

EDITION

3

RWA12

RWA12H

Ceiling hatch with pneumatic actuation

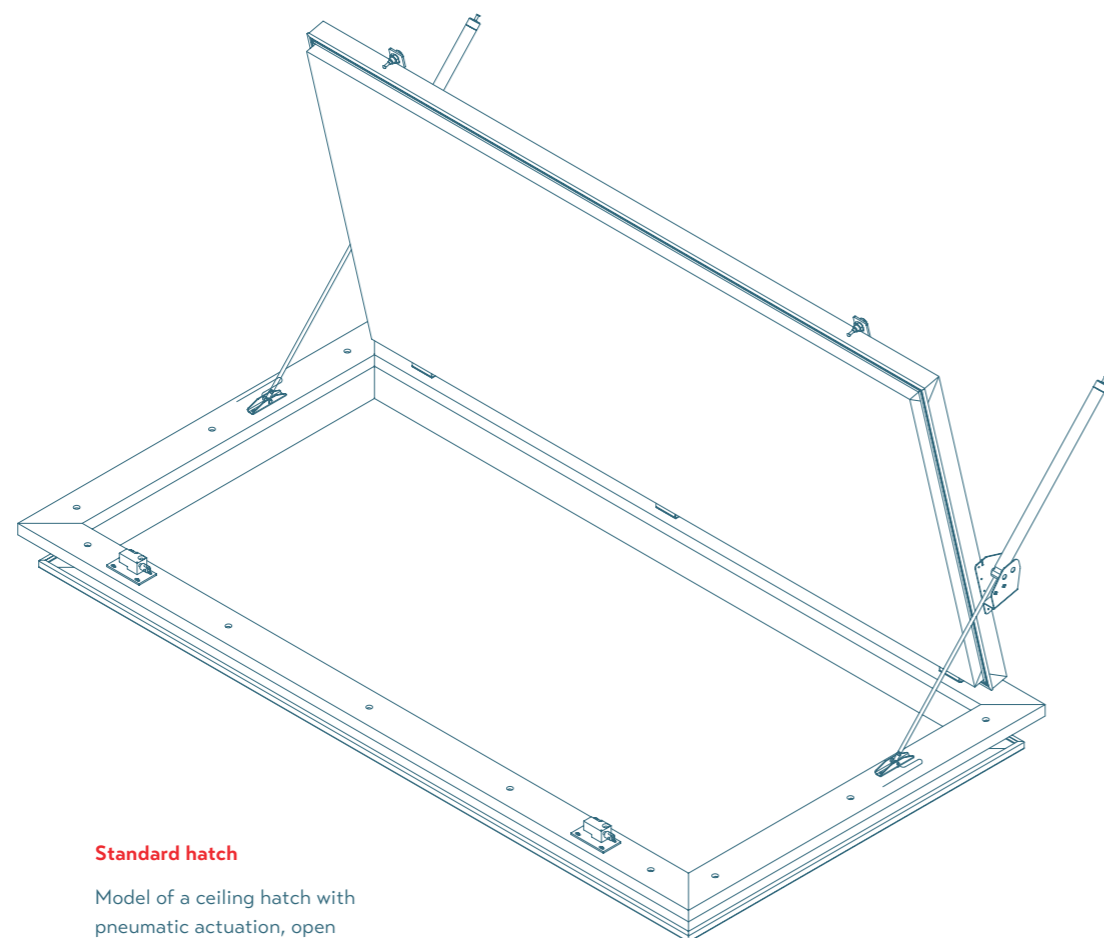
Smoke ventilation systems for cold stores and freezer rooms

Please make sure that you are informed about the current status of this document. This is a technical information sheet. All calculations must be performed in accordance with the Expert Assessment issued by *Halfkann und Kirchner*, version 11.12.2014.

The publication of an updated version supersedes and renders obsolete any previous versions. Please ask your responsible sales person for information. Thank you!

VERSION: OCTOBER 2016

Whenever a reliable thermal room sealing point is required, *cool it* has proven itself to be a strong partner for over 30 years. And *cool it* also excels with innovative solutions in the field of fire protection doors and smoke and heat ventilation systems. There are more than ten years of experience underpinning every *cool it* evacuation hatch. The results of this continuous further development are top-quality, evacuation hatches for cold stores and freezer rooms that have proven themselves in practical use – as independent experts have testified.



Standard hatch

Model of a ceiling hatch with pneumatic 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.

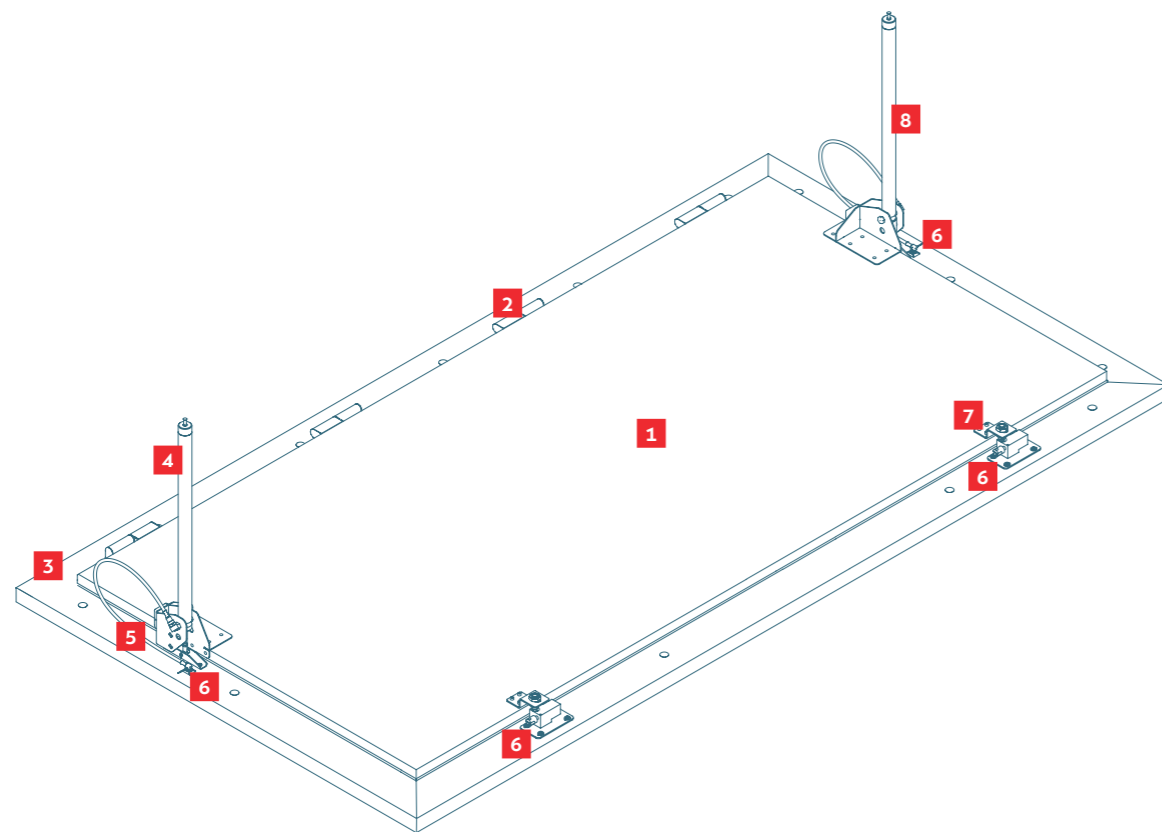
In the past, the available protective mechanisms (circuit breaker and residual current device) did not provide adequate protection against hazardous arc faults, whether serial or parallel in nature. The FSS extends these systems and consequently reduces the probability of fires resulting from electrical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



- | | | |
|--|---|---|
| <p>1 Ceiling hatch type RWA12/ RWA12H, 12 cm sheet thickness</p> <p>2 cool it belts</p> <p>3 Thermotec frame 150 x 50 mm (type RWA12H: with flush-mounted heater)</p> | <p>4 Pneumatic cylinder with integrated locking mechanism</p> <p>5 Flexible connecting hose</p> <p>6 Connection to the CO₂ system provided by the customer, 6 mm cutting ring fitting</p> | <p>7 Locks on opening system (locking units)</p> <p>8 Pneumatic cylinder with integrated locking mechanism and end position locking</p> |
|--|---|---|

CO₂ inlet screw connection

The standard hatches RWA12 and RWA12H are supplied factory-fitted with CO₂ inlet screw connections.

After triggering, the hatches must be closed manually.

Optionally, the hatch can be supplied factory-fitted with the complete piping (see option 1).



