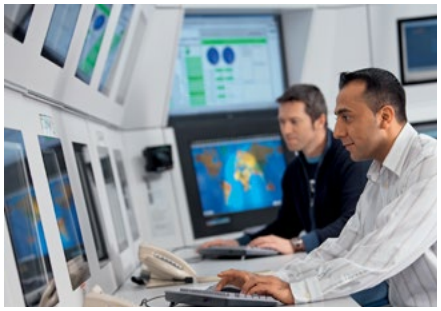
Our Ethernet interface enables an event-controlled transfer of diagnostics information, which in turn supports the elimination of faults in, for example, plant operation.

Universal signal conversion
Can be used in a multitude of applications thanks to customer and application specific defined conversion methods with just one single module.

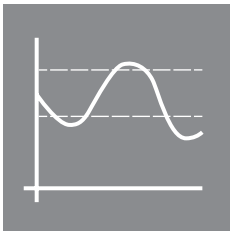
Simple operation and configuration
Software supported configuration allows a fast application of settings and simple operation.

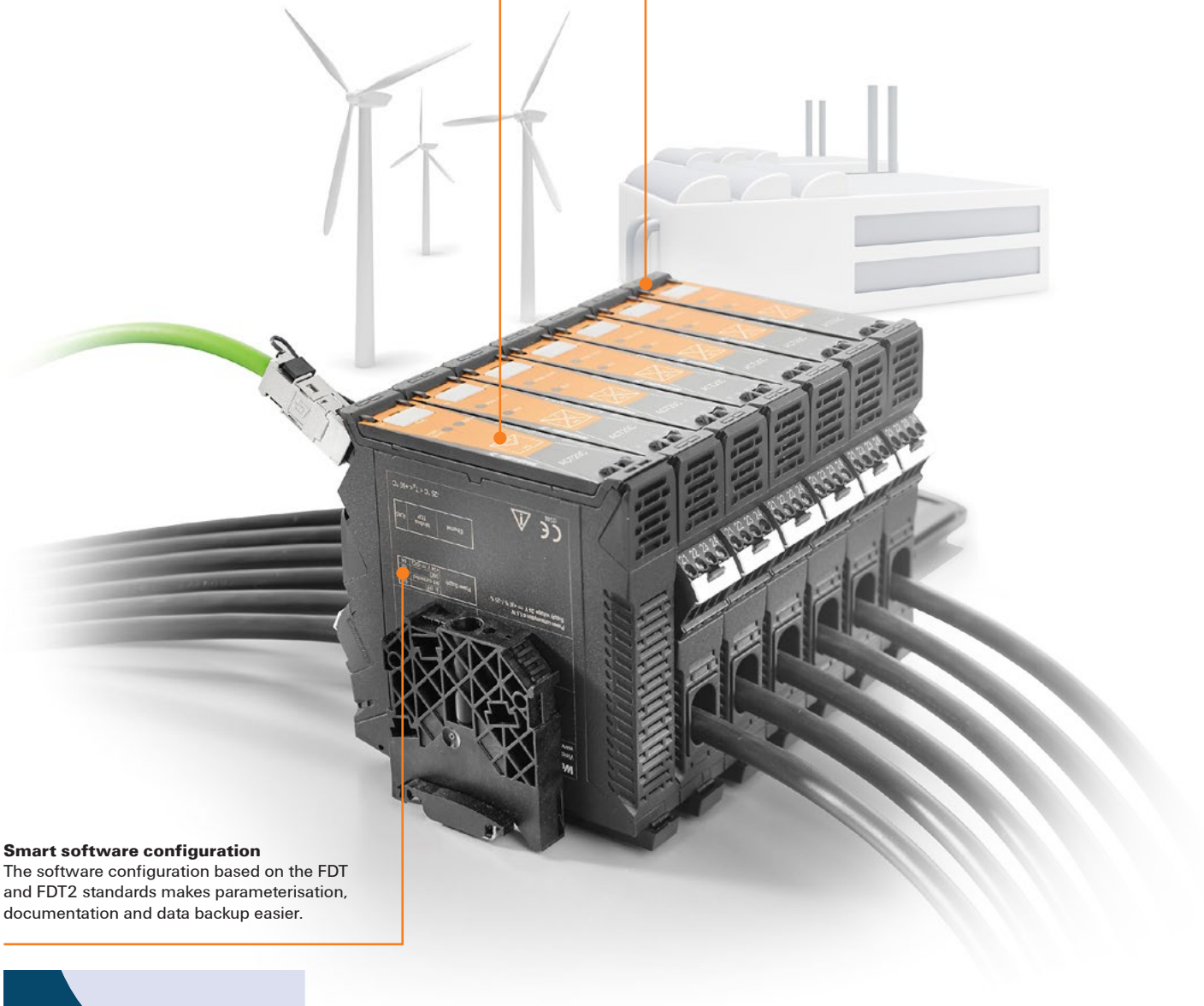
Simple remote access
Continuous monitoring of device and system functions, simple and affordable integration of existing Ethernet networks.

Condition monitoring
Preventative maintenance strategies using automation-independent information about operating conditions and process data for connected devices.



Multiple limit value monitoring
The main alarm and auxiliary alarm permit precise identification of all alarm situations.

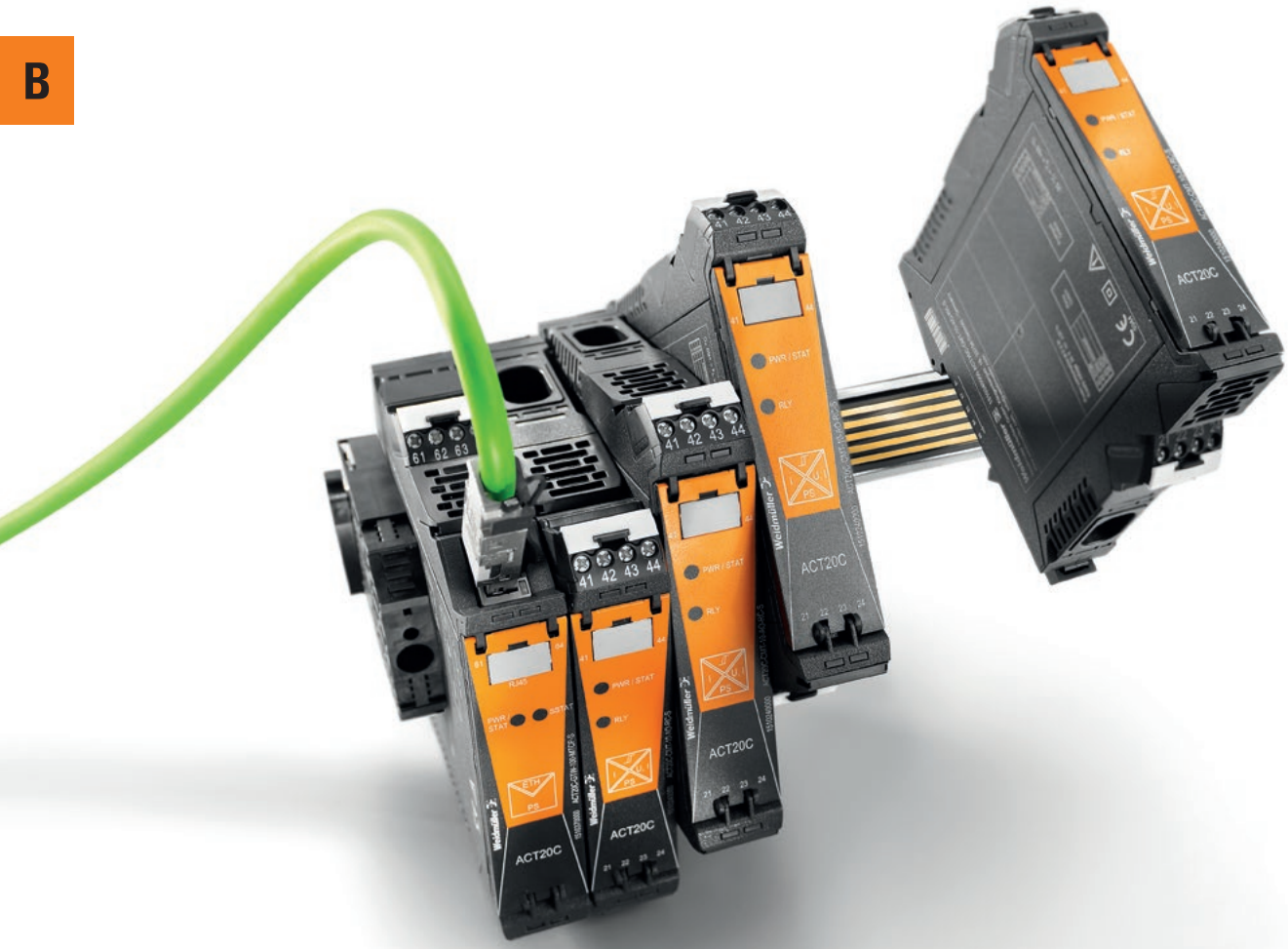




Smart software configuration
The software configuration based on the FDT and FDT2 standards makes parameterisation, documentation and data backup easier.

High process reliability
A galvanic four-way isolation and an impulse withstand voltage of 6.4 kV pursuant to IEC 61010-2-201 guarantee optimum fusing.

Selection table



Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Network-compatible current measuring transducers – ACT20C											
1510370000	ACT20C-GTW-100-MTCP-S	1								RJ45, Modbus TCP	22.5 mm	
1510240000	ACT20C-CMT-10-AO-RC-S	1								0...5/10 A AC/DC	22.5 mm	
1510420000	ACT20C-CMT-60-AO-RC-S	1								0...40/50/60 A AC/DC	22.5 mm	
2044840000	ACT20C-CML-10-AO-RC-S	1								0...1/5/10 A AC/DC	22.5 mm	
1510340000	ACT20C-LBT-10	0									20.6 mm	

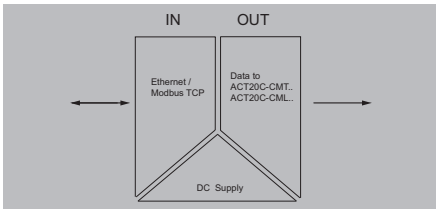
	Output						Configuration	Auxiliary power	Rated voltage	Isolation	Connection system	Special characteristics
	Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous						
	0						Software	24 V DC	30 V	3-way	S	Modbus TCP Gateway
	1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Through hole current converter
	1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Through hole current converter
	1	X	X	X	X	± 20 mA, Limit value relays	Software	24 V DC	300 V	4-way	S	Current carrying conductor at the terminals
	0											Electrical termination on mounting rail bus, ACT20C station

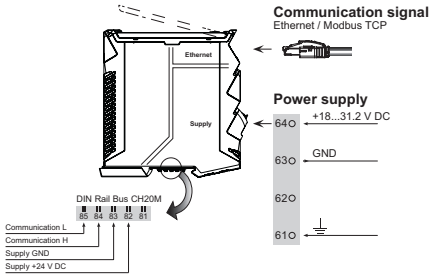
Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Gateway for ACT20C station

- Access to all data from the devices connected to an ACT20C station
- RJ45 port with Ethernet TCP/IP
- Configuration by means of the FDT/DTM standard
- Station management with "Plug & Produce" and "Hot Swapping"

ACT20C-GTW-100-MTCP-S





Technical data

Communication	
Addressing	DHCP or manual adjustment
Configuration	With FDT/DTM software, DHCP
RJ45 ports	10/100BaseT(X), auto negotiation
Interface	Ethernet 10/100 Base T, Jack plug for CBX200, Communication via CH20M rail bus with all current measuring transducers (ACT20C-CMT-x)
General data	
Configuration	With FDT/DTM software, DHCP
Power consumption, max.	1.5 W
Voltage supply	18.0 ... 31.2 V DC
Insulation coordination	
Rated voltage / test voltage: Ethernet interface to supply / functional earth to supply / Ethernet interface	30 V AC RMS
Standards	IEC 61010-1, IEC 61010-2-201:2013, 1st Edition, IEC 61326-1:2012
Test voltage	1.1 kV
Impulse withstand voltage	0,5 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	II

Dimensions		Screw connection, RJ45 plug-in connector
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Depth / Height / Width		113.6 / 117.2 / 22.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20C-GTW-100-MTCP-S	1	1510370000

Note

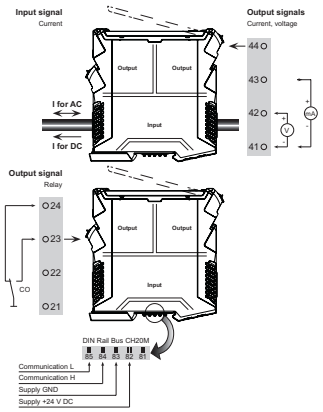
Accessories

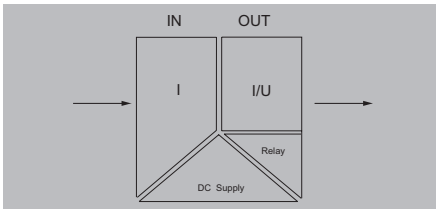
Note

Communicative current-measuring transducer

- Measuring and monitoring of AC/DC current
- Input and output ranges are adjustable
- Contact-free through-hole technology
- Relay output for limit value alarm with switching threshold, delay, hysteresis
- Monitoring/configuration via ACT20C station/gateway

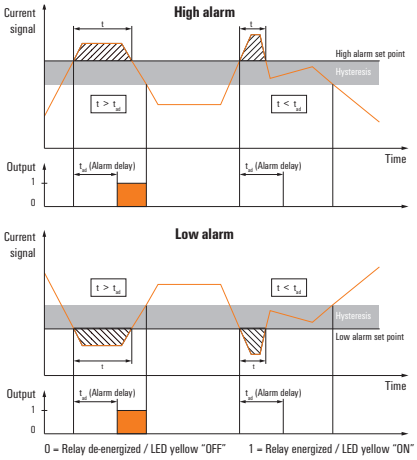
ACT20C-CMT





Technical data

Input	
Input measurement range	1510240000: configurable, 0...5/10 A AC (RMS) or DC; 1510420000: configurable, 0...40/50/60 A AC (RMS) or DC
Input signal	Current-carrying cable in feed-through hole, Diameter 10.5 mm
Input frequency	AC: 15...700 Hz
Output (analogue)	
Output voltage	Adjustable, 0...10 V, 2...10 V, 0...5 V, 1...5 V, -5...+5 V, -10...+10 V
Output current	Adjustable, 0...20 mA, 4...20 mA, -20...+20 mA
Load resistance current	≤ 600 Ω
Load resistance voltage	≥ 10 kΩ
Output (digital)	
Type	Relay, 1 CO contact, Process alarms (4x) with hysteresis, with alarm delay (configurable) 0...180 s
Rated switching current	6 A
Max. switching voltage, AC	250 V
General data	
Configuration	With FDT/DTM software, via gateway (ACT20C-GTW-100-MTCP-S), Addressing via DIP switches
Step response time	< 300 ms
Temperature coefficient	typ. 0.04 % / K, max. 0.09 % / K
Voltage supply	via the system bus
Insulation coordination	
Rated voltage	300 V AC_{rms}
EMC standards	IEC 61326-1
Galvanic isolation	4-way isolator;, between input / output / supply / relay
Test voltage	4 kV
Impulse withstand voltage	6.4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III



Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth / Height / Width	
Note	

Screw connection	
1.5 / 0.5 / 2.5	
113.6 / 117.2 / 22.5	

User address	DIP switch S1 1	2	3	4	5	6
2		■				
3	■	■				
4			■			
5	■		■			
6		■	■			
7	■	■	■			
8				■		
....						
16					■	
....						
32						■
33	■					■

■ = ON

Ordering data

	Type	Qty.	Order No.
Input measurement range 0...5/10 A	ACT20C-CMT-10-A0-RC-S	1	1510240000
Input measurement range 0...40/50/60 A	ACT20C-CMT-60-A0-RC-S	1	1510420000

Note

Accessories

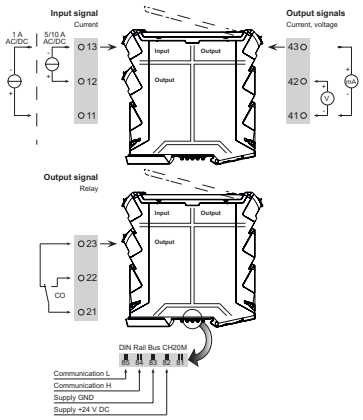
Note

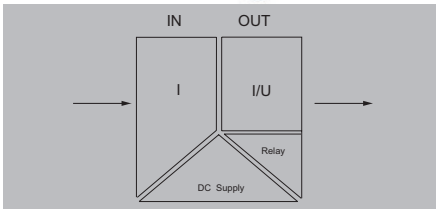
Network-compatible current measuring transducers – ACT20C

Communicative current-measuring transducer

- Measurement and monitoring of AC/DC currents
- Input/output electrically isolated
- Measurement range extension via passive current transformers
- A component of the ACT20C station
- Relay output for limit value alarm with switching threshold, delay, hysteresis

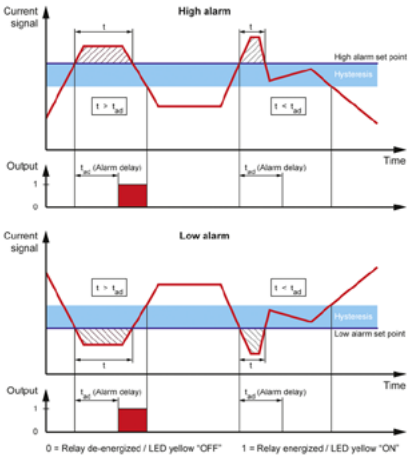
ACT20C-CML-10-AO-RC-S





Technical data

Input	
Input measurement range	configurable, 0...1/5/10 A AC (RMS) or DC
Input signal	Power cable can be connected to the terminals
Input frequency	AC: 15...400 Hz (true root mean square), AC: 50 Hz (arithmetic average)
Output (analogue)	
Output voltage	Adjustable, 0...10 V, 2...10 V, 0...5 V, 1...5 V, -5...+5 V, -10...+10 V
Output current	Adjustable, 0...20 mA, 4...20 mA, -20...+20 mA
Load resistance current	≤ 600 Ω
Load resistance voltage	≥ 10 kΩ
Output (digital)	
Type	Relay, 1 CO contact, Process alarms (4x) with hysteresis, with alarm delay (configurable) 0...180 s
Rated switching current	2 A
Max. switching voltage, AC	250 V
General data	
Configuration	for thresholds (overcurrent / undercurrent), delay and hysteresis, via gateway (ACT20C-GTW-100-MTCP-S), With FDT/DTM software
Step response time	≤ 300 ms (RMS), ≤ 60 ms (AA)
Temperature coefficient	≤ ±100 ppm/K @ -25...+55 °C, ≤ ±200 ppm/K @ +55...+70 °C
Voltage supply	24 V DC ± 30 %
Insulation coordination	
Rated voltage	300 V AC_{rms}
EMC standards	IEC 61326-1, IEC 61010-2-201
Galvanic isolation	4-way isolator;, between input / output / supply / relay
Test voltage	4 kV
Impulse withstand voltage	6 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III



Configuration

	DIP switch S1					
User address	1	2	3	4	5	6
2		■				
3	■	■				
4			■			
5	■		■			
6		■	■			
7	■	■	■			
8				■		
....						
16					■	
....						
32						■
33	■					■

■ = ON

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Depth / Height / Width		113.6 / 117.2 / 17.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20C-CML-10-AO-RC-S	1	**2044840000**

Note

Accessories

Note

Bus termination terminal

- Electrical termination of the CH20M rail bus of an ACT20C station
- Acts as a mechanical end bracket at the same time

ACT20C-LBT-10

Technical data

Humidity	5...95 %, no condensation
Ambient temperature	-25 °C...+60 °C
General data	
Tightening torque, min.	1.2 Nm
Tightening torque, max.	2.4 Nm
Rail	TS 35

Dimensions	
Depth / Width / Height	63 / 20.6 / 56

Note

Ordering data

Type	Qty.	Order No.
ACT20C-LBT-10	1	1510340000

Note

Accessories

Note

Intrinsically safe signal converters – ACT20X

Secure isolation of signals from hazardous areas
Intrinsically safe ACT20X Ex-signal converters

Your application requires signals to be routed to or from hazardous areas. Our intrinsically safe ACT20X signal isolating convertors meet the strict standards of the process industry and process signals from a wide range of Ex-zones (Zones 0, 1, 2) for control purposes.

ACT20X can be used universally. On the input side, the converter can process HART® input signals, or DC, RTD, thermocouple or NAMUR signals from the Ex-zone. On the output side, the ACT20X controls field devices with analogue or digital signals. All ACT20X products are characterised by high insulation, high accuracy and high temperature stability.

The 2-channel versions with width of 22.5 mm are available with either transistor or relay output. Because of this highly integrated design, the ACT20X helps you to reduce installation costs and use less space.

Intrinsically safe signal converters with SIL approval are available for safety functions, e.g. switching aggregates on/off, monitoring actuators or temperature/ pressure. Our ACT20X complies with these stringent standards of the process industry, as well as mining industry requirements.

Configuration via FDT

All modules can be quickly and conveniently configured with manufacturer-independent FDT/DTM software.

Alarm function

No laborious troubleshooting. Alarm function integrated for cable or sensor errors. In case of failures, a diagnostic signal is sent to the control system.

Worldwide application

Fulfils the strict standards and requirements of the process industry. Can be used worldwide due to international and local approvals ATEX, IECEX, CULUS, FM, GOST and DNV.

Robust

Wide ambient temperature range from – 20 °C ... + 60 °C.

Intelligent connection system

Pluggable, coded, with release lever. The release lever simplifies maintenance and allows disconnection without damaging the cables.

SIL certification according 61508

Available for safety functions, e.g. switching aggregates on/off, monitoring actuators or temperature/pressure.

Selection table

Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Intrinsically safe signal converters – ACT20X											
	HART® transparent supply isolator											
8965430000	ACT20X-HAI-SAO-S	1	X	X						EX, HART® transparent / X	22.5 mm	
2456140000	ACT20X-HAI-SAO-P	1	X	X						EX, HART® transparent / X	22.5 mm	
8965440000	ACT20X-2HAI-2SAO-S	2	X	X						EX, HART® transparent / X	22.5 mm	
2456150000	ACT20X-2HAI-2SAO-P	2	X	X						EX, HART® transparent / X	22.5 mm	
	HART® transparent output driver											
8965450000	ACT20X-SAI-HAO-S	1		X						HART® transparent	22.5 mm	
2456160000	ACT20X-SAI-HAO-P	1		X						HART® transparent	22.5 mm	
8965460000	ACT20X-2SAI-2HAO-S	2		X						HART® transparent	22.5 mm	
2456170000	ACT20X-2SAI-2HAO-P	2		X						HART® transparent	22.5 mm	
	Temperature transducer											
8965470000	ACT20X-HTI-SAO-S	1	X	X			X	X		EX, temperature + mA	22.5 mm	
2456180000	ACT20X-HTI-SAO-P	1	X	X			X	X		EX, temperature + mA	22.5 mm	
8965480000	ACT20X-2HTI-2SAO-S	2	X	X			X	X		EX, temperature + mA	22.5 mm	
2456190000	ACT20X-2HTI-2SAO-P	2	X	X			X	X		EX, temperature + mA	22.5 mm	
	Pulse isolators with relay output											
8965340000	ACT20X-HDI-SDO-RNO-S	1								EX, Namur initiator, switching signal / X	22.5 mm	
2456050000	ACT20X-HDI-SDO-RNO-P	1								EX, Namur initiator, switching signal / X	22.5 mm	
8965350000	ACT20X-HDI-SDO-RNC-S	1								EX, Namur initiator, switching signal / X	22.5 mm	
2456060000	ACT20X-HDI-SDO-RNC-P	1								EX, Namur initiator, switching signal / X	22.5 mm	
8965370000	ACT20X-2HDI-2SDO-RNO-S	2								EX, Namur initiator, switching signal / X	22.5 mm	
2456080000	ACT20X-2HDI-2SDO-RNO-P	2								EX, Namur initiator, switching signal / X	22.5 mm	
8965380000	ACT20X-2HDI-2SDO-RNC-S	2								EX, Namur initiator, switching signal / X	22.5 mm	
2456090000	ACT20X-2HDI-2SDO-RNC-P	2								EX, Namur initiator, switching signal / X	22.5 mm	
	Pulse isolators with transistor output											
8965360000	ACT20X-HDI-SDO-S	1								EX, Namur initiator, switching signal / X	22.5 mm	
2456070000	ACT20X-HDI-SDO-P	1								EX, Namur initiator, switching signal / X	22.5 mm	
8965390000	ACT20X-2HDI-2SDO-S	2								EX, Namur initiator, switching signal / X	22.5 mm	
2456100000	ACT20X-2HDI-2SDO-P	2								EX, Namur initiator, switching signal / X	22.5 mm	
	Digital output											
8965400000	ACT20X-SDI-HDO-L-S	1								NPN / PNP switching signal	22.5 mm	
2456100000	ACT20X-SDI-HDO-L-P	1								NPN / PNP switching signal	22.5 mm	
8965420000	ACT20X-2SDI-2HDO-S	2								NPN / PNP switching signal	22.5 mm	
2456120000	ACT20X-2SDI-2HDO-P	2								NPN / PNP switching signal	22.5 mm	
8965410000	ACT20X-SDI-HDO-H-S	1								NPN / PNP switching signal	22.5 mm	
2456120000	ACT20X-SDI-HDO-H-P	1								NPN / PNP switching signal	22.5 mm	
	Universal measurement transducers											
8965490000	ACT20X-HUI-SAO-S	1	X	X	X	X	X	X		EX, temperature + mA + V / X	22.5 mm	
2456200000	ACT20X-HUI-SAO-P	1	X	X	X	X	X	X		EX, temperature + mA + V / X	22.5 mm	
1318220000	ACT20X-HUI-SAO-LP-S	1	X	X	X	X	X	X		EX, temperature + mA + V	12.5 mm	

Output						Configuration	Auxiliary power		Isolation	Connection system	Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage			
1		X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
1		X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
2		X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
2		X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
1		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
1		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
2		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety, HART® transparent
2		X			Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety, HART® transparent
1	X	X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1	X	X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2	X	X			Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2	X	X			Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2				X	Relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1					Transistor output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1					Transistor output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2					Transistor output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
2					Transistor output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
2					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	ATEX approval, intrinsic safety ignition protection IIC
2					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	ATEX approval, intrinsic safety ignition protection IIC
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	S	ATEX approval, intrinsic safety ignition protection IIB
1					Ex Output, Status relay	Software	24 V DC	300 V	3-way	P	ATEX approval, intrinsic safety ignition protection IIB
1	X	X		X	Limit value relay output, Status relay	Software	24 V DC	300 V	3-way	S	With ATEX approval, intrinsic safety
1	X	X		X	Limit value relay output, Status relay	Software	24 V DC	300 V	3-way	P	With ATEX approval, intrinsic safety
1		X			-	Software	output loop	300 V	2-way	S	With ATEX approval, intrinsic safety

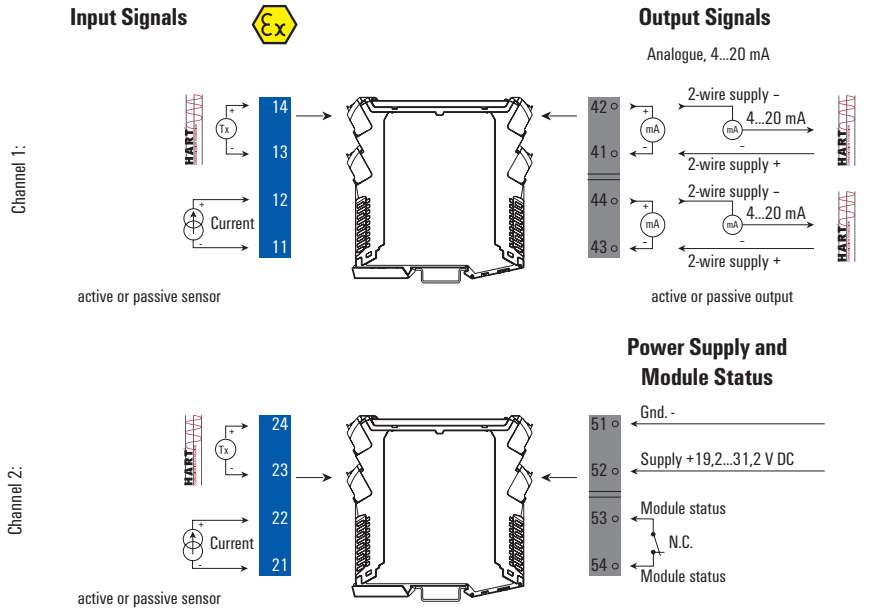
Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

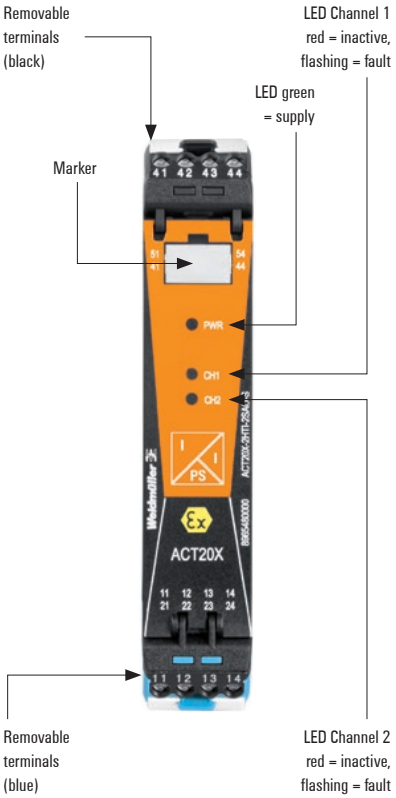
HART® transparent supply isolator

HART® transparent current supply isolators

The ACT20X-HAI-SAO current supply isolator is a HART®-protocol transparent signal isolator for analogue input signals from Ex zone 0. It provides an analogue signal for the safe zone on the output side. It is available in a single-channel or double-channel version.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

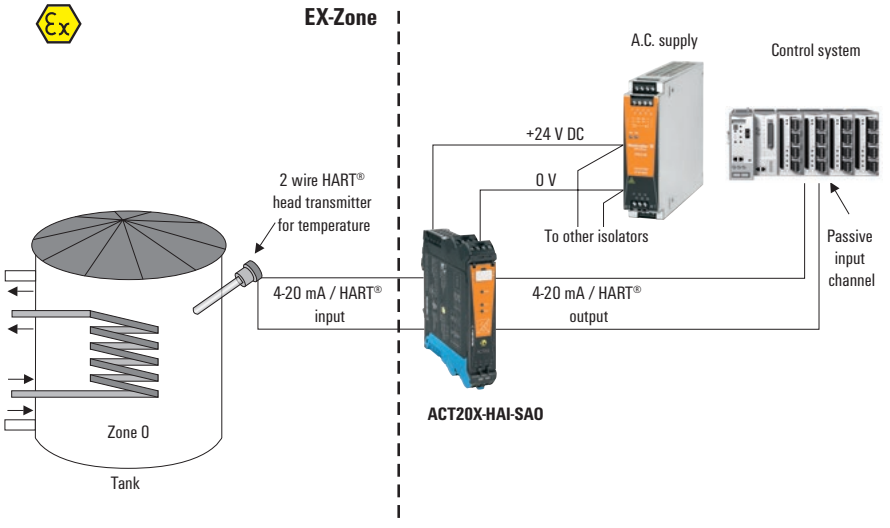




Ex label (excerpt)

ATEX	**FM**	U_o/U_i	0 V / 30 V
II 3 G Ex nA nC IIC T4 Gc	Installation in CL I DIV2 GP A-D T4	I_o/I_i	0 mA / 120 mA
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G or	P_o/P_i	0 mW / 0,85 W
II (1) D [Ex ia Da] IIIC	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	L_i	0 µH
	Example:	C_i	2 nF
IECEx	ATEX version,	IIC	C_o = 0,08 µF, L_o= 3 mH
Ex nA nC IIC T4 Gc	Ex input, External Current Source:	IIB	C_o = 0,6 µF, L_o= 12 mH
[Ex ia Ga] IIC/IIB/IIA	(More details in ATEX certificate)	IIA	C_o = 2,15 µF, L_o= 25 mH

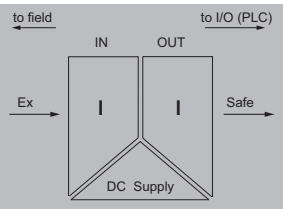
Application example:
Measuring temperature with a head transmitter, signal transmission with HART®



Current supply isolator

- Converts analogue signals from Ex zone 0 into analogue output signals for safe zones.
- Active and passive current inputs/outputs
- HART® - transparent
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Relay output for failure alarm
- 2-channel module, can also be used as a signal splitter

ACT20X-HAI-SAO-S / 2HAI-2SAO-S



Technical data

Input	
Input current	4...20mA
Sensor supply	3.8...26 V DC
Residual ripple (current loop)	< 7.5 mV_{eff}
Output analogue	
Output current	4...20 mA
Output signal limit	< 28 mA
Load impedance current	≤ 600 Ω
2-wire supply	≤ 26 V DC
Accuracy	< 0.1% span
Temperature coefficient	< 0.01% of span/°C (TU)
Step response time	≤ 5 ms
Cut-off frequency (-3 dB)	0.5...2.5 kHz @ 3.5...23 mA bi-directional HART® signal
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 1.0 W
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DEKRAATEX; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXDEK
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.25 / 2.5	
Depth x width x height	mm	113.6 / 22.5 / 119.2	114.6 / 22.5 / 127.3
Note			

Ordering data

1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-HAI-SAO-S	1	**8965430000**
PUSH IN connection	ACT20X-HAI-SAO-P	1	**2456140000**
2-channel version			
Screw connection	ACT20X-2HAI-2SAO-S	1	**8965440000**
PUSH IN connection	ACT20X-2HAI-2SAO-P	1	**2456150000**

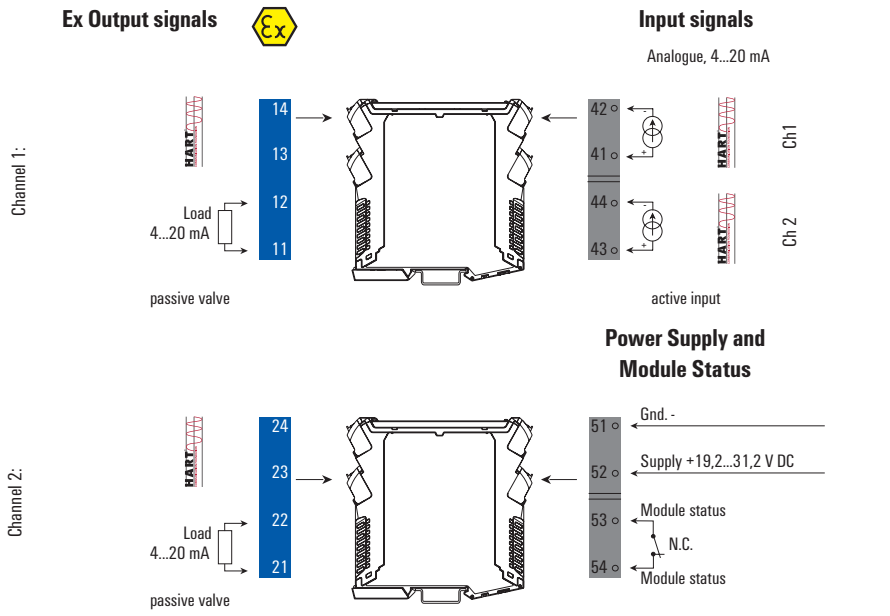
Note	
	CBX200 USB configuration adapter - 8978580000

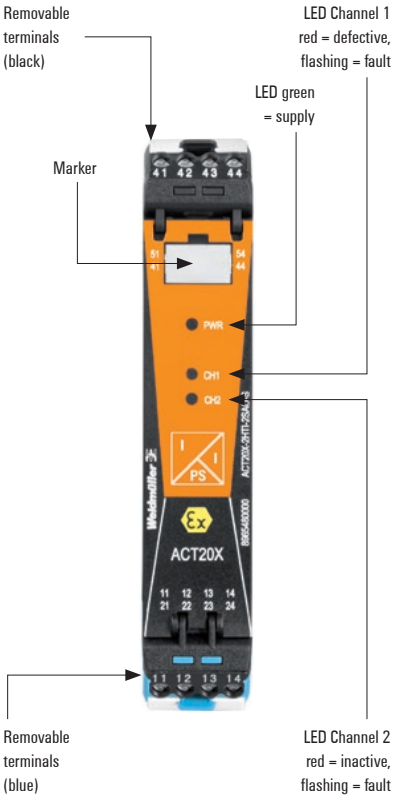
HART® transparent output driver

HART® transparent current output isolators

The ACT20X-SAI-HAO current output isolator is HART®-transparent. The input is connected to the safe area controller or PLC, and the output is connected to an analog actuator in a hazardous area, e.g. Zone 0. It is available in a single-channel or double-channel version.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

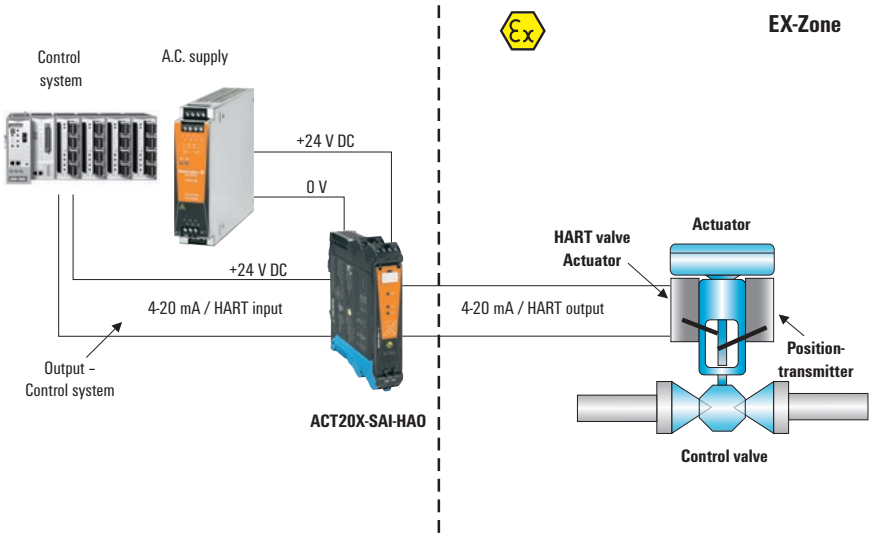




Ex label (excerpt)

ATEX	**FM**	U_o	28 V
II 3 G Ex nA nC IIC T4 Gc	Installation in CL I DIV2 GP A-D T4	I_o	93 mA
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G or	P_o	0.65 W
II (1) D [Ex ia Da] IIIC	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	IIC	C_o = 0.08 µF, L_o= 4 mH
IECEx	Example:	IIB	C_o = 0.65 µF, L_o= 16 mH
Ex nA nC IIC T4 Gc	ATEX version,	IIA	C_o = 2.15 µF, L_o= 32 mH
[Ex ia Ga] IIC/IIB/IIA	Ex output,		
[Ex ia Da] IIIC	(More details in ATEX certificate)		

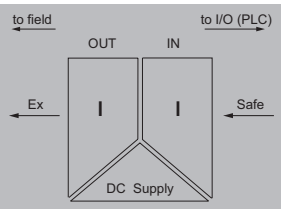
Application example: controlling an actuator in the Ex zone.



Current output isolator

- For controlling field devices located in explosion risk zones
- HART® Transparent
- Relay output for error alarm
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- 1 or 2 channels in one module

ACT20X-SAI-HAO-S / 2SAI-2HAO-S



Technical data

Input	
Input current	4...20mA
Voltage drop	< 2 V
Output analogue	
Output current	4...20 mA (max. 23 mA)
Output signal limit	< 28 mA
Load impedance current	≤ 725 Ω
2-wire supply	> 14.5 V @ 20 mA
Residual ripple (current loop)	< 7.5 mV_{eff}
Accuracy	< 0.1% span
Temperature coefficient	< 0.01% of span/°C (TU)
Step response time	≤ 5 ms
Cut-off frequency (-3 dB)	0.5...2.5 kHz @ 3.5...23 mA bi-directional HART® signal
Alarm output	
Type	Relay, 1 NO (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 1.0 W
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DEKRAATEX; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXDEK
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.25 / 2.5	
Depth x width x height	mm	113.6 / 22.5 / 119.2	114.6 / 22.5 / 127.3
Note			

Ordering data

1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-SAI-HAO-S	1	**8965450000**
PUSH IN connection	ACT20X-SAI-HAO-P	1	**2456160000**
2-channel version			
Screw connection	ACT20X-2SAI-2HAO-S	1	**8965460000**
PUSH IN connection	ACT20X-2SAI-2HAO-P	1	**2456170000**

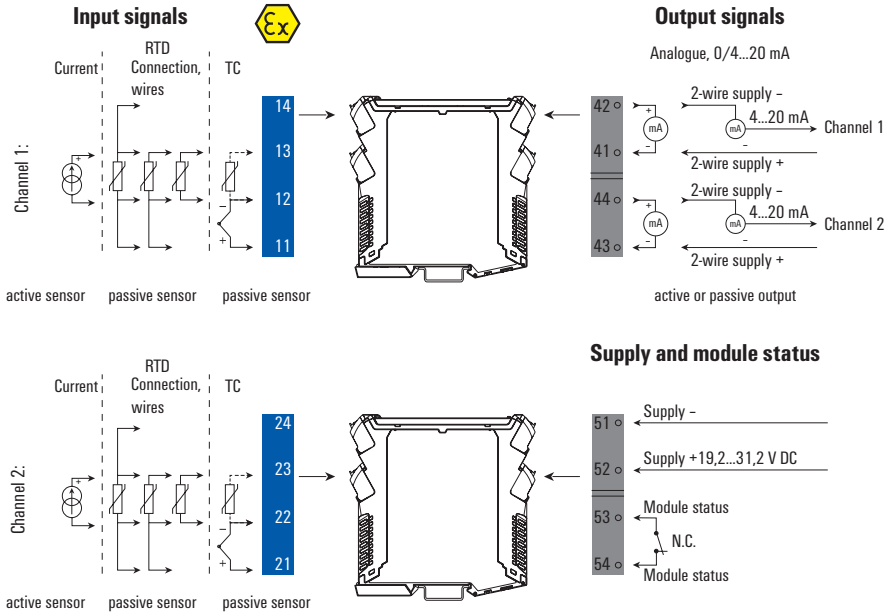
Note	
	CBX200 USB configuration adapter - 8978580000

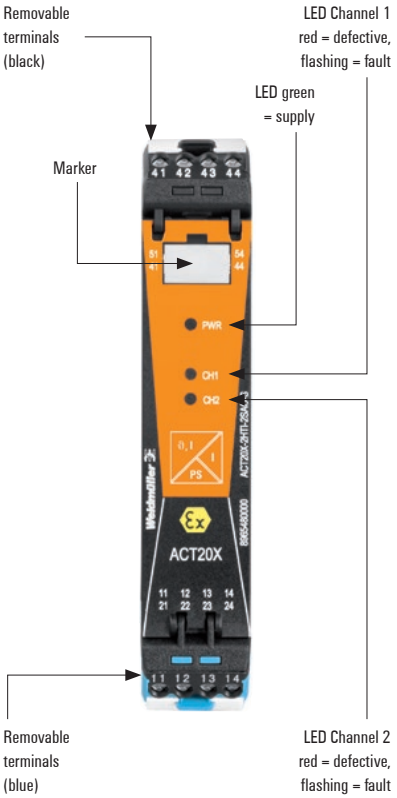
Temperature transducer

Temperature transducer

The ACT20X-HTI-SAO temperature transducer processes temperature signals from PT100 sensors and thermocouples originating in the Ex zone. A current signal (mA) can also be connected as the input signal. The input is part of an intrinsically safe circuit (Zone 0). The isolated milliamp analogue output is the input to the receiver or controller in the safe area. It is available in a single-channel or double-channel version.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

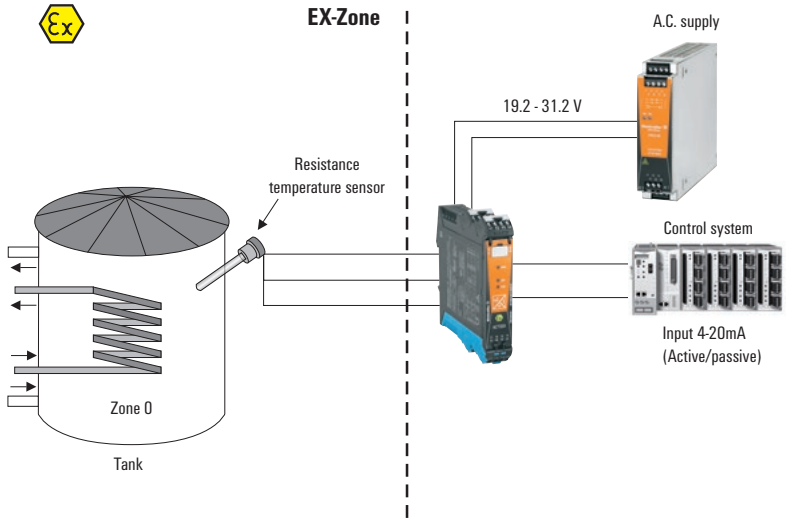




Ex label (excerp)

ATEX	**FM**	U_o/U_i	8.7 V / 10 V
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	I_o/I_i	18.4 mA / 30 mA
II (1) G [Ex ia] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G or	P_o	400 mW
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	$L_o/R_o/L_i$	892 µH/Ω / 820 nH
	Example:	C_i	30 nF
IECEx	ATEX version,	IIC	C_o = 5 µF, L_o= 100 mH
Ex nA nC IIC T4 Gc	Ex input Temperature,	IIB	C_o = 50 µF, L_o= 300 mH
[Ex ia Ga] IIC/IIB/IIA	(More details in ATEX certificate)	IIA	C_o = 1000 µF, L_o= 700 mH

Application example: temperature measurements in the Ex zone



Accuracy / temperature coefficients ACT20X-HTI-SAO

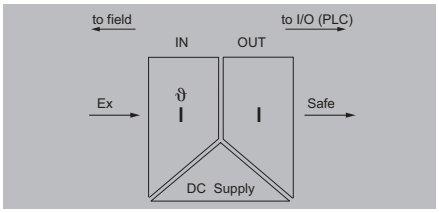
Input	Accuracy	Temperature coefficient
Input mA	≤ ±4 µA	≤ ±4 µA / °C
Input RTD		
Pt100	≤ ±0.2 °C	≤ ±0.02 °C / °C
Ni100	≤ ±0.3 °C	≤ ±0.03 °C / °C
Input TC		
Type B	≤ ±4.5 °C	≤ ±0.45 °C / °C
Type E, J, K, L, N, T, U	≤ ±1 °C	≤ ±0.1 °C / °C
Type R, S, W3, W5, LR	≤ ±2 °C	≤ ±0.2 °C / °C
Note		

Temperature transducer

- Converts intrinsically safe RTD, thermocouple and mA signals into analogue signals for safe zones.
- PC configuration with FDT/DTM software, download link at www.weidmueller.com
- Relay output for failure alarm
- 1 or 2 channels in one module
- 2-channel module, can also be used as a signal splitter

ACT20X-HTI-SAO-S / 2HTI-2SAO-S

Usable as:
- Safety barrier (insulator)
- Signal conversion
- 2-wire measuring transducer
- Amplifier, repeater



Technical data

Input	
Type	intrinsically safe circuit, RTD, TC, DC (mA)
Temperature input range	Configurable
Line resistance in measuring circuit	≤ 50 Ω
Input current	0...20 mA, 4...20mA
Input resistance, current	20 Ω + PTC 50 Ω
Output	
Output current	0...23 mA, configurable: 0...20 / 4...20 / 20...0 / 20...4 mA, configurable downscale (3.5 mA) / upscale (23 mA) @ error
Output signal limit	3.8...20.5 mA / 0...20.5 mA (dependent on range)
Load impedance current	≤ 600 Ω
Influence of load resistance	≤ 0.01% of span / 100 Ω
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 0.8 W
Tightening torque, min. / Tightening torque, max.	0.4 Nm / 0.6 Nm
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Type	Temperature-range	Accuracy
Metal PTC		
Pt100	-200...850 °C	± (0.15 + 0.02 x T) Class A ± (0.30 °C + 0.005 x T) Class B
Pt500	-200...850 °C	
Pt1000	-200...850 °C	
Ni50		
Ni100	-60...0 °C	± (0.4 + 0.007 x T)
Ni120	0...180 °C	± (0.4 + 0.028 x T)
Ni1000		
TC-Type according to IEC60584-1		
B	50...250 °C	± 25 K
	250...500 °C	± 10 K
	500...1820 °C	± 6 K
E	-200...-150 °C	± 4 K
	-150...1000 °C	± 3 K
J	-200...-150 °C	± 4 K
	-150...1200 °C	± 3 K
K	-200...-150 °C	± 5 K
	-150...1200 °C	± 3 K
	1200...1372 °C	± 4 K
N	-200...-150 °C	± 6 K
	-150...1300 °C	± 3 K
R	-50...200 °C	±10 K
	200..1780 °C	± 6 K
S	-50...200 °C	± 10 K
	200...1780 °C	± 6 K
T	-200...-150 °C	± 5 K
	-150...400 °C	± 3 K
according to DIN43710		
U	0...600 °C	± 3 °C
L	0...900 °C	± 3 °C

Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.25 / 2.5	
Length x width x height	mm	22.5 / 119.2	22.5 / 127.3
Note			

Ordering data

1-channel version	Type	Qty.	Order No.
Screw connection	ACT20X-HTI-SAO-S	1	8965470000
PUSH IN connection	ACT20X-HTI-SAO-P	1	2456180000
2-channel version			
Screw connection	ACT20X-2HTI-2SAO-S	1	8965480000
PUSH IN connection	ACT20X-2HTI-2SAO-P	1	2456190000

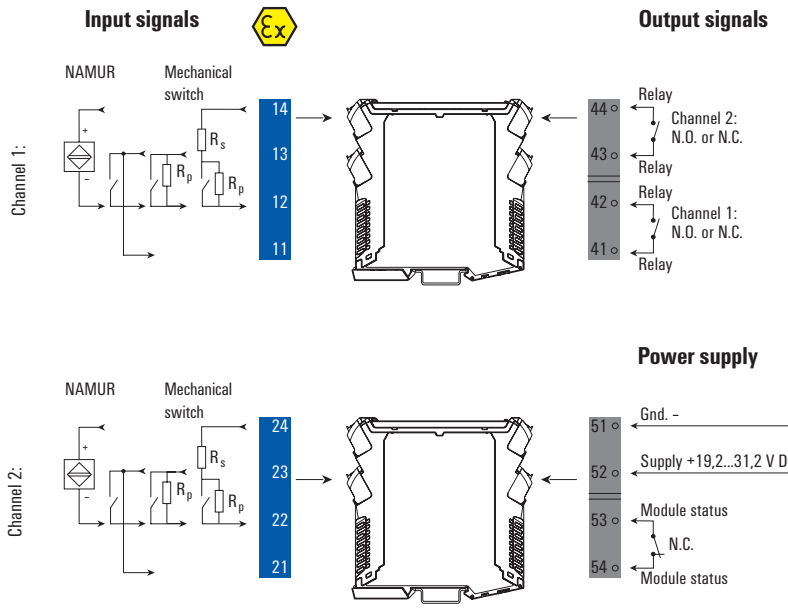
Note
CBX200 USB configuration adapter - 8978580000

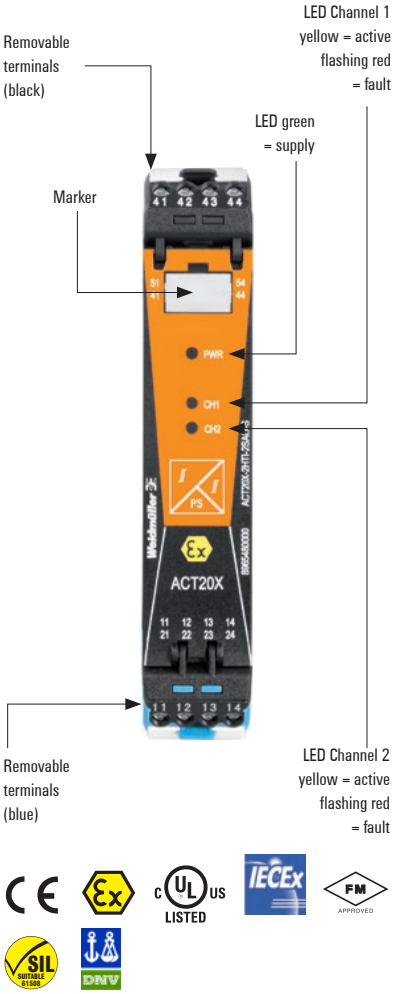
Pulse isolators with relay output

NAMUR disconnect-switch amplifiers with relay output

The ACT20X-HDI-SDO-RNO (NC) isolating switching amplifier is a specialised signal isolating converter for Namur sensor signals or for volt-free contacts from a Zone 0 hazardous area. A single relay, available optionally as NC or NO, provides the output signal in the safe zone. Single-channel or double-channel versions are also available.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

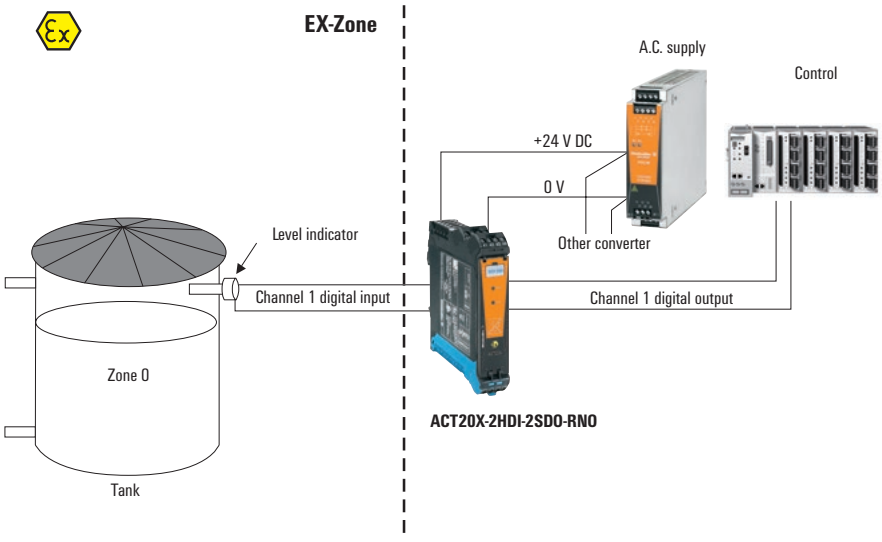




Ex label (excerpt)

ATEX	**FM**	U_o	10.6 V	
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	I_o	12 mA	
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G oder	P_o	32 mW	
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	L_o / R_o	1150 µH/Ω	
IECEx	Example:	IIC	C_o = 2 µF,	L_o= 260 mH
Ex nA nC IIC T4 Gc	ATEX version,	IIB	C_o = 6 µF,	L_o= 780 mH
[Ex ia Ga] IIC/IIB/IIA	Ex input	IIA	C_o = 18 µF,	L_o= 1000 mH
[Ex ia Da] IIIC	(More details in ATEX certificate)			

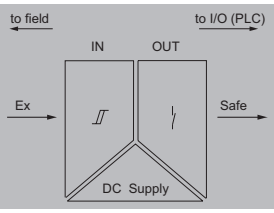
Application: monitoring of fill level with the ACT20X HDI-SDO-RNO (relay output)



NAMUR isolating switching amplifier

- Converts intrinsically safe digital signals (NAMUR / switching contact) from EX Zone 0 into digital output signals (relay output) for the safe zone
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Relay output for error alarm, cable break, short-circuit
- 1 or 2 channels in one module

ACT20X-HDI-SDO-RNO-S / RNC-S
ACT20X-2HDI-2SDO-RNO-S / RNC-S



Technical data

Input	
Sensor	NAMUR sensor, according to EN60947-5-6, switch with or w/o RS, RP
Sensor supply	8 V DC / 8 mA
Resistance	RP = 750 Ω / RS = 15kΩ
Input frequency	< 20 Hz
Trigger level low / Trigger level high	< 1.2 mA / > 2.1 mA
Output signal in case of wire break	< 0.1 mA, > 6.5 mA (in case of wire break)
Output	
Type	Relay, 1 NO, Switching frequency 20 Hz
Nominal switching voltage	≤ 250 V AC / 30 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 1.3 W
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.25 / 2.5	
Length x width x height	mm	22.5 / 119.2	22.5 / 127.3
Note			

