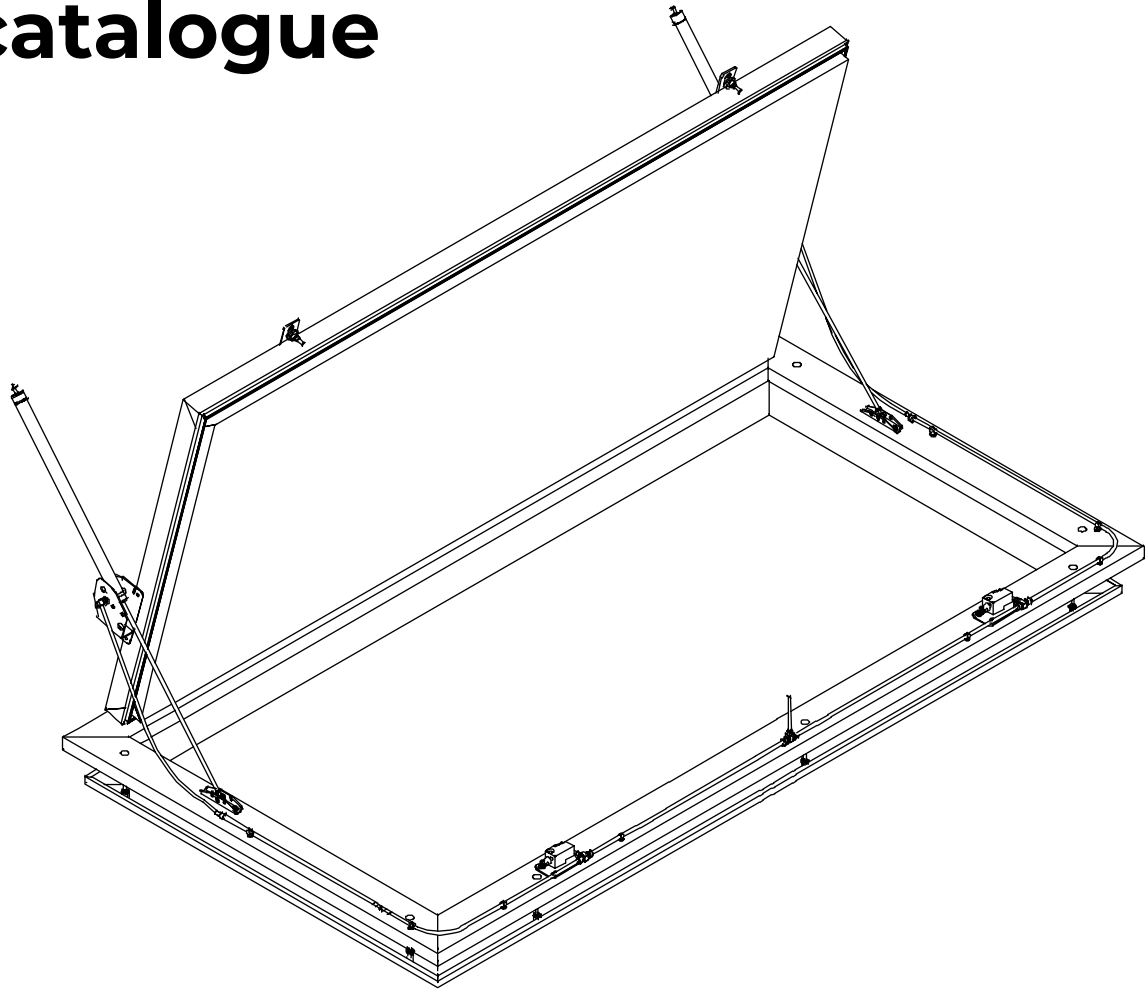


Technical catalogue



mcr COOL THERM

TYPE RWA12H

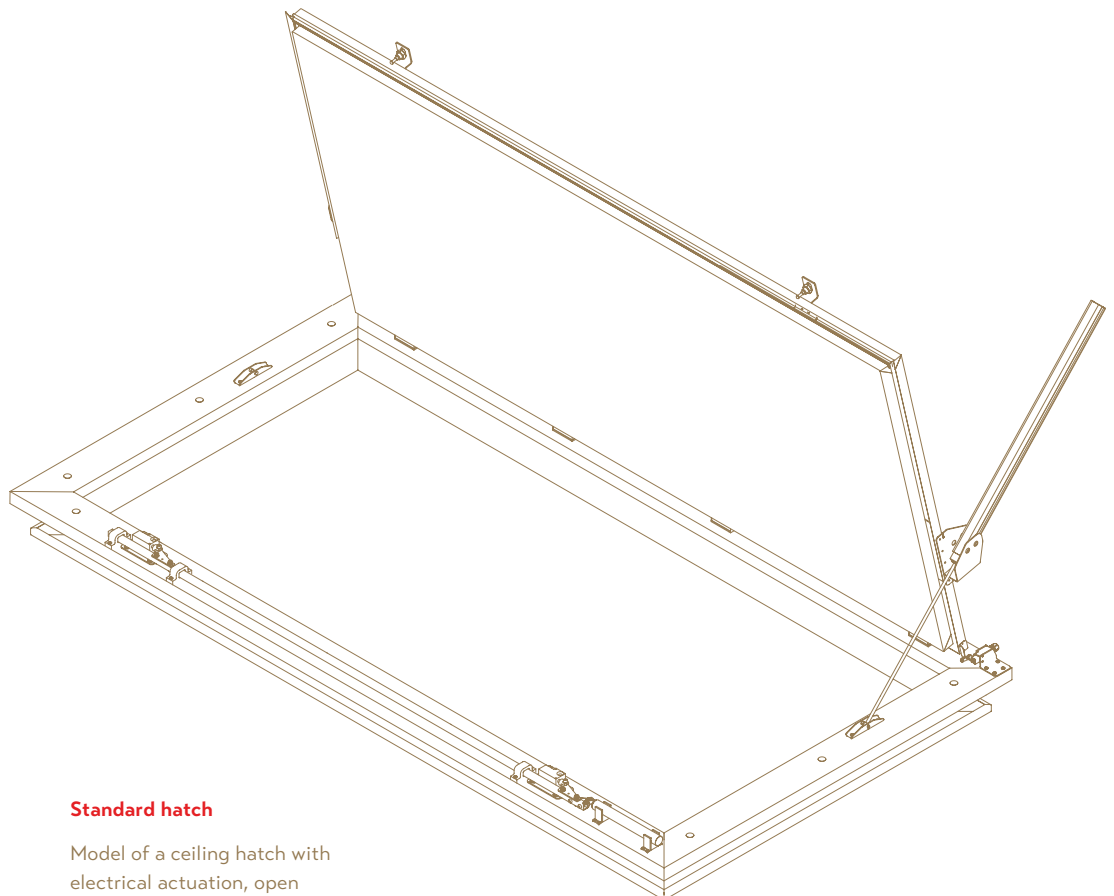
Smoke vents for cold stores
and freezer rooms with electrical actuation

Whenever a reliable thermal room sealing point is required, *cool it* has proven itself to be a strong partner for over 30 years.

As a further development of the pneumatically powered ceiling hatch, the variant with electric spindle drives illustrated here can open and close completely automatically.

This eliminates the time-consuming task of opening and closing each hatch individually after conducting a function check as is required for the pneumatically actuated variant.

As a result, the annual inspection required under the existing legislation can be performed very easily, quickly and safely. In freezer rooms in particular, the fact that this system locks again quickly and fully automatically ensures that any warming in the associated building areas is kept to an absolute minimum. At the same time, the costs of the annual inspection are reduced because, unlike its pneumatic counterpart, this system does not require any wear materials (CO₂ bottles and glass pistons).



Standard hatch

Model of a ceiling hatch with electrical actuation, open



Outstanding quality

The *cool it* ceiling hatches are manufactured from high-quality materials using state-of-the-art production methods.



For practically any application or requirements – with the optional extensions to the standard *cool it* smoke and ventilation hatches, anything is possible.

Hygiene / occupational health and safety: In freezer rooms, it is important that no ice can form in the area around the ceiling hatches. That is why the *cool it* hatch has been engineered to open "upwards". On hatches that open "downwards", water condensation necessarily collects on the hatch sheet and then penetrates through the seal into the interior of the room. This can cause hygiene-related problems in cold stores or cause hazardous icicles to form in freezer rooms.

Corrosion-resistant materials: All the hatch mounting parts are manufactured from rustproof materials: the brackets from rustproof stainless steel and the locks on the opening system from aluminium.

Optimum operating reliability: VdS-tested mounting parts and the frame heater (RWA12H) that is fitted as standard effectively prevent the seal from freezing tight to the frame. The 4-point locking mechanism guarantees an optimised hermetic seal.

Energy efficiency: The use of special connecting elements prevents the formation of thermal bridges. The insulation values of the 12 cm-thick hatch sheet ensure minimum energy loss.

The *cool it* smoke and ventilation hatches with pneumatic actuation – thoroughly tested by leading experts.

Our RWA12 and RWA12H have been evaluated by the well-known, independent experts from *Halfkann und Kirchner*. As a result, they can be unreservedly recommended for installation anywhere where a smoke evacuation concept is required.

THE NEW OPTION FOR THE COOL IT HATCH RWA12/RWA12H: FIRE PROTECTION SWITCH (FSS) AS PER DIN VDE 0100-420

The *International Electrotechnical Commission* and the *German Standardization Institute (DIN)* recommend the use of a fire safety switch (FSS) as good engineering practice. Since 2016, the use of such a device in certain applications has been set out in DIN VDE 0100, part 420. On expiry of a transitional period up to 18.12.2017, installation will be obligatory in many facilities.

