

ADW 535HDx (ATEX)

Line type heat detector

Beginning with production version 301018 and FW version 01.03.xx

The ADW 535Dx is an integrating line type heat detector that consists of the evaluation unit and one or two sensing tubes. The sensing tube is made of copper (Cu), stainless steel (St) or Teflon (PTFE).

The ADW 535HDx is suitable for operational use in **explosion hazardous areas of zone 2 and 22** in accordance with VDE 0165 and IEC 60079-10.



Fig. 1 ADW 535-2HDx



II 3G Ex nA nC IIC T4 Gc
II 3D Ex tc IIIC T135°C Dc

General



Before handling, mounting and commissioning the ADW 535HDx in **explosion hazardous areas**, the following safety information and descriptions in **Operating instructions T 140 459** must be strictly observed.

Target group:

Electricians in accordance with [BetrSichV](#), IEC 60079-17 and trained persons.

The national accident prevention regulations and safety regulations as well as the following safety information designated with the following symbol must be observed.



- This operating material (evaluation unit) is not permitted to be used in potentially explosive atmospheres of zones 0, 20, 1 and 21.
- Observe the technical data specified on this operating material.
- Conversions and modifications to this operating material are not permitted.
- This operating material must be operated in accordance with the intended purpose and only when in an undamaged and trouble-free state.
- Only original parts from the manufacturer as replacement.
- Repairs may be performed only by the manufacturer

Use

The ADW 535HDx is a line type heat detector for detection of fires. Temperature increases and absolute temperature are detected and evaluated.

Standards conformity

This operating material complies with the requirements of EN 60079-0, EN 60079-15 and EC Directive "Equipment and protective systems intended for use in potentially explosive atmospheres" (2014/34/EU) and "Electromagnetic compatibility" (2014/30/EU). It was developed, manufactured and tested based on the latest technical standards and in compliance with ISO 9001.

The evaluation unit is suitable for use in potentially explosive atmospheres of **zone 2** and **zone 22** in compliance with VDE 0165 and IEC 60079-10.

The names and specifications of the **EN 54-22** product standard contained in this data sheet relate to the draft edition **prEN 54-22**.

The response behaviour of the ADW 535HDx is tested in compliance with:

- **EN 54-22** → classes **A11** to **G1**;
- **UL 521 – ULC-S530-M91** → acc. to EN 54-22 cl. **A11** to **G1**;
- **FM 3210 / NFPA 72** = classes **Ordinary**, **Intermediate**, **High – Spacings** 15 ft / 20 ft / 25 ft / 30 ft / 40 ft;
- **RVS** → in acc. with the requirements for road tunnels (AT);
- **KFI** → in acc. with the requirements for road tunnels (KR).

Installation / Mounting



The safety regulations (according to [BetrSichV](#), IEC 60079-17) and the device safety regulations as well as the generally recognised rules and technology applicable to installing and operating electrical operating materials are to be observed.

- The evaluation unit and the sensing tube must be connected to equipotential bonding (earthing).
- Before the ADW 535HDx evaluation unit is opened, it must be ensured that it is de-energized and that appropriate protective measures are used.
- Lines with a diameter of 7–17 mm are to be conveyed through the cable gland.
- To ensure the required minimum protection type, the cable gland(s) must be firmly tightened.
- Unused cable glands must be closed with the original sealing.
- Before the housing cover is mounted, the state and position of the seal must be checked.
- The retaining screws of the housing cover must be firmly and uniformly tightened.
- Transport and storage of this operating material are permitted only when the original packaging is used.

Commissioning



Prior to commissioning this operating material, the tests named in the individual national provisions must be performed.

In addition, prior to commissioning it is necessary to check that the operating material is correctly installed and functions properly as specified in these operating instructions and other applicable regulations.

This operating material may be operated only when closed.

Maintenance



The applicable regulations of [BetrSichV](#) and VDE 0165 or IEC 60079-14 for servicing, maintenance and testing must be observed.

Because of the danger of electrostatic charges, only a damp cloth or sponge may be used to clean this operating material.

Operating material for servicing and maintenance must be suitable for the explosion hazardous environment.

Description

The working principle is based on the volume expansion of gas due to heating in a pneumatically sealed system and the consequential pressure increase. If the pressure in the sensing tube rises to values as defined by the ADW 535HDx firmware, the system triggers an alarm.

The pneumatically sealed system is composed of the sensing tube that is locally installed in the area to be monitored. It is connected to the evaluation unit in which the pneumatic line is wired to the LSU 35 supervising unit. There is regular ambient air in the entire pneumatic volume.

The ADW 535HDx with two sensing tubes has two completely independent pneumatic circuits; all control circuitry and measured value loggings are individually designed for each sensing tube.

The ADW 535HDx is available in two versions:

- ADW 535-1HDx for 1 sensing tube, 2 relays/OCs
- ADW 535-2HDx for 2 sensing tubes, 4 relays/OCs

The ADW 535HDx has four slots for expansion modules. The following modules can be fitted:

- XLM 35 SecuriLine eXtended Module (**not UL/ULC tested**);
- RIM 36 Relay interface Module with 5 relays (2 units)
- SIM 35 Serial Interface Module



When using the ADW 535HDx in potentially explosive atmospheres, **only** the **RIM 36**, **XLM 35** and **SIM 35** expansion modules may be installed in the ADW. The installation of other modules such as the **BX-OI3** or **line modules from external FACP**s is **not permitted**. Such modules may only be installed in separate Ex-approved map cases and are the personal responsibility of the supplier or user of the modules

The ADW 535HDx can be connected to a superordinate FACP by means of potential-free change-over contacts.


