

Intrinsically safe signal conditioners for hazardous area applications

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Intrinsically safe signal conditioners for hazardous area applications

ACT20X signal converters

The ACT20X is a completely new line of signal converter products for the Ex zone. These compact modules require only 11 mm per channel and take up very little space in the electrical cabinet. Weidmüller has specifically designed the ACT20X line for process automation applications in Ex and non-Ex zones. The 17 different variants can process all standard input signals (such as 2-wire, HART®, NAMUR-, RTD, thermocouple or DC signals) from Ex zone 0. They can also handle digital or analogue signals from Ex-zone field devices to the controller. The integrated relay output issues an alert in the event of a malfunction; this makes troubleshooting easier and reduces facility down times. The WI-Manager configuration software is based on FDT (Field Device Tool) technology. The software allows you to configure all ACT20X products with your PC so that they can be custom-fit to a wide variety of process applications. Weidmüller provides a device type manager (DTM) for the ACT20X modules that can be used in any FDT-based frame. The DTMs allow you to configure different devices quickly and accurately. They also enable you to analyse measurements and diagnostics data. The DTM can also be used to clearly identify the connected device. The FDT frame application "WI Manager" and the device-specific DTMs are available from Weidmüller free of charge. The ACT20X modules can be used in a temperature range from -20 °C to +60 °C without limitations. The modules can be installed in the safe zone or in the explosion risk area of Zone 2. The ACT20Xs always deliver a pure, interference-free signal

thanks to their accuracy, temperature stability and high insulation strength. They can easily be used around the globe since they already have all the necessary international approvals, including ATEX, IECEx, GOST and FM. The newest member of the ACT20X family is the ACT20X-HUI-SAO-LP. This offers an intrinsically safe input for 0/4 to 20 mA, 0 to 10 V, temperature and resistance signals, and separates the Ex zone from the safe zone. The narrow 12.5 mm module is supplied via the 4 to 20 mA output.

Features

- International approvals for Zone 0, 1 and 2 (IECEx, ATEX) and Class 1 Division 1 and 2 (FM)
- Analogue and binary signal interface to Zone 0/Div.1 for explosion-risk inputs and outputs
- All standard input signals (4 to 20 mA HART®, NAMUR-, RTD- or thermocouple signals) out of Ex zone 0, 1 or 2
- Two-channel type saves space in the electrical cabinet and reduces installation costs
- HART® transparent signal isolator
- Integrated alarm contact
- Configuration over FDT/DTM standard with the frame application "WI Manager"



B



ACT20X

ACT20X – intrinsic safety signal conditioners for hazardous areas

PC-configurable conditioners family for hazardous areas in the new Weidmüller electronics housing for installation in safe or hazardous areas.

B ACT20X meets the arduous requirements of the process industry where potentially explosive fluids are controlled. The range connects to sensors and actuators in the hazardous area, isolates their signals and limits the energy passed to them. On the input side ACT20X models can process d.c.,

temperature, Namur and volt-free contact signals. On the output side field devices in the Ex area are controlled via the ACT20X with analogue or digital signals. All ACT20X products are characterised by insulation, accuracy and high temperature stability.

The digital 2-channel versions with width of 22.5 mm are available with either transistor or relay output. Due to this high component density, the space requirements and installation costs are reduced accordingly.





Configuration via FDT

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



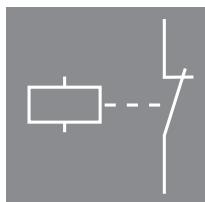
Worldwide application

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.



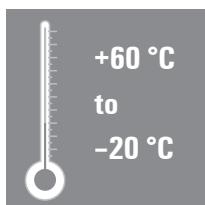
Intelligent connection system

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



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.



Robust

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



**Current supply isolator,
HART® Transparent**



**Current output isolator,
HART® Transparent**



Temperature transducer



**Universal measurement and signal
isolator/converter**



**NAMUR disconnect-switch
amplifier**



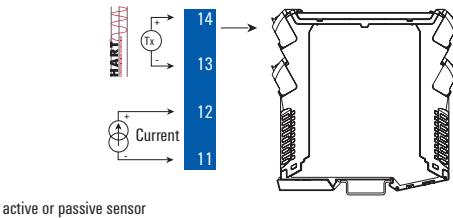
Valve control component

Current-supply isolator, HART® Transparent

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**Input Signals**

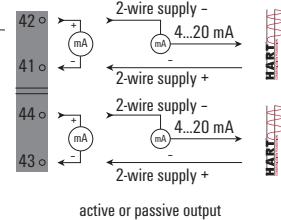
Channel 1:



active or passive sensor

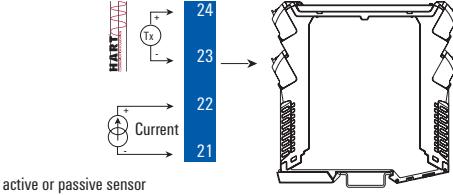
Output Signals

Analogue, 4...20 mA

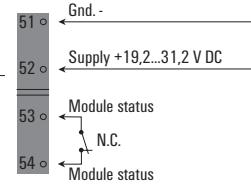


active or passive output

Channel 2:



active or passive sensor

Power Supply and Module Status

Removable terminals (black)

LED Channel 1
red = inactive,
flashing = fault

Marker

LED green
= supply

Removable terminals (blue)

LED Channel 2
red = inactive,
flashing = fault

CE

cUL US
LISTEDFM
APPROVED**Ex label (excerpt)**

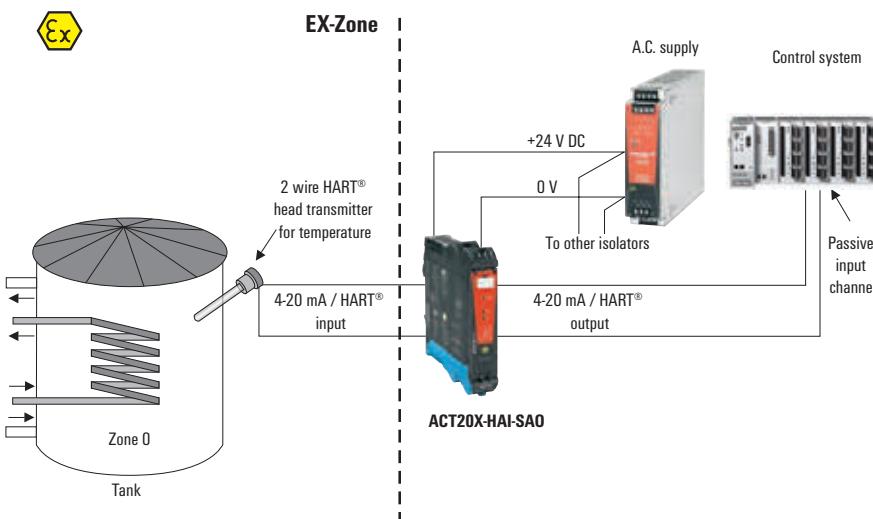
ATEX
II 3 G Ex nA nC IIC T4 Gc
II (1) G [Ex ia Ga] IIC/IIIB
II (1) D [Ex ia Da] IIIC

IECEx
Ex nA nC IIC T4 Gc
[Ex ia Ga] IIC/IIIB/IIA

FM
Installation in CL I DIV2 GP A-D T4
KI. III ABT 1/2 GP A-G or
KI. I Zn2 AEx/Ex nA nC [ia] IIC T4

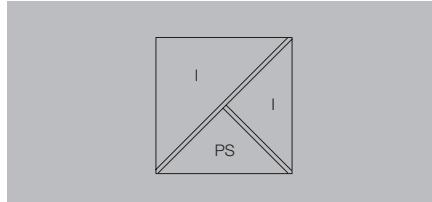
Example:
ATEX version,
Ex input, External Current Source:
(More details in ATEX certificate)

U_o/U_i	0 V / 30 V
I_o/I_i	0 mA / 120 mA
P_o/P_i	0 mW / 0,85 W
L_i	0 μ H
C_i	2 nF
IIC	$C_o = 0,08 \mu F$, $L_o = 3 mH$
IIB	$C_o = 0,6 \mu F$, $L_o = 12 mH$
IIA	$C_o = 2,15 \mu F$, $L_o = 25 mH$

