## 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, ICEEX, GOST and FM. The newest member of the ACT20X family is the ACT20X-HUI-SA0-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”
Intrinsically safe signal conditioners for hazardous area applications – Overview
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.

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

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.

### Input Signals

**Channel 1:**
- Active or passive sensor

**Channel 2:**
- Active or passive sensor

### Output Signals

- Analogue, 4...20 mA
- 2-wire supply + 4...20 mA
- 2-wire supply –
- 2-wire supply +
- Active or passive output

### Power Supply and Module Status

- Ground (Gnd.)
- Supply +19.2...31.2 V DC
- Module status
- Module status
- Module status
- Module status
- N.C.
- N.C.

### Ex label (excerpt)

- **ATEX:**
  - I 3 G Ex nA nC IIC T4 Gc
  - II (1) D (Ex ia Ga) IIC/IIB/IIA
  - Ex nA nC IIC T4 Gc
  - Example: Ci 2 nF

- **IECEx:**
  - Ex input, External Current Source: (More details in ATEX certificate)
  - IIA Co = 0.08 µF, Lo= 3 mH
  - IIB Co = 2.15 µF, Lo= 25 mH

- **UL:**
  - 0 V / 30 V
  - 0 mA / 120 mA
  - 0 mW / 0.85 W
  - 0 µF

### Application example:

*Measuring temperature with a head transmitter, signal transmission with HART®*

- **EX Zone:**
  - 2 wire HART® head transmitter for temperature
  - 4-20 mA / HART® input
  - Actuated by: +24 V DC
- **A.C. supply:**
  - Control system
- **To other isolators:**
  - Passive input channel
- **ACT20X-HAI-SA0:**
  - 4-20 mA / HART® output
  - 0 V
  - 31.2 V DC
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

Technical data

**Input**
- Input current
- Sensor supply
- Residual ripple (current loop)

**Output analogue**
- Output current
- Output signal limit
- Load impedance current
- 2-wire supply
- Accuracy
- Temperature coefficient
- Step response time
- Cut-off frequency (-3 dB)

**Alarm output**
- Type
- Nominal switching voltage
- Continuous current
- Power rating

**General data**
- Supply voltage
- Power consumption
- Ambient temperature / Storage temperature

**Approvals**
- Approvals
- Insulation coordination
- Insulation voltage
- Rating voltage
- EMC standards

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

**Note**

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-channel version</td>
<td>1</td>
<td>8965430000</td>
</tr>
<tr>
<td>2-channel version</td>
<td>1</td>
<td>8965440000</td>
</tr>
</tbody>
</table>

**ACT20X-HAI-SA0-S / 2HAI-2SA0-S**

- 4...20 mA
- ≤ 20 V DC
- < 7.5 mV
- 3.5 – 23 mA
- < 28 mA
- ≤ 600 Ω
- ≤ 28 V DC
- < 0.1% span
- < 0.01% of span/°C (TU)
- ≤ 5 ms
- 0.5...2.5 kHz @ 3.5...23 mA bi-directional HART® signal
- 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)
- ≤ 10 VA / 32 W (Zone 2)
- 19.2…31.2 V DC
- ≤ 3 W (2 channels)
- -20 °C...+60 °C / -20 °C...+85 °C
- cULus, DERTADEX, DETNORMAR, FMEX, GOSTEX, GOSTME25, IECCEXX
- 2.6 kV (input / output)
- 300 V
- DIN EN 61326

**Screw connection**

- 2.5 / 0.5 / 2.5
- 1136 / 225 /
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**

