AMX5000

Aspirating smoke detector

From production number 060608 and SW version 01.02.01

The AMX5000 aspirating smoke detector performs the task of taking continuous air samples via one or two sampling pipe networks from a monitored area and feeding the samples to one or two smoke sensors.

The AMX5000 consists of the detector housing and one or two sampling pipe tube networks. The sampling pipes have several sampling holes whose size is such that each hole draws the same amount of air. The sampling pipes may be I-, U-, T-, H-, or E-shaped. The sampling pipes are usually symmetrically designed. Asymmetrical sampling pipe tube networkscan also be implemented using the "HELIOS PipeCalc" calculation software.

Fig. 1 AMX5102

Description

You find all necessary Information for setting up AMX5000 fire alarm systems in the short instruction; for the complete information and specifications refer to the Technical Description AMX5000, FHB 34 (908146)

Integrated in the detector housing is a high-speed fan which, in conjunction with the sampling pipe, ensures uninterrupted air supply to the detector housing. Airflow monitoring detects any block-ages or breaks in each of the sampling pipe networks.

The AMX5000 is available in four versions:
- AMX5001 for 1 sampling tube, and 1 smoke sensor without smoke level indicator;
- AMX5002 for 2 sampling tubes, and 2 smoke sensors without smoke level indicator;
- AMX5101 for 1 sampling tube, and 1 smoke sensor with smoke level indicator;
- AMX5102 for 2 sampling tubes, and 2 smoke sensors with smoke level indicator.

The AMX5000 can be equipped with the following smoke sensor types:
- OMX5005 Sensitivity range 0.5%/m to 10%/m (0.15%/ft to 3.15%/ft)
- OMX5010 Sensitivity range 0.1%/m to 10%/m (0.03%/ft to 3.15%/ft)
- OMX5020 Sensitivity range 0.02%/m to 10%/m (0.006%/ft to 3.15%/ft)

The AMX5000 aspirating smoke detector has four slots for expansion modules. The following modules can be added:
- KMX5005 RK Relay Interface Module with 5 relays (max. 2 units);
- MMX5005 Memory module
- Other In preparation (interface module)

The AMX5000 can be linked to a higher level FACP by means of relays.

The AMX5000 can be connected to a fire alarm system by using potential free contacts.

Integration in the System FMZ5000 Loop Ap is possible by modules. Displaying status and control of the AMX device can thus be performed directly from the FACP.

A further expansion option is the KMX5005 RK Relay Interface Module. This module enables the availability of all three pre-signal levels as well as the states "smoke sensor dirty" and "LS-Ü blockage" as relay contacts. The relays are also freely configurable via the HELIOS Config configuration software.

The MMX5005 Memory module serves to record operating data.

The AMX5000 aspirating smoke detector can be used for:
- **Equipment monitoring:** EDP systems, electrical distributors, switch cabinets, etc.
- **Space surveillance:** EDP rooms, clean rooms, warehouses, high-rack storage buildings, hollow floors, protection of cultural objects, transformer stations, prison cells, etc.

The AMX5000 is also deployed in areas where conventional point type detectors are used. The local provisions and regulations must be observed from case to case.

The response behavior of the AMX5000 has been tested in compliance with EN 54-20, Class A, B and C (or NFPA 72).

When setting up AMX5000 fire alarm systems, the information and specifications in **"Technical Description AMX5000"** must be observed and adhered to. This includes among others:

• **General**	Section 1
• **Planning**	Section 4
• **Mounting**	Section 5
• **Installation**	Section 6
• **Commissioning**	Section 7

Opening the detector housing

Press the rotary snap locks firmly with the screwdriver (min. No. 5) toward the housing base and then turn 90°. The position of the lock slit shows the current state:
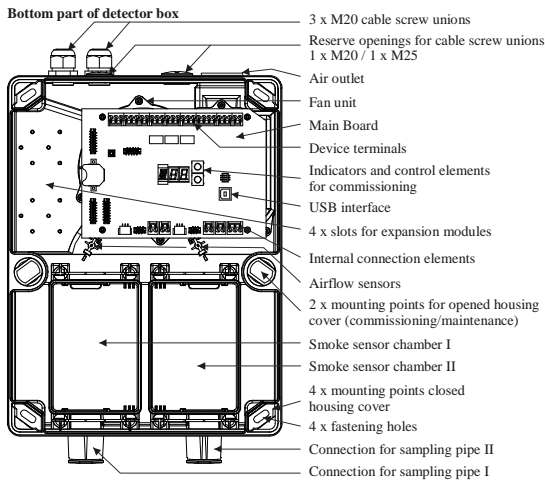- approx. 45° angled toward detector housing corner = closed
- approx. 45° angled toward detector housing edge = open

The rotary snap locks must snap into place.

The housing cover (control unit) is connected to the Main Board by a flat cable. Make sure that when the housing cover is lifted away the flat cable does not become damaged.

