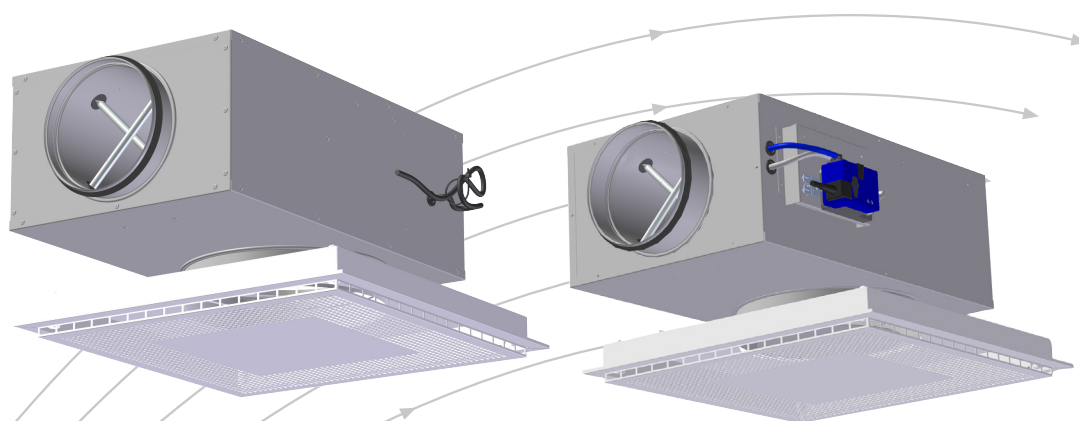


Orion-PTV with Sirius

VAV box for supply diffuser



- Unique damper function
- Extensive working range
- Can be used with internal linear regulator, or external rotary regulator

TROX[®] TECHNIK

Auranor

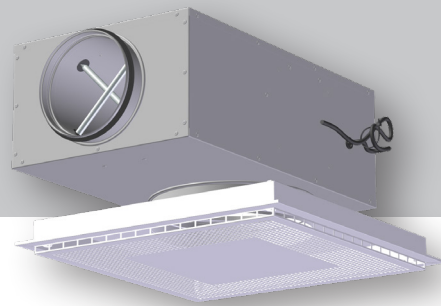
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Orion-PTV with Sirius



APPLICATION

Orion-PTV with Sirius is a diffuser unit with VAV function, and is used as volume flow controller and diffuser in ventilation systems to enable air flow rates to be set as per requirements. Orion-PTV is a high-capacity system with excellent induction, and is ideal for high air flow rates.

FUNCTION

Orion-PTV with Sirius has a built-in VAV controller for adjustment of air flow rates according to requirements. 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. Sirius VAV chambers can be supplied with several different bus options for SD systems.

If T-pipes are used, a spacing of at least $5 \times \text{ØD}$ is recommended in order to maintain the measurement accuracy.

The diffuser front can be supplied with integrated motion sensor. Product sheet for Motion sensor can be found on our website: www.trox.no

DESIGN

Orion-PTV with Sirius is a complete measuring and control unit where the air flow rates in ventilation systems can be set as required. At the measuring station, the differential pressure is measured by using measuring rods integrated in the unit. Sirius 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 engine variants can be delivered on request.

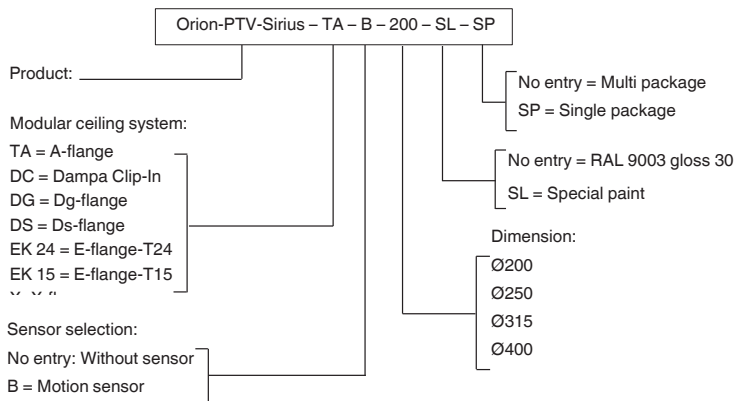
The regulators' specifications can be found in table 1. Complete technical documentation can be found on our website.

