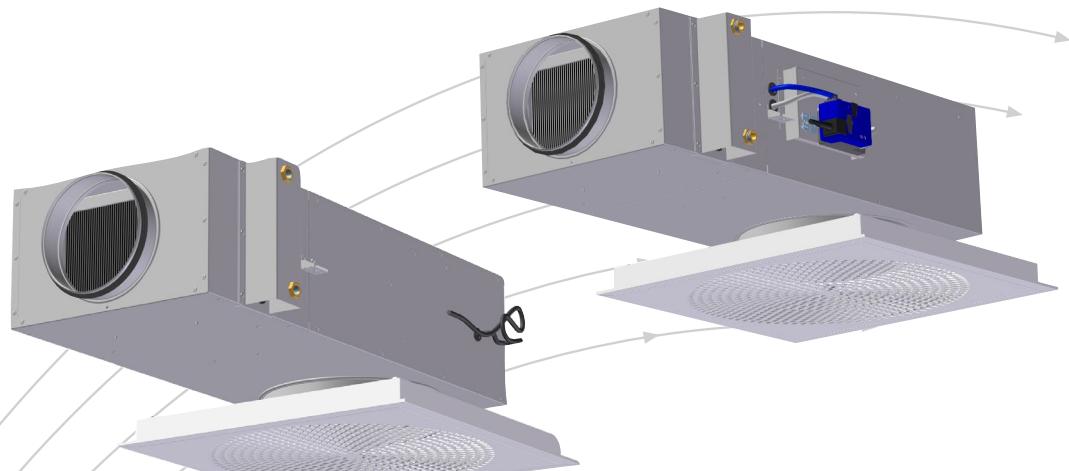


Orion-LØV with Sirius Comfort

VAV box for supply diffuser with heating coil



- With heating coil for waterborne heating of inlet air
- Unique damper function
- Large working range
- Can be used with internal linear regulator, or external rotary regulator

TROX® TECHNIK

 **Auranor**

TROX Auranor AS

Auranorvegen 6
NO-2770 Jaren

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

Orion-LØV with Sirius Comfort



APPLICATION

Sirius Comfort is a diffuser unit with VAV and heating functions. It is used as a volume regulator and diffuser unit in demand controlled ventilation systems. Sirius Comfort has unique characteristics, that is well-suited for variable airflows and contributes to the valve's very good induction.

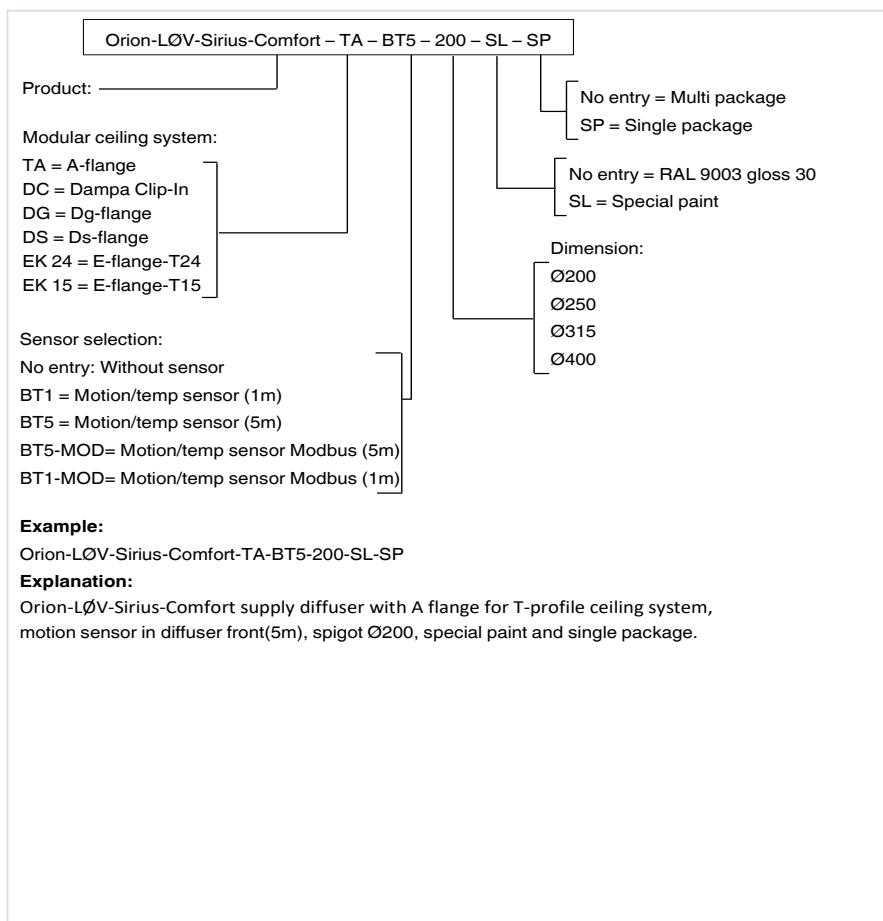
FUNCTION

Sirius Comfort has a built-in VAV regulator for demand control of airflows. The damper solution will choke the pressure at high flow rates and will maintain a low sound level. This may reduce the need for additional dampers and sound attenuators in a duct system. The unit is equipped with a heating coil for waterborne heating of inlet air. Sirius Comfort VAV can be supplied with several different bus options for SD systems.