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 link 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...20 mA

Sensor supply

≤ 28 V DC

Residual ripple (current loop)

< 7.5 mV_{eff}**Output analogue**

Output current

3.5 - 23 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)

Continuous current

≤ 32 V AC / 32 V DC (Zone 2)

Power rating

≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0.5 A AC / 1 A DC (Zone 2)

General data

Supply voltage

≤ 62.5 VA / 32 W (safe area)

Power consumption

≤ 16 VA / 32 W (Zone 2)

Ambient temperature / Storage temperature

19.2 - 31.2 V DC

Approvals

Approvals

≤ 3 W (2 channels)

Insulation coordination

Insulation voltage

-20 °C...+60 °C / -20 °C...+85 °C

Rated voltage

cULus; DEKRAATEX; DETNORVER; FMEX; GOSTEX; GOSTME25; IECExDEK

EMC standards

2.6 kV (input / output)

300 V

DIN EN 61326

Ordering data

Type	Qty.	Order No.
1-channel version		
ACT20X-HAI-SAO-S	1 ST	8965430000
2-channel version		
ACT20X-2HAI-2SAO-S	1 ST	8965440000

CBX200 USB configuration adapter - 8978580000

Dimensions

Clamping range (nominal / min. / max.)

mm²

Depth x width x height

mm

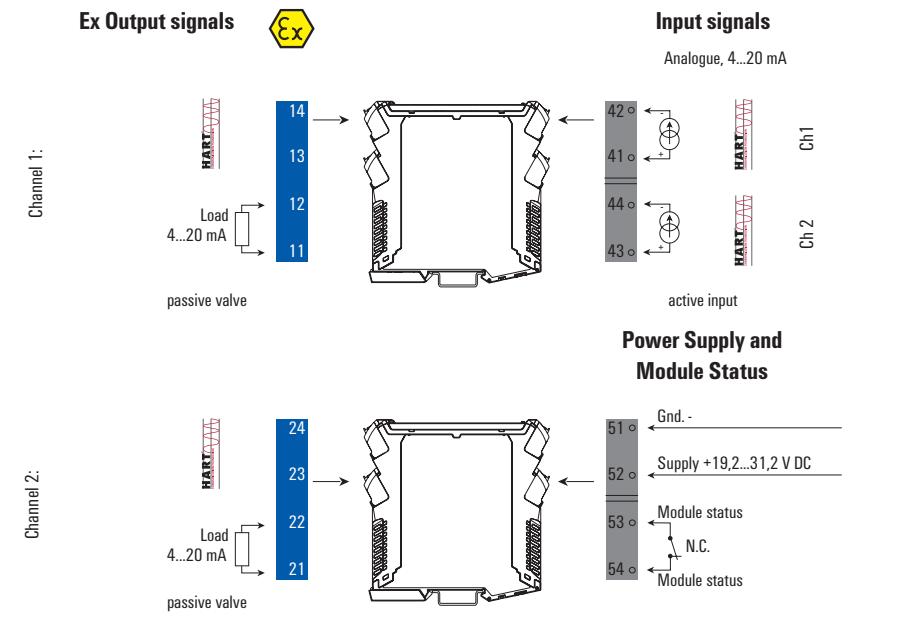
Note**Screw connection**

2.5 / 0.5 / 2.5

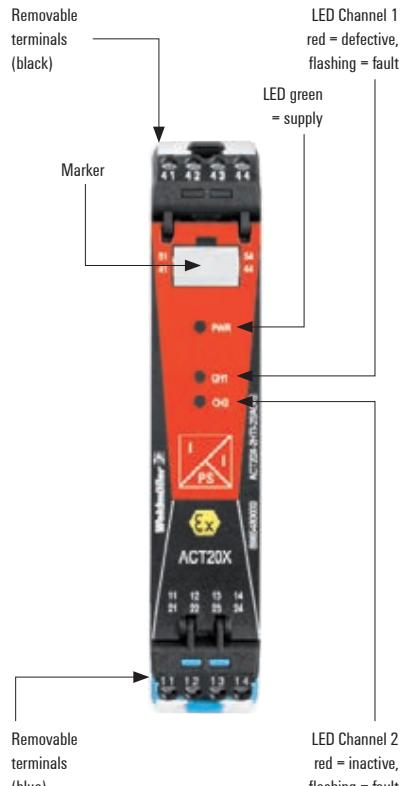
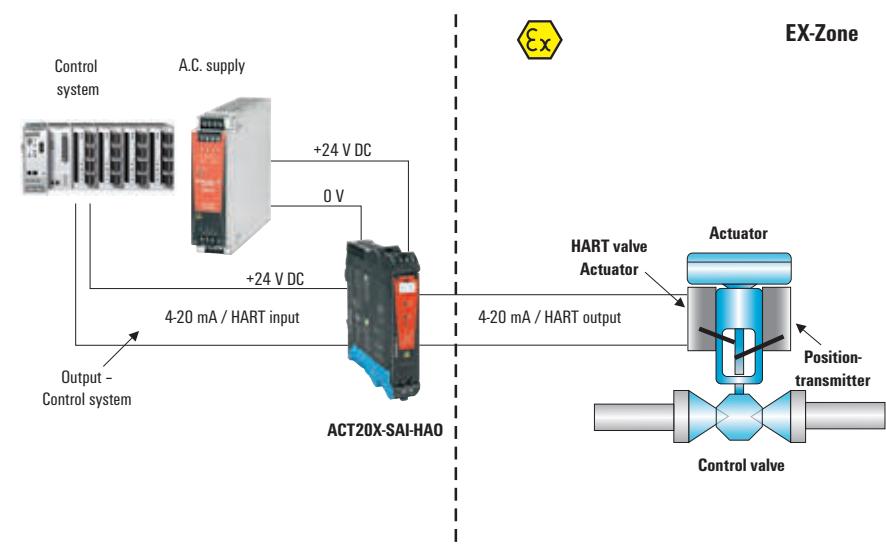
113.6 / 22.5 /

Current output isolator, HART® Transparent

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**Ex label (excerpt)**

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

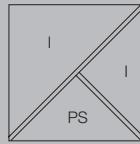
Application example: controlling an actuator in the Ex zone.

Removable terminals (blue)
LED Channel 2
red = inactive,
flashing = fault



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

≤ 600 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 NC (voltage-free)

Nominal switching voltage

≤ 125 V AC / 110 V DC (safe area)

Continuous current

≤ 32 V AC / 32 V DC (Zone 2)

Power rating

≤ 62.5 VA / 32 W (safe area)

≤ 16 VA / 32 W (Zone 2)

General data

Supply voltage

19.2 - 31.2 V DC

Power consumption

≤ 3 W (2 channels)

Ambient temperature / Storage temperature

-20 °C...+60 °C / -20 °C...+85 °C

Approvals

Approvals

cULus; DEKRAATEX; DETNORVER; FMEX; GOSTEX; GOSTME25; IECExDEK

Insulation coordination

Insulation voltage

2.6 kV (input / output)

Rated voltage

300 V

EMC standards

DIN EN 61326

Ordering data

Type	Qty.	Order No.
1-channel version		
ACT20X-SAI-HAO-S	1 ST	8965450000
2-channel version		
ACT20X-2SAI-2HAO-S	1 ST	8965460000

CBX200 USB configuration adapter - 8978580000

Dimensions

Clamping range (nominal / min. / max.)

mm²

Depth x width x height

mm

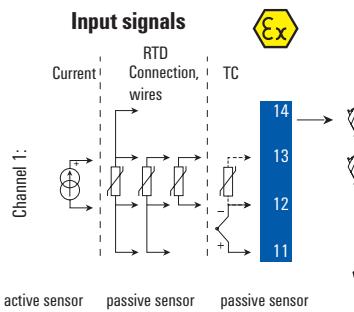
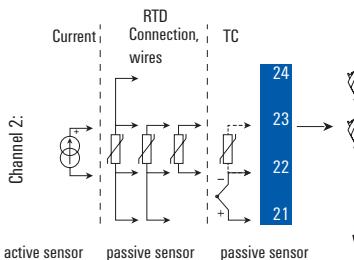
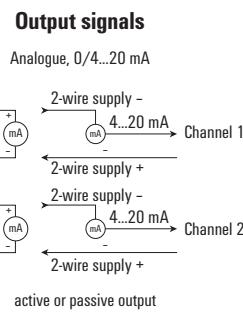
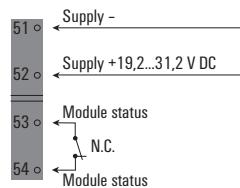
Note**Screw connection**