Locking unit

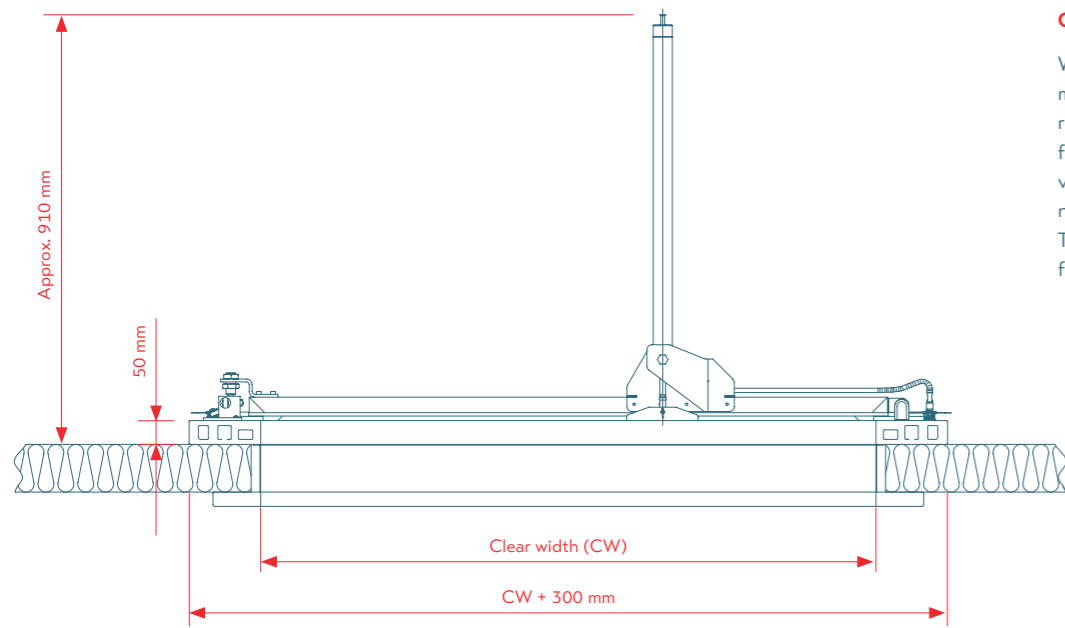
VdS-approved locking units of type Jofo TS 6000 P are used for the hatches.



Technical information

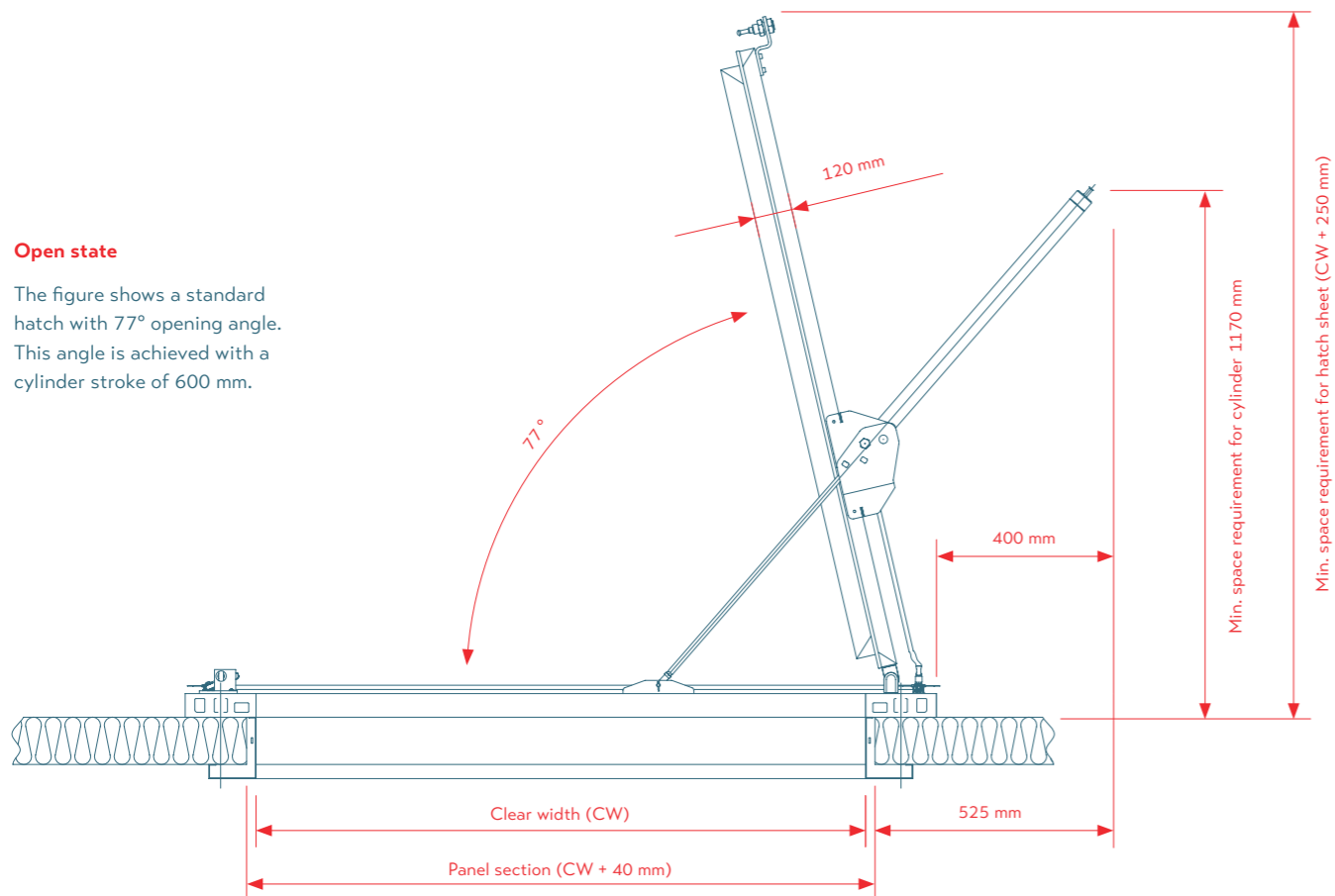
	RWA12 HATCH FOR COLD STORES	RWA12H HATCH FOR FREEZER ROOMS
DIMENSIONS		
Standard size	1280 mm x 2500 mm	
Max. size	1350 mm x 2800 mm (on assessment)	
Min. size	1000 mm x 1000 mm (on assessment, smaller sizes are also possible at the technical level)	
Weight for standard size	approx. 130 kg	
TYPE OF INSTALLATION		
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		
Top side of hatch sheet	Stainless steel or 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 x 50 mm	
MECHANICAL CONSTRUCTION		
Pneumatic cylinder	Jofo, PCV 32, Type 00 and 04	
Locking units	Jofo, TS 6000 P	
OPENING AREA STANDARD SIZE		
Aerodynam. cross-section A _w	Calculation using the example of a standard-size ceiling hatch (1.28 m x 2.5 m) in rooms of up to 1600 m ² : 1.28 m x 2.5 m = 3.2 m² (corresponds to A _{geo}) and in rooms larger than 1600 m ² : 1.28 m x 2.5 m x 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 x CH[m] + 2 x CW[m]) x 50 W The capacity of all the heaters connected to a fuse must be less than 1000 W.
Fire safety switch FSS (optional)		1. Fire safety switch + residual current device/ circuit breaker 2. Fire safety switch + circuit breaker if the required residual current device is already provided by the customer upstream in the building.
SHEV SYSTEM (PROVIDED IN BUILDING)		
Filling volumes	1.35 litres for the complete system as of the screw connection	
CO ₂ quantity	100 grams at -5 °C	
Pressure	Initial pressure: 25 bar ; final pressure: max. 60 bar	

The ceiling hatches in detail



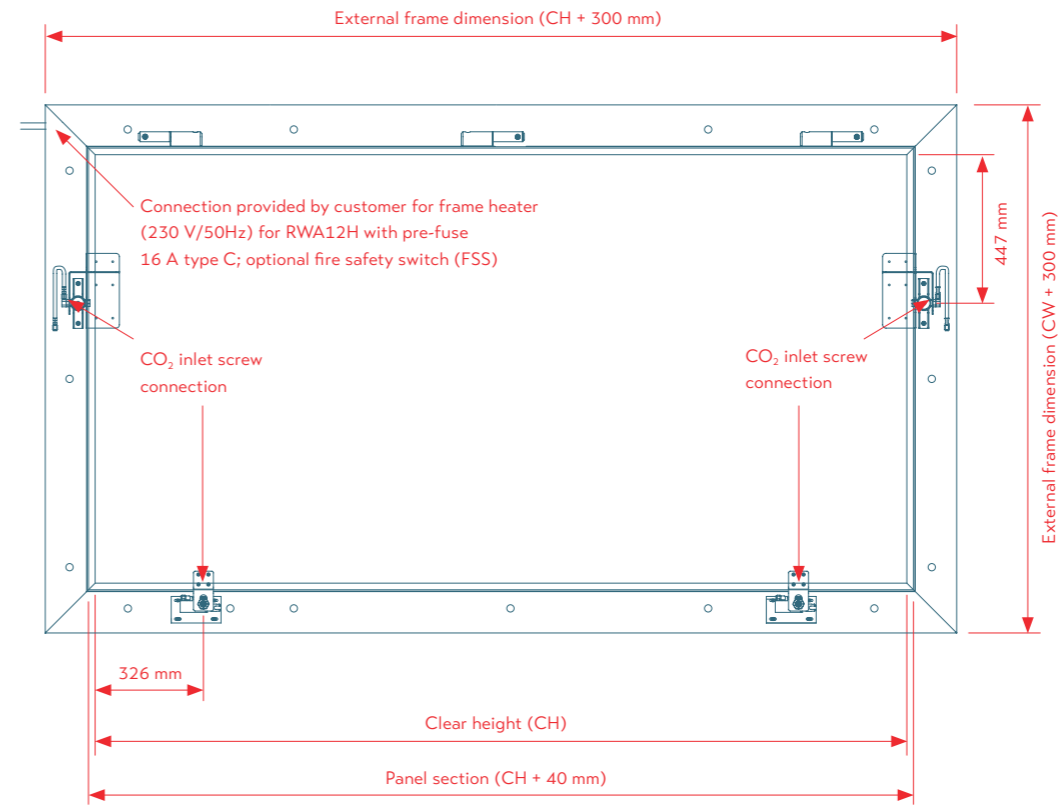
Closed state

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.

