Air Handling Unit

Envistar®

Air flow 0,1-9,0 m³/s

Product Catalogue

IV PRODUKT

Air handling with the focus on LCC

IV Produkt

IV Produkt develops, produces and markets environmentally compatible and energy-efficient air handling products. We've been doing so since 1969.

IV Produkt's head office and production facilities are situated in Växjö, Sweden. The company is owned by IV Produkt Holding AB.

Product development

We make strict demands on design ingenuity as we develop new products and production methods. Our aim is to save you time and the resources needed for installing, operating and maintaining our products.

We are constantly involved in making our products energy efficient. The life cycle cost, i.e. the collective cost for procurement, operation, maintenance and minimal environmental impact, is always incorporated into our calculations when we develop new products and product selection software. Our goal is to offer you products with minimal life cycle cost.

IV PRODUKT DESIGNER

IV Produkt Designer

Our product selection program is there to make your job easier – selecting the right air handling units for your application. The software can be downloaded from www.ivprodukt.com or you can alternatively get in touch with our sales organisation.

Quality and environmental awareness

Our quality management system is certified to ISO 9001:2000. This guarantees both client and user with prime quality and reliable performance throughout the life of our products.

We develop and manufacture our products according to the guidelines of our environmental management system, certified to ISO 14001:2004.

The environmental compatibility of our products is rated on the basis of the materials they contain and the propensity of these materials for recycling.

Eurovent

Our Envistar and Flexomix air handling units are certified by Eurovent and they always comply with Energy Class A in accordance with the classification of 2009. Our product's are tested by Eurovent in accordance with EN 1886 and EN 13053. All data presented in our documentation is verified by independent laboratories.

EUROVENT CERTIFIED PERFORMANCE
AHU N°: 05.07.300 and AHU N°: 00.09.027
Range: Envistar and Flexomix
www.eurovent-certification.com

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

Contents

General Technical Description

Design

The Envistar has been designed to meet demands on quiet air handling units equipped with high-efficiency systems for heating and cooling energy recovery. All the units are available with factory-wired, performance-tested control equipment.

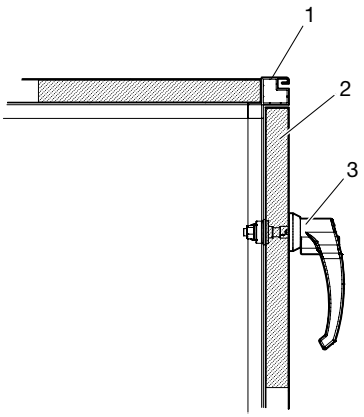
Casing

The unit sections are fabricated on a framework consisting of extruded, anodized aluminium profiled frame members. The casing panels, inspection covers and doors are of double-skin design, made of aluminium/zinc-plated sheet steel with (ALC) protective coating that meets the provisions of Corrosion Resistance Class C4 to SS-EN ISO 12944-2.

The intervening insulation consists of standard fire resistant mineral wool (code 00); 25 mm thick for Envistar Top, Compact and Flex in sizes 100-600. The Envistar Flex in sizes 740-850 has 45 mm thick insulation. Insulation to Fire Resistance Rating EI 30 (code E3) is also available.

The casing meets the provisions of Tightness Class B (L2) for negative pressure and A (L3) for positive pressure as well as heat transfer coefficient, T4 to CEN Standard preEN 1886:2007.

Door Panels and Lock



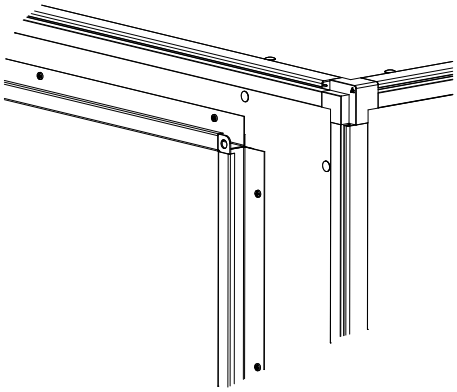
1. Anodised aluminium profiled section

2. Inspection door panel of double-skin design

3. Door handle with cam latch

All the inspection door panels are hung on adjustable hinges. The door handles have a cam latch as standard. Door panels in front of moving parts have handles that can be locked with a key.

Duct connections



The air handling units with circular connections have connection spigots fitted with a rubber seal ring. The rectangular connections are equipped with slip-clamp connection or with bolted joints at the corners, so-called METU connections.

Installation

The Envistar should be installed where the temperatures range from ±0 to +30 °C and the humidity in the fan room is less than 3.5 g/kg air in the winter.

Arrangement

The Envistar Top and Compact are as standard mounted on base beams that can be fitted with adjustable feet (code: ETET-01, ECET-01).

The Envistar Compact can be supplied for outdoor installation with supplementary parts kit (code ACET-05).

The Envistar Flex can be supplied with a fan room stand, or the air handling unit can be supplied mounted on a base frame (code: EMMT-05).

Sizing

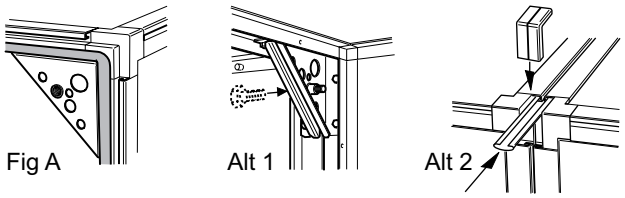
The purpose of this product catalogue is to provide information about the products in the Envistar series and should be regarded as a complement to the IV Produkt Designer product selection software.

Always use the latest valid version of the IV Produkt Designer product selection software for sizing our products before placing your order.

Jointing of Blocks and Lifting

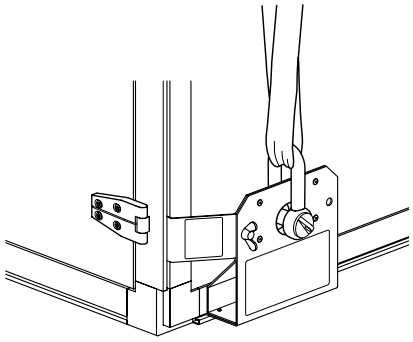
Jointing of blocks

(gäller endast Envistar Flex i blockutförande)

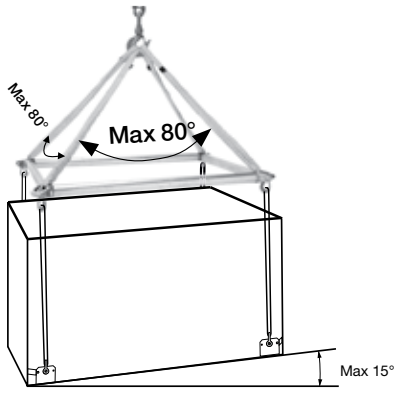


On the Envistar Flex units in the block version, fit the sealing strip between the unit blocks (Fig A) and joint the blocks together using bolts (Alt 1) or slip clamps (Alt 2).

Lifting units without base frame



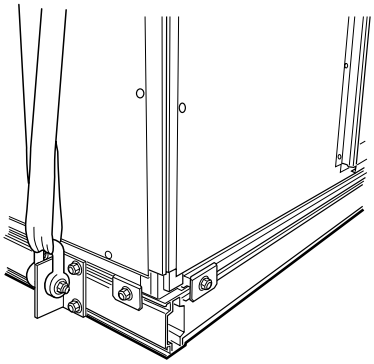
Use lifting brackets (code: EMMT-08) for lifting units/ modules without base frame.



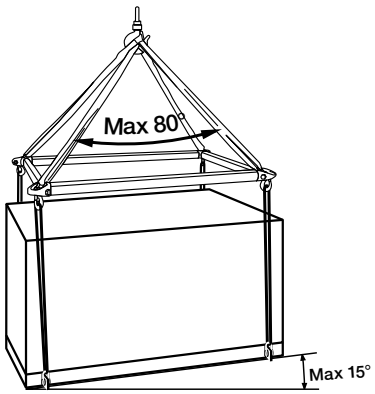
Use sling spreaders for lifting.

For instructions about lifing the air handling units, see the separate Assembly Instructions.