With the installation of an **XLM 35**, the ADW 535HDx can be ideally connected via the addressable loop to the SecuriFire and Integral fire alarm systems.

The **RIM 36** is available as a further installation option. This module makes the individual alarms and the pre-signals "Diff" and "Max" available as relay contacts. The relays are also freely programmable via the "ADW Config" configuration software.

Up to 250 ADWs can be networked with the **SIM 35** and can also be visualised and operated on a PC using "ADW Config".

The ADW has an SD memory card to log operating data.

Technical data

Type	ADW 535HDx			
Identification according to 2014/34/EU	 II 3G Ex nA nC IIC T4 Gc II 3D Ex tc IIIC T135°C Dc			
Supply voltage range	9 to 30 (UL/FM = 10.6 to 27)			VDC
Maximum power consumption, measured at →	12 VDC operation	24 VDC operation	typical	
	9 VDC ①	18 VDC ①	24 VDC	
ADW 535-1HDx	Quiescent/fault	approx. 75	approx. 45	approx. 35 mA
	Alarm I	approx. 90	approx. 52	approx. 42 mA
	Test	approx. 660	approx. 270	approx. 210 mA
	Heating below –20°C	approx. 775	approx. 360	approx. 275 mA
ADW 535-2HDx	Quiescent/fault	approx. 95	approx. 53	approx. 43 mA
	Alarm I + II	approx. 125	approx. 71	approx. 57 mA
	Test	approx. 660	approx. 290	approx. 230 mA
	Heating below –20°C	approx. 775	approx. 375	approx. 290 mA
	additionally with 1x RIM 36 (all relays triggered)	approx. 48	approx. 23	approx. 15 mA
	additionally with 2x RIM 36 (all relays triggered)	approx. 96	approx. 46	approx. 30 mA
	additionally XLM 35 (not UL/ULC tested)	approx. 20	approx. 10	approx. 5 mA
	additionally with SIM 35	approx. 20	approx. 10	approx. 5 mA
	SMM 535 (not from ADW but rather from PC via USB connection)			max. 100 mA
Switch-on current peak ② (caused by EMC protection elements on the ADW power input)			approx. 5	A
			for max. 1	ms
Sensing tube length	see T 140 458, Sec. 4.5			
Sensing tube diameter, copper (Cu), steel (VA) (outer / inner)	Ø 5 / 4 mm			
Sensing tube diameter, PTFE (outer / inner)	Ø 6 / 4 mm			
Response range	EN 54-22, classes A1I – GI / UL/ULC, acc. to cl. A1I – GI NFPA 72, classes Ordinary , Intermediate , High / RVS / KFI			
Protection type compliant with IEC 60529 / EN 60529	66			IP
Ambient conditions compliant with IEC 60721-3-3 / EN 60721-3-3	3K5 / 3Z1			class
Environmental group compliant with EN 54-22	III			group
Extended ambient conditions:				
• Temperature range evaluation unit			–30 – +70 (ATEX –20 – +70)	°C
• Sensing tube temperature range			–40 – +300 (Teflon = –40 – +200) ③	°C
• Max. permissible storage temperature for evaluation unit (without condensation)			–30 – +70	°C
• Humidity ambient condition of evaluation unit (continuous, IP65)			95	% rel. humidity
• Humidity ambient condition of sensing tube (continuous)			100	% rel. humidity
Max. loading capacity, relay contact		50 (UL / ATEX max. 30)		VDC
		1 (ATEX max. 0.1)		A
		30 (ATEX max. 20)		W
Max. loading capacity per OC output (dielectric strength 30 VDC)		100		mA
Plug-in terminals		2.5		mm ²
Cable entry for cable Ø		Ø 7 – 13 (M20) / Ø 11 – 17 (M25)		mm
Protection sleeve ART 535-x		stainless steel V4A 1.4571		
Housing	material	glass-fibre reinforced, duroplastic polyester, UL 94-V0		
	colour	graphite black 9011 / platinum grey 7036		
Approvals	EN 54-22 / FM 3210 / UL 521 / ULC-S530-M91 / RVS / KFI			
Dimensions ADW 535-1HDx / -2HDx (W x H x D)	260 x 203 x 134			mm
Weight	ADW 535-1HDx		3.050	g
	ADW 535-2HDx		3.420	g



- ① Power consumption at maximum permitted voltage drop in the electrical installation (decisive value for calculating the conductor cross-section).
- ② May cause the protective circuit to trigger immediately in the case of power supplies with overload protective circuits (primarily in devices with no emergency power supply and output current of < 1.5 A).
- ③ Higher temperature ranges are also possible based on sensing tube material after consultation with the manufacturer. When using the sensing tube at 100 °C and above, use metal pipe clamps.