Ordering data

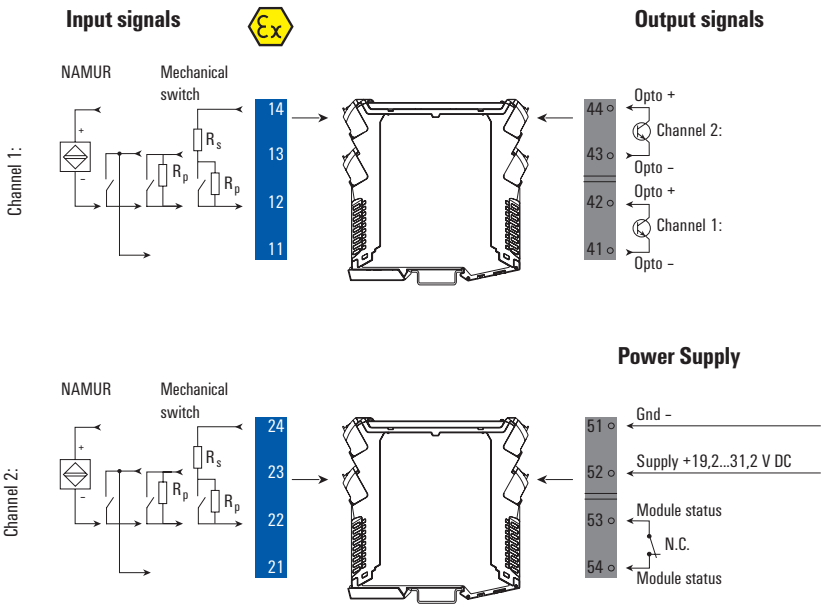
		Type	**Qty.**	**Order No.**
1-channel version, NO				
	Screw connection	ACT20X-HDI-SDO-RNO-S	1	**8965340000**
	PUSH IN connection	ACT20X-HDI-SDO-RNO-P	1	**2456050000**
1-channel version, NC				
	Screw connection	ACT20X-HDI-SDO-RNC-S	1	**8965350000**
	PUSH IN connection	ACT20X-HDI-SDO-RNC-P	1	**2456060000**
2-channel version, NO				
	Screw connection	ACT20X-2HDI-2SDO-RNO-S	1	**8965370000**
	PUSH IN connection	ACT20X-2HDI-2SDO-RNO-P	1	**2456080000**
2-channel version, NC				
	Screw connection	ACT20X-2HDI-2SDO-RNC-S	1	**8965380000**
	PUSH IN connection	ACT20X-2HDI-2SDO-RNC-P	1	**2456090000**
Note		CBX200 USB configuration adapter - 8978580000		

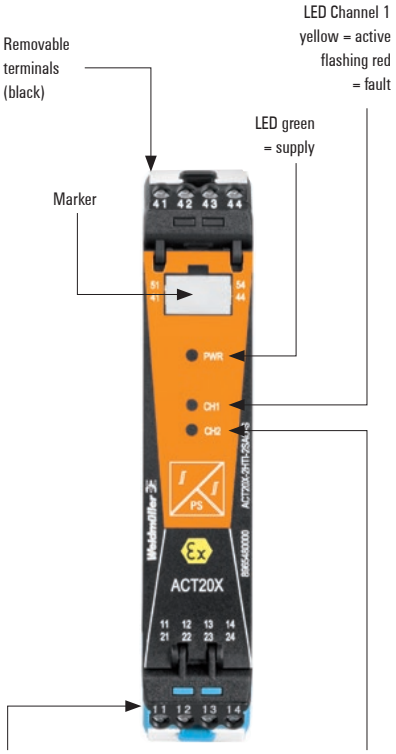
Pulse isolators with transistor output

NAMUR disconnect-switch amplifiers with NPN transistor output

The ACT20X-HDI-SDO isolating switching amplifier is a digital pulse signal isolator for Namur sensors or volt-free contacts from a Zone 0 hazardous area. A transistor (NPN) output is provided for the receiver or controller in the safe area. Single-channel or double-channel versions are also available.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

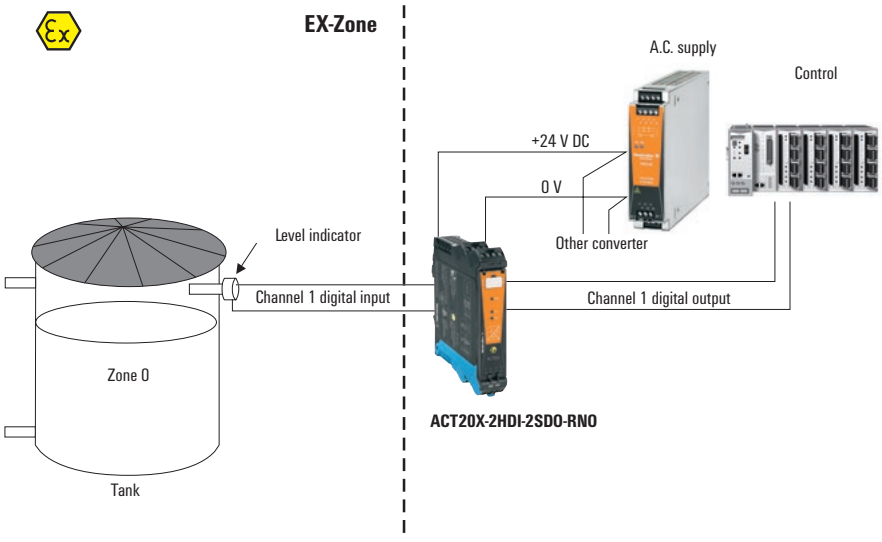




Ex label (excerpt)

ATEX	**FM**	U_o	10.6 V	
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	I_o	12 mA	
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G oder	P_o	32 mW	
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	L_o / R_o	1150 µH/Ω	
IECEx	Example:	IIC	C_o = 2 µF,	L_o= 260 mH
Ex nA nC IIC T4 Gc	ATEX version	IIB	C_o = 6 µF,	L_o= 780 mH
[Ex ia Ga] IIC/IIB/IIA	Ex input	IIA	C_o = 18 µF,	L_o= 1000 mH
[Ex ia Da] IIIC	(More details in ATEX certificate)			

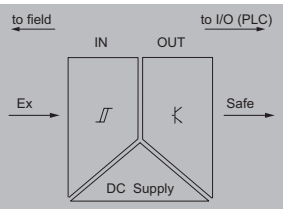
Application: monitoring the fill level with isolating switching amplifier



NAMUR isolating switching amplifier

- Converts intrinsically safe signals (NAMUR / switching contact) from EX Zone 0 into digital output signals (relay output) for the safe zone
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Relay output for error alarm
- 1 or 2 channels in one module

ACT20X-HDI-SDO-S / 2HDI-2SDO-S



Technical data

Input	
Sensor	NAMUR sensor, according to EN60947-5-6, switch with or w/o RS, RP
Sensor supply	8 V DC / 8 mA
Resistance	Series resistor 750Ω, Parallel resistor 15kΩ
Input frequency	0...5 kHz
Pulse duration	> 0.1 ms
Input resistance	1 kΩ
Trigger level low / Trigger level high	< 1.2 mA / > 2.1 mA
Output signal in case of wire break	< 0.1 mA, > 6.5 mA (in case of wire break)
Output	
Type	NPN-Transitor
Pulse duration	> 0.1 ms
Nominal switching voltage	30 V DC
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Power consumption	≤ 1.1 W
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 1.1 W
Tightening torque, min. / Tightening torque, max.	0.4 Nm / 0.6 Nm
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.25 / 2.5	
Length x width x height	mm	22.5 / 119.2	22.5 / 127.3
Note			

Ordering data

1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-HDI-SDO-S	1	**8965360000**
PUSH IN connection	ACT20X-HDI-SDO-P	1	**2456070000**
2-channel version			
Screw connection	ACT20X-2HDI-2SDO-S	1	**8965390000**
PUSH IN connection	ACT20X-2HDI-2SDO-P	1	**2456100000**

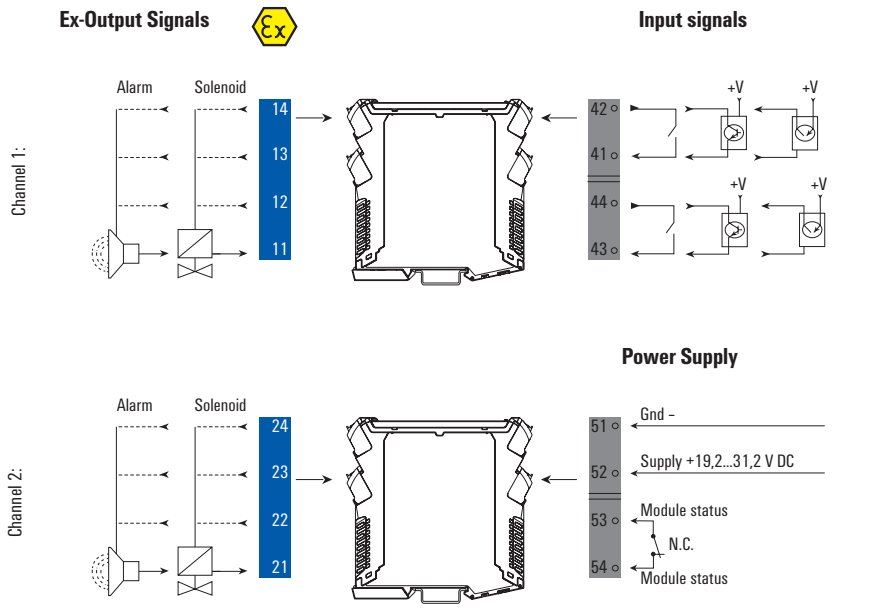
Note	
	CBX200 USB configuration adapter - 8978580000

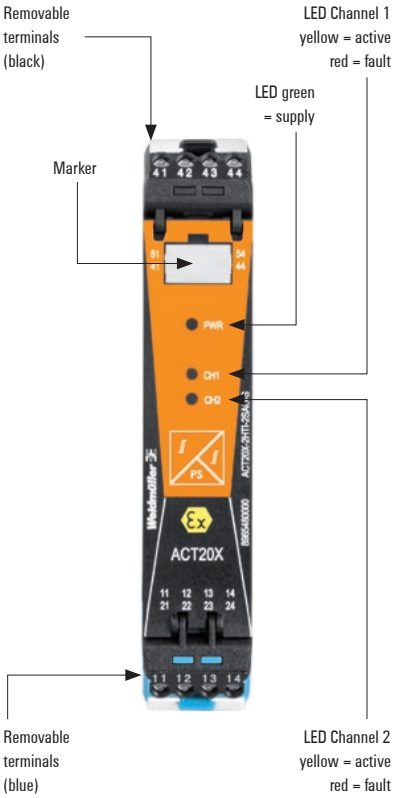
Digital output

Valve control component for gas group IIC, 35 mA

The ACT20X-SDI-HAO-S solenoid/actuator driver takes a switched input from e.g. a safe area controller and delivers an corresponding output to operate an actuator in a hazardous area, e.g. Zone 0. It is available in a single-channel or double-channel version.

EX area Zone 0, 1, 2, 20, 21, 22 | **Save area Zone 2 /FM Kl. 1 Abt. 2**

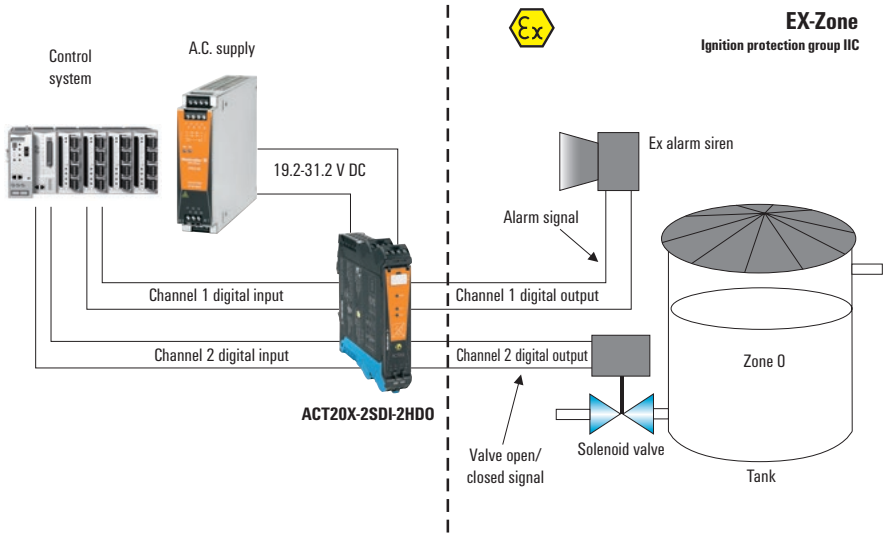




Ex label (excerpt)

ATEX	**FM**	U_o	28 V
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	I_o	100 mA
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G oder	P_o	0.70 mW
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	IIC	C_o = 0.08 µF, L_o= 2.9 mH
IECEx	Example:	IIB	C_o = 0.64 µF, L_o= 12.8 mH
Ex nA nC IIC T4 Gc	ATEX version	IIA	C_o = 2.1 µF, L_o= 22.8 mH
[Ex ia Ga] IIC/IIB/IIA	Ex Output Terminal (11-14)		
[Ex ia Da] IIIC	(More details in ATEX certificate)		

Application: Inflow control in Ex zone with gas group IIC



Output data

For gas group IIC (≤ 35 mA)

Connection terminal			
Channel 1	**U without load**	**U with load**	**I max**
11-12	Min. 24 V	Min. 12.5 V	35 mA
11-13	Min. 24 V	Min. 13.5 V	35 mA
11-14	Min. 24 V	Min. 14.5 V	35 mA
Note			

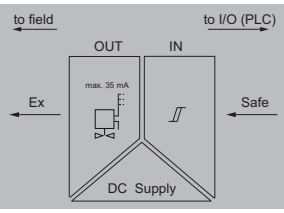
For gas group IIC (≤ 35 mA)

Connection terminal			
Channel 2	**U without load**	**U with load**	**I max**
21-22	Min. 24 V	Min. 12.5 V	35 mA
21-23	Min. 24 V	Min. 13.5 V	35 mA
21-24	Min. 24 V	Min. 14.5 V	35 mA
Note			

Solenoid driver

- Valve control component for control of intrinsically safe valves, LEDs, acoustic alarms, etc.
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Output current is limited to 35 mA for ignition group IIC
- 1 or 2 channels in one module
- Relay output for error alarm

ACT20X-SDI-HDO / 2SDI-2HDO



Technical data

Input	
Type	NPN, PNP transistor, switching signal [input safe-side valve component]
Input voltage	≤ 28 V DC, Trigger level low: ≤ 2.0 V DC (NPN), ≤ 8.0 V DC (PNP), Trigger level high: ≥ 4.0 V DC (NPN), ≥ 10.0 V DC (PNP)
Input resistance, voltage	3.5 kΩ
Ex-output	
Type	intrinsically safe circuit, digital, output = input, direct or inverse (configurable)
Output current	max. 35 mA
Output values	depending on terminal assignment
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 1.9 W
Tightening torque, min. / Tightening torque, max.	0.4 Nm / 0.6 Nm
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.25 / 2.5	
Length x width x height	mm	22.5 / 119.2	22.5 / 127.1
Note			

Ordering data

1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-SDI-HDO-L-S	1	**8965400000**
PUSH IN connection	ACT20X-SDI-HDO-L-P	1	**2456110000**
2-channel version			
Screw connection	ACT20X-2SDI-2HDO-S	1	**8965420000**
PUSH IN connection	ACT20X-2SDI-2HDO-P	1	**2456130000**

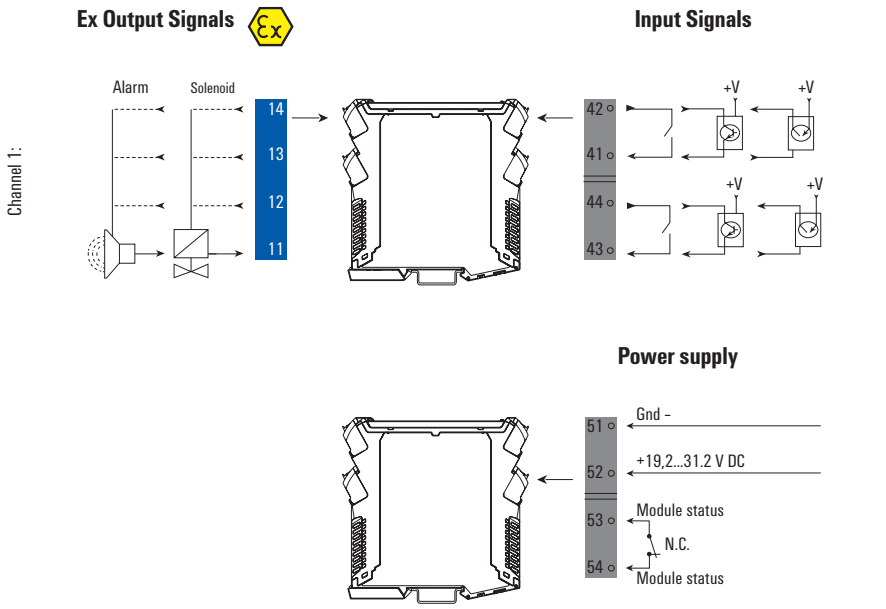
Note	
	CBX200 USB configuration adapter - 8978580000

Digital output

Valve control component for gas group IIB, 60 mA

The ACT20X-SDI-HAO-S solenoid/actuator driver takes a switched input from e.g. a safe area controller and delivers an corresponding output to operate an actuator in a hazardous area, e.g. Zone.
This driver is suitable for switching solenoid valves or alarm devices.

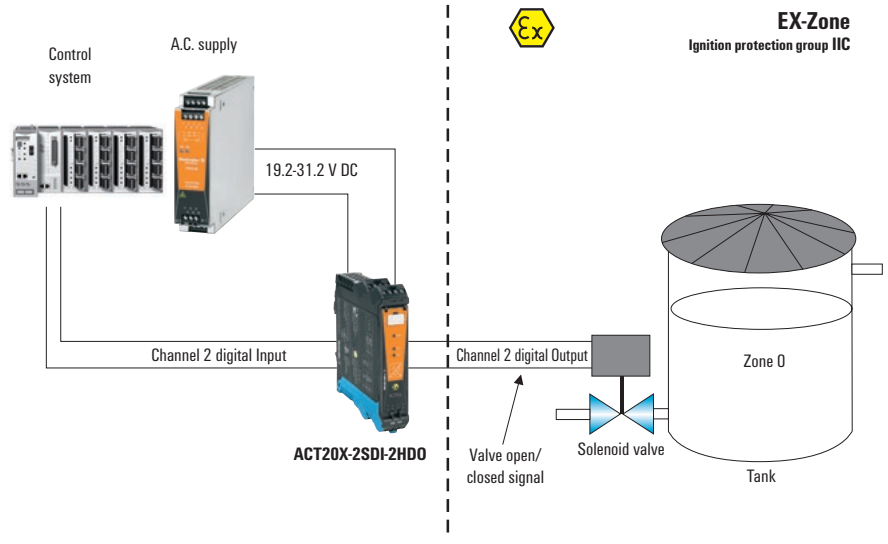
EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**



Ex label (excerpt)

ATEX	FM			
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	U_o	28 V	
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G oder	I_o	135 mA	
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	P_o	0.95 W	
IECEx	Example:	IIC	C_o = –,	L_o= –
Ex nA nC IIC T4 Gc	ATEX version,	IIB	C_o = 0.64 µF,	L_o= 7.8 mH
[Ex ia Ga] IIC/IIB/IIA	Ex Output Terminal (11-14)	IIA	C_o = 2.1 µF,	L_o= 15.1 mH
[Ex ia Da] IIIC	(More details in ATEX certificate)			

Application: Inflow control in Ex zone with gas group IIB



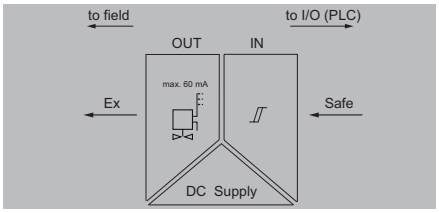
Output data
For gas group IIB (≤ 60 mA)

Connection terminal			
Channel 1	**U without load**	**U with load**	**I max**
11-12	Min. 24 V	Min. 9 V	60 mA
		Min. 11.5 V	50 mA
11-13	Min. 24 V	Min. 12.5 V	60 mA
		Min. 10 V	50 mA
11-14	Min. 24 V	Min. 11 V	60 mA
		Min. 13 V	50 mA
Note			

Solenoid driver

ACT20X-SDI-HDO-H-S

- Valve control component for control of intrinsically safe valves, LEDs, acoustic alarms, etc.
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Output current is limited to 35 mA for ignition group IIC
- 1 or 2 channels in one module
- Relay output for error alarm



Technical data

Input	
Type	NPN, PNP transistor, switching signal [input safe-side valve component]
Input voltage	≤ 28 V DC, Trigger level low: ≤ 2.0 V DC (NPN), ≤ 8.0 V DC (PNP), Trigger level high: ≥ 4.0 V DC (NPN), ≥ 10.0 V DC (PNP)
Input resistance, voltage	3.5 kΩ
Ex-output	
Type	intrinsically safe circuit, digital, output = input, direct or inverse (configurable)
Output current	max. 60 mA
Output values	depending on terminal assignment
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0,5 A AC / 1 A DC (zone 2)
Power rating	≤ 62.5 VA / 32 W (safe area) ≤ 16 VA / 32 W (Zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 2.5 W
Tightening torque, min. / Tightening torque, max.	0.4 Nm / 0.6 Nm
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage	2.6 kV (input / output)
Rated voltage	300 V
EMC standards	DIN EN 61326, NE 21

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.25 / 2.5	
Length x width x height	mm	22.5 / 119.2	22.5 / 127.1
Note			

Ordering data

1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-SDI-HDO-H-S	1	**8965410000**
PUSH IN connection	ACT20X-SDI-HDO-H-P	1	**2456120000**

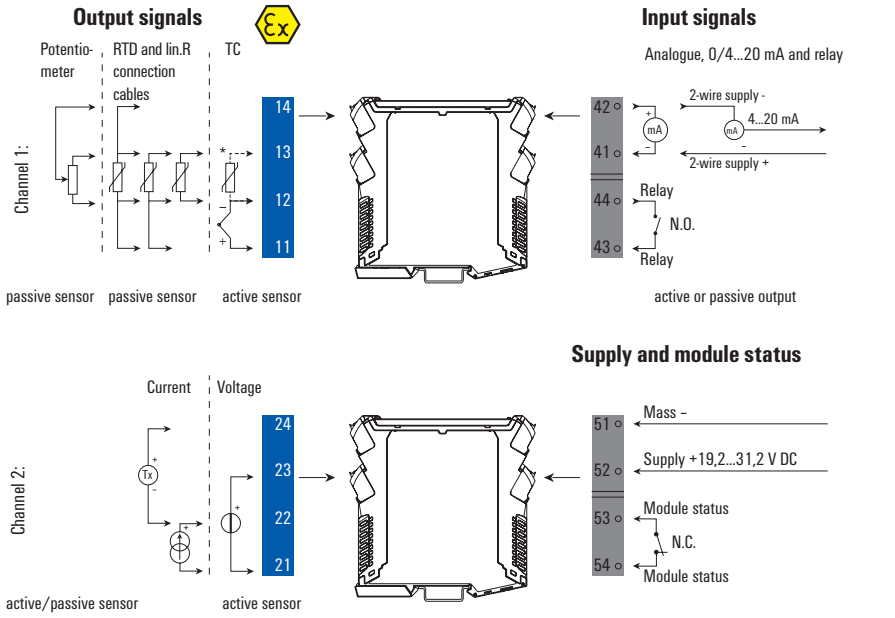
Note	
	CBX200 USB configuration adapter - 8978580000

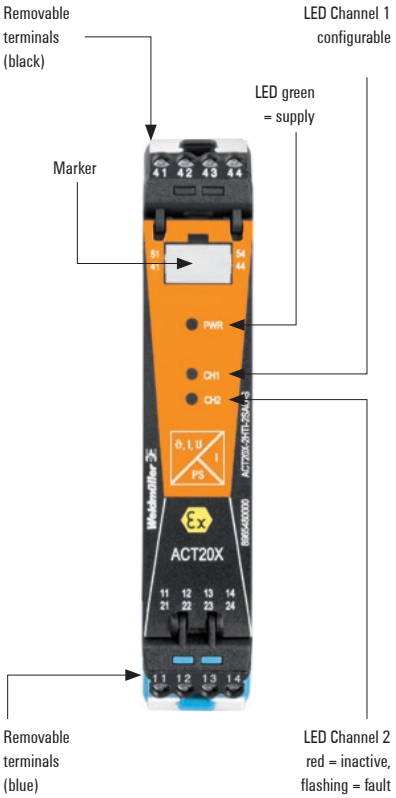
Universal measurement transducers

Universal measurement transducers for temperature, standard and potentiometer signals

The ACT20X-HUI-SAO-S is a universal input signal isolator/converter. This model processes temperature signals from PT100 sensors and thermocouples as well as DC voltage and current signals (mA) from the hazardous area. On the output side, an isolated milliamp signal is passed to the receiver or controller in the safe area. This model also has a relay output which can be used for a process alarm or trip.

EX area Zone 0, 1, 2, 20, 21, 22 | **Safe area Zone 2 / FM Class 1, Division 2**

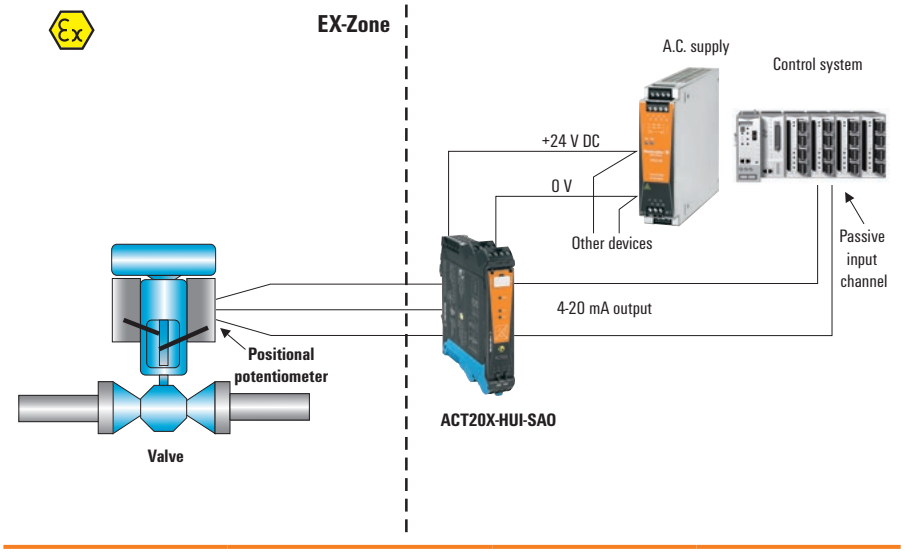




Ex label (excerpt)

ATEX	**FM**	U_i / U_o	30 V / 8.3 V	
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	I_i / I_o	120 mA / 0.2 mA	
II (1) G [Ex ia] IIC/IIB/IIA	Kl. I-III ABT 1/2 GP A-G or	P_i /P_o	900 mW / 0.4 mW	
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4	C_i	3 nF	
IECEx	Example:	L_i	1 µH	
Ex nA nC IIC T4 Gc	ATEX version,	IIC	C_o= 7 µF	L_o=1000 mH
[Ex ia Ga] IIC/IIB/IIA	Ex input External Current Source	IIB	C_o= 73 µF	L_o=1000 mH
[Ex ia a] IIIC	(More details in ATEX certificate)	IIA	C_o= 1000 µF	L_o=1000 mH

Application example: position measurement of an actuator



Accuracy / temperature coefficients ACT20X-HUI-SAO

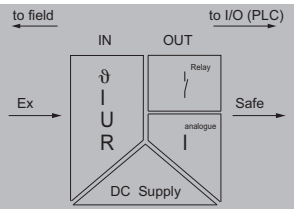
Input	Accuracy	Temperature coefficient
Input mA	≤ ±4 µA	≤ ±4 µA / °C
Input Volt	≤ ±20 µV	≤ ±2 µV / °C
Input RTD		
Pt100	≤ ±0.2 °C	≤ ±0.02 °C / °C
Ni100	≤ ±0.3 °C	≤ ±0.03 °C / °C
Input TC		
Type B	≤ ±4.5 °C	≤ ±0.45 °C / °C
Type E, J, K, L, N, T, U	≤ ±1 °C	≤ ±0.1 °C / °C
Type R, S, W3, W5, LR	≤ ±2 °C	≤ ±0.2 °C / °C
Note		

Universal signal converter

- Universal isolator for intrinsically safe RTD signals, thermal sensor signals, resistor signals, potentiometer signals and DC signals (mA,V)
- PC configuration with FDT/DTM software, download at www.weidmueller.com
- Digital relay output adjustable as threshold switch
- Relay output for error alarm

ACT20X-HUI-SAO-S

Usable as:
- Safety barrier (insulator)
- Signal conversion
- 2-wire measuring transducer
- Amplifier, repeater



Technical data

Input	
Type	intrinsically safe circuit, active (as current source) or passive (as current sink)
Temperature input range	Adjustable from -200...+800°C
Line resistance in measuring circuit	≤ 50 Ω
Input current	0...20 mA, 4...20 mA
Input voltage	configurable, 0...1 V DC, 0,2...1 V DC, 1...5 V DC, 0...(5)10 V, 2...10 V DC
Potentiometer	10 Ω...10 kΩ
Input resistance, voltage/current	> 10 MΩ @ 600 mV, 2 MΩ @ 28 V / 20 Ω + PTC 50 Ω
Output analogue	
Output current	0...23 mA, configurable: 0...20 / 4...20 / 20...0 / 20...4 mA, configurable downscale (3.5 mA) / upscale (23 mA) @ error
Output signal limit	3.8...20.5 mA / 0...20.5 mA (dependent on range)
Load impedance current	≤ 600 Ω
Output digital	
Type	Relay, 1 NO / NC contact
Function	Configurable switching thresholds, Sensor error, Window function
Nominal switching voltage	≤ 250 V AC / 30 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
Continuous current	≤ 2 A AC/DC (safe area, Zone 2 area)
Alarm output	
Type	Relay, 1 NC (voltage-free)
Nominal switching voltage	≤ 125 V AC / 110 V DC (safe area) ≤ 32 V AC / 32 V DC (zone 2)
General data	
Voltage supply	19.2...31.2 V DC
Power consumption	≤ 2.1 W
Ambient temperature / Storage temperature	-20 °C...60 °C / -20 °C...85 °C
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; FUSAFETY; IECEXKEM; KEMAATEX
Insulation coordination	
Insulation voltage / Rated voltage	2.6 kV (input / output) / 300 V
EMC standards	DIN EN 61326, NE 21
Dimensions	
Clamping range (nominal / min. / max.) mm²	2.5 / 0.25 / 2.5
Length x width x height mm	22.5 / 119.2
Note	

Screw connection	**PUSH IN**
2.5 / 0.25 / 2.5	
22.5 / 119.2	22.5 / 127.3

Type	**Temperature-range**	**Accuracy**
Metal PTC		
Pt100	-200...850 °C	± (0.15 + 0.02 x T) Class A ± (0.30 °C + 0.005 x T) Class B
Pt500	-200...850 °C	
Pt1000	-200...850 °C	
Ni50		
Ni100	-60...0 °C	± (0.4 + 0.007 x T)
Ni120	0...180 °C	± (0.4 + 0.028 x T)
Ni1000		
TC-Type according to IEC60584-1		
B	50...250 °C	± 25 K
	250...500 °C	± 10 K
	500...1820 °C	± 6 K
E	-200...-150 °C	± 4 K
	-150...1000 °C	± 3 K
J	-200...-150 °C	± 4 K
	-150...1200 °C	± 3 K
K	-200...-150 °C	± 5 K
	-150...1200 °C	± 3 K
	1200...1372 °C	± 4 K
N	-200...-150 °C	± 6 K
	-150...1300 °C	± 3 K
R	-50...200 °C	±10 K
	200..1780 °C	± 6 K
S	-50...200 °C	± 10 K
	200...1780 °C	± 6 K
T	-200...-150 °C	± 5 K
	-150...400 °C	± 3 K
according to DIN43710		
U	0...600 °C	± 3 °C
L	0...900 °C	± 3 °C

Ordering data

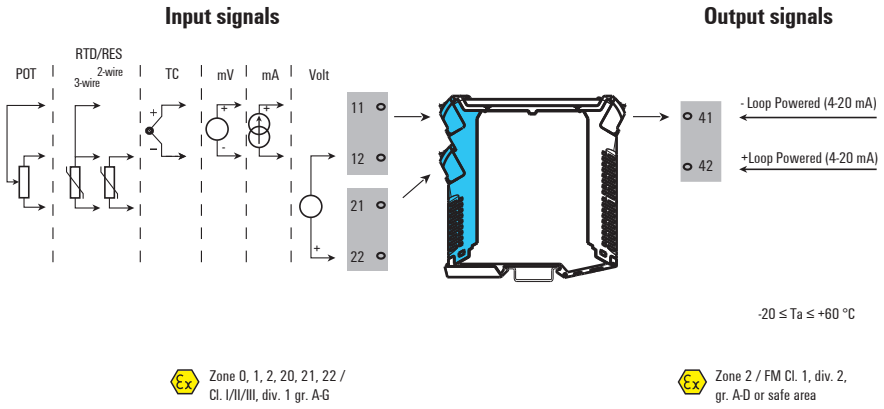
1-channel version	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20X-HUI-SAO-S	1	**8965490000**
PUSH IN connection	ACT20X-HUI-SAO-P	1	**2456200000**

Note	CBX200 USB configuration adapter - 8978580000

Output -powered universal measurement transducers

The ACT20X-HUI-SAO-LP is a universal input, isolating signal converter. This model processes temperature signals from PT100 sensors and thermocouples as well as DC voltage and current signals (mA) from the hazardous area. The 12.5 mm wide module is powered through it's 4-20 mA output.

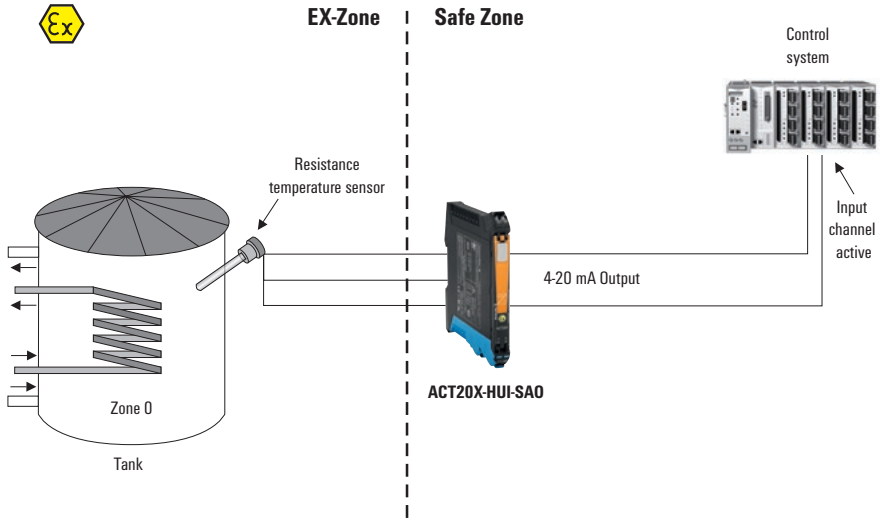
EX area Zone 0, 1, 2, 20, 21, 22 — Safe area Zone 2 / FM Class 1, Division 2



Ex label

ATEX		U_o	5.88 V
II 3 G Ex nA nC IIC T4		I_o	3.1 mA
II (1) G [Ex ia] IIC/IIB/IIA		P_o	4.6 mW
II (1) D [Ex iaD]		C_i	0.001 µF
IECEx		L_i	negligible
Ex nA IIC T4 Gc	Example:		
[Ex ia Ma Ga] I/IIC [Ex ia Da] IIIC	IECEx version		
	(More details in IECEx certificate)		

Application example: Temperature measurement in the EX-zone



Accuracy / temperature coefficients ACT20X-HUI-SAO-LP

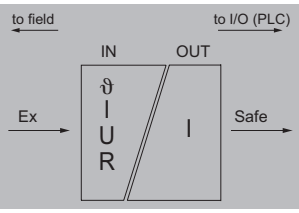
Input	Accuracy	Temperature coefficient
Input mA	≤ ±4 µA	≤ ±4 µA / °C
Input Volt	≤ ±20 µV	≤ ±2 µV / °C
Input RTD		
Pt100	≤ ±0.2 °C	≤ ±0.02 °C / °C
Ni100	≤ ±0.3 °C	≤ ±0.03 °C / °C
Input TC		
Type B	≤ ±4.5 °C	≤ ±0.45 °C / °C
Type E, J, K, L, N, T, U	≤ ±1 °C	≤ ±0.1 °C / °C
Type R , S, W3, W5, LR	≤ ±2 °C	≤ ±0.2 °C / °C
Note		

Universal measurement and signal isolator-converter

Output-loop powered

- Universal isolator for intrinsically safe RTD signals, thermal sensor signals, resistor signals, potentiometer signals and DC signals (mA,V)
- Supply via output loop
- 12.5 mm thin housing
- PC configuration with FDT/DTM software, download at www.weidmueller.com

ACT20X-HUI-SAO-LP-S



Technical data

Input	
Type	intrinsically safe circuit
Temperature input range	Adjustable from -200...+800°C
Input current	configurable, ± 25 mA, 0...20 mA, 4...20mA
Input voltage	configurable, ± 12 V DC (min. measurement range 1 V), ± 28 V DC (min. measurement range 2 V), ± 600 mV DC (min. measurement range 50 mV), ± 150 mV DC (min. measurement range 15 mV)
Potentiometer	1.2...500 kΩ
Input resistance, voltage/current	> 10 MΩ @ 600 mV, 2 MΩ @ 28 V / 70 Ω
Output analogue	
Output current	4...20 mA (max. 23 mA)
Load impedance current	≤ 700 Ω
Residual ripple (current loop)	≤ 10 mV_{ss}
Accuracy	< 0.1 % of end value
Temperature coefficient	< 0.02 °C of measuring range / °C
Step response time	250 ms (10...90%)
Cut-off frequency (-3 dB)	100 Hz
General data	
Voltage supply	via output current loop, 11...28 V DC (loop powered)
Tightening torque, min. / Tightening torque, max.	0.4 Nm / 0.6 Nm
Ambient temperature / Storage temperature	0 °C...60 °C / -20 °C...70 °C
Approvals	
Approvals	CE; EAC
Insulation coordination	
Insulation voltage / Rated voltage	3.51 kV between input and output / 300 V_{eff}
Rated voltage	300 V_{eff}
Standards	DIN EN 61326-1, IEC 61010-1, IEC 61010-2-030, IEC 60079-0, IEC 60079-11, IEC 60079-15, IEC 60079-26
Impulse withstand voltage	4 kV (1.2/50 µs)
Overvoltage category	III
Pollution degree	2

Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.25 / 2.5	
Depth / Width / Height		113.6 / 12.5 / 117.2117.2	113.6 / 12.5 / 117.2117.2
Note			

Inputs					
Type			Thermocouples (TC), RTD, mA, Volt, mV, resistor, potentiometer		
Thermocouple inputs	Type	Standard	Lower limit	Upper limit	Min. area
	B	IEC584	100 °C	1820 °C	400 °C
	E		-270 °C	1000 °C	80 °C
	J		-270 °C	1200 °C	
	K		-270 °C	1372 °C	
	L	DIN43710	-100 °C	900 °C	
	N	IEC584	-180 °C	1300 °C	100 °C
	R, S		-50 °C	1768 °C	300 °C
	T		-270 °C	400 °C	80 °C
	U	DIN43710	-200 °C	600 °C	100 °C
	User-defined Input		Up to 101 values		
	Error detection		Upper error signalling value: 23 mA, Lower error signalling value: 3,5 mA		
mA			±25 mA @ 70 Ω		4 mA
Volt			±28 V @ 2 MΩ		2,0 V
			±12 V @ 2 MΩ		1,0 V
mV			±600 mV @ >10 MΩ		50 mV
			±150 mV @ >10 MΩ		15 mV
2-, 3-, 4-wire RTD	Type	Standard	Lower limit	Upper limit	Min. area
	Pt100, Pt200	DIN43710	-200 °C	850 °C	-20 °C
	Pt1000				
	Ni120		-80 °C	320 °C	15 °C
	Cu10		-100 °C	260 °C	100 °C
	User-defined Input		Up to 101 values		
Resistance			0 to12 kΩ		500 Ω
			0 to15 kΩ		100 Ω
			0 to 750 Ω		50 Ω
Potentiometer			1.2 kΩ to 500 kΩ		

Ordering data

1-channel version	Type	Qty.	Order No.
Screw connection	ACT20X-HUI-SAO-LP-S	1	1318220000
PUSH IN connection	ACT20X-HUI-SAO-LP-P	1	2456210000

Note	
	CBX200 USB configuration adapter - 8978580000

Signal converters and monitoring components – ACT20P

Your practical requirements are many
Just like our ACT20P signal isolating converters

The reliable isolation and specific conversion of analogue signals plays an increasingly important role in many areas of industry and technology. When we developed the ACT20P signal converter we took full account of various technical requirements of machine engineering, the process industry and energy technology. In particular, the specifications of EN61010-1 provided important basic parameters for the technology of the equipment.

Perfectly equipped for the machine engineering sector

Filling systems and packaging machines used in the food or pharmaceutical industry, for example, are a classic area of application for signal converters. They convert analogue signals such as temperature, pressure, fill level, flow, weight, etc. directly into standard signals for processing by the PLC. And best of all: a signal converter solution usually costs much less than an input module in the remote-i/o-system adapted to the specific requirements of the sensor.

Ideally suited for the process industry and energy technology

In water treatment plants, conveyor technology, gas and coal-fired power plants, energy distribution stations and in many other types of plant in the process and energy technology sector signal converters have two main functions: on the one hand, they provide reliable galvanic isolation – especially if the cables of the sensors from the field are several hundred meters in length. On the other hand, our signal converters enable individual signals such as potentiometer signals from rotary encoders or TC type J signals from temperature sensors to be adapted for the standardised inputs of DCS- or Remote-i/o-systems.

Can be integrated in HART® communication
Signal converters are suitable for HART®, transparent communication.

HART® COMMUNICATION FOUNDATION transparent

Reliable connection
Individually customisable protection against mismatching.

Rapid device replacement
Practical release lever for simple removal of the female connector.

More space in the cabinet
Two channels measure a mere 12.5 mm wide.

Variants for different applications
The range of products is rounded off by the intrinsically safe ACT20X signal converter and the high-performance ACT20M signal converter, which is just 6 mm across.

Selection table

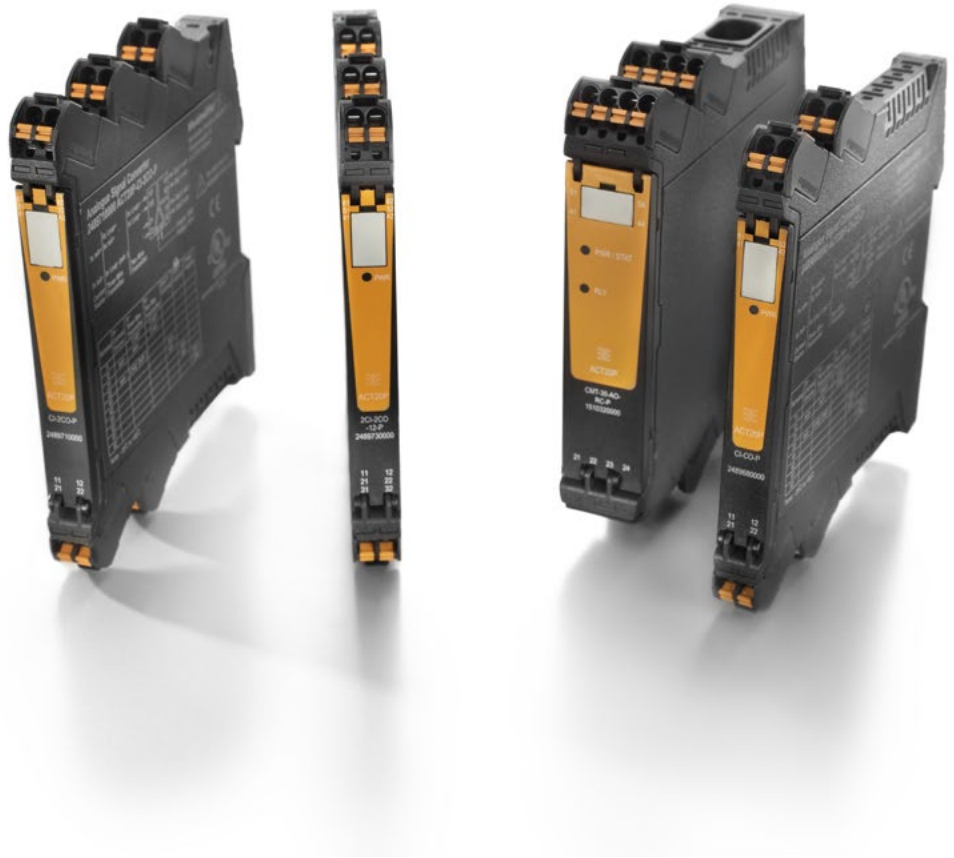
Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Signal converters and monitoring components – ACT20P											
	Signal converters											
7760054114	ACT20P-CI-CO-S	1	X	X						2-/3-wire transmitter, HART® transparent / X	12.5 mm	
2489680000	ACT20P-CI-CO-P	1	X	X						2-/3-wire transmitter, HART® transparent / X	12.5 mm	
7760054117	ACT20P-2CI-2CO-12-S	2	X	X						4-wire sensor, HART® transparent	12.5 mm	
2489730000	ACT20P-2CI-2CO-12-P	2	X	X						4-wire sensor, HART® transparent	12.5 mm	
1540010000	ACT20P-CI-VO-S	1	X	X						2-/3-/4-wire sensor / X	12.5 mm	
2489740000	ACT20P-CI-VO-P	1	X	X						2-/3-/4-wire sensor / X	12.5 mm	
7760054306	ACT20P-VM-AO-S	1								0...440 V AC, 0...660 V DC	22.5 mm	
	Passive isolators											
7760054123	ACT20P-CI-CO-ILP-S	1	X	X						4-wire sensor / X	12.5 mm	
7760054124	ACT20P-2CI-2CO-ILP-S	2	X	X						4-wire sensor / X	12.5 mm	
7760054122	ACT20P-CI-2CO-OLP-S	1		X						4-wire sensor / X	12.5 mm	
7760054118	ACT20P-CI1-CO-OLP-S	1	X							4-wire sensor / X	12.5 mm	
7760054119	ACT20P-CI2-CO-OLP-S	1		X						4-wire sensor / X	12.5 mm	
7760054121	ACT20P-VI-CO-OLP-S	1			X					4-wire sensor / X	12.5 mm	
7760054120	ACT20P-VI1-CO-OLP-S	1				X				4-wire sensor / X	12.5 mm	
7760054122	ACT20P-CI-2CO-OLP-S	1		X						4-wire sensor / X	12.5 mm	
	Signal splitters											
7760054115	ACT20P-CI-2CO-S	1	X	X						2-/3-/4-wire sensor, HART® transparent / X	12.5 mm	
2489710000	ACT20P-CI-2CO-P	1	X	X						2-/3-/4-wire sensor, HART® transparent / X	12.5 mm	
	Temperature transducer											
7760054305	ACT20P-TMR-RTI-S	1						X		PT100	22.5 mm	
2448100000	ACT20P-PRO-RTCI-AO-DO-S	1					X	X		RTD, SRTD, Pot, mV, resistance / X	12.5 mm	
2448110000	ACT20P-PRO-RTCI-AO-DO-P	1					X	X		RTD, SRTD, Pot, mV, resistance / X	12.5 mm	
7940045760	ACT20P-UI-2RCO-DC-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm	
2456840000	ACT20P-UI-2RCO-DC-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm	
1238910000	ACT20P-UI-2RCO-AC-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm	
2495690000	ACT20P-UI-2RCO-AC-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 30 V DC, ± 300 V DC, potentiometer, resistance / X	22.5 mm	
	Measurement and monitoring relays											
7760054164	ACT20P-VMR-1PH-H-S	1								1 phase 0...400 V AC/DC	22.5 mm	
7760054165	ACT20P-VMR-3PH-ILP-H-S	1								3 phases 180...500 V AC	22.5 mm	
	Current measuring transducers											
2044850000	ACT20P-CML-10-AO-RC-S	1								0...1/5/10 A AC/DC	17.5 mm	
2489910000	ACT20P-CML-10-AO-RC-P	1								0...1/5/10 A AC/DC	17.5 mm	
1510470000	ACT20P-CMT-10-AO-RC-S	1								0...5/10 A AC/DC	22.5 mm	
1510540000	ACT20P-CMT-30-AO-RC-S	1								0...20/25/30 A AC/DC	22.5 mm	
1510440000	ACT20P-CMT-60-AO-RC-S	1								0...40/50/60 A AC/DC	22.5 mm	
1510390000	ACT20P-CMT-60-RC-S	1								0...40/50/60 A AC/DC	22.5 mm	
1510330000	ACT20P-CMT-10-AO-RC-P	1								0...5/10 A AC/DC	22.5 mm	
1510320000	ACT20P-CMT-30-AO-RC-P	1								0...20/25/30 A AC/DC	22.5 mm	
1510290000	ACT20P-CMT-60-AO-RC-P	1								0...40/50/60 A AC/DC	22.5 mm	
1510280000	ACT20P-CMT-60-RC-P									0...40/50/60 A AC/DC	22.5 mm	
	Bridge measuring transducers											
1067250000	ACT20P-BRIDGE-S	1								4-,6-wire strain gauge / X	22.5 mm	
2456820000	ACT20P-BRIDGE-P	1								4-,6-wire strain gauge / X	22.5 mm	
	Universal measurement transducers											
1481970000	ACT20P-PRO DCDC II-S	1	X	X	X	X				± 100 mA, ± 300 V DC / X	12.5 mm	
1481960000	ACT20P-PRO DCDC II-P	1	X	X	X	X				± 100 mA, ± 300 V DC / X	12.5 mm	
1453210000	ACT20P-UI-AO-DO-LP-S	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 28 V DC, ± 300 V DC, 300 V AC / X	12.5 mm	
2456850000	ACT20P-UI-AO-DO-LP-P	1	X	X	X	X	X	X		± 25 mA, ± 5 A DC, ± 28 V DC, ± 300 V DC, 300 V AC / X	12.5 mm	
1477420000	ACT20P-AI-AO-DC-S	1	X	X	X	X				0...11 V, 0...22 mA / X	12.5 mm	
2456860000	ACT20P-AI-AO-DC-P	1	X	X	X	X				0...11 V, 0...22 mA / X	12.5 mm	

Output						Configuration	Auxiliary power	Isolation		Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage	Connection system	
1	X	X				-	24 V DC	300 V	3-way	S	HART® transparent
1	X	X				-	24 V DC	300 V	3-way	P	HART® transparent
2	X	X				-	24 V DC	300 V	3-way	S	HART® transparent
2	X	X				-	24 V DC	300 V	3-way	P	HART® transparent
1			X			-	24 V DC	300 V	3-way	S	
1			X			-	24 V DC	300 V	3-way	P	
1	X	X	X			Software	24...240 V UC	600 V	3-way	S	
1	X	X				-	input loop	300 V	2-way	S	
2	X	X				-	input loop	300 V	4-way	S	
2		X				-	output loop	300 V	3-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
1		X				-	output loop	300 V	2-way	S	
2		X				-	output loop	300 V	4-way	S	
2	X	X				-	24 V DC	300 V	4-way	S	HART® transparent
2	X	X				-	24 V DC	300 V	4-way	P	HART® transparent
2				X	2 x relay outputs (limit value)	Software, Display	20...264 V UC	300 V	5-way	S	
1	X	X	X		analogue and NPN output, Limit value	Display, Button	24...240 V UC	300 V	3-way	S	
1	X	X	X		analogue and NPN output, Limit value	Display, Button	24...240 V UC	300 V	5-way	P	
1				X	2 x Limit value relay output	Software, Display	9...60 V DC	300 V	5-way	S	
1				X	2 x Limit value relay output	Software, Display	9...60 V DC	300 V	5-way	P	
1				X	2 x Limit value relay output	Software, Display	90...264 V AC	300 V	5-way	S	
1				X	2 x Limit value relay output	Software, Display	90...264 V AC	300 V	5-way	P	
2				X	2 x Limit value relay output	DIP switch, potentiometer	20...240 V UC	300 V	5-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	Input loop	600 V	5-way	S	
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Power cable can be connected to the terminals
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Power cable can be connected to the terminals
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	S	Through hole current converter
1				X	Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	S	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1	X	X	X	X	± 10 V, ± 20 mA, Limit value relays	DIP switch, potentiometer	24 V DC	300 V	4-way	P	Through hole current converter
1				X	Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	P	Through hole current converter
1	X	X	X		Reset button (TARE)	DIP switch, button	10...60 V DC	300 V	3-way	S	
1	X	X	X		Reset button (TARE)	DIP switch, button	10...60 V DC	300 V	3-way	P	
1	X	X	X		± 10 V, ± 20 mA	Display, DIP switch, button	24 V - 230 V AC/DC	600 V	3-way	S	aktiv or passiv output
1	X	X	X		± 10 V, ± 20 mA	Display, DIP switch, button	24 V - 230 V AC/DC	600 V	3-way	P	aktiv or passiv output
1		X			NPN output, Limit value	Software	output loop	300 V	3-way	S	Output Loop powered
1		X			NPN output, Limit value	Software	output loop	300 V	3-way	P	Output Loop powered
1	X	X	X		0...11V, 0...22mA	DIP switch, button, LED	12...60 V DC	300 V	3-way	S	
1	X	X	X		0...11V, 0...22mA	DIP switch, button, LED	12...60 V DC	300 V	3-way	P	

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

ACT20P

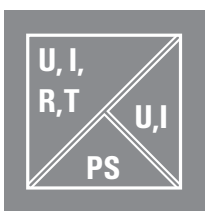


Reliable connection

Individually configurable protection against mismating with release lever

Simple signal conditioning

Devices configured for converting standard sensor signals to standard DC signals.



