



# ACT20X

Manual



## Revision History

Version	Date	Change
0.0	02/2009	First Edition
1.0	12/2011	Further products complemented
2.0	02/2014	Updating of ATEX and IEC labeling Further products complemented
3.0	05/2014	Updating of application illustrations
4.0	09/2014	Application illustrations 7-6, 7-12, 7-17 corrected
5.0	11/2014	Updating of product pictures
6.0	03/2015	Application illustration 7-3 corrected
7.0	06/2016	Mounting illustrations Appendix G corrected
8.0	12/2018	PUSH IN product variants supplemented, various updates

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# 1. Approvals

## 1.1 CE

These products fulfill the guidelines issued by the European Union and are therefore entitled to carry the CE mark.



DEKRA Certification B.V.

## 1.2 EMC

In accordance with:

- EN 61326-1:2006

## 1.3 LVD

In accordance with:

- EN 61010-1:2010

## 1.4 UL

In accordance with:

- UL 61010-1



## 1.5 ATEX

In accordance with:

- EN 60079-0:2012
- EN 60079-11:2012
- EN 60079-15:2010
- EN 60079-26:2007

ATEX marking:

II (1) G [Ex ia Ga] IIC/IIB/IIA  
II 3 G Ex nA nC IIC T4 Gc

II (1) D [Ex ia Da] IIIC

I (M1) [Ex ia Ma] I



## 1.6 IECEx

In accordance with:

- IEC 60079-0:2011
- IEC 60079-11:2011
- IEC 60079-15:2010
- IEC 60079-26:2007

IECEx marking:

Ex nA nC IIC T4 Gc

[Ex ia Ga] IIC/IIB/IIA

[Ex ia Da] IIIC

[Ex ia Ma] I

## 1.7 cFMus

In accordance with:

### Canada

- |             |                |
|-------------|----------------|
| - E60079-0  | - CSA 22.2-157 |
| - E60079-11 | - CSA 22.2-213 |
| - E60079-15 |                |

### USA

- |               |          |
|---------------|----------|
| - UL 60079-0  | - FM3600 |
| - UL 60079-11 | - FM3610 |
| - UL 60079-15 | - FM3611 |
|               | - FM3810 |

cFMus marking:

Install in CL I DIV2 GP A-D T4

Provides IS circuits to CL I-III DIV 1/2 GP A-G or  
CL I Zn2 AEx/Ex nA nC [ia] IIC T4.



## 1.8 SIL



## 1.9 EAC



## 1.10 DNV-GL



## 2. Warranty Statement

### 2.1 36 Months Warranty

Weidmüller gives a 36 months warranty on the product in accordance with the warranty terms as described in the general business conditions of the Weidmüller company which has sold the products to you.

Weidmüller guarantees that defects which have already existed at the time when the risk passed will be repaired by Weidmüller free of charge or Weidmüller will provide a new, functionally equivalent product to replace the defective one.

The warranty referred to above covers Weidmüller products. Unless otherwise expressly stated in this catalogue/product description, Weidmüller gives no warranty or guarantee as to the interoperability in specific systems or the fitness for any particular purpose. To the extent permitted by law, any claims for damages and reimbursement of expenses, based on whatever legal reason, including contract or tort, shall be excluded.

Unless otherwise expressly stated in this warranty, the general business conditions and the expressive liability commitments therein of the respective Weidmüller company which has sold the products to you are applicable.

## 3. Safety Instructions

### 3.1 Approved Use

This product is intended for use in applications as described in the operating instructions only.

Any other utilization is not permitted and can lead to accidents or destruction of the device.

Using the device in non-approved applications will immediately void all guarantee and warranty claims on the part of the operator against the manufacturer.

### 3.2 Qualified Personnel

These operating instructions are intended for trained and qualified personnel that is familiar with the valid regulations and standards relevant to the field of application.

### 3.3 Accuracy of the Technical Documentation

This manual was written with due care and attention.

However, unless otherwise required by law, we do not guarantee that the data, images and drawings are accurate or complete nor do we accept liability for their contents.

Weidmüller's general business conditions apply in their respective valid form. They are subject to alteration without notice.


### 3.4 Liability


To the extent that instructions in this manual are not strictly observed, the customer cannot advance a demand against Weidmüller that would otherwise exist according to the concluded sales agreement.


### 3.5 Definitions

- Hazardous voltages have been defined as the ranges: 75...1500 V DC and 50...1000 V AC.
- Technicians are qualified persons trained to mount, operate and troubleshoot technically correct and in accordance with safety regulations.
- Operators, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.


### 3.6 Symbol Identification


	<b>DANGER</b> Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------


	<b>WARNING</b> Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------


	<b>CAUTION</b> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------

<b>NOTICE</b> Indicates a situation that may result in material damage.	
----------------------------------------------------------------------------	--


	The CE mark proves the compliance of the module with the essential requirements of the directives.
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------

	Ex modules have been approved according to the ATEX directive for use in connection with installations in explosive areas.
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------

	This symbol is combined with one of the signal words DANGER, WARNING or CAUTION to indicate a hazardous situation.
-------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------

	The double insulation symbol shows that the device is protected by double or reinforced insulation..
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------

### 3.7 Electrical Precautions

	<b>WARNING</b> High voltage! <ul style="list-style-type: none"> <li>Before removing or mounting the unit, turn off power supply.</li> </ul> Follow ESD installation regulations, including EMI precautions.
-----------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 3.8 General Instructions

- Read and follow all instructions in this manual.
- Inform yourself about hazards which can be caused by the product.
- Observe the safety and accident prevention regulations.
- Regularly check that all measures to prevent accidents are being complied with.
- Only operate the product if it is in perfect technical condition, according to its intended use, in awareness of safety and risks and in adherence to the instructions in this manual.
- Keep this manual and all other applicable documents complete, legible and accessible to personnel at all times.
- Refrain from any procedures and actions that would expose personnel or third parties to any risk.



## 4. Introduction

### 4.1 Product Description

#### 4.1.1 Product Family ACT20X

Order No.	Type	Description	Function
8965340000 2456050000	ACT20X-HDI-SDO-RNO-S ACT20X-HDI-SDO-RNO-P	NAMUR pulse isolator – relay NO	NAMUR in (from Ex) to relay out
8965350000 2456060000	ACT20X-HDI-SDO-RNC-S ACT20X-HDI-SDO-RNC-P	NAMUR pulse isolator – relay NC	NAMUR in (from Ex) to relay out
8965360000 2456070000	ACT20X-HDI-SDO-S ACT20X-HDI-SDO-P	NAMUR pulse isolator	NAMUR in (from Ex) to digital out
8965370000 2456080000	ACT20X-2HDI-2SDO-RNO-S ACT20X-2HDI-2SDO-RNO-P	2-channel NAMUR pulse isolator – relay NO	2x NAMUR in (from Ex) to 2x relays out
8965380000 2456090000	ACT20X-2HDI-2SDO-RNC-S ACT20X-2HDI-2SDO-RNC-P	2-channel NAMUR pulse isolator – relay NC	2x NAMUR in (from Ex) to 2x relays out
8965390000 2456100000	ACT20X-2HDI-2SDO-S ACT20X-2HDI-2SDO-P	2-channel NAMUR pulse isolator	2x NAMUR in (from Ex) to 2x digital out
8965400000 2456110000	ACT20X-SDI-HDO-L-S ACT20X-SDI-HDO-L-P	Solenoid/alarm driver, L = low current max. 35 mA	digital in to safe digital out (to Ex IIC)
8965410000 2456120000	ACT20X-SDI-HDO-H-S ACT20X-SDI-HDO-H-P	Solenoid/alarm driver, H = high current max. 60 mA	digital in to safe digital out (to Ex IIB)
8965420000 2456130000	ACT20X-2SDI-2HDO-S ACT20X-2SDI-2HDO-P	2-channel Solenoid/alarm driver, L = low current max. 35 mA	2x digital in to 2x safe digital out (to Ex)
8965430000 2456140000	ACT20X-HAI-SAO-S ACT20X-HAI-SAO-P	HART-transparent repeater	mA in (from Ex) to mA out with HART transparency
8965440000 2456150000	ACT20X-2HAI-2SAO-S ACT20X-2HAI-2SAO-P	2-channel HART-transparent repeater	2x mA in (from Ex) to 2x mA out with HART transparency
8965450000 2456160000	ACT20X-SAI-HAO-S ACT20X-SAI-HAO-P	HART-transparent driver	mA in to mA out (to Ex) with HART transparency
8965460000 2456170000	ACT20X-2SAI-2HAO-S ACT20X-2SAI-2HAO-P	2-channel HART-transparent driver	2x mA in to 2x mA out (to Ex) with HART transparency
8965470000 2456180000	ACT20X-HTI-SAO-S ACT20X-HTI-SAO-P	Temperature/mA converter	temperature in (from Ex) to mA out
8965480000 2456190000	ACT20X-2HTI-2SAO-S ACT20X-2HTI-2SAO-P	2-channel Temperature/mA converter	2x temperature in (from Ex) to 2x mA out

8965490000 2456200000	ACT20X-HUI-SAO-S ACT20X-HUI-SAO-P	Universal converter	universal analog in (from Ex) to analog (V / mA) + trip relay out
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*Table 4-1: Family ACT20X*

### 4.1.2 General Description

Weidmüller's ACT20X – new signal converters for hazardous areas: Universal family of products covers the entire field of hazardous area applications with six different basic functions.

With the introduction of its ACT20X modules Weidmüller is offering a completely new family of signal converters for hazardous area applications. With just 11 mm per channel these compactly designed modules require very little space in the electrical cabinet. All ACT20X converters can be configured via a PC utilizing the software "WI-Manager". This software is based on vendor-neutral FDT/DTM technology. The innovative modules are designed to be installed in safe or hazardous areas of Zone 2. The ACT20X family includes digital and analogue intrinsically safe converters that both isolate and convert signals from as well as into hazardous areas. The innovative signal converters process 2-wire HART, NAMUR, RTD, thermocouple or DC signals as well as digital signals with electrical connection to hazardous area Zone 0. All modules have 3-way separation and are optionally available with dual channel functionality. With high levels of insulation resistance, accuracy and thermal stability ACT20X modules provide a pure, disturbance free signal at all times. A relay-based error monitoring facility simplifies servicing. ACT20X modules can be utilized in temperatures from -20 °C to +60 °C without restrictions. They have all relevant international approvals such as ATEX, IECEx, FM – in other words, the modules are predestined for use in applications all over the world.

Utilizing the "WI-Manager" configuration software based on FDT technology (Field Device Tool) makes it possible to adapt all ACT20X products via a PC to meet different process application requirements. For this purpose Weidmüller provides the Device Type Manager (DTM), which can be executed in any FDT-based frame application. As well as fast and error-free parameterization of individual devices DTMs make it possible to evaluate measurement and diagnostic data. In addition, it is possible to unambiguously identify a connected device via DTM.

ACT20X modules are equipped with a cleverly designed connection technology that supports

simple, coded mating. The integrated release lever ensures the connection can be disconnected without damage when servicing is required. Devices from the ACT20X family have been designed to operate in an ambient temperature range of -20 °C to +60 °C – in other words in practically all fields of industry. The hinged and transparent front plate can easily be opened upwards. It has been designed for simple accommodation of device markers.

Products from the ACT20X assortment are designed to be installed in Zone 2 / Division 2 or in non-hazardous areas; international approvals such as ATEX, IECEx and FM (Class I, Division 1 and 2) allow processing of signals from Zone 0 / Division 1. Put succinctly, the modules are suitable for use in applications across the globe.

### 4.1.3 The Six Basic Module Types in Detail

#### NAMUR Pulse Isolator

The pulse isolator ACT20X-HDI-SDO is a special signal isolator/converter for NAMUR sensor signals from within Ex Zone 0. Transistor or relay outputs are available on the output side.

A dual-channel version is optionally available.

#### Solenoid/Alarm Driver

The ACT20X-SDI-HDO is a solenoid/alarm driver for the control of solenoids, acoustic alarms and LEDs mounted in the hazardous area (Ex Zone 0).

Optionally one or two channel versions available.

#### HART-Transparent Repeater

The ACT20X-HAI-SAO current supply isolator is a HART-protocol, transparent isolator for analogue input signals from Exzone 0. The input may also operate as an active current loop (the loop current provided by the device). It provides an 4...20 mA current signal for the safe zone on the output side.

It is available in a single-channel or two-channel version.

#### HART-Transparent Driver

The ACT20X-SAI-HAO is a HART-protocol, transparent current output isolator. A DC current input signal from the safe area will be galvanically separated and drives controlled field devices in Ex zone 0.

It is available in a single-channel or two-channel version.

#### Temperature/mA Converter

The devices of the ACT20X-HTI-SAO family transmit analog signals galvanic isolated from hazardous areas to the safe area. The input circuits are designed intrinsically safe.

The ACT20X-HTI-SAO converts and isolates current and temperature sensor signals (mA, RTD and TC). The two-channel version ACT20X-2HTI-2SAO can be used as a signal splitter for mA signals.

For the higher accuracy of thermo couple signals, the use of special cold junction terminals ACT20X-CJC-HTI-S (PRT 11 = 1-channel, PRT 21 = 2-channel) recommended

#### Universal Converter

The universal isolator/converter ACT20X-HUI-SAO is a user configurable temperature and signal converter for Pt100, thermal and current (mA) inputs from within Ex Zone 0 as well as an output for non-hazardous area devices.

The ACT20X-HUI-SAO converts and isolates current, voltage, potentiometer and temperature sensor signals (mA, V, potentiometer, RTD and TC).

For the higher accuracy of thermocouple signals, the use of special cold junction terminal ACT20X-CJC-HTI-S is recommended:

1160640000 ACT20X-CJC-HTI-S PRT 11 (1-chan.)


#### Features


- Full functionality interfacing with Zone 0 / Division 1 hazardous area inputs and outputs
- Approvals include use for Zone 0 (IECEX, ATEX), Class I, Division 1 and 2 (FM).
- Analogue and binary signal interfacing with measurement and control devices.

Temperature, DC, resistance and potentiometer

- inputs
- Milliamp and relay/opto outputs
- High quality, 3-port isolation
- Dual channel options – minimizes rail space and installation cost
- HART-transparent signaling
- Integral fault alarm
- -20 to +60 °C ambient temperature
- All modules configurable with FDT/DTM Software "WI-Manager"

## 5. Installation

	<b>DANGER</b>
	<p>Risk of explosion!</p> <ul style="list-style-type: none"> <li>• For installation in Zone 2, install the module in an outer enclosure with IP protection of at least IP54.</li> <li>• Protection must be according to type of protection Ex-n or Ex-e.</li> </ul>

	<b>WARNING</b>
	<p>High voltage!</p> <ul style="list-style-type: none"> <li>• Before removing or mounting the unit, turn off power supply.</li> </ul>

<b>NOTICE</b>
<p>Material damage through ESD!</p> <ul style="list-style-type: none"> <li>• Only carry out the following procedures under ESD-safe conditions.</li> </ul>

### 5.1 General

This product should only be installed by technically qualified personnel with sufficient training in instrumentation and control engineering.

VDE 0105 Part 1 / DIN EN 50110-1 defines qualified personnel as electrically skilled workers, electronically instructed personnel or personnel meeting similar local standards.

#### 5.1.1 Environment

This product is designed for use either indoors (IP20) in a control panel, or in a weather-proof field enclosure.

- Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock as well as rain and heavy moisture.
- If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by ventilation.
- Product must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.
- Product is designed to be safe at least under an altitude of up to 2000 m.

### 5.2 Unpacking

- 1 Check on receipt that the product received corresponds to the one ordered.
  - 2 Also make sure that installation instructions have been supplied.
  - 3 Unpack the product carefully.
- The use of stranded wires is not permitted for mains wiring except for wires fitted with cable ends.
  - Descriptions of input/output and supply connections are shown in the block diagram and on the side label.
  - The module is provided with field wiring terminals and must be supplied from a power supply having double/reinforced insulation.
  - A power switch must be easily accessible and close to the module.
  - The power switch must be marked with a label telling that it will switch off the voltage to the module.
  - Year of manufacture can be taken from the first two digits in the serial number.
  - Should there be any doubt as to the correct handling of the module, contact your local distributor.

### 5.3 Mounting

The product is designed to be mounted onto a TS 35 DIN rail.

It clips onto the rail via a spring-loaded mounting foot and can be removed via a spring release on the edge of the product near the mounting rail.

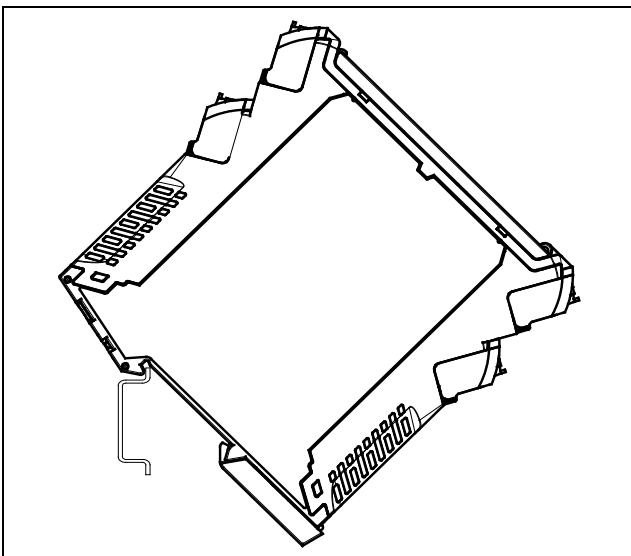


Illustration 5-1: Mounting, Step 1

### 5.4 Marking

A device marker is located below the upper set of terminals for customer identification.

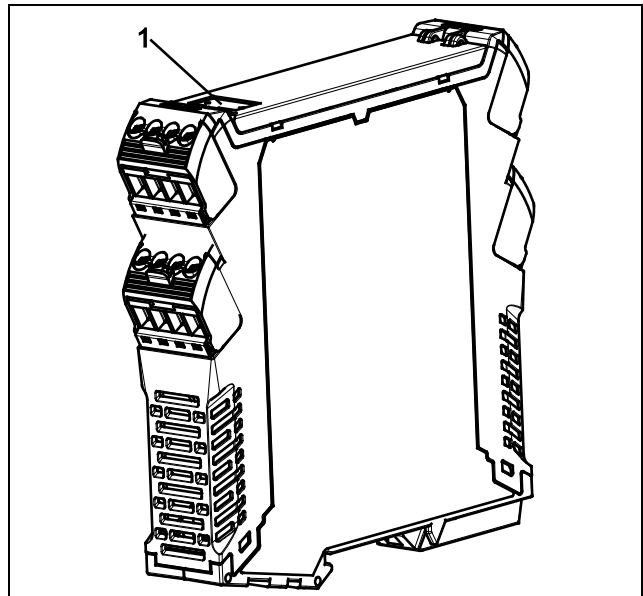


Illustration 5-3: Marking

1 Device Marker

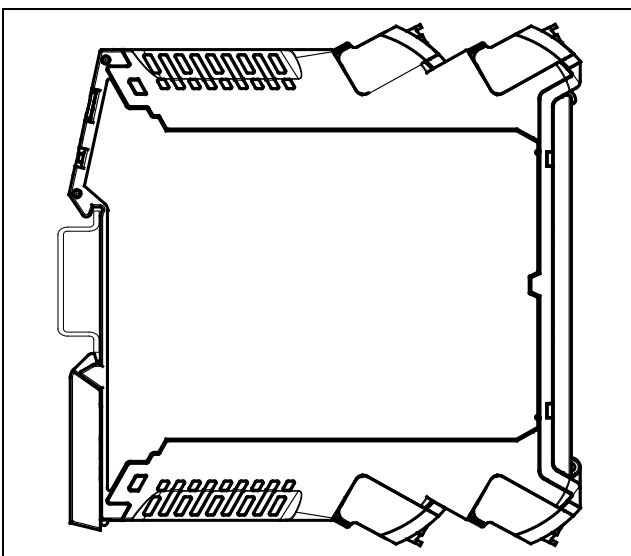


Illustration 5-2: Mounting, Step 2

## 5.5 Electrical Connections

See section 7, "Product Installation / Operation" for further information.

### 5.5.1 EMI Protection

#### NOTICE

Do not install input, output and power supply cables close to sources of electrical interference!

For example, sources of electrical interference could include relays, contactors, motors and their controls, including thyristor drives and the cables which connect these devices. Avoid installing ACT20X cables in the same ducting as such cables.

Local electrical installation practices must be followed.

## 5.6 Calibration and Adjustment

- During calibration and adjustment, carry out the measuring and connection of external voltages according to the specifications in this manual.
- Only use tools and instruments that are safe to use.

## 5.7 Release Lever

The terminals are released with a release lever.

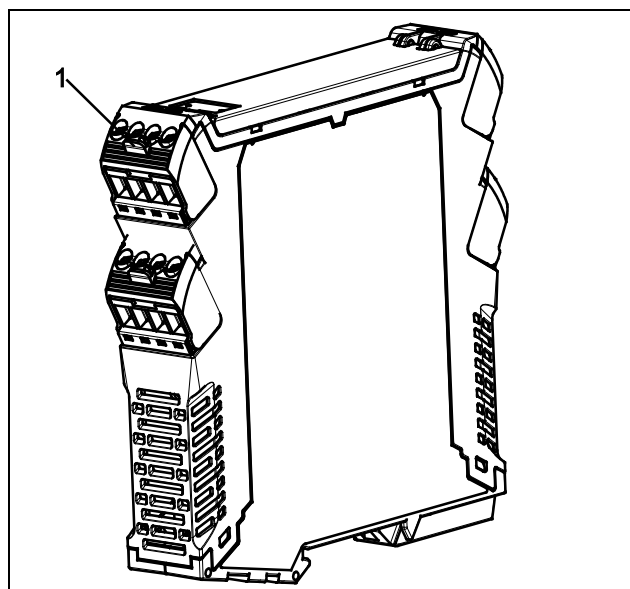


Illustration 5-4: Release Lever

1 Release lever

See section 7.8, "Female Plug BHZ 5.00" for further information.

## 5.8 Encoding

### NOTICE

Leaving the product connectors uncoded results in lack of interchanging protection. All connectors will be identically encoded.

- Create connector coding plan prior to first mating and encode connectors accordingly.
- Perform encoding procedure for each new module.

The product housing is equipped with an automatic encoding.

This connector interchanging protection is initially encoded upon shipping and can be individually adjusted.

- 1 Use screw driver to turn adjusting dial of connector clockwise.  
Either dial has 4 encoding positions, resulting in  $4^2 = 16$  possible positions.  
Connector is encoded.

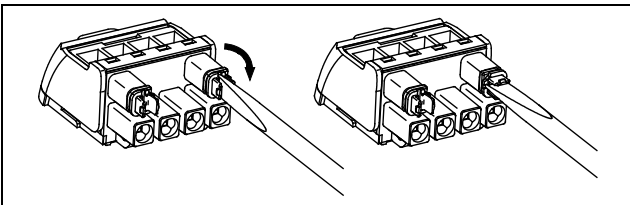


Illustration 5-5: Encoding Connector

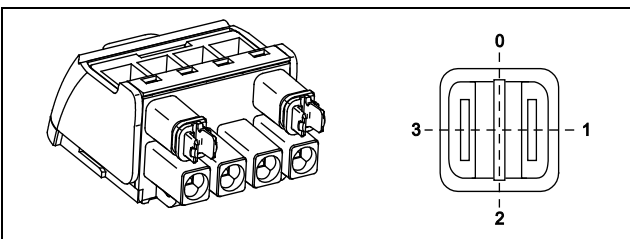


Illustration 5-6: Encoding Positions

- 2 Plug encoded connector onto pin header.  
Encoding element is transferred from connector to pin header.  
Encoding element remains in the pin header housing.

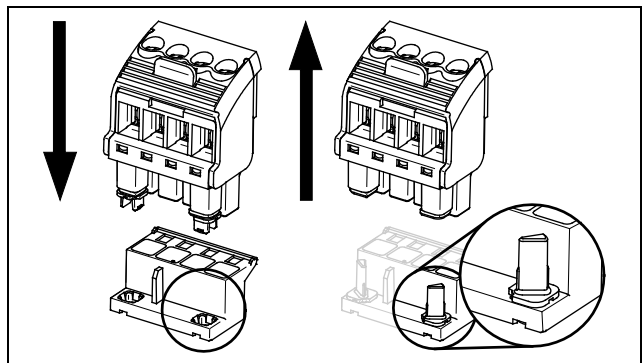


Illustration 5-7: Transfer Encoding Element

See section 7.8, "Female Plug BHZ 5.00" for further information.



## 5.9 Configuration



### DANGER

Configuration must be performed in a safe area!

Configuration is performed via a connector located behind the front flap.

- 1 Open the front flap, as shown in the illustration:

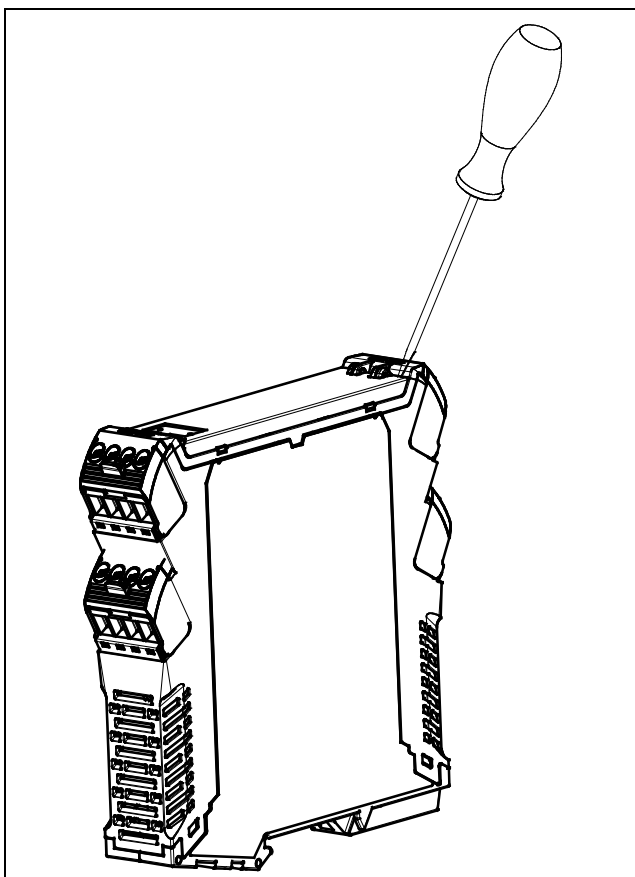


Illustration 5-8: Opening Front Flap

- 2 Connect the CBX200 USB jack, as shown in the illustration:

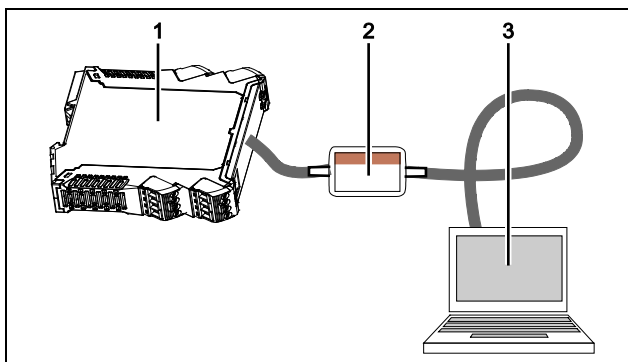


Illustration 5-9: CBX200 USB Connection

- 1 Jack connection under front flap
  - 2 CBX200 with USB connection
  - 3 PC
- 3 See "WI-Manager" documentation for further information.

## 6. Operation

### 6.1 Normal Operation

Operators are only allowed to adjust and operate modules that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard and the module is easily accessible.

### 6.2 Warm-Up

The product is designed to start-up as soon as power is supplied. However a warm-up period of 15 minutes is required before it performs to the specifications above.

When auxiliary power is switched on, for the first 200 ms the product will consume up to 200 mA.

### 6.3 Cleaning

- 1 Power supply switched off.
- 2 Clean with cloth moistened with distilled water.

## 7. Product Installation / Operation

### 7.1 ACT20X-HDI-SDO (NAMUR Pulse Isolator)

#### 7.1.1 Description

The pulse isolator ACT20X-HDI-SDO is a special signal isolator/converter for NAMUR sensor signals from within Ex Zone 0. The product is able for an intrinsically safe operation of NAMUR sensors or for contacts with floating and resistance circuits.

Transistor or relay outputs are available on the output side. A dual-channel version is optionally available.

The following NAMUR pulse isolators are available:

Order No.	Type	Description
8965340000 2456050000	ACT20X-HDI-SDO-RNO-S ACT20X-HDI-SDO-RNO-P	NAMUR pulse isolator – relay NO
8965350000 2456060000	ACT20X-HDI-SDO-RNC-S ACT20X-HDI-SDO-RNC-P	NAMUR pulse isolator – relay NC
8965360000 2456070000	ACT20X-HDI-SDO-S ACT20X-HDI-SDO-P	NAMUR pulse isolator
8965370000 2456080000	ACT20X-2HDI-2SDO-RNO-S ACT20X-2HDI-2SDO-RNO-P	2-channel NAMUR pulse isolator – relay NO
8965380000 2456090000	ACT20X-2HDI-2SDO-RNC-S ACT20X-2HDI-2SDO-RNC-P	2-channel NAMUR pulse isolator – relay NC
8965390000 2456100000	ACT20X-2HDI-2SDO-S ACT20X-2HDI-2SDO-P	2-channel NAMUR pulse isolator

7.1.2 Status/Alarm LEDs

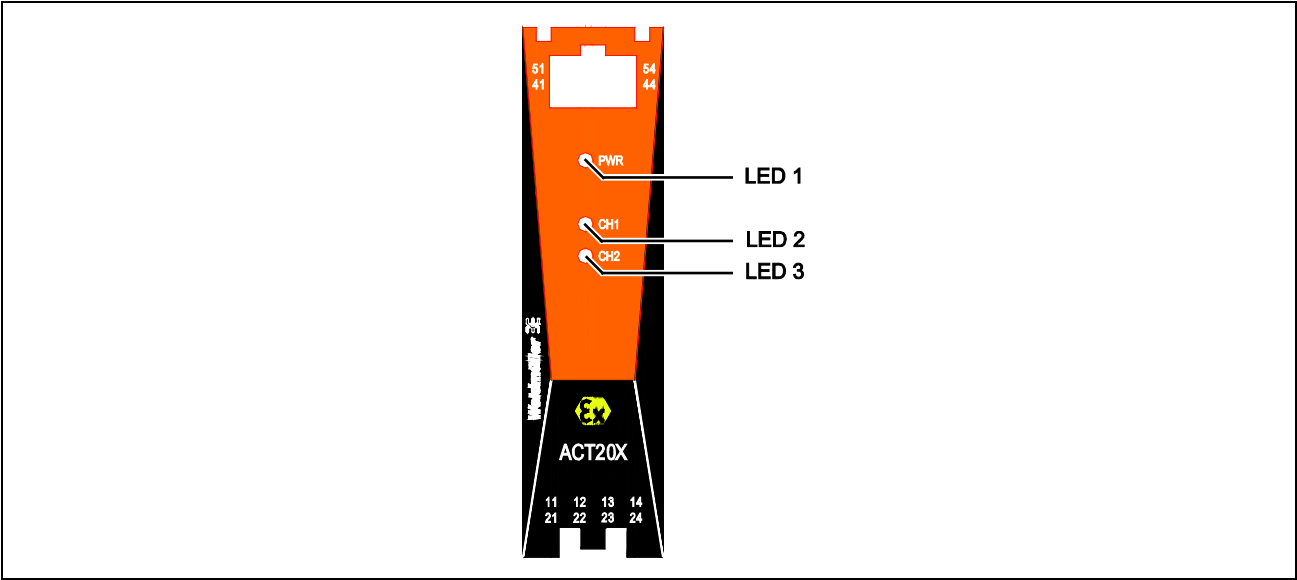


Illustration 7-1: Status/Alarm LEDs

Condition		LED 1	Channel 1		Channel 2		Status Relay (NC)
			LED 2	Output	LED 3	Output	
Device OK							
Channel 1	activated	green flashing	yellow	ON			energized
	de-activated		OFF	OFF			energized
	wire short/break		red flashing	OFF			de-energized
Channel 2	activated	green flashing			yellow	ON	energized
	de-activated				OFF	OFF	energized
	wire short/break				red flashing	OFF	de-energized
No supply		OFF	OFF	OFF	OFF	OFF	de-energized
Device failure		OFF	red	OFF	red	OFF	de-energized

Flashing: 8% ON and 92% OFF

Table 7-1: Status/Alarm LEDs

### 7.1.3 Electrical Connections

Terminal	Function	Connector	Terminal	Function	Connector
11	SW Sense	Ex input channel 1	41	COM / / OPTO +	output channel 1
12	NAMUR –		42	NO / NC / OPTO –	
13	SW Supply		43	COM / / OPTO +	output channel 2
14	NAMUR +		44	NO / NC / OPTO –	
21	SW Sense	Ex input channel 2	51	GND	power supply
22	NAMUR –		52	+24 V DC	
23	SW Supply		53	NC	status relay
24	NAMUR +		54	COM	

Table 7-2: Electrical Connections

### 7.1.4 Function Description

- (1) NAMUR sensor with cable error detection in case of cable disconnection or short circuit.
- (2) Mechanical switch with cable error detection in case of cable disconnection or short circuit, when series resistance ( $R_S$ ) and parallel resistance ( $R_P$ ) are mounted on the switch.
- (3) Mechanical switch with cable error detection in case of cable disconnection, when parallel resistance ( $R_P$ ) is mounted on the switch.
- (4) Mechanical switch without cable error detection.

See illustration 7-2 "Functional Block Diagram" for further information.

### 7.1.5 Specifications

#### Features

- Configuration and monitoring via FDT/DTM-Software "WI-Manager".
- Selection of direct or inverted function for each channel.
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- Extended self diagnostic: Monitoring of error events and cable breakage via the individual status relay.
- LED indication for operation status and malfunction.
- 3-way galvanic isolation between input, output and supply.



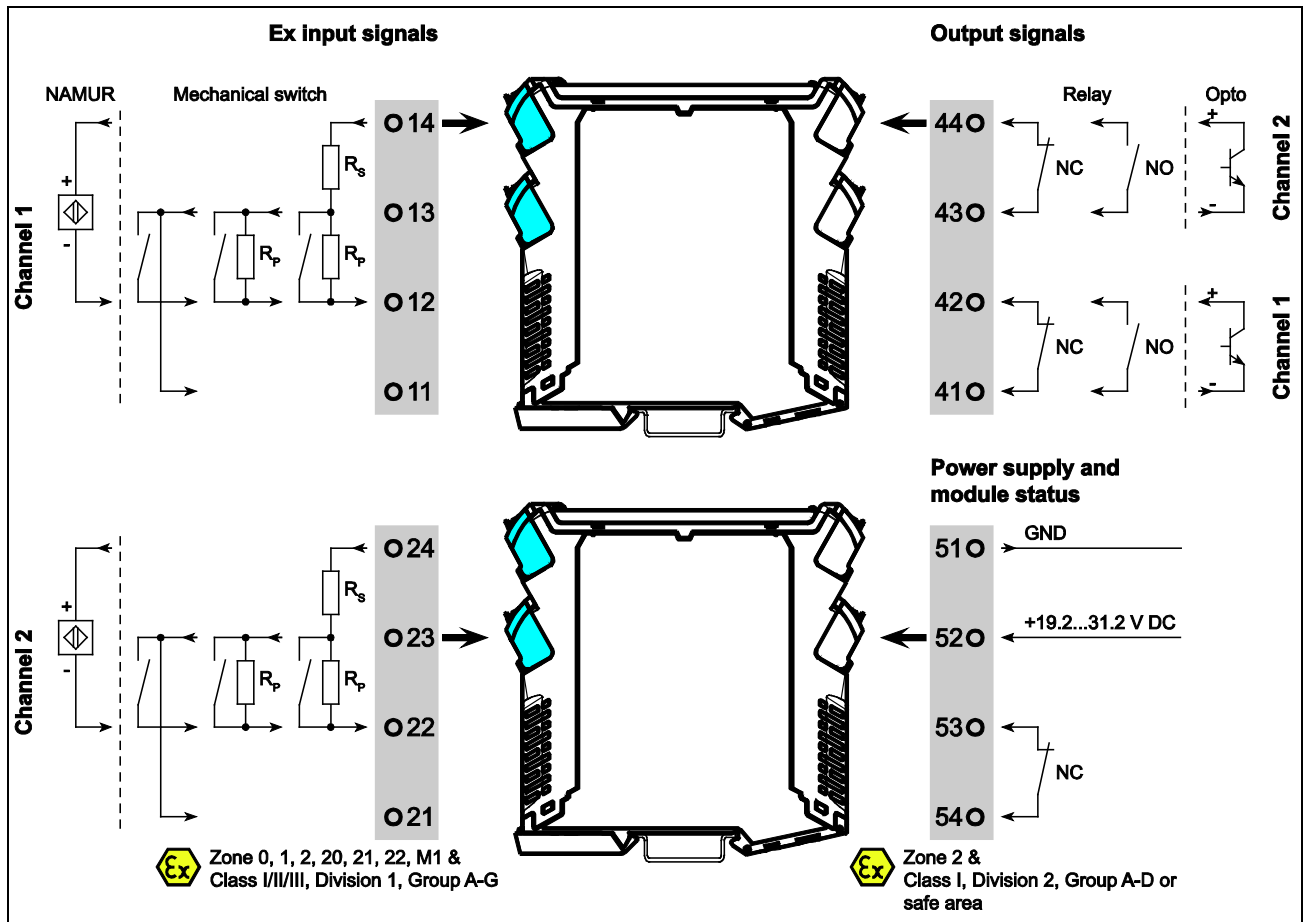


Illustration 7-3: Applications

Input NAMUR / Mechanical Switch with Series and Parallel Resistance	
NAMUR sensor, according to	EN 60947-5-6
Mechanical Switch, Series resistance ( $R_S$ )	nom. 750 $\Omega$
Mechanical Switch, Parallel resistance ( $R_P$ )	nom. 15 k $\Omega$
Frequency range	0...5 kHz
Min. pulse length	> 0.1 ms
Resistance	nom. 1 k $\Omega$
Trigger level, signal	< 1.2 mA, > 2.1 mA
Trigger level, cable fault	< 0.1 mA, > 6.5 mA

Status Relay	Safe Area	Zone 2 Installation
Voltage max.	125 V AC / 110 V	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

Relay Output	Safe Area	Zone 2 Installation
Voltage max.	250 V AC / 30 V	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	16 VA / 60 W
Max. switching frequency	20 Hz	

Opto NPN Output	
Max. switching frequency	5 kHz
Min. pulse length	60 µs
Max. load, current / voltage	80 mA / 30 V DC
Voltage drop at 80 mA	< 2.5 V DC

Power Supply	
Supply voltage	19.2...31.2 V DC
NAMUR supply	8 V DC / 8 mA
Max. consumption (2-channels)	≤ 3 W
Fuse	400 mA / 250 V AC

Isolation Voltages (reinforced insulation), Test/Operation	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Output 1 to output 2	1.5 kV AC / 150 V AC
Status relay to supply	1.5 kV AC / 150 V AC

Environmental Specifications	
Specifications range	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %
Calibration temperature	+20...28 °C



General Specifications	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6, test Fc, 1g, 2...100 Hz
Vibration, continuous	IEC 60068-2-64, test Fh, 1g, 3...100 Hz
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>
Response time for cable fault	< 200 ms

Default Settings	
Channel 1 function	direct
Channel 2 function	direct
Short circuit indication	yes
Breakage indication	yes

## 7.2 ACT20X-HTI-SAO (Temperature/mA Converter)

### 7.2.1 Description

The modules of the ACT20X-HTI-SAO family transmit analog signals galvanic isolated from hazardous areas to the safe area. The input circuits are designed intrinsically safe.

The ACT20X-HTI-SAO converts and isolates current and temperature sensor signals (mA, RTD and TC). The two-channel version ACT20X-2HTI-2SAO can be used as a signal splitter for mA signals.