Dimensioned drawing ADW 535-2HDx (-1HDx)

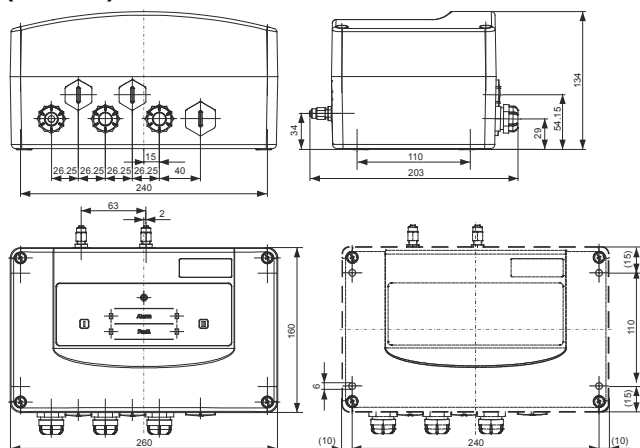


Fig. 2 Dimensioned drawing, drilling plan for evaluation unit

Planning

Thanks to its excellent properties under severe ambient conditions, the ADW 535HDx is used wherever problems are to be expected owing to latent disturbance variables during operation such that optimal protection can no longer be guaranteed with conventional point detectors.

Application areas



The following list of application areas may also be regulated by country-specific regulations, directives or laws:

- Ex zones 2 and 22 acc. to VDE 0165 and IEC 60079-10;
- Paint spray and paint shops, tank storage, chemical industry, underground mining (see also Technical description, T 140 458, Sec. 4.9);
- Road tunnels, railway and underground railway tunnels in extreme ambient conditions;
- Loading platforms, car park halls, car decks on ships, in extreme environmental conditions.

Requirements for installing ADW 535HDx systems



Target group: Experienced electricians in accordance with [BetrSichV](#), IEC 60079-17 and trained persons.

Regulations: The country-specific directives and regulations for planning and installing automatic fire detection and fire alarm systems apply when planning. Also, the information and specifications in “**Technical description ADW 535HDx**” must be observed. This includes among others:

- **General** Section 1
- **Planning** Section 4
- **Mounting** Section 5
- **Installation** Section 6
- **Commissioning** Section 7
- **Operation** Section 8

For the construction, operation and maintenance of the system, the regulations of the relevant country or region where the system is constructed apply.

Material and products: Only the following materials supplied by the manufacturer may be used for setting up the system:

- Evaluation unit, sensing tube, screw-junction pieces, pipe clamps.
- Materials from other sources may be used only if the manufacturer's written consent has been obtained.

Safety information: This operating material is for reporting temperatures and temperature increases. This operating material must be set up and maintained to ensure that no electrostatic charges occur.

Installation: The [BetrSichV](#), IEC 60079-17 and device safety regulations as well as the generally recognised rules of technology and these operating instructions are to be observed when setting up and operating.

Maintenance: The applicable regulations of [BetrSichV](#) and VDE 0165 or IEC 60079-14 for repairs, maintenance and testing must be observed. This operating material is maintenance free.

Connection

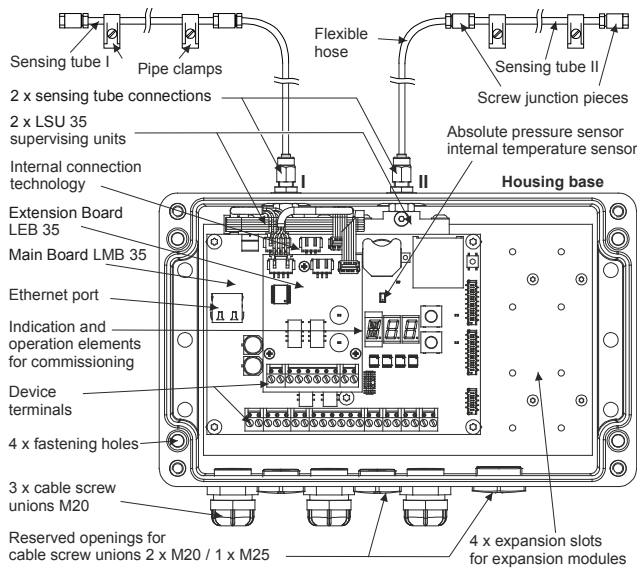


Fig. 3 View inside the ADW 535-2HDx

Devices connection on the LMB 35 main board

The electrical connection is by means of plug-in terminals.

Terminal	Signal	
1	PWR +	Main power supply line
2	PWR –	9 – 30 VDC (UL/FM = 10.6 – 27)
3	PWR +	Redundant supply line
4	PWR –	9 – 30 VDC (UL/FM = 10.6 – 27)
5	+OC	+ Supply (for OC consumers)
6	Flt OC Out1	Output Fault I, OC
7	Al OC Out1	Output Alarm I, OC
8	Rel Flt1 ("NO")	Fault I
9	Rel Flt1 ("NO")	Contact (terminals 10/8) closed in idle state
10	Rel Flt1 "COM"	
11	Rel Al1 "NO"	
12	Rel Al1 "NC"	Alarm I
13	Rel Al1 "COM"	
14	TempSens1 +	External temperature sensor I
15	TempSens1 –	
16	ResExt +	Reset external input
17	ResExt –	(opto-isolator input)
18	InPrg1 +	Day/night control from FACP
19	InPrg1 –	(opto-isolator input)
20	InPrg2 +	Reserve, no function
21	InPrg2 –	(opto-isolator input)

Device connection on the LEB 35 extension board

Sensing tube II connection to ADW 535-2HDx.