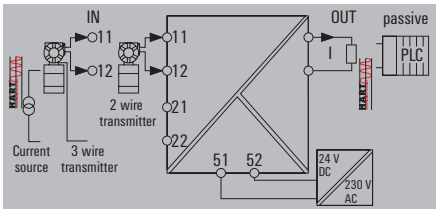
High level of galvanic isolation

The galvanic isolation of 2 kV (300 V rated voltage) ensures high process reliability

Signal converters

- Isolation of DC- signals
- Passive transmitter or active current input
- 3-way isolation
- HART® - transparent

ACT20P-CI-CO



Technical data

Input	
Input signal	2-/3-wire transmitter, HART signal® bidirectional
Input current	0...20 mA, 4...20mA
Voltage drop	ca. 3.8 V @ R_{Load} = 0 Ω; ca. 15 V @ R_{Load} = 600 Ω; (I_{input} = 20 mA)
Output	
Output current	0...20 mA (if input: 0...20 mA), 4...20 mA (if input: 4...20 mA), HART® digital signal
Load impedance current	≤ 550 Ω
General data	
Configuration	none
Voltage supply	20...30 V DC
Accuracy	< 0.1 % of end value
Step response time	≤ 0,5 ms
Current consumption	≤60 mA (24V power supply, 20mA output)
Temperature coefficient	80 ppm/K
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, EN 61326-1
Insulation voltage	2 kV inputs / outputs / power supply
Test voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	
Depth x width x height	mm	113.7 / 12.5 / 117.2	113.7 / 12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-CI-CO-S	1	**7760054114**
PUSH IN connection	ACT20P-CI-CO-P	1	**2489680000**
Note			

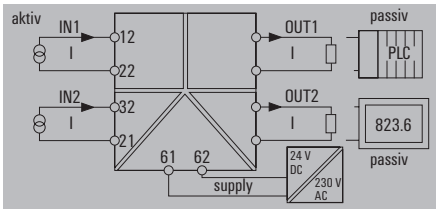
Accessories

Note

Signal converters

ACT20P-2CI-2CO-12

- Isolation of DC- signals
- Passive input
- 2 channels in one module
- 3-way isolation
- HART® - transparent



Technical data

Input	
Input current	0...20 mA, 4...20mA
Voltage drop	≤ 1 V
Output	
Output current	0...20 mA (if input: 0...20 mA), 4...20 mA (if input: 4...20 mA), HART® digital signal
Load impedance current	< 300 Ω, per channel
General data	
Configuration	none
Voltage supply	20...30 V DC
Accuracy	< 0.1 % of end value
Step response time	≤ 0,5 ms
Temperature coefficient	80 ppm/K
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, EN 61326-1
Insulation voltage	2 kV inputs / outputs / power supply
Test voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	
Depth x width x height	mm	113.7 / 12.5 / 117.2	113.7 / 12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-2CI-2CO-12-S	1	**7760054117**
PUSH IN connection	ACT20P-2CI-2CO-12-P	1	**2489730000**
Note			

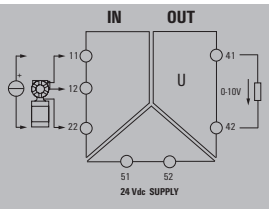
Accessories

Note

Signal converters

ACT20P-CI-VO

- Isolation of DC signals
- Passive 3-wire transmitter and active current input
- 3-way isolation
- Removable terminals



Technical data

Input	
Input current	0...20 mA, 4...20mA
Input signal	2-/3-wire transmitter, Current source
Number of inputs	1
Sensor supply	> 17 V DC at 20 mA
Output	
Number of outputs	1
Output voltage	0...10 V (if input: 0...20 mA), 2...10 V (if input: 4...20 mA)
load impedance voltage	≥ 600 kΩ
General data	
Accuracy	±0,1 % FSR max., 0,05 % FSR typ.
Configuration	none
Current consumption	≤60 mA (24V power supply, 20mA output)
Step response time	≤ 0,5 ms
Temperature coefficient	80 ppm/K
Voltage supply	20...30 V DC
Insulation coordination	
EMC standards	EN 61326-1
Galvanic isolation	3-way isolator, between input / output / supply
Impulse withstand voltage	4 kV (1.2/50 µs)
Insulation voltage	2 kV (Input /Output), 1 min, 50 Hz
Test voltage	300 V
Overvoltage category	III
Standards	EN 61010-1, UL 61010-1
Pollution degree	2

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	0.6 / 0.5 / 2.5	
Depth / Width / Height	mm	113.7 / 12.5 / 117.2	113.7 / 12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-CI-VO-S	1	**1540010000**
PUSH IN connection	ACT20P-CI-VO-P	1	**2489740000**
Note			

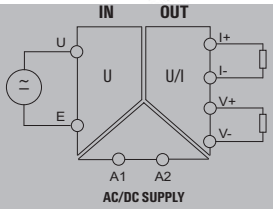
Accessories

Note

Voltage measurement, 1-phase

- Voltage monitoring of single-phase network up to 500 V AC
- 3 input ranges can be selected
- 2 relays with CO contacts
- Holding function can be activated
- Rotary switch for setting limit values

ACT20P-VM-AO-S



Technical data

Input	
Input resistance	1 MΩ±5%
Input signal	U_{DC}, U_{AC}Effective value (sinusoidal only) 40-60 Hz
Input voltage	0...30 V DC, 0...60 V DC, 0...150 V DC, 0...300 V DC, 0...440 V DC, 0...660 V DC, 0...60 V AC, 0...144 V AC, 0...300 V AC, 0...440 V AC, configurable
Number of inputs	1
Output	
Load impedance current	≤ 500 Ω
Output current	0...20 mA, 4...20 mA
Output voltage	0...10 V
load impedance voltage	≥ 10 kΩ
General data	
Accuracy	0.5 % FSR
Configuration	With FDT/DTM software
Power consumption	≤ 100 mA @ 24 VDC, ≤ 120mA @ 24V AC
Step response time	< 300 ms
Temperature coefficient	≤ 200 ppm/K
Voltage supply	24...240 VUC (±10%)
Insulation coordination	
EMC standards	IEC 61000-6 /-2, IEC 61000-6-4, IEC 61326-1
Galvanic isolation	3-way isolator, between input / output / supply
Impulse withstand voltage	4 kV (1.2/50 µs) input - output, 4 kV (1.2/50 µs) input / supply, 2.5 kV (1.2/50 µs) output / supply
Insulation voltage	1.5 kV AC output / supply, 2 kV AC input / output, 2 kV AC input / supply
Rated voltage	600 V input / output, 600 V input / supply, 300 V output / supply
Overvoltage category	III
Pollution degree	2
Standards	EN 50178

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Depth / Width / Height	mm	114.3 / 22.5 / 119.2
Note		

Ordering data

Type	Qty.	Order No.
ACT20P-VM-AO-S	1	**7760054306**

Note

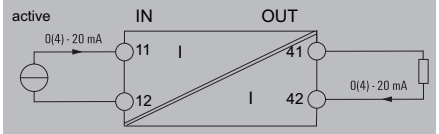
Accessories

Note	
	CBX 200

Passive isolators input loop powered

ACT20P-CI-CO-ILP

- Isolation of DC- signals
- Power supply via the input circuit (input loop powered)
- 1 or 2 channels in one module
- 2-way isolation
- Removable terminals



Technical data

Input	
Input current	0(4)...20 mA current loop
Voltage drop, current input	3.8 V
Sensor	Current source
Number of inputs	1
Output	
Load impedance current	≤ 600 Ω
Output current	0...20 mA (if input: 0...20 mA), 4...20 mA (if input: 4...20 mA)
Number of outputs	1
General data	
Accuracy	< 0.1 % of end value
Temperature coefficient	≤ 100 ppm/K
Voltage supply	Loop powered, via 4...20 mA input
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, IEC61000-6-2, IEC 61000-6-4
Galvanic isolation	2-way isolator
Impulse withstand voltage	4 kV (1.2/50 µs)
Insulation voltage	2 kV inputs / outputs
Rated voltage	300 V
Overvoltage category	III
Pollution degree	2

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5
Depth / Width / Height	mm	114 / 12.5 / 117.2
Note		

Ordering data

Channel	**Type**	**Qty.**	**Order No.**
2-channel	ACT20P-2CI-2CO-ILP-S	1	**7760054124**
1-channel	ACT20P-CI-CO-ILP-S	1	**7760054123**

Note

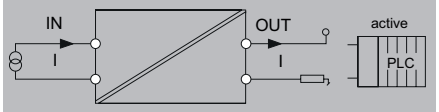
Accessories

Note

Passive isolators output loop powered

- Removable terminals
- Power supply via the output circuit (output loop powered)
- 2-way isolation

ACT20P-CI-CO-OLP



Technical data

Input	
Number of inputs	1
Input voltage	7760054120: 0...5 V DC; 7760054121: 0...10 V
Input current	7760054118: 0...20 mA; 7760054119: 4...20mA
Output	
Load impedance current	≤ 600 Ω
Output current	4...20 mA, loop-powered
Number of outputs	1
General data	
Accuracy	< 0.1 % of end value
Configuration	none
Step response time	≤ 1 ms
Temperature coefficient	≤ 100 ppm/K
Voltage supply	via output current loop, min. 12 V DC/ max. 30 V DC
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, IEC61000-6-2, IEC 61000-6-4
Galvanic isolation	2-way isolator
Impulse withstand voltage	4 kV (1.2/50 µs)
Insulation voltage	2 kV (Input /Output), 1 min, 50 Hz
Rated voltage	300 V
Overvoltage category	III
Pollution degree	2

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth / Width / Height	mm	114 / 12.5 / 117.2
Note		

Ordering data

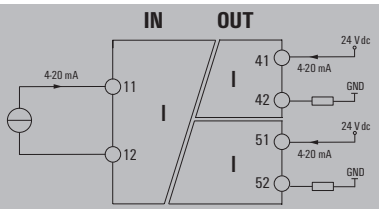
Input voltage	**Type**	**Qty.**	**Order No.**
0...10 V	ACT20P-VI-CO-OLP-S	1	**7760054121**
0...5 V	ACT20P-VI1-CO-OLP-S	1	**7760054120**
Input current			
0...20 mA	ACT20P-CI1-CO-OLP-S	1	**7760054118**
4...20 mA	ACT20P-CI2-CO-OLP-S	1	**7760054119**

Note

Passive isolators output loop powered

ACT20P-CI-2CO-OLP

- Removable terminals
- Doubling of the signal
- Power supply via the output circuit (output loop powered)
- 3-way isolation



Technical data

Input	
Number of inputs	1
Input current	4...20mA
Sensor	Current source
Output	
Number of outputs	2
Output current	4...20 mA, loop-powered
Load impedance current	R_L = (U_B-12 V) / 20 ± 20mA, e.g. 600 Ω at 24 V
General data	
Configuration	none
Galvanic isolation	3-way isolator
Accuracy	< 0.1 % of end value
Temperature coefficient	≤ 100 ppm/K
Voltage supply	via output current loop, min. 12 V DC/ max. 30 V DC
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, IEC61000-6-2, IEC 61000-6-4
Insulation voltage	2 kV (Input /Output), 1 min, 50 Hz
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth / Width / Height	mm	114 / 12.5 / 117.2
Note		

Ordering data

Input current
4...20 mA

Type	**Qty.**	**Order No.**
ACT20P-CI-2CO-OLP-S	1	**7760054122**

Note

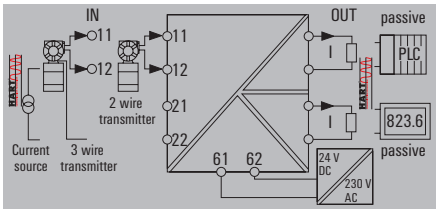
Accessories

Note

Signal splitters

ACT20P-CI-2CO

- Isolation and splitting of DC signals
- Passive transmitter or active current input
- 3-way isolation
- HART® - transparent



Technical data

Input	
Input signal	2-/3-wire transmitter, HART signal® bidirectional
Input current	0...20 mA, 4...20mA
Voltage drop	ca. 3.8 V @ R_{Load} = 0 Ω; ca. 15 V @ R_{Load} = 600 Ω; (I_{input} = 20 mA)
Output	
Output current	0...20 mA (if input: 0...20 mA), 4...20 mA (if input: 4...20 mA), HART® digital signal
Load impedance current	< 300 Ω
General data	
Configuration	none
Voltage supply	20...30 V DC
Accuracy	< 0.1 % of end value
Step response time	≤ 0,5 ms
Temperature coefficient	80 ppm/K
Insulation coordination	
EMC standards	EN 61010-1:2011, UL 61010-1, EN 61326-1
Insulation voltage	2 kV inputs / outputs / power supply
Test voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	
Depth x width x height	mm	113.7 / 12.5 / 117.2	113.7 / 12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-CI-2CO-S	1	**7760054115**
PUSH IN connection	ACT20P-CI-2CO-P	1	**2489710000**
Note			

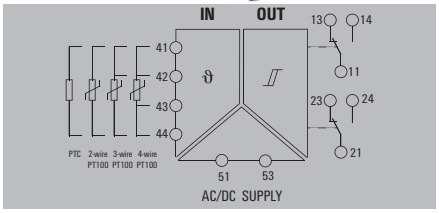
Accessories

Note

Temperature limit-value monitoring

- Temperature monitoring of PT100 sensors or PTC
- Temperature range can be selected
- 2 relays with CO contacts
- Limit value can be set with software configuration

ACT20P-TMR-RTI-S



Technical data

Input	
Number of inputs	1
Sensor	PT100 / 2-/3-/4-wire, PTC: 0...4 kΩ
Temperature input range	Configurable, PT100: -200°C...850 °C
Output (digital)	
Number of digital outputs	2
Type	2 x 1 - or 1 x 2 changeover contact relay
Alarm function	Alarm range: -200...850 °C, Top and bottom limit values, window range, Hysteresis: 2 °C (adjustable), Alarm delay: 0...10 s
Rated switching current	5 A
Max. switching voltage, AC	250 V
Max. switching voltage, DC	30 V
General data	
Configuration	With FDT/DTM software
Accuracy	0.2% FSR, ≤ 2 °C (PT100), ≤ 8 Ω (PTC)
Power consumption	≤ 100 mA @ 24 VDC, ≤ 120mA @ 24V AC
Step response time	≤ 500 ms
Temperature coefficient	≤ 100 ppm/K
Voltage supply	20...264 VUC
Insulation coordination	
EMC standards	IEC 61326-1
Galvanic isolation	3-way isolator, between input / output / supply
Insulation voltage	2 kV (Input /Output), 1 min, 50 Hz
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III
Rated voltage	300 V
Standards	IEC 61010-1

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 2.5
Depth / Width / Height	mm	114.3 / 22.5 / 119.2
Note		

Ordering data

Type	Qty.	Order No.
ACT20P-TMR-RTI-S	1	**7760054305**

Note

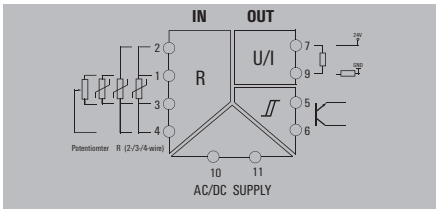
Accessories

Note

Temperature transducer with limit relay

ACT20P-PRO-RTCI-AO-DO

- Configurable from buttons and display
- Monitoring of resistance changes (e.g.: motor winding / heating resistors)
- Analog and digital output
- Removable terminals



Technical data

Input	
Number of inputs	1
Potentiometer	10...150 kΩ
Resistance	0...15 kΩ
Sensor	PT100 / 2-/3-/4-wire, PT200, PT500, N50, N100, P 1K, N 1K, KT16, KT81, KT82, KT83, KT84, ST13, ST20
Output (digital)	
Alarm function	configurable, Top and bottom limit values, window range, Short circuit at input, Alarm delay: 0...10 s, Hysteresis 5% / 10%
Rated switching voltage	24 VDC ±30%
Type	NPN-Transitor, Switching frequency 5 kHz
Output (analogue)	
Output current	configurable, 0(4)...20 mA, -20...+20 mA, ± 10mA, upscale (23 mA), downscale (3,5 mA)
Output voltage	configurable, 0(1)...5 V, 0(2)...10 V, downscale (0 V), upscale (11 V), -5...+5 V, -10...+10 V
Load resistance current	≤ 600 Ω
General data	
Accuracy	< ±0.1 % of span, ≤ 2 °C (PT100)
Configuration	with push-buttons and display
Step response time	2- / 4- wire: 320 ms;, 3- wire / Poti: 640 ms
Temperature coefficient	≤ 0.02 % / °C, ≤ 200 ppm/K
Voltage supply	24...230 V DC ±15%, 24...230 V AC ±15% @48...62 Hz
Insulation coordination	
EMC standards	EN 61326-1
Impulse withstand voltage	5 kV (1.2/50 µs)
Galvanic isolation	4-way isolator;, between input / output / supply
Insulation voltage	4 kV_{eff} / 1 min.
Rated voltage	600 V
Overvoltage category	II

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5	
Depth / Width / Height	mm	113.7 / 12.5 / 119.2	113.7 / 12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-PRO-RTCI-AO-DO-S	1	**2448100000**
PUSH IN connection	ACT20P-PRO-RTCI-AO-DO-P	1	**2448110000**

Note

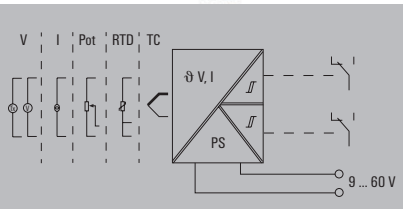
Accessories

Note

Universal limit-value monitoring

- Universally configurable input for temperature, voltage, current, potentiometer, resistance
- 2 independent relay outputs with multiple limit value functions: window alarm, upper/lower limits, hysteresis, delay, etc.
- Configuration on the device from 7-segment display or via FDT/DTM software
- External power supply DC or AC

ACT20P-UI-2RCO-DC-S



Technical data

Input	
Number of inputs	1
Sensor	Thermocouples: B, E, J, K, L, N, R, S, T, U, RTD: PT100, PT200, PT1000, Ni120, Cu10, 2-/3-/4-wire
Temperature input range	B: +100...+1820 °C, E: -270...+1000 °C, J: (-210...+1200 °C), K: -270...+1372 °C, L: +100...+900 °C, N: (-180...+1300 °C), R: -50...+1768 °C, S: -50...+1768 °C, T: -270...+400 °C, U: -200...+600 °C
Output (digital)	
Alarm function	configurable, Top and bottom limit values, window range, Alarm delay: 0...99 s, Hysteresis adjustable, auto / manual reset
Rated switching current	200mA @ 110Vdc, 6A @ 24Vdc / 240Vac
Number of digital outputs	2
Type	2 CO contacts, normal / inverse adjustment, Switching frequency 20 Hz
Max. switching voltage, AC	240 V
General data	
Accuracy	< 0.1 % of measuring range
Configuration	With FDT/DTM software, or via 7-segment display, push-buttons and rotary encoder on the device itself
Step response time	450 ms
Power consumption	≤ 3.5 W
Temperature coefficient	< 0.02 °C of measuring range / °C
Voltage supply	9...60 V DC
Insulation coordination	
Standards	DIN EN 61010-1
Pollution degree	2
Ambient temperature (operational)	-20 °C...70 °C

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	
Depth / Width / Height	mm	113.6 / 22.5 / 119.2	113.6 / 22.5 / 127.1
Note			

Ordering data

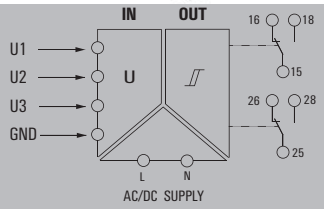
DC supply voltage	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-UI-2RCO-DC-S	1	**7940045760**
PUSH IN connection	ACT20P-UI-2RCO-DC-P	1	**2456840000**
AC supply voltage			
Screw connection	ACT20P-UI-2RCO-AC-S	1	**1238910000**
PUSH IN connection	ACT20P-UI-2RCO-AC-P	1	**2495690000**

Note

Voltage monitoring, 1-phase

- Monitoring of single-phase systems up to 400 V AC/DC
- 3 input ranges can be selected
- 2 relays with CO contacts
- Holding function can be activated
- Rotary switch for setting limit values

ACT20P-VMR-1PH-H



Technical data

Input	
Number of inputs	1
Input voltage	Channel 1: (U1-E): 110V AC/DC, Channel 2: (U2-E): 240V AC/DC, Channel 3 1: (U3-E): 400V AC/DC
Input measurement range	50...120% $U_{rated\ voltage}$
Input frequency	40...60 Hz, DC
Input resistance, voltage	1 MΩ±5%
Output (digital)	
Number of digital outputs	2
Type	2 x 1 - or 1 x 2 changeover contact relay, Relay polarity can be inverted
Alarm function	Top and bottom limit values, window range, Holding function can be activated, Alarm delay: 0...10 s
Rated switching current	5 A
Max. switching voltage, AC	250 V
Max. switching voltage, DC	30 V
General data	
Configuration	DIP switch and potentiometer
Accuracy	3 % *$U_{rated\ voltage}$
Measurement calibration	max: 70...120% *$U_{rated\ voltage}$, min: 50...100% *$U_{rated\ voltage}$
Power consumption	≤ 100 mA @ 24 VDC, ≤ 120mA @ 24V AC
Step response time	< 220 ms (10...90 %)
Temperature coefficient	350 ppm/K
Repeat accuracy	2 % *$U_{rated\ voltage}$
Voltage supply	24...240 VUC ±10%
Insulation coordination	
EMC standards	IEC 61326-1
Galvanic isolation	3-way isolator, between input / output / supply
Rated voltage	300 VAC (output 1 - output 2), 300 VAC (supply-output), 500 VAC (supply-input; input-output)
Insulation voltage	2.5 kV (input / output), 2 kV input / output/ power supply
Impulse withstand voltage	Supply/output: 4 kV; input/output, input/output: 6 kV, 1.2/50 µs
Pollution degree	2
Overvoltage category	III
Standards	EN 50178
Dimensions	**Screw connection**
Clamping range (nominal / min. / max.) mm²	1.5 / 0.5 / 2.5
Depth / Width / Height mm	114.3 / 22.5 / 117
Note	

Ordering data

Type	Qty.	Order No.
ACT20P-VMR-1PH-H-S	1	7760054164

Note

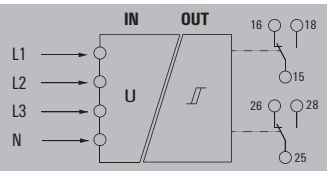
Accessories

Note

Voltage monitoring, 3-phase

- Voltage monitoring of single-phase network up to 500 V AC
- 3 input ranges can be selected
- 2 relays with CO contacts
- Holding function can be activated
- Rotary switch for setting limit values

ACT20P-VMR-3PH-ILP-H



Technical data

Input	
Number of inputs	1
Input frequency	40...60 Hz
Input measurement range	200...480 VAC
Input voltage	180...500 VAC
Input resistance, voltage	≥1,8MΩ
Output (digital)	
Number of digital outputs	2
Type	2 x 1 - or 1 x 2 changeover contact relay, Relay polarity can be inverted
Alarm function	Top and bottom limit values, window range, Holding function can be activated, Phase error, Phase sequence, Asymmetry, Alarm delay: 0...10 s
Rated switching current	5 A
Max. switching voltage, AC	250 V
Max. switching voltage, DC	30 V
General data	
Configuration	DIP switch and potentiometer
Accuracy	3 % $*U_{rated\ voltage}$
Measurement calibration	max: 70...120% $*U_{rated\ voltage}$, min: 50...100% $*U_{rated\ voltage}$
Unbalanced	Hysteresis: 5%, Phase imbalance in range of adjustment: 5...25%, OFF
Repeat accuracy	2 % $*U_{rated\ voltage}$
Step response time	≤ 100 ms
Temperature coefficient	350 ppm/K
Voltage supply	supplied from voltage measurement inputs
Insulation coordination	
EMC standards	EN 61326-1
Galvanic isolation	2-way isolator, between input/output
Rated voltage	600 VAC (input - output), 300 VAC (output 1 - output 2)
Insulation voltage	2.5 kV (input / output)
Impulse withstand voltage	6 kV (input - output), 4 kV (output 1- output 2), 1.2/50 µs
Pollution degree	2
Overvoltage category	III
Standards	EN 50178

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Depth / Width / Height	mm	114.3 / 22.5 / 117
Note		

Ordering data

Type	Qty.	Order No.
ACT20P-VMR-3PH-ILP-H-S	1	**7760054165**

Note

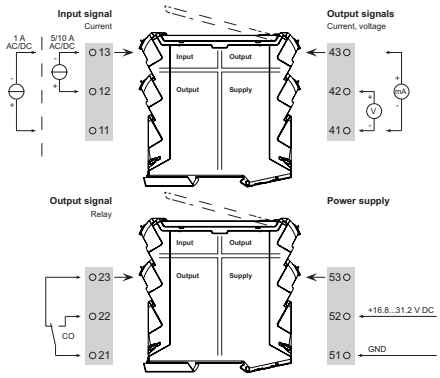
Accessories

Note

Current measuring transducer

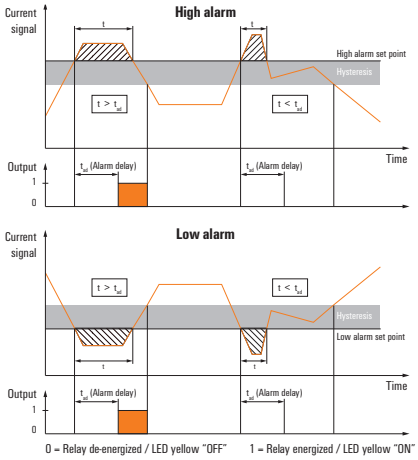
- Measuring and monitoring AC/DC currents
- Input/output electrically isolated
- Input and output ranges are adjustable
- Measurement range extension via external current transformer
- Relay output for limit value alarm with switching threshold, delay, hysteresis

ACT20P-CML-10-AO-RC-S



Technical data

Input	
Number of inputs	1
Input signal	Power cable can be connected to the terminals
Input frequency	AC: 15...400 Hz (true root mean square), AC: 50 Hz (arithmetic average)
Input measurement range	configurable, 0...1/5/10 A AC (RMS) or DC
Output (digital)	
Alarm function	Surge current, Under-current, Alarm delay: 0...10 s
Rated switching current	2 A
Number of digital outputs	1
Type	Relay, 1 CO contact, normal / inverse adjustment
Max. switching voltage, AC	250 V
Output (analogue)	
Load resistance current	≤ 600 Ω
Load resistance voltage	≥ 10 kΩ
Number of analogue outputs	1
Output current	Adjustable, 0...20 mA, 4...20 mA, -20...+20 mA
Output voltage	Adjustable, 0...10 V, 2...10 V, 0...5 V, 1...5 V, -5...+5 V, -10...+10 V
General data	
Accuracy	≤ ±0.3 % @ 1 A / 5 A, ≤ ±0.6 % @ 10 A
Configuration	DIP switch and potentiometer
Step response time	≤ 300 ms (RMS), ≤ 60 ms (AA)
Power consumption, max.	2.2 W
Temperature coefficient	≤ ±100 ppm/K @ -25...+55 °C, ≤ ±200 ppm/K @ +55...+70 °C
Voltage supply	16,8 V...31,2 V
Insulation coordination	
EMC standards	IEC 61326-1, IEC 61010-2-201
Impulse withstand voltage	6 kV (1.2/50 µs)
Galvanic isolation	4-way isolator,, between input / output / supply / relay
Insulation voltage	4 kV_{eff} / 1 min.
Test voltage	4 kV
Overvoltage category	III



Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5	
Depth / Width / Height	mm	113.6 / 17.5 / 119.2	114 / 17.5 / 127.1
Note			

Ordering data

Connection type	Type	Qty.	Order No.
Screw connection	ACT20P-CML-10-AO-RC-S	1	**2044850000**
PUSH IN connection	ACT20P-CML-10-AO-RC-P	1	**2489910000**

Note

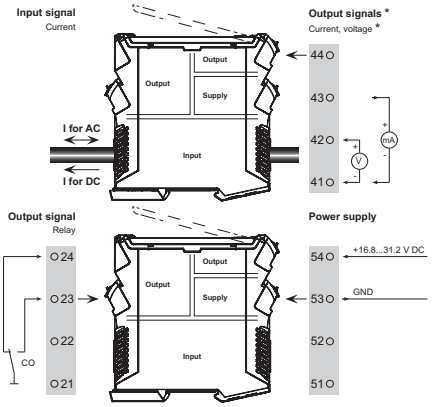
Accessories

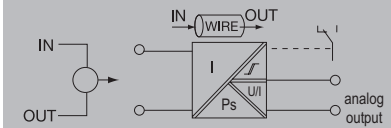
Note

Current measuring transducer

- Measuring and monitoring of AC/DC current
- Input/output electrically isolated
- Input and output ranges are adjustable
- Contact-free through-hole technology
- Relay output for limit value alarm with switching threshold, delay, hysteresis

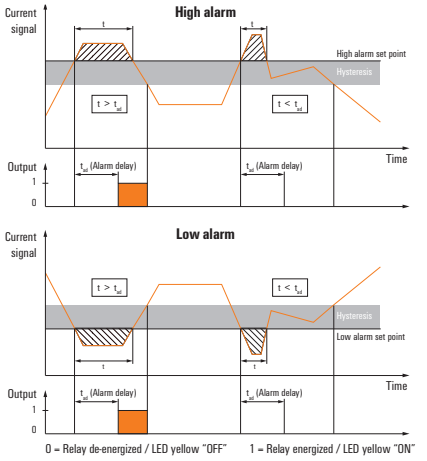
ACT20P-CMT

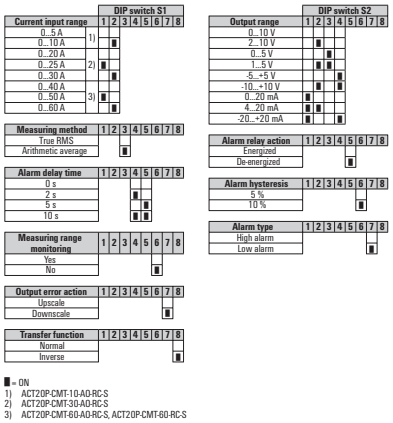




Technical data

Input	
Input measurement range	configurable, 0...5/10 A AC (RMS) or DC
Input signal	Current-carrying cable in feed-through hole, Diameter 10.5 mm
Input frequency	AC: 15...700 Hz (true root mean square), AC: 50 Hz (arithmetic average)
Output (analogue)	
Output voltage	Adjustable, 0...10 V, 2...10 V, 0...5 V, 1...5 V, -5...+5 V, -10...+10 V
Output current	Adjustable, 0...20 mA, 4...20 mA, -20...+20 mA
Load resistance voltage	≥ 10 kΩ
Load resistance current	≤ 600 Ω
Output (digital)	
Type	Relay, 1 CO contact, normal / inverse adjustment
Alarm function	Surge current, Under-current, Alarm delay: 0...10 s, Hysteresis 5% / 10%
Rated switching current	6 A
Max. switching voltage, AC	250 V
General data	
Galvanic isolation	4-way isolator;, between input / output / supply / relay
Accuracy	< 0.75 % FSR
Configuration	DIP switch and potentiometer
Step response time	≤ 300 ms (RMS), ≤ 60 ms (AA)
Temperature coefficient	≤ ±100 ppm/K @ -25...+55 °C, ≤ ±200 ppm/K @ +55...+70 °C
Voltage supply	16,8 V...31,2 V
Insulation coordination	
Rated voltage	300 V AC_{rms}
Standards	IEC 61010-1:2010, 3rd Edition, IEC 61010-2-201:2013, 1st Edition, EN 61326-1
Impulse withstand voltage	6.4 kV (1.2/50 µs)
Test voltage	4 kV
Pollution degree	2
Overvoltage category	III





Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5	
Depth / Width / Height	mm	113.6 / 22.5 / 119.2	114 / 22.8 / 127.1
Note			

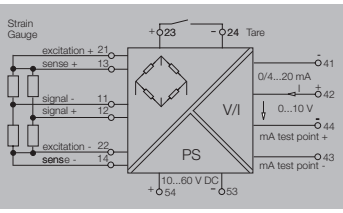
Ordering data

Connection type		Type	Qty.	Order No.
Input measurement range 0...5/10 A	Screw connection	ACT20P-CMT-10-AO-RC-S	1	**1510470000**
Input measurement range 0...20/25/30 A	Screw connection	ACT20P-CMT-30-AO-RC-S	1	**1510540000**
Input measurement range 0...40/50/60 A	Screw connection	ACT20P-CMT-60-AO-RC-S	1	**1510440000**
Input measurement range: 0 to 40/50/60 A	Screw connection	ACT20P-CMT-60-RC-S	1	**1510390000**
Input measurement range 0...5/10 A	PUSH IN connection	ACT20P-CMT-10-AO-RC-P	1	**1510330000**
Input measurement range 0...20/25/30 A	PUSH IN connection	ACT20P-CMT-30-AO-RC-P	1	**1510320000**
Input measurement range 0...40/50/60 A	PUSH IN connection	ACT20P-CMT-60-AO-RC-P	1	**1510290000**
Input measurement range: 0 to 40/50/60 A	PUSH IN connection	ACT20P-CMT-60-RC-P	1	**1510280000**
Note				

Configurable

Bridge measuring transducer for reading from load cells
- 3-way isolation
- Supplies measuring bridges up to 4 x 350 Ω
- Simple calibration of the tare weight using external switch or PLC input
- Input and output ranges adjustable via DIP switch

ACT20P-BRIDGE-S



Technical data

Input	
Bridge sensitivity	1.0 mV / V to 5.0 mV / V
Input measurement range	± 10 mV / ± 20 mV / ± 30 mV / ± 50 mV (adjustable)
Sensor	Resistance measuring bridge, Total resistance of all parallel resistance measuring bridges: min. 87Ω
Sensor supply	120 mA @ 10 V (= 4 x 350 Ω bridge resistors)
Bridge supply voltage	5 V or 10 V
Output	
Type	Voltage and current output (configurable)
Output voltage / Output current	0...11 V (adjustable) / 0...22 mA (adjustable)
Load impedance, voltage/current	600 Ω / ≤ 600 Ω
General data	
Configuration	DIP switch and button
Voltage supply	10...60 V DC
Power consumption	3 W @ 24 V DC
Linearity	Typically ± 0.05 % of signal range
Repeat accuracy	± 0.05 % of final value
Humidity	10...90 %, no condensation
Temperature coefficient	typ. 0.005 % / °C
Long-term drift	0.1 % / 10.000 h
Step response time	< 400 ms (10...90 %)
Ambient temperature	-40 °C...70 °C
Approvals	CE; EAC
Insulation coordination	
Standards	DIN EN 61010-1, DIN EN 61000-4-2
EMC standards	EN 61326
Rated voltage	300 V_{eff}
Pollution degree	2
Overvoltage category	III
Insulation voltage	5.7 kV (input / output, input / supply)

Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	
Depth x width x height	mm	113.6 / 22.5 / 119.2	113.6 / 22.5 / 127.1
Note			

Ordering data

Connection type	
	Screw connection
	PUSH IN connection
Note	

Type	Qty.	Order No.
ACT20P-BRIDGE-S	1	1067250000
ACT20P-BRIDGE-P	1	2456820000

Accessories

Note

Front panel DIP Switch settings

Switch	Action if On	Action if Off
1	10 V Excitation	5 V Excitation
2	mA Output	Voltage Output
3	10 mV Span	Turn off for other ranges
4	20 mV Span	
5	30 mV Span	
6	50 mV Span	
7	4-wire Measurement	6-wire Measurement
8		

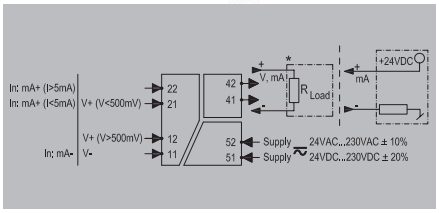
Connections

Terminal	Signal	
11	Signal –	Input signal
12	Signal +	
13	Sense +	Bridge Excitation Voltage
14	Sense –	
21	Excitation +	
22	Excitation –	
23	Tare +	External Tare switch
24	Tare –	
41	mA Output –	Output signal
42	Output +	
43	mA-Test Point –	
44	Voltage Output –	
44	mA-Test Point +	
54	+	Power Supply
53	–	

Universal DC isolation amplifier

ACT20P-PRO DCDC II

- Universally configurable input and output for voltage/ current
- Active or passive output
- Universal voltage supply 24..230 V AC/DC
- 3-way isolation
- Convenient configuration on the device with DIP switches or by means of clear-text display + buttons, without reference source.



Technical data

Input	
Input voltage	configurable, ±40 mV...±300 V, Measuring range. min 40 mV
Input current	configurable, ± 0.1mA...± 100 mA
Input resistance, current	< 5 mA: approx. 100 Ω; >5 mA: approx. 5 Ω
Input resistance, voltage	approx. 1 MΩ
Output	
Output voltage	Adjustable, 0...±10 V
Output current	Adjustable, 0...±20 mA
load impedance voltage	≥ 1 kΩ
Load impedance current	≤ 600 Ω
Offset voltage	< 10 mV
Cut-off frequency (-3 dB)	> 10 kHz/ < 10 Hz
General data	
Galvanic isolation	3-way isolator, between input / output / supply
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤0,01% des Messbereichs/°C
Configuration	DIP switch, or via display and push-buttons
Power consumption	≤2.3 W
Step response time	≤50 µs
Voltage supply	24...230 V DC ±20 %, 24...230 V AC ±10 % @ 48...62 Hz
Insulation coordination	
Rated voltage	600 V
Standards	EN 60079-0, EN 60079-15, EN 61010-1, EN 61140, EN 61326-1, UL 61010-1, SN29500 for MTBF
Insulation voltage	4 kV_{eff}, input / output / power supply
Impulse withstand voltage	5 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	II

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5	
Length x width x height	mm	12.5 / 119.2	12.5 / 127.1
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-PRO DCDC II-S	1	**1481970000**
PUSH IN connection	ACT20P-PRO DCDC II-P	1	**1481960000**

Note

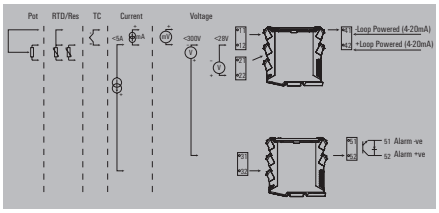
Accessories

Note

Universal converter with digital output

ACT20P-UI-AO-DO-LP

- Independent of external supply thanks to output loop-powered supply
- All-purpose usage thanks to versatile input functions
- Simple software configuration
- Digital output for versatile limit value setting



Technical data

Input	
Sensor	PT100 (2-/3- wire), PT1000 (2-/3- wire), PT200, N120, Cu 10, Thermocouples: B, E, J, K, L, N, R, S, T, U
Input voltage	configurable, -150...+150 mV DC (min. measurement range15 mV), -600...+600 mV DC (min. measurement range 50 mV), ± 12 V DC (min. measurement range 1 V), ± 28 V DC (min. measurement range 2 V), ± 300 V DC (min. measurement range 100 V), 0...1 V AC (min. measurement range300 mV), 0...250 V AC (min. measurement range 100 V)
Input current	configurable, ± 5 A DC (min. measurement range 0.5 A)
Potentiometer	1.2...500 kΩ
Output (analogue)	
Output current	4...20 mA (current loop)
Signal output	direct or inverted
Output (digital)	
Alarm function	configurable, Top and bottom limit values, window range, Alarm delay: 0...99 s
Hysteresis	≥ 0.1 % of FS
Type	Transistor, open collector
Rated switching voltage	≤ 30 V DC
Rated switching current	20 mA
General data	
Galvanic isolation	2-way isolator, between input/output
Accuracy	< 0.1 % of measuring range
Configuration	With FDT/DTM software
Step response time	450 ms
Voltage supply	Output loop powered
Insulation coordination	
Rated voltage	300 V_{eff}
Standards	DIN EN 61326-1, DIN EN 61010-1
Insulation voltage	3.51 kV between input and output
Impulse withstand voltage	4 kV (1.2/50 µs)
Pollution degree	2
Overvoltage category	III

Dimensions		Screw connection	PUSH IN
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5	
Depth / Width / Height		113.6 / 12.5 / 119.2 mm	113.7 / 12.5 / 127.1 mm
Note			

Ordering data

Connection type	Type	Qty.	Order No.
Screw connection	ACT20P-UI-AO-DO-LP-S	1	**1453210000**
PUSH IN connection	ACT20P-UI-AO-DO-LP-P	1	**2456850000**

Note	
	CBX200 USB configuration adapter - 8978580000

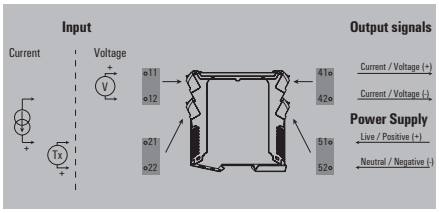
Accessories

Note	

Signal converters

ACT20P-AI-AO-DC

- Isolation and conversion of DC signals
- 24 V - sensor supply
- Configuration via DIP switch/button
- Supply 12-60 V DC
- 3-way isolation



Technical data

Input	
Input voltage	configurable, 0-11 V (min. measurement range 2 V)
Input current	configurable, 0-22 mA (min. measurement range 4 mA)
Input resistance, current	100 Ω
Input resistance, voltage	≥ 1 MΩ
Sensor supply	24 V DC
Output	
Output voltage	Adjustable, 0...11 V, Output range, min, 2 V
Output current	Adjustable, 0...22 mA, Output range, min, 4 mA
load impedance voltage	> 600 Ω @ 10 V
Load impedance current	1 kΩ @ 20 mA
Offset voltage	≤ 20 mV
General data	
Galvanic isolation	3-way isolator, between input / output / supply
Linearity	< ± 0.1 % of signal range, Typ. ± 0.05 % of signal range
Temperature coefficient	< 0.05 % / °C
Configuration	DIP switch, Keys and LED display, with reference voltage/current sources
Step response time	350 ms
Voltage supply	12...60 V DC
Insulation coordination	
Standards	IEC 61326-1:2012, UL 61010-1:2012, 3rd Edition
EMC standards	IEC 61326-1
Insulation voltage	2 kV inputs / outputs
Impulse withstand voltage	4 kV (1.2/50 µs)
Overvoltage category	III

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 2.5	
Depth / Height / Width		113.7 / 119.2 / 12.5 mm	113.7 / 127.1 / 12.5 mm
Note			

Ordering data

Connection type	**Type**	**Qty.**	**Order No.**
Screw connection	ACT20P-AI-AO-DC-S	1	**1477420000**
PUSH IN connection	ACT20P-AI-AO-DC-P	1	**2456860000**

Note

Accessories

Note

Space-saving signal converters – ACT20M

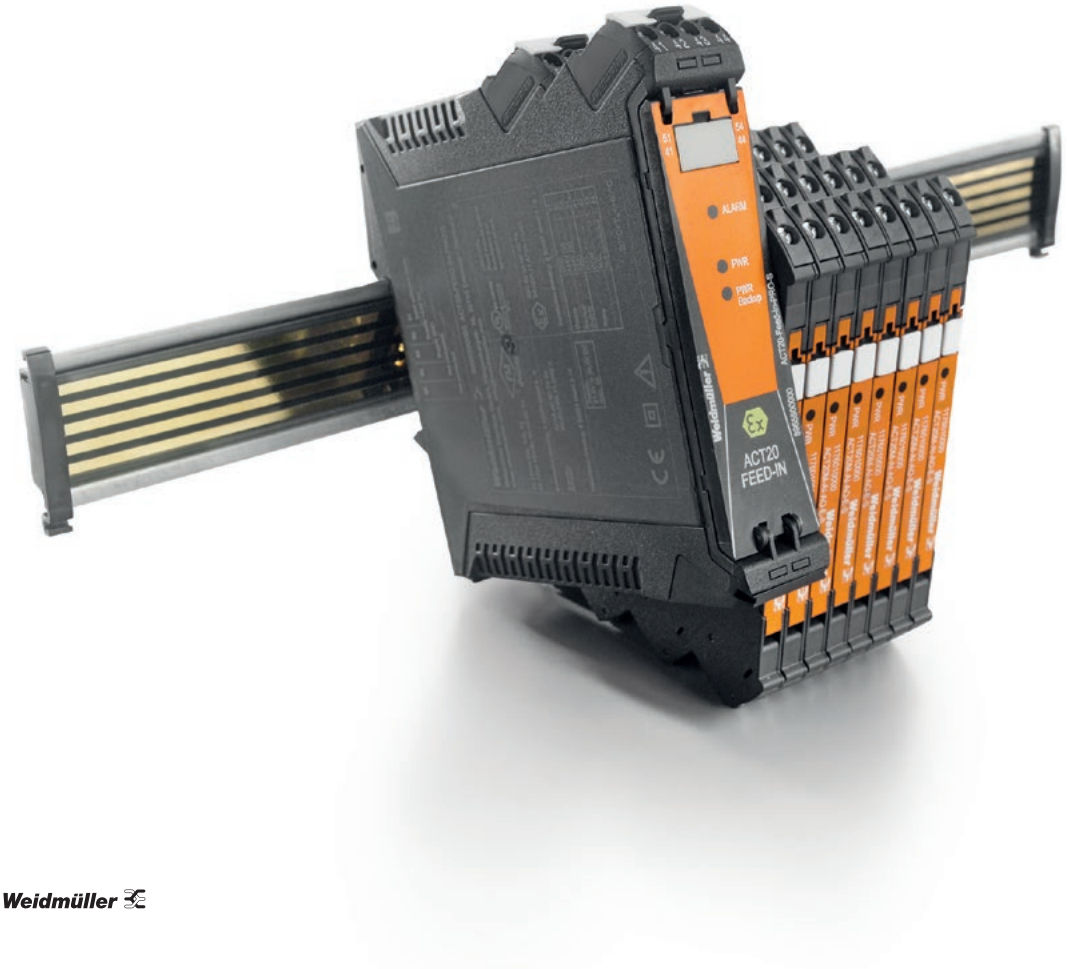
Reliable conversion and isolation of signals in confined spaces

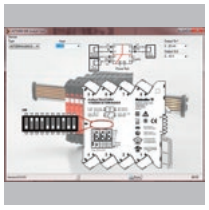
With ACT20M signal converters with 6 mm wide design

The new dimension for converting and isolating – housed in a 6 mm width

The ACT20M series of products combines innovative technology with maximum functionality in an electronics housing measuring just 6 mm in width. The ACT20-FEED-IN-PRO-S power-feed unit eliminates the need to wire the power supply to the modules. This reduces the installation time by at least 30%. The ACT20-FEED-IN-PRO-S can supply and monitor up to 120 devices, which are mounted on the CH20 terminal rail bus.

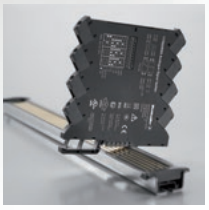
The product line consists of Input Loop Powered, Output Loop Powered and Auxiliary Powered analog isolators and converters, including a universal input converter.
The eight-connection housing allows additional functionality such as 2 channel ILP, 2 channel OLP isolation and signal splitting with input powering option.
The configuration is carried out via DIP switches or the FDT/ DTM software. The ACT20M modules are supplied via direct wiring or a rail bus.





The DIP switch can be configured simply on the module

In the “ACT20M Tool” software, simply select the type of input and output, and set the DIP switch configuration as displayed.



Installation is simple and quick

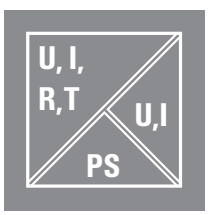
The power supply is simply snapped onto the rail bus for fast and easy installation. The supply can be through any ACT20M module or a separate power-feed unit.

Easy configuration

DIP switches on the side are used to configure the input and output parameters, as well as the response time.

Approvals

Fulfils the strict standards and requirements of the process industry. Can be used worldwide due to international and local approvals ATEX, IECEX, CULUS, FM, GL and DNV.



High level of galvanic isolation

2.5 kV of electrical isolation (300 V rated voltage) ensures excellent process reliability.

Selection table

Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Space-saving signal converters – ACT20M											
	Signal converters											
1175980000	ACT20M-CI-CO-S	1	X	X						4-wire sensor	6.1 mm	
1176000000	ACT20M-AI-AO-S	1	X	X	X	X				2-,4-wire sensor X	6.1 mm	
1176010000	ACT20M-AI-AO-E-S	1	X	X	X	X				4-wire sensor	6.1 mm	
1375450000	ACT20M-BAI-AO-S	1								-10(20)...+10(20) mA, -5(10)...+5(10) V	6.1 mm	
	Passive isolators											
1176070000	ACT20M-CI-CO-ILP-S	1	X	X						4-wire sensor	6.1 mm	
1176080000	ACT20M-2CI-2CO-ILP-S	2	X	X						4-wire sensor	6.1 mm	
1176040000	ACT20M-CI-CO-OLP-S	1		X						2-wire transmitter X	6.1 mm	
1176050000	ACT20M-2CI-2CO-OLP-S	2		X						2-wire transmitter X	6.1 mm	
	Signal splitters											
1175990000	ACT20M-CI-2CO-S	1	X	X						4-wire sensor	6.1 mm	
1176020000	ACT20M-AI-2SAO-S	1	X	X	X	X				2-,4-wire sensor X	6.1 mm	
1375470000	ACT20M-BAI-2AO-S	1								-10(20)...+10(20) mA, -5(10)...+5(10) V	6.1 mm	
	Temperature transducer											
1435590000	ACT20M-RTCI-CO-OLP-S	1					X	X		PT100 Type: J,K	6.1 mm	
1435610000	ACT20M-RTI-CO-EOLP-S	1						X		PT100	6.1 mm	
1375510000	ACT20M-RTI-AO-S	1						X		PT100	6.1 mm	
1375520000	ACT20M-RTI-AO-E-S	1						X		PT100	6.1 mm	
1375480000	ACT20M-TCI-AO-S	1					X			Type J,K	6.1 mm	
1375500000	ACT20M-TCI-AO-E-S	1					X			Type J,K	6.1 mm	
	Universal measurement transducers											
1176030000	ACT20M-UI-AO-S	1	X	X	X	X	X	X		PT50/100/250/300/400/1000, Ni50/100/1000 Type: B / C / E / J / K / L / N / R / S / T X	6.1 mm	

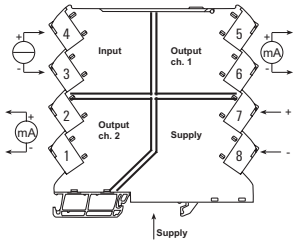
Output						Configuration	Auxiliary power	Isolation		Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage	Connection system	
1	X	X					24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
1	X	X	X			DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X					input loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2	X	X					input loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
1		X					output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2		X					output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
2	X	X				DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
2	X	X	X			DIP switch	24 V DC	300 V	3-way	S	ATEX approval Zone 2
2	X	X	X		-10(20)...+10(20) mA	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1		X			20...4 mA	DIP switch	output loop	300 V	2-way	S	ATEX approval Zone 2, Passive converter
1		X			20...4 mA	DIP switch	output loop		-	S	ATEX approval Zone 2, Passive converter
1	X	X	X		0(1)...5 V	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X			0(1)...5 V	DIP switch	24 V DC		-	S	ATEX approval Zone 2
1	X	X	X		interne CJC, externe CJC	DIP switch	24 V DC	300 V	2-way	S	ATEX approval Zone 2
1	X	X	X		interne CJC, externe CJC	DIP switch	24 V DC		-	S	ATEX approval Zone 2
1	X	X	X			Software	24 V DC	300 V	3-way	S	ATEX approval Zone 2

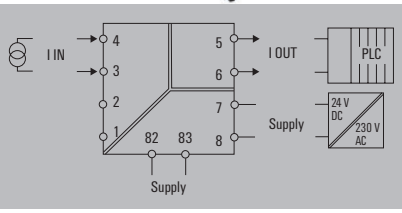
Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

Signal converter

- Isolation of DC signals
- Power supply via the mounting rail bus
- 3-way isolation

ACT20M-CI-CO-S





Technical data

Input	
Number of inputs	1
Input current	0...20 mA, 4...20mA
Voltage drop, current input	< 1.5 V
Output	
Number of outputs	1
Output current	0...20 mA, 4...20 mA
Load impedance current	≤ 600 Ω, @ max 23mA
General data	
Configuration	none
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, typ.	0 W
Power consumption, max.	0.7
Step response time	≤ 7 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	CE; cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-CI-CO-S		
	Input	Power Supply	Output 1
	mA		mA
1			
2			
3	□		
4	■		
5			■
6			□
7		■	
8		□	

■ = +
□ = -

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Type	Qty.	Order No.
Screw connection	ACT20M-CI-CO-S	1	1175980000

Note

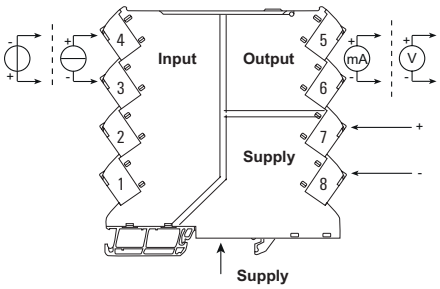
Accessories

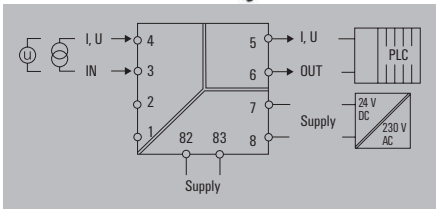
Note
DIN mounting rail, see Accessories

Signal converter

- Isolation and conversion of DC signals
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 3-way isolation
- Support for adjustment by ACT20M Tool software, download link at www.weidmueller.com

ACT20M-AI-AO-S





Technical data

Input	
Input current	configurable, 0...20 mA, 4...20mA
Input voltage	configurable, 0(2)...10 V, 0(1)...5 V
Sensor supply	17...28 V DC (@ 20 mA)
Input resistance, voltage	>500 kΩ
Voltage drop, current input	<1,5 V
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω, @ max 23mA
load impedance voltage	≥ 10 kΩ
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, typ.	1 W
Power consumption, max.	1.2 W
Step response time	≤ 7 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	CE; cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-AI-AO-S					
	Input			Power supply	Output 1	
	V	mA	mA Loop		V	mA
1						
2						
3	■	□	■			
4	□	■	□			
5					■	■
6					□	□
7				■		
8				□		

■ = +
□ = -

DIP switch settings

Range	Input				Output					
	1	2	3	4	5	6	7	8	9	10
0 ... 20 mA		□	□	□	□	□	□			
4 ... 20 mA		□	■	□	□	■	□			
0 ... 10 V		■	□	□	■	□	□			
2 ... 10 V		■	■	□	■	■	□			
0 ... 5 V		■	□	■	■	□	■			
1 ...5 V		■	■	■	■	■	■			
0 ... 20 mA loop	■	□	□	□						
4 ... 20 mA loop	■	□	■	□						

■ = on
□ = off

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Screw connection
Note	

Type	Qty.	Order No.
ACT20M-AI-AO-S	1	1176000000

Accessories

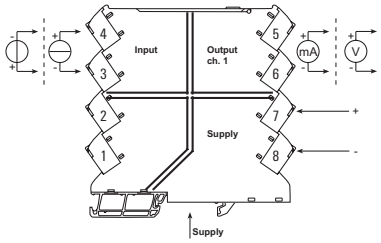
Note	

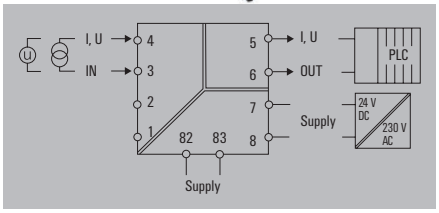
DIN mounting rail, see Accessories

Signal converter

- Isolation and conversion of DC signals
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 3-way isolation
- Support for adjustment by ACT20M Tool software, download link at www.weidmueller.com

ACT20M-AI-AO-E-S





Technical data

Input	
Input current	configurable, 0...20 mA, 4...20mA
Input voltage	configurable, 0(2)...10 V, 0(1)...5 V
Input resistance, voltage	>500 kΩ
Voltage drop, current input	<1,5 V
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω, @ max 23mA
load impedance voltage	≥ 10 kΩ
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Ambient temperature	0 °C...70 °C
Accuracy	< 0.2 % of measuring range
Temperature coefficient	≤ 0.015 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, typ.	1 W
Power consumption, max.	0.8 W
Step response time	≤ 7 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} /1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	CE; cULus; DETNORVER; DNVGL; EAC

Electrical connections

Terminal	ACT20M-AI-AO-E-S					
	Input		Power supply	Output 1		
	V	mA		V	mA	
1						
2						
3	■	□				
4	□	■				
5				■	■	
6				□	□	
7			■			
8			□			

■ = +
□ = -

DIP switch settings

Range	Input				Output					
	1	2	3	4	5	6	7	8	9	10
0 ... 20 mA		□	□	□	□	□	□			
4 ... 20 mA		□	■	□	□	■	□			
0 ... 10 V		■	□	□	■	□	□			
2 ... 10 V		■	■	□	■	■	□			
0 ... 5 V		■	□	■	■	□	■			
1 ...5 V		■	■	■	■	■	■			

■ = on
□ = off

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Type	Qty.	Order No.
Screw connection	ACT20M-AI-AO-E-S	1	1176010000

Note

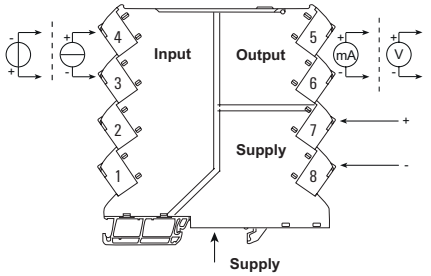
Accessories

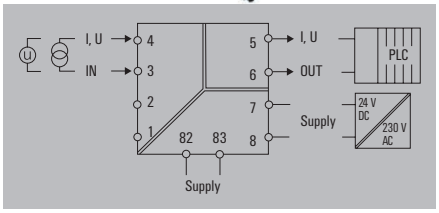
Note
DIN mounting rail, see Accessories

Signal converter

- Isolation and conversion of bipolar DC signals into standard signals
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 3-way isolation
- Support for adjustment by ACT20M Tool software, download link at www.weidmueller.com

ACT20M-BAI-AO-S





Technical data

Input	
Input current	configurable, -10 mA...0...+10 mA, -20 mA...0...+20 mA
Input voltage	configurable, -5 V...0...+5 V, -10 V...0...+10 V
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω
load impedance voltage	≥ 10 kΩ
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Storage temperature	-40 °C...85 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	< 0.01% of span/°C (TU)
Cut-off frequency (-3 dB)	≥ 100 Hz, 10 Hz
Insulation coordination	
Insulation voltage	2.5 kV_{eff} /1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions	
Clamping range (nominal / min. / max.)	mm^2
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally via mounting rail bus CH20M