<table>
<thead>
<tr>
<th>Ex Output signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1: Load 4...20 mA</td>
</tr>
<tr>
<td>passive valve</td>
</tr>
</tbody>
</table>

| Channel 2: Load 4...20 mA |
| passive valve |

**Input signals**

- Analogue, 4...20 mA

**Power Supply and Module Status**

- Gnd.
- Supply +19.2...31.2 V DC
- Module status
- Module status

**Ex label (excerpt)**

- ATEX
  - II 3 G Ex nA nC IIC T4 Gc
  - II (1) D (Ex ia Ga) 1G/IB/IA
  - IECEx
  - Ex nA nC IIC T4 Gc
  - [Ex ia Ga] RC/IB/IA
  - [Ex ia Da] MC

- FM
  - Installation in CL I DIV2 GP A G T4
  - KI: HI ABT 1/2 GP A G or
  - KI: I Zn2 D4x Ex x A C (a) IIC T4

- UL 28 V
- IL 93 mA
- IR 0.65 W
- IC C_a = 0.08 µF, L_a = 4 mH
- IB C_a = 0.05 µF, L_a = 16 mH
- IA C_a = 2.15 µF, L_a = 52 mH

**Application example: controlling an actuator in the Ex zone.**

- Control system
  - A.C. supply
  - +24 V DC
  - 0 V
  - 4-20 mA / HART input
  - Output - Control system

- ACT20X-SAI-HAO
  - +24 V DC
  - 4-20 mA / HART output

- HART valve
  - Actuator
  - Position-transmitter
  - Control valve

- LED Channel 1
  - red = defective, flashing = fault

- LED Channel 2
  - red = inactive, flashing = fault

- Removable terminals (black)
  - Removable terminals (blue)
Intrinsically safe signal conditioners
for hazardous area applications

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.weidmuller.com
- 1 or 2 channels in one module

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

Technical data

Input
- Input current
- Voltage drop

Output analogue
- Output current
- Output signal limit
- Load impedance current
- 2 wire supply
- Residual ripple (current loop)
- Accuracy
- Temperature coefficient
- Step response time
- Cut-off frequency (-3 dB)

Alarm output
- Type
- Nominal switching voltage
- Continuous current
- Power rating

General data
- Supply voltage
- Power consumption
- Ambient temperature / Storage temperature

Approvals

Insulation coordination

Insulation voltage
- Insulation voltage
- EMC standards

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

Note

4…20mA
< 2 V

4…20 mA (max. 23 mA)
< 28 mA
< 600 Ω
> 14.5 V @ 20 mA
< 7.5 mV<sub>eff</sub>
< 0.01% span / °C (TU)
≤ 5 ms
0.5…2.5 kHz @ 3.5…23 mA bi-directional HART® signal

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)
≤ 10 VA / 32 W (Zone 2)
19.2 – 31.2 V DC
≤ 3 W (2 channels)
≤ 20 °C, +60 °C / -20 °C, +85 °C
cULus, DekaATEX, DETONORM, FMEx, GOSTEX, GOSTME25, TCO/OKX
2.6 kV (input / output)
300 V
DIN EN 61326

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>1-channel version</td>
<td>1 ST</td>
<td>8965450000</td>
</tr>
<tr>
<td>2-channel version</td>
<td>1 ST</td>
<td>8965460000</td>
</tr>
</tbody>
</table>

Ordering data

- CBX200 USB configuration adapter: 8978580000
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**

**Input signals**

- Current
- RTD Connection, wires
- TC

**Output signals**

- Analogue, 0/4.20 mA
- 2-wire supply -
- 2-wire supply +

**Supply and module status**

- Supply -
- Supply +19.2÷31.2 V DC

**Ex label (excerpt)**

- ATEX
- II 3 G Ex nA nC IIC T4
- II (1) G (Ex ia) IC/IB/IA
- II (1) D (Ex ad)
- Example:
  - K1.2n2+4=Ex nA nC (a) IC T4
  - UL/UL 8.7 V / 10 V
  - UL/L 18.4 mA / 30 mA
  - Pn 400 mW
  - L/R/L 867 µH / 820 nH
  - C 50 µf
  - IC C = 5 µf, L = 100 mH
  - IB C = 50 µf, L = 300 mH
  - NA C = 1000 µf, L = 700 mH