2.5 / 0.5 / 2.5

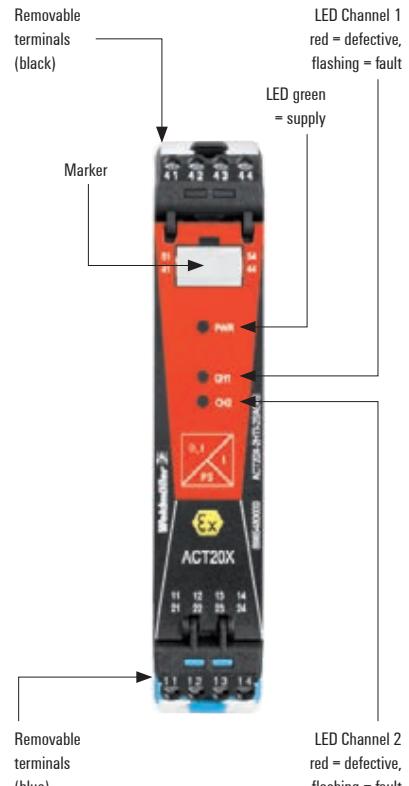
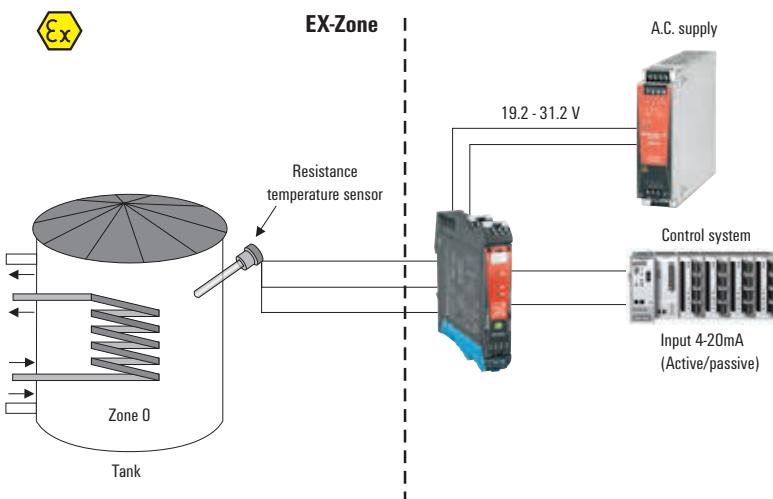
113.6 / 22.5 /

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****Supply and module status****Ex label (excerpt)**

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

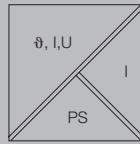
**Application example: temperature measurements in the Ex zone****Accuracy / temperature coefficients
ACT20X-HTI-SAO**

Input	Accuracy	Temperature coefficient
Input mA	$\leq \pm 4 \mu\text{A}$	$\leq \pm 4 \mu\text{A} / ^\circ\text{C}$
Input RTD		
Pt100	$\leq \pm 0.2 ^\circ\text{C}$	$\leq \pm 0.02 ^\circ\text{C} / ^\circ\text{C}$
Ni100	$\leq \pm 0.3 ^\circ\text{C}$	$\leq \pm 0.03 ^\circ\text{C} / ^\circ\text{C}$
Input TC		
Type B	$\leq \pm 4.5 ^\circ\text{C}$	$\leq \pm 0.45 ^\circ\text{C} / ^\circ\text{C}$
Type E, J, K, L, N, T, U	$\leq \pm 1 ^\circ\text{C}$	$\leq \pm 0.1 ^\circ\text{C} / ^\circ\text{C}$
Type R, S, W3, W5, LR	$\leq \pm 2 ^\circ\text{C}$	$\leq \pm 0.2 ^\circ\text{C} / ^\circ\text{C}$
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



Technical data

Input	RTD, TC, DC (mA)	Type	Temperature-range	Accuracy
Type	Configurable	Metal PTC		
Sensor supply	$\leq 50 \Omega$	Pt100	-200...850 °C	$\pm (0.15 + 0.02 \times T) \text{ Class A}$
Temperature input range	0...20 mA, 4...20mA	Pt500	-200...850 °C	$\pm (0.30 \text{ }^{\circ}\text{C} + 0.005 \times T) \text{ Class B}$
Line resistance in measuring circuit	$20 \Omega + \text{PTC } 50 \Omega$	Pt1000	-200...850 °C	
Input current	0(4)...20 mA / 20...4 mA (configurable)	Ni50		
Input resistance, current	3.8...20.5 mA / 0...20.5 mA (dependent on range)	Ni100	-60...0 °C	$\pm (0.4 + 0.007 \times T)$
Output	$\leq 600 \Omega$	Ni120	0...180 °C	$\pm (0.4 + 0.028 \times T)$
Output current	$\leq 0.01\% \text{ of span} / 100 \Omega$	Ni1000		
Output signal limit	4...20 mA	TC-Type according to IEC60584-1		
load impedance current	$(U_b - 3.5) / 0.023 \text{ A}$	B	50...250 °C	$\pm 25 \text{ K}$
Influence of load resistance	$\leq 0.01\% \text{ of span} / 100 \Omega$		250...500 °C	$\pm 10 \text{ K}$
Current loop output	3.5...26 V DC		500...1820 °C	$\pm 6 \text{ K}$
Output current (current loop)	Relay, 1 NC (voltage-free)	E	-200...-150 °C	$\pm 4 \text{ K}$
Load resistance	$\leq 125 \text{ V AC} / 110 \text{ V DC} \text{ (safe area)}$		-150...1000 °C	$\pm 3 \text{ K}$
Influence of load resistance	$\leq 32 \text{ V AC} / 32 \text{ V DC} \text{ (Zone 2)}$	J	-200...-150 °C	$\pm 4 \text{ K}$
2-wire supply	$\leq 0.5 \text{ A AC} / 0.3 \text{ A DC} \text{ (safe zone)}, \leq 0.5 \text{ A AC} / 1 \text{ A DC} \text{ (Zone 2)}$		-150...1200 °C	$\pm 3 \text{ K}$
Alarm output	$\leq 62.5 \text{ VA} / 32 \text{ W} \text{ (safe area)}$	K	-200...-150 °C	$\pm 5 \text{ K}$
Type	$\leq 16 \text{ VA} / 32 \text{ W} \text{ (Zone 2)}$		-150...1200 °C	$\pm 3 \text{ K}$
Nominal switching voltage	19.2 - 31.2 V DC	N	-200...-150 °C	$\pm 6 \text{ K}$
Continuous current	$\leq 3 \text{ W} \text{ (2 channels)}$		-150...1300 °C	$\pm 3 \text{ K}$
Power rating	0.4 Nm / 0.6 Nm	R	-50...200 °C	$\pm 10 \text{ K}$
General data	-20 °C...+60 °C / -20 °C...+85 °C		200...1780 °C	$\pm 6 \text{ K}$
Supply voltage	cULus; DETNORVER; FMEX; GOSTEX; GOSTME25; IECExKEM; KEMAATEX	S	-50...200 °C	$\pm 10 \text{ K}$
Power consumption	2.6 kV (input / output)		200...1780 °C	$\pm 6 \text{ K}$
Tightening torque, min. / Tightening torque, max.	300 V	T	-200...-150 °C	$\pm 5 \text{ K}$
Ambient temperature / Storage temperature	DIN EN 61326		-150...400 °C	$\pm 3 \text{ K}$
Approvals	according to DIN43710	U	0...600 °C	$\pm 3 \text{ }^{\circ}\text{C}$
Approvals		L	0...900 °C	$\pm 3 \text{ }^{\circ}\text{C}$
Insulation coordination				
Insulation voltage				
Rated voltage				
EMC standards				