Electrical connections

Terminal	ACT20M-BAI-AO-S					
	Input		Power supply	Output 1		
	V	mA		V	mA	
1						
2						
3	■	□				
4	□	■				
5				■	■	
6				□	□	
7			■			
8			□			

■ = +
□ = -

DIP switch settings

Range	Bandwidth	Input			Output					
	1	2	3	4	5	6	7	8	9	10
10 Hz	■									
100 Hz	□									
-10...+10 mA		■	■	■						
-20...+20 mA		■	■	□						
-5...+5 V		□	□	■						
-10...+10 V		□	□	□						
0 ... 20 mA					□	□	□			
4 ... 20 mA					□	■	□			
0 ... 10 V					■	□	□			
2 ... 10 V					■	■	□			
0 ... 5 V					■	□	■			
1 ...5 V					■	■	■			
±20 mA set-up										
±10 mA set-up										

■ = on
□ = off

Ordering data

Type	Qty.	Order No.
ACT20M-BAI-AO-S	1	1375450000

Note

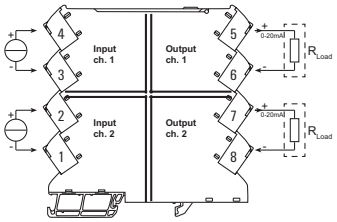
Accessories

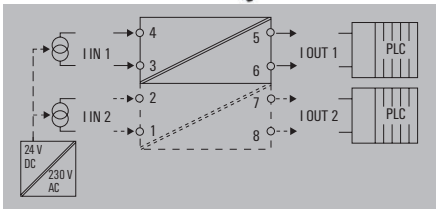
Note
Mounting rail bus, see accessories

Passive isolator

- Isolation of DC signals without additional voltage supply
- Supply from the input measuring circuit
- Optionally available as a 1-channel / 2-channel version
- 2-way isolation

ACT20M-CI-CO-ILP-S





Technical data

Input	
Voltage drop, current input	1.25 V + 0.015 V_{out} @25°C
Input current	0...20 mA, 4...20mA
Output	
Output current	0...20 mA, 4...20 mA
Load impedance current	≤600 Ω
General data	
Configuration	none
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.1 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption	30 mW per channel
Voltage supply	Loop powered, via 4...20 mA input
Step response time	≤ 5 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} /1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-CI-2CO-S			
	Input 1	Output 1	Input 2	Output 2
	mA	mA	mA	mA
1			□	
2			■	
3	□			
4	■			
5		■		
6		□		
7				■
8				□

Electrical connections

Terminal	ACT20M-CI-CO-ILP-S	
	Input 1	Output 1
	mA	mA
1		
2		
3	□	
4	■	
5		■
6		□
7		
8		

■ = +
□ = -

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Type	Qty.	Order No.
1-channel version	ACT20M-CI-CO-ILP-S	1	1176070000
2-channel version	ACT20M-2CI-2CO-ILP-S	1	1176080000

Note

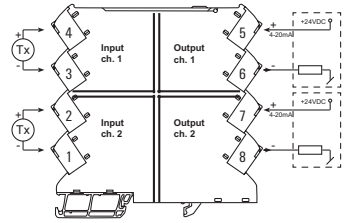
Accessories

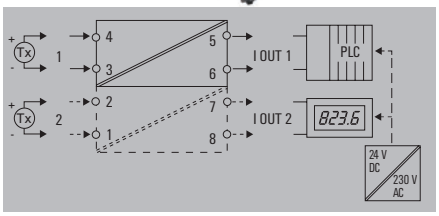
Note
DIN mounting rail, see Accessories

Passive isolator

- Isolation of DC signals without additional voltage supply
- Supply from the output measurement circuit
- Optionally available as a 1-channel / 2-channel version
- 2-way isolation

ACT20M-CI-CO-OLP-S





Technical data

Input	
Voltage drop, current input	Typical 2.5 V
Input current	4...20mA
Output	
Output current	4...20 mA
General data	
Configuration	none
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤±0.02 µA x (Δ °C x V_{supply}) @ Tamb > 25 °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, max.	0.5 W
Voltage supply	Output loop powered
Step response time	≤ 5 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-2CI-2CO-OLP-S			
	Input 1	Output 1	Input 2	Output 2
	mA	mA	mA	mA
1			□	
2			■	
3	□			
4	■			
5		■		
6		□		
7				■
8				□

Electrical connections

Terminal	ACT20M-CI-CO-OLP-S	
	Input 1	Output 1
	mA	mA
1		
2		
3	□	
4	■	
5		■
6		□
7		
8		

■ = +
□ = -

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection
2.5 / 0.5 / 2.5
114.3 / 6.1 / 112.5
Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Type	Qty.	Order No.
1-channel version	ACT20M-CI-CO-OLP-S	1	1176040000
2-channel version	ACT20M-2CI-2CO-OLP-S	1	1176050000

Note

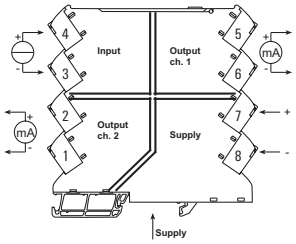
Accessories

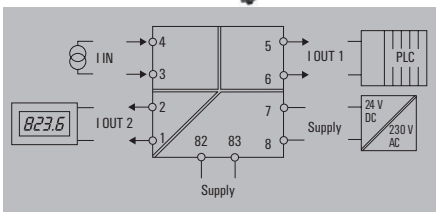
Note
DIN mounting rail, see Accessories

Signal splitter

- Isolation and doubling of DC signals
- Power supply via the mounting rail bus
- 4-way isolation

ACT20M-CI-2CO-S





Technical data

Input	
Number of inputs	1
Input current	0...20 mA, 4...20mA
Voltage drop, current input	< 1.5 V
Output	
Number of outputs	2
Output current	0...20 mA, 4...20 mA
Load impedance current	< 300 Ω, per channel, @ max 23mA
General data	
Configuration	none
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, typ.	1 W
Power consumption, max.	0.8 W
Step response time	≤ 7 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	CE; cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-CI-2CO-S			
	Input	Power Supply	Output 1	Output 2
	mA		mA	mA
1				□
2				■
3	□			
4	■			
5			■	
6			□	
7		■		
8		□		

■ = +
□ = -

Dimensions		
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Screw connection
Note	

Type	Qty.	Order No.
ACT20M-CI-2CO-S	1	1175990000

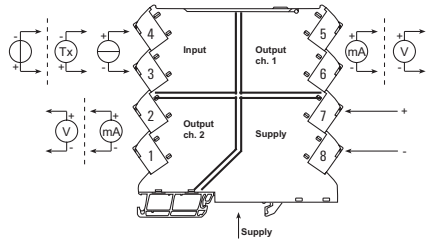
Accessories

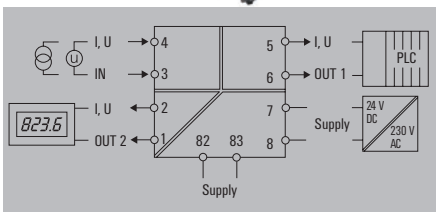
Note	DIN mounting rail, see Accessories

Signal splitter

- Isolation, conversion and doubling of DC signals
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 4-way isolation
- Support for adjustment by ACT20M Tool software, download link at www.weidmueller.com

ACT20M-AI-2AO-S





Technical data

Input	
Number of inputs	1
Input current	configurable, 0...20 mA, 4...20mA
Input voltage	configurable, 0(2)...10 V, 0(1)...5 V
Sensor supply	17...28 V DC (@ 20 mA)
Input resistance, voltage	500 kΩ
Voltage drop, current input	< 1.5 V
Output	
Number of outputs	2
Output current	Adjustable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	< 300 Ω, per channel, @ max 23mA
load impedance voltage	≥ 10 kΩ
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Cut-off frequency (-3 dB)	100 Hz
Power consumption, typ.	1 W
Power consumption, max.	1.2 W
Step response time	≤ 7 ms
Insulation coordination	
Insulation voltage	2.5 kV_{eff} /1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	CE; cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-AI-2AO-S							
	Input			Power supply	Output 1		Output 2	
	V	mA	mA Loop		V	mA	V	mA
1							□	□
2							■	■
3	■	□	■					
4	□	■	□					
5					■	■		
6					□	□		
7				■				
8				□				

■ = +
□ = -

DIP switch settings

Range	Input				Output 1			Output 2		
	1	2	3	4	5	6	7	8	9	10
0 ... 20 mA		□	□	□	□	□	□	□	□	□
4 ... 20 mA		□	■	□	□	■	□	□	■	□
0 ... 10 V		■	□	□	■	□	□	■	□	□
2 ... 10 V		■	■	□	■	■	□	■	■	□
0 ... 5 V		■	□	■	■	□	■	■	□	■
1 ...5 V		■	■	■	■	■	■	■	■	■
0 ... 20 mA loop	■	□	□	□						
4 ... 20 mA loop	■	□	■	□						

■ = on
□ = off

Dimensions		
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		Power supply optionally over the DIN mounting rail CH20M

Ordering data

	Type	Qty.	Order No.
Screw connection	ACT20M-AI-2AO-S	1	1176020000

Note

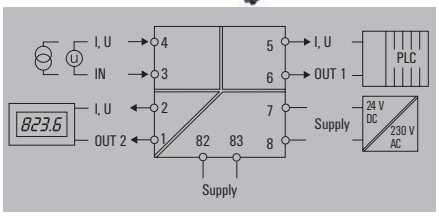
Accessories

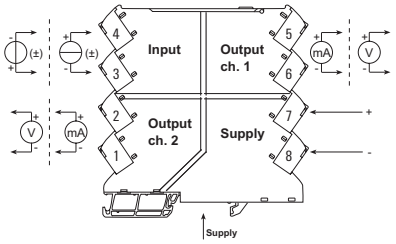
Note	DIN mounting rail, see Accessories

Signal splitter

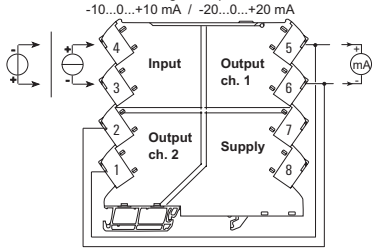
- Isolation and conversion of bipolar DC signals
- Splitting into standard signal or bipolar output
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 4-way isolation
- Support for adjustment by ACT20M Tool software, download link at www.weidmueller.com

ACT20M-BAI-2AO-S





Wiring for output:
-10...0...+10 mA / -20...0...+20 mA



Technical data

Input	
Number of inputs	1
Input current	configurable, -10 mA...0...+10 mA, -20 mA...0...+20 mA
Input voltage	configurable, -5 V...0...+5 V, -10 V...0...+10 V
Output	
Number of outputs	2
Output current	configurable, 0...20 mA, 4...20 mA, 1 channel -10...0...+10 mA, 1 channel -20...0...+20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	< 300 Ω, per channel
load impedance voltage	≥ 10 kΩ
General data	
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Storage temperature	-40 °C...85 °C
Accuracy	< 0.05 % of measuring range
Temperature coefficient	< 0.01% of span/°C (TU)
Cut-off frequency (-3 dB)	≥ 100 Hz, 10 Hz
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Screw connection	
2.5 / 0.5 / 2.5	
114.3 / 6.1 / 112.5	

Electrical connections

Terminal	ACT20M-BAI-2AO-S					
	Input		Power supply	Output 1		Output 2	
	V	mA		V	mA	V	mA
1						□	□
2						■	■
3	■	□					
4	□	■					
5				■	■		
6				□	□		
7			■				
8			□				

■ = +
□ = -

DIP switch settings

Range	Bandwidth	Input				Output 1				Output 2	
	1	2	3	4	5	6	7	8	9	10
10 Hz	■									
100 Hz	□									
-10...+10 mA		■	■	■						
-20...+20 mA		■	■	□						
-5...+5 V		□	□	■						
-10...+10 V		□	□	□						
0 ... 20 mA					□	□	□	□	□	□
4 ... 20 mA					□	■	□	□	■	□
0 ... 10 V					■	□	□	■	□	□
2 ... 10 V					■	■	□	■	■	□
0 ... 5 V					■	□	■	■	□	■
1 ...5 V					■	■	■	■	■	■
±20 mA set-up					□	□	■	□	□	■
±10 mA set-up					□	■	■	□	■	■

■ = on
□ = off

Ordering data

Type	Qty.	Order No.
ACT20M-BAI-2AO-S	1	1375470000

Note

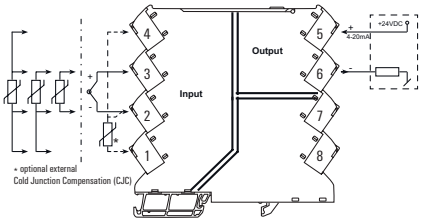
Accessories

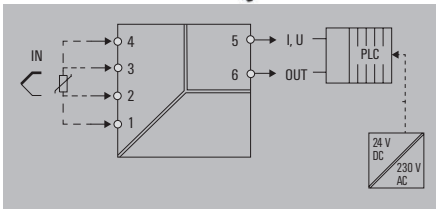
Note	
DIN mounting rail, see accessories	

Temperature transducers

- Isolation and conversion of temperature signals, (RTD and thermocouple)
- Configuration via DIP switches
- Power supply via the output circuit
- 2-way isolation

ACT20M-RTCI-CO-OLP-S





Technical data

Input	
Sensor	PT100 / 2-/3-/4-wire, Thermocouple acc. to IEC 584, type: J, Thermocouple acc. to IEC 584, type: K
Input measurement range	PT100 -200...+850 °C, Thermocouple type J -100...+1200°C, Thermocouple type K -200...+1370°C
Temperature input range	Configurable, min. measurement range 10°C (RTD), min. measurement range 50°C (TC)
Output	
Output current	configurable, 4...20 mA, 20...4 mA
Sensor error detection	3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	Output loop powered, 6...35 V
Power consumption, max.	0.8 W
Storage temperature	-40 °C...85 °C
Accuracy	absolute accuracy: < ±0.05 % of the measurement range, RTD (PT100) Basic accuracy: < ±0.1 °C of the measurement range, TC (J,K) Basic accuracy: < ±0.5 °C of the measurement range
Galvanic isolation	2-way isolator
Step response time	≤ 30 ms, < 300 ms
Ambient temperature	-25 °C...+70 °C
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20M-RTCI-CO-OLP-S	1	1435590000

Note

Accessories

Note

DIN mounting rail, see accessories

Electrical connections

Terminal	ACT20M-RTCI-CO-OPL-S				
	Input				Output 1
	RTD			TC	mA
	2 wire	3 wire	4 wire		
1		Sense-	Sense-	CJC+*	
2	R	R-	R-	TC-/CJC-*	
3	R	R+	R+	TC+	
4			Sense+	CJC-*	
5					■
6					□
7					
8					

* optional

■ = +

□ = -

Configuration

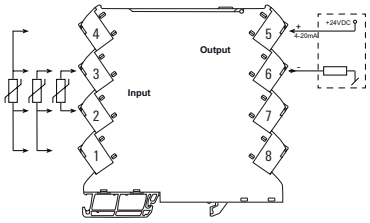
Temperature range [°C] Pt100: -200...+850 °C // TC J: -100...+1200°C // TC K: -180...+1372 °C																		
Min.	S2				Max.	S2					Max.	S2						
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10
-200					0							170	■					
-180				■	5						■	180	■					■
-150			■		10					■		190	■				■	
-100			■	■	15					■	■	200	■				■	■
-50		■			20				■			225	■				■	
-25		■		■	25				■		■	250	■				■	■
-10		■	■		30				■	■		275	■				■	■
-5		■	■	■	35				■	■	■	300	■				■	■
0	■				40			■				325	■		■			
5	■			■	45			■			■	350	■		■			■
10	■		■		50			■		■		375	■		■		■	
20	■		■	■	55			■		■	■	400	■		■		■	■
25	■	■			60			■	■			450	■		■	■		
50	■	■		■	65			■	■		■	500	■		■	■		■
100	■	■	■		70			■	■	■		550	■		■	■	■	
200	■	■	■	■	75			■	■	■	■	600	■		■	■	■	■
					80		■					650	■	■				
					85		■				■	700	■	■				■
					90		■			■		750	■	■			■	
					95		■			■	■	800	■	■				■
					100		■		■			850	■	■		■		
					105		■		■		■	900	■	■		■		■
					110		■		■	■		950	■	■		■	■	
					115		■		■	■	■	1000	■	■		■	■	■
					120		■	■				1050	■	■	■			
					125		■	■			■	1100	■	■	■			■
					130		■	■		■		1150	■	■	■		■	
					135		■	■		■	■	1200	■	■	■		■	■
					140		■	■	■			1250	■	■	■	■		
					145		■	■	■		■	1300	■	■	■	■		■
					150		■	■	■	■		1350	■	■	■	■	■	
					160		■	■	■	■	■	1372	■	■	■	■	■	■

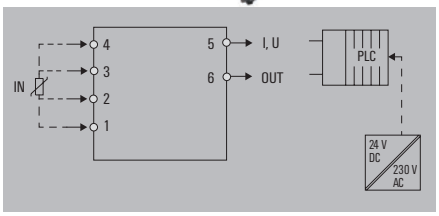
■ = On

Temperature transducers

- Conversion of temperature signals, RTD
- Configuration via DIP switches
- Power supply via the output circuit

ACT20M-RTI-CO-EOLP-S





Technical data

Input	
Sensor	PT100 / 2-/3-/4-wire
Input measurement range	PT100 -200...+850 °C
Temperature input range	Configurable, min. measurement range 10°C (RTD)
Output	
Output current	configurable, 4...20 mA, 20...4 mA
Sensor error detection	3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	Output loop powered, 6...35 V
Power consumption, max.	0.8 W
Storage temperature	-40 °C...85 °C
Accuracy	absolute accuracy: < ±0.1 % of the measurement range, Basic accuracy: < ±0.2°C
Galvanic isolation	Without isolation
Step response time	≤ 30 ms, < 300 ms
Ambient temperature	-25 °C...+70 °C
EMC standards	IEC 61326-1, NE 21
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Electrical connections

Terminal	ACT20M-RTCI-CO-OPL-S			
	Input			Output 1
	RTD			mA
	2 wire	3 wire	4 wire	
1		Sense-	Sense-	
2	R	R-	R-	
3	R	R+	R+	
4			Sense+	
5				■
6				□
7				
8				

* optional

■ = +

□ = -

Configuration

Temperature range [°C]																					
Pt100: -200...+850 °C // TC J: -100...+1200°C // TC K: -180...+1372 °C																					
Min.	S2				Max.	S2					Max.	S2									
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10			
-200					0							170	■								
-180				■	5						■	180	■					■			
-150			■		10					■		190	■				■				
-100			■	■	15					■	■	200	■				■	■			
-50		■			20				■			225	■				■				
-25		■		■	25				■		■	250	■				■		■		
-10		■	■		30				■	■		275	■				■	■			
-5		■	■	■	35				■	■	■	300	■				■	■	■		
0	■				40				■			325	■		■						
5	■			■	45				■		■	350	■		■				■		
10	■		■		50				■		■	375	■		■				■		
20	■		■	■	55				■		■	400	■		■				■	■	
25	■	■			60				■	■		450	■		■	■					
50	■	■		■	65				■	■	■	500	■		■	■			■		
100	■	■	■		70				■	■	■	550	■		■	■	■				
200	■	■	■	■	75				■	■	■	600	■		■	■	■	■			
					80		■					650	■	■							
					85		■				■	700	■	■					■		
					90		■			■		750	■	■				■			
					95		■			■	■	800	■	■					■	■	
					100		■		■			850	■	■		■					
					105		■		■		■										
					110		■		■	■											
					115		■		■	■	■										
					120		■	■													
					125		■	■			■										
					130		■	■		■											
					135		■	■		■	■										
					140		■	■	■												
					145		■	■	■		■										
					150		■	■	■	■											
					160		■	■	■	■	■										

■ = On

Dimensions	
Clamping range (nominal / min. / max.)	mm²
Depth x width x height	mm
Note	

Dimensions	Screw connection
2.5 / 0.5 / 2.5	
114.3 / 6.1 / 112.5	

Ordering data

Type	Qty.	Order No.
ACT20M-RTI-CO-EOLP-S	1	1435610000

Note

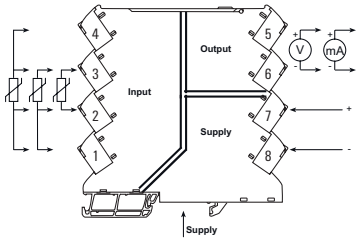
Accessories

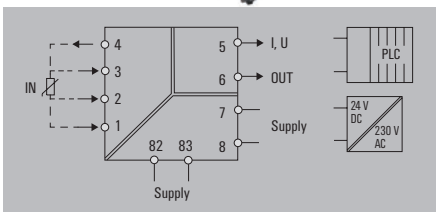
Note	
	DIN mounting rail, see accessories

Temperature transducers

- Isolation and conversion of temperature signals, RTD (PT100)
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 3-way isolation

ACT20M-RTI-AO-S





Technical data

Input	
Sensor	PT100 / 2-/3-/4-wire
Input measurement range	PT100 -200...+850 °C
Temperature input range	Configurable, min. measurement range 10°C (RTD)
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω
load impedance voltage	≥ 10 kΩ
Sensor error detection	3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Power consumption, max.	0.7 W
Accuracy	absolute accuracy: < ±0.05 % of the measurement range, Basic accuracy: < ±0.1°C
Galvanic isolation	3-way isolator
Temperature coefficient	≤0.01 % of the measurement range/°C or 0.02 °C / °C
Step response time	≤ 30 ms
Ambient temperature	-25 °C...+70 °C
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20M-RTI-AO-S	1	1375510000

Note

Accessories

Note	DIN mounting rail, see accessories

Electrical connections

Terminal	ACT20M-RTI-AO-S					
	Input			Power supply	Output 1	
	RTD					
	2 wire	3 wire	4 wire		V	mA
1		Sense-	Sense-			
2	R	R-	R-			
3	R	R+	R+			
4			Sense+			
5					■	■
6					□	□
7				■		
8				□		

■ = +
□ = -

Configuration

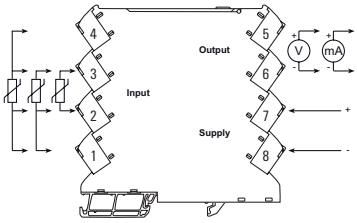
Temperature range [°C] Pt100: -200...+850 °C																						
Min.	S2				Max.	S2						Max.	S2									
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10				
-200					0							170	■									
-180				■	5						■	180	■					■				
-150			■		10					■		190	■					■				
-100			■	■	15					■	■	200	■					■	■			
-50		■			20				■			225	■				■					
-25		■		■	25				■		■	250	■				■		■			
-10		■	■		30				■	■		275	■				■	■				
-5		■	■	■	35				■	■	■	300	■				■	■	■			
0	■				40			■				325	■		■							
5	■			■	45			■			■	350	■		■				■			
10	■		■		50			■		■		375	■		■			■				
20	■		■	■	55			■		■	■	400	■		■			■	■			
25	■	■			60			■	■			450	■		■	■						
50	■	■		■	65			■	■		■	500	■		■	■			■			
100	■	■	■		70			■	■	■		550	■		■	■	■					
200	■	■	■	■	75			■	■	■	■	600	■		■	■	■	■				
					80		■					650	■	■								
					85		■				■	700	■	■					■			
					90		■			■		750	■	■					■			
					95		■			■	■	800	■	■					■	■		
					100		■		■			850	■	■		■						
					105		■		■		■											
					110		■		■	■												
					115		■		■	■	■											
					120		■	■														
					125		■	■			■											
					130		■	■		■												
					135		■	■		■	■											
					140		■	■	■													
					145		■	■	■		■											
					150		■	■	■	■												
					160		■	■	■	■	■											

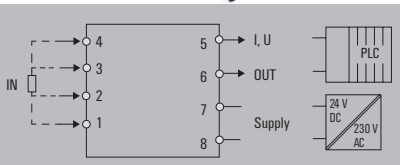
■ = On

Temperature transducers

- Conversion of temperature signals, RTD (PT100)
- Configuration via DIP switches

ACT-20M-RTI-AO-E-S





Technical data

Input	
Sensor	PT100 / 2-/3-/4-wire
Input measurement range	PT100 -200...+850 °C
Temperature input range	Configurable, min. measurement range 10°C (RTD)
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω
load impedance voltage	≥ 10 kΩ
Sensor error detection	3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Power consumption, max.	0.5 W
Accuracy	absolute accuracy: < ±0.1 % of the measurement range
Galvanic isolation	Without isolation
Temperature coefficient	≤0.01 % of the measurement range/°C or 0.02 °C / °C
Step response time	≤ 30 ms
Ambient temperature	-25 °C...+70 °C
EMC standards	IEC 61326-1, NE 21
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20M-RTI-AO-E-S	1	1375520000

Note

Accessories

Note	
	DIN mounting rail, see accessories

Electrical connections

Terminal	ACT20M-RTI-AO-E-S					
	Input			Power supply	Output 1	
	RTD					
	2 wire	3 wire	4 wire		V	mA
1		Sense-	Sense-			
2	R	R-	R-			
3	R	R+	R+			
4			Sense+			
5					■	■
6					□	□
7				■		
8				□		

■ = +
□ = -

Configuration

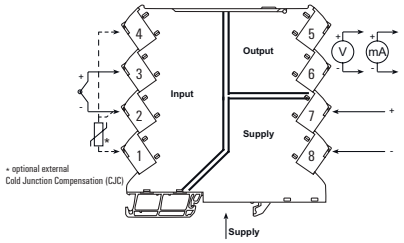
Temperature range [°C] Pt100: -200...+850 °C																						
Min.	S2				Max.	S2						Max.	S2									
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10
-200					0							170	■					
-180				■	5						■	180	■					■
-150			■		10					■		190	■				■	
-100			■	■	15					■	■	200	■				■	■
-50		■			20				■			225	■			■		
-25		■		■	25				■		■	250	■			■		■
-10		■	■		30				■	■		275	■			■	■	
-5		■	■	■	35				■	■	■	300	■			■	■	■
0	■				40			■				325	■		■			
5	■			■	45			■			■	350	■		■			■
10	■		■		50			■		■		375	■		■		■	
20	■		■	■	55			■		■	■	400	■		■		■	■
25	■	■			60			■	■			450	■		■	■		
50	■	■		■	65			■	■		■	500	■		■	■		■
100	■	■	■		70			■	■	■		550	■		■	■	■	
200	■	■	■	■	75			■	■	■	■	600	■		■	■	■	■
					80		■					650	■	■				
					85		■				■	700	■	■				■
					90		■			■		750	■	■			■	
					95		■			■	■	800	■	■			■	■
					100		■		■			850	■	■		■		
					105		■		■		■							
					110		■		■	■								
					115		■		■	■	■							
					120		■	■										
					125		■	■			■							
					130		■	■		■								
					135		■	■		■	■							
					140		■	■	■									
					145		■	■	■		■							
					150		■	■	■	■								
					160		■	■	■	■	■							

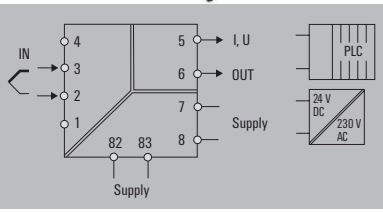
■ = On

Temperature transducers

- Isolation and conversion of temperature signals, (thermocouple)
- Configuration via DIP switches
- Power supply via the mounting rail bus
- 3-way isolation

ACT20M-TCI-AO-S





Technical data

Input	
Sensor	Thermocouple (type J, K)
Input measurement range	Thermocouple type J -100...+1200°C, Thermocouple type K -200...+1370°C
Temperature input range	Configurable, min. measurement range 50°C (TC)
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω
load impedance voltage	≥ 10 kΩ
Sensor error detection	Configurable, 3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Power consumption, max.	0.7 W
Accuracy	absolute accuracy: < ±0.05 % of the measurement range, Basic accuracy: < ±0.5°
Galvanic isolation	3-way isolator
Temperature coefficient	0,1 °C / °C, or, ≤0,01% des Messbereichs/°C
Step response time	≤ 30 ms, < 300 ms, Configurable
Ambient temperature	-25 °C...+70 °C
Insulation coordination	
Insulation voltage	2.5 kV_{eff} / 1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20M-TCI-AO-S	1	1375480000

Note

Accessories

Note	DIN mounting rail, see accessories

Electrical connections

Terminal	ACT20M-TCI-AO-S			
	Input	Power	Output 1	
	TC	supply	V	mA
1	CJC+ 1,2)			
2	TC-/CJC- 1,2)			
3	TC+			
4	CJC- 1,2)			
5			■	■
6			□	□
7		■		
8		□		

1) only 2) optional

■ = +

□ = -

Configuration

Temperature range [°C]
TC J: -100...+1200 °C // TC K: -180...+1372 °C

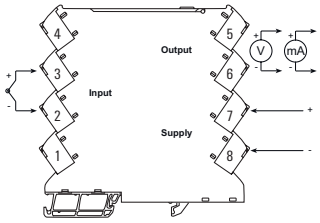
Min.	S2				Max.	S2					Max.	S2					
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10
-200					0							170	■					
-180				■	5						■	180	■					■
-150			■		10					■		190	■				■	
-100			■	■	15					■	■	200	■				■	■
-50		■			20				■			225	■			■		
-25		■		■	25				■		■	250	■			■		■
-10		■	■		30				■	■		275	■			■	■	
-5		■	■	■	35				■	■	■	300	■			■	■	■
0	■				40				■			325	■		■			
5	■			■	45				■		■	350	■		■			■
10	■		■		50				■		■	375	■		■		■	
20	■		■	■	55				■		■	400	■		■		■	■
25	■	■			60				■	■		450	■		■	■		
50	■	■		■	65				■	■	■	500	■		■	■		■
100	■	■	■		70				■	■	■	550	■		■	■	■	
200	■	■	■	■	75				■	■	■	600	■		■	■	■	■
					80		■					650	■	■				
					85		■				■	700	■	■				■
					90		■			■		750	■	■			■	
					95		■			■	■	800	■	■			■	■
					100		■		■			850	■	■		■		
					105		■		■		■	900	■	■		■		■
					110		■		■	■		950	■	■		■	■	
					115		■		■	■	■	1000	■	■		■	■	■
					120		■	■				1050	■	■	■			
					125		■	■			■	1100	■	■	■			■
					130		■	■		■		1150	■	■	■		■	
					135		■	■		■	■	1200	■	■	■		■	■
					140		■	■	■			1250	■	■	■	■		
					145		■	■	■		■	1300	■	■	■	■		■
					150		■	■	■	■		1350	■	■	■	■	■	
					160		■	■	■	■	■	1372	■	■	■	■	■	■

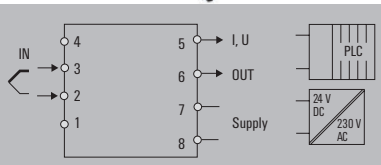
■ = On

Temperature transducers

- Conversion of temperature signals, (thermocouple)
- Configuration via DIP switches

ACT-20M-TCI-AO-E-S





Technical data

Input	
Sensor	Thermocouple (type J, K)
Input measurement range	Thermocouple type J -100...+1200°C, Thermocouple type K -200...+1370°C
Temperature input range	Configurable, min. measurement range 50°C (TC)
Output	
Output current	configurable, 0...20 mA, 4...20 mA
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V
Load impedance current	≤ 600 Ω
load impedance voltage	≥ 10 kΩ
Sensor error detection	Configurable, 3.5 mA / 23 mA / none
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 30 %
Power consumption, max.	0.5 W
Accuracy	absolute accuracy: < ±0.1 % of the measurement range, Basic accuracy: < ±1 °C
Galvanic isolation	Without isolation
Temperature coefficient	0,1 °C / °C, or, ≤0,01% des Messbereichs/°C
Step response time	≤ 30 ms, < 300 ms, Configurable
Ambient temperature	-25 °C...+70 °C
EMC standards	IEC 61326-1, NE 21
Approvals	
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height	mm	114.3 / 6.1 / 112.5
Note		

Ordering data

Type	Qty.	Order No.
ACT20M-TCI-AO-E-S	1	1375500000

Note

Accessories

Note	DIN mounting rail, see accessories

Electrical connections

Terminal	ACT20M-TCI-AO-E-S			
	Input	Power supply	Output 1	
	TC		V	mA
1	CJC+ 1,2)			
2	TC-/CJC- 1,2)			
3	TC+			
4	CJC- 1,2)			
5			■	■
6			□	□
7		■		
8		□		

1) only 2) optional

■ = +

□ = -

Configuration

Temperature range [°C]
TC J: -100...+1200 °C // TC K: -180...+1372 °C

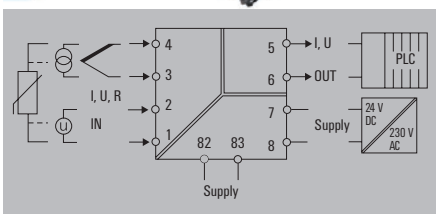
Min.	S2				Max.	S2					Max.	S2					
Temp.	1	2	3	4	Temp.	5	6	7	8	9	10	Temp.	5	6	7	8	9	10
-200					0							170	■					
-180				■	5						■	180	■					■
-150			■		10					■		190	■				■	
-100			■	■	15					■	■	200	■				■	■
-50		■			20				■			225	■			■		
-25		■		■	25				■		■	250	■			■		■
-10		■	■		30				■	■		275	■			■	■	
-5		■	■	■	35				■	■	■	300	■			■	■	■
0	■				40			■				325	■		■			
5	■			■	45			■			■	350	■		■			■
10	■		■		50			■		■		375	■		■		■	
20	■		■	■	55			■		■	■	400	■		■		■	■
25	■	■			60			■	■			450	■		■	■		
50	■	■		■	65			■	■		■	500	■		■	■		■
100	■	■	■		70			■	■	■		550	■		■	■	■	
200	■	■	■	■	75			■	■	■	■	600	■		■	■	■	■
					80		■					650	■	■				
					85		■				■	700	■	■				■
					90		■			■		750	■	■			■	
					95		■			■	■	800	■	■			■	■
					100		■		■			850	■	■		■		
					105		■		■		■	900	■	■		■		■
					110		■		■	■		950	■	■		■	■	
					115		■		■	■	■	1000	■	■		■	■	■
					120		■	■				1050	■	■	■			
					125		■	■			■	1100	■	■	■			■
					130		■	■		■		1150	■	■	■		■	
					135		■	■		■	■	1200	■	■	■		■	■
					140		■	■	■			1250	■	■	■	■		
					145		■	■	■		■	1300	■	■	■	■		■
					150		■	■	■	■		1350	■	■	■	■	■	
					160		■	■	■	■	■	1372	■	■	■	■	■	■

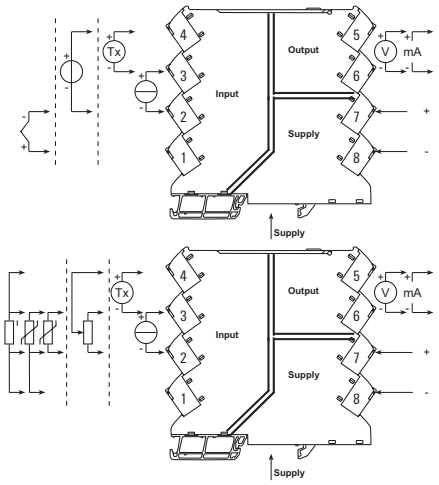
■ = On

Universal measurement and signal converter

- Isolation and conversion of temperature signals and DC signals
- Configuration using FDT/DTM software
- Power supply via the mounting rail bus
- 3-way isolation

ACT20M-UI-AO-S





Technical data

Input	
Sensor	Thermocouples: B / C / E / J / K / L / N / R / S / T / W3 / W5 - 200...+ 2300 °C depending on thermocouple, RTD: PT10, PT20, PT50, PT100, PT250, PT300, PT400, PT500, PT1000, Ni50, Ni100, Ni120, Ni1000, 2-/3-/4-wire
Potentiometer	10...100 kΩ
Resistance	0...10 kΩ
Input current	configurable, 0...20 mA, 4...20mA
Input voltage	configurable, 0(2)...10 V, 0(1)...5 V, 0...1 V DC, 0,2...1 V DC
Input resistance, voltage	> 10 MΩ
Voltage drop, current input	< 3 V
Sensor supply	> 15 V DC at 20 mA
Output	
Output current	configurable, 0...20 mA, 4...20 mA, 20...0 mA, 20...4 mA, downscale (3,5 mA), upscale (23 mA), in case of sensor error
Output voltage	configurable, 0(2)...10 V, 0(1)...5 V, 0(0,2)...1 V, 1...(0,2)0 V, 5...(1)0 V, 10...(2)0 V, downscale (0 V), upscale (11 V), in case of sensor error
Load impedance current	≤ 600 Ω, @ max 28mA
load impedance voltage	≥ 10 kΩ
General data	
Configuration	With FDT/DTM software
Voltage supply	24 V DC ± 30 %
Ambient temperature	-25 °C...70 °C
Accuracy	< 0.1 % of measuring range
Temperature coefficient	≤ 0.01 % / °C
Power consumption, typ.	1 W
Power consumption, max.	1.2 W
Step response time	400 ms (10...90%) @ U/I, 1 s @ temp
Insulation coordination	
Insulation voltage	2.5 kV_{eff} /1 min.
Rated voltage	300 V_{eff}
EMC standards	IEC 61326-1, NE 21
Pollution degree	2
Overvoltage category	II
Approvals	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX
Dimensions	**Screw connection**
Clamping range (nominal / min. / max.) mm²	2.5 / 0.5 / 2.5
Depth x width x height mm	114.3 / 6.1 / 112.5
Note	Power supply optionally over the DIN mounting rail CH20M

Electrical connections

Terminal	ACT20M-UI-AO-S											
	Input									Power supply	Output	
	V	mA	mA Loop	RTD 2 wire	RTD 3 wire	RTD 4 wire	POT	TC			V	mA
1					Sense-	Sense-		■			□	□
2	□	□		R	R-	R-	R	□				
3		■		R	R+	R+	R					
4	■					Sense+	R					
5											■	■
6											□	□
7										■		
8										□		

■ = +
□ = -

Ordering data

	Type	Qty.	Order No.
Screw connection	ACT20M-UI-AO-S	1	1176030000

Note

Accessories

Note	CBX200 USB configuration adapter - 8978580000 DIN mounting rail, see Accessories

Signal converters in terminal format – MCZ

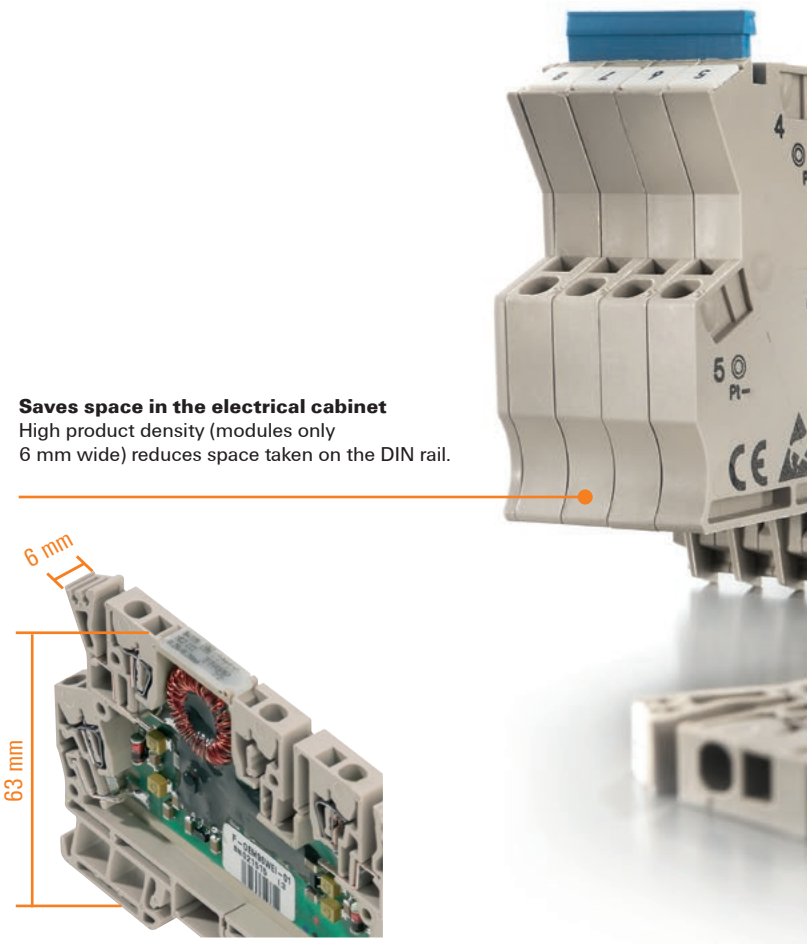
Isolate and convert signals at the interface level
MCZ signal converter in terminal format

The MCZ-SERIES signal converters have a slim terminal design and convert, isolate and monitor analogue signals. They have five tension clamp connections. The open side of the housing can be closed using a standard cover plate accessory. The housing has a low height of just 6.3 cm. It also accommodates a cross-connector for reducing the wiring of multiple module's 24 V and 0 V connections. Two WS 10/6-markers can be used for labelling. These are available in MultiCard format and can be printed using Weidmüller's professional printing system.

Your special advantages:

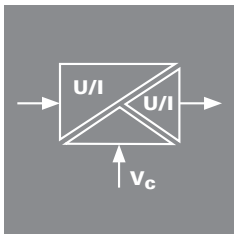
Slim design

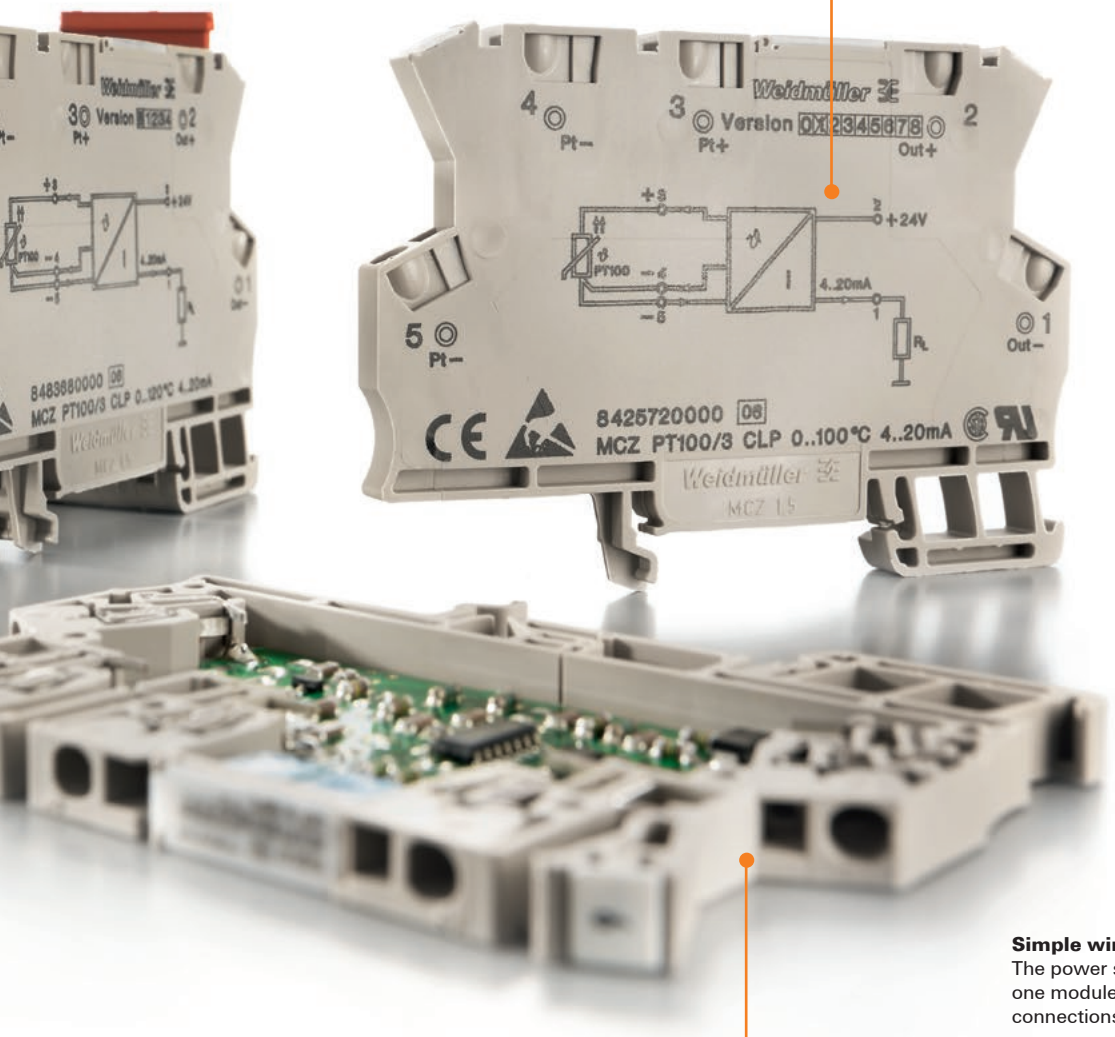
At the interface level signals are often connected to machine-oriented or customer-specific encoders. These should be individually adapted. The typical terminal block design of the MCZ signal converter allows it to be used on site instead of the corresponding modular terminal, thus allowing external analogue signals to be individually isolated and processed.



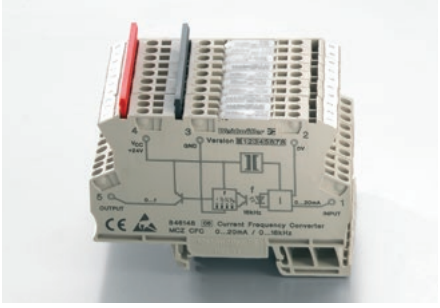
Saves space in the electrical cabinet
High product density (modules only 6 mm wide) reduces space taken on the DIN rail.

Security
Electrical isolation increases the safety of operations and reduces the risk of facility malfunctions.

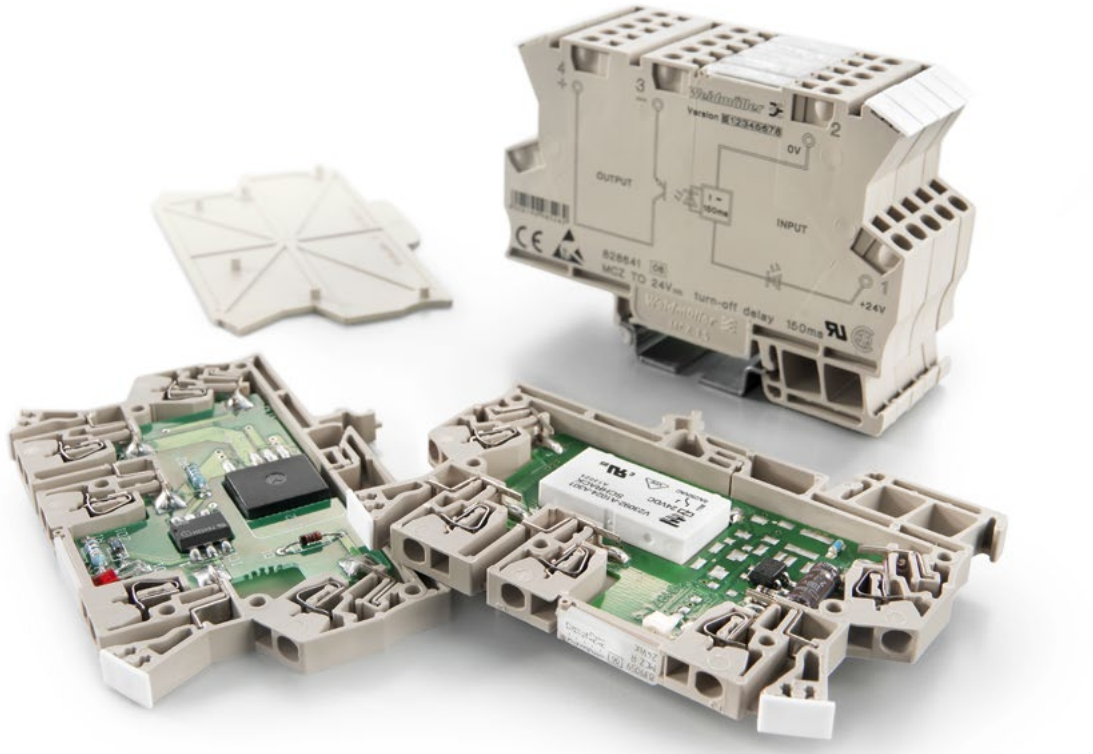




Simple wiring
The power supply can easily be bridged from one module to the next using pluggable cross-connections.



Selection table



Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Signal converters in terminal format – MCZ											
	Frequency signal converters											
8461470000	MCZ VFC 0-10V	1			X					4-wire sensor	6 mm	
8461480000	MCZ CFC 0-20MA	1	X							4-wire sensor	6 mm	
8461490000	MCZ CFC 4-20MA	1		X						4-wire sensor	6 mm	
	Limit monitoring											
8260280000	MCZ SC 0-10V	1			X					4-wire sensor	6 mm	
8227350000	MCZ SC 0-20MA	1	X							4-wire sensor	6 mm	
	Passive isolators											
8411190000	MCZ CCC 0-20mA/0-20mA	1	X							4-wire sensor	6 mm	
	Temperature transducer											
8425720000	MCZ PT100/3 CLP 0...100C	1						X		Measuring range 0...100°C	6.1 mm	
8483680000	MCZ PT100/3 CLP 0...120C	1						X		Measuring range 0...120°C	6.1 mm	
8604420000	MCZ PT100/3 CLP 0...150C	1						X		Measuring range 0...150°C	6.1 mm	
8473010000	MCZ PT100/3 CLP 0...200C	1						X		Measuring range 0...200°C	6.1 mm	
8473020000	MCZ PT100/3 CLP 0...300C	1						X		Measuring range 0...300°C	6.1 mm	
8473000000	MCZ PT100/3 CLP -50C...+150C	1						X		Measuring range -50...150°C	6.1 mm	
8604430000	MCZ PT100/3 CLP -40C...100C	1						X		Measuring range -40...100°C	6.1 mm	

Output						Configuration	Auxiliary power		Isolation		Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage		Connection system	
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
1					Frequency: 0...1/ 4/ 8/ 16 kHz	DIP switch	24 V DC	100 V	2-way	Z	Frequency output
2					NPN output, Limit value	Potentiometer	24 V DC			Z	
2					NPN output, Limit value	Potentiometer	24 V DC			Z	
1	X						input loop	100 V	2-way	Z	Passive isolator ILP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP
1		X					output loop	50 V	2-way	Z	Passive converter OLP

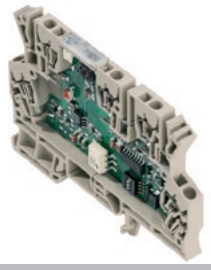
Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

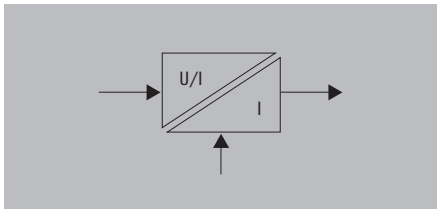
Frequency signal isolator

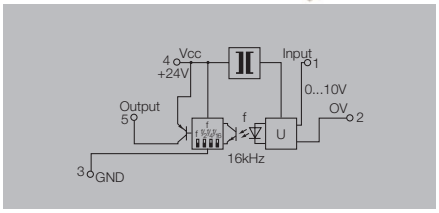
DC/f converter

The analogue input signal is converted into a configurable frequency signal. Thus analogue signals can be read by the PLC's counter inputs.

