SECURITON

ADW 535-1 ATEX

Line Type Heat Detector

Technical Documentation

Imprint

Notice

This documentation TD 003 007 only applies to the product described in chapter 1.

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In this documentation, some words are highlighted in blue colour. This indicates designations and identifications identical in all languages that are not translated.

Users of the documentation are asked to notify the publisher on incorrect or unclear information, errors, false statements etc.

Safety information

Provided the product is deployed by trained and qualified persons in accordance with documentation TD 003 007 and the hazard, safety and general information in this technical description is observed, there is no danger to persons or property under normal conditions and when used properly.
National and state-specific laws, regulations and guidelines must be observed and adhered to in all cases.
Below are the designations, descriptions and symbols of general, danger, and safety information as found in this document.

DANGER

If the “Danger” notice is not properly observed, the product and any other system parts may present a hazard for persons and property, or the product and other system parts may be damaged to the extent that malfunctioning results in danger to persons and property.

- Description of which dangers can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

WARNING

The product may be damaged if the warning information is not heeded.

- Description of which damage can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

NOTICE

The product may malfunction if this notice is not observed.

- Description of the notice and which malfunctions can be expected
- Measures and preventative actions
- Other safety-relevant information

ENVIROMENTAL PROTECTION / RECYCLING

Neither the product nor product components present a hazard to the environment provided they are handled properly.

- Description of parts for which there are environmental issues
- Description of how devices and their parts have to be disposed of in an environmentally-friendly way
- Description of the recycling possibilities

Document history

First issue: **Date 01/06/2017**

Index "a" **Date 01/09/2017**

Main changes to the first issue:

Chapter	New (n) / changed (c) / deleted (d)		What / Reason
• 7	c	Article numbers	Correction

Table of contents

1 General information

The line type heat detector SecuriSens® ADW 535-1 ATEX is an automatic fire detector with differential and maximum temperature evaluation for the intended use in potentially explosive areas in zone 1 (category 2G) according to the directive 2014/34/EU (ATEX).

The control and evaluation electronic systems are enclosed in a specific housing of protection type II2G Ex d e IIC T6; this enables the assembly of the complete evaluation unit directly in the potentially explosive zone 1 (category 2G). The responding characteristics of this line type heat detector have been tested and approved in accordance with EN 54-22, heat detector response class A1I to GI.

1.1 Application

Within the potentially explosive zones, problems may occur in every respect, for instance with respect to the operating procedures, safety precautions or fire protection. In particular, fire detection with automatic fire detection systems in such zones harbours the risk that these themselves become a potential ignition source in the potentially explosive zone. Solutions are mostly complex and expensive.

The line type heat detector SecuriSens® ADW 535-1 ATEX provides new solution options for an early fire detection within potentially explosive zones. The areas of application for this special fire detector are extremely diverse. For instance, it is successfully used in works in the chemical industry, in drum storage facilities, paint shops and painting lines (e.g. in the automobile industry), underground mining as well as in many other application cases.

1.2 Description

The line type heat detector SecuriSens® ADW 535-1 ATEX consists of a complete detection and evaluation unit (pneumatic and electric) for the intended use in explosive areas in zone 1 (category 2G) in accordance with the directive 2014/34/EU (ATEX) as well as the sensing tube (SENSTUBE). In accordance with the existing ambient conditions, the sensing tube can be made of copper, stainless steel or, in areas with aggressive components in the atmosphere, teflon.

NOTICE

Generally, the current version of the data sheet (T140359) as well as the technical documentation (T140358) for the line type heat detector SecuriSens® ADW 535 is to be observed additionally.

The evaluation unit consists of a junction box with the EX tested and approved connecting terminals as well as the device housing with the evaluation electronics. The control and evaluation electronics include a signal processor for the differential pressure and absolute pressure measurement. Furthermore, an automatic testing system for automatic testing is an integral part of the evaluation electronics. For the configuration of the line type heat detector SecuriSens® ADW 535-1 ATEX, an Ethernet interface is located on the basic print.