Dimensions

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

Note

Screw connection

2.5 / 0.5 / 2.5
119.2 / 22.5 /

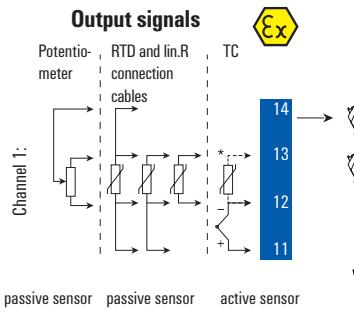
Ordering data

Type	Qty.	Order No.
1-channel version		
ACT20X-HTI-SAO-S	1 ST	8965470000
2-channel version		
ACT20X-2HTI-2SAO-S	1 ST	8965480000

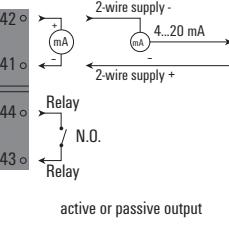
CBX200 USB configuration adapter - 8978580000

Universal measurement and signal isolator-converter

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 millamp 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****Input signals**

Analogue, 0/4...20 mA and relay

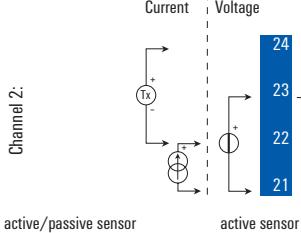
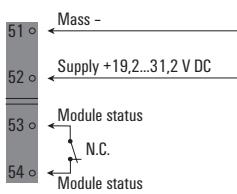


Removable terminals (black)

LED Channel 1 configurable

Marker

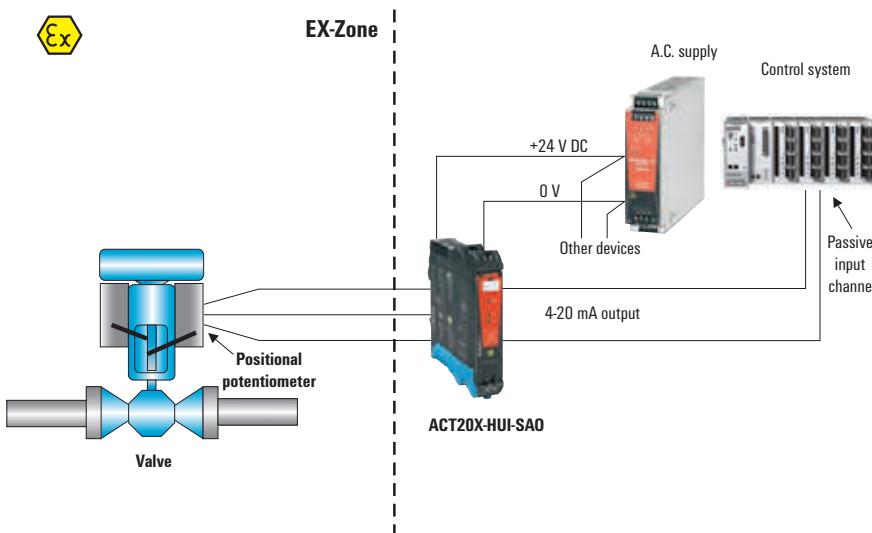
LED green = supply

**Supply and module status**

Removable terminals (blue)

LED Channel 2
red = inactive, flashing = fault**Ex label (excerpt)**

ATEX	FM	
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4	U _i / U _o 30 V / 8.3 V
II (1) G [Ex ia] IIC/IIB/IIA	KI. III ABT 1/2 GP A-G or	I _i / I _o 120 mA / 0.2 mA
II (1) D [Ex iaD]	KI. I Zn2 AEx/Ex nA nC [ia] IIC T4	P _i / P _o 900 mW / 0.4 mW
IECEx	Example:	C _i 3 nF
Ex nA nC IIC T4 Gc	ATEX version,	L _i 1 µH
[Ex ia Ga] IIC/IIB/IIA	Ex input External Current Source	IIC C _o = 7 µF L _o =1000 mH
[Ex ia a] IIC	(More details in ATEX certificate)	IIB C _o = 73 µF L _o =1000 mH
		IIA C _o = 1000 µF L _o =1000 mH

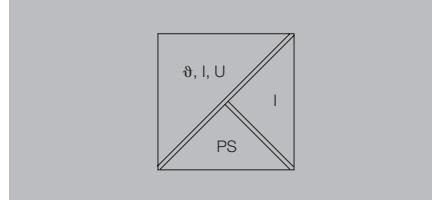
Application example: position measurement of an actuator**Accuracy / temperature coefficients
ACT20X-HUI-SAO**

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 measurement and signal isolator 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

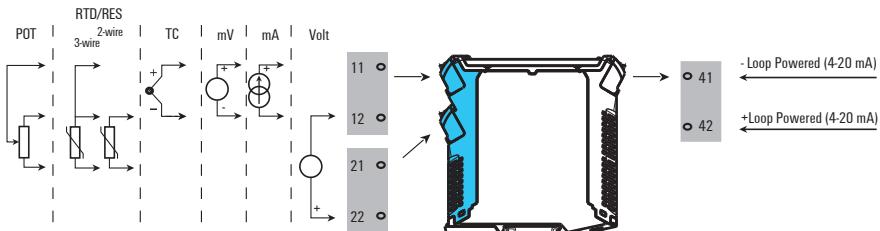


Technical data

Input		
Type	RTD, TC, DC (mA, V)	
Sensor supply	28...16.5 V DC/0...20 mA	
Temperature input range	Configurable	
Line resistance in measuring circuit	$\leq 50 \Omega$	
Input current	0...20 mA, 4...20mA	
Input voltage	0...12 V DC, configurable: 0.1 / 0.2...1 / 0...5 / 0...10 and 2...10 V DC	
Potentiometer	10 Ω ...10 k Ω	
Input resistance, voltage/current	> 10 M Ω / 20 Ω + PTC 50 Ω	
Output analogue		
Output current	0...23 mA, configurable: 0...20 / 4...20 / 20...0 / 20...4 mA	
Output signal limit	3.8...20.5 mA / 0...20.5 mA (dependent on range)	
Load impedance current	$\leq 600 \Omega$	
Influence of load resistance	$\leq 0.01\%$ of span / 100 Ω	
Current loop output		
Output current (current loop)	4...20 mA	
Load resistance	$\leq (V_s - 10) / 20 \text{ mA}$ (current loop)	
Influence of load resistance	$\leq 0.01\%$ of span / 100 Ω	
2-wire supply	$\leq 26 \text{ V DC}$	
Output digital		
Type	Relay, 1 NO / NC contact	
Function	Configurable switching thresholds, Sensor error, Window function	
Nominal switching voltage	$\leq 250 \text{ V AC} / 30 \text{ V DC}$ (safe area)	
Continuous current	$\leq 32 \text{ V AC} / 32 \text{ V DC}$ (Zone 2)	
Alarm output	$\leq 2 \text{ A AC/DC}$ (safe area, Zone 2 area)	
Type	Relay, 1 NC (voltage-free)	
Nominal switching voltage	$\leq 125 \text{ V AC} / 110 \text{ V DC}$ (safe area)	
Continuous current	$\leq 32 \text{ V AC} / 32 \text{ V DC}$ (Zone 2)	
General data	$\leq 0.5 \text{ A AC} / 0.3 \text{ A DC}$ (safe zone), $\leq 0.5 \text{ A AC} / 1 \text{ A DC}$ (Zone 2)	
Supply voltage	19.2 – 31.2 V DC	
Power consumption	$\leq 3.5 \text{ W}$	
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; FMEX; GOSTEX; GOSTME25; IECExKEM; KEMAATEX	
Insulation coordination		
Insulation voltage / Rated voltage	2.6 kV (input / output) / 300 V	
EMC standards	DIN EN 61326	
Dimensions		
Clamping range (nominal / min. / max.)	mm ²	
Length x width x height	mm	
Note		
Screw connection		
2.5 / 0.5 / 2.5		
119.2 / 22.5 /		
Ordering data		
Type	Qty.	Order No.
1-channel version		
ACT20X-HUI-SAO-S	1 ST	8965490000
CBX200 USB configuration adapter - 8978580000		

Output loop powered universal measurement and signal isolating converter

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 its 4-20 mA output.