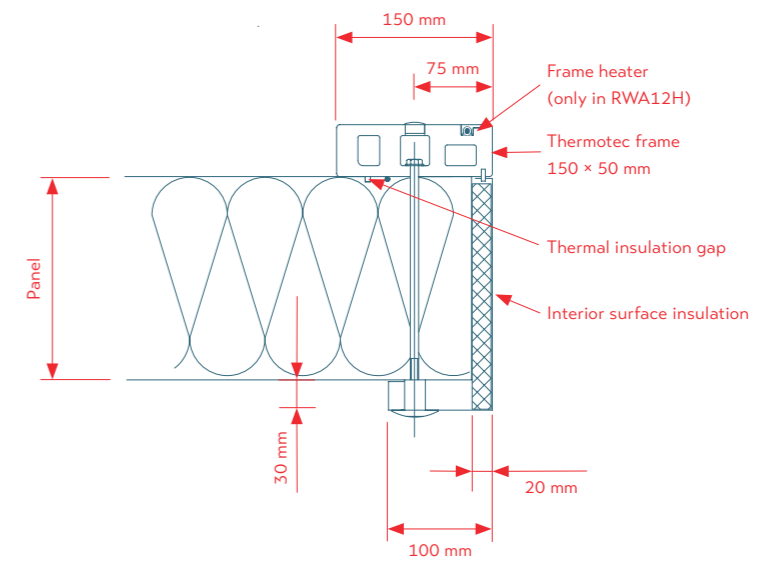


Top view

We supply the standard hatch in the sizes 1280 mm x 2500 mm. The minimum dimensions are 1000 mm x 1000 mm and the maximum dimensions 1350 mm x 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.



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, Energie,
Verkehr und Landesentwicklung,
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 Landesentwicklung
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

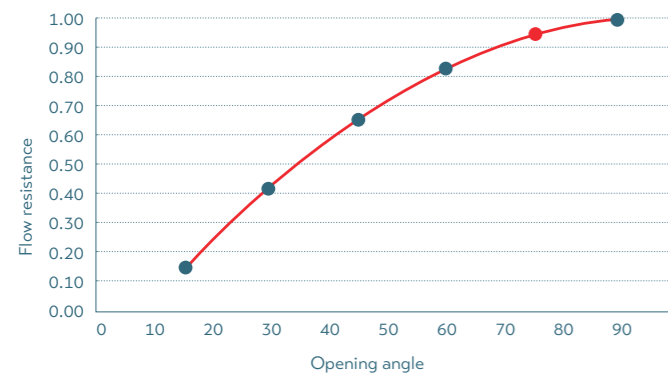
The geometrical opening area ($A_{geo} = CW \times CH$) of the clear ceiling opening is achieved even at a relatively small **limit opening angle of 40 °** (cylinder stroke 350 mm). This is therefore the minimum opening angle required in order to be able to perform the calculation in accordance with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

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

Aerodynamically effective opening area

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

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:

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

Calculation for a standard hatch for rooms > 1600 m²

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

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

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 information. Just contact us

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

OPTION 1

Factory-fitted internal piping at a central connection with approved flexible hoses

Optionally, the hatch can be supplied factory-fitted with the **complete piping**. In this case, the system is equipped with a central connection in the form of a 6-mm cutting ring fitting. This can be connected directly to the standard 6-mm SHEV piping. The piping is made from approved steel-braided flexible hoses.

The actual pipework is usually executed by the supplier of the SHEV domes in the outer skin. This supplier also provides the alarm boxes and installs a branch to the *cool it* SHEV hatches if the simultaneous opening of the hatches is desired.

Alternatively, it is possible to **install independent piping** for the *cool it* SHEV hatches and create an interface to the system provided by the customer (see Appendix 2).

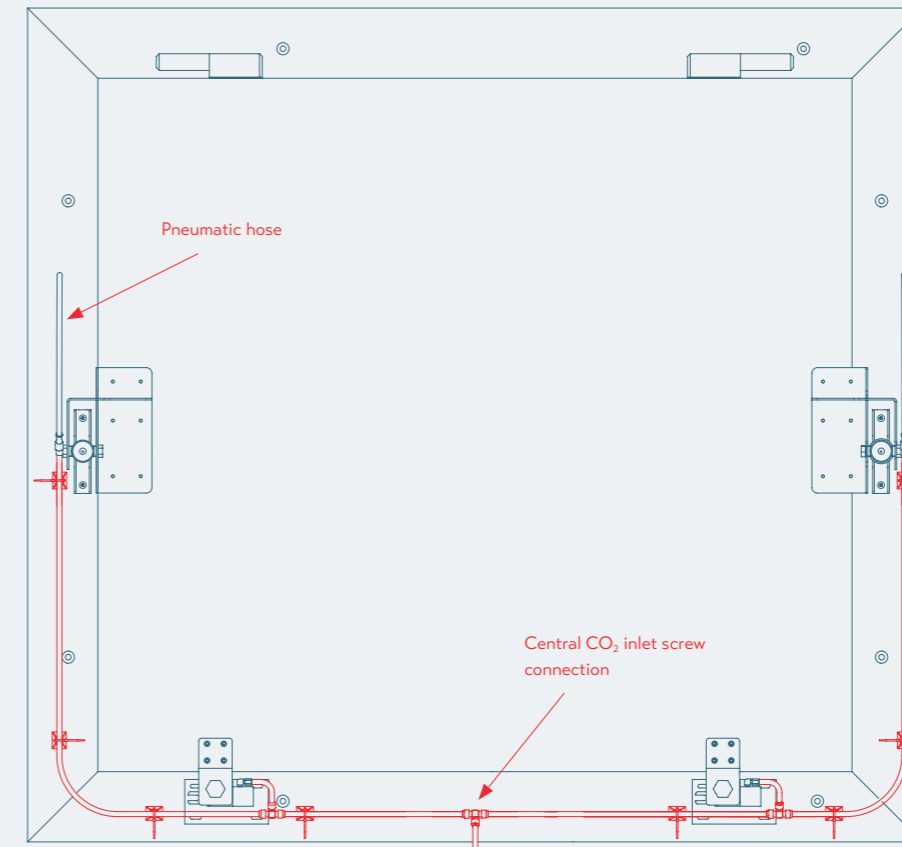
Piping

VdS-approved flexible hose is used for the connection to the SHEV system provided by the customer.



Locking mechanism

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



Top view

The piping with approved steel-braided flexible hoses (red) and central CO₂ inlet screw connection (bottom).

OPTION 2

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.

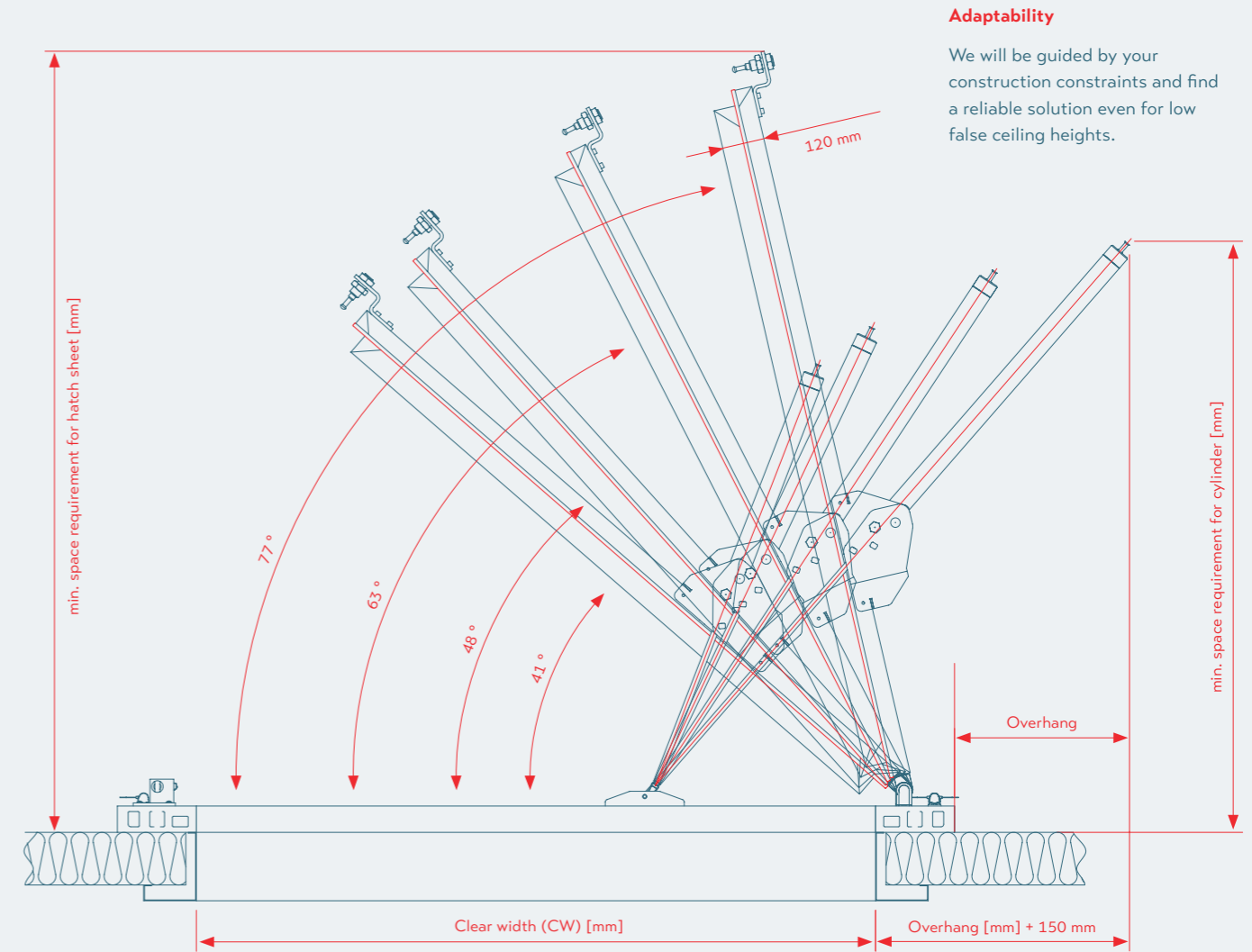
If the existing space requirement is smaller than that indicated in the table at the bottom right, we can design customer-specific hatches that also comply with the assessment by *Halfkann und*

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	1170	390
63 °	500	970	1060	1145	1235	1325	1410	1455	1125	130
48 °	400	850	925	1000	1075	1150	1215	1265	1025	-150
41 °	350	780	845	915	980	1045	1115	1145	955	-240

OPTION 3

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 3** 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 3.1**, 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 3.2**, a feedback contact can be installed on the closing side of the hatch in order to monitor the **closed position**.

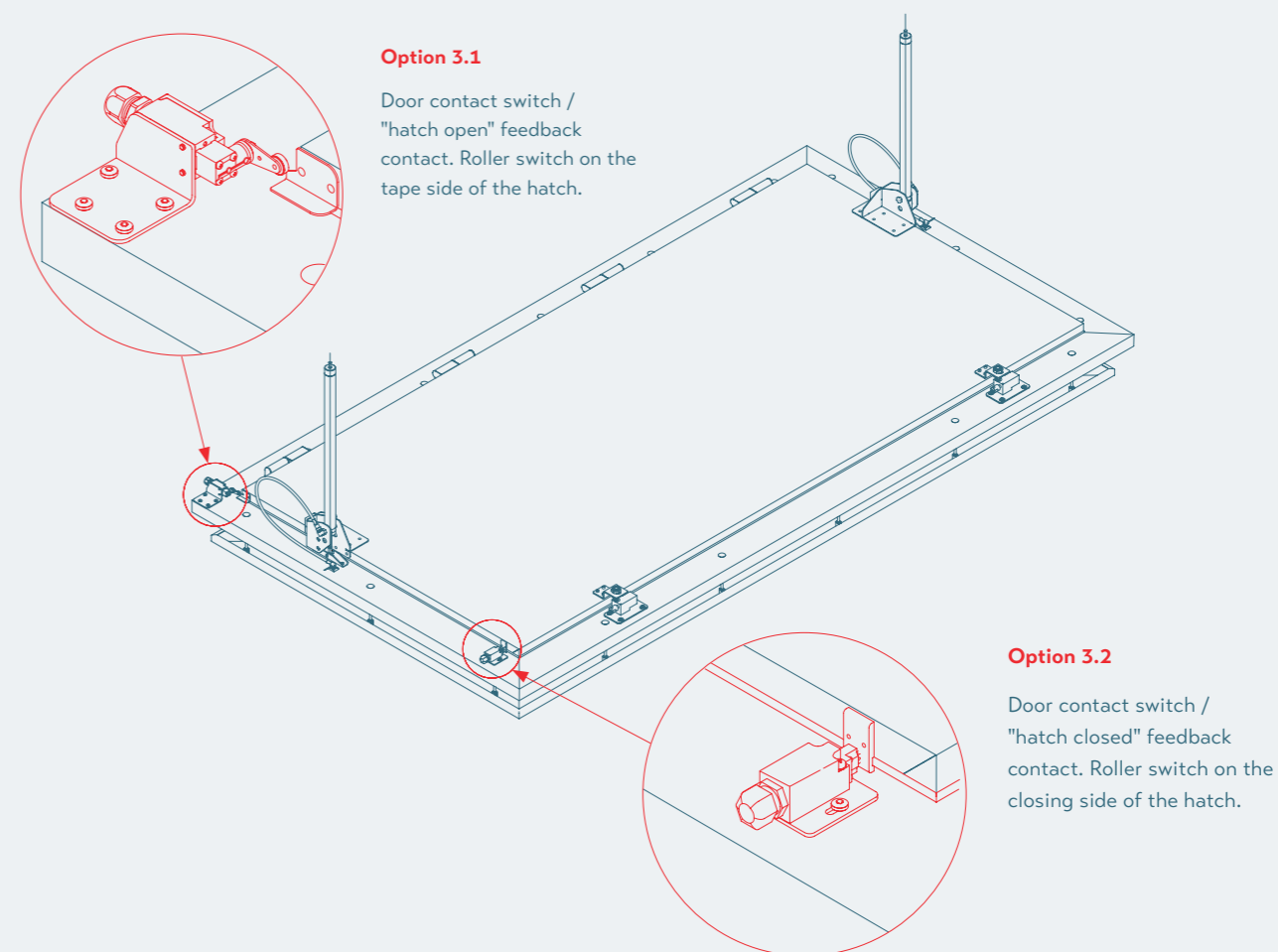
Option 3.1



Option 3.2



Technical data	OPTION 3.1	OPTION 3.2
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 4

Electrical remote initiation

The hatches are triggered individually via a decentralised CO₂ supply

Electrical remote initiation is also possible by means of the VdS-approved system TAG 692-40 (VdS approval number G 592013). This is a decentralised CO₂ trigger unit. In this case, an integrated fire detection element (glass piston) is destroyed by a solenoid and the CO₂ stored in the energy source (CO₂ bottle) is released.

To provide additional security, the glass pistons trigger automatically at 68 °C depending on type.

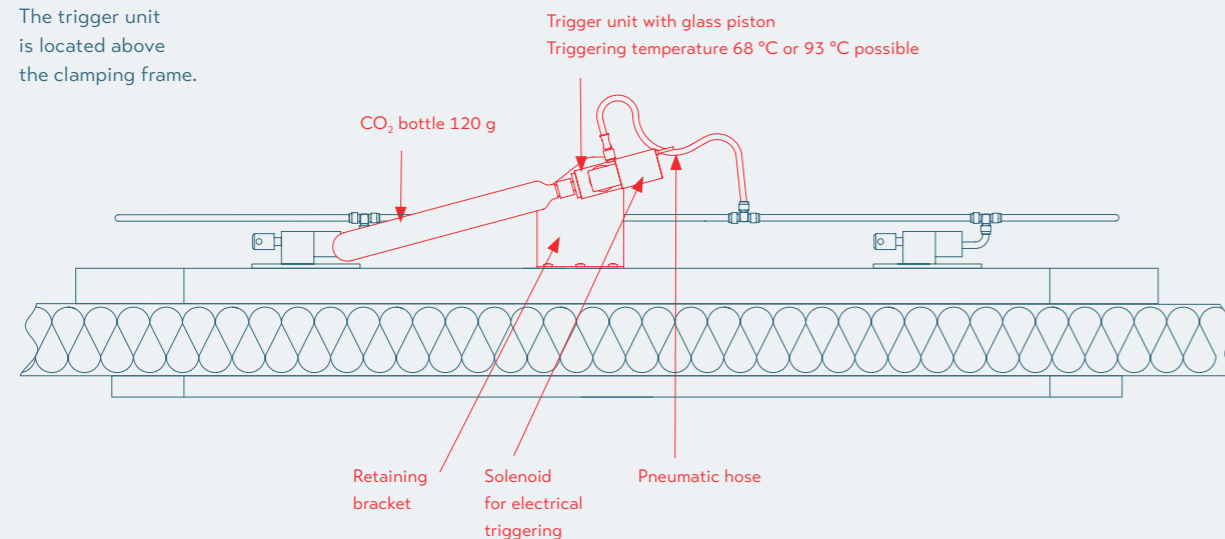
The glass pistons and CO₂ bottle are consumable items and must therefore be replaced each time they are triggered. The fire detection element and the CO₂ bottle must be installed by qualified, expert personnel. If you should need any assistance in bringing the system into service, please contact our service department.

Technical data

TRIGGERING VOLTAGE	24 V DC
CAPACITY/IDLE CURRENT	1.6 W
CAPACITY/PULSED CURRENT	3.5 W
CONNECTING CABLE	Two-core, calculation based on line length and number of units
PERCENTAGE DUTY CYCLE	100 % PDC
TEMPERATURE RANGE	-20 °C to +80 °C
ENERGY SOURCE	CO ₂ bottle 120 g

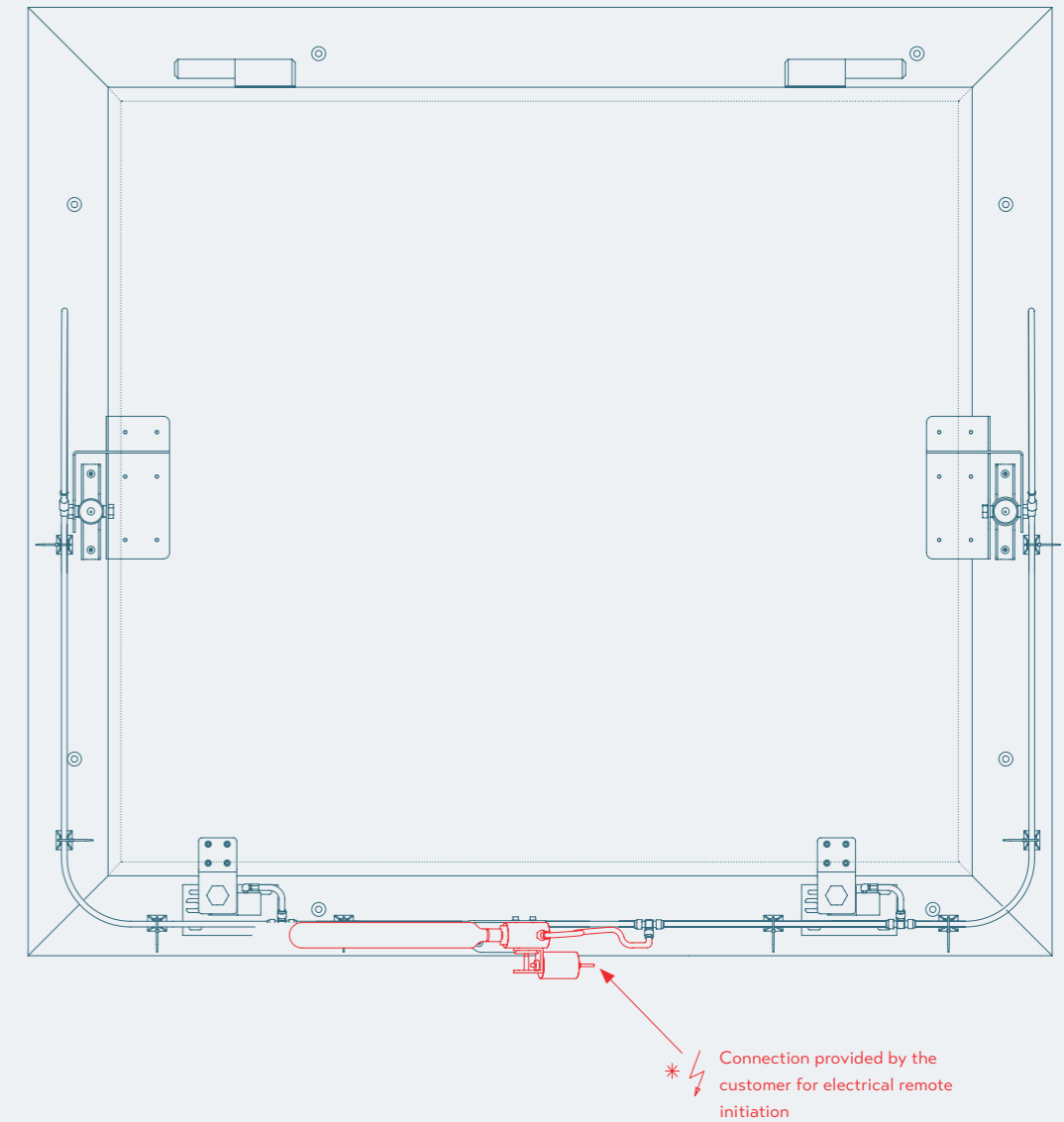
Side view

The trigger unit is located above the clamping frame.



Top view

Decentralized trigger unit In this case, each hatch is supplied individually. There is no need for a central CO₂ supply. In the example illustrated here, the hatch is controlled via an electrical trigger unit.



Trigger unit

Complete trigger unit with integrated fire detection element and solenoid.

OPTION 5

Thermal triggering of individual hatches at the clamping frame via a decentralised CO₂ supply

Thermal triggering of individual hatches (option 5.1) is possible by means of the VdS-approved system TAG 690-WV-41. This is a decentralised CO₂ trigger unit. In this case, if a fire occurs, an integrated fire detection element (glass piston) is destroyed by the heat and the CO₂ stored in the energy source (120-g CO₂ bottle) is released.

The TAG is supplied in aluminium as standard. The TAG can alternatively be supplied in stainless steel for areas requiring intensive cleaning.

If the hatches are **also to be triggered via a central SHEV system provided by the customer** (option 5.2) then a separate connection can be provided for this SHEV system. This takes the form of an additional flexible connection on the frame side for a 6-mm pipe.

Electrical remote initiation (option 5.3) is also possible by means of the VdS-approved system TAG 692-40 (VdS approval number G 592013). This is a decentralised CO₂ trigger unit. In this case again,

an integrated fire detection element (glass piston) is destroyed by a solenoid and the CO₂ stored in the energy source (CO₂ bottle) is released. Alternatively, the unit triggers automatically when the triggering temperature of the fire detection element is exceeded. This temperature level is determined by the type of glass piston.

Because of the **IP 00** safety class, this variant should not be used in areas that are wet-cleaned if at all possible.

Due to the method of installation, fragments of glass necessarily fall into the unit after triggering. In addition, the solenoid is made of aluminium for design reasons and is therefore attacked and destroyed by the cleaning agents used in the food industry. If the use of this system is required in the building then the frequency of maintenance must be adapted accordingly and the systems replaced.



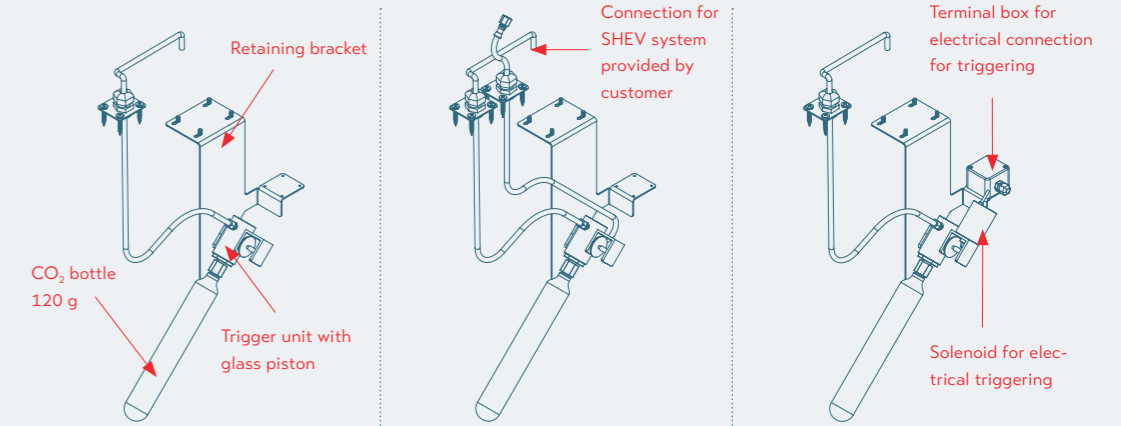
Trigger unit

Left: fully assembled trigger unit for mounting at the angle bracket frame

Right: the 120-g CO₂ bottle as energy source



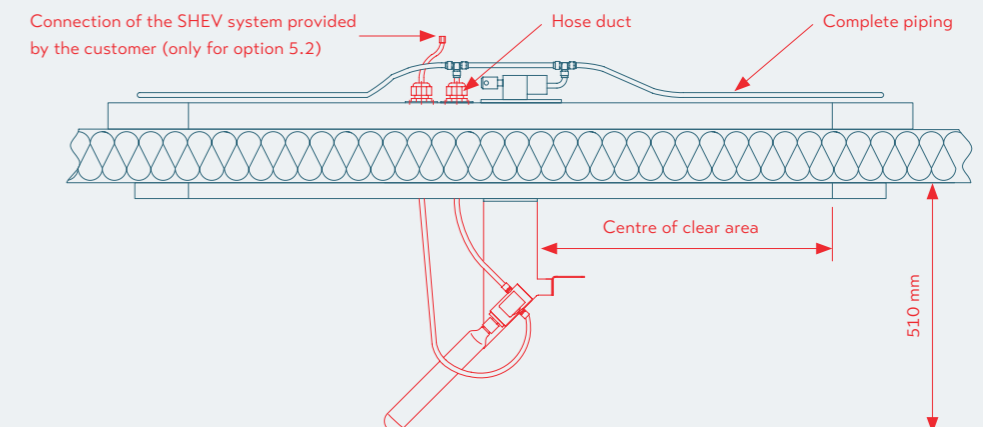
Variants and technical data



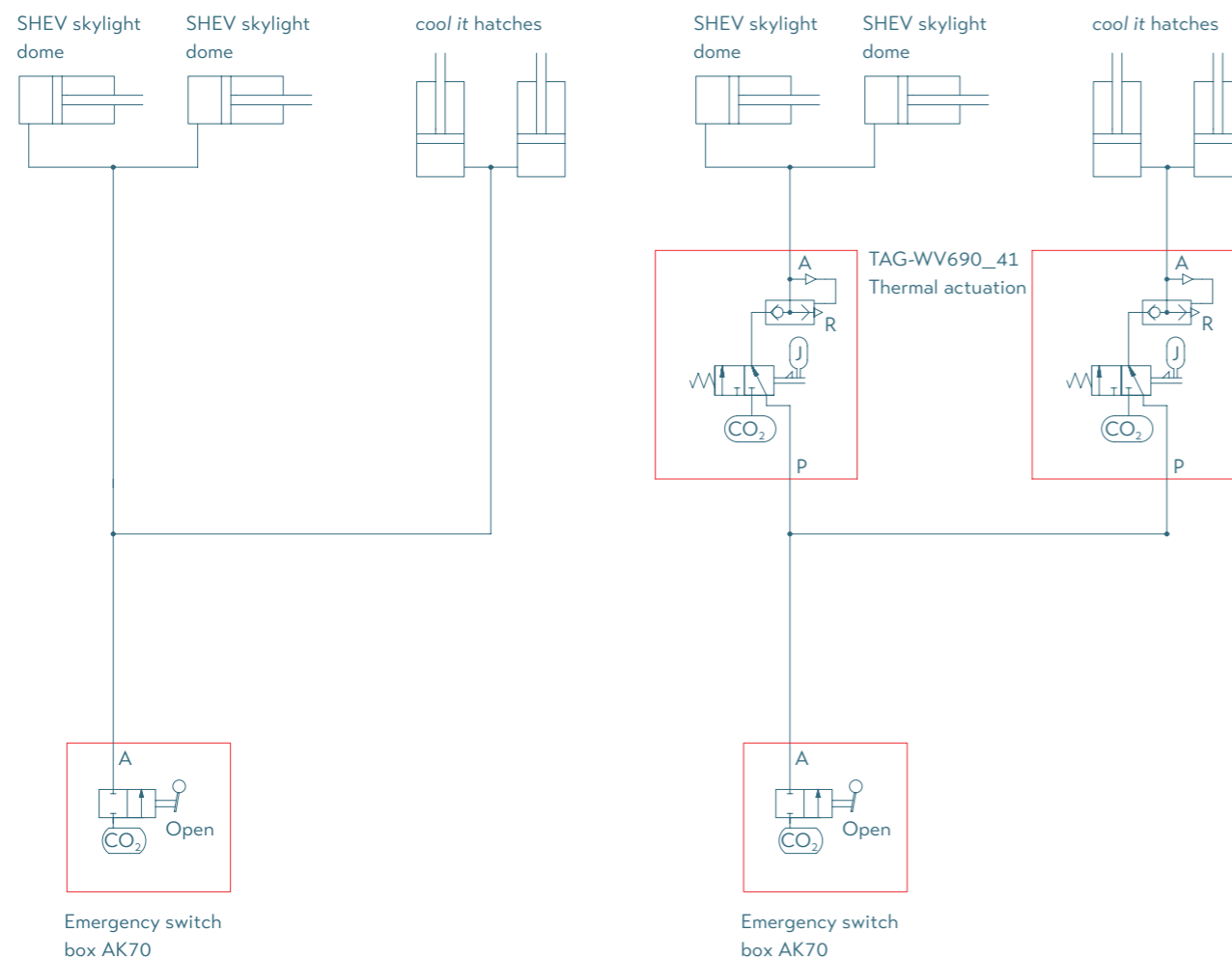
	OPTION 5.1	OPTION 5.2	OPTION 5.3
TRIGGERING METHOD			
Thermal triggering with fire detection element	✓	✓	✓
Connection to the CO ₂ system provided by customer		✓	
Electrical triggering via signal provided by the customer			✓
THERMAL TRIGGERING			
Fire detection element	Standard: Glass piston 68 °C (optional: 93 °C, 141 °C, 182 °C)		
Energy source	CO ₂ bottle 120 g		
Material	Standard: Aluminium (optional: available in stainless steel)		
Ambient temp. for use	-25 °C to +80 °C		
ELECTRICAL TRIGGERING			
Triggering voltage			24 V DC
Capacity			Idle current 1.6 W, pulsed current 3.5 W
Connecting cable			Two-core, calculation based on line length and number of units
Percentage duty cycle			100 % PDC
Temperature range			-20 °C to +80 °C
Safety class			IP 00

Position (here based on the example of option 5.3)

The trigger unit is positioned in the centre of the clear area below the frame. It can be connected to the piping through a hose duct.



Appendix 1 Connection examples for the standard hatch



Supply via an emergency switch box provided by the customer

The *cool it* hatches are supplied with CO₂ via the SHEV system (emergency switch box). The required quantity of CO₂ must be calculated by the specialist SHEV company performing the work in the light of the characteristics of the building (line lengths, temperatures, etc.). The required corresponding specifications of the filling volumes can be found in the *Technical Data*.

Supply via an emergency switch box provided by the customer with thermal triggering of individual hatches

The *cool it* hatches are supplied with CO₂ via the SHEV system. The hatches also possess an individual triggering mechanism that opens the hatch when the triggering temperature is reached at the fire detection element (option 5.2).

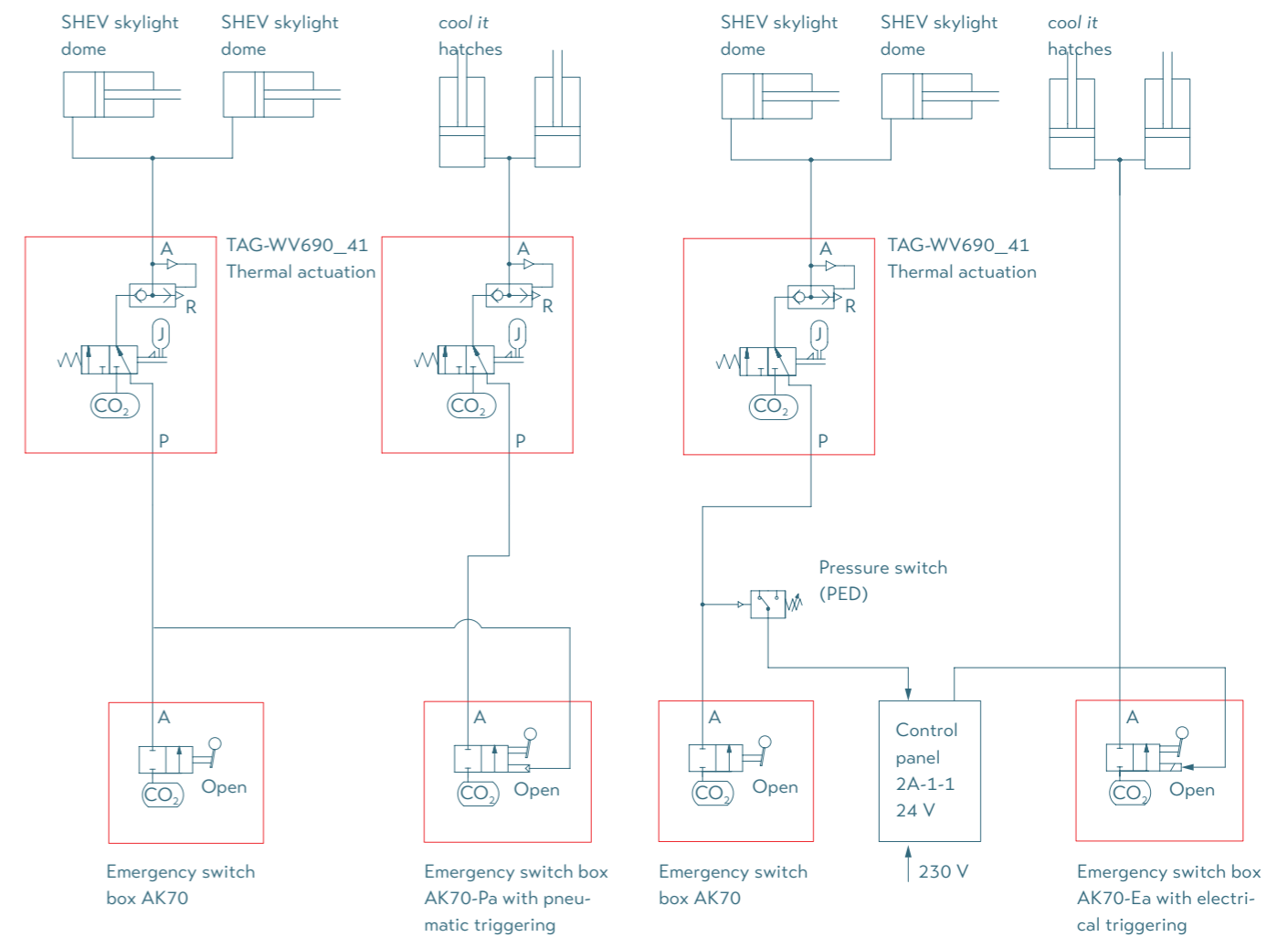
Appendix 2 Interface between different areas of activity

If, for example for warranty-related reasons, the *cool it* SHEV hatches are not to be connected to the SHEV system provided by the customer for the ceiling hatches, then there are various ways of **separating the different areas of activity**.

In this case, the supply to the hatches is provided by a separate emergency switch box. However, because the systems necessarily have to be triggered at the same time, it

is necessary to create an **interface between the different areas of activity**. Below, by way of example, we present two possible ways of connecting the systems to one another. The systems can be interconnected via a **pneumatic or electrical interface** for example.

There are also various other ways of creating interfaces, including for group triggering. Please contact us to design a tailor-made, custom-specific solution for you.



Pneumatic interface

In this case, it is necessary to establish a pneumatic line between the emergency switch boxes. Because, in this case, this is simply a signal line, the additional amount of CO₂ that must be provided by the emergency switch boxes for the skylight domes is minimal. It is only necessary to take account of the volume of the laid line length and the pressure switches.

Electrical interface

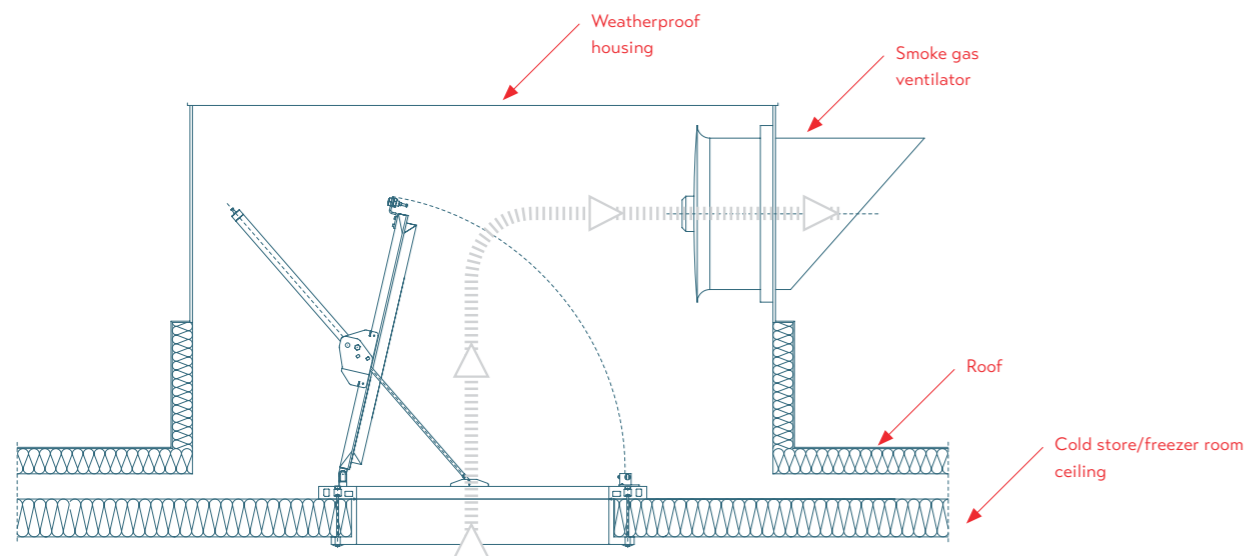
In this case, a pressure switch is installed in the supply line of the SHEV system for the skylight domes. If this part of the system is triggered, the signal from the pressure switch is electrically transmitted to a control panel which in turn triggers the emergency switch boxes and opens the *cool it* hatches.

Appendix 3 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 3.1) 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.

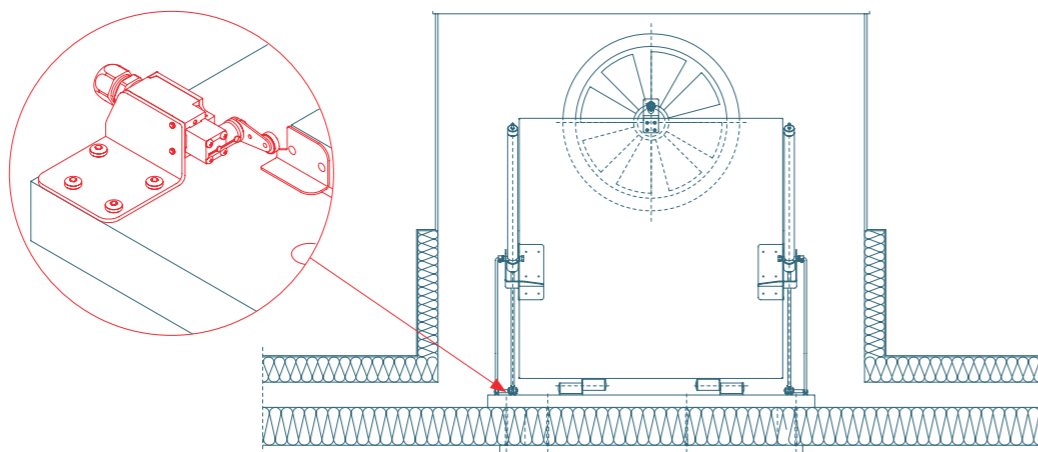
If your building project involves the use of smoke gas ventilators, please request our information material *risk assessments for mechanical smoke ventilation in combination with smoke and heat ventilation hatches* and read it carefully.

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.

