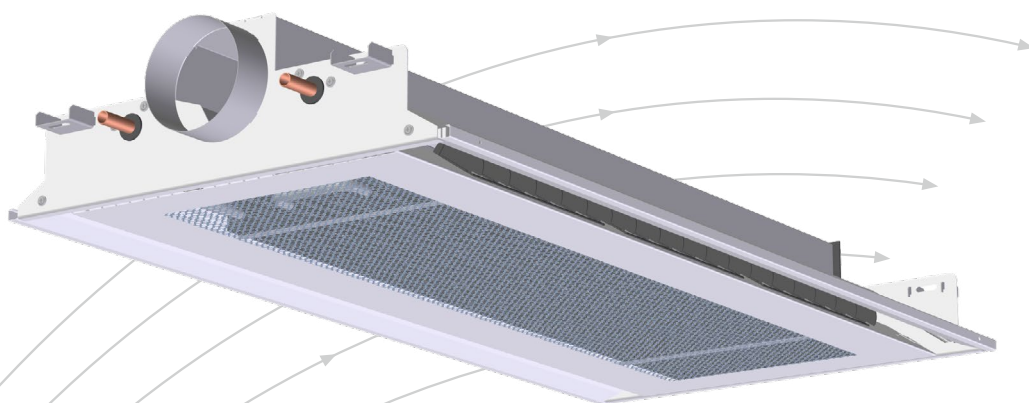


Svalbard-I

Chilled beam for ceiling installation



- Ceiling-integrated installation
- Available in 1200 mm to 3000 mm lengths
- Adjustable pressure/air flow rate
- Variable flow pattern
- Dimensioning and simulation in AURASIM

TROX[®] TECHNIK

 **Auranor**



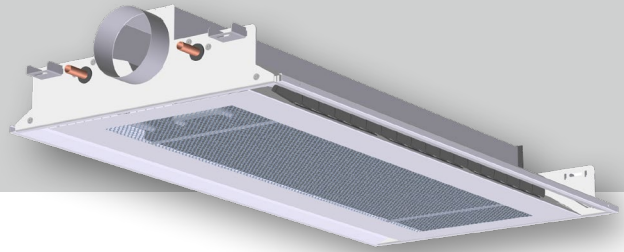
TROX Auranor AS

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Svalbard-I



APPLICATION

Svalbard-I is a hydronic cooling, heating and ventilation system for use in offices, shops, schools etc. The system is designed to provide a draft-free cooling effect in the occupied zone. Svalbard-I is suitable into a standard A-edge suspended ceiling system with a 600 mm modul.

FUNCTION

Air is supplied via nozzles, and indoor air is extracted and fed through the coil. Effective mixing of indoor air and supply air, i.e. induction, minimises the risk of draft in the occupied zone. When Svalbard-I is used for heating, the same technique is used for dispersion of heat along the ceiling. The indoor air is extracted through the perforated area on the unit's front panel in order to avoid dirt accumulation on the ceiling.

DESIGN

- Nozzle configuration for the chilled beam, i.e. desired air supply and pressure, is specified at time of order.
- Svalbard-I is delivered with integrated pressure outlet for air flow rate measurements.
- The front panel can be folded down for inspection and cleaning.
- Dispersion options: symmetrical 50/50 or asymmetrical 75/25 (25/75) – can be adjusted on site.
- Connection to air: Svalbard-I, 175mm height, is equipped with a Ø125 spiro connection at gable end (spigot dimension). Fig. 1 and 2. Svalbard-I, 235mm height, is available with Ø125 side spigot. For alternative positioning options, see fig. 1 & 3 and under order code.
- Connection to water: copper pipe, Ø15x1.0 mm. .
- changeable flowpattern via Jet Split lamellae in the beams outlet.
- Hygiene design, foldown battery, only available on request.

MATERIALS AND SURFACE COATING

Frame and casing in a galvanised, steel-plated finish. Delivered in white painted finish (RAL 9003 - gloss 30) as standard. Copper tube coils with aluminium lamellae. Adjustable lamellae are in a plastic design.

ACCESSORIES

See order code, supplied loose/unmounted.
W = TROX TRV 2-way valve, Broen. See separate data sheet.
A1 = Actuator 24V on/off, Broen. See separate data sheet.
A2 = Actuator 230V on/off, Broen. See separate data sheet.