Lifting units mounted on a base frame

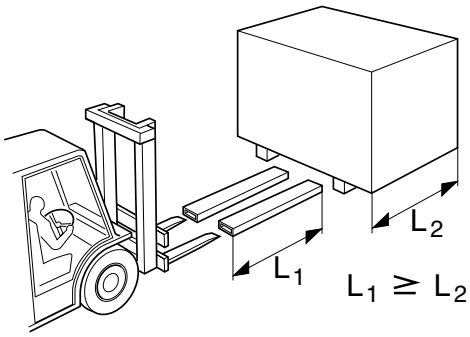


If the unit is mounted on a base frame, lifting lugs should be used for lifting. On the aluminium base frames, fit the lifting lugs in the grooves provided on the frame and secure them with bolts.



On welded bases, the lifting lugs are welded to the base frame. Sling spreaders must be used for lifting.

The size of the sling spreaders = length of the unit + 100-400 mm.



Lift the unit by means of a fork-lift truck. Make sure that the lifting forks are sufficiently long.

Norms and standards

The air handling units in the Envistar series that are supplied fitted with control equipment and are ready for commissioning, are CE marked. The other air handling units are delivered with a Declaration by the manufacturer.

This signifies that the air handling units on delivery meet the appropriate provisions specified in EU Machinery Directive 2006/42/EG.

The air handling units also conform among others to the provisions of the following norms and standards:

EN 1886:2007
SS-EN ISO 12100-1
SS-EN ISO 12100-2
SS-EN 13053:2006

PED 97/23/EC

SS-EN1751 (VVS AMA-98)

Low Voltage Directive 2006/95/EG
EMC-Directive 2004/108/EG
ELSÄK 2008:1
SS-EN 60204-1
SS-EN 61000-6-2
SS-EN 61000-6-3
SS-EN 60529
SS 436 4000

Envistar Top

The purpose of this product catalogue is to provide information about the products in the Envistar Series and should be regarded as a complement to the IV Produkt Designer product selection software. Always do your sizing work in IV Produkt Designer before placing an order.

Air Handling Unit Description

The Envistar Top is a one-piece air handling unit produced in 4 different sizes (04, 06, 10 and 16) for airflows ranging from 0.10 to 1.60 m³/s.

The unit has direct-driven, speed-controlled, open-discharge type plenum fans with backward-curved blades.

Tappings for airflow measurement are standard. The fan/motor units are withdrawable from the unit casing to make servicing easier.

The Envistar Top is equipped with a rotary regenerative heat exchanger that recovers heat, cooling energy as well as humidity. The units have built-in air heaters and can be supplied in a left-hand or a right-hand version.

The Envistar Top is available in 2 versions: with rotor as well as with rotor and integrated StarCooler cooling unit.

The size 16 unit is in three sections for minimising the external dimensions of the three unit sections. When the unit is assembled, the condenser is shifted over to the opposite unit section for final assembly.

The filters are of bag type with plastic frame and can be selected in 2 different filter classes.

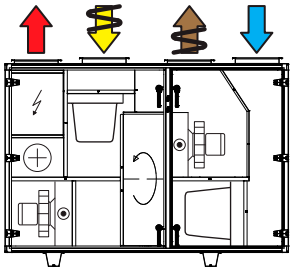
The air handling units have as standard control equipment with extensive functionality and communication possibilities. The control equipment is positioned in an enclosed space. For alternative delivery configurations see page 90. For further particulars use the Controls register tab.

Supplementary functions such as dampers, air coolers and silencers are available for installation in the ducting.

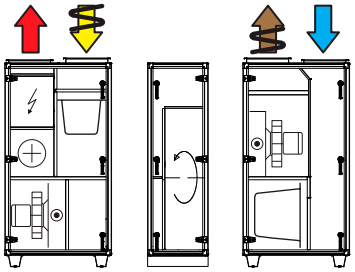
Configurations

The air handling units below are illustrated in the left-hand version.

Envistar Top with rotor (code: ATER)

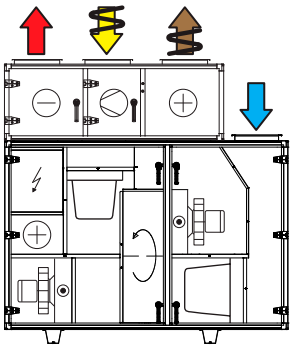


Sizes 04–10

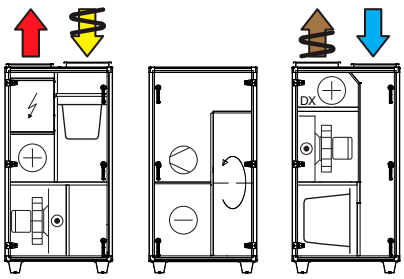


Size 16

Envistar Top with Rotor and StarCooler Cooling Unit (code: ATCR)



Sizes 04–10



Size 16

Outdoor air Supply air Extract air Exhaust air

Capacity and Technical Data

Sizes 04 and 06

Size	04	StarCooler 04		06	StarCooler 06	
		Cap. var. 1	Cap. var. 2		Cap. var. 1	Cap. var. 2
Airflow range (m³/s) *	0.10–0.37	0.19-0.35	0.25-0.35	0.15–0.62	0.34–0.60	0.40–0.60
Length (mm)	1530	1530	1530	1680	1680	1680
Width (mm) **	708	708	708	850	850	850
Height incl. base beams (mm)	1325	1830	1830	1325	1830	1830
Weight, standard insulation (kg)	230	350	350	275	405	405
Weight, EI 30 insulation (kg)	265	390	390	320	460	160
Duct connection size (mm)	Ø 250	500×200	500×200	500×250	500×250	500×250
Max. cap. water heating (kW) ***	13.5	–	–	18.9	–	–
Cap., el. heater cap. var. 1 (kW)	4	4	4	6	6	6
Cap., el. heater cap. var. 2 (kW)	6	6	6	9	9	9
Cooling capacity (kW) ****	–	4.7	5.9	–	9.3	10.3
Refrigerant, R134a (kg)	–	1.7	1.7	–	2.5	2.5

Sizes 10 and 16

Size	10	StarCooler 10		16	StarCooler 16		
		Cap. var. 1	Cap. var. 2		Cap. var. 1	Cap. var. 2	Cap. var. 3
Airflow range (m³/s) *	0.20–1.00	0.59–0.96	0.70–0.96	0.30–1.60	0.74–1.58	0.90–1.58	1.08–1.58
Length (mm)	1950	1950	1950	2285	2670	2670	2670
Width (mm) **	980	980	980	1255	1255	1255	1255
Height incl. base beams (mm)	1395	1900	1900	1700	1700	1700	1700
Weight, standard insulation (kg)	355	515	515	621	839	839	938
Weight, EI 30 insulation (kg)	410	580	580	711	944	944	944
Duct connection size (mm)	700×300	700×300	700×300	900×350	900×350	900×350	900×350
Max. cap. water heating (kW) ***	24	–	–	53.4	–	–	–
Cap., el. heater cap. var. 1 (kW)	9	9	9	9	9	9	9
Cap., el. heater cap. var. 2 (kW)	15	15	15	15	15	15	15
Cap., el. heater cap. var. 3 (kW)	–	–	–	21.2	21.2	21,2	21.2
Cooling capacity (kW) ****	–	15	16.9	–	19	22.9	27.4
Refrigerant, R134a (kg)	–	3	3	–	5	5	5

* The flow range applies to air handling units with water coil, F7 filters, dampers and 200 Pa duct pressure.