Orion-PTV features a removable front panel with perforation at the front and sides, and is suitable for a range of ceiling systems.

MATERIALS AND SURFACE COATING

Sirius comes in a galvanised steel design. The measurement unit is in aluminium, and hoses and nipples are in plastic. The damper is equipped with polyester material, and the connection collar is fitted with EPDM rubber gasket.

ORDER CODE, diffuser - Orion-PTV Sirius



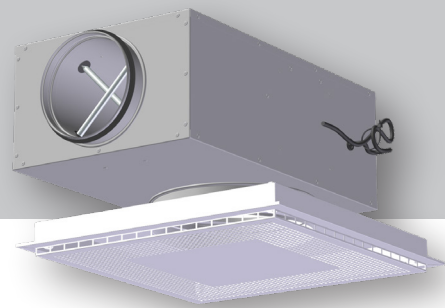
Example:

Orion-PTV-Sirius-TA-B-200-SL-SP

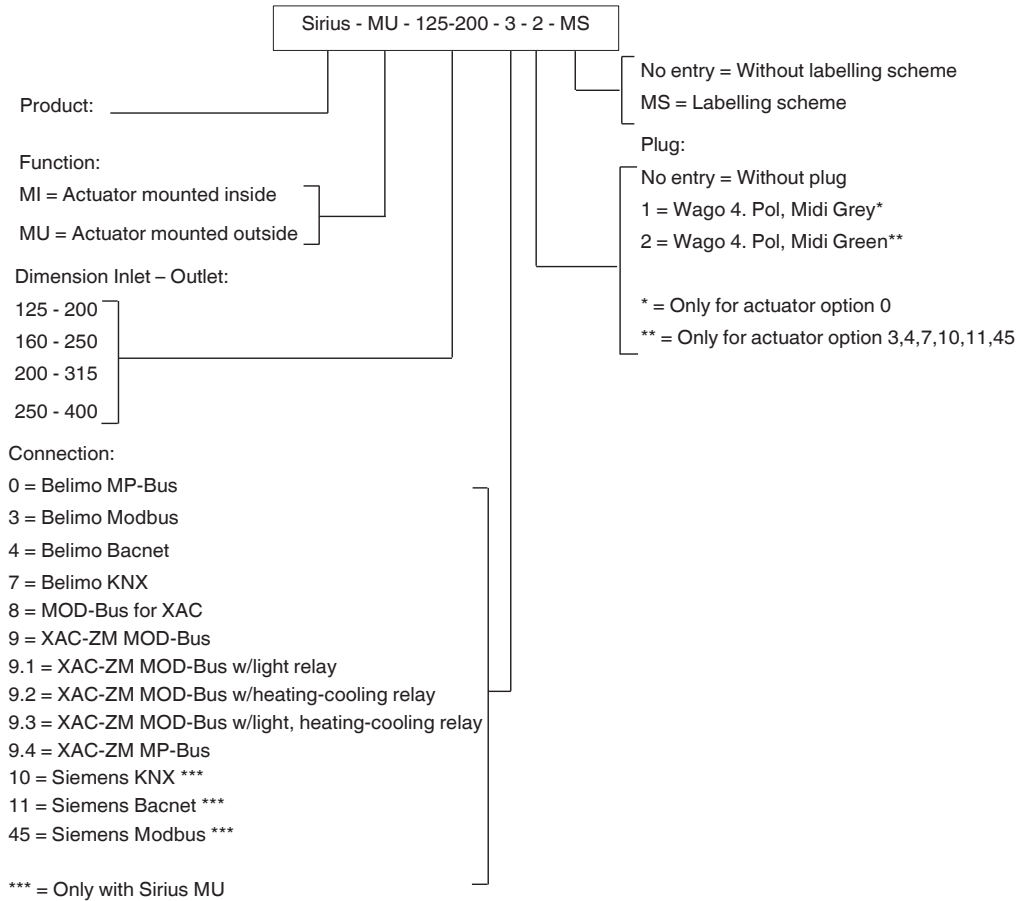
Explanation:

Orion-PTV-Sirius supply diffuser with A flange for T-profile ceiling system, motion sensor at diffuser front, spigot Ø200. Special paint, single package

Orion-PTV with Sirius



ORDER CODE, Sirius



Example:

Sirius-MU-125-200-3-2-MS

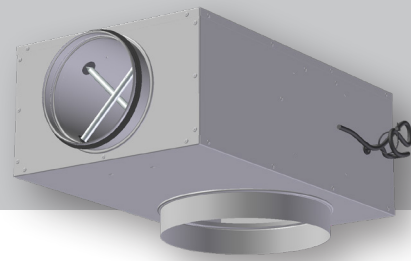
Explanation:

Sirius with Ø125 inlet and Ø200 outlet, with Belimo Modbus, Wago-plug mounted, with labelling scheme.

Produsent	Regulator code	Moment	Type	Operating voltage	Power consumption in operation	Dim.effect
Belimo	LHV-D3-MP/MOD/BAC/KNX	150 N	Lineær	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	Roterende	AC/DC 24 V, 50/60 Hz	2W	4 VA (max. 8 A @ 5 ms)
Siemens	GDB181.1E/KN (KNX)	5 Nm	Roterende	AC 24 V, 50/60 Hz	2.5W	3 VA
Siemens	GDB181.1E/BA (Bacnet)	5 Nm	Roterende	AC 24 V, 50/60 Hz	2,5W	3 VA
Siemens	GDB181.1E/MO (Modbus)	5 Nm	Roterende	AC 24 V, 50/60 Hz	2,5W	3 VA

Table 1: Technical specification

Orion-PTV with Sirius



QUICK SELECTION, Orion-PTV with Sirius

Sirius dim.	[Open] m ³ /h		
	25dB(A)	30dB(A)	35dB(A)
125	198	238	284
160	299	352	414
200	374	440	516
250	498	597	715

Sirius dim.	(75Pa) m ³ /h		
	25dB(A)	30dB(A)	35dB(A)
125	166	234	288
160	234	334	414
200	378	438	510
250	382	547	697

Table 2: Quick selection, Orion-PTV with Sirius

Sirius ØD.	(m ³ /h)	
	Minimum	Maksimum
125	26	265
160	43	434
200	70	700
250	106	1060

Table 3: Adjustment range for VAV controller, air flow rate in m³/h.
See calculation diagram for sound power level and pressure drop.

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, Orion-PTV with Sirius

Dim.	D	DA	B	H	L	L1	Weight Sirius [kg]	Weight Sirius with valve [kg]
125-200	124	202	325	175	645	386	8	12
160-250	159	252	360	210	645	402	9	13
200-315	199	317	400	240	645	435	10,5	14,5
250-400	249	402	450	290	645	392	12	16

Table 4

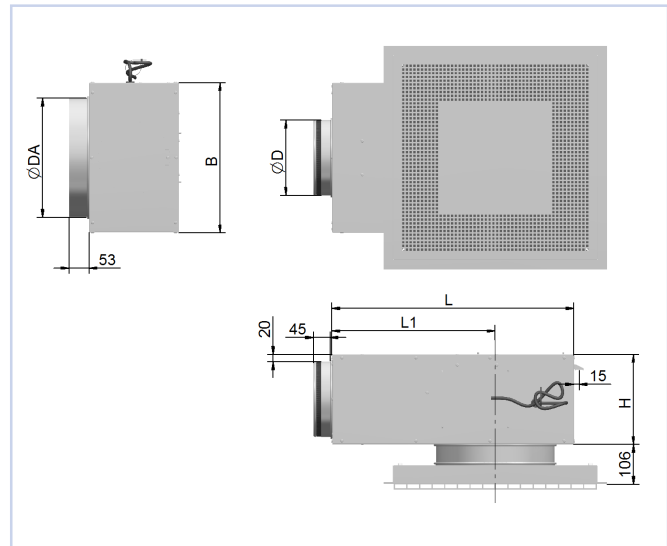
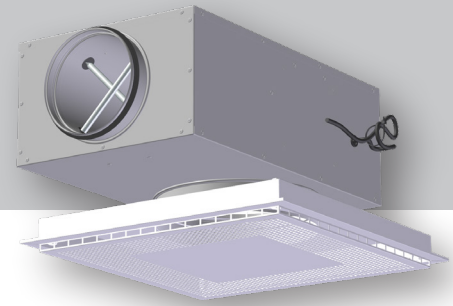


