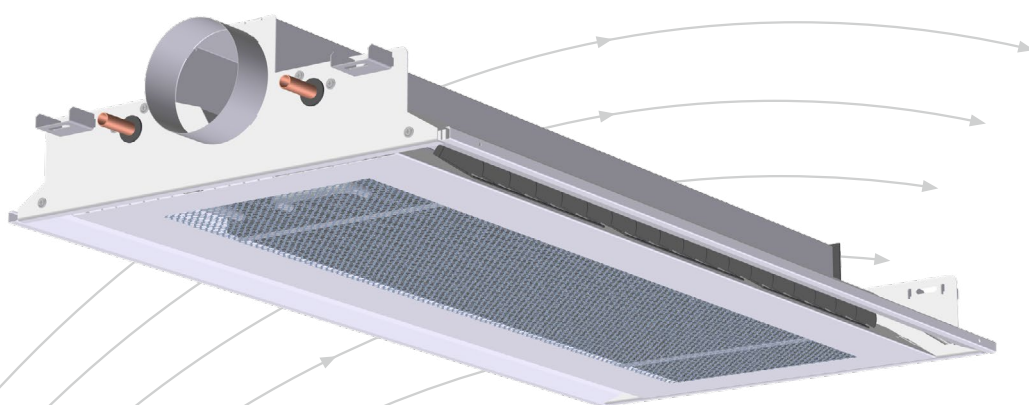


Svalbard-I

Chilled beam for ceiling installation



epd

NEPD-6153-5423

- 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



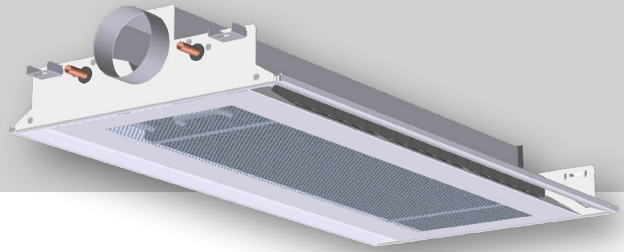
TROX Auranor AS

Auranorvegen 6
NO-2770 Jaren

Telephone +47 61 31 35 00

e-mail: office-no@troxgroup.com
www.trox.no/en

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.

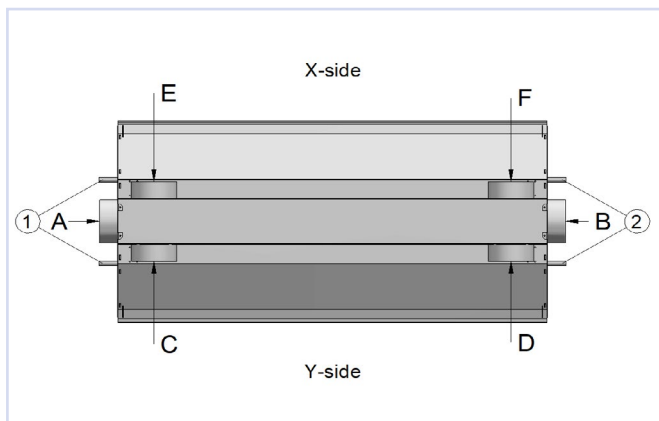
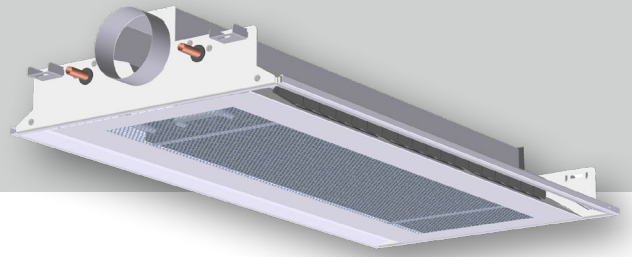



Fig. 1 (spigot C to F only available for 235 mm height)

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

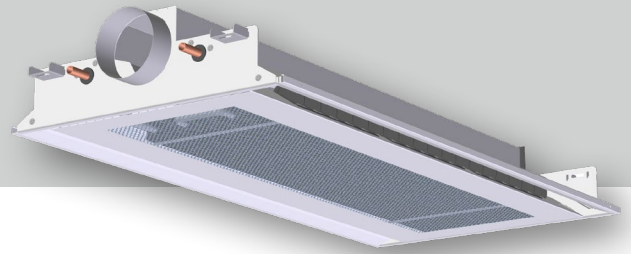
* standard air- and water connection is A1 or B2, see fig.1.