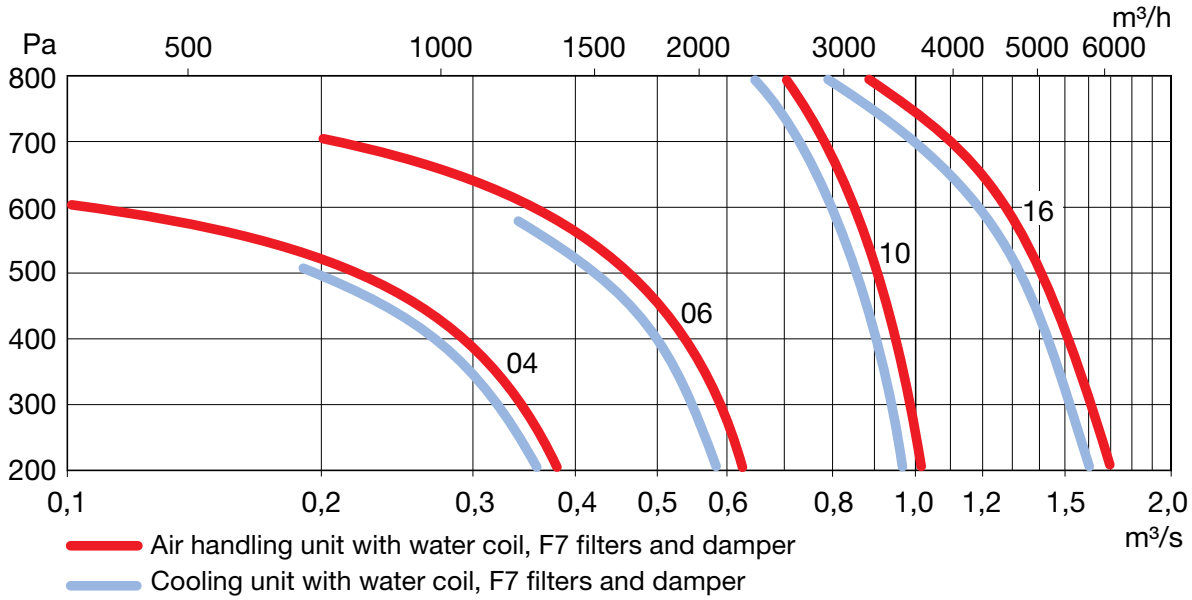
** The dimensions specified do not include the door handles (65 mm) and hinges (15 mm).

*** Applicable to $t_{supply\ air}$ 20 °C, water temp. 55-35 °C

**** Applies to an outdoor air temperature of +26 °C, 50% RH and an extract air of +22 °C.

Capacity and Technical Data

Available external pressure



Dimensions and Weights, Envistar Top with Rotor (code: ATER)

The air handling unit is illustrated with left-hand inspection side. The depth specified does not include the handles (65 mm) and the hinges (15 mm).

Positions in the dimension sketch:

1. Electrical connections

2. Water coil connections

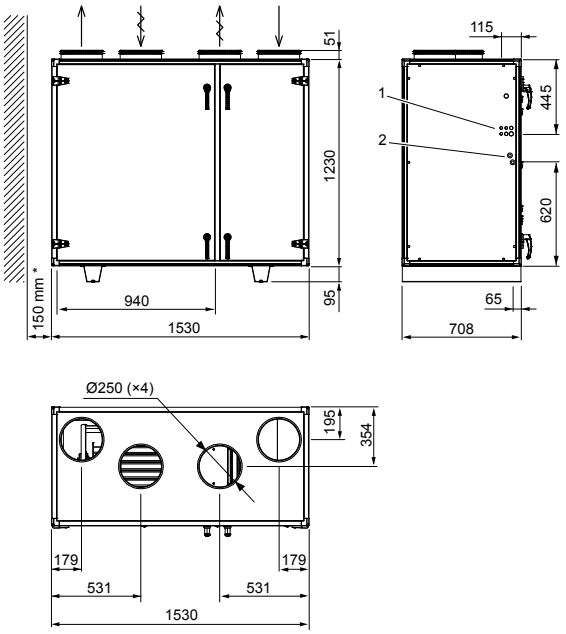
*The electric and pipe connections are on the end panel. An air handling unit in the left-hand version has the connections in the left-hand end panel; a unit in the right-hand version has the connections in the right-hand end panel.

When arranging the pipe connections, provide at least 150 mm free space to the side of the unit.

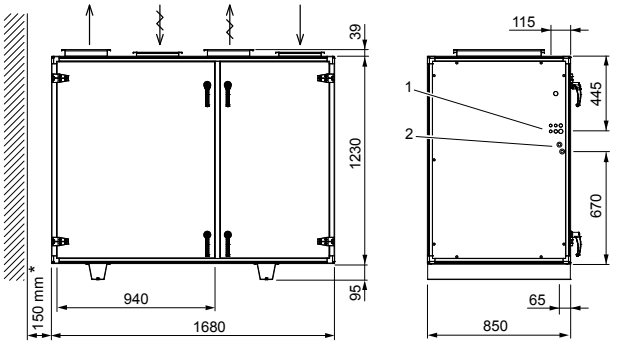
Weight (kg)

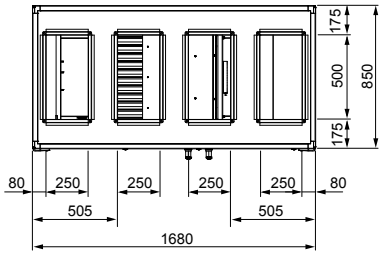
Size	Standard insulation	Insulation to fire resistance class EI 30
04	230	265
06	275	320
10	355	410
16	621	711

ATER 04 Dimensions (mm)

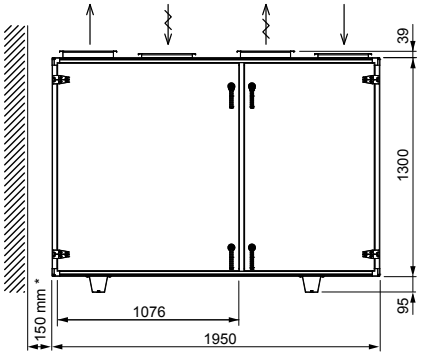


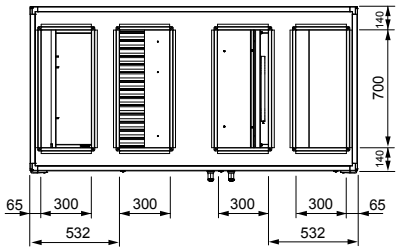
ATER 06 Dimensions (mm)



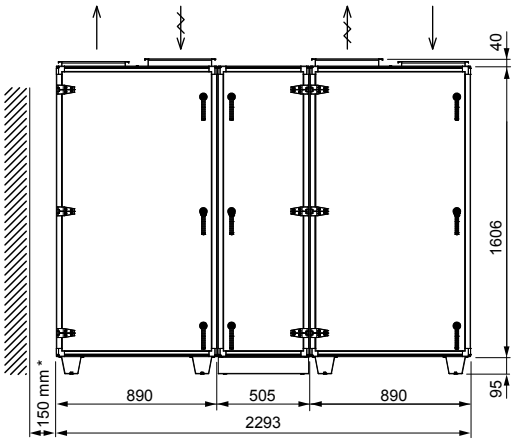


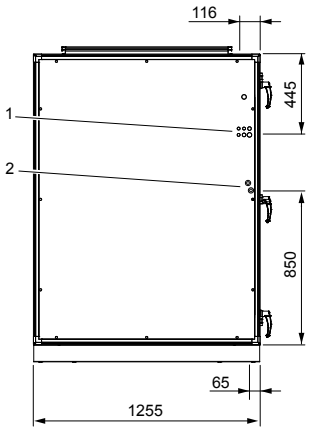
ATER 10 Dimensions (mm)

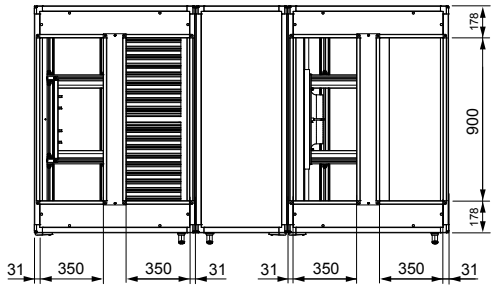




ATER 16 Dimensions (mm)







Dimensions and Weights, Envistar Top with Rotor (code: ATER)

The air handling unit is illustrated with left-hand inspection side. The depth specified does not include the handles (65 mm) and the hinges (15 mm). The pipe connection (Item. 1) sticks out approx. 20 mm.