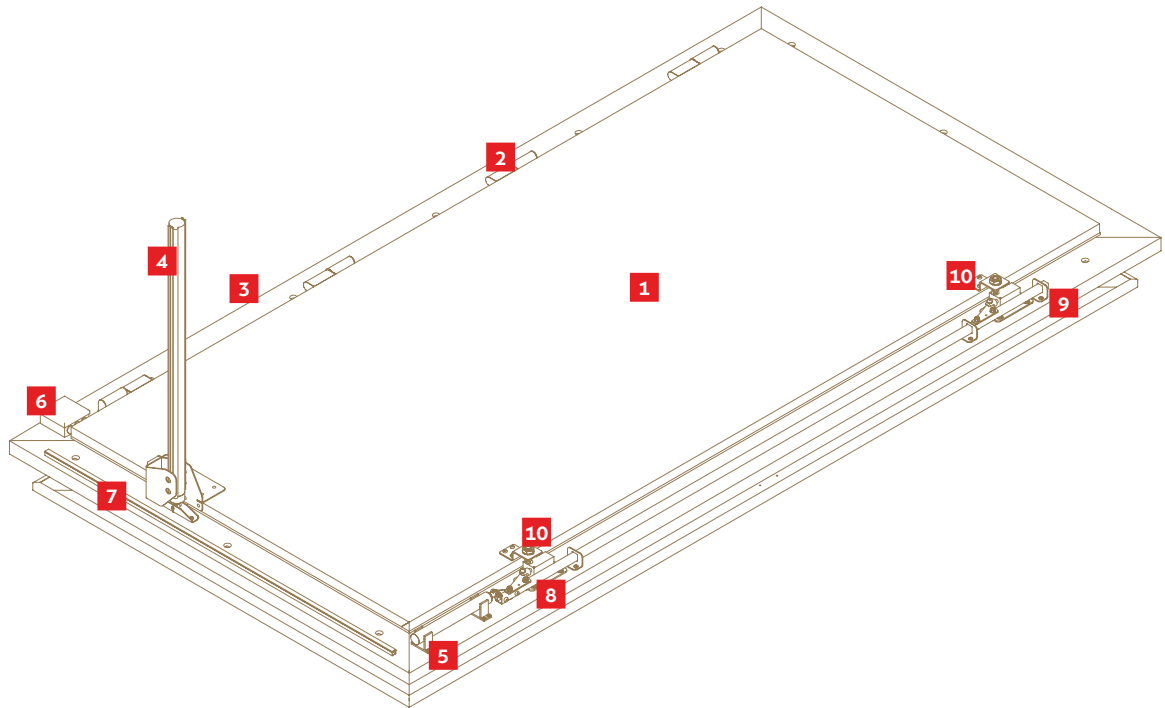
In the past, the available protective mechanisms (circuit breaker and residual current device) did not provide adequate protection against hazardous arc faults, whether serial or parallel in nature. The FSS extends these systems and consequently reduces the probability of fires resulting from electrical causes.

At *cool it*, the FSS is optionally available to protect the heating circuits. It is recommended to take account of this type of safety mechanism when planning and installing *cool it* hatches of type RWA12.

The FSS is supplied in a separate box and is therefore suitable for use in new installations or in retrofit installations. It is supplied as a unit with another safety mechanism. Two variants are available:

1. Fire safety switch + residual current device/circuit breaker (combination circuit breaker).
2. Fire safety switch + circuit breaker if the required residual current device is already provided by the customer upstream in the building.

Design of the electric ceiling hatch



- 1** Ceiling hatch type RWA12/ RWA12H, 12 cm sheet thickness
- 2** cool it belts
- 3** Thermotec frame 150 × 50 mm (type RWA12H: with flush-mounted heater)

- 4** 24 V spindle drive, JM-DC2-2500-0600 M8/ 8 mm
- 5** 24 V spindle drive, JM-DC-650-0020 gk
- 6** Sequence controller for spindle drive LA-F

- 7** Electrical connection cable Silitherm H05SS-F
- 8** Mechanical coupling rod for locking units
- 9** Bearing blocks for coupling rod
- 10** Locks on opening system (locking units)

Lifting cylinder

High-speed, fully automated opening and closing – minimum temperature increase during the statutory annual inspection.



Locking unit

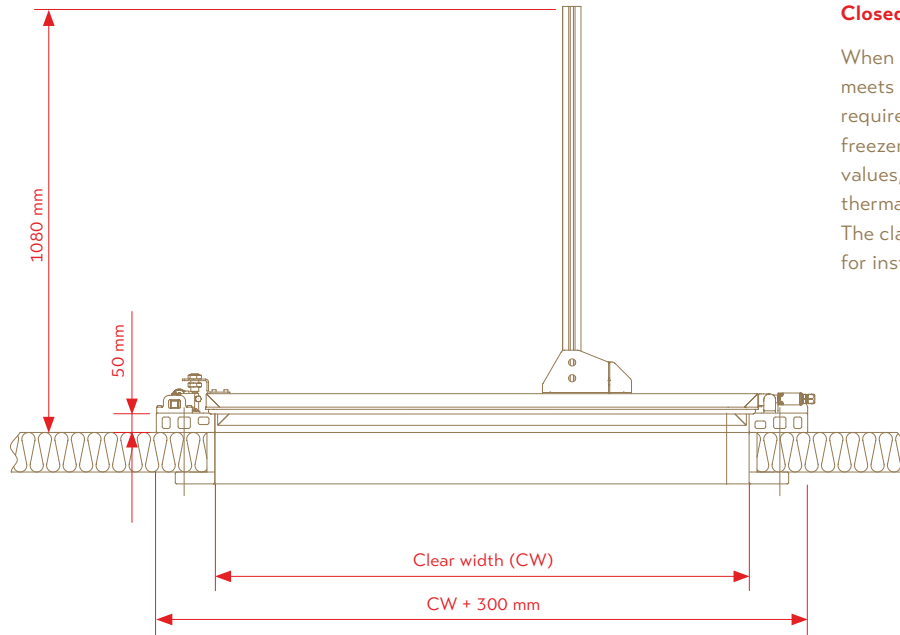
VdS-approved locking units of type Jofo TS 6000 are used for the hatches.



Technical information

		RWA12 HATCH FOR COLD STORES	RWA12H HATCH FOR FREEZER ROOMS
DIMENSIONS			
Standard size	1280 mm × 2500 mm		
Max. size	1350 mm × 2800 mm (on assessment)		
Min. size	1000 mm × 1000 mm (on assessment, smaller sizes are also possible at the technical level)		
Weight (standard size)	approx. 140 kg		
TYPE OF INSTALLATION			
Ceiling hatch	Installation in false ceiling using angle bracket frame in cold stores (> +4 °C), hatch sheet thickness 12 cm, Min. ambient temperature on outside +4 °C	Installation in false ceiling using angle bracket frame in freezer rooms (+4 °C to -28 °C), hatch sheet thickness 12 cm, Min. ambient temperature on outside -20 °C	
MATERIAL			
Outer hatch sheet material	Steel aluminium sheet 0.63 mm – 0.8 mm; galvanised and plastic-coated		
Core insulation	Polyurethane B2 as per DIN 4102-1, no thermal bridges with 120 mm thickness of insulation		
Frame	PVC, Thermotec frame: 150 mm × 50 mm		
MECHANICAL CONSTRUCTION			
Lifting cylinder	Jofo, JM-DC2-2500-0600		
Unlocking cylinder	Jofo, JM-DC-650-0020		
Locking units	Jofo, TS 6000		
Controller	Sequence controller LA-F		
OPENING			
Aerodynam. cross-section A_w	Calculation using the example of a standard-size ceiling hatch (1.28 m × 2.5 m) in rooms of up to 1600 m ² : 1.28 m × 2.5 m = 3.2 m² (corresponds to A_{geo}) and in rooms larger than 1600 m ² : 1.28 m × 2.5 m × 0.57 (drag coefficient) = 1.82 m²		
Geometr. opening area A_{geo}	3.2 m²		
Cylinder stroke	600 mm		
Opening angle	77° ± 2°		
FRAME HEATER			
Capacity	self-regulating, 27 W/m at 10 °C (max. 50 W)		
Electrical connections (provided by the customer)	Power supply 230 V/50 Hz , pre-fuse 16 A type C , residual current device 30 mA Total capacity = (2 × CH[m] + 2 × CW[m]) × 50 W The capacity of all the heaters connected to a fuse must be less than 1000 W.		
Fire safety switch FSS (optional)	<ol style="list-style-type: none"> Fire safety switch + residual current device/ circuit breaker Fire safety switch + circuit breaker if the required residual current device is already provided by the customer upstream in the building. 		