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

Zone 0, 1, 2, 20, 21, 22 /
Cl. I/II/III, div. 1 gr. A-G

Zone 2 / FM Cl. 1, div. 2,
gr. A-D or safe area

Removable
terminals
(black)

Marker



Removable
terminals
(blue)

**Ex label**

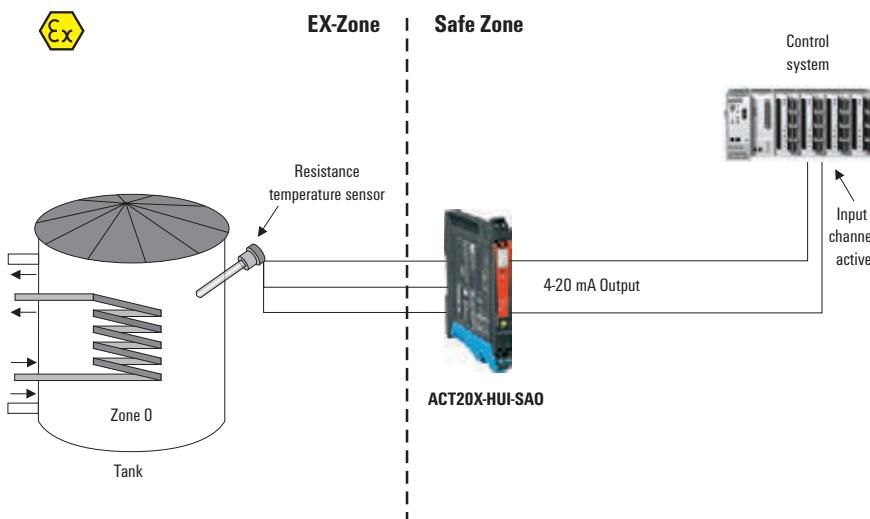
ATEX
II 3 G Ex nA nC IIC T4
II (1) G [Ex ia] IIC/IIB/IIA
II (1) D [Ex id]

IECEx

Ex nA IIC T4 Gc
[Ex ia Ma Ga] I/IIC [Ex ia Da] IIIC

Example:
IECEx version
(More details in IECEx certificate)

U_o	5.88 V
I_o	3.1 mA
P_o	4.6 mW
C_i	0.001 μ F
L_i	negligible

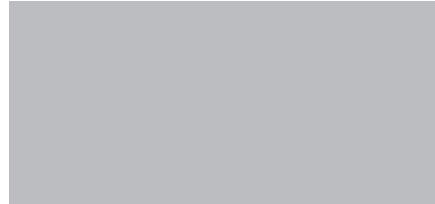
Application example: Temperature measurement in the EX-zone**Accuracy / temperature coefficients
ACT20X-HUI-SAO-LP**

Input	Accuracy	Temperature coefficient
Input mA	$\leq \pm 4 \mu$ A	$\leq \pm 4 \mu$ A / °C
Input Volt	$\leq \pm 20 \mu$ V	$\leq \pm 2 \mu$ V / °C
Input RTD		
Pt100	$\leq \pm 0.2$ °C	$\leq \pm 0.02$ °C / °C
Ni100	$\leq \pm 0.3$ °C	$\leq \pm 0.03$ °C / °C
Input TC		
Type B	$\leq \pm 4.5$ °C	$\leq \pm 0.45$ °C / °C
Type E, J, K, L, N, T, U	$\leq \pm 1$ °C	$\leq \pm 0.1$ °C / °C
Type R, S, W3, W5, LR	$\leq \pm 2$ °C	$\leq \pm 0.2$ °C / °C
Note		

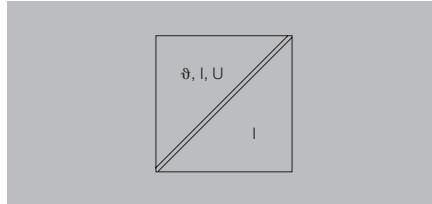
Universal measurement and signal isolator-converter

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
Temperature input range
Input current
Input voltage
Potentiometer
Input resistance, voltage/current

Output analogue

Output current
load impedance current
Residual ripple (current loop)
Accuracy
Temperature coefficient
Step response time
Cut-off frequency (-3 dB)

General data

Supply voltage
Tightening torque, min. / Tightening torque, max.
Ambient temperature / Storage temperature

Approvals

Approvals

Insulation coordination

Insulation voltage / Rated voltage
Rated voltage
EMC standards

RTD, TC, DC (mA, V), 2 - 3 wire resistor

Configurable

± 25 mA
± 28 V DC
10 Ω...10 kΩ
> 10 MΩ @ 600 mV, 2 MΩ @ 28 V / 70 Ω

4...20 mA (max. 23 mA)

≤ 700 Ω
≤ 10 mV_{ss}
< 0.1 % of end value
Max. 200 ppm/K of output range
< 400 ms (10...90 %)

100 Hz

11...28 V DC (loop powered)

0.4 Nm / 0.6 Nm
0 °C...+60 °C / -20 °C...+70 °C

cULus; GOSTEX

4 kV (input / output) / 300 V_{eff}
300 V_{eff}
DIN EN 61326

Inputs

Type Thermocouples (TC), RTD, mA, Volt, mV, resistor, potentiometer

Type	Standard	Lower limit	Upper limit	Min. area
B		100 °C	1820 °C	400 °C
E	IEC584	-270 °C	1000 °C	
J		-270 °C	1200 °C	
K		-270 °C	1372 °C	80 °C
L	DIN43710	-100 °C	900 °C	
N		-180 °C	1300 °C	100 °C
R, S	IEC584	-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 ±28 V @ 2 MΩ
Volt	±12 V @ 2 MΩ
mV	±600 mV @ >10 MΩ ±150 mV @ >10 MΩ
Type	Standard

Type	Standard	Lower limit	Upper limit	Min. area
Pt100, Pt200		-200 °C	850 °C	-20 °C
Pt1000	DIN43710			
Ni120		-80 °C	320 °C	15 °C
Cu10		-100 °C	260 °C	100 °C
User-defined Input		Up to 101 values		

Resistance	0 to 12 kΩ 0 to 15 kΩ 0 to 750 Ω	500 Ω 100 Ω 50 Ω
Potentiometer	1.2 kΩ to 500 kΩ	

Ordering data

Type	Qty.	Order No.
1-channel version	1 ST	1318220000

CBX200 USB configuration adapter - 8978580000

Dimensions

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

Note

Screw connection

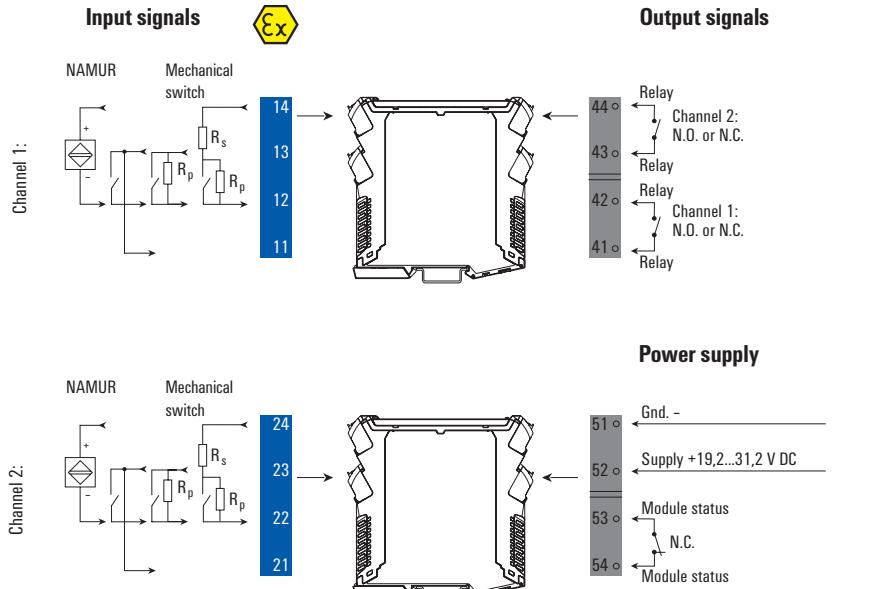
2.5 / 0.5 / 2.5
119.2 / 12.5 /

NAMUR isolating switching amplifier: 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.