Positions in the dimension sketch:

1. Condensate drain connection (15 mm dia.)

2. Electrical connections

3. Water coil connections

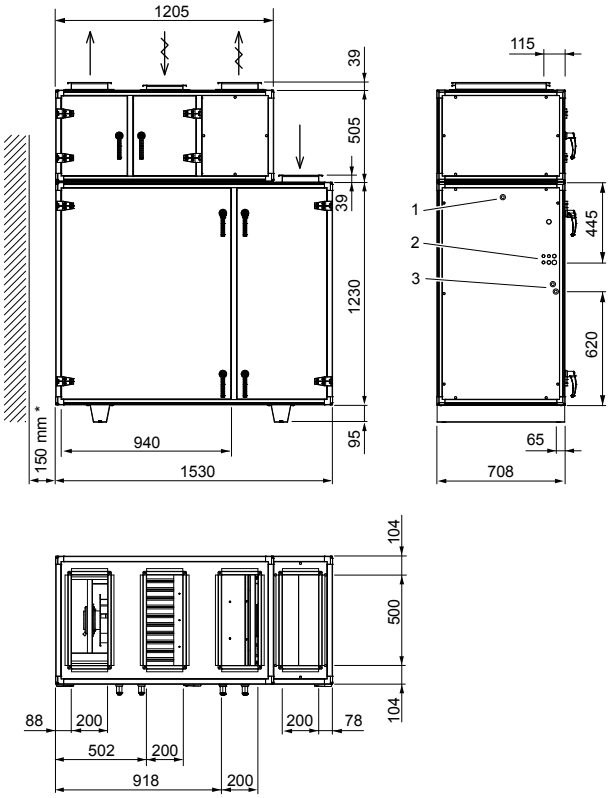
*The electric and pipe connections are on the end panel. An air handling unit in the left-hand version has the connections in the left-hand end panel; a unit in the right-hand version has the connections in the right-hand end panel.

When arranging the pipe connections, provide at least 150 mm free space to the side of the unit.

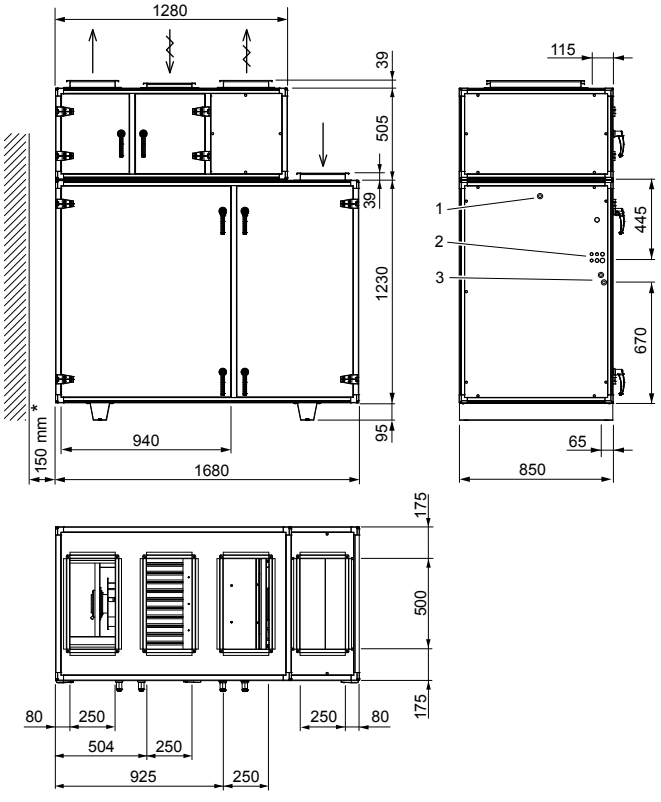
Weight (kg)

Size	Standard insulation	Insulation to fire resistance class EI 30
04	350	390
06	405	460
10	515	580
16	840	945

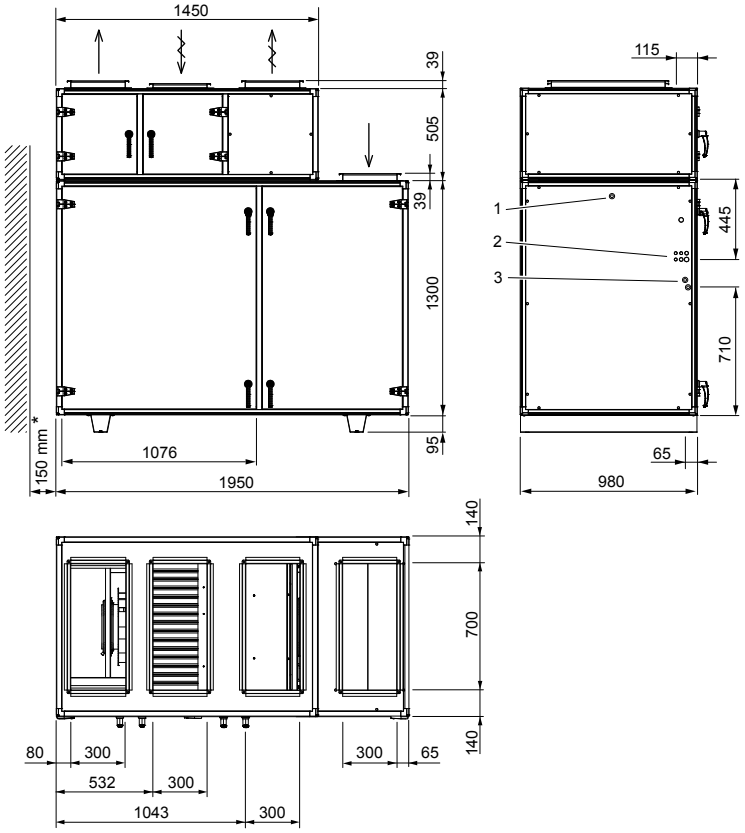
ATCR 04 Dimensions (mm)



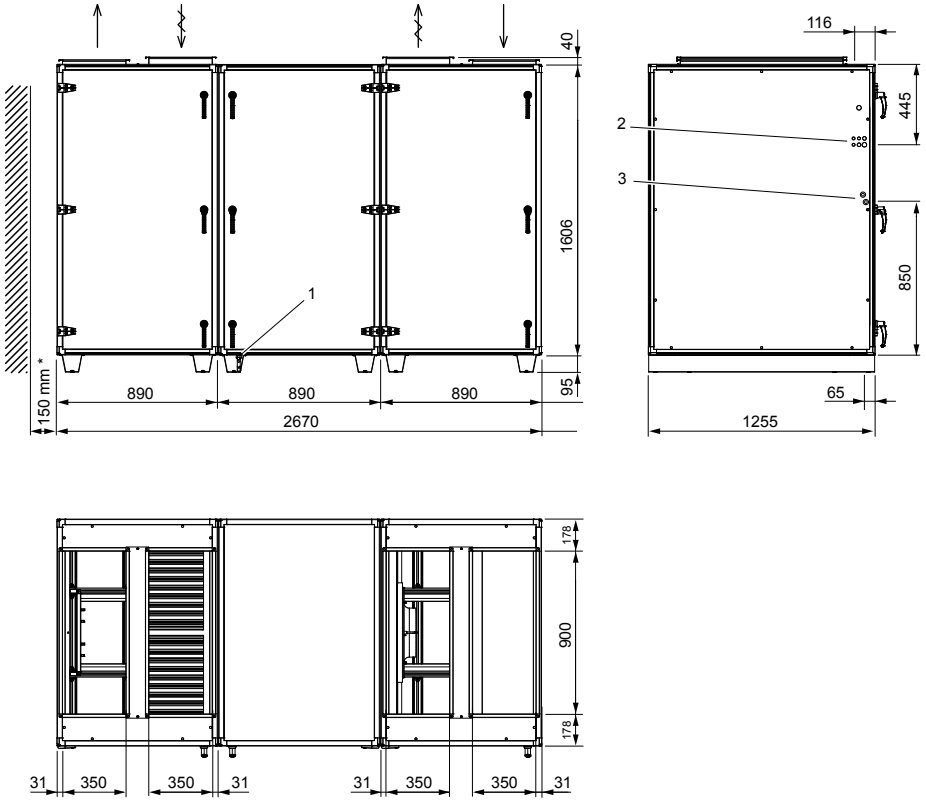
ATCR 06 Dimensions (mm)



ATCR 10 Dimensions (mm)



ATCR 16 Dimensions (mm)

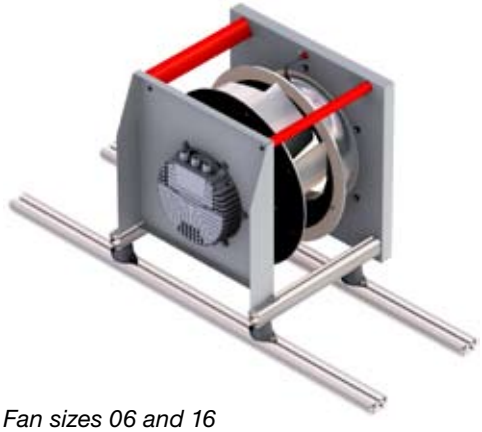


Air Handling Unit Components

Fans

The Envistar Top units have direct-driven, vibration-isolated plenum fans with type B-impeller (backward-curved blades). EC motors with built-in electronic speed control system. The airflow rate is variably controlled in response to a 0-10 V signal from a main contral system.