Short instruction

Connection

Bottom part of detector box

3 x M20 cable screw unions
Reserve openings for cable screw unions
1 x M20 / 1 x M25
Air outlet
Fan unit
Main Board
Device terminals
Indicators and control elements
for commissioning
USB interface
4 x slots for expansion modules
Internal connection elements
Airflow sensors
2 x mounting points for opened housing
cover (commissioning/maintenance)
Smoke sensor chamber I
Smoke sensor chamber II
4 x mounting points closed
housing cover
4 x fastening holes
Connection for sampling pipe II
Connection for sampling pipe I

MAIN BOARD device connections

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

Terminal	Signal	
1	+10.5 to +30 VDC	Main power supply line
2	0 V	
3	+10.5 to +30 VDC	Redundant supply line
4	0 V	
5	+ Supply (for OC consumers)	
6	Output fault, OC (all events)	
7	Output alarm I, OC	
8	Output alarm II or freely programmable, OC	
9	Free	
10	Rel. 1 „(NO)"	Fault
11	Rel. 1 „NC"	Contact (te. 10/12) closed in idle state
12	Rel. 1 „COM"	
13	Rel. 2 „NO"	Alarm I
14	Rel. 2 „NC"	
15	Rel. 2 „COM"	
16	Rel. 3 „NO"	Alarm II or freely programmable
17	Rel. 3 „NC"	
18	Rel. 3 „COM"	
19	External reset input +	Optocoupler input
20	External reset input -	
21	+ F	Connection for modules (available later)
22	DF	
23	-	
24	+ S	Connection for modules (available later)
25	DS	
26	-	

MAIN BOARD internal connections

Terminal	Signal
MOT / M-	Fan - (black wire)
MOT / T	Fan tacho signal (white wire)
MOT / M+	Fan + (red wire)
OEM2 / AI-	Optocoupler inputs for smoke sensor/ detector 2
OEM2 / AI+	
OEM2 / St-	
OEM2 / St+	
OEM1 / AI-	Optocoupler inputs for smoke sensor/ detector 1
OEM1 / AI+	
OEM1 / St-	
OEM1 / St+	

Terminal assignmentsKMX5005 RK

For the terminal assignment of the KMX5005 RK please refer to the corresponding data sheet FHK 34.1 (908144).

Wiring principle

 Examples of and information about wiring are found in Technical Description AMX5000, FHB 34 (908146), section 6.

Deploying smoke sensors

Smoke sensors are not fitted when the AMX5000 is delivered. They are application specific (according to required sensitivity range), purchased from the manufacturer and installed after the detector housing is mounted (see Fig. 3).

- The smoke sensors should always be removed from their protective packaging just before deployment in the detector housing.
- Depending on the situation (e.g. if there is a long time between mounting and commissioning or if the environment is very dusty due, for example, to construction), the smoke sensors should be installed just before commissioning the AMX5000.
- Before installing the smoke sensors, check that the protective screens against insects are properly fitted to the air inlet and outlet in the smoke sensor chambers.
- The smoke sensor chamber must be absolutely free of dirt and dust. Any waste or other materials resultingfrom mounting the detector housing must be removed.

The installation position of the smoke sensors depends on the particular smoke sensor chamber (I or II). The connectors of the smoke sensors are oriented toward the outside of the AMX housing. Incorrect installation positioning is prevented by the anti-twist rib on the smoke sensor housing.

The smoke sensors are fastened with the two lock clamps in the AMX housing. The electrical connection to the Main Board is accomplished with the supplied ribbon cable.

The smoke sensor chamber II on the AMX5001 and AMX5101 (only one smoke sensor) remains open (insect protection screens and lock clamps are not fitted, air channels are closed).
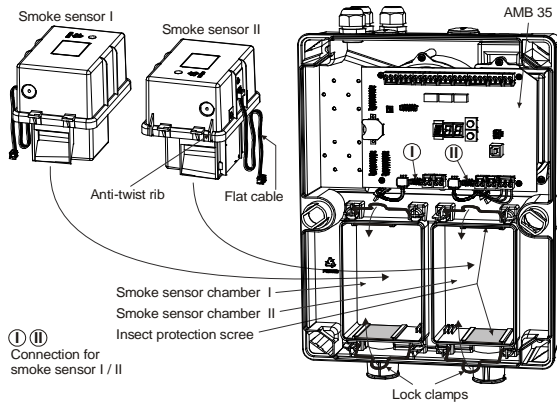
Fig. 3 Deploying the smoke sensors

Displays on the control unit

Several LEDs on the control unit indicate the current state of the AMX5000. The table below lists only the states for the AMX5001 and AMX5101 (one smoke sensor / one sampling pipe). Except for the operation display, the displays are doubled for the AMX5002 and AMX5102 (I and II).

Function / state	Operation	Alarm	Fault	Det. dusty / dirty	Smoke level
	green	red	yell.	yell.	yell.
System off (no voltage)					
System inactive (external reset)	On		$^1/_2$ T		
Smoke sensor off (from FACP)	On		$^1/_2$ T		
Idle state	On				
Blockage / pipe breakage, delay time running ②	On		1 T		
Blockage / pipe breakage, fault triggered	On		On		
Fan tacho signal lacking	On		On		
Fault triggered	On		On		
Pre-signal 1 (AMX5001/ 5002)	On	2 T			
Pre-signal 2 (AMX5001/ 5002)	On	1 T			
Pre-signal 3 (AMX5001/ 5002)	On	$^1/_2$ T			
Smoke level 1–10 (AMX5101/ 5102) ③	On				On
Pre-signal 1, 2, 3 (AMX5101/ 5102) ③	On				1 T
Alarm	On	On			
Dusty smoke sensor	On			1 T	
Dirty smoke sensor	On			$^1/_2$ T	
Smoke sensor fault	On		On		

① Additional for AMX5101 and AMX5102

② No fault triggered (triggers only after the delay time expires → "Fault" LED display continuously lit).