The diffuser front can be supplied with integrated motion sensor or motion/temperature sensor. This can be delivered in two versions:

- a) X-Sense: Digital output for motion sensor and PT-1000 element for temperature measurement.
- b) X-Sense MOD: Transmission of values via Modbus Product sheet for Motion and motion/temperature sensor can be found by following this link:
www.trox.no/en/downloads/12767671808fd044/Orion-X-Sense-GB-.pdf?type=product_info

ORDER CODE



DESIGN

Sirius Comfort is built as a complete measurement and regulating unit for demand control of airflows in the ventilation system. The measurement station measures pressure difference via measurement rods integrated into the unit. Sirius Comfort is equipped with VAV regulators from Belimo or Siemens. Sirius MI (motor inside) is supplied with a linear regulator from Belimo. Access to the engine is via the valve front. Sirius MU (external motor) is supplied with a rotating motor from Belimo and Siemens. Access to the motor is via the ceiling plate next to the valve. If there is a fixed ceiling, an inspection hatch must be made. When choosing Sirius MU, other regulator variants can be delivered on request. The regulators' specifications can be found in table 1. Complete technical documentation can be found on our website.

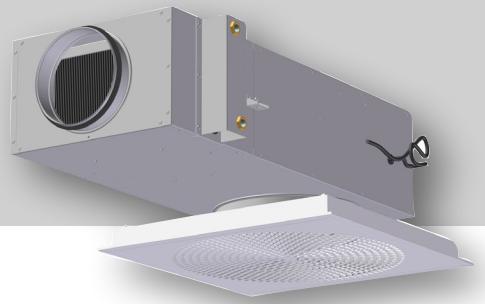
Orion-LØV has a detachable front plate with LØV perforation, and can be delivered adapted to different types of ceiling systems. Pipe connection water side is delivered standard with 1/2" internal threads.

MATERIALS AND FINISH

Sirius Comfort is made of galvanised steel. The measurement cross is in aluminium, hoses and nipples are in plastic. The damper has an affixed polyester cloth.

The spigot has a rubber EPDM seal. Heating coil is copper and aluminium.

Orion-LØV with Sirius Comfort



| Sirius-Comfort - MU - 125-200 - 3 - 2 - MS | |
|---|--|
| Product: | _____ |
| Function: | MI = Actuator mounted inside MU = Actuator mounted outside |
| Dimension Inlet – Outlet: | 125 - 200 160 - 250 200 - 315 250 - 400 |
| Connection: | 0 = Belimo MP-Bus 3 = Belimo Modbus 4 = Belimo Bacnet 7 = Belimo KNX 8 = MOD-Bus for XAC 9 = XAC-ZM MOD-Bus 9.1 = XAC-ZM MOD-Bus w/light relay 9.2 = XAC-ZM MOD-Bus w/heating-cooling relay 9.3 = XAC-ZM MOD-Bus w/light, heating-cooling relay 9.4 = XAC-ZM MP-Bus 10 = Siemens KNX *** 11 = Siemens Bacnet *** 45 = Siemens Modbus *** |
| | *** = Only with Sirius MU |
| Example: Sirius-Comfort-MU-125-200-3-2-MS | |
| Explanation: Sirius-Comfort with Ø125 inlet and Ø200 outlet, with Belimo Modbus, Wago-plug mounted, with labeling scheme. | |

| Produsent | Regulator code | Moment | Type | Operating voltage | Power consumption in operation | Dim.effect |
|-----------|-----------------------|--------|----------|----------------------|--------------------------------|--------------------------|
| Belimo | LHV-D3-MP/MOD/BAC/KNX | 150 N | Linear | AC/DC 24 V, 50/60 Hz | 2,5W | 4,5 VA (max. 8 A @ 5 ms) |
| Belimo | LMV-D3-MP/MOD/BAC/KNX | 5 Nm | Rotating | AC/DC 24 V, 50/60 Hz | 2W | 4 VA (max. 8 A @ 5 ms) |
| Siemens | GDB181.1E/KN (KNX) | 5 Nm | Rotating | AC 24 V, 50/60 Hz | 2,5W | 3 VA |
| Siemens | GDB181.1E/BA (Bacnet) | 5 Nm | Rotating | AC 24 V, 50/60 Hz | 2,5W | 3 VA |
| Siemens | GDB181.1E/MO (Modbus) | 5 Nm | Rotating | AC 24 V, 50/60 Hz | 2,5W | 3 VA |

Table 1, Technical specification



► QUICK SELECTION ORION-LØV WITH SIRIUS COMFORT

| Orion-Løv with Sirius Comfort | m³/h (open) | | |
|-------------------------------|-------------|----------|----------|
| ØD | 25 dB(A) | 30 dB(A) | 35 dB(A) |
| 125 | 140 | 180 | 223 |
| 160 | 238 | 288 | 338 |
| 200 | 320 | 385 | 446 |
| 250 | 446 | 540 | 655 |

| Orion-Løv with Sirius Comfort | m³/h (75Pa) | | |
|-------------------------------|-------------|----------|----------|
| Dim. | 25 dB(A) | 30 dB(A) | 35 dB(A) |
| 125 | 137 | 176 | 216 |
| 160 | 194 | 281 | 230 |
| 200 | 281 | 371 | 446 |
| 250 | 270 | 511 | 655 |

Table 2. Quick selection Orion LØV with Sirius Comfort

REGULATION RANGE

| Sirius | (m³/h) | |
|--------|---------|---------|
| ØD | Minimum | Maximum |
| 125 | 26 | 265 |
| 160 | 43 | 434 |
| 200 | 70 | 700 |
| 250 | 106 | 1060 |

Table 3. Regulation range for vav regulator, airflow in m³/h.
See dimensioning diagram for sound power and pressure loss.