ACCESSORIES

Ordered separately and supplied loose./unmounted.
Ballorex Dynamisk valve. See separate data sheet.
Actuator: 24V, 230V or 24V modulating 0 - 10V signal.
Transformer EasyTrafo 75 V A. See separate data sheet.
Transformer EasyTrafo 105 V A. See separate data sheet.
Room controller EasyReg. See separate data sheet.

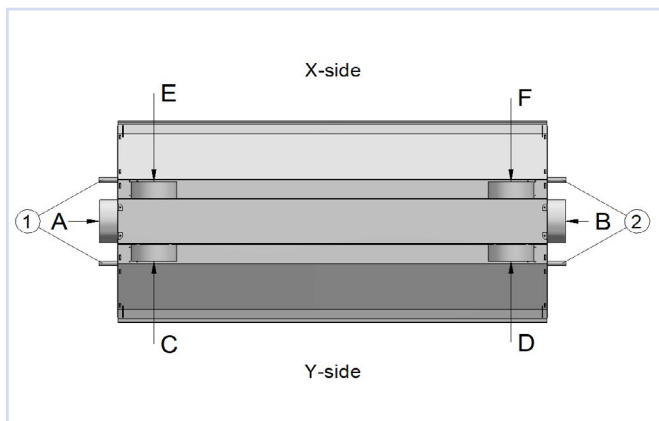
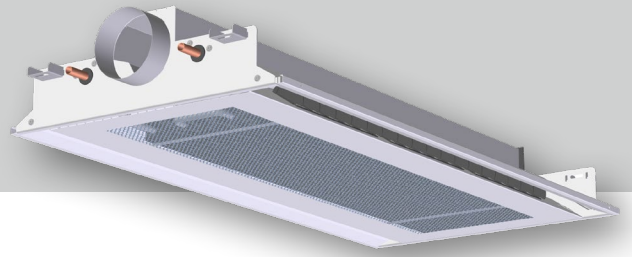



Fig. 1 (spigot C to F only available for 235 mm height)

Svalbard-I



 **ORDER CODE, Svalbard-I-L**
Low overall height, 175 mm.

Svalbard-I-L-1800-118-SKB-A-50/50-1-W-A1-S-0
1 2 3 4 5 6 7 8 9 10 11

1 Type/variant

Svalbard-I-L, integrated low

2 Length

1200, 1800, 2400 eller 3000

3. Preset value

Auracool

4. Coil type

SKB standard cooling coil
HKB high-capacity coil
VKB heating and cooling coil

5. Connection to air*

A or B

6.Flow pattern

0 standard 50/50
25/75 asymmetrical, x= 25/ y= 75
75/25 asymmetrical, x= 75/ y= 25

7 Connection to water*

1 or 2

8 Water valve

0 without water valve
W TRV 2-way valve, supplied loose/unmounted**

9 Actuator

0 without actuator
A1 actuator 24V, supplied loose/unmounted**
A2 actuator 230V, supplied loose/unmounted**

10 Damper

0 without damper
S damper DRS-K ø125**

11 Exposed surface

0 RAL 9003
SL-RAL special finish RAL
SL-NCS special finish NCS

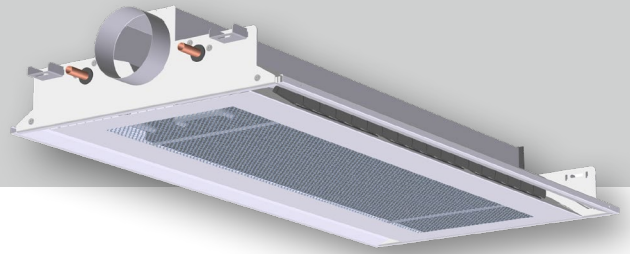
* standard air- and water connection is A1 or B2, see fig.1.

** accessories delivered loose/unmounted.

Exampel: Svalbard-I-L-1800-118-SKB-A-50/50-1-W-A1-S-0

Type/variant	Svalbard-I-L
Length	1800
Preset value	118
Coil type	SKB
Connection to air	A
Flow pattern	50/50
Connection to water	1
Water valve	W
Actuator	A1
Damper	S
Exposed surface	0 RAL 9003

Svalbard-I



 **ORDER CODE, Svalbard-I-H**
Height 235 mm.

Svalbard-I-H-1800-105-SKB-A-50/50-1-W-A1-S-0

1 2 3 4 5 6 7 8 9 10 11

1 Type/variant

Svalbard-I-H, integrated high

2 Length

1200, 1800, 2400 eller 3000

3. Preset value

Auracool

4. Coil type

SKB standard cooling coil
HKB high-capacity coil
VKB heating and cooling coil

5. Connection to air*

Gable: A or B (L=1200-3000)
Side connection: C, D, E or F (L=1200-2400)
Side connection: CD or EF (L=3000)***

