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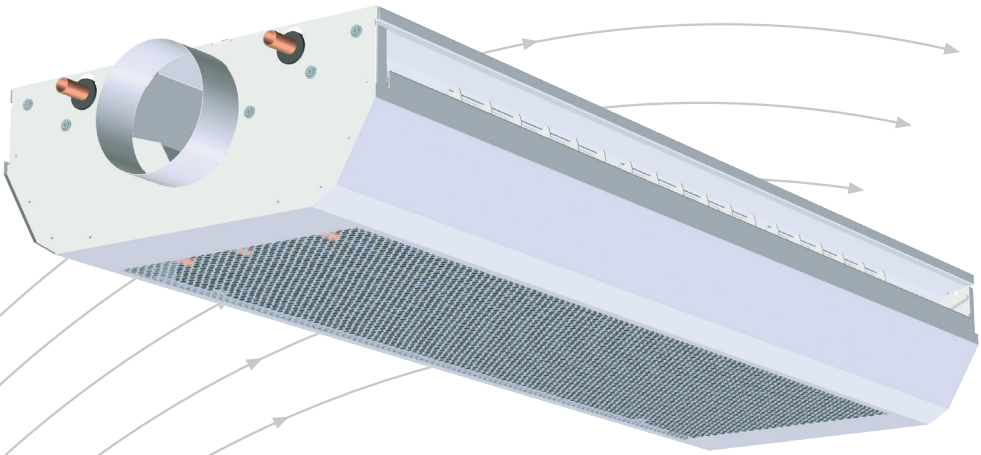
Svalbard-F

Chilled beam for open installation in ceiling or covering



- Open installation
- Available in 1200mm to 3000mm lengths
- Adjustable pressure/air flow rate
- Variable flow pattern
- Dimensioningprogram Auracool - F on our website

TROX® TECHNIK

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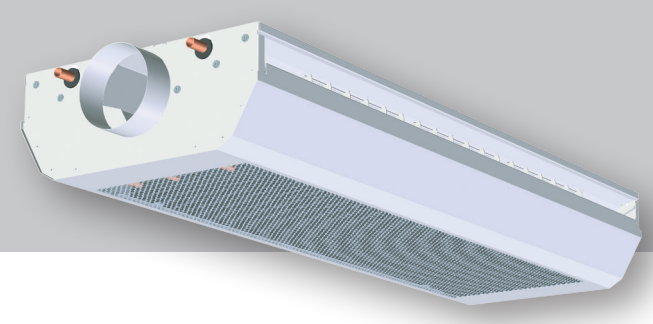
Svalbard-F



APPLICATION

Svalbard-F is a hydronic cooling, heating and ventilation system for use in offices, shops, schools etc. The system is designed to provide excellent cooling effect, and a high induction level ensures a draft-free environment in the occupied zone. Svalbard-F is designed for open installation in ceiling or covering.

FUNCTION

Air is supplied via adjustable nozzles which ensure that the air is dispersed along the ceiling in a fan-shaped flow pattern. This technique optimises the dispersion effect by providing a larger area for the supply air and indoor air to mix.
Such effective mixing of indoor air and supply air, i.e. induction, minimises the risk of draft in the occupied zone. Svalbard systems which are used for heating only utilises the same technique for effective dispersion of heat along the ceiling.
The secondary air is extracted through the perforated area on the unit's frontpanel 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-F is delivered with integrated pressure outlet for air flow rate measurements.
- The front panel can be folded down for inspection and cleaning.
- Svalbard-F is available in installation lengths of 1200, 1800, 2400 and 3000 mm.
- Dispersion options: symmetrical 50/50 or asymmetrical 75/25 (25/75) – can be adjusted on site.
- Connection to air: gable end Ø125 mm (spigot dimension).
- Connection to water: Cu Ø15 x 1, 0 mm.
- Changeable flowpattern via Jet Split lamellaes in the beams outlet, standard pattern is fan style.
- Blind cover can be provided for adaptation to the wall. See Figure 9.