**Application example: temperature measurements in the Ex zone**

- EX Zone
- Resistance temperature sensor
- Zone 0
- Tank
- Control system
- A.C. supply
- 19.2÷31.2 V

**Accuracy / temperature coefficients**

<table>
<thead>
<tr>
<th>ACT20X-HTI-SAO</th>
<th>Input</th>
<th>Accuracy</th>
<th>Temperature coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input mA</td>
<td>≤ ±4 µA</td>
<td>≤ ±4 µA / °C</td>
<td></td>
</tr>
<tr>
<td>Input RTD Pt100</td>
<td>≤ ±0.2 °C</td>
<td>≤ ±0.02 °C / °C</td>
<td></td>
</tr>
<tr>
<td>Ni100</td>
<td>≤ ±0.3 °C</td>
<td>≤ ±0.03 °C / °C</td>
<td></td>
</tr>
<tr>
<td>Input TC Type B</td>
<td>≤ ±4.5 °C</td>
<td>≤ ±0.45 °C / °C</td>
<td></td>
</tr>
<tr>
<td>Type E, J, K, L, N, T, U</td>
<td>≤ ±1 °C</td>
<td>≤ ±0.1 °C / °C</td>
<td></td>
</tr>
<tr>
<td>Type R, S, W3, W5, LR</td>
<td>≤ ±2 °C</td>
<td>≤ ±0.2 °C / °C</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

Removable terminals (black)

LED green = supply

LED Channel 1 red = defective, flashing = fault

Removable terminals (blue)

LED Channel 2 red = defective, flashing = fault

UL LISTED
**ACT20X-HTI-SAO-S / 2HTI-2SAO-S**

**Technical data**

<table>
<thead>
<tr>
<th>Input</th>
<th>Qty. Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-channel version</td>
<td>ACT20X-HTI-SAO-S</td>
</tr>
<tr>
<td>2-channel version</td>
<td>ACT20X-2HTI-2SAO-S</td>
</tr>
</tbody>
</table>

**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

**Usable as:**

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

**Technical data**

<table>
<thead>
<tr>
<th>Input</th>
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<tr>
<td>1-channel version</td>
<td>ACT20X-HTI-SAO-S</td>
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<td>ACT20X-2HTI-2SAO-S</td>
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**Intrinsically safe signal conditioners for hazardous area applications**

**Technical data**

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**Usable as:**

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

**Technical data**

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<tr>
<td>1-channel version</td>
<td>ACT20X-HTI-SAO-S</td>
</tr>
<tr>
<td>2-channel version</td>
<td>ACT20X-2HTI-2SAO-S</td>
</tr>
</tbody>
</table>

**Usable as:**

- Safety barrier (insulator)
- Signal conversion
- 2-wire measuring transducer
- Amplifier, repeater
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 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**

**Output signals**
- Potential-meter
- RTD and 1/s.R
- TC
- Channel 1:
  -被动传感器
  -被动传感器
  -主动传感器
- Channel 2:
  -当前
  -电压
  -主动或被动传感器
  -被动传感器

**Safe area Zone 2 / FM Class 1, Division 2**

**Input signals**
- Analogue, 0/4–20 mA and relay
- Current, 3 mA
- Relay
  - N.O.
  - N.C.

**Supply and module status**
- Mass –
- Voltage: +19.2…31.2 V DC
- Module status
  - N.O.
  - N.C.

**Ex label (excerpt)**

- ATEX
- FM
  - Installation in CL I DIV2 GP A O T4
  - KI IIIB ABT 1/2 GP A G or
  - KI I 1.2o2.4x7ext.x5: N C (a) IC T4
- IECEx
  - Ex nA nC IIC T4
  - Ex input External Current Source IIB
  - Co = 7 μF
  - Lo = 1000 mH
- Ex nA nC IIC T4 Ga
  - Ex input ATEX version, IIC Co = 7 μF
  - Lo = 1000 mH
- Ex nA nC IIC T4 Gc
  - Ex input External Current Source IIB
  - Co = 73 μF
  - Lo = 1000 mH
- Ex nA nC IIC T4 GC
  - Ex input External Current Source IIB
  - Co = 1000 μF
  - Lo = 1000 mH