Deviation for working range 10 - 20% of V_{nom} : $\pm 25\%$
20 - 40%: of V_{nom} < $\pm 10\%$
40 - 100%: of V_{nom} < $\pm 4\%$

► DIMENSIONS AND WEIGHT

| Dim. | D | DA | B | H | L | E | F | Weight [Kg] |
|------|-----|-----|-----|-------|-----|----|-----|-------------|
| 125 | 124 | 202 | 325 | 175* | 666 | 18 | 138 | 11.5 |
| 160 | 159 | 252 | 360 | 210** | 682 | 23 | 163 | 13.5 |
| 200 | 199 | 317 | 400 | 240 | 715 | 26 | 188 | 15.5 |
| 250 | 249 | 402 | 450 | 290 | 672 | 26 | 238 | 18 |

Table 4. Sirius Comfort dimensions and weight table.

*) 185 with the coil pipe parts are mounted on the left

**) 220 with the coil pipe parts are mounted on the left

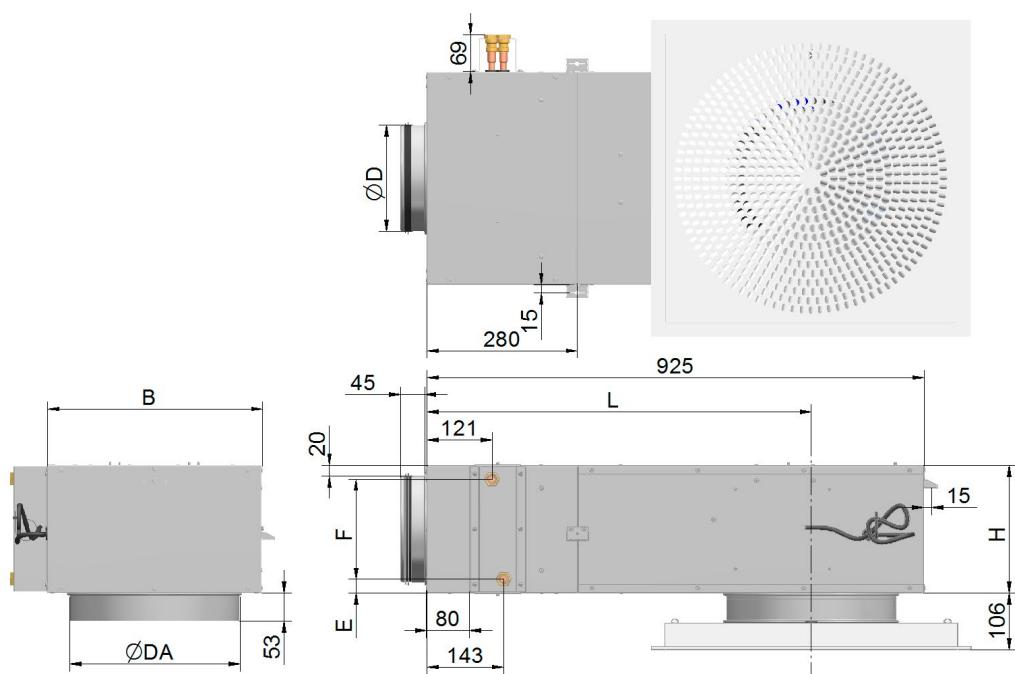
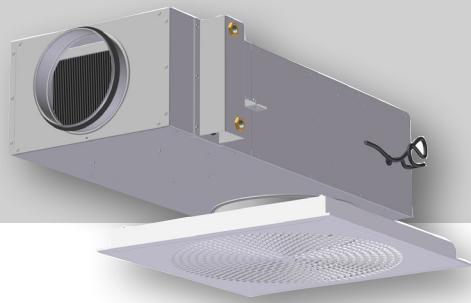


Figure 1, Orion LØV with Sirius Comfort – Dimensional sketch

Orion-LØV with Sirius Comfort



Speaker ACOUSTIC DOCUMENTATION

In the diagrams, the summed A-weighted sound power level from the valve is given, L_{WA} . The correction factors in table 5 on page 9 will be used to calculate the emitted frequency-distributed sound power level, $L_w = L_{WA} + KO$. The sound pressure level in a room with absorption equivalent to 10 m² Sabine will be 4 dB lower than the emitted sound power level.

Example:

Sirius Comfort Ø125 with Orion-LØV with desired airflow 130 m³/h, (36 l/s). From the diagram we find that $L_{WA} = 23$ dB(A) with open damper and 28 Pa total pressure loss.

We would like to find the following data:

- a) Specified sound power level at 250 Hz with open damper.
 - b) A-weighted sound pressure level from the valve in an office with 4dB room attenuation.
 - c) A-weighted sound pressure level if the pressureloss increases to 75 PA
- a) Correction factor for 250 Hz is -1 dB. Emitted sound power level at 250 Hz then becomes: $L_w = L_{WA} + KO = 23 + (-) = 21$ dB
- b) With 4dB room attenuation the A-weighted sound pressure level is: $23 - 4 = 19$ dB(A)
- c) By following the line for 130 m³/h in the diagram up to 75 Pa, 24dB(A) is read. With 4dB room attenuation the A-weighted sound pressure level is: $24 - 4 = 20$ dB(A)