The ceiling hatches in detail



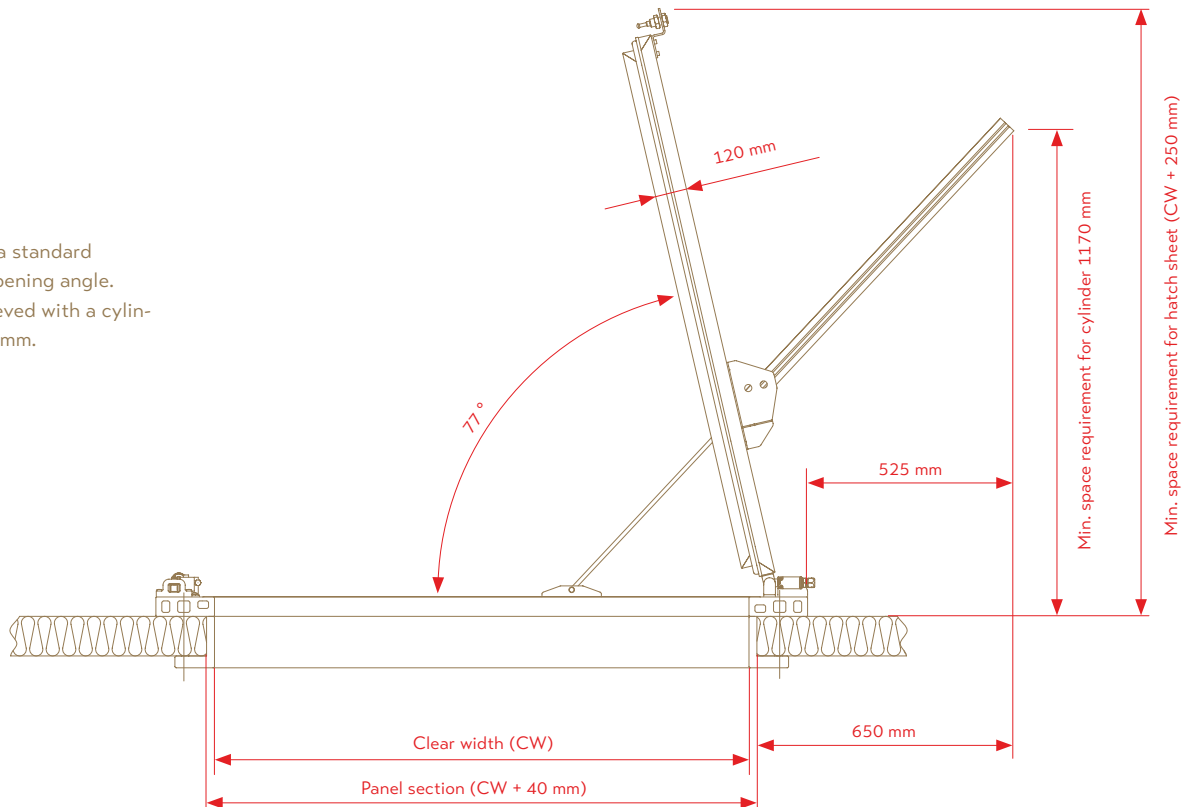
Closed state

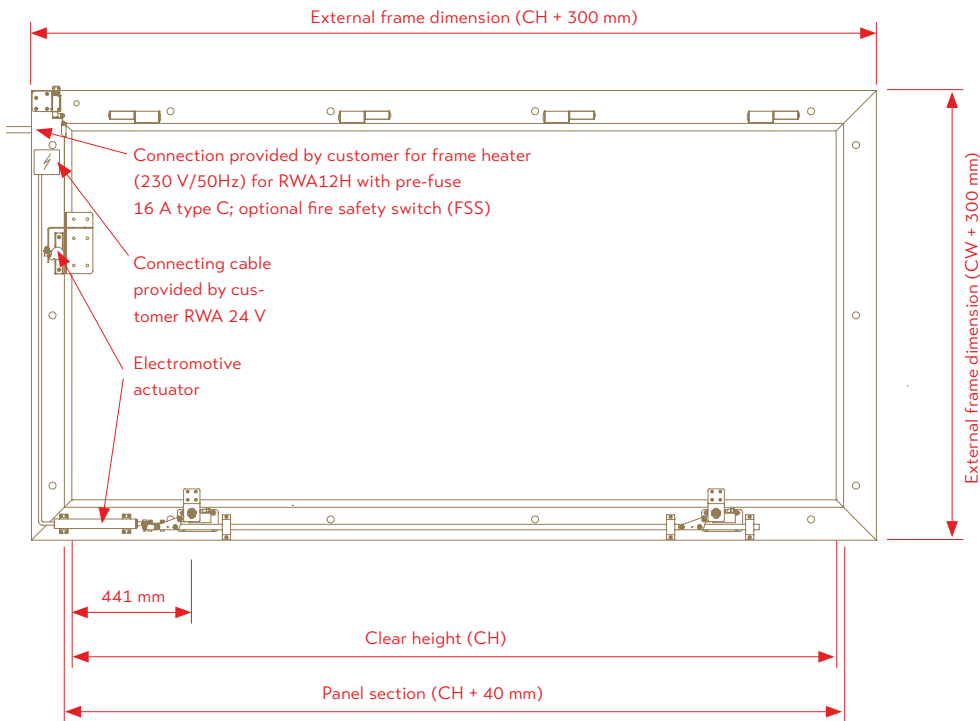
When closed, the ceiling hatch meets all thermal partitioning requirements in cold stores and freezer rooms: high insulation values, good sealing properties, no thermal bridges.

The clamping frame system is ideal for installation in sandwich panels.

Open state

The figure shows a standard hatch with 77 ° opening angle. This angle is achieved with a cylinder stroke of 600 mm.



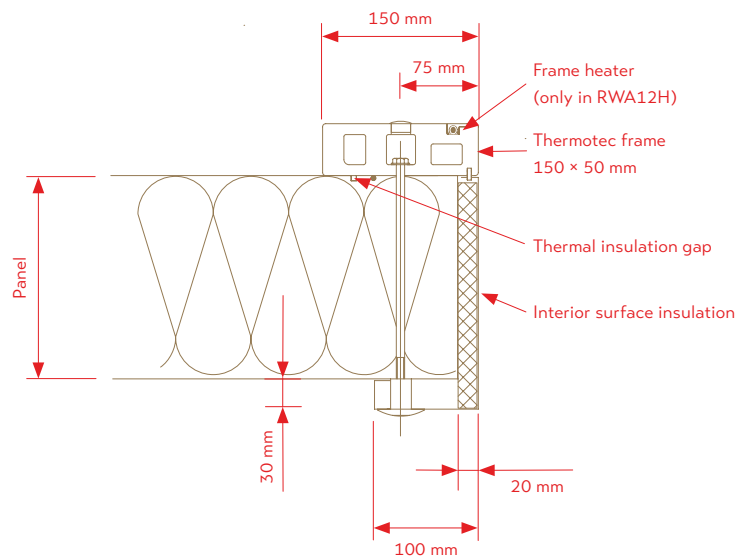


Top view

We supply the standard hatch in the sizes 1290 mm × 2500 mm. The minimum dimensions are 1000 mm × 1000 mm and the maximum dimensions 1350 mm × 2800 mm.

Detailed view of frame

RWA12H, the hatch for freezer rooms, is also equipped with a frame heater and interior surface insulation. Thanks to the thermal insulation gap, the frame is designed to have no thermal bridges.



Load cut-off LA-F sequence controller

When push-rod actuators of type JM-DC2-2500-0600 are used as servomotor and a JM-DC-650-0020 is used as locking motor then an electronic sequence controller LA-F is required.

The logic monitors the power consumption of each motor. The switching threshold for the servomotor is preset to $I = 3.5 \text{ A}$ (this cut-off value can be set to the values 3.5 A/4.0 A). The switching threshold for the locking motor is preset to $I = 1.6 \text{ A}$ (this cut-off value can be set to the values 1.6 A/2.1 A).

In the opening direction

The locking motor operates first (3 s or 5 s). Once this period has elapsed, the servomotor is activated. If the current at a motor rises above the permitted maximum value then its travel is stopped **immediately**. However, this does not affect the second motor

In the closing direction

The servomotor operates first (45 s or 55 s). Once this period has elapsed, the locking motor is activated. If the current at a motor rises above the permitted maximum value then its travel is stopped **immediately**. However, this does not affect the second motor

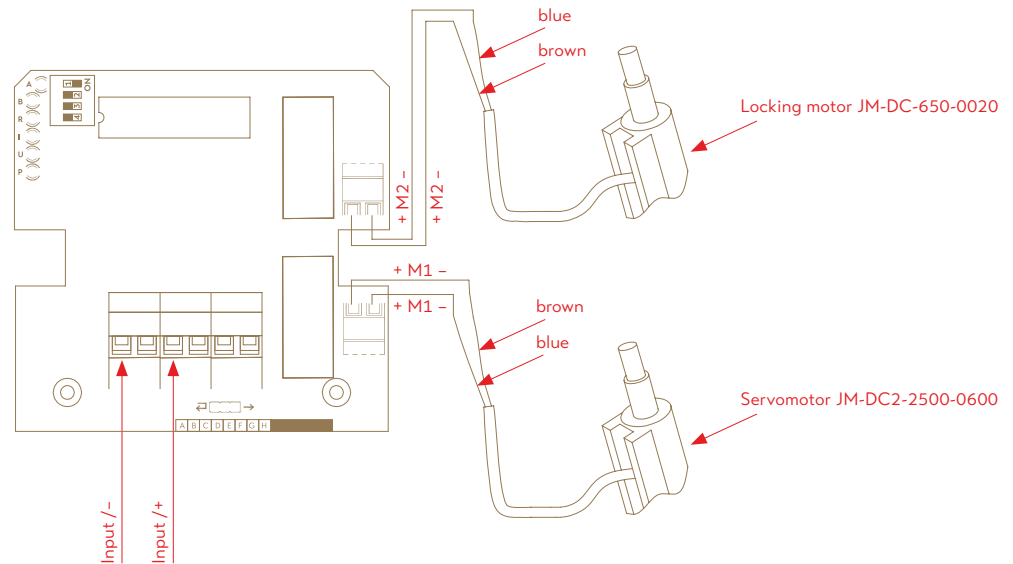
The sequence controller LA-F may only be operated with a protective low voltage as per DIN EN 60742.

Characteristic technical data

TYPE	LA-F
NOMINAL VOLTAGE	as per DIN EN 60742 24 V DC +30 %/-20 % residual ripple 5 %
CUT-OFF CURRENT	Servomotor adjustable 3.5 A or 4.0 A Locking motor adjustable 1.6 A or 2.1 A
TURN-ON DELAY	Servomotor adjustable 3 s or 5 s Locking motor adjustable 45 s or 55 s
PERCENTAGE DUTY CYCLE	Maximum 100% PDC
PROTECTION CLASS	IP54 splash-proof
TERMINALS	Cable max. 2.5 mm ² rigid, max. 1.5 mm ² flexible with end sleeve
TEMPERATURE RANGE	-20 °C to +60 °C
COLOUR	Box: white
WEIGHT	200 g

View of LA-F

Connection diagram for sequence controller



Connection plan LA-T2

TERMINAL NO.	1	2	M+	M-	M+	M-
VOLTAGE	Input		Motor 1		Motor 2	
			Servomotor		Locking motor	
OPEN	+	-	+	-	+	-
CLOSE	-	+	-	+	-	+

Function of the DIP switch

MOTOR CUT-OFF CURRENT		DIP-S. 1	
SERVOMOTOR M1	OFF	ON	
	4.0 A	3.5 A	
MOTOR CUT-OFF CURRENT		DIP-S. 2	
LOCKING MOTOR M2	OFF	ON	
	1.6 A	2.1 A	
OVERTRAVEL TIME (S)		DIP-S. 3	
SERVOMOTOR M1	OFF	ON	
	3 s	5 s	
MOTOR CUT-OFF CURRENT		DIP-S. 4	
LOCKING MOTOR M2	OFF	ON	
	45 s	55 s	

Procedure for obtaining approval in specific cases

When planning a building with a smoke and heat ventilation (SHEV) system, it is necessary to comply with the requirements set out in the building regulations regarding the location, size, number and arrangement of *cool it* SHEV hatches in the false ceiling or roof in order to prevent any future liability in the event of a fire and, at a minimum, ensure that the escape routes are kept free of smoke in order to permit escape and evacuation.

Such smoke and heat ventilation systems may only provide for and use natural smoke and heat exhaust ventilators that possess a formal usage certificate. In practice, this means either devices with the CE label in the case of standard solutions or a special approval for individual cases when dealing with complex, individual roof designs. The specifications for testing these natural smoke and heat exhaust ventilators are set out in the applicable standard DIN EN 12101-2.

Since a *cool it* smoke and heat ventilation hatch is only ever a single component in an individually planned smoke and heat ventilation system, it must always be approved by means of a special approval for individual cases. No CE label is possible!