③ The LED of the respective smoke level 1–10 (corresponds to 10–100% of alarm threshold) is continuously lit when exceeded. If a pre-signal is programmed on this level, the LED subsequently begins to flash (default: VS 1 = level 3, VS 2 = level 5, VS 3 = level 7).

T = Flashing indicator; ½s cycle / 1s cycle / 2s cycle

Displays on the Main Board

On the Main Board there is a 3-digit segment display which can have the following outputs and displays:

- flashing point and **AL** = Autolearning running;
- flashing point and point continuously lit = day/night control active;
- switch setting **E** = event memory (99 events **E01** to **E99**), for more information see FHB 34 (908142), section 8.5.3;
- switch setting **F** = operating software version (firmware), for more information see FHB 34 (908142), section 7.3.6;
- pushbutton "UP" = the set configuration (**A11** to **C32**, **W01** to **W48**, **X01** to **X03**), see also **"Programming"**;
- switch setting **V** = airflow values (airflow rate), for more information see Technical Description, section 7.6.1

Programming

The AMX5000 has several switch settings which are configured with permanently assigned parameters:

- normative system limits according to EN 54-20, Class A to C (or NFPA 72), settings **A11** to **C32**;
- non-normative system limits, settings **W01** to **W48**;
- configurable settings for saving settings after using "HELIOS PipeCalc" and/or changing the device configuration via the "HELIOS Config" configuration software, **X01** to **X03**.

⚠ The parameters are configured post-factory with defaultstates and values so that the triggering properties comply with EN 54-20 (NFPA 72). Changing the parameters may result in non-compliance with EN 54-20 (NFPA 72). Any adjustments or modifications to the AMX5000 via "HELIOS Config" may be performed only by the manufacturer or by persons under the supervision of and trained by the manufacturer.

Switch settings on the Main Board

Pos.	Range / Display	Purpose
A	**A11 / A12**	Normative system limits according to EN 54-20, Class A (or NFPA 72)
b	**b11 / b12 / b21 / b22**	Normative system limits in compliance with EN 54-20, Class B (or NFPA 72)
C	**C11 / C12 / C21 / C22 / C31 / C32**	Normative system limits in compliance with EN 54-20, Class C (or NFPA 72)
E	**E01** to **E99** ↳ **G00** to **G99**	Event memory **E01 – E99** ↳ Event group **G00 – G99**
F	**F00** to **F99** (3 x)	Display of operating software version (firmware)
o	**o00**	Log off expansion modules (optional modules)
T	**Y05** to **Y99 / M01** to **M12 d01** to **d31 / H00** to **H23 M00** to **M59**	Setting the date Setting the time
U	**U01**	Execute initial reset
V	**V01 / V02**, each **000** to **255**	Output airflow rate in % Pipe I (= **V01**), pipe II (= **V02**)
W	**W11** to **W48**	Non-normative system limits
X	**X01** to **X03**	Configurable switch settings

The table lists only the available switch settings. Information about entry procedure is found in Technical Description FHB 34 (908142), section 8.3.

Short instruction

System limits without "HELIOS PipeCalc" calculation

The system limits apply to planning without the "HELIOS Pipe-Calc" calculation software. There are two areas with the following meaning:

- **Normative system limits** compliant to EN 54-20, Class A to C (or NFPA 72), switch settings **A11** to **C32**;
- **Non-Normative system limits,** switch settings **W01** to **W48**.

Normative system limits

Switch settings **A11** to **C32** have configured values which are necessary for alarm response sensitivity and airflow monitoring compliance with EN 54-20 Class A to C (or NFPA 72). The switch setting designation is deciphered as follows:

- First figure   Response class **A**, **b**, **C** compliant with EN 54-20 (or NFPA 72);
- Second figure   System limit **1**, **2**, **3** (pipe topology);
- Third figure   Number of pipe networks **1**, **2** on the AMX.

Example: **b22**   Response class **b** / system limit **2** / 2 pipe networks.

Non-normative system limits

Switch settings **W01** to **W48** contain system limits which fulfill **only** the alarm response sensitivity for EN 54-20 Class A to C (or NFPA 72) **but not** the normative limits concerning airflow monitoring. Since these are identical to system limits **A11** to **C32** concerning pipe topology (pipe network length, number of sampling holes), switch settings **W01** to **W48** are also included in the tables below in section 4.4.4.3. Additional information about switch settings **W01** to **W48** concerning number of pipe networks and airflow monitoring can be found in Technical Description FHB 34 (908142), section 4.4.4.4.

> ⚠ Switch settings **W01** to **W48** may be used only after consulting with the manufacturer. The configured values theycontain concerning airflow monitoring are **not** tested inaccordance with EN (or NFPA 72).
> Further information about using the system limits table is found in Technical Description FHB 34 (908142), sections 4.4.4.3 and 4.4.4.4.