Speaker CALCULATION DIAGRAM

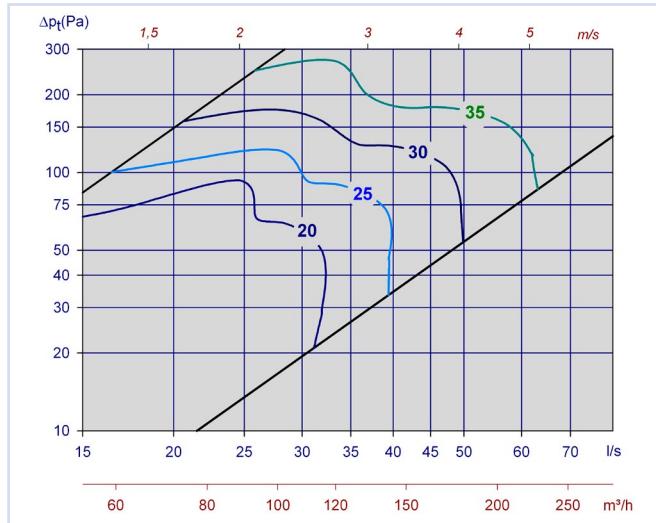


Diagram 1, Orion LØV with Sirius Comfort 125

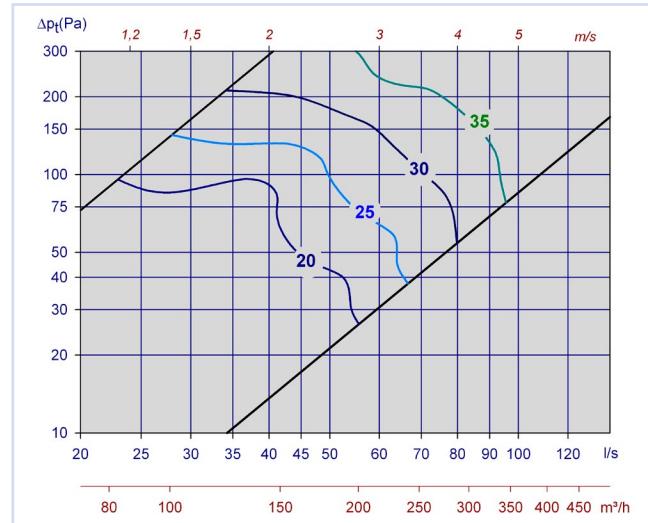


Diagram 2, Orion LØV with Sirius Comfort 160

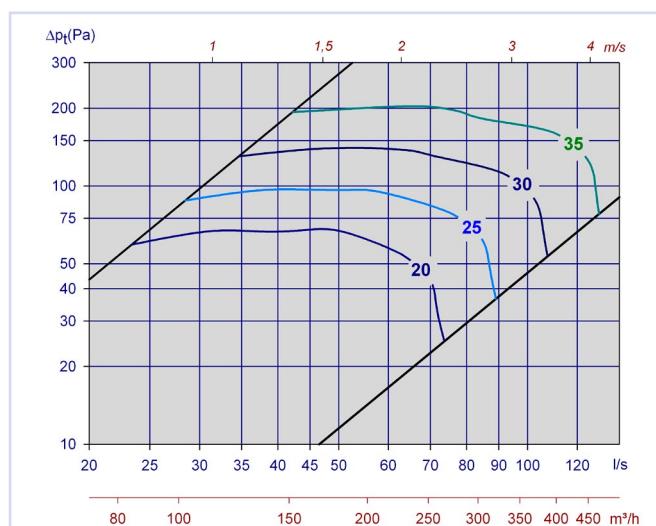


Diagram 3, Orion LØV with Sirius Comfort 200

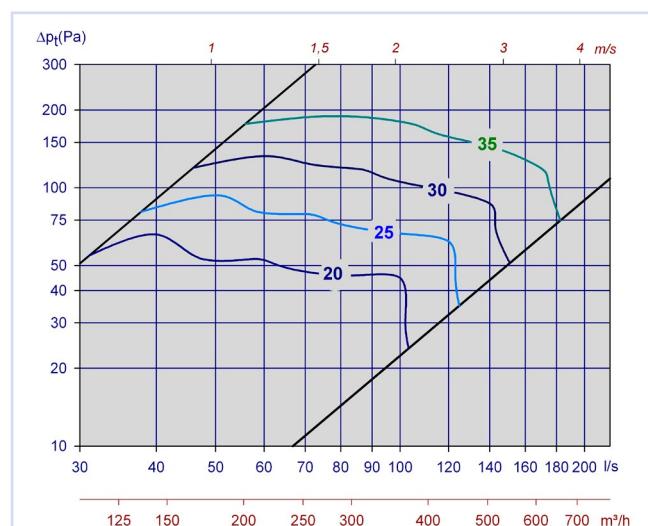
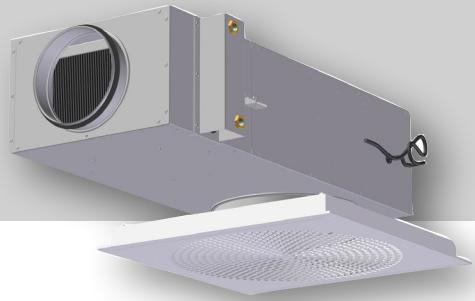


Diagram 4, Orion LØV with Sirius Comfort 250



HEAT CALCULATION

Explanation of diagram for thermal power Sirius Comfort:

In the diagrams, the heating power from the inlet air is shown as a function of the water quantity from 0.01 to 0.04 l/s, and the supply water temperature from 35 to 50 °C. A precondition for the diagram's powers are that the air temperature is 20 °C.

Example:

A Sirius Comfort-LÖV 125 with airflow of 150m³/h has been selected for comfort ventilation and the possibility of heating an office cell with a size of 4.2 x 2.4 x 2.7. A heating requirement of approx. 40W/m² is calculated. This gives a heating need of 40 x 4.2 x 2.4=403Watt. In diagram 5 we see that the power need is covered by the supply temperature of 40°C and the water quantity of 0.02 l/s.