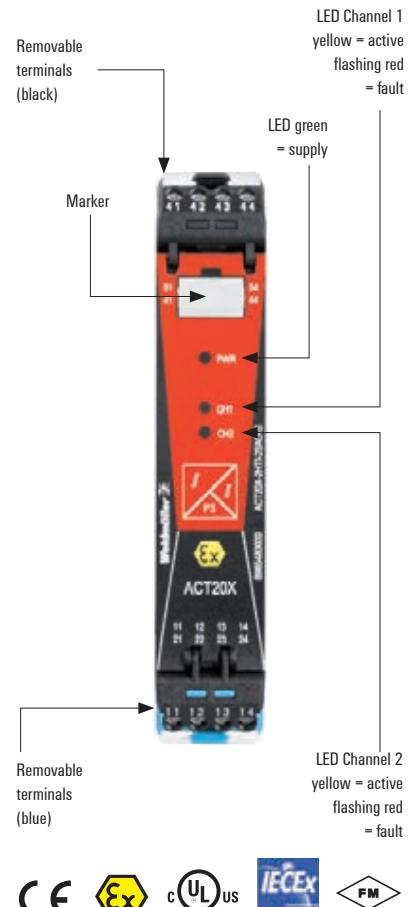
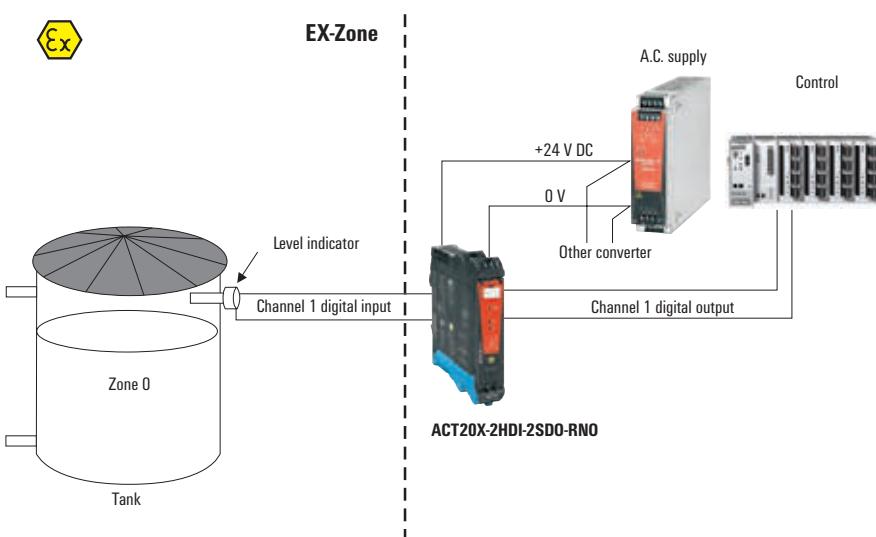
EX area Zone 0, 1, 2, 20, 21, 22

Safe area Zone 2 / FM Class 1, Division 2

**Ex label (excerpt)**

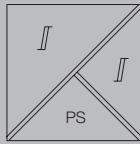
ATEX	FM
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4
II (1) G [Ex ia Ga] IIC/IIB/IIA	KI. HII ABT 1/2 GP A-G oder
II (1) D [Ex id]	KI. I Zn2 AEx/Ex nA nC [ia] IIC T4
IECEx	Example:
Ex nA nC IIC T4 Gc	ATEX version,
[Ex ia Ga] IIC/IIB/IIA	Ex input
[Ex ia Da] IIIC	(More details in ATEX certificate)

U_o	10.6 V
I_o	12 mA
P_o	32 mW
L_o / R_o	1150 μ H/Q
IIC	$C_o = 2 \mu$ F, $L_o = 260$ mH
IIB	$C_o = 6 \mu$ F, $L_o = 780$ mH
IIA	$C_o = 18 \mu$ F, $L_o = 1000$ mH

**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
Sensor supply
Resistance
Input frequency
Pulse duration
Input resistance
Trigger level low / Trigger level high
Output signal in case of wire break

Output

- Type
Rated switching voltage

Continuous current
Power rating

Relay, 2 NC (voltage-free), Switching frequency 20 Hz
≤ 250 V AC / 30 V DC (safe area)
≤ 32 V AC / 32 V DC (Zone 2)
≤ 2 A AC/DC (safe area, Zone 2 area)
≤ 500 VA / 60 W (safe area)
≤ 16 VA / 32 W (Zone 2)

Alarm output

- Type
Nominal switching voltage

Continuous current
Power rating

Relay, 1 NC (voltage-free)
≤ 125 V AC / 110 V DC (safe area)
≤ 32 V AC / 32 V DC (Zone 2)
≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0.5 A AC / 1 A DC (Zone 2)

≤ 62.5 VA / 32 W (safe area)
≤ 16 VA / 32 W (Zone 2)

General data

- Supply voltage
NAMUR supply
Power consumption
Tightening torque, min. / Tightening torque, max.
Ambient temperature / Storage temperature

Approvals

- Approvals
cULus; DETNRVER; FMEX; GOSTEX; GOSTME25; IECExKEM; KEMAATEX

Insulation coordination

- Insulation voltage
Rated voltage
EMC standards
DIN EN 61326

Dimensions

- Clamping range (nominal / min. / max.)
Length x width x height

Note**Screw connection**

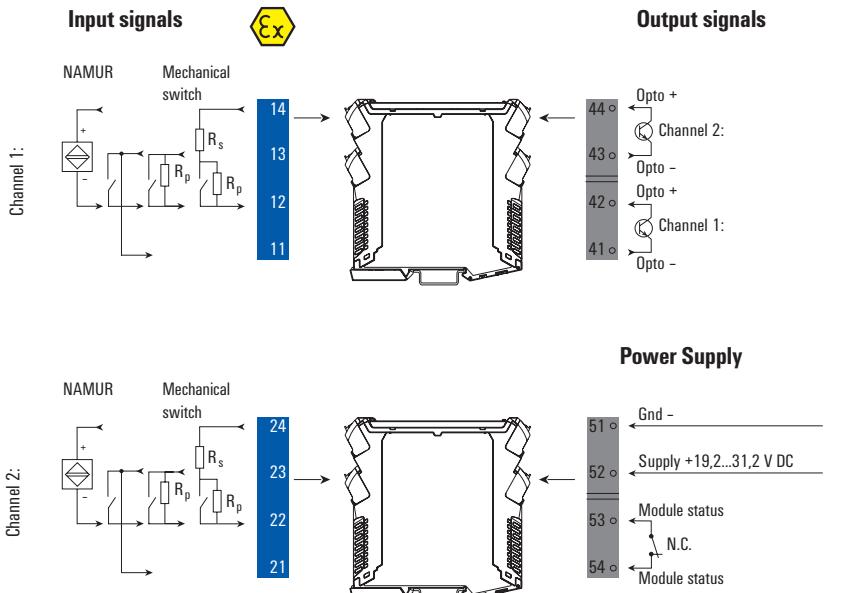
- 2.5 / 0.5 / 2.5
119.2 / 22.5 /

Ordering data

Type	Qty.	Order No.
1-channel version, NO		
ACT20X-HDI-SDO-RNO-S	1 ST	8965340000
1-channel version, NC		
ACT20X-HDI-SDO-RNC-S	1 ST	8965350000
2-channel version, NO		
ACT20X-2HDI-2SDO-RNO-S	1 ST	8965370000
2-channel version, NC		
ACT20X-2HDI-2SDO-RNC-S	1 ST	8965380000
CBX200 USB configuration adapter - 8978580000		