System limits table for planning without "HELIOS PipeCalc" calculation
EN 54-20 compliance, Class A (highly sensitive) (or NFPA 72)

Shape	System limit	Switch setting to EN 54-20 (or NFPA 72) 1 tube	2 tube	Switch setting Non-normative ⚠ 1 tube	2 tube	Smoke sensor type OMX50xx	Alarm threshold % / m (% / ft)	Length from AMX to the last T-piece/cross	Max. length from AMX to the farthes sampling hole	Number of sampling holes per sampling branch	Max. total length of the sampling pipe per pipe network (smoke sensor)
I	1	A11	A12	W01 – W04	W05 – W08	20	0.03 (0.01)	---	50 m (164 ft)	1 – 7	50 m (164 ft)
U / T	1	A11	A12	W01 – W04	W05 – W08	20	0.03 (0.01)	3'-3"– 65'-6" (1 – 20 m)	40 m (131 ft)	1 – 4	80 m (262 ft)
H	1	A11	A12	W01 – W04	W05 – W08	20	0.03 (0.01)	3'-3"– 65'-6" (1 – 20 m)	40 m (131 ft)	1 – 2	100 m (328 ft)
E	1	A11	A12	W01 – W04	W05 – W08	20	0.03 (0.01)	3'-3"– 65'-6" (1 – 20 m)	40 m (131 ft)	1 – 3	100 m (328 ft)
EN 54-20 compliance, Class B (sensitive) (or NFPA 72)											
I	1	b11	b12	W09 – W12	W13 – W16	20	0.09 (0.03)	---	50 m (164 ft)	1 – 7	50 m (164 ft)
I	2	b21	b22	W17 – W20	W21 – W24	20	0.06 (0.02)	---	70 m (229 ft)	5 – 9	70 m (229 ft)
U / T	1	b11	b12	W09 – W12	W13 – W16	20	0.09 (0.03)	3'-3"– 65'-6" (1 – 20 m)	40 m (131 ft)	1 – 3	80 m (262 ft)
U / T	2	b21	b22	W17 – W20	W21 – W24	20	0.06 (0.02)	3'-3"– 65'-6" (1 – 20 m)	55 m (180 ft)	3 – 5	110 m (360 ft)
H	1	b11	b12	W09 – W12	W13 – W16	20	0.09 (0.03)	3'-3"– 65'-6" (1 – 20 m)	35 m (114 ft)	1 – 2	140 m (459 ft)
H	2	b21	b22	W17 – W20	W21 – W24	20	0.06 (0.02)	3'-3"– 65'-6" (1 – 20 m)	455 m (147 ft)	2 – 3	140 m (459 ft)
E	1	b11	b12	W09 – W12	W13 – W16	20	0.09 (0.03)	3'-3"– 65'-6" (1 – 20 m)	40 m (131 ft)	1 – 2	120 m (393 ft)
E	2	b21	b22	W17 – W20	W21 – W24	20	0.06 (0.02)	3'-3"– 65'-6" (1 – 20 m)	50 m (164 ft)	2 – 3	140 m (459 ft)
EN 54-20 compliance, Class C (standard) (or NFPA 72)											
I	1	C11	C12	W25 – W28	W29 – W32	05	0.8 (0.266)	---	40 m (131 ft)	1 – 5	40 m (131 ft)
I	2	C21	C22	W33 – W36	W37 – W40	10	0.35 (0.116)	---	80 m (262 ft)	3 – 9	80 m (262 ft)
I	3	C31	C32	W41 – W44	W45 – W48	10	0.13 (0.043)	---	110 m (360 ft)	7 – 16	110 m (360 ft)
U / T	1	C11	C12	W25 – W28	W29 – W32	05	0.8 (0.266)	1 – 20 m (3'-3"– 65'-6")	30 m (98 ft)	1 – 3	60 m (196 ft)
U / T	2	C21	C22	W33 – W36	W37 – W40	10	0.35 (0.116)	1 – 20 m (3'-3"– 65'-6")	60 m (196 ft)	3 – 5	120 m (393 ft)
U / T	3	C31	C32	W41 – W44	W45 – W48	10	0.13 (0.043)	1 – 20 m (3'-3"– 65'-6")	70 m (229 ft)	5 – 9	140 m (459 ft)
H	1	C11	C12	W25 – W28	W29 – W32	05	0.8 (0.266)	1 – 25 m (3'-3"– 82'-$\frac{1}{4}$")	35 m (114 ft)	1 – 2	140 m (459 ft)
H	2	C21	C22	W33 – W36	W37 – W40	10	0.35 (0.116)	1 – 25 m (3'-3"– 82'-$\frac{1}{4}$")	45 m (147 ft)	2 – 3	180 m (590 ft)
H	3	C31	C32	W41 – W44	W45 – W48	10	0.13 (0.043)	1 – 25 m (3'-3"– 82'-$\frac{1}{4}$")	60 m (196 ft)	3 – 5	200 m (656 ft)
E	1	C11	C12	W25 – W28	W29 – W32	05	0.8 (0.266)	1 – 20 m (3'-3"– 65'-6")	30 m (98 ft)	1 – 2	90 m (295 ft)
E	2	C21	C22	W33 – W36	W37 – W40	10	0.35 (0.116)	1 – 20 m (3'-3"– 65'-6")	50 m (164 ft)	2 – 3	150 m (492 ft)
E	3	C31	C32	W41 – W44	W45 – W48	10	0.13 (0.043)	1 – 20 m (3'-3"– 65'-6")	60 m (196 ft)	3 – 6	180 m (590 ft)

Sampling holes for planning without "HELIOS PipeCalc"-calculation

The tables below show the respective hole diameters for the numbers in **Fig. 4** as a function of the number of sampling holes per sampling branch.