Operating conditions:

Desired room temperature: 22.0 °C

Airflow: 150m³/h

Inlet air temperature: 20°C

Supply temperature of hot water: 40°C

1. Calculation of requisite thermal power.

Because the inlet air have 2 °C lower temperature than the desired room temperature, this cooling effect must be compensated for by the following formula:

$$\frac{q_{(m^3/h)}}{3,6} \times \Delta t \times \rho \Rightarrow \underline{150/3,6 \times 2 \times 1,2 = 100 \text{ W}}$$

Total heating needs: 403+100=503Watt.

Explanation:

q: Airflow

Δt: Air temperature difference (°K)

ρ: Air density.(rho) = 1.2(kg/m³)

2. Calculation of the water's return temperature:

In diagram 5 we find that the power is covered by the water quantity of 0.02 l/s. The water's temperature reduction will be computed as per the formula:

$$\Delta t_{water} = \frac{P_{water\ side}}{(Cp \cdot q_w)} \Rightarrow \frac{503}{(4207 \cdot 0,02)} = 5,98$$

Explanation:

P_{water side}: Power. (W)

Cp: The water's specific heat capacity. J/(K . kg)

q_w: Water quantity. (l/s)

Δ_{water} The water's temperature difference. (°K)

The water's return temperature: 40 – 5.98=34°C.