Fan sizes 04 and 06



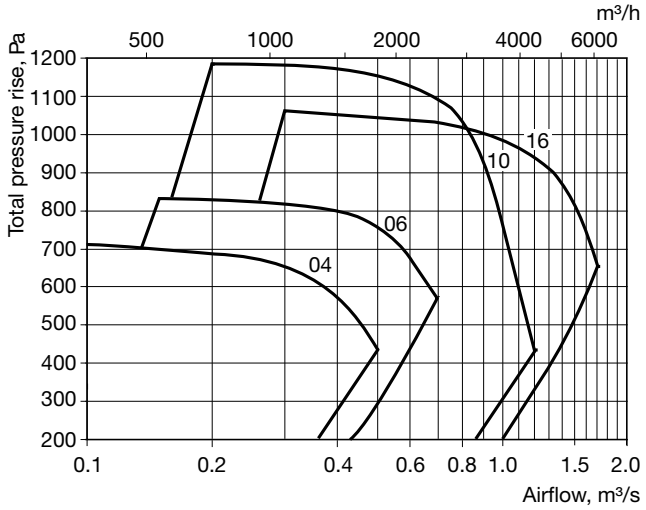
Fan sizes 06 and 16

Electrical Data

Size	Motor output (kW)	Voltage (V)	Rated current (A)	Rec. fuse (AT)
04	0.42	230	2.5	10
06	0.75	230	3.5	10
10	1.5	230	7.0	10
16	1.95	3×400	3.0	10

See also the section: Wiring Diagrams and Fuses.

Fan Performance



Accessory

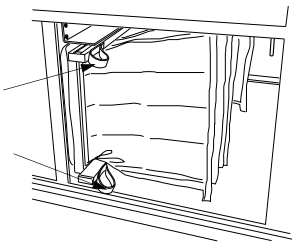
- Flow meter, manometer type (code: ATET-04).

See also the section: Accessories.

Filters (code: ATEF)

Tightly pleated class F5 or F7 bag filters.

- The filters are mounted on rails and can be easily withdrawn and replaced. The filters are completely disposable by burning.



- To minimize the risk of leakage, the pressure drop across the filter is utilised to achieve effective tightness.
- Equipped with tappings for differential pressure measurement.

Size	Qty. of filters	Dimension (mm)		Filter class	Filter area total (m²)
		Frame	Length		
04	1	650×287	320	F5 F7	1.7 2.2
06	1	790×287	370	F5 F7	2.5 3.1
10	1	892×380	520	F5 F7	5.3 6.4
16	2	592×400	520	F5 F7	2 × 3.3 2 × 4.5

Accessories *See also the section: Accessories.*

- Stainless bottom plate, outd. air intake (code ATET-06)
- Filter guard, U-tube manometer (code MIET-FB 01)
- Filter guard, Kytölä manometer (code MIET-FB 02)
- Filter guard, Magnehelic manometer (code MIET-FB 03)

Heat Recovery Rotor

The heat recovery rotor is a rotary heat exchanger that transfers heat according to the air-to-air principle.

Design

The rotor in the heat exchanger is composed of alternately wound flat and corrugated bands of aluminium foil, forming smooth passages through which the air can flow in laminar manner. This provides low pressure drop and little risk of dust or other impurities collecting inside the air passages.

The rotor is journalled in permanently lubricated, self-aligning ball bearings.

An effective bristled seal is fitted along the periphery of the rotor and between the supply air and extract airflow paths to prevent carry-over.

The rotor is available in four different versions:

- NO, normal rotor
- HY, hygroscopic rotor for increased cooling energy and humidity recovery
- NP, normal Plus rotor for higher efficiency
- HP, hygroscopic rotor in the Plus version

An adjustable purging sector enables a continuous purging air flow to blow the rotor clean of impurities

The rotor is driven by a worm-gear motor with electronic speed control.

Speed Control

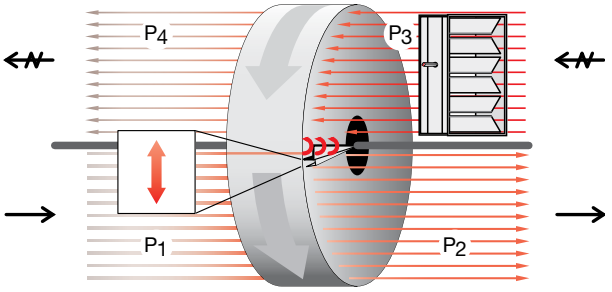
Power transmitted is controlled by means of built-in control equipment. The control unit has ready-to-use functions for purging, speed detector and alarms.

Motor Data

Size	Motor output	Voltage	Rated current	Rec. fuse
04–16	40 W	230 V	0.7 A	10 AT

See also the section: Wiring Diagrams and Fuses.

Purging Operation and Leakage Flow



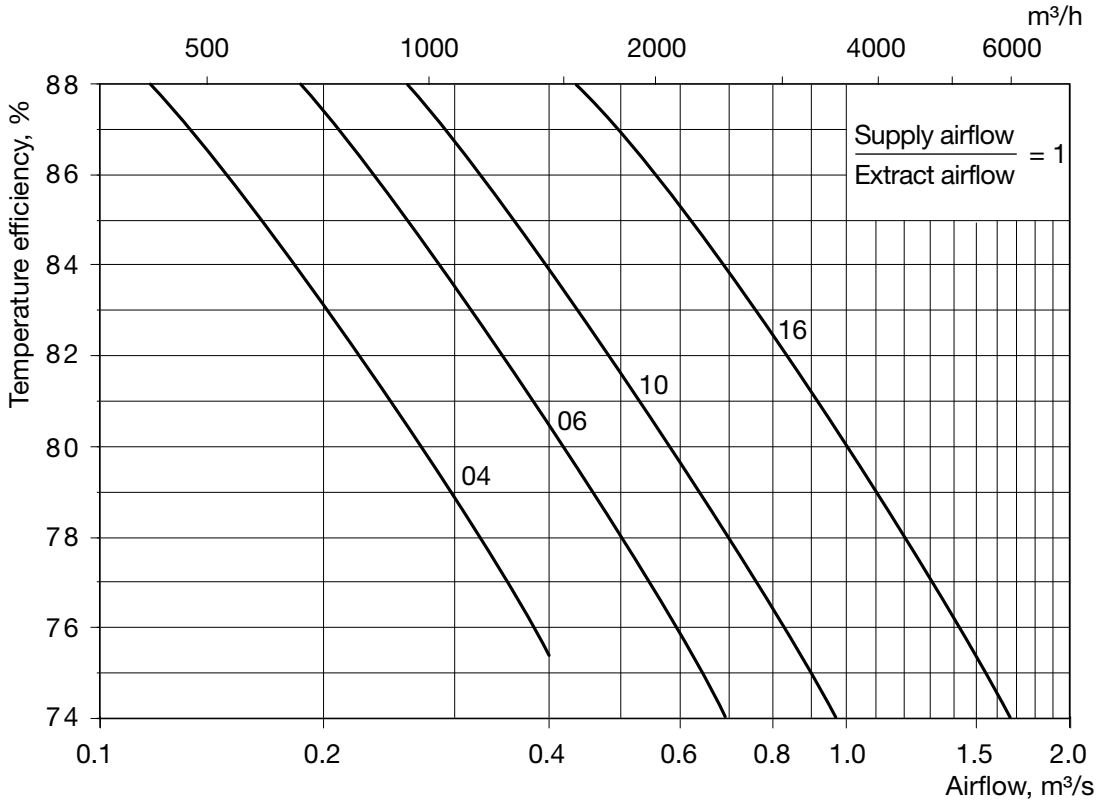
As the rotor rotates, a certain portion of the extract air is always carried over in the rotary heat exchanger to the supply air and vice versa.