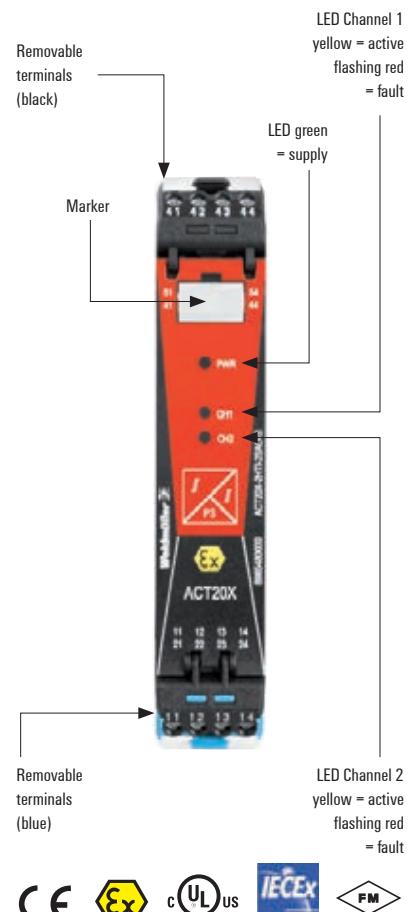
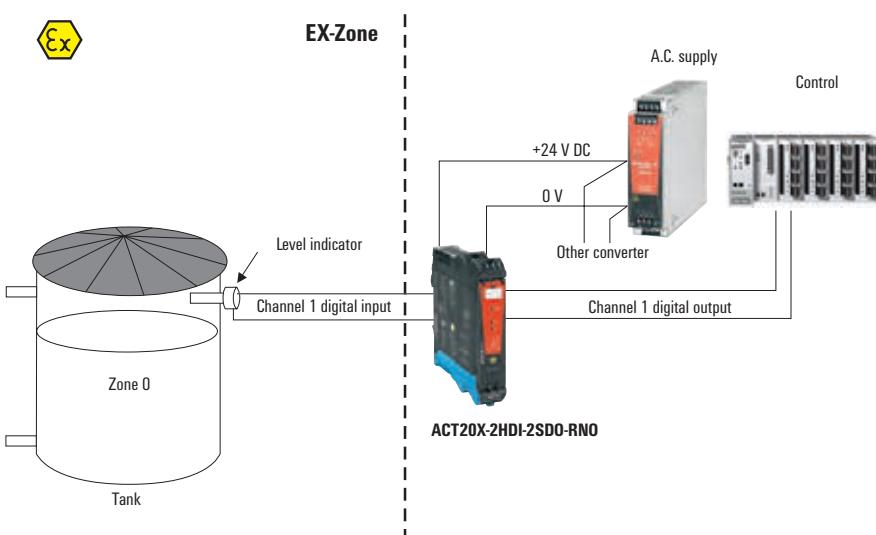
Pulse Isolator, with NPN transistor output.

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)**

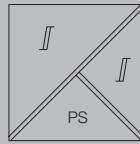
ATEX	FM
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4
II (1) G [Ex ia Ga] IIC/IIB/IIA	KI. HII ABT 1/2 GP A-G oder
II (1) D [Ex id]	KI. I Zn2 AEx/Ex nA nC [ia] IIC T4
IECEx	Example:
Ex nA nC IIC T4 Gc	ATEX version
[Ex ia Ga] IIC/IIB/IIA	Ex input
[Ex ida] IIIC	(More details in ATEX certificate)

U_o	10.6 V
I_o	12 mA
P_o	32 mW
L_o / R_o	1150 μ H/Q
IIC	$C_o = 2 \mu$ F, $L_o = 260$ mH
IIB	$C_o = 6 \mu$ F, $L_o = 780$ mH
IIA	$C_o = 18 \mu$ F, $L_o = 1000$ mH

**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, switch with or without RS, RP
Sensor supply	8 V DC / 8 mA
Resistance	Parallel resistor 15kΩ, Series resistor 750Ω
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 transistor output
Switching frequency	5 kHz
Pulse duration	> 0.1 ms
Rated switching voltage	≤ 30 V DC
Power rating	≤ 80 mA / ≤ 2.4 W
Voltage drop at max. load	< 2.5 V DC
Alarm output	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	≤ 3 W (2 channels)
Supply voltage	19.2 – 31.2 V DC
NAMUR supply	8 V DC / 8 mA
Power consumption	≤ 3 W (2 channels)
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; FMEX; GOSTEX; GOSTME25; IECExKEM; KEMAATEX
Insulation coordination	2.6 kV (input / output)

Insulation coordination

Insulation voltage	300 V
Rated voltage	DIN EN 61326

EMC standards**Dimensions**

Clamping range (nominal / min. / max.)	mm ²
Length x width x height	mm

Note**Screw connection**

2.5 / 0.5 / 2.5
119.2 / 22.5 /

Ordering data

Type	Qty.	Order No.
1-channel version		
ACT20X-HDI-SDO-S	1 ST	8965360000
2-channel version		
ACT20X-2HDI-2SDO-S	1 ST	8965390000

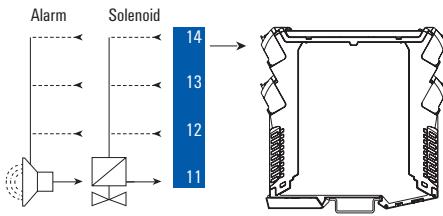
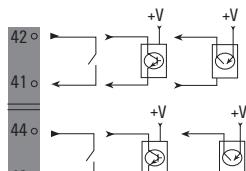
CBX200 USB configuration adapter - 8978580000

Valve control component for gas group IIC, 35 mA

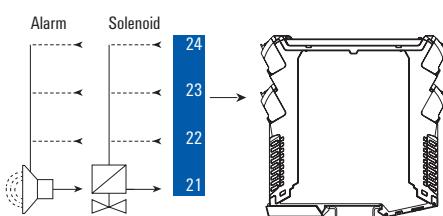
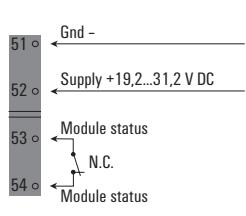
The ACT20X-SDI-HAO-S solenoid/actuator driver takes a switched input from e.g. a safe area controller and delivers an corresponding output to operate an actuator in a hazardous area, e.g. Zone 0. It is available in a single-channel or double-channel version.

EX area Zone 0, 1, 2, 20, 21, 22**Safe area Zone 2 /FM Kl. 1 Abt. 2****Ex-Output Signals**

Channel 1:

**Input signals**

Channel 2:

**Power Supply****Ex label (excerpt)**

ATEX	FM
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4
II (1) G [Ex ia Ga] IIC/IIB/IIA	Kl. II ABT 1/2 GP A-G oder
II (1) D [Ex iaD]	Kl. I Zn2 AEx/Ex nA nC [ia] IIC T4
IECEx	Example: ATEX version
Ex nA nC IIC T4 Gc	AEx version
[Ex ia Ga] IIC/IIB/IIA	Ex Output Terminal (11-14)
[Ex ia Da] IIIC	(More details in ATEX certificate)

U_o	28 V
I_o	100 mA
P_o	0.70 mW
IIC	$C_o = 0.08 \mu F, L_o = 2.9 \text{ mH}$
IIB	$C_o = 0.64 \mu F, L_o = 12.8 \text{ mH}$
IIA	$C_o = 2.1 \mu F, L_o = 22.8 \text{ mH}$

Removable terminals
(black)