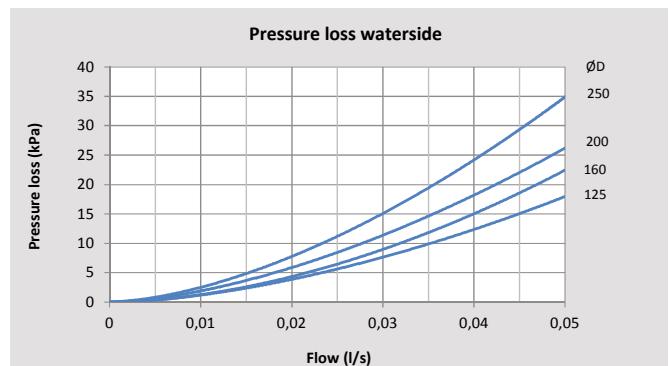


Diagram 5

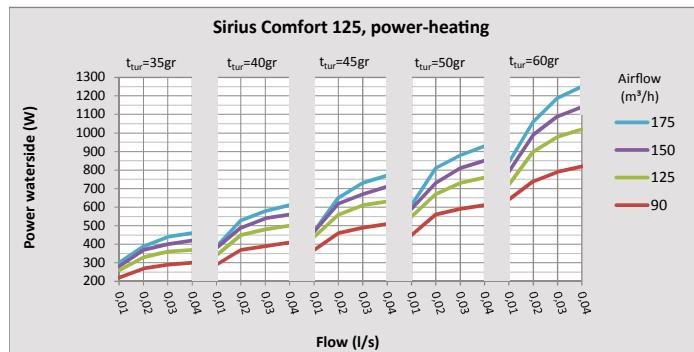


Diagram 6

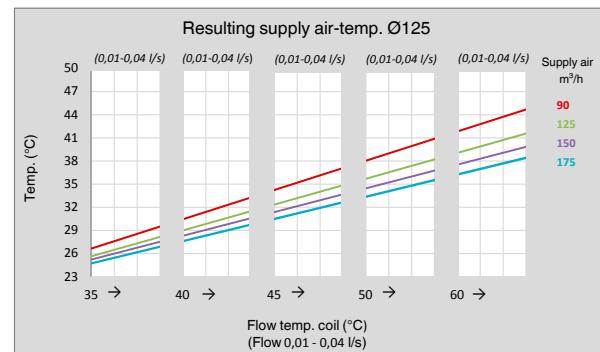


Diagram 7

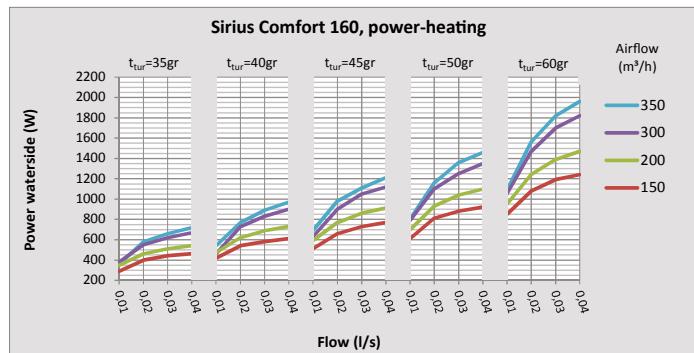


Diagram 8

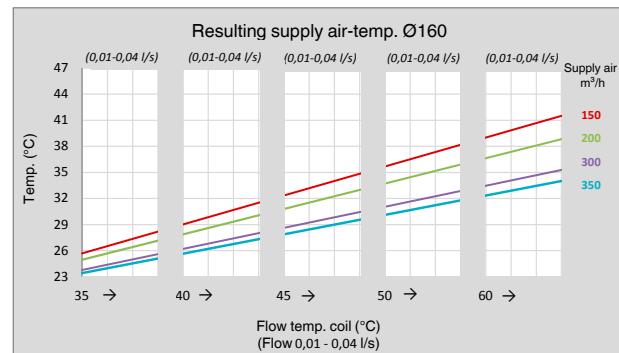


Diagram 9

Orion-LØV with Sirius Comfort

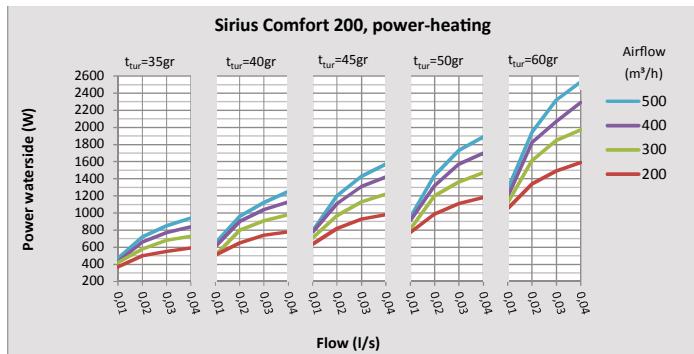


Diagram 10

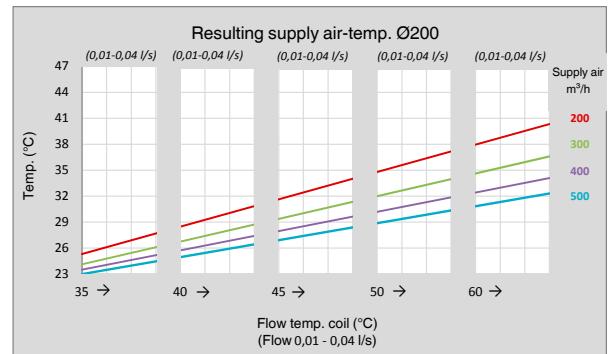


Diagram 11

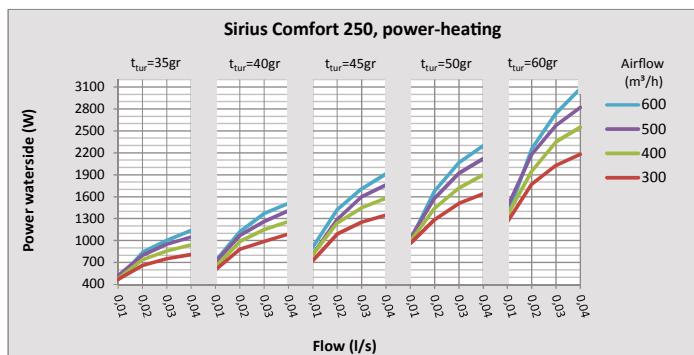


Diagram 12

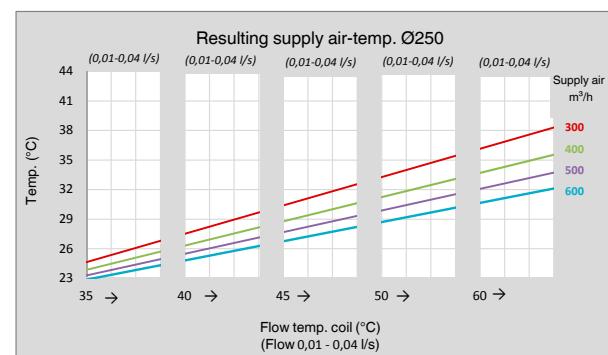


Diagram 13

Orion-LØV with Sirius Comfort



DISTRIBUTION PATTERN

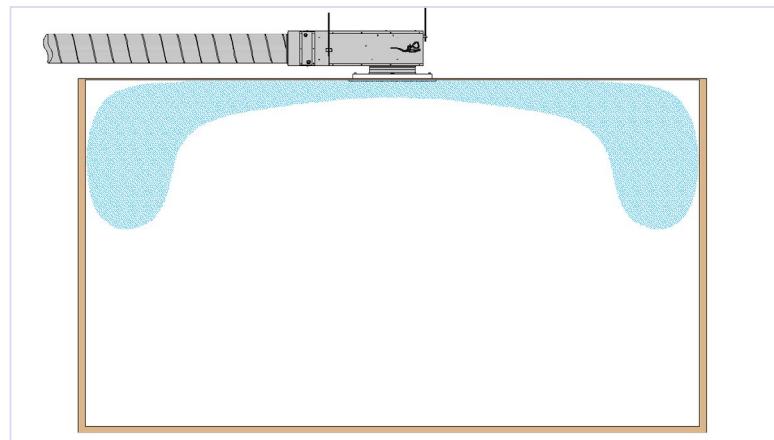


Figure 2, Distribution pattern Orion LØV with Sirius Comfort.