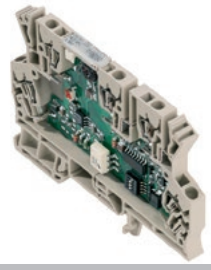
MCZ VFC

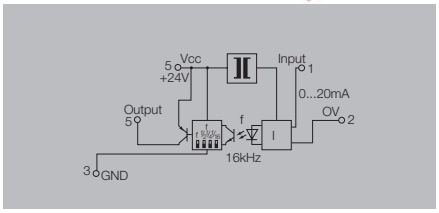






MCZ CFC





Technical data

Input		
Input voltage / Input current	0...10 V /	/ 0...20 mA
Input resistance, voltage/current	100 kΩ /	/ 50 Ω
Voltage drop		1 V at 20 mA
Output		
Output frequency	0...1/ 4/ 8/ 16 kHz	0...1/ 4/ 8/ 16 kHz
Output level	PNP, Ub-0.7 V	PNP, Ub-0.7 V
Output current	max. 20 mA	max. 20 mA
Accuracy	0.2 % v. FSR	0.2 % v. FSR
Temperature coefficient	≤ 250 ppm/K	≤ 250 ppm/K
Status indicator	LED, pulsing	LED, pulsing
General data		
Configuration	DIP switch	DIP switch
Voltage supply	24 V DC ± 10 %	24 V DC ± 10 %
Current consumption	14 mA without load	14 mA without load
Current-carrying capacity of cross-connect.	≤ 20 A	≤ 20 A
Ambient temperature	0 °C...50 °C	0 °C...50 °C
Approvals	CE; EAC	CE; EAC
Insulation coordination		
Standards	DIN EN 50178	DIN EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	100 V	100 V
Impulse withstand voltage	1.5 kV	1.5 kV
Insulation voltage	1 kV DC	1 kV DC
Overvoltage category	III	III
Pollution degree	2	2
Clearance & creepage distances	≥ 1.5 mm	≥ 1.5 mm

Dimensions		**Tension-clamp connection**	**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 1.5	1.5 / 0.5 / 1.5
Depth x width x height	mm	63.2 / 6 /	63.2 / 6 /
Note			Without DC/DC converter input loop-powered

Ordering data

	Type	**Qty.**	**Order No.**	**Type**	**Qty.**	**Order No.**
Tension-clamp connection	MCZ VFC 0-10V	10	**8461470000**	MCZ CFC 0-20MA	10	**8461480000**
Tension clamp connection				MCZ CFC 4-20MA	10	**8461490000**
Note						

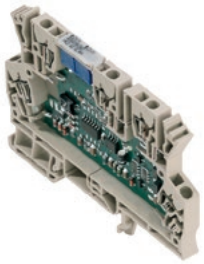
Accessories

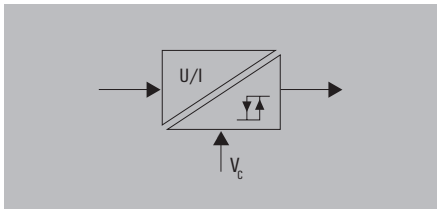
Note	Cross-connectors for power supplies and markers: refer to accessories	Cross-connectors for power supplies and markers: refer to accessories

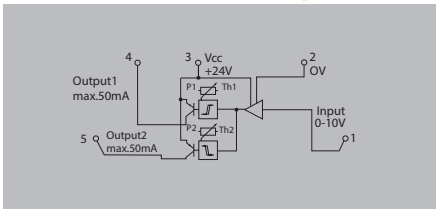
Transistor output

- 2 digital outputs
- Monitoring of upper and lower limit values
- 3 selectable input ranges: 300 mV...10 V, 30 mV...1 V, 10 mV...100 mV

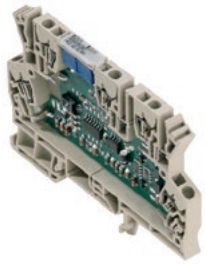
MCZ SC 0...10 V

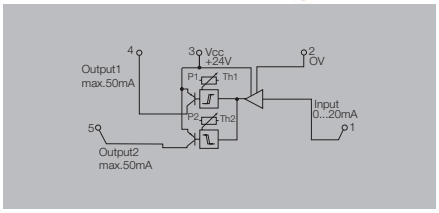






MCZ SC 0...20 mA





Technical data

Input		
Input voltage / Input current	0...10 V /	/ 0.5...20 mA
Input resistance, voltage/current	60 kΩ /	/ 50 Ω
Voltage drop		1 V
Output		
Contact assembly	Transistor output, double switch output PNP	Transistor output, double switch output PNP
Function	$U_{IN}<U_{TH1}$: output 1 active / $U_{IN}>U_{TH2}$: output 2 active	$I_{IN}<I_{TH1}$: output 1 active; $I_{IN}>I_{TH2}$: output 2 active
Switching thresholds	Via 2 potentiometers (12 turns)	Via 2 potentiometers (12 turns)
Hysteresis	1% of adjusted final value	1% of adjusted final value
Switching current	50 mA - per channel (voltage drop at transistor: < 1.2 V at 50 mA)	50 mA - per channel (voltage drop at transistor: < 1.2 V at 50 mA)
Step response time	< 250 µs (switching threshold at 90% of max. input signal; $R_l \leq 1$ kΩ)	< 250 µs (switching threshold at 90% of max. input signal; $R_l \leq 1$ kΩ)
Cut-off frequency (-3 dB)	100 Hz	100 Hz
Temperature coefficient	max. 250 ppm/K	max. 250 ppm/K
General data		
Configuration	Potentiometer	Potentiometer
Voltage supply	24 V DC ± 20 %	24 V DC ± 20 %
Ambient temperature	0 °C...50 °C	0 °C...50 °C
Approvals	CE; CSA; cURus; EAC	CE; CSA; cURus; EAC
Insulation coordination		
Standards	DIN EN 50178	DIN EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6

Dimensions		**Tension-clamp connection**	**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 1.5	1.5 / 0.5 / 1.5
Depth x width x height	mm	63.2 / 6 /	63.2 / 6 /
Note			

Ordering data

	Type	**Qty.**	**Order No.**	**Type**	**Qty.**	**Order No.**
Tension clamp connection	MCZ SC 0-10V	10	**8260280000**	MCZ SC 0-20MA	10	**8227350000**
Note						

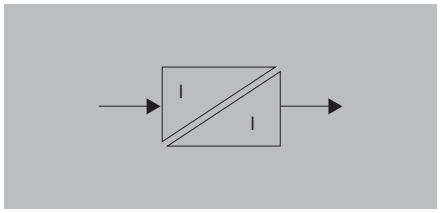
Accessories

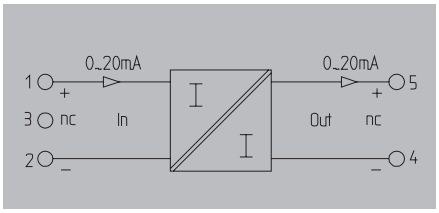
Note	Cross-connectors for power supplies and markers: refer to accessories	Cross-connectors for power supplies and markers: refer to accessories

Input current loop feed

- Passive isolators for galvanic isolation of 0/4...20 mA standard signals.
- The component draws power from the measurement signal and requires no additional auxiliary power
- Low energy consumption, pick-up current of < 100 µA.
- 2-way isolation

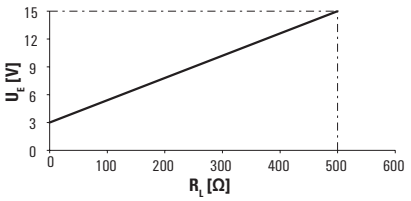
MCZ CCC / ILP





Technical data

Input	
Input voltage / Input current	/ 0(4)...20 mA current loop
Pick-up current	< 100 µA
Voltage drop	2.5....3 V at 20 mA
Output	
Output voltage / Output current	/ 0...20 mA, 4...20 mA
Load impedance, voltage/current	/ ≤ 500 Ω
Accuracy	< 0.1 % of end value
Temperature coefficient	≤ 50 ppm/K of measured value at 0 Ω load resistance
Cut-off frequency (-3 dB)	100 Hz
General data	
Configuration	none
Ambient temperature	-25 °C...60 °C
Approvals	CE; CSA; cURus; EAC
Insulation coordination	
Standards	DIN EN 60529, DIN EN 61010-1
EMC standards	EN 61000-6
Insulation voltage	



Dimensions		**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 1.5
Depth x width x height	mm	63.2 / 6 /
Note		

Ordering data

	Type	**Qty.**	**Order No.**
Tension clamp connection	MCZ CCC 0-20MA/0-20MA	10	**8411190000**

Note

Accessories

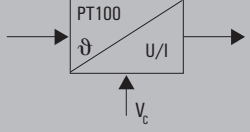
Note	Cross-connectors for power supplies and markers: refer to accessories

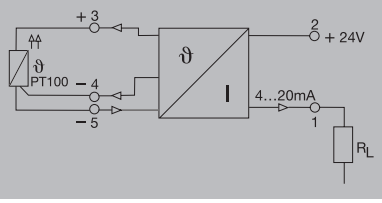
RTD 2-/3-conductor converter

Output-loop powered

- RTD signal converter for galvanic isolation and conversion of PT100 signals
- The component draws power from the output circuit and requires no additional auxiliary power
- 2-way isolation

MCZ PT100/3 CLP / OLP





Technical data

Input	
Sensor	PT100/2-/3-wire (in compliance with IEC 751)
Sensor supply	0.8 mA / 9...30 V DC
Output	
Output current	4...20 mA (current loop) at 9...30V DC
Load impedance, voltage/current	/ ≤ 600 Ω
General data	
Configuration	none
Ambient temperature / Storage temperature	/ -25 °C...50 °C / -25 °C...85 °C
Accuracy	Typ.: 0.2 %, máx. 0.5 % v. FSR
Approvals	CE; CSA; cURus; EAC
Standards	DIN EN 50178, DIN EN 61000-4-2
EMC standards	EN 61000-6

Dimensions		**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 1.5
Depth x width x height	mm	63.2 / 6 /
Note		

Ordering data

		Type	Qty.	Order No.
0...100 °C	Tension clamp connection	MCZ PT100/3 CLP 0...100C	10	**8425720000**
0...120 °C	Tension clamp connection	MCZ PT100/3 CLP 0...120C	10	**8483680000**
0...150 °C	Tension clamp connection	MCZ PT100/3 CLP 0...150C	10	**8604420000**
0...200 °C	Tension clamp connection	MCZ PT100/3 CLP 0...200C	10	**8473010000**
0...300 °C	Tension clamp connection	MCZ PT100/3 CLP 0...300C	10	**8473020000**
-50...+150 °C	Tension clamp connection	MCZ PT100/3 CLP -50C...+150C	10	**8473000000**
-40...+100 °C	Tension clamp connection	MCZ PT100/3 CLP -40C...100C	10	**8604430000**
Note				

Accessories

Note	Cross-connectors for power supplies and markers: refer to accessories

Compact standard signal isolators – PicoPak

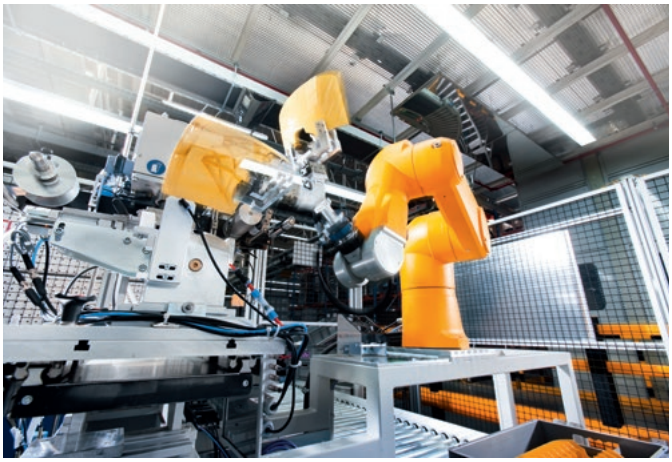
Measuring and isolating without auxiliary power supply

PicoPak - the smallest standard signal isolator

Many processes are only possible with the safe conversion and reliable separation of analogue current signals. With impressive performance, our analogue signal converter PicoPak supports the simultaneous measurement and galvanic isolation of signals from active field sensors and PLC input cards. Because of their integrated input and output current loop, the module does not require any additional auxiliary power supply and can also be easily used in remote switch boxes. Being integrated into a housing that is only 6 mm wide means that the signal converters take up very little space on a terminal rail. Both the tried-and-tested screw connectors and the convenient PUSH IN connection technology designs ensure reliable connections.

Your special advantages:

- High flexibility for a variety of applications due to worldwide approvals and an extended
- temperature range from -40 to +70°C
- Loop powered to isolate active field sensors without additional auxiliary power supply from active PLC input cards
- Reliable measurement range and zero point calibration using a potentiometer



Span and Zero point calibration
Adjustable by potentiometer

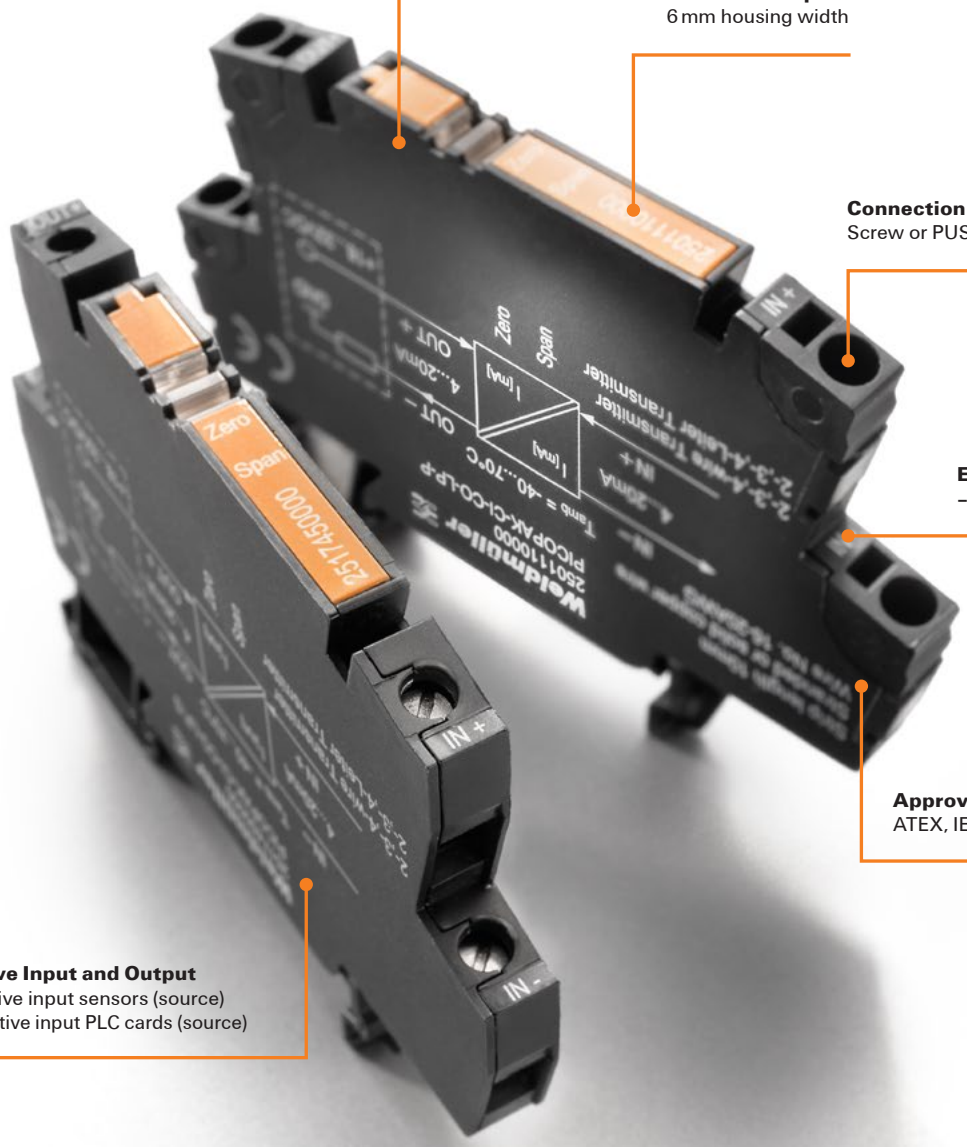
Slim and compact
6 mm housing width

Connection technology
Screw or PUSHIN terminals

Extended temperature range
–40 °C...+70 °C

Approvals for world wide use
ATEX, IECEX, cULus, Cl1 Div2

Passive Input and Output
for active input sensors (source)
and active input PLC cards (source)



Selection table

Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Compact standard signal isolators – PicoPak											
2517450000	PICOPAK-CI-CO-LP-S	1		X						4-wire sensor	6.1 mm	
2501110000	PICOPAK-CI-CO-LP-P	1		X						4-wire sensor	6.1 mm	

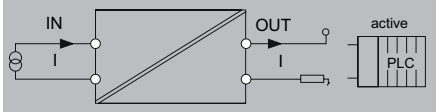
Output						Configuration	Auxiliary power	Rated voltage	Isolation	Connection system	Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous						
1		X				Potentiometer	output loop	300 V	2-way	S	Passive converter, ATEX approval Zone 2, UL certified
1		X				Potentiometer	output loop	300 V	2-way	P	Passive converter, ATEX approval Zone 2, UL certified

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

PicoPak

PICOPAK-CI-CO-LP

- Loop powered at output
- Increased operating temperature range -40 °C ...+70 °C
- Zero and span adjustment possible



Technical data

Input	
Number of inputs	1
Input current	4...20 mA
Sensor	Current source
Voltage drop, current input	≤3,5 V
Analogue outputs	
Load impedance current	≤ 600 Ω
Output current	4...20 mA, loop-powered
Supply voltage (output)	18...32 V
General data	
Accuracy	< 0.1 % of measuring range
Configuration	Potentiometer
Voltage supply	Output loop powered
Step response time	≤ 5 ms
Temperature coefficient	≤ 200 ppm/K
Power consumption, max.	0.8 W
Voltage supply	Output loop powered
Long-term drift	≤±0.05% of the measurement range / year
Insulation coordination	
EMC standards	EN 61326-1
Galvanic isolation	2-way isolator
Overvoltage category	II
Insulation voltage	3.5 kV
Rated voltage	300 V AC_{rms}

Dimensions		**Screw connection**	**PUSH IN**
Clamping range (nominal / min. / max.)	mm^2		
Depth x width x height	mm	55 / 6.1 / 79.4	55 / 6.1 / 79.4
Note			

Ordering data

	Type	**Qty.**	**Order No.**
Screw connection	PICOPAK-CI-CO-LP-S	1	**2517450000**
PUSH IN connection	PICOPAK-CI-CO-LP-P	1	**2501110000**

Note

Accessories

Note

Signal & serial interface converters – WAVESERIES

Be prepared for every application
With the WAVESERIES signal & serial interface converters

Universal signal & serial interface converters offer a lot of benefits for signal processing. A service technician who does not have the right spare isolator or converter available and has to operate a part of the system manually for a day or two before the spare part arrives will understand this all too well. This is a waste of time and money. This is why Weidmüller has developed a signal converter with unique flexibility that combines an isolator, a converter, an encoder, a lineariser and a trip amplifier in a single module. The combination of the best features and exceptional configuration options is what makes the WAVESERIES universal signal converter unique. Designed for process industry applications, the signal converter operates accurately and stably with all common sensor types in a wide ambient temperature and power supply range. A 24 V DC power supply is provided for sensors or field devices using two-wire technology. Alternatively, the universal signal converter offers a passive loop powered input.

In addition, Weidmüller's WAVESERIES serial interface converters enable data to be exchanged between data processing systems, controllers and peripheral devices. These process converters are ideal for use in harsh, process-oriented environments. Different versions of the interface converter are available for different applications. In order to ensure high transmission reliability, the serial interface converters are designed with a high-port 4kV 3-way isolation and are galvanically isolated.

Universal input signals:
Temperature signals such as RTDs, thermocouples, potentiometers, frequency transmitters, DC voltage signals and current signals in one module.

Inputs and outputs are PC-configurable
The input and output signals are easy to configure via an interface (CBX200 USB) using a PC.

Easy to service
The electronic unit can be removed from the housing without using any tools.

Secure connection
9-pole connector for the RS232 interface

Testing without additional wiring
Current and voltage inputs can be tested via an additional test contact without disconnecting the existing wiring.

High data transmission speeds
Up to 115 kBit/s and freely adjustable

Selection table

Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Signal & serial interface converters – WAVESERIES											
	Universal measurement transducers											
8939670000	WAS6 TTA	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm	
8939680000	WAZ6 TTA	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm	
8964310000	WAS6 TTA EX	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm	
8964320000	WAZ6 TTA EX	1	X	X	X	X	X	X	X	-200...500 mV, T192-20...50 V, 2 Hz...100 kHz, RTD, TC, resistance, potentiometer / X	45 mm	
	Current measuring transducers											
8528650000	WAS1 CMA LP 1/5/10A ac	1								0...1/5/10 A AC	22.5 mm	
8528660000	WAZ1 CMA LP 1/5/10A ac	1								0...1/5/10 A AC	22.5 mm	
8975590000	WAS1 CMA LP 1/5/10A EX	1								0...1/5/10 A AC	22.5 mm	
	Serial interface converters											
8615700000	WDS2 RS232/RS485/422	1								RS232/RS485/422	22.5 mm	
8615690000	WDS2 RS232/TTY	1								RS232/TTY	22.5 mm	
	Limit & current monitoring											
8543820000	WAS5 DC/Alarm	1	X	X	X					4-wire sensor	17.5 mm	
8543880000	WAZ5 DC/Alarm	1	X	X	X					4-wire sensor	17.5 mm	
8742610000	PAS CMR 0,5...2,5 A DC									Input range 7.5 A	15.3 mm	
8742620000	PAS CMR 2,0...5,0 A DC									Input range 15 A	15.3 mm	
8742630000	PAS CMR 4,5...10 A DC									Input range 30 A	15.3 mm	

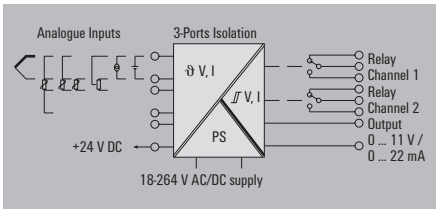
Output						Configuration	Auxiliary power		Isolation		Special characteristics
Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage		Connection system	
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	S	
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	Z	
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V	3-way	S	ATEX approval Zone 2
3	X	X	X	X	1 x analogue output + 2 x Limit value relay output	Software	18 V - 230 V AC/DC	300 V		Z	ATEX approval Zone 2
1		X				DIP switch	output loop	300 V	2-way	S	
1		X				DIP switch	output loop	300 V	2-way	Z	
1		X				DIP switch	output loop	300 V	2-way	S	ATEX approval Zone 2
1					RS232/RS485/422	DIP switch	24 V DC		3-way	S	
1					RS232/TTY	DIP switch	24 V DC		3-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	S	
2				X	2 x Limit value relay output	DIP switch, potentiometer	24 V DC	300 V	3-way	Z	
1				X	Reed contact activated from 0.5 A DC	-	-	-	2-way	S	
1				X	Reed contact activated from 2 A DC	-	-	-	2-way	S	
1				X	Reed contact activated from 4,5 A DC	-	-	-	2-way	S	

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

WAVE TTA

- Input and outputs can be configured on PC with the TTA-SET software, download at www.weidmueller.com
- Universal input signals
- Loop-powered or passive input
- Pluggable connection terminals

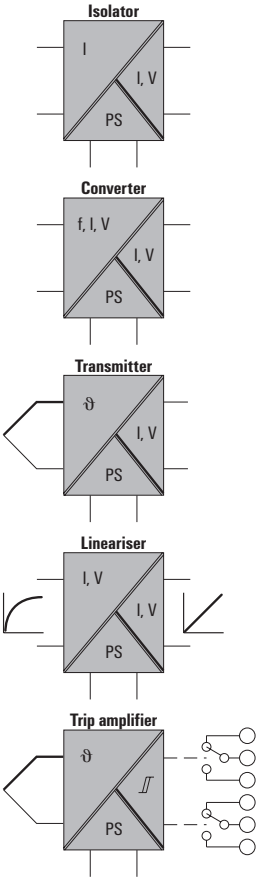
WAS6 TTA / WAZ6 TTA



Technical data

Input	
Sensor	Thermocouples: B, E, J, K, L, N, R, S, T (IEC 60584), PT100, PT1000, (EN 60571) Ni100, Ni1000, (JIS1604), Cu10, Cu25, Cu50, Cu100 (DIN 43760) 2-/3-/4-wire
Potentiometer	10...50 Ω, 50...100 Ω, 100...200 Ω, 200...400 Ω, 400...800 Ω, 800 Ω...2 kΩ, 2...6.5 kΩ, 6.5...100 Ω
Resistance	10 Ω...5 kΩ
Input frequency	adjustable, 2 Hz...100 kHz
Input voltage	-200...500 mV (min. 4 mV span), -20...50 V DC (min. 0.5 V span)
Input current	-20...+50 mA (min. interval 0.4 mA)
Sensor supply	24 V DC / 22 mA
Output analogue	
Output voltage	adjustable between -10...+10 V (min. span 2.5 V)
Output current	adjustable between 0 and 20 mA (min. span of 5 mA)
Load impedance, voltage/current	> 10 kΩ @ 0...10 V / > 20 kΩ @ -10...+10 V / < 700 Ω
Signal output	direct or inverted
Transmit function	Linear, $x^{1/2}$, $x^{3/2}$, $x^{5/2}$ or user-defined curve (101 points)
Output digital	
Type	2 x 1 CO contact (hard gold-plated), Process alarms (4x) with hysteresis, with alarm delay (configurable) 0...180 s
Switching voltage AC, max. / DC, max.	250 V /
General data	
Configuration	Using free Windows software, TTA Set Software
Voltage supply	18...264 V AC/DC
Power consumption	< 3.5 W
Accuracy	< 0.1 % span (DC, RTD); 0.2 % span (or 1 °C) + CJ failure
Temperature coefficient	< 0.1 % / K (DC, RTD); < 0.1 % FSR / K + CJ error 0.07 °C/K (thermocouples)
Ambient temperature / Storage temperature	/ -40 °C...70 °C / -40 °C...85 °C
Step response time	50 ms...1 sec (RTD, mV inputs), 110 ms...1 sec (V, mA inputs)
Humidity	5...95 %, no condensation
Approvals	CE; cULus; DNVGL; EAC
Insulation coordination	
Standards	DIN EN 50178, DIN EN 61000-4-2
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution degree	2
Overvoltage category	III
Clearance & creepage distances	≥ 5.5 mm (1 mm $_{input/output}$)
Insulation voltage	2.5 kV

Typical functions



Ordering data

Type	Qty.	Order No.
Screw connection		
WAS6 TTA	1	8939670000
Tension-clamp connection		
WAZ6 TTA	1	8939680000

Dimensions		Screw connection	Tension-clamp connection
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
Depth x width x height	mm	112.4 / 45 /	112.4 / 45 /
Note			

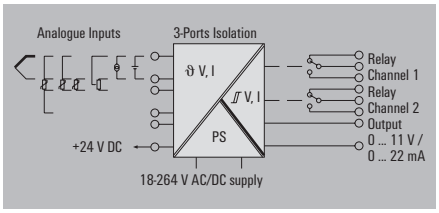
CBX200 USB configuration adapter - 8978580000

WAVE TTA EX

- Input and outputs can be configured on PC with the TTA-SET software, download at www.weidmueller.com
- Universal input signals
- Loop-powered or passive input
- Pluggable connection terminals
- ATEX 3 G Ex nA IIC T4
- UL Class I, Div.2

WAS6 TTA EX / WAZ6 TTA EX

Ex n

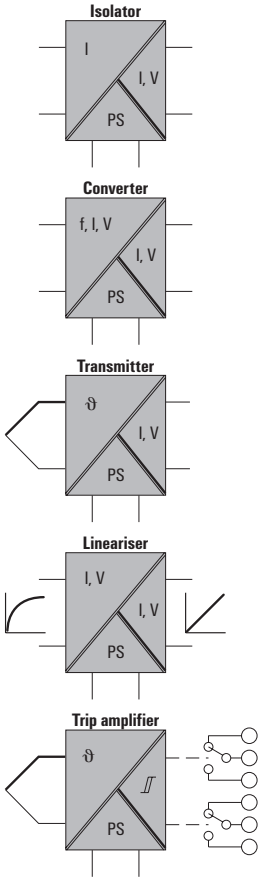


Technical data

Input	
Sensor	Thermocouples: B, E, J, K, L, N, R, S, T (IEC 60584), PT100, PT1000, (EN 60571) Ni100, Ni1000, (JIS1604), Cu10, Cu25, Cu50, Cu100 (DIN 43760) 2-/3-/4-wire
Potentiometer	10...50 Ω, 50...100 Ω, 100...200 Ω, 200...400 Ω, 400...800 Ω, 800 Ω...2 kΩ, 2...6.5 kΩ, 6.5...100 Ω
Resistance	10 Ω...5 kΩ
Input frequency	adjustable, 2 Hz...100 kHz
Input voltage	-200...500 mV (min. 4 mV span), -20...50 V DC (min. 0.5 V span)
Input current	-20...+50 mA (min. interval 0.4 mA)
Sensor supply	24 V DC / 22 mA
Output analogue	
Output voltage	adjustable between -10...+10 V (min. span 2.5 V)
Output current	adjustable between 0 and 20 mA (min. span of 5 mA)
Load impedance, voltage/current	> 10 kΩ @ 0...10 V / > 20 kΩ @ -10...+10 V / < 700 Ω
Signal output	direct or inverted
Transmit function	Linear, $x^{1/2}$, $x^{3/2}$, $x^{5/2}$ or user-defined curve (101 points)
Data for Ex applications (ATEX)	
Marking	II 3 G Ex nA nC IIC T4 Gc
Output digital	
Type	2 x 1 CO contact (hard gold-plated), Process alarms (4x) with hysteresis, with alarm delay (configurable) 0...180 s
Switching voltage AC, max. / DC, max.	250 V /
General data	
Configuration	Using free Windows software, TTA Set Software
Voltage supply	24...240 V AC/DC; 24...36 V AC / 24...50 V DC (ATEX Zone 2)
Power consumption	< 3.5 W
Accuracy	< 0.1 % span (DC, RTD); 0.2 % span (or 1 °C) + CJ failure
Temperature coefficient	< 0.1 % / K (DC, RTD); < 0.1 % FSR / K + CJ error 0.07 °C/K (thermocouples)
Ambient temperature / Storage temperature	/ -40 °C...70 °C / -40 °C...85 °C
Step response time	50 ms...1 sec (RTD, mV inputs), 110 ms...1 sec (V, mA inputs)
Humidity	5...95 %, no condensation
Approvals	CE; cULus; cULusEX; EAC; WATEXIECEX
Insulation coordination	
Standards	DIN EN 50178, DIN EN 60079, DIN EN 61000-4-2
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution degree	2
Overvoltage category	III
Clearance & creepage distances	≥ 5.5 mm (1 mm $_{input/output}$)
Insulation voltage	2.5 kV

Dimensions		**Screw connection**	**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
Depth x width x height	mm	112.4 / 45 /	112.4 / 45 /
Note			

Typical functions



Ordering data

Type	Qty.	Order No.
Screw connection		
WAS6 TTA EX	1	**8964310000**
Tension-clamp connection		
WAZ6 TTA EX	1	**8964320000**

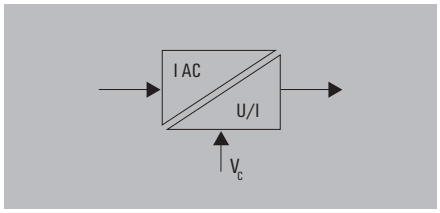
CBX200 USB configuration adapter - 8978580000

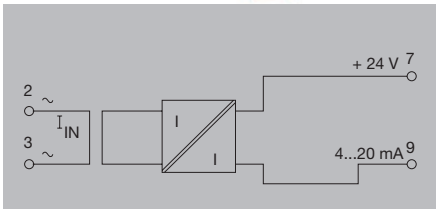
Analogue output

- Monitors AC currents
- Input and output are electrically isolated
- Input and output ranges adjustable via DIP switch

1/5/10 A AC 4...20 mA

Loop-powered

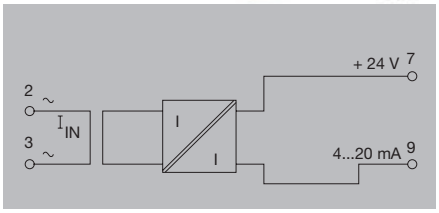




1/5/10 A AC 4...20 mA

Loop-powered

Ex n



Technical data

Input		
Input current	0...1 A AC/ 0...5 A AC/ 0...10 A AC	0...1 A AC/ 0...5 A AC/ 0...10 A AC
Input frequency	50...60Hz	50...60Hz
Max. current	100 A for 1s	100 A for 1s
Voltage of measuring circuit	250 V AC	250 V AC
Sensor		
Output		
Output current / Output voltage	4...20 mA (current loop) /	4...20 mA (current loop) /
Offset current	max. 100 µA	max. 100 µA
Output signal limit	Approx. 24 mA	Approx. 24 mA
Load impedance, voltage/current	/ ≤ 600 Ω	/ ≤ 600 Ω
Accuracy	0.5 % FSR	0.5 % FSR
Temperature coefficient	≤ 200 ppm/K	≤ 200 ppm/K
Status indicator	LED ON: OK; LED flashing: signal out of range; LED OFF: Error	LED ON: OK; LED flashing: signal out of range; LED OFF: Error
General data		
Configuration	DIP switch	DIP switch
Voltage supply	13...30 V DC, via output current loop	13...30 V DC, via output current loop
Step response time	typ. 700 ms	typ. 700 ms
Ambient temperature / Storage temperature	/ 0 °C...50 °C / -20 °C...70 °C	/ 0 °C...50 °C / -20 °C...70 °C
Default setting	0...5 A AC, 4...20 mA	0...5 A AC, 4...20 mA
Approvals	CE; cULus; EAC	CE; cULusEX; EAC
Insulation coordination		
Standards	DIN EN 50178 (secure separation)	DIN EN 50178 (secure separation)
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	300 V	300
Impulse withstand voltage	6 kV	6 kV
Pollution degree	2	2
Overvoltage category	III	III
Clearance & creepage distances	≥ 5.5 mm	≥ 5.5 mm
Insulation voltage	4 kV_{eff} / 5 s	4 kV_{eff} / 5 s

Dimensions		**Screw connection**	**Tension-clamp connection**	**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
Depth x width x height	mm	112.4 / 22.5 /	112.4 / 22.5 /	112.4 / 22.5 /
Note				

Ordering data

	Type	**Qty.**	**Order No.**	**Type**	**Qty.**	**Order No.**
Screw connection	WAS1 CMA LP 1/5/10A AC	1	**8528650000**	WAS1 CMA LP 1/5/10A EX	1	**8975590000**
Tension clamp connection	WAZ1 CMA LP 1/5/10A AC	1	**8528660000**			
Note						

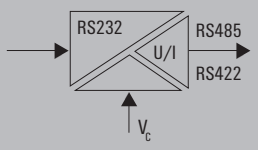
Accessories

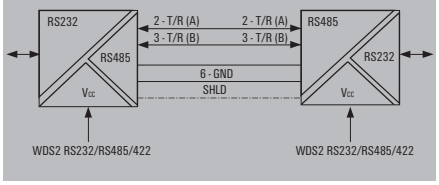
Note	Cross-connectors for power supplies and markers – refer to Accessories	Cross-connectors for power supplies and markers – refer to Accessories

RS232/RS485/422

- 3-way isolation
- RS232 connection via SUB-D 9
- RS485/422, shield connection via KLBUE
- Switchable DTE or DCE assignment
- Bi-directional communication

RS232/RS485/422





Technical data

RS232	
Connection type / Input current	SUB-D9 (male plug) /
Assignment	DTE/DCE switchable with DIP switch
RS485/422	
Terminating resistors	Pull-down/pull-up via DIP switch
Type of connection	Screw connection
Bit distortion	< 5 %
Bit delay	≤ 3 µs
Control of data direction	Automatic or via RS232 RTS/CTS
Shield connection	KLBÜ 4-6/Z1
Status indicator	LED green: supply voltage, TxD, RxD
Transmission rate	2.4, 4.8, 9.6, 19.2, 57.6, 115.2 kBaud, 8 bit or 8 bit + parity bit
Transmission channels	Half-duplex (RS485 2-wire) Full-duplex (RS485 4-wire and RS422)
Transmission distance	Max. 1200 m twisted pair
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 20 %
Power consumption	ca. 1.5 W
Ambient temperature	0 °C...55 °C
Approvals	BURVER; CE; cULus; DNVGL; EAC
Insulation coordination	
Standards	DIN EN 50178, DIN EN 61000-4-2
EMC standards	EN 55011, EN 61000-6-2, EN 61000-6-4
Rated voltage	between adjacent electric circuits: 300 V between electric circuits and PE: 150 V
Impulse withstand voltage	4 kV
Pollution degree	2
Overvoltage category	III
Clearance & creepage distances	Between neighbouring circuits: 3 mm Between the circuits and PE: 1.5 mm
Insulation voltage	2 kV DC / 1 min.

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height		/ 22.5 / 112.4
Note		

Ordering data

		Type	**Qty.**	**Order No.**
	Screw connection	WDS2 RS232/RS485/422	1	**8615700000**
Note				

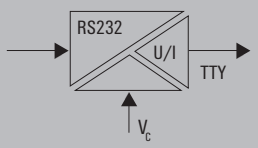
Accessories

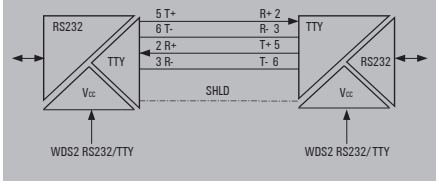
Note	Cross-connector for power supplies and markers – refer to Accessories

RS232/TTY

- 3-way isolation
- RS232 connection via SUB-D 9
- TTY shield connection via KLBUE retaining clip
- Switchable DTE or DCE assignment
- Bi-directional communication

RS232/TTY





Technical data

RS232	
Connection type / Input current	SUB-D9 (male plug) /
Assignment	DTE/DCE switchable with DIP switch
TTY	
Type of connection	Screw connection
Bit distortion	< 1.5%
Bit delay	≤ 3 µs
Load	≤ 500 Ω
Shield connection	KLBÜ 4-6/Z1
Status indicator	LED green: supply voltage, TxD, RxD
Transmission rate	19.2 kBit/s
Transmission channels	Full-duplex
Transmission distance	Max. 1000 m twisted pair
General data	
Configuration	DIP switch
Voltage supply	24 V DC ± 20 %
Power consumption	ca. 0.8 W
Ambient temperature	0 °C...55 °C
Storage temperature	-20 °C...85 °C
Approvals	CE; cULus; DNVGL
Insulation coordination	
Standards	DIN EN 50178, DIN EN 61000-4-2
EMC standards	EN 55011, EN 61000-6-2, EN 61000-6-4
Rated voltage	between adjacent electric circuits: 300 V between electric circuits and PE: 150 V
Impulse withstand voltage	4 kV
Pollution degree	2
Overvoltage category	III
Clearance & creepage distances	Between neighbouring circuits: 3 mm Between the circuits and PE: 1.5 mm
Insulation voltage	2 kV DC / 1 min.

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm²	2.5 / 0.5 / 2.5
Depth x width x height		/ 22.5 / 112.4
Note		

Ordering data

		Type	**Qty.**	**Order No.**
	Screw connection	WDS2 RS232/TTY	1	**8615690000**
Note				

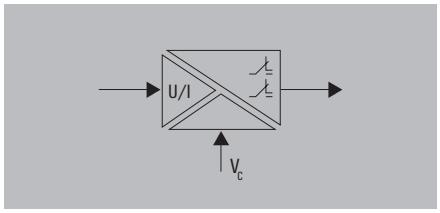
Accessories

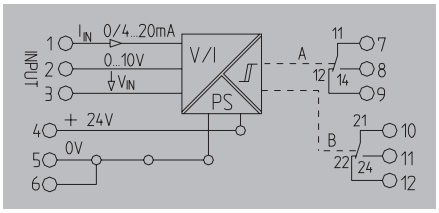
Note	Cross-connector for power supplies and markers – refer to Accessories

Relay output

- 3-way isolation
- Low trip / high trip
- FAILSAFE / NON-FAILSAFE
- 2 relay outputs 250 V AC / 3 A

DC/Alarm





Switch position/setting options

	SW 1			
function	1	2	3	4
Channel A High Trip	■			
Channel A Low Trip	□			
Channel B High Trip		■		
Channel B Low Trip		□		
FAILSAFE, Channel 1 & 2			□	□
NON FAILSAFE, Chan. 1 & 2			■	■

■ = on
□ = off

NON FAILSAFE: The relay picks up when the alarm is triggered
FAILSAFE: The relay drops out when the alarm is triggered. An alarm is also triggered in the FAILSAFE mode, if for example, the operating voltage to the modules fails
Low Trip: Alarm is triggered if the signal is under the threshold.
High Trip: Alarm is triggered if the signal is over the threshold.
Signal threshold: Adjustments of the signal threshold (1...90)% are made for channel 1 with the potentiometer P1, and separately for channel 2 via potentiometer P2.
Hysterese: Adjustments of the hysteresis (1...10)% are made for channel 1 with the potentiometer P3, and separately for channel 2 via potentiometer P3.

Technical data

Input	
Input voltage	0...10 V
Input current	0(4)...20 mA
Input resistance, voltage/current	≥ 100 kΩ / ≤ 110 Ω
Output	
Type	2 CO contacts, Open or closed-circuit principle
Contact material	AgNi 90/10
Switching thresholds	1...90 % (independently for channel 1 and channel 2)
Hysteresis	1...10 % (independent for channel 1 and channel 2)
Max. switching voltage, AC	250 V
Continuous current	3 A
Function	Open-circuit/closed-circuit principle
Temperature coefficient	≤ 500 ppm/K
Status indicator	LED green ON: OK, LED red ON: alarm (per channel)
General data	
Configuration	DIP switch, Potentiometer
Voltage supply	24 V DC ± 25 %
Power consumption	Typ.: 1 W both relays picked up
Current-carrying capacity of cross-connect.	≤ 2 A
Ambient temperature	0 °C...55 °C
Default setting	Channel A/B: low trip and FAILSAFE
Approvals	CE; cULus
Insulation coordination	
Standards	DIN EN 50178
EMC standards	EN 61000-4-2, -3, -4, -5, -6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Pollution degree	2
Overvoltage category	III
Clearance & creepage distances	≥ 3 mm
Insulation voltage	2 kV_{eff} / 5 s

Dimensions		**Screw connection**	**Tension-clamp connection**
Clamping range (nominal / min. / max.)	mm^2	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	mm	92.4 / 17.5 /	92.4 / 17.5 /
Note			

Ordering data

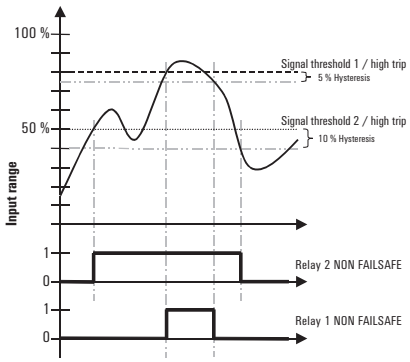
	Type	**Qty.**	**Order No.**
Screw connection	WAS5 DC/ALARM	1	**8543820000**
Tension clamp connection	WAZ5 DC/ALARM	1	**8543880000**
Note			

Accessories

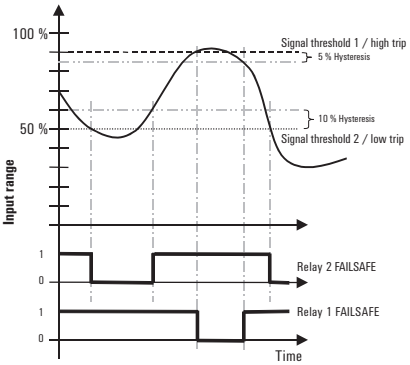
Note	Cross-connector for power supplies and markers – refer to Accessories

WAVEANALOG DC/Alarm – Alarm indication

Example 1



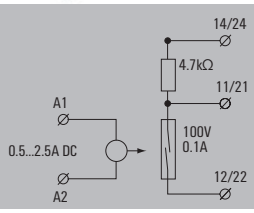
Example 2



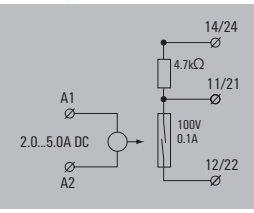
Relay output

- Monitors currents up to 10 A DC
- Used with valves, servo-controls or DC motors
- Pull-up / pull-down resistor 4.7 kΩ

PAS CMR 0.5...2.5 A DC



PAS CMR 2.0...5.0 A DC



Technical data

Input		
Input current	0.5...2.5 A DC	2...5.0 A DC
Max. current	7.5 A for 10 s	15 A for 10 s
Making current threshold	≤ 500 mA	≤ 2 A
Input resistance, current	< 50 mΩ	< 50 mΩ
Secure off	≤ 50 mA	≤ 300 mA
Pulse duration	min. 1 ms	min. 1 ms
Output		
Switching current	100 mA	100 mA
Switching voltage AC / Switching voltage DC	/ 1 V...100 V1 V...100 V	/ 1 V...100 V1 V...100 V
Max. switching frequency	15 Hz	15 Hz
Contact assembly	1 NO contact	1 NO contact
Contact material	RH/Rd (Reed contact)*	RH/Rd (Reed contact)*
General data		
Configuration	none	none
Ambient temperature	0 °C...55 °C	0 °C...55 °C
Humidity	5-95% relative humidity, T_u = 40°C, without condensation	5-95% relative humidity, T_u = 40°C, without condensation
Approvals	CE; cULus	CE; cULus
Insulation coordination		
Standards	DIN EN 50178 (secure separation)	DIN EN 50178 (secure separation)
EMC standards	EN 55011, EN 61000-6-1, 2, 3, 4	EN 55011, EN 61000-6-1, 2, 3, 4
Rated voltage	300 V	300 V
Impulse withstand voltage	6 kV	6 kV
Insulation voltage	4 kV_{eff} / 1 min.	4 kV_{eff} / 1 min.
Overvoltage category	III	III
Pollution degree	2	2
Clearance & creepage distances	≥ 5 mm (grout encapsulated)	≥ 5 mm (grout encapsulated)

Dimensions		**Screw connection**	**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 2.5 / 2.5	1.5 / 2.5 / 2.5
Length x width x height	mm	92 / 15.3 /	92 / 15.3 /
Note		* The peak current should be limited to 100 mA when under capacitive loads.	* The peak current should be limited to 100 mA when under capacitive loads.

Ordering data

	Type	Qty.	Order No.	Type	Qty.	Order No.
Screw connection	PAS CMR 0,5...2,5 A DC	10	**8742610000**	PAS CMR 2,0...5,0 A DC	10	**8742620000**
Note						

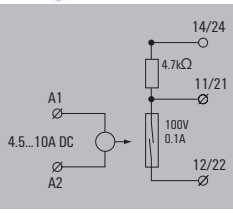
Accessories

Note	Cross-connectors and markers - refer to WAVESERIES accessories	Cross-connectors and markers - refer to WAVESERIES accessories

Relay output

PAS CMR 4.5...10 A DC

- Monitors currents up to 10 A DC
- Used with valves, servo-controls or DC motors
- Pull-up / pull-down resistor 4.7 kΩ



Technical data

Input	
Input current	4.5...10 A DC
Max. current	30 A for 10 s
Making current threshold	≤ 4.5 A
Input resistance, current	< 50 mΩ
Secure off	≤ 600 mA
Pulse duration	min. 1 ms
Output	
Switching current	100 mA
Switching voltage AC / Switching voltage DC	/ 1 V...100 V1 V...100 V
Max. switching frequency	15 Hz
Contact assembly	1 NO contact
Contact material	RH/Rd (Reed contact)*
General data	
Configuration	none
Ambient temperature	0 °C...55 °C
Humidity	5-95% relative humidity, T_u = 40°C, without condensation
Approvals	CE; cULus
Insulation coordination	
Standards	DIN EN 50178 (secure separation)
EMC standards	EN 55011, EN 61000-6-1, 2, 3, 4
Rated voltage	300 V
Impulse withstand voltage	6 kV
Insulation voltage	4 kV_{eff} / 1 min.
Overvoltage category	III
Pollution degree	2
Clearance & creepage distances	≥ 5 mm (grout encapsulated)

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 2.5 / 2.5
Length x width x height	mm	92 / 15.3 / 95
Note		* The peak current should be limited to 100 mA when under capacitive loads.

Ordering data

	Type	**Qty.**	**Order No.**
Screw connection	PAS CMR 4,5...10 A DC	10	**8742630000**

Note

Accessories

Note

Cross-connectors and markers - refer to WAVESERIES accessories

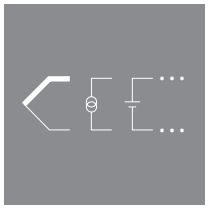
Process value displays

Process value displays

With its process instruments, Weidmüller offers you a comprehensive range of innovative products for analogue signal processing. This range is specially designed for the demanding and complex requirements of modern process automation. The product series ranges from simple dedicated units to complex microprocessor-controlled devices, and can therefore be used with almost all signal types and all common measurement sensors. The products also offer a wide range of integrated functions. These include time delays, adjustable thresholds, high/low trip switching behaviour and display scaling.

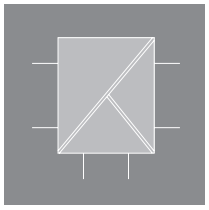
Selection table

Order No.	Product	Input										Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous	Sensor feed		
	Process value displays												
7940012323	PTX800D RO/AO	1								NAMUR, PNP/NPN, TTL-Logic, 0...10 Hz		97 mm	
7940011133	PTX800D	1								NAMUR, PNP/NPN, TTL-Logic, 0...10 Hz		97 mm	
7940014374	PTX800A 4-20MA/RO/AO	1								-24...+24 mA / -11...+11 V		97 mm	
7940010243	PTX800A 4-20MA	1								-24...+24 mA / -11...+11 V		97 mm	
7940018957	PMX420PLUS	1	X	X	X	X						97 mm	
7940018956	PMX420	1	X	X	X	X			0			97 mm	
7940011979	PMX400HZX RO/AO	1				0			X	NAMUR, PNP/NPN, TTL-Logic		97 mm	
7940015595	PMX400HZX	1							X	NAMUR, PNP/NPN, TTL-Logic		97 mm	
7940011570	DI350 0-10V/0-100.0	1			X							97 mm	
7940010185	DI350 4-20MA/0-100.0	1		X								97 mm	
7940010236	LPD450F 4-20MA	1		X								140 mm	
7940010163	LPD350 4-20MA/0-100.0	1		X								97 mm	



All-purpose

A fitting solution for any application – with a multitude of input ranges, external of input loop-powered supply, and analogue or digital outputs.



Saves time

Easy push-button configuration.

Security

No additional signal isolation is required since there is a high insulation voltage.

IP 65

Protection

IP 65 protection allows for use in harsh industrial conditions.

	Output						Configuration	Auxiliary power	Rated voltage	Isolation	Connection system	Special characteristics
	Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous						
	1	X	X	X	X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
	1				X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
	1	X	X	X	X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
	1				X	Display with 8 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
					X	4 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
						Display with 4 Digits	Buttons on the device	18...50 V DC	300 V	3-way	S	
	1	X	X	X	X	2 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
	1				X	2 x Relays, Display with 4 Digits	Buttons on the device	24 V DC	300 V	3-way	S	
						Display with 4,5 Digits 0...100%	Buttons on the device	24 V DC	300 V	3-way	S	
						Display with 4,5 Digits 0...100%	Buttons on the device	24 V DC	300 V	3-way	S	
						Display with 4,5 Digits 0...100%	Buttons on the device	loop powered			S	
						Display with 4,5 Digits 0...100%	Buttons on the device	loop powered			S	

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

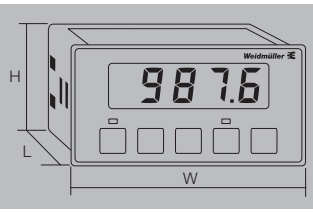
PTX800 Series

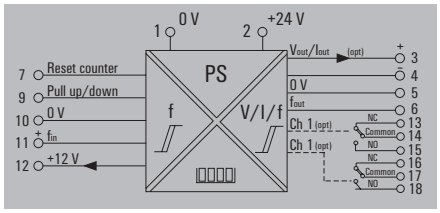
Counter and totaliser with additional functionality and limit-value monitoring

- Installation in control panels
- Pluggable connection terminals
- Scalable impulse and frequency counters for digital input signals
- Suitable on input side for all standard initiators

PTX800D

Digital pulse input





Technical data

Input	
Type	Digital pulse (NAMUR, PNP/NPN, TTL logic, optocoupler, voltage pulse, no-voltage contacts)
Input signal	0...10 Hz
Sensor supply	12 V DC to 25 mA
Input voltage	50 mV...250 V adjustable
Total display, display range	Configurable (≤ 10 pulse per signal jump)
Analogue output (optional)	
Type (analogue output)	Current of voltage output, configured with jumper
Input reset	
Pulse duration, min.	100 ms
Pulse output	
Pulse rate, max.	16 / s
General data	
Type	RO/AO version with 1 analogue output and 2 alarm outputs
EMC standards	DIN EN 61326
Approvals	CE; cULus

Connections

Terminal	Signal	
7	Reset by connection to class 12	Reset
8	Setup configuration by connection to class 12	Configuration
9	Pull Up / Down	Inputs
10	Signal – / 0 V	
11	Signal +	
12	12 V DC	

Dimensions		
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 2.5
Length x width x height	mm	137 / 96.6 / 48.8
Note		

Screw connection
1.5 / 0.5 / 2.5
137 / 96.6 / 48.8

Ordering data

	Type	Qty.	Order No.
with analogue/alarm output	PTX800D RO/AO	1	7940012323
without analogue/alarm output	PTX800D	1	7940011133

Note

Accessories

Note

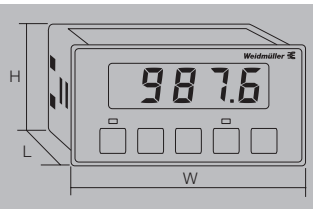
PTX800 Series

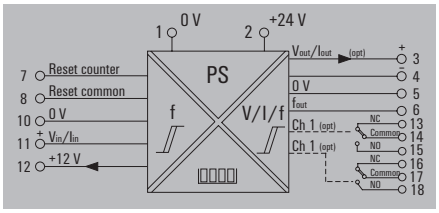
Counter and totaliser with additional functionality and limit-value monitoring

- Installation in control panels
- Pluggable connection terminals
- Configurable for analogue current and voltage signals
- Linearisation and interference suppression
- Power supply for external sensors

PTX800A

Analogue current input / voltage input





Technical data

Input	
Type	Conversion of linear/quadratic input signals into analogue signals
Input signal	-24...+24 mA / -11...+11 V
Sensor supply	24 V DC (up to 25 mA)
Resolution	0.6 µ, A / 0.3 mV
Input resistance	22 Ω (current input); 1 MΩ (voltage input)
Total display, display range	0,001; 0,01; 0,1; 1; 10; 100; 1000
Analogue output (optional)	
Type (analogue output)	Current of voltage output, configured with jumper
Input reset	
Pulse duration, min.	250 ms
Pulse output	
Pulse rate, max.	15 / s
General data	
Type	RO/AO version with 1 analogue output and 2 alarm outputs
EMC standards	DIN EN 61326
Approvals	CE; cULus

Connections

Terminal	Signal	
7	Reset by connection to class KI. 8	Reset
8	Common	
9	Setup configuration by connection to class 8	Configuration
10	Signal – / 0 V	Inputs
11	Signal +	
12	24 V DC	

Dimensions		
Clamping range (nominal / min. / max.)	mm²	
Length x width x height	mm	
Note		

Screw connection
1.5 / 0.5 / 2.5
137 / 96.6 / 48.8

Ordering data

	Type	**Qty.**	**Order No.**
with analogue/alarm output	PTX800A 4-20MA/RO/AO	1	**7940014374**
without analogue/alarm output	PTX800A 4-20MA	1	**7940010243**

Note

Accessories

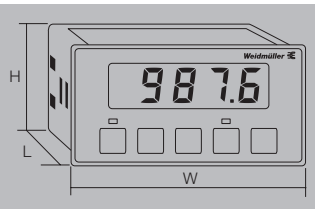
Note

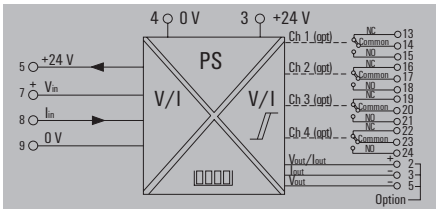
PMX420 Series

Universal, 4-character current/voltage display
- Display instrument for control panel installation
- Pluggable connection terminals
- 4-character, scalable display
- Simple menu-driven configuration

PMX420Plus

Display with analogue output and 4 alarm channels





Technical data

Alarm	
Type	Adjustable output for current or voltage
Scaling	Variable
Output current	0...22 mA
Output voltage	0...11 V
Transmit function	direct or inverted
Load impedance, voltage/current	850 Ω @ 20 mA (current output) / < 500 Ω (voltage output)
Residual ripple	≤ 20 mV_{ss}

Alarm	
Type	Internal Alarm via LED or output signal to external controller
Number of channels	4
Type of contact	2 CO contact und 2 NO contacts
Switching current	5 A @ 240 V AC, 10 A @ 24 V DC
Insulation voltage	2 kV input / power supply
Leakage current quenching	internal

Dimensions		Screw connection
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Length x width x height	mm	137 / 96.6 / 48.8
Note		

Connections

Terminal	Signal	
1	–	Supply voltage
2	+	High level
3	+	Supply voltage
4	–	Low level
5	Signal + sensor supply	Inputs
6	Configuration	
7	Signal + voltage input	
8	Signal + current input	
9	Signal 0 V	
10	Not used	
11	NC contact	Alarm channel 1
12	Common	
13	NO contacts	
14	NC contact	Alarm channel 2
15	Common	
16	NO contacts	
17	NO contacts	Alarm channel 3
18	Common	
19	NO contacts	Alarm channel 4
20	Common	
21	Signal +	Analogue Output
22	Signal –	

Ordering data

		Type	Qty.	Order No.
Voltage input / current input		PMX420PLUS	1	7940018957
Note				

Accessories

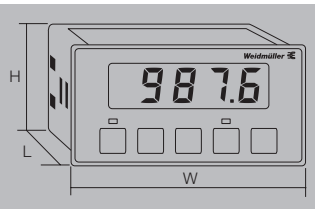
Note

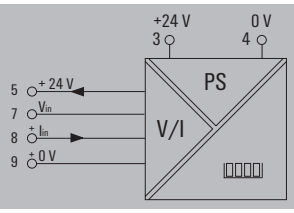
PMX420 Series

Universal, 4-character current/voltage display
- Display instrument for control panel installation
- Pluggable connection terminals
- 4-character, scalable display
- Simple menu-driven configuration

PMX420

Display





Technical data

Display	
Type	4-digit, red LED, 14.2 mm
Scaling	Variable
Display range	-9999...9999
Status indicator	
Inputs	
Type	Adjustable input for current or voltage
Input current	-22...+22 mA (preset to 4...20 mA)
Input resistance	25 Ω (current input) or 1.5 MΩ (voltage input)
Resolution	4 µA / 2 mV
Sensor current	4...20 mA
Current output	
Transfer functions	
Power supply	
Voltage supply	18...50 V DC, other voltages on request
Input	
Attenuation factor	0...99, programmable digital filter
General data	
Sampling rate	
Linearity	< 0.05 %
Repeat accuracy	
Temperature coefficient	
Long-term drift	0.1 % / 10.000 h
Cut-off frequency (-3 dB)	5 Hz
Step response time	
Insulation coordination	
Rated voltage	
Overvoltage category	
Impulse withstand voltage	4 kV (1.2/50 µs)
Insulation voltage	2 kV input / power supply
Ambient temperature (operational)	0 °C...60 °C
Storage temperature	-25 °C...70 °C
Pollution degree	
Humidity	0...90 % (no condensation)

Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Length x width x height	mm	137 / 96.6 / 48.8
Note		

Connections

Terminal	Signal	
1	–	Supply voltage
2	+	High level
3	+	Supply voltage
4	–	Low level
5	Signal + sensor supply	Inputs
6	Configuration	
7	Signal + voltage input	
8	Signal + current input	
9	Signal 0 V	
10	Not used	

Ordering data

	Type	Qty.	Order No.
Voltage input / current input	PMX420	1	7940018956

Note

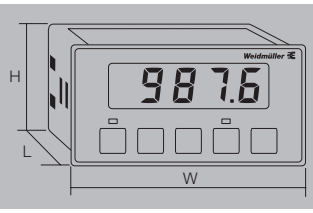
Accessories

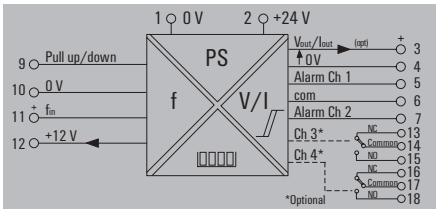
Note

PMX400 Series

- Frequency measuring and monitoring (3-wire NPN/PNP, NPN/PNP Open Collector, TTL logic, solid-state switch, potential-free contacts)
- Integrated power supply for external sensors
- Two outputs for monitoring limit-values
- De-bouncing of switched input pulses