Fig. 1: Dimensions, Orion-PTV with Sirius

Orion-PTV with Sirius



ACOUSTIC DATA

The diagrams provide a summary of the A-weighted sound power level from diffuser, L_{WA} . Correction factors in table 5, page 5, are used to calculate emitted sound power level at the respective frequencies, $L_W = L_{WA} + KO$. A room with absorption equivalent to 10m² Sabine will have a sound pressure level which is 4 dB below the sound power level emitted.

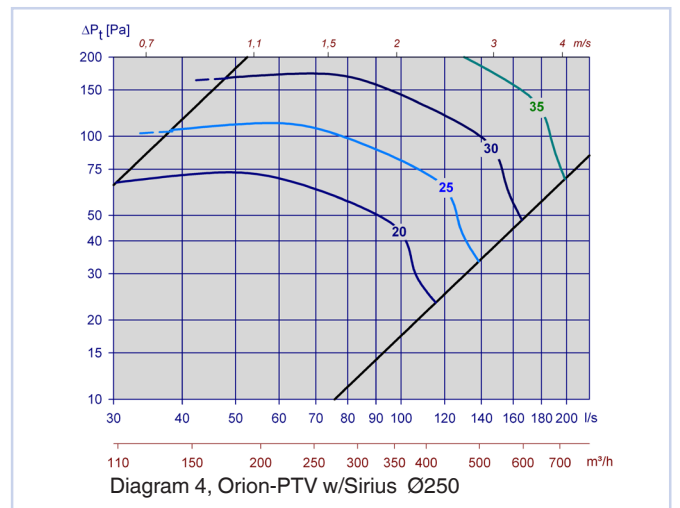
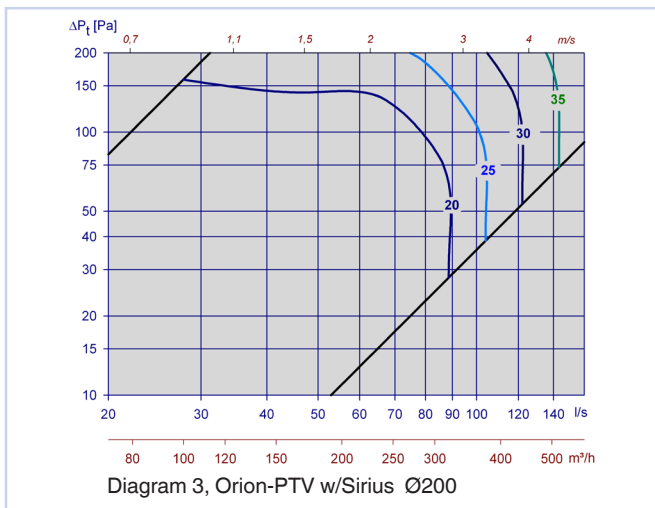
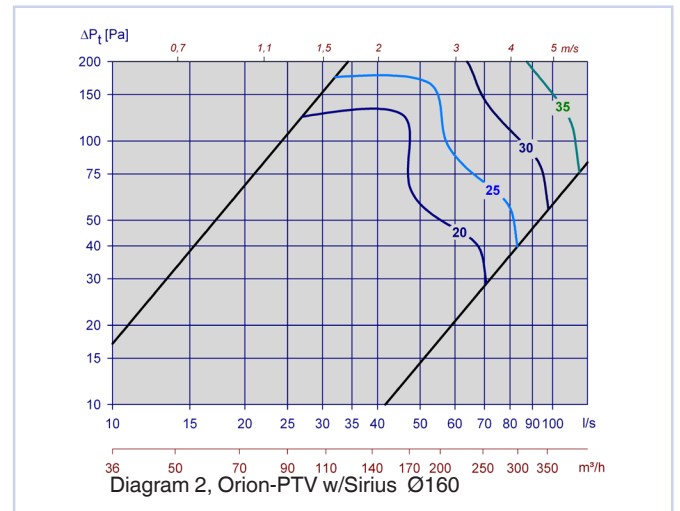
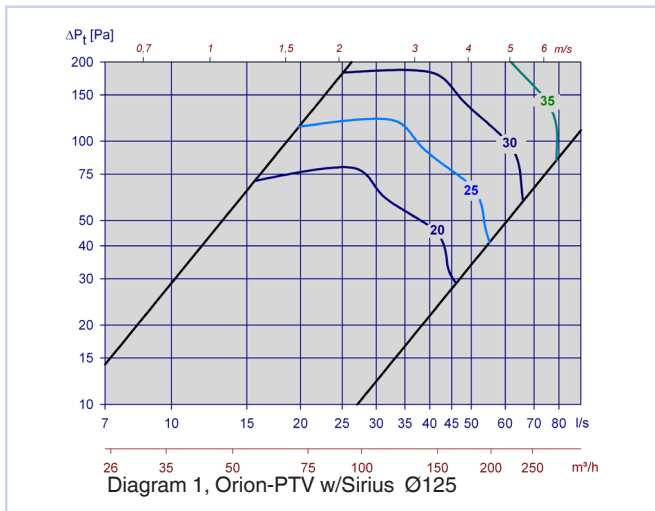
Eksempel:

Sirius 160 with Orion-PTV supply diffuser, desired volume flow 90 l/s. From diagram 2, we find that $L_{WA} = 27$ dB(A) with open damper and 45 Pa total pressure drop. The aim is to find the following data:

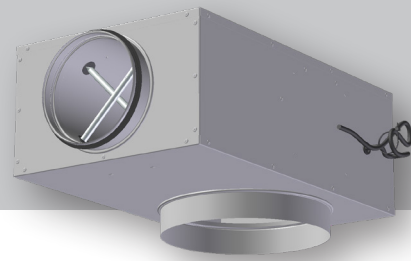
- Emitted sound power level at 250Hz with open damper.
- A-weighted total sound pressure level from diffuser in an office with 4dB room attenuation.
- A-weighted sound pressure level in an office at 75 Pa total pressure loss, i.e. 27 Pa choking with the unit's damper.

- The correction factor for 250 Hz is -2 dB. Emitted sound power at 250 Hz is then: $L_W = L_{WA} + KO = 27 + (-2) = 25$ dB
- With room attenuation equivalent to 4 dB, A-weighted sound pressure level is: $27 - 4 = 23$ dB(A)
- At the operating point of 50 l/s and 75 Pa total pressure loss, the diagram indicates 29dB(A). With 4dB room attenuation the sound pressure level in the room will be: $29 - 4 = 25$ dB(A)