I-shaped sampling pipes

Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from AMX															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	5.0															
2	4.0	5.0														
3	4.0	4.0	5.0													
4	3.5	3.5	4.0	5.0												
5	3.5	3.5	3.5	4.0	5.0											
6	2.5	2.5	2.5	2.5	3.0	5.0										
7	2.5	2.5	2.5	2.5	2.5	2.5	5.0									
8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5.0								
9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5.0							
10	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	3.0	7.0						
11	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	4.0	7.0					
12	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	4.0	7.0				
13	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	4.0	7.0			
14	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	4.0	7.0		
15	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	4.0	7.0	
16	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	4.0	7.0

U/T-shaped sampling pipes

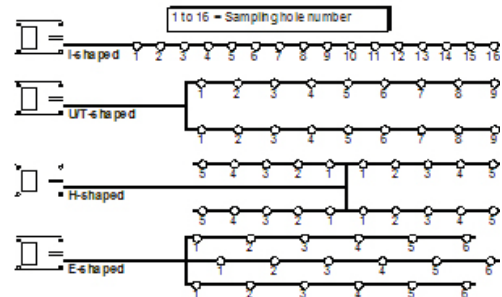| Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from AMX								
	1	2	3	4	5	6	7	8	9
1	5.0								
2	4.0	5.0							
3	4.0	4.0	5.0						
4	4.0	4.0	4.0	5.0					
5	4.0	4.0	4.5	5.0	6.5				
6	3.0	3.0	3.5	3.5	4.0	6.5			
7	2.5	3.0	3.0	3.5	3.5	4.0	6.5		
8	2.5	2.5	3.0	3.0	3.5	3.5	3.5	7.0	
9	2.5	2.5	3.0	3.0	3.5	3.5	3.5	3.5	7.0

H/E-shaped sampling pipes

Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from AMX					
	1	2	3	4	5	6
1	5.0					
2	4.0	5.0				
3	4.0	4.0	5.5			
4	3.0	3.0	3.5	5.5		
5	2.5	3.0	3.0	3.0	6.0	
6 (E-shaped only)	2.5	2.5	3.0	3.0	3.0	6.0

Fig. 4 Size of sampling holes

Short instruction

Configuration options, Table A:

The following criteria can be set for each smoke sensor / sampling pipe. Also, the criteria for day/night control can be separately set. Configuration changes are saved on one of the freely programmable switch settings *X01* to *X03*.

Sector • Parameter	Default Setting	Range	Resolution / Levels	Saving after change
Alarm				
• Alarm threshold (dependent on smoke sensor type and response class according to EN 54-5 or NFPA 72)	C11 / C12	0.02 – 10%/m (0.006 – 3 .15%/ft) 0.1 – 10%/m (0.03 – 3.15%/ft) 0.5 – 10%/m (0.15 – 3.15%/ft)	0.001%/m (0.0003%/ft)	X01 – X03
• Smoke level average value formation	4 s	1 – 10 s	1 s	X01 – X03
• Alarm delay	2 s	0 s – 60 s	1 s	X01 – X03
• Alarm self-hold	On	On/Off		X01 – X03
Pre-signal				
• Pre-signal 1 On/Off	On	On/Off		X01 – X03
• Pre-signal 2 On/Off	On	On/Off		X01 – X03
• Pre-signal 3 On/Off	On	On/Off		X01 – X03
• Pre-signal 1 (100% = alarm threshold)	30%	10 – 90%	10%	X01 – X03
• Pre-signal 2 (100% = alarm threshold)	50%	VS 1 + 10 – 90%	10%	X01 – X03
• Pre-signal 3 (100% = alarm threshold)	70%	VS 2 + 10 – 90%	10%	X01 – X03
• Pre-signal delay (VS 1 – VS 3)	2 s	0 s – 60 s	1 s	X01 – X03
• Pre-signal self-hold	Off	Off/On		X01 – X03
Smoke sensor dust/dirt				
• Smoke sensor dust On/Off	On	On/Off		X01 – X03
• Smoke sensor dirt On/Off	On	On/Off		X01 – X03
• Dust threshold (% of AI)	50%	5 – 60%	5%	X01 – X03
• Dirt threshold (% of AI)	75%	65 – 90%	5%	X01 – X03
• Dust self-hold	On	On/Off		X01 – X03
• Dirt self-hold	On	On/Off		X01 – X03
• Fault delay of smoke sensor	30 s	0 s – 60 s	1 s	X01 – X03
Airflow monitoring				
• LS-Ü blockage On/Off	On	On/Off		X01 – X03
• LS-Ü pipe breakage On/Off	On	On/Off		X01 – X03
• LS-Ü sensitivity	±20% ①	±10 – ±70%	± 10%	X01 – X03
• LS-Ü average value formation	20 s	1 – 30 s	1 s	X01 – X03
• LS-Ü delay time	300 s ①	2 min – 60 min	10 s / 1 min	X01 – X03

☞ ① The default settings of the LS-Ü sensitivity and LS-Ü delay time correspond to the above specifications for switch settings *A01* to *C32*. Increased values are configured for switch settings *W01* to *W48*; these are **not** tested for EN or NFPA 72 compliance (see Technical Description FHB 34 (908142), section 4.4.4.4).