For the connection of a sensing tube to the device housing, a flame arrester is located inside so that possible ignitions within the housing cannot propagate to the outside. The patented, fully automatic testing system complies with the specific maintenance conditions in potentially explosive zones so that no manual function checks are necessary.

WARNING

The sensing tube in potentially explosive areas must generally be grounded!

2 Function

The working principle of the line type heat detector SecuriSens® ADW 535-1 ATEX is based on the volume expansion of gas due to heating in a pneumatically sealed system and the consequent pressure increase. If the pressure in the sensing tube rises to values as defined by the ADW 535 firmware (time basis, pressure threshold in mbar), the system triggers an alarm. The alarm is indicated visually on the ADW 535 and can be transmitted via a potential-free change-over contact to a superordinate control and indicating equipment.

By means of an intelligent, application-specific connection of the measurement value, the responding characteristics of the detector can be adjusted to the specific ambient conditions.

A pressure measurement and monitoring device creates a desired, accurately defined overpressure in the sensing tube in regular intervals. If the measurement value of the pressure sensor does not correspond to the set point value, e.g. due to a leakage or crushing in the sensing tube, this is transmitted to the control and indicating equipment.

3 Construction

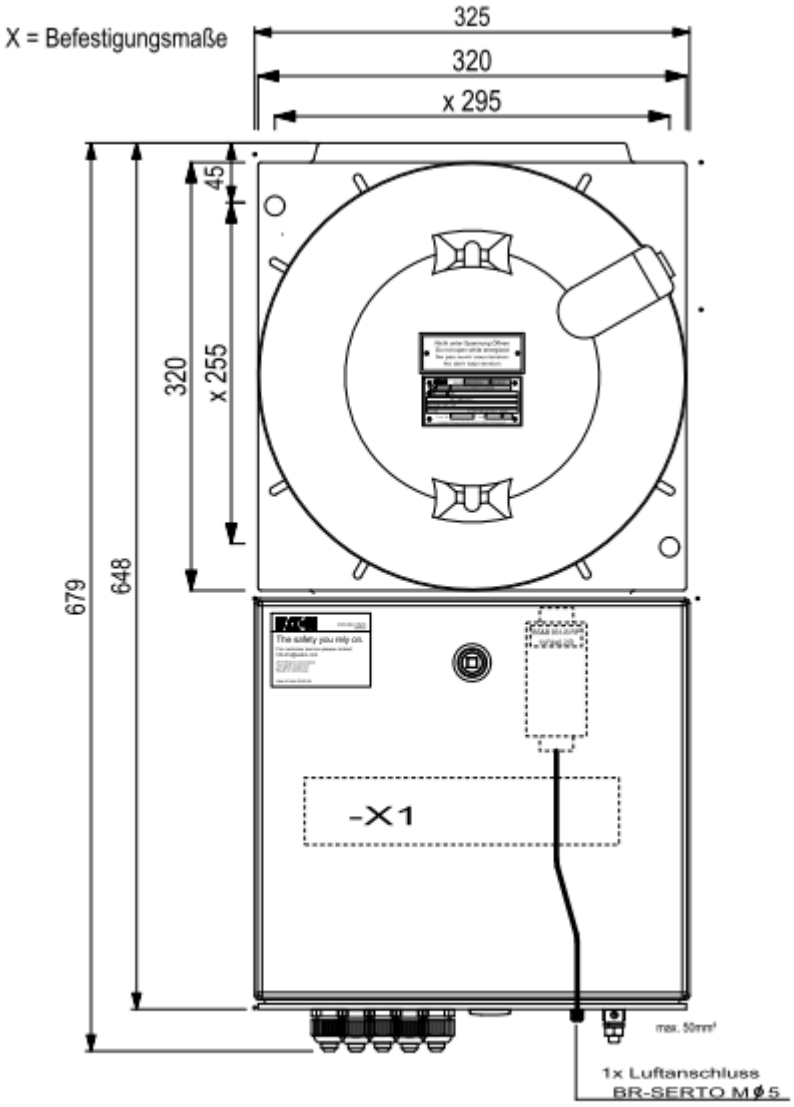


Fig. 1 Front view

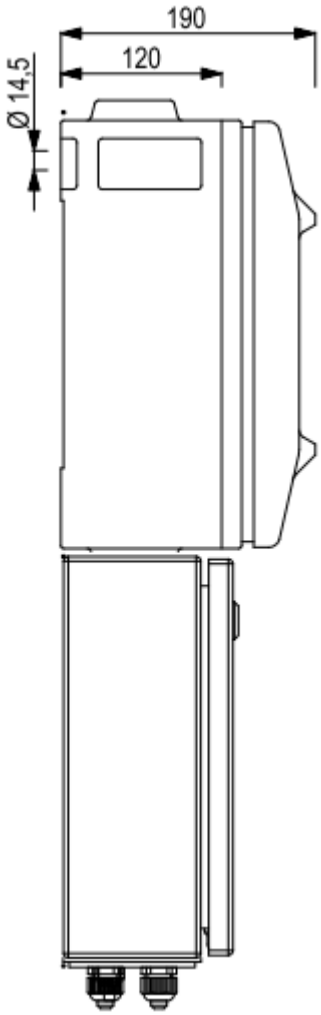


Fig. 2 Side view

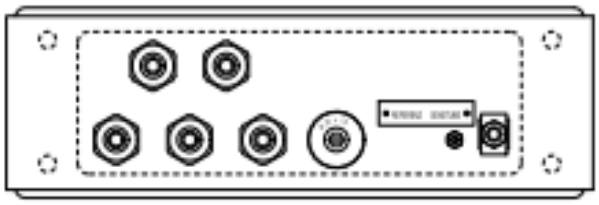


Fig. 3 Bottom view

4 Connection diagram

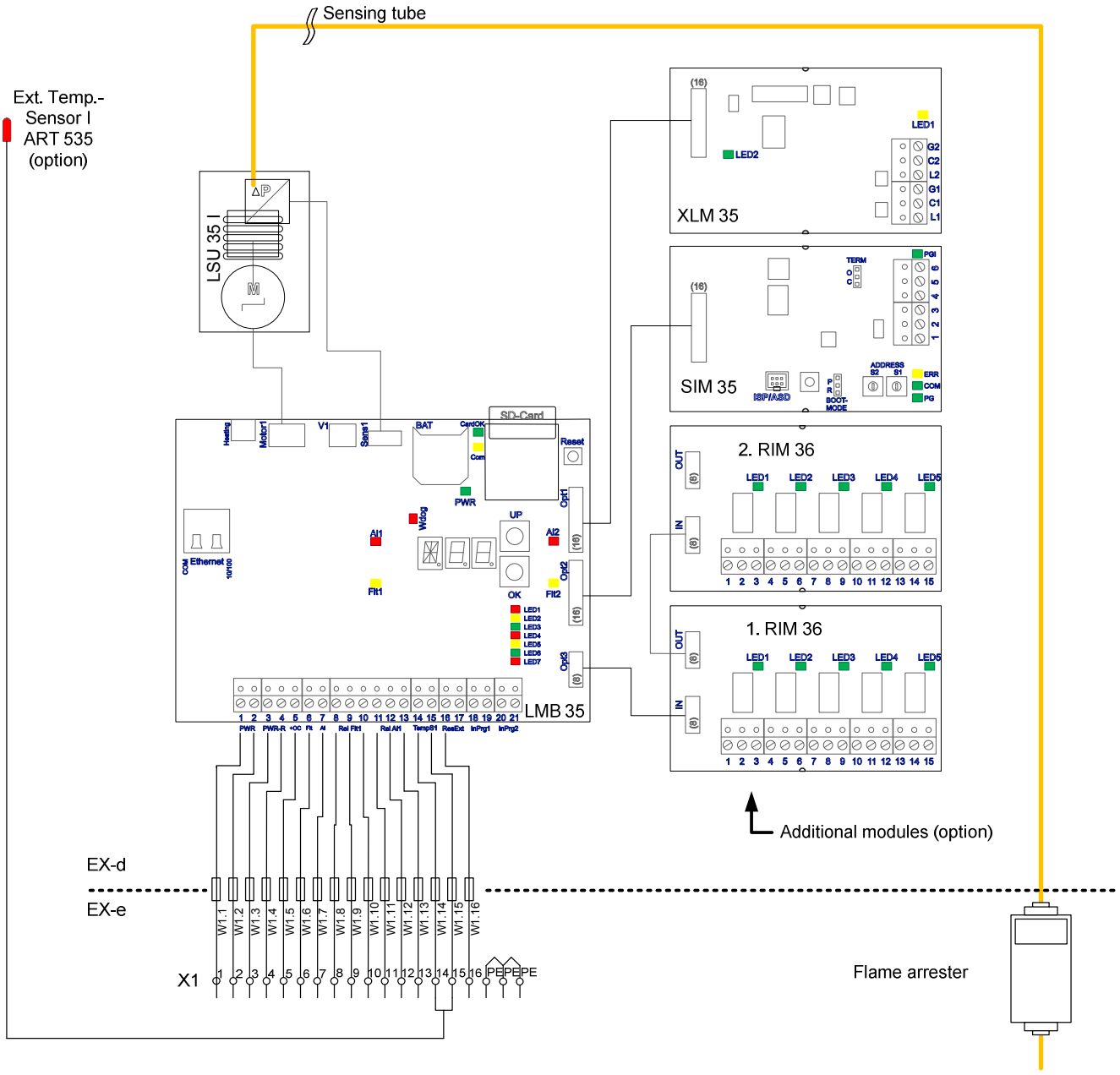
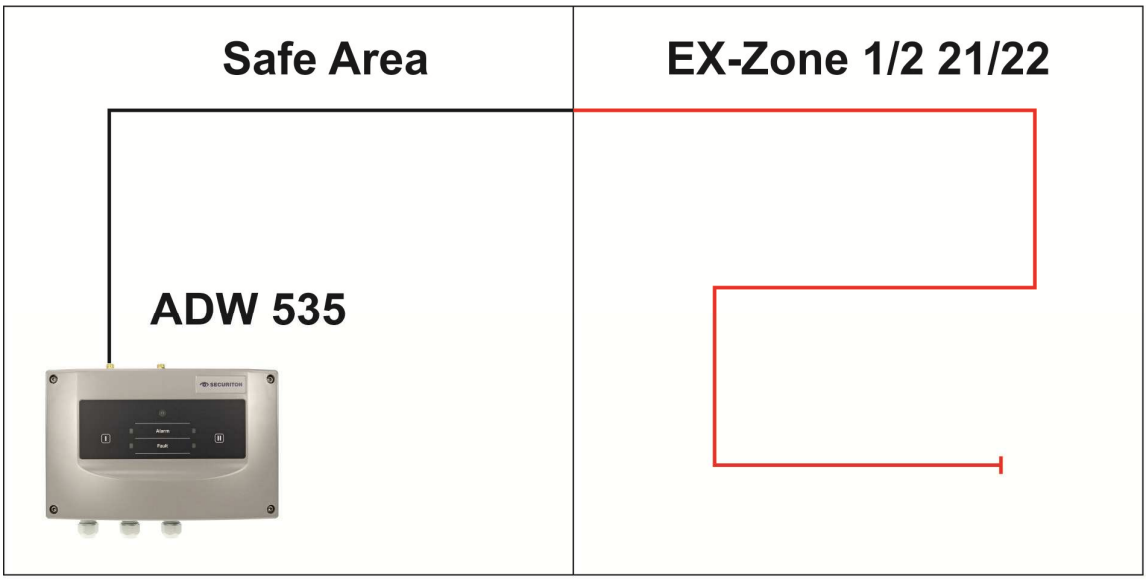