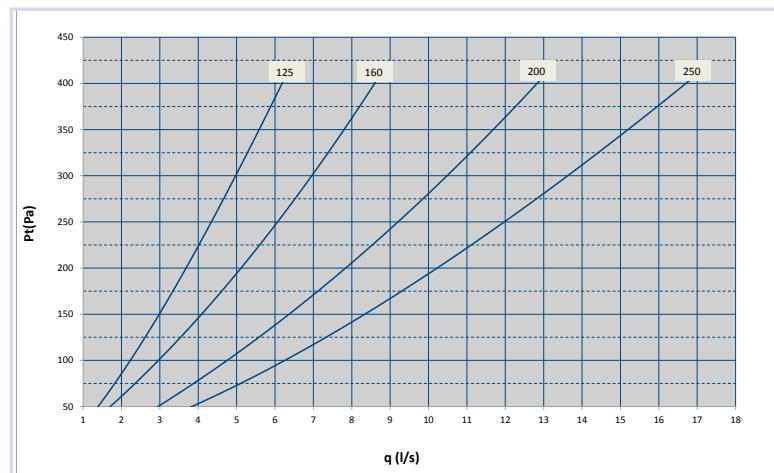


Figure 3, Leakage amount with closed damper

→ THROW LENGTH

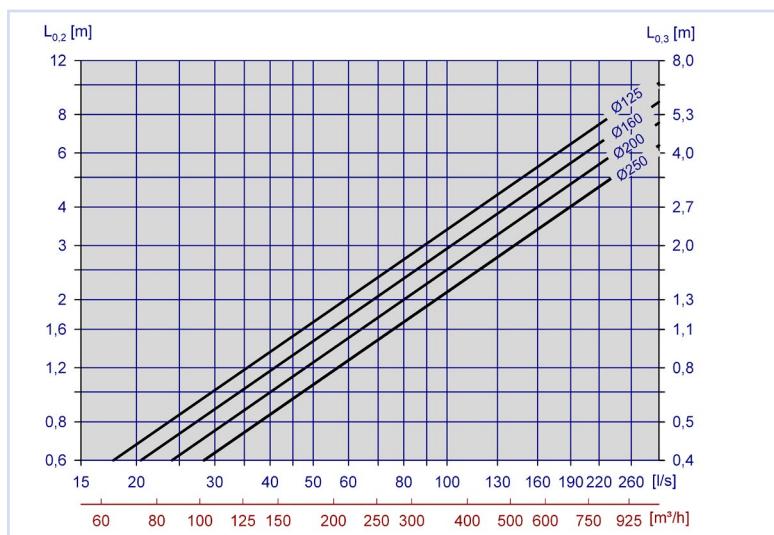


Diagram 14, Throw length Orion-LØV with Sirius Comfort

Orion-LØV with Sirius Comfort



MOUNTING

The valve Orion-LØV can be mounted in different types of false ceilings or in a permanent ceiling. On Sirius Comfort a suspension bracket in the back edge is used with a threaded rod or belt, see figure 4.

For connecting up of the two components, the suspension bracket is used as shown in figure 7. This is placed against the side of the plenumbox and fastened with a mounting screw.