**Application example: position measurement of an actuator**

**Accuracy / temperature coefficients**

<table>
<thead>
<tr>
<th>Input</th>
<th>Accuracy</th>
<th>Temperature coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>mA</td>
<td>≤ ±4 μA</td>
<td>≤ ±4 μA/°C</td>
</tr>
<tr>
<td>Volt</td>
<td>≤ ±20 μV</td>
<td>≤ ±2 μV/°C</td>
</tr>
<tr>
<td>RTD</td>
<td>≤ ±4.5 °C</td>
<td>≤ ±4.5 °C/°C</td>
</tr>
<tr>
<td>Ni100</td>
<td>≤ ±0.2 °C</td>
<td>≤ ±0.02 °C/°C</td>
</tr>
<tr>
<td>Pt100</td>
<td>≤ ±0.3 °C</td>
<td>≤ ±0.03 °C/°C</td>
</tr>
</tbody>
</table>

**Note**
- Type E, J, K, L, N, T, U
- Type R, S, W3, W5, LR
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

### Technical data

#### Input

<table>
<thead>
<tr>
<th>Type</th>
<th>Sensor supply</th>
<th>Temperature input range</th>
<th>Line resistance in measuring circuit</th>
<th>Input current</th>
<th>Input voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Potentiometer

- Potentiometer input resistance, voltage/current

- Output analogue

<table>
<thead>
<tr>
<th>Output current</th>
<th>Output signal limit</th>
<th>Load impedance current</th>
<th>Influence of load resistance</th>
<th>Current loop output</th>
<th>Load resistance</th>
<th>Influence of load resistance</th>
<th>2-wire supply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Output digital

- Output type

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
<th>Nominal switching voltage</th>
<th>Continuous current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

#### Alarm output

- Alarm type

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal switching voltage</th>
<th>Continuous current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### General data

- Supply voltage

- Power consumption

- Tightening torque, min. / max.

- Ambient temperature / Storage temperature

#### Approvals

- Approvals

#### Insulation coordination

- Insulation voltage / Rated voltage

#### EMC standards

- DIN EN 61326

#### Dimensions

- Clamping range (nominal / min. / max.)

- Length x width x height

#### Screw connection

- 2.5 / 0.5 / 2.5

### Ordering data

- Type

#### 1-channel version

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>ACT20X-HUI-SA0-S</td>
<td>1 ST</td>
<td>8965480000</td>
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<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
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<tbody>
<tr>
<td>CBX200 USB configuration adapter</td>
<td>1 ST</td>
<td>8978580000</td>
</tr>
</tbody>
</table>

### Note

**ACT20X-HUI-SA0-S**

- Intrinsically safe signal conditioners for hazardous area applications

- **ACT20X**

### Useable as:

- Safety barrier (insulator)

- Signal conversion

- 2-wire measuring transducer

- Amplifier, repeater
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**

**Input signals**

<table>
<thead>
<tr>
<th>PT1</th>
<th>RTD/RUS (2wire)</th>
<th>TC</th>
<th>mA</th>
<th>Volt</th>
</tr>
</thead>
</table>

**Output signals**

<table>
<thead>
<tr>
<th>11</th>
<th>12</th>
<th>21</th>
<th>22</th>
</tr>
</thead>
</table>