6. Flow pattern

0 standard 50/50
25/75 asymmetrical, x= 25/ y= 75
75/25 asymmetrical, x= 75/ y= 25

7 Connection to water*

1 or 2

8 Water valve

0 without water valve
W TRV 2-way valve, supplied loose/unmounted**

9 Actuator

0 without actuator
A1 actuator 24V, supplied loose/unmounted**
A2 actuator 230V, supplied loose/unmounted**

10 Damper

0 without damper
S damper DRS-K ø125**

11 Exposed surface

0 RAL 9003
SL-RAL special finish RAL
SL-NCS special finish NCS

* standard air- and water connection is A1 or B2, see fig. 1.

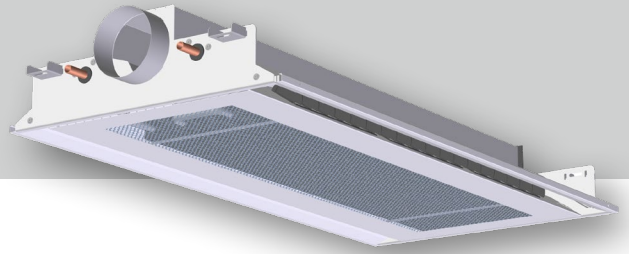
** accessories delivered loose/unmounted.

***Svalbard-I-H high variant with side connection, length 3000, comes with two connections.

Exempel: Svalbard-I-H-1800-105-SKB-A-50/50-1-W-A1-S-0

Type/variant	Svalbard-I-H
Length	1800
Preset value	105
Coil type	SKB
Connection to air	A
Flow pattern	50/50
Connection to water	1
Water valve	W
Actuator	A1
Damper	S
Exposed surface	0 RAL 9003

Svalbard-I



QUICK SELECTION Svalbard-I

The tables state the cooling effect from the chilled beam's water circuit and the emitted sound power level from the beam.

In order to calculate total cooling effect, the cooling effect of the supply air must be added as shown in the example below.

Example			
Product:	Svalbard-I 1800		
Battery type:	Standard	Water-side cooling effect at 40 Pa as per table 2 =	580 W
Air flow rate:	75 m ³ /h	Supply-air cooling effect: $q/3600 \times 1,2 \times c_p \times \Delta t_{\text{room-supply air}} =$	
$\Delta t_{\text{room-water (mid.)}}$:	10°K	$75/3600 \times 1,2 \times 1010 \times 6 =$	152 W
$\Delta t_{\text{room-supply air}}$:	6°K	Total cooling effect =	732 W

Svalbard-I-1200 mm

Δt_k [°C]	6				8				10				L_w dB(A)						
	40		80		40		80		40		80		Low, gable		High, gable		High, side		
Total pressure in duct [Pa]	40		80		40		80		40		80		40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Coll type	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Air flow rate [m ³ /h]	40	210	250	240	280	280	330	320	370	350	410	410	470	<20	27	<20	29	<20	29
	60	240	280	270	330	330	380	390	440	410	470	470	550	<20	28	22	30	22	30
	80	260	300	300	340	340	390	400	460	420	510	510	600	24	30	23	31	23	31
	100	270	320	320	360	360	420	430	490	450	550	550	650	27	32	26	32	26	32
	120	280	340	330	380	380	440	450	520	470	570	570	680	31	35	29	34	29	34

Table 1: Cooling effects at 0.06 litres of water per sec.

Svalbard-I-1800 mm

Δt_k [°C]	6				8				10				L_w dB(A)						
	40		80		40		80		40		80		Low, gable		High, gable		High, side		
Total pressure in duct [Pa]	40		80		40		80		40		80		40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Coll type	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Air flow rate [m ³ /h]	50	300	350	340	400	400	460	440	520	500	580	560	640	<20	24	<20	23	<20	26
	75	340	400	380	460	460	520	500	600	580	660	640	740	<20	26	<20	26	23	30
	100	380	450	420	500	500	580	560	680	620	700	680	820	22	30	21	28	27	32
	125	400	480	460	550	550	640	620	740	700	780	760	880	26	32	24	31	30	34
	150	420	500	480	580	580	680	660	780	740	840	820	940	29	34	27	33	31	36

Table 2: Cooling effects at 0.06 litres of water per sec.