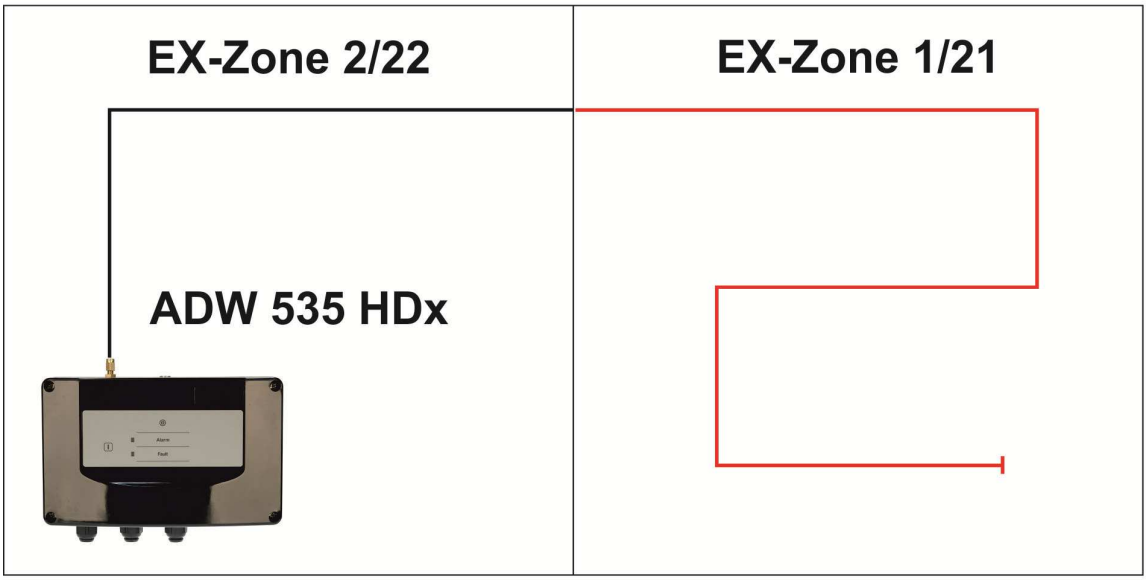
Fig. 4 Connection of the line type heat detector SecuriSens® ADW 535-1 ATEX

Connection diagram

4.1 Terminal configuration in the EX housing for the connection of the line type heat detector

EX-e housing	Motherboard LMB 35
Terminal 1	Supply voltage 9 VDC to 30.0 VDC
Terminal 2	GND
Terminal 3	Reset input +
Terminal 4	Reset input -
Terminal 5	+OC
Terminal 6	Fault OC-Out1
Terminal 7	Alarm OC-Out1
Terminal 8	Relay Fault1 (“NO”)
Terminal 9	Relay Fault1 (“NC”)
Terminal 10	Relay Fault1 (“COM”)
Terminal 11	Relay Alarm1 (“NO”)
Terminal 12	Relay Alarm1 (“NC”)
Terminal 13	Relay Alarm1 (“COM”)
Terminal 14	TempSens 1+ (external temperature sensor connection)
Terminal 15	TempSens 1- (external temperature sensor connection)
Terminal 16	Reset External +
Terminal 17	Reset External -
Terminal 18	InPrg 1+ (day/night control as CIE)