CALCULATION DIAGRAM



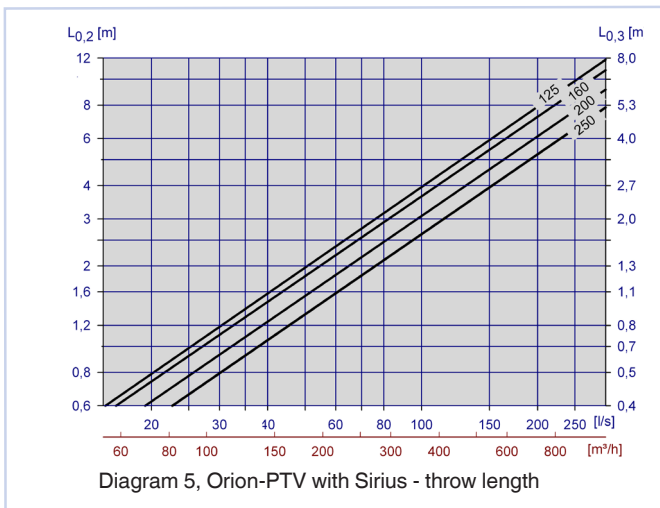
Orion-PTV with Sirius



Sirius dim.	KO [dB]								KO [dB]							
	Right pressure drop line (open)								Left pressure drop line (heavily choked)							
	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
125	5	0	0	-2	-6	-13	-13	-10	2	-7	-7	-11	-9	-9	-5	-6
160	6	-1	-2	-2	-4	-15	-14	-10	3	-6	-7	-10	-7	-7	-8	-7
200	6	-1	-3	-3	-4	-13	-14	-10	4	-3	-4	-3	-5	-11	-9	-9
250	7	3	-1	-2	-5	-14	-14	-10	3	-3	-6	-9	-8	-8	-6	-5

Table 5: Correction factor, Orion-PTV with Sirius

THROW LENGTH



FLOW PATTERN

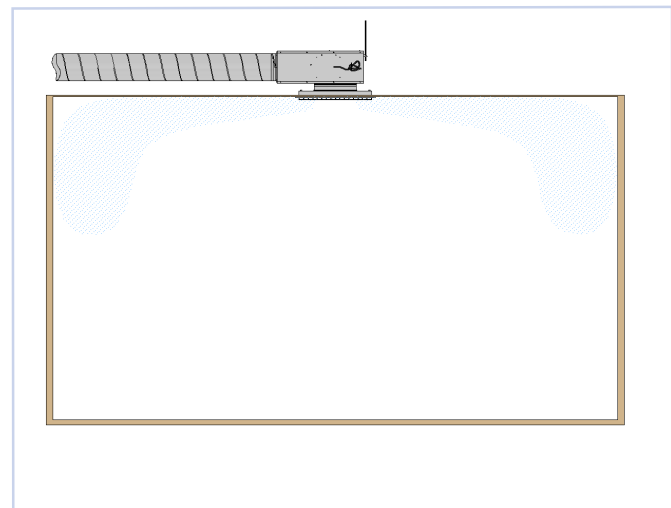
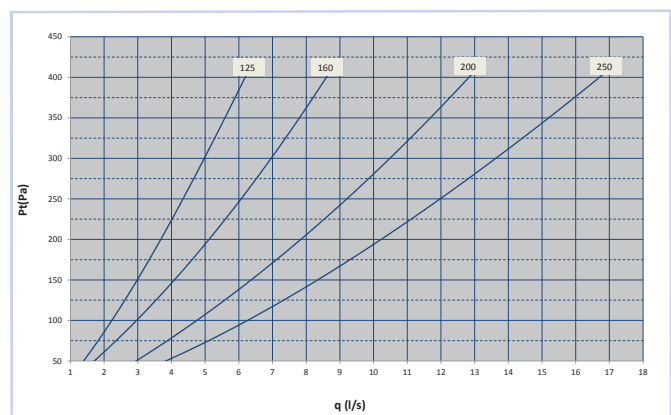


Fig. 2: Flow pattern, Orion-PTV

Sirius Dim.	Attenuation [dB]							
	63	125	250	500	1k	2k	4k	8k
125	23	10	14	16	12	11	12	15
160	17	7	10	13	10	11	13	17
200	15	5	11	11	9	10	12	13
250	14	6	12	9	9	11	11	14

Table 6: Static sound attenuation incl. end reflection, Orion-PTV with Sirius



Orion-PTV with Sirius

INSTALLATION

The Orion-PTV diffuser can be installed in a range of modular ceiling systems as well as in fixed ceilings. Sirius is attached to the rear of the support bracket by means of threaded rod or strap (fig. 4). In order to maintain the system's measurement accuracy, it is important to install units with spacing as shown in fig. 5.