Svalbard-I-2400 mm

Δt_k [°C]	6				8				10				L_w dB(A)						
	40		80		40		80		40		80		Low, gable		High, gable		High, side		
Total pressure in duct [Pa]	40		80		40		80		40		80		40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Coll type	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Air flow rate [m ³ /h]	60	400	440	440	500	500	580	540	640	620	720	680	800	<20	24	<20	23	<20	22
	90	440	500	480	600	600	680	640	740	700	800	760	900	<20	26	<20	26	<20	25
	120	480	560	540	640	640	740	720	840	800	920	900	1060	23	29	22	28	24	29
	150	520	620	580	680	680	780	760	880	840	980	980	1040	26	32	25	31	29	32
	180	550	660	620	740	720	840	820	960	900	1040	1040	1200	30	35	27	33	33	35

Table 3: Cooling effects at 0.06 litres of water per sec.

Svalbard-I-3000 mm

Δt_k [°C]	6				8				10				L_w dB(A)						
	40		80		40		80		40		80		Low, gable		High, gable		High, side		
Total pressure in duct [Pa]	40		80		40		80		40		80		40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Coll type	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	40 Pa	80 Pa	40 Pa	80 Pa	40 Pa	80 Pa	
Air flow rate [m ³ /h]	80	486	556	538	620	658	763	714	818	815	947	898	1038	<20	26	<20	28	<20	24
	110	538	623	718	819	724	822	813	937	907	1044	1001	1175	<20	29	<20	29	<20	27
	140	574	677	657	782	784	923	902	1035	987	1141	1098	1304	25	31	22	30	22	28
	170	616	723	698	835	824	955	959	1096	1039	1224	1173	1421	28	34	25	31	26	30
	200	638	749	740	860	864	1000	975	1135	1089	1263	1259	1514	32	37	28	33	28	32

Table 4: Cooling effects at 0.06 litres of water per sec.

Svalbard-I

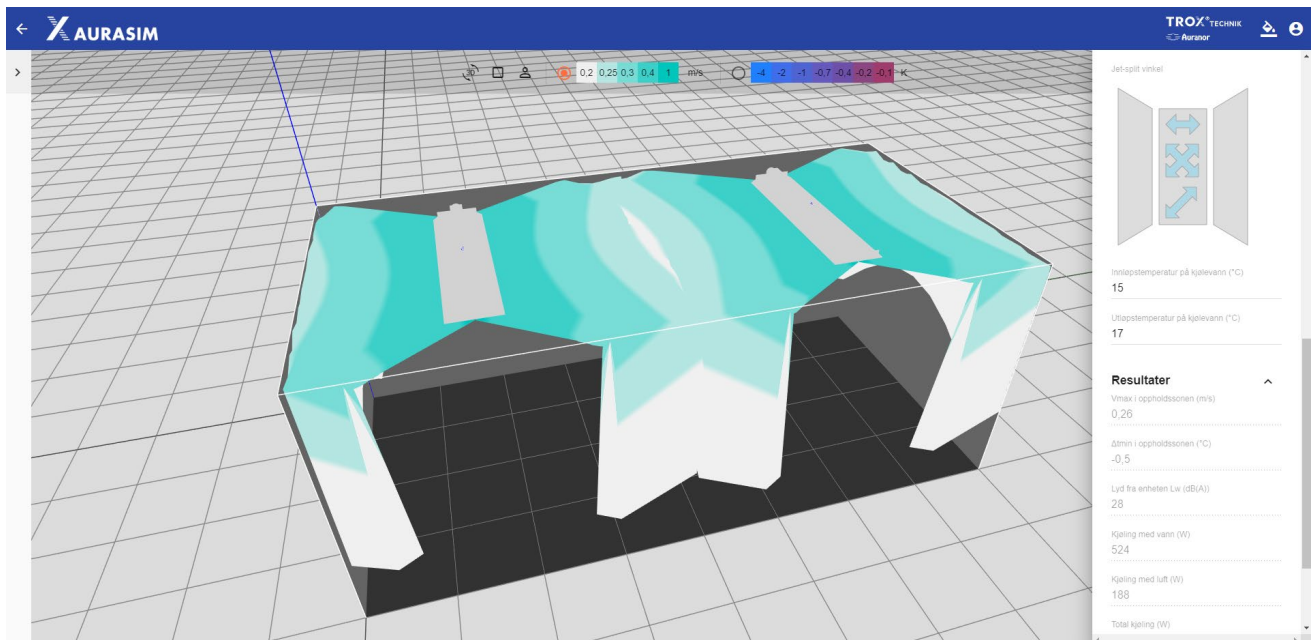
DIMENSIONING

For accurate dimensioning, please use the Aurasim software available for download at our website www.trox.no/en or aurasim.no/en. The software enables selection of the optimum chilled beam for the prevailing conditions.