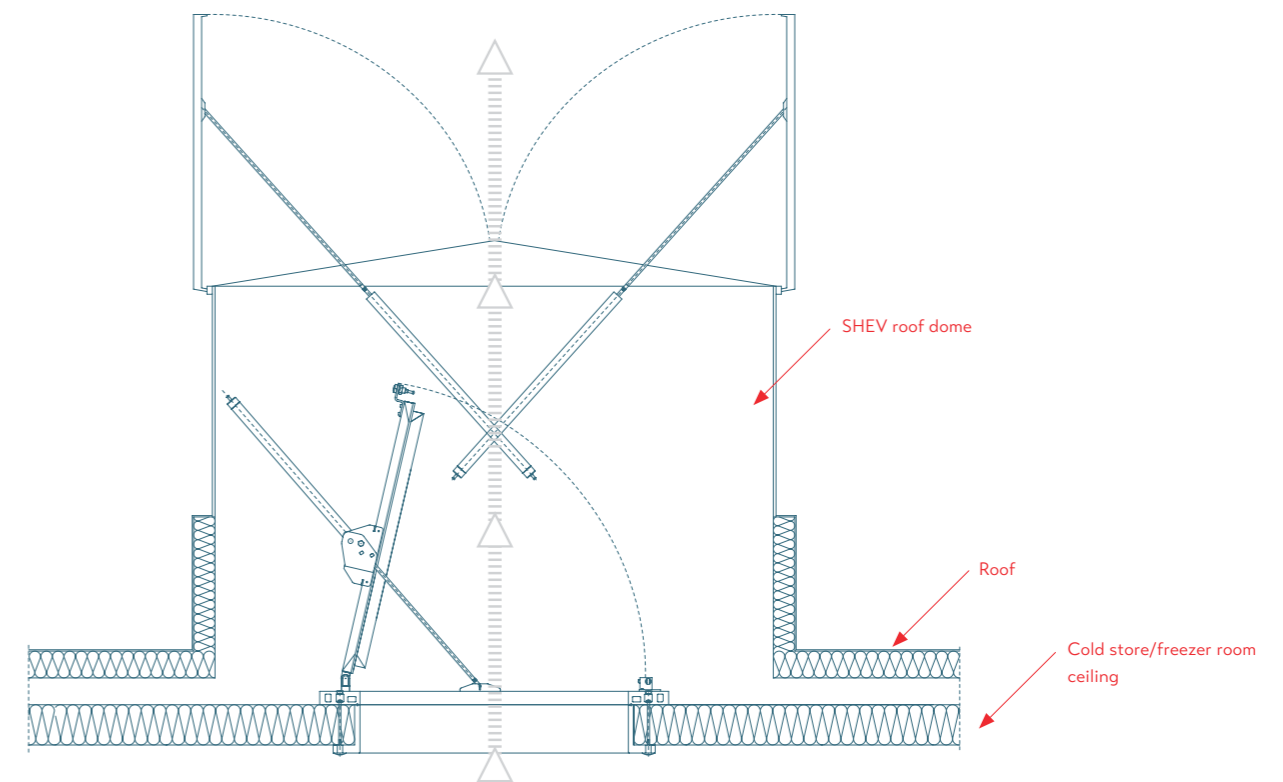


Appendix 4 Installation examples for installation without false ceiling – Natural smoke evacuation

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

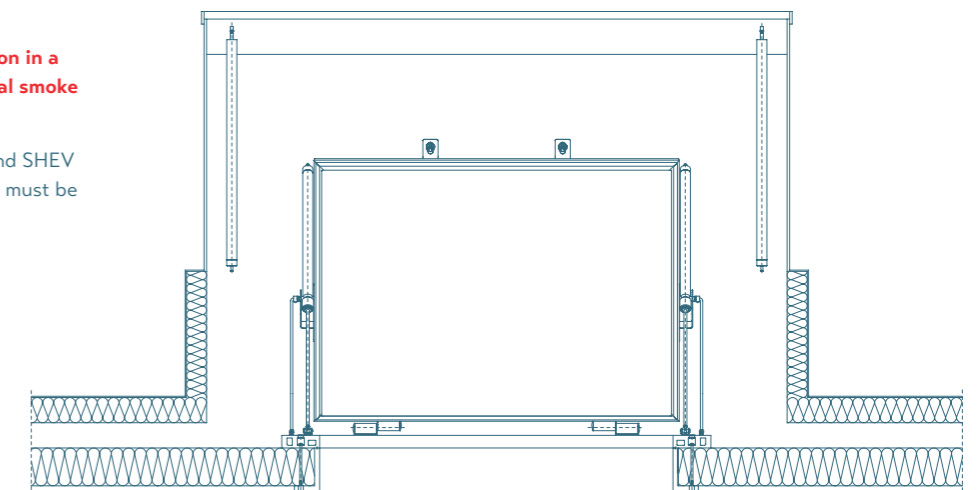
without touching one another at any point. Alternatively, it is possible to consider using a sequence controller. We are able to design an optimised hatch for these operating conditions by adapting the width of the hatch sheet and the opening angle.

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

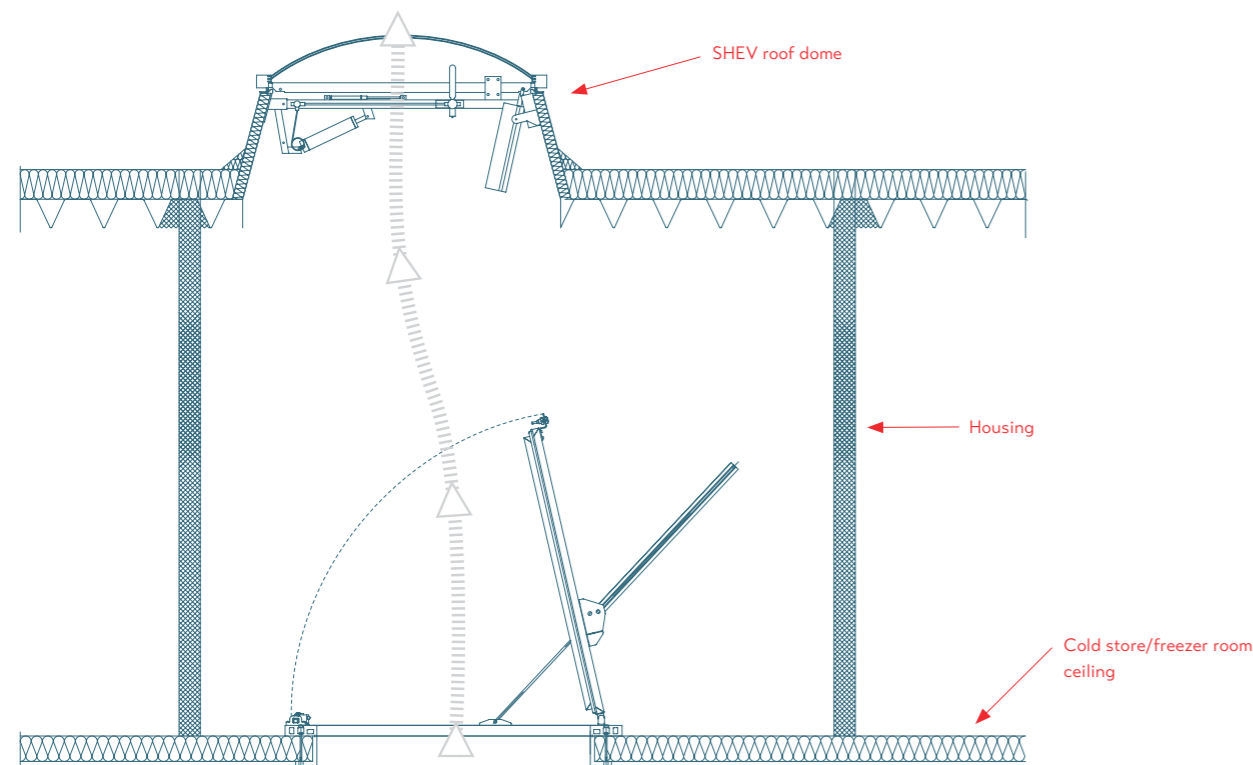
The SHEV hatch and SHEV roof dome systems must be compatible.



Appendix 5 Example realisation of installation in false ceiling with housing for smoke gas evacuation

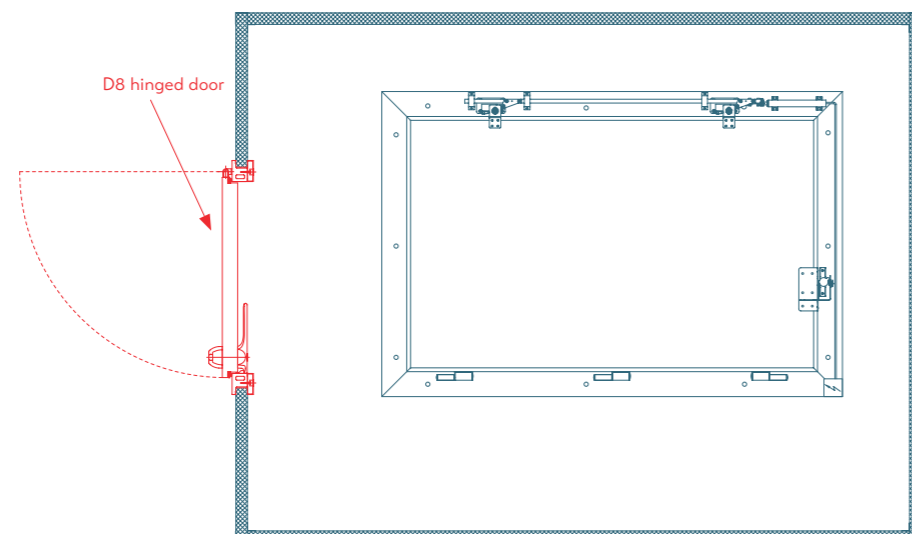
When positioning the *cool it* SHEV hatch relative to the smoke evacuation hatches in the roof, it is important to ensure that the rising air is aerodynamically guided as optimally as possible. It is essential to avoid unnecessary eddying. As far as possible, therefore, there should be no cables etc. 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 6 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*.



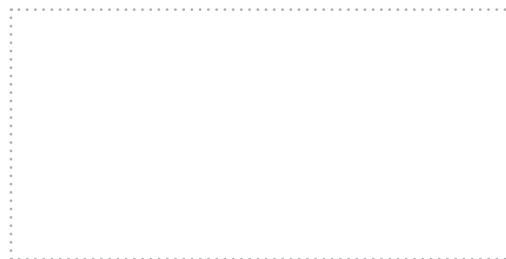
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