Configuration options, Table B:

The following criteria apply to the entire AMX5000. Saving a configuration after changes is performed in the context of the adaptations in Table A on one of the freely programmable switch settings *X01* to *X03*.

Sector • Parameter	Default Setting	Range	Resolution / Levels	Saving after change
Autolearning				
• Autolearning On/Off	Off	On		X01 – X03
• Autolearning duration	3 days	1 min to 14 days	min, h, days	X01 – X03
• Autolearning factor (of measured AI threshold)	1.5	1.1 – 10 x		X01 – X03
Day/night control				
• Day/night control On/Off	Off	On/Off		X01 – X03
• Day start time	06:00	00:00 – 24:00	15 min	X01 – X03
• Night start time	20:00	00:00 – 24:00	15 min	X01 – X03
General faults				
• Lithium battery / clock fault	On	On/Off		X01 – X03
Ventilator				
• Fan speed	Level III	Level I to V	1	X01 – X03

Configuration options, Table C:
Independent configurations. These can be changed independently of the switch settings in the AMX5000.

Sector	Default	Selection
Time		
• Year, month, day, hour, minute	---	Minutes - year
Relay / OC output / reset button		
• Relay 3 and OC module 3, MAIN BOARD	Alarm II	
• Relay 1, 1st KMX5005 RK	Pre-signal 1 smoke sensor I	
• Relay 2, 1st KMX5005 RK	Pre-signal 2 smoke sensor I	
• Relay 3, 1st KMX5005 RK	Pre-signal 3 smoke sensor I	
• Relay 4, 1st KMX5005 RK	Smoke sensor I dirty	According to
• Relay 5, 1st KMX5005 RK	Sampling tube I pipe blockage	*"Configuration options*
• Relay 1, 2nd KMX5005 RK	Pre-signal 1 smoke sensor II	*relay allocation"*
• Relay 2, 2nd KMX5005 RK	Pre-signal 2 smoke sensor II	
• Relay 3, 2nd KMX5005 RK	Pre-signal 3 smoke sensor II	
• Relay 4, 2nd KMX5005 RK	Smoke sensor II dirty	
• Relay 5, 2nd KMX5005 RK	Sampling tube II pipe blockage	
• Reset button On/Off	On	On/Off
• Start initial reset	---	On/Off

Relay allocation configuration options:
The following criteria can be programmed on a max. of 11 relays (1 Main Board unit on AMX5001and AMX5101, 6 units on 1st KMX5005 RK, 5 units on 2nd KMX5005 RK):

Smoke sensor I / LS-Ü I	Smoke sensor II / LS-Ü II	General
Smoke sensor I alarm	Smoke sensor II alarm	Fan fault
Pre-signal 1 smoke sensor I	Pre-signal 1 smoke sensor II	Operating voltage fault
Pre-signal 2 smoke sensor I	Pre-signal 2 smoke sensor II	Initial reset fault
Pre-signal 3 smoke sensor I	Pre-signal 3 smoke sensor II	Lithium battery / clock fault
Smoke sensor I dusty	Smoke sensor II dusty	
Smoke sensor I dirty	Smoke sensor II dirty	
Smoke sensor I fault	Smoke sensor II fault	
Sampling tube I blockage	Sampling tube II blockage	
Sampling tube I pipe breakage	Sampling tube II pipe breakage	
The criteria can also be allocated with the <u>or</u> function (example: smoke sensor dust or dirt <u>together</u> on one relay).		

Commissioning

When commissioning the AMX5000, it is necessary to perform an initial reset in order to collect basic data (e.g. connected sampling pipe, motor data). An initial reset also performs an automatic adjustment of the airflow monitoring on the connected sampling pipe(s).

If the AMX5000 is operated within the system limits without "HELIOS PipeCalc" calculation, commissioning with the **"EasyConfig" method** can be carried out directly on the AMX5000.

For projects in which the "HELIOS PipeCalc" calculation software was used or in which customer-specific adaptations have to be made in the device configuration, the **"HELIOS Config"** configuration software has to be used.

Starting up

⚠️ Before the AMX5000 is switched on, it is absolutely necessary that all of the required measures have been performed (see FHB 34 (908142), section 7.1).

- sampling pipe correctly mounted and connected to the AMX;
- smoke sensors and expansion modules installed in the AMX and connected;
- isolation strip on the Lithium battery (MAIN BOARD) removed.

Sequence and procedure for starting up:

1. Switch on supply voltage (FACP); while the fan accelerates incrementally to its final speed (takes about 100 s), the next procedure can be carried out. **The system is immediately armed for alarm.**

2. **"EasyConfig":** select necessary switch setting for operation according to *"System limit table"* (e.g. *"b2"*) → see *"Re-programming"*.
   - or:
   "HELIOS Config": after adapting the configuration (alarm threshold according to "HELIOS PipeCalc" and other criteria in Tables A and B), select switch setting *"X01"*, "X02" or *"X03"*.