Information on the procedure

When applying for building permission, the special approval for individual cases should be submitted to the relevant state building supervisory authority (for Germany, see the *List of addresses of building supervisory authorities*). Such approvals are only issued exclusively for the specific building in question.

The individual regulations in the 16 German states differ slightly from one another. Some building supervisory authorities publish information sheets to assist in the submission of applications. These information sheets and

notes on the procedure to be followed are available on the Internet. They also set out who may make an application for approval.

During the overall planning process for a building, the application for special approval should be submitted early enough to ensure that extensive changes to planning, and in particular changes to the building permit, are avoided.

The special approval is never granted for a multi-component smoke and heat ventilation system as a whole but always only for an individual smoke ventilation device with actuator. In our case, this is the *cool it* smoke and heat ventilation hatch.

Paperless application for special approval

We recommend that you first take note of the comments regarding the procedure and the submission of the application issued by the building supervisory authority in the relevant German state. Unless specified to the contrary or if such comments do not exist in any given state, we recommend that you submit the application and its attached documents in duplicate.

The application for special approval should have the following structure:

RE

"To the building supervisory authority of the State of ..."
(see *List of addresses of building supervisory authorities*)

APPLICANT

- Client or on behalf of client
- Architect
- Specialist planner

SPECIFICATIONS ON THE BUILDING PROJECT

- Designation, address
- Object of application: *cool it* smoke and heat ventilation hatch
- Client
- Responsible building supervisory authority subdivision
- Person responsible for draft, possibly number or reference of building application

THE APPLICATION SHOULD BE ACCOMPANIED BY

- Expert Assessment *Halfkan und Kirchner: "Fire protection assessment of ceiling hatches for smoke ventilation in cold stores and freezer rooms" version 11.12.2014*. Please request the complete document from your responsible sales person.
- Request for special approval
- Specifications on the installing company (if already known)
- Number and dimensions of the employed smoke and heat ventilation hatches
- Explanation of the building's fire protection concept, in particular in the case of buildings of a special type or intended for a special use. In particular, this should include a presentation of the requirements regarding the function of the *cool it* smoke and heat ventilation hatch for the purposes of evacuation within the framework of the individual fire protection concept.
- Possibly specifications of any approvals already issued for special cases for which the object of the application is the same. The number or reference of the application should be cited.

List of addresses of building supervisory authorities

BADEN-WÜRTTEMBERG

Landesstelle für Bautechnik
Konrad-Adenauer-Straße 20
72072 Tübingen
Tel.: +49 (7071) 757-0

BAVARIA

Staatsministerium des Innern
Postfach 221253
80502 München
Tel.: +49 (89) 2192-02

BERLIN

Senatsverwaltung für
Stadtentwicklung und Umwelt
Württembergische Straße 6
10707 Berlin
Tel.: +49 (30) 90139-4340

BRANDENBURG

Landesamt für Bauen und
Verkehr, Dezernat 35
Bautechnisches Prüfam
Gulbener Straße 24
03046 Cottbus
Tel.: +49 (3342) 4266-3500

BREMEN

Der Senator für Umwelt, Bau
und Verkehr
Ansgaritorstraße 2
28195 Bremen
Tel.: +49 (421) 361-2407

HAMBURG

Behörde für Stadtentwicklung
und Wohnen, Amt für
Bauordnung und Hochbau
Neuenfelder Straße 19
21109 Hamburg
Tel.: +49 (40) 42840-2214

HESSEN

Ministerium für Wirtschaft, Ener-
gie, Verkehr und Landesentwick-
lung, Referat VI 3
Kaiser-Friedrich-Ring 75
65185 Wiesbaden
Tel.: +49 (611) 815-2954

MECKLENBURG-VORPOMMERN

Ministerium für Wirtschaft, Bau
und Tourismus, Abteilung 5
Johannes-Stelling-Straße 14
19053 Schwerin
Tel.: +49 (385) 588-0

LOWER SAXONY

Ministerium für Soziales,
Gesundheit und Gleichstellung,
Abteilung 5,
Hinrich-Wilhelm-Kopf-Platz 2
30159 Hannover
Tel.: +49 (511) 120-0

NORTH RHEIN-WESTFALIA

Ministerium für Bauen, Wohnen,
Stadtentwicklung und Verkehr,
Abteilung VI
Jürgensplatz 1
40219 Düsseldorf
Tel.: +49 (211) 3843-0

RHEINLAND-PALATINATE

Ministerium der Finanzen, Abt. 5,
Kaiser-Friedrich-Straße 5
55116 Mainz
Tel.: +49 (6131) 16-0

SAARLAND

Ministerium für Inneres und
Sport, Referat F/4
Keplerstraße 18
66117 Saarbrücken
Tel.: +49 (681) 501-4231

SAXONY

Landesdirektion Sachsen,
Referat 37, Landesstelle für
Bautechnik
Braustraße 2
04107 Leipzig
Tel.: +49 (341) 977-3700

SAXONY-ANHALT

Ministerium für Landesentwick-
lung und Verkehr, Referat 2
Turmschanzenstraße 30
39114 Magdeburg
Tel.: +49 (391) 567-01

SCHLESWIG-HOLSTEIN

Innenministerium, Abteilung IV 2,
Düsternbrooker Weg 92
24105 Kiel
Tel.: +49 (431) 988-0

THÜRINGEN

Ministerium für Infrastruktur und
Landwirtschaft, Referat 24
Postfach 900362
99106 Erfurt
Tel.: +49 (361) 37-91249

Calculation of opening area

All the formulae used for the calculations are taken from the assessment by *Halfkann & Kirchner* "Expert Assessment: "Fire protection assessment of ceiling hatches for smoke ventilation in cold stores and freezer rooms" (version 11.12.2014). The configuration and calculation of the number of hatches must be undertaken in the light of the full assessment.

Limit opening angle

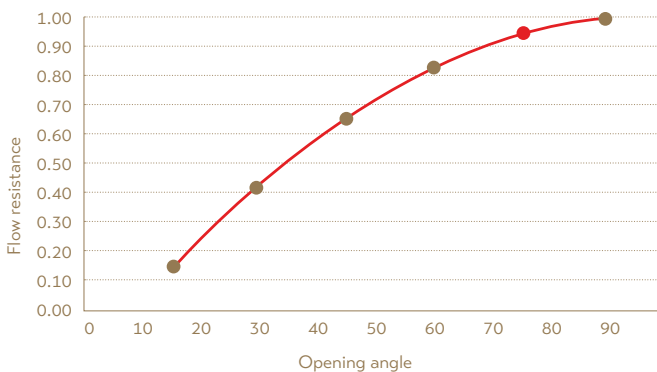
The geometrical opening area ($A_{\text{geo}} = CW \times CH$) of the clear ceiling opening is achieved even at a relatively small **limit opening angle of 40 °** (cylinder stroke 350 mm). This is therefore the minimum opening angle required in order to be able to perform the calculation in accordance with the assessment.

Pinch effects at the ceiling opening

A **rating factor of 0.6** can be used as the default value for the flow resistance of components with no particular aerodynamic design that are exposed to flows.

Deflection and pinch effects at the mounted hatch flap

The factor for the **drag coefficient** for hatches with smaller opening angles must be determined from the diagram below:



Geometrical opening area

$$A_{\text{geo}} = \text{clear width} \times \text{clear height}$$

Aerodynamically effective opening area

$$A_w = A_{\text{geo}} \times 0.6 \times \text{drag coefficient}$$

Configuration procedure for rooms < 1600 m²

In most cases, the smoke ventilation of cold stores or freezer rooms in order to provide qualitative assistance in fire-fighting is provided for and/or demanded by the fire service. Values are usually specified for the geometrical clear opening areas A_{geo} that are to be installed. This is frequently the case for rooms with a floor area of up to 1600 m² in accordance with German industrial building regulations (IndBauRL 03.2000, section 5.7). If only A_{geo} is required, then it can be assumed that:

$$A_w = A_{\text{geo}} = 1.28 \text{ m} \times 2.5 \text{ m} = \mathbf{3.2 \text{ m}^2}$$

Calculation for a standard hatch for rooms > 1600 m²

$$A_{\text{geo}} = 1.28 \text{ m} \times 2.5 \text{ m} = \mathbf{3.2 \text{ m}^2}$$

$$A_w = 3.2 \text{ m}^2 \times 0.6 \times 0.95 = \mathbf{1.82 \text{ m}^2}$$

In the case of a standard hatch, reducing the cylinder stroke results in the following aerodynamically effective opening area:

OPENING ANGLE	CYLINDER STROKE	DRAG COEFFICIENT	AERODYN. OPENING AREA
77 ° (standard hatch)	600 mm	0.95	1.82 m²
63 °	500 mm	0.83	1.59 m²
48 °	400 mm	0.70	1.34 m²
41 °	350 mm	0.60	1.15 m²

Our options

for the factory extension
of ceiling hatches

Do you need support?

Do you need any support
in the planning of your project?
cool it will work with you through
every phase of your project.
We would be happy to provide
you with all the necessary infor-
mation. Just contact us

Phone **+49 (0) 54 22 6 09-0**

OPTION 3

24 V control panel for SHEVs

OPTION 2

Door contact switch

OPTION 1

Reduction of installation height

OPTION 1

Reduced installation height through the factory installation of cylinders with reduced stroke

The *cool it* smoke and heat ventilation hatch can be supplied with **four different opening angles as standard**. This means that the system **can be adapted to the existing spatial configuration of the false ceiling** in your building project. The limit opening angle of 41° in accordance with the assessment by *Halfkann und Kirchner* is adhered to in the standard cylinders.

If the existing space requirement is smaller than that indicated in the table at the bottom right, we can design customer-specific hatches that

also comply with the assessment by *Halfkann und Kirchner*. To do this it is possible to determine the optimum combination of clear width and opening angle. In addition, at the customer's request, it is possible to implement any intermediate cylinder stroke between 350 and 600 mm. Although cylinder strokes of less than 350 mm are possible in principle, they are no longer covered by the assessment issued by *Halfkann und Kirchner*.

We would be delighted to produce a drawing of your specific installation situation for you in order to check the freedom of movement and assembly position of the hatch. Please contact your *cool it* team.