When the purging sector is in use, the rotor is purged with air to clean it and this eliminates transfer of extract air to the supply air.

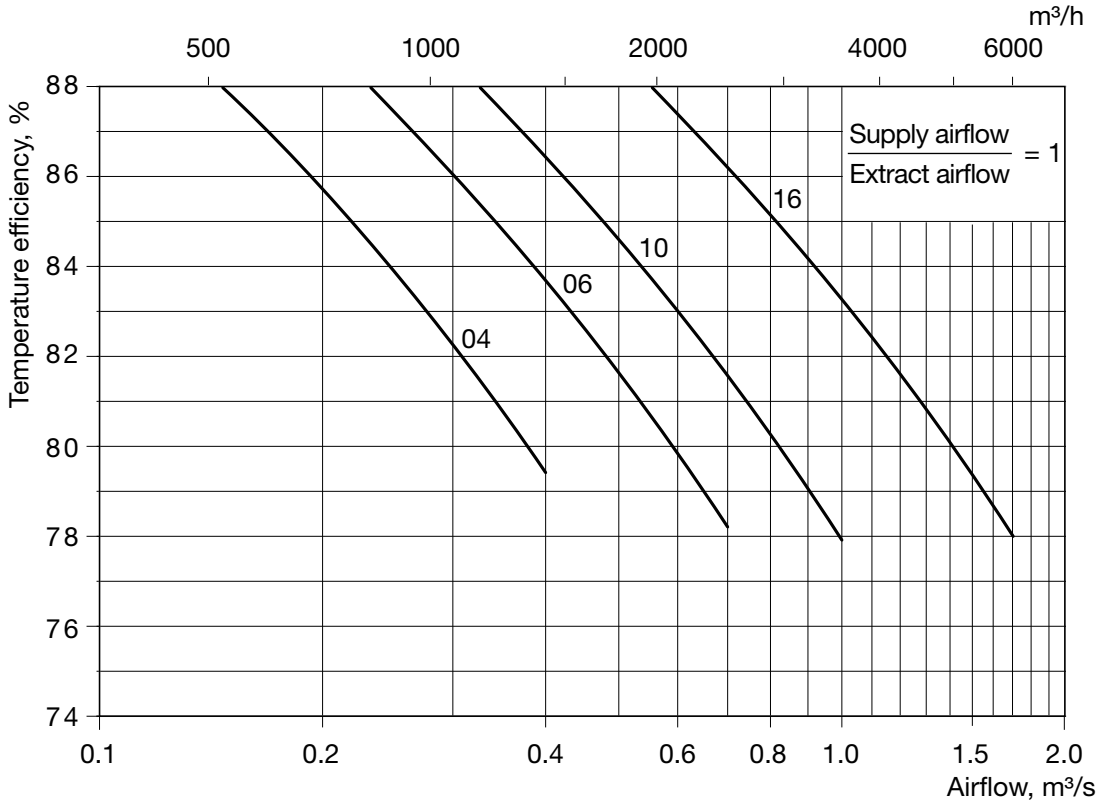
If the need arises, the trimming damper can be used for achieving the necessary pressure ratio: P2 is greater than P3.
The purging airflow can be adjusted by altering the setting of the adjustable purging sector.

The IV Produkt Designer computer program calculates the leakage air flow and determines whether a trimming damper is needed.

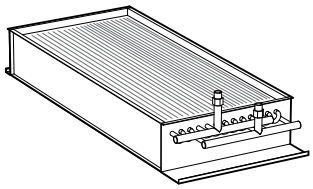
Temperature Efficiency, Type NO Rotor (Normal)



Temperature Efficiency, Type NP Rotor (Normal Plus)



Air Heater for Water (code: ATEV)



The air heater is a build-in finned-tube heat exchanger for hot water.

- The coil body consists of copper tubes and aluminium fins.
- Water connections with clamp ring couplings.
- Max. permissible pressure: 15 bar.

Pipe connections

Size	Capacity variant/ pipe connections	
	1	2
04	15	15
06	15	15
10	15	20
16	15	25

Air Heater for Water, Thermoguard (code: ATTV)

The air heater is a build-in finned-tube heat exchanger for hot water with built-in anti-frost protection.

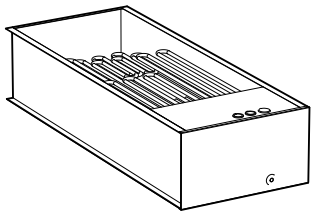
- The coil body consists of copper tubes and aluminium fins.
- Water connections with clamp ring couplings.
- Max. permissible pressure: 6 bar.
- Type Thermoguard frost damage protection

Always provide the air heater with the means for relieving the pressure to the return pipe of the heating system. If a 2-way valve is used for controlling the flow, unconditionally fit the valve on the inlet piping.

Pipe Connections

Size	Capacity variant/ pipe connections	
	1	2
04	15	15
06	15	15
10	15	15
16	15	20

Electric Air Heater (code ATEE)



The ATEE is a built-in electric air heater of high-temperature design.

- Includes complete control equipment for controlling the heating output.
- Requires a separate power supply, or the ST65 accessory for the control equipment.
- Tubular stainless steel heating elements.
- The heaters have double thermal overload protection that switch off the power if overheating is likely. One of them must be manually reset.
- Degree of protection IP 43 to SS-EN 60529.

Electrical Data

Size	Output variant / rec. fuse		
	1	2	3
04	4 kW 2×400V 16A	6 kW 2×400V 16A	–
06	6 kW 2×400V 16A	9 kW 3×400V 16A	–
10	9 kW 3×400V 16A	15 kW 3×400V 25A	–
16	9 kW 3×400V 16A	15 kW 3×400V 25A	21 kW 3×400V 32A

See also the section: Wiring Diagrams and Fuses.

StarCooler Cooling Unit with Cooling Energy Recovery

ATCR 16, Cooling unit shown without inspection panel

A complete top-mounted cooling unit, designed for cooling the supply air. Consists of a cooling circuit with evaporator and condenser, compressor and electrical equipment for power and safety.

- Flow range: 0.19-1.58 m³/s with cooling capacity from 4.5 to 27.4 kW at max. airflow.
- 2 capacity variants in sizes 04–10.
- 3 capacity variants in size 16.
- Cooling energy recovery by means of a rotor.
- The capacity is regulated by means of a capacity controller and cooling energy recovery.
- Environmentally compatible refrigerant: R134a.
- Supplied CE labelled, tested and documented as a ready-to-use cooling installation.

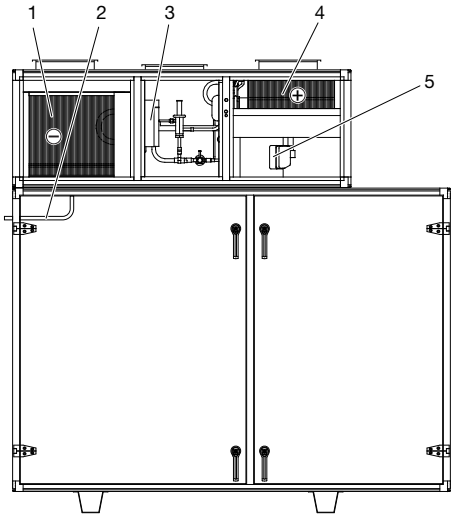
Design

The StarCooler with cooling recovery is designed to operate as a direct expansion system, contains a minimum volume of refrigerant and has a high coefficient of cooling performance. The compressor circuit chills the supply air as it flows through the evaporator coil. There, the absorbed heat is transferred to a condenser situated in the exhaust air path.