MATERIALS AND SURFACE COATING

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

DIMENSIONS AND WEIGHT, Svalbard-F

Length	L	Weight *	Weight: water in cooling coil [kg]		
[mm]	[mm]	[kg]	SKB	HKB	VKB
1200	1200	19	0,5	1,0	0,8
1800	1800	27	0,8	1,5	1,2
2400	2400	35	1,0	2,1	1,5
3000	2994	45	1,3	2,6	2,0

Table 1 (* No water in cooling coil)

ORDER CODE, Svalbard-F

Svalbard-F - 1800 - 104 - SKB - A - 1 - 50/50 / W - A1- S - 0

- Product
- L = Length: 1200, 1800, 2400 or 3000
- Pre-set value from Auracool
- Coil type:
  - SKB = Standard cooling coil
  - HKB = High-capacity coil
  - VKB = Heating and cooling coil
- *Connection to air, see fig. 2:
  - A = Standard
  - B = Special
- Flow pattern, X/Y:
  - Symmetrical: standard 50/50
  - Asymmetrical: 75/25 or 25/75
- *Connection to water, see fig. 2:
  - 1 = Standard
  - 2 = Special
- SL = Special finish
- S = Damper, DRS-K Ø125
- A1 = Actuator 24V off/on
- A2 = Actuator 230V off/on
- W = TROX TRV 2-way valve

Example:
Svalbard-F-1800-104-SKB-A-1-50/50 / W-A1-S-O
Explanation:
Svalbard-F for open installation, 1800mm length, pre-set value 104.
Standard coil and connection to air Ø125 (A1), symmetrical flow pattern 50/50.
Water valve TROX TRV and 24V actuator fitted, commissioning damper DRS-K Ø125 supplied separately.
*Connection to air and water will be on gable A1 or B2 as standard (see fig.2).

ACCESSORIES - See order code, delivered fitted in chilled beam.

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 and supplied separately.

Ballorex Dynamic valve (see separate data sheet).
Actuator: 24V, 230V or 24V modulating 0 - 10V signal.
Transformer, EasyTrafo 75 VA (see separate data sheet).
Transformer, EasyTrafo 105 VA (see separate data sheet).
Room controller, EasyReg (see separate data sheet).

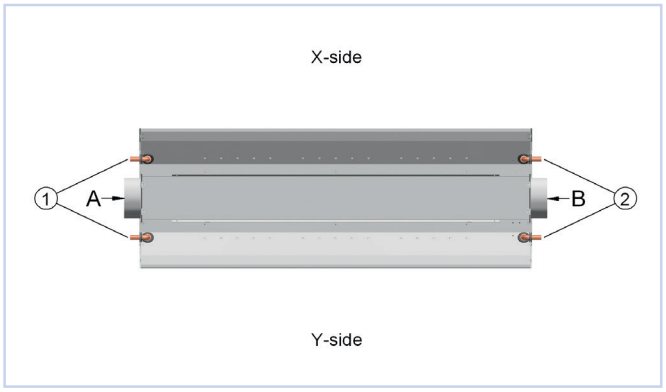


Fig. 2

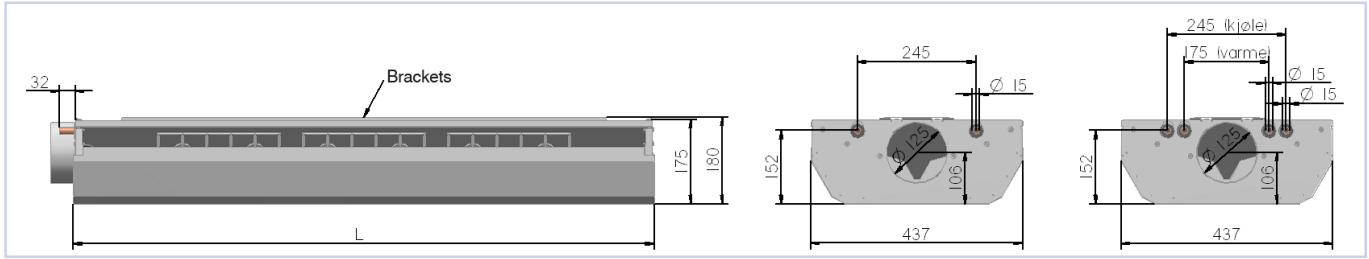
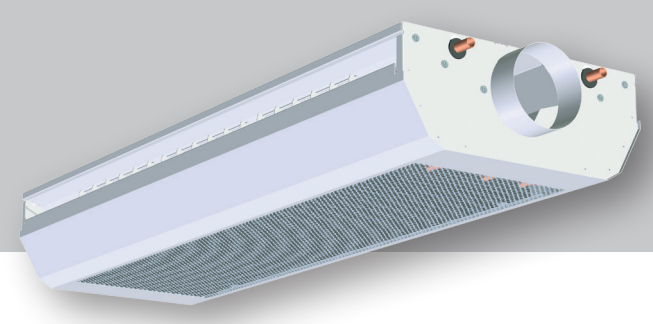


