

PARAGON b



Compact comfort module

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PARAGON b

Comfort module PARAGON

PARAGON is the name of a new family of compact comfort modules especially designed for use in hotels and hospitals.

PARAGON provides high cooling/heating capacity through optimal utilisation of its cooling/heating coil already while the air pressure and airflows are low. At the same time, the installation height of the product is kept at an absolute minimum which enables maximum room height in e.g. the entrance to a hotel room.

Quick facts

- ▶ Cooling, heating (water or electric) and ventilation
- ▶ Low installation height
- ▶ High capacity
- ▶ Built-in Control Equipment
- ▶ Simple Installation
- ▶ Closed system
- ▶ Flexible airflow (-VariFlow)
- ▶ Adjustable direction of air discharge (-ADC and adjustable louvres)

Key figures

Airflow range:	10 - 72 l/s
Pressure range:	50 – 200 Pa
Total cooling capacity:	Up to 2400 W
Heating capacity	Water: Up to 3000 W
	Electric: Up to 1000 W
Size:	L=900, 1100, 1300 and 1500
	B=695
	H=185 mm

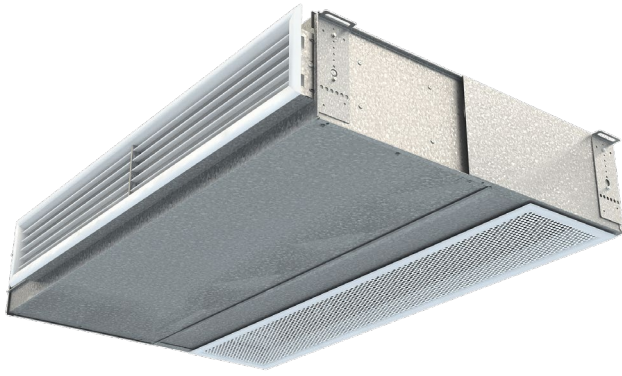


Figure 1. PARAGON

Technical description

Outstanding features of the PARAGON comfort module

The PARAGON has been developed for the purpose of creating an optimal indoor climate mainly in hotel rooms and hospital wards. Strong focus has been directed on a high degree of comfort as well as low running costs in these applications. Since the PARAGON is driven by a central air handling unit, there is no built-in fan that would otherwise generate noise and require servicing. Through patent-pending technology, the built-in coil is optimally utilized which provides high cooling/heating capacity already while the air pressure and airflows are low. The optimal use of the coil at the same time provides a design that minimizes the height of the unit. This makes it possible to increase the ceiling height in a hotel room entrance, for instance, and in this way create more volume and a brighter entrance.

Version

Paragon is available in the following variants:

- Variant A: Ventilation, water-based cooling
- Variant B: Ventilation, water-based cooling and heating from a coil.
- Variant X: Ventilation, water-based cooling from a coil and heating from electric elements in the coil

PARAGON in a nutshell

- Plug & play
- Factory-installed controls
- Low flow-generated noise level
- Draught-free indoor climate
- No fan in the room
- Dry system without condensation
- No need for any drainage system
- No filters
- Requires minimal maintenance
- Low energy consumption
- Flexible adjustment of the air volume (VariFlow)
- Guaranteed comfort through flexible adjustment of the direction of air discharge (ADC)
- Paragon can be ordered with or without grilles.

How the Unit Operates

PARAGON

Hotel & Hospital

The primary air is supplied via duct connection in the rear edge of the unit and this builds up positive pressure inside the unit. The positive pressure distributes the primary air with relatively high velocity via two rows of nozzle holes, one row in the upper edge and one row in the lower edge of the outlet. The high velocity of the primary air creates negative pressure which generates induction of the room air. The recirculation air is sucked up through the recirculation grille of the unit and flows on through the coil where it is cooled, heated, if required, or just passes untreated, before it mixes with the primary air and is discharged into the room.

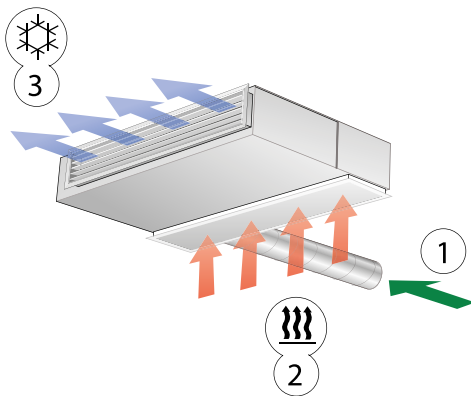


Figure 2 – PARAGON cooling function
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with chilled room air

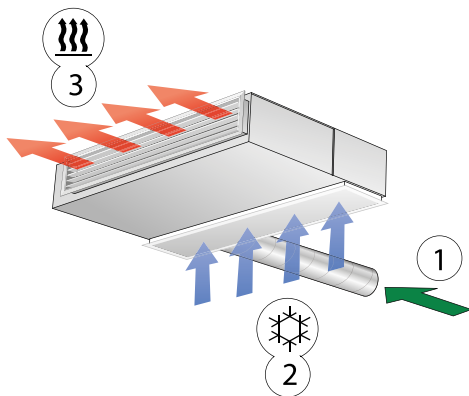


Figure 3 – PARAGON heating function (Waterborne or electric)
 1 = Primary air
 2 = Induced room air
 3 = Primary air mixed with heated room air

The supply air discharged into hotel rooms and hospital wards is advantageously distributed as straight as possible by allowing it to follow the ceiling, i.e. utilising the Coanda effect. This enables the air to reach all the way to the perimeter wall. If horizontal air distribution is desirable, this is simply achieved by means of the ADC (Anti Draught Control) feature, which is included as standard in all PARAGON comfort modules. If vertical air distribution is desirable, this is achieved by setting the vanes of the outlet grille to slant upward or downward. If you like, you can lock the angle setting of the outlet grille using an accessory that secures the vanes in fixed position.

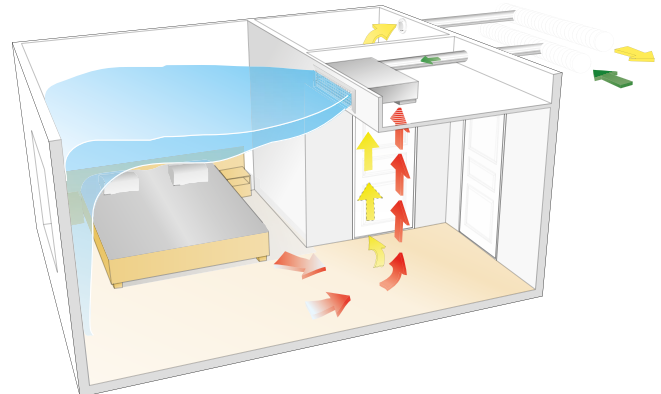


Figure 4 – Air distribution with the PARAGON in a hotel room

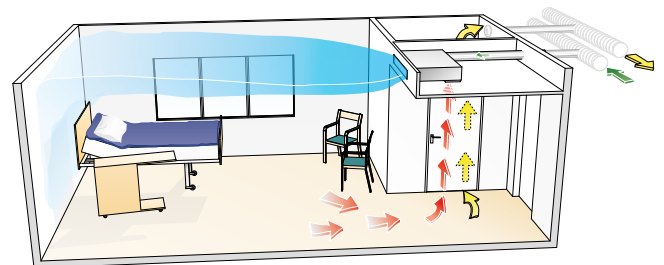


Figure 5 – Air distribution with the PARAGON in a hospital ward

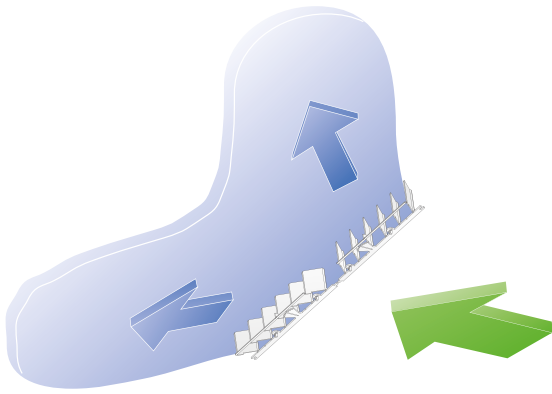


Figure 6 – Horizontal air distribution with ADC

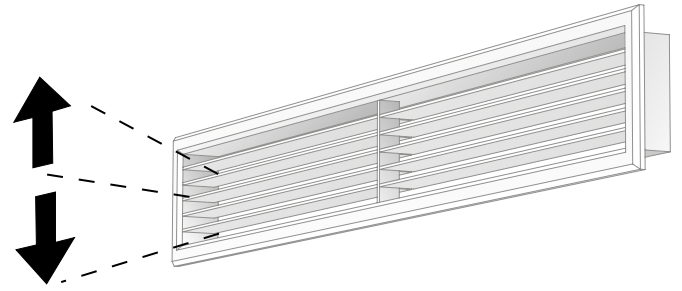


Figure 8. Vertical air distribution with adjustable louvres in the supply air grille.

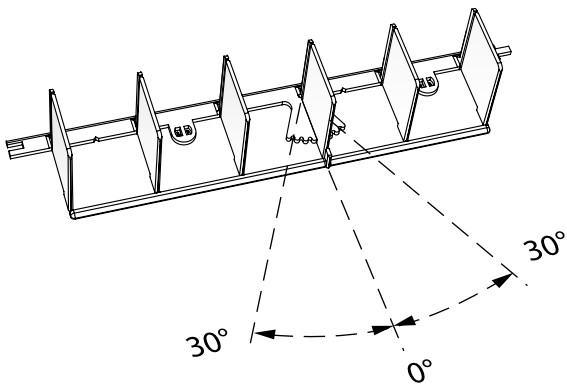


Figure 7. PARAGON ADC



Figure 9. Adjustment, nozzle L

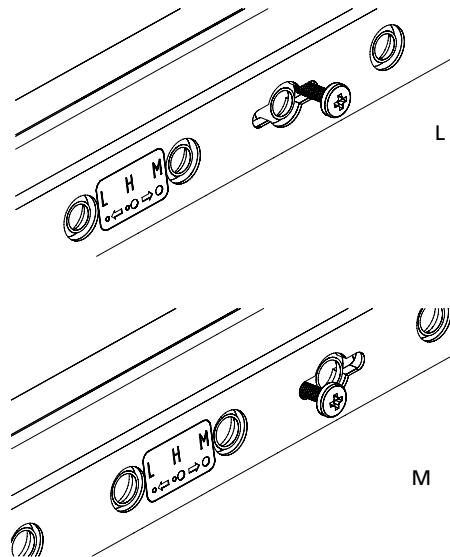


Figure 10. Adjustment, nozzle M

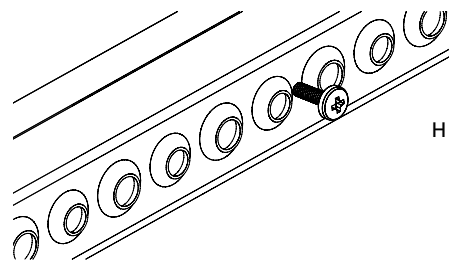


Figure 12. Adjustment of the nozzles L, M and H
(The throttling strip by nozzle H has been removed.)



Figure 11. Adjustment, nozzle H

CONDUCTOR control equipment

Energy efficient

The control equipment for the PARAGON in the standard version is based on the CONDUCTOR in order to save on energy to the fullest possible extent. The CONDUCTOR is Swegon's in-house designed controller specially designed for controlling water-borne and airborne indoor climate systems.

The W3/W4.1 application used in combination with the PARAGON demand-controls both the room temperature and the air quality in the room. When someone is in the room, the functions of the controller adapt to provide comfort feed-back control. If no one is in the room, the controls activate the economy comfort mode, allowing the room temperature to deviate more from the preset setpoint. At the same time, the system reduces the airflow to the relevant room to a minimum in order to save fan energy. In addition, there are a number of other functions for both comfort and energy feed-back control coupled to temperature deviations, open/closed windows and possible condensation precipitation.

Communication

CONDUCTOR has been developed as a subsystem in Swegon's electrical and control equipment platform. The GOLD air handling units, used in combination with the SuperWISE communication unit, offer unique opportunities for achieving energy-efficient applications all the way from the room level and up to the plant room.

The CONDUCTOR communicates via Modbus RTU Main control systems can access the entire list of parameters for both reading and writing values.

Simple installation and simple maintenance

Factory-fitted control equipment makes the installation work simple. All the necessary components are then easily accessible via the removable recirculation air grill and ready for fastest possible installation

The room controller included in the supply communicates wirelessly or via wired connection to the comfort module controller. Wireless communication reduces the costs for running cables. On the other hand, a wired connection reduces the need for maintenance since the user then does not need to periodically replace batteries.

For more information regarding the CONDUCTOR, see separate product data sheet.

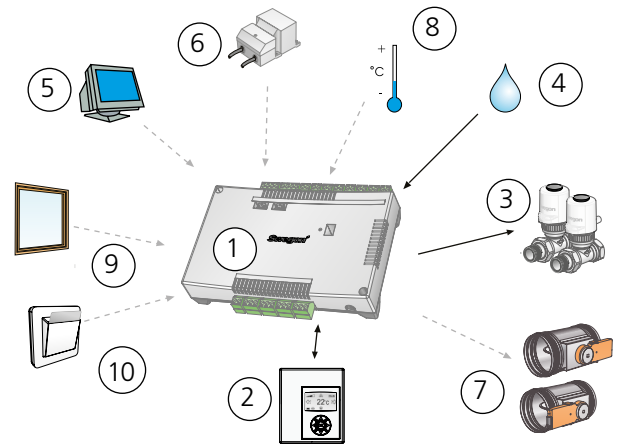


Figure 13. Factory-fitted CONDUCTOR W3 control equipment

- 1 = Controller
- 2 = Room controller
- 3 = Valves and valve actuators for cooling and heating water
- 4 = Condensation sensor
- 5 = Communication via Modbus RTU

Accessories, if required:

- 6 = Transformer
- 7 = Motorised ventilation damper
- 8 = External temperature sensor
- 9 = Window contact
- 10 = Key card holder or presence sensor

LUNA control equipment

In applications where the user does not want demand-controlled ventilation in the room, and has no need of communication with an external monitoring system, a simpler form of control equipment is available. This variant of control is called the LUNA and regulates the temperature in the room only (not the air quality). The PARAGON with factory-fitted LUNA is available to order.

Please note that the controller in this case is incorporated into the room controller and requires a cable connection from the room to the actuator and possibly to the condensation sensor up inside the PARAGON. For more information, see the separate datasheet for the LUNA.

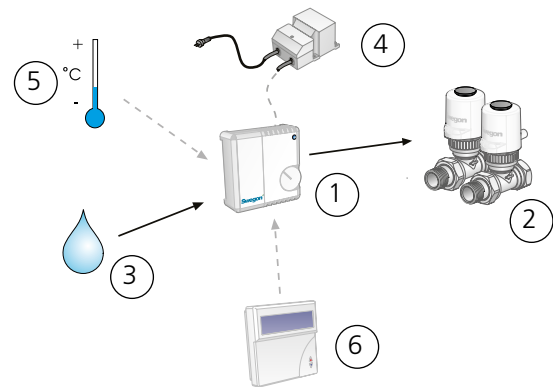


Figure 14. Factory-fitted LUNA control equipment

1 = Room controller with room thermostat

2 = Valves and valve actuators for cooling and heating water

3 = Condensation sensor

Accessories, if required:

4 = Transformer

5 = External temperature sensor

6 = Hand unit for changing the factory settings

Planning

Both planning and sizing are made easier by using Swegon's ProSelect Project design computer program. ProSelect is available at Swegon's home page: www.swegon.com.

Sizing

Designations

P: Capacity (W, kW)

v: Velocity (m/s)

q: Airflow (l/s)

p: Pressure, (Pa, kPa)

t_r : Room temperature (°C)

t_m : Mean water temperature (°C)

ΔT_m : Temperature difference [$t_r - t_m$] (K)

ΔT : Temperature difference, between inlet and return (K)

ΔT_i : Temperature difference, between room and supply air (K)

Δp : Pressure drop (Pa, kPa)

k_p : Pressure drop constant

Supplementary index: k = cooling, l = air, v = heating, i = commissioning

Recommended limit values, water

Max. recommended operating pressure (above coil only): 1600 kPa

Max. recommended test pressure (across coil only): 2400 kPa

Max. recommended pressure drop across standard valve: 20 kPa

Min. permissible hot water flow: 0.013 l/s

Max. permissible inlet flow temperature: 60 °C

Min. permissible cooling water flow: 0.03 l/s

Lowest permissible inlet flow temperature: Should always be dimensioned so that the system works without condensation

Cooling

Cooling capacity

Cooling capacities achieved from both the primary air and chilled water for various lengths of unit, damper settings and airflows are tabulated in Table 1. The total cooling capacity for one unit is the sum of the cooling capacity of the primary air and the chilled water.

The cooling capacity of the primary air can also be calculated using the formula:

$$P_1 = 1.2 \cdot q_1 \cdot \Delta T_1 \text{ where}$$

P_1 = Cooling capacity of the air (W)

q_1 = Airflow (l/s)

ΔT_1 = Temperature differential (K)

Pressure drop

The pressure drop on the water side can be calculated using the formula:

$$\Delta p = (q / k_{pk})^2 \text{ where}$$

Δp = Pressure drop in the water circuit (kPa)

q = Water flow (l/s), see Diagram 1

k_{pk} = pressure drop constant read from Table 1.

Table 1. Pressure drop

Pressure drop, water		
NC	Length	K_{pk} Cooling
	900	0.0217
	1100	0.0202
	1300	0.0190
	1500	0.0180
HC	Length	K_{pk} Cooling
	900	0.0186
	1100	0.0174
	1300	0.0164
	1500	0.0155

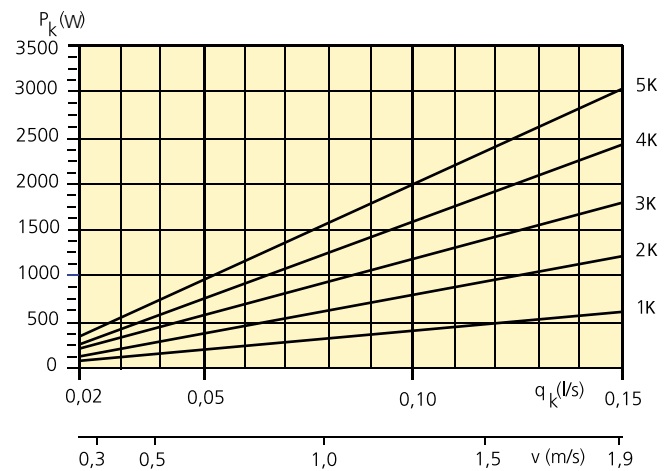
NC = Normal version; HC = High capacity version

Table 2. Cooling Capacity for Natural Convection

Natural convection: The cooling capacity of water (W) for ΔT_{mk}								
Size	5	6	7	8	9	10	11	12
900	16	19	23	26	30	33	37	40
1100	20	25	29	34	38	43	47	52
1300	25	30	36	41	47	52	58	63
1500	30	36	42	49	55	62	68	75

Diagram 1 – Cooling capacity

The function between cooling capacity P_k (W), change in temperature ΔT_k (K) and cooling water flow q_k (l/s).



Capacity correction

Different water flows influence the available cooling effect to a certain degree. To calculate the actual cooling power based on a flow-dependant correction factor, use Swegon's ProSelect computer program, available at www.swegon.com.

Diagram 2. Water flow – capacity correction

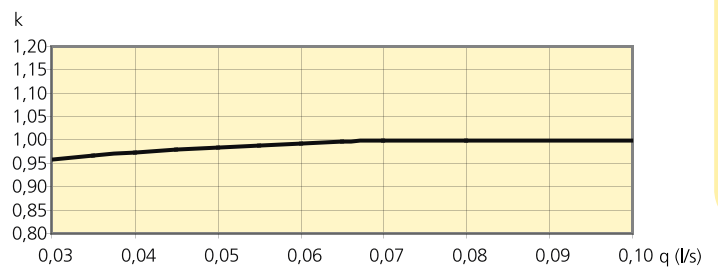


Table 3 – Cooling capacity, NC, 70 Pa

Length of the unit mm	Various disc settings		Air-flow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾						Pressure drop constant, air k _{pl}	
						6	8	10	12	6	7	8	9	10	11		12
900	L	L	12.6	<20	70	91	121	151	181	242	282	321	361	401	441	480	1.50
900	M	M	15.8	20	70	114	152	190	228	265	309	353	397	440	484	527	1.89
900	H	H	27.1	21	70	195	260	325	390	319	370	420	470	521	571	620	3.24
1100	L	L	16.2	<20	70	117	156	194	233	310	362	413	464	515	566	617	1.94
1100	M	M	20.4	21	70	147	196	245	294	342	399	455	511	568	624	680	2.44
1100	H	H	35.1	23	70	253	337	421	505	412	478	543	608	673	738	802	4.19
1300	L	L	19.4	<20	70	140	186	233	279	381	444	507	570	633	695	758	2.32
1300	M	M	24.4	22	70	176	234	293	351	420	489	558	627	696	765	834	2.92
1300	H	H	41.9	24	70	302	402	503	603	505	585	665	745	825	904	982	5.00
1500	L	L	16.5	22	70	119	158	198	238	402	471	541	612	682	753	824	1.97
1500	M	M	28.1	23	70	202	270	337	405	489	572	656	739	823	907	991	3.35
1500	H	H	42.9	27	70	309	412	515	618	585	679	773	867	960	1053	1146	5.12

Table 4 – Cooling capacity, NC, 100 Pa

Length of the unit mm	Various disc settings		Air-flow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾						Pressure drop constant, air k _{pl}	
						6	8	10	12	6	7	8	9	10	11		12
900	L	L	15	<20	100	108	144	180	216	283	329	375	421	466	512	557	1.50
900	M	M	18.9	25	100	136	181	227	272	311	361	411	461	511	561	610	1.89
900	H	H	32.4	26	100	233	311	389	467	368	427	486	544	602	660	718	3.24
1100	L	L	19.4	<20	100	140	186	233	279	366	425	484	543	602	661	719	1.94
1100	M	M	24.4	26	100	176	234	293	351	401	466	531	595	659	723	787	2.44
1100	H	H	41.9	28	100	302	402	503	603	475	551	627	702	778	852	927	4.19
1300	L	L	23.2	20	100	167	223	278	334	448	521	594	666	738	810	882	2.32
1300	M	M	29.2	27	100	210	280	350	420	492	572	651	730	809	887	966	2.92
1300	H	H	50	29	100	360	480	600	720	581	675	768	860	952	1044	1135	5.00
1500	L	L	19.7	27	100	142	189	236	284	475	555	636	716	797	877	958	1.97
1500	M	M	33.5	28	100	241	322	402	482	572	667	763	858	954	1049	1145	3.35
1500	H	H	51.2	32	100	369	492	614	737	670	778	887	994	1102	1209	1316	5.12

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon’s ProSelect sizing program. Room attenuation = 4 dB

2) The specified capacities are based on a complete unit including standard distribution and recirculation grille. Without grille the water capacity increases by approx. 5%. With ADC adjusted to Fan shape you lose approx. 5% in water capacity. The primary air capacity is not affected.

N.B.! The total cooling capacity is the sum of the air-based and water-based cooling capacities.

Table 5 – Cooling capacity, NC, 150 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	18.4	24	150	132	177	221	265	332	385	438	490	542	595	647	1.50
900	M	M	23.2	31	150	167	223	278	334	363	421	479	536	592	649	705	1.89
900	H	H	39.7	32	150	286	381	476	572	424	492	560	628	695	762	829	3.24
1100	L	L	23.8	25	150	171	228	286	343	428	497	565	633	700	768	835	1.94
1100	M	M	29.9	32	150	215	287	359	431	468	542	616	690	763	836	908	2.44
1100	H	H	51.3	33	150	369	492	616	739	547	635	722	810	897	984	1070	4.19
1300	L	L	28.4	26	150	204	273	341	409	524	608	692	775	858	940	1022	2.32
1300	M	M	35.7	33	150	257	343	428	514	573	664	755	845	935	1024	1113	2.92
1300	M	H	48.5	34	150	349	466	582	698	634	736	837	938	1039	1139	1238	3.96
1500	L	L	24.1	31	150	174	231	289	347	559	651	743	835	927	1018	1110	1.97
1500	M	M	41.1	34	150	296	395	493	592	668	778	887	996	1105	1214	1323	3.35
1500	M	H	51.9	35	150	374	498	623	747	728	847	965	1084	1202	1319	1437	4.24

Table 6 – Cooling capacity, NC, 200 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	21.2	29	200	153	204	254	305	365	423	481	538	595	652	709	1.50
900	M	M	26.7	35	200	192	256	320	384	399	462	524	586	648	709	770	1.89
1100	L	L	27.4	30	200	197	263	329	395	471	546	621	695	768	841	914	1.94
1100	M	M	34.5	36	200	248	331	414	497	515	596	677	757	836	915	994	2.44
1300	L	L	32.8	31	200	236	315	394	472	579	670	762	852	943	1032	1122	2.32
1300	M	M	41.3	37	200	297	396	496	595	632	731	830	928	1026	1123	1220	2.92
1500	L	L	27.9	35	200	201	268	335	402	620	720	821	921	1021	1121	1220	1.97
1500	M	M	47.4	38	200	341	455	569	683	735	855	974	1093	1211	1329	1447	3.35

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon’s ProSelect sizing program. Room attenuation = 4 dB

2) The specified capacities are based on a complete unit including standard distribution and recirculation grille. Without grille the water capacity increases by approx. 5%. With ADC adjusted to Fan shape you lose approx. 5% in water capacity. The primary air capacity is not affected.

N.B.! The total cooling capacity is the sum of the air-based and water-based cooling capacities.

Table 7 – Cooling capacity, HC, 70 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	12.5	<20	70	90	120	150	180	245	286	326	367	407	448	488	1.50
900	M	M	15.8	20	70	114	152	190	228	277	323	368	414	459	505	550	1.89
900	H	H	27.1	21	70	195	260	325	390	343	397	452	506	560	613	667	3.24
1100	L	L	16.2	<20	70	117	156	194	233	318	370	422	475	527	579	632	1.94
1100	M	M	20.4	21	70	147	196	245	294	357	416	475	533	592	651	709	2.44
1100	H	H	35.1	23	70	253	337	421	505	443	514	584	654	724	793	863	4.19
1300	L	L	19.4	<20	70	140	186	233	279	390	455	519	584	648	712	776	2.32
1300	M	M	24.4	22	70	176	234	293	351	438	511	583	655	727	799	870	2.92
1300	H	H	41.8	24	70	301	401	502	602	542	628	714	800	885	970	1054	5.00
1500	L	L	16.5	22	70	119	158	198	238	411	482	554	626	698	771	844	1.97
1500	M	M	28	23	70	202	269	336	403	509	586	671	757	844	930	1017	3.35
1500	H	H	42.8	27	70	308	411	514	616	627	729	830	930	1030	1130	1230	5.12

Table 8 – Cooling capacity, HC, 100 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	15	<20	100	108	144	180	216	297	345	393	441	489	537	584	1.50
900	M	M	18.9	25	100	136	181	227	272	333	386	440	493	547	600	652	1.89
900	H	H	32.4	26	100	233	311	389	467	404	469	534	598	662	726	790	3,24
1100	L	L	19.4	<20	100	140	186	233	279	384	446	508	570	631	693	754	1,94
1100	M	M	24.4	26	100	176	234	293	351	429	498	567	636	705	773	841	2,44
1100	H	H	41.9	28	100	302	402	503	603	522	606	689	772	855	937	1019	4,19
1300	L	L	23.2	20	100	167	223	278	334	471	547	623	699	775	850	926	2,32
1300	M	M	29.2	27	100	210	280	350	420	527	612	696	781	865	949	1033	2,92
1300	H	H	50	29	100	360	480	600	720	639	742	844	946	1047	1148	1248	5,00
1500	L	L	19.7	27	100	142	189	236	284	499	583	667	751	836	920	1005	1,97
1500	M	M	33.5	28	100	241	322	402	482	611	700	800	901	1002	1102	1203	3,35
1500	H	H	51.2	32	100	369	492	614	737	736	856	975	1093	1212	1329	1447	5,12

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon’s ProSelect sizing program. Room attenuation = 4 dB

2) The specified capacities are based on a complete unit including standard distribution and recirculation grille. Without grille the water capacity increases by approx. 5%. With ADC adjusted to Fan shape you lose approx. 5% in water capacity. The primary air capacity is not affected.

N.B.! The total cooling capacity is the sum of the air-based and water-based cooling capacities.

Table 9 – Cooling capacity, HC, 150 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	18.4	24	150	132	177	221	265	355	412	468	525	581	637	692	1.5
900	M	M	23.1	31	150	166	222	277	333	395	458	520	583	644	706	767	1.89
900	H	H	39.7	32	150	286	381	476	572	475	551	627	703	779	854	929	3.24
1100	L	L	23.8	25	150	171	228	286	343	459	532	605	678	750	822	894	1.94
1100	M	M	29.9	32	150	215	287	359	431	510	592	672	753	832	912	991	2.44
1100	H	H	51.3	33	150	369	492	616	739	612	711	809	907	1005	1102	1199	4.19
1300	L	L	28.4	26	150	204	273	341	409	562	651	741	830	918	1006	1094	2.32
1300	M	M	35.8	33	150	258	344	430	516	627	726	825	924	1022	1120	1217	2.92
1300	M	H	48.5	34	150	349	466	582	698	704	817	930	1042	1153	1265	1375	3.96
1500	L	L	24.1	31	150	174	231	289	347	598	697	795	894	992	1090	1188	1.97
1500	M	M	41	33	150	295	394	492	590	726	856	975	1095	1217	1334	1453	3.35
1500	M	H	51.9	35	150	374	498	623	747	807	943	1075	1206	1339	1468	1599	4.24

Table 10 – Cooling capacity, HC, 200 Pa

Length of the unit	Various disc settings		Air-flow	Noise level ¹⁾	p _i	Cooling capacity, primary air (W) ΔT _i				Cooling capacity of water (W) for ΔT _{mk} ²⁾							Pressure drop constant, air
										6	7	8	9	10	11	12	
mm			l/s	dB (A)	Pa	6	8	10	12	6	7	8	9	10	11	12	k _{pl}
900	L	L	21.2	29	200	153	204	254	305	395	458	521	583	644	706	767	1.5
900	M	M	26.7	35	200	192	256	320	384	440	510	578	647	715	783	850	1.89
1100	L	L	27.4	30	200	197	263	329	395	510	591	672	752	831	911	990	1.94
1100	M	M	34.5	36	200	248	331	414	497	568	657	746	835	922	1010	1097	2.44
1300	L	L	32.8	31	200	236	315	394	472	626	726	824	923	1020	1118	1215	2.32
1300	M	M	41.3	37	200	297	396	496	595	697	807	916	1024	1132	1239	1346	2.92
1500	L	L	27.9	35	200	201	268	335	402	671	780	889	997	1105	1213	1321	1.97
1500	M	M	47.4	38	200	341	455	569	683	808	988	1124	1260	1399	1529	1664	3.35

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon’s ProSelect sizing program. Room attenuation = 4 dB

2) The specified capacities are based on a complete unit including standard distribution and recirculation grille. Without grille the water capacity increases by approx. 5%. With ADC adjusted to Fan shape you lose approx. 5% in water capacity. The primary air capacity is not affected.

N.B. ! The total cooling capacity is the sum of the air-based and water-based cooling capacities.

Heating

Pressure drop

The pressure drop on the water side can be calculated using the formula:

$$\Delta p = (q / k_{pv})^2 \text{ where}$$

Δp = Pressure drop in the water circuit (kPa)

q = Water flow (l/s), see Diagram 3

k_{pv} = Pressure drop constant read from Table 11.

For a more detailed pressure drop calculation, use the Swegon ProSelect computer program available at www.swegon.com.

Table 11. Pressure drop

Pressure drop, water		
NC	Length	K_{pv} Heating
	900	0.0178
	1100	0.0166
	1300	0.0156
1500	0.0148	
HC	Length	K_{pv} Heating
	900	0.0178
	1100	0.0166
	1300	0.0156
	1500	0.0148

NC = Normal version; HC = High capacity version

Diagram 3 - Heating capacity

The function between heating capacity P_v (W), change in temperature ΔT_v (K) and heating water flow, q_v (l/s).

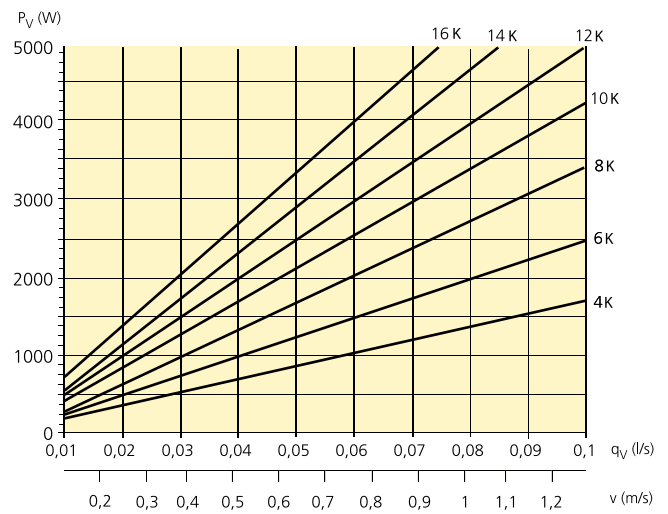


Table 12 - Heating capacity for natural convection

Length	Heat emission when ΔT_{mv} [K] (W)						
	5	10	15	20	25	30	35
900	2	7	14	24	35	49	64
1100	3	9	18	31	46	63	83
1300	3	11	22	37	56	77	102
1500	4	13	26	44	66	92	121

Table 13 - Electric heating

Length	Capacity
900	400W
1100	800W
1300	1000W
1500	1000W

Table 14 – Heating capacity, NC/HC, 70 Pa

Length of the unit mm	Various disc settings		Airflow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Heating capacity, water (W) for ΔT _{mv}							Pressure drop constant, air k _{pl}
						5	10	15	20	25	30	35	
900	L	L	12.5	<20	70	115	230	346	463	581	698	816	1.5
900	M	M	15,8	20	70	147	294	440	586	732	878	1024	1.89
900	H	H	27.1	21	70	155	310	474	639	806	974	1144	3.24
1100	L	L	16.2	<20	70	148	297	448	599	751	903	1056	1.94
1100	M	M	20.4	21	70	189	379	567	756	944	1132	1320	2.44
1100	H	H	35.1	23	70	200	401	613	825	1042	1259	1479	4.19
1300	L	L	19.4	<20	70	182	365	550	736	922	1109	1297	2.32
1300	M	M	24.4	22	70	232	465	696	927	1157	1388	1619	2.92
1300	H	H	41.8	24	70	245	490	750	1009	1274	1539	1808	5.0
1500	L	L	16.5	22	70	216	432	651	870	1091	1312	1534	1.97
1500	M	M	28	23	70	275	549	822	1095	1368	1641	1913	3.35
1500	H	H	42.8	27	70	290	580	887	1194	1508	1822	2140	5.12

Table 15 – Heating capacity, NC/HC, 100 Pa

Length of the unit mm	Various disc settings		Airflow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Heating capacity, water (W) for ΔT _{mv}							Pressure drop constant, air k _{pl}
						5	10	15	20	25	30	35	
900	L	L	15	<20	100	135	269	404	539	674	809	945	1.5
900	M	M	18.9	25	100	167	334	498	661	824	986	1148	1.89
900	H	H	32.4	26	100	170	340	521	703	889	1075	1264	3.24
1100	L	L	19.4	<20	100	174	347	522	696	870	1045	1220	1.94
1100	M	M	24.4	26	100	215	431	642	853	1062	1272	1481	2.44
1100	H	H	41.9	28	100	219	438	673	907	1147	1387	1631	4.19
1300	L	L	23.2	20	100	213	426	640	853	1068	1282	1496	2.32
1300	M	M	29.2	27	100	264	528	787	1046	1303	1560	1817	2.92
1300	H	H	50	29	100	268	537	824	1110	1405	1699	1998	5
1500	L	L	19.7	27	100	252	503	756	1008	1261	1514	1768	1.97
1500	M	M	33.5	28	100	312	624	930	1236	1540	1844	2147	3.35
1500	H	H	51.2	32	100	318	636	975	1314	1662	2011	2364	5.12

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon's ProSelect sizing program. Room attenuation = 4 dB

Table 16 – Heating capacity, NC/HC, 150 Pa

Length of the unit mm	Various disc settings		Airflow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Heating capacity, water (W) for ΔT _{mv}							Pressure drop constant, air k _{pl}
						5	10	15	20	25	30	35	
900	L	L	18.4	24	150	157	313	469	624	779	934	1089	1.5
900	M	M	23.1	31	150	189	379	562	746	927	1108	1288	1.89
900	H	H	39.7	32	150	187	373	574	775	982	1189	1400	3.24
1100	L	L	23.8	25	150	202	404	605	806	1006	1206	1406	1.94
1100	M	M	29.9	32	150	245	489	726	963	1197	1431	1664	2.44
1100	H	H	51.3	33	150	241	482	741	1000	1267	1534	1806	4.19
1300	L	L	28.4	26	150	248	495	741	987	1232	1477	1721	2.32
1300	M	M	35.8	33	150	300	600	891	1181	1468	1756	2041	2.92
1300	M	H	48.5	34	150	297	594	901	1209	1521	1833	2148	3.96
1500	L	L	24.1	31	150	292	585	875	1165	1455	1744	2033	1.97
1500	M	M	41	33	150	354	709	1052	1395	1734	2073	2410	3.35
1500	M	H	51.9	35	150	351	703	1066	1429	1797	2165	2537	4.24

Table 17 – Heating capacity, NC/HC, 200 Pa

Length of the unit mm	Various disc settings		Airflow l/s	Noise level ¹⁾ dB (A)	p _i Pa	Heating capacity, water (W) for ΔT _{mv}							Pressure drop constant, air k _{pl}
						5	10	15	20	25	30	35	
900	L	L	21.2	29	200	172	344	513	683	852	1021	1189	1.5
900	M	M	26.7	35	200	206	411	609	806	1001	1196	1389	1.89
1100	L	L	27.4	30	200	222	444	663	881	1099	1317	1534	1.94
1100	M	M	34.5	36	200	265	531	786	1040	1292	1543	1792	2.44
1300	L	L	32.8	31	200	272	544	813	1081	1349	1616	1882	2.32
1300	M	M	41.3	37	200	326	651	964	1276	1584	1893	2198	2.92
1500	L	L	27.9	35	200	322	644	962	1279	1595	1911	2226	1.97
1500	M	M	47.4	38	200	385	770	1139	1509	1873	2238	2599	3.35

1) The specified noise level is applicable to connection without damper or with fully open damper. In other cases where the airflow is demand-controlled with motor-driven dampers, the required data can be read from Swegon's ProSelect sizing program. Room attenuation = 4 dB

Example

Cooling

Conditions

A hotel room having dimensions $L \times W \times H = 3.7 \times 3.5 \times 2.7$ m is to be ventilated, cooled and heated by the PARAGON. The cooling demand is estimated to be 50 W/m^2 for an occupied room and normal load conditions.

In rare cases, the load conditions may be slightly higher and are then estimated to be 65 W/m^2 . The cooling demand is then a total of $50 \cdot 3.7 \cdot 3.5 = 648 \text{ W}$ and $65 \cdot 3.7 \cdot 3.5 = 842 \text{ W}$ respectively.

Under normal load conditions, the supply air flow should be 20 l/s and have a temperature of $15 \text{ }^\circ\text{C}$. For higher load conditions, an increase in supply air flow up to a maximum of 25 l/s is permissible. The available duct pressure is kept constant at 120 Pa . The sound level must not exceed 30 dB(A) under normal circumstances and 35 dB(A) in the event of higher load conditions.

The design room temperature in the summer case is set to $24 \text{ }^\circ\text{C}$. The inlet temperature of the cooling water is $14 \text{ }^\circ\text{C}$ and its outlet temperature on returning is $16 \text{ }^\circ\text{C}$.

Solution

The $15 \text{ }^\circ\text{C}$ supply air temperature and the $24 \text{ }^\circ\text{C}$ room temperature provide $\Delta T_i = 9 \text{ K}$.

The temperature increase of the cooling water is $16 - 14 = 2 \text{ K}$.

The mean temperature of the cooling water is $(14 + 16) / 2 = 15 \text{ }^\circ\text{C}$.

The $15 \text{ }^\circ\text{C}$ mean temperature of the cooling water and the $24 \text{ }^\circ\text{C}$ room temperature provide $\Delta T_{mk} = 9 \text{ K}$.

Normal case

The cooling capacity of the supply air is calculated: $P_i = 1.2 \cdot 20 \cdot 9 = 216 \text{ W}$.

The residual cooling capacity demanded by the cooling water is:

$$648 - 216 = 432 \text{ W}.$$

In Table 3, we read that a PARAGON 1100 with MM nozzle adjustment produces 511 W in cooling capacity for 20 l/s supply airflow, 70 Pa nozzle pressure and $\Delta T_{mk} = 9 \text{ K}$. This is more than adequate to meet the cooling demand.

From Diagram 1 we read 511 W capacity and an increase in cooling water temperature of 2 K as well as a water flow of approx. 0.061 l/s . Using the water flow and pressure drop constant k_{pk} which is taken from Table 1. The pressure drop across the coil will then be:

$$\Delta p_k = (0.061 / 0.0202)^2 = 9.1 \text{ kPa}.$$

Read from Table 3, the sound level is 21 dB(A) , which meets the max. permissible level of 30 dB(A) required.

High load

Under high load conditions, the motorized damper is opened to set boost level by the automatic function in the CONDUCTOR control equipment. A supply airflow of 24 l/s is obtained, if the spray nozzle pressure is 100 Pa , which is in conformity with the demand on maximal 25 l/s .

Calculate the cooling capacity of the supply air: $P_i = 1.2 \cdot 24 \cdot 9 = 259 \text{ W}$.

The residual cooling capacity demanded by the cooling water is:

$$842 - 259 = 583 \text{ W}.$$

In Table 4, we read that a PARAGON 1100 with MM nozzle adjustment produces 595 W in cooling capacity for 24 l/s supply airflow, 100 Pa nozzle pressure and $\Delta T_{mk} = 9 \text{ K}$. This is adequate to meet the higher cooling load.

From Diagram 1 we read 595 W capacity and an increase in cooling water temperature of 2 K as well as a water flow of approx. 0.071 l/s . Using the water flow and pressure drop constant k_{pk} which is taken from Table 1. The pressure drop across the coil will then be:

$$\Delta p_k = (0.071 / 0.0202)^2 = 12.1 \text{ kPa}.$$

The sound level as specified in Table 4 and is 26 dB(A) , which is clearly lower than the requirement of maximal permissible 35 dB(A) under max load conditions.

However note that the sound levels in the tables do not include the sound generated from the damper.

Heating

Waterborne heating

The method for the heating calculation is the same as for cooling. The heating capacity can be found in tables 14-17. The water flow is taken from diagram 3 and the pressure constant k_{pv} can be found in table 11.

Electric heating

For particulars of electric heating, see Table 13.

Conditions

The prerequisites are the same as in the example for cooling, with the exception that the design room temperature in the winter case is 22 °C and the supply air temperature is 18 °C.

The heating load is estimated to be 40 W/m² for an occupied room and normal load conditions. In rare cases, the load conditions may be slightly higher and are then estimated to be 54 W/m². The heating demand is then a total of $40 \cdot 3.7 \cdot 3.5 = 518$ W and $54 \cdot 3.7 \cdot 3.5 = 699$ W respectively.

The inlet temperature of the heating water is 50 °C and the return temperature is 44 °C.

Solution

The 18 °C supply air temperature is lower than the 22 °C design room temperature and then has a negative effect on the heating capacity:

$$1.2 \cdot 20 \cdot (22 - 18) = 96 \text{ W.}$$

The heating demand for heating water then increases to $518 + 96 = 614$ W and $699 + 96 = 795$ W respectively.

The 47 °C mean temperature of the heating water and the 22 °C room temperature provide $\Delta T_{mv} = 47 - 22 = 25$ K.

In Table 13, we read that a PARAGON 1100 with MM nozzle adjustment produces 944 W in heating capacity for 19 l/s supply airflow, 70 Pa nozzle pressure and $\Delta T_{mv} = 25$ K.

This is enough to manage the heating demand when normal load (614 W). From Table 14, we read 14 W for a supply airflow of 24 l/s, which meets the demand under high load conditions (795 W).

From Diagram 3 we read a capacity of 944 W and a 6 K decrease in heating water temperature as well as a water flow of approx. 0.038 l/s.

By means of the water flow and the pressure drop constant k_{pv} which is taken from Table 11. the pressure drop can be calculated across the coil:

$$\Delta p_v = (0.038 / 0.0166)^2 = 2.3 \text{ kPa.}$$

The same calculation for the heating capacity during high load provides the pressure drop $\Delta p_v = (0.042 / 0.0166)^2 = 6.4$ kPa.

ProSelect

Planning and sizing based on given design considerations can also be carried out in Swegon's ProSelect project design program.

ProSelect is available at Swegon's home page: www.swegon.com.

Acoustics

Natural attenuation

Natural attenuation is the total reduction in sound power from duct to room including the end reflection of the unit.

Table 18. Natural attenuation with lining

Natural attenuation (dB) for mid frequency f (Hz) ΔL_w [dB]							
63	125	250	500	1k	2k	4k	8k
24	14	9	6	9	14	14	18

Accessories

Supply air kit – PARAGON T-SAK-VAV

A motor-driven damper is needed in applications where the user wants to demand-control the supply air by means of CONDUCTOR control equipment. The damper causes a certain amount of flow-generated sound. Therefore a sound attenuator is also needed to guarantee a low sound level in the room. The following components are included in PARAGON T-SAK-VAV:

- Motor-driven damper CRTc including Belimo CM24
- Sound attenuators CLA rectangular sound attenuator with circular connection spigots. L=500mm

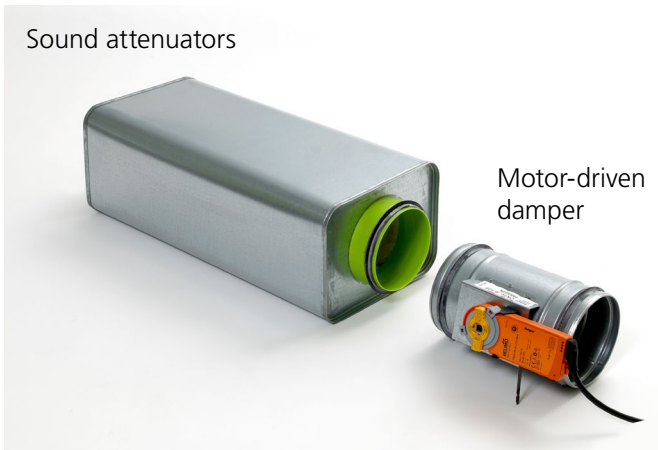


Figure 15. PARAGON T-SAK-VAV

Supply air kit – PARAGON T-SAK-CAV

A commissioning damper is needed to ensure the correct airflow if a simpler regulation system with constant airflow has been selected. Commissioning dampers also generate a certain amount of sound. We therefore recommend the use of a sound attenuator for keeping the sound level at a minimum. The following components are included in PARAGON T-SAK-CAV:

- Commissioning damper CRPc-9 commissioning damper with perforated damper blade and manually adjustable blade.
- Sound attenuators CLA rectangular sound attenuator with circular connection spigots. L=500mm



Figure 16. PARAGON T-SAK-CAV

Extract air kit – PARAGON T-EAK-VAV

If the supply air is demand-controlled, the extract air also needs to be feed-back controlled. An extract air kit is needed for balancing the supply air and the extract air. Precisely like the supply air kit, this kit consists of a motor-driven damper and a sound attenuator. In addition an extract air register and two alternative mounting frames: one with a nipple and one with a joint.

- Motor-driven damper CRTc including Belimo CM24
- Sound attenuators CLA rectangular sound attenuator with circular connection spigots. L=500mm
- Extract air register EXCa and accompanying mounting frames: one with a nipple and one with a joint

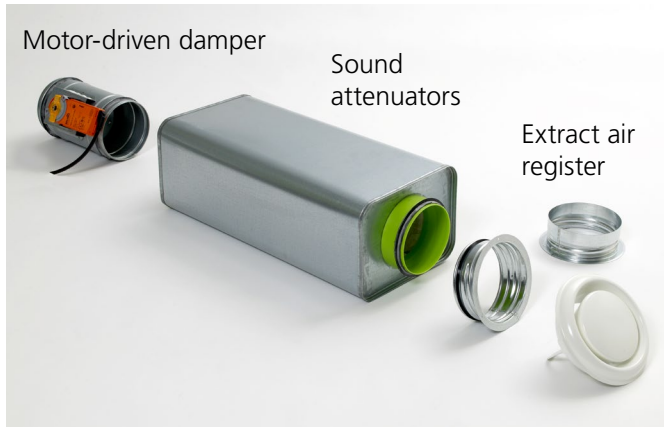


Figure 17. Extract air kit, PARAGON T-EAK-VAV

Extract air kit – PARAGON T-EAK-CAV

A commissioning damper is needed in systems with constant airflows in order to balance the extract airflow with the supply airflow.

Therefore a kit designed for constant airflows is available for simpler systems. This kit contains commissioning damper, sound attenuator, extract air register and mounting frames.

- Commissioning damper CRPc-9 commissioning damper with perforated damper blade and manually adjustable blade.
- Sound attenuators CLA rectangular sound attenuator with circular connection spigots. L=500mm
- Extract air register EXCa and accompanying mounting frames: one with a nipple and one with a joint.

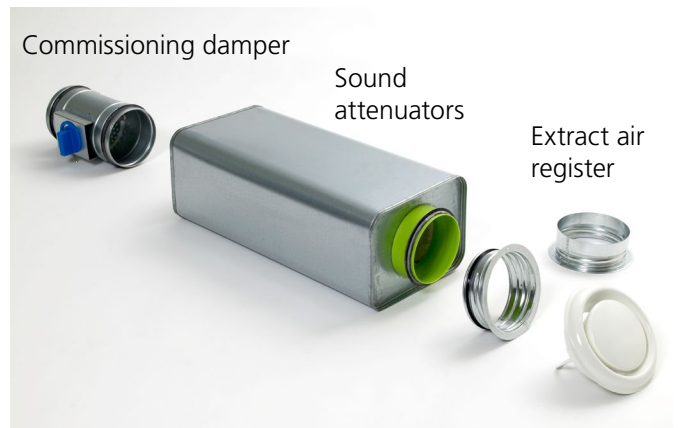


Figure 18. Extract air kit - PARAGON T-EAK-CAV

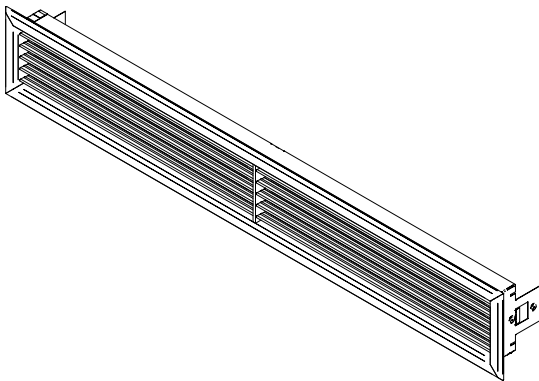
Accessories – Supply air

The supply air grille is supplied with a 45 mm spigot / frame as standard however it can be combined with an extra spigot for use as an extension in increments of 45 mm.

A grille with a telescopic spigot that covers an interval of 100 - 140 mm between the module and wall is available as an optional extra. Cannot be combined with the standard frame stated above.

PARAGON b T-SG

Supply air grille incl. 45 mm spigot



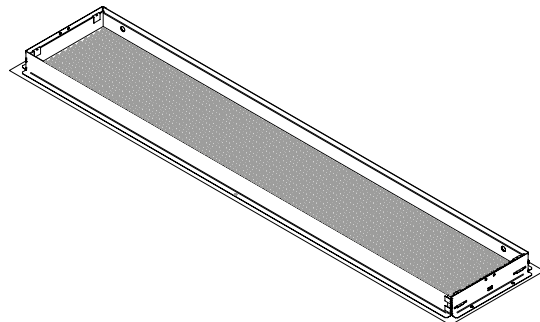
Accessories - Return air

The return air grille is supplied with a 35 mm spigot/ frame which can be inserted into the module and which then covers the 13-35 mm interval between the module and the ceiling.

An extra spigot for the return air grille can be ordered as an accessory and then covers the 35-70 interval installed together with the standard spigot.

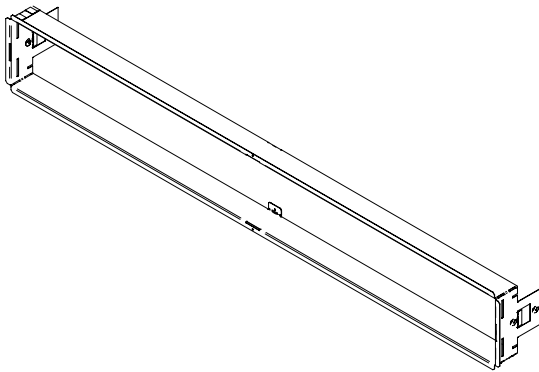
PARAGON b T-RG

Return air grille incl. 13-35 mm spigot



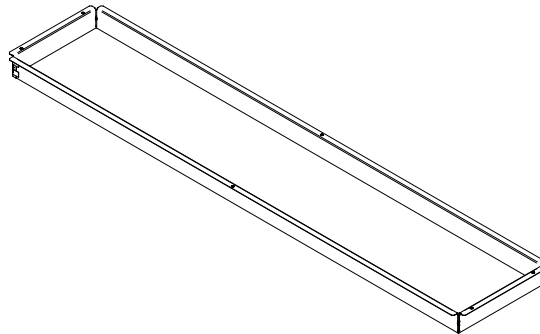
PARAGON b T-OE-SG

Extra 45 mm spigot for the supply air grille



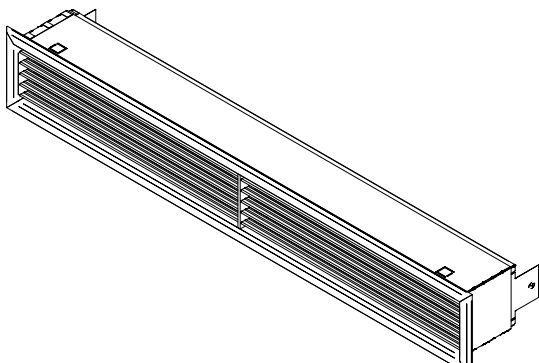
PARAGON b T-OE-RG

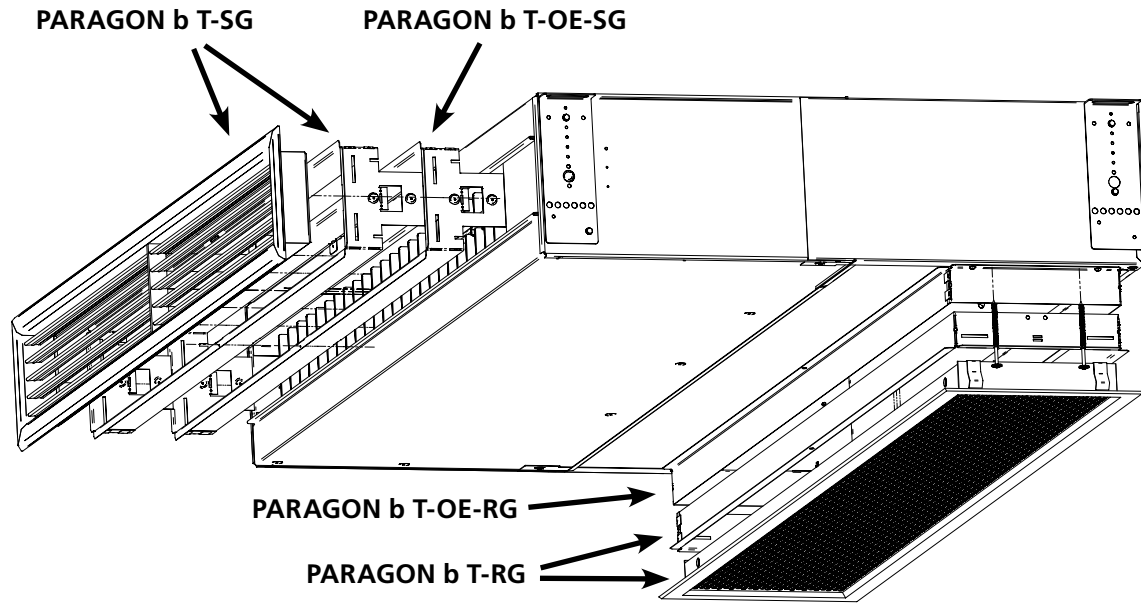
Extra 35-70 mm spigot for the return air grille



PARAGON b T-TE-SG

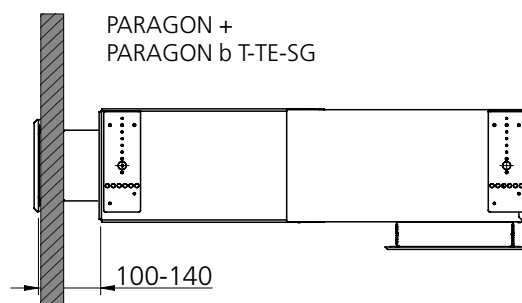
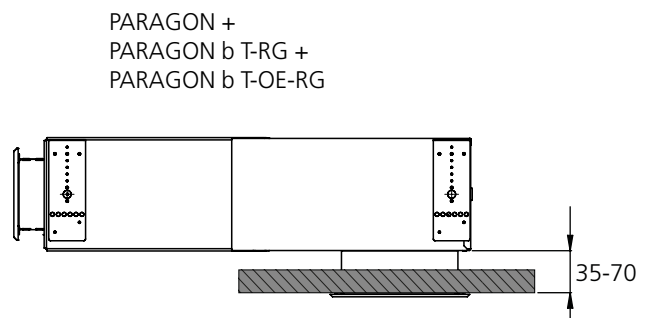
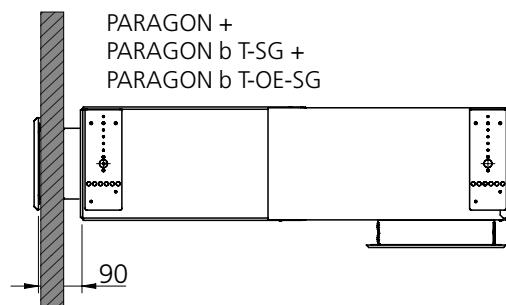
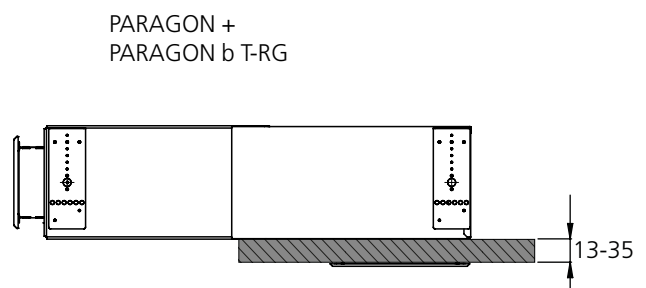
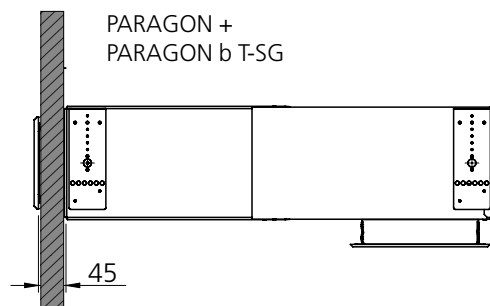
Supply air grille incl. telescopic spigot, 100-140 mm





Accessories - Supply air

Accessories - Extract air



SYST MS M8 suspension kit

In the applications in which the PARAGON is not mounted in direct contact with the ceiling, there is a suspension kit available in order to simplify hanging it at the level desired.

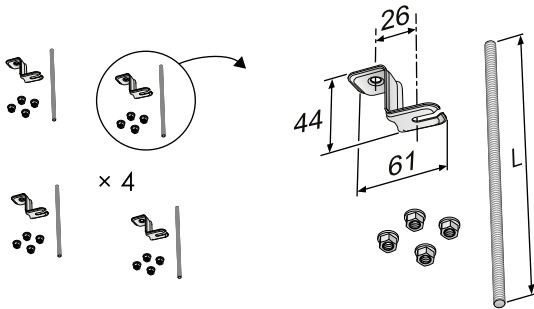


Figure 19. Suspension kit, SYST MS M8

Venting nipple

An venting nipple with push-on connection can be utilized in combination with type SYST FS F20 flexible hoses. This is normally not needed, but can be an option if the coil in the PARAGON is the highest point on the water loop.

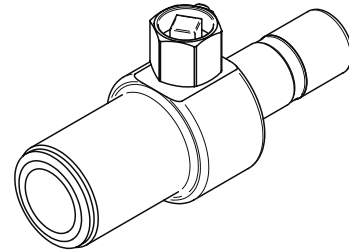


Figure 21. Venting nipple, SYST AR

Flexible hoses

In applications in which you desire to avoid risk of movement in the pipe system caused by heat expansion, you can advantageously utilize flexible hoses for the connection of chilled water and hot water. Eventual vibrations via the pipe system are at the same time diminished to an absolute minimum.

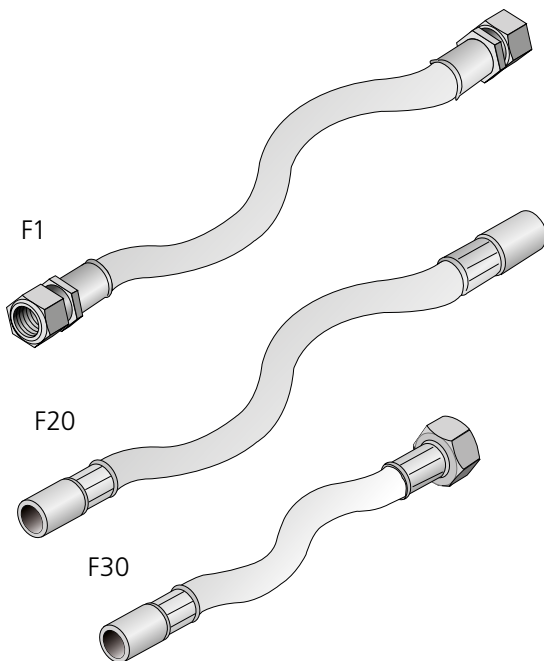


Figure 20. Flexible connection hoses, SYST FH

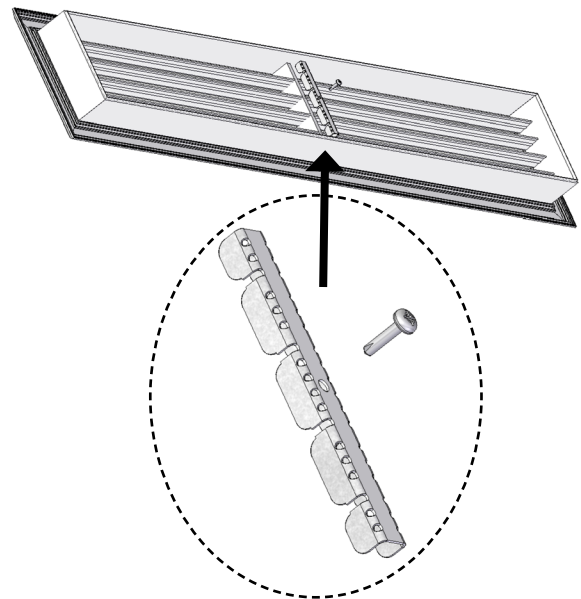


Figure 22. Grille lock, PARAGON T-GL for fixing supply air grille position

Installation

Assembly

The PARAGON is delivered with four mounting brackets designed for installation directly against the ceiling or installation suspended from the ceiling. The mounting brackets allow a certain amount of further adjustment after the comfort module/ceiling mounting brackets has/ have been mounted as accurately as possible. This enables you to position the supply spigot correctly in relation to the wall and the grille. The next step is to connect the air duct, cooling pipes, heating pipes and power supply (24 V AC) to the control equipment. The motor dampers are directly connected to the controller in the PARAGON, if a supply air kit and an extract air kit are included in the installation. The SYST MS M8 suspension kit (must be ordered separately) can be used to advantage in applications in which the PARAGON should not be mounted tight against the ceiling. For detailed mounting instructions, see separate document available for downloading at www.swegon.com.

Water connections

If the PARAGON is supplied with factory-fitted control equipment, the supply water (cooling and heating) is connected to a flat pipe end $\varnothing 12 \times 1.0$ mm (Cu). The return water (cooling and heating) is connected to the valves, DN 1/2" male threads.

If the PARAGON is supplied without control equipment, all the pipes (supply/return – cooling/heating) are connected to a flat pipe end $\varnothing 12 \times 1.0$ mm (Cu).

N.B. ! Support sleeves must be used if compression ring couplings are fitted. It is important use a pipe wrench to adequately restrain the pipe connections when tightening external connections to prevent damage to the connection pipes.

Air connection

A $\varnothing 125$ mm air duct including gasket is connected directly to a fixed nipple.

If the supply air kit is included in the installation, connect the parts in the following order, viewed from the PARAGON:

1. Comfort module PARAGON
2. Air duct, $\varnothing 125$ mm
3. Sound attenuator CLA
4. Air duct, $\varnothing 125$ mm
5. CRT motor-driven damper

Note that the supply and extract air kit is also available with a 100mm dia. This kit is suitable for use if the space is limited and low airflows are discharged into the room.

To connect the control equipment CONDUCTOR

If the CONDUCTOR control equipment is supplied in factory-fitted condition, the actuator (cooling and heating) is wired to the controller on delivery. The controller must be energized in order to start up the feed-back control functions. This occurs either through the supply of power via a 24 V AC network or through the addition of a separate transformer.

The transformer is available as accessory and must be ordered separately. Note that a transformer normally handles the operation of up to 6 controllers. This assumes that the PARAGON units with factory-fitted mounted CONDUCTOR are situated within a reasonable distance, to avoid too drastic voltage drops in the cables.

The room unit is delivered well packaged together with the PARAGON. The room unit can either operate with wireless remote control or have a wired cable connection. If the controller operates through wireless communication, 4 size AAA batteries supply it with power. If cable connection is used, the room unit is supplied with power via the same cabling used for communication between the controller and the room unit. As soon as the controller and the room unit are energized, you simply enter the ID number of the controller into the room unit to start wireless communication. In the case of cable connection, you are not required to enter an ID number.

There are several accessories available to special order for utilising the energy saving functions available in the CONDUCTOR with application W4.1 (standard). The motor operated dampers can be easily wired directly to the controller, if the supply and extract air kits are included in the installation.

For hotels there is provision for connecting a key card holder intended to serve as a presence sensor. Of course traditional presence sensors can also be connected, if they are required. There is also an input for a window contact (not accessory), which can be utilized for saving energy when the window is opened. For more information regarding CONDUCTOR W4.1, see the separate product data sheet.

LUNA

If the PARAGON is equipped with LUNA factory-fitted control equipment, the actuator (cooling and heating) is wired to a terminal block, which is simple to reach after removing the recirculation air grille from the underside of the PARAGON. Since the intelligence in the LUNA is integrated into the room controller, there is no controller mounted inside the PARAGON. The controller is then, instead, supplied separately, well packaged together with the PARAGON. The controller must be energized in order to start up the feed-back control functions. This occurs either through the supply of power via a 24 V AC network or through the addition of a separate transformer.

The transformer is available as accessory and must be ordered separately. Note that a transformer normally handles the operation of up to 6 controllers. This assumes that the PARAGON units with factory-fitted mounted CONDUCTOR are situated within a reasonable distance, to avoid too drastic voltage drops.

Lining

The work involving lining the terminal can begin when the PARAGON has been completely installed. The PARAGON is designed for use in most common types of load-carrying T-grid ceiling systems with panels, plaster board, etc. To make your work simpler, detailed dimensions for cutting the opening are specified below in the "Dimensions" section on page 26 in this brochure. More detailed information is also available in separate installation instructions at www.swegon.com.

Maintenance

Since the PARAGON operates without any built-in fan, without filter and without a drainage system, very little maintenance is required. In a hotel room or a hospital room, it is normally sufficient to vacuum clean the back side of the coil every six months to remove loose dust. A simple visual inspection of connections and wiping the supply air grille and return air grille with a damp cloth is also recommended. Avoid aggressive cleaning agents which may harm painted surfaces. Normally a mild soap or alcohol solution is fully adequate for cleaning. Note that the dry operation without condensation minimises the risk of bacteria growth that otherwise is occurs in wet systems.

The requirement for maintenance is yet lower in an office room, since this type of environment is normally much more dust-free, and this allows longer intervals between scheduled maintenance. It is normally enough to clean the coil in an office room once every second year.

To wire the electric heating elements

Swegon's LUNA or your own control system can be used for controlling the heating elements in the electric variant of the Paragon.

Information about how to wire the control system is provided in a separate product data sheet and installation instructions at www.swegon.com

CE marking

The Paragon with electric heating is CE marked in accordance with applicable regulations.

The CE Declaration is available at our home page: www.swegon.com

PARAGON - Dimensions and Weights

Table 19 - Weight, Variant B

NC	RYY Dry	RYN Dry	RNY Dry	RNN Dry	Water volume litres	
L	kg	kg	kg	kg	Cooling	Heating
900	22.4	21.1	20.6	19.3	0,7	0,2
1100	26.0	24.4	23.8	22.2	0,8	0,3
1300	29.7	27.8	27.1	25.2	0,95	0,35
1500	33.3	31.1	30.3	28.1	1,1	0,4
HC	RYY Dry	RYN Dry	RNY Dry	RNN Dry	Water volume litres	
L	kg	kg	kg	kg	Cooling	Heating
900	23.0	21.7	21.2	19.9	1,0	0,2
1100	27.0	25.4	24.8	23.2	1,2	0,3
1300	31.0	29.1	28.4	26.5	1,35	0,35
1500	35.0	32.8	32.0	29.8	1,6	0,4

RYY: Connection side: R = Right; Supply air grille: Y = Yes;
Recirculation air grille: Y = Yes

Table 20 - Weight, Variant X

NC	RYY Dry	RYN Dry	RNY Dry	RNN Dry	Water volume litres
L	kg	kg	kg	kg	Cooling
900	23.0	22.3	21.8	20.5	0.7
1100	26.7	25.8	25.2	23.6	0.8
1300	30.5	29.4	28.7	26.8	0.95
1500	34.1	32.7	31.9	29.7	1.10
HC	RYY Dry	RYN Dry	RNY Dry	RNN Dry	Water volume litres
L	kg	kg	kg	kg	Cooling
900	24.0	24.3	23.8	22.5	1.0
1100	27.8	28.0	27.4	25.8	0.8
1300	31.8	32.0	31.3	29.4	0.95
1500	35.6	35.7	34.9	32.7	1.10

RYY: Connection side: R = Right; Supply air grille: Y = Yes;
Recirculation air grille: Y = Yes

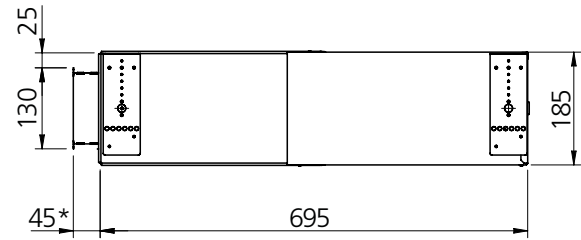


Figure 23. End view excl. grille
* with extra spigot = 90 mm
with telescopic spigot = 100-140 mm

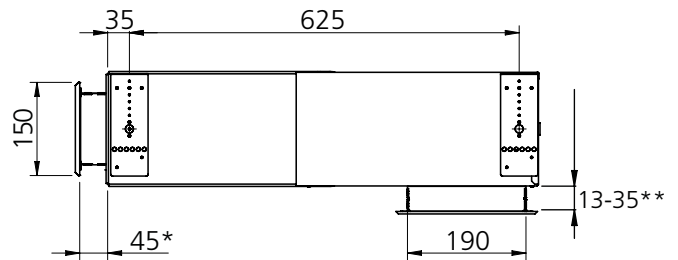


Figure 24. End view incl. grille
* with extra spigot = 90 mm
with telescopic spigot = 100-140 mm
** with extra spigot = 35-70 mm

Table 21 - Dimensions

L	L + 42	A	B	L/2
900	942	785	750	450
1100	1142	985	950	550
1300	1342	1185	1150	650
1500	1542	1385	1350	750

Connection on the right hand side –R

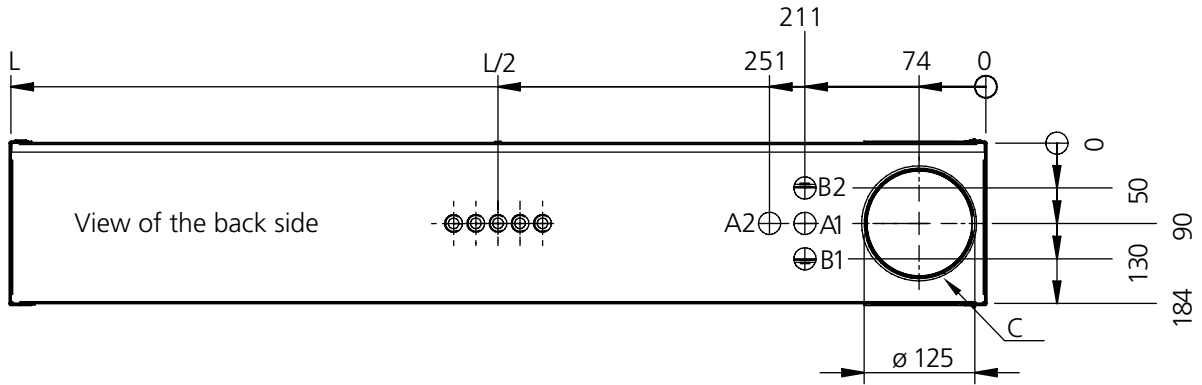


Figure 25. View of the back side with connection on the right-hand side - R.

A1 = Cooling water, inlet water pipe
 B1 = Heating water, inlet water

A2 = Cooling water, return
 B2 = Heating water, return

C = Supply air

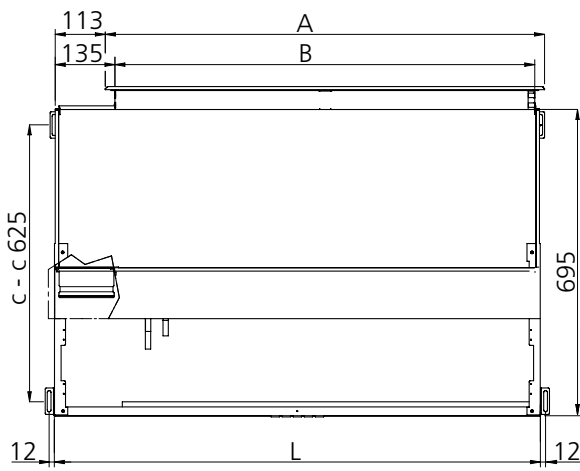


Figure 26 a. View seen from underneath

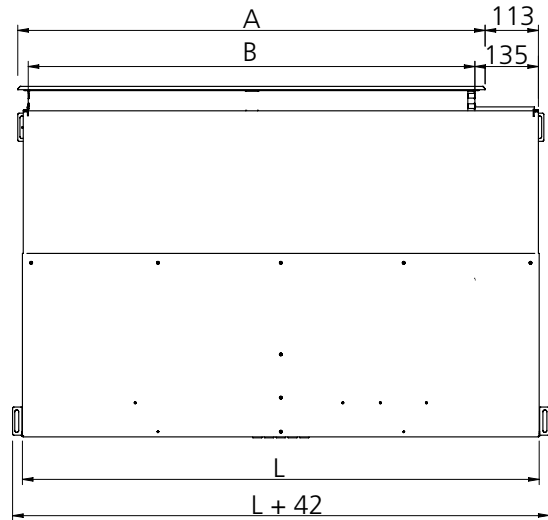


Figure 27. View seen from above.

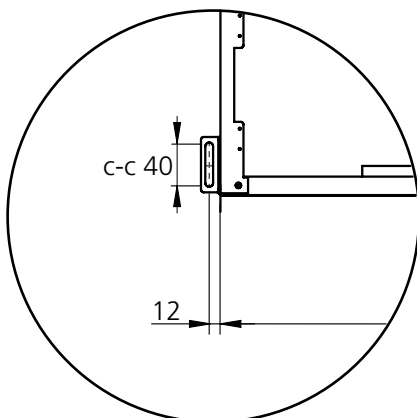


Figure 26 b. Mounting bracket

PARAGON b

Connection on the left hand side -L

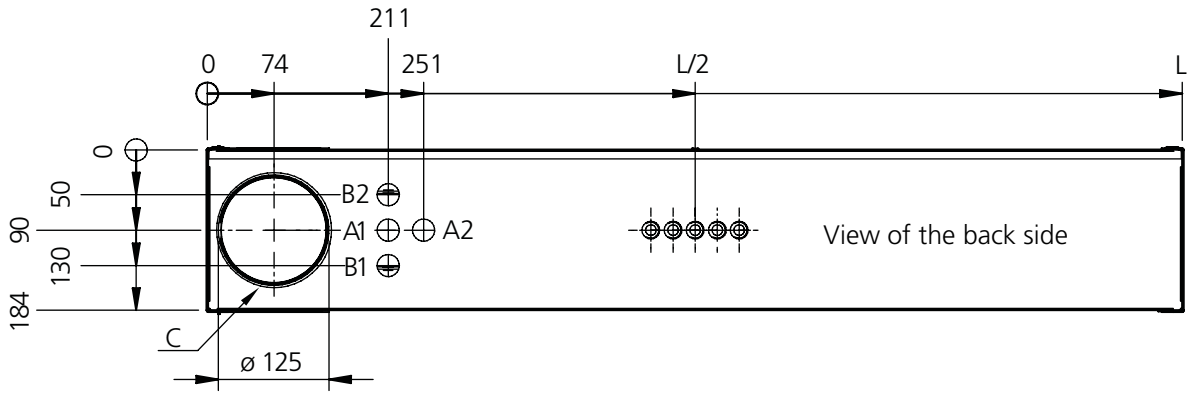


Figure 28. View of the backside, L – left-hand version

A1 = Cooling water, inlet pipe
 B1 = Heating water, inlet water

A2 = Cooling water, return
 B2 = Heating water, return

C = Supply air

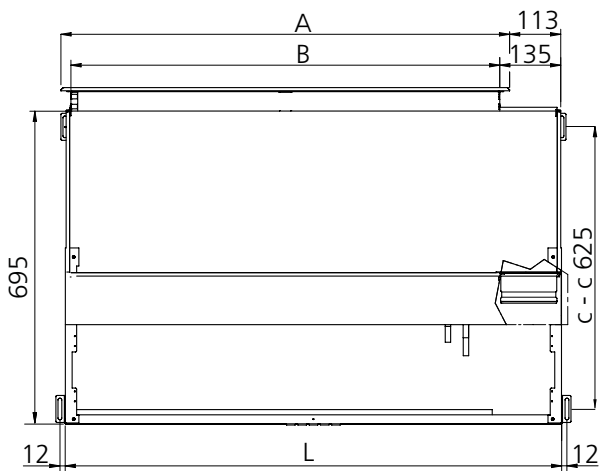


Figure 29 a. View seen from underneath

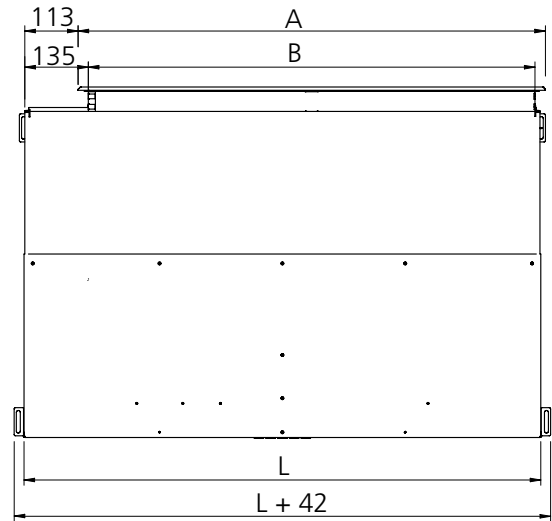


Figure 30. View seen from above.

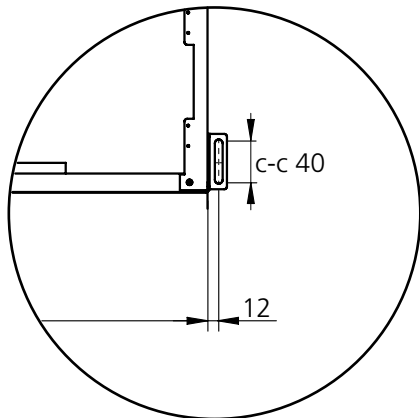


Figure 29 b. Mounting bracket

Dimensions, accessories

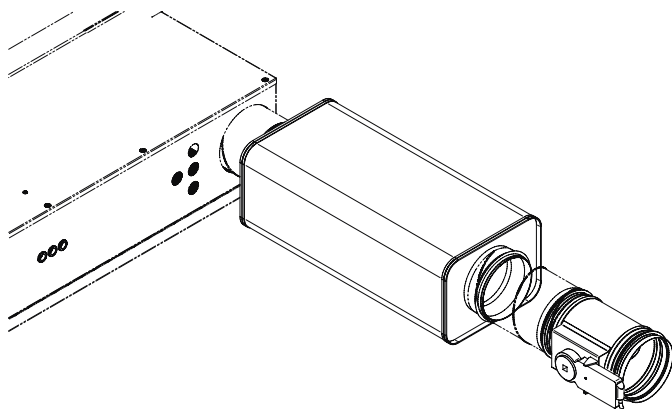


Figure 31. Supply air kit, PARAGON T-SAK-VAV

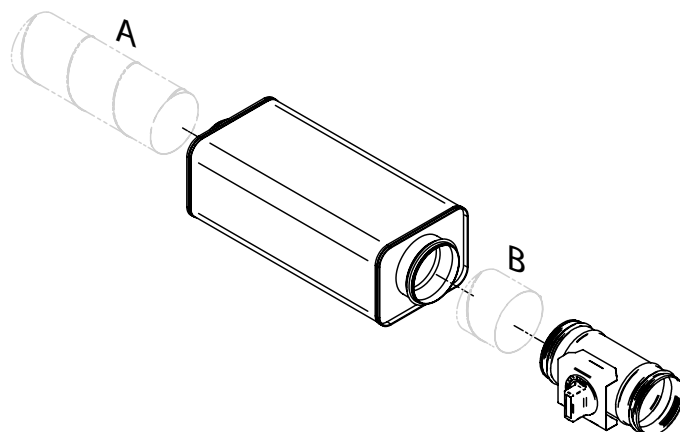


Figure 34. Supply air kit, PARAGON T-SAK-CAV-125
Spiral ducts are not included.
Spiral duct A: Min. length: 330mm
Spiral duct B: Min. length: 70mm

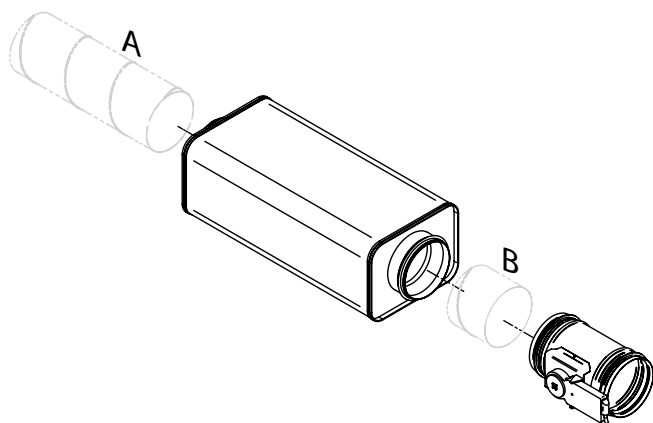


Figure 32. Supply air kit, PARAGON T-SAK-VAV-125
Spiral ducts are not included.
Spiral duct A: Min. length: 330mm
Spiral duct B: Min. length: 70mm

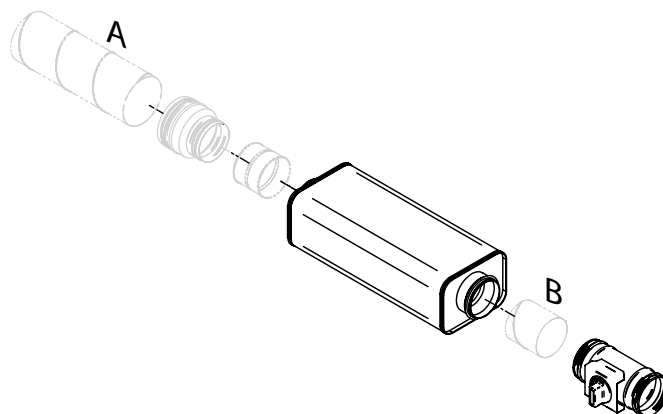


Figure 35. Supply air kit, PARAGON T-SAK-CAV-100
Size 100 spiral ducts and jointing sleeve are not included.
Spiral duct A: Min. length: 330mm
Spiral duct B: Min. length: 70mm

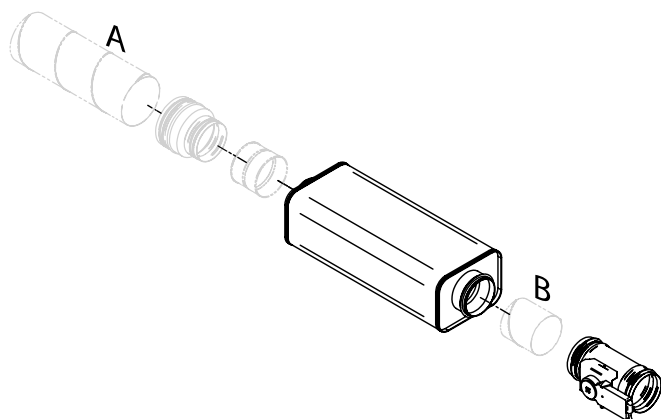


Figure 33. Supply air kit, PARAGON T-SAK-VAV-100
Size 100 spiral ducts and jointing sleeve are not included.
Spiral duct A: Min. length: 330mm
Spiral duct B: Min. length: 70mm

PARAGON b

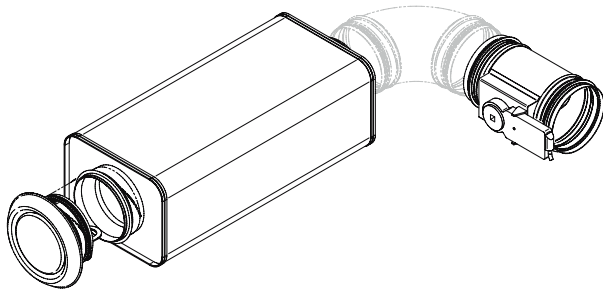


Figure 36. Extract air kit, PARAGON T-EAK

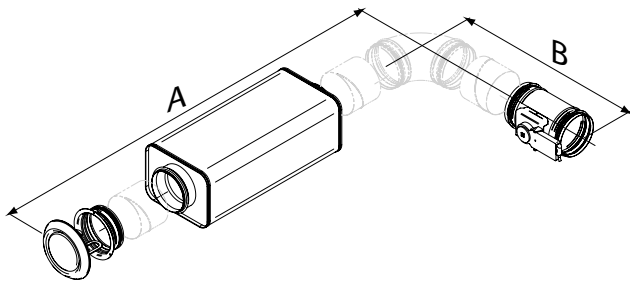


Figure 37. Extract air kit, PARAGON T-EAK-VAV
 Available for connection sizes 125 and 100.
 Spiral ducts and jointing sleeve are not included
 A: Min. length: 770mm
 B: Min. length: 360mm

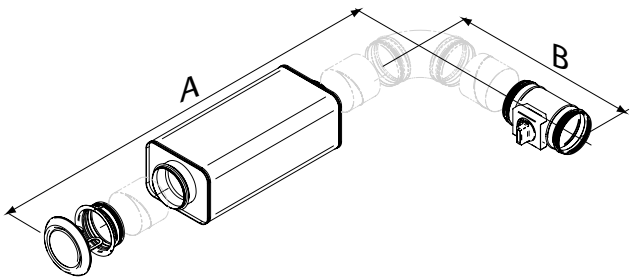


Figure 38. Extract air kit, PARAGON T-EAK-CAV
 Available for connection sizes 125 and 100.
 Spiral ducts and jointing sleeve are not included
 A: Min. length: 770mm
 B: Min. length: 360mm

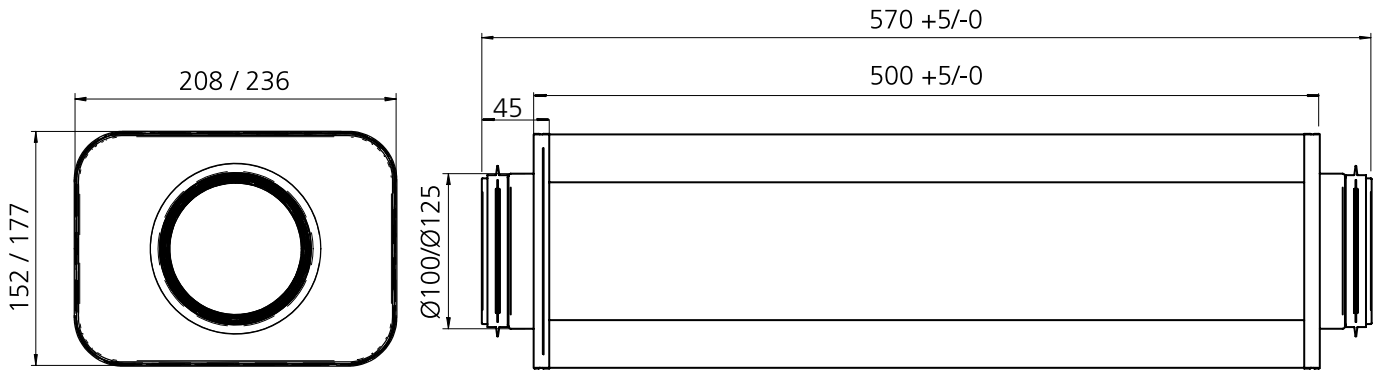


Figure 39. Dimension print, CLA sound attenuator Ø100-500 or Ø125-500. Included in PARAGON T-SAK and PARAGON T-EAK.