PMX400HZX





Technical data

Display	
Display value	Percentage or real value display
Input	
Type	Adjustable frequencies
Input signal	Configurable for 4 ranges
Sensor supply	12 V DC to 25 mA
Input voltage	
Alarm (channel 1/2)	
Type	Channel 1/2: transistor output channel 3/4: relay contact (CO)
Rated switching current	200 mA
Rated switching voltage	50 V DC
Alarm (channel 3/4)	
Type	Channel 1/2: transistor output channel 3/4: relay contact (CO)
Switching current	Channel 3/4: 3 A @ 240 V AC / 24 V DC (resistive load)
General data	
Voltage supply	24 V DC ± 10 %
Power consumption	6 W @ 24 V DC
Step response time	< 220 ms (10...90 %)
Attenuation factor	0...99, programmable digital filter
Type	RO/AO version with 1 analogue output and 2 alarm outputs
Insulation voltage	1 kV input / output / power supply
EMC standards	DIN EN 61326
Approvals	CE; cULus

Connections

Terminal	Signal	
1	–	Supply voltage
2	+	
3	Signal +	Analogue output (only for AO version)
4	Signal –	
5	Common	Alarm channel 1 and 2 (only for 4RO version)
6	Channel 1	
7	Channel 2	
8	Configuration	Inputs/Configuration (Set-up: 12/8 connection)
9	Pull up / pull down	
10	Signal –	
11	Signal +	
12	12 V DC	
13	Common	Alarm channel 3 (only for 4RO version)
14	NC contact	
15	NO contacts	
16	Common	Alarm channel 4 (only for 4RO version)
17	NC contact	
18	NO contacts	

Input range	Offset	Resolution
0...9.999 Hz	0...9.998 Hz	0.001 Hz
0...99.99 Hz	0...99.98 Hz	0.01 Hz
0...999.9 Hz	0...999.8 Hz	0.1 Hz
0...9999 Hz	0...9998 Hz	1 Hz

Dimensions		
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 2.5
Length x width x height	mm	137 / 96.6 / 48.8
Note		

Screw connection
1.5 / 0.5 / 2.5
137 / 96.6 / 48.8

Ordering data

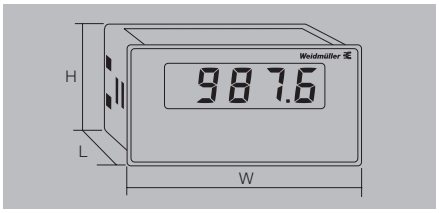
	Type	**Qty.**	**Order No.**
with analogue/alarm output	PMX400HZX RO/AO	1	**7940011979**
without analogue/alarm output	PMX400HZX	1	**7940015595**
Note			

Accessories

Note

DI350

- Display instrument for control panel installation
- 1/8 DIN standard front
- 3½ digits
- IP 65 fully insulated
- Pluggable connection terminals



DI350

Display with voltage input

- Integrated power supply for external sensors
- Linearity with an accuracy of 0.1 % of the measuring range
- Complete galvanic isolation

DI350

Display with current input

- Integrated power supply for external sensors
- Linearity with an accuracy of 0.1 % of the measuring range
- Complete galvanic isolation

Technical data

Input		
Input signal	0...10 V	4...20 mA
Input resistance	1 MΩ	22 Ω
Supply voltage	24 V DC (up to 25 mA)	24 V DC (up to 25 mA)
Display		
Type	3.5 digits, red LED, 14.2 mm	3.5 digits, red LED, 14.2 mm
Display range	-1999...1999	-1999...1999
Display value	Percentage or real value display	Percentage or real value display
Format	1-line / decimal point: 1.000, 100.0, 10.00	1-line / decimal point: 1.000, 100.0, 10.00
Settings		
Offset	± 1200 digital steps	± 1200 digital steps
Range of adjustment	20 - 2100 digital steps	20 - 2100 digital steps
General data		
Voltage supply	24 V DC (12...35 V DC)	24 V DC (12...35 V DC)
Power consumption	6 W @ 24 V DC	6 W @ 24 V DC
Linearity	< 0.1 % typ.	< 0.1 % typ.
Humidity	0...90 % (no condensation)	0...90 % (no condensation)
Temperature coefficient	≤ 0.02 % / °C	≤ 0.02 % / °C
Long-term drift	0.1 % / 10.000 h	0.1 % / 10.000 h
Step response time	200 ms (10...90 %)	200 ms (10...90 %)
Impulse withstand voltage	4 kV (1.2/50 µs)	4 kV (1.2/50 µs)
Insulation voltage	1 kV input / power supply	1 kV input / power supply
Ambient temperature / Storage temperature	/ 0 °C...60 °C / -25 °C...70 °C	/ 0 °C...60 °C / -25 °C...70 °C
EMC standards	DIN EN 61326	DIN EN 61326
Approvals	CE; cULus; cULusEX	CE; cULus; cULusEX; EAC

Dimensions			
Clamping range (nominal / min. / max.)	mm²	Screw connection	Screw connection
Length x width x height	mm	1.5 / 0.5 / 2.5 137 / 96.6 / 48.8	1.5 / 0.5 / 2.5 137 / 96.6 / 48.8
Note			

Ordering data

	Type	Qty.	Order No.	Type	Qty.	Order No.
Voltage input / current input	DI350 0-10V/0-100.0	1	**7940011570**	DI350 4-20MA/0-100.0	1	**7940010185**
Note						

Accessories

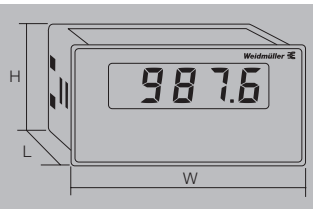
Note		

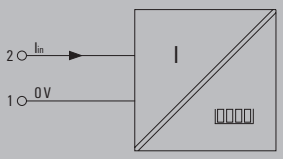
LPD350

- Display instrument for control panel installation
- 1/8 DIN standard front
- 3½ digits
- IP 65 fully insulated
- Pluggable connection terminals

LPD350

Current input





Technical data

Input	
Input current	4...20 mA
Voltage drop	2.5 V @ 20 mA
Input resistance	125 Ω
Input current, max.	100 mA constant / 500 mA for 10 s
Input current, max. when wired incorrectly	500 mA constant
Display	
Type	3.5 digits, black LCD with clear background, 12.7 mm
Display range	-1999...1999
Format	Single-line
Settings	
Offset	± 1999 digital steps in two switching ranges
Range of adjustment	0...3998 in three switching ranges
General data	
Accuracy	± 0.05 % from signal range ± 1 digital step
Repeat accuracy	± 0.05 % of signal range
Temperature coefficient	Offset ± ± 0.1 digital steps per °°C Adjustment range ± 0.1 digital steps per °C
Step response time	200 ms (10...90 %)
Sampling rate	2,5 x pro s
Ambient temperature / Storage temperature	/ -20 °C...70 °C / -25 °C...85 °C
EMC standards	DIN EN 61326
Approvals	CE; cULus; cULusEX

Connections

Terminal	Signal
1	Input –
2	Input +

Dimensions		Screw connection
Clamping range (nominal / min. / max.)	mm²	1.5 / 0.5 / 2.5
Length x width x height	mm	75 / 96.6 / 48.8
Note		

Ordering data

	Type	Qty.	Order No.
Current input	LPD350 4-20MA/0-100.0	1	**7940010163**

Note

Accessories

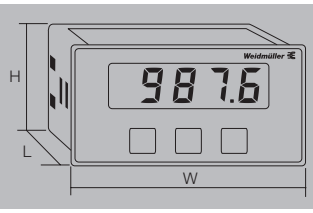
Note

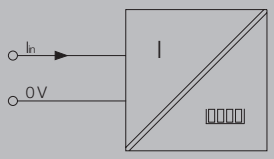
LPD450F

- Display instrument for outdoor use
- 4½ Digits
- IP 67 fully insulated
- Optionally available with fixing clips for pipe mounting

LPD450F

Current input

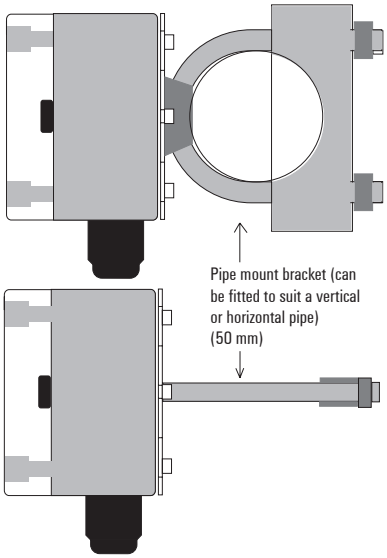




Technical data

Input	
Input current	4...20 mA
Transmit function	√, $x^{3/2}$, $x^{5/2}$ or programmable (2-21 steps)
Display	
Type	4.5-character, black LCD with clear background, 20 mm
Display value	Percentage or real value display
Display range	±19.999 (0.00...100.00 factory setting)
Decimal point	18888, 1.8888, 18.888, 188.88, 1888.8
General data	
Voltage supply	Loop powered, via 4...20 mA input
Voltage drop	< 4.3 V
Accuracy	± 0.05 % from signal range ± 1 digital step
Repeat accuracy	± 0.01 % of signal range
Temperature coefficient	Offset ± 0.01 % / °C Adjustment range ± 0.1 digital steps or 0.01 % / °C
Humidity	10...90 %, no condensation
Step response time	Programmable in 99 steps from 1...30 sec.
Sampling rate	16 x pro s
Change of display	2 x per sec.
Ambient temperature / Storage temperature	/ 0 °C...60 °C / -25 °C...70 °C
EMC standards	DIN EN 61326
Approvals	CE; cULus; cULusEX

Mounting sketch



Dimensions		**Screw connection**
Clamping range (nominal / min. / max.)	mm^2	1.5 / 0.5 / 2.5
Length x width x height	mm	65 / 140 / 80
Note		

Ordering data

	Type	**Qty.**	**Order No.**
Current input	LPD450F 4-20MA	1	**7940010236**

Note

Accessories

Note	Fixing clip Pipe Mount Kit - 7940010667

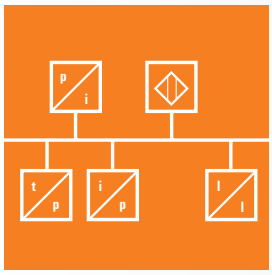
Configuration software

Device configuration for analogue signal conditioners
using FDT- and FDT2-technology

The WI-Manager is a device-management frame application which supports the FDT and FDT2 (Field Device Tool) standards. The software can be used to configure and maintain all of our configurable ACT20 devices. It can manage all device drivers that are available through their DTM (Device Type Manager). The DTM permits access to device data with a graphical user interface (GUI) that offers the user a variety of functions such as configuration, operation and monitoring of devices. WI-Manager helps to reduce the costs related to planning and maintaining the devices in a facility.

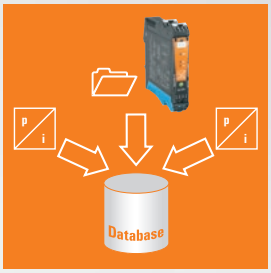
Full FDT-functionality
The WI-Manager software provides total support for FDT and FDT2 functions. As such, it is both state-of-the-art and backwards compatible.

Universal network topology
WI-Manager supports all communication protocols though their corresponding DTMs.

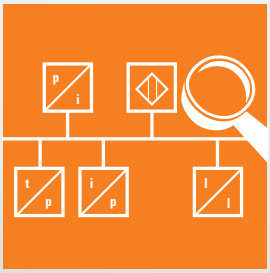


Integrated security
The WI-Manager user administration allows access to be limited to uncritical device functions. This increases the overall safety and security of the facility.

Centralised data management
Centralised administration of all available project and product data in one unified format – the result is reduced software management and data administration costs.

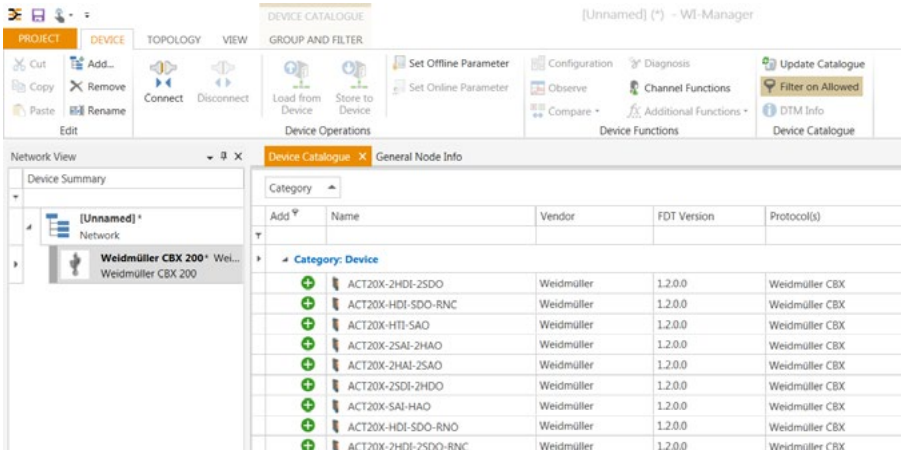


Automated network planning
Connected networks and products are automatically detected and displayed by means of the SCAN function. This makes planning and initial commissioning easier.



Device configuration

SW Weidmueller DTM-Library Setup



Technical Data

Function and performance features	
Online constraint	No
GUI	Yes
Usage model software	Local installation
Language	English, German
System requirements	
Operating system	Windows 8, Windows 10
Required rights	Admin
Product information	With the FDT / DTM software you can configure and monitore the devices of the ACT20 series.The software includes the respective Device Type Manager (DTM) as well as the FDT2.0 Frame Application WI-Manager.

Note

Ordering Data

Type	Qty.	Order No.
SW Weidmueller DTM-Library Setup	1	1466380000

Note

Accessories

Accessories

Configure, calibrate, mount, mark, (cross-) connect.

A comprehensive line of accessories is available for the analogue signal converter product family. The line includes configuration adapters for software-programmable products, interface modules, calibrators and mounting accessories (such as cross-connectors, end plates and terminal connectors) – all naturally in the top Weidmüller quality that you've come to expect.

Selection table

Order No.	Product	Input									Width	
		Amount	0...20 mA	4...20 mA	0...10 V	0...5 V	TC	RTD	Frequency	Miscellaneous / Sensor feed		
	Accessories											
8965500000	ACT20-FEED-IN-PRO-S	1								24 V + 24 V redundancy	22.5 mm	
2456870000	ACT20-FEED-IN-PRO-P	1								24 V + 24 V redundancy	22.5 mm	
1282490000	ACT20-FEED-IN-BASIC-S	1								24 V	6.1 mm	
8978580000	CBX200 USB	1								Chinch plug		

	Output						Configuration	Auxiliary power		Isolation		Special characteristics
	Amount	0...20 mA	4...20 mA	0...10 V	Relay	Miscellaneous			Rated voltage		Connection system	
	1				X	24 V for CH2OM bus systems + redundancy		24 V DC			S	
	1				X	24 V for CH2OM bus systems + redundancy		24 V DC			P	
	1					24 V for CH2OM bus systems		24 V DC			S	
	1						Software	-			RJ45	Interface adapter for configuration

Connection system: S = screw / **Z** = tension clamp / **P** = Push In, **ILP** = Input Loop Powered, **OLP** = Output Loop Powered

CBX200

- Interface converter for configuration, with galvanic isolation
- USB port for connecting to PC
- TX and RX status displays
- WI-Manager and TTA Set configuration software programs, download at www.weidmueller.com

CBX200 USB

The CBX200 USB is a USB2.0/RS232-interface converter with galvanic isolation. It has additional functionality for controlling and supplying the connected RS232 device. The CBX200 USB makes it possible to configure the intrinsically safe ACT20X product line and the WAVE TTA signal converter.
The CBX200 USB is not compatible with the CBX100 USB.

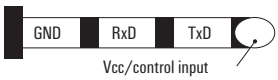
Technical data

Input	
Type	USB 2.0 (USB type A plug)
Input current	≤ 100 mA
Input resistance	22 kΩ
Input voltage	1.6...5.6 V
Output	
Type	RS232 (4-pole 2.5-mm jack plug)
Output voltage	3.3 V regulated
Output current	3 A
Level on interfaces	1.8...5.6 V (automatically adapted)
Baud rate	≤ 115 kBd
Activation signal	9...15 V typ. 12 V / 4 mA
Insulation coordination	
Insulation voltage	2.5 kV (input / output)

Table for selecting a configuration adapter

Product	CBX100	CBX200
ACT20X		X
WAVE TTA	X	X
ITX+	X	

Pin assignments for jack plug



DTR*	Vcc
0	3,3 V
1	0 V

Control input	RTS*	RS232 interface
12 V	1	active
12 V	0	active
0 V	1	active
0 V	0	not active

* RTS and DTR are internal control signals

Installation notes
The power supply to the device comes from the USB port via a USB type-A plug. The output-side of the RS232 interface uses a four-pole 2.5-mm jack plug to connect. This jack plug is also capable of activating the RS232 interface when needed with a 12-V control voltage. With the assistance of the DTM, the USB interface is diverted to a COM interface. The RS232 interface can be activated with an RTS signal (RTS = 1→ output activated) via the diverted COM interface. The jack plug is also capable of supplying the RS232 node with a regulated voltage of 3.3 V at 4 mA current. The DTR signal (DTR = 0 → supply activated) is used for control. It is also possible to query the status using the DSR signal (DSR = 0 → output activated).

The "WI-Manager" software, the "TTA Set" and the DTM library can all be downloaded free of charge from www.weidmueller.com.

Note

Ordering data

Type	Qty.	Order No.
CBX200 USB	1	**8978580000**

Note

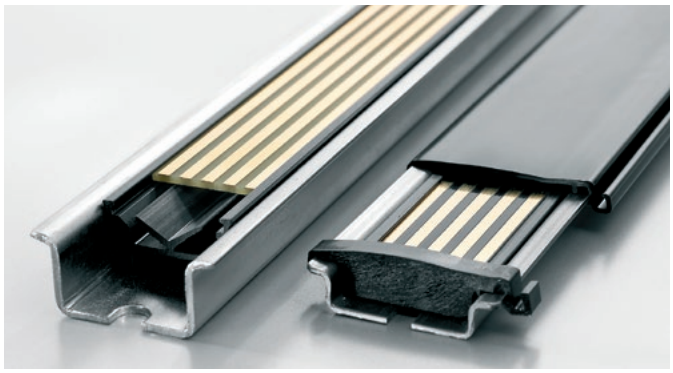
Accessories

Note

CH20M DIN rail bus

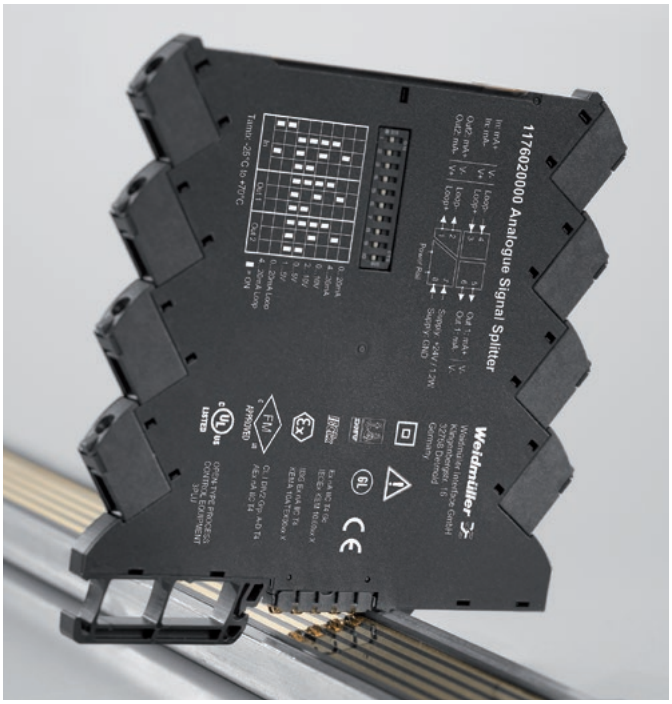
Quick and safe power supply through the mounting rail.

This customer-friendly infrastructure solution brings power, signals and data to the rail in a quick and reliable manner. The DIN rail bus can replace the tedious individual wiring process with a flexible and uninterrupted system solution. As a result, the wiring overhead and the error rate are both reduced. The uninterrupted system bus is securely integrated within the 35 mm standard mounting rail. Whether 7.5 mm or 15 mm high, the custom-fit rail profiles are easy to install on all TS 35 standard rails in accordance with DIN EN 60715.



The resistant gold-plated contacts ensure a permanent and reliable contact. The ACT20M modules are simply snapped onto the mounting rail and are automatically in contact with the DIN rail bus.

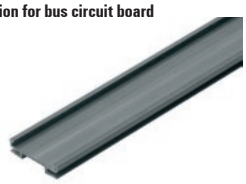
The supply to the 24 V power supply can be from either one of the modules (up to 400 mA) or a separate power supply terminal (up to 4 A). This is sufficient for up to 120 modules. The ACT20-Feed-In-Basic provides a simple and compact (6 mm width) power supply terminal solution.
The ACT20-Feed-In-Pro is a more powerful 22.5 mm wide solution. This makes a backup power supply that includes error messaging possible.



Rail bus accessories

CH20M BUS-PROFIL TS35x7.5/1000

Support section for bus circuit board



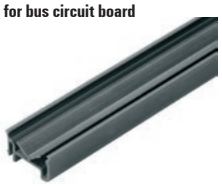
- Support section for TS 35 x 7.5
- Length: 250, 500 or 750 mm

Ordering data

Type	Qty.	Order No.
CH20M BUS-PROFIL TS35x7.5/250	10	1248150000
CH20M BUS-PROFIL TS35x7.5/500	10	1248160000
CH20M BUS-PROFIL TS35x7.5/750	5	1248170000

CH20M BUS-PROFIL TS35x15/1000

Support section for bus circuit board



- Support section for TS 35 x 15
- Length: 250, 500 or 750 mm

Ordering data

Type	Qty.	Order No.
CH20M BUS-PROFIL TS35x15/250	5	1248180000
CH20M BUS-PROFIL TS35x15/500	5	1248190000
CH20M BUS-PROFIL TS35x15/750	5	1248210000

CH20M BUS 4.50/05 AU/1000

Bus PCB

- Bus circuit board for use on TS 35 x 7.5 and TS 35 x 15
- Length: 250, 500 or 750 mm
- Five conductor paths, gold-plated
- Electrical rating: 63 V AC, 5 A/conductor path

Ordering data

Type	Qty.	Order No.
CH20M BUS 4.50/05 AU/250	10	1248220000
CH20M BUS 4.50/05 AU/500	10	1248230000
CH20M BUS 4.50/05 AU/750	5	1248240000

CH20M BUS-ADP TS35/1000

Cover plate

- Cover plate for DIN rail bus
- Length: 250, 500 or 750 mm

Ordering data

Type	Qty.	Order No.
CH20M BUS-ADP TS35/250	10	1248250000
CH20M BUS-ADP TS35/500	10	1248260000
CH20M BUS-ADP TS35/750	5	1248270000

CH20M BUS-AP LI TS35x7.5 & 15

End plate

- End plate for DIN rail bus
- Fits on TS 35 x 7.5 and TS 35 x 15
- left

Ordering data

Type	Qty.	Order No.
CH20M BUS-AP LI TS35x7.5 & 15	50	1193160000

CH20M BUS-AP RE TS35x7.5 & 15

End plate

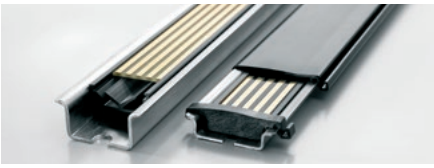
- End plate for DIN rail bus
- Fits on TS 35 x 7.5 and TS 35 x 15
- right

Ordering data

Type	Qty.	Order No.
CH20M BUS-AP RE TS35x7.5 & 15	50	1193170000

SET CH20M BUS 250MM TS 35X15

Set



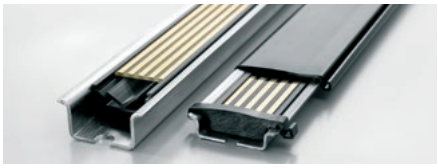
- SET consists of one each of
  CH20M BUS 4.50/05 AU/250
  CH20M BUS-ADP TS 35/250
  CH20M BUS-AP LI TS 35X7.5 & 15
  CH20M BUS-AP RE TS 35X7.5 & 15
  CH20M BUS-PROFIL TS 35X15/250

Ordering data

Type	Qty.	Order No.
SET CH20M BUS 250MM TS 35X15	1	1335150000

SET CH20M BUS 250MM TS 35X7.5

Set



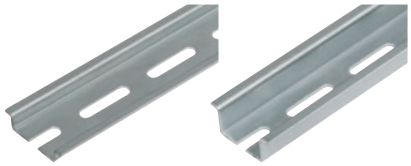
- SET consists of one each of
  CH20M BUS 4.50/05 AU/250
  CH20M BUS-ADP TS 35/250
  CH20M BUS-AP LI TS 35X7.5 & 15
  CH20M BUS-AP RE TS 35X7.5 & 15
  CH20M BUS-PROFIL TS 35X7.5/250

Ordering data

Type	Qty.	Order No.
SET CH20M BUS 250MM TS 35X7.5	1	1335140000

TS 35x7.5 / TS 35x15

DIN rail



- DIN rail with slot
- Passivated galvanised steel

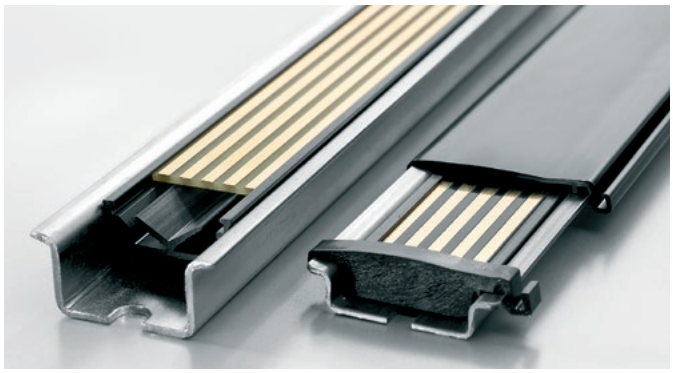
Ordering data

Type	Qty.	Order No.
TS 35X7.5/LL 1M/ST/ZN	10	0514510000
TS 35X15/LL 1M/ST/ZN	10	0236510000

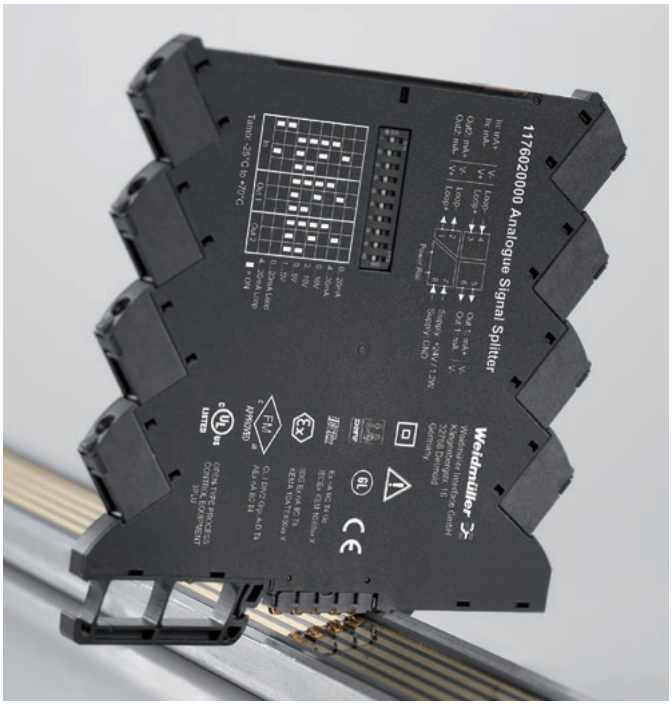
Power-feed module for the CH20M DIN rail bus

4 A supply with backup supply and error analysis

The power-feed unit ACT20-FEED-IN-PRO-S supplies the devices on the CH20M DIN rail bus with 24 V DC. At the same time, the FEED-IN device reads the group error contact – optionally provided by the installed devices – from the CH20M rail bus and sends a message through the status relay to the external controller. Optionally, two power supplies can be connected for the primary and secondary supplies (backup). An installation in Zone 2 / Division 2 is also possible. Three LEDs show the status of the power supply and the error status.



The FEED-IN-PRO can supply a maximum of 4 A to feed up to 120 devices mounted on a CH20M rail bus. Quick identification of errors on the DIN rail bus is through the internal status relay. The FEED-IN-PRO device immediately recognises and displays when a power supply has failed. The supply is then switched automatically to the redundant power supply.

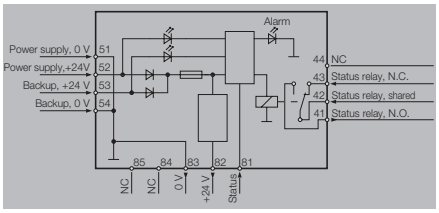


Weidmüller offers a compact and narrow 6 mm feed-in module as an alternative. This wires the terminal level directly to the DIN rail bus. Up to 80 modules can be fed with a maximum available current of 2.5 A.

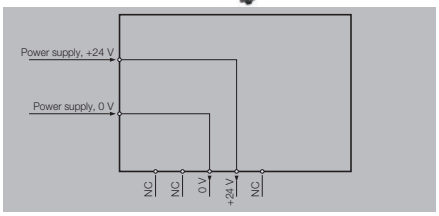
ACT20 power-feed module

- Distributes the supply onto the busbar
- Compatible with Weidmüller CH20 DIN rail bus
- Optional connection for backup supply
- Approved for use in Ex-Zone 2 /Div. 2
- Monitoring of the supply voltage
- Alarm alerts via the status relay

ACT20-Feed-In-PRO-S



ACT20-Feed-In-BASIC-S



Technical data

Input		
Voltage supply	21.6...26.4 V DC	21.6...26.4 V DC
Input current	max. 4 A	0.5...2.5 A DC
Backup power supply	21.6...26.4 V DC	
Trigger level for the power supply	Fault < 21 V DC	
Output		
Output current	max. 4 A, (Supply of e.g. 110 devices of ACT20M-CI-2CO-S on one CH20M BUS)	Equivalent to input current, (Supply of e.g. 75 devices of ACT20M-CI-2CO-S on one CH20M BUS)
Output power	96 W	
Supply voltage (output)	24 V DC	
Output, status relay in safe zone		
Max. switching voltage, AC / Max. switching voltage, DC	250 V /	250 V /
Continuous current	2 A	
AC power, max.	500 VA / 60 W	
General data		
Degree of efficiency	0,976	100 %
Ambient temperature	-20...+60 °C	-25 °C...+70 °C
Power consumption	< 2 W	
Protection degree	IP20	IP20
Weight	140	70
Humidity	95 %, no condensation	95 %, no condensation
Approvals	cULus; DEKRAATEX; DETNORVER; EAC; FMEX; IECEXDEK	cULus; DETNORVER; DNVGL; EAC; FMEX; IECEXKEM; KEMAATEX

Dimensions			
Clamping range (nominal / min. / max.)	mm²	**Screw connection** 2.5 / 0.5 / 2.5	**Screw connection** 2.5 / 0.5 / 2.5
Length x width x height	mm	**PUSH IN** 22.5 / 117.2	6.1 / 112.5
Note			

Ordering data

	Type	**Qty.**	**Order No.**
Screw connection	ACT20-FEED-IN-PRO-S	1	**8965500000**
PUSH IN connection	ACT20-FEED-IN-PRO-P	1	**2456870000**

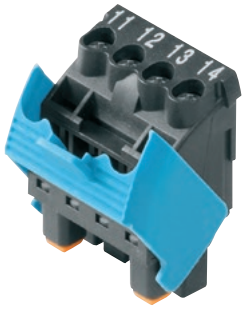
Type	**Qty.**	**Order No.**
ACT20-FEED-IN-BASIC-S	1	**1282490000**

Note

Accessories

Note	DIN mounting rail, see Accessories	DIN mounting rail, see Accessories

ACT20X/ACT20C/ACT20P



Connection terminals

Colour of housing	Release lever colour	Connection number	Printing	Type	Order No.
black	blue	65/66/67/68	white	BHZ 5.00/04/90LH BK/BL PRT 65	1086480000
		55/56/57/58	white	BHZ 5.00/04/90LH BK/BL PRT 55	1086470000
		45/46/47/48	white	BHZ 5.00/04/90LH BK/BL PRT 45	1086460000
		61/62/63/64	white	BHZ 5.00/04/90LH BK/BL PRT 61	1086420000
		51/52/53/54	white	BHZ 5.00/04/90LH BK/BL PRT 51	1086410000
		41/42/43/44	white	BHZ 5.00/04/90LH BK/BL PRT 41	1086400000
	black	65/66/67/68	white	BHZ 5.00/04/90LH BK/BK PRT 65	1086240000
		55/56/57/58	white	BHZ 5.00/04/90LH BK/BK PRT 55	1086230000
		45/46/47/48	white	BHZ 5.00/04/90LH BK/BK PRT 45	1086220000
		61/62/63/64	white	BHZ 5.00/04/90LH BK/BK PRT 61	1086180000
		51/52/53/54	white	BHZ 5.00/04/90LH BK/BK PRT 51	1086170000
		41/42/43/44	white	BHZ 5.00/04/90LH BK/BK PRT 41	1086160000
black	blue	35/36/37/38	white	BHZ 5.00/04/90LH BK/BL PRT 35	1086450000
		25/26/27/28	white	BHZ 5.00/04/90LH BK/BL PRT 25	1086440000
		15/16/17/18	white	BHZ 5.00/04/90LH BK/BL PRT 15	1086430000
		31/32/33/34	white	BHZ 5.00/04/90LH BK/BL PRT 31	1086390000
		21/22/23/24	white	BHZ 5.00/04/90LH BK/BL PRT 21	1086380000
		11/12/13/14	white	BHZ 5.00/04/90LH BK/BL PRT 11	1086370000
		11/12	white	BHZ 5.00/02/90LH BK/BL PRT 11	1086250000
		21/22	white	BHZ 5.00/02/90LH BK/BL PRT 21	1086260000
	black	35/36/37/38	white	BHZ 5.00/04/90LH BK/BK PRT 35	1086210000
		25/26/27/28	white	BHZ 5.00/04/90LH BK/BK PRT 25	1086200000
		15/16/17/18	white	BHZ 5.00/04/90LH BK/BK PRT 15	1086190000
		31/32/33/34	white	BHZ 5.00/04/90LH BK/BK PRT 31	1086150000
		21/22/23/24	white	BHZ 5.00/04/90LH BK/BK PRT 21	1086140000
		11/12/13/14	white	BHZ 5.00/04/90LH BK/BK PRT 11	1086130000
		41/42	white	BHZ 5.00/02/90LH BK/BK PRT 41	1086040000

Cold-junction compensation terminals (optional for the ACT20X temperature modules)

1-channel	Release lever colour	Connection number	Printing	Order No.
black	blue	11/12/13/14	white	1160640000
2-channel				
black	blue	11/12/13/14	white	1160650000

Markers

Type	Version	Dimensions	Qty.	Order No.
ESG 66/20BHZ500/04	Individual markers	6.6 x 20 mm	200	1082540000
ESG 8/13,5/43,3 SAI AV	MultiCard (24 individual markers per MultiCard)	8 x 13.5 mm	5	1912130000

ACT20M

Ordering data markers

	Type	Qty.	Order No.
ACT20M marker	MS 5/7,5 MC NEUTRAL	320	**1877680000**
Note	The ACT20M voltage supply is cross-connected using the CH20M rail bus. Details are available on pages C.14 and G.6		

ACT20P

Ordering data markers

	Type	Order No.
ACT20P/X/C marker	ESG 8/13.5/43.3 SAI AU	**1912130000**
Note		

Accessories MCZ

Ordering data end plates

	Type	Qty.	Order No.
End plate	AP MCZ 1.5	50	8389030000

Ordering data cross-connection

	No. of poles	Type	Qty.	Order No.
Plug-in cross-connection, yellow	2	ZQV 4N / 2 GE	20	1758250000
Plug-in cross-connection, yellow	3	ZQV 4N / 3 GE	20	1762630000
Plug-in cross-connection, yellow	4	ZQV 4N / 4 GE	20	1762620000
Plug-in cross-connection, yellow	10	ZQV 4N / 10 GE	20	1758260000

Ordering data markers

	Type	Qty.	Order No.
Multicard connector marker	WS10/6 MC	600	1828450000

WAVE Accessories

Ordering data cross-connection

	No. of poles	Type	Qty.	Order No.
Plug-in cross-connection, black	2	ZQV 2,5N/2 sw	60	1718080000
Plug-in cross-connection, red	2	ZQV 2,5N/2 rt	60	1717900000
Plug-in cross-connection, blue	2	ZQV 2,5N/2 bl	60	1717990000
Plug-in cross-connection, yellow	2	ZQV 2,5N/2 ge	60	1693800000

Ordering data markers

	Type	Qty.	Order No.
Multicard connector marker	WS 10/5 MC NE WS	920	1635000000
Multicard connector marker	WS15/5 MC	480	1609880000
Multicard connector marker	WS10/6 MC	600	1828450000

Screw-connect connector strip for the WAVESERIES

3-pole

Type	Printing	Order No.
BLZ 5.08/3 SN OR BEDR.	1, 2, 3	**2242030000**
BLZ 5.08/3 SN OR BEDR.	4, 5, 6	**2242050000**
BLZ 5.08/3 SN OR BEDR.	7, 8, 9	**2242060000**
BLZ 5.08/3 SN OR BEDR.	10, 11, 12	**2242070000**

2-pole

Type	Printing	Order No.
BLZ 5.08/02/180 SN OR BX	without labelling	**1526460000**
BLZ 5.08/02/180 SN OR PRT	1, 2	**2246070000**
BLZ 5.08/02/180 SN OR PRT	3, 4	**2246080000**
BLZ 5.08/02/180 SN OR PRT	5, 6	**2246090000**
BLZ 5.08/02/180 SN OR PRT	7, 8	**2246100000**

Portacal 1000EU

Calibration device for current and voltage signals

The Portacal 1000EU is a calibration device which is controlled by a microprocessor. It is used for current and voltage signals. It has three output modes for simulating signals:

- **Voltage source:** for the simulation of externally-supplied voltage transmitters
- **Current source:** for the simulation of externally-supplied current sensors
- **Current sink mode:** simulates the outputs of a two-wire (loop-powered) transmitter.

Commonly used calibration functions can be invoked for each mode by pressing a button. Up to 9 storage locations per mode are available to save the individual values.

Furthermore, the Portacal 1000EU can be programmed in a way that all modes can be cycled automatically. The corresponding values are controlled continually for a pre-defined time by means of a value storage. The following values can be checked and parameterised:

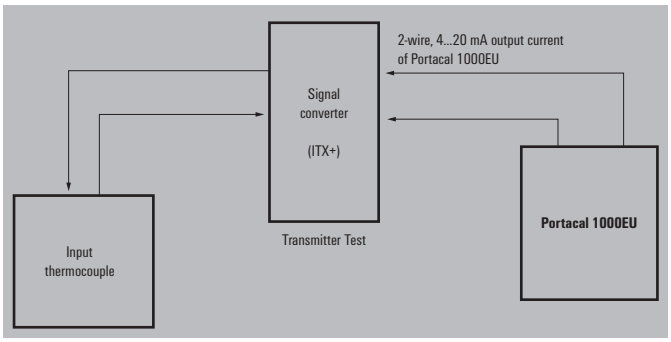
- Voltage outputs
- Current outputs
- Two-wire transmitter outputs

The Portacal 1000EU provides the necessary voltage supply for the sensor in order to check a two-wire transmitter.

Technical features:

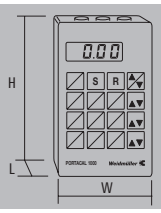
- Complete diagnosis tool for current and voltage supply
- Measuring and simulating of voltage and current signals
- Simulation of function of signal transmitter, which can be auxiliary-powered or process-powered (two-wire type)
- Continually adjustable step and ramping function
- Accuracy < 0.05 % in all signal domains
- Light and portable
- Supply via NiMH rechargeable battery or comparable battery
- Signal tone at the press of a button

Typical application of Portacal 1000EU



PORTACAL 1000EU

Instrument Calibrator



Technical data

Output voltage mode	
Output voltage	0...13 V
Resolution	0.01 V
Load current	0...10 mA
Accuracy	±5 mV
Residual ripple	< 1 mV
Internal storage	Nine user-defined voltages
Output current mode	
Output current	0...26 mA
Resolution	0.01 mA
Load resistance	600 Ω @ 20 mA (power source) 100 Ω (current sink)
max. input voltage current sink	9...45 V DC
Accuracy	±5 µA
Residual ripple	< 1 µA
Internal storage	Nine user-defined currents
Input voltage mode	
Input voltage	0...13 V
Input resistance	200 kΩ
Accuracy	±5 µA or ±1 digital step
Input current mode	
Input current	0...26 mA
Input resistance	47 Ω
Accuracy	±5 µA or ±1 digital step
Loop powered mode	
Type	Mode for loop-powered signal-converters
Input current	0...26 mA
Feed voltage	16 V ±10 %
Accuracy	±5 µA or ±1 digital step
Auto step/ramp mode	
Step	Output of each value within a certain time period
Ramp	Output via a programmed ramp function
Number of recorded values	2...9
Time interval	10...4200 s
Display	
Type	Four-digit display with LCD, 12 mm
Status indicator	Five LEDs for output mode, signal amplification and reduction
Display value	Percent or real-value displayed
Keyboard	
Type	16 buttons with acoustic signal
Calibration	Adjustable fixed values: 0, 2, 4, 8, 10, 12, 16, 18, 20 mA 0, 1, 2, 4, 5, 6, 8, 9, 10 V
Memory	Nine freely-definable values
Decimals	1 / 0.1 / 0.01 mA or V
General data	
Supply voltage	Battery, 4x type ‚AA‘
Temperature coefficient	< 0.01 % / °C at 100 %
Ambient temperature (operational)/storage temperature	0 °C...60 °C / -25 °C...+70 °C
Type of connection	Sockets
EMC standard	DIN EN 61326
Approvals	CE, cULus
Dimensions	
Length x width x height	44 x 100 x 180 mm
Note	

Ordering data

Type	Qty.	Order No.
PORTACAL 1000EU	1	1439640000
Note		
2 x 1 m test cable sw/rt with banana plug/terminal		

Accessories

Note

Portacal 275

Hand-held signal source and loop calibrator

The Portacal 275 is a precise hand-held signal source for current and voltage signals. It can be used in four modes which allows the calibration of standard current/voltage transmitters.

The operating mode “voltage source“ simulates auxiliary-powered transmitters with proportional voltage outputs. The mode “current source“ allows emulation of transmitters with proportional current outputs. The “mv source“ mode simulates a variety of other analogue signals from many different applications. The “current sink“ mode simulates the outputs of a two-wire (loop powered) transmitter.

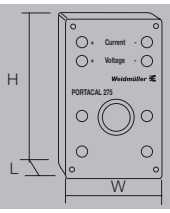
The Portacal 275 is equipped with a scalable potentiometer (0 to 100 %) that can be adjusted in steps to an accuracy of 0.1 %. Together with the output-range switch, the potentiometer allows for a quick and precise adjustment of the signal value. A typical accuracy of ± 0.25 % is possible. An integrated test point, for connecting external measurement devices, allows for a higher accuracy of ± 0.1 %.

Technical features:

- Light and portable device
- Simulates loop-powered transmitter operation
- LED for indication of source/sink operating mode
- Current ranges: 0 to 20 mA / 4 to 20 mA / Voltage ranges: 0 to 5 V / 1 to 5 V / 0 to 200 mV
- 0.1 % accurate current source
- Test points for current output monitoring
- Switch select 0 %, 100 % or variable output
- Signal outputs can be adjusted with spindle potentiometer for high accuracy
- Powered from two 9 V block batteries

Portacal 275

Calibration device for current and voltage signals



Portacal 275

Technical data

Output of voltage mode	
Output voltage	0...5 V / 1...5 V; 0...200 mV / 40...200 mV
Resolution	0.01 V
Output resistance	250 Ω @ V / 10 Ω @ mV
Accuracy	< 0.2% (0% and 100%)
Output current mode	
Output current	0 (4)...20 mA
Resolution	0.01 mA
Last resistor, max.	700 Ω (current source) (V_{out} - 4) / 0.02 Ω (current sink)
Output voltage, max. @ current sink	4...45 V DC
Accuracy	< 0.1% (0% and 100%)
Residual ripple	< 1 µA
Settings	
Range of adjustment	0 (4)...20 mA / 0...200 mA (current source).0 ...5 V (voltage source) or as current sink selectable with toggle switch
Output, variable	0...100 % with precision potentiometer
Output, fixed	0 or 100 % with toggle switch
General data	
Temperature coefficient	typ. 40 ppm @ °°C
Accuracy	0.25 % of signal range
Voltage supply	Batteries, 2 x 9-V blocks 6...22 mA (current source) 2 mA (current sink)
Ambient temperature	0 °C...60 °C
Storage temperature	-25 °C...70 °C
Type of connection	Socket connector
EMC standards	DIN EN 61326
Approvals	CE; cULus

Dimensions		
Length x width x height	mm	31 / 62 / 112

Note	Including two one-metre-long test leads sw/rt with banana plug/terminal and one bridge lead

Ordering data

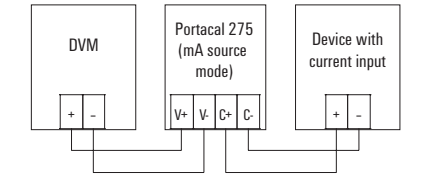
Type	Qty.	Order No.
P275	1	7940010202

Note

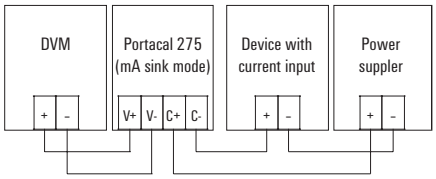
Accessories

Note

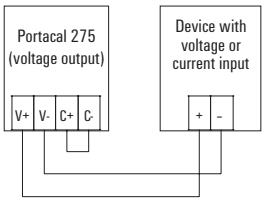
Wiring diagram



Calibration of a transmitter with four-wire connection and current output



Calibration of a transmitter with two-wire connection



Calibration of a transmitter with four-wire connection and current or voltage input

Service and support

Our expertise for your requirements
Service connects – worldwide

Automation technology functions are becoming more complex in a globally-oriented world facing ambitious targets in terms of energy efficiency and smart production. We are your equal partners for the best connections in Industrial Connectivity.

Our personal support can answer any questions reliably and expertly. Our online services are available 365 day a year around the clock to provide answers to your questions on our products – from user documentation through software to planning tools.

In short: Weidmüller's global service combines our expertise with your requirements.

Your way to our service
www.weidmueller.com/service

Engineering support and customised assembly

Automation engineering and connectivity consulting belongs to our services as well as assembly of engineered products. We also support the process from the idea to the product with our Weidmüller Configurator and the Configure-to-Order process.

Consulting and engineering
The challenge for you is reducing costs and increasing efficiency. This requires intelligent, individual solutions. Whether it is modified products, pre-fitted mounting rails or complete small cabinets – our application centres provide a highly qualified custom-made engineering and production service.

Connectivity Consulting
Alongside our product offering, we support you with our range of services through all the phases of machine construction. The result of this collaboration is a reduction of up to 30% in cycle times, up to 20% more space in the control cabinet and significant fault reduction.
Our experienced Connectivity Consulting team delivers a practical impetus rather than just abstract theories.

Fitted mounting rails
Your processes in panel building have to be fast, flexible and productive. This is the only way you can cut your costs and increase efficiency. Depending on the application in question, you will have different requirements with respect to the engineering service, delivery speed and flexibility to be provided.

Processed and assembled enclosures
To compete internationally, your plants need to satisfy high standards of safety, quality and performance. The smart combination of consultation, application expertise and industry know-how is our key to finding a custom-fit solution for your application. Reduce costs and increase efficiency

Personal support

Exactly the right help and information on our solutions and products

If our products are used in your automation technology applications, you need the best possible individual support, from planning through installation to operation. For every stage of your application, we can offer the right tools and information for our products and solutions. Up-to-date, uncomplicated, comprehensive and around the clock via our service portal at www.weidmueller.com/support.

Your way to your local personal support
www.weidmueller.com/support

Technical downloads
All information, such as technical data, manuals, certificates and much more for the appropriate use of our products and solutions in your application

Engineering data
For the quick integration of our products into your design, there are a lot of digital product data for engineering systems like EPLAN, Zuken E3.series, WSCAD and many others available for download.

Product software
Our software makes using and configuration of our products easier for you when it comes to operation, configuration and monitoring

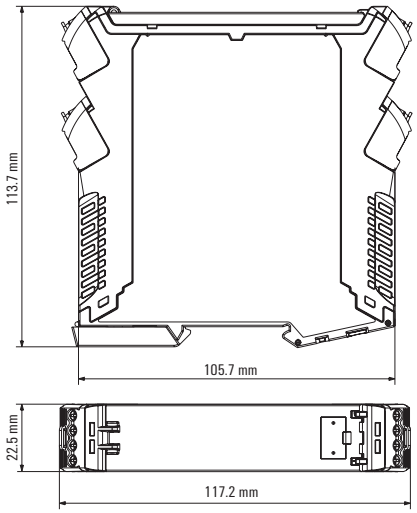
Approvals, certificates & declaration of conformity
We supply product- or company-related approvals and certificates for your documentation

Security advisory board
Our Product Security Incident Response Team (PSIRT) continuously informs you about possible security-related vulnerabilities of our products

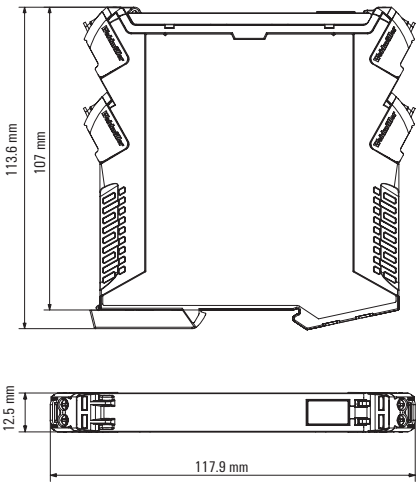
Technical appendix/Glossary

Dimensioned drawings

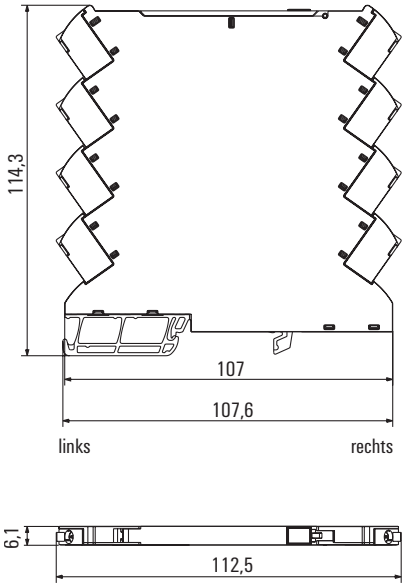
ACT20X/ACT20C/ACT20P



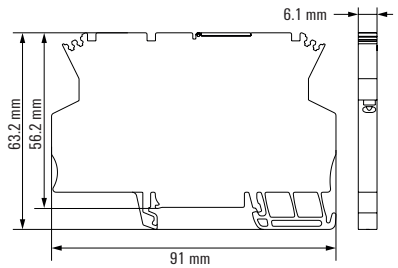
ACT20X HUI-SAO-LP-S



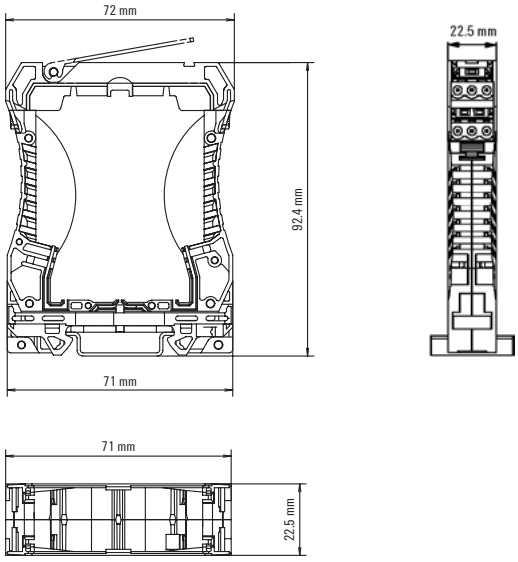
ACT20M – Dimensioned drawings



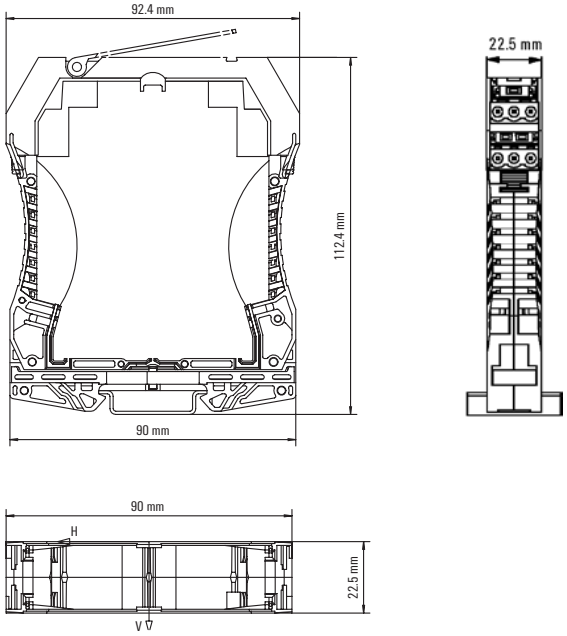
MCZ



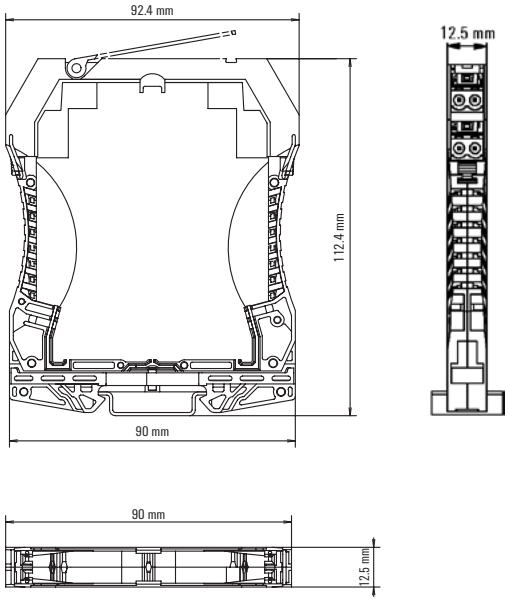
WAVEBOX S 22,5



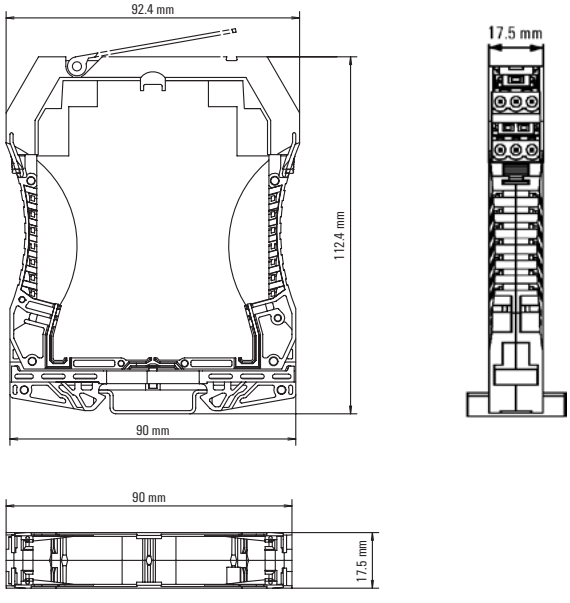
WAVEBOX L 22,5



WAVEBOX 12,5



WAVEBOX 17,5



Different types of analogue signalling

The working environment can be measured in many different forms, e.g. in terms of temperature, humidity or air pressure. The values of these physical variables change constantly. Components that monitor the status and changes of a given environment and provide alerts of any changes must be able to continuously display the changes taking place.

In industrial and process automation, the outputs received from field sensors, switches and transmitters provides measurement and status data which becomes the analogue and digital inputs (AI and DI) for the control system. Similarly, control signals are passed from the control system to field control equipment such as analog and digital valves and actuators.

If automation processes are expected to reach certain statuses or keep them constant, then analogue signal conditioning is required. It is also important in areas where this has already been part of long established practice, e. g. in process engineering or the chemicals industry.

In process engineering, standardised electrical signals are normally used. Currents of 0 ... 20 mA, 4 ... 20 mA or voltages of 0 ... 10 V have become established as the output variables for sensors recording various different physical parameters.