Fig. 1

Svalbard-F



QUICK SELECTION, Svalbard-F

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-F 1800		
Battery type:	Standard	Water-side cooling effect at 40 Pa as per table 3 =	580 W
Air flow rate:	75 m^3/h	Supply-air cooling effect: q/3600 x 1,2 x c_p x $\Delta t_{room\text{-}supply\ air:}$ =	
$\Delta t_{room\text{-}water:}$	10^0K	75/3600 x 1,2 x 1010 x 6 =	152 W
$\Delta t_{room\text{-}supply\ air:}$	6^0K	**Total cooling effect =**	**732 W**

Svabard-F-1200 mm

Δt_k [°C]		6				8				10				L_w	
Total pressure in duct [Pa]		40		80		40		80		40		80		dB(A)	
Coil type		SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	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
	60	240	280	270	330	330	380	390	440	410	470	470	550	<20	28
	80	260	300	300	340	340	390	400	460	420	510	510	600	24	30
	100	270	320	320	360	360	420	430	490	450	550	550	650	27	32
	120	280	340	330	380	380	440	450	520	470	570	570	680	31	35

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

Svabard-F-1800 mm

Δt_k [°C]		6				8				10				L_w	
Total pressure in duct [Pa]		40		80		40		80		40		80		dB(A)	
Coil type		SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	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
	75	340	400	380	460	460	520	500	600	580	660	640	740	<20	26
	100	380	450	420	500	500	580	560	680	620	700	680	820	22	30
	125	400	480	460	550	550	640	620	740	700	780	760	880	26	32
	150	420	500	480	580	580	680	660	780	740	840	820	940	29	34

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

Svabard-F-2400 mm

Δt_k [°C]		6				8				10				L_w	
Total pressure in duct [Pa]		40		80		40		80		40		80		dB(A)	
Coil type		SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	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
	90	440	500	480	600	600	680	640	740	700	800	760	900	<20	26
	120	480	560	540	640	640	740	720	840	800	920	900	1060	23	29
	150	520	620	580	680	680	780	760	880	840	980	980	1040	26	32
	180	550	660	620	740	720	840	820	960	900	1040	1040	1200	30	35

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

Svabard-F-3000 mm

Δt_k [°C]		6				8				10				L_w	
Total pressure in duct [Pa]		40		80		40		80		40		80		dB(A)	
Coil type		SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	SKB	HKB	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
	110	538	623	718	819	724	822	813	937	907	1044	1001	1175	<20	29
	140	574	677	657	782	784	923	902	1035	987	1141	1098	1304	25	31
	170	616	723	698	835	824	955	959	1096	1039	1224	1173	1421	28	34
	200	638	749	740	860	864	1000	975	1135	1089	1263	1259	1514	32	37

Table 5: Cooling effects at 0.06 litres of water per sec.

DIMENSIONING

For accurate dimensioning, please use the Auracool software available for download at our website: www.trox.no. The software enables selection of the optimum chilled beam for the prevailing conditions. Among the factors calculated in Auracool are:

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

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 00. 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.

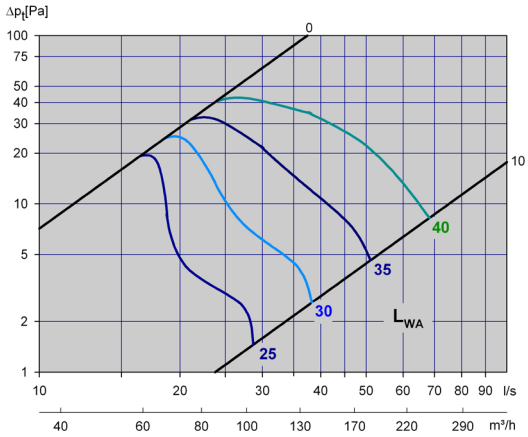


Diagram 1
Pressure drop and sound pressure level for commissioning damper DRS-K Ø125

Fig. 3, DRS-K Ø125

Correction factor [KO], DRS-K Ø125

	Octave band (Hz)							
DRS-K	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 6: Correction factors for conversion to sound power level at the respective frequencies.