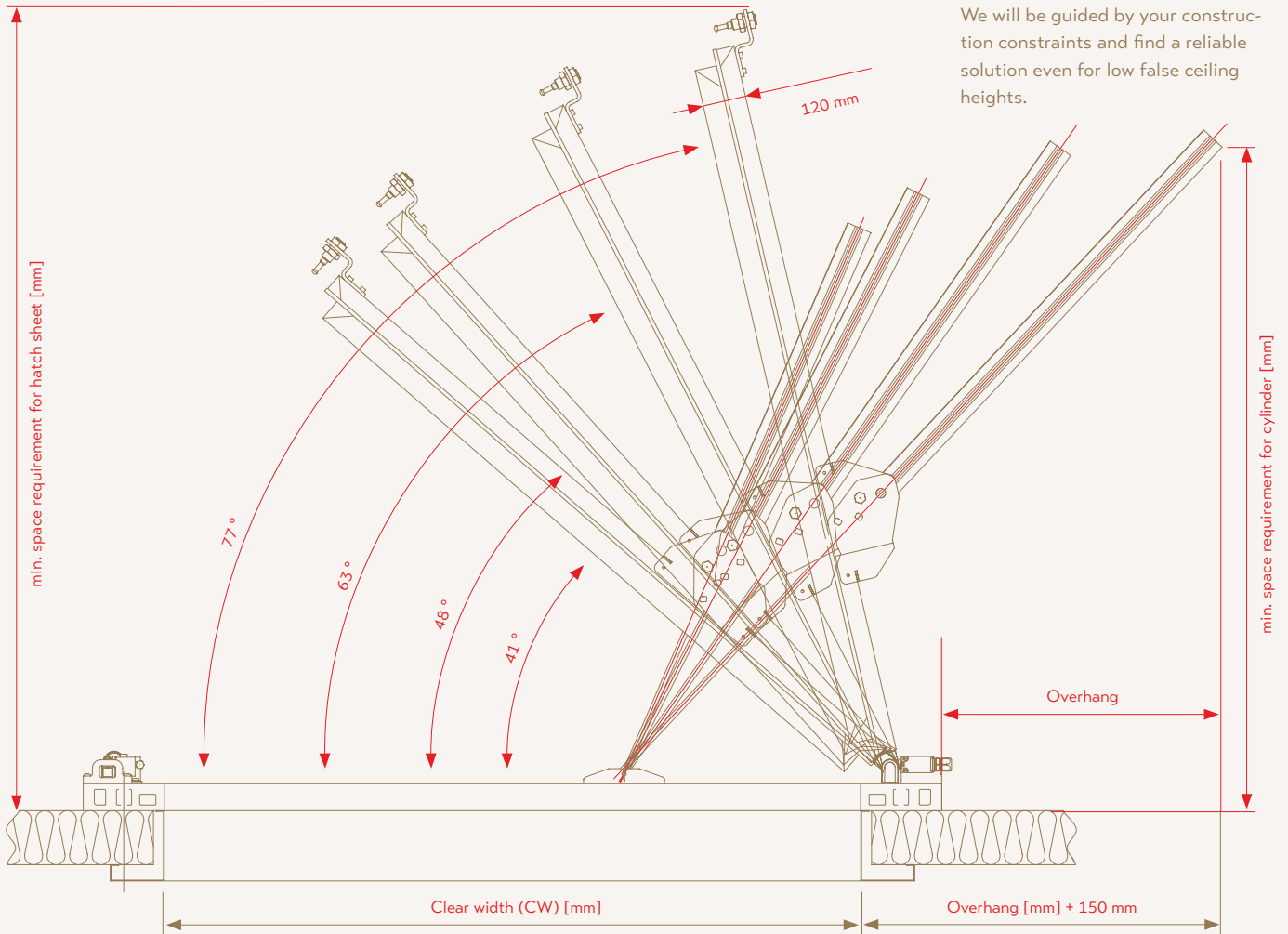


Cylinder

Installing cylinders with reduced stroke makes it possible to reduce the installation height.

Adaptability

We will be guided by your construction constraints and find a reliable solution even for low false ceiling heights.



Technical data

OPENING ANGLE	CYLINDER STROKE (mm)	MIN. SPACE REQUIREMENT FOR HATCH SHEET (mm)							MIN. SPACE REQ. FOR CYLINDER (mm)	OVERHANG (mm)
		BL 800	BL 900	BL 1000	BL 1100	BL 1200	BL 1300	BL 1350		
77°	600	1045	1140	1240	1335	1435	1530	1580	1335	520
63°	500	970	1055	1145	1235	1320	1410	1455	1300	235
48°	400	850	925	1000	1075	1150	1215	1260	1210	-60
41°	350	780	845	910	980	1045	1110	1145	1150	-165

OPTION 2

Door contact switch for reporting "hatch open" or "hatch closed"

The hatch can be optionally equipped with contact switches for **monitoring its position**. These are needed, for example, as feedback contacts to the control system in a mechanical ventilation system.

If you plan to realize your construction project using a mechanical smoke evacuation solution, it is essential that you read **Appendix 1** in this brochure. Please also request our information material on **risk assessments for mechanical smoke ventilation in combination with smoke and heat ventilation hatches**.

In **option 2.1**, a feedback contact can be installed on

the belt side of the hatch. This switch can be set to emit a signal either when the hatch is **fully open** or when it is in the **closed position**.

In **option 2.2**, a feedback contact can be installed on the closing side of the hatch in order to monitor the **closed position**.

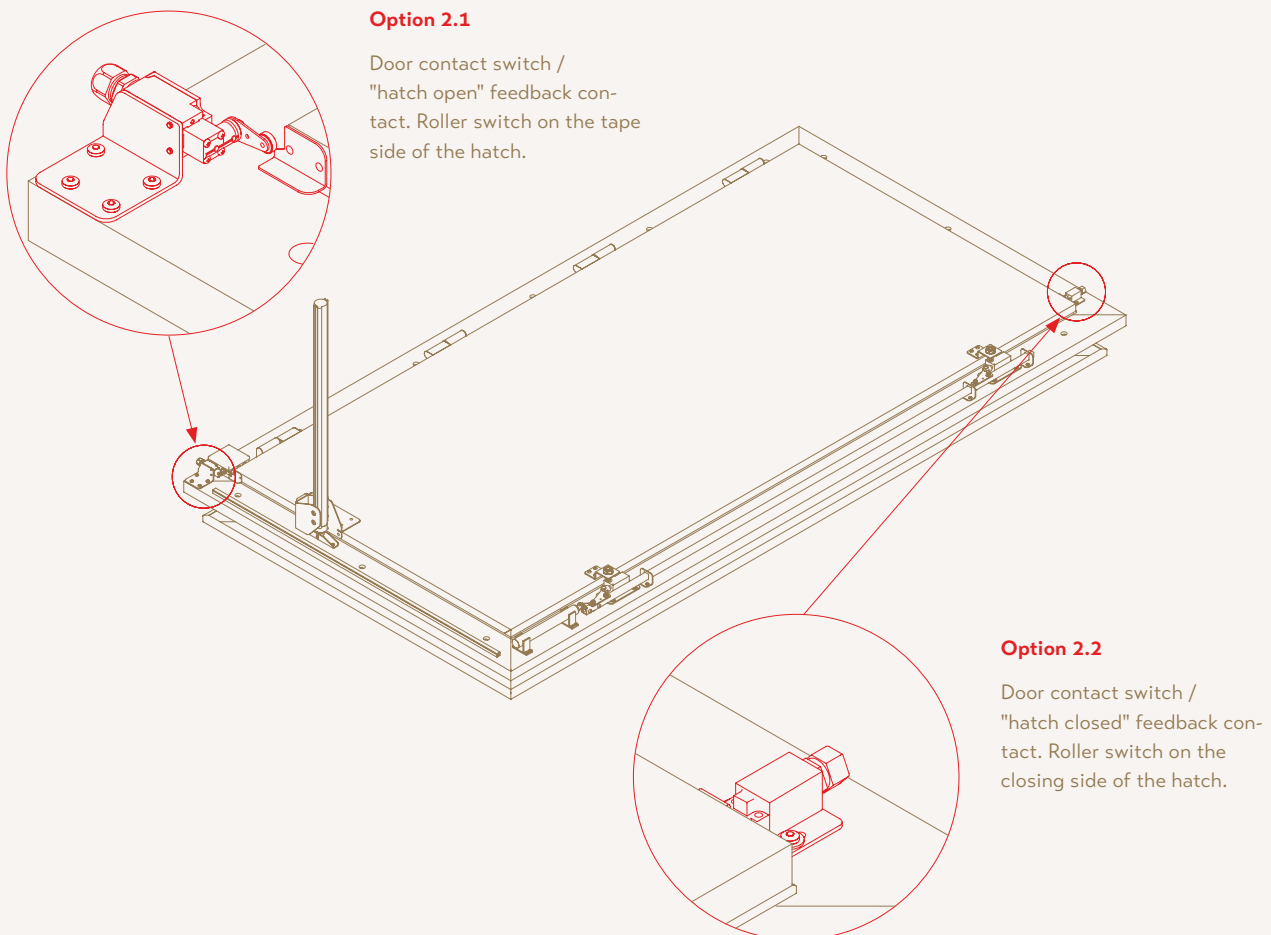
Option 2.1



Option 2.2



Technical data	OPTION 2.1	OPTION 2.2
TYPE	Door contact switch for polling "hatch open"	Door contact switch for polling "hatch closed"
ITEM NUMBER	52-021	52-006
RATED INSULATION VOLTAGE	$U_i = 500 \text{ V}$	$U_i = 400 \text{ V}$
RATED IMPULSE WITHSTAND VOLTAGE	$U_{imp} = 6 \text{ kV}$	$U_{imp} = 4 \text{ kV}$
CONTINUOUS THERMAL CURRENT	$I = 10 \text{ A}$	$I = 6 \text{ A}$
SAFETY CLASS	IP67 in accordance with ICE/EN 60529	
UTILIZATION CATEGORY	AC-15 230V/4A, AC-13 24V/1A	AC-15 230V/6A, AC-13 24V/1A
TYPE OF CIRCUIT	Normally Closed (NC) / Normally Open (NO)	
CONNECTION CROSS-SECTION	$0.75 \text{ mm}^2 - 2.5 \text{ mm}^2$	max. 2.5 mm^2 (incl. end sleeves)
TEMPERATURE RANGE	$-30 \text{ }^\circ\text{C}$ to $+80 \text{ }^\circ\text{C}$	$-20 \text{ }^\circ\text{C}$ to $+80 \text{ }^\circ\text{C}$
LOAD APPLICATION	M20 x 1.5	
SWITCHING SYSTEM		Snap-action
REGULATIONS	EN ISO 13849-1, EN 60947-5-1, BG-GS-ET-15	



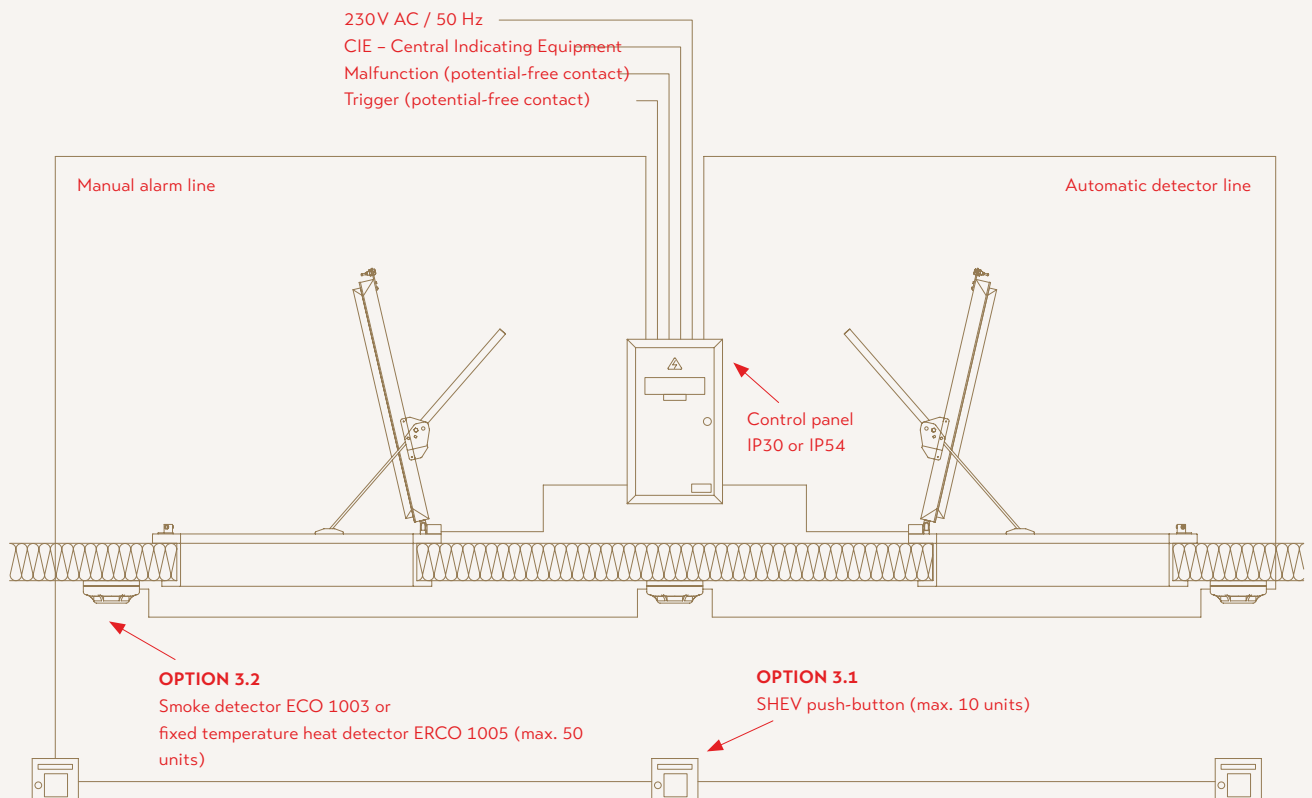
OPTION 3

Diagrammatic presentation of a complete system for the operation of an RWA12 hatch

Operation of the *cool it* smoke and heat ventilation hatches requires a 24V power supply. This can be provided by the customer. Alternatively, the *cool it* company is able to supply all the components required for the operation of the smoke and heat ventilation hatches.

The diagram below illustrates a complete system consisting of hatches, backup power supply, automatic detectors (smoke detectors or fixed temperature heat detectors) and manual alarms (push-buttons for manual activation).

You will find all the necessary components in the options below.



Function

In the event of a fire, a signal is sent to the hatch's spindle motors and the hatch opens. The open pulse can be initiated by means of three different signals:

- 1 **manually by pressing a smoke and heat ventilation "Trigger" push-button (option 3.1),**
- 2 **automatically by a connected smoke or heat detector (option 3.2),**
- 3 **by the fire alarm system installed in the building.**

If necessary or if requested by the fire service, the opened smoke and heat ventilation hatch can be closed again by a reset command. To do this, the smoke and heat ventilation trigger action is first acknowledged using the Reset button at the smoke and heat ventilation push-button. The close button at the smoke and heat ventilation push-button itself or the close button on the circuit board on the control panel can then be used to close the hatches again.

At 10A, the smallest available smoke and heat ventilation control unit is able to power two *cool it* hatches. The distances between the hatches must be considered here because the actuators are direct current devices (see table *Determining the cable cross-section*).

Depending on the structural constraints and the number of hatches to be installed, we are able to select an appropriately dimensioned control panel.

The following requirements and observations must be adhered to:

- State building regulations
- DIN 18232 *Structural Fire Protection in Industrial Buildings*
- VdS Guideline 2098
- Provisions set out by the responsible fire prevention authority
- Guideline ZH 1/494 *Powered windows, doors and gates*
- VDE 0100, VDE 0108
- The provisions of the responsible power supply companies
- Clarify the required cable types with the responsible building and fire prevention authorities
- Take account of the most recent versions of the technical documentation from the company *Jofo Pneumatik* (version 02/2014: *Control panel EN 230V/24V – Technical documentation – development status: July 2013, Data sheet on load cut-off for LA-F sequence controller, 28.05.2013*)

Determining the cable cross-section

NUMBER OF SHEV HATCHES	MAXIMUM CURRENT	CABLE CROSS-SECTION	MAX. SINGLE DISTANCE	CONTROL PANEL
1	4 A	2 × 1.5 mm ²	21 m	5A-1-1
1	4 A	2 × 3 mm ²	42 m	5A-1-1
2	8 A	2 × 4 mm ²	28 m	15A-1-1
2	8 A	2 × 6 mm ²	42 m	15A-1-1
3	12 A	2 × 8 mm ²	37 m	15A-1-1
3	12 A	2 × 12 mm ²	56 m	15A-1-1

The performance calculation is based on a maximum voltage loss of 2 V at a maximum motor current of 4 A.

OPTION 3

24 V control panel with backup power supply in the event of mains failure

The **24V control panel is a smoke and heat ventilation control unit with backup power supply allowing for 72 hours of operation in the event of a mains power failure.** It is used to open and close the *cool it* smoke and heat ventilation hatches.

Important for RWA12H: The backup power supply for the frame heater must be provided and monitored by the customer. The 24V control panel only powers the hatch actuators!

The type EN control panels available from us comply with the valid European standard DIN EN 12101-10. This standard specifies the requirement for a redundant power supply in the case of natural smoke and heat ventilation.

Two equivalent sources of energy are installed in this control panel version: a powerful power supply unit and rechargeable batteries.

The power supply unit is powerful enough to cover the maximum peak loads that may occur. The SHEV hatch is operated by the rechargeable batteries only if the 230V power supply fails. The employed rechargeable batteries are dimensioned in such a way that they can ensure a backup power supply for 72 hours and then still open the connected hatches twice and close them once.

Caution: Control panels that are not redundantly configured are also available on the market. With these devices, the function of the system cannot be fulfilled if the batteries fail. As a result, the actuators cannot move and the hatch does not open in the event of a fire!

Safety classes

The control panels are available with safety class IP30 (left) and safety class IP54 (right).



Technical data	SAFETY CLASS IP30	SAFETY CLASS IP54
TYPE	15A(10A)-1-1 IP30	15A(10A)-1-1 IP54
POTENTIAL-FREE CONTACTS	"SHEV triggered", "Malfunction"	
INPUTS	for CIE contact (Central Indicating Equipment)	
NUM. AUTOMAT. DETECTORS	max. 50 units ECO 1003/ECO 1005T (see option 3.2)	
NUM. SHEV PUSH-BUTTONS	max. 10 units (see option 3.1)	
MAX. NUM. SHEV HATCHES	2	
NUMBER OF TRIGGER GROUPS	1	
BOX	Sheet steel box with cylinder lock 455, greyish white (similar to RAL 9002)	Sheet steel box with sash lock, greyish white (similar to RAL 7035)
DIMENSIONS	255 mm × 440 mm × 155 mm	380 mm × 380 mm × 210 mm
WEIGHT	10.8kg	
NOMINAL BATTERY CAPACITY	7.2 Ah	
NOMINAL BATTERY VOLTAGE	24V (2 × 12V)	
NOMINAL OUTPUT	230V AC/32VA	
TEMPERATURE RANGE	Temperature class 3 as per VdS 2581 (-5°C to +40°C) Temperature class 3 as per VdS 2593 (-5°C to +40°C)	
CERTIFICATE TEST NUMBER	R 60025243	
NOMINAL OUTPUT	230V AC/32VA	

Planning the smoke and heat ventilation system

If your building project includes more than one hatch then a **custom-designed control panel** can be created for you. For this, the following information is essential:

- Situation plan of the hatches and required installation location of the control panel. Alternatively:
Distance between the control panel and each individual hatch in metres
- Number of trigger groups (e.g. total of four hatches: If all four hatches are to open at once then there is a single trigger group. If only two hatches are to be triggered by any one push-button then there are two trigger groups.)

OPTION 3.1

Optional smoke and heat ventilation push-button with weather protection cover safety class IP54

The pulse that causes the SHEV hatches to open can be triggered by manually activating an optional smoke and heat ventilation push-button. The smoke and heat ventilation push-button fulfils the following tasks:

- 1 **Trigger** the SHEV function
- 2 **Reset** the SHEV group To do this, the push-button at the top right is pressed
- 3 **Close** the SHEV group If the push-button is pressed once, the SHEV group moves autonomously in the close direction.
- 5 **Visual indication** of the operating state:
green: Operating
red: Triggered
yellow: Malfunction

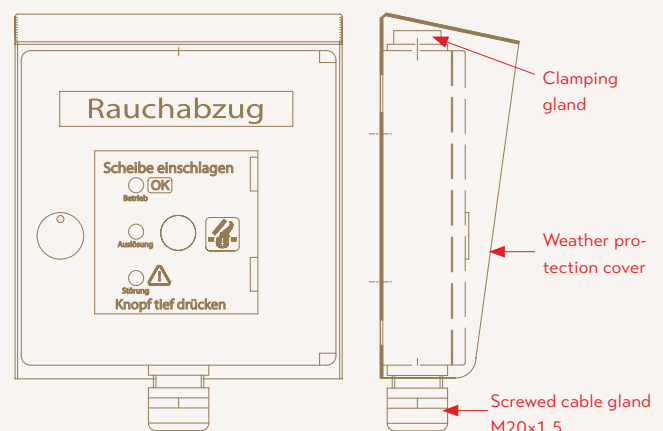
Up to 10 smoke and heat ventilation push-buttons can be combined in a line. To do this, a 33KOhm terminating resistance must be connected in the last (or only) smoke and heat ventilation push-button in the line.