** 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.

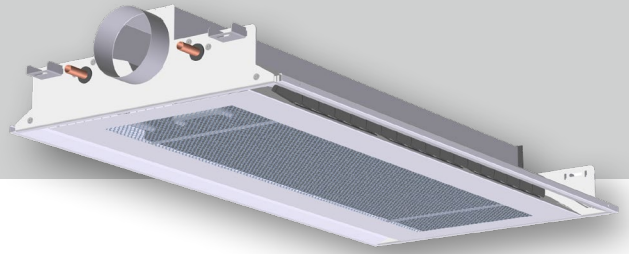
** accessories delivered loose/unmounted.

***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

DIMENSIONS AND WEIGHT, Svalbard-I H=175

| Length [mm] | L [mm] | L2 [mm] | Weight* [kg] | Weight: water in cooling coil [[kg] | | |
|----------------|-----------|------------|-----------------|--------------------------------------|-----|-----|
| | | | | SKB | HKB | VKB |
| 1200 | 1194 | 1248±10 | 17 | 0,5 | 1,0 | 0,8 |
| 1800 | 1794 | 1848±10 | 25 | 0,8 | 1,5 | 1,2 |
| 2400 | 2394 | 2448±10 | 33 | 1,0 | 2,1 | 1,5 |
| 3000 | 2994 | 3048±10 | 43 | 1,3 | 2,6 | 2,0 |

Table 5 (* No water in cooling coil)

DIMENSIONS AND WEIGHT, Svalbard-I H=235

| Length [mm] | L [mm] | L2 [mm] | Weight* [kg] | Weight: water in cooling coil [[kg] | | |
|----------------|-----------|------------|-----------------|--------------------------------------|-----|-----|
| | | | | SKB | HKB | VKB |
| 1200 | 1194 | 1248±10 | 18 | 0,5 | 1,0 | 0,8 |
| 1800 | 1794 | 1848±10 | 26 | 0,8 | 1,5 | 1,2 |
| 2400 | 2394 | 2448±10 | 35 | 1,0 | 2,1 | 1,5 |
| 3000 | 2994 | 3048±10 | 44 | 1,3 | 2,6 | 2,0 |

Table 6 (* No water in cooling coil)