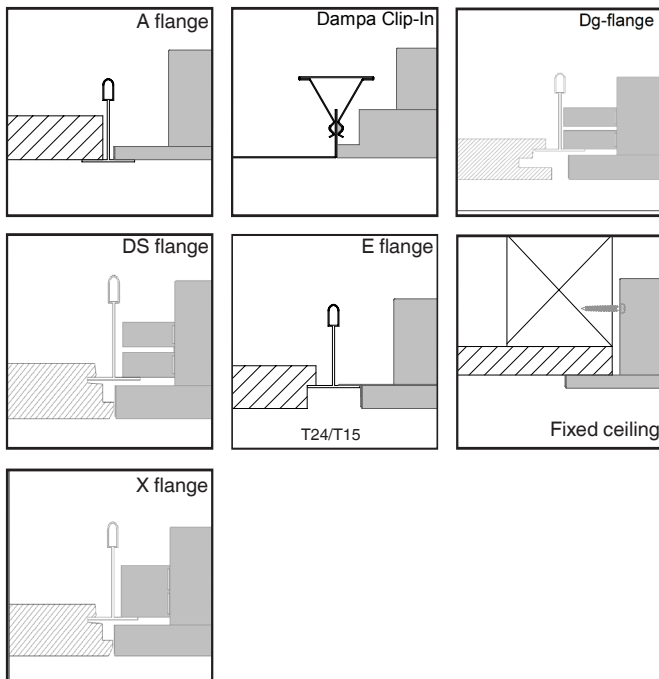


Fig. 3: Installation

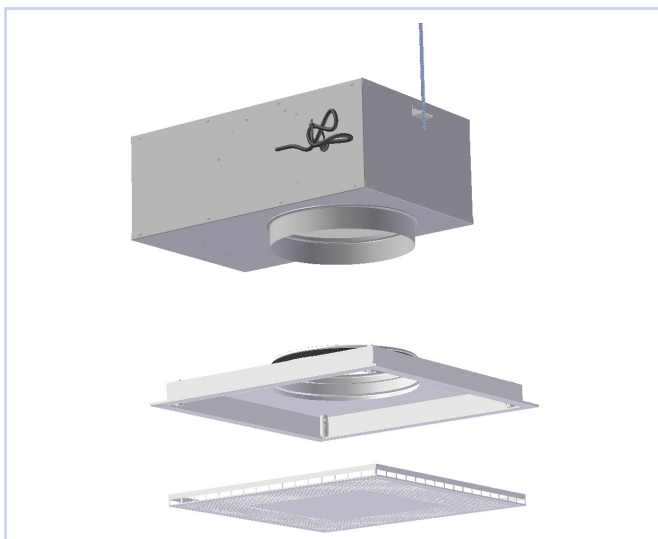


Fig. 4: Installation

COMMISSIONING

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.

MAINTENANCE

No specific maintenance requirements.

ENVIRONMENT

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

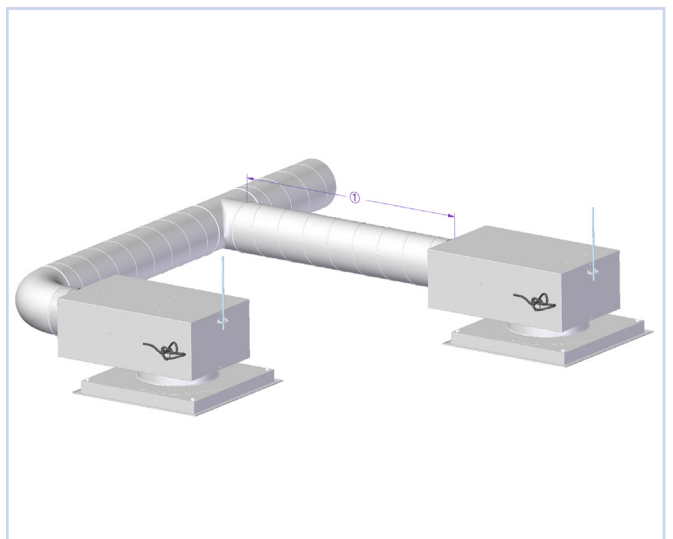


Fig. 5: Installation ① Recommended min. 5 x Dia.

Orion-PTV with Sirius is developed and manufactured by:
TROX Auranor Norge AS

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