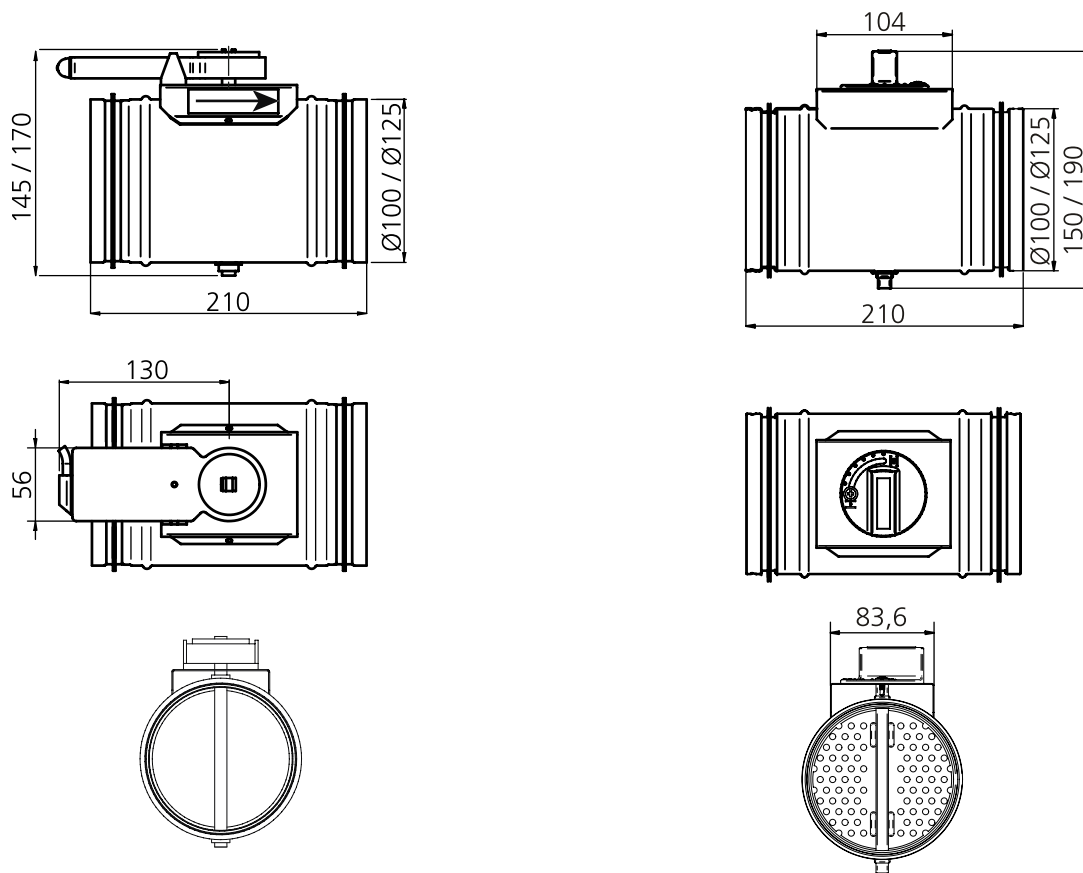


Figure 40. Dimension print, motor-driven damper. Included in PARAGON T-SAK-VAV and PARAGON T-EAK-VAV.

Figure 41. Dimension print, commissioning damper. Included in PARAGON T-SAK-CAV and PARAGON T-EAK-CAV.

PARAGON b

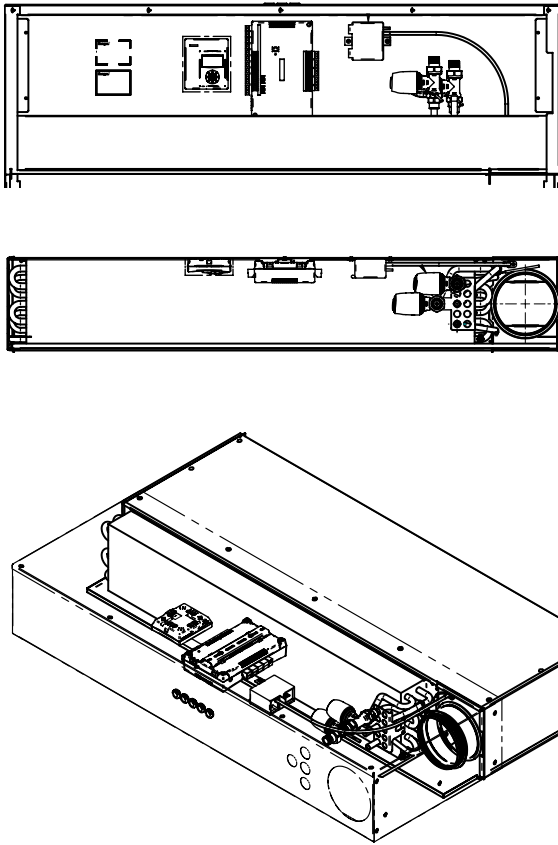


Figure 42. PARAGON with factory-fitted Conductor W4.1 controller including RU room unit, pressure sensor, VDN215 valve and ACTUATOR b 24V NC actuator for cooling and heating. See all the options in the table below.

ProSelect

ProSelect is Swegon's sizing program which is available at www.swegon.com.

Several options and combinations can be sized in ProSelect.

The factory-fitted control equipment described in Figure 42 is shown below as an example.

Accessories

Selected accessories

PARAGON Factory Mounted Accessories

Number of accessories

Number of accessories

Controller
Conductor W4.1 +RU +PS

Valve, Actuator Cool
SYST VDN215 + ACTUATOR NC

Valve, Actuator Heat
SYST VDN215 + ACTUATOR NC

Sensor
No

OK

Following will be mounted on product
 Conductor W4.1 +RU +PS
 SYST VDN215 + ACTUATOR b 24V NC
 SYST VDN215 + ACTUATOR b 24V NC

Table 22. Factory-fitted accessories

All the options below and all the possible combinations of the same can be sized in ProSelect
Conductor RE W1 controller incl. RU room unit
Conductor RE W3 controller incl. RU room unit
Conductor RE W4.1 controller incl. RU room unit and mounted pressure sensor for supply air.
LUNA controller (extra wiring terminals are fitted; the controller is packaged together with the module)
SYST VDN215 straight valve
SYST VDN215 straight valve + ACTUATOR b 24V NC actuator wired to terminals
ACTUATOR b 24V NC actuator only, wired to terminals
Condensation sensor, wired to terminals
Temperature sensor, wired to terminals (Only in combination with Conductor RE)

Ordering key

Specification, PARAGON

Type PARAGON comfort module for cooling, heating, ventilation and control. As standard, factory assembled components are included for plug & play installation.

PARAGON delivery demarcation

Swegon's limits of supply are at the connection points for water.

At these connection points, the RE pipework contractor connects to plain pipe end and/or male threads towards valves, fills the system, bleeds it and tests the pressure in the circuits.

The ventilation contractor connects to the duct connections with dimensions as specified on the basic size drawing in the section "Dimensions".

EE electrical equipment contractor provides a 24 V AC network power supply or earthed 230 V outlets for a transformer, as well as a junction box, if required, installed in a wall for a room thermostat.

The building contractor cuts the openings in corridor wall for the supply air duct, in the interior wall and suspended ceiling for the supply air and extract air grilles and in the bathroom ceiling for the extract air duct.

The electrical installation contractor connects the power (24 V) and the signal cables to the wiring terminals equipped with spring-loaded pressure connections. The maximum permissible cable cross-sectional area is 2.5 mm². For reliable operation we recommend the use of cable ends with multi-pin connectors.

For particulars on how to wire the electric heating, see the separate installation instructions at www.swegon.com

The PARAGON ordering key

PARAGON	b	aaaa-	b-	cc-	d-	ef
Version:						
Length (mm)						
Function:						
A = Cooling						
B = Cooling and heating						
X = Cooling and electric heating						
Capacity variant						
NC – Normal version						
HC – High capacity version						
Connection side						
R - Right						
L - Left						
Flow variant						
Upper nozzle row:						
L, M, H						
Lower nozzle row:						
L, M, H						

Available to order, kit and accessories

Supply air kit	VAV: PARAGON CRTc motor-driven damper with tight damper blade with damper actuator and CLA sound attenuator
	CAV: PARAGON CRPc manually adjustable damper with perforated damper blade and CLA sound attenuator
Extract air kit	VAV: PARAGON CRTc motor-driven damper with tight damper blade with damper actuator, CLA sound attenuator and extract air register with mounting frame.
	CAV: PARAGON CRPc manually adjustable damper with perforated damper blade, CLA sound attenuator and extract air register with mounting frame.
Flexible connection hose	Connection hose is supplied with clamping ring coupling, push-on coupling or sleeve nut.
Assembly piece	Ceiling mounting bracket and threaded rod for mounting in ceiling. Double threaded rods with thread lock are also available.
Side mounting brackets	Side mounting brackets for suspending the module, 2 brackets (alternative to standard mounting brackets)
Venting nipple	Venting nipple with push-on coupling for connection to the return pipe for water, diameter 12 mm.
Supply air grille	Supply air grille incl. 45 mm spigot
Extra spigot	Extra 45 mm spigot for the supply air grille, gives a total dimension of 90 mm
Supply air grille with telescopic spigot	Supply air grille incl. telescopic spigot, 100 – 140 mm
Grille lock	For fixing supply air grille position
Return air grille	Return air grille incl. 13-35 mm spigot
Extra spigot	Extra spigot for the return air grille, gives a total dimension of 35-70 mm
For further accessories of control equipment, see product sheet CONDUCTOR and LUNA.	

Accessories kit

Supply air kit	PARAGON	b-	T-SAK-VAV-	bbb
Version:				
Kit with motor-driven damper				
Ø100; Ø125				

Supply air kit	PARAGON	b-	T-SAK-CAV-	bbb
Version:				
Kit with manually adjustable damper				
Ø100; Ø125				

Extract air kit	PARAGON	b-	T-EAK-VAV-	bbb
Version:				
Kit with motor-driven damper				
Ø100; Ø125				

Extract air kit	PARAGON	b-	T-EAK-CAV-	bbb
Version:				
Kit with manually adjustable damper				
Ø100; Ø125				

Ordering Key, Accessories

Assembly piece	SYST MS M8-	aaaa-	b
Length of threaded rod (mm): 200; 500; 1000			
Type: 1=One threaded rod 2=Two threaded rods and a thread lock			

Supply air grille incl. 45 mm spigot	PARAGON b T-	SG-	aaaa
L = 900, 1100, 1300, 1500			

Extra spigot for the supply air grille	PARAGON b T-	OE-SG-	aaaa
L = 900, 1100, 1300, 1500			

Supply air grille incl. telescopic spigot, 100-140 mm	PARAGON b T-	TE-SG	aaaa
L = 900, 1100, 1300, 1500			

Return air grille incl. 13-35 mm spigot	PARAGON b T-	RG-	aaaa
L = 900, 1100, 1300, 1500			

Extra spigot for the return air grille, 35-70 mm	PARAGON b T-	OE-RG-	aaaa
L = 900, 1100, 1300, 1500			

Side mounting bracket for suspension, 2 brackets	PARAGON b T-	SB	
--	--------------	----	--

Flexible connection hose, (1 piece)	SYST FH F1-	aaa-	12
Compression ring (Ø12 mm) against pipe in both ends (excl. support sleeves)			
Length (mm): 300; 500; 700			

Flexible connection hose, (1 piece)	SYST FH F20-	aaa-	12
Quick-fit push-on coupling (Ø12 mm) against pipe in both ends			
Length (mm): 275; 475; 675			

Flexible connection hose, (1 piece)	SYST FH F30-	aaa-	12
Quick-fit push-on coupling (Ø12 mm) against pipe in one end, sleeve nut G20ID in the other end.			
Length (mm): 200; 400; 600			

Venting nipple SYST AR12

Grille lock PARAGON T-GL

Specification text

Example of a specification text conforming to VVS AMA Standard.

KB XX

Swegon's PARAGON comfort module that supplies air via a supply air grille in a wall

and has integrated circulating air opening in the bottom part.

For rear edge installation in a wall/ceiling, with the following functions:

- Cooling
- Heating, water
- Heating, electric
- Ventilation
- VariFlow for simple adjustment of the airflows
- ADC
- 125 mm dia. duct connection
- Integrated circulating air opening in the bottom part
- Coil and control equipment, if required, accessible via the recirculating air grille (magnet fastener)
- Cleanable
- Fixed measurement tapping with tube
- Contractor demarcation at the connection points for water and air according to the outline drawing
- At the connection points, the pipe contractor connects the piping to 12 mm plain pipe ends then the ventilation contractor connects the ducting to the 125 mm dia. insertion joint(s).
- The pipework contractor fills, bleeds, tests the pressure and assumes responsibility for the design water flows reaching each branch of the system and the climate beam.
- The ventilation contractor conducts initial commissioning of the airflows.

Accessories kit:

- PARAGON b-T-SAK-VAV-bbb xx items
- PARAGON b-T-SAK-CAV-bbb xx items
- PARAGON b-T-EAK-VAV-bbb xx items
- PARAGON b-T-EAK-CAV-bbb xx items

Accessories:

- Supply air grille, PARAGON b T-SG-aaa xx pcs.
- Extra spigot (supply air) PARAGON b T-OE-SG-aaaa xx pcs.
- Supply air grille, PARAGON b T-TE-SG-aaaa xx pcs.
- Grille lock, PARAGON T-GL xx pcs.
- Return air grille, PARAGON T-RG-aaaa xx pcs.
- Extra spigot (return air) PARAGON T-OE-RG-aaaa xx pcs.
- Commissioning damper, SYST CRPc 9-125, xx pcs.
- Assembly piece, SYST MS M8 aaaa-b
- Side mounting brackets, PARAGON b-T-SB xx pcs.
- Flexible connection hose, SYST FH F1 aaa- 12 xx pcs.
- Flexible connection hose, SYST FH F20 aaa- 12 xx pcs.
- Flexible connection hose, SYST FH F30 aaa- 12 xx pcs.
- Venting nipple, SYST AR 12 xx pcs.

etc.

Specify the quantities individually or with reference to the drawing.