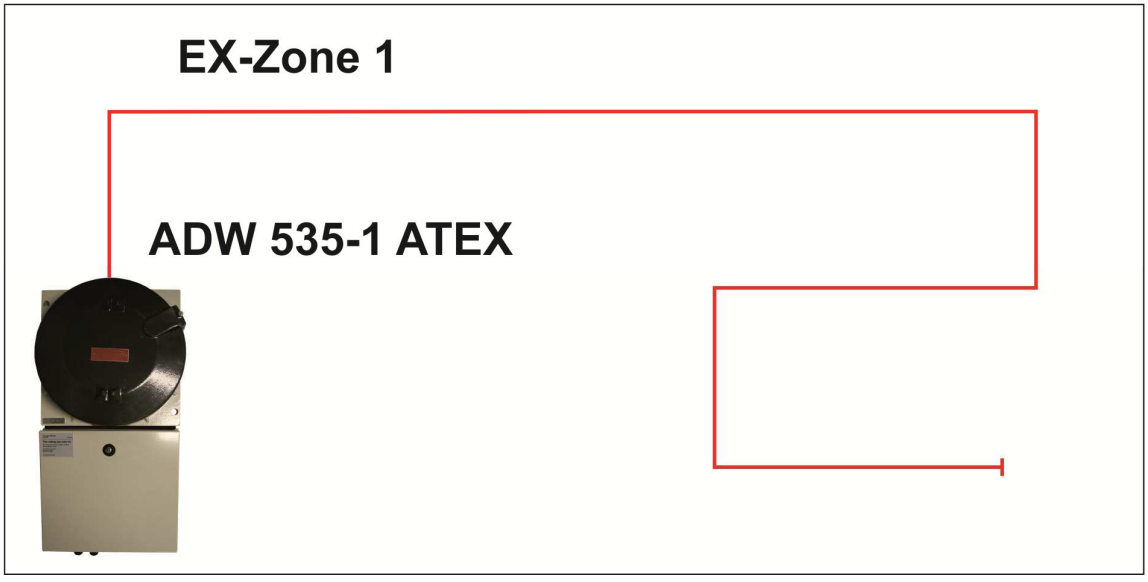


Fig. 5 Application examples for room monitoring

5 Work in the potentially explosive area

WARNING

Before starting any work, it is to be ensured by means of a measurement that NO explosive atmosphere is present in the existing object!

NOTICE

In order to prevent that control and indicating equipment, the activation of transfer units and/or fire extinguishing areas are triggered by the implementation of service work, these are to be blocked and/or deactivated before the start of such work **at all times**.

6 Maintenance and Service

WARNING

Country-specific guidelines and standards apply to servicing. The maintenance and servicing of fire detection and alarm systems may only be carried out by trained personnel!

Additionally, the technical documentation of the respective line type heat detector SecuriSens® ADW 535 is to be taken into consideration.

7 Article numbers

Abbreviated designation		Art. no. SECURITON
Line type heat detector SecuriSens® ADW 535-1	ADW 535-1	11-1000000-01-xx
Line type heat detector SecuriSens® ADW 535-2	ADW 535-2	11-1000000-02-xx
Line type heat detector SecuriSens® ADW 535-1 HDx	ADW 535-1 HDx	11-1000001-01-xx
Line type heat detector SecuriSens® ADW 535-2 HDx	ADW 535-2 HDx	11-1000001-02-xx
Line type heat detector SecuriSens® ADW 535-1 ATEX	ADW 535-1 ATEX	50-0500259-01-xx
External temperature sensor ART 535-30 EX / 400°C	ART 535-30 / 400°C / EX zone 1	50-0500176-03-xx
External temperature sensor ART 535-30 EX / 400°C	ART 535-30 / 400°C / EX zone 21	50-0500176-04-xx
External temperature sensor ART 535-30 EX / 400°C	ART 535-30 / 400°C / EX zone 1	50-0500176-05-xx
Safety barrier EXBAR 535	EXBAR 535	50-0500519-01-xx
Sensing tube, copper, d=5/4	Copper tube, d = 5/4	50-0500201-01-xx
Sensing tube, steel, d=5/4	Stainless steel tube, d = 5/4	50-0500217-01-xx
Sensing tube, teflon, d=6/4	Teflon tube, d=6/4 (ring=100m)	30-6900053-02-xx
Sensing tube, teflon, d=6/4	Teflon tube, d=6/4 (ring=50m)	30-6900053-03-xx
Sensing tube, teflon, d=6/4 - ATEX	Teflon tube, d=6/4 EX (ring=100m)	50-0500140-02-xx
SecuriLine eXtended module XLM 35	XLM 35	11-2200003-01-xx
Relay interface module RIM 36	RIM 36	11-2200005-01-xx
SD memory card ASD/ADW	SD card	11-4000007-01-xx
Serial interface module SIM 35	SIM 35	11-2200000-01-xx
Serial master module SMM 535	SMM 535	11-2200001-01-xx
Motherboard LMB 35	LMB 35	11-1200001-01-xx
Expansion board LEB 35	LEB 35	11-1200002-01-xx
Lithium battery BR 2032	Battery BR 2032	11-4000008-01-xx
Universal module support UMS 35	UMS 35	4301252-0101