3. Set date and time via MAIN BOARD with "EasyConfig" or from "HELIOS Config" (adoption by PC).

4. Following a **minimum waiting time of 5 min** after switching on, an initial reset must be performed (possible only via MAIN BOARD) → see *"Initial reset"*.

5. The AMX5000 is now ready for operation.

Re-programming

Example: Response class B, system limit 2, AMX5102 (2 sampling tubes), required switch setting *b22*.

Measure	Display / indication	Procedure Remark
⚠️	Switch settings *W01* to *W48* may be used only after consulting with the manufacturer. The configured values they contain concerning airflow monitoring are **not** tested in accordance with EN (or NFPA).	
6. Press the "UP" button	Flashing *C32*	• Display of the default setting
7. Press "UP" twice until display shows *b*	In sequence: *A / b*	• Display switch setting group *b*
8. Press the "OK" button	*b11*	• Display of the smallest possible setting in group *b*
9. Press "UP" until display shows *b22*	In sequence: *b11 / b12 / b21 / b22*	• Display of the possible settings in group *b*
10. Press the "OK" button	Flashing *b - -* (approx. 4 x)	• New setting is programmed
11. Check: Press the "UP" button	Flashing *b22*	• Display of the new setting

Initial reset

Measure	Display / indication	Procedure Remark
⚠️	Before performing an initial reset after switching on the AMX5000, a **waiting time of at least 5 min** must be observed.	
1. Press the "UP" button	Flashing *C32* or other	• Display of the default setting or the installation-specific switch setting
2. Press "UP" several times until display shows *U*	In sequence: *A to U*	• Display of the switch setting group *U*
3. Press the "OK" button	*U01*	• Display initial reset On
4. Press the "OK" button again	Flashing *U - -* *(5 to max. 120 s)*	• Initial reset runs
5. Wait	Flashing point (watchdog indicator)	• Initial reset completed

Measurements / commissioning protocol

Carry out the following measurements:
- Measure operating voltage on terminals 1 (+), 2 (-) (if redundant supply, then also terminals 3 & 4) → target value = 12.3 to 13.8 VDC (in 12 VDC operation) or 21.6 to 27.6 VDC (in 24 VDC operation).

- Airflow values in switch settings *V* (see Technical Description FHB 34 (908142), section 7.6.1)

- The commissioning protocol is like a personal history of the AMX5000 and should therefore be filled out conscientiously and completely and stored in the AMX5000. If required, a copy can be made and stored in the installation dossier.

Checking fault and alarm actuation

Test	Procedure	Action
👉	Block or switch off fire control installations and remote alarms on the superordinate FACP.	
Check airflow monitoring	Tape sampling holes (adhesive tape); number depends on the pipe configuration	• As soon as the resulting change in the airflow is exceeded by ±20% (can be checked via the switch setting V) the "Fault" LED begins to flash. • When the LS-Ü delay expires (300 s), the AMX triggers a fault → fault on FACP ① / ②.
Check alarm actuation	Subject maintenance sampling hole or sampling hole to smoke.	• AMX actuates an alarm → alarm on FACP; correct alarm actuation checked (zone and range actuation) on the FACP ① / ②. • If there are pre-signals they are also actuated.

① Between each check the AMX5000 must be reset (caution: a reset on the AMX does not reset the FACP).
② For the AMX5002 and AMX5102, checks have to be carried out for both sampling pipes.

Article numbers / spare parts

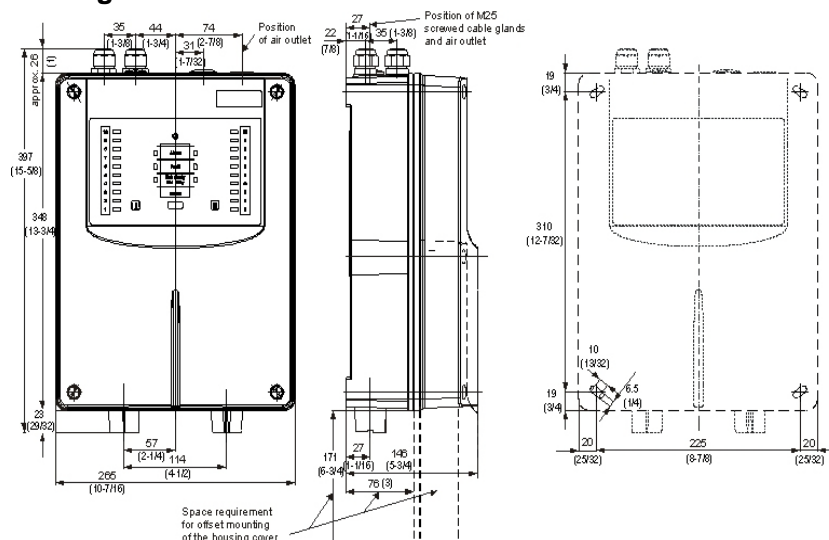| Brief description	Article number
Aspirating smoke detector AMX5001	908095
Aspirating smoke detector AMX5002	908096
Aspirating smoke detector AMX5101	908097
Aspirating smoke detector AMX5102	908098
Smoke sensor OMX5005, 0.5%/m –10%/m (0.15%/ft – 3.15%/ft)	908099
Smoke sensor OMX5010; 0.1%/m – 10%/m (0.03%/ft – 3.15%/ft)	908100
Smoke sensor OMX5020; 0.02%/m – 10%/m (0.006%/ft – 3.15%/ft)	908101
Relay Interface Module KMX5005 RK	908103
Memory module MMX5005	908104
SD memory card (min. 1 GB)	
USB cable, 4.5 m (14' – 9")	
CD with "HELIOS Config" configuration software	908105
CD with "HELIOS PipeCalc" calculation software	
Aspirating fan unit AMX5000, complete	
Airflow sensor AMX5000	
Lithium battery	
Cable screw union M20	
Cable screw union M25	
Universal Module Support AMX5000	
Technical Description AMX5000	FHB 34 / 908142
Material for the sampling pipe	
Commissioning protocol AMX5000	
Short instruction KMX5005 RK data sheet	FHK 34.2 / 908145
Short instruction MMX5005 data sheet	FHK 34.1 / 908144
Installation instructions aspirating fan unit AMX5000	