THROW LENGTH

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

FLOW PATTERN

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

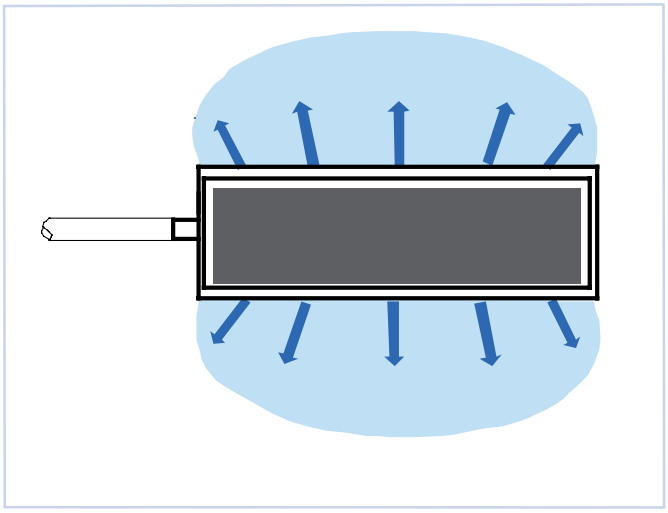


Fig. 4: Flow pattern

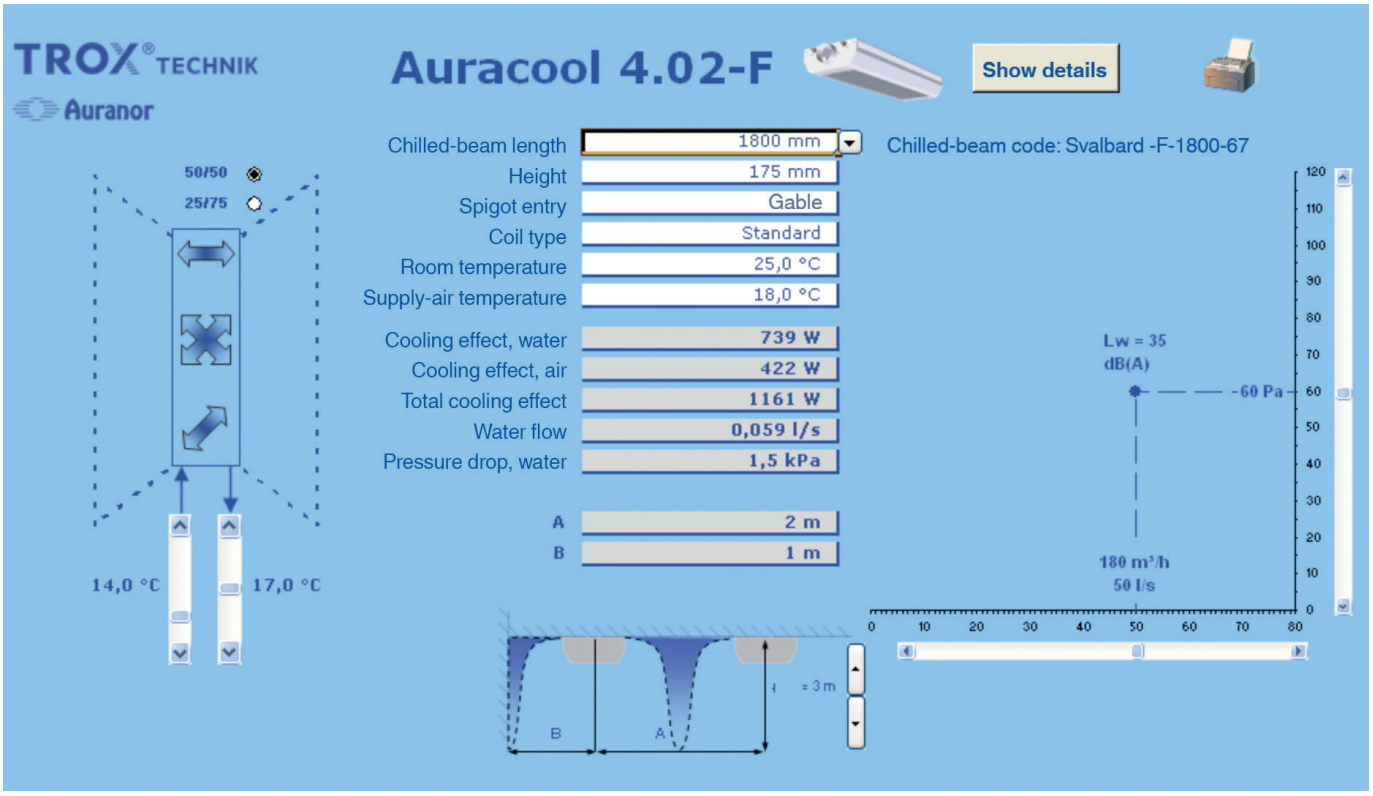


Fig. 5: Auracool window

Svalbard-F

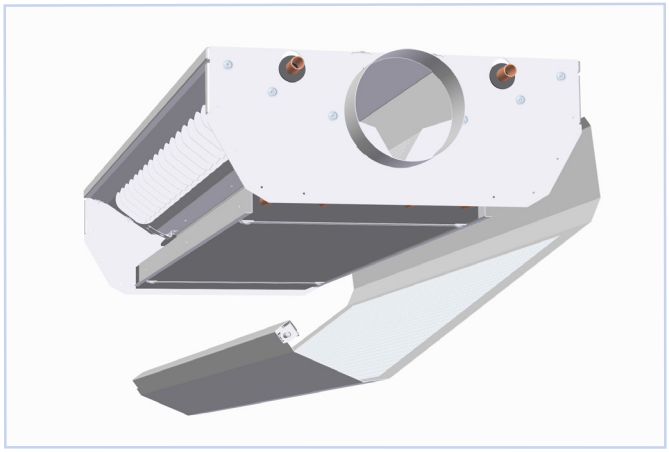


Fig. 6: Svalbard-F, installation

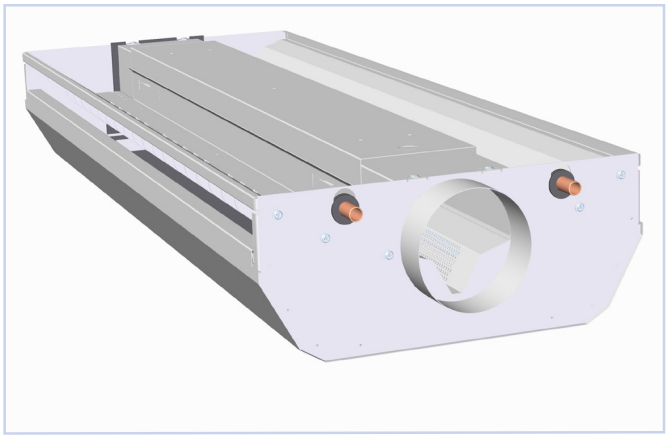


Fig. 7: Svalbard-F, installation

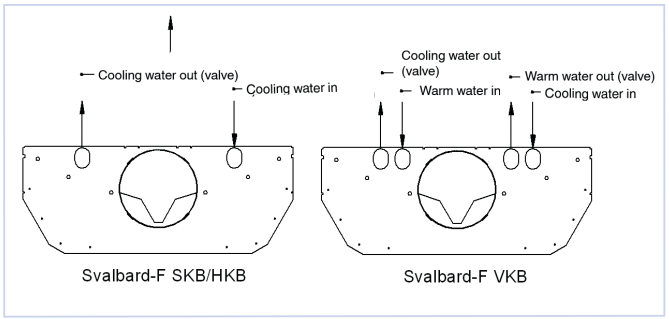


Fig. 8: Svalbard-F, installation water valve

INSTALLATION

Svalbard-F is supplied with a mounting bar for attachment to ceiling or covering (fig. 7). Detailed installation instructions are included every single product delivery.
For connection to water (copper pipe Ø15/1), use press, push or screw fittings. I.e. do not use soldering or similar as theheat may damage the O-ring on the push fitting between the cooling coil and pipe bend (see fig. 6 and 7).

INSTALLATION, water valve