8 Technical data

Type				ADW 535	
Labelling according to 2014/34/EU				Ex IIG 2 Ex d e IIC T6	
Supply voltage range			9 to 30 **(UL/FM = 10.6 to 27)**		V-DC
Maximum current consumption		in 12 V DC operation	in 24 V DC operation	typically	
measured at ➔		9 V DC ①	18 V DC ①	24 V DC	
ADW 535-1	Silence/fault	approx. 75	approx. 45	approx. 35	mA
	Alarm	approx. 90	approx. 52	approx. 42	mA
	Testing	approx. 550	approx. 270	approx. 210	mA
additionally with 1 RIM 36		approx. 15	approx. 10	approx. 7	mA
additionally with 2 RIM 36		approx. 30	approx. 20	approx. 14	mA
additionally with XLM 35		approx. 20	approx. 10	approx. 5	mA
additionally with SIM 35		approx. 20	approx. 10	approx. 5	mA
SMM 535 (not as of ADW but as of PC via USB connection)				max. 100	mA
Start-up peak ② (caused by the EMC protection element at the ADW supply inlet)				approx. 5	A
				for max. 1	ms
Sensing tube					
Sensing tube, copper, d=5/4				115	m
Sensing tube, steel, d=5/4				115	m
Sensing tube, teflon, d=6/4 - ATEX				105	m
Sensing tube Ø, Cu and St (external and internal)				Ø 5 / 4	mm
Sensing tube Ø, teflon (external / internal)				Ø 6 / 4	mm
Response range (observe FW version)				EN 54-22, Class A1l - Gl	
Degree of protection in accordance with IEC 529 / EN 60529 (1991)				65	IP
Environmental conditions in accordance with IEC 721-3-3 / EN 60721-3-3 (1995)				3K5 / 3Z1	Class
Expanded environmental conditions:					
• Evaluation unit temperature range				–20 – +40	°C
• Sensing tube temperature range				–40 – +180 ③	°C
• Maximum admissible storage temperature of the evaluation unit (excluding condensation)				–30 – +70	°C
• Ambient conditions, humidity, evaluation unit (permanent, IP 65)				95	% rel/H
• Ambient conditions, humidity, sensing tube (permanent)				100	% rel/H
Maximum load bearing capacity of relay contact				50 (**ATEX max. 30**)	V-DC
				1 (**ATEX max. 0.1**)	A
				30 (**ATEX max. 20**)	W
Maximum load bearing capacity for each OC output (voltage stability 30 V-DC)				100	mA
Cable entry for cable Ø				Ø 5 – 12 (M20) / Ø 9 – 18 (M25)	mm
Housing material				Steel sheet	
Approvals				EN 54-22	
Dimensions ADW 535-1 ATEX (W x H x D)				679 x 325 x 190	mm
Weight ADW 535-1 ATEX				27000	g

Notice

① Current consumption at maximum admissible voltage drop in the electrical installation (decisive value for calculation of the cable cross-section).

② May lead to immediate activation of the protective circuit of power supplies with overload protection (mainly at devices without emergency power supply and an output current of < 1.5 A).

③ After consultation of the manufacturer, also lower or higher temperature ranges are possible. When using the sensing tube as of 100°C, fastening clips made of metal are to be used.

9 List of figures