Weidmüller takes account of the growing preference for automation – including and the resulting need for analogue signal conditioning – and offers a wide range of products tailor-made to the requirements involved in handling sensor signals. Units for the common signals (0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V) generate an output signal as a proportional value of the variable input signal. “Protective separation”, e.g. of the sensor circuit from the evaluation circuit, is also taken into account. “Protective separation” prevents mutual interference among several sensor circuits, e.g. as in the case of earth loops in interlinked measuring circuits.

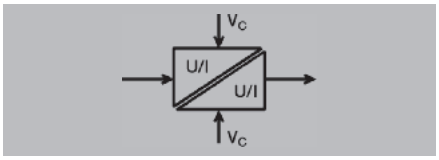
The wide range of Weidmüller products completely covers the functions involved in signal conversion, signal separation and signal monitoring. The products can thus handle nearly all applications in industrial measuring technology, and safeguard elementary functions between field signals and further processing systems. The mechanical properties of the products are built up around a consistent concept.

Signal converters can be used with other Weidmüller products and combined with each other. They are designed to entail a minimum wiring workload and maintenance in both electrical and mechanical terms.

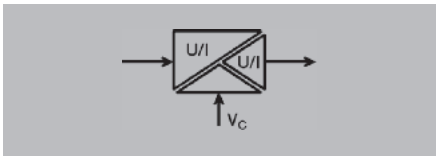
The product range contains the following functions:
- DC/DC converters
- Current converters
- Voltage converters
- Temperature converters for resistance thermometers (RTDs) and thermocouples
- Frequency converters
- Potentiometer transducers
- AC transducers
- Bridge transducers (strain gauges)
- Threshold monitoring modules
- AD/DA converters

The products are available as pure signal converters, or with 2-port or 3-port isolation and a choice of passive or output loop powered or auxiliary powered, depending on the application requirements.

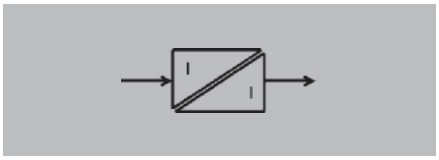
2-way isolation separates the signals from each other electrically and decouples the measuring circuits. Potential differences – caused by long line lengths and common reference points – are eliminated. Furthermore, the electrical separation protects against irreparable damage caused by overvoltages as well as inductive and capacitive interference.



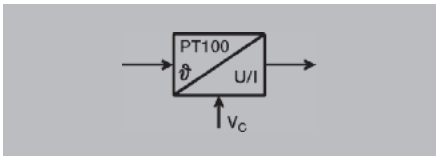
3-way isolation decouples the supply voltage from the input and output circuits as well and enables the function to operate with just one operating voltage.



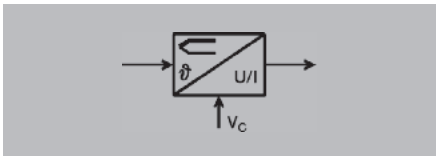
The **passive separator** offers an extra, decisive advantage – it requires no additional voltage supply. The power supply to the module is achieved via the input or output circuit and is transmitted to the input/output. This current loop feed is characterised by a very low consumption.



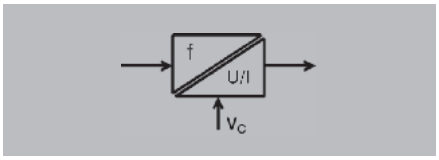
A number of products are available for temperature measurements. For example, **PT100** signals in 2-, 3- and 4-wire systems are converted into standard 0...20 mA, 4...20 mA and 0...10 V signals.



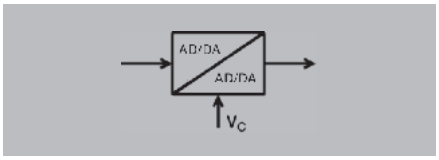
The modules for connecting conventional **thermoelements** are fitted with cold trap compensation as standard. Furthermore, they amplify and linearise the voltage signal provided by the thermocouple. This guarantees accurate analogue signal conditioning while eliminating sources of interference or error.



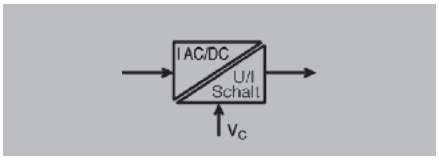
Frequency converters convert frequencies into standard analogue signals. Downstream controls can therefore directly process pulse strings for measuring rpm or speed.



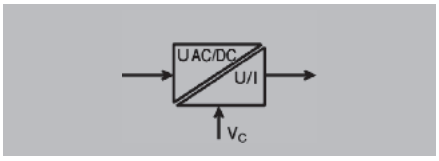
AD or DA converters are required for bringing together the analogue signal forms mapping the local conditions and the digital processing in the process monitoring system. Weidmüller can supply such components for the customary 0...20 mA, 4...20 mA and 0...10 V input and output signals. 8-bit processors are available on the digital side.



Current-monitoring modules can be used to control DC and AC currents up to 60 amps. A switching operation is triggered when the set current values are not met or exceeded. Components with analogue outputs monitor the current load continuously via downstream controls.



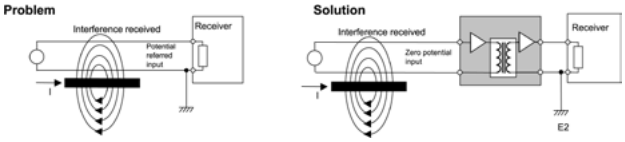
Voltage monitoring modules can be used to monitor AC and DC voltages. Adjustable switching thresholds can be used to reliably detect and notify in the event of fluctuations caused by switching operations or mains overloads.



Technical data

Common Mode Noise Elimination

- Generally, signals emitted by sensors have low levels and are thus susceptible to capacitive and inductive interference, such as those generated by motors, frequency changers and other change processes. This noise contents the measuring value and frequently destroys expensive analog I/O cards in the control electronics. Through the utilisation of analogue signal isolators this interferace, which usually actions both signal lines in common mode (push push), is effectively eliminated through the zero potential input.

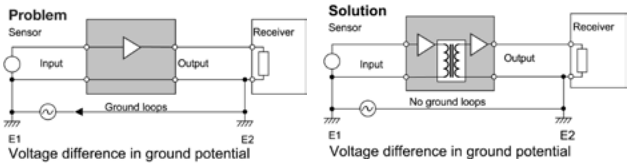


Active Isolator / Passive Isolator

- Active isolators draw their power supply from a separate supply terminal to ensure that they can operate perfectly. Depending upon the applications the input, output and additionally the power supply are isolated from each other. Only one supply is required for 3-port isolation. However, it is isolated from the input and output circuits. Thus even in the event of a short circuit, surge voltage or reverse polarity, the downstream control electronics cannot be damaged. Isolating the signals between the input and output can be conducted either optically or by transformer barrier depending upon the transfer rate. Active isolators are non interacting, i.e. a change in the load does not exert any influence on an input circuit.
- Passive isolators generate the current required for the supply from the measuring signal. The current required internally is so small that transfer problems do not occur here.
- The feed can be effected from either the input or the output side. Isolation is by transformer barrier. The advantages are: cessation of network influences, outstanding accuracy, low signal delay and low potential requirement. Passive isolators are not non interacting; a change in load in the output circuit will influence the input circuit.

Ground Loops

- The voltage supply's secondary side is earthed for the purpose of setting up fast and secure ground loop monitoring. If an analogue signal is fed in from a separate voltage supply or if the sensing device itself is earthed, then transient currents will flow between the ground potentials across the interconnected ground connectors, which in turn corrupts the measuring signal. Analogue signal isolating amplifiers prevent this form of measuring signal corruption and influence.

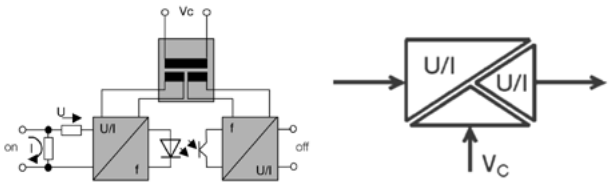


2-port Isolation

- The simplest form of analogue signal isolator is that of 2-port isolation. It serves to isolate the input circuit from the output circuit as well as the two auxiliary voltages from each other. Depending upon the isolator design and the observed isolation data one refers here to base isolation (galvanic isolation) or safe separation. ①
  For current signals, 4...20 mA input current loop fed modules are available. An additional auxiliary voltage for the input circuit is not required here. ②
  By connecting the input and output side voltage supplies, the 2-port isolation can be converted to operate as a simple signal converter. This is of particular interest where isolation is not required for an application, but a signal conversion has to be performed.

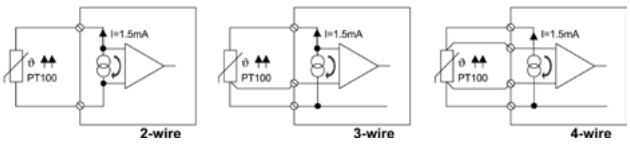
3-port Isolation

- 3-port isolation is the most universal form of signal isolator
- An optical coupler or transformer isolates the input from the output circuit. Together with the clearance and creepage distances it serves to define the isolation level. For example, the input signal is converted by means of pulse-width modulation into a frequency signal and demodulated again on the output side to form an analogue value. An amplifier then generates a standardised analogue signal. A galvanic isolated DC/DC converter feeds the input and output circuit with a potential free supply voltage. It also determines the isolation level through its data, air and creepage distances. In the case of these three isolation paths (input/output, input/auxiliary voltage, output/auxiliary voltage) one refers to 3-port isolation.



Temperature Signal Measuring Method

- Measurement using resistors (RTD)
  When measuring with temperature-dependent resistors a current of approx. 1.5 mA is passed through the resistor from a constant current source in the signal converter.



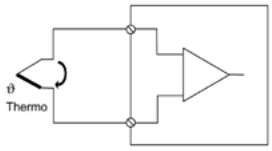
  An operational amplifier is used to measure the potential drop at the resistor (2-wire circuit).
  In order to take account of lead length, the voltage drop is measured at the return conductor and calculated with double the value (3-wire circuit). This simulates the wire resistances from the feed and return lines.
  Accurate measurements are achieved by separately measuring the voltage drop at the feed and return lines (4-wire circuit). The values for the supply lines are calculated against the measured value.

Temperature Signal Measuring Method

- Measurements using thermocouples
  When conducting measurements using thermocouples the voltage that is generated when two differently alloyed metals come into contact with each other is measured. A differential amplifier is then used to recondition the signal. The easiest (and the most cost-efffective) method of subsequent processing is conducted by means of an amplifier circuit, which converts these signals into standard signals. High-end components process the measuring signal using a microprocessor, which simultaneously reconditions the signal (filtering, linearisation)

Cold Junction Compensation For Thermocouples

- Recording temperatures by using thermocouples encounters the problem of a thermal voltage forming at the clamping terminals on the signal converter on account of the different materials in the conductors and bus bar. This voltage then counteracts the thermal element's voltage.

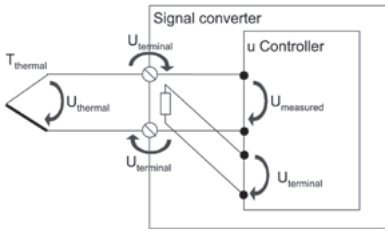


  In order to compensate for the error to the measured value which arises here, the temperature is measured at the clamping terminal. The microprocessor in the signal converter reads the value measured there and calculates it against the measured value. This procedure is known as cold junction compensation.

Voltage at the measuring point (V_{meas})
+ Voltage at the terminal ($V_{terminal}$)
= Voltage at the thermocouple (Vt_{thermo})
=> Temperature at the thermocouple (T_{thermo})

Linearisation

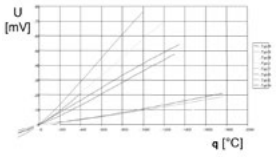
- Temperature-dependent components do not normally have linear characteristic curves. To ensure that further processing can take place with the necessary accuracy, these characteristic curves have to be linearised to some extent. The graph showing measurements of thermocouples, in particular, reveals significant deviations at some points from the "ideal graph". As a consequence, the signal which has been measured is worked up by microprocessor.

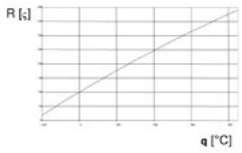


The microprocessor compares the value measured with the characteristic curve for the thermocouple in its memory and calculates the corresponding value on the "ideal characteristic curve". At the output, it supplies the latter to an amplifier, which produces the analogue value in linear form. The output stage converts this into a standardised value or into a switching output with a switching threshold.
The linearisation of PT100-elements can be undertaken via simple amplifier stages. The first stage corrects the peak value of the graph of the measurements. The deviation at the end of the graph resulting from this is corrected by a second stage. The under- and over-shooting generated in this way is very slight and is covered by the tolerance for the module.

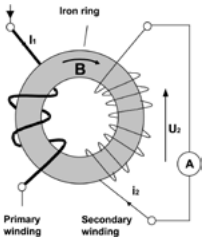
Current Measurement Using A Measuring Transformer

- Transformer principle: Each conductor through which current flows is surrounded by a magnetic field H, the intensity of which is proportional to the current. The field, which is bundled in a magnetic core, generates a magnetic flux B, through which suitable sensors are used to measure current.





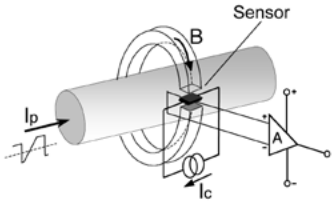
Converters with transformer-type couplings are used to establish the most cost effective measurement method for simple sinusoidal currents. The current to be measured flows directly through the measuring transformer's primary winding.



The secondary winding supplies the measuring electronics with a proportional current signal. Because of power loss this method of measuring current is limited to smaller currents up to 5 A. These converters react sensitively to peak loads and therefore have to be fused on the primary winding side.

Measuring Current Using A Hall-type Sensor

- Hall-type sensor principle:
  Hall-type sensors also measure the magnetic flux B and supply a proportional voltage at the measured output, which is then reconditioned to form a standard signal by an amplifier circuit.
- Components with Hall-type sensors are ideally suited to measuring higher currents, as any possible high residual currents from motors or peak loads cannot damage the component. Additionally, they are also ideal for measuring direct and alternating currents of various curve shapes.

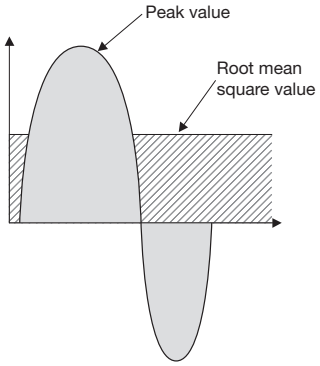


Root Mean Square Measurement / Crest Factor

- The root mean square value (r.m.s) of a sinusoidal shaped alternating current is the value, which in an ohmic resistor converts the same (effective) output as that of an equal sized direct current.
- Non sinusoidal shaped signals can only be measured with "True RMS" capable devices and/or further processed.
- True RMS = True root mean square
- Root mean square measurement is required where the (effective) output content of alternating voltages or currents are to be measured or evaluated.
- The crest factor indicates the ratio of the crest factor to the root mean square value.

Load / Load Resistor

- The load is a load resistor on the output side of a measuring transducer or isolating amplifier. The load is usually less than 500 Ω at the current outputs. Voltage outputs are normally under a load greater than 1 KΩ.



Galvanic Isolation / Safe Separation

- Galvanic isolation is understood to mean an electrical isolation between the input and output circuit and the circuit's supply voltage. It can be set up either optically using an opto coupler or with a transformer. The isolation serves to safeguard the measuring circuit against damage and to eliminate ground loops, which could cause the measured signal to be corrupted.
- Safe separation is specified under the German DIN VDE 0106 Section 101 standard. This fundamental safety standard is intended to safeguard persons against hazardous body currents and describes the basic requirements for safe separation in electrical operating equipment. Thus, for instance, the voltage supply of 50 V AC/ 75 V DC as under 50178 may not be exceeded. If this voltage is exceeded a reinforced or double insulated and thus an increase in the clearance and creepage distances is stipulated.

Cut-off Frequency

- Cut-off frequencies indicate the dynamic transfer characteristic of an isolation amplifier.
- The given frequency is the (-3dB-) limit, at which a distinct change occurs to the signal.
- An increased cut-off frequency leads to a transmission of higher-frequency alternating components, which corrupts the required signal.

Hysteresis

- Hysteresis indicates the percentage difference between the input and output points of a switching contact. It should not be lower than a given minimum value, as otherwise a specified chase can no longer be implemented.

Broken-wire Detection

- When measuring transformers with broken wire detection the input signal is monitored permanently. In the event of a fault (broken wire) the output signal exceeds its rated range. The downstream control circuit can then analyse the fault case.

Response Time

- Response time refers to the change in output signal for an input signal jump (10 ... 90 %). It is directly related to the cut-off frequency (inversely proportional).

Accuracy / Temperature Coefficient

- Accuracy describes the capability of a measuring device to deliver a measured value as accurately as possible. It relates to the end value and is given for ambient temperature (23 °C). Example:
  An RTD is given with an accuracy of 1 %. The measuring range is set to 0 – 200 °C. The expected effective error of: 200*1 % = +/– 2K applies across the entire measurement range.
- Temperature coefficiency describes the deviations in accuracy of the measuring devices dependent on the ambient temperature. It is given as a % or in parts per million / Kelvin (ppm /K).
  Example:
  An RTD with an accuracy of 1 % and a measuring range of 0 – 200 °C has a temperature coefficiency of 250 ppm / K. If the device is operated at +40 °C, it will then contribute the following to an expected absolute error: (([40 °C – 23 °C] *250 ppm/K) +1 %) *200K) = +/– 2,85K across the entire measurement range.

FDT/DTM – The standard solution for device configuration

Field Device Tool (FDT)

FDT technology specifies and standardises the integration of communicating devices from different manufacturers. It makes use of a superimposed device management program. The key feature is its independence from the communication protocol and software used by the device and the host system. FDT allows access to any device from any host using any protocol.

Device Type Manager (DTM)

Device manufacturers make available a Device Type Manager (DTM) software driver for each device or device group. The DTM specifies all device-specific information, functions and rules (such as the device structure, communication capabilities, internal dependencies and the human-machine interface (HMI)). DTMs define functions for access to device parameters, troubleshooting, configuration and operation of devices. DTMs are available which can be simple GUIs for setting device parameters or more complex applications that are capable of carrying out calculations for diagnostic or maintenance purposes.

There are several different types of DTMs:

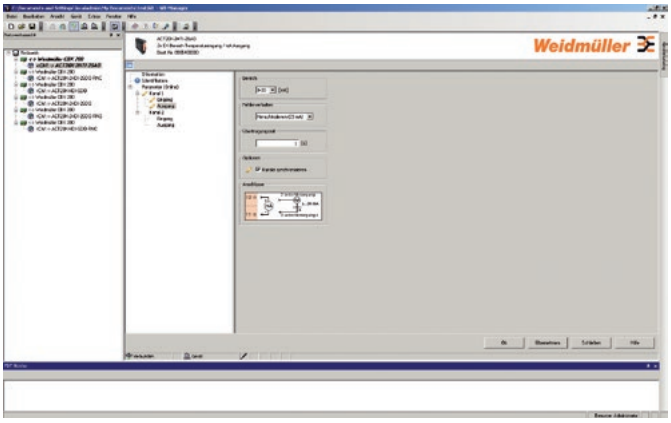
- **Device DTM**
  This is a "normal" field device that uses communication channels to communicate with the connected physical device.
- **Communication DTM**
  This is a communications device that provides communication using communication channels. Communication channels provide access to the communications infrastructure (such as PC interface cards or modems). They are used by device DTMs or gateway DTMs for communication services.
- **Gateway DTM**
  This is a gateway device. It allows data to be exchanged between two communication channels. For example, this could be a gateway between PROFIBUS-DP and PROFIBUS-PA.

The DTM is loaded and started up within a FDT container program or "frame" application.

FDT frame application

Frame applications can be used as a tool to configure devices, plan projects, operate consoles or administer facilities. The FDT frame application provides a PC software environment with the following functions:

- User administration
- DTM administration
- Data management
- Network configuration
- Navigation



Weidmüller offers their WI-Manager FDT frame program to the user for no cost. This certified software is compatible and works together with all certified DTMs. This screenshot shows the WI-Manager with an opened DTM for the ACT20X series.

Download at www.weidmueller.com!

FDT User Group

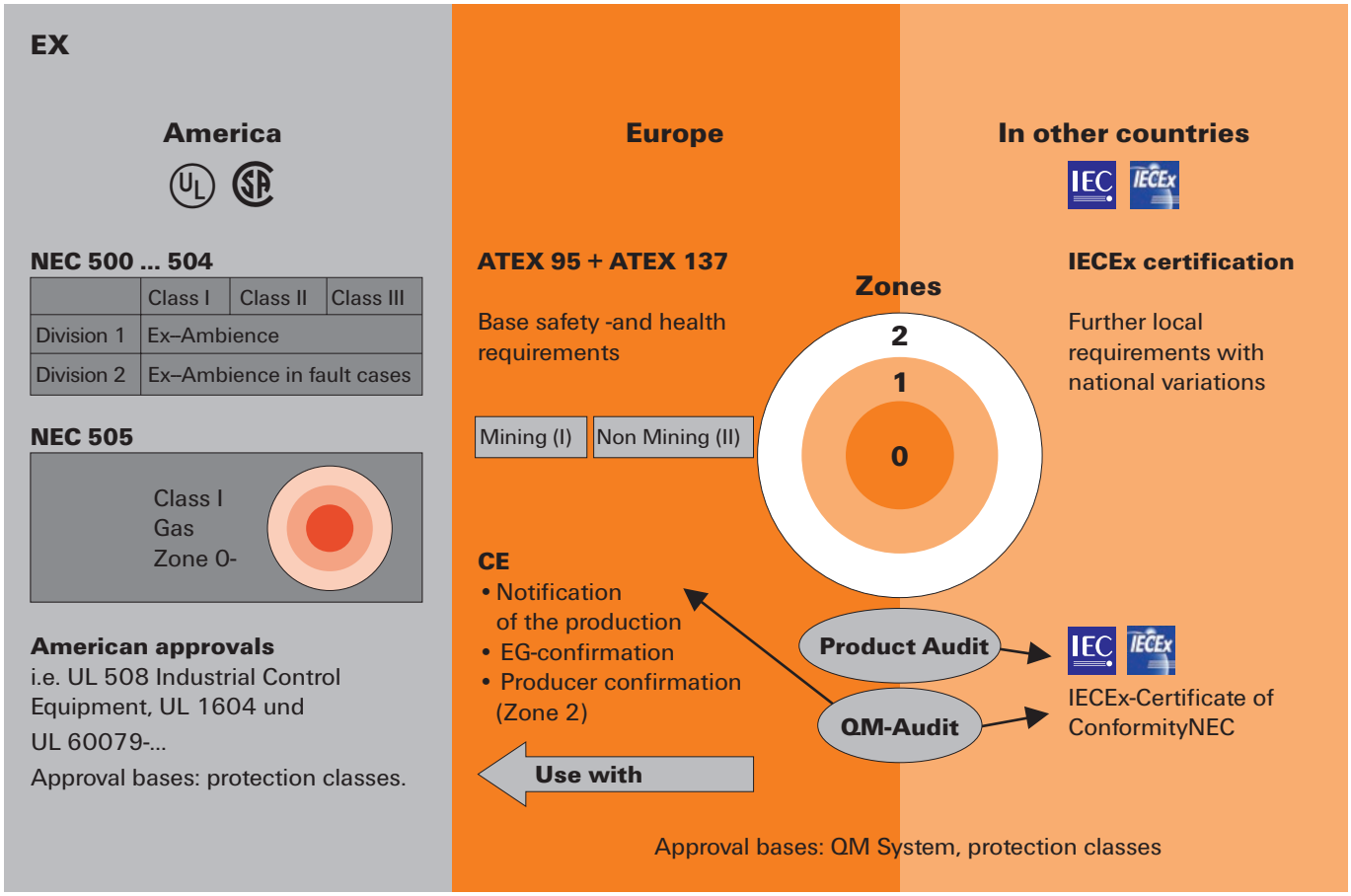
The FDT User Group is an alliance of users and manufacturers interested in defining the specifications and moving the FDT/DTM technology forward. Weidmüller is a member of this group along with most process automation manufacturers and work towards advancing this standard further.
More details are available at http://www.fdtgroup.org/

Safety in hazardous areas

When operating electrical devices within hazardous areas, you must comply with the requirements regulating their use in such zones. Explosive atmospheres may be created from mixtures of flammable gases, mists, vapours or dusts. If their concentration is high enough in the surrounding air, any source of ignition or spark could trigger an explosion. Such explosions can cause death, serious injuries and significant property damages.
There are basically two strategies for reducing the risk of explosion. Firstly, no dangerous materials should be released into the air that could create an explosive atmosphere. Secondly, there should be no mechanism present that could create a spark.
Many explosions in the past could have been avoided if only the international regulation governing the use of equipment in hazardous areas had been observed.

But what are the most important global regulations regarding the use of devices in hazardous areas?

In North America, the US National Electric Code (NEC) regulations (Articles 500 to 505 and the Canadian CEC (Canadian Electrical Code) Articles 18-000, -090, -100, -200 and -300 are all valid.
In Europe, both EU directives ATEX 95 (94/9/EG) and ATEX 137 (1992/92/EC) are relevant. They describe preparation (ATEX 95) and usage (ATEX 137) for facilities in potential Ex zones. Throughout the rest of the world, there is a mixture of national regulations (in Eastern Europe) and international IECEx conformity declarations (in Asia) that must be followed. In certain Asian countries, the European ATEX directives have been accepted and applied.



A brief overview of regulations used throughout the world and their basic content.

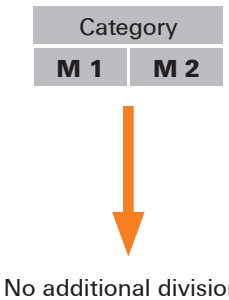
The European ATEX Regulation applies to facilities and their usage in hazardous areas.

The term "ATEX" derives from the French phrase "Atmospheres Explosive". The regulation currently includes two directives from the European Union concerning explosion protection. These are the ATEX operational directive 1999/92/EG (ATEX 137) and the ATEX product directive 94/9/EG (ATEX 95). The ATEX 137 operational directive specifies the minimum requirements for improving the protection of health and security of workers in environments at risk of explosions. The ATEX 95 product directive specifies the rules for introducing products on the market that will be used in zones where there is risk of explosion. This directive is the first to include non-electric devices within its jurisdiction.

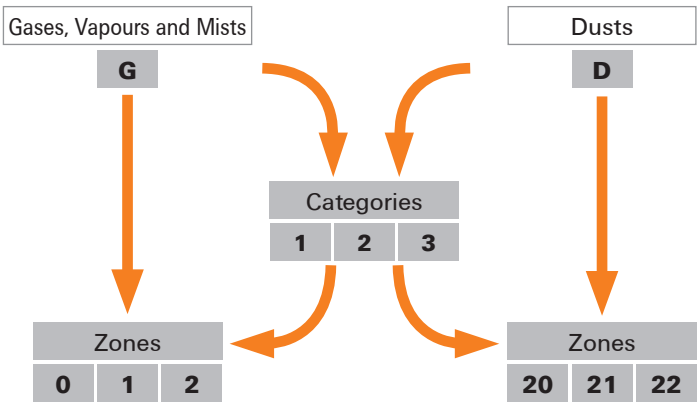
The purpose of the directive is to protect personnel who work in hazardous areas. Appendix II of the directive contains the basic health and safety requirements. These must be followed by the manufacturer and compliance must be proven by declarations of conformity. Since June 30, 2003, all devices, components and protective systems brought to the market must be in compliance with the ATEX 95 product directive.

The ATEX 95 directive classifies devices and components for the Ex zone into two main groups:

Group I
=> Devices for use in mining, for underground and above-ground operations
- Coal dust
- Methane
- Harsh operating conditions



Group II
=> Devices for use in the other hazardous areas



For applications in the oil, gas and chemical industries, it is particularly important to follow the Group-II "G" requirements concerning electrical or electronic devices and components.

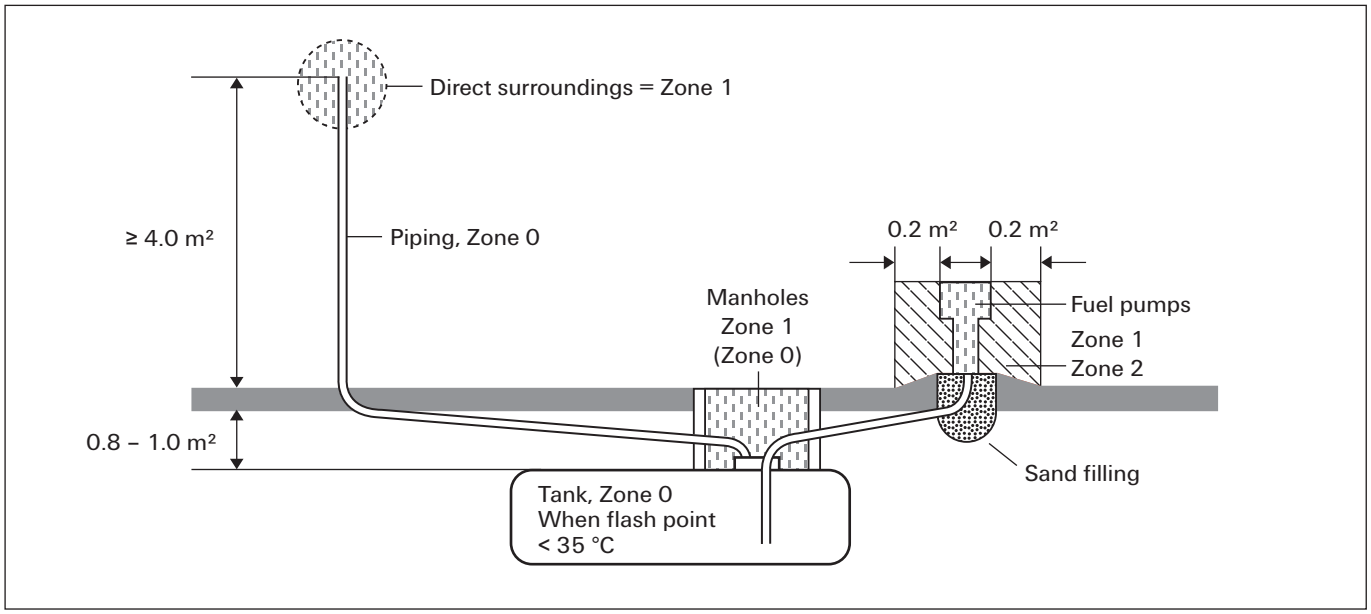
Safety in hazardous areas

Group II "G" divides the Ex zone into three zones with different safety requirements.

- **Zone 0** This zone applies to dangerous explosive atmospheres where the risk is present often or over long time periods.
  => > 50 % of the operational time, or more than 1.000 hours per year.
- **Zone 1** This zone applies to situation where explosive atmospheres may occasionally be present during normal operations.
  => Occasionally, less than 10 hours per year.
- **Zone 2** This zone applies to situation where explosive atmospheres are normally not present or only briefly present during normal operations.
  => Max. 30 min/year.

Hazardous areas

	Zone 0	Zone 1	Zone 2	Safe zone
Explosion risk	Continual, long-term, often	Occasionally	Rarely	None
Spark source	None	Rarely and short-term	Occasionally	Continual, long-term, often



Typical division of zones at a fuelling station

In which operations are ATEX-certified electronic devices (such as signal converters, isolation amplifier, Namur switches and switching amplifiers) used?

ATEX-certified devices are used within industrial facilities and production halls where there is the possibility that explosive gases or dusts may be released.
Transportation and production applications which require the use of such certified devices are listed below:

- Off-shore oil and gas drilling
- Tanker ships which carry oil, gas or chemicals
- Ships which carry potentially explosive materials
- Refineries and other oil or gas production plants
- Transportation and filling stations for oil and gas
- Petro-chemicals

What are the differences between standard devices and intrinsically safe devices?

For electronic devices that are being used in Zone 0(20) or 1(21), none of the components or electrical circuitry are permitted to generate unallowable high temperatures or sparks, whether during normal operations or during malfunctions. In other words: "All of the circuits in intrinsically safe electrical devices (Ex i) are safe and are not capable of igniting explosive atmospheres".

What is the device category?

The device Group II (hazardous areas not including underground or above-ground mining operations) is divided into device categories 1, 2 and 3. They have the following safety levels:

Surroundings	Device category	Occurrence and duration of explosive atmosphere	Ignitable materials	Safety levels Permitted errors	Groups and zones Comparison
Group II	1	Constantly occurring Long-term Regularly	Gases, vapours, mist, dust	**Very high safety level** 2 different protection classes or 2 independent errors	Group II **Zone 0 (gas)** Zone 20 (dust)
Group II	2	Occurrence probable over a limited time period	Gases, vapours, mist, dust	**High safety level** 1 protection class For which no more than one error may occur	Gruppe II **Zone 1 (gas)** Zone 21 (dust)
Group II	3	Occurrence improbable Only for short periods	Gases, vapours, mist, dust	**Normal I safety level** Required protective measures	Group II **Zone 2 (gas)** Zone 22 (dust)

Safety in hazardous areas

Which explosion protection categories are most commonly used?

- **Pressure-resistant encapsulation (Ex d) in compliance with EN60079-1:**
  Components that are capable of triggering an explosion are enclosed in a housing that is capable of withstanding the explosion. Openings in the housing are designed to prevent the explosion from being transmitted externally.

- **Increased safety (Ex e) in compliance with EN60079-1:**
  This explosion protection category is normally applied to transformers, motors, batteries, terminal blocks, electrical lines and cables. It is not suitable for the protection of electronic components and spark-generating components (such as switches, relays or surge protection). Additional measures and an increased safety level are implemented in order to prevent any sparks, electrical arcing or unallowable high temperatures which could trigger ignitions. Increased safety is made possible by housing that prevents dusts from penetrating within.

- **Explosion protection methods (Ex n):**
  This explosion protection category may only be used in the hazardous areas 2/22. Here there is no danger of an explosion from the electrical equipment during normal operations or during defined malfunctions. This includes all electrical devices and components that have no spark-forming contacts and that have a water-proof or dust-proof housing. Larger creepage and clearance distances are not required as long as the maximum rated voltage of 60 V AC / 70 V DC is maintained.

- **Intrinsic safety (Ex i) in compliance with EN60079-11:**
  Power supply to electrical equipment is carried out through a safety barrier which functions to limit the current and voltage so that the minimum power and temperature levels for creating an explosive mixture are not reached. Intrinsic safety for electrical and electronic devices is specified so that their circulating or stored power (even in event of malfunction) is never strong enough to trigger an explosion in an explosive atmosphere. You must also remember that not only the electrical device but also all other components connected to the circuit may be exposed to the explosive atmosphere. All switching circuits in intrinsically safe devices must be designed so that they are also intrinsically safe.

These devices are divided into the category groups <ia> and <ib> which differ in the number of occurring malfunctions.

Category <ia>
=> Switching circuits within category <ia> electrical devices must not be able to cause a spark even if two independent malfunctions take place.

Category <ib>
=> Switching circuits in electrical devices must not be able to cause a spark when a malfunction.

Electrical devices for use in explosive gas, vapour and mist atmospheres – in accordance with CENELEC

Explosion protection type	Identification	Protective design
Pressure-resistant encapsulation	Ex d	Encloses the explosion and prevents fire from spreading
Increased safety	Ex e	No spark formation or hot surfaces
Method of explosion protection	Ex n	No spark formation or hot surfaces
Intrinsic safety	Ex i	Limited energy for preventing spark formation or overheated surface temperatures

CENELEC classification of gases, dusts and the maximum permitted surface temperatures of devices and components

Gas group	Temperature classes					
	T1	T2	T3	T4	T5	T6
I	Methane	-	-	-	-	-
IIA	Ammonia Methane Ethane Propane	Ethyl alcohol Cyclohexane n-Butane n-Hexane	Benzene, Kerosene	Acetaldehyde	-	-
IIB	Lighting gases, Acrylonitrile	Ethylene, Ethylene oxide	Ethylene glycol, Hydrogen sulphide	Ethyl ether	-	-
IIC	Hydrogen	Ethine (Acetylen)	-	-	-	Hydrocarbons

IEC (group II) Classification	Max. surface temperature	Comment
T1	450 °C (842 °F)	The temperature is relevant to all parts of the devices that can come into contact with potentially explosive materials.
T2	300 °C (572 °F)	
T3	200 °C (392 °F)	
T4	135 °C (275 °F)	
T5	100 °C (212 °F)	
T6	85 °C (185 °F)	
Tx	Max. surface temperature undefined	Valid for the closed tank systems used on container ships where the individual contents cannot be monitored in event of a fire. It is the responsibility of the operator to assess each temperature class.

What labelling is considered proper?

An example of device labelling:

CE 0539	⟨Ex⟩	II	2	G	Ex ia	IIA	T4
Certification authority ex. DEMKO	European Commission mark for Ex devices	Device group “Surface”	Device category zone 1	Gas	Protection explosion type: intrinsically safe category <ia>	Gas group	Surface temperature: max 135 °C

ATEX directives

Since July 1, 2003, all new facilities in hazardous areas must be certified according to ATEX Directive 94/9/EG or ATEX 95 (ATEX: ATmosphère EXplosive = explosive atmosphere). This directive is one of the "New-Approach" directives. It is valid in all European Union countries, as well as Iceland, Lichtenstein and Norway. In these countries, the directive refers to the sale and commissioning of products which have been designed particularly for high explosion risk environments (where explosive atmospheres exist due to gases, vapours, mists, or dusts). It now also covers the mining sector and purely mechanical devices.

Class of protection

Type of protection	Code	CENELEC EN	IEC	Product category explosion protect.
General requirements	–	60079-0	60079-0	–
Oil immersion	o	60079-6	60079-6	2
Pressurised apparatus	p	60079-2	60079-2	2
Powder filling	q	60079-5	60079-5	2
Flameproof enclosure	d	60079-1	60079-1	2
Increased safety	e	60079-7	60079-7	2
Intrinsic safety	ia	60079-11	60079-11	1
Intrinsic safety	ib	60079-11	60079-11	2
Intrinsic safety	ic	60079-11	60079-11	3
Typ n (Ex n)	n	60079-15	60079-15	3
Encapsulation	m	60079-18	60079-18	2

Classification for potentially hazardous areas

CENELEC classification IEC60079-10	Presence of potentially explosive atmosphere	Product-category	US classification NEC 500	Combustible media
Zone 0	permanent, long-term	1G	Class I, Div 1	gases, vapours
Zone 20	or frequently	1D	Class II, Div 1	dust
Zone 1	occasionally	2G	Class I, Div 1	gases, vapours
Zone 20		2D	Class II, Div 1	dust
Zone 2	rarely and	3G	Class I, Div 2	gases, vapours
Zone 22	briefly	3D	Class II, Div 2	dust

Explosion groups

Gas (e.g.)	CENELEC	NEC 500
Propane	IIA	D
Ethylene	IIB	C
Hydrogen	IIC	B
Acetylene	IIC	A
Methane (mining)	I	mining (MSHA)

Temperature classes

Max. surface temperatur (°C)	Temperature class CENELEC	Temperature class NEC 500-3
450	T1	T1
300	T2	T2
280	–	T2A
260	–	T2B
230	–	T2C
215	–	T2D
200	T3	T3
180	–	T3A
165	–	T3B
160	–	T3C
135	T4	T4
120	–	T4A
100	T5	T5
85	T6	T6

Labelling for ATEX approval of a signal converter

II 3 G Ex nAnCnL IIC T4

II = Device group 2: devices for use in hazardous areas (except for mines and above-ground mining facilities that are exposed to flammable dusts or methane)
3 = Device category 3: the danger occurs rarely or only for short periods. The requirement is for normal security, suitable for use in zone 2.
G = Intended for the gas zone
Ex = Explosion protection
nA = Non-sparking equipment
nC = Enclosed facility (suitable protection)
nL = Equipment with limited power
IIC = Explosion groups: typical gas for C is hydrogen
T4 = Temperature class: The max. permitted surface temperature for T4 is 135 °C

Zone 2 a zone for which, during normal operations, there is at most, only a short-term occurrence of dangerous hazardous atmospheres (mixtures of air and flammables gases, vapours or mists).

II (1) G [Ex ia] IIC/IIB/IIA

II = Device group 2: devices for use in hazardous areas (except for mines and above-ground mining facilities that are exposed to flammable dusts or methane)
(1) = Device category (1): Equipment from category 1 can be connected to this signal converter. The signal converter must be operated in the safe zone or in zone 2 (II 3 G ...).
G = Intended for the gas zone.
[Ex ia] = Explosion protection type: protected with intrinsic safety. This signal converter, as accompanying equipment, in intended to be used for the connection of intrinsically safe circuits.
IIC/ IIB/IIA = Explosion groups – typical gases: propane for A, Ethylene for B, and hydrogen for C.

II (1) D [Ex iaD]

II = Device group 2: devices for use in hazardous areas (except for mines and above-ground mining facilities that are exposed to flammable dusts or methane)
(1) = Device category (1): Equipment from category 1 can be connected to this signal converter. The signal converter must be operated in the safe zone or in zone 2 (II 3 G ...).
D = Designed for the dust zone.
[Ex iaD] = Explosion protection type: protected with intrinsic safety. This signal converter, as accompanying equipment, in intended to be used for the connection of intrinsically safe circuits.

Design of clearance and creepage distances in electrical equipment – influencing factors

Rated impulse withstand voltage

The rated impulse withstand voltage is derived from:

- **Voltage conductor – earth** (the rated voltage of the network, taking into account all networks)
- **Surge category**

Table 1: Rated impulse withstand voltages for electrical equipment

Rated voltage of power supplies system *) in V		Rated impulse withstand voltage in kV			
Three-phase systems	Single-phase systems with neutral point	Electrical equipment at the supplies point of the installation **(Surge category IV)**	Electrical equipment as part of the permanent installation **(Surge category III)**	Electrical equipment to be connected to the permanent installation **(Surge category II)**	Specially protected electrical equipment **(Surge category I)**
	120 to 240	4.00	2.50	1.50	0.80
230/400 277/480		6.00	4.00	2.50	1.50
400/690		8.00	6.00	4.00	2.50
1000		Values depend on the particular project of, if no values are available, the values of thepreceding line apply.			

*) to IEC 38

Surge categories

are stipulated in accordance with the German standard DIN VDE 0110-1 (for electrical equipment fed directly from the low-voltage network).

Surge category I

- Equipment that is intended to be connected to the permanent electrical installation of a building. Measures to limit transient surges to the specific level are taken outside the equipment, either in the permanent installation or between the permanent installation and the equipment.

Surge category II

- Equipment to be connected to the permanent electrical installation of a building, e.g. household appliances, portable tools, etc.

Surge category III

- Equipment that is part of the permanent electrical installation and other equipment where a higher degree of availability is expected, e.g. distribution boards, circuit-breakers, wiring systems (including cables, busbars, junction boxes, switches, power sockets) in the permanent installation, and equipment for industrial use and some other equipment, e.g. stationary motors with permanent connections to the permanent installation.

Surge category IV

- Equipment for use at or near the power supplies in the electrical installations of buildings, between the principal distribution and the mains, e.g. electricity meters, circuit-breakers and centralised ripple controllers.

Pollution severity categories

Pollution severity category 1

- No pollution, or only dry, non-conductive pollution that has no influence.

Pollution severity category 2

- Non-conductive pollution only; occasional condensation may cause temporary conductivity.

Pollution severity category 3

- Conductive pollution, or dry, non-conductive pollution that is liable to be rendered conductive through condensation.

Pollution severity category 4

- Contamination results in constant conductivity, e.g. caused by conductive dust, rain or snow.

Unless explicitly stated otherwise, the measurement of clearance and creepage distances and the resulting rating data for electromechanical components is based on pollution severity 2 and surge category III, taking account of all network types.

Derating curve (current-carrying capacity curve)

The **derating curve** shows which currents may flow continuously and simultaneously via all possible connections when the component is subjected to various ambient temperatures below its upper limit temperature.

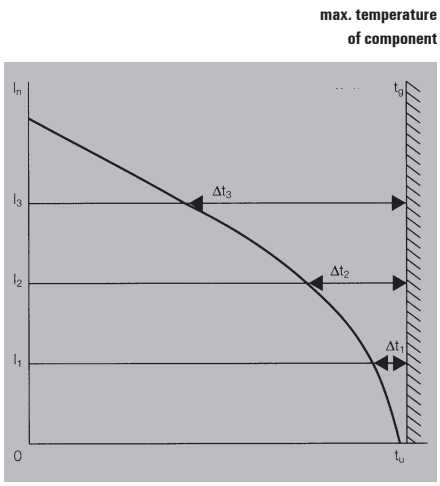
The **upper limit temperature** of a component is the rated value determined by the materials used. The total of the ambient temperature plus the temperature rise caused by the current load (power loss at volume resistance) may not exceed the upper limit temperature of the component, otherwise it will be damaged or even completely ruined.

The current-carrying capacity is hence not a constant value, but rather decreases as the component ambient temperature increases. Furthermore, the current-carrying capacity is influenced by the geometry of the component, the number of poles and the conductor(s) connected to it.

The current-carrying capacity is determined empirically according to DIN IEC 60512-3. To do this, the resulting component temperatures t_{b1}, t_{b2} and the ambient temperatures t_{u1}, t_{u2} are measured for three different currents I_1, I_2.

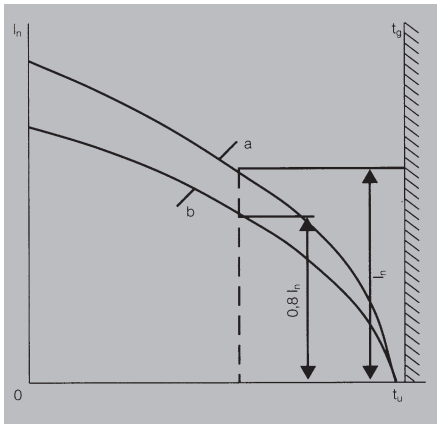
The values are entered on a graph with a system of linear coordinates to illustrate the relationships between the currents, the ambient temperatures and the temperature rise in the component.

Base curve



t_g = maximum temperature of component
t_u = ambient temperature
I_n = current

Derating curve



t_g = maximum temperature of component
t_u = ambient temperature
I_n = current
a = base curve
b = reduced base curve (derating curve)

The **loading currents** are plotted on the y-axis, the **component ambient temperatures** on the x-axis.

A line drawn perpendicular to the x-axis at the upper limit temperature t_g of the component completes the system of coordinates.

The associated average values of the temperature rise in the component, $\Delta t_1 = t_{b1} - t_{u1}$, $\Delta t_2 = t_{b2} - t_{u2}$, are plotted for every current I_1, I_2 to the left of the perpendicular line.
The points generated in this way are joined to form a roughly parabolic curve.
As it is practically impossible to choose components with the maximum permissible volume resistances for the measurements, the base curve must be reduced.

Reducing the currents to 80 % results in the **"derating curve"** in which the maximum permissible volume resistances and the measuring uncertainties in the temperature measurements are taken into account in such a way that they are suitable for practical applications, as experience has shown. If the derating curve exceeds the currents in the low ambient temperature zone, which is given by the current-carrying capacity of the conductor cross-sections to be connected, then the derating curve should be limited to the smaller current in this zone.

IP class of protection to DIN EN 60529

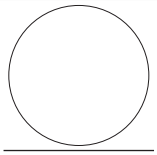
The class of protection is indicated by a code consistingof the two letters IP and two digits representing the class of protection.

Example: **I P 6 5**

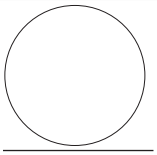
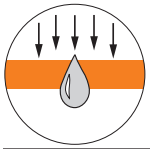
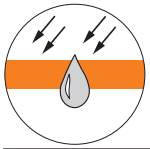
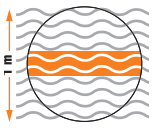
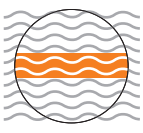
2nd digit: protection from liquids

1st digit: protection from solid bod

Protection against intrusion of external particle matter (1st digit)

Digit		
0		No protection
1		Protection against ingress of large solid bodies with diameter > 50 mm. (Protection to prevent dangerous parts being touched with the back ofthe hand.)
2		Protection against ingress of large solid bodieswith diameter > 12.5 mm. (Protection to prevent dangerous parts being touched with the fingers.)
3		Protection against ingress of large solid bodies with diameter > 2.5 mm. (Protection to prevent dangerous parts being touched with a tool.)
4		Protection against ingress of large solid bodieswith diameter > 1 mm. (Protection to prevent dangerous parts being touched with a piece of wire.)
5		Protection against harmful deposits of dust, which cannot enter in an amount sufficient to interfere with satisfactory operation.
6		Complete protection against ingress of dust.

Protection against penetration of liquids (2nd digit)

Digit		
0		No protection
1		Protection against drops of condensed water falling vertically.
2		Protection against drops of liquid falling at an angle of 15° with respect to the vertical.
3		Protection against drops of liquid falling at an angle of 60° with respect to the vertical.
4		Protection against liquids splashed from any direction.
5		Protection against water jets projected by a nozzle from any direction.
6		Protection against water from heavy sea on ships' decks.
7		Protection against immersion in water under defined conditions of pressure and time.
8		Protection against indefinite immersion in water under defined conditions of pressure (which must be agreed between manufacturer and user and must be more adverse than number 7).

Glossary

1-9

2-way isolation	The input and output signals are separated electrically from each other and decoupled. Potential differences caused by long wire lengths and common reference points are eliminated.
3-way isolation	Also decouples the power supply to the input and output circuit and enables supply with only one operating voltage.

A

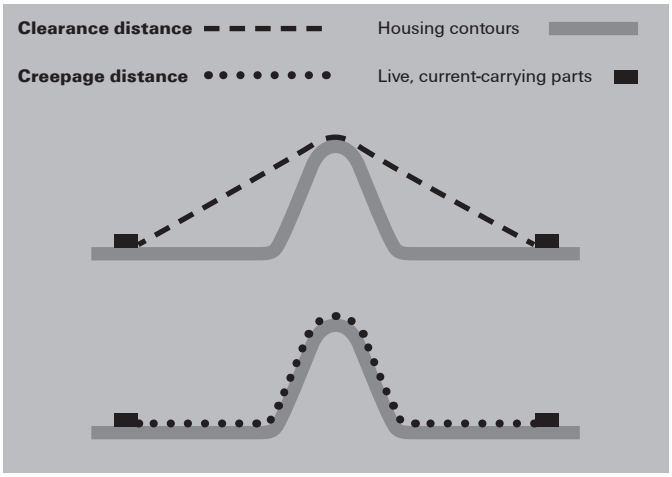
A/D converter	Converts standardised analogue current and voltage signals into an 8-bit, 12-bit or 16-bit digital signal. It may be necessary to convert analogue signals into digital signals when you need the analogue signal from the surroundings to work with the typical digital processing requirements of process monitoring.
AC	Alternating current
Accuracy	Describes the ability of an analogue signal isolating converter to transmit a measured value as precisely as possible. It is specified in the percent deviation from the measuring range end value at room temperature.
Active sensor	In an active sensor, an electrical signal is generated from the measurement itself, for example dynamometric or piezo-electric. Thus no auxiliary power source is required. Because of their physical operating principals (since energy cannot be sent during the static and quasi-static states), only a change in the measured variable can be detected.
Actuator	The actuator is a sensor counterpart – it converts electrical current into another form of energy.
Alarm contact	A switching contact that activates when a disturbance occurs (for example, an overload or short circuit).
Ambient temperature	DIN EN 60204-1 uses this term to refer to the temperature of the surrounding air or medium at which the equipment can be properly and safely operated. This is a part of the surrounding physical and operational conditions. Failure to maintain this temperature level can invalidate the product warranty.
Analogue signal	A signal is designated as an analogue signal if it transmits parameter information that is infinitely variable between a minimum and maximum value (this includes instantaneous values such as current, voltage or temperature). This applies to practically all real-world processes or states. It is theoretically possible to register any small signal changes (there is a very large dynamic range).

ATEX	The ATEX directive from 23.4.1994 is valid within the EU and the EFTA Western European nations. It applies to devices, machinery components, controllers and protective systems that are to be used in hazardous areas. This directive harmonises the different national regulations from the EU member nations concerning the proper and intended use of machines and facilities in hazardous areas. **ATEX** is derived from the phrase "**AT**mosphere **EX**plosive". It stipulates that operators should prevent explosions and ensure protection. Regarding explosion protection in a potentially explosive atmosphere, the ATEX directive 94/9/EC has precedence over machinery directives and must be followed The directive describes the following steps: • Describe how often a potentially explosive atmosphere occurs and where it occurs. • These areas are then divided into zones according to the specifications. • Make sure that only properly categorised equipment is present within each different zone. As soon as an area is classified as being dangerous, steps must be taken to limit the potential ignition sources that are present there.

C

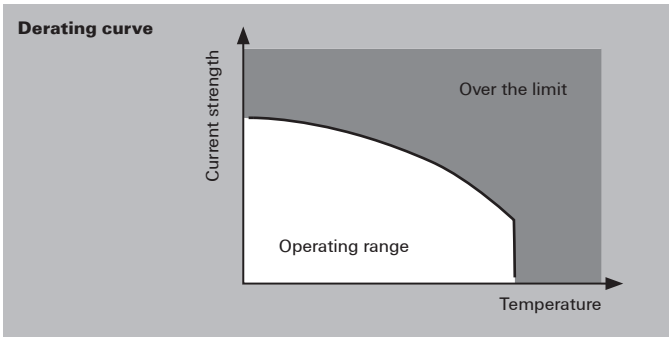
Calibration device	A special instrument used for the calibration and configuration of analogue signal conditioning devices. The calibration device produces highly precise standardised signals. It is equipped with a load indicator for quick loop diagnostics.
CE	Abbreviation for **C**ommunauté **E**uropéenne (the European Community). Manufacturers use the CE label to confirm that their products comply with the corresponding EC directives and the "essential requirements" therein.
Cold-junction compensation	Thermocouples require a temperature reference point to compensate for unwanted "cold junctions". The usual method for achieving this is by measuring the temperature at the reference junction with a temperature sensor that can be read immediately. The interfering voltage can then be compensated for in the measurement results. This process is referred to as cold-junction compensation (CJC).
Common-mode interference	Interfering currents and voltages that can occur on the connecting cables between electrical devices and facility components. These can then spread with similar phase and current direction to the feed line and the return line.
Counter	A counter can be used for measuring flow or for counting events. Analogue or digital input signals (pulses) may also be processed. Integrated function such as linearisation, interference suppression, hysteresis configuration and reference values expand the range of use of a counter. Switching contacts are available on the output side for monitoring threshold.

Creepage and clearance distances	The safety gaps between two current-carrying wires. The creepage distance is the shortest path along an insulating surface between two live components. The clearance distance is the shortest path in the air between two points of reference.



D

D/A converter	D/A converters convert standardised digital signals (for example, with an 8-bit structure) into analogue current and voltage signals. It may be necessary to convert digital signals into analogue signals when you need the analogue signal from the surroundings to work with the typical digital processing requirements of process monitoring.
DC	Direct current
Derating	The continuous current level reduction in relation to an ambient temperature increase, represented as a derating curve (a load reduction curve).



Device categories	The device category determines which equipment can be used in which zone. There are six device categories. The categories 1 G, 2 G and 3 G are classifications for gas explosion protection (G = Gas). Equipment with 1 G is suitable for zones 0, 1 and 2. Equipment with 2 G is suitable for zones 1 and 2. Equipment with 3 G is suitable for zone 2. The categories 1 D, 2 D and 3 D are classifications for dust explosion protection (D = Dust). Equipment with 1 D is suitable for zones 20, 21 and 22. Equipment with 2 D is suitable for zones 21 and 22. Equipment with 3 D is suitable for zone 22.
Device groups	Equipment is divided into groups I and II. Group I concerns underground mining while group II concerns explosion protection for gas and dust in all other applications.
DTM	DTMs (**D**evice **T**ype **M**anager) are software drivers that are vendor- and device-neutral. DTMs define functions for access to device parameters, troubleshooting, configuration and operation of devices The DTM specifies all device-specific information, functions and rules (such as the device structure, communication capabilities, internal dependencies and the human-machine interface (HMI)). Device manufacturers make available a Device Type Manager (DTM) software driver for each device or device group.