Characteristic technical data

TYPE	SHEV push-button IP54
LED OPERATING VALUES	24V +50%/-30%/2mA DC1
BREAKING CAPACITY OF ALL PUSH-BUTTONS	24V +50%/-30%/20mA DC1 (normally open)
SCREW TERMINALS	max. 1.5mm ²
ENVIRONMENTAL CLASS	3 (-5°C to +40°C)
TEMPERATURE RANGE	Flame-retarded up to 90 °C
BOX	125mm x 145mm x 55mm, orange (RAL 2011), weather protection: grey (RAL 7035)

Weather protection cover

A weather protection cover is also supplied to extend the safety class to IP54.



OPTION 3.2

Optional automatic smoke or heat detector

In addition, up to 50 automatic detectors that trigger the open pulse can be connected to the control panel. It is possible to choose between the 58°C fixed temperature heat detector ECO 1005T available as **option 3.2.1** and the optical smoke detector ECO 1003 available as **option 3.2.2**. Both detectors possess a robust, flat construction for architecturally demanding environments. The bayonet connections permit easy installation. They are also fool-proofed to ensure the correct polarity of the supply voltage.

The detectors have a removable cover to simplify cleaning operations. Internally, they are equipped with an easy-to-clean insect protection. The encapsulated detector boxes prevent penetration by moisture or crawling animals (to prevent false alarms).



Option 3.2.1
Fixed temperature-
heat detector
ECO 1005T



Option 3.2.2
Optical smoke
detector ECO
1003

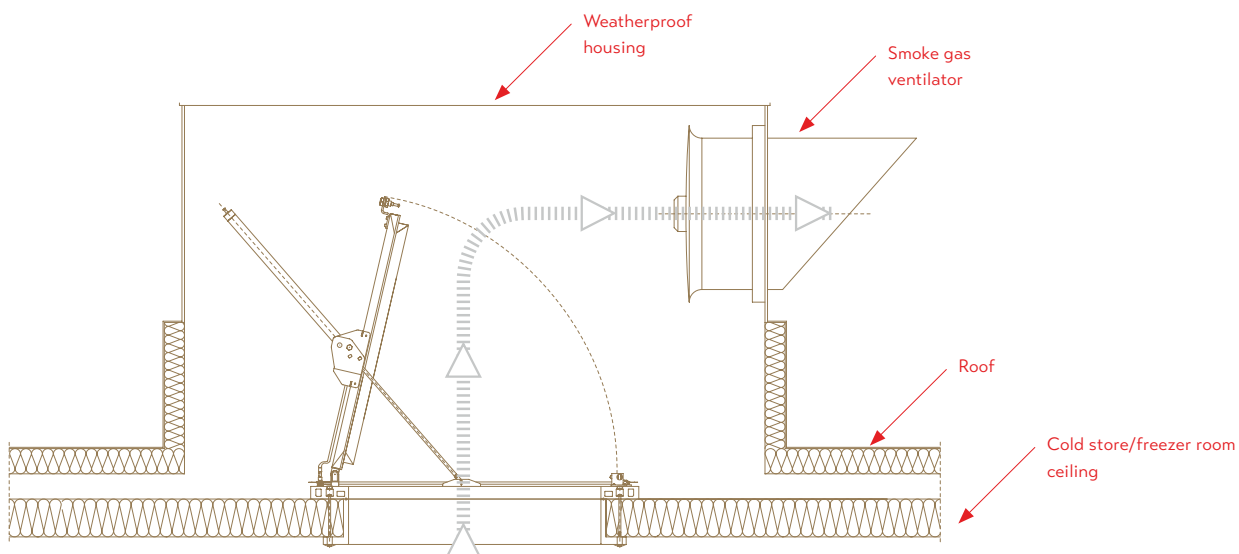
Technical data	OPTION 3.2.1	OPTION 3.2.2
TYPE	ECO 1005T fixed temperature heat detector	ECO 1003 smoke detector
OPERATING VOLTAGE	8–30V DC	
OPERATING TEMPERATURE	-30°C to +70°C	
COLOUR	similar to RAL 9016 ("traffic white")	
WEIGHT	70g + 45g base	75g + 45g base
AIR HUMIDITY	5% to 95%	
MAX. PERCENTAGE DUTY CYCLE	100% PDC	
IDLE CURRENT	55 µA (typical)	45 µA (typical)
VdS APPROVAL NUMBER	G 201073	G 201060
SAFETY CLASS	IP00	

Appendix 1 Installation examples for installation without false ceiling – Mechanical smoke evacuation

When *cool it* smoke and heat ventilation hatches are used in a **system with mechanical smoke evacuation**, it is essential to use the feedback contact (option 2.1) for the "hatch open" state and to analyse this feedback in the controller provided by the customer in the building. It is necessary to ensure that the smoke gas ventilators do not start up until the inlet and exhaust air flows are assured in the corresponding building section. If this requirement is not complied with then the company *cool it* will not accept any liability for consequential loss or damage at the building resulting from the ensuing under- or overpressure.

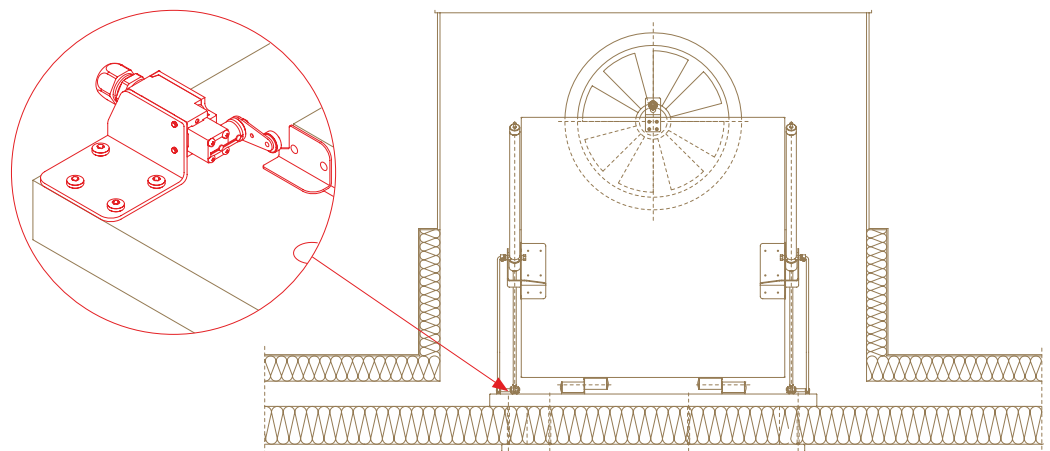
If your building project involves the use of smoke gas ventilators, please request our information material *risk assessments for mechanical smoke ventilation in combination with smoke and heat ventilation hatches* and read it carefully.

Please note that unobstructed access to the hatch must be possible at all times. There must also be sufficient space to perform assembly and maintenance work.



Example installation in a system with mechanical smoke evacuation

It is essential to use a door contact switch/"hatch open" feedback contact.

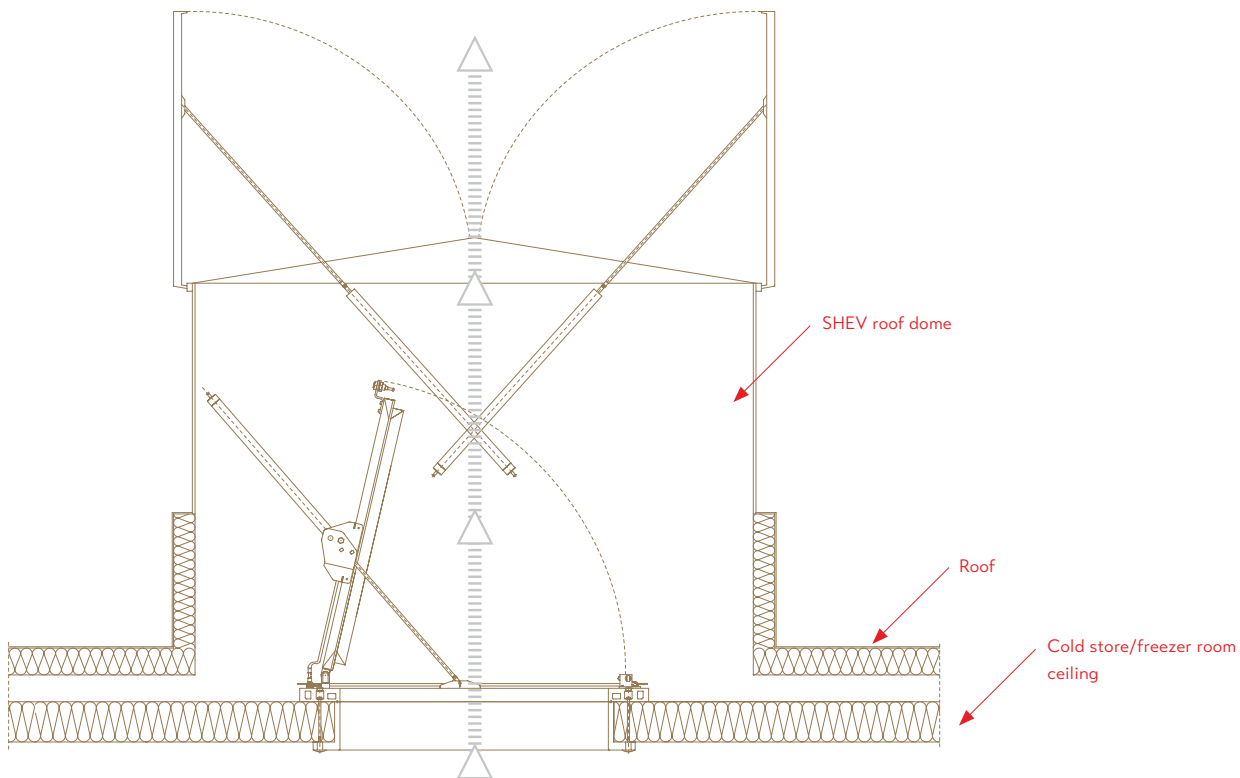


Appendix 2 Installation examples for installation without false ceiling – Natural smoke evacuation