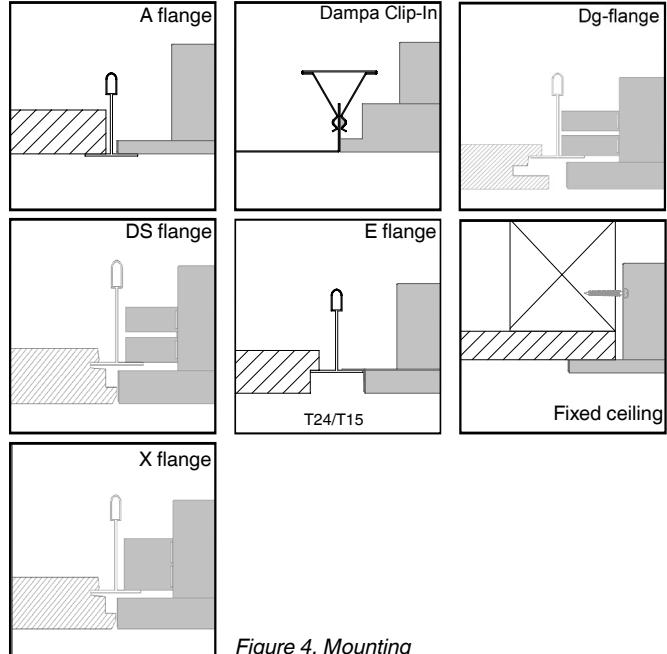


Figure 4, Mounting

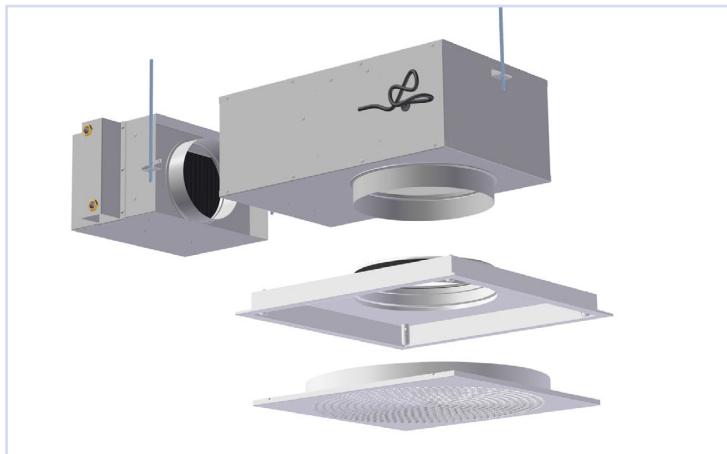


Figure 5, Orion LØV with Sirius Comfort

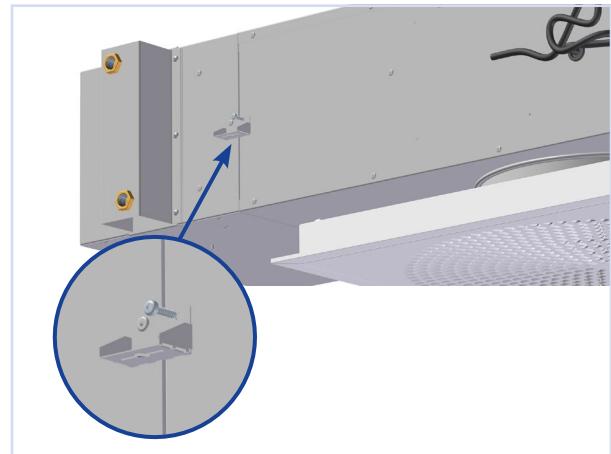


Figure 6, Orion LØV with Sirius Comfort

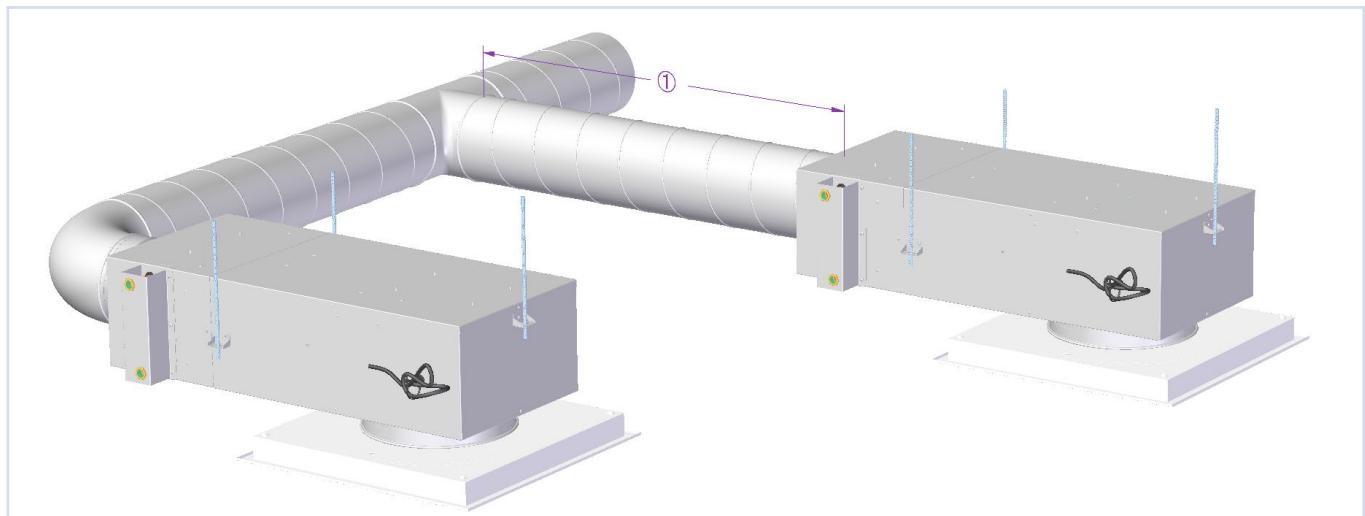


Figure 7, Orion LØV with Sirius Comfort ① Recommended min. 5 x Dia.



ADJUSTMENT

The PC program Belimo PC-Tool can be used for adjustment and service or you can use Siemens ACS941. With these service tools, the regulators can be set to e.g. desired minimum and maximum air volumes, 0-10 V or 2-10 V control signal and Open-loop. It can also be run function tests that can be displayed graphically for documentation of the regulator's function. There are also service tools that do not require a PC, Belimo ZTH-VAV and Siemens AST20. For more information, see www.belimo.eu and www.siemens.com or contact one of our sales representatives.

Max. working pressure waterside 10 bars.

Max. test pressure waterside 15 bars.

| | KO (dB) | | | | | | | | Left pressure loss line (closed) | | | | | | | | 63 | | | | 125 | | | | 250 | | | | 500 | | | | 1k | | | | 2k | | | | 4k | | | | 8k | | | |
|------|----------------------------------|-----|-----|-----|----|-----|-----|-----|----------------------------------|----|----|-----|-----|----|----|-----|-----|--|--|--|-----|--|--|--|-----|--|--|--|-----|--|--|--|----|--|--|--|----|--|--|--|----|--|--|--|----|--|--|--|
| | Higher pressure loss line (open) | | | | | | | | 63 | | | | 125 | | | | 250 | | | | 500 | | | | 1k | | | | 2k | | | | 4k | | | | 8k | | | | | | | | | | | |
| Dim. | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 125 | 5 | 3 | -1 | -1 | -9 | -12 | -12 | -8 | 6 | 0 | -5 | -11 | -10 | -8 | -5 | -6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 160 | 5 | 2 | -1 | -2 | -6 | -11 | -14 | -11 | 1 | -3 | -5 | -10 | -7 | -8 | -6 | -7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | 4 | 2 | -1 | -2 | -6 | -12 | -13 | -9 | 4 | -2 | -9 | -14 | -10 | -9 | -4 | -7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 250 | 4 | 3 | -1 | -3 | -6 | -12 | -13 | -10 | -1 | -5 | -8 | -12 | -8 | -6 | -5 | -10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 5. KO factor Orion-LØV with Sirius Comfort.

| Sirius dim. | Attenuation (dB) | | | | | | | |
|-------------|------------------|-----|-----|-----|----|----|----|----|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 125 | 19 | 11 | 14 | 17 | 12 | 10 | 11 | 14 |
| 160 | 17 | 10 | 13 | 15 | 10 | 9 | 10 | 13 |
| 200 | 14 | 9 | 10 | 12 | 9 | 8 | 10 | 11 |
| 250 | 11 | 7 | 11 | 10 | 9 | 8 | 9 | 11 |

Table 6. Static sound absorption incl. end reflection, Orion-LØV with Sirius Comfort.

MAINTENANCE

There are no special requirements for maintenance.

ENVIRONMENT

Inquiries concerning building product declarations may be directed to one of our sales representatives, or be found on our Web site: www.trox.no

Orion-LØV with Sirius Comfort is developed and produced by:

The right to make changes is reserved.

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