E

EIA-232/ RS232	The term EIA-232 (originally RS232) refers to a serial interface standard developed by a U.S. standards committee (now known as the EIA – Electronic Industries Alliance) in the early 1960s. EIA-232 specifies the connection between the data terminal equipment (DTE) and the modem (data communication equipment or DCE). It defines timing, voltage level, plug and protocol details. EIA-232 defines a voltage interface. The information bits are encoded using electrical voltage. The data lines (TxD and RxD) use a negative logic whereby a voltage level between -3 V and -15 V (ANSI/EIA/TIA-232-F-1997) represents a logical one and a voltage level between +3 V and +15 V represents a logical zero. Signal levels between -3 V and +3 V are undefined.
EIA-422/ RS422	EIA-422 (also known as RS422) is an interface standard for cable-based differential, serial data transmission. In contrast to the asymmetric serial interface specified by the EIA-232 standard, the EIA-422 interface is designed for symmetric transmissions. This means that two sets of twisted pair wires are required to carry the positive and negative signals from the sender to the receiver. This minimises common-mode interferences and also increases the data rates in comparison to the asymmetric EIA-232 interface. EIA-422 can be used to establish a full-duplex, point-to-point connection. Multi-drop networks with one sender and up to ten receivers are also possible. The sender and receiver in multi-drop networks can only be operated in half-duplex (in one direction). Because of the high data rate (up to several MBit/s), a wire pair on the EIA-422 interface must be terminated with a terminating resistor (normally 120 ohm).

EIA-485/ RS485	EIA-485, also referred to as RS485, is an interface standard for digital, cable-based, differential, serial data transmissions. EIA-485 uses a wire pair for transmitting inverted and non-inverted levels for a single-bit data signal. The original data signal is reconstructed by the receiver as the difference between the two voltage levels. This has the advantage of increasing the resistance to interference, since common-mode interference then has no effect on the transmission. The EIA-485 interface operates with a voltage differential of +/-200 mV, so that the voltage interface has a differential related to half of the operational voltage. It normally uses a single wire pair and is operated in half-duplex. However full-duplex operations are possible with two wire pairs.This connection has multi-point capabilities; up to 32 nodes can be connected to an EIA-485 bus. Standard cable lengths run up to 1.2 km in length and support transmission speeds up to 10 MBit/s. The wire pairs must be terminated with resistors (typically 120 Ohm) because of the cable length and high data rates.
Electrical equipment	All of the electrical and electronic components and circuits within an enclosure.
Explosion groups	Depending on the ignition protection, explosion-protected equipment intended for gases, vapours and mists are divided into three explosion groups (IIA-IIB-IIC). The explosion group provides a measure of the explosive break-though capability of gases (in an explosive atmosphere). The requirements for the equipment increase in strictness from II A to II C.
Explosion protection types	The ignition protection type is a term used in explosion protection that refers to the various types of protective construction designed into the product. Ignition protection types are formulated to minimise the risk that an ignition source will be present in an explosive atmosphere. The following ignition protection types are specified: • **For electrical equipment in a gas** • Intrinsic safety Ex i • Pressure-resistant Ex d encapsulation • Increased safety Ex e • Pressurization encapsulation Ex p • Oil immersion Ex o • Moulded encapsulation Ex m • Sand encapsulation Ex q • Ignition protection type for zone 2 Ex n • Special ignition protection type Ex s • **For electrical equipment in dust** • Pressurization encapsulation Ex pD • Intrinsic safety Ex iD • Moulded encapsulation Ex mD • Protection provided by housing Es tD

Explosive atmospheres	This is defined as a mixture of flammable materials and oxygen. An ignition leads to a explosive burning process throughout the entire mixture. Usually the oxygen is supplied by the surrounding air. Flammable materials may be gases, liquids, vapours, mists or dusts. Explosion protection considers this to be normal atmospheric conditions. The explosiveness of the mixture depends of the flammability of the materials and the concentration of air or oxygen.

F

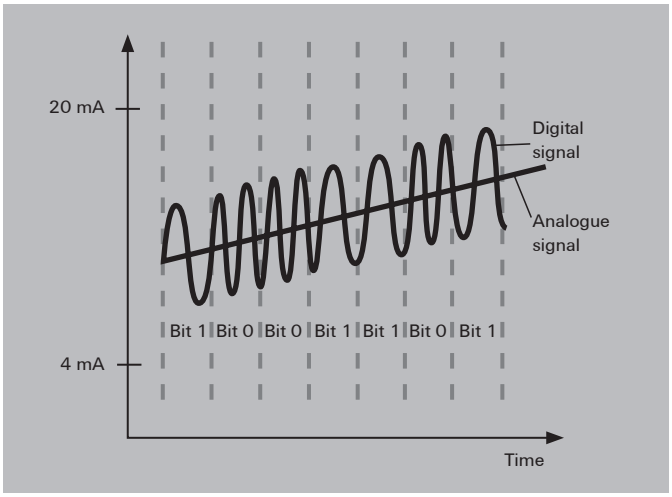
Flammability rating	Flammability class specification according to the American UL 94 specification. Duration of burning, annealing time and the burning drop formation are all taken into account. The highest category is V-0.
Frequency converter	Converts frequencies into analogue signals (or vice versa). In-line control systems can then directly process pulse strings from speed or rotational measurements.

G

Galvanic isolation	Potential-free isolation between electrical components. Normally, the inputs circuit, output circuit and power supply are designed so that they are electrically isolated from each other. The isolation can be achieved using optical means (an optocoupler) or by using a transformer. The electrical isolation of measurement signals ensures that the differences in earth potentials and common-mode interference are suppressed
GOST-R	The Russian certification for products, materials and technical facilities.

H

Hall sensor current measurement	Hall sensors can measure the magnetic field of a conducting wire. They then generate a proportional voltage on the measurement output (the Hall voltage). This can be converted to a standardised signal by means of an amplifier circuit. Such a measurement is well suited for measuring high DC and AC currents with frequencies up to 1 kHz. Start-up currents and current peaks cannot damage a Hall sensor.

HART®	HART® (Highway Addressable Remote Transducer) is a communications protocol for bus-addressed field devices used in process automation. In HART®-based communications, field devices and controllers are connected together over 4–20 mA current loops. This analogue signal is superimposed with a digital signal by using the FSK process (Frequency Shift Keying). The process allows additional measurements, configuration and device data to be transmitted without influencing the analogue signal. Ex isolators can also be used in hazardous areas. 
Hazardous area	According to the ATEX directive, an hazardous area is where the extent of the explosive atmosphere mandates that extra measures must be taken to safeguard health and protect surrounding machinery. Hazardous areas are classified according to the frequency and duration of the occurrence of the explosive atmosphere (refer to the sub-divided zones).
Hysteresis	Specifies the percent difference between the switch-on and switch-off points of a switching contact. The hysteresis must not fall below a minimal value. Otherwise it would no longer be possible to carry out specific switching during the monitoring of threshold.

I

IECEx	An international directive regarding the creation of declarations of conformity by the manufacturers of facilities, devices and components that are intended for use in explosion risk zones. This directive is valid throughout the globe but is only currently used in some Asian nations.
Impulse withstand voltage	The high pulse voltage of a specified form and polarity that does not lead to an insulation breakthrough or flashover, under the specific conditions defined in EN 60664-1.

Initiator PNP/NPN switched	Two wires in a three-wire sensor are responsible for keeping the supply activated. The third connecting wire is used for transferring commands (NO/NC contact). Initiators with NPN outputs switch the load in active mode towards the minus potential. Proximity switches with PNP outputs switch toward the plus potential.
Insulation voltage	For electronics components with electrical isolation, this is the maximum AC test voltage that can be applied for a specified time interval (5 s / 60 s) without causing a break-through.
Intrinsic safety "i"	Electrical equipment for hazardous areas with the ignition protection type "Intrinsic safety Ex i" Intrinsic safety is divided into ignition protection types "ia" or "ib" The ignition protection type "intrinsic safety" is a protective strategy that requires a complex analysis of electronic devices. So it is not only important to protect intrinsically safe current from the other unsafe circuits. It is also important to limit the open-circuit voltage, short-circuit current, power, stored energy and the surface temperature of components that will be exposed to the explosive atmosphere. Intrinsically safe circuits are circuits where a spark or thermal effect (as may occur under the testing conditions specified by EN 60079-11) is not capable of igniting an explosive atmosphere (of sub-groups IIA, IIB or IIC) or a dust-air mixture. The testing conditions cover normal operations and certain error conditions as specified in the standard.
IP protection classes	Equipment is assigned an IP protection class to indicate which environmental conditions it can be used in.
Isolation amplifier (active isolator)	An isolation amplifier is used to provide electrical isolation for analogue standard signals. They are designed with 2-way or 3-way isolation. The isolation of the potentials eliminates interference on the measurement signal that can be caused by earth loops or common-mode noise. The active isolator makes use of a separate voltage source for its power supply. It functions without feedback; a change on the output side load does not influence the input circuit.

L

Leakage current	The current on the load side of an optocoupler that flows towards the output circuit while in a closed state.
Limiting frequency	The limiting frequency of an analogue signal isolating converter is that frequency where the output signal is reduced to 1/(sqr2) of the value of the input signal (approx. 70.7 % = -3 dB).
Line break monitoring	Analogue measuring transducer with wire-break detection capability that permanently monitors the input signal. In the event of an fault (a wire break), the output signal jumps up to a defined value over the nominal range so that a controller wired further down the circuit can evaluate the error.

Linearisation	Temperature-dependent components normally do not have a linear characteristic curve. Their characteristic curves must be linearised so that they can be evaluated as precisely as possible. The measurement curves of thermocouples and temperature-dependent resistors (NTC/ PTC), in particular, exhibit significant deviation from an "ideal curve". In the linearisation process, the measurement signal is processed by a microprocessor and an ideal characteristic curve is generated which can then be analysed or processed further.
Load cell	A load cell is a special type of force sensor used in weighing systems (i.e., with scales). They are calibrated in grams (g), kilograms (kg) or tons (t). Load cells usually have a spring mechanism used as a force sensor. The spring is a specially shaped piece of metal whose shape changes slightly when under the influence of weight. This elastic deformation is recorded by strain gauges and converted into an electrical signal. Weights can be recorded ranging from a few hundred grams to several thousand tons.
Load resistance (load)	This is the load resistance on the output side of a measuring transducer or transmitter. For analogue current outputs, the load is 500–600 ohms maximum. Voltage outputs normally have a load of at least 10 kOhm.

M

Measurement isolating transformer	Converts electric and non-electric input signals into standard analogue signals. At the same time it provides electrical isolation between the input and output (2-way isolation) or between the input, output and supply (3-way isolation). Measurement isolators are typically used to record temperatures (RTD, thermocouples) or for measuring current, voltage, power, frequency, resistance and conductivity.
Measuring bridge	Sensors based on Wheatstone bridge circuitry can capture force, pressure and torque. Relatively small length changes under 10 – 4 mm can be recorded using DMS strain gauges in the form of resistance changes. A typical application is for capturing measurements in load cells.

N

Namur sensor	NAMUR-compliant sensors (The standardization commission for measuring and control technology in the German chemical industry) operate with a load-independent current. They have four modes so that an analogue evaluative unit can detect a sensor malfunction. 1) Current of 0 mA => wire break, circuit is open 2) Current of approx. 20 % of the max. value => Sensor ready, activated 3) Current of approx. 60 % of the max. value => Sensor ready, not activated 4) Current at max. value => short circuit, max. current NAMUR sensors are suited for use in hazardous areas.
NEC 500 – 505	The relevant directives for the classification of explosion protection in the USA. NEC 500 regulates the standard Ex classifications (class – division – model). The NEC 505 defines the zone model based on the European and IEC classifications.

Nominal switching current – load side	The permitted load current of a relay contact or semiconductor contact when in continuous operations.
Nominal switching voltage – load side	The switching voltage that a relay contact or semiconductor contact uses in relation to its application.

O

Output-current loop-powered	Output loop powered 2-wire transmitters have a 4 – 20 mA output. The transmitter is supplied with power via the current loop on the output side. A typical loop consists of a regulated DC power supply, the 2-wire transmitter and a receiving device.
Overvoltage category	The overvoltage categories are described in DIN EN 60664-1. The category dictates the insulation clearance gaps required. Category III is the default specification (EN 50178). • **Overvoltage category I** Devices that are intended to be connected to the permanent electrical building installation. The measures for limiting transient surge voltages to the proper level are taken outside of the device. The protective mechanisms can either be in the permanent installation or between the permanent installation and the device. • **Overvoltage category II** Devices that are intended to be connected to the permanent electrical building installation (such household appliances or portable tools). • **Overvoltage category III** Devices that are a part of the permanent installation and other devices where a higher degree of availability is required. This includes the distributor panels, power switches, distribution systems (including cable, busbars, distributor boxes, switches and outlets) that are part of the permanent installation, devices intended for industrial use, and devices that are continually connected to the permanent installation (such as stationary motors). • **Overvoltage category IV** Devices that are intended to be used on or near the power feed in a building's electrical installation – ranging from the main distribution to the mains power system. This includes electrical meters, surge protection switches and ripple control equipment.

P

Passive isolator/ input loop powered	Generates its power supply from the input signal (0/4–20 mA). The amount of current needed internally is so small that the measurement signal is not influenced. Transformers are used to provide the isolation between the input and the output. The advantages include: eliminates the influence of the mains power system, highly accurate, minimal signal delay, and minimal power used. Passive isolators do not function free from feedback; so a load change on the output circuit will automatically effect the input circuit as well.
Passive sensor	Contains passive components whose parameters can be changed by the measured variables. A primary electronic mechanism converts these parameters into electric signals. An auxiliary external power source is needed for the passive sensor. Passive sensors can be used to determine both static and semi-static measured variables. For this reason, the majority of sensors have a passive construction. Examples of this type include load cells and resistance thermometers.
Pollution severity level	The pollution severity level specifies the conditions of the immediate surroundings. It is defined in DIN EN 50178, Section 5.2.15.2. The pollution (contamination) severity level should be used to determine the required creepage distance for the insulation. Pollution degree 2 is the default specification. • **Pollution severity level 1** There is no contamination or only dry occurrences of non-conductive pollution. This pollution has no influence. • **Pollution severity level 2** There is only non-conductive pollution. Temporary occurrences of conductivity caused by condensation may also occur. • **Pollution severity level 3** Conductive pollution or dry, non-conductive pollution that can become conductive due to condensation is likely to occur. • **Pollution severity level 4** The contamination leads to continual conductivity which can be caused by such contaminants as conductive dust, rain or snow.

R

Rated voltage	Specified by the insulation coordination – the rated voltage is the voltage level at which the product can be safely operated, in relation to the corresponding pollution severity level and the surge voltage category.
Relative humidity	The relationship between the actual moisture and the maximum possible quantity of water in the air. Expressed as a percentage.

RoHS	The EC directive 2002/95/EC – concerning the restriction of the use of certain hazardous substances in electrical and electronic equipment – regulates the use of hazardous materials within devices and components. This directive, and it's various implementations into national laws, are referred to by the abbreviation RoHS (Restriction of Hazardous Substances).
RTD/ PT100/ 1000	RTD sensors are temperature probes that operate based on the resistance changes which take in metal as the temperature changes. They are resistance thermometers based on PTC resistors. The electrical changes in resistance of a platinum wire or platinum film is often used for measuring temperatures ranging from -200 °C to 850 °C. The platinum temperature sensors are characterised by their nominal resistance R0 at a temperature of 0 °C. The standard types include: • PT100 (R0= 100 Ohm) • PT1000 (R0= 1 kOhm) A two-wire, three-wire or four-wire electrical connection can be used to electrically connect the PT/RTD sensor to the evaluative electronics. A three-wire or four-wire method eliminates any errors caused by the inherent resistance of the sensor connecting wires. In the three-wire method, one end is equipped with two pigtail connectors. In the four-wire method, both ends are equipped with two pigtail connectors.

S

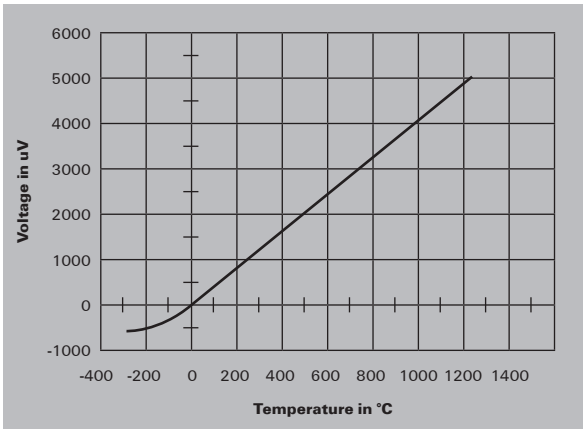
Self-heating	Self-heating refers to the temperature increase in an operating device caused by the internal power loss.
Sensor	A sensor is a physical component capable of capturing certain physical or chemical properties (such as thermal radiation, temperature, humidity, pressure, noise, brightness or acceleration) as a measurement. It may also be able to analyse the quality of the composition of the material surroundings. These values are captured using physical or chemical phenomena and then converted into another form (usually electrical signals) so they can be post-processed.
Signal distributorsplitter	A signal isolator that accepts an analogue input signal and delivers at least two signals on the output side. This permits the signal to be transmitted to a PLC/ DCS system and to a separate display. A signal multiplier is designed either as an active isolator with an external power feed or as an output loop powered version.
SIL	**S**afety **I**ntegrity **L**evel. The components must meet the requirements of IEC 61508 is order to reduce risk. This standard provides general requirements for avoiding and minimising device and equipment outages. It stipulates organization and technical requirements concerning device development and operation. Four safety levels are defined (from SIL1 for minimal risk to SIL4 for very high risk) for classifying facilities and risk-reduction measures. Risk-reduction measures must be more reliable when the classified risk level is higher.
Status indicator	An LED that displays the operational status, such as operational (yellow), switching (green), and alarm/malfunction (red).
Step response time	This is the time delay in the output signal change when there is a signal jump ranging from 10 to 90 % on the input side. The step response time is inversely proportional to the limiting frequency
Storage temperature	The permitted ambient temperature, related to a specific relative humidity level, for which the product should be stored while in a current-free state.

Switching threshold	The switch-on or switch-off point.

T

Temperature classes	Explosion-protected equipment that is to be installed into the Ex zone is subdivided into six temperature classes (T1 to T6). These temperature classes define the maximum surface temperature permitted for the equipment. The definition is based on an ambient temperature of +40 °C. This temperature may not be exceeded on any part of the equipment at any point in time. In all cases, the maximum surface temperature must be lower than the ignition temperature of the surrounding medium. The requirements placed on the equipment become stricter from class T1 to T6.
Temperature coefficient	The temperature coefficient describes the relative change of a physical variable based on the temperature change relative to a reference temperature (room temperature). It directly influences the precision of an analogue signal converter. The coefficient is specified in ppm/K of the corresponding measuring range end value.
Thermocouple	A thermocouple is a component made of two different materials which are connected to each other at one end. An electrical voltage is created (based on the principle of the Seebeck effect) along a wire that connects the unattached ends when there is a temperature differential. The juncture point and the unattached ends must have different temperatures for a voltage to be generated. The following thermocouples are used for industrial applications:

Thermal pair	Short name	Type	Temperature range in °C
Nickel/Chrome-Nickel/Al	NiCr-Ni/Al	K	-200 ... +1372
Iron-constantan	Fe-CuNi	J	-200 ... +1200
Copper-constantan	Cu-CuNi	T	-200 ... +400
Nickel/Chrome constantan	NiCr-CuNi	E	-200 ... +1000
Platinum/10 % Rhodium-Platinum	Pt10Rh-Pt	S	–50 ... +1760
Platinum/13 % Rhodium-Platinum	Pt13Rh-Pt	R	-50 ... +1760
Nickel/Chrome-Nickel/Magnesium	NiCr-NiMg	N	-200 ... +1300
Platinum/30 % Rhodium - Platinum/6 % Rhodium	Pt30Rh - Pt6Rh	B	0 ... +1820



Threshold monitoring	The limiting values of physical variables must be continually monitored for industrial processes. This includes fill levels, temperatures, speed, positions, weights and frequencies. Specialised threshold monitoring components are used for this purpose. The sensor signals are captured on the input side, evaluated electronically and converted. The corresponding threshold (min/max) are then made available via the digital switching outputs (relays or transistors) to the external devices. Potentiometers can be used to customise each switching point and its minimum/maximum threshold as well as the switching hysteresis.
Transformer-based current measurement	Signal converters with transformer coupling are used for taking cost-effective measurements of sinusoidal currents (50/60 Hz). The current being measured flows directly through the primary coil of the measurement transformer. It is then stepped down and electronically processed in the converter.
True RMS value	True RMS is the measure of the active component of alternating current and voltages. The root mean square (RMS) is a measure of the magnitude of varying quantities (such as alternating current and voltage). It is a constant value that relates to the power consumed by a resistive load in a specified time period. The RMS is dependent on the amplitude and the curve slope. Non-sinusoidal signals can only be measured and processed with "true RMS"-compliant devices.
TTY	The TTY interface is a serial interface. This interface is often referred to as a 20-mA-current interface since a constant DC current of 20 mA flows through it during the idle state. In contrast to RS232, the data transmission for the asymmetric signal connection is not controlled by voltage changes but by a load-independent line current (typically 20 mA for High and 0 mA for Low). Thus there is no significant length-dependent voltage loss to take into consideration. Here the cable lengths can run up to several kilometres. TTY interfaces are currently used mostly where dedicated connections are required: for exchanging data between electronic scales, for large industrial displays, or for log printers.
Type of contact	A contact is called normally open (NO) or a make contact if it is open when the armature is dropped out (no current in coil) and closed when the armature is picked up (current flowing in coil). A contact is called a break contact or normally closed (NC) contact if it interrupts the circuit when the armature is picked up. A combination of NC and NO is called a changeover (CO) contact. A relay may have one or more of such contacts: NC – Normally Closed = break contact (11, 12: NC contact) NO – Normally Open = make contact (13, 14: NO contact) CO – Change Over contact (11, 12, 14: CO contact (11 is the shared (root) contact))

Z

Zone division

Hazardous areas are divided into zones. These divisions take into account the various risks from explosive atmospheres. The corresponding explosion protection can then be implemented economically and safely in accordance with the particular conditions of the zone. The zone definitions in the ATEX directive provide comprehensive regulations for the European Community.

IEC 60079-10 is valid for gases and vapours. A similar classification is used for facilities in the USA which are covered by the US standard NEC 505.

IEC 61241-3 covers the division into zones according to the dust level.

Explosion risk areas are classified into zones according to likelihood of explosive atmospheres occurring and their persistence:

Zone 0: this zone has an explosive atmosphere that is a mixture of air and flammable gases, vapours or mists. The mixture is present frequently or over long periods.

Zone 1: an explosive atmosphere may occasionally occur in this zone under normal operating conditions.

Zone 2: an explosive atmosphere is not likely to occur in this zone or may only occur briefly.

Zone 20: this zone has an explosive atmosphere that is a flammable mixture of air and dust. The mixture is present often or over long periods.

Zone 21: an explosive atmosphere, in the form of a flammable dust/air mixture, may occasionally occur in this zone under normal operating conditions.

Zone 22: an explosive atmosphere, in the form of a flammable dust/air mixture, is not likely to occur in this zone or may only occur briefly.

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1330000000

1335140000	SET CH20M BUS 250MM TS 35X7.5	K.7
1335150000	SET CH20M BUS 250MM TS 35X15	K.7

1370000000

1375450000	ACT20M-BAI-AO-S	E.4
1375450000	ACT20M-BAI-AO-S	E.9
1375450000	ACT20M-BAI-AO-S	VIII
1375470000	ACT20M-BAI-2AO-S	E.4
1375470000	ACT20M-BAI-2AO-S	E.14
1375470000	ACT20M-BAI-2AO-S	VIII
1375480000	ACT20M-TCI-AO-S	E.4
1375480000	ACT20M-TCI-AO-S	E.19
1375480000	ACT20M-TCI-AO-S	VIII
1375500000	ACT20M-TCI-AO-E-S	E.4
1375500000	ACT20M-TCI-AO-E-S	E.20
1375500000	ACT20M-TCI-AO-E-S	VIII
1375510000	ACT20M-RTI-AO-S	E.4
1375510000	ACT20M-RTI-AO-S	E.17
1375510000	ACT20M-RTI-AO-S	VIII
1375520000	ACT20M-RTI-AO-E-S	E.4
1375520000	ACT20M-RTI-AO-E-S	E.18
1375520000	ACT20M-RTI-AO-E-S	VIII

1430000000

1435590000	ACT20M-RTCI-CO-OLP-S	E.4
1435590000	ACT20M-RTCI-CO-OLP-S	E.15
1435590000	ACT20M-RTCI-CO-OLP-S	VIII
1435610000	ACT20M-RTI-CO-EOLP-S	E.4
1435610000	ACT20M-RTI-CO-EOLP-S	E.16
1435610000	ACT20M-RTI-CO-EOLP-S	VIII
1439640000	PORTACAL 1000EU	K.15

1450000000

1453210000	ACT20P-UI-AO-DO-LP-S	D.4
1453210000	ACT20P-UI-AO-DO-LP-S	D.24
1453210000	ACT20P-UI-AO-DO-LP-S	VI

1460000000

1466380000	SW Weidmueller DTM-Library Setup	J.4

1470000000

1477420000	ACT20P-AI-AO-DC-S	D.4
1477420000	ACT20P-AI-AO-DC-S	D.25
1477420000	ACT20P-AI-AO-DC-S	VI

1480000000

1481960000	ACT20P-PRO DCDC II-P	D.4
1481960000	ACT20P-PRO DCDC II-P	D.23
1481960000	ACT20P-PRO DCDC II-P	VI
1481970000	ACT20P-PRO DCDC II-S	D.4
1481970000	ACT20P-PRO DCDC II-S	D.23
1481970000	ACT20P-PRO DCDC II-S	VI

1510000000

1510240000	ACT20C-CMT-10-AO-RC-S	B.4
1510240000	ACT20C-CMT-10-AO-RC-S	B.7
1510240000	ACT20C-CMT-10-AO-RC-S	IV
1510280000	ACT20P-CMT-60-RC-P	D.4
1510280000	ACT20P-CMT-60-RC-P	D.21
1510280000	ACT20P-CMT-60-RC-P	VI
1510290000	ACT20P-CMT-60-AO-RC-P	D.4
1510290000	ACT20P-CMT-60-AO-RC-P	D.21
1510290000	ACT20P-CMT-60-AO-RC-P	VI
1510320000	ACT20P-CMT-30-AO-RC-P	D.4
1510320000	ACT20P-CMT-30-AO-RC-P	D.21
1510320000	ACT20P-CMT-30-AO-RC-P	VI
1510330000	ACT20P-CMT-10-AO-RC-P	D.4
1510330000	ACT20P-CMT-10-AO-RC-P	D.21
1510330000	ACT20P-CMT-10-AO-RC-P	VI
1510340000	ACT20C-LBT-10	B.4
1510340000	ACT20C-LBT-10	B.9
1510340000	ACT20C-LBT-10	IV
1510370000	ACT20C-GTW-100-MTCP-S	B.4
1510370000	ACT20C-GTW-100-MTCP-S	B.6
1510370000	ACT20C-GTW-100-MTCP-S	IV
1510390000	ACT20P-CMT-60-RC-S	D.4
1510390000	ACT20P-CMT-60-RC-S	D.21
1510390000	ACT20P-CMT-60-RC-S	VI
1510420000	ACT20C-CMT-60-AO-RC-S	B.4
1510420000	ACT20C-CMT-60-AO-RC-S	B.7
1510420000	ACT20C-CMT-60-AO-RC-S	IV
1510440000	ACT20P-CMT-60-AO-RC-S	D.4
1510440000	ACT20P-CMT-60-AO-RC-S	D.21
1510440000	ACT20P-CMT-60-AO-RC-S	VI
1510470000	ACT20P-CMT-10-AO-RC-S	D.4
1510470000	ACT20P-CMT-10-AO-RC-S	D.21
1510470000	ACT20P-CMT-10-AO-RC-S	VI
1510540000	ACT20P-CMT-30-AO-RC-S	D.4
1510540000	ACT20P-CMT-30-AO-RC-S	D.21
1510540000	ACT20P-CMT-30-AO-RC-S	VI

1520000000

1526460000	BLZ 5.08/02/180 SN OR BX	K.13

1540000000

1540010000	ACT20P-CI-VO-S	D.4
1540010000	ACT20P-CI-VO-S	D.9
1540010000	ACT20P-CI-VO-S	VI

1600000000

1609880000	WS 15/5 MC NE WS	K.12

1630000000

1635000000	WS 10/5 MC NE WS	K.12

1690000000

1693800000	ZQV 2.5N/2 GE	K.12

1710000000

1717900000	ZQV 2.5N/2 RT	K.12
1717990000	ZQV 2.5N/2 BL	K.12
1718080000	ZQV 2.5N/2 SW	K.12

1750000000

1758250000	ZQV 4N/2 GE	K.12
1758260000	ZQV 4N/10 GE	K.12

1760000000

1762620000	ZQV 4N/4 GE	K.12
1762630000	ZQV 4N/3 GE	K.12

1820000000

1828450000	WS 10/6 MC NE WS	K.12

1870000000

1877680000	MF 5/7.5 MC NE WS	K.11

1910000000

1912130000	ESG 8/13.5/43.3 SAI AU	K.10
1912130000	ESG 8/13.5/43.3 SAI AU	K.11

2040000000

2044840000	ACT20C-CML-10-AO-RC-S	B.4
2044840000	ACT20C-CML-10-AO-RC-S	B.8
2044840000	ACT20C-CML-10-AO-RC-S	IV
2044850000	ACT20P-CML-10-AO-RC-S	D.4
2044850000	ACT20P-CML-10-AO-RC-S	D.20
2044850000	ACT20P-CML-10-AO-RC-S	VI

2240000000

2242030000	BLZ 5.08/03/180 SN OR PRT	K.13
2242050000	BLZ 5.08/03/180 SN OR BX PRT	K.13
2242060000	BLZ 5.08/03/180 SN OR PRT	K.13
2242070000	BLZ 5.08/03/180 SN OR BX PRT	K.13
2246070000	BLZ 5.08/02/180 SN OR BX PRT	K.13
2246080000	BLZ 5.08/02/180 SN OR PRT	K.13
2246090000	BLZ 5.08/02/180 SN OR PRT	K.13
2246100000	BLZ 5.08/02/180 SN OR BX PRT	K.13

2440000000

2448100000	ACT20P-PRO-RTCI-AO-DO-S	D.4
2448100000	ACT20P-PRO-RTCI-AO-DO-S	D.16
2448100000	ACT20P-PRO-RTCI-AO-DO-S	VI
2448110000	ACT20P-PRO-RTCI-AO-DO-P	D.4
2448110000	ACT20P-PRO-RTCI-AO-DO-P	D.16
2448110000	ACT20P-PRO-RTCI-AO-DO-P	VI

2450000000

2456050000	ACT20X-HDI-SDO-RNO-P	C.4
2456050000	ACT20X-HDI-SDO-RNO-P	C.13
2456050000	ACT20X-HDI-SDO-RNO-P	IV
2456060000	ACT20X-HDI-SDO-RNC-P	C.4
2456060000	ACT20X-HDI-SDO-RNC-P	C.13
2456060000	ACT20X-HDI-SDO-RNC-P	IV
2456070000	ACT20X-HDI-SDO-P	C.4
2456070000	ACT20X-HDI-SDO-P	C.15
2456070000	ACT20X-HDI-SDO-P	IV
2456080000	ACT20X-2HDI-2SDO-RNO-P	C.4
2456080000	ACT20X-2HDI-2SDO-RNO-P	C.13
2456080000	ACT20X-2HDI-2SDO-RNO-P	IV
2456090000	ACT20X-2HDI-2SDO-RNC-P	C.4
2456090000	ACT20X-2HDI-2SDO-RNC-P	IV
2456100000	ACT20X-2HDI-2SDO-P	C.4
2456100000	ACT20X-2HDI-2SDO-P	C.15
2456100000	ACT20X-2HDI-2SDO-P	IV
2456110000	ACT20X-SDI-HDO-L-P	C.17
2456120000	ACT20X-SDI-HDO-H-P	C.4
2456120000	ACT20X-SDI-HDO-H-P	C.19
2456120000	ACT20X-SDI-HDO-H-P	IV
2456130000	ACT20X-2SDI-2HDO-P	C.17
2456140000	ACT20X-HAI-SAO-P	C.4
2456140000	ACT20X-HAI-SAO-P	C.7
2456140000	ACT20X-HAI-SAO-P	IV
2456150000	ACT20X-2HAI-2SAO-P	C.4
2456150000	ACT20X-2HAI-2SAO-P	C.7
2456150000	ACT20X-2HAI-2SAO-P	IV
2456160000	ACT20X-SAI-HAO-P	C.4
2456160000	ACT20X-SAI-HAO-P	C.9
2456160000	ACT20X-SAI-HAO-P	IV
2456170000	ACT20X-2SAI-2HAO-P	C.4
2456170000	ACT20X-2SAI-2HAO-P	C.9
2456170000	ACT20X-2SAI-2HAO-P	IV
2456180000	ACT20X-HTI-SAO-P	C.4
2456180000	ACT20X-HTI-SAO-P	C.11
2456180000	ACT20X-HTI-SAO-P	IV
2456190000	ACT20X-2HTI-2SAO-P	C.4
2456190000	ACT20X-2HTI-2SAO-P	C.11
2456190000	ACT20X-2HTI-2SAO-P	IV
2456200000	ACT20X-HUI-SAO-P	C.4
2456200000	ACT20X-HUI-SAO-P	C.21
2456200000	ACT20X-HUI-SAO-P	IV
2456210000	ACT20X-HUI-SAO-LP-P	C.23
2456820000	ACT20P-BRIDGE-P	D.4
2456820000	ACT20P-BRIDGE-P	D.22
2456820000	ACT20P-BRIDGE-P	VI
2456840000	ACT20P-UI-2RCO-DC-P	D.4
2456840000	ACT20P-UI-2RCO-DC-P	D.17
2456840000	ACT20P-UI-2RCO-DC-P	VI
2456850000	ACT20P-UI-AO-DO-LP-P	D.4
2456850000	ACT20P-UI-AO-DO-LP-P	D.24
2456850000	ACT20P-UI-AO-DO-LP-P	VI
2456860000	ACT20P-AI-AO-DC-P	D.4
2456860000	ACT20P-AI-AO-DC-P	D.25
2456860000	ACT20P-AI-AO-DC-P	VI
2456870000	ACT20-FEED-IN-PRO-P	K.2
2456870000	ACT20-FEED-IN-PRO-P	K.9
2456870000	ACT20-FEED-IN-PRO-P	X

2480000000

2489680000	ACT20P-CI-CO-P	D.4
2489680000	ACT20P-CI-CO-P	D.7
2489680000	ACT20P-CI-CO-P	VI
2489710000	ACT20P-CI-2CO-P	D.4
2489710000	ACT20P-CI-2CO-P	D.14
2489710000	ACT20P-CI-2CO-P	VI
2489730000	ACT20P-2CI-2CO-12-P	D.4
2489730000	ACT20P-2CI-2CO-12-P	D.8
2489730000	ACT20P-2CI-2CO-12-P	VI
2489740000	ACT20P-CI-VO-P	D.4
2489740000	ACT20P-CI-VO-P	D.9
2489740000	ACT20P-CI-VO-P	VI
2489910000	ACT20P-CML-10-AO-RC-P	D.4
2489910000	ACT20P-CML-10-AO-RC-P	D.20
2489910000	ACT20P-CML-10-AO-RC-P	VI

2490000000

2495690000	ACT20P-UI-2RCO-AC-P	D.4
2495690000	ACT20P-UI-2RCO-AC-P	D.17
2495690000	ACT20P-UI-2RCO-AC-P	VI

2500000000

2501110000	PICOPAK-CI-CO-LP-P	G.4
2501110000	PICOPAK-CI-CO-LP-P	G.6
2501110000	PICOPAK-CI-CO-LP-P	VIII

2510000000

2517450000	PICOPAK-CI-CO-LP-S	G.4

Order No.	Type	Page
2517450000	PICOPAK-CI-CO-LP-S	G.6
2517450000	PICOPAK-CI-CO-LP-S	VIII

2740000000

2740080000	IT20-ATDIORO-NB-P	A.4

7760000000

7760054114	ACT20P-CI-CO-S	D.4
7760054114	ACT20P-CI-CO-S	D.7
7760054114	ACT20P-CI-CO-S	VI
7760054115	ACT20P-CI-2CO-S	D.4
7760054115	ACT20P-CI-2CO-S	D.14
7760054115	ACT20P-CI-2CO-S	VI
7760054117	ACT20P-2CI-2CO-12-S	D.4
7760054117	ACT20P-2CI-2CO-12-S	D.8
7760054117	ACT20P-2CI-2CO-12-S	VI
7760054118	ACT20P-CI1-CO-OLP-S	D.4
7760054118	ACT20P-CI1-CO-OLP-S	D.12
7760054118	ACT20P-CI1-CO-OLP-S	VI
7760054119	ACT20P-CI2-CO-OLP-S	D.4
7760054119	ACT20P-CI2-CO-OLP-S	D.12
7760054119	ACT20P-CI2-CO-OLP-S	VI
7760054120	ACT20P-VI1-CO-OLP-S	D.4
7760054120	ACT20P-VI1-CO-OLP-S	D.12
7760054120	ACT20P-VI1-CO-OLP-S	VI
7760054121	ACT20P-VI-CO-OLP-S	D.4
7760054121	ACT20P-VI-CO-OLP-S	D.12
7760054121	ACT20P-VI-CO-OLP-S	VI
7760054122	ACT20P-CI-2CO-OLP-S	D.4
7760054122	ACT20P-CI-2CO-OLP-S	D.13
7760054122	ACT20P-CI-2CO-OLP-S	VI
7760054123	ACT20P-CI-CO-ILP-S	D.4
7760054123	ACT20P-CI-CO-ILP-S	D.11
7760054123	ACT20P-CI-CO-ILP-S	VI
7760054124	ACT20P-2CI-2CO-ILP-S	D.4
7760054124	ACT20P-2CI-2CO-ILP-S	D.11
7760054124	ACT20P-2CI-2CO-ILP-S	VI
7760054164	ACT20P-VMR-1PH-H-S	D.4
7760054164	ACT20P-VMR-1PH-H-S	D.18
7760054164	ACT20P-VMR-1PH-H-S	VI
7760054165	ACT20P-VMR-3PH-ILP-H-S	D.4
7760054165	ACT20P-VMR-3PH-ILP-H-S	D.19
7760054165	ACT20P-VMR-3PH-ILP-H-S	VI
7760054305	ACT20P-TMR-RTI-S	D.4
7760054305	ACT20P-TMR-RTI-S	D.15
7760054305	ACT20P-TMR-RTI-S	VI
7760054306	ACT20P-VM-AO-S	D.4
7760054306	ACT20P-VM-AO-S	D.10
7760054306	ACT20P-VM-AO-S	VI

7940000000

7940010163	LPD350 4-20MA/0-100.0	I.2
7940010163	LPD350 4-20MA/0-100.0	I.10
7940010163	LPD350 4-20MA/0-100.0	X
7940010185	DI350 4-20MA/0-100.0	I.2
7940010185	DI350 4-20MA/0-100.0	I.9
7940010185	DI350 4-20MA/0-100.0	X
7940010202	P275	K.17
7940010236	LPD450F 4-20MA	I.2
7940010236	LPD450F 4-20MA	I.11
7940010236	LPD450F 4-20MA	X
7940010243	PTX800A 4-20MA	I.2
7940010243	PTX800A 4-20MA	I.5
7940010243	PTX800A 4-20MA	X
7940011133	PTX800D	I.2
7940011133	PTX800D	I.4
7940011133	PTX800D	X
7940011570	DI350 0-10V/0-100.0	I.2
7940011570	DI350 0-10V/0-100.0	I.9
7940011570	DI350 0-10V/0-100.0	X
7940011979	PMX400HZX RO/AO	I.2
7940011979	PMX400HZX RO/AO	I.8
7940011979	PMX400HZX RO/AO	X
7940012323	PTX800D RO/AO	I.2
7940012323	PTX800D RO/AO	I.4
7940012323	PTX800D RO/AO	X
7940014374	PTX800A 4-20MA/RO/AO	I.2
7940014374	PTX800A 4-20MA/RO/AO	I.5
7940014374	PTX800A 4-20MA/RO/AO	X
7940015595	PMX400HZX	I.2
7940015595	PMX400HZX	I.8
7940015595	PMX400HZX	X
7940018956	PMX420	I.2
7940018956	PMX420	I.7
7940018956	PMX420	X
7940018957	PMX420PLUS	I.2
7940018957	PMX420PLUS	I.6
7940018957	PMX420PLUS	X
7940045760	ACT20P-UI-2RCO-DC-S	D.4
7940045760	ACT20P-UI-2RCO-DC-S	D.17
7940045760	ACT20P-UI-2RCO-DC-S	VI

8220000000

8227350000	MCZ SC 0-20MA	F.4
8227350000	MCZ SC 0-20MA	F.7
8227350000	MCZ SC 0-20MA	VIII

8260000000

8260280000	MCZ SC 0-10V	F.4
8260280000	MCZ SC 0-10V	F.7
8260280000	MCZ SC 0-10V	VIII

8380000000

8389030000	AP MCZ1.5 1674	K.12

8410000000

8411190000	MCZ CCC 0-20MA/0-20MA	F.4
8411190000	MCZ CCC 0-20MA/0-20MA	F.8
8411190000	MCZ CCC 0-20MA/0-20MA	VIII

8420000000

8425720000	MCZ PT100/3 CLP 0...100C	F.4
8425720000	MCZ PT100/3 CLP 0...100C	F.9
8425720000	MCZ PT100/3 CLP 0...100C	VIII

8460000000

8461470000	MCZ VFC 0-10V	F.4
8461470000	MCZ VFC 0-10V	F.6
8461470000	MCZ VFC 0-10V	VIII
8461480000	MCZ CFC 0-20MA	F.4
8461480000	MCZ CFC 0-20MA	F.6
8461480000	MCZ CFC 0-20MA	VIII
8461490000	MCZ CFC 4-20MA	F.4
8461490000	MCZ CFC 4-20MA	F.6
8461490000	MCZ CFC 4-20MA	VIII

8470000000

8473000000	MCZ PT100/3 CLP -50C...+150C	F.4
8473000000	MCZ PT100/3 CLP -50C...+150C	F.9
8473000000	MCZ PT100/3 CLP -50C...+150C	VIII
8473010000	MCZ PT100/3 CLP 0...200C	F.4
8473010000	MCZ PT100/3 CLP 0...200C	F.9
8473010000	MCZ PT100/3 CLP 0...200C	VIII
8473020000	MCZ PT100/3 CLP 0...300C	F.4
8473020000	MCZ PT100/3 CLP 0...300C	F.9
8473020000	MCZ PT100/3 CLP 0...300C	VIII

8480000000

8483680000	MCZ PT100/3 CLP 0...120C	F.4
8483680000	MCZ PT100/3 CLP 0...120C	F.9
8483680000	MCZ PT100/3 CLP 0...120C	VIII

8520000000

8528650000	WAS1 CMA LP 1/5/10A AC	H.4
8528650000	WAS1 CMA LP 1/5/10A AC	H.8
8528650000	WAS1 CMA LP 1/5/10A AC	X
8528660000	WAZ1 CMA LP 1/5/10A AC	H.4
8528660000	WAZ1 CMA LP 1/5/10A AC	H.8
8528660000	WAZ1 CMA LP 1/5/10A AC	X

8540000000

8543820000	WAS5 DC/ALARM	H.4
8543820000	WAS5 DC/ALARM	H.11
8543820000	WAS5 DC/ALARM	X
8543880000	WAZ5 DC/ALARM	H.4
8543880000	WAZ5 DC/ALARM	H.11
8543880000	WAZ5 DC/ALARM	X

8600000000

8604420000	MCZ PT100/3 CLP 0...150C	F.4
8604420000	MCZ PT100/3 CLP 0...150C	F.9
8604420000	MCZ PT100/3 CLP 0...150C	VIII
8604430000	MCZ PT100/3 CLP -40C...100C	F.4
8604430000	MCZ PT100/3 CLP -40C...100C	F.9
8604430000	MCZ PT100/3 CLP -40C...100C	VIII

8610000000

8615690000	WDS2 RS232/TTY	H.4
8615690000	WDS2 RS232/TTY	H.10
8615690000	WDS2 RS232/TTY	X
8615700000	WDS2 RS232/RS485/422	H.4
8615700000	WDS2 RS232/RS485/422	H.9
8615700000	WDS2 RS232/RS485/422	X

8740000000

8742610000	PAS CMR 0,5...2,5 A DC	H.4
8742610000	PAS CMR 0,5...2,5 A DC	H.12
8742610000	PAS CMR 0,5...2,5 A DC	X
8742620000	PAS CMR 2,0...5,0 A DC	H.4
8742620000	PAS CMR 2,0...5,0 A DC	H.12
8742620000	PAS CMR 2,0...5,0 A DC	X
8742630000	PAS CMR 4,5...10 A DC	H.4
8742630000	PAS CMR 4,5...10 A DC	H.13
8742630000	PAS CMR 4,5...10 A DC	X

8930000000

8939670000	WAS6 TTA	H.4
8939670000	WAS6 TTA	H.6
8939670000	WAS6 TTA	X
8939680000	WAZ6 TTA	H.4
8939680000	WAZ6 TTA	H.6
8939680000	WAZ6 TTA	X

8960000000

8964310000	WAS6 TTA EX	H.4
8964310000	WAS6 TTA EX	H.7
8964310000	WAS6 TTA EX	X
8964320000	WAZ6 TTA EX	H.4
8964320000	WAZ6 TTA EX	H.7
8964320000	WAZ6 TTA EX	X
8965340000	ACT20X-HDI-SDO-RNO-S	C.4
8965340000	ACT20X-HDI-SDO-RNO-S	C.13
8965340000	ACT20X-HDI-SDO-RNO-S	IV
8965350000	ACT20X-HDI-SDO-RNC-S	C.4
8965350000	ACT20X-HDI-SDO-RNC-S	C.13
8965350000	ACT20X-HDI-SDO-RNC-S	IV
8965360000	ACT20X-HDI-SDO-S	C.4
8965360000	ACT20X-HDI-SDO-S	C.15
8965360000	ACT20X-HDI-SDO-S	IV
8965370000	ACT20X-2HDI-2SDO-RNO-S	C.4
8965370000	ACT20X-2HDI-2SDO-RNO-S	C.13
8965370000	ACT20X-2HDI-2SDO-RNO-S	IV
8965380000	ACT20X-2HDI-2SDO-RNC-S	C.4
8965380000	ACT20X-2HDI-2SDO-RNC-S	C.13
8965380000	ACT20X-2HDI-2SDO-RNC-S	IV
8965390000	ACT20X-2HDI-2SDO-S	C.4
8965390000	ACT20X-2HDI-2SDO-S	C.15
8965390000	ACT20X-2HDI-2SDO-S	IV
8965400000	ACT20X-SDI-HDO-L-S	C.4
8965400000	ACT20X-SDI-HDO-L-S	C.17
8965400000	ACT20X-SDI-HDO-L-S	IV
8965410000	ACT20X-SDI-HDO-H-S	C.4
8965410000	ACT20X-SDI-HDO-H-S	C.19
8965410000	ACT20X-SDI-HDO-H-S	IV
8965420000	ACT20X-2SDI-2HDO-S	C.4
8965420000	ACT20X-2SDI-2HDO-S	C.17
8965420000	ACT20X-2SDI-2HDO-S	IV
8965430000	ACT20X-HAI-SAO-S	C.4
8965430000	ACT20X-HAI-SAO-S	C.7
8965430000	ACT20X-HAI-SAO-S	IV
8965440000	ACT20X-2HAI-2SAO-S	C.4
8965440000	ACT20X-2HAI-2SAO-S	C.7
8965440000	ACT20X-2HAI-2SAO-S	IV
8965450000	ACT20X-SAI-HAO-S	C.4
8965450000	ACT20X-SAI-HAO-S	C.9
8965450000	ACT20X-SAI-HAO-S	IV
8965460000	ACT20X-2SAI-2HAO-S	C.4
8965460000	ACT20X-2SAI-2HAO-S	C.9
8965460000	ACT20X-2SAI-2HAO-S	IV
8965470000	ACT20X-HTI-SAO-S	C.4
8965470000	ACT20X-HTI-SAO-S	C.11
8965470000	ACT20X-HTI-SAO-S	IV
8965480000	ACT20X-2HTI-2SAO-S	C.4
8965480000	ACT20X-2HTI-2SAO-S	C.11
8965480000	ACT20X-2HTI-2SAO-S	IV
8965490000	ACT20X-HUI-SAO-S	C.4
8965490000	ACT20X-HUI-SAO-S	C.21
8965490000	ACT20X-HUI-SAO-S	IV
8965500000	ACT20-FEED-IN-PRO-S	K.2
8965500000	ACT20-FEED-IN-PRO-S	K.9
8965500000	ACT20-FEED-IN-PRO-S	X

8970000000

8975590000	WAS1 CMA LP 1/5/10A EX	H.4
8975590000	WAS1 CMA LP 1/5/10A EX	H.8
8975590000	WAS1 CMA LP 1/5/10A EX	X
8978580000	CBX200 USB	K.2
8978580000	CBX200 USB	K.4
8978580000	CBX200 USB	X

Addresses worldwide

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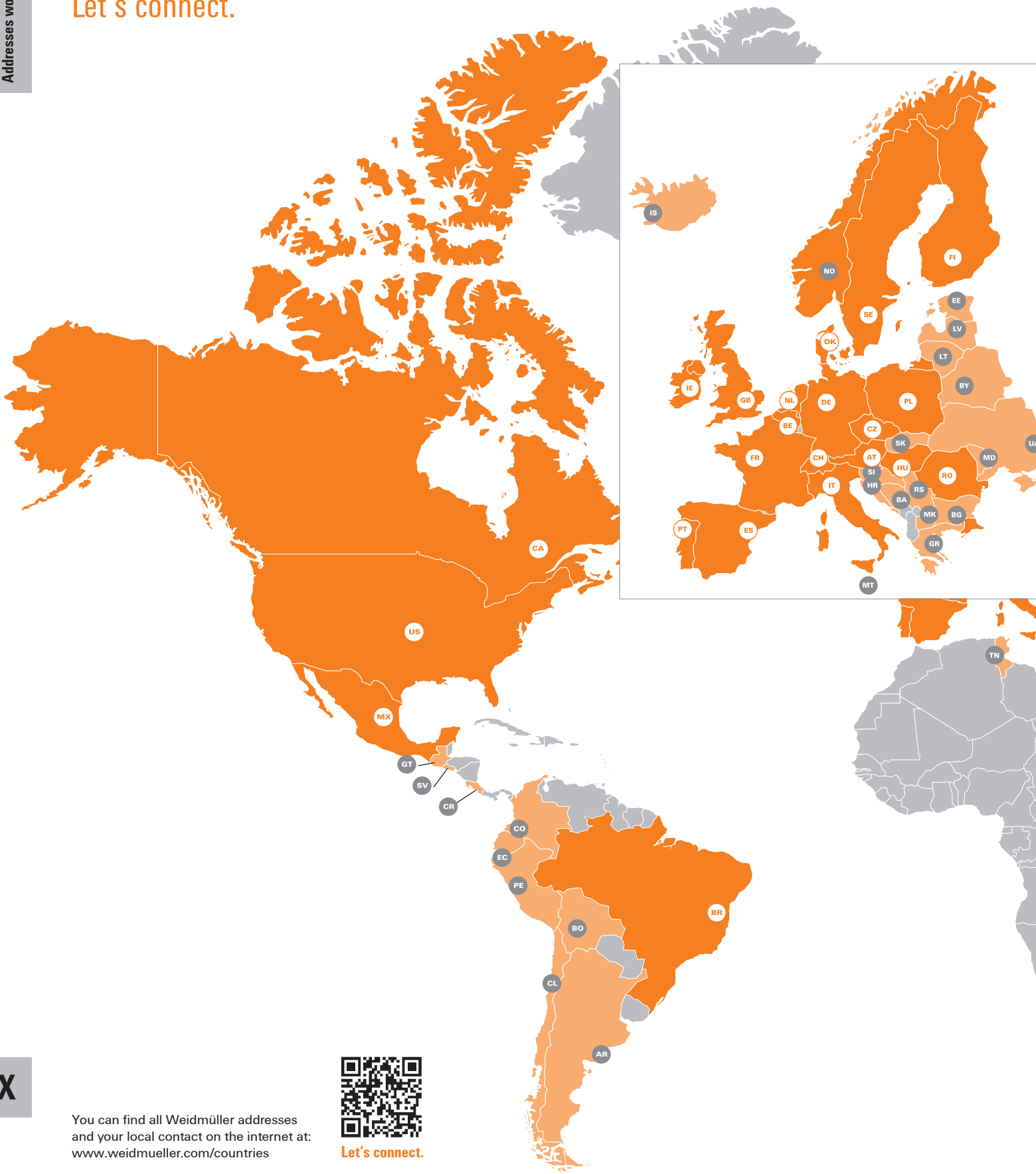

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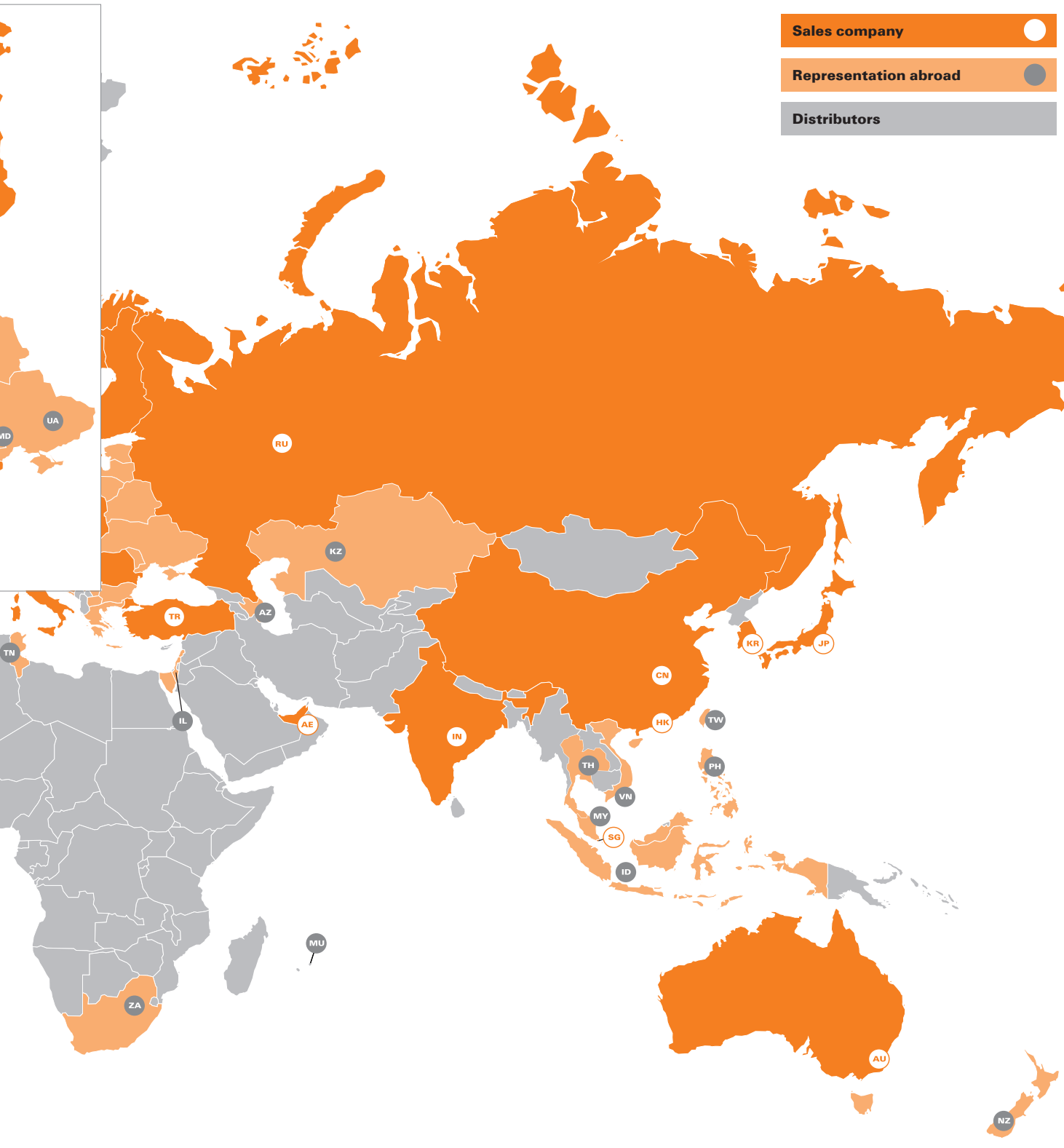
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