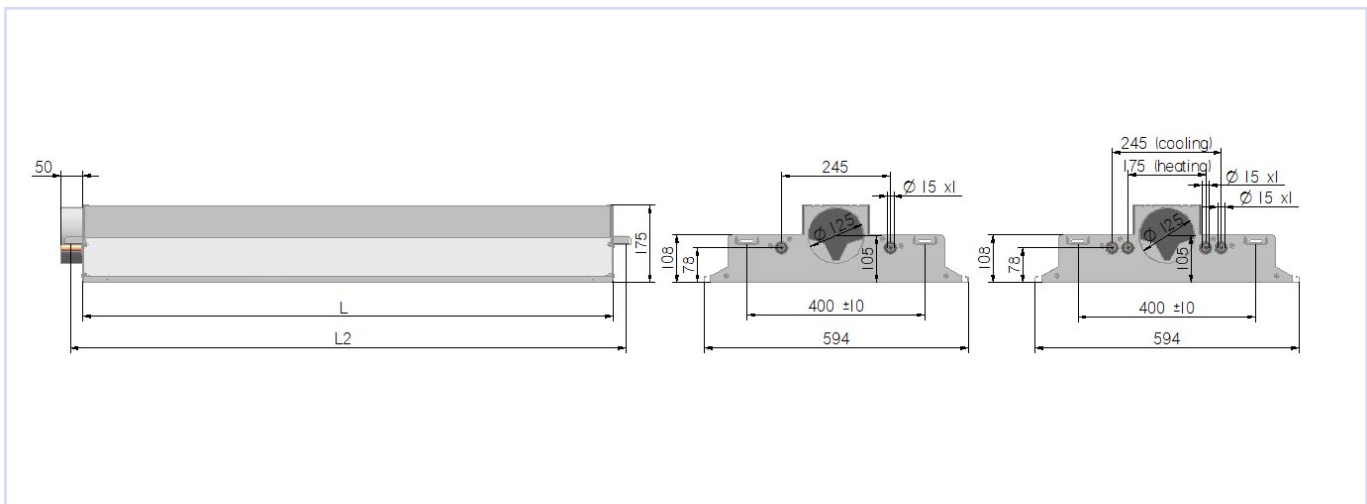


Fig. 2: Svalbard-I H=175

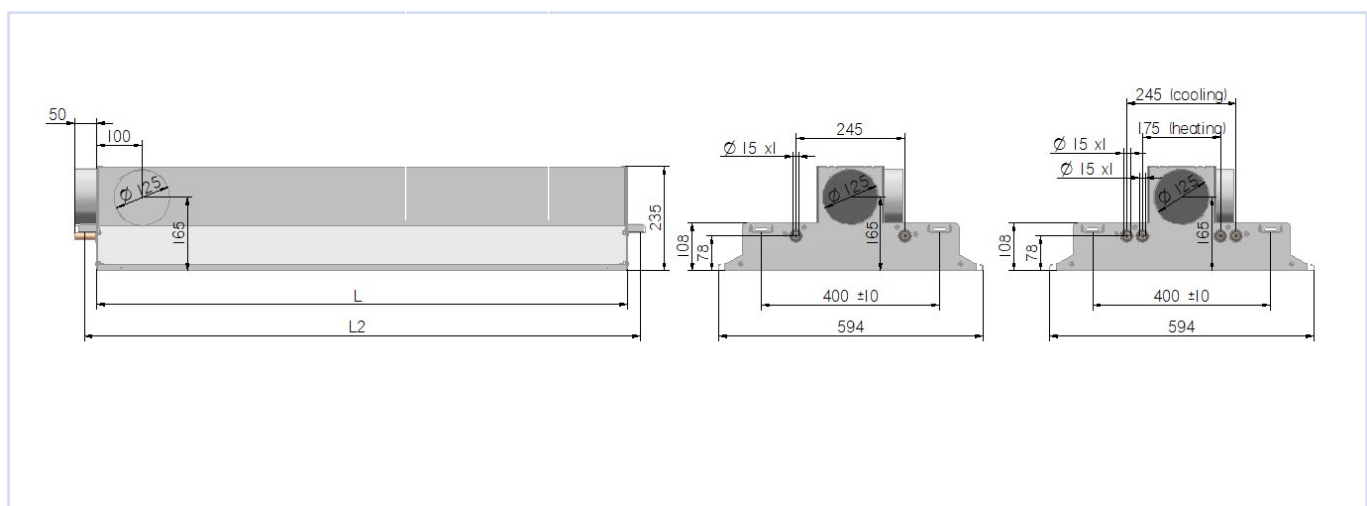


Fig. 3: Svalbard-I H=235

Svalbard-I

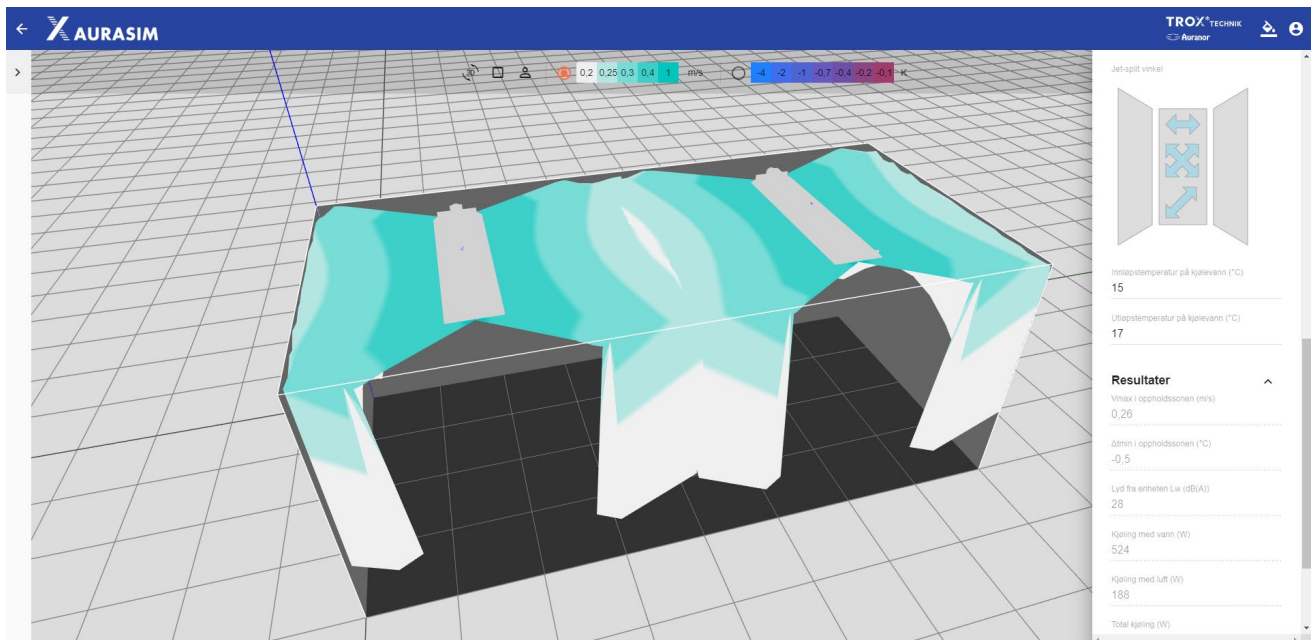
DIMENSIONING

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.