Terminal	Signal	
22	Flt OC Out2	Output Fault II, OC
23	Al OC Out2	Output Alarm II, OC
24	Rel Flt2 ("NO")	Fault II
25	Rel Flt2 ("NC")	Contact (Cl. 26/24) closed in idle state
26	Rel Flt2 "COM"	
27	Rel Al2 "NO"	
28	Rel Al2 "NC"	Alarm II
29	Rel Al2 "COM"	
30	TempSens2 +	External temperature sensor II
31	TempSens2 –	

Terminal assignment XLM 35, RIM 36, SIM 35

The terminal assignments of the XLM 35, RIM 36 and SIM 35 can be found in Data Sheets T 140 088 (XLM 35), T 140 364 (RIM 36) and T 140 011 (SIM 35).

External temperature sensor ART 535

The purpose of external temperature sensor ART 535 is to compensate (adjust) the maximum response behaviour and must be used for:

- Applications compliant with EN 54-22, Class CI to GI;
- always (for all response grades or applications), as soon as the application temperature in the monitored area deviates more than 20°C from the temperature of the evaluation unit.



The ART 535 is to be introduced to the monitored area and positioned so that it is optimally exposed to the local ambient temperatures (see also "Technical description ADW 535HDx T 140 458", Sec. 6.5.6 and 11.1).

Connection principle



Examples and information about the connection principle are found in Technical description ADW 535HDx, T 140 458, Sec. 6.


Line monitoring elements such as alarm resistances, alarm transmitters, termination resistances and diodes can be used in the ADW 535HDx based on the line evaluation. However, the ATEX conformity must be met, possibly by means of a specific certification and proof of conformity.

Operating instructions

Displays

The following displays are included on the evaluation unit (may be doubled on ADW 535-2HDx I and II):


①	Alarm	Fault	Function / state
green	red	yellow	
			System off (no voltage)
On		½ s T	System inactive / Sensing tube deactivated
On			Quiescent state
On		1 s T	Start phase of the system (approx. 60 s)
On		1 s T	Sensing tube fault, test running ① / ②
On		On	Sensing tube fault, fault triggered
On		On	Gen. fault triggered (internal faults)
On	1 s T		Pre-signal (Diff or Max)
On	On		Alarm (Diff or Max)

-  ① No fault triggered (only if negative test procedure → LED "Fault" continuous display).
 ② Does not apply to cyclical testing.
 T = flashing display; ½ s cycle / 1 s cycle

Programming

The ADW 535HDx has several switch positions that are configured with permanently assigned parameters:

- Response behaviour acc. to EN 54-22, classes A11 to G1,
→ C > A1 to G → ①;
- Response behaviour acc. to NFPA 72, classes Ordinary, Intermediate, High,
→ C > No, NI, NH (every 30 ft Spacing);
- Response behaviour for road tunnels according to RVS (AT),
→ C > T1;
- Response behaviour for road tunnels according to KFI (KR),
→ C > T2 (T3 for laboratory tests "Class A");
- Normative systems limits (EN 54-22) concerning sensing tube monitoring,
→ C > W00 to W03;
- Non-normative system limits concerning sensing tube monitoring,
→ C > W04 to W09;
- Parameterised positions X01 to X03 for saving settings after using "ADW HeatCalc" and/or changes in the device configuration via "ADW Config"

-  ① Positions A1– and A2– are oriented to classes A11 and A21 for space surveillance acc. to EN 54-22, but without detection properties for test fire TF6 slow. **Caution:** These switch positions may **not be used for the comprehensive requirements of EN 54-22** (only after consultation with the manufacturer).

Switch positions on the LMB 35 main board

Pos.	Area / Display	Purpose
C	A1 to T3 ↳ L01 / L02 ↳ 015 to 115 (or 200) (per tube) ↳ W00 to W09	Normative system limits Acc. to "Programming" ↳ Sensing tube length I / II ↳ Sensing tube length in m Sensing tube monitoring
E	E01 to E99 ↳ G00 to G99	Event mem.; E01 – E99 ↳ Event group G00 – G99
F	V00. to 99 (3 blocks)	Read out firmware version
I	IA1 / IA2 IF1 / IF2 IP1 / IP2 IC1 / IC2	Triggering; test alarm (IA.) Test fault (IF.) Test pre-signal (IP.) Test check IC.)
N	Polling (RE) Setting (SE) ↳ FSE	IP configuration; Polling and factory setting
o	o00	Log off expansion modules; (optional modules, all)
P	UP1 / UP2 UL1 / UL2 TP1 / TP2 MP1 / MP2	Pressure values output; "Initial reset pressure" (UP.) "Initial reset length" (UL.) "Test pressure" TP.) "Absolute pressure" MP.)
R	R00	Perform state reset
S	Ch1 / Ch2 ↳ on / off	Sensor activation; sensing tube I / II (Ch1 / Ch2)
T	Y10 to Y99 / M01 to M12 d01 to d31 / H00 to H23 M00 to M59 / S00 to S59	Date and time; Poll (RE), Setting (SE)
U	U01 / U02	Start Initial reset (per tube)
X	X01 to X03	Can be parameterised (with ADW Config)



The table lists only the available switch positions (information about the input procedure, see Technical description T 140 458, Sec. 8.3).

General information about system limits

When using an ADW 535HDx line type heat detector, the system limits below apply and ensure compliance to EN 54-22 / NFPA 72 / RVS / KFI requirements.