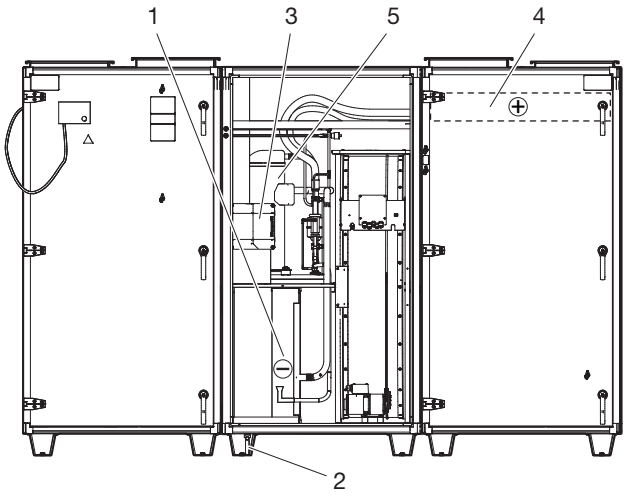
The cooling unit is compact and its casing conforms to Corrosion Resistance Class C4, of a design similar to the other components in the air handling unit series. A lockable cover in the front of the unit is provided enabling access for adjustments and servicing.

The condensate drain connection on sizes 04-10 is located on the supply air fan's pressure side, and do not require a water trap. Size 16 has its condensate drain connection located on the supply air fan's suction side and is equipped with a built-in water trap.

The condensate drain connection is made of plastic on sizes 04–10 and copper on size 16.



Sizes 04–10



Size 16

1. Evaporator *2. Condensate drain conn. Ø 15 mm*
3. Electrical equip. *4. Condenser*
5. Compressor

Refrigerant Circuits

The refrigerant circuits consist of the following:

- Fully hermetic scroll-type compressor with oil sight glass and temperature and current-sensitive phase switch.
- Evaporator coil with drip tray, condenser coil, drying filter, choke for expansion, capacity controller, low pressure and high pressure switches.
- Refrigerant tubing made of copper jointed together by brazing.
- Service connection and refrigerant.

Project Design

The unit can be engineered to handle optional supply and extract airflows within the specified min. and max. permissible flow range

Accurate sizing is carried out in the IV Produkt Designer product selection program.

Electrical Equipment

The electrical equipment includes a protective motor switch, contactor and starter for the compressor.

The cooling capacity is controlled by means of external potential-free contacts (230 V~). The cooling unit is permitted to start when both fans are running. If a pressure switch or protective motor switch should trip, the compressor will be switched out and a group alarm will be initiated across potential-free contacts.

Technical Data, ATCR

			Size	04		06		10		16		
			Capacity variant	1	2	1	2	1	2	1	2	3
Airflow rate	**min.**	(m^3/s)		0.19	0.25	0.34	0.4	0.59	0.7	0.74	0.9	1.08
	max.	(m^3/s)		0.35	0.35	0.60	0.60	0.96	0.96	1.58	1.58	1.58
Max. cooling capacity *		(kW)		4.7	5.9	9.3	10.3	15	16.9	19	22.9	27.4
Power required, compressor		(kW)		1.34	1.42	2.11	2.40	3.23	3.93	4.13	4.98	5.96
Coefficient of cooling performance		(C.O.P.)		3.5	4.2	4.4	4.3	4.7	4.3	4.6	4.6	4.6
Max. operating current, 3×400V+N 50Hz		(A)		2.8	3.7	4.3	5.7	6.4	7.8	8.3	9.7	11.3
Req. fuse, sooling section only, 3×400V+N 50Hz		(A)		10	10	10	10	10	16	16	20	20
Refrigerant R134a		(kg)		1.7	1.7	2.5	2.5	3	3	5	5	5

* Applies to an outdoor air temperature of +26 °C, 50% RH and an extract air temperature of +22 °C and a hygroscopic rotor.

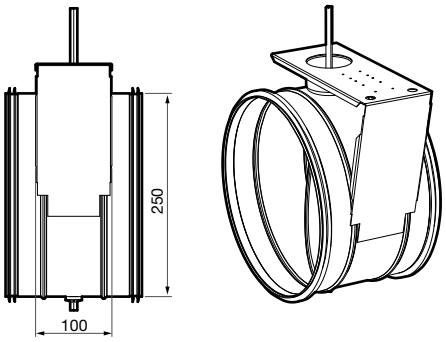
Components for Duct Mounting

Damper excl. Motor (code: ETET-UM)

The ETET-UM is a duct damper intended for use as a shut-off or control damper. The damper can be connected directly to the unit or in the ducting.

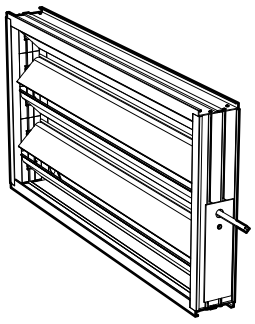
- Permissible temperature: -40 to +80 °C
  Permissible differential pressure: max. 1400 Pa
- Tightness class 3 for rectangular dampers, tightness class 4 for circular dampers to SS-EN1751 (VVS AMA-98).

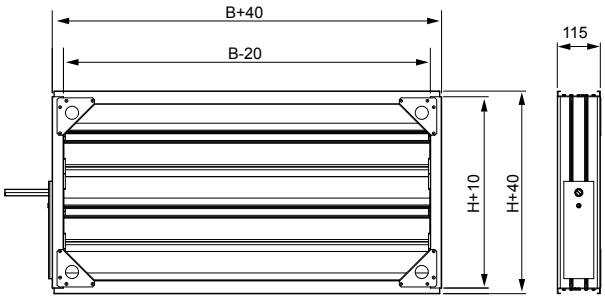
Size 04



Size 04 dampers have circular connections fitted with rubber ring gaskets.

Sizes 04C*, 06, 10 and 16





Sizes 04C* 06, 10 and 16 are designed with rectangular PG connections. The damper blades are driven by ABS-plastic gears and are fitted with tubular gaskets made of fixed silicone rubber to ensure tightness. The dampers are made of aluminium profiled sections and conform to Corrosion Resistance Class C4.

Dimensions, Weights and Torque

Size	Ø d1 (mm)	B (mm)	H (mm)	Wgt. (kg)	Torque req. (Nm)
04	250	–	–	4	3
04C*	–	500	200	5	3
06	–	500	250	5	3
10	–	700	300	7	4
16	–	900	350	10	4

Damper with Lever Actuator (code: ETET-TR)

The ETET-TR is a trimming damper that can be installed in the extract air duct, if needed, to ensure correct pressure balance for rotor purging operation. Connected directly to the unit or the ducting.

- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 04C*, 06, 10 and 16 are made with rectangular PG connections and have damper blades driven by ABS plastic gears and are fitted with tubular gaskets made of fixed silicone rubber to ensure tightness. The dampers are made of aluminium profiled sections and conform to Corrosion Resistance Class C4.
- Permissible temperature: -40 to +80 °C
  Permissible differential pressure: max. 1400 Pa
- Tightness class 3 for rectangular dampers, tightness class 0 for circular dampers to SS-EN1751 (VVS AMA-98)
- Lever actuator

Dimensions and Weights

Size	Dimensions (mm)			Wgt. (kg)
	Ø d1	B	H	
04	250	–	–	4
04C*	–	500	200	5
06	–	500	250	5
10	–	700	300	7
16	–	900	350	10

** Refers to ATCR-04 with rectangular duct connections.*

Air Cooler for Water (code: ETET-VK)

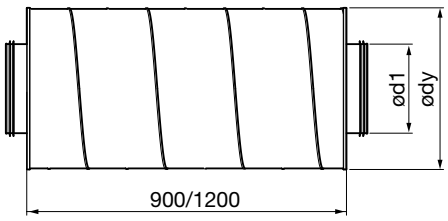
- The casing is made of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have male-threaded connection branches.
- Max. permissible operating pressure: 15 bar.
- A corrosion-resistant drip tray with drain connection is situated on bottom of the section.
- The size 04 air coolers are made for circular connection and are made of galvanized sheet steel. The connections are fitted with rubber gasket.
- The size 06, 10 and16 air coolers are made with rectangular connections for PG jointing.

The air coolers for duct connection are not stocked as standard parts. For the best possible performance, they are sized to suit each individual application.

Sound Absorber (code: ETET-LD)

The ETET-LD sound absorber is of absorption type for connection in the ducting.

Size 04



The size 04 sound absorbers are designed for circular connection. The connection branches are fitted with rubber ring gaskets.

The casing consists of a spiral ventilation duct and an inner jacket made of perforated, galvanized sheet steel. The intermediate space is filled with mineral wool covered with fibre fabric.