The water valve should be placed on the return, that is,with arrow on the valve away from the cooling battery and at the tube as figure 8 shows.

COMMISSIONING

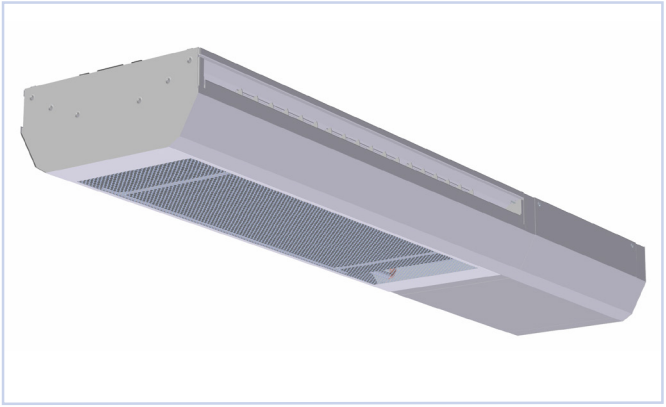
Svalbard-F will have a pre-set air flow rate and pressure in accordance with the details specified. The pre-set value and correction factor will be specified on an appropriately positioned label which is visible when the front is folded down.
If required, the air flow rate can be adjusted on site. New 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.

MAINTENANCE

Full access to the coil is achieved by folding down the front panel as shown in fig. 6.
Vacuuming and, if required, using a damp cloth to clean the unit is recommended.

ENVIRONMENT

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



Figur 9. Svalbard-F blind cover.

Svalbard-F is developed and manufactured by:

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

TROX® TECHNIK
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