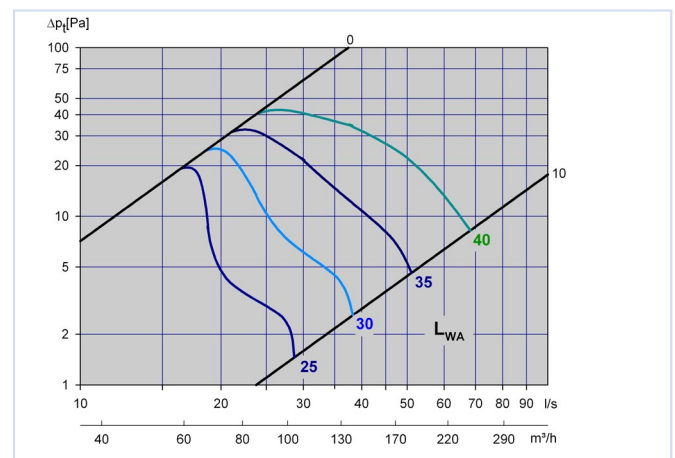


Diagram 1
Pressure drop and sound power level for commissioning damper

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

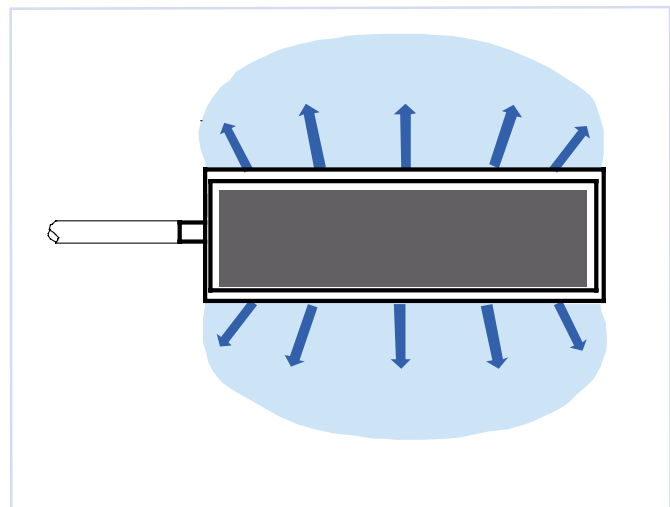


Fig. 5: Flow pattern

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.