- 30 ≤ Ta ≤ +90 °C

**Ex label**

ATEX

II 3 G Ex nA nC T4

II (1) G (Ex ia) IC/IIIA

IECEx

Ex nA IC T4 Gc

Example: IECEx version

Ex nA IIC T4 Gc

Example: IECEx certificate

**Application example: Temperature measurement in the EX-zone**

<table>
<thead>
<tr>
<th>EX Zone</th>
<th>Safe Zone</th>
</tr>
</thead>
</table>

**Accuracy / temperature coefficients**

<table>
<thead>
<tr>
<th>Input</th>
<th>Accuracy</th>
<th>Temperature coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>mA</td>
<td>≤ ±4 μA</td>
<td>≤ ±4 μA / °C</td>
</tr>
<tr>
<td>Volt</td>
<td>≤ ±20 μV</td>
<td>≤ ±2 μV / °C</td>
</tr>
<tr>
<td>RTD</td>
<td>≤ ±4.5 °C</td>
<td>≤ ±0.45 °C / °C</td>
</tr>
<tr>
<td>Type B</td>
<td>≤ ±4.5 °C</td>
<td>≤ ±0.45 °C / °C</td>
</tr>
</tbody>
</table>

**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.weidmüller.com

**Technical data**

**Input**
- Type
- Temperature input range
- Input current
- Input voltage
- Potentiometer
- Input resistance, voltage/current

**Output analogue**
- Output current
- Load impedance current (output loop)
- Accuracy
- Temperature coefficient
- Step response time
- Cut-off frequency (-3 dB)

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

**Approvals**
- Approvals
- Insulation coordination
  - Insulation voltage / Rated voltage
  - EMC standards

**Inputs**

<table>
<thead>
<tr>
<th>Type</th>
<th>Thermocouples (TC), RTD, mA, Volt, mV, resistor, potentiometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Lower limit</td>
</tr>
<tr>
<td>E</td>
<td>IEC584</td>
</tr>
<tr>
<td>J</td>
<td>IEC584</td>
</tr>
<tr>
<td>L</td>
<td>DIN43710</td>
</tr>
<tr>
<td>N</td>
<td>-180 °C</td>
</tr>
<tr>
<td>R_S</td>
<td>IEC584</td>
</tr>
<tr>
<td>T</td>
<td>IEC584</td>
</tr>
<tr>
<td>U</td>
<td>DIN43710</td>
</tr>
</tbody>
</table>

**User-defined Input**
- Up to 101 values
- Upper error signalling value: 23 mA
- Lower error signalling value: 3.5 mA

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>Min. area</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT100</td>
<td>0 to 1200 °C</td>
<td>0 to 1200 °C</td>
<td>100 °C</td>
<td></td>
</tr>
<tr>
<td>PT1000</td>
<td>0 to 1200 °C</td>
<td>0 to 12000 °C</td>
<td>1000 °C</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>0 to 1200 °C</td>
<td>0 to 12000 °C</td>
<td>15 °C</td>
<td></td>
</tr>
<tr>
<td>Cu10</td>
<td>0 to 1200 °C</td>
<td>0 to 12000 °C</td>
<td>100 °C</td>
<td></td>
</tr>
</tbody>
</table>

**Resistance**
- User-defined Input
  - Up to 101 values
- 0 to 12 kΩ: 500 Ω
- 0 to 15 kΩ: 100 Ω
- 0 to 750 Ω: 50 Ω

**Potentiometer**
- 1.2 kΩ to 500 kΩ

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT20X-HUI-SAO-LP-S</td>
<td>1 ST</td>
<td>1318220000</td>
</tr>
</tbody>
</table>

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

**Screw connection**
- 2.5 / 0.5 / 2.5
- 11.9 / 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

#### Input signals

<table>
<thead>
<tr>
<th>Channel 1:</th>
<th>Channel 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMUR</td>
<td>NAMUR</td>
</tr>
<tr>
<td>Mechanical switch</td>
<td>Mechanical switch</td>
</tr>
</tbody>
</table>

#### Output signals

<table>
<thead>
<tr>
<th>Relay</th>
<th>Channel 2:</th>
<th>N.O. or N.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Channel 1:</td>
<td>N.O. or N.C.</td>
</tr>
</tbody>
</table>

#### Power supply

<table>
<thead>
<tr>
<th>Supply</th>
<th>+19.2...31.2 V DC</th>
</tr>
</thead>
</table>

#### Ex label (excerpt)

<table>
<thead>
<tr>
<th>ATEX</th>
<th>FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 3 G Ex na nC IC T4</td>
<td>Installation in CLI DIV2 GP A G T4</td>
</tr>
<tr>
<td>II 1 G (Ex ia Ga) IIC/III A</td>
<td>K1 IIB A &amp; T2 G A-G color</td>
</tr>
<tr>
<td>II 1 G (Ex ia Ga)</td>
<td>KI.1 Zn2 A &amp; T2 A G nC (a) IC T4</td>
</tr>
<tr>
<td>IECEx</td>
<td>Example:</td>
</tr>
<tr>
<td>Ex na nC IC T4 Gc</td>
<td>ATEX version,</td>
</tr>
<tr>
<td>[Ex ia Ga] IIC/III A</td>
<td>Ex input</td>
</tr>
<tr>
<td>[Ex ia Ga] MC</td>
<td>(More details in ATEX certificate)</td>
</tr>
</tbody>
</table>

**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

Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensor supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input frequency</td>
<td></td>
<td></td>
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<tr>
<td>Pulse duration</td>
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<td></td>
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<tr>
<td>Input resistance</td>
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<td></td>
</tr>
<tr>
<td>Trigger level low / Trigger level high</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output signal in case of wire break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Type</td>
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<td></td>
</tr>
<tr>
<td>Rated switching voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power rating</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarm output</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal switching voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power rating</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAMUR supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tightening torque, min. / Tightening torque, max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature / Storage temperature</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approvals</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Approvals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Insulation coordination</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC standards</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordering data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Qty.</td>
<td>Order No.</td>
</tr>
<tr>
<td>1-channel version, NO</td>
<td>1</td>
<td>ACT20X-HDI-SDO-RNO-S</td>
</tr>
<tr>
<td>1-channel version, NC</td>
<td>1</td>
<td>ACT20X-HDI-SDO-RNC-S</td>
</tr>
<tr>
<td>2-channel version, NO</td>
<td>1</td>
<td>ACT20X-2HDI-2SDO-RNO-S</td>
</tr>
<tr>
<td>2-channel version, NC</td>
<td>1</td>
<td>ACT20X-2HDI-2SDO-RNC-S</td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping range (nominal / min. / max.)</td>
<td>mm²</td>
<td></td>
</tr>
<tr>
<td>Length x width x height</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

Note

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

NAMUR sensor, according to EN60947, switch with or without RG, RP
8 V DC / 8 mA
RP = 750 Ω / RS = 15kΩ
0...5 kHz
> 0.1 ms
1 kΩ
< 1.2 mA / > 2.1 mA
< 0.1 mA, > 6.5 mA (in case of wire break)

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 / 80 W (safe area)
≤ 16 VA / 32 W (Zone 2)

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 area), ≤ 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
8 V DC / 8 mA
≤ 3 W (2 channels)
0.4 Nm / 0.6 Nm
20 °C +60 °C / -20 °C +85 °C
cUL, DETNORVER, FMEX, GOSTEX, GOSTMEX; ICExKEX; KEMAATEX
2.6 kV (input / output)
300 V
DIN EN 61326

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**

**Input signals**
- NAMUR switch
- Mechanical switch

**Output signals**
- Opto +
- Opto -
- Opto +
- Opto -

**Power Supply**
- Gnd –
- Supply +19.2...31.2 V DC

**Ex label (excerpt)**
- ATEX
  - II 3 G Ex na nC IIC T4
  - II (1) G (Ex ia Ga) IC/IB/IA
  - II (1) D (Ex iaD)

- FM
  - Installation in CL1 DIV2 GP A O T4
  - KI: IIB ABT 1/2 GP A-G oder
  - KI: I 2n2 4Xy/Ex na nC (a) IC T4