Among the factors calculated in Aurasim are:

- Cooling effect
- Heating effect
- Sound power level
- Sound attenuation
- Pressure drop air/water
- Appropriate positioning

Cooling and heating effect is calculated in the AURASIM simulation program available at: www.trox.no/en or aurasim.no/en.



TECHNICAL DATA FOR COMMISSIONING DAMPER DRS-K, Ø125

Diagram 1 shows total pressure drop over the damper alone as a function of air flow rate.

The graphs represent A-weighted sound pressure level. Table 7 provides the correction factor [KO] for conversion to various frequency levels.

Correction factors shown in the diagram are for open damper (right/lower line) and closed damper (left/upper line). Open is equivalent to a damper angle of 0°.

The correction factors for intermediate points are interpolated between these. Sound power level for each frequency is calculated using the formula: $L_{Wokt} = L_{WA} + KO$ where L_{WA} is sound pressure level obtained from diagram 1.

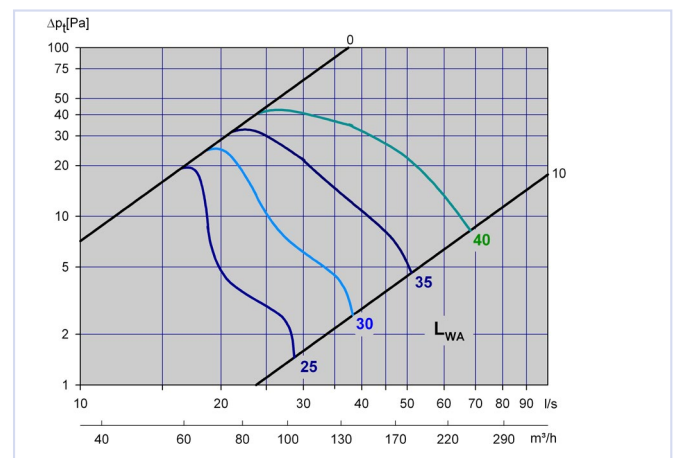


Diagram 1
Pressure drop and sound power level for commissioning damper

Svalbard-I

Correction factor [KO], DRS-K Ø125

DRS-K	Octave band (Hz)							
	63	125	250	500	1k	2k	4k	8k
Damper open(10)	19	5	1	-3	-9	-12	-16	-1
Damper closed(0)	17	0	-5	-10	-14	-9	-8	-19

Table 7: Correction factors for conversion to sound power level at the respective frequencies.



Fig. 4: DRS-K Ø125

FLOW PATTERN

The direction and angle of the flow pattern may be adjusted via Jet Split lamella. This can be visualised in the Aurasim software available for download at our website: www.trox.no

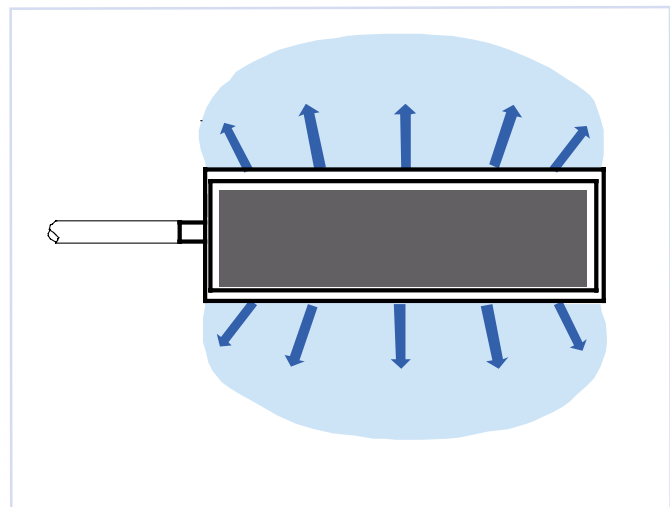


Fig. 5: Flow pattern

THROW LENGTH

Appropriate positioning in order to prevent high velocities in the occupied zone is calculated by using the product selection software Aurasim available for download via our website: www.trox.no/en.

Svalbard-I

INSTALLATION

Svalbard-I is supplied with four mounting brackets that is attached to the baffles short ends, by hooking brackets into the rectangular slits in the gables. See Figure 7. You have possibility of adjustment +/- 10 mm in the baffle width direction, and vertically by means of threaded rod. Use of anchor or similar is recommended when mounting on a concrete base.