Length of the sensing tube per evaluation channel ① (Fig. 4 "B")		
Application	Copper / Stainless steel	Teflon ①
EN 54-22, A1I to GI	10 – 115 m	10 – 105 m ①
NFPA 72, NO / NI / NH	10 – 200 m	10 – 150 m ①
RVS, tunnel	10 – 200 m	10 – 150 m ①
KFI, tunnel	10 – 115 m	10 – 105 m ①
outside standard ①	10 – 200 m ①	10 – 150 m ①

① For applications under less than 15 m, outside a specified standard, and with a Teflon sensing tube the "ADW HeatCalc" calculation software must always be used. The calculated trigger thresholds are written with the "ADW Config" calculation software to switch positions **X01** to **X03**.

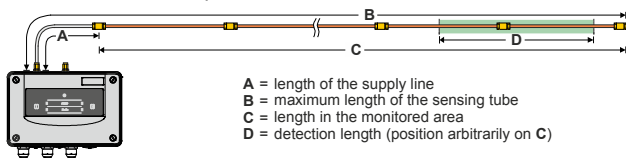


Fig. 4 Sensing tube lengths definition

System limits without "ADW HeatCalc" calculation

The system limits apply to planning without the "ADW HeatCalc" calculation software. There are two areas, with the following meaning:

- **Normative system limits** acc. to "Programming", positions **C > A1** to **T3**
- **Non-normative system limits** concerning sensing tube monitoring compliant with EN 54-22, positions **W04** to **W09**.

Normative system limits

Positions **C > A1** to **T3** have configured values which are necessary for alarm response sensitivity and sensing tube monitoring compliant with the relevant standards or guidelines (see also Sec. "Programming").

Non-normative system limits

Settings **W04** to **W09** contain **non-normative system limits** concerning **sensing tube monitoring compliant with EN 54-22**. The alarm response sensitivity compliant with EN 54-22 is not influenced but rather corresponds to the settings of the additionally set **EasyConfig** switch positions **C > A1** to **G**.

For more information about switch positions **W00** to **W09** with regard to sensing tube monitoring, please refer to Technical Description T 140 458, Sec. 4.5.1.2. The settings always apply to **both** sensing tubes **together**.

Operating instructions

System limit table for planning without “ADW HeatCalc” calculation

Switch position: C > A1 to T3 ① / ② / ③ Standard / guideline	Switch position (additional), W04 to W09 Not standards compliant for EN 54-22 ④	Application ⑤	Diff alarm			Max alarm threshold ⑥ (mbar)	AI delay (s)	Length of the supply line (ADW to monit. area) ⑦ (Fig. 4 „A“)	Max. length of sensing tube (ADW to tube end) ③ / ⑥ (Fig. 4 „B“)	
			Diff alarm threshold ⑥ (mbar/min)	Alarm verification Delta pressure ⑥ (mbar)	Time (s)					
EN 54-22	A1	C > W01 – W03	R	2.3	6.1	600	210.9	4	5 m	115 m
	A2	C > W01 – W03	R	2.3	8.2	600	220.4	4	5 m	115 m
	A1– ①	C > W01 – W03	R	5.1	7.9	600	210.9	4	5 m	115 m
	A2– ①	C > W01 – W03	R	5.1	10.6	600	220.4	4	5 m	115 m
	b	C > W01 – W03	E	2.3	8.2	600	273.2	4	5 m	115 m
	C ②	C > W01 – W03	E	2.3	8.2	600	326.8	4	5 m	115 m
	d ②	C > W01 – W03	E	2.3	8.2	600	380.5	4	5 m	115 m
	E ②	C > W01 – W03	E	2.3	8.2	600	433.2	4	5 m	115 m
NFPA 72	No	C > W01 – W09	N	3.9	2.6	300	267.6	4	5 m	200 m
	NI	C > W01 – W09	N	5.4	3.2	300	362.1	4	5 m	200 m
	NH	C > W01 – W09	N	6.8	3.9	300	510.5	4	5 m	200 m
RVS KFI KFI (Lab)	T1	C > W01 – W09	T	3.0	2.0	600	214.7	4	5 m	200 m
	T2	C > W01 – W09	T	8.7	1.7	600	210.9	4	5 m	115 m
	T3	C > W01 – W09	--	3.0	1.5	600	215.8	3	0 m	100 m

Notice about the table:

- ① Switch positions **A1–** and **A2–** are oriented to Classes A1I and A2I for space surveillance compliant with EN 54-22 but have no detection properties for test fire TF6 **slow**. If slowly developing fires are **not** to be taken into consideration in an application. These switch positions can be used **after consulting with the manufacturer**. **Caution:** These switch positions may **not be used for the comprehensive requirements of EN 54-22**.
- ② For response-class-related use of the ADW 535HDx, the information in the Sec. “Programming” must be observed. In classes **CI** to **GI** the ART 535 external temperature sensor must always be used for temperature compensation.
- ③ Programming sensing tube lengths **greater than 115 m** is possible only in switch positions **No, NI, NH** and **T1**.
- ④ Switch positions **W04** to **W09** may be used only after consulting with the manufacturer. The configured values they contain concerning sensing tube monitoring are **not tested in accordance with EN**.
- ⑤ **R = space surveillance** = acc. to EN 54-22 → 10 m heat impingement.
E = equipment monitoring = acc. to EN 54-22 → heat impingement of the **entire length** in the monitored area (crucial only for the Max alarm).
N = space surveillance = acc. to NFPA 72 → 30 ft (9.1 m) heat impingement.
T = tunnel surveillance = acc. to RVS/KFI → heat impingement of a partial length, dependent on the airflow in the object.
- ⑥ The values for **Diff alarm**, **Max alarm** and **delta pressure** specified in the table above are valid only for a version of the sensing tube that is 115 m or 200 m in length. With the programming of the project-specific length of the sensing tube in the setting procedure (**EasyConfig** submenu **L01 / L02 > 015 to 115** or to **200** in the concerned switch position **C**) the values are converted accordingly and configured in the ADW.
- ⑦ The length of the **supply line** must be observed as specified above. Deviations of ± 10% are permitted.



When operating the **Teflon sensing tube**, the “ADW HeatCalc” software must be used to determine alarm thresholds.

Configuration options, Table A

The following criteria can be set for each sensing tube. Also, the criteria for day/night control can be separately set. Configuration changes are saved with "ASD Config" on one of the freely programmable switch positions **X01** to **X03** after a change.

Sector	Default setting	Area	Resolution / levels	Saving after change
Sensing tube parameters (length / outer diameter)				
• Feed line "A" (see also Fig. 4)	5 m	0 – 20 m	1 m	X01 – X03
• Supply line, inner diameter	3 mm	3 – 4 mm	1 mm	X01 – X03
• ① Monitored area "C" (see also Fig. 4)	110 m	10 (> "A") – 200 m	1 m	X01 – X03
• Monitored area, inner diameter	4 mm	---	---	X01 – X03
Alarm (EN 54-22 / NFPA 72 / RVS / KFI)				
• ① Diff alarm status (On/Off)	On	On/Off ②		X01 – X03
• ① Diff alarm threshold (dependent on sensing tube length and the response grade acc. to EN 54-22 / NFPA 72 / RVS / KFI)	A1	0.5 to 250 mbar/min.	0.1 mbar/min.	X01 – X03
• ① Diff alarm verification status (On/Off)	On	On/Off		X01 – X03
• ① Diff alarm verification delta pressure value	A1	1 – 100 mbar	0.1 mbar	X01 – X03
• ① Diff alarm verification time	600 s	60 s – 1,200 s	1 s	X01 – X03
• ① Diff alarm delay	4 s	0 s – 30 s	1 s	X01 – X03
• Diff alarm latching	On	On/Off		X01 – X03
• ① Max. alarm status (On/Off)	On	On/Off ②		X01 – X03
• ① Max. alarm threshold (dependent on sensing tube length and the response grade acc. to EN 54-22 / NFPA 72 / RVS / KFI)	A1	1 – 1,200 mbar	0.1 mbar	X01 – X03
• ① Max. alarm delay	4 s	0 s – 30 s	1 s	X01 – X03
• Max. alarm latching	On	On/Off		X01 – X03
• ① Adjustment (compensation), On/Off	On	On/Off		X01 – X03
• Adjustment (compensation), temp. sensor selection	Internal	Int./Ext. I / Ext. II		X01 – X03
• Adjustment (compensation), interval	60 min	1 – 1,440 min	1 min	X01 – X03
• Ext. alarm Temp. sensor	Off	55 – 300°C	1°C	X01 – X03
• Ext. alarm Temp. sensor, delay	2 s	0 s – 30 s	1 s	X01 – X03
• Ext. alarm Temp. sensor, latching	On	On/Off		X01 – X03
Pre-signal				
• Pre-signal Diff alarm On/Off	Off	off / on		X01 – X03
• Pre-signal Max alarm On/Off	Off	off / on		X01 – X03
• Pre-signal Diff alarm (100% = alarm threshold)	---	5 – 95%	5%	X01 – X03
• Pre-signal Max alarm (100% = alarm threshold)	---	5 – 95%	5%	X01 – X03
• Pre-signal delay (Diff and Max)	4 s	0 s – 30 s	1 s	X01 – X03
• Pre-signal latching (Diff and Max)	Off	off / on		X01 – X03
Sensing tube monitoring / testing				
• ① Sensing tube monitoring EN 54-22 On/Off	On	On/Off		X01 – X03
• Sensing tube monitoring cyclic On/Off	On	On / Off		X01 – X03
• Testing through monitoring (EN) / cyclic ③	Monit. + cycl.	Monit. + cycl.		X01 – X03
• Testing interval	24 h	1 – 48 h	1 h	X01 – X03
• Testing sensitivity	Medium	Low / medium / high	3	X01 – X03
• Self-test repetition rate ③	2 ③	1 – 4	1	X01 – X03
• Testing waiting time ③	30 min ③	1 – 60 min	1 min	X01 – X03



① **Changes** to these parameters have an effect on the response characteristics of the ADW 535HDx and can mean that the requirements according to EN 54-22 / NFPA 72 / RVS / KFI are no longer met. Any adjustments or modifications to the ADW 535HDx via "ADW Config" may be performed only by the manufacturer or by qualified personnel instructed and trained by the manufacturer.

② Diff alarm status "Off" / Max alarm status "Off"; both criteria cannot be switched off at the same time.

③ Valid for **C > A1** to **G** and **W00** to **W03**. Increased values are configured for switch positions **W04** to **W09**; these are not tested for EN 54-22 compliance (see Technical description T 140 458, Sec. 4.5.1.2).

Operating instructions

Configuration options, Table B

The following criteria apply to the entire ADW 535HDx. Saving a configuration after changes is performed in conjunction with the adaptations in Table A on one of the freely programmable switch positions **X01** to **X03**.

Sector • Parameter	Default setting	Area	Resolution / levels	Saving after change
Day/night control & weekday control				
• ① Day/night control On/Off	Off	Off / clock / FACP		X01 – X03
• Day start time	06:00	00:00 – 24:00	1 min	X01 – X03
• Night start time	20:00	00:00 – 24:00	1 min	X01 – X03
• Weekday control	On	Mon. to Sun.	Days	X01 – X03
General faults				
• Lithium battery / clock fault	On	On/Off		X01 – X03
Deactivate / switch off sensing tube				
• ① Switch off sensing tube I / sensing tube II (partial planning) only sensing tube II	On	On / deactivated / switched off (partial planning)		X01 – X03

① See note **Table A**

Configuration options, Table C

Independent configurations. These can be changed regardless of the switch position in the ADW 535HDx.

Sector • Parameter	Default adjustment	Selection
Clock		
• Year, month, day, hour, minute, second	---	Seconds – year
Relay / OC output / reset key / various		
• Relay 1, 1 st RIM 36	Diff alarm of sensing tube I	According to “Configuration options relay allocation”
• Relay 2, 1 st RIM 36	Max alarm of sensing tube I	
• Relay 3, 1 st RIM 36	Diff alarm pre-signal of sensing tube I	
• Relay 4, 1 st RIM 36	Max alarm pre-signal of sensing tube I	
• Relay 5, 1 st RIM 36	Alarm LMB temperature sensor	
• Relay 1, 2 nd RIM 36	Diff alarm of sensing tube II	
• Relay 2, 2 nd RIM 36	Max alarm of sensing tube II	
• Relay 3, 2 nd RIM 36	Diff alarm pre-signal of sensing tube II	
• Relay 4, 2 nd RIM 36	Max alarm pre-signal of sensing tube II	
• Relay 5, 2 nd RIM 36	Freely programmable	
• Logging interval of SD memory card	1 s	1 – 120 s
• Perform initial reset, sensing tube I	---	On/Off
• Perform initial reset, sensing tube II	---	On/Off
• Manually initiate testing, sensing tube I	---	On/Off
• Manually initiate testing, sensing tube II	---	On/Off
• Isolate sensing tube (sensing tube I / II)	Normal operation	Isolate / normal operation

Relay allocation configuration options

The following criteria are freely programmable on max. 10 relays (5 units on 1st RIM 36, 5 units on 2nd RIM 36):

Sensing tube I	Sensing tube II	General
Diff alarm, sensing tube I	Diff alarm, sensing tube II	Alarm temperature sensor LMB
Max alarm, sensing tube I	Max alarm, sensing tube II	Undervoltage fault
Diff alarm pre-signal, sensing tube I	Diff alarm pre-signal, sensing tube II	Clock fault
Max alarm pre-signal, sensing tube I	Max alarm pre-signal, sensing tube II	
Pressure sensor I fault	Pressure sensor II fault	
Test unit I fault	Test unit II fault	
Fault ext. temperature sensor I	Fault ext. temperature sensor II	

The criteria can also be allocated with the “OR” function (example: sensing tube I interruption or sensing tube II interruption together on one relay).

Commissioning



Prior to commissioning this operating material, the tests named in the individual national provisions must be performed.

In addition, prior to commissioning it is necessary to check that the operating material is correctly installed and functions properly as specified in these operating instructions and other applicable regulations.

This operating material may be operated only when closed.

When commissioning the ADW 535HDx, it is necessary to perform an initial reset in order to acquire basic data (e.g. pressure check dependent on the connected sensing tube volume). A sealing check of the connected sensing tube is also carried out during the initial reset. The initial reset must take place when the **ADW housing is open**.

If the ADW 535HDx is operated without the "ADW HeatCalc" calculation, commissioning with the "**EasyConfig**" procedure can be carried out directly on the ADW 535HDx.

For projects in which the "ADW HeatCalc" calculation software was used or in which customer-specific adjustments to the device configuration are required, use the "**ADW Config**" configuration software.

Starting up



Before the ADW 535HDx is switched on, it is absolutely necessary that all of the required measures have been performed (see T 140 458, Sec. 7.1).

- Sensing tube correctly mounted, cleaned (blown out) and only then connected to the ADW
- Isolation strips on the Lithium battery (LMB 35) removed

Startup sequence and procedure:

1. Switch on voltage supply (FACP), step motor goes into starting position, pressure pump is completely wound.
2. "**EasyConfig**": Select required switch position for operation according to "**System limit table**" (e.g. "**C > A2 > L01 > 085 > L02 > 095**") → see "**Re-programming**".
- or:
"**ADW Config**": after making adjustments to the configuration (alarm thresholds, set values according to "ADW HeatCalc" and other criteria according to Tables A and B) select switch position "**X01**", "**X02**" or "**X03**".
3. Set date and time via LMB 35 with "EasyConfig" or from "ADW Config" (adoption by PC).
4. Following a **minimum waiting time of 5 min.** after switching on, an initial reset must be performed. → See "**Initial reset**".
Important: The initial reset must always be performed under the system's "normal conditions", i.e. if possible, under the normal operating temperature of the sensing tube.
5. The ADW 535HDx is now ready for operation.

Measurements / commissioning protocol

Carry out the following measurements (after "**Re-programming**" and "**Initial reset**"):

- Operating voltage on terminals 1 (+), 2 (-) (if redundant supply then also terminals 3 & 4) → Target value = 10.8 to 13.8 VDC (in 12 VDC operation) or 21.6 to 27.6 VDC (in 24 VDC operation).
- Configuration and pressure values in switch positions **N** and **P** (see Technical description T 140 458, Sec. 7.6.1).

The commissioning protocol is like a personal history of the ADW 535HDx and should therefore be filled out conscientiously and completely and stored in the ADW 535HDx.

Re-programming

Example: ADW 535-2HDx (2 sensing tubes) compliant with EN 54-22, Class **A2I**. Sensing tube I = **85 m**, sensing tube II = **95 m**. Required switch position **C > A2 > L01 > 085 > L02 > 095**.

Measure	Display	Procedure / remarks
1. Press UP key	Flashing A1 > W00 > L01 > 115 > L02 > 115	• Displays the Default setting
2. Press UP key until C	In sequence A1 / C	• Displays switch position group C
3. Press OK key	A1	• Displays Class A1 in group C
4. Press UP key until A2	In sequence A1 / A2 / b / C / etc.	• Displays Class A2 in group C
5. Press OK key	L01	• Displays length entry sensing tube I
6. Press OK key	015	• Displays minimum length = 15 m
7. Press UP key until 085 (= 85 m)	Stepwise, 015 / 020 / 025 to 085	• Displays length in 5 m steps
8. Press OK key	L02	• Displays length entry sensing tube II
9. Press OK key	015	• Displays minimum length = 15 m
10. Press UP key until 095 (= 95 m)	Stepwise, 015 / 020 / 025 to 095	• Displays length in 5 m steps
11. Press OK key	Flashing - - - (approx. 4 x)	• New setting is programmed
12. Check: Press UP key	Flashing A2 > W00 > L01 > 085 > L02 > 095	• Displays the new setting

Operating instructions

Initial reset

Switch position **U01** = initial reset for sensing tube I

Switch position **U02** = initial reset for sensing tube II

Measure	Display	Procedure / remarks
1. Press UP key	Flashing A2 > W00 > L01 > 085 > L02 > 095	<ul style="list-style-type: none"> System-specific setting
2. Press UP key until U	In sequence A2 / C / to U	<ul style="list-style-type: none"> Displays switch setting group U
3. Press OK key	U01	<ul style="list-style-type: none"> Displays initial reset On for sensing tube I
4. Press UP key until U01	Stepwise, U01 / U02	<ul style="list-style-type: none"> Selection U01, initial reset for sensing tube I
5. Press OK key	Static U , Flashing 01	<ul style="list-style-type: none"> Pressure pump is fully wound
6. Vent sensing tube for 60 s	Static U , Flashing 01	<ul style="list-style-type: none"> Pressure equalisation at "0"
7. Press OK key → Wait	Flashing U01 (automatic sequence, approx. 2 min)	<ul style="list-style-type: none"> Test pressure Length check Pressure build-up Sealing check
	Flashing --- ①	<ul style="list-style-type: none"> Initial reset completed

① The display **---** signals only the completed initial reset process. Depending on the result, there may be an initial reset fault.

Following the sequence above, the initial reset must be carried out separately for each individually selected sensing tube.

Checking fault and alarm release



Testing with heat **EXPLOSION HAZARD!**

Testing the response characteristics of the ADW 535HDx by means of effective fire characteristic "heat" (hot air blower) is not possible due to the potentially explosive atmosphere!

If required, it is possible to generate the required heat with hot water or steam to simulate (similar to an actual fire) the response of the ADW 535HDx (test coil, see Technical description T 140 458, Sec. 5.4.2.4).



Block or switch off fire incident control and remote alerting on superordinate FACP's.

To check the fault and alarm release, **test triggerings** must be carried out in switch position **I**. Observe the information in Technical description T 140 458, Sec. 7.7.1.

Article numbers and spare parts

Short designation	Article number
ADW 535-1HDx	11-1000001-01-XX
ADW 535-2HDx	11-1000001-02-XX
SecuriLine eXtended line module XLM 35 ①	11-2200003-01-XX
RIM 36 relay interface module	11-2200005-01-XX
SIM 35 serial interface board	11-2200000-01-XX
SMM 535 serial master module	11-2200001-01-XX
ART 535-10 ext. temp. sensor	11-1000002-10-XX
ART 535-10 / 400 °C ext. temp. sensor	50-0500176-01-XX
ART 535-30 400 °C / EX 1 ext. t.sens. ②	50-0500176-03-XX
ART 535-30 400 °C / EX 21 ext. t.sens. ②	50-0500176-04-XX
Ethernet cable 3.0 m	30-6800006-02-XX
SD memory card (Industrial version)	11-4000007-01-XX
LMB 35 main board	11-1200001-01-XX
LEB 35 extension board (for ADW 535-2HDx)	11-1200002-01-XX
LSU 35 supervising unit, complete	11-1200003-01-XX
Lithium battery BR 2032	11-4000008-01-XX
Cable screw union M20 ATEX (set of 10)	11-4000006-01-XX
M25 ATEX (set of 10)	11-4000005-01-XX
Adapter US cable screw union AD US M-inch	11-2300029-01-XX
UMS 35 universal module support	4301252.0101
Technical description ADW 535HDx	T 140 458
Mounting and Installation	T 140 360
Material for sensing tube	T 140 362
Commissioning protocol	T 140 363
Data sheets XLM 35	T 140 088
RIM 36	T 140 364

① not UL/ULC tested

② see also "Technical description ADW 535HDx T 140 458", Sec. 6.5.6 and 11.1.