- ECEx
  - Ex nA nC IIC T4 Gc
  - Ex Ga IC/IB/IA
  - Ex Ga IC

- Example
  - Co = 2 µF, L= 260 mH
  - Co = 6 µF, L= 780 mH
  - Co = 18 µF, L= 1000 mH

- IECEx
  - Example: IIC Co = 2 µF, L= 260 mH
  - IECEx version IIB Co = 18 µF, L= 1000 mH
  - IECEx version IIIC (More details in ATEX certificate)

**Application: monitoring the fill level with isolating switching amplifier**

**ACT20X**
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

### 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: < 1.2 mA / > 2.1 mA
- Trigger level low / Trigger level high: < 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: ≤ 0.8 mA / ≤ 2.4 W
- Voltage drop at max. load: ≤ 2.5 V DC
- Output signal in case of wire break: ≤ 0.25 V DC

#### Alarm output
- Type: Relay, 1 NC (voltage-free)
- Nominal switching voltage: ≤ 125 V AC / 110 V DC (safe area)
- Power rating: ≤ 0.5 A AC / 0.3 A DC (safe area), ≤ 0.5 A AC / 1 A DC (Zone 2)
- Continuous current: ≤ 62.5 VA / 32 W (safe area)
- Voltage drop at max. load: ≤ 16 VA / 32 W (Zone 2)

#### General data
- Power consumption: ≤ 3 W (2 channels)
- Supply voltage: 19.2 – 31.2 V DC
- NAMUR supply: ≤ 3 W (2 channels)
- Power consumption: ≤ 0.4 Wm / 0.6 Wm
- Tightening torque, min. / Tightening torque, max.: -20 °C...+60 °C / -20 °C...+85 °C
- Ambient temperature / Storage temperature: ≤ 90 °C, ≤ 90 °C
- Approvals: cULus; DETNORVER; FMEX; GOSTEX; GOSTME25; IECEXKEM; KEMAATEX
- Insulation coordination: 2.6 kV (input / output)
- Insulation voltage: 300 V
- Rated voltage: 2.5 / 0.5 / 2.5
- EMC standards: DIN EN 61326

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Qty.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-channel version</td>
<td>ACT20X-HDI-SDO-S</td>
<td>1 ST</td>
</tr>
<tr>
<td>2-channel version</td>
<td>ACT20X-2HDI-2SDO-S</td>
<td>1 ST</td>
</tr>
</tbody>
</table>

Note: CBX200 USB configuration adapter - 8976580000
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

**Ex-Output Signals**

- Alarm
- Solenoid

**Power Supply**

- Gnd
- Supply +19.2...31.2 V DC

### Save area Zone 2 / FM Kl. 1 Abt. 2

**Input signals**

- Channel 1
- Channel 2

**Output data**

**For gas group IIC (≤ 35 mA)**

<table>
<thead>
<tr>
<th>Connection terminal</th>
<th>U without load</th>
<th>U with load</th>
<th>I max</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-12</td>
<td>Min. 24 V</td>
<td>Min. 12.5 V</td>
<td>35 mA</td>
</tr>
<tr>
<td>11-13</td>
<td>Min. 24 V</td>
<td>Min. 13.5 V</td>
<td>35 mA</td>
</tr>
<tr>
<td>11-14</td>
<td>Min. 24 V</td>
<td>Min. 14.5 V</td>
<td>35 mA</td>
</tr>
</tbody>
</table>

### Example: Inflow control in Ex zone with gas group IIC

**Application:**

- Control system
- A.C. supply
- Channel 1 digital input
- Channel 2 digital input
- 19.2...31.2 V DC
- ACT20X-2SDI-2HDO
- Valve open/closed signal
- Zone 0
- Tank