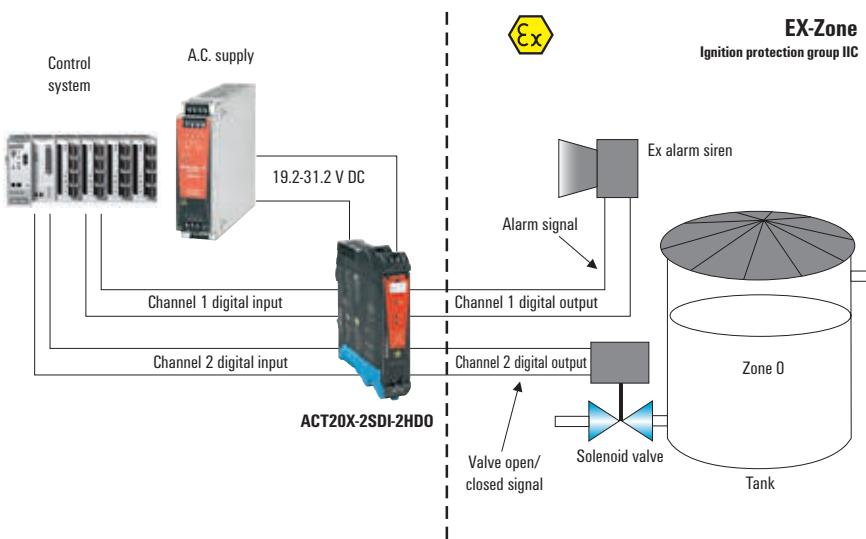
LED Channel 1
yellow = active
red = fault

Marker

LED green
= supply

Removable terminals
(blue)

LED Channel 2
yellow = active
red = fault

CE**cUL US**
LISTED**FM**
APPROVED**Application: Inflow control in Ex zone with gas group IIC****Output data****For gas group IIC ($\leq 35 \text{ mA}$)**

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

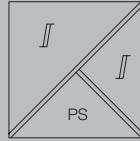
Note**For gas group IIC ($\leq 35 \text{ mA}$)**

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

Note

Valve control module

- 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
Input voltage
Input resistance, voltage
Trigger level low
Trigger level high

Alarm output

Type
Nominal switching voltage
Continuous current
Power rating

General data

Supply voltage
Power consumption
Tightening torque, min. / Tightening torque, max.
Ambient temperature / Storage temperature

Approvals

Approvals

Insulation coordination

Insulation voltage
Rated voltage
EMC standards

NPN, PNP switching signal

≤ 28 V DC

3.5 k Ω

≤ 2.0 V DC (NPN), ≤ 8.0 V DC (PNP)

≥ 4.0 V DC (NPN), ≥ 10 V DC (PNP)

Relay, 1 NC (voltage-free)

≤ 125 V AC / 110 V DC (safe area)

≤ 32 V AC / 32 V DC (Zone 2)

≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0.5 A AC / 1 A DC (Zone 2)

≤ 62.5 VA / 32 W (safe area)

≤ 16 VA / 32 W (Zone 2)

19.2 – 31.2 V DC

≤ 3.5 W (with 2 channels)

0.4 Nm / 0.6 Nm

-20 °C...+60 °C / -20 °C...+85 °C

cULus; DETNORVER; FMEX; GOSTEX; GOSTME25; IECExKEM; KEMAATEX

2.6 kV (input / output)

300 V

DIN EN 61326

Ordering data

Type	Qty.	Order No.
1-channel version		
ACT20X-SDI-HDO-S	1 ST	8965400000
2-channel version		
ACT20X-2SDI-2HDO-S	1 ST	8965420000

CBX200 USB configuration adapter - 8978580000

Dimensions

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

Note**Screw connection**

2.5 / 0.5 / 2.5
119.2 / 22.5 /

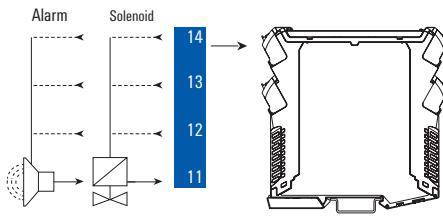
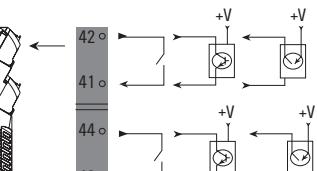
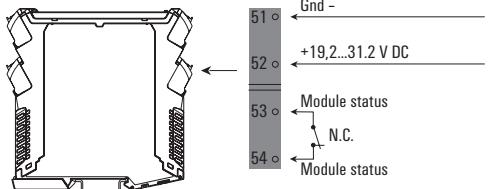
Valve control component for gas group IIB, 60 mA

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 Output Signals**

Channel 1:

**Input Signals****Power supply**

Removable
terminals
(black)

Marker

LED green
= supply

LED



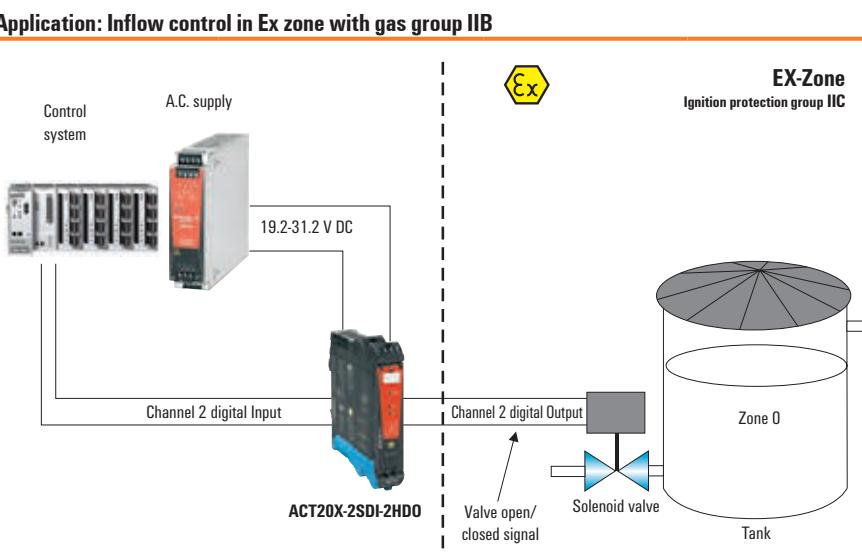
Removable
terminals
(blue)

**Ex label (excerpt)**

ATEX	FM
II 3 G Ex nA nC IIC T4	Installation in CL I DIV2 GP A-D T4
II (1) G [Ex ia Ga] IIC/IIB/IIA	KI. HII ABT 1/2 GP A-G oder
II (1) D [Ex id]	KI. I Zn2 AEx/Ex nA nC [ia] IIC T4
IECEx	Example:
Ex nA nC IIC T4 Gc	ATEX version,
[Ex ia Ga] IIC/IIB/IIA	Ex Output Terminal (11-14)
[Ex ia Da] IIIC	(More details in ATEX certificate)



EX-Zone
Ignition protection group IIC

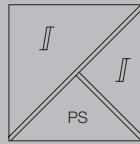
**Output data****For gas group IIB (≤ 60 mA)**

Connection terminal	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

Valve control module

- 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-H-S**Technical data****Input**

Type
Input voltage
Input resistance, voltage
Trigger level low
Trigger level high

NPN, PNP switching signal
≤ 28 V DC
3.5 kΩ
≤ 2.0 V DC (NPN), ≤ 8.0 V DC (PNP)
≥ 4.0 V DC (NPN), ≥ 10V DC (PNP)

Alarm output

Type
Nominal switching voltage
Continuous current

Relay, 1 NC (voltage-free)
≤ 125 V AC / 110 V DC (safe area)
≤ 32 V AC / 32 V DC (Zone 2)
≤ 0.5 A AC / 0.3 A DC (safe zone), ≤ 0.5 A AC / 1 A DC (Zone 2)

General data

Supply voltage
Power consumption
Tightening torque, min. / Tightening torque, max.
Ambient temperature / Storage temperature

19.2 - 31.2 V DC
< 2 W
0.4 Nm / 0.6 Nm
-20 °C...+60 °C / -20 °C...+85 °C

Approvals

Approvals

cULus; DETNORVER; FMEX; GOSTEX; GOSTME25; IECExKEM;

KEMAATEX

Insulation coordination

Insulation voltage
Rated voltage
EMC standards

2.6 kV (input / output)
300 V
DIN EN 61326

Ordering data

Type	Qty.	Order No.
1-channel version	1 ST	8965410000

Dimensions

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

Note**Screw connection**

2.5 / 0.5 / 2.5
119.2 / 22.5 /

CBX200 USB configuration adapter - 8978580000