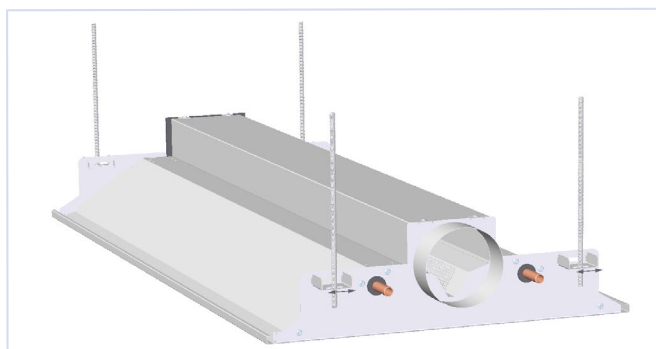


Fig. 6 Svalbard-I, installation

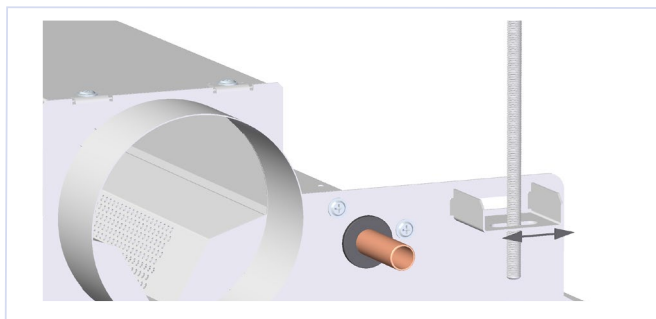


Fig. 7: Svalbard-I, installation

INSTALLATION, water valve

The water valve should be placed on the return, that is, with arrow on the valve away from the cooling battery.

The cooling batteries in Svalbard-I are not directional, so the return can be connected at your own request, but the water valve is directional.

COMMISSIONING

Svalbard-I will have a preset air flow rate and pressure. The preset value and correction factor will be specified on a label by the nozzle adjustment points. If required, the air flow rate can be adjusted on site. New nozzle positions can be obtained from the factory or in Auracool which can be downloaded from our website: www.trox.no
Max. working pressure waterside 10 bars.
Max. test pressure waterside 15 bars.

Svalbard-I

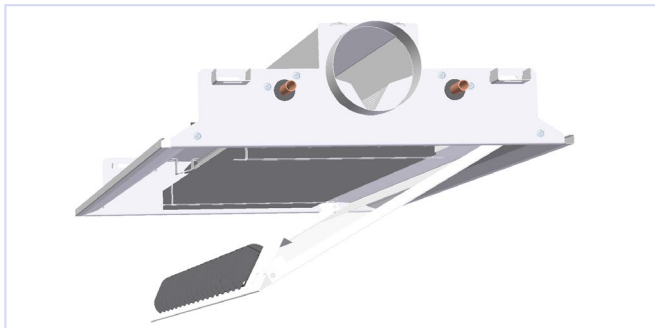


Fig. 8: Svalbard-I, maintenance.

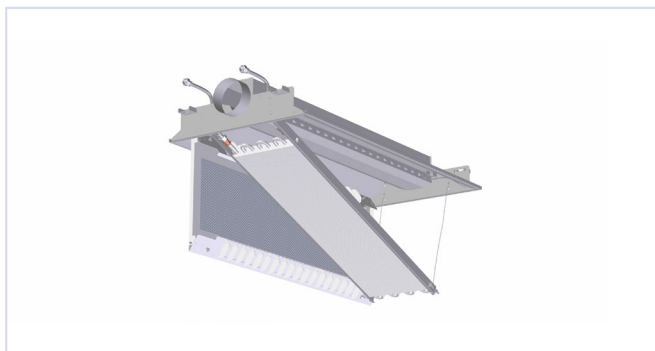


Fig.9: Svalbard-I, maintenance.

MAINTENANCE

Full access to the coil is achieved by folding down the front panel as shown in fig. 8. Vacuuming and, if required, using a damp cloth to clean the unit is recommended.

If the baffle is delivered in a hygiene version with foldable battery (supplied only on request), as shown in fig. 9, can the battery also be cleaned on the upper side.

ENVIRONMENT

Enquiries regarding product declaration can be directed to our sales team, or information can be found at our website: www.trox.no

Svalbard-I is developed and manufactured by: