SILVER

High performance air handling units without integrated control system



The new SILVER-family

Compact Air Handling Unit SILVER C

Compact air handling unit SILVER C is an air handling unit where the vital functional components (fans, filters, heat exchangers) are integrated on site in the same casing. This provides quick and simple installation.

Flexibility is still achieved through the selection of fan placement as well as air directions. Even the type of heat exchanger can be selected. If additional functional sections such as dampers and air heaters are required, these must be installed in the ductwork or docked to the air handling unit.

The direct-driven fans with EC motors and heat exchangers belong to the industry's most energy efficient components.

SILVER C supplied without control equipment. However, fan motor control, motor control for rotary heat exchangers and damper actuator for plate heat exchangers are included.



Pages 3-9: More information about SILVER C

Modular Air Handling Unit SILVER M

The modular air handling unit SILVER M is an immensely flexible air handling unit and includes a large range of components, which offer potential for meeting specific demands and requirements for each individual ventilation system. SILVER M has several unique solutions that above all provide a high degree of thermal insulation and excellent hygienic properties.

The air handling unit is made up of optional modules with functional parts. They are supplied individually, or in suitable blocks, and assembled on site together into a complete air handling unit.

High quality and mechanical stability together with high technical performance guarantee energy-efficient operation for many years to come.



Pages 10-15: More information about SILVER M



Compact Air Handling Unit SILVER C



General

The SILVER C is a complete, one-piece air handling unit with direct-driven supply air and extract air fans, supply air and extract air filters in filter class F7 and heat exchanger. The heat exchanger is either of rotary type (RX), plate type (PX) or consists of two coils (CX).

If supplementary functional sections such as dampers and air coolers are required, these must be installed in the ductwork or docked to the air handling unit.

The SILVER C SD supply air and extract air units are air handling units equipped with direct-driven supply air or extract air fans and where filters and coil heat exchangers are available as options.

Application area

SILVER C unit are designed for use in comfort ventilation applications. Depending on the variant selected, the air handling unit can be utilised in buildings such as office buildings, schools, day nurseries, public buildings, shops, residential buildings, etc.

SILVER C unit equipped with plate/coil heat exchanger (PX/ CX) and separate supply air and extract air handling units (SD) can also be used for the ventilation of moderately humid buildings; however not where the humidity is continuously high, such as in indoor swiming baths.

Energy efficiency Air handling unit

- 18 standard sizes with airflows up to 14 m³/s (50,400 m³/h)
- Great flexibility to choose air directions and fan placement
- Large selection of supplementary functional parts
- Energy efficient fans with EC motors
- Energy efficient heat exchanger
- Can be placed outdoors
- Supplied with integrated motor control of fan motors and control of the rotary heat exchanger, otherwise without control equipment



Technical description SILVER C

Unit casing

The SILVER C casing is made up of aluzinc coated sheet steel cover panels and inspection doors both internally and externally. Environmental Class C4. Intervening insulation: 50 mm thick mineral wool.

The inspection doors are hung on hinges and are fitted with flush-mounted door handles. The door handles must be opened in two steps to equalise the pressure before the door can be opened completely.

The air handling unit can be selected with or without end connection panels for each air direction.

Leakage class L2(M) according to EN 1886:2007.

Filters

The air handling unit is supplied with polyester bag filters, Filter class F7. On the air intake on the top, the bag filter is replaced with a pleated filter in filter class F7.

Fans

The air handling unit features direct-driven fans with EC motors. Motor control 0-10 Volt included. A hand terminal for fan motor parameters is available as an accessory.

Heat exchanger

RX, rotary heat exchanger, all sizes

The RECOnomic rotary heat exchanger has a temperature efficiency of up to 85%. Motor control 0-10 V, purging sector, commissioning plates and pressure measurement tappings included as standard.

Also available in an sorption version for moisture recovery.

PX, cross-flow plate heat exchanger, size 04-30

The plate heat exchanger is as standard equipped with bypass damper, either as interlinked damper or in sections, in both cases with mounted damper actuator.

CX, coil heat exchangers, size 35-120

The coil heat exchanger is supplied in empty condition from the factory. Pipe coupling unit for installation on site available as an accessory.

Accessories

There is a large selection of supplementary function sections, for example, dampers, mixing parts, air heaters, air coolers and sound attenuators. These are positioned in the duct or docked to the air handling unit.

A roof, outdoor air and exhaust air hoods are available as accessories for outdoor placement. These are supplied unassembled.

Control equipment

Apart from the fan motor control, motor control for rotary heat exchangers and damper actuator for plate heat exchangers, the air handling unit is supplied without control equipment.

Certification

Swegon AB has a certified Quality Assurance System that conforms to ISO 9001 Standard and a certified Environmental Management System to ISO 14001. The SILVER C air handling system is also certificated by Eurovent.









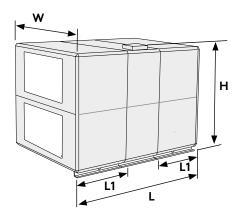




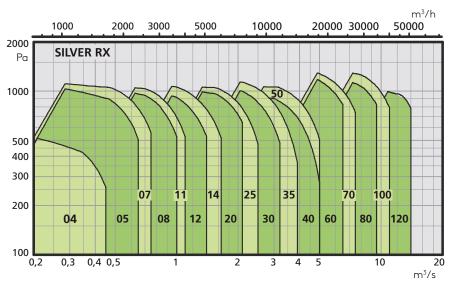
www.eurovent-certification.com www.certiflash.com



Technical data SILVER C, RX





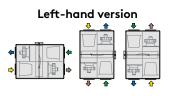


SILVER C	L		L1		w	н	н		Min.		.0/200 Pa	Max.		Max. Ecodesign	
RX	mm	kg	mm	kg	mm	mm	mm	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h
04	1500	214-243	-	-	825	1028	Ø 315	0.08	290	0.42	1510	0.45	1620	0.45	1620
05	1500	214-243	-	-	825	1028	Ø 315	0.08	290	0.42	1510	0.65	2340	0.65	2340
07	1600	262-301	-	-	995	1193	Ø 400	0.08	290	0.69	2480	0.75	2700	0.75	2700
08	1600	270-309	-	-	995	1193	Ø 400	0.20	720	0.77	2770	1.00	3600	1.00	3600
11	1860	444-496	655	141-167	1199	1503	Ø 500	0.20	720	1.00	3600	1.10	3960	1.10	3960
12	1860	466-518	655	178	1199	1503	Ø 500	0.20	720	1.14	4100	1.40	5040	1.40	5040
14	2080	521-589	765	175-209	1400	1603	1000x400	0.20	720	1.65	5940	1.65	5940	1.65	5940
20	2080	557-625	765	193-227	1400	1603	1000x400	0.30	1080	1.80	6480	2.10	7560	2.10	7560
25	2220	666-746	835	225-265	1600	1803	1200x500	0.30	1080	2.25	8100	2.50	9000	2.50	9000
30	2220	706-786	835	245-285	1600	1803	1200x500	0.50	1800	2.35	8460	3.20	11520	2.81	10120
35	2446	956-1070	948	322-379	1990	2085	1400x600	0.50	1800	3.50	12600	3.90	14040	3.90	14040
40	2446	1006-1120	948	347-404	1990	2085	1400x600	0.75	2700	3.80	13680	3.90	14040	3.90	14040
50	2670	1294-1418	1050	440-502	2318	2353	1600x800	0.60	2160	4.75	17100	5.00	18000	5.00	18000
60	2670	1374-1498	1050	480-542	2318	2353	1600x800	1.00	3600	5.00	18000	6.50	23400	6.00	21600
70	3120	2059-2211	1275	740-816	2637	2740	1800x1000	1.00	3600	6.60	23760	7.50	27000	7.50	27000
80	3120	2159-2435	1275	790-928	2637	2740	1800x1000	1.50	5400	6.85	24660	9.50	34200	8.31	29920
100	3322	3540-3900	1126	834+529	3340	3440	2400x1200	1.50	5400	10.00	36000	11.00	39600	11.00	39600
120	3322	3746-4168	1126	968+529	3340	3440	2400x1200	2.50	9000	10.30	37080	14.00	50400	13.04	46940

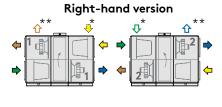
SILVER C RX 04-08

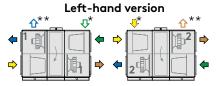
Right-hand version





SILVER C RX 11-120



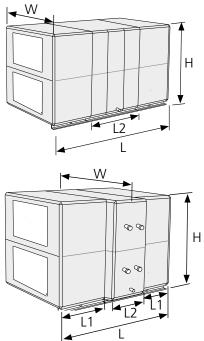


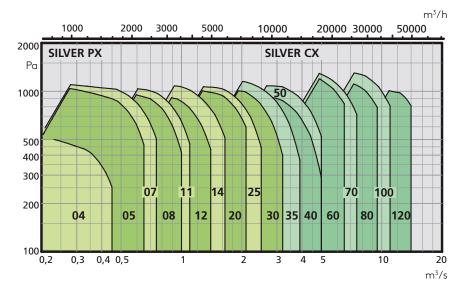


*) Inlet on the top side possible for sizes 14-30 **) Outlet on the top side possible for sizes 14-120 1.2) Possible fan placement



Technical data SILVER C, PX/CX





Division can occur on site to facilitate transporting into the installation area. Maximum dimensions and weights for division = L1&L2

SILVER C	C L L2		W	н	\emptyset	Min.		≤ SFP _v 2.0	0/200 Pa	Max.		Max. Ecodesign			
PX	mm	kg	mm	kg	mm	mm	mm	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h
04	2000	291-337	-	-	825	1100	Ø 315	0.08	290	0.45	1620	0.45	1620	0.45	1620
05	2000	291-337	-	-	825	1100	Ø 315	0.08	290	0.47	1690	0.65	2340	0.53	1910
07	2230	360-419	-	-	995	1265	Ø 400	0.08	290	0.71	2560	0.75	2700	0.75	2700
08	2230	369-428	-	-	995	1265	Ø 400	0.20	720	0.79	2840	1.00	3600	0.83	2930
11	2510	552-646	1219	270-312	1199	1395	Ø 500	0.20	720	1.01	3640	1.10	3960	1.05	3780
12	2510	574-668	1219	270-312	1199	1395	Ø 500	0.20	720	1.14	4100	1.40	5040	1.20	4320
14	2830	667-773	1319	317-355	1400	1495	1000x400	0.20	720	1.65	5940	1.65	5940	1.65	5940
20	2830	703-809	1319	317-355	1400	1495	1000x400	0.30	1080	2.00	7200	2.10	7560	1.85	6660
25	3170	905-1058	1569	455-528	1600	1695	1200x500	0.30	1080	2.45	8820	2.50	9000	2.40	8640
30	3170	945-1098	1569	455-528	1600	1695	1200x500	0.50	1800	2.55	9180	3.20	11520	2.32	11520

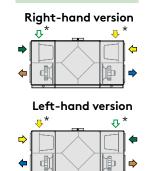
SILVER	R L		L1		L2		wн			Min.		≤ SFP _v 2.0/200 Pa		Max.		Max. Ecodesign	
с сх	mm	kg	mm	kg	mm	kg	mm	mm	mm	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h	m³/s	m³/h
35	2719	1410-1524	948	-	-	766	2190	2085	1400x600	0.50	1800	3.78	13608	3.90	14040	3.88	13970
40	2719	1460-1574	948	-	-	766	2190	2085	1400x600	0.75	2700	3.90	14040	3.90	14040	3.90	14040
50	2956	1887-2011	1050	-	-	1007	2518	2353	1600x800	1.00	3600	5.00	18000	5.00	18000	5.00	18000
60	2956	1967-2091	1050	-	-	1007	2518	2353	1600x800	1.00	3600	5.95	21420	6.50	23400	6.02	21670
70	3454	2797-2949	1275	-	-	1317	2837	2740	1800x1000	1.50	5400	7.30	26280	7.50	27000	7.48	26930
80	3454	2897-3173	1275	-	-	1317	2837	2740	1800x1000	1.50	5400	8.00	28800	9.50	34200	7.86	28300
100	3396	4374-4734	-	1183-1363	1144	-	3540	3440	2400x1200	1.50	5400	11.00	39600	11.00	39600	11.00	39600
120	3396	4580-5002	-	1286-1597	1144	-	3540	3440	2400x1200	2.50	9000	11.70	42120	14.00	50400	12.68	45650

SILVER C PX 04-08

Right-hand ver-

sion

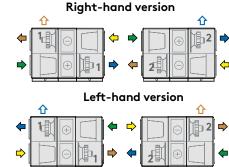
Left-hand version



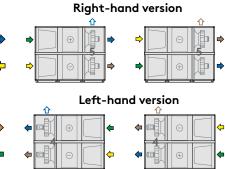
SILVER C PX 11-30

**) Inlet and outlet on the top side possible for sizes 14-30.

SILVER C CX 35-120



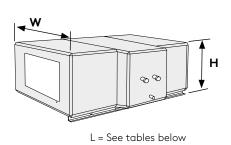
SILVER C CX 100-120



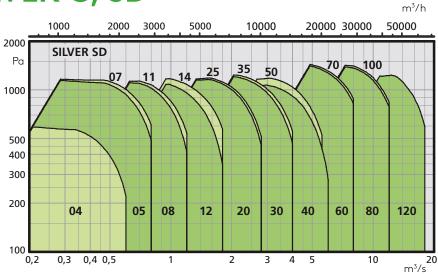
1.2) Possible fan placement. 4.5) Possible fan placement in addition to 1 and 2.



Technical data SILVER C, SD

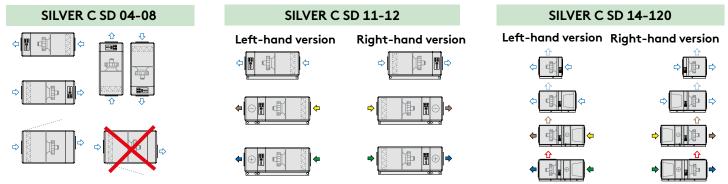


Division can occur on site to facilitate transporting into the installation area. Maximum dimensions and weights for division = L1



SILVER C SD 04-08		L					Min.		P _v 1.0	/200 Pc	I M	ax.	Max. Ecodesign			
	mm	kg	W mm	H mm	Ø	m³/	′s m³∕h	m	³ /s	m³/h	m³/s	m³/h	m³/s	m³/h		
04	1099	105-119	825	490	Ø 315	0.08	3 290	0.	60	2160	0.60	2160	0.60	2160		
05	1099	105-119	825	490	Ø 315	0.08	8 290	0.	80	2880	0.80	2880	0.66	2380		
07	1174	113-133	995	575	Ø 400	0.08	8 290	0.	80	2880	0.80	2880	0.80	2880		
08	1174	117-137	995	575	Ø 400	0.20	0 720	1.	19	4280	1.20	4320	1.07	3850		
SILVER C SD 11-12		L		L1					M	lin.	≤ SFP ₂ .0/20		0/200 Pa		Max. Ecodesign	
	mm	kg	mm	kg	W mm	H mm	Ø		m³/s	m³/h	m³/s	m³/	'n m	¹³∕s m³∕h	m³/s	m³/h
11	2092	321-347	1404	150-176	1199*	748	Ø 500		0.20	720	1.05	378	0 1	.20 4320	1.20	4320
12	2092	332-358	1404	161-187	1199*	748	Ø 500	۶ 5 00 ک		720	1.20	432	0 1	.80 6480	1.41	5080
SILVER C SD 14-120	L		L1						М	in.	≤ SFP _v 2	.0/200 Po	3	Max.	Max. Ecodesign	
	mm	kg	mm	kg	W mm	H mm	mm		m³/s	m³/h	m³/s	m³/h	m³/	′s m³/h	m³/s	m³∕h
14	2615	450-518	1040	169-188	1400*	906	1000x40	00	0.20	720	1.65	5940	1.8	0 6480	1.80	6480
20	2615	498-536	1040	187-206	1400*	906	1000x40	00	0.30	1080	2.10	7560	2.8	0 10080	2.25	8100
25	2720	626-678	1145	241-267	1600*	1126	1200x50	00	0.30	720	2.50	9000	2.8	0 10080	2.80	10080
30	2720	646-698	1145	261-287	1600*	1126	1200x50	00	0.50	1800	3.19	11480	4.0	0 14400	3.47	12490
35	2720	793-861	1145	316-350	1990*	1226	1400x60	00	0.50	1800	3.90	14040	4.0	0 14400	4.00	14400
40	2720	818-886	1145	341-375	1990*	1226	1400x60	00	0.75	2700	4.00	14400	5.0	0 18000	4.92	17710
50	2687	1093-1155	1078	379-410	2318*	1420	1600x80	0C	0.60	2160	5.00	18000	5.6	0 20160	5.60	20160
60	2687	1133-1195	1078	419-450	2318*	1420	1600x80	00	1.00	3600	6.50	23400	8.0	0 28800	6.99	25160
70	3452	1563-1639	1327	552-590	2637*	1420	1800x10	00	1.00	3600	7.30	26280	8.0	0 28800	7.79	28040
80	3452	1613-1689	1327	602-640	2637*	1420	1800x10	00	1.50	5400	8.00	28800	12.0	00 43200	7.86	28300
100	3396	2187-2367	1182	654-834	3340*	1720	2400x12	00	1.50	5400	11.00	39600	12.0	00 43200	11.48	41330
120	3396	2290-2501	1182	757-968	3340*	1720	2400x12	00	2.50	9000	11.70	42120	18.0	00 64800	12.69	45680

1) Width of a possible coil heat exchanger = W + 200 mm.





Dust accessories for SILVER C

In addition to the duct accessories presented below, pre-filters and carbon filters are also available for all SILVER C and mixing section for SILVER C SD.

				04/05	07/08	11/12	14/20	25/30	35/40	50/60	70/80	100/120
Damper TBSA	\checkmark		L (mm)	140	210	210	220	220	220	220	220	220
Sound attenuator TBDA			L (mm)	915	1200	1200	650	650	650	650	1250	1250
Air heater TBLA, water	⊕⊙	0	L (mm)	300	300	300	148- 300	148- 300	148- 300	-	-	-
Air cooler TBKA, chilled water TBKC, direct expansion.	Θ	0	L (mm)	500	500	500	500	500	500	_	_	_
Air recirculation section TCBRS	-	E	L (mm)	-	_	550	550	550	550	570	570	1070
Air bypass section TCBPS		E	L (mm)	_	_	550	550	550	550	_	_	_

Mechanical accessories for SILVER C

TBXZ Pipework package

The pipework package is used for the SILVER C CX and SD with coil heat exchanger.

Installation, pipe connection, filling and electrical connection are on site.

Droplet eliminator

To prevent condensate entrainment for SILVER C CX/SD sizes 14-120.

Water trap

Water trap for the drain branch of plate heat exchangers and coil heat exchangers.

Support foot

Adjustable support foot for taking up unevenness or sloping of the floor. The support foot should be mounted on the base beam of the air handling unit.

Support stand

For sizes 04–08.

Set of support legs For SILVER C PX.

Mounting

For SILVER C PX sizes 04-08.

Cover holder

Facilitates inspection and maintenance of vertical installations.

TCWP Component box

Component box TCWP is designed to provide protection against damage or weather, for example, valves and actuators.

Slip-clamp jointing flanges

Set of slip clamps in appropriate lengths for one joint.

Metu connection

Type METU connection frame with set of bolts, 30 mm wide flange.



Roof and hoods for SILVER C

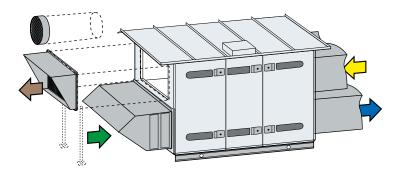
Outdoor installation

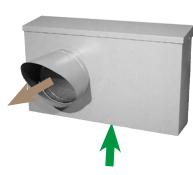
SILVER C units can be installed outdoors if fitted with the roof, air intake section and exhaust air hood accessories. However, the roof cannot be used on air handling units with the fan outlet/inlet positioned on the top of the unit.

The roof is supplied as an assembly kit.

Hoods

Hoods are available in different versions for up to unit size 40. Hoods for size 04-12 have circular duct connections equipped with a rubber seal ring and hoods for the size 14-40 have rectangular duct connections.





TBHE Exterior wall hood size 04-12



Hood

size 04-40

TBHB Exhaust Air Hood size 04-40



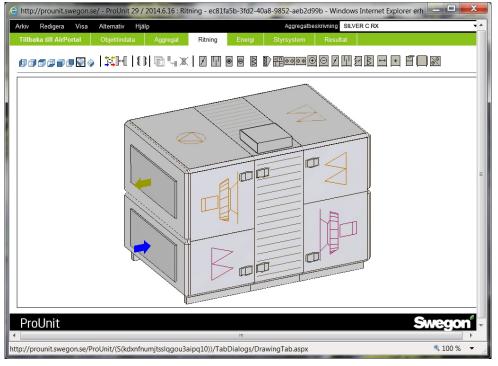
TBHC Dual-purpose Hood size 04-12

Sizing in ProUnit

ProUnit is Swegon's calculation software for the design of the air handling unit SILVER C. The software is always used to get the exact value and performance for the current item.

After entering basic data the software provides the following information:

- Size suggestions
- Dimensions
- Weight
- Selection of accessories
- Acoustic data
- Object-specific flowcharts
- Contractor demarcations
- Efficiency of the heat exchangers
- Energy calculation
- Links to CAD



Examples from the sizing software ProUnit.



Modular Air Handling Unit SILVER M



General

The SILVER M consists of several functional sections that are supplied to the building site separately or joined together in blocks. This gives great flexibility and the opportunity to adapt the air handling unit to the prevailing conditions.

Depending on the sizes and transport facilities, the units can be manufactured and delivered in one common casing.

The casing is made of panels and supporting frame members. Its design makes it simple to dismantle if modifications are required.

The interior surfaces of the unit are completely smooth and are free from sharp edges.

The configuration of the unit allows good access for maintenance of all the incorporated parts and components.

The patented thermal sealing strips between the panels and frame members in the unit casing prevent thermal bridges.

Application area

Immense flexibility characterises the SILVER M. Thanks to its large selection of solutions, the unit can be used in ventilation systems designed for various purposes. The air handling units are therefore especially well-suited for special projects such as production facilities, hospitals, spray-painting facilities, indoor swiming baths, etc.

Versatile solutions

- 33 standard sizes with airflows up to 90 m³/s (315 000 m³/h)
- Scope for special dimensions beside standard
- Large selection of components, materials and accessories
- Unique engineering solutions offer the highest mechanical and thermal performance
- Meets high stipulated hygienic demands
- Versions for indoor and outdoor installation
- Available in special versions, e.g. explosion-proof or hygienic version



Technical description SILVER M

Unit casing

The SILVER M casing is manufactured of panels and frame members. The 50 mm thick panels of "sandwich type" are made of galvanised sheet steel, both inner and outer skins. The panels are filled with an intervening slab of mineral wool that provides effective thermal and acoustic insulation. The casing panels contain mineral wool insulation with a density of 50 kg/m³; the floor panels have insulation with a density of 90 kg/m³.

The casing panels are jointed together with corner pieces by means of screws driven in from outside. The screw holes are blanked off by plastic covers.

The inspection doors are produced in the same way as the wall panels. The inspection doors are hung on robust metal hinges and are equipped with handles with or without lock depending on the requirements of the user. The inspection doors can, as an option, be equipped with inspection windows.

The standard unit casing has an earth connection at each fan section as well as an extra connection on the unit end panel by the air outlet (if the fan section is not the outermost section inside the air handling unit.

Transport eye bolts are included in the supply as standard for lifting the air handling unit blocks.

The standard casing for SILVER M can, as an option, be equipped with several different accessories.

The casing comes in leakage class L1(M) according to EN 1886:2007.

Joint brackets

Special screwed connections are used for jointing adjacent functional sections or unit blocks together. The screwed connections are a unique solution that prevent lateral and vertical displacement as well as ensure an exact interconnection of the unit sections. The joint brackets are supplied together with the unit.

Base beams

The design of the air handling unit makes it so stable that no base beams are required for stabilising the unit. If it is necessary to give the unit extra height, base beams and/or support feet are available as accessories.

Version for outdoor installation

Each functional section or unit block of the air handling units for outdoor installation is supplied with a factory-fitted roof. Profiled brackets for jointing together the roof of one unit block to the next are included in the supply.

The units with roof can also be equipped with extra accessories, such as outdoor air intake and exhaust air hood.

Certification

Swegon AB has a certified Quality Assurance System that conforms to ISO 9001 Standard and a certified Environmental Management System to ISO 14001. The SILVER M air handling system is also certificated by Eurovent.











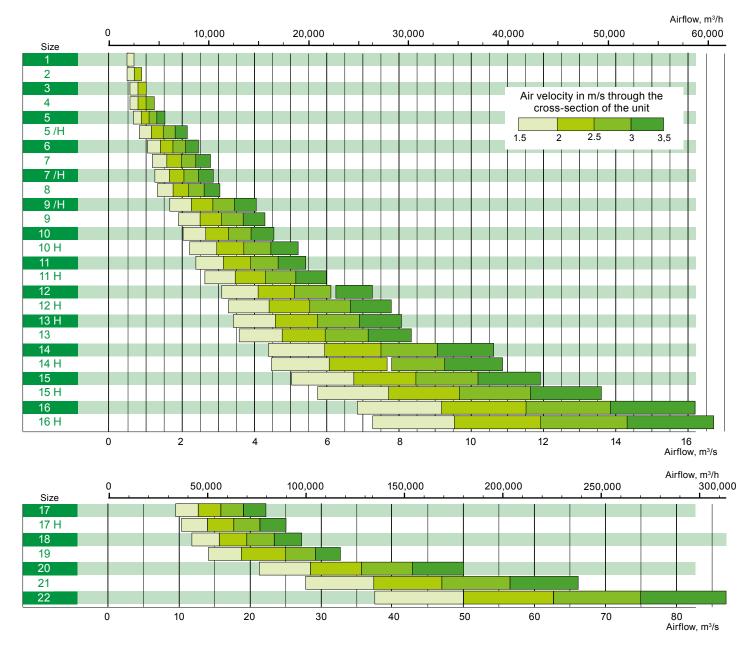




www.eurovent-certification.com www.certiflash.com



Capacity SILVER M



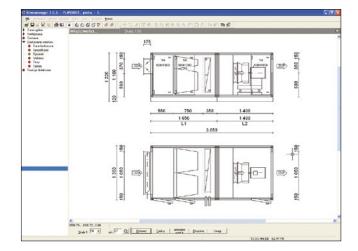
Sizing in Klimamanager

The SILVER M with all accessories is sized with precision in the Klimamanager unit sizing program.

The Klimamanager unit sizing program computes and presents all the necessary data for correct air handling unit selection, among others the following:

- Air temperatures and humidity
- Air resistance in each unit section
- Water flow resistance in the air heater and air cooler
- Air heater and air cooler capacities
- Efficiency of the heat exchangers
- Sound power level of the fans
- Attenuation capability of the silencers
- Energy consumption of the fan motors

Get in touch with Swegon for calculations in Klimamanager.



Examples from the Klimamanager unit sizing program.



Functional sections SILVER M

Damper section

The damper casing and the damper blades in the standard version are made of galvanised sheet steel. The damper blades are available with rubber seals to Ductwork leakage class 2 and 4 or without seals.

Mixing section

Available in several versions and consist of two or three dampers.