**Output data**

**For gas group IIC (≤ 35 mA)**

<table>
<thead>
<tr>
<th>Connection terminal</th>
<th>U without load</th>
<th>U with load</th>
<th>I max</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-22</td>
<td>Min. 24 V</td>
<td>Min. 12.5 V</td>
<td>35 mA</td>
</tr>
<tr>
<td>21-23</td>
<td>Min. 24 V</td>
<td>Min. 13.5 V</td>
<td>35 mA</td>
</tr>
<tr>
<td>21-24</td>
<td>Min. 24 V</td>
<td>Min. 14.5 V</td>
<td>35 mA</td>
</tr>
</tbody>
</table>

**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

Technical data

<table>
<thead>
<tr>
<th>Input</th>
<th>Type</th>
<th>Input voltage</th>
<th>Trigger level low</th>
<th>Trigger level high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input resistance, voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm output</td>
<td>Type</td>
<td>Nominal switching voltage</td>
<td>Continuous current</td>
<td>Power rating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tightening torque, min. / max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature / Storage temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approvals</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Approvals</td>
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</tr>
<tr>
<td>Insulation coordination</td>
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<tr>
<td>Insulation voltage</td>
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<td>Rated voltage</td>
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<tr>
<td>EMC standards</td>
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<tr>
<td>Dimensions</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw connection</td>
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Ordering data

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<tr>
<th>Type</th>
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<td>ACT20X-SDI-HDO-L-S</td>
<td>1 ST</td>
<td>8965400000</td>
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<tr>
<td>ACT20X-2SDI-2HDO-S1 ST</td>
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<td>8965420000</td>
</tr>
<tr>
<td>CBX200 USB configuration adapter</td>
<td></td>
<td>8978580000</td>
</tr>
</tbody>
</table>
ACT20X

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)**

<table>
<thead>
<tr>
<th>ATEX</th>
<th>FM</th>
<th>U_L</th>
<th>I_A</th>
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</thead>
<tbody>
<tr>
<td>II 3 G Ex na nC IIC T4</td>
<td>Installation in CL I DIV2 GP A O T4</td>
<td>28 V</td>
<td>135 mA</td>
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<tr>
<td>II (1) G (Ex ia Ga) IIC1IB/IA</td>
<td>Kl. IIIB ABT 1/2 GP A G referer</td>
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<td>II (1) (Ex ad)</td>
<td>Kl. I 2n2.A4x/Ex nC (a) IIC T4</td>
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<td>IECex</td>
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<td>Ex nA nC IIC T4 Gc</td>
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<td>[Ex ia Ga] IIC1IB/IA</td>
<td>Ex Output Terminal (11-14)</td>
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<td>[Ex ia Da] IIC</td>
<td>(More details in ATEX certificate)</td>
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**Application: Inflow control in Ex zone with gas group IIB**

**Output data**

For gas group IIB (≤ 60 mA)

<table>
<thead>
<tr>
<th>Connection terminal</th>
<th>Channel 1</th>
<th>U without load</th>
<th>U with load</th>
<th>I_max</th>
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<tbody>
<tr>
<td>11-12</td>
<td>Min. 24 V</td>
<td>Min. 9 V</td>
<td>60 mA</td>
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<tr>
<td>11-13</td>
<td>Min. 24 V</td>
<td>Min. 11.5 V</td>
<td>60 mA</td>
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<td>11-14</td>
<td>Min. 24 V</td>
<td>Min. 11 V</td>
<td>60 mA</td>
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</tbody>
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**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

<table>
<thead>
<tr>
<th>Input</th>
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Cable configuration adapter - 8978580000

Ordering data

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<tr>
<td>1-channel version</td>
<td>ACT20X SDI-HDO-H-S</td>
<td>1 ST</td>
</tr>
</tbody>
</table>

Note

Dimensions

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

Screw connection

2.5 / 0.5 / 2.5
11.2 / 22.5 /