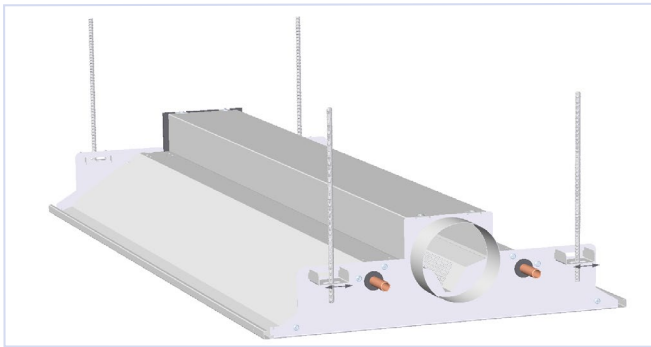


Fig. 6 Svalbard-I, installation

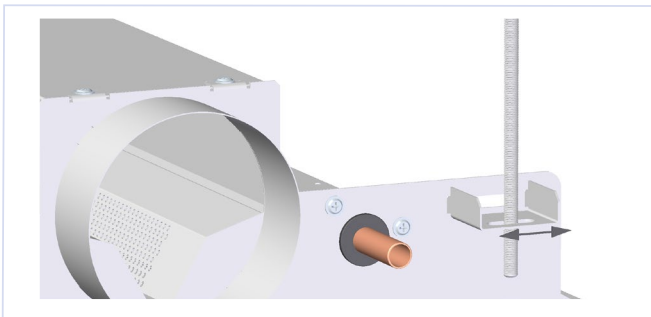


Fig. 7: Svalbard-I, installation

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

Ventilate with a number between 1 and 10, where the current value is not in use. KVS/KV is listed in the Trox TRV-2 database under the heading Venti_KV-verdier. KVS is the maximum value (expressed in l/h) that is exceeded by the ventilator at a pressure drop of 1 bar, and open the ventilator in the required position. KVS valves are equipped with a motor. If the actuator is connected to KV (BP2).

Max. working pressure waterside 10 bars.

Max. test pressure waterside 15 bars.

Svalbard-I

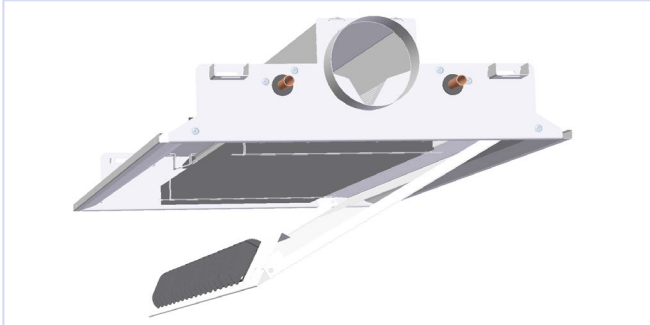


Fig. 8: Svalbard-I, maintenance.

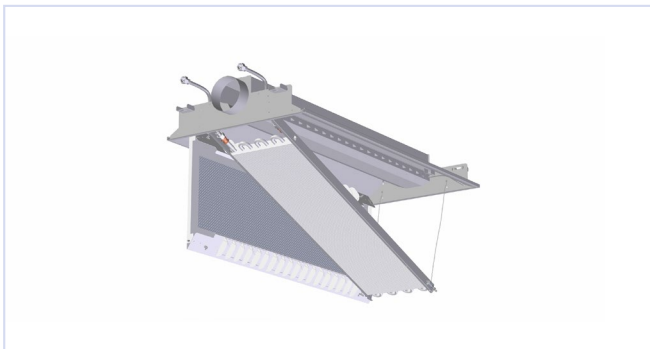


Fig.9: Svalbard-I, maintenance.

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:

The company reserves the right to make amendments without prior notice.

TROX

Hovedkontor:
TROX Auranor as, Auranorvegen 6, 2770 Jaren
Telefon: 61 31 35 00 www.auranor.no