For the higher accuracy of thermo couple signals, the use of special cold junction terminals ACT20X-CJC-HTI-S recommended:

1160640000 ACT20X-CJC-HTI-S PRT 11 (1-channel)

1160650000 ACT20X-CJC-HTI-S PRT 21 (2-channel)

The following converter types are available:

Order No.	Type	Description
8965470000 2456180000	ACT20X-HTI-SAO-S ACT20X-HTI-SAO-P	Temperature/mA converter
8965480000 2456190000	ACT20X-2HTI-2SAO-S ACT20X-2HTI-2SAO-P	2-channel temperature/mA converter

### 7.2.2 Status/Alarm LEDs

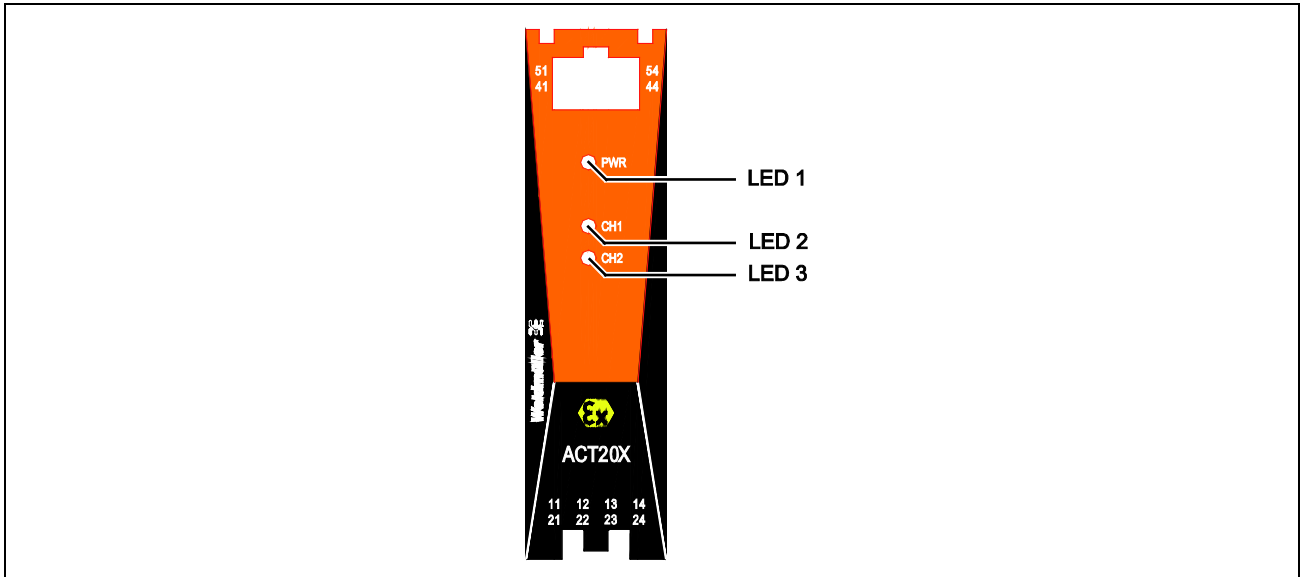


Illustration 7-4: Status/Alarm LEDs

Condition	LED 1	Channel 1		Channel 2		Status Relay (NC)
		LED 2	Output	LED 3	Output	
Device						
Channel 1	green flashing	OFF	ON			energized
		red	fault state			de-energized
		red flashing	fault state			de-energized
Channel 2	green flashing			OFF	ON	energized
				red	fault state	de-energized
				red flashing	fault state	de-energized
No supply	OFF	OFF	OFF	OFF	OFF	de-energized
Device failure	OFF	red	OFF	red	OFF	de-energized

Flashing: 8% ON and 92% OFF

Table 7-3: Status/Alarm LEDs

### 7.2.3 Electrical Connections

Terminal	Function					Connector	Terminal	Function	Connector
	mA	RTD			TC				
		2W	3W	4W					
11			Sense–	Sense–	+	Ex input channel 1	41	Out –	output channel 1
12	–	R	R–	R–	–		42	Out +	
13	+	R	R+	R+			43	Out –	output channel 2
14				Sense+			44	Out +	
21			Sense–	Sense–	+	Ex input channel 2	51	GND	power supply
22	–	R	R–	R–	–		52	+24 V DC	
23	+	R	R+	R+			53	NC	status relay
24				Sense+			54	COM	

Table 7-4: Electrical Connections

### 7.2.4 Specifications

#### Features

- Configuration and monitoring are performed via FDT/DTM Software "WI-Manager".
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- The passive signal inputs for RTD, TC and mA are made for one or two channels and completely electrically isolated.
- The two-channel version is suitable to use as a signal splitter.
- 3-way galvanic isolation between input, output and supply.
- Front LEDs indicate operation status and malfunction.
- The cold junction compensation for TC-signal inputs is either the internal cold junction compensation, or for higher accuracy is an external cold junction compensation terminal available — 1 channel 1160640000 ACT20X-CJC-HTI-S PRT 11 or 2 channel 1160650000 ACT20X-CJC-HTI-S PRT 21.
- Extended self diagnostic: Monitoring of error events and cable breakage via the individual status relay.

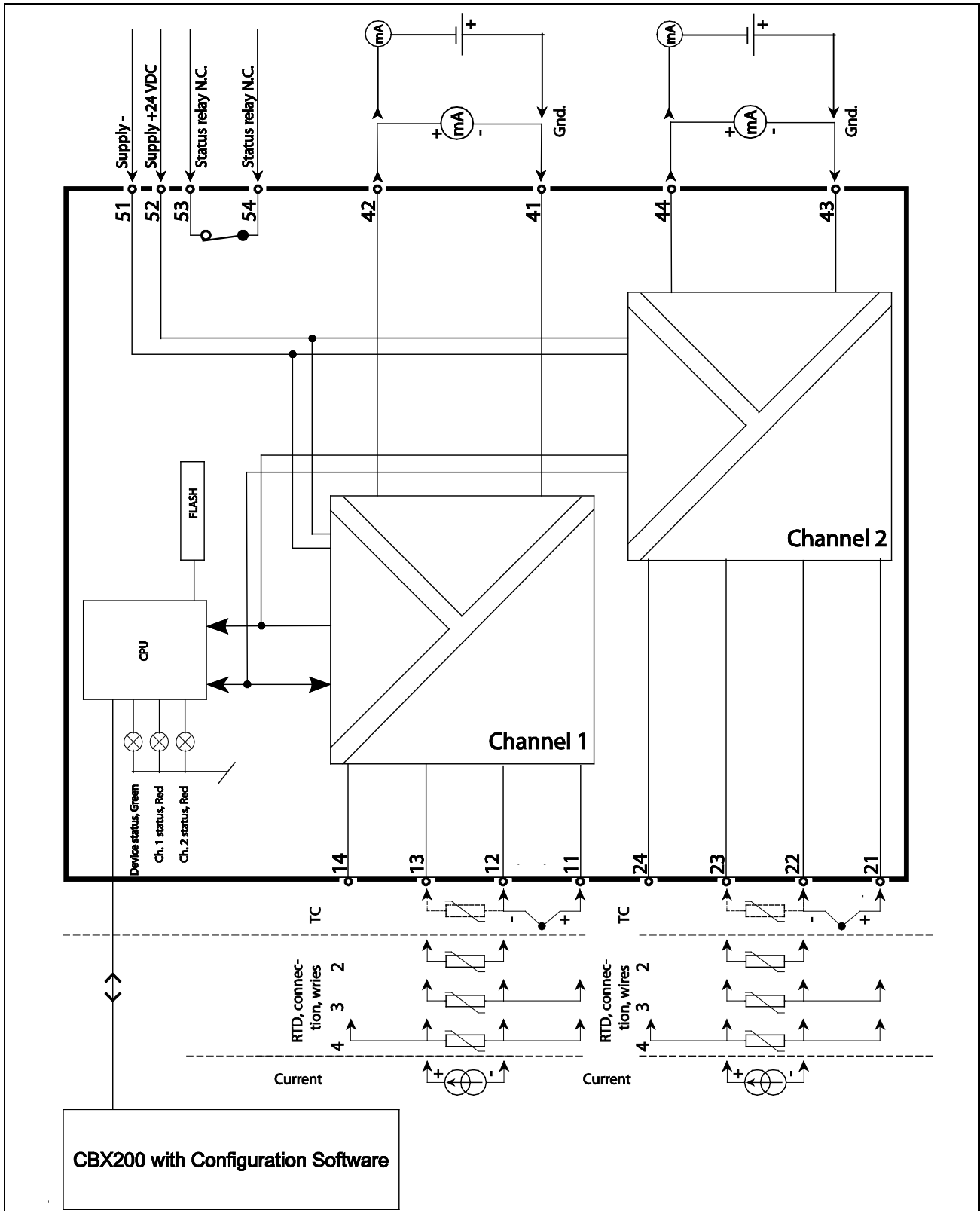


Illustration 7-5: Functional Block Diagram

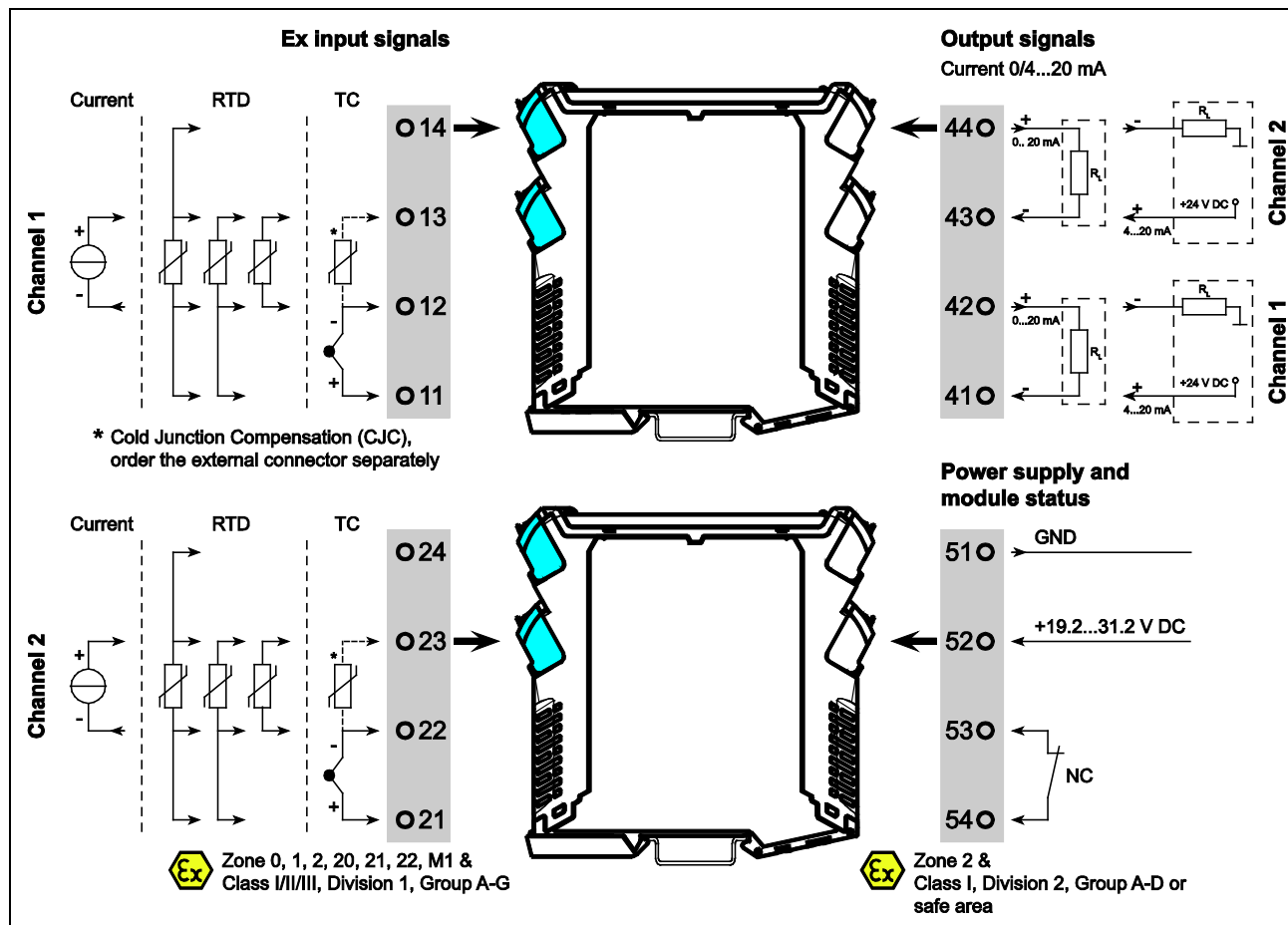


Illustration 7-6: Applications

RTD Input	
Pt100, according to	-200...+850 °C, IEC 60751
Ni100, according to	-60...+250 °C, DIN 43760
Sensor types (* = without short circuit detection)	Pt10*, Pt20*, Pt50*, Pt100, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.)	50 Ω
Sensor current	nom. 0.2 mA
Effect of sensor cable resistance (3/4-wire)	< 0.002 Ω
Sensor error detection (programmable)	ON/OFF
Sensor error current: when detecting else	< 2 µA 0 µA

TC Input, Sensor Types	Temperature Range	Standard
B	0...+1820 °C	IEC 60584-1
E	-100...+1000 °C	IEC 60584-1
J	-100...+1200 °C	IEC 60584-1
K	-180...+1372 °C	IEC 60584-1
L	-200...+900 °C	DIN 43710
N	-180...+1300 °C	IEC 60584-1
R	-50...+1760 °C	IEC 60584-1
S	-50...+1760 °C	IEC 60584-1
T	-200...+400 °C	IEC 60584-1
U	-200...+600 °C	DIN 43710
W3	0...+2300 °C	ASTM E988-90
W5	0...+2300 °C	ASTM E988-90
LR	-200...+800 °C	GOST 3044-84

Accuracy, General Values	Accuracy	Temperature Coefficient
All	$\leq \pm 0.1$ % of span	$\leq \pm 0.01$ % of span / °C

Accuracy, Basic Values	Absolute Accuracy	Temperature Coefficient
mA	$\leq \pm 16$ $\mu$ A	$\leq \pm 1.6$ $\mu$ A / °C
Pt100, Pt200, Pt1000	$\leq \pm 0.2$ °C	$\leq \pm 0.02$ C / °C
Pt500, Ni100, Ni120, Ni1000	$\leq \pm 0.3$ °C	$\leq \pm 0.03$ C / °C
Pt50, Pt400, Ni50	$\leq \pm 0.4$ °C	$\leq \pm 0.04$ C / °C
Pt250, Pt300	$\leq \pm 0.6$ °C	$\leq \pm 0.06$ C / °C
Pt20	$\leq \pm 0.8$ °C	$\leq \pm 0.08$ C / °C
Pt10	$\leq \pm 1.4$ °C	$\leq \pm 0.14$ C / °C
TC type: E, J, K, L, N, T, U	$\leq \pm 1$ °C	$\leq \pm 0.1$ C / °C
TC type: R, S, W3, W5, LR	$\leq \pm 2$ °C	$\leq \pm 0.2$ C / °C
TC type: B (160...400 °C)	$\leq \pm 4.5$ °C	$\leq \pm 0.45$ C / °C
TC type: B (400...1820 °C)	$\leq \pm 2$ °C	$\leq \pm 0.2$ C / °C

TC Input, Cold Junction Compensation (CJC)	
CJC: external with ACT20X-CJC-HTI (1160640000 or 1160650000)	+20...+28 °C ≤ ±1 °C -20...+20 °C and +28...+60 °C ≤ ±1.6 °C
CJC via internal sensor Δt = internal temperature – ambient temperature	±(2.0 °C + 0.2 °C * Δt)
Sensor error detection (programmable, only wire breakage)	ON/OFF
Sensor error current: when detecting else	nom. 2 μA 0 μA

Current Input	
Measurement range	0...20 mA
Programmable measurement ranges	0...20 / 4...20 mA
Input resistance	nom. 20 Ω + PTC 50 Ω
Sensor error detection (programmable)	ON/OFF

Current Output	
Programmable signal ranges	0...20 mA / 4...20 mA / 20...0 mA / 20...4 mA
Load max.	4 mA / 600 Ω / 12 V DC
Load stability	≤ ±0.01 % of span / 100 Ω
Sensor error detection	0 / 3.5 mA / 23 mA / none
Output limitation: on 4...20 and 20...4 mA signals on 0...20 and 20...0 mA signals	3.8...20.5 mA 0...20.5 mA
Current limit	≤ 28 mA

2-wire 4...20 mA Loop Powered Output	
Signal range	4...20 mA
Load resistance	≤ (V <sub>supply</sub> – 3.5 V) / 0.023 A [Ω]
Load stability	≤ 0.01 % of span / 100 Ω
Max. external 2-wire supply	3.5...26 V DC
Effect of external 2-wire supply voltage variation	< 0.005 % of span / V



Status Relay	Safe Area	Zone 2 Installation
Voltage max.	125 V AC / 110 V	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

Power Supply	
Supply voltage	19.2...31.2 V DC
Max. consumption (2-channels)	≤ 3.5 W
Fuse	1.25 A / 250 V AC

Isolation Voltages (reinforced insulation), Test/Operation	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Output 1 to output 2	1.5 kV AC / 150 V AC
Status relay to supply	1.5 kV AC / 150 V AC

Environmental Specifications	
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %
Calibration temperature	+20...28 °C

General Specifications	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6, test Fc, 1g, 2...100 Hz
Vibration, continuous	IEC 60068-2-64, test Fh, 1g, 3...100 Hz
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>
EMC immunity influence	≤ ±0.5 % of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	≤ ±1 % of span
Signal/Noise ratio	min. 60 dB (0...100 kHz)

Average response time incl. delay:	
Temperature input	$\leq 1 \text{ s}$
mA input	$\leq 0.4 \text{ s}$

Default Settings	
Input type	Temperature
Connection type	3-wire
Temperature unit	°C
Temperature sensor type	Pt100
Temperature range	0...150°C
Output current range	0...20 mA
Output current on error	0...23 mA
Analog output response time (1/10 s)	1 s

## 7.3 ACT20X-SDI-HDO (Solenoid/Alarm Driver)

### 7.3.1 Description

The ACT20X-SDI-HDO is a solenoid/alarm driver for the control of solenoids, acoustic alarms and LEDs mounted in the hazardous area (Ex Zone 0).

Optionally one or two channel versions available.

The following solenoid/alarm drivers are available:

Order No.	Type	Description
8965400000 2456110000	ACT20X-SDI-HDO-L-S ACT20X-SDI-HDO-L-P	Solenoid/alarm driver, L = low current max. 35 mA
8965410000 2456120000	ACT20X-SDI-HDO-H-S ACT20X-SDI-HDO-H-P	Solenoid/alarm driver, H = high current max. 60 mA
8965420000 2456130000	ACT20X-2SDI-2HDO-S ACT20X-2SDI-2HDO-P	2-channel solenoid/alarm driver, L = low current max. 35 mA

7.3.2 Status/Alarm LEDs

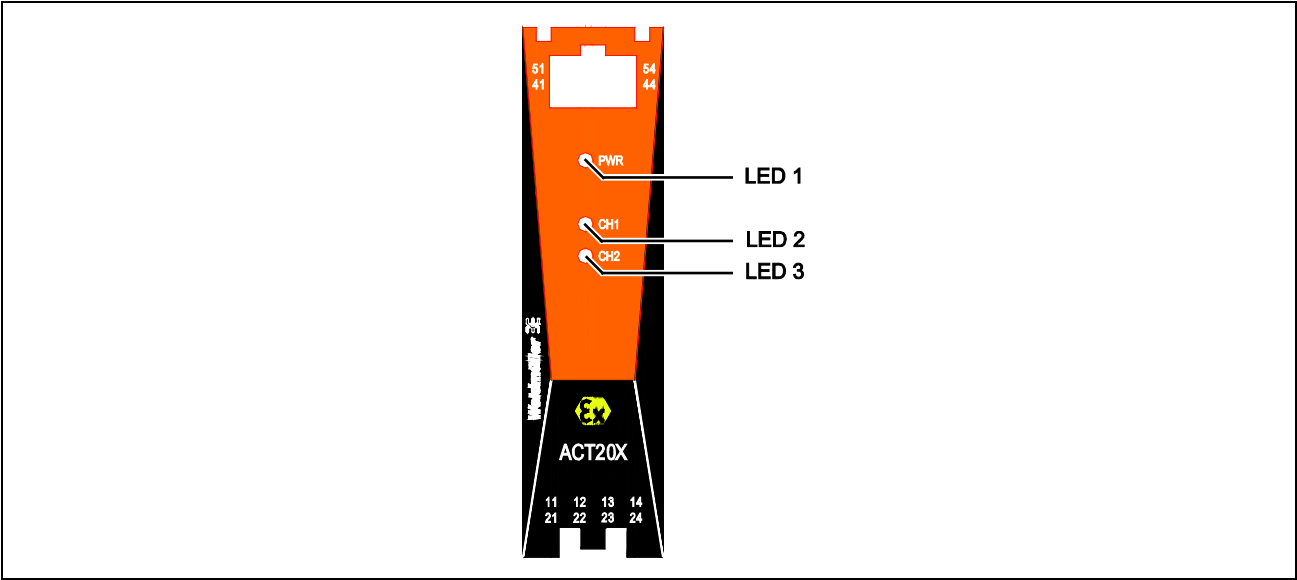


Illustration 7-7: Status/Alarm LEDs

Condition	LED 1	Channel 1		Channel 2		Status Relay (NC)
		LED 2	Output	LED 3	Output	
Device OK						
Channel 1 activated	green flashing	yellow	ON			energized
		OFF	OFF			energized
Channel 2 activated	green flashing			yellow	ON	energized
				OFF	OFF	energized
No supply	OFF	OFF	OFF	OFF	OFF	de-energized
Device failure	OFF	red	OFF	red	OFF	de-energized

Flashing: 8% ON and 92% OFF

Table 7-5: Status/Alarm LEDs

### 7.3.3 Electrical Connections

Terminal	Function	Connector	Terminal	Function	Connector
11	GND	Ex output channel 1	41	In –	input channel 1
12	Ex 1		42	In +	
13	Ex 2		43	In –	input channel 2
14	Ex 3		44	In +	
21	GND	Ex output channel 2	51	GND	power supply
22	Ex 1		52	+24 V DC	
23	Ex 2		53	COM	status relay
24	Ex 3		54	NC	

Table 7-6: *Electrical Connections*

### 7.3.4 Specifications

#### Features

- Solenoid/alarm driver for the control of solenoids, acoustic alarms and LEDs installed in the hazardous area.
- Two hardware versions make it possible to choose either low (35 mA) or high (60 mA) current output with 1-channel or 2-channel versions.
- Configuration and monitoring via FDT/DTM-Software "WI-Manager".
- Selection of direct or inverted function for each channel and the possibility of reducing the output current to the hazardous area to suit the application.
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- Extended self diagnostic: Monitoring of error events via the individual status relay.
- LED indication: green and 2 yellow/red front LEDs to indicate operation status and malfunction.
- 3-way galvanic isolation between input, output and supply, 2.6 kV AC.

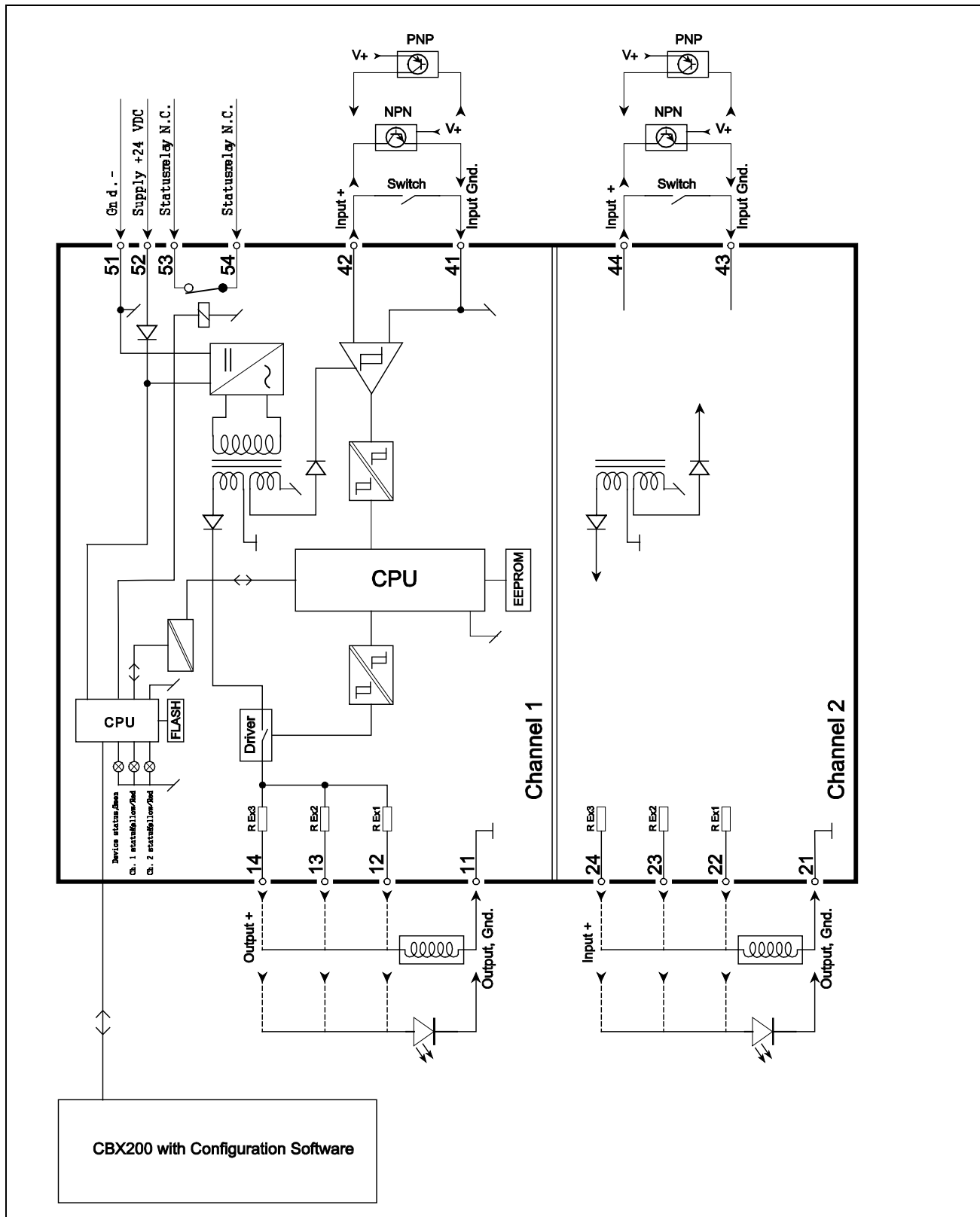


Illustration 7-8: Functional Block Diagram

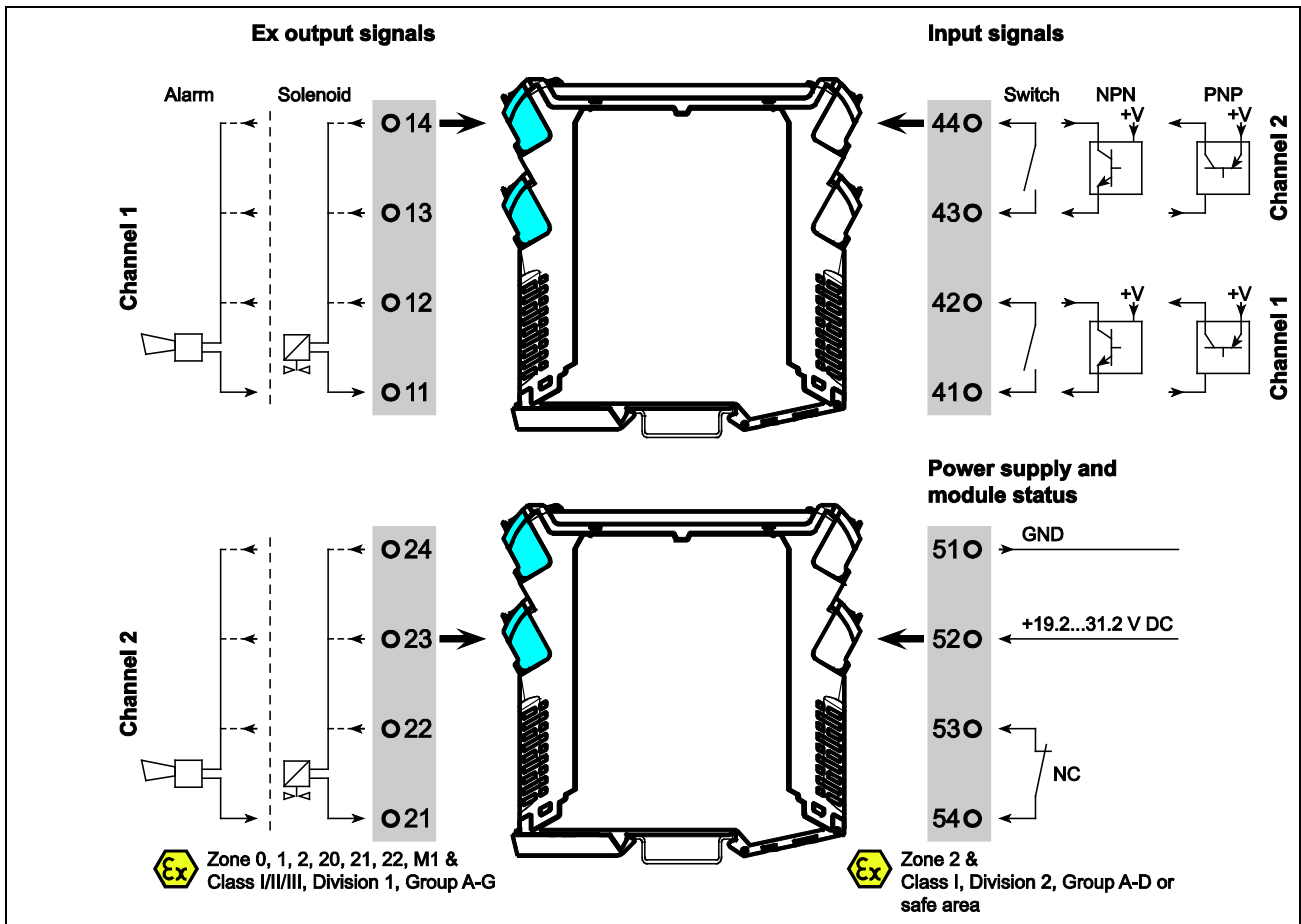


Illustration 7-9: Applications

NPN Input (NPN and mechanical switch)	
Trigger level (low)	≤ 2 V DC
Trigger level (high)	≥ 4 V DC
Max. external voltage	28 V DC
Input impedance	3.5 kΩ

PNP Input	
Trigger level (low)	≤ 8 V DC
Trigger level (high)	≥ 10 V DC
Max. external voltage	28 V DC
Input impedance	3.5 kΩ

Output	
Output ripple	< 40 mV RMS

ACT20X-SDI-HDO-L, ACT20X-2SDI-HDO, low current (< 35 mA), Ex barrier data channel 1	V <sub>out</sub> no load	V <sub>out</sub> with load	I <sub>out</sub> 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

ACT20X-2SDI-HDO, low current (< 35 mA), Ex barrier data channel 2	V <sub>out</sub> no load	V <sub>out</sub> with load	I <sub>out</sub> 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

ACT20X-SDI-HDO-H, high current (< 60 mA), Ex barrier data channel 1	V <sub>out</sub> no load	V <sub>out</sub> with load	I <sub>out</sub> max.
11–12	min. 24 V	min. 9 V	60 mA
		min. 11.5 V	50 mA
11–13	min. 24 V	min. 10 V	60 mA
		min. 12.5 V	50 mA
11–14	min. 24 V	min. 11 V	60 mA
		min. 13.5 V	50 mA

Status Relay	Safe area	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 AC / 0.1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



<b>Power Supply</b>	
Supply voltage	19.2...31.2 V DC
Max. consumption (2-channels)	≤ 3.5 W
Fuse	1.25 A / 250 V AC
EMC immunity influence	< ±0.5 % of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1 % of span

<b>Isolation Voltages (reinforced insulation), Test/Operation</b>	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Output 1 to output 2	1.5 kV AC / 150 V AC
Status relay to supply	1.5 kV AC / 150 V AC

<b>Environmental Specifications</b>	
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %
Calibration temperature	+20...28 °C

<b>General Specifications</b>	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>

<b>Default Settings</b>	
Channel 1 function	Direct
Channel 2 function	Direct

## 7.4 ACT20X-HUI-SAO (Universal Converter)

### 7.4.1 Description

The device ACT20X-HUI-SAO transmits analog signals from hazardous areas safely galvanically separated into non or less hazardous areas. The input circuits are designed intrinsically safe.

The ACT20X-HUI-SAO converts and isolates current, voltage, potentiometer and temperature sensor signals (mA, V, potentiometer, RTD and TC).

For the higher accuracy of thermocouple signals, the use of special cold junction terminal ACT20X-CJC-HTI-S is recommended:

1160640000 ACT20X-CJC-HTI-S PRT 11 (1-Kanal)

The following converter type is available:

Order No.	Type	Description
8965490000	ACT20X-HUI-SAO-S	Universal converter
2456200000	ACT20X-HUI-SAO-P	

### 7.4.2 Status/Alarm LEDs

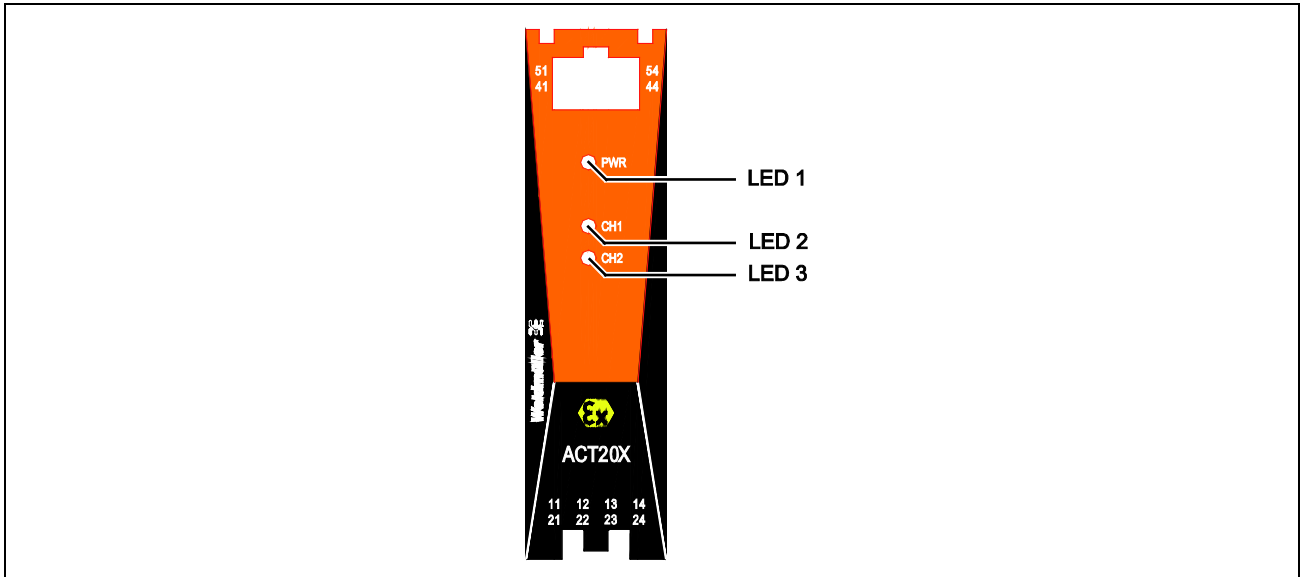


Illustration 7-10: Status/Alarm LEDs

Condition	LED 1	LED 2	Output Analog	Output Relay	LED 3 (Error)	Status Relay (NC)
Device/Signal						
OK	green flashing	1)	active	1)	OFF	energized
OK and wire short/break		1)	fault state	1)	red flashing	de-energized
de-activated and wire short/break		1)	fault state	1)	red flashing	de-energized
Output relay						
activated	green flashing	yellow		energized		
de-activated		OFF		de-energized		
No supply	OFF	OFF	OFF	de-energized	OFF	de-energized
Device failure	OFF	red	OFF	de-energized	red	de-energized

Flashing: 8% ON and 92% OFF

1) depends on configuration

Table 7-7: Status/Alarm LEDs

### 7.4.3 Electrical Connections

Terminal	Function						Terminal	Function	Connector
	TC	RTD	POT	V	mA	mA Loop			
11	+	3W / 4W					41	Out –	output
12	– / CJC	2W / 3W / 4W	M3				42	Out +	
13	CJC	2W / 3W / 4W	M1				43	COM	output relay
14		4W	M2				44	NO	
21				–	–		51	+24 V DC	power supply
22					+	–	52	GND	
23				+			53	NC	status relay
24						+	54	COM	

Table 7-8: Electrical Connections

### 7.4.4 Specifications

#### Features

- Configuration and monitoring via FDT/DTM-Software "WI-Manager".
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- The active or passive signal inputs for RTD, TC, potentiometer, V and mA are completely electrically isolated.
- The device detects automatically whether an active or passive current signal is connected.
- The cold junction compensation for TC-signal inputs is either the internal cold junction compensation, or for higher accuracy is an external cold junction compensation terminal available — 1 channel 1160640000 ACT20X-CJC-HTI-S PRT 11.
- Extended self diagnostic: Monitoring of error events (e.g. cable breakage) via status relay.
- Front LEDs indicates operation status and malfunction.
- 3-way galvanic isolation between input, output and power supply.



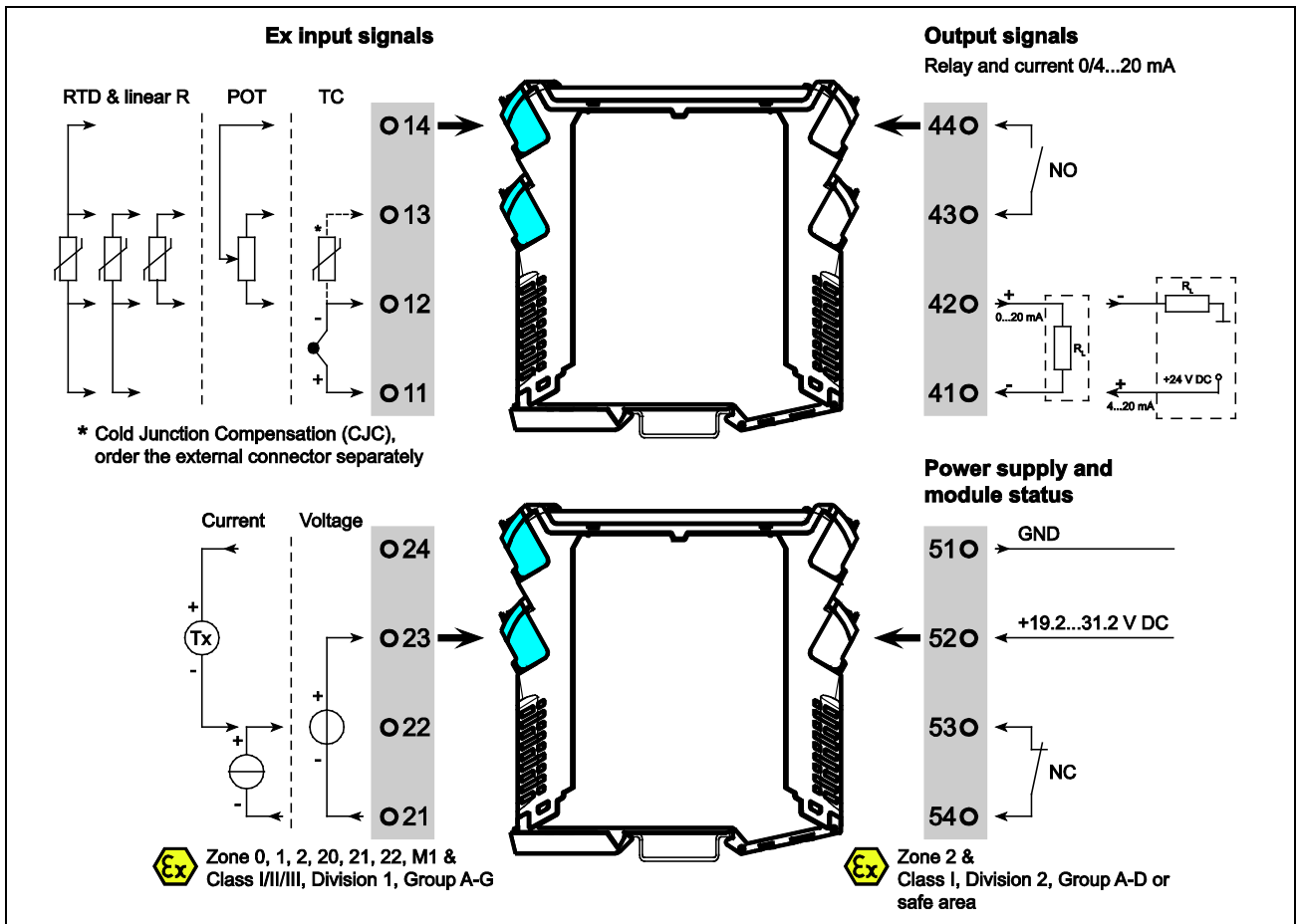


Illustration 7-12: Applications

RTD, Resistance and Potentiometer Input	
Pt100, according to	-200...+850 °C, IEC 60751
Ni100, according to	-60...+250 °C, DIN 43760
Resistance (without short circuit detection in the range $R = 0...18\Omega$ , appr.)	0...10 k $\Omega$
Potentiometer	10 $\Omega$ ...10 k $\Omega$
Sensor types (* = without short circuit detection)	Pt10*, Pt20*, Pt50*, Pt100, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.)	50 $\Omega$
Sensor current	nom. 0.2 mA
Effect of sensor cable resistance (3/4-wire)	< 0.002 $\Omega$
Sensor error detection (programmable)	ON/OFF
Short circuit detection, RTD	Yes

TC Input, Sensor Types	Temperature Range	Standard
B	0...+1820 °C	IEC 60584-1
E	-100...+1000 °C	IEC 60584-1
J	-100...+1200 °C	IEC 60584-1
K	-180...+1372 °C	IEC 60584-1
L	-200...+900 °C	DIN 43710
N	-180...+1300 °C	IEC 60584-1
R	-50...+1760 °C	IEC 60584-1
S	-50...+1760 °C	IEC 60584-1
T	-200...+400 °C	IEC 60584-1
U	-200...+600 °C	DIN 43710
W3	0...+2300 °C	ASTM E988-90
W5	0...+2300 °C	ASTM E988-90
LR	-200...+800 °C	GOST 3044-84

Accuracy, General Values	Absolute Accuracy	Temperature Coefficient
All	$\leq \pm 0.1$ % of span	$\leq \pm 0.01$ % of span / °C

Accuracy, Basic Values	Absolute Accuracy	Temperature Coefficient
mA	$\leq \pm 16$ $\mu$ A	$\leq \pm 1.6$ $\mu$ A / °C
Volt	$\leq \pm 20$ $\mu$ V	$\leq \pm 2$ $\mu$ V / °C
Pt100, Pt200, Pt1000	$\leq \pm 0.2$ °C	$\leq \pm 0.02$ C / °C
Pt500, Ni100, Ni120, Ni1000	$\leq \pm 0.3$ °C	$\leq \pm 0.03$ C / °C
Pt50, Pt400, Ni50	$\leq \pm 0.4$ °C	$\leq \pm 0.04$ C / °C
Pt250, Pt300	$\leq \pm 0.6$ °C	$\leq \pm 0.06$ C / °C
Pt20	$\leq \pm 0.8$ °C	$\leq \pm 0.08$ C / °C
Pt10	$\leq \pm 1.4$ °C	$\leq \pm 0.14$ C / °C
TC type: E, J, K, L, N, T, U	$\leq \pm 1$ °C	$\leq \pm 0.1$ C / °C
TC type: R, S, W3, W5, LR	$\leq \pm 2$ °C	$\leq \pm 0.2$ C / °C
TC type: B (160...400 °C)	$\leq \pm 4.5$ °C	$\leq \pm 0.45$ C / °C
TC type: B (400...1820 °C)	$\leq \pm 2$ °C	$\leq \pm 0.2$ C / °C

<b>TC Input, Cold Junction Compensation (CJC)</b>	
CJC: external with ACT20X-CJC-HTI (1160640000)	+20...+28 °C $\leq \pm 1$ °C -20...+20 °C and +28...+60 °C $\leq \pm 1.6$ °C
CJC via internal sensor $\Delta t$ = internal temperature – ambient temperature	$\pm(2.0 \text{ °C} + 0.4 \text{ °C} * \Delta t)$
Sensor error detection (programmable, only wire breakage)	ON/OFF
Sensor error current: when detecting else	nom. 2 $\mu$ A 0 $\mu$ A

<b>Current Input</b>	
Measurement range	0...20 mA
Programmable measurement ranges	0...20 and 4...20 mA
Input resistance	nom. 20 $\Omega$ + PTC 50 $\Omega$
Sensor error detection: loop break (only when input is selected as 4...20 mA)	Yes

<b>Voltage Input</b>	
Measurement range	0...12 V DC
Programmable measurement ranges	0...1 V / 0.2...1 V / 0...5 V / 1...5 V / 0...10 V / 2...10 V
Input resistance	nom. > 10 M $\Omega$

<b>Current Output</b>	
Signal range (span)	0...23 mA
Programmable signal ranges	0...20 mA / 4...20 mA / 20...0 mA / 20...4 mA
Load max.	4 mA / 600 $\Omega$ / 12 V DC
Load stability	$\leq 0.01$ % of span / 100 $\Omega$
Sensor error detection	0 / 3.5 mA / 23 mA / none
NAMUR NE 43, Upscale / Downscale	23 mA / 3.5 mA
Output limitation: on 4...20 and 20...4 mA signals on 0...20 and 20...0 mA signals	3.8...20.5 mA 0...20.5 mA
Current limit	$\leq 28$ mA



<b>2-wire 4...20 mA Output</b>	
Signal range	4...20 mA
Load resistance	$\leq (V_{\text{supply}} - 3.5 \text{ V}) / 0.023 \text{ A } [\Omega]$
Load stability	$\leq 0.01 \text{ \% of span} / 100 \Omega$
Max. external 2-wire supply	3.5...26 V DC
Effect of external 2-wire supply voltage variation	$< 0.005 \text{ \% of span} / \text{V}$

<b>Relay Output</b>	<b>Safe Area</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W
Relay functions	Setpoint, Window, Sensor error, Power and Off	
Hysteresis in % / display counts	0.1...25 % / 1...2999	
On and Off delay	0...3600 s	
Sensor error detection	Break / Make / Hold	

<b>Status Relay</b>	<b>Safe Area</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

<b>Power Supply</b>	
Supply voltage	19.2...31.2 V DC
Max. consumption	$\leq 3.5 \text{ W}$
Fuse	1.25 A / 250 V AC

<b>Isolation Voltages (reinforced insulation), Test/Operation</b>	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Status relay to supply	1.5 kV AC / 150 V AC

Environmental Specifications	
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %
Calibration temperature	+20...28 °C

General Specifications	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6, test Fc, 1g, 2...100 Hz
Vibration, continuous	IEC 60068-2-64, test Fh, 1g, 3...100 Hz
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>
EMC immunity influence	≤ ±0.5 % of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	≤ ±1 % of span
Signal/Noise ratio	min. 60 dB (0...100 kHz)
Response time (0...90 %, 100...10 %): Temperature input, programmable mA / V input, programmable	1...60 s 0.4...60 s

Default Settings	
Input type	Temperature
Connection type	3-wire
Temperature unit	°C
Temperature sensor type	Pt100
Temperature range	0...150 °C
Output current range	0...20 mA
Output current on error	23 mA
Analog output response time (1/10 s)	1 s

Relay Software Parameters / Default Settings	
Function	SETPOINT

Contact function	Normally Open (NO)
Setpoint	50 °C (input type temperature) / 50 %
Activation direction	Increasing
Hysteresis	1 °C (input type temperature) / 1 %
Action on error	Relay OPEN
Activation delay	0 s
Deactivation delay	0 s

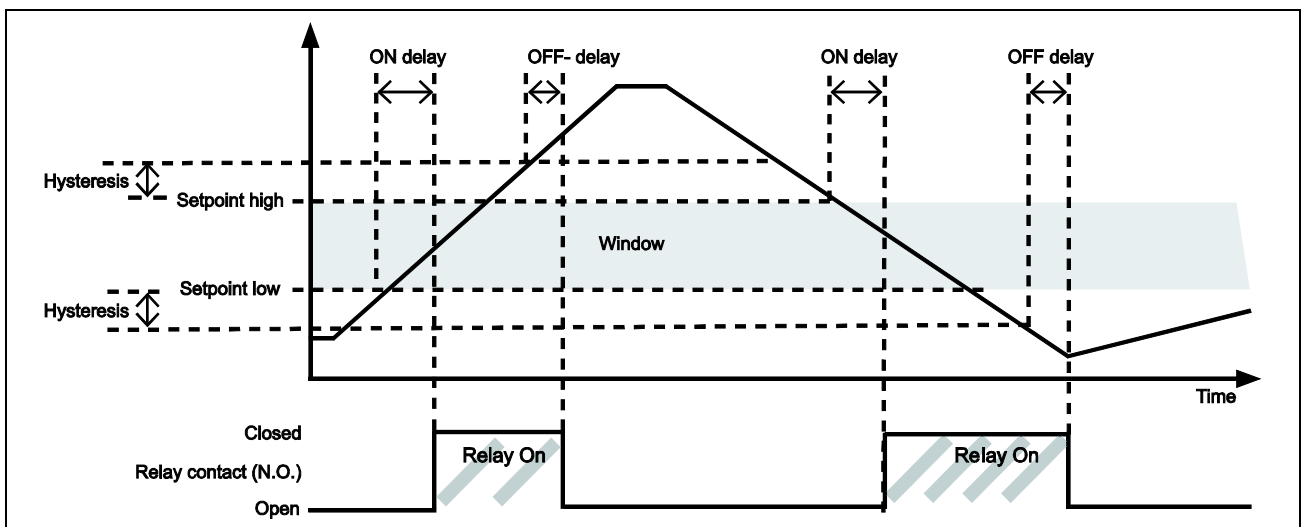


Illustration 7-13: Graphic depiction of window

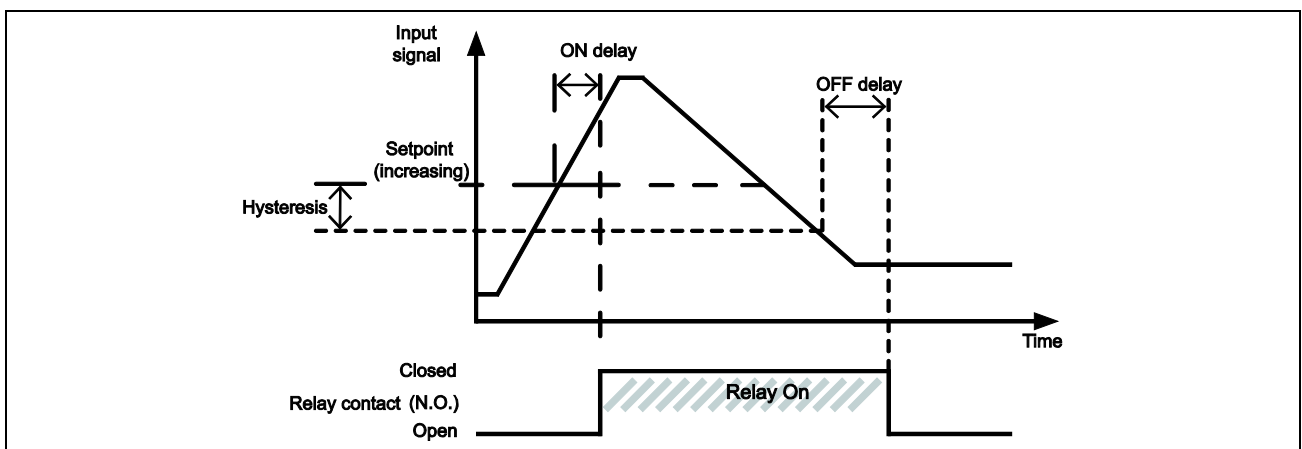


Illustration 7-14: Graphic depiction of setpoint

## 7.5 ACT20X-HAI-SAO (HART-transparent Repeater)

### 7.5.1 Description

The ACT20X-HAI-SAO current supply isolator is a HART-protocol, transparent isolator for analogue input signals from Ex Zone 0. The input may also operate as an active current loop (the loop current provided by the device). It provides an 4...20 mA current signal for the safe zone on the output side.

It is available in a single-channel or two-channel version.

The following HART-transparent repeaters are available:

Order No.	Type	Description
8965430000 2456140000	ACT20X-HAI-SAO-S ACT20X-HAI-SAO-P	HART-transparent repeater
8965440000 2456150000	ACT20X-2HAI-2SAO-S ACT20X-2HAI-2SAO-P	2-channel HART-transparent repeater

## 7.5.2 Status/Alarm LEDs

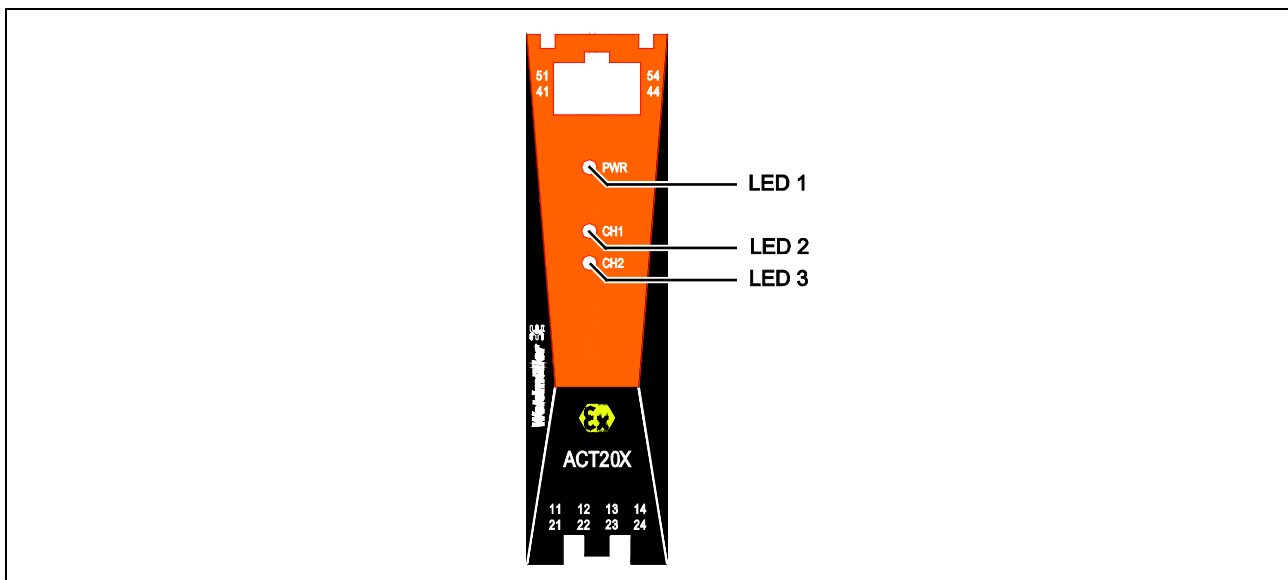


Illustration 7-15: Status/Alarm LEDs

Condition		LED 1	Channel 1		Channel 2		Status Relay (NC)
			LED 2	Output	LED 3	Output	
Device OK							
Channel 1	activated	green flashing	OFF	active			energized
	defective		red	inactive			de-energized
	signal limit exceeded		red flashing	inactive			de-energized
	fixed loop break limit exceeded		red blinking	inactive			de-energized
Channel 2	activated	green flashing			OFF	active	energized
	defective				red	inactive	de-energized
	signal limit exceeded				red flashing	inactive	de-energized
	fixed loop break limit exceeded				red blinking	inactive	de-energized
No supply		OFF	OFF	OFF	OFF	OFF	de-energized
Device failure		OFF	red	OFF	red	OFF	de-energized

Blinking: 50% ON and 50% OFF

Flashing: 8% ON and 92% OFF

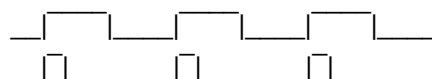


Table 7-9: Status/Alarm LEDs

### 7.5.3 Electrical Connections

Terminal	Function	Connector	Terminal	Function	Connector
11	I Passive –	Ex input channel 1	41	Out –	output channel 1
12	I Passive +		42	Out +	
13	I Active Return		43	Out –	output channel 2
14	I Active Supply		44	Out +	
21	I Passive –	Ex input channel 2	51	GND	power supply
22	I Passive +		52	+24 V DC	
23	I Active Return		53	NC	status relay
24	I Active Supply		54	COM	

Table 7-10: Electrical Connections

### 7.5.4 Specifications

#### Features

- HART-compatible for 0.5...2.5 kHz
- Configuration and monitoring via FDT/DTM-Software "WI-Manager".
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- The active or passive mA current signal inputs are completely electrically isolated.
- The device detects automatically whether an active or passive current signal is connected.
- The two-channel device can be used as a signal splitter.
- Extended self diagnostic: Monitoring of error events (e.g. cable breakage) via status relay.
- Front LEDs indicates operation status and malfunction.
- 3-way galvanic isolation between input, output and power supply.

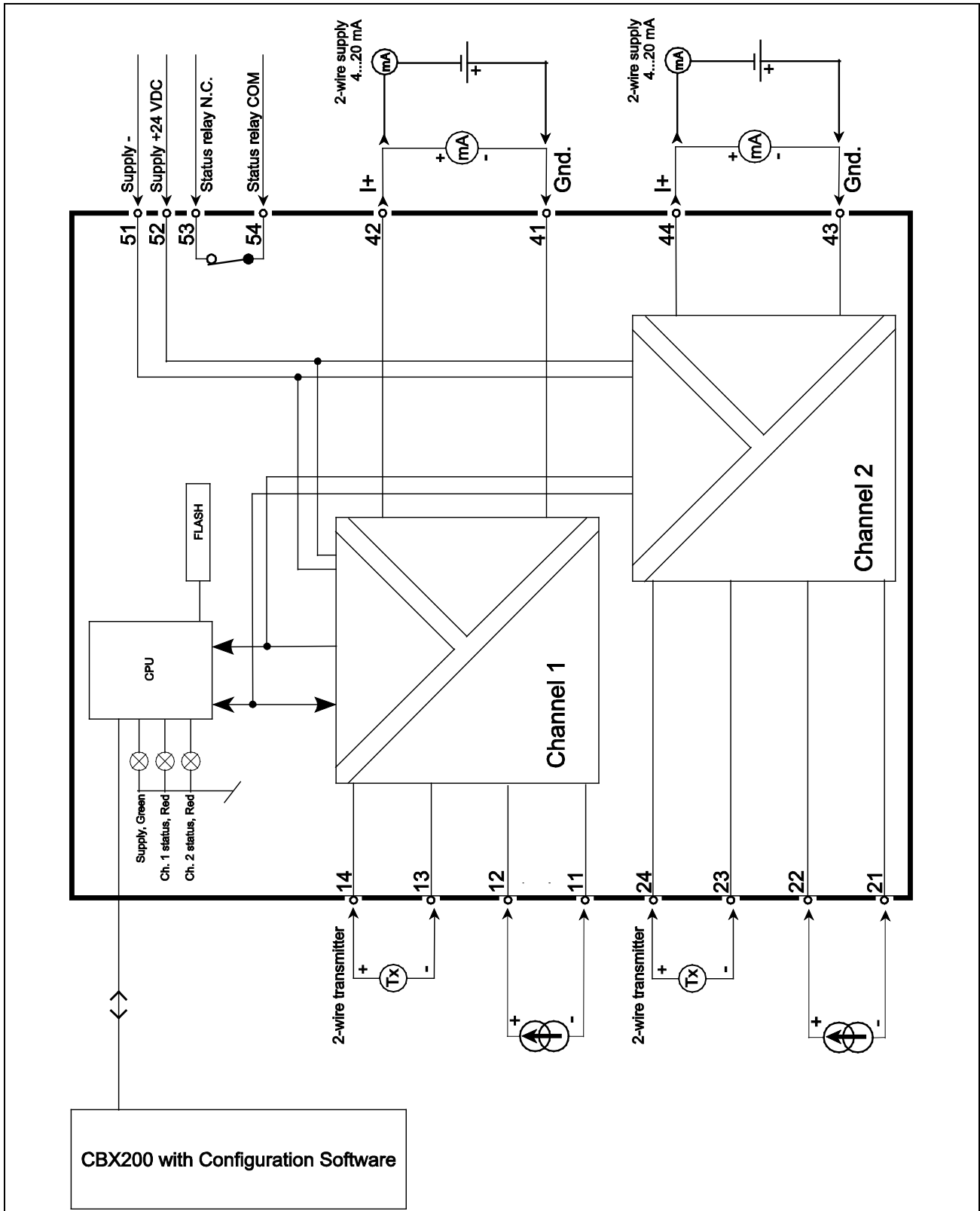


Illustration 7-16: Functional Block Diagram

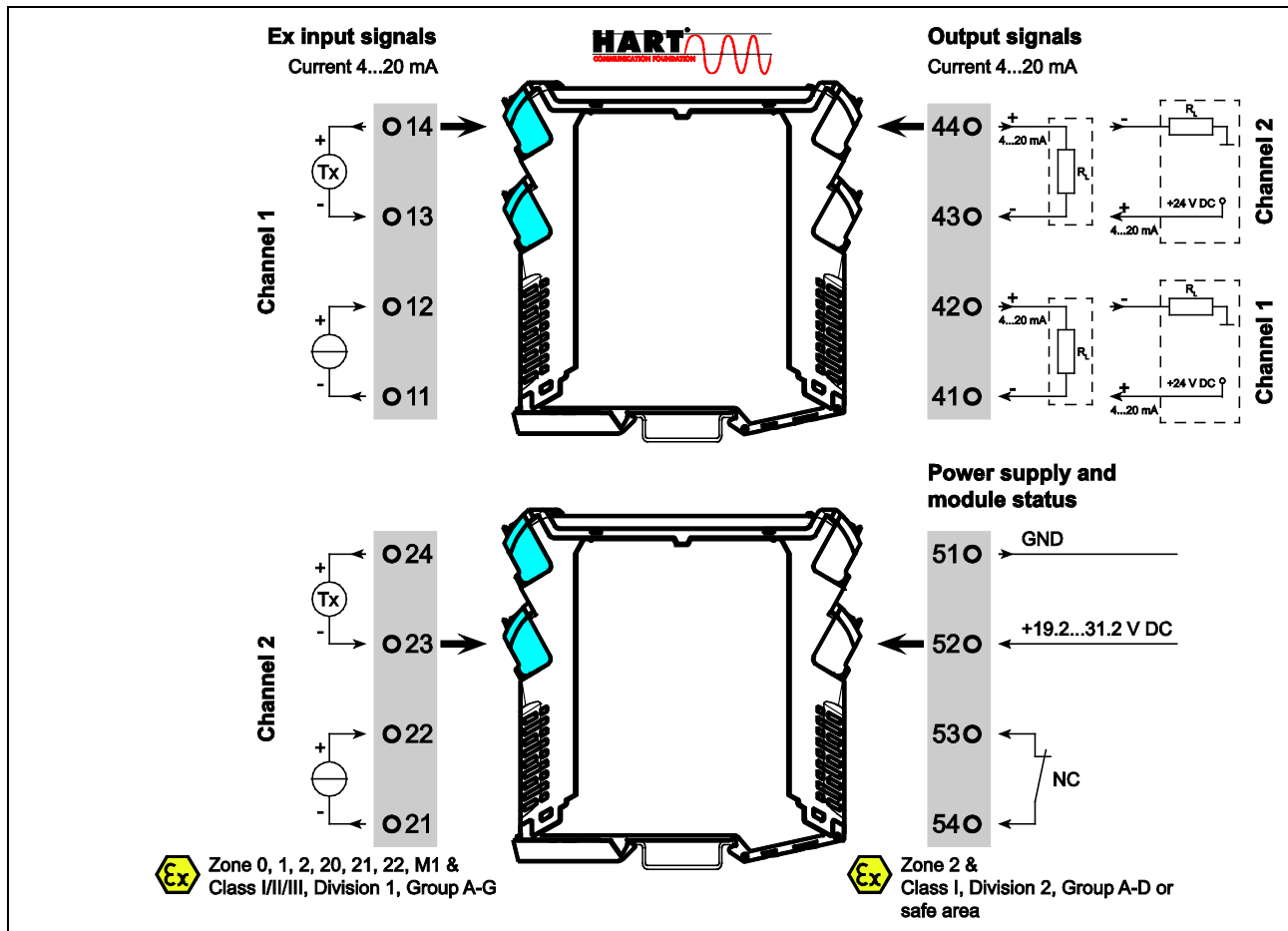


Illustration 7-17: Applications

Current Input	
Measurement range	3.5...23 mA
Alarm setpoint, low/high limit (programmable)	0...28 mA
Sensor error detection	< 1 mA

Current Output	
Signal range (programmable)	3.5...23 mA
Load max.	20 mA / 600 $\Omega$ / 12 V DC
Load stability	$\leq 0.01$ % of span / 100 $\Omega$
Sensor error detection (programmable)	3.5 mA / 23 mA / none
Current limit	$\leq 28$ mA
Effect of supply voltage change	< $\pm 10$ $\mu$ A



<b>2-wire 4...20 mA Current Loop Output</b>	
Signal range	3.5...23 mA
Load resistance	$\leq (V_{\text{supply}} - 3.5 \text{ V}) / 0.023 \text{ A } [\Omega]$
Load stability	$\leq 0.01 \text{ \% of span} / 100 \Omega$
External 2-wire supply voltage	3.5...26 V DC
Effect of external 2-wire supply voltage change	$< 0.005 \text{ \% of span} / \text{V}$

<b>Accuracy</b>	<b>Absolute Accuracy</b>	<b>Temperature Coefficient</b>
General values	$\leq \pm 0.1 \text{ \% of span}$	$\leq \pm 0.01 \text{ \% of span} / ^\circ\text{C}$
Basic values	$\leq \pm 16 \mu\text{A}$	$\leq \pm 1.6 \mu\text{A} / ^\circ\text{C}$

<b>Status Relay</b>	<b>Safe Area</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

<b>Power Supply</b>	
Supply voltage	19.2...31.2 V DC
Max. consumption (2-channels)	$\leq 3 \text{ W}$
Fuse	1.25 A / 250 V AC

<b>Isolation Voltages (reinforced insulation), Test/Operation</b>	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Output 1 to output 2	1.5 kV AC / 150 V AC
Status relay to supply	1.5 kV AC / 150 V AC

<b>Environmental Specifications</b>	
Specifications range	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	$< 95 \text{ \%}$
Calibration temperature	+20...28 °C

General Specifications	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6, test Fc, 1g, 2...100 Hz
Vibration, continuous	IEC 60068-2-64, test Fh, 1g, 3...100 Hz
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>
EMC immunity influence	$\leq \pm 0.5$ % of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	$\leq \pm 1$ % of span
Response time for cable fault	< 200 ms

HART Communication	
Frequency range	0.5...2.5 kHz
Signal / noise ratio	min. 60 dB (0.5...10 kHz)
Response time (0...90 %, 100...10 %)	< 5 ms

Default Settings	
Low/high limit	3.8 mA / 20.5 mA

## 7.6 ACT20X-SAI-HAO (HART-transparent Driver)

### 7.6.1 Description

The ACT20X-SAI-HAO is a HART-protocol, transparent current output isolator. A DC current input signal from the safe area will be galvanically separated and drives controlled field devices in Ex Zone 0.

It is available in a single-channel or two-channel version.

The following HART-transparent drivers are available:

Order No.	Type	Description
8965450000 2456160000	ACT20X-SAI-HAO-S ACT20X-SAI-HAO-P	HART-transparent driver
8965460000 2456170000	ACT20X-2SAI-2HAO-S ACT20X-2SAI-2HAO-P	2-channel HART-transparent driver

7.6.2 Status/Alarm LEDs

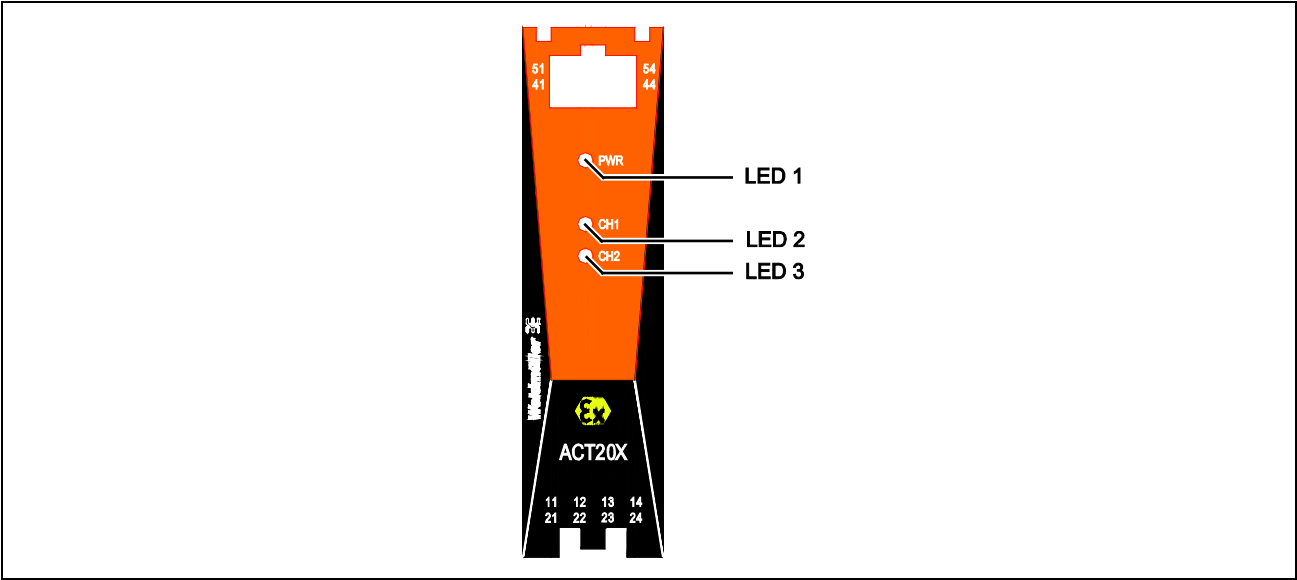


Illustration 7-18: Status/Alarm LEDs

Condition	LED 1	Channel 1		Channel 2		Status Relay (NC)
		LED 2	Output	LED 3	Output	
Device						
Channel 1	OK	OFF	ON			energized
	defective	red	fault state			de-energized
	signal limit exceeded	red flashing	fault state			de-energized
	fixed loop break limit exceeded	red blinking	fault state			de-energized
Channel 2	OK			OFF	ON	energized
	defective			red	fault state	de-energized
	signal limit exceeded			red flashing	fault state	de-energized
	fixed loop break limit exceeded			red blinking	fault state	de-energized
No supply	OFF	OFF	OFF	OFF	OFF	de-energized
Device failure	OFF	red	OFF	red	OFF	de-energized

Blinking: 50% ON and 50% OFF

Flashing: 8% ON and 92% OFF



Table 7-11: Status/Alarm LEDs

### 7.6.3 Electrical Connections

Terminal	Function	Connector	Terminal	Function	Connector
11	Out –	Ex output channel 1	41	In –	input channel 1
12	Out +		42	In +	
13			43	In –	input channel 2
14			44	In +	
21	Out –	Ex output channel 2	51	GND	power supply
22	Out +		52	+24 V DC	
23			53	NC	status relay
24			54	COM	

Table 7-12: Electrical Connections

### 7.6.4 Specifications

#### Features

- HART-compatible for 0.5...2.5 kHz
- Configuration and monitoring via FDT/DTM-Software "WI-Manager".
- The device can be mounted in the safe area and in Zone 2 / Class I, Division 2 and receive signals from Zone 0, 1, 2 and Zone 20, 21 and 22 including M1 / Class I/II/III, Division 1, Group A-G.
- The mA current signal inputs are completely electrically isolated.
- The device detects automatically whether an active or passive current signal is connected.
- Extended self diagnostic: Monitoring of error events (e.g. cable breakage) via status relay.
- Front LEDs indicates operation status and malfunction.
- 3-way galvanic isolation between input, output and power supply.



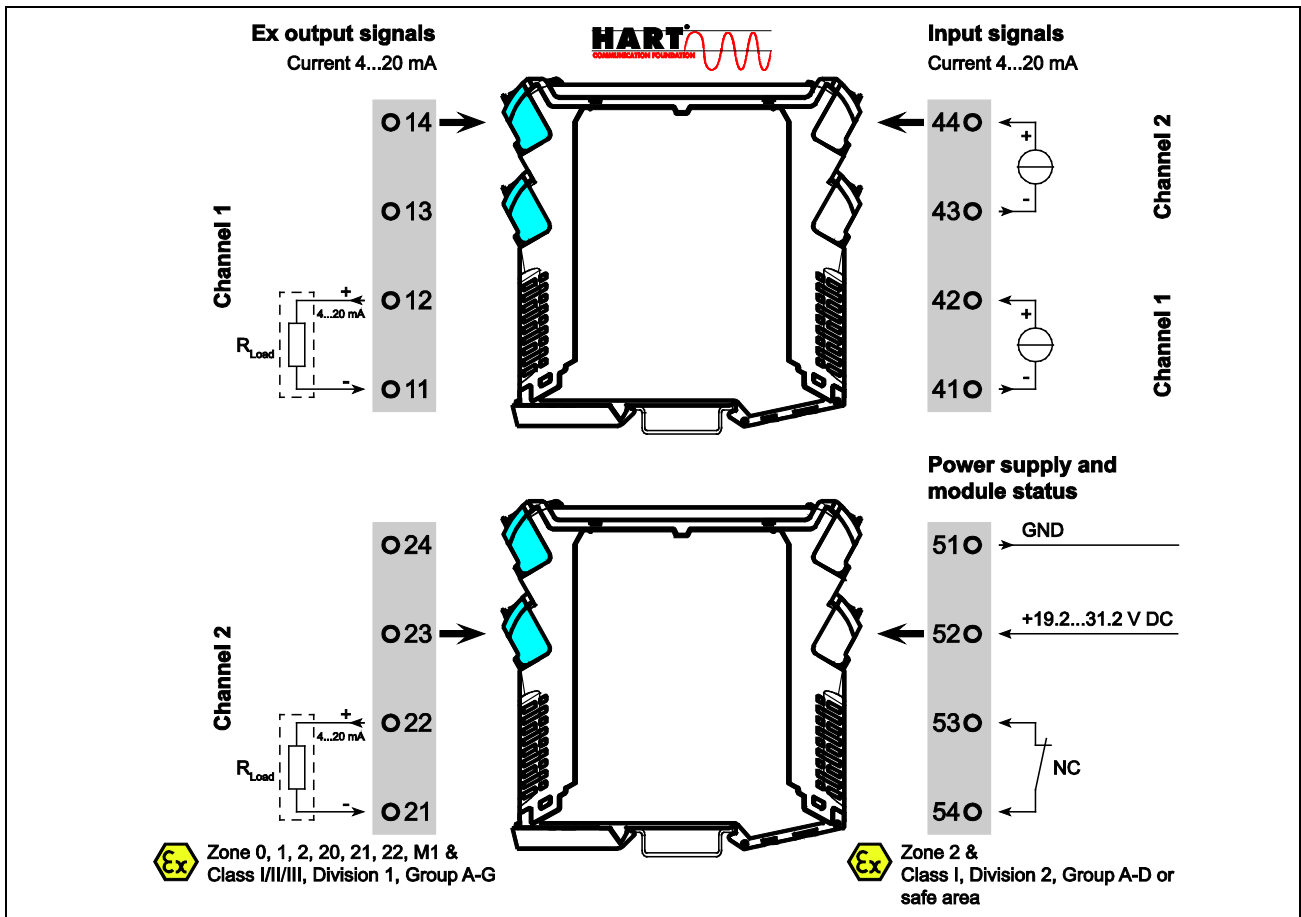


Illustration 7-20: Applications

Current Input	
Measurement range	3.5...23 mA
Input resistance	nom. 20 $\Omega$ + PTC 50 $\Omega$
Alarm setpoint, low/high limit (programmable)	0...28 mA
Sensor error detection	< 1 mA

Current Output	
Signal range (programmable)	3.5...23 mA
Load max.	20 mA / 725 $\Omega$ / 14.5 V DC
Load stability	$\leq 0.01$ % of span / 100 $\Omega$
Sensor error detection (programmable)	3.5 mA / 23 mA / none
Current limit	$\leq 28$ mA

Accuracy	Absolute Accuracy	Temperature Coefficient
General values	$\leq \pm 0.1$ % of span	$\leq \pm 0.01$ % of span / °C
Basic values	$\leq \pm 16$ $\mu$ A	$\leq \pm 1.6$ $\mu$ A / °C

Status Relay	Safe Area	Zone 2 Installation
Voltage max.	125 V AC / 110 V	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A	0.5 A AC / 1 A DC
Power max.	62.5 V AC / 32 W	16 VA / 32 W

Power Supply	
Supply voltage	19.2...31.2 V DC
Max. consumption (2-channels)	$\leq 3.5$ W
Fuse	1.25 A / 250 V AC

Isolation Voltages (reinforced insulation), Test/Operation	
Inputs / outputs / supply	2.6 kV AC / 300 V AC
Input 1 to input 2	1.5 kV AC / 150 V AC
Status relay to supply	1.5 kV AC / 150 V AC

Environmental Specifications	
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %
Calibration temperature	+20...28 °C

General Specifications	
Communications interface, adapter / configuration software / FDT-DTM device driver	CBX200 USB / "WI-Manager" / ACT20X DTM
Dimensions (H x W x D)	105.6 x 22.5 x 114.7 mm
Protection degree	IP20
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6, test Fc, 1g, 2...100 Hz
Vibration, continuous	IEC 60068-2-64, test Fh, 1g, 3...100 Hz
Wire size, stranded wire	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>



EMC immunity influence	$\leq \pm 0.5$ % of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	$\leq \pm 1$ % of span

<b>HART Communication</b>	
Frequency range	0.5...2.5 kHz
Signal / noise ratio	min. 60 dB (0.5...10 kHz)
Response time (0...90 %, 100...10 %)	< 5 ms

<b>Default Settings</b>	
Low/high limit	3.8 mA / 20.5 mA

## 7.7 ACT20-FEED-IN-PRO

### 7.7.1 Description

The power feed-in unit ACT20-FEED-IN-PRO supplies the devices on the CH20M DIN rail bus with 24 V DC. At the same time, the ACT20-FEED-IN-PRO 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 ACT20-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 ACT20-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.

The following Power Feed-In Unit is available:

Order No.	Type	Description
8965500000	ACT20-FEED-IN-PRO-S	Power Feed-In Unit
2456870000	ACT20-FEED-IN-PRO-P	

## 7.7.2 Status/Alarm LEDs

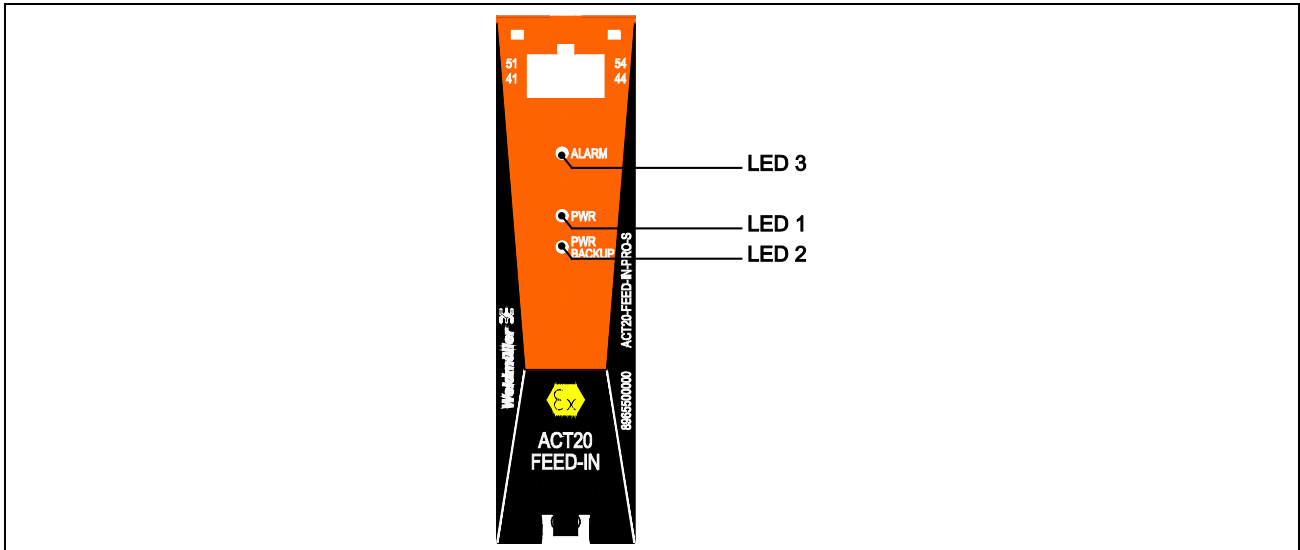


Illustration 7-21: Status/Alarm LEDs

Condition	LED 1 (PWR)	LED 2 (PWR BACKUP)	LED 3 (Alarm)	Status Relay (NC)	Status Relay (NO)
No power supply	OFF	OFF	OFF	de-energized	de-energized
Primary supply voltage	green	OFF	red	de-energized	de-energized
Secondary supply voltage	OFF	green	red	de-energized	de-energized
Primary and secondary supply voltage	green	green	OFF	1)	1)
Collective error message					
active			red	de-energized	de-energized
inactive			OFF	energized 2)	energized 2)

1) depends on collective error message

2) if the primary and/or secondary power supply is applied

Table 7-13: Status/Alarm LEDs

### 7.7.3 Electrical connections

Terminal	Function	Connector
41	NO	status relay
42	COM	
43	NC	
44		
51	GND	power supply
52	+24 V DC	
53	+24 V DC	backup power supply
54	GND	
81	collective error contact	Weidmüller DIN rail bus CH20M
82	+24 V DC	
83	GND	
84		
85		

Table 7-14: Electrical connections

### 7.7.4 Specifications

#### Features

- The power feed-in unit ACT20-FEED-IN-PRO detects errors from any of the devices mounted on the Weidmüller DIN rail bus CH20M and transmits a collective alarm to an external control system via the internal status relay.
- Optional connection of two power supplies - a primary power supply and a backup power supply.
- Redundant power supply can be obtained by mounting two feed-in units connected to two separate power supplies.
- The status relay will be energised when the following conditions are met:
  - The power supply is present on terminal 51 and 52.
  - The backup power supply is present on terminal 53 and 54.  
If the backup power supply is not required, the included jumper must be employed between terminal 52 and 53.
  - There are no error signals from the devices connected to the Weidmüller DIN rail bus.
- The device can be mounted in the safe area (non-hazardous) and in zone 2 / division 2.
- The status of the power supply and the backup power supply is indicated by two green LEDs.
- A malfunction is indicated by a red LED.

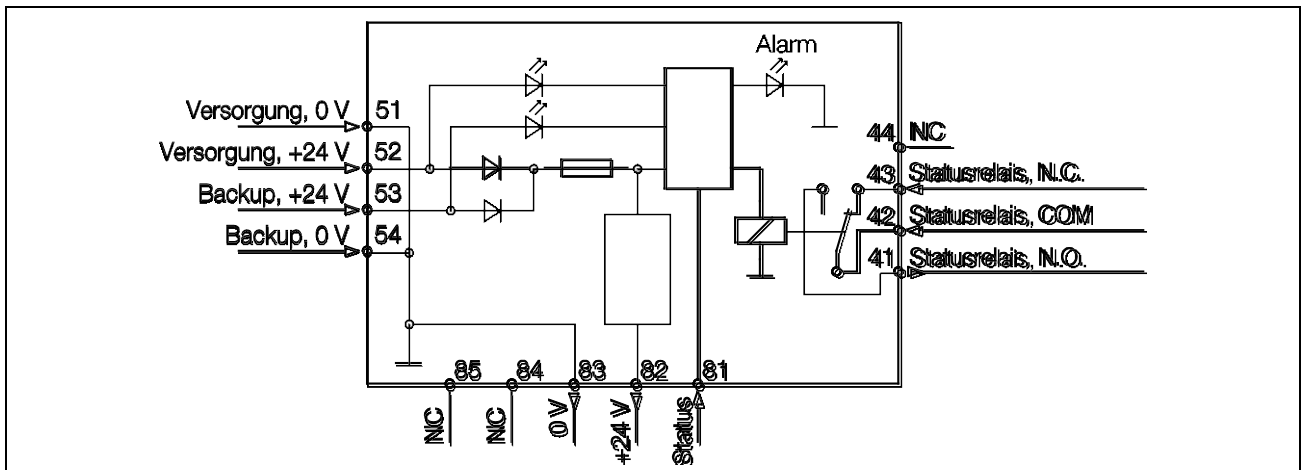
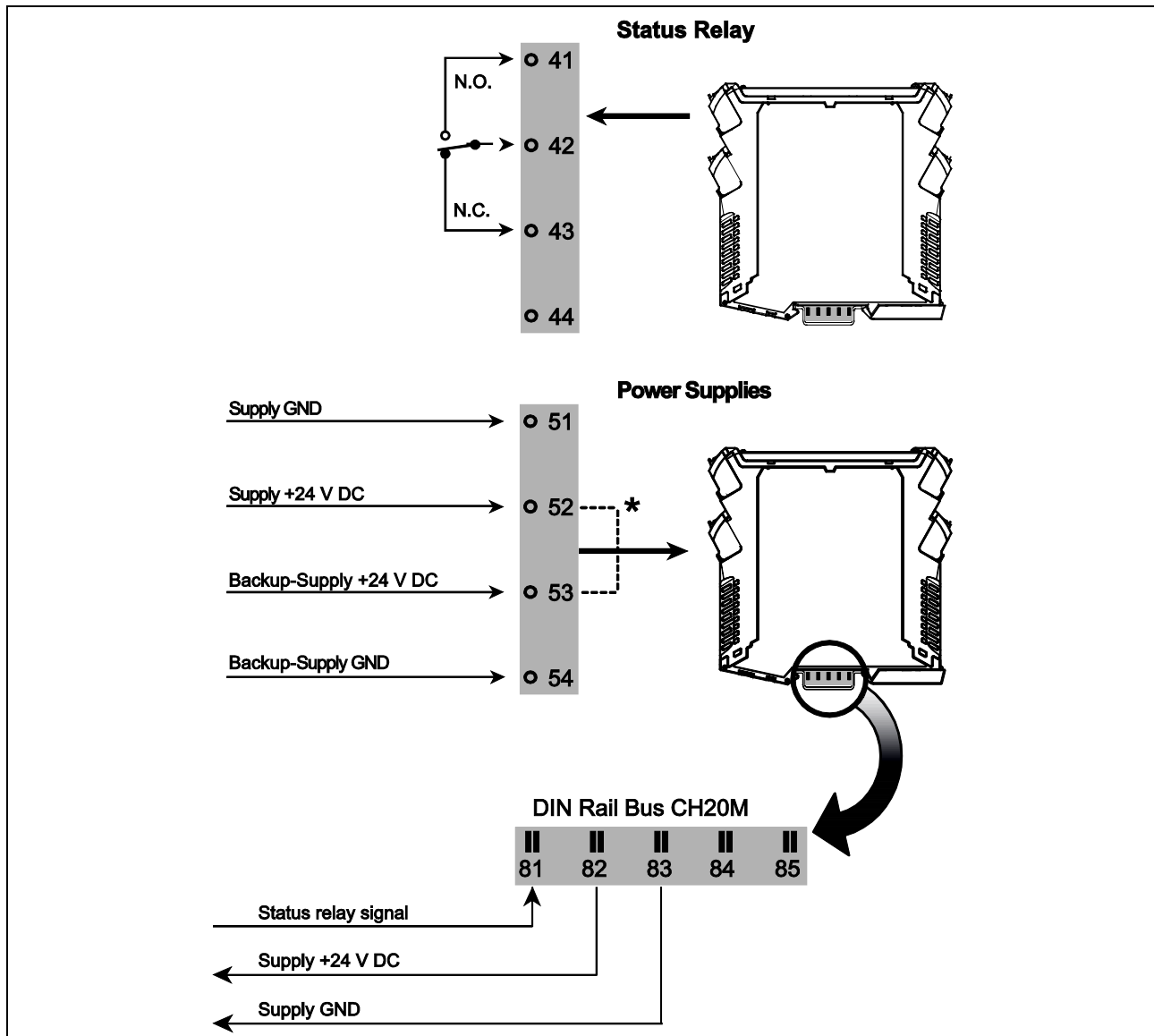


Illustration 7-22: Functional Block Diagram



\* If the backup power supply is not required, the included jumper must be employed between terminal 52 and 53.

Illustration 7-23: Applications

Input Supply Voltage	
Supply voltage	21.6...26.4 V DC
Backup supply voltage	21.6...26.4 V DC
Trigger level for collective alarm on DIN rail bus	< 21 V DC
Efficiency	> 97.9 %
Internal consumption max.	2 W

Output Power Supply	
Output voltage at 4 A	$V_{\text{input power supply}} - 0.5 \text{ V DC}$
Output current max.	4 A DC
Output power max.	96 W

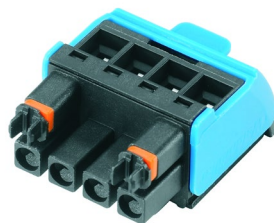
Status Relay (Alarm), Safe Area	
Voltage max.	250 V AC / 30 V DC
Current max.	2 A AC / 2 A DC
Power max.	500 VA / 60 W

Environmental Specifications	
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Relative humidity (non-condensation)	< 95 %

General Specifications	
Dimensions L x W x H	109.2 x 22.5 x 113.6 mm
Protection degree	IP 20
Screw terminal torque	0.5 Nm
Wire size (stranded wire)	AWG 26...14 / 0.13...2.08 mm <sup>2</sup>
Isolation test voltage	2.6 kV AC

## 7.8 Female Plug BHZ 5.00

### 7.8.1 Description



Among other things, the following female plug is available:

Order No.	Type	Description
1069380000	BHZ 5.00/04/90LH BK/BL	Female plug

#### Features

- Simple, component-friendly unplugging of the female plug using the integrated release lever.
- Together with the captive, unique "Auto-Set" encoding, the uniquely detectable markers on the plug connection and in the front ensure misconnection-proof assignment of the connections. Both markers can be printed as cards in a PrintJet and then permanently snapped on.
- Quick and easy operation by means of an integrated colour-coded release lever with grip tab and including a screwdriver pocket.
- Touch protection for the male and female header on both sides.
- During the installation: the quick all-purpose "Multi-Tool" screw head ensures a secure contact, user-friendly operation and less complexity. Additional features, such as the "Wire ready" technology, enable you to minimize wiring costs and increase customer satisfaction.



## 7.8.2 Specifications

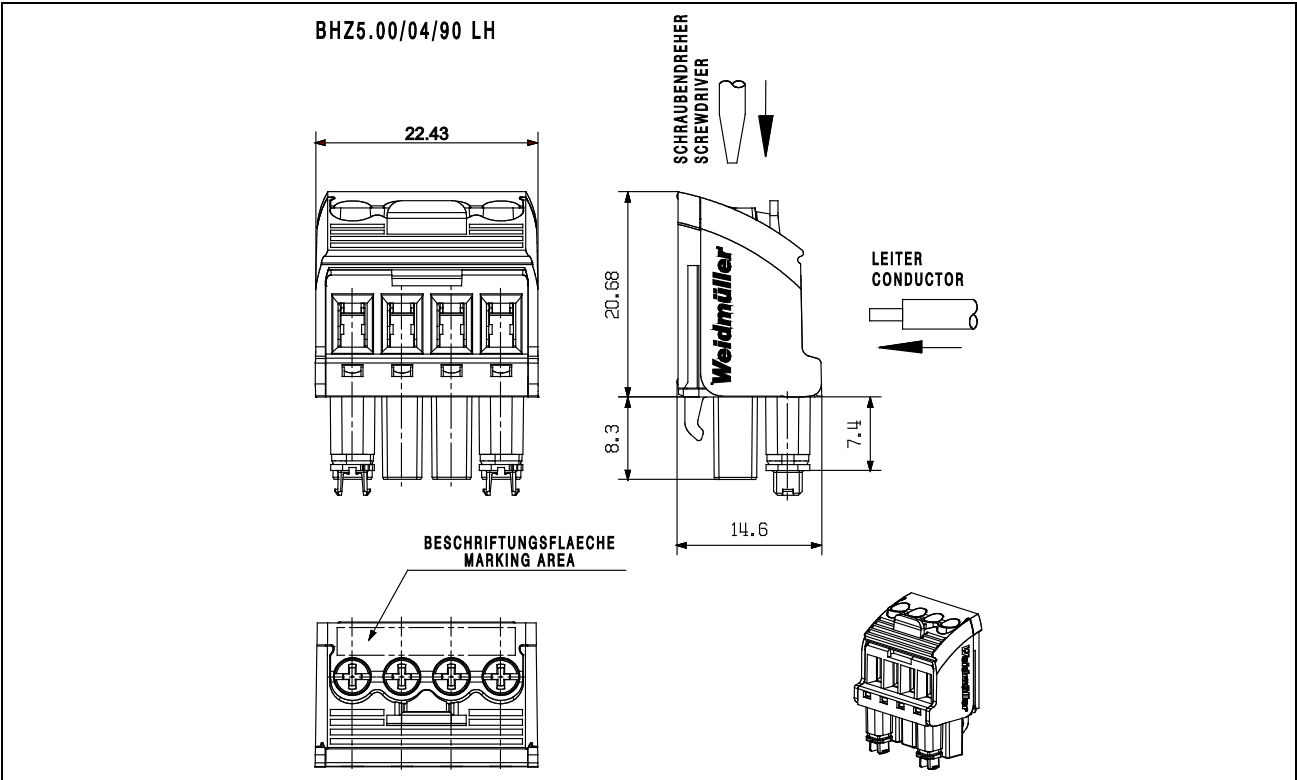
General Specifications	
Product family	OMNIMATE Housing - series CH20M
Wire connection method	Clamping yoke connection
Conductor outlet direction	90°
Pitch	5 mm / 0.197 inch
Number of poles	4
Screwdriver blade DIN 5264	0.6 x 3.5
Tightening torque	0.4...0.6 Nm
Clamping screw	M 2.5
Stripping length	8 mm
Dimensions L x W x H	14.6 x 22.4 x 29 mm

Connectable Wires	
Clamping range	0.13...3.31 mm <sup>2</sup>
Solid, H05(07) V-U	0.2...2.5 mm <sup>2</sup>
Flexible, H05(07) V-K	0.2...2.5 mm <sup>2</sup>
With wire end ferrule, DIN 46228/1	0.25...2.5 mm <sup>2</sup>
With wire end ferrule and plastic collar, DIN 46228/4	0.25...2.5 mm <sup>2</sup>

Rated Data according to UL 1059 and CSA	
Rated voltage / Rated current (use group B)	300 V / 10 A
Rated voltage / Rated current (use group C)	50 V / 10 A
Rated voltage / Rated current (use group D)	300 V / 10 A
Wire cross-section	AWG 26...12

Rated Data according to DIN IEC	
Rated current, max. number of poles	10 A @ T <sub>u</sub> = 20 °C, 9 A @ T <sub>u</sub> = 40 °C
Rated voltage / overvoltage category / pollution degree	400 V / II / 2 320 V / III / 2 250 V / III / 3
Rated impulse voltage / overvoltage category / pollution degree	4 kV / II / 2 4 kV / III / 2 4 kV / III / 3

Material Data	
UL 94 flammability rating	V-0
Insulating material	PA 66 GV30
Colour	black





## Appendix A. Installation Drawings ACT20X-HDI-SDO (NAMUR Pulse Isolator)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965340000 2456050000	4 50102 Sheet 1-2	ACT20X-HDI-SDO-RNO-S ACT20X-HDI-SDO-RNO-P
8965350000 2456060000	4 50102 Sheet 1-2	ACT20X-HDI-SDO-RNC-S ACT20X-HDI-SDO-RNC-P
8965360000 2456070000	4 50588 Sheet 1-2	ACT20X-HDI-SDO-S ACT20X-HDI-SDO-P
8965370000 2456080000	4 50589 Sheet 1-2	ACT20X-2HDI-2SDO-RNO-S ACT20X-2HDI-2SDO-RNO-P
8965380000 2456090000	4 50589 Sheet 1-2	ACT20X-2HDI-2SDO-RNC-S ACT20X-2HDI-2SDO-RNC-P
8965390000 2456100000	4 50590 Sheet 1-2	ACT20X-2HDI-2SDO-S ACT20X-2HDI-2SDO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)HDI-(2)SDO-(RNO/RNC) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits have been installed in a type of protection other than “intrinsic safety”, the module must not be re-installed in type of protection “intrinsic safety”.

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		KEMA 09ATEX 0168 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007

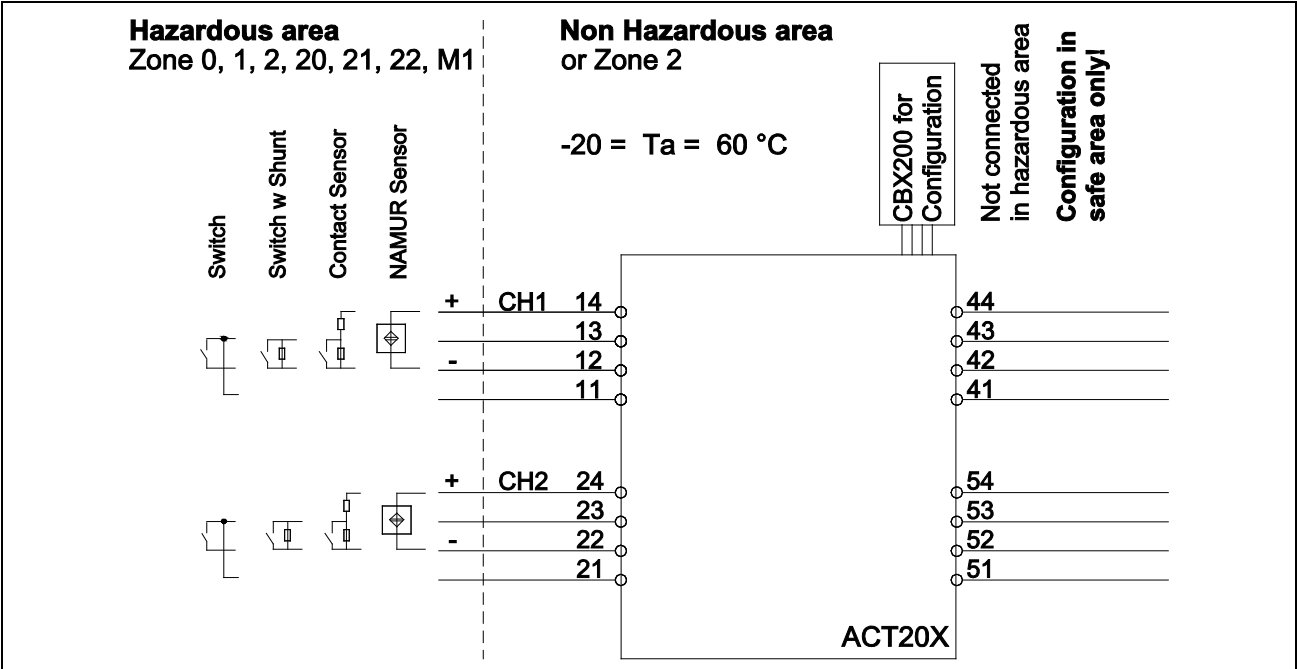


Illustration 7-24: ATEX Installation Drawing, (450102 Sheet 1-2, 450588 Sheet 1-2, 450589 Sheet 1-2, 450590 Sheet 1-2)

Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)

Ex Input	
U <sub>o</sub>	10.6 V DC
I <sub>o</sub>	12 mA DC
P <sub>o</sub>	32 mW
L <sub>o</sub> /R <sub>o</sub>	1150 µH/Ω

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	2 µF	260 mH
IIB	6 µF	780 mH
IIA	18 µF	1000 mH
I	90 µF	1000 mH

Terminal (41, 42, 43, 44) and (51, 52, 53, 54)

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

<b>Supply</b>	
Voltage	19.2...31.2 V DC
Power max.	3 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**Terminal CH1 (41, 42) and CH2 (43, 44)**

<b>Digital Output, NPN Output</b>	
Voltage max.	30 V DC
Current max.	80 mA


**Terminal CH1 (41, 42) and CH2 (43, 44)**


<b>Relay Output</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965340000 2456050000	4 50102 Sheet 3-4	ACT20X-HDI-SDO-RNO-S ACT20X-HDI-SDO-RNO-P
8965350000 2456060000	4 50102 Sheet 3-4	ACT20X-HDI-SDO-RNC-S ACT20X-HDI-SDO-RNC-P
8965360000 2456070000	4 50588 Sheet 3-4	ACT20X-HDI-SDO-S ACT20X-HDI-SDO-P
8965370000 2456080000	4 50589 Sheet 3-4	ACT20X-2HDI-2SDO-RNO-S ACT20X-2HDI-2SDO-RNO-P
8965380000 2456090000	4 50589 Sheet 3-4	ACT20X-2HDI-2SDO-RNC-S ACT20X-2HDI-2SDO-RNC-P
8965390000 2456100000	4 50590 Sheet 3-4	ACT20X-2HDI-2SDO-S ACT20X-2HDI-2SDO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)HDI-(2)SDO-(RNO/RNC) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits have been installed in a type of protection other than “intrinsic safety”, the module must not be re-installed in type of protection “intrinsic safety”.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEx Certificate	KEM 09.0072 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007



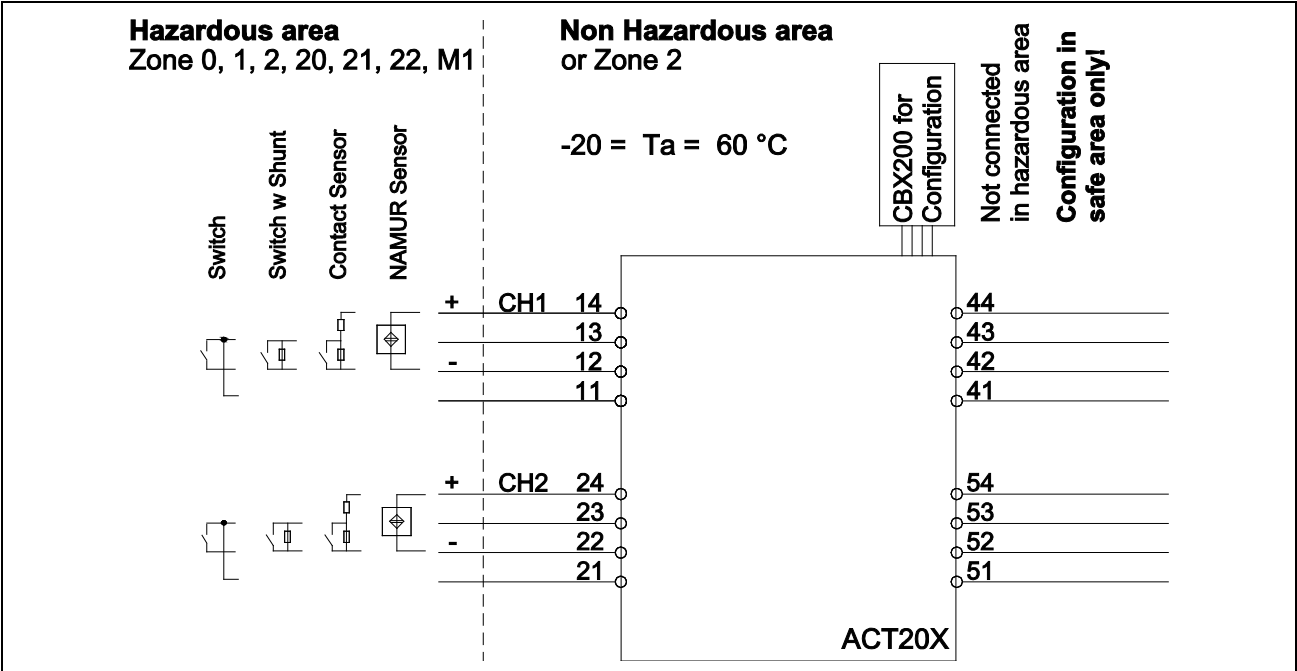


Illustration 7-25: IECEx Installation Drawing, (450102 Sheet 3-4, 450588 Sheet 3-4, 450589 Sheet 3-4, 450590 Sheet 3-4)

Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)

Ex Input	
U <sub>o</sub>	10.6 V DC
I <sub>o</sub>	12 mA DC
P <sub>o</sub>	32 mW
L <sub>o</sub> /R <sub>o</sub>	1150 μH/Ω

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	2 μF	260 mH
IIB	6 μF	780 mH
IIA	18 μF	1000 mH
I	90 μF	1000 mH

Terminal (41, 42, 43, 44) and (51, 52, 53, 54)

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

<b>Supply</b>	
Voltage	19.2...31.2 V DC
Power max.	3 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**Terminal CH1 (41, 42) and CH2 (43, 44)**

<b>Digital Output, NPN Output</b>	
Voltage max.	30 V DC
Current max.	80 mA


**Terminal CH1 (41, 42) and CH2 (43, 44)**


<b>Relay Output</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W


**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965340000 2456050000	4 50102 Sheet 5-6	ACT20X-HDI-SDO-RNO-S ACT20X-HDI-SDO-RNO-P
8965350000 2456060000	4 50102 Sheet 5-6	ACT20X-HDI-SDO-RNC-S ACT20X-HDI-SDO-RNC-P
8965360000 2456070000	4 50588 Sheet 5-6	ACT20X-HDI-SDO-S ACT20X-HDI-SDO-P
8965370000 2456080000	4 50589 Sheet 5-6	ACT20X-2HDI-2SDO-RNO-S ACT20X-2HDI-2SDO-RNO-P
8965380000 2456090000	4 50589 Sheet 5-6	ACT20X-2HDI-2SDO-RNC-S ACT20X-2HDI-2SDO-RNC-P
8965390000 2456100000	4 50590 Sheet 5-6	ACT20X-2HDI-2SDO-S ACT20X-2HDI-2SDO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)HDI-(2)SDO-(RNO/RNC) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

	<b>WARNING</b>
	Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

The installation and wiring must be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be supplied from a Power Supply having double or reinforced insulation.

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

The module must be installed in an enclosure suitable for the environment where it is used.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure according to the regulations in the CEC for Canada or NEC for USA.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG 26-14.

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us Certificate	3038275C / 3038275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4
Standards	<u>Canada</u> Zones: E60079-0, E60079-11, E60079-15 Divisions: CSA 22.2-157, CSA 22.2-213 <u>USA</u> Zones: UL 60079-0, UL 60079-11, UL 60079-15 Divisions: FM3600, FM3610, FM3611, FM3810

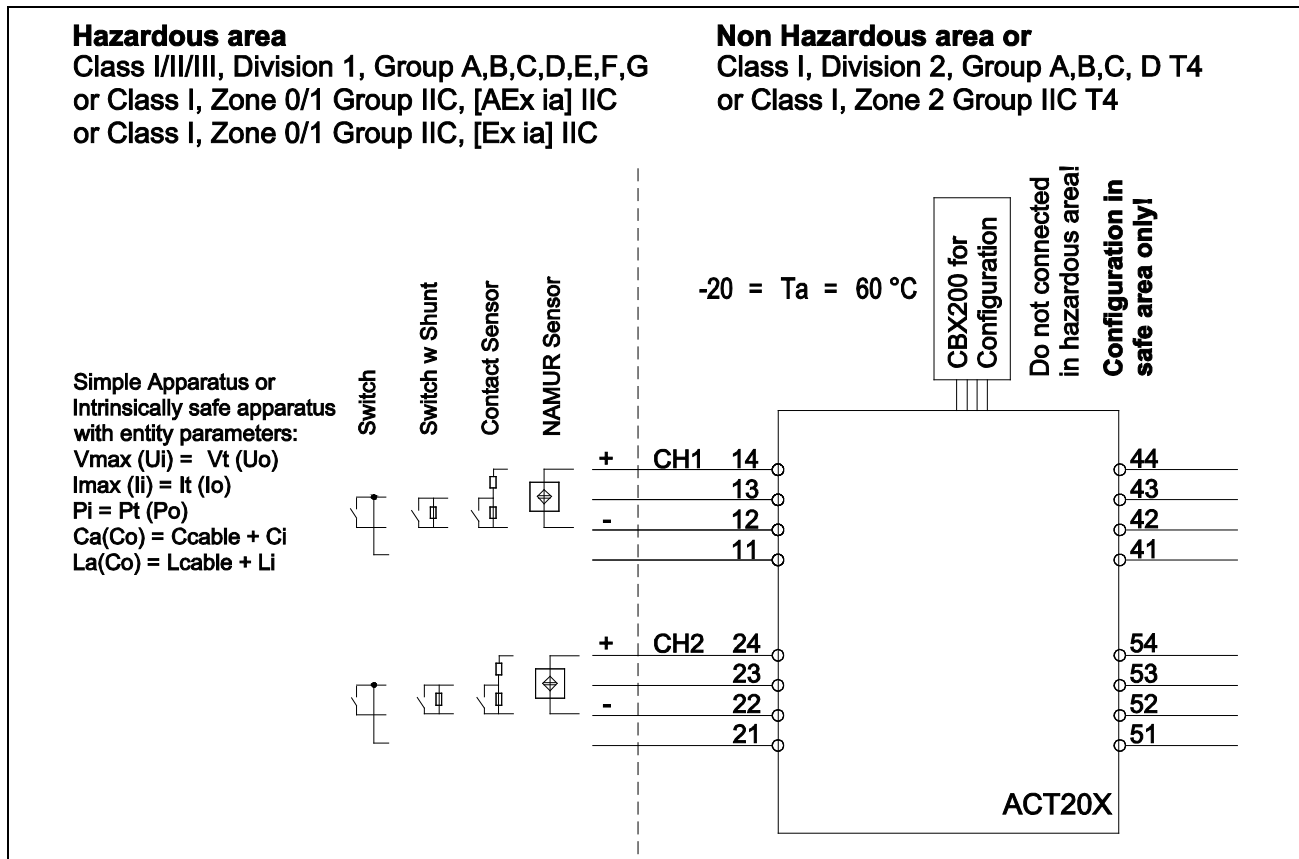


Illustration 7-26: FM Installation Drawing, (450102 Sheet 5-6, 450588 Sheet 5-6, 450589 Sheet 5-6, 450590 Sheet 5-6)

#### Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)

Ex Input	
$U_o, V_t$	10.6 V DC
$I_o, I_{sc}$	12 mA DC
$P_o, P_t$	32 mW
$L_o/R_o, L_a/R_a$	1150 $\mu\text{H}/\Omega$

Group	$C_o, C_a$	$L_o, L_a$
IIC or A, B	2 $\mu\text{F}$	260 mH
IIB or C, E, F	6 $\mu\text{F}$	780 mH
IIA or D, G	18 $\mu\text{F}$	1000 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC
Power max.	3 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**Terminal CH1 (41, 42) and CH2 (43, 44)**

Digital Output, NPN Output	
Voltage max.	30 V DC
Current max.	80 mA

**Terminal CH1 (41, 42) and CH2 (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

## Appendix B. Installation Drawings ACT20X-HTI-SAO (Temperature/mA Converter)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965470000 2456180000	4 50594 Sheet 1-2	ACT20X-HTI-SAO-S ACT20X-HTI-SAO-P
8965480000 2456190000	4 50595 Sheet 1-2	ACT20X-2HTI-2SAO-S ACT20X-2HTI-2SAO-P



#### DANGER

For safe installation of the Temperature and mA Converter ACT20X-(2)HTI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.



#### DANGER

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIC” the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits (Terminals 11...14, 21...24) have been installed in a type of protection other than “intrinsic safety”, the module must not be re-installed in type of protection “intrinsic safety”.

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		KEMA 10ATEX 0020 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007



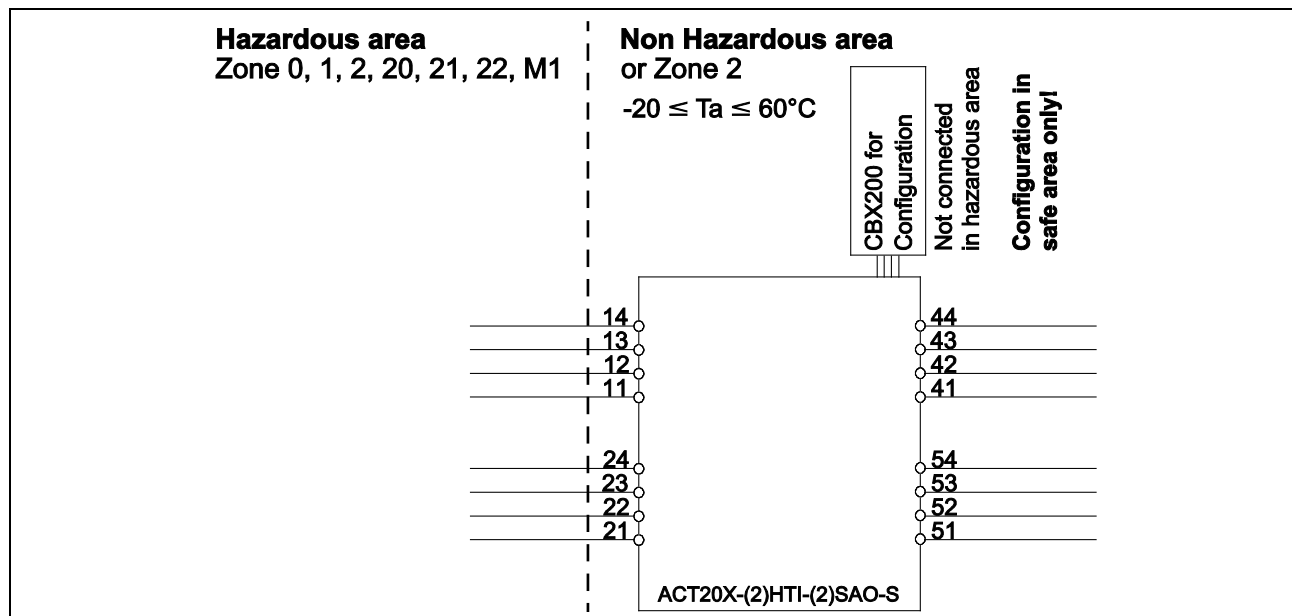


Illustration 7-27: ATEX Installation Drawing (1), (450594 Sheet 1-2, 450595 Sheet 1-2)

**Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)**

Ex Input	
$U_o$	8.7 V
$I_o$	18.4 mA
$P_o$	40 mW
$L_o/R_o$	892 $\mu\text{H}/\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	30 nF
$L_i$	820 nH

Group	$C_o$	$L_o$
IIC	5 $\mu\text{F}$	100 mH
IIB	50 $\mu\text{F}$	300 mH
IIA or I	1000 $\mu\text{F}$	700 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

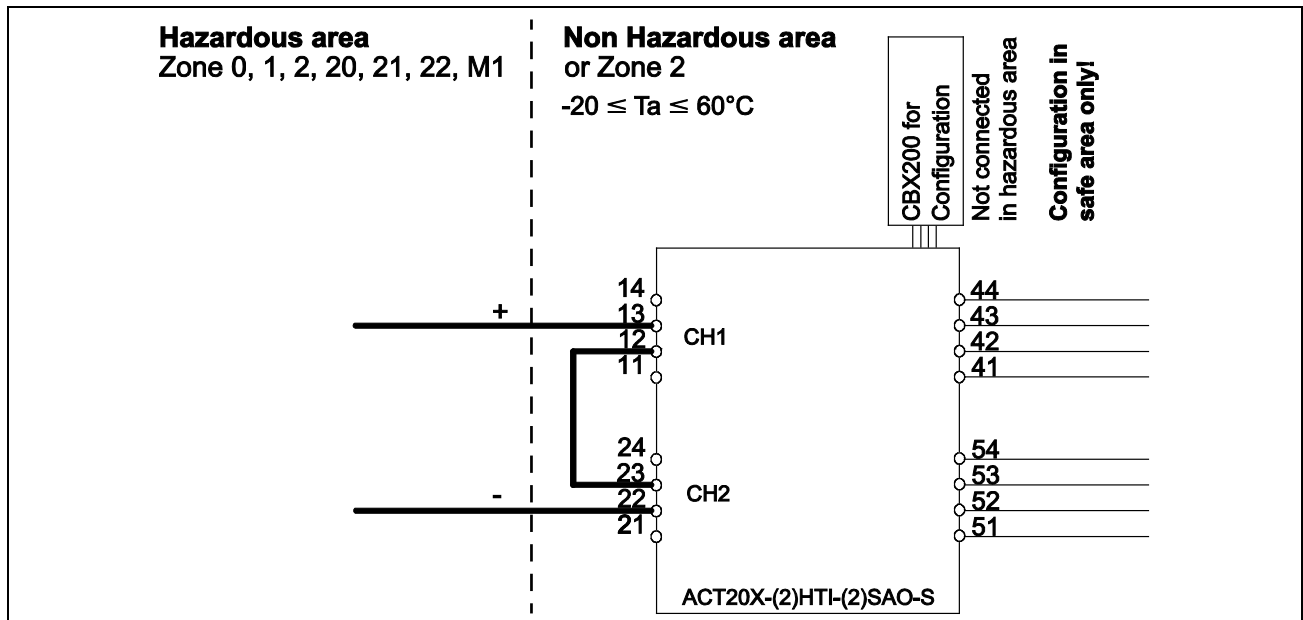


Illustration 7-28: ATEX Installation Drawing (2), (450594 Sheet 1-2, 450595 Sheet 1-2)

#### Terminal CH1 (13), CH2 (22)

Ex Input	
$U_o$	17.4 V
$I_o$	18.4 mA
$P_o$	80 mW
$L_o/R_o$	445 $\mu\text{H}/\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	15 nF
$L_i$	1.7 $\mu\text{H}$

Group	$C_o$	$L_o$
IIC	0.3 $\mu\text{F}$	80 mH
IIB	1.6 $\mu\text{F}$	250 mH
IIA or I	8 $\mu\text{F}$	600 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC


**Terminal (53, 54)**


Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965470000 2456180000	4 50594 Sheet 3-4	ACT20X-HTI-SAO-S ACT20X-HTI-SAO-P
8965480000 2456190000	4 50595 Sheet 4-6	ACT20X-2HTI-2SAO-S ACT20X-2HTI-2SAO-P

	<b>DANGER</b>
	For safe installation of the Temperature and mA Converter ACT20X-(2)HTI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits (Terminals 11...14, 21...24) have been installed in a type of protection other than “intrinsic safety”, the module must not be reinstalled in type of protection “intrinsic safety”.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEX Certificate	KEM 09.0092 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007

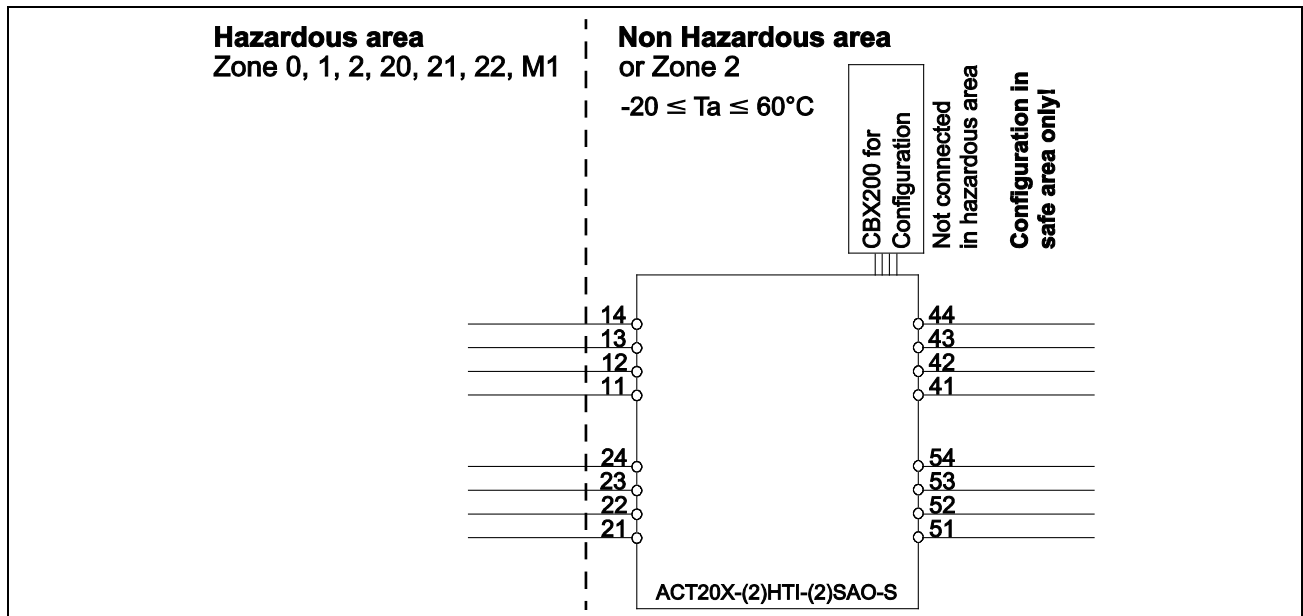


Illustration 7-29: IECEx Installation Drawing (1), (450594 Sheet 3-4, 450595 Sheet 4-6)

#### Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)

Ex Input	
$U_o$	8.7 V
$I_o$	18.4 mA
$P_o$	40 mW
$L_o/R_o$	892 $\mu$ H/ $\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	30 nF
$L_i$	820 nH

Group	$C_o$	$L_o$
IIC	5 $\mu$ F	100 mH
IIB	50 $\mu$ F	300 mH
IIA or I	1000 $\mu$ F	700 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



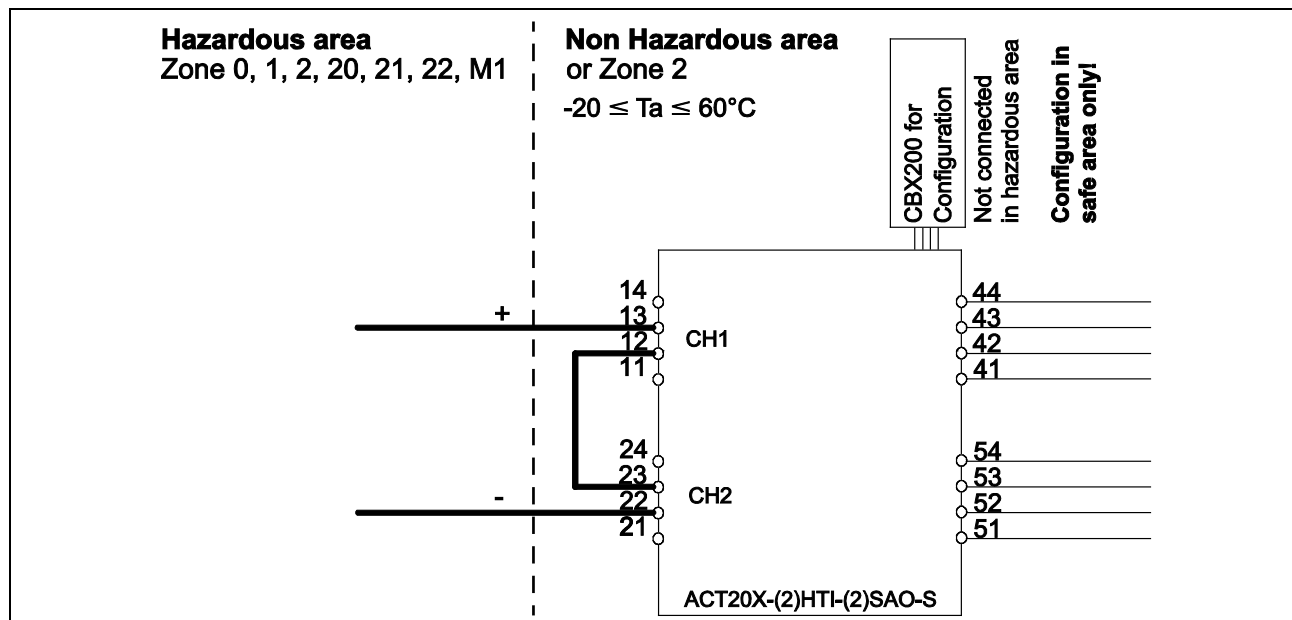


Illustration 7-30: IECEx Installation Drawing (2), (450594 Sheet 3-4, 450595 Sheet 4-6)

**Terminal CH1 (13), CH2 (22)**

Ex Input	
$U_o$	17.4 V
$I_o$	18.4 mA
$P_o$	80 mW
$L_o/R_o$	445 $\mu\text{H}/\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	15 nF
$L_i$	1.7 $\mu\text{H}$

Group	$C_o$	$L_o$
IIC	0.3 $\mu\text{F}$	80 mH
IIB	1.6 $\mu\text{F}$	250 mH
IIA or I	8 $\mu\text{F}$	600 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC


**Terminal (53, 54)**


Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W


**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965470000 2456180000	4 50594 Sheet 5-6	ACT20X-HTI-SAO-S ACT20X-HTI-SAO-P
8965480000 2456190000	4 50595 Sheet 7-9	ACT20X-2HTI-2SAO-S ACT20X-2HTI-2SAO-P

	<b>DANGER</b>
	For safe installation of the Temperature and mA Converter ACT20X-(2)HTI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

	<b>WARNING</b>
	Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

The installation and wiring must be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be supplied from a Power Supply having double or reinforced insulation.

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

The module must be installed in an enclosure suitable for the environment where it is used.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure according to the regulations in the CEC for Canada or NEC for USA.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG 26-14.

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us Certificate	3038275C / 308275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4
Standards	<u>Canada</u> Zones: E60079-0, E60079-11, E60079-15 Divisions: CSA 22.2-157, CSA 22.2-213 <u>USA</u> Zones: UL 60079-0, UL 60079-11, UL 60079-15 Divisions: FM3600, FM3610, FM3611, FM3810

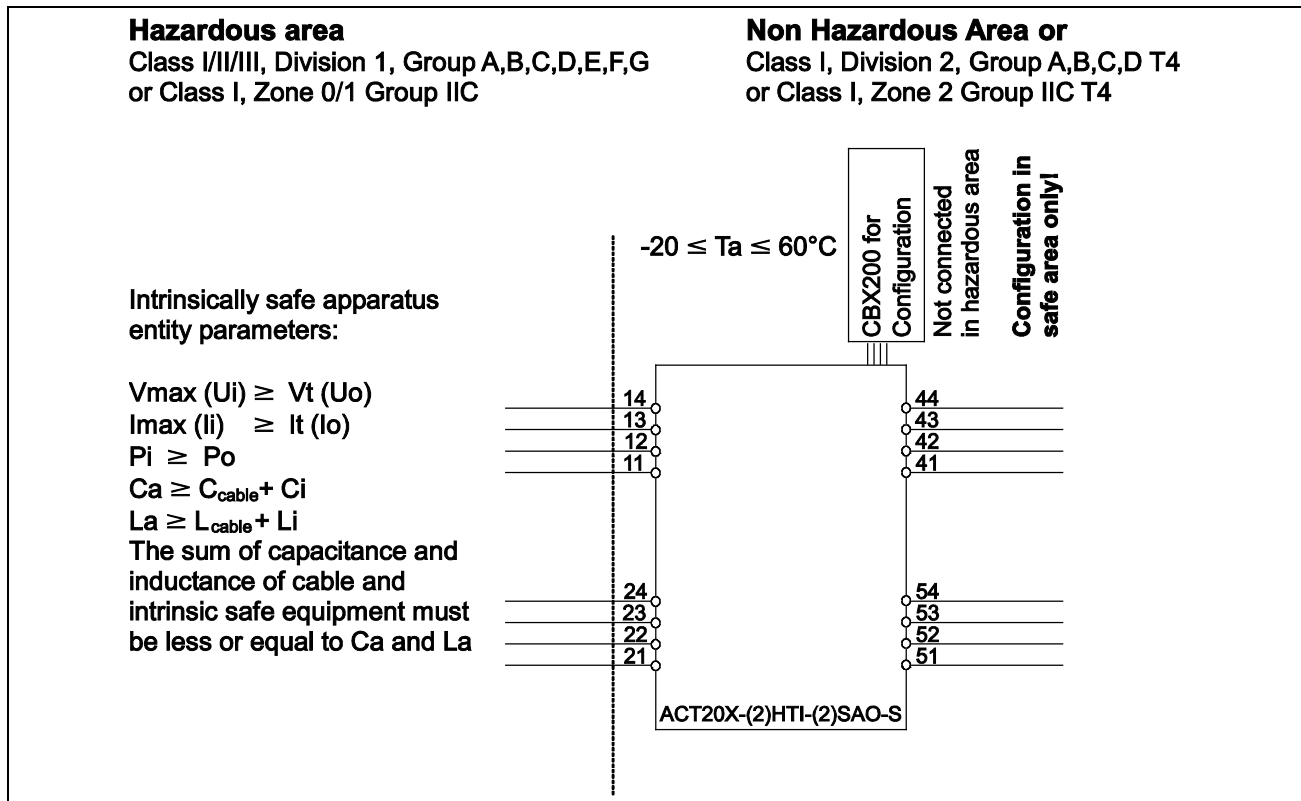


Illustration 7-31: FM Installation Drawing (1), (450594 Sheet 5-6, 450595 Sheet 7-9)

**Terminal CH1 (11, 12, 13, 14), CH2 (21, 22, 23, 24)**

Ex Input	
$U_o, V_t$	8.7 V
$I_o, I_t$	18.4 mA
$P_o$	40 mW
$L_o/R_o$	892 $\mu\text{H}/\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	30 nF
$L_i$	820 nH

Group	$C_o, C_a$	$L_o, L_a$
IIC Group A, B	5 $\mu\text{F}$	100 mH
IIB Group C, E, F	50 $\mu\text{F}$	300 mH
IIA Group D, G	1000 $\mu\text{F}$	700 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

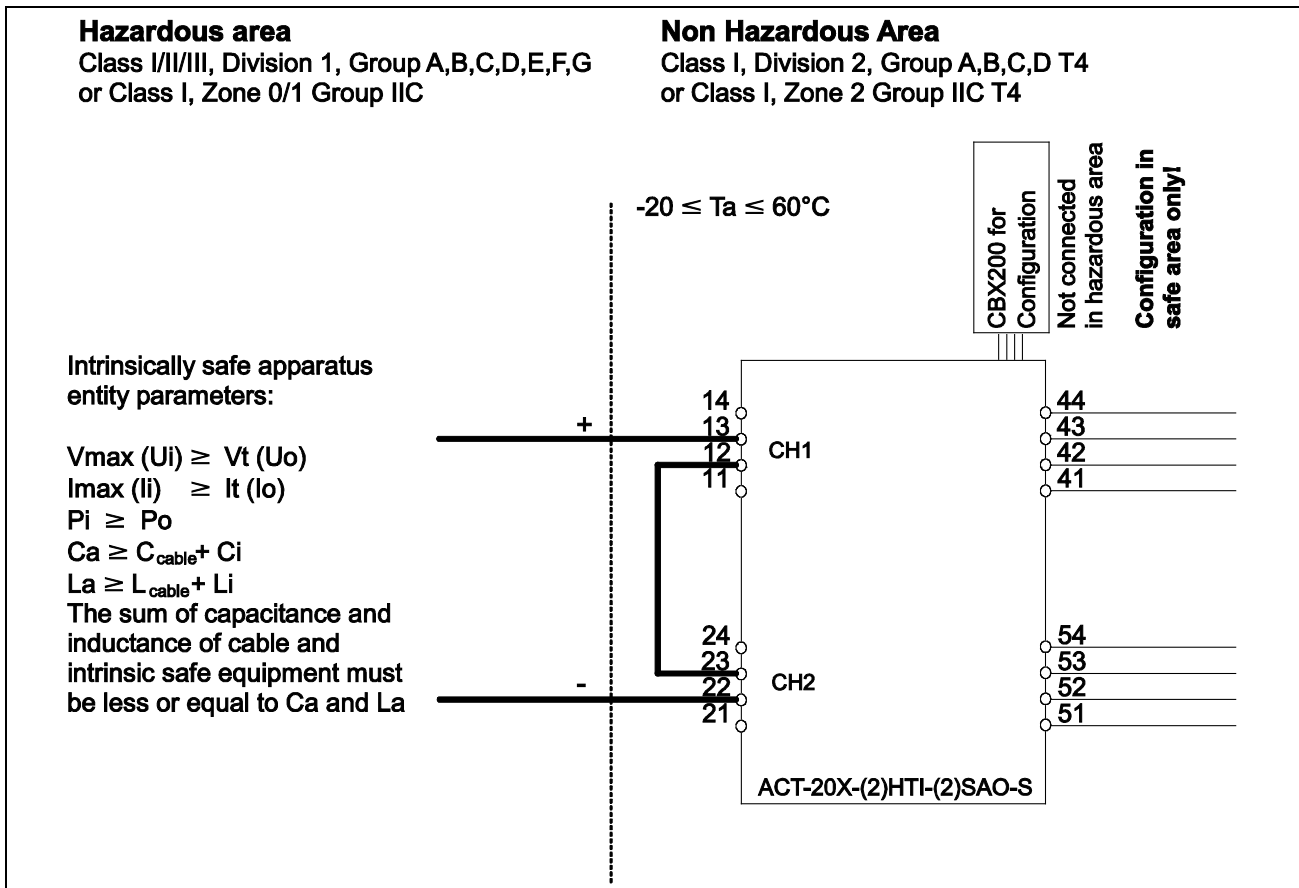


Illustration 7-32: FM Installation Drawing (2), (450594 Sheet 5-6, 450595 Sheet 7-9)

**Terminal CH1 (13), CH2 (22)**

Ex Input	
$U_o, V_t$	17.4 V
$I_o, I_t$	18.4 mA
$P_o$	80 mW
$L_o/R_o$	445 $\mu\text{H}/\Omega$
$U_i$	10 V
$I_i$	30 mA
$C_i$	15 nF
$L_i$	1.7 $\mu\text{H}$

Group	C <sub>o</sub> , C <sub>a</sub>	L <sub>o</sub> , L <sub>a</sub>
IIC or Group A, B	0.3 µF	80 mH
IIB or Group C, E, F	1.6 µF	250 mH
IIA or Group D, G	8 µF	600 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W





## Appendix C. Installation Drawings ACT20X-SDI-HDO (Solenoid/Alarm Driver)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965400000 2456110000	4 51478 Sheet 1-2	ACT20X-SDI-HDO-L-S ACT20X-SDI-HDO-L-P
8965410000 2456120000	4 51478 Sheet 1-2	ACT20X-SDI-HDO-H-S ACT20X-SDI-HDO-H-P
8965420000 2456130000	4 51478 Sheet 1-2	ACT20X-2SDI-2HDO-S ACT20X-2SDI-2HDO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)SDI-(2)HDO-(L/H) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection "intrinsic safety for group IIIC" the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits have been installed in a type of protection other than "intrinsic safety", the module must not be re-installed in type of protection "intrinsic safety".

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		KEMA 10ATEX 0019 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007

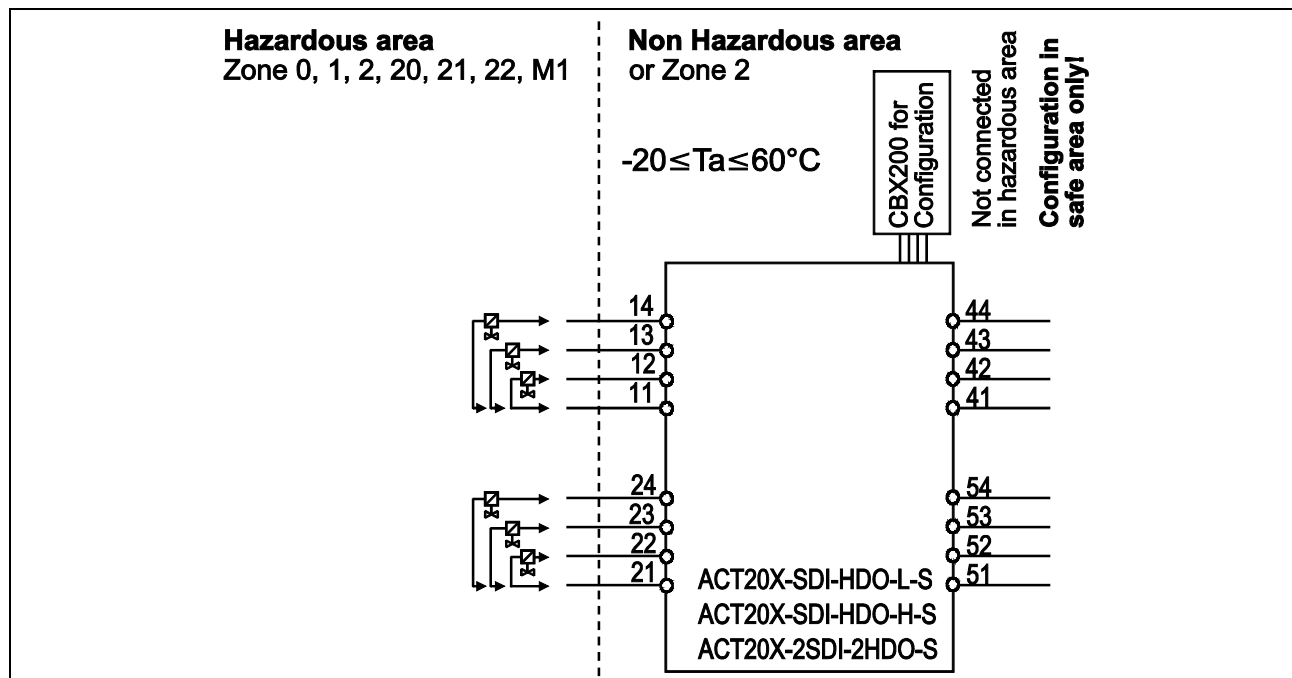


Illustration 7-33: ATEX Installation Drawing, (451478 Sheet 1-2)

**Terminal CH1 (41, 42) and CH2 (43, 44)**

Input	
Voltage max	28 V DC
Trigger: NPN	Low < 2 V, High > 4 V
Trigger: PNP	Low < 8 V, High > 10 V

**Terminal (11–12, 21–22)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	28 V	IIC	80 nF	4.2 mH	54 μH/Ω
I <sub>o</sub>	93 mA	IIB	640 nF	16.8 mH	218 μH/Ω
P <sub>o</sub>	0.65 W	IIA	2.1 μF	32.6 mH	436 μH/Ω
		I	3.76 μF	47 mH	717 μH/Ω

**Terminal (11–13, 21–23)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	100 mA
P <sub>o</sub>	0.70 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	3.5 mH	50 µH/Ω
IIB	640 nF	14.2 mH	201 µH/Ω
IIA	2.1 µF	27.6 mH	402 µH/Ω
I	3.76 µF	46 mH	667 µH/Ω

**Terminal (11–14, 21–24)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	110 mA
P <sub>o</sub>	0.77 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.9 mH	46 µH/Ω
IIB	640 nF	11.8 mH	184 µH/Ω
IIA	2.1 µF	22.8 mH	369 µH/Ω
I	3.76 µF	38 mH	607 µH/Ω

**Terminal (11–12)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	115 mA
P <sub>o</sub>	0.81 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.69 mH	44 µH/Ω
IIB	640 nF	10.8 mH	176 µH/Ω
IIA	2.1 µF	20.8 mH	353 µH/Ω
I	3.76 µF	33 mH	578 µH/Ω

**Terminal (11–13)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	125 mA
P <sub>o</sub>	0.88 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	–	–	–
IIB	640 nF	9.1 mH	163 µH/Ω
IIA	2.1 µF	17.6 mH	327 µH/Ω
I	3.76 µF	28 mH	533 µH/Ω

**Terminal (11–14)**

<b>Ex Output ACT20X-SDI-HDO-H</b>		<b>Group</b>	<b>C<sub>o</sub></b>	<b>L<sub>o</sub></b>	<b>L<sub>o</sub>/R<sub>o</sub></b>
U <sub>o</sub>	28 V	IIC	80 nF	–	–
I <sub>o</sub>	135 mA	IIB	640 nF	7.8 mH	150 µH/Ω
P <sub>o</sub>	0.95 W	IIA	2.1 µF	15.1 mH	301 µH/Ω
		I	3.76 µF	24 mH	493 µH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

<b>Supply / Input</b>	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

<b>Supply</b>	
Voltage	19.2...31.2 V DC
Power max	3.5 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965400000 2456110000	4 51478 Sheet 3-4	ACT20X-SDI-HDO-L-S ACT20X-SDI-HDO-L-P
8965410000 2456120000	4 51478 Sheet 3-4	ACT20X-SDI-HDO-H-S ACT20X-SDI-HDO-H-P
8965420000 2456130000	4 51478 Sheet 3-4	ACT20X-2SDI-2HDO-S ACT20X-2SDI-2HDO-P

**DANGER**

For safe installation of ACT20X-(2)SDI-(2)HDO-(L/H) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

If the sensor circuits have been installed in a type of protection other than “intrinsic safety”, the module must not be re-installed in type of protection “intrinsic safety”.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEx Certificate	KEM 09.0071 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007



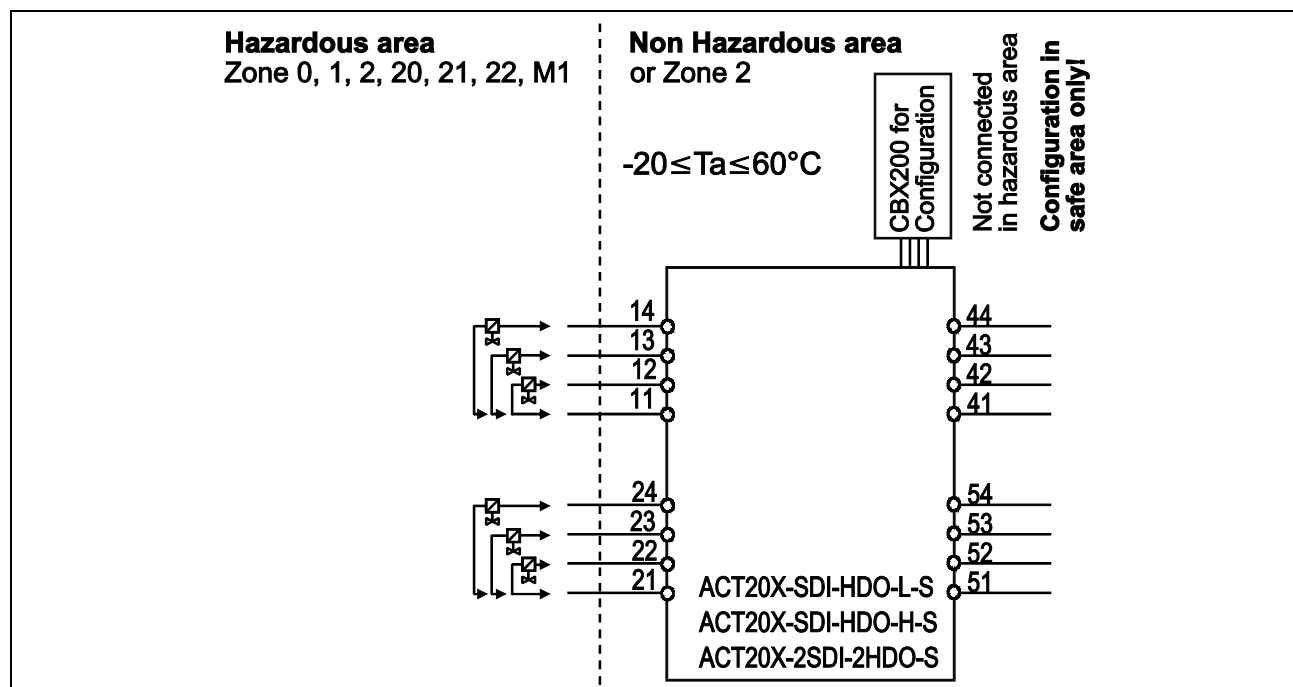


Illustration 7-34: IECEx Installation Drawing, (451478 Sheet 3-4)

**Terminal CH1 (41, 42) and CH2 (43, 44)**

Input	
Voltage max	28 V DC
Trigger: NPN	Low < 2 V, High > 4 V
Trigger: PNP	Low < 8 V, High > 10 V

**Terminal (11–12, 21–22)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	28 V	IIC	80 nF	4.2 mH	54 μH/Ω
I <sub>o</sub>	93 mA	IIB	640 nF	16.8 mH	218 μH/Ω
P <sub>o</sub>	0.65 W	IIA	2.1 μF	32.6 mH	436 μH/Ω
		I	3.76 μF	32.6 mH	436 μH/Ω

**Terminal (11–13, 21–23)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	100 mA
P <sub>o</sub>	0.70 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	3.5 mH	50 µH/Ω
IIB	640 nF	14.2 mH	201 µH/Ω
IIA	2.1 µF	27.6 mH	402 µH/Ω
I	3.76 µF	46 mH	667 µH/Ω

**Terminal (11–14, 21–24)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	100 mA
P <sub>o</sub>	0.70 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.9 mH	46 µH/Ω
IIB	640 nF	12.8 mH	184 µH/Ω
IIA	2.1 µF	22.8 mH	369 µH/Ω
I	3.76 µF	38 mH	607 µH/Ω

**Terminal (11–12)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	115 mA
P <sub>o</sub>	0.81 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.69 mH	44 µH/Ω
IIB	640 nF	10.8 mH	176 µH/Ω
IIA	2.1 µF	20.8 mH	353 µH/Ω
I	3.76 µF	33 mH	578 µH/Ω

**Terminal (11–13)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	125 mA
P <sub>o</sub>	0.88 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	–	–	–
IIB	640 nF	9.1 mH	162 µH/Ω
IIA	2.1 µF	17.6 mH	325 µH/Ω
I	3.76 µF	28 mH	533 µH/Ω

**Terminal (11–14)**

<b>Ex Output ACT20X-SDI-HDO-H</b>		<b>Group</b>	<b>C<sub>o</sub></b>	<b>L<sub>o</sub></b>	<b>L<sub>o</sub>/R<sub>o</sub></b>
U <sub>o</sub>	28 V	IIC	–	–	–
I <sub>o</sub>	135 mA	IIB	640 nF	7.8 mH	150 µH/Ω
P <sub>o</sub>	0.95 W	IIA	2.1 µF	15.1 mH	301 µH/Ω
		I	3.76 µF	24 mH	493 µH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

<b>Supply / Input</b>	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

<b>Supply</b>	
Voltage	19.2...31.2 V DC
Power max	3.5 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965400000 2456110000	4 51478 Sheet 5-6	ACT20X-SDI-HDO-L-S ACT20X-SDI-HDO-L-P
8965410000 2456120000	4 51478 Sheet 5-6	ACT20X-SDI-HDO-H-S ACT20X-SDI-HDO-H-P
8965420000 2456130000	4 51478 Sheet 5-6	ACT20X-2SDI-2HDO-S ACT20X-2SDI-2HDO-P

**DANGER**

For safe installation of ACT20X-(2)SDI-(2)HDO-(L/H) the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**WARNING**

Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

The installation and wiring shall be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be supplied from a Power Supply having double or reinforced insulation.

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

The module must be installed in an enclosure suitable for the environment where it is used.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure according to the regulations in the CEC for Canada or NEC for USA.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG 26-14.

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us Certificate	3038275C / 3038275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4
Standards	<u>Canada</u> Zones: E60079-0, E60079-11, E60079-15 Divisions: CSA 22.2-157, CSA 22.2-213 <u>USA</u> Zones: UL 60079-0, UL 60079-11, UL 60079-15 Divisions: FM3600, FM3610, FM3611, FM3810

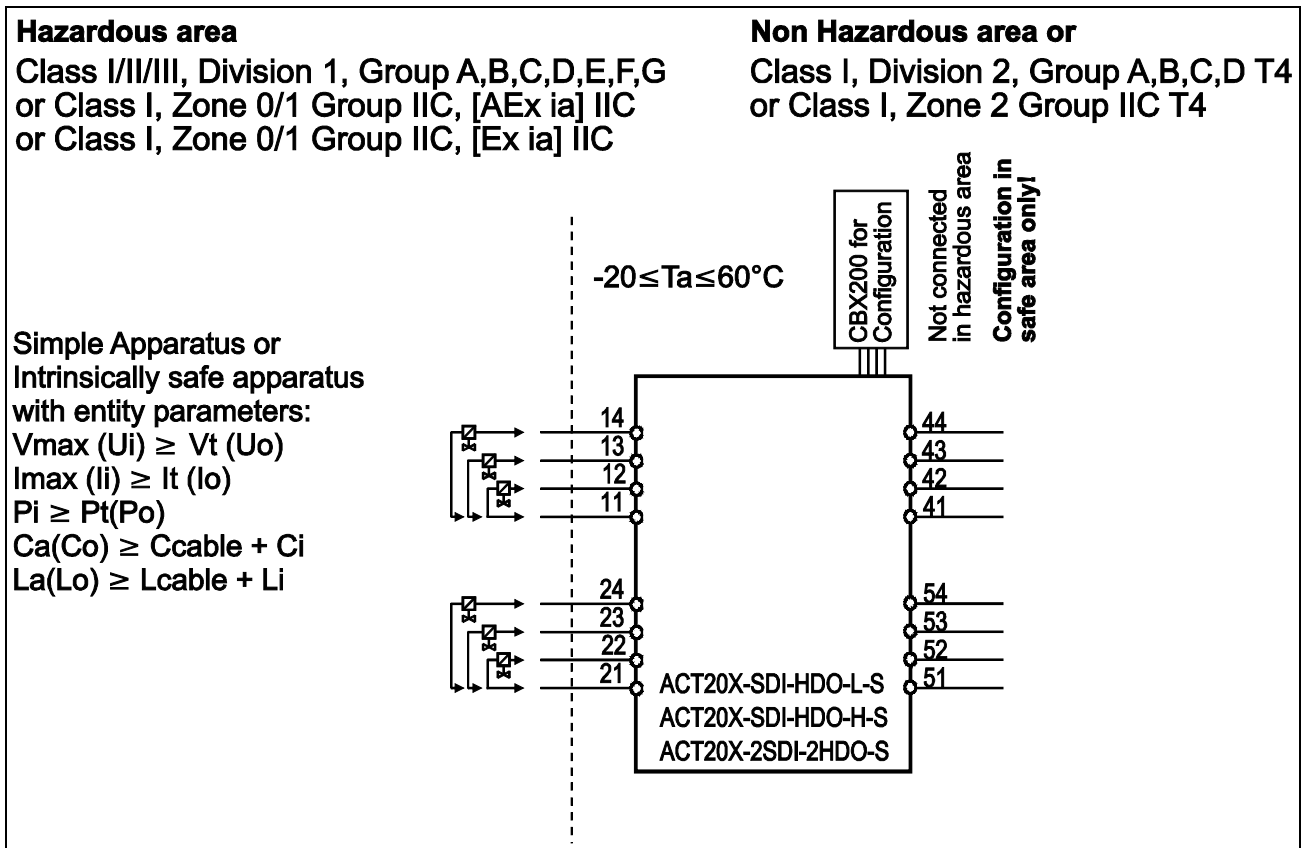


Illustration 7-35: FM Installation Drawing, (451478 Sheet 5-6)

**Terminal CH1 (41, 42) and CH2 (43, 44)**

Input	
Voltage max	28 V DC
Trigger: NPN	Low < 2 V, High > 4 V
Trigger: PNP	Low < 8 V, High > 10 V

**Terminal (11–12, 21–22)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	28 V	IIC	80 nF	4.2 mH	54 µH/Ω
I <sub>o</sub>	93 mA	IIB	640 nF	16.8 mH	218 µH/Ω
P <sub>o</sub>	0.65 W	IIA	2.1 µF	32.6 mH	436 µH/Ω

**Terminal (11–13, 21–23)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	100 mA
P <sub>o</sub>	0.70 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	3.5 mH	50 µH/Ω
IIB	640 nF	14.2 mH	201 µH/Ω
IIA	2.1 µF	27.6 mH	402 µH/Ω

**Terminal (11–14, 21–24)**

Ex Output ACT20X-SDI-HDO-L ACT20X-2SDI-2HDO	
U <sub>o</sub>	28 V
I <sub>o</sub>	100 mA
P <sub>o</sub>	0.70 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.9 mH	46 µH/Ω
IIB	640 nF	12.8 mH	184 µH/Ω
IIA	2.1 µF	22.8 mH	369 µH/Ω

**Terminal (11–12)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	115 mA
P <sub>o</sub>	0.81 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	2.69 mH	44 µH/Ω
IIB	640 nF	10.8 mH	176 µH/Ω
IIA	2.1 µF	20.8 mH	353 µH/Ω

**Terminal (11–13)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	125 mA
P <sub>o</sub>	0.88 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	–	–	–
IIB	640 nF	9.1 mH	162 µH/Ω
IIA	2.1 µF	17.6 mH	325 µH/Ω

**Terminal (11–14)**

Ex Output ACT20X-SDI-HDO-H	
U <sub>o</sub>	28 V
I <sub>o</sub>	135 mA
P <sub>o</sub>	0.95 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	–	–	–
IIB	640 nF	7.8 mH	150 µH/Ω
IIA	2.1 µF	15.1 mH	301 µH/Ω



**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

<b>Supply / Input</b>	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

<b>Supply</b>	
Voltage	19.2...31.2 V DC
Power max	3.5 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



## Appendix D. Installation Drawings ACT20X-HUI-SAO (Universal Converter)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965490000 2456200000	4 51481 Sheet 1-4	ACT20X-HUI-SAO-S ACT20X-HUI-SAO-P



#### DANGER

For safe installation of the Universal Converter ACT20X-HUI-SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.



#### DANGER

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure in type of protection Ex-n or Ex-e, providing an IP protection of at least IP54. Cable entry devices and blanking elements shall fulfil the same requirements.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		KEMA 10ATEX 0071 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007

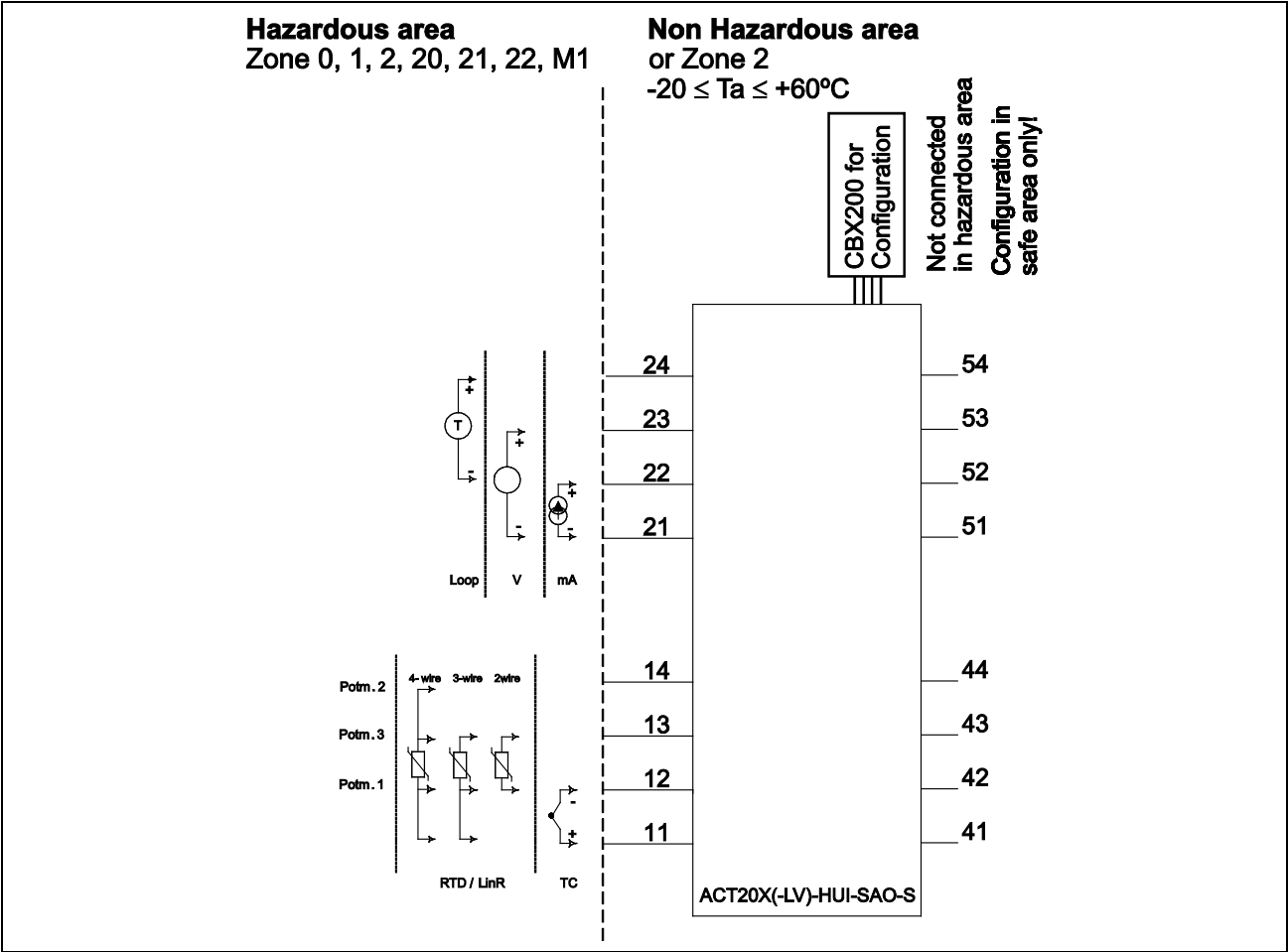


Illustration 7-36: ATEX Installation Drawing (1), (451481 Sheet 1-4)

Terminal (21, 22) and (21, 23)

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	1 $\mu\text{H}$

**Terminal (21–24, 22–24)**

Input	
U <sub>o</sub>	28 V
I <sub>o</sub>	93 mA
P <sub>o</sub>	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	4 mH	54 $\mu$ H/ $\Omega$
IIB	640 nF	16 mH	218 $\mu$ H/ $\Omega$
IIA or I	2.1 $\mu$ F	32 mH	436 $\mu$ H/ $\Omega$

**Terminal (21–23)**

Input	
U <sub>o</sub>	28 V
I <sub>o</sub>	1.1 mA
P <sub>o</sub>	8 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	1000 mH	4 mH/ $\Omega$
IIB	640 nF	1000 mH	17 mH/ $\Omega$
IIA or I	2.1 $\mu$ F	1000 mH	35 mH/ $\Omega$

**Terminal (21–22)**

Input	
U <sub>o</sub>	8.3 V
I <sub>o</sub>	0.2 mA
P <sub>o</sub>	0.4 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	7 $\mu$ F	1000 mH	100 mH/ $\Omega$
IIB	73 $\mu$ F	1000 mH	400 mH/ $\Omega$
IIA or I	1000 $\mu$ F	1000 mH	800 mH/ $\Omega$

**Terminal (11, 12, 13, 14)**

Input	
U <sub>o</sub>	8.3 V
I <sub>o</sub>	13.1 mA
P <sub>o</sub>	27.3 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	7 $\mu$ F	207 mH	1 mH/ $\Omega$
IIB	73 $\mu$ F	828 mH	5 mH/ $\Omega$
IIA or I	1000 $\mu$ F	1000 mH	10 mH/ $\Omega$

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (41, 42)**

Output	
Current	0/4...20 mA

**Terminal (43, 44)**

<b>Relay Output</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

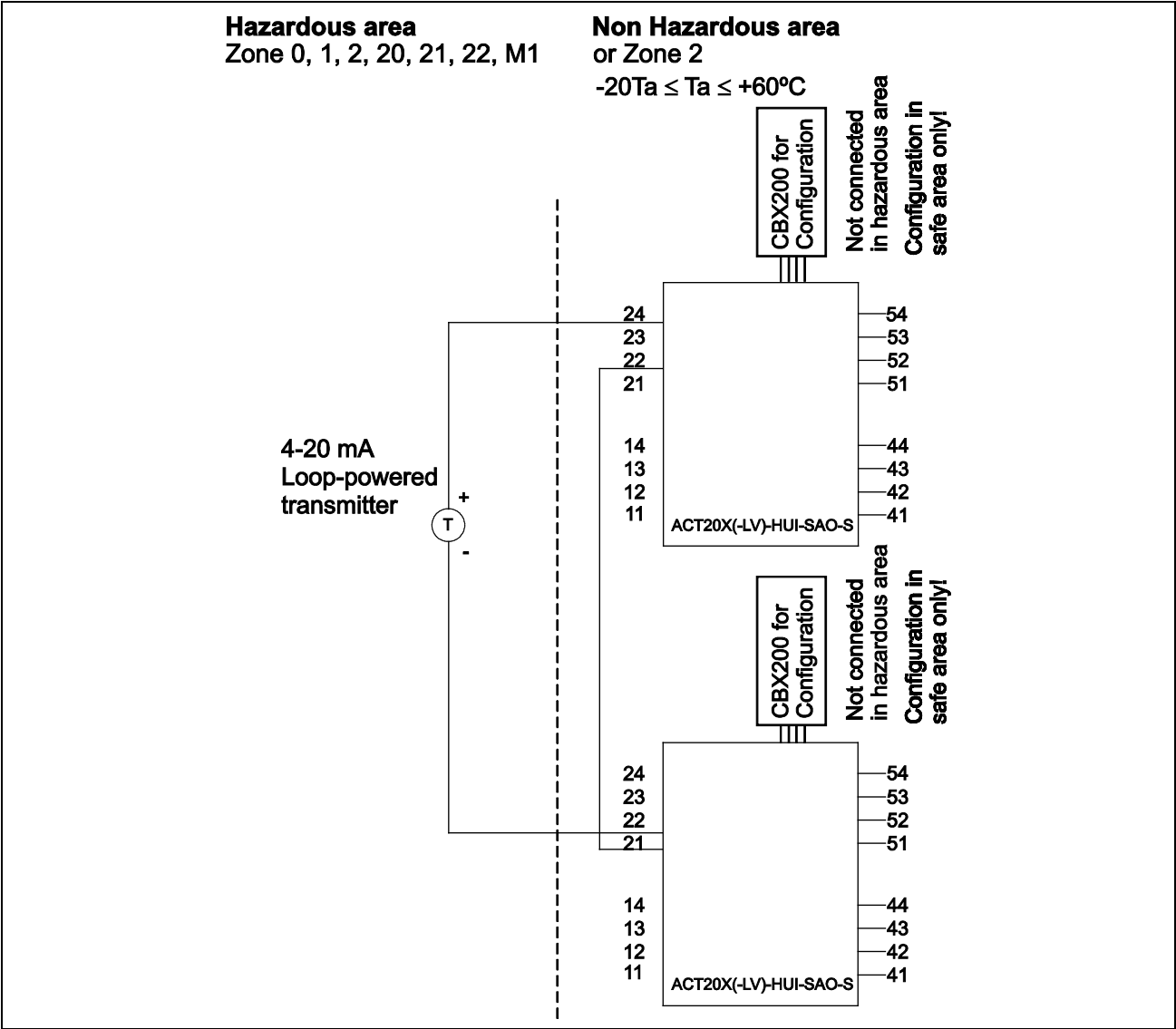


Illustration 7-37: ATEX Installation Drawing (2), (451481 Sheet 1-4)

**Terminal (24-22)**

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	2 $\mu$ H



**Terminal (24–22, 22–21)**

Input		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	28 V	IIC	80 nF	4.2 mH	54 µH/Ω
I <sub>o</sub>	93 mA	IIB	640 nF	16 mH	218 µH/Ω
P <sub>o</sub>	0.65 W	IIA or I	2.1 µF	32 mH	436 µH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

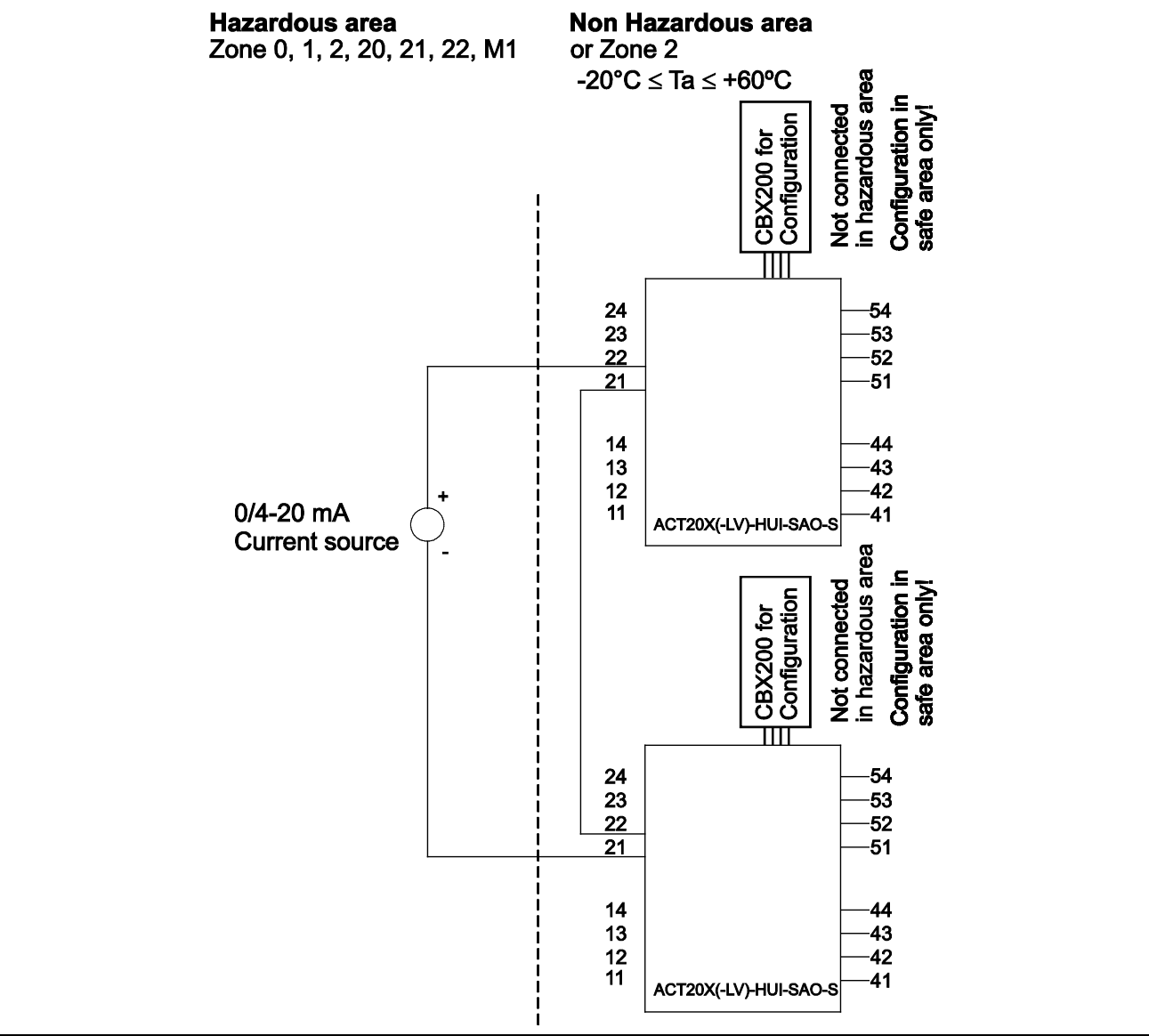


Illustration 7-38: ATEX Installation Drawing (3), (451481 Sheet 1-4)

**Terminal (21-22)**

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	1 $\mu\text{H}$

**Terminal (22–21, 21–22)**

Input		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	16.6 V	IIC	0.4 µF	1000 mH	25 mH/Ω
I <sub>o</sub>	0.2 mA	IIB	2.3 µF	1000 mH	100 mH/Ω
P <sub>o</sub>	0.8 mW	IIA or I	9.5 µF	1000 mH	200 mH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965490000 2456200000	4 51481 Sheet 5-8	ACT20X-HUI-SAO-S ACT20X-HUI-SAO-P

**DANGER**

For safe installation of the Universal Converter ACT20X-HUI-SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety for group IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

For group I (mining), the parameters for group IIA apply.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEx Certificate	KEM 10.0034 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007

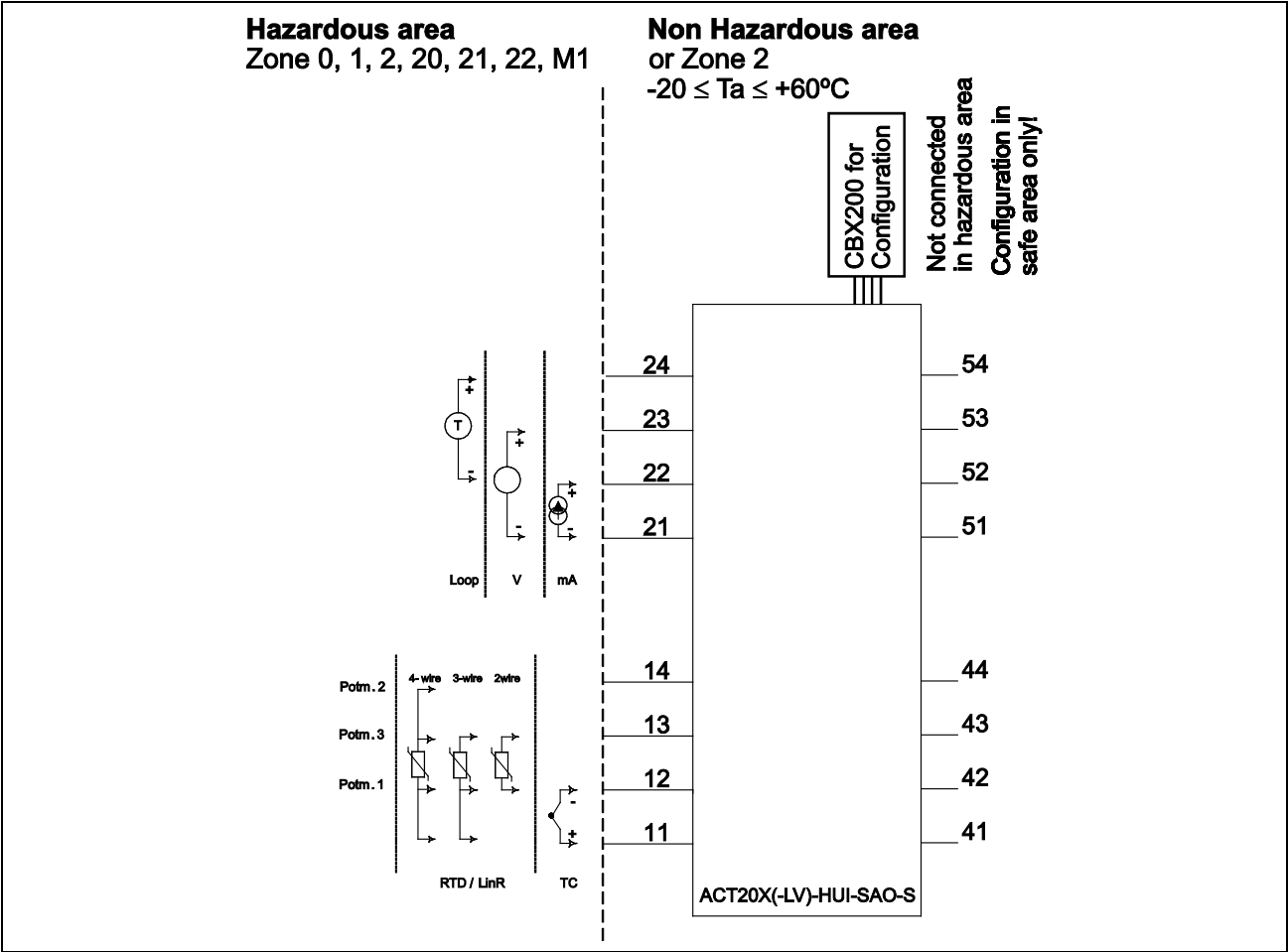


Illustration 7-39: IECEx Installation Drawing (1), (451481 Sheet 5-8)

Terminal (21, 22) and (21, 23)

Input	
U <sub>i</sub>	30 V
I <sub>i</sub>	120 mA
P <sub>i</sub>	900 mW
C <sub>i</sub>	3 nF
L <sub>i</sub>	1 µH

**Terminal (21–24, 22–24)**

Input	
U <sub>o</sub>	28 V
I <sub>o</sub>	93 mA
P <sub>o</sub>	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	4 mH	54 $\mu$ H/ $\Omega$
IIB	640 nF	16 mH	218 $\mu$ H/ $\Omega$
IIA or I	2.1 $\mu$ F	32 mH	436 $\mu$ H/ $\Omega$

**Terminal (21–23)**

Input	
U <sub>o</sub>	28 V
I <sub>o</sub>	1.1 mA
P <sub>o</sub>	8 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	80 nF	1000 mH	4 mH/ $\Omega$
IIB	640 nF	1000 mH	17 mH/ $\Omega$
IIA or I	2.1 $\mu$ F	1000 mH	35 mH/ $\Omega$

**Terminal (21–22)**

Input	
U <sub>o</sub>	8.3 V
I <sub>o</sub>	0.2 mA
P <sub>o</sub>	0.4 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	7 $\mu$ F	1000 mH	100 mH/ $\Omega$
IIB	73 $\mu$ F	1000 mH	400 mH/ $\Omega$
IIA or I	1000 $\mu$ F	1000 mH	800 mH/ $\Omega$

**Terminal (11, 12, 13, 14)**

Input	
U <sub>o</sub>	8.3 V
I <sub>o</sub>	13.1 mA
P <sub>o</sub>	27.3 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC	7 $\mu$ F	207 mH	1 mH/ $\Omega$
IIB	73 $\mu$ F	828 mH	5 mH/ $\Omega$
IIA or I	1000 $\mu$ F	1000 mH	10 mH/ $\Omega$

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (41, 42)**

Output	
Current	0/4...20 mA



**Terminal (43, 44)**

<b>Relay Output</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

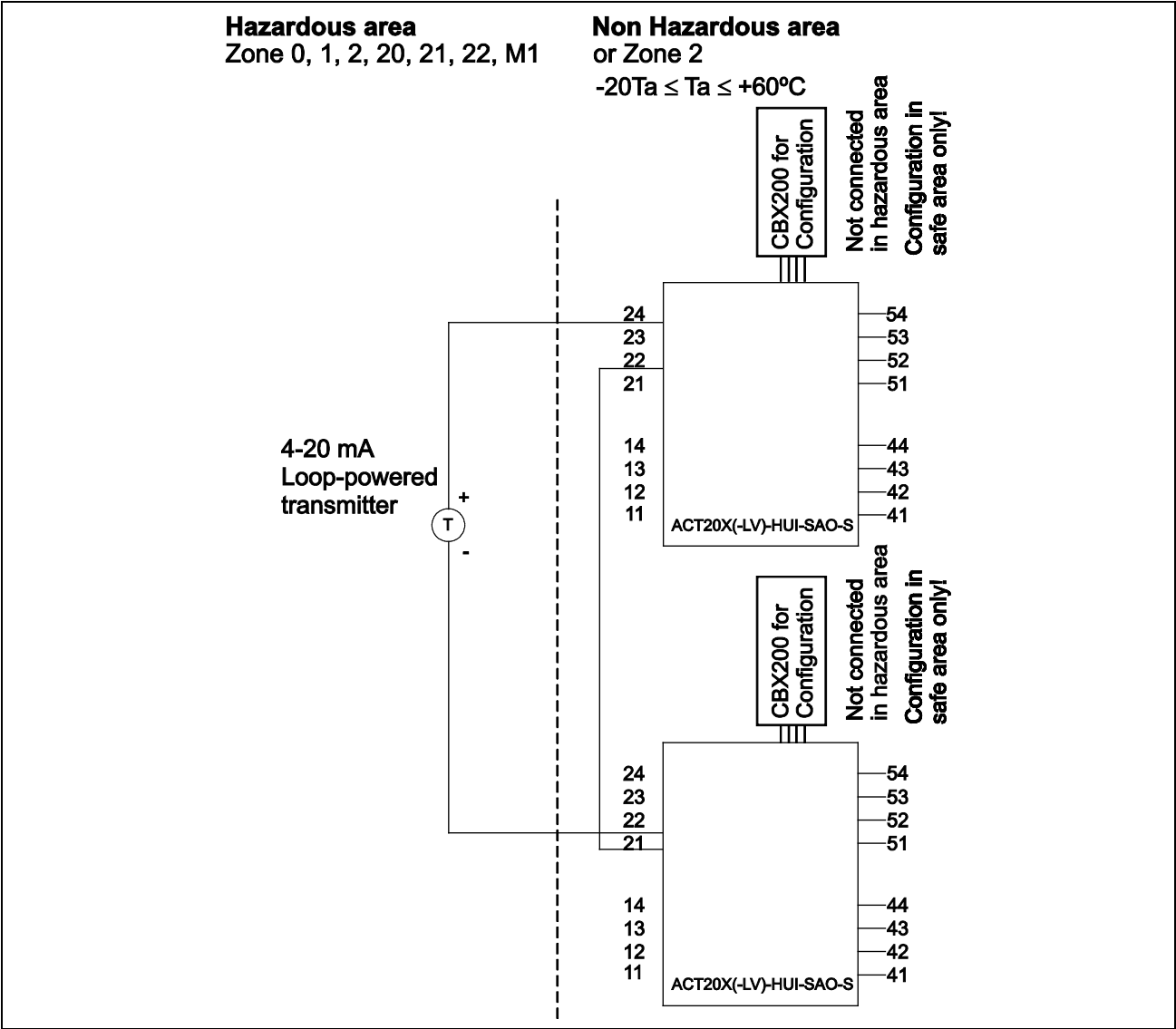


Illustration 7-40: IECEx Installation Drawing (2), (451481 Sheet 5-8)

**Terminal (24-22)**

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	2 $\mu\text{H}$

**Terminal (24–22, 22–21)**

Input		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	28 V	IIC	80 nF	4.2 mH	54 µH/Ω
I <sub>o</sub>	93 mA	IIB	640 nF	16 mH	218 µH/Ω
P <sub>o</sub>	0.65 W	IIA or I	2.1 µF	32 mH	436 µH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

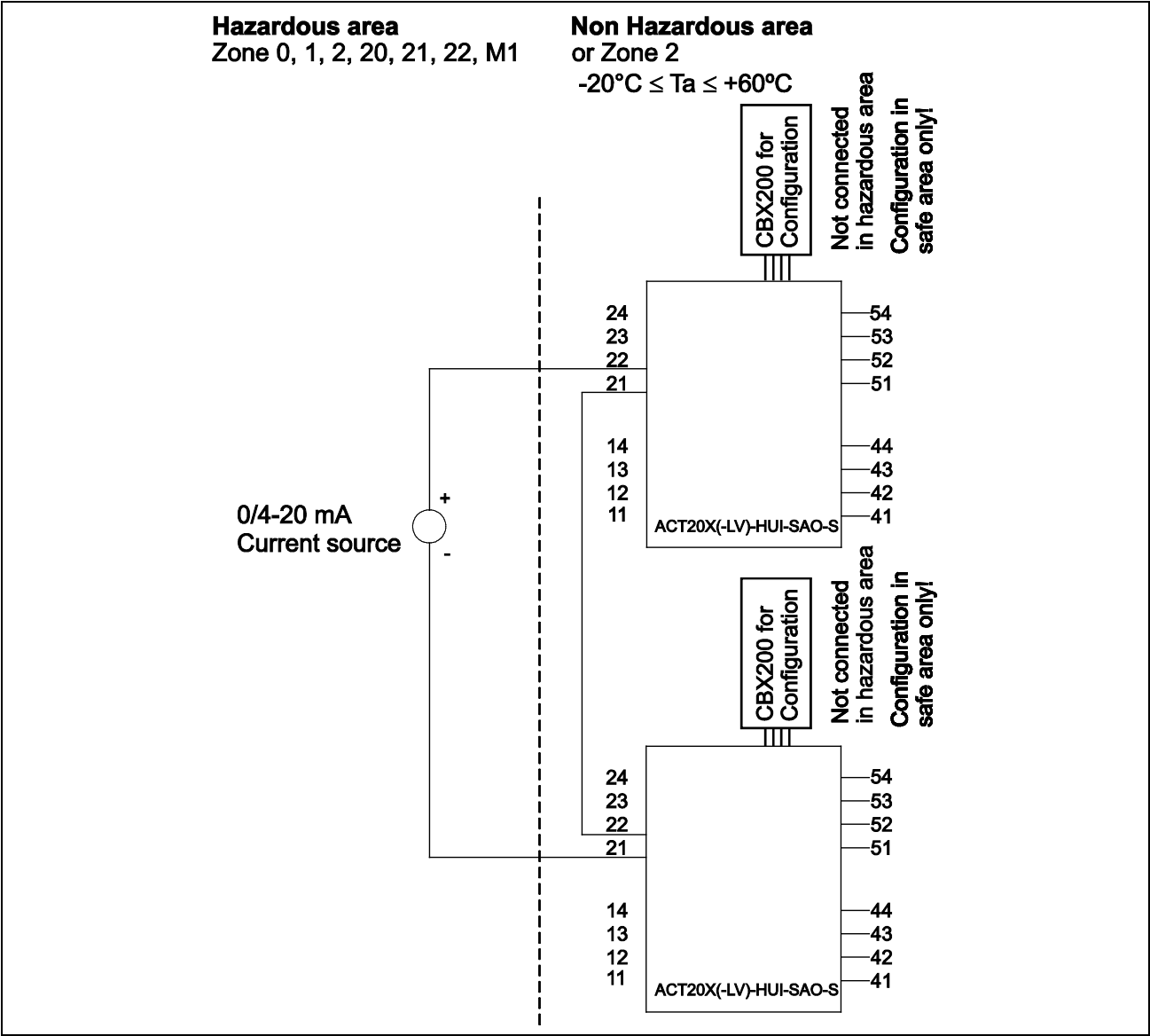


Illustration 7-41: IECEx Installation Drawing (3), (451481 Sheet 5-8)

**Terminal (21-22)**

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	2 $\mu\text{H}$

**Terminal (22–21, 21–22)**

Input		Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
U <sub>o</sub>	16.6 V	IIC	0.4 µF	1000 mH	25 mH/Ω
I <sub>o</sub>	0.2 mA	IIB	2.3 µF	1000 mH	100 mH/Ω
P <sub>o</sub>	0.8 mW	IIA or I	9.5 µF	1000 mH	200 mH/Ω

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965490000 2456200000	4 51481 Sheet 9-12	ACT20X-HUI-SAO-S ACT20X-HUI-SAO-P

**DANGER**

For safe installation of the Universal Converter ACT20X-HUI-SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**WARNING**

Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

The installation and wiring must be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure having an IP protection of at least IP54.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG 26-14.

In type of protection "intrinsic safety for group IIIC" the parameters for intrinsic safety for gas group IIB are applicable.

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us Certificate	3038275C / 3038275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4
Standards	<u>Canada</u> Zones: E60079-0, E60079-11, E60079-15 Divisions: CSA 22.2-157, CSA 22.2-213 <u>USA</u> Zones: UL 60079-0, UL 60079-11, UL 60079-15 Divisions: FM3600, FM3610, FM3611, FM3810



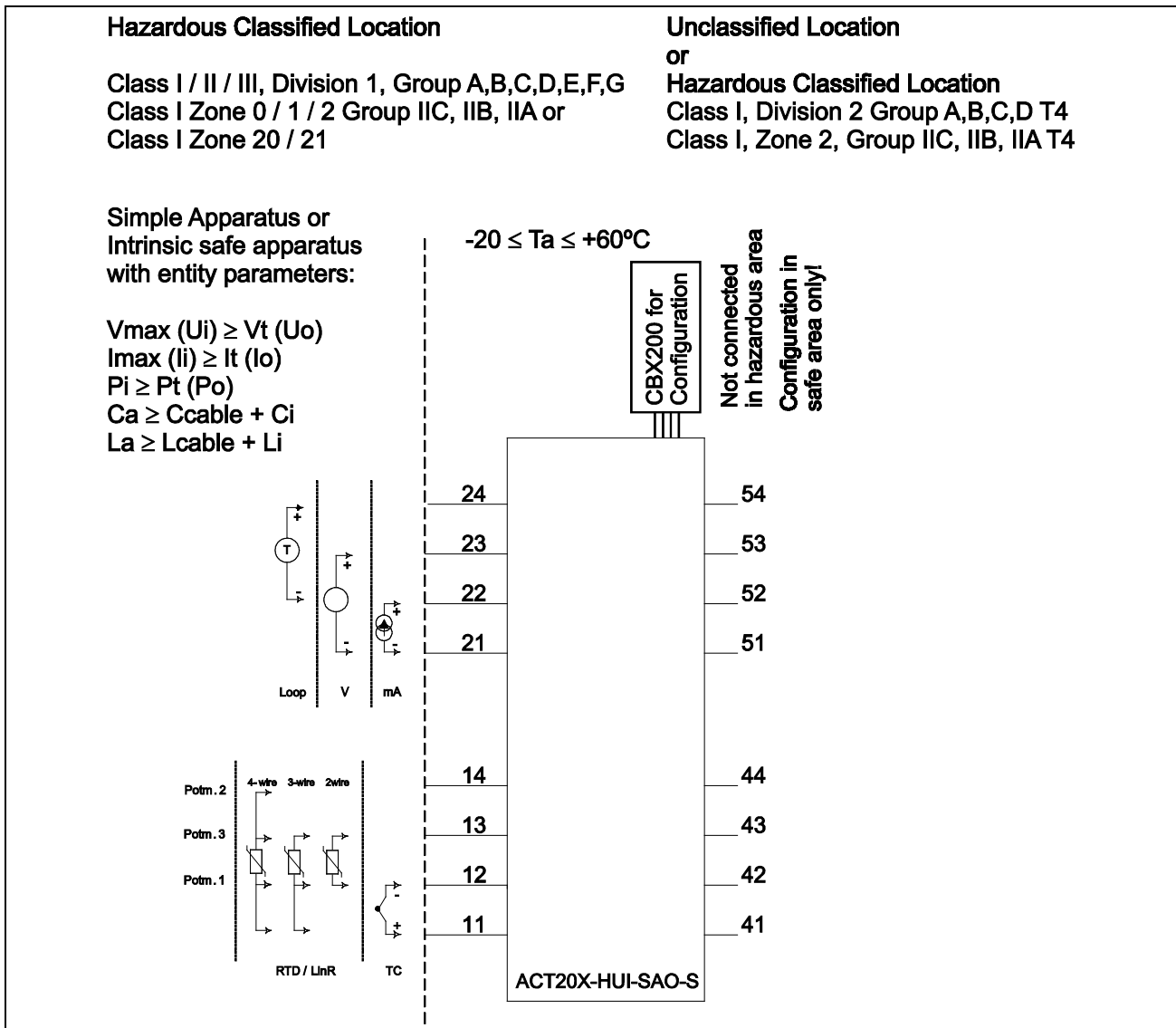


Illustration 7-42: FM Installation Drawing (1), (451481 Sheet 9-12)

### Terminal (21-22) and (21-23)

Input	
$U_i, V_{max}$	30 V
$I_i, I_{max}$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	1 $\mu\text{H}$

**Terminal (21–24, 22–24)**

Input	
U <sub>o</sub> , V <sub>OC</sub>	28 V
I <sub>o</sub> , I <sub>SC</sub>	93 mA
P <sub>o</sub>	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC or A, B	80 nF	4 mH	54 $\mu$ H/ $\Omega$
IIB or C, E, F	640 nF	16 mH	218 $\mu$ H/ $\Omega$
IIA or D, G	2.1 $\mu$ F	32 mH	436 $\mu$ H/ $\Omega$

**Terminal (21–23)**

Input	
U <sub>o</sub> , V <sub>OC</sub>	28 V
I <sub>o</sub> , I <sub>SC</sub>	1.1 mA
P <sub>o</sub>	8 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC or A, B	80 nF	1000 mH	4 mH/ $\Omega$
IIB or C, E, F	640 nF	1000 mH	17 mH/ $\Omega$
IIA or D, G	2.1 $\mu$ F	1000 mH	35 mH/ $\Omega$

**Terminal (21–22)**

Input	
U <sub>o</sub> , V <sub>OC</sub>	8.3 V
I <sub>o</sub> , I <sub>SC</sub>	0.2 mA
P <sub>o</sub>	0.4 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC or A, B	7 $\mu$ F	1000 mH	100 mH/ $\Omega$
IIB or C, E, F	73 $\mu$ F	1000 mH	400 mH/ $\Omega$
IIA or D, G	1000 $\mu$ F	1000 mH	800 mH/ $\Omega$

**Terminal (11, 12, 13, 14)**

Input	
U <sub>o</sub> , V <sub>OC</sub>	8.3 V
I <sub>o</sub> , I <sub>SC</sub>	13.1 mA
P <sub>o</sub>	27.3 mW

Group	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
IIC or A, B	7 $\mu$ F	207 mH	1 mH/ $\Omega$
IIB or C, E, F	73 $\mu$ F	828 mH	5 mH/ $\Omega$
IIA or D, G	1000 $\mu$ F	1000 mH	10 mH/ $\Omega$

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (41, 42)**

Output	
Current	0/4...20 mA

**Terminal (43, 44)**

<b>Relay Output</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

<b>Status Relay</b>	<b>Non Hazardous Location</b>	<b>Zone 2 Installation</b>
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

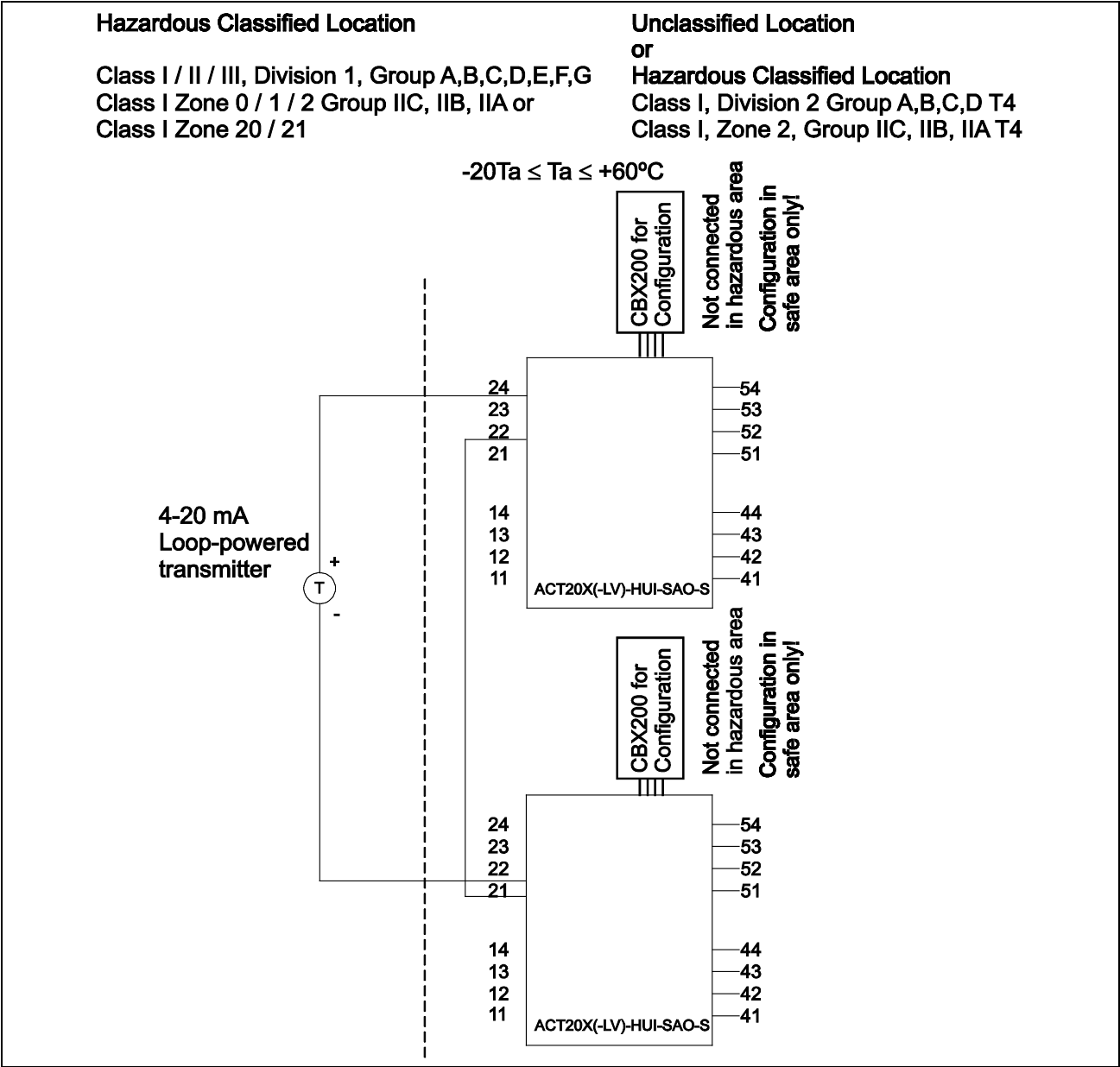


Illustration 7-43: FM Installation Drawing (2), (451481 Sheet 9-12)

**Terminal (24-22)**

Input	
$U_i$	30 V
$I_i$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	2 $\mu$ H

**Terminal (24-22, 22-21)**

Input		Group	$C_o$	$L_o$	$L_o/R_o$
$U_o$	28 V	IIC or A, B	80 nF	4 mH	54 $\mu$ H/ $\Omega$
$I_o$	93 mA	IIB or C, E, F	640 nF	16 mH	218 $\mu$ H/ $\Omega$
$P_o$	0.65 W	IIA or D, G	2.1 $\mu$ F	32 mH	436 $\mu$ H/ $\Omega$

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
$U_m$	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

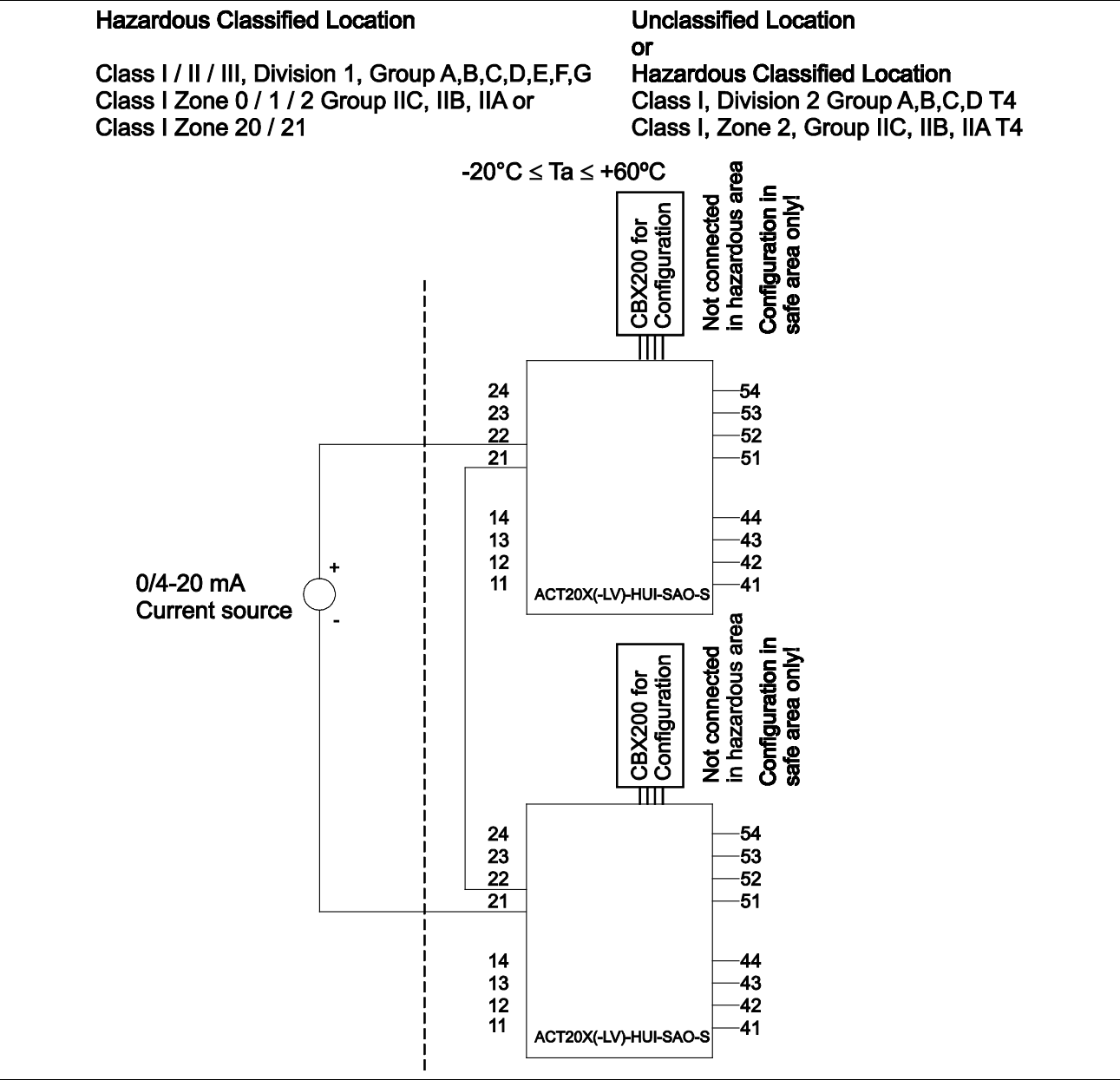


Illustration 7-44: FM Installation Drawing (3), (451481 Sheet 9-12)

**Terminal (21-22)**

Input	
$U_i, V_{\max}$	30 V
$I_i, I_{\max}$	120 mA
$P_i$	900 mW
$C_i$	3 nF
$L_i$	2 $\mu$ H

**Terminal (22–21, 21–22)**

Input		Group	$C_o$	$L_o$	$L_o/R_o$
$U_o, V_{OC}$	16.6 V	IIC or A, B	0.4 $\mu$ F	1000 mH	25 mH/ $\Omega$
$I_o, I_{SC}$	0.2 mA	IIB or C, E, F	2.3 $\mu$ F	1000 mH	100 mH/ $\Omega$
$P_o$	0.8 mW	IIA or D, G	9.5 $\mu$ F	1000 mH	200 mH/ $\Omega$

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
$U_m$	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (43, 44)**

Relay Output	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W





## Appendix E. Installation Drawings ACT20X-HAI-SAO (HART-transparent Repeater)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965430000 2456140000	4 53449 Sheet 1-4	ACT20X-HAI-SAO-S ACT20X-HAI-SAO-P
8965440000 2456150000	4 53449 Sheet 1-4	ACT20X-2HAI-2SAO-S ACT20X-2HAI-2SAO-P



#### DANGER

For safe installation of ACT20X-(2)HAI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.



#### DANGER

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure in type of protection Ex-n or Ex-e, providing an IP protection of at least IP54. Cable entry devices and blanking elements shall fulfil the same requirements.

In type of protection "intrinsic safety ia IIIC" the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

The Loop Supply and Current Input terminals for the same channel shall not be applied at the same time. The wiring of unused terminals is not allowed.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		DEKRA 11ATEX 0131 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007

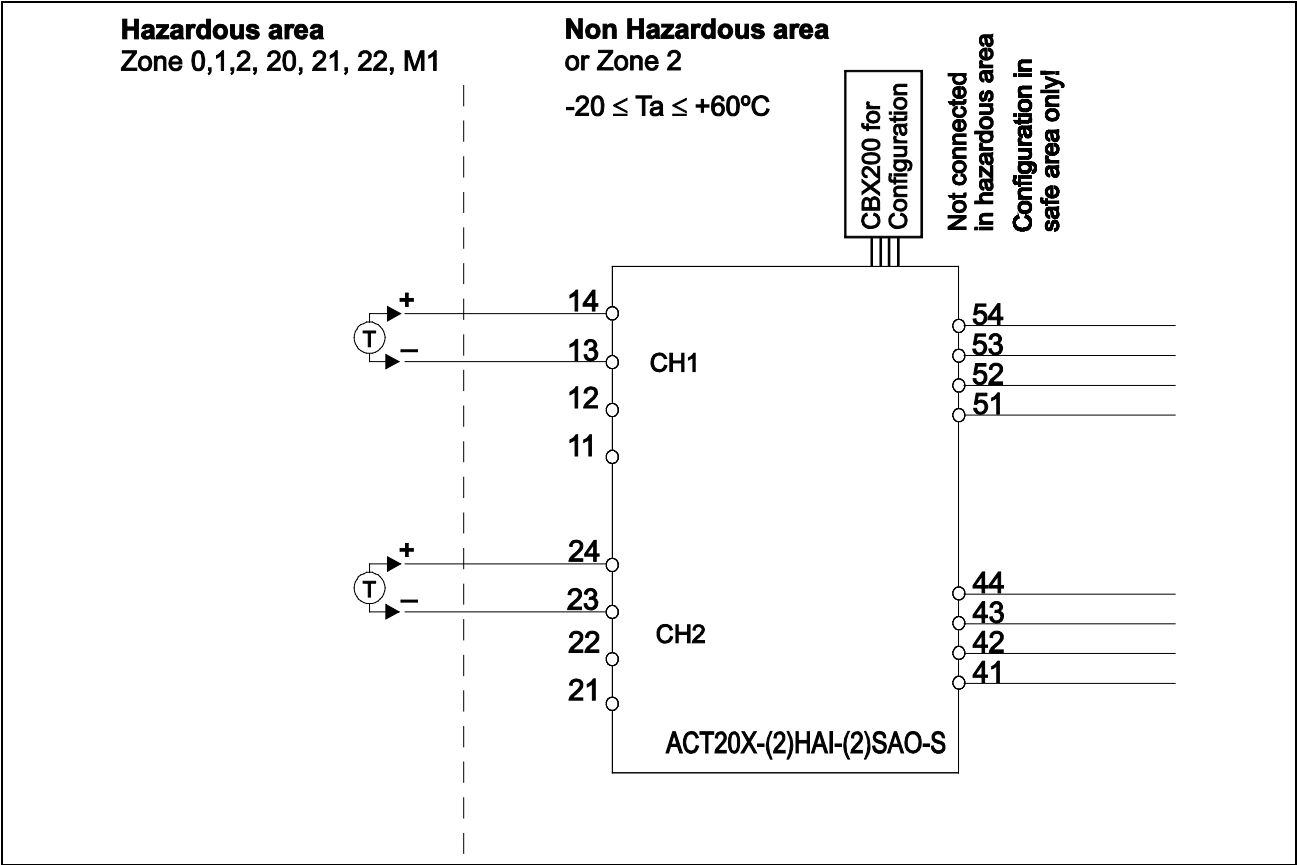


Illustration 7-45: ATEX Installation Drawing (1), (453449 Sheet 1-4)

**Terminal CH1 (13, 14), CH2 (23, 24)**

Ex Input (Loop Current Source)	
$U_o$	28 V
$I_o$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC	0.08 $\mu\text{F}$	3 mH
IIB	0.6 $\mu\text{F}$	12 mH
IIA	2.15 $\mu\text{F}$	25 mH
I	3.76 $\mu\text{F}$	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

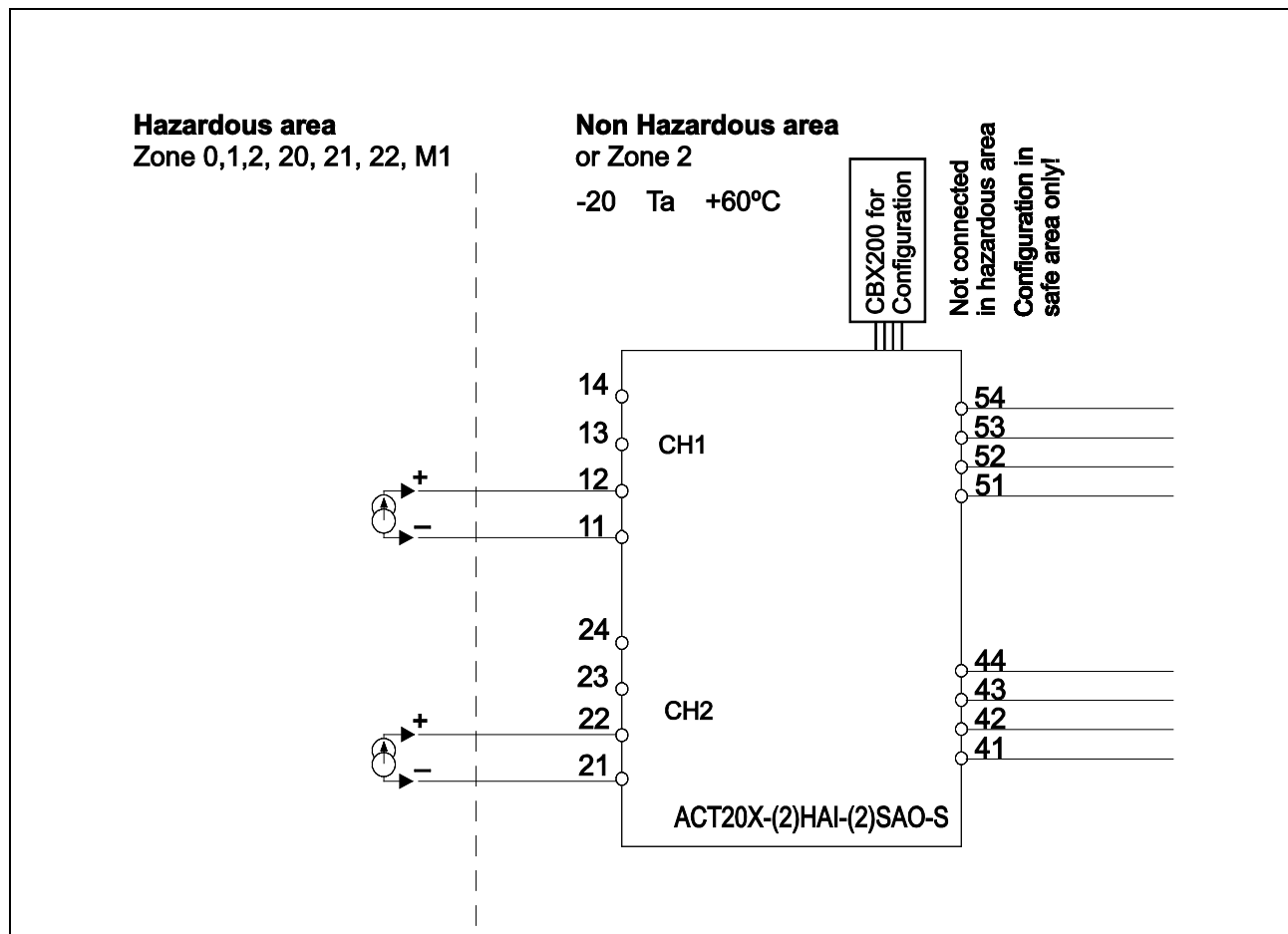


Illustration 7-46: ATEX Installation Drawing (2), (453449 Sheet 1-4)

**Terminal CH1 (11, 12), CH2 (21, 22)**

Ex Input (External Current Source)	
$U_o$	0 V
$I_o$	0 mA
$P_o$	0 mW
$U_i$	30 V
$I_i$	120 mA
$P_i$	0.85 W
$C_i$	2 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 $\mu$ F	3 mH
IIB	0.6 $\mu$ F	12 mH
IIA	2.15 $\mu$ F	25 mH
I	3.76 $\mu$ F	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V AC, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

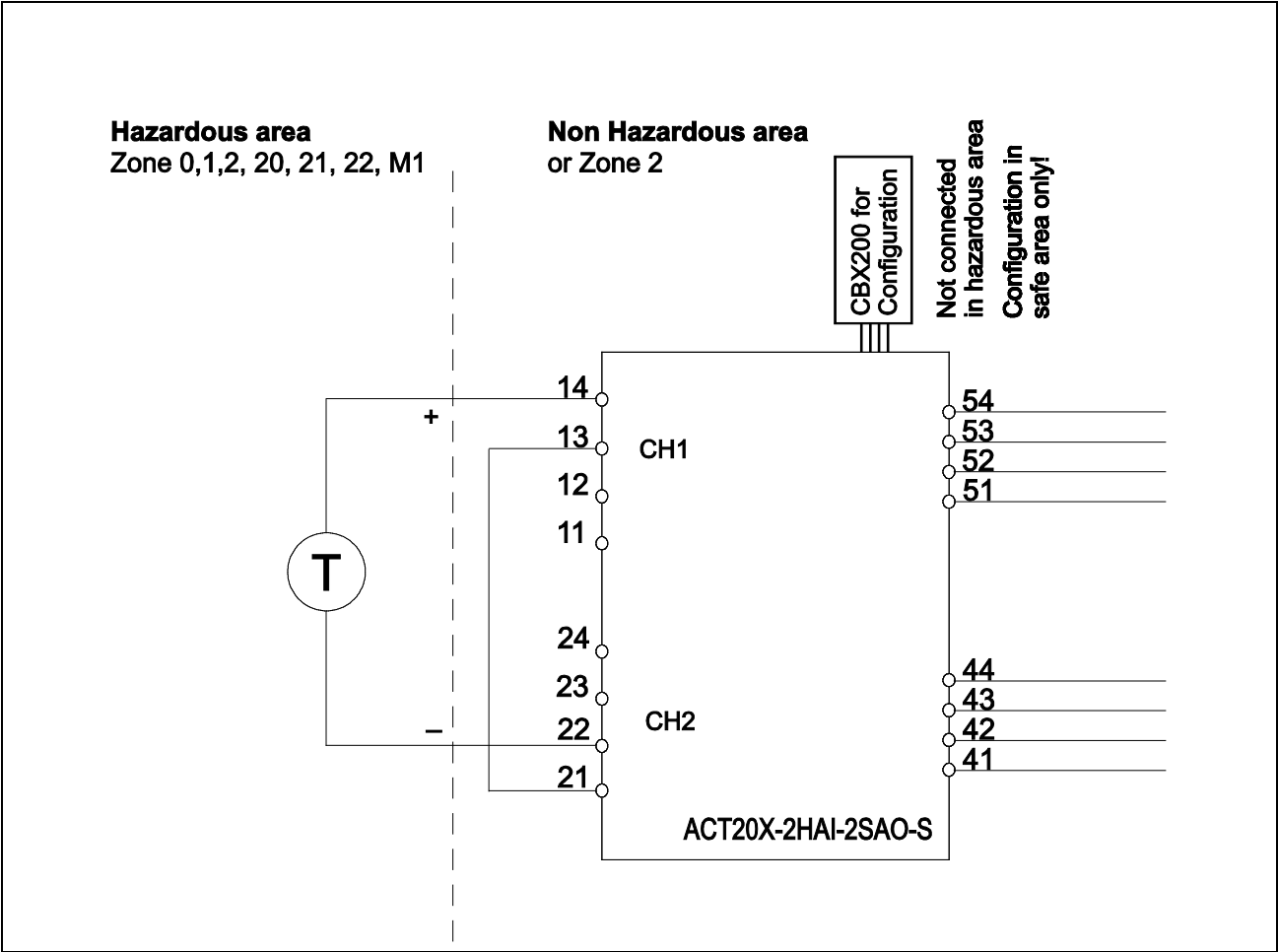


Illustration 7-47: ATEX Installation Drawing (3), (453449 Sheet 1-4)

Terminal CH1 (14), CH2 (22)

Ex Input (Loop Current Source Channel 1 to Channel 2)	
U <sub>o</sub>	28 V
I <sub>o</sub>	93 mA
P <sub>o</sub>	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 µF	3 mH
IIB	0.6 µF	12 mH
IIA	2.15 µF	25 mH
I	3.76 µF	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



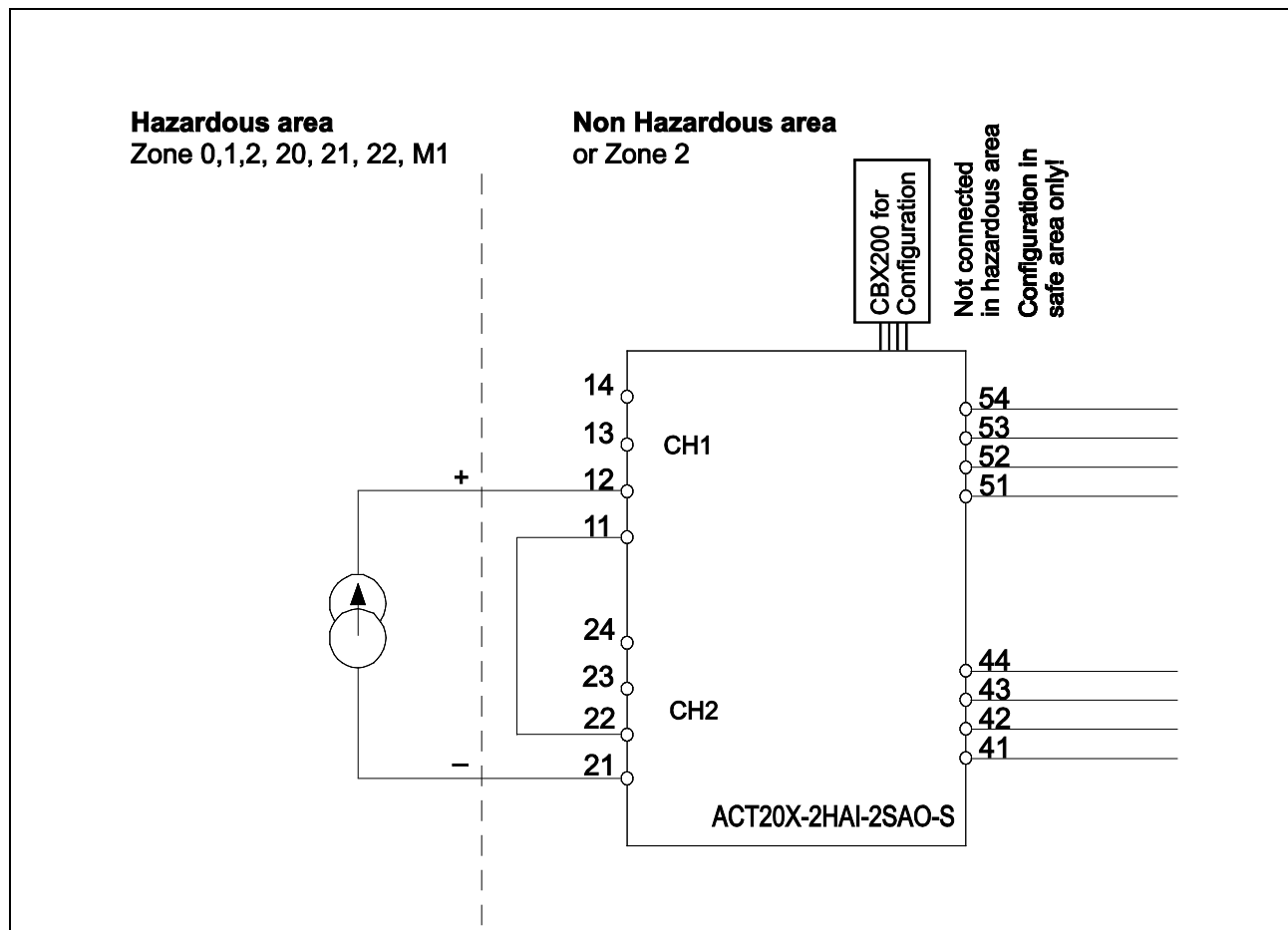


Illustration 7-48: ATEX Installation Drawing (4), (453449 Sheet 1-4)

#### Terminal CH1 (12), CH2 (21)

Ex Input (External Current Source Channel 1 to Channel 2)	
$U_o$	0 V
$I_o$	0 mA
$P_o$	0 mW
$U_i$	30 V
$I_i$	120 mA
$P_i$	0.85 W
$C_i$	4 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 µF	3 mH
IIB	0.6 µF	12 mH
IIA	2.15 µF	25 mH
I	3.76 µF	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC


**Terminal (53, 54)**


Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965430000 2456140000	4 53449 Sheet 5-8	ACT20X-HAI-SAO-S ACT20X-HAI-SAO-P
8965440000 2456150000	4 53449 Sheet 5-8	ACT20X-2HAI-2SAO-S ACT20X-2HAI-2SAO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)HAI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “intrinsic safety ia IIIC” the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

The Loop Supply and Current Input terminals for the same channel shall not be applied at the same time. The wiring of unused terminals is not allowed.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEx Certificate	DEK 11.0050 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007

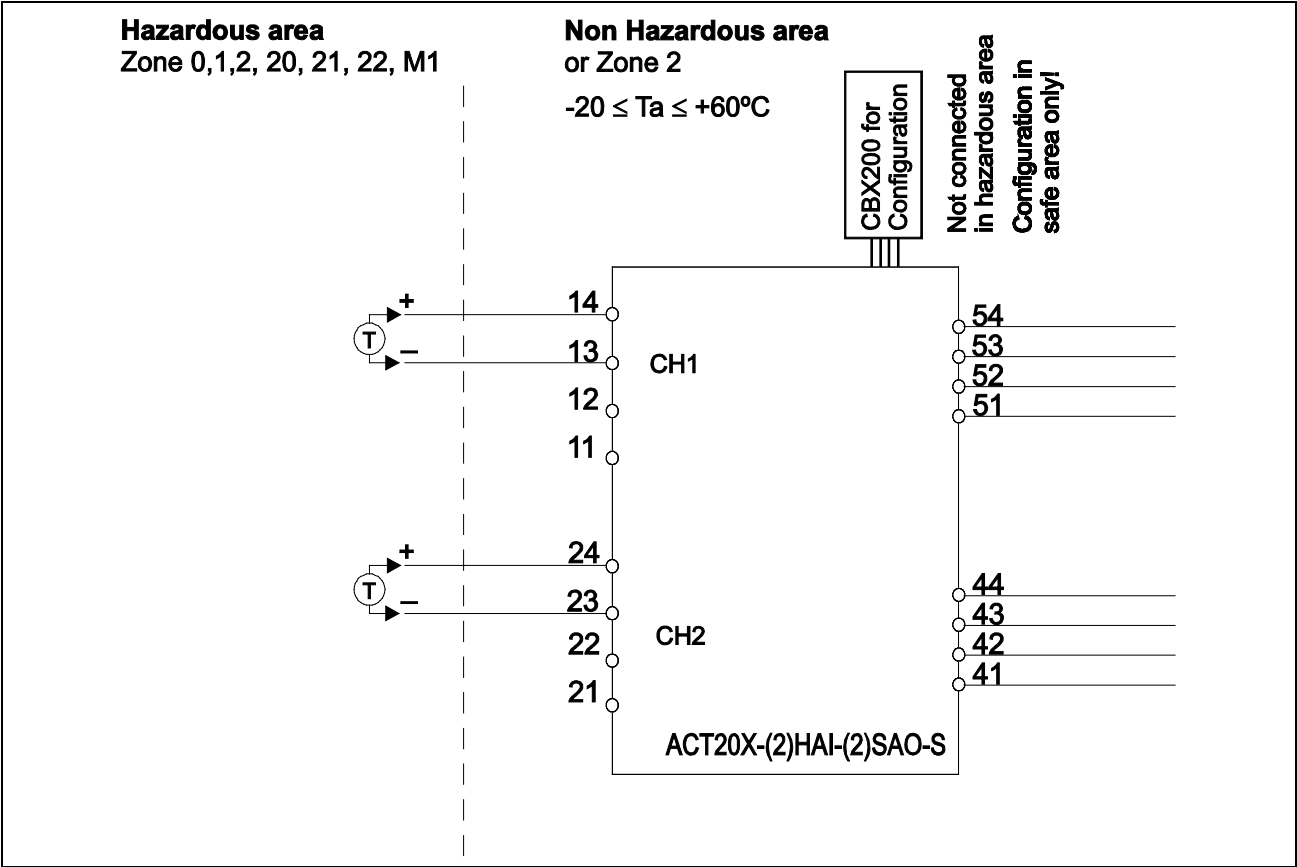


Illustration 7-49: IECEx Installation Drawing (1), (453449 Sheet 5-8)

**Terminal CH1 (13, 14), CH2 (23, 24)**

Ex Input (Loop Current Source)	
$U_o$	28 V
$I_o$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC	0.08 $\mu\text{F}$	3 mH
IIB	0.6 $\mu\text{F}$	12 mH
IIA	2.15 $\mu\text{F}$	25 mH
I	3.76 $\mu\text{F}$	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

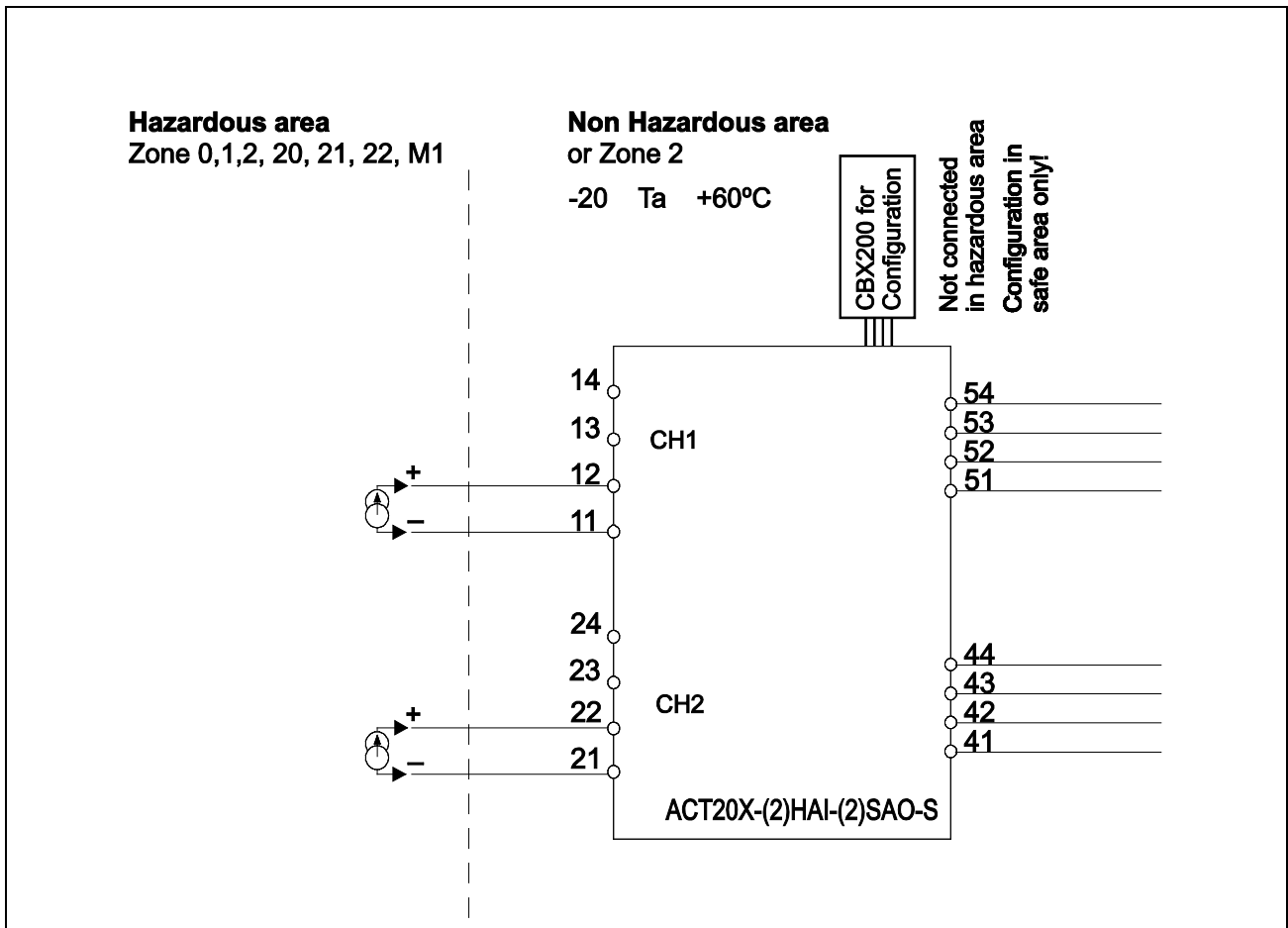


Illustration 7-50: IECEx Installation Drawing (2), (453449 Sheet 5-8)

#### Terminal CH1 (11, 12), CH2 (21, 22)

Ex Input (External Current Source)	
$U_o$	0 V
$I_o$	0 mA
$P_o$	0 mW
$U_i$	30 V
$I_i$	120 mA
$P_i$	0.85 W
$C_i$	2 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 µF	3 mH
IIB	0.6 µF	12 mH
IIA	2.15 µF	25 mH
I	3.76 µF	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V AC, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



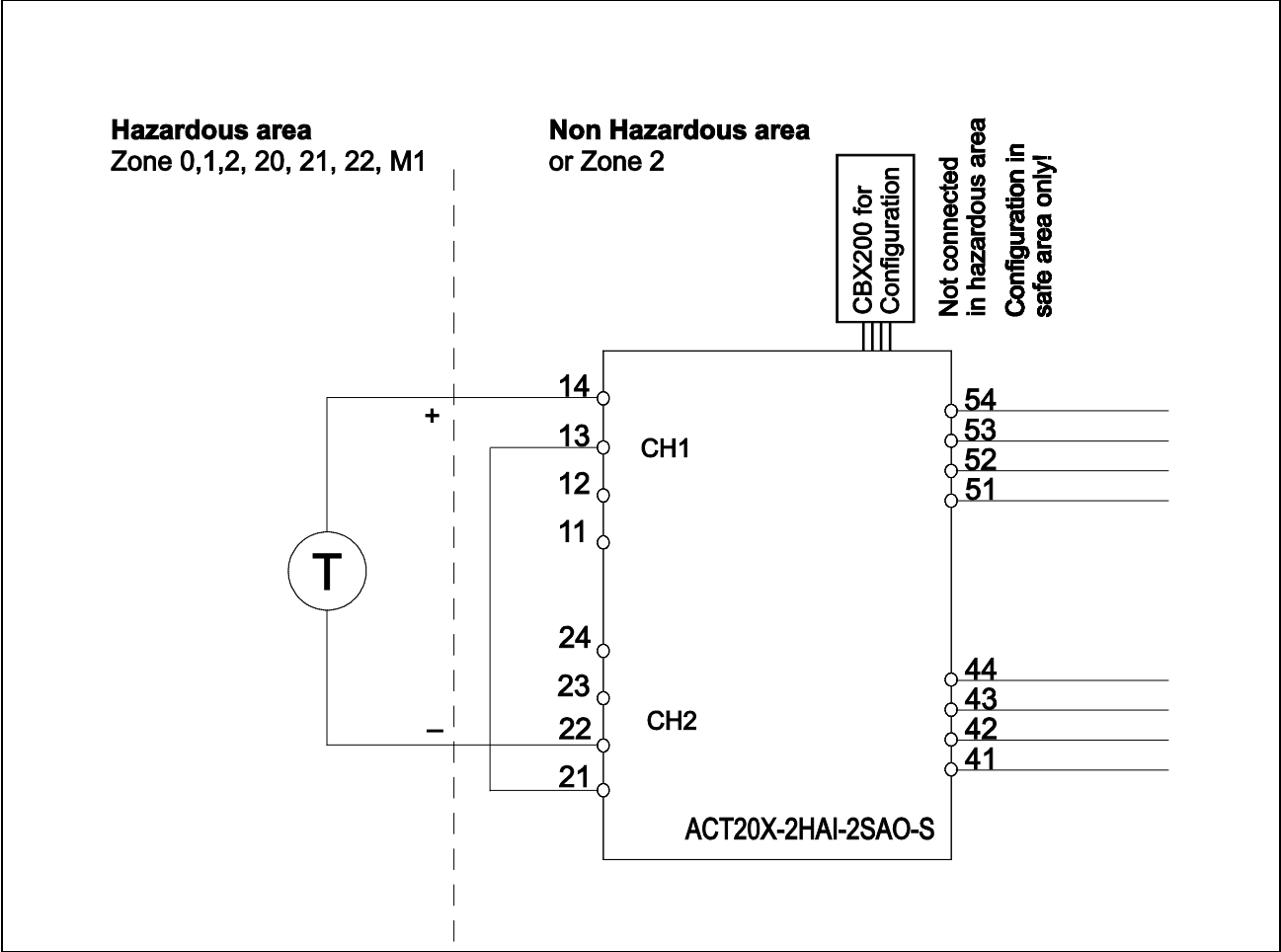


Illustration 7-51: IECEx Installation Drawing (3), (453449 Sheet 5-8)

Terminal CH1 (14), CH2 (22)

Ex Input (Loop Current Source Channel 1 to Channel 2)	
U <sub>o</sub>	28 V
I <sub>o</sub>	93 mA
P <sub>o</sub>	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 µF	3 mH
IIB	0.6 µF	12 mH
IIA	2.15 µF	25 mH
I	3.76 µF	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

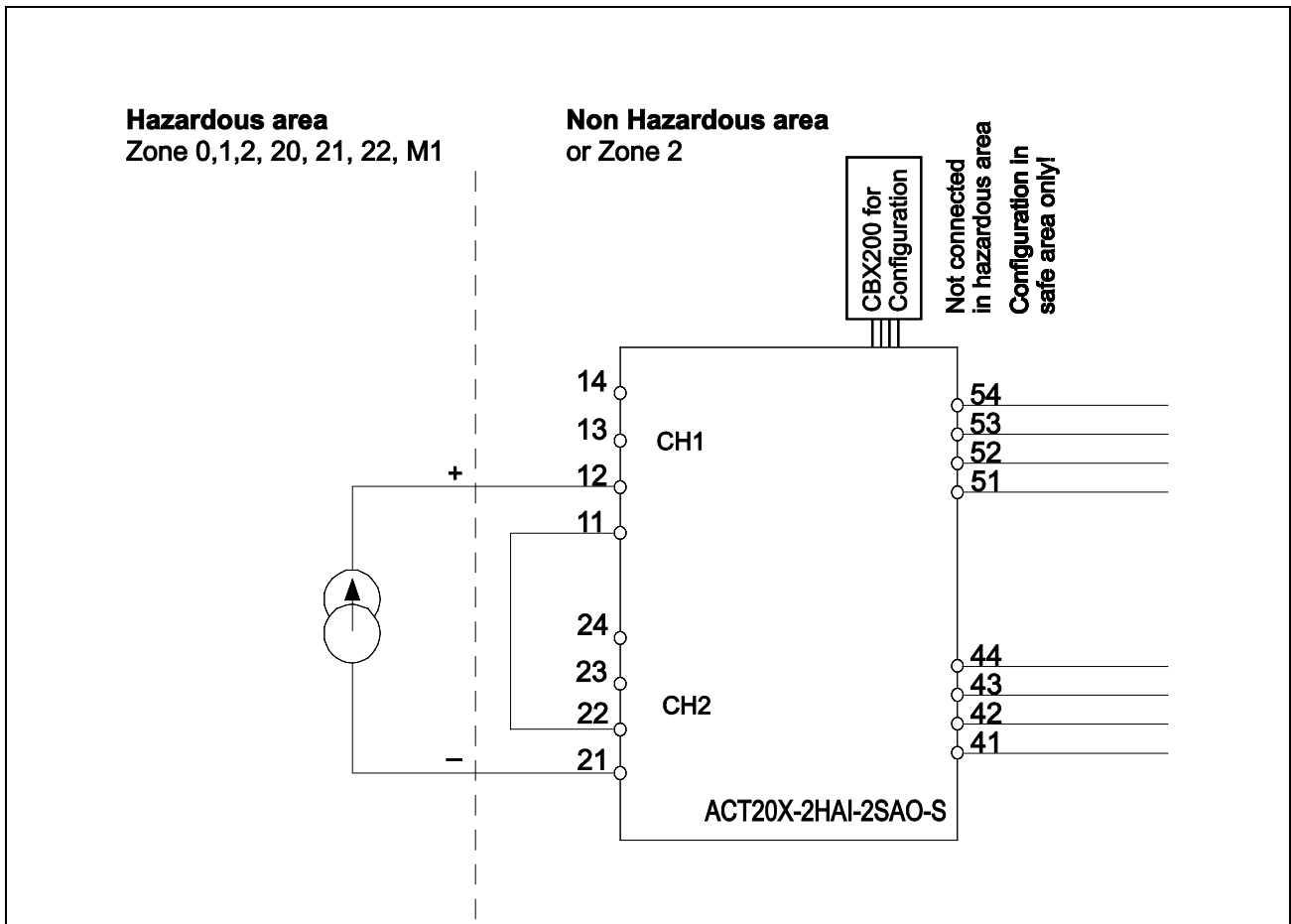


Illustration 7-52: IECEx Installation Drawing (4), (453449 Sheet 5-8)

**Terminal CH1 (12), CH2 (21)**

Ex Input (External Current Source Channel 1 to Channel 2)	
$U_o$	0 V
$I_o$	0 mA
$P_o$	0 mW
$U_i$	30 V
$I_i$	120 mA
$P_i$	0.85 W
$C_i$	4 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC	0.08 µF	3 mH
IIB	0.6 µF	12 mH
IIA	2.15 µF	25 mH
I	3.76 µF	30 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965430000 2456140000	4 53449 Sheet 9-13	ACT20X-HAI-SAO-S ACT20X-HAI-SAO-P
8965440000 2456150000	4 53449 Sheet 9-13	ACT20X-2HAI-2SAO-S ACT20X-2HAI-2SAO-P

**DANGER**

For safe installation of ACT20X-(2)HAI-(2)SAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**WARNING**

Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

In Class I, Division 2 installations, the subject equipment shall be mounted within a tool-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70) or Canadian Electrical Code (C22.1).

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure having an IP protection of at least IP54.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG 26-14.

The Loop Supply and Current Input terminals for the same channel shall not be applied at the same time.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us certificate	3038275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4

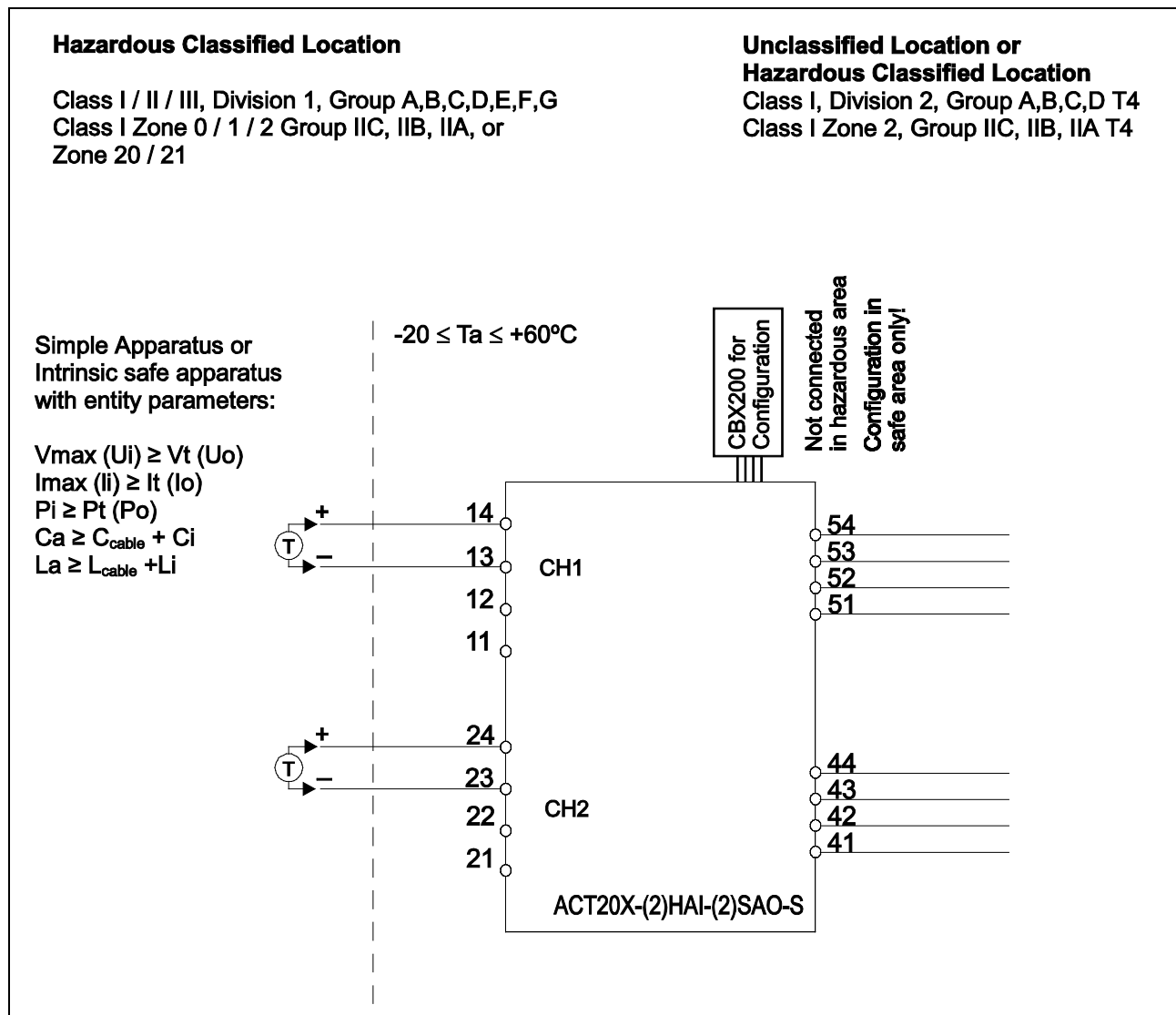


Illustration 7-53: FM Installation Drawing (1), (453449 Sheet 9-13)

**Terminal CH1 (13, 14), CH2 (23, 24)**

Ex Input (Loop Current Source)	
$U_o, V_{oc}$	28 V
$I_o, I_{sc}$	93 mA
$P_o$	0.65 W

Group	C <sub>o</sub>	L <sub>o</sub>
IIC or A, B	0.08 µF	3 mH
IIB or C, E, F	0.6 µF	12 mH
IIA or D, G	2.15 µF	25 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W



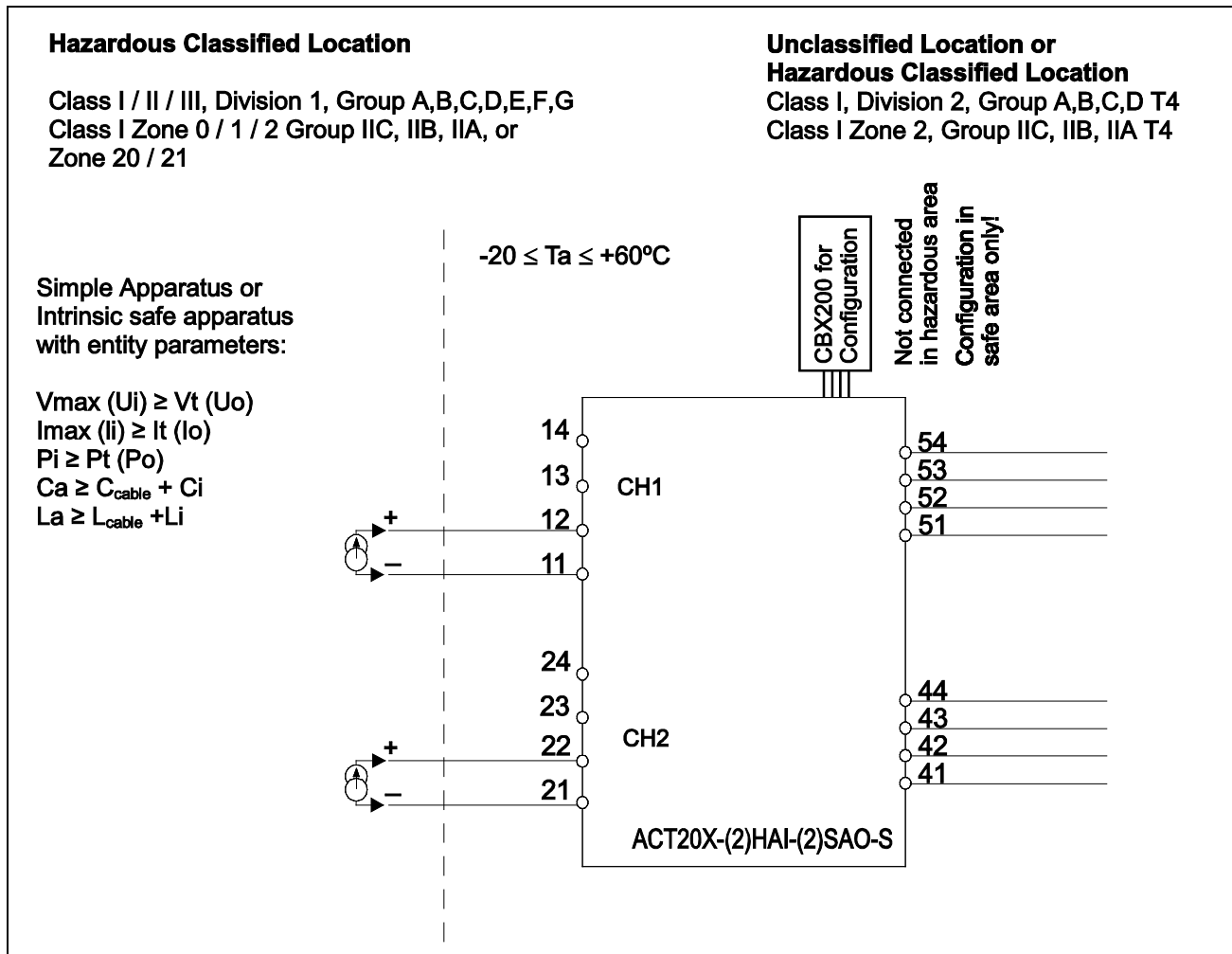


Illustration 7-54: FM Installation Drawing (2), (453449 Sheet 9-13)

#### Terminal CH1 (11, 12), CH2 (21, 22)

Ex Input (External Current Source)	
$U_o, V_{oc}$	0 V
$I_o, I_{sc}$	0 mA
$P_o$	0 mW
$U_i, V_{max}$	30 V
$I_i, I_{max}$	120 mA
$P_i$	0.85 W
$C_i$	2 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC or A, B	0.08 µF	3 mH
IIB or C, E, F	0.6 µF	12 mH
IIA or D, G	2.15 µF	25 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

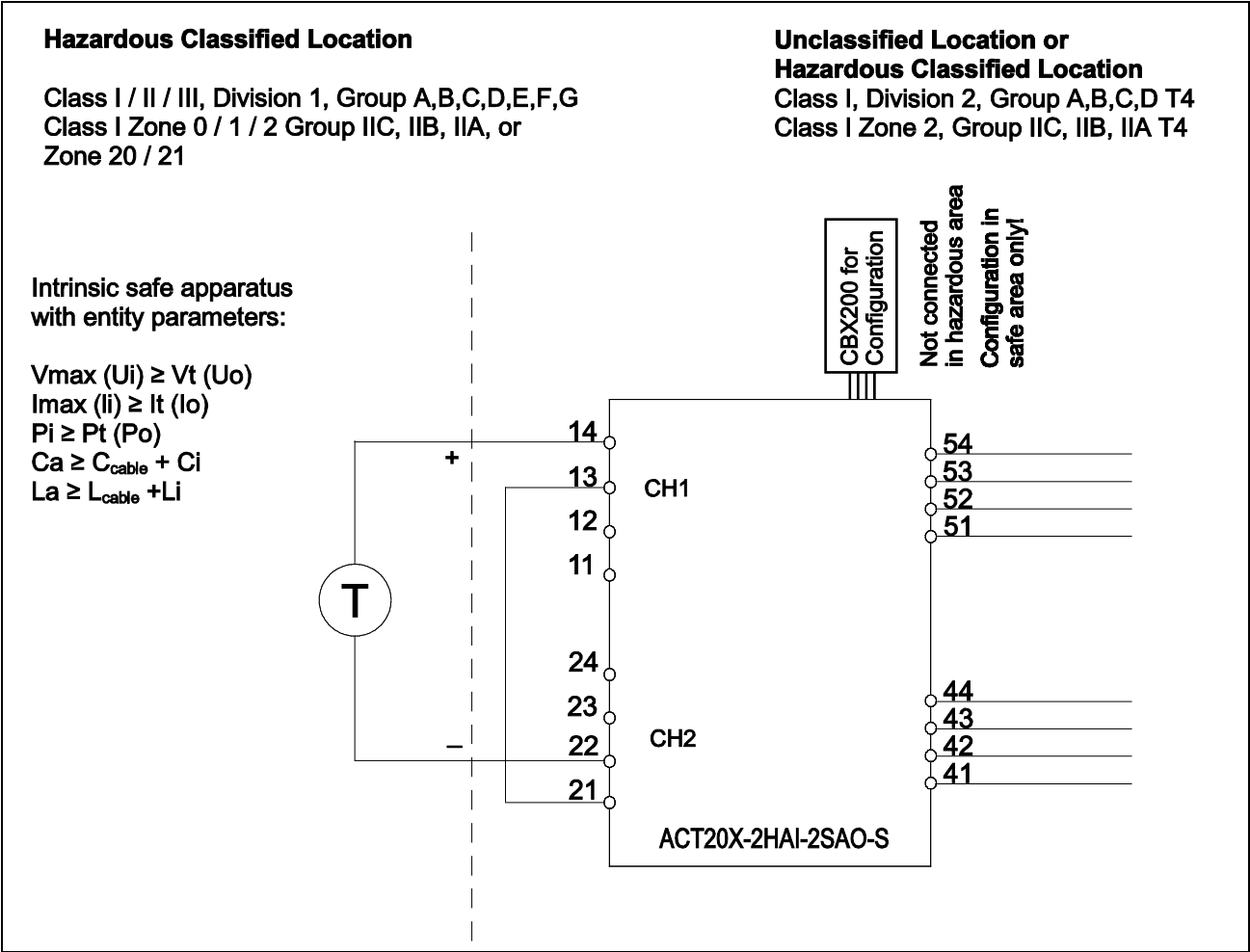


Illustration 7-55: FM Installation Drawing (3), (453449 Sheet 9-13)

Terminal CH1 (14), CH2 (22)

Ex Input (Loop Current Source Channel 1 to Channel 2)	
$U_o, V_{oc}$	28 V
$I_o, I_{sc}$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC or A, B	0.08 $\mu F$	3 mH
IIB or C, E, F	0.6 $\mu F$	12 mH
IIA or D, G	2.15 $\mu F$	25 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

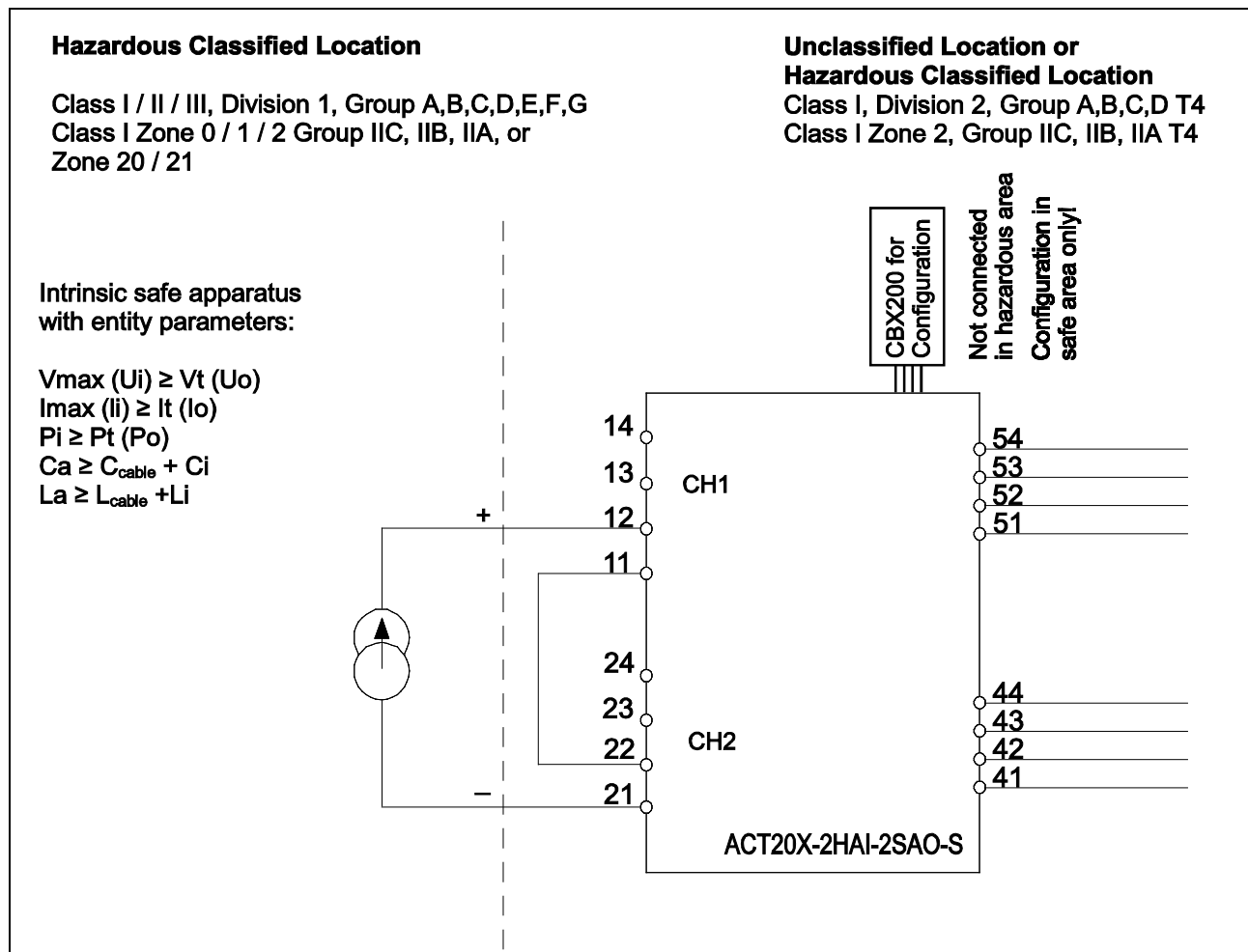


Illustration 7-56: FM Installation Drawing (4), (453449 Sheet 9-13)

### Terminal CH1 (12), CH2 (21)

Ex Input (External Current Source Channel 1 to Channel 2)	
$U_o$	0 V
$I_o$	0 mA
$P_o$	0 mW
$U_i, V_{max}$	30 V
$I_i, I_{max}$	120 mA
$P_i$	0.85 W
$C_i$	4 nF
$L_i$	0 $\mu$ H

Group	C <sub>o</sub>	L <sub>o</sub>
IIC or A, B	0.08 µF	3 mH
IIB or C, E, F	0.6 µF	12 mH
IIA or D, G	2.15 µF	25 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Output	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

## Appendix F. Installation Drawings ACT20X-SAI-HAO (HART-transparent Driver)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965450000 2456160000	4 53448 Sheet 1-2	ACT20X-SAI-HAO-S ACT20X-SAI-HAO-P
8965460000 2456170000	4 53448 Sheet 1-2	ACT20X-2SAI-2HAO-S ACT20X-2SAI-2HAO-P



#### DANGER

For safe installation of ACT20X-(2)SAI-(2)HAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.



#### DANGER

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “Ex ia Da” the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in EN 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>


Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

ATEX Certificate		DEKRA 11ATEX 0164 X
Marking		II (1) G [Ex ia Ga] IIC/IIB/IIA II 3 G Ex nA nC IIC T4 Gc II (1) D [Ex ia Da] IIIC I (M1) [Ex ia Ma] I
Standards		EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010, EN 60079-26:2007



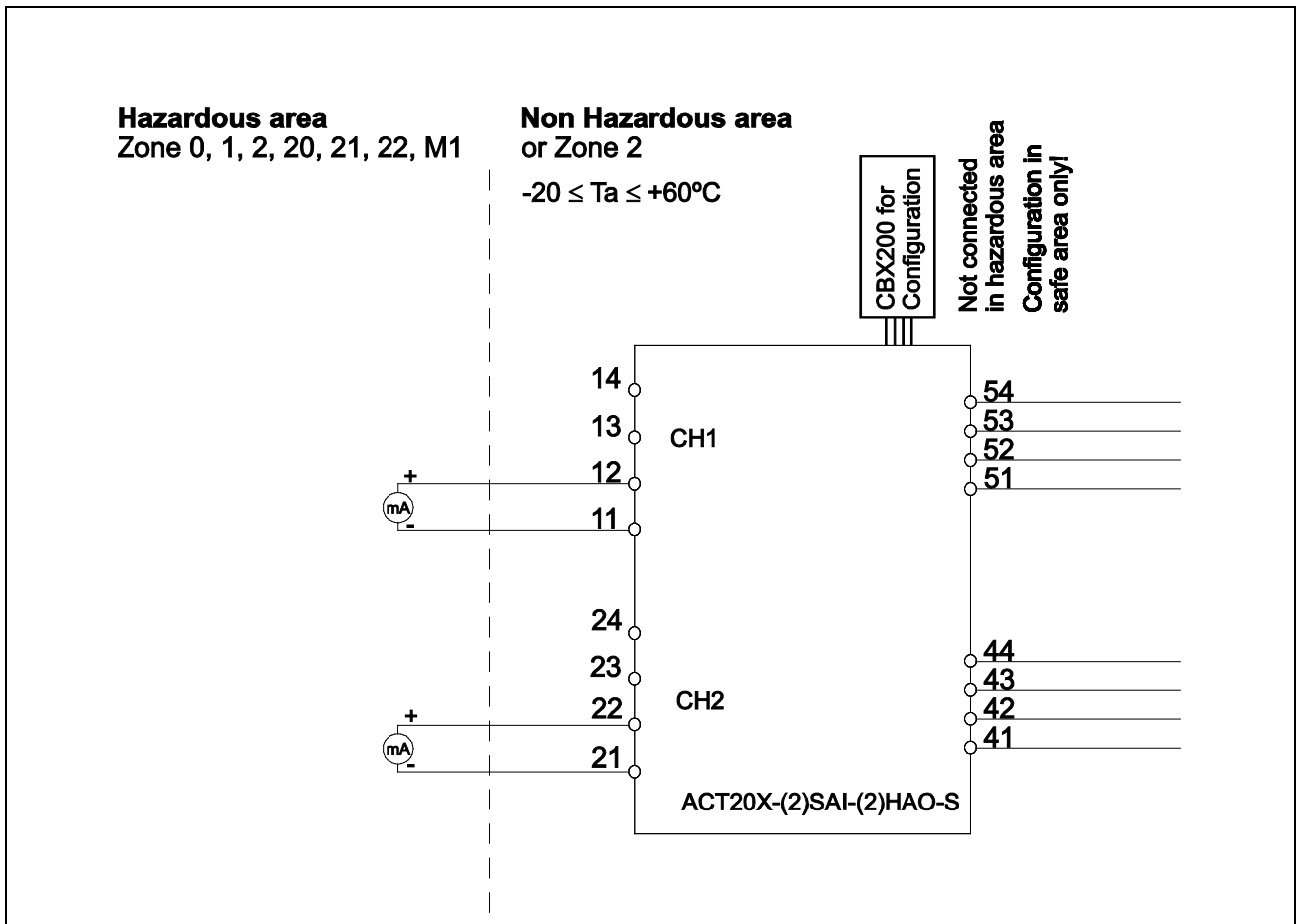


Illustration 7-57: ATEX Installation Drawing, (453448 Sheet 1-2)

**Terminal CH1 (11, 12), CH2 (21, 22)**

Ex Output	
$U_o$	28 V
$I_o$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC	0.08 $\mu$ F	4 mH
IIB	0.65 $\mu$ F	16 mH
IIA	2.15 $\mu$ F	32 mH
I	3.76 $\mu$ F	46 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Current Input	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC


**Terminal (53, 54)**


Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965450000 2456160000	4 53448 Sheet 3-4	ACT20X-SAI-HAO-S ACT20X-SAI-HAO-P
8965460000 2456170000	4 53448 Sheet 3-4	ACT20X-2SAI-2HAO-S ACT20X-2SAI-2HAO-P

	<b>DANGER</b>
	For safe installation of ACT20X-(2)SAI-(2)HAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

	<b>DANGER</b>
	To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

In type of protection “Ex ia Da” the parameters for intrinsic safety for gas group IIB are applicable.

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

Do not separate connectors when energized and an explosive gas mixture is present.

The wiring of unused terminals is not allowed.

The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

IECEx Certificate	DEK 11.0059 X
Marking	Ex nA nC IIC T4 Gc [Ex ia Ga] IIC/IIB/IIA [Ex ia Da] IIIC [Ex ia Ma] I
Standards	IEC 60079-0:2011, IEC 60079-11:2011, IEC 60079-15:2010, IEC 60079-26:2007

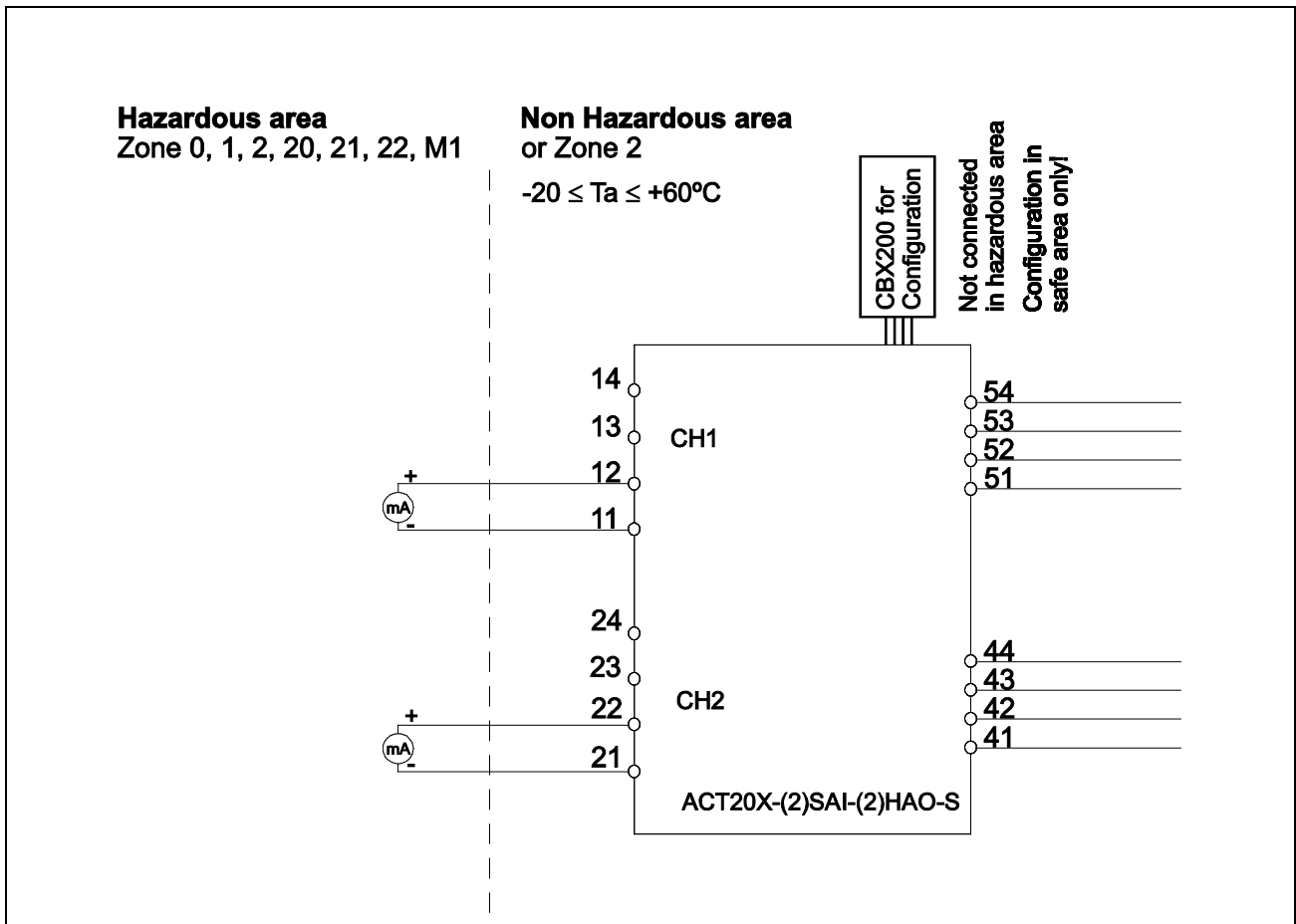


Illustration 7-58: IECEx Installation Drawing, (453448 Sheet 3-4)

**Terminal CH1 (11, 12), CH2 (21, 22)**

Ex Output	
$U_o$	28 V
$I_o$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC	0.08 $\mu\text{F}$	4 mH
IIB	0.65 $\mu\text{F}$	16 mH
IIA	2.15 $\mu\text{F}$	32 mH
I	3.76 $\mu\text{F}$	25 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Current Input	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965450000 2456160000	4 53448 Sheet 5-6	ACT20X-SAI-HAO-S ACT20X-SAI-HAO-P
8965460000 2456170000	4 53448 Sheet 5-6	ACT20X-2SAI-2HAO-S ACT20X-2SAI-2HAO-P

**DANGER**

For safe installation of ACT20X-(2)SAI-(2)HAO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**WARNING**

Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

In Class I, Division 2 or Zone 2 installations, the subject equipment shall be mounted within a tool-secured enclosure which is capable of accepting one or more of Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70) or the Canadian Electrical code (C22.1).

The module must be installed in pollution degree 2, overvoltage category II as defined in IEC 60664-1.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure having an IP protection of at least IP54.

The module is galvanically isolated and does not require grounding.

Use 60/75 °C copper conductors in the wire size AWG (26-14).

The year of manufacture can be taken from the first two digits in the serial number.

### CBX200 – "WI-Manager" Software

For installation in Zone 2 / Division 2 the following must be observed:

- The CBX200 is an interface cable for configuration via PC.
- Configuration must be performed only in a safe area.

c-FM-us Certificate	3038275
Marking	Install in CL I DIV2 GP A-D T4 Provides IS Circuits to CL I-III DIV 1/2 GP A-G or CL I Zn2 AEx/Ex nA nC [ia] IIC T4
Standards	<u>Canada</u> Zones: CAN/CSA-C22.2 E60079-0, CAN/CSA-C22.2 E60079-11, CAN/CSA-C22.2 E60079-15 Divisions: CSA 22.2-157, CSA 22.2-213 <u>USA</u> Zones: ANSI/ISA 60079-0, ANSI/ISA 60079-11, ANSI/ISA 60079-15 Divisions: FM3600, FM3610, FM3611, FM3810



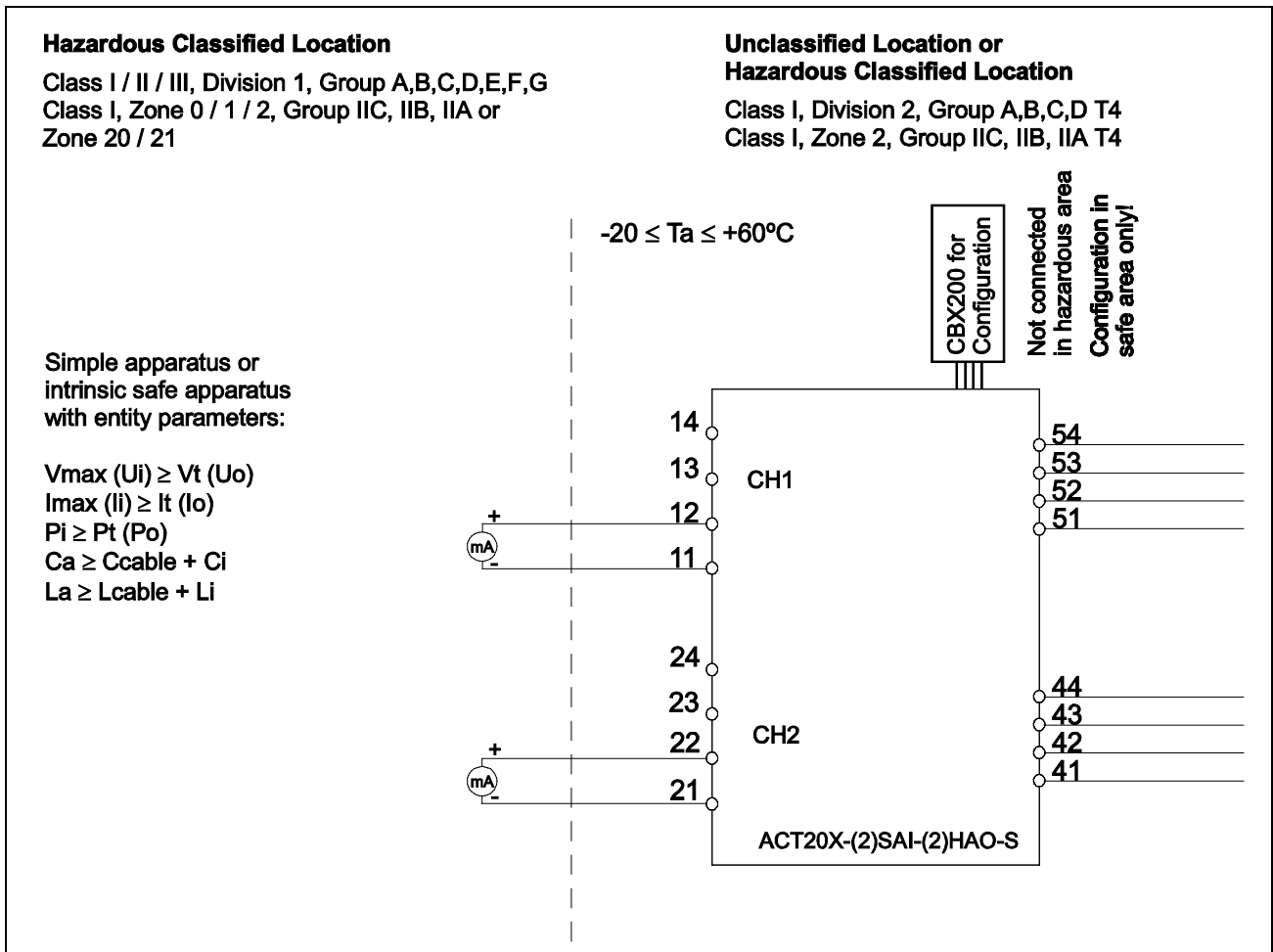


Illustration 7-59: FM Installation Drawing, (453448 Sheet 5-6)

**Terminal CH1 (11, 12), CH2 (21, 22)**

Ex Output	
$U_o$	28 V
$I_o$	93 mA
$P_o$	0.65 W

Group	$C_o$	$L_o$
IIC	0.08 $\mu\text{F}$	4 mH
IIB	0.65 $\mu\text{F}$	16 mH
IIA	2.15 $\mu\text{F}$	32 mH

**Terminal (41, 42, 43, 44) and (51, 52, 53, 54)**

Supply / Current Input	
U <sub>m</sub>	253 V, max. 400 Hz

**Terminal (51, 52)**

Supply	
Voltage	19.2...31.2 V DC

**Terminal (53, 54)**

Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	125 V AC / 110 V DC	32 V AC / 32 V DC
Current max.	0.5 A AC / 0.3 A DC	0.5 A AC / 1 A DC
Power max.	62.5 VA / 32 W	16 VA / 32 W

## Appendix G. Installation Drawings ACT20-FEED-IN-PRO (Power Feed-In Unit)

### ATEX Installation Drawing

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965500000 2456870000	4 52691 Sheet 1-2	ACT20-FEED-IN-PRO-S ACT20-FEED-IN-PRO-P



#### DANGER

For safe installation of ACT20-FEED-IN-PRO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.



#### DANGER

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.



#### DANGER

Do not install or remove modules from the Power Rail unless area is known to be non-hazardous.

The ACT20-FEED-IN-PRO must be supplied from a power source with double or reinforced insulation to mains.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

Cable entry devices and blanking elements shall fulfil the same requirements.


Transients are suppressed by an internal transient protection device, which is set to a level not exceeding 40% of the rated voltage.

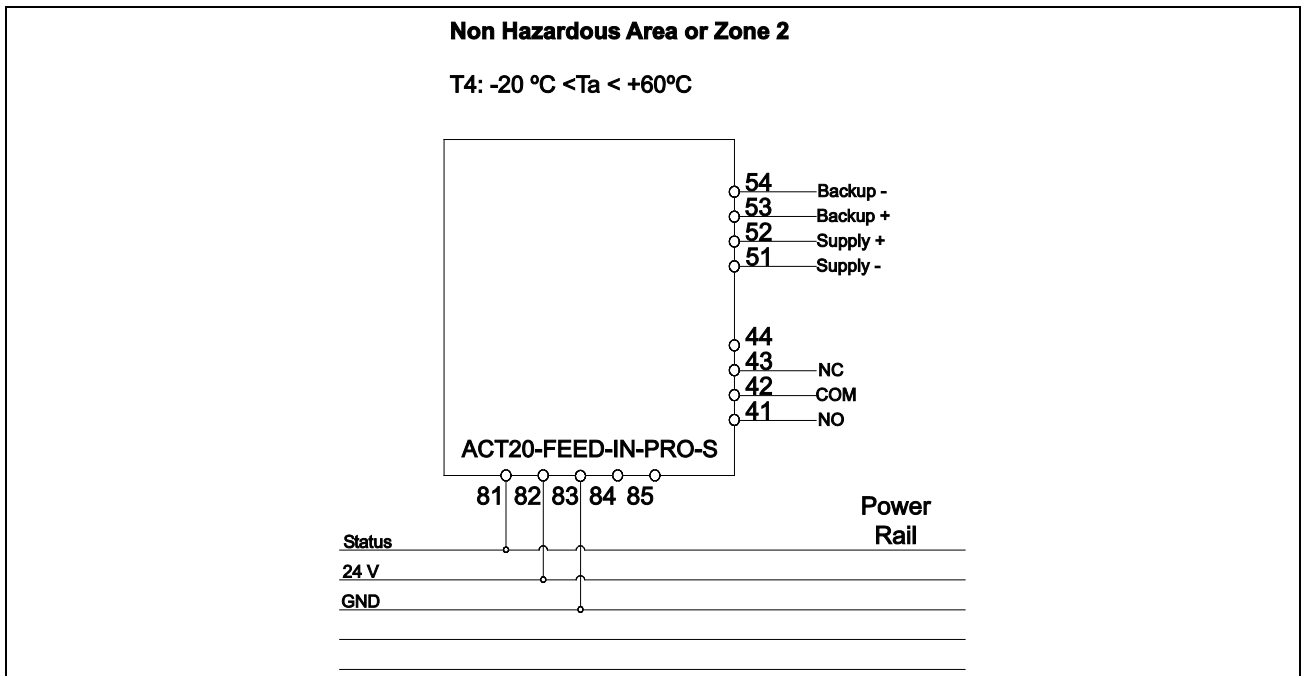
The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

ATEX Certificate	DEKRA 11ATEX 0129 X
Marking	 II 3 G Ex nA nC IIC T4 Gc
Standards	EN 60079-0:2012, EN 60079-15:2010



**Illustration 7-60:** ATEX Installation Drawing, (452691 Sheet 1-2)

### Terminal (51, 52)

Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

### Terminal (53, 54)

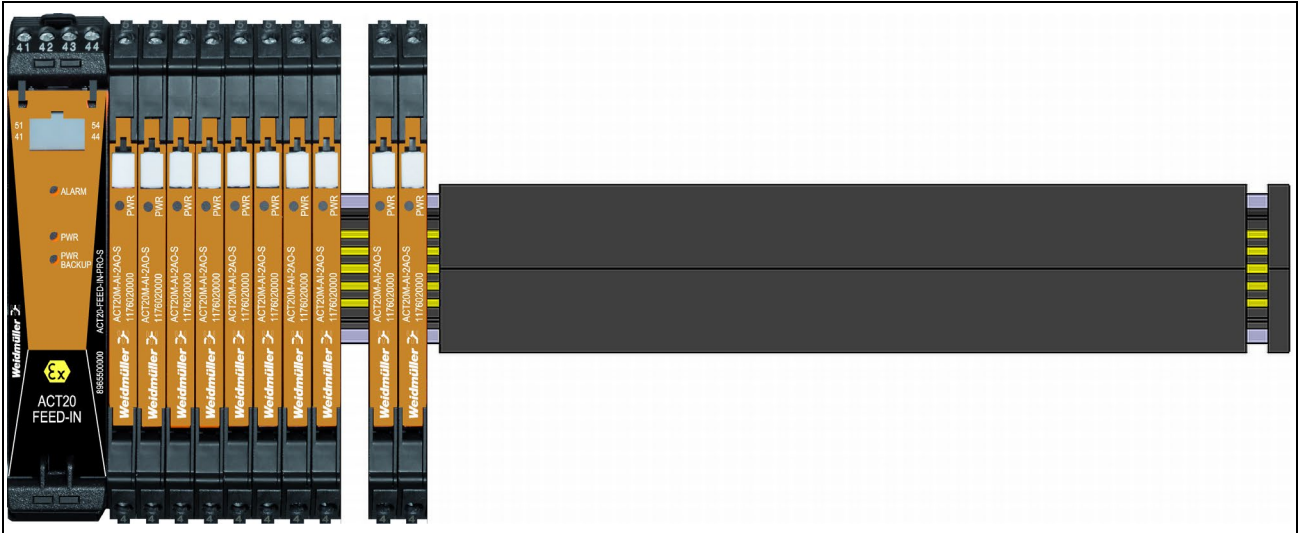
Backup Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

### Terminal (41, 42, 43)

Power Rail Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

### ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.

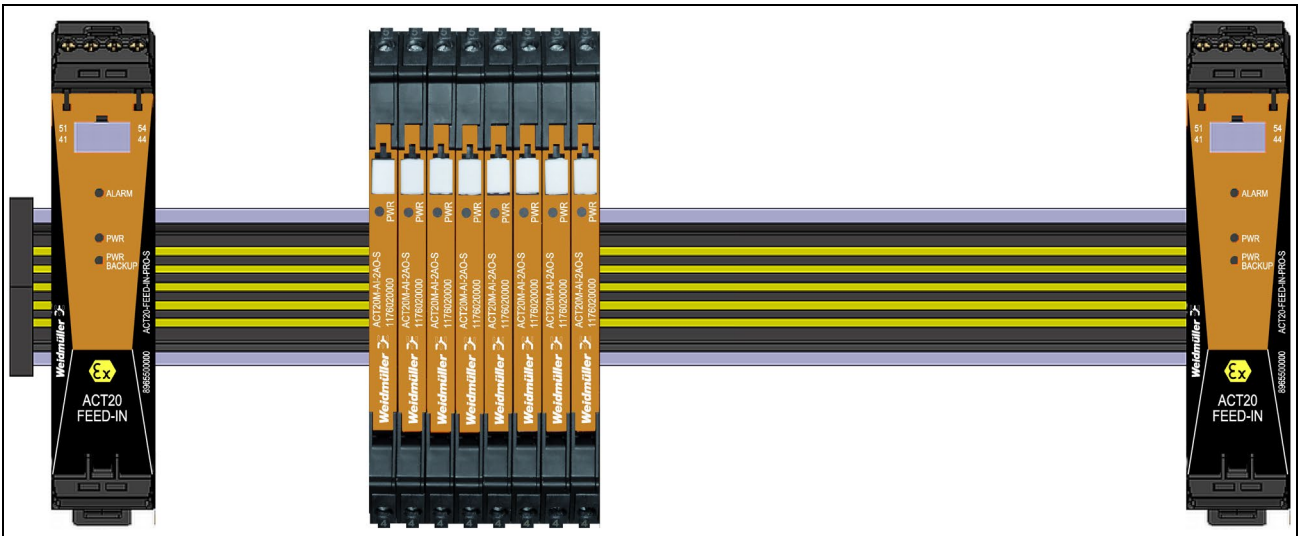


Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Use CH20M BUS-ADP (Bus Cover) to prevent the open mounting rail from being accidentally short circuited.

### Redundant ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.



Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Power is supplied to the Power Rail from two ACT20-FEED-IN-PRO modules. Both modules have connections for normal supply and backup supply.



**IECEx Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965500000 2456870000	4 52691 Sheet 3-4	ACT20-FEED-IN-PRO-S ACT20-FEED-IN-PRO-P

**DANGER**

For safe installation of ACT20-FEED-IN-PRO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**DANGER**

Do not install or remove modules from the Power Rail unless area is known to be non-hazardous.

The ACT20-FEED-IN-PRO must be supplied from a power source with double or reinforced insulation to mains.

For installation in Zone 2, the module must be installed in an outer enclosure having an IP protection of at least IP54 according to type of protection Ex-n or Ex-e.

Cable entry devices and blanking elements shall fulfil the same requirements.

Transients are suppressed by an internal transient protection device, which is set to a level not exceeding 40% of the rated voltage.

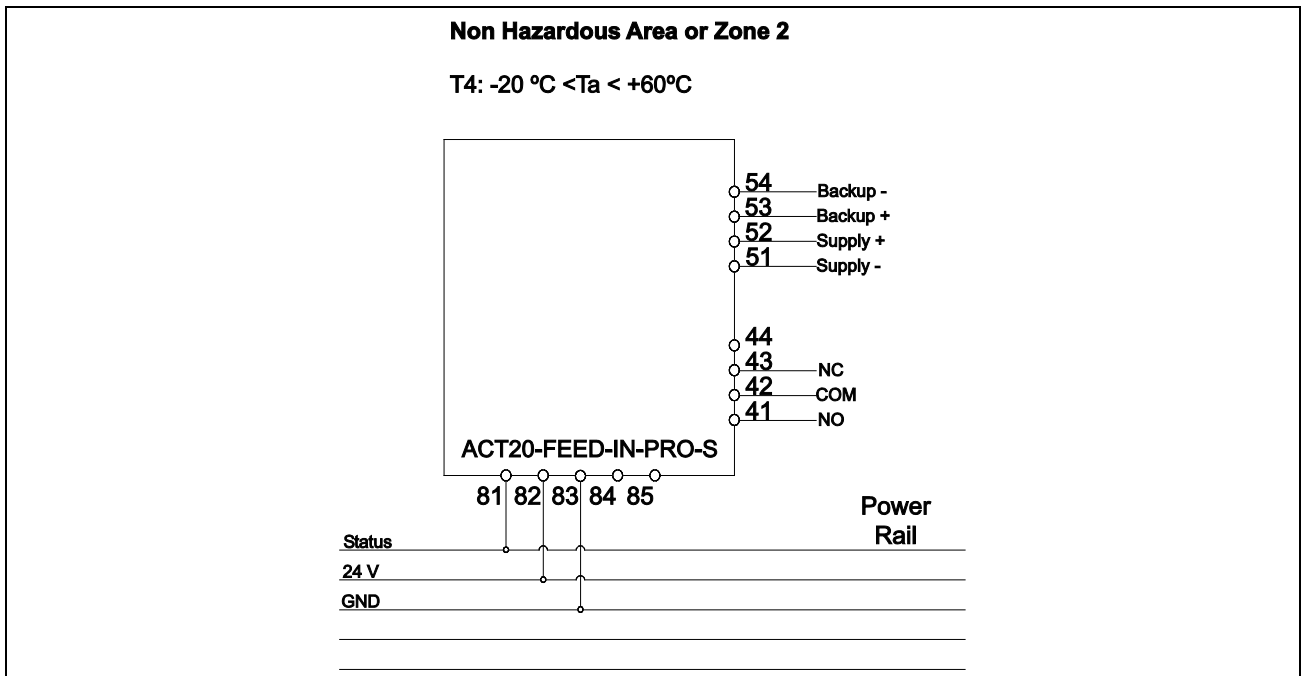
The year of manufacture can be taken from the first two digits in the serial number.

Wire cross-section: AWG 26...12 / 0.13...3.31 mm<sup>2</sup>

Number of wires per terminal: 1 wire or 2 wires in a common ferrule

Tightening torque per terminal, max.: 0.6 Nm

IECEx Certificate	DEK 11.0048 X
Marking	Ex nA nC IIC T4 Gc
Standards	IEC 60079-0:2011, IEC 60079-15:2010



**Illustration 7-61: IECEx Installation Drawing, (452691 Sheet 3-4)**

### Terminal (51, 52)

Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

### Terminal (53, 54)

Backup Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

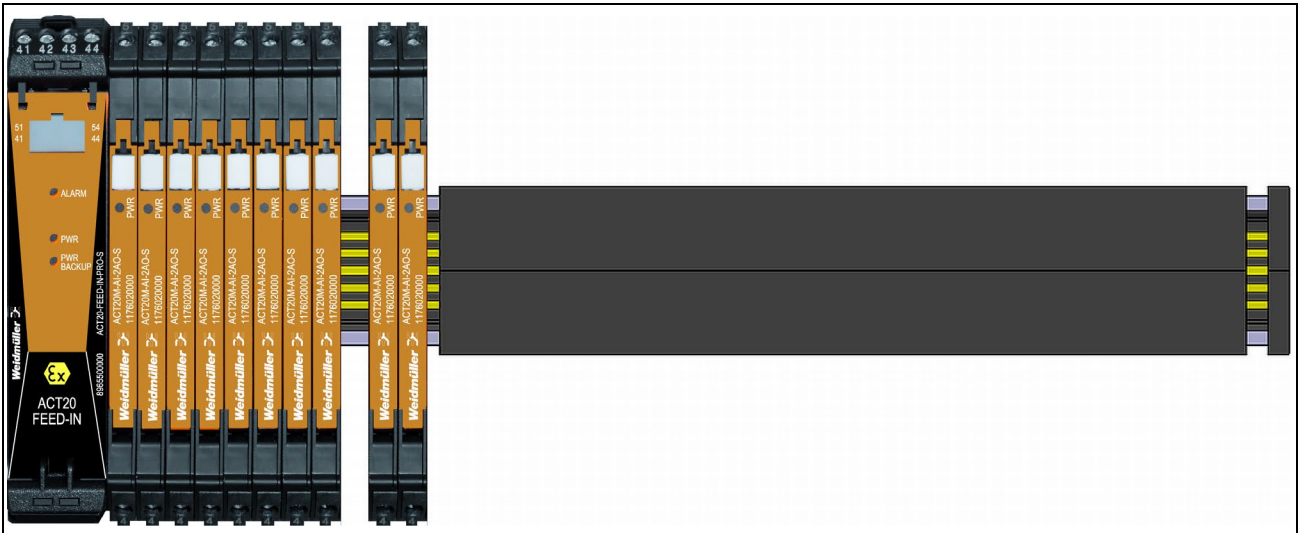
### Terminal (41, 42, 43)

Power Rail Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W



### ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.

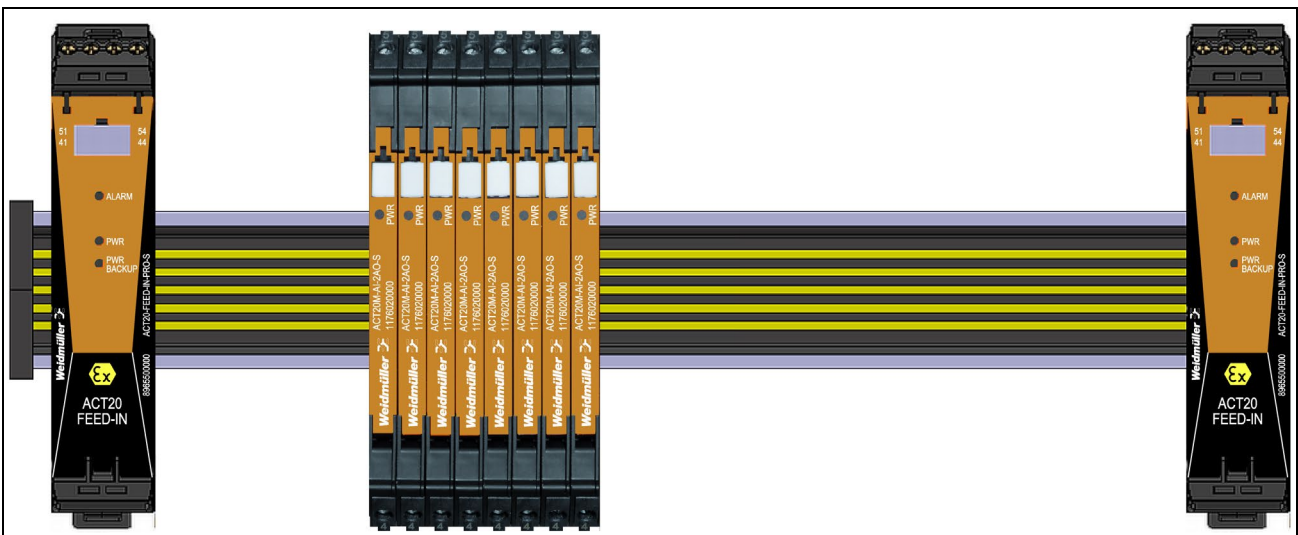


Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Use CH20M BUS-ADP (Bus Cover) to prevent the open mounting rail from being accidentally short circuited.

### Redundant ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.



Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Power is supplied to the Power Rail from two ACT20-FEED-IN-PRO modules. Both modules have connections for normal supply and backup supply.



**FM Installation Drawing**

The module is available in the following variants:

Order No.	Installation Drawing	Type
8965500000 2456870000	4 52691 Sheet 5-6	ACT20-FEED-IN-PRO-S ACT20-FEED-IN-PRO-P

**DANGER**

For safe installation of ACT20-FEED-IN-PRO the following must be observed: The module may only be installed by qualified personnel familiar with the national and international laws, directives and standards that apply to this region.

**DANGER**

To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

**DANGER**

Do not install or remove modules from the Power Rail unless area is known to be non-hazardous.

**WARNING**

Substitution of components may impair intrinsic safety and/or suitability for Division 2 / Zone 2.

The installation and wiring must be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be installed in pollution degree 2 or better.

The module must be supplied from a Power Supply having double or reinforced insulation.

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

For installation in Zone 2 or Division 2, the module must be installed in a suitable outer enclosure according to the regulations in the CEC for Canada or NEC for USA.

The year of manufacture can be taken from the first two digits in the serial number.

c-FM-us Certificate	3043148
Marking	CL I DIV2 GP A-D T4 CL I Zn2 AEx/Ex nA nC IIC T4
Standards	Class 3600, Class 3611, Class 3810, ANSI/ISA 12.00.01, ANSI/ISA 12.12.02, ISA 60079-15:2002, CSA-E79-15, CSA-C22.2-213

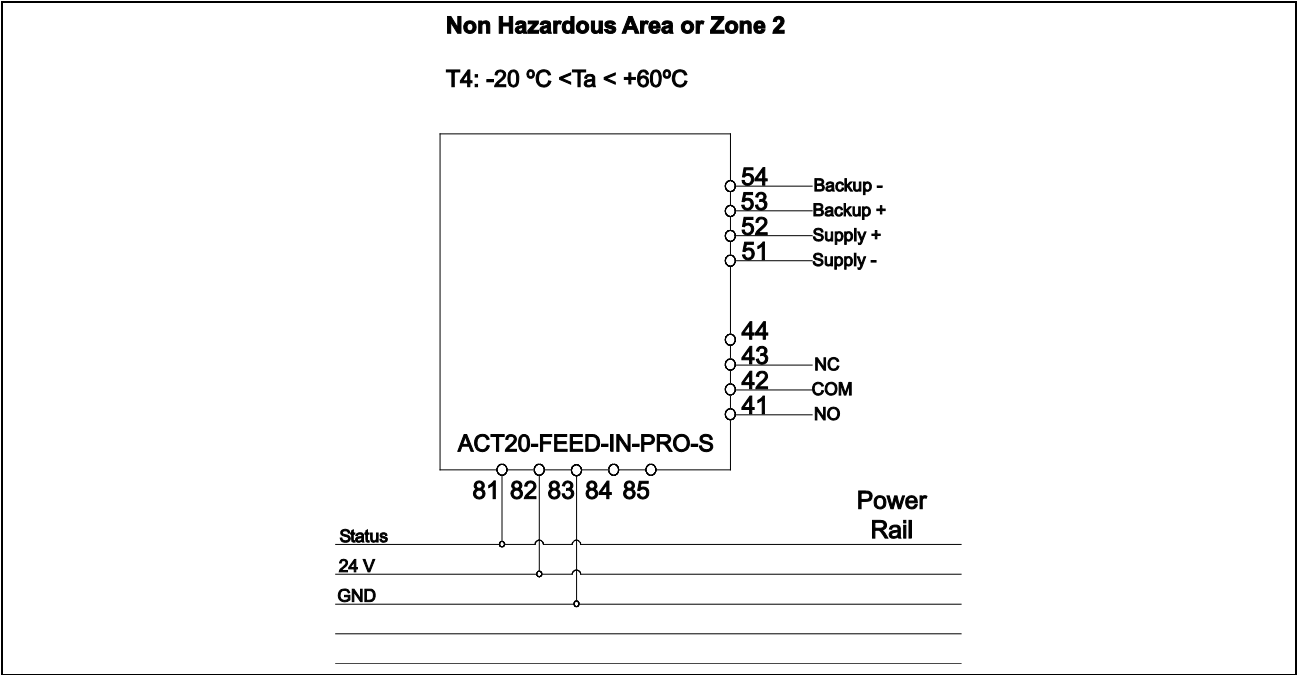


Illustration 7-62: FM Installation Drawing, (452691 Sheet 5-6)

**Terminal (51, 52)**

Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

**Terminal (53, 54)**

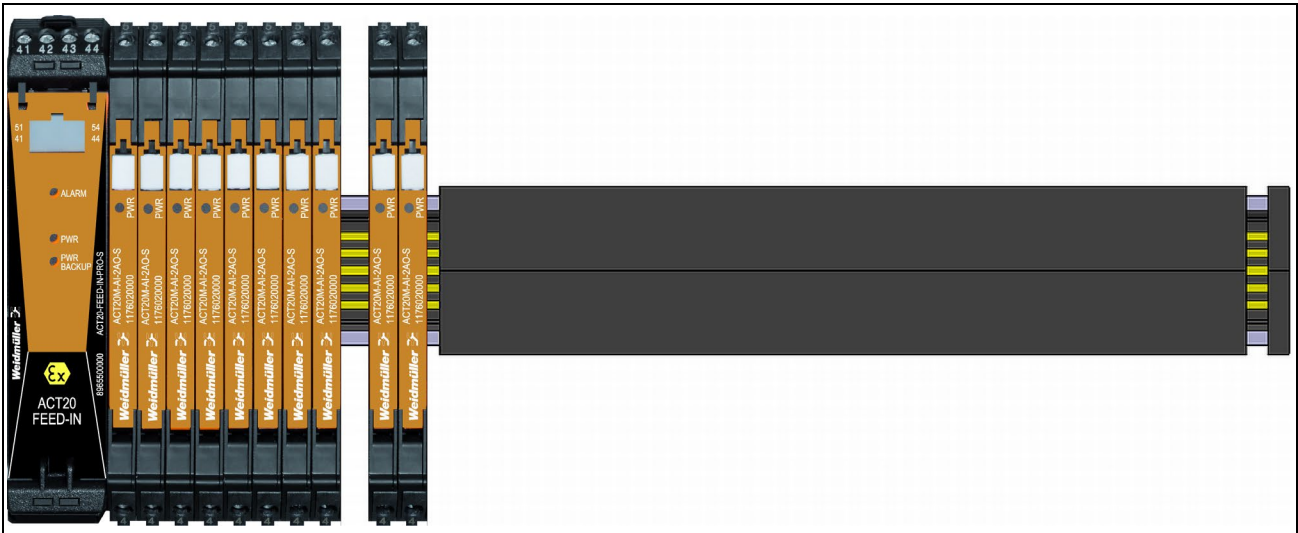
Backup Supply	
Voltage	21.6...26.6 V DC
Current	4 A DC

**Terminal (41, 42, 43)**

Power Rail Status Relay	Non Hazardous Location	Zone 2 Installation
Voltage max.	250 V AC / 30 V DC	32 V AC / 30 V DC
Current max.	2 A AC / 2 A DC	2 A AC / 2 A DC
Power max.	500 VA / 60 W	64 VA / 60 W

### ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.

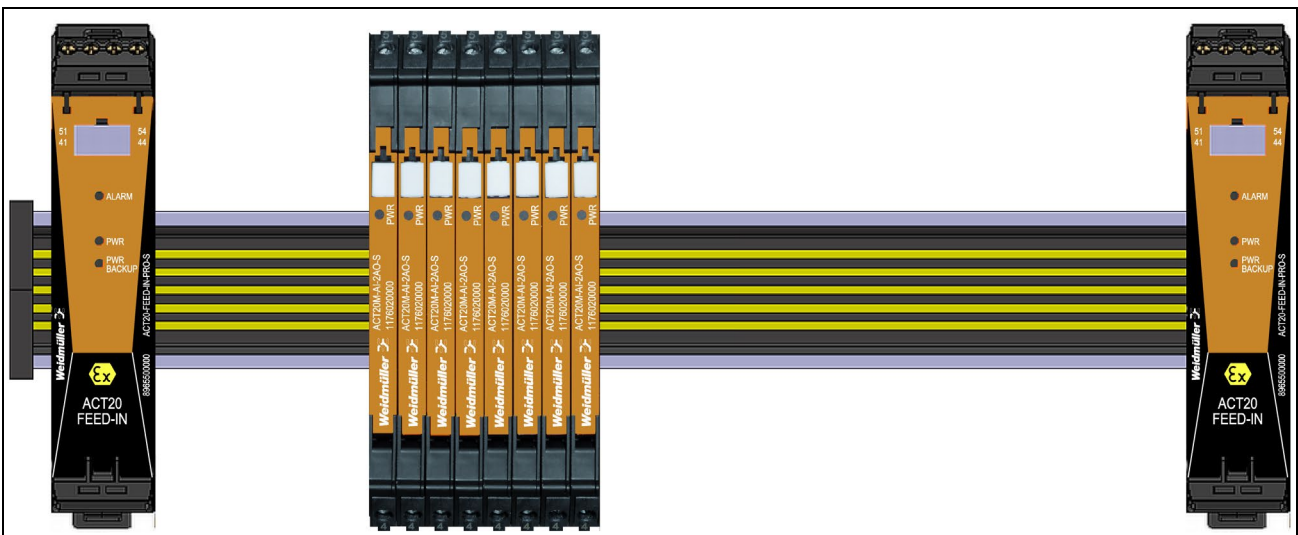


Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Use CH20M BUS-ADP (Bus Cover) to prevent the open mounting rail from being accidentally short circuited.

### Redundant ACT20-FEED-IN-PRO Power unit with backup.

ACT20-FEED-IN-PRO shall only be used with the CH20M-BUS supplied by Weidmüller.



Use CH20M BUS-AP (Bus End Plate) to prevent the mounting rail from being short circuited by the outer enclosure.

Power is supplied to the Power Rail from two ACT20-FEED-IN-PRO modules. Both modules have connections for normal supply and backup supply.





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