If you plan to use natural smoke extraction in your building project then it is vitally important that the **systems are compatible with one another**. It must be ensured at the installation site that the two systems cannot interfere with one another under any circumstances. The reliability of the smoke evacuation function must be assured at all times. At the geometrical level, the installation space provided must be sufficient to enable the systems to open simultaneously

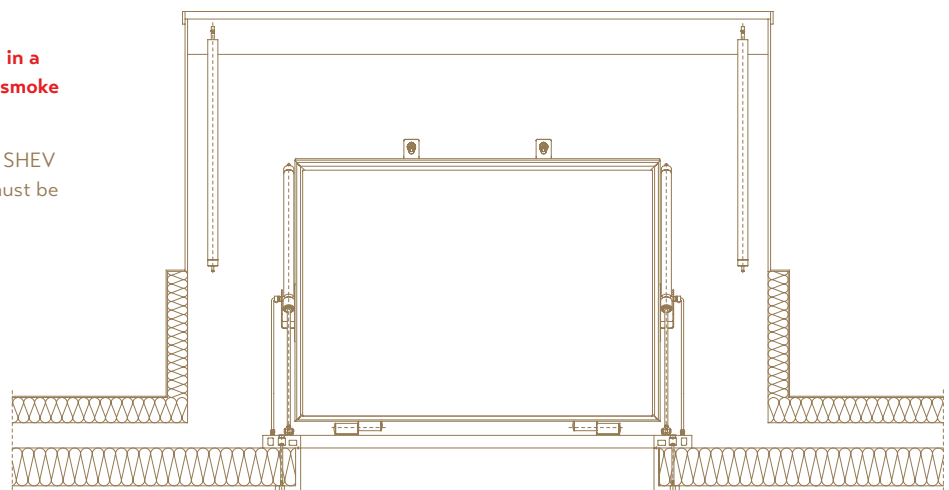
without touching one another at any point. Alternatively, it is possible to consider using a sequence controller. We are able to design an optimised hatch for these operating conditions by adapting the width of the hatch sheet and the opening angle.

Please note that unobstructed access to the hatch must be possible at all times. There must also be sufficient space to perform assembly and maintenance work.



Example installation in a system with natural smoke evacuation

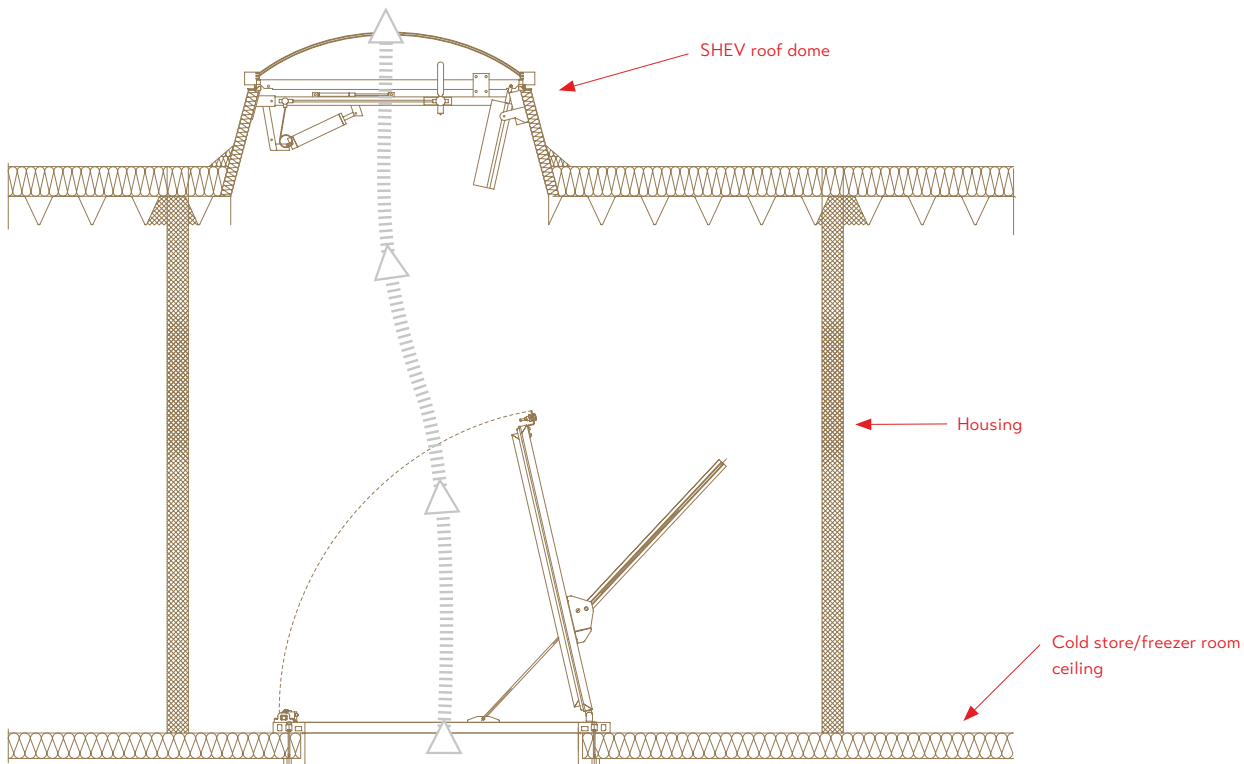
The SHEV hatch and SHEV roof dome systems must be compatible.



Appendix 3 Example realisation of installation in false ceiling with housing for smoke gas evacuation

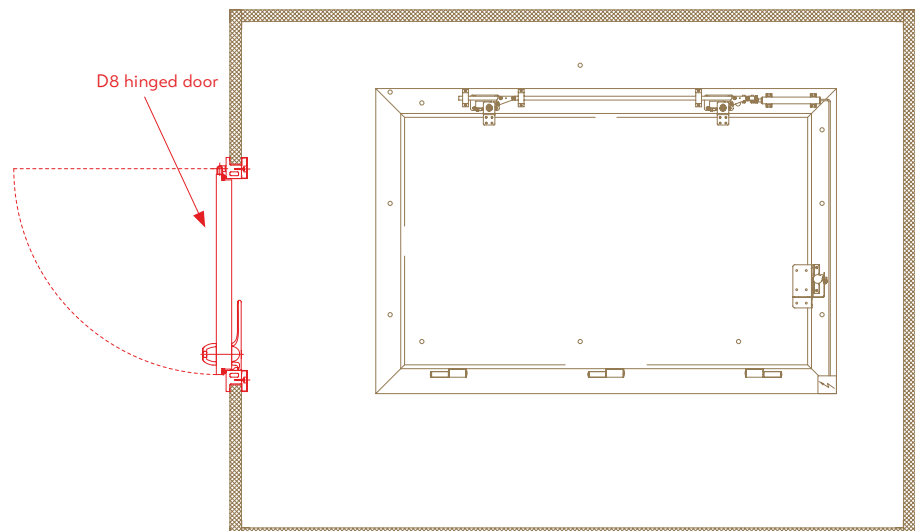
When positioning the *cool it* SHEV hatch relative to the smoke evacuation hatches in the roof, it is important to ensure that the rising air is aerodynamically guided as optimally as possible. It is essential to avoid unnecessary eddying. As far as possible, therefore, there should be no cables etc. in the vicinity of the rising smoke gas.

The optimum design variant has an additional housing going from the false ceiling to the roof. When planning this housing, it is essential to take account of the free space for the drive cylinders (see option 2). In addition, it is necessary to allow for sufficient space for installation and maintenance work. The space required for this should be approximately 500 mm on all sides.



Unhindered, rapid access must be ensured at all times.

If hatches are opened involuntarily in freezer rooms then they must be closed again as quickly as possible. Because pneumatic systems have to be closed manually, it is necessary to ensure rapid access via a hinged door. In such cases, it is advisable to install a *cool it* type D8 hinged door. In freezer rooms, it is advisable to use *cool it* SHEV hatches with electrical actuator which close automatically within 20 seconds at the touch of a button!



Appendix 4 Notes on maintenance and inspection of the SHEV system

The regular, professional maintenance and inspection of the cool it SHEV hatches is essential in order to ensure the permanent correct functioning of the system.

Maintenance is a vital obligation on the part of the owners or operators of the building and is stipulated in various laws, ordinances, guidelines and other regulations. (e.g. §3 of the German standard building regulations: "Building systems must be arranged, installed and maintained in such a way that [...] in particular, there can be no risk to life and health." §4 Ordinance on workplaces (ArbStV), Special requirements relating to workplace operation (1): "The employer must maintain the workplace and ensure that any identified deficiencies are eliminated immediately. If deficiencies that are associated with a direct hazard cannot be eliminated immediately then work must be suspended."). If the necessary maintenance work is not carried out then the building owner or operator faces the risk not only of fines and the closure of the works by the authorities but also the loss of any warranty entitlements.

Frequency of maintenance

Servicing and maintenance of the SHEV system must be performed at regular intervals in accordance with DIN 18232 RWA and DIN 57833 (VDE 833) and at least once a year as per the manufacturer's specifications and these activities must be recorded in the inspection log. In addition, a half-yearly visual inspection must be carried out by the operator (DIN 18232-2).

Inspection log

The inspection log must be kept by the operator of the system. It documents the operator's fulfilment of their obligation to maintain the SHEV system in a way that ensures that it is fit for use and operation.

Authorised companies

Maintenance and service work may only be performed by qualified specialist companies in accordance with the above-mentioned DIN standard. Qualified companies are the installer/manufacturer of the system or companies trained by or designated as qualified by *cool it*. When replacing wear or spare parts, it is necessary to use original *cool it* spare parts. Only in this way is it possible to ensure that all the system components interact correctly and without error (system compatibility).

Maintenance agreements

cool it offers the corresponding maintenance agreements. During these maintenance operations, only the *cool it* SHEV hatches are inspected and not the entire system.

This maintenance does not replace the inspection of smoke evacuation systems to be performed in accordance with DIN 15232 part 2, DIN 57833 part 1.

The annual inspection is performed automatically by specialist personnel. The agreement on dates and monitoring of the services are naturally undertaken by *cool it*.



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