Dimensional drawing

Fig. 5   Detector housing AMX5000 dimensional drawing

Short instruction

Technical data

Type		AMX5000			
Supply voltage range				10.5 to 30	VDC
Max. current consumption, measured in		**12 VDC operation**	**24 VDC operation**	**Typical**	
Fan speed level V and at →		10.5 VDC ①	18 VDC ①	24 VDC	
AMX5001	Idle/fault	approx. 575	approx. 340	approx. 260	mA
	Alarm I	approx. 660	approx. 390	approx. 295	mA
AMX5002	Idle/fault	approx. 645	approx. 380	approx. 290	mA
	Alarm I + II	approx. 745	approx. 450	approx. 350	mA
AMX5101	Idle/fault	approx. 575	approx. 340	approx. 260	mA
	Alarm I	approx. 695	approx. 405	approx. 310	mA
AMX5102	Idle/fault	approx. 645	approx. 380	approx. 290	mA
	Alarm I + II	approx. 820	approx. 490	approx. 385	mA
Additionally with 1 KMX5005 RK units		approx. 15	approx. 10	approx. 7	mA
Additionally with 2 KMX5005 RK units		approx. 30	approx. 20	approx. 14	mA
Additionally with MMX5005		approx. 25	approx. 15	approx. 10	mA
Switch-on current peak ② (caused by EMC protection elements on the AMX supply input)				approx. 5	A
				for max. 1	ms
				(0.001	s)
Sampling pipe length			See FHB 34 (908142), section 4.2.1		
Sampling pipe Ø, typical (inner/outer)			Ø (20 / 25		mm
			Ø 25/32 / 1		inch)
Max. number of sampling holes			See FHB 34 (908142), section 4.2.1		
Sampling hole diameter			Ø 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7		mm
Response range			EN 54-20, Class A, B, C	(NFPA 72)	
Protection type acc. to IEC 529 / EN 60529 (1991)			54		IP
Ambient conditions acc. to IEC 721-3-3 / EN 60721-3-3 (1995)			3K5 / 3Z1		Class
Extended ambient conditions:					
• Detector housing temperature range			-30 – +60		°C
			(-4 – +140		°F)
• Sampling pipe temperature range			-30 – +60 ③		°C
			(-4 – +140 ③		°F)
• Max. approved temperature fluctuation in detector housing and sampling pipe operation			20 ③		°C
			(68 ③		°F)
• Max. storage temperature deflector housing (no condensation)			-30 – +70		°C
			(-4 – +158		°F)
• Ambient pressure difference of detector housing to sampling pipe (sampling holes)			Must be identical		
• Detector housing humidity ambient condition (transient without condensation)			95 ③		% rel.
• Humidity ambient temperature (continuous)			70 ③		% rel.
Max. loading capacity relay contact			50		VDC
			1		A
			30		W
Max. loading capacity per open collector output			100		mA
Plug-in terminals			2.5		mm²
			12		ga
Cable entry for cable Ø			Ø 5 – 12 (M20) / Ø 9 – 18 (M25)		mm
Noise level (at fan speed level III)			43		dB (A)
Housing material			ABS blend, UL 94-V0		
Housing color			Grey 280 70 05 / anthracite violet 300 20 05		RAL
Approval			G208193	EN 54-20	
Dimensions (W x H x D)			(265 x 397 x 146)		mm
			10-$^7/_{16}$ x 15-$^5/_8$ x 5-$^3/_4$		inch)
Weight (AMX5102, incl. expansion modules)			max. 3850		g
			(max. 135		oz)

① Current consumption at maximum permitted voltage drop in the electrical installation (guideline value for calculating the conductor cross-section).

② May cause an immediate actuation of the protection circuit in power supplies with overload protection circuits (primarily in devices with no emergency power supply and output current of < 1.5 A).

③ Lower or higher temperature ranges are possible after consulting with the manufacturer. The manufacturer must be consulted if deployment is to be in the condensation range.