Can be obtained with bag filters, cassette filters, HEPA filters or carbon filters and in an appropriate filter class.

Rotary heat exchanger

The heat exchanger is also available in three versions:

Standard rotor – aluminium. Hygroscopic rotor – recovers both heat and moisture in the extract air.

Epoxy-coated rotor – recovers heat in chemically aggressive extract air.

Cross-flow plate heat exchanger

The heat exchanger section is equipped with a bypass damper and interlinked damper located in the outdoor air inlet of the heat exchanger. As standard the heat exchanger insert is made of aluminium, but can also be obtained epoxy treated for chemically aggressive extract air.

Coil heat exchangers

The coil consists of copper tubes and pressed-on aluminium fins. The headers of the coils are made of copper and the connection pipes are made of steel. As standard the heat exchanger insert is made of aluminium, but can also be obtained epoxy treated for chemically aggressive extract air.











Functional sections SILVER M

Fan section

Fans are available for direct drive or belt drive. The motors conform to the

protection class IP55 and efficiency class IE2.

As an option, the fan assemblies are available in a stainless or explosion-proof version.





Silencer section

The silencer in the air handling unit is composed of specially designed sound baffles that guarantee effective sound attenuation.

The sound baffles are filled with mineral wool and can be obtainable with coverage as follows:

- Fibre woven material

- Fibre woven material and perforated sheet

- Plastic foil and perforated sheet

- Fibre woven material and perforated sheet with resonator.

Inspection section

The inspection section is an empty section equipped with an inspection door. The inspection section can be one separate section or it can be included in a module with several functions.

Spacer section

The spacer section does not have any inspection door and can be one separate section or it can be included in a module with several functions.





Common accessories SILVER M

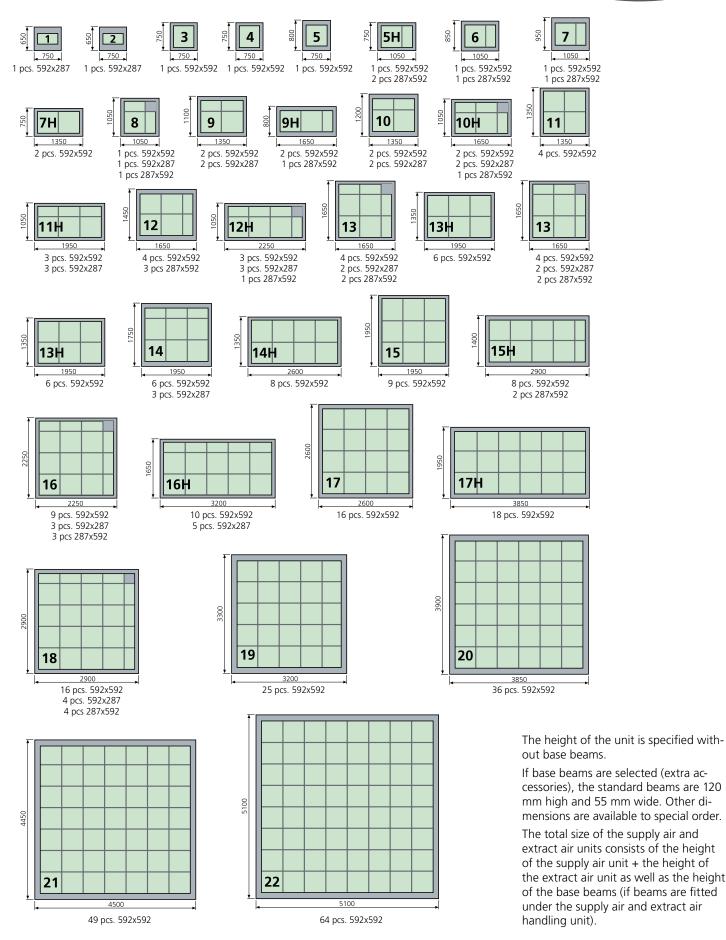




Dimensions SILVER M

The external dimensions of each unit size as well as the number and size of the filter cassettes in the filter section.

Besides the standard sizes, special dimensions are available!





We make every breath count.