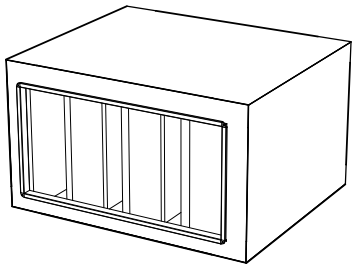
The sound absorber is available in two attenuation variants:

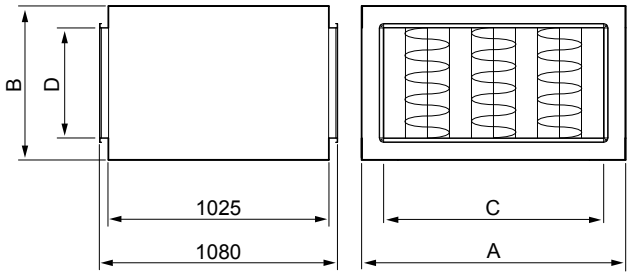
- Type 1 with 50 mm thick insulation, L=900mm
- Type 2 with 100 mm thick insulation, L=1200mm

Sizes 04C*, 06, 10 and 16

* Refers to ATCR-04 with rectangular duct connections.

Sizes 04C, 06, 10 and 16 are made with rectangular connections for PG jointing.





Sizes 04C, 06, 10 and 16 are made with rectangular connections for PG jointing.

- The sound absorber consists of a casing made of galvanized sheet steel with 200 mm thick baffle elements. The baffle elements are made of mineral wool and are fitted with a layer of Cleantech on the air side.
- The baffles are positioned 100 mm apart.
- The baffles are pointed to reduce pressure drop.

Dimensions and Weights

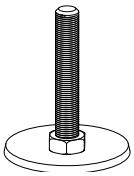
Size	Dimensions (mm)						Wgt. (kg)
	Ø d1	Ø dy	A	B	C	D	
04 type 1 04 type 2	250	365 465	–	–	–	–	16 23
04C*	–	–	600	280	500	200	30
06	–	–	600	400	500	250	35
10	–	–	900	400	700	300	50
16	–	–	1200	410	900	350	70

Sound Attenuation (dB)

	Frequency band (Hz)	63	125	250	500	1000	2000	4000	8000
Size	04 type 1	2	2	8	22	37	34	18	16
	04 type 2	6	9	22	35	39	33	20	21
	04C*	7	10	19	31	42	36	30	17
	06	7	10	19	31	42	36	30	17
	10	7	10	19	31	42	36	30	17
	16	7	10	19	31	42	36	30	17

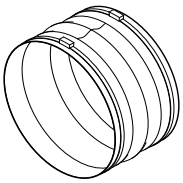
Accessories

Adjustable foot (code: ETET-01)

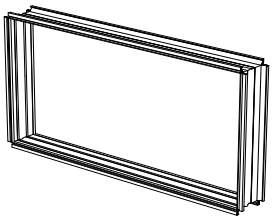


Adjustable foot for mounting in a base frame.

Flexible connection (code ETET-02)



Size 04

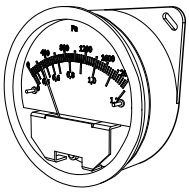


Sizes 04C, 06 and 10*

Made of flexible woven fabric for connection to a duct.
Length: 110–150 mm.

** Refers to the ATCR-04 with rectangular connections.*

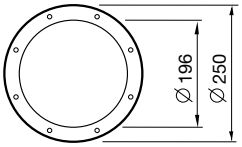
Flow meter, manometer type (code: ATET-04)



Stainless bottom plate for outdoor air intake (code: ATET-06)

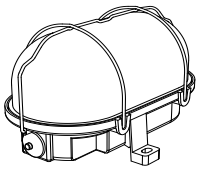
Inspection door handle (code: ATET-07)

Inspection window (code EMMT-06)



Consists of an inner and an outer Plexiglas pane. For casing 00 (standard insulation).

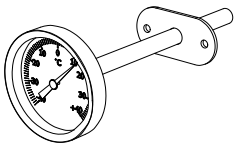
Interior light fitting (code: EMMT-07)



The light fitting conforms to enclosure class IP 44 and is fitted with an aluminium reflector, ribbed glass cover and steel wire protection.

Height = 175, width = 120, depth = 115 mm.

Thermometer (code: EMMT-16)

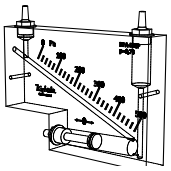


Dial thermometer, insertion type. -40 to +40 °C.

Filter guard, U-tube manometer (code: MIET-FB 01)

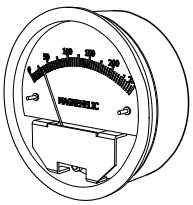
Range of measurement 0±400 Pa

Filter guard, Kytölä manometer (code: MIET-FB 02)



Range of measurement 0–500 Pa.

Filter guard, Magnehelic manometer (code: MIET-FB 03)



Range of measurement 0–250 Pa.

Wiring Diagrams and Fuses

Air handling units including control system

Safety isolating switch

A safety isolating switch should be installed and wired across the mains power supply cable.

Wiring diagrams

For wiring diagrams for the air handling unit with control equipment, see the wiring diagrams that accompany the air handling units when they are delivered.

Fuse protection for unit functions

The unit functions have a common power supply. The following fuses are recommended.

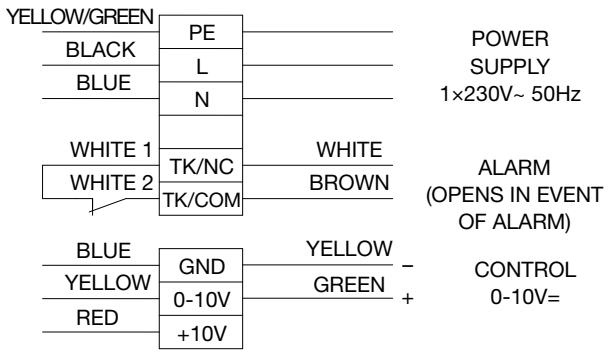
Size	Ventilation	Ventilation + Cooling unit			Ventilation + Electric air heater		
		Cap. var. 1	Cap. var. 2	Cap. var. 3	Cap. var. 1	Cap. var. 2	Cap. var. 3
04	230V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	–	3×400V+N 16AT	3×400V+N 20AT	–
06	3×400V+N 10AT	3×400V+N 16AT	3×400V+N 16AT	–	3×400V+N 25AT	3×400V+N 20AT	–
10	3×400V+N 16AT	3×400V+N 20AT	3×400V+N 20AT	–	3×400V+N 25AT	3×400V+N 32AT	–
16	3×400V+N 10AT	3×400V+N 25AT	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 40AT

Size	Ventilation + Cooling unit + Electric air heater								
	Cap. var. 1+1	Cap. var. 1+2	Cap. var. 1+3	Cap. var. 2+1	Cap. var. 2+2	Cap. var. 2+3	Cap. var. 3+1	Cap. var. 3+2	Cap. var. 3+3
04	3×400V+N 16AT	3×400V+N 20AT	–	3×400V+N 16AT	3×400V+N 20AT	–	–	–	–
06	3×400V+N 25AT	3×400V+N 20AT	–	3×400V+N 25AT	3×400V+N 20AT	–	–	–	–
10	3×400V+N 25AT	3×400V+N 32AT	–	3×400V+N 25AT	3×400V+N 32AT	–	–	–	–
16	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 40AT	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 40AT	3×400V+N 32AT	3×400V+N 32AT	3×400V+N 40AT

Components excluding control system

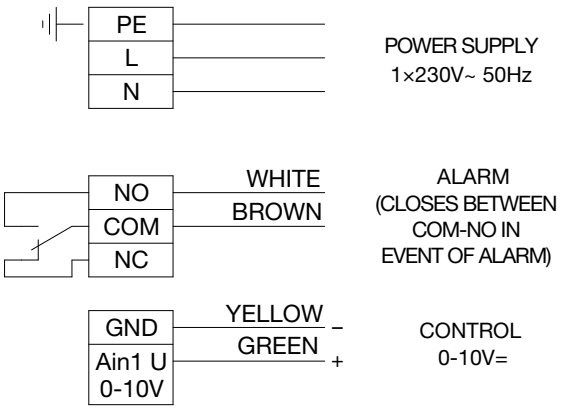
The following wiring diagrams are applicable to the units supplied without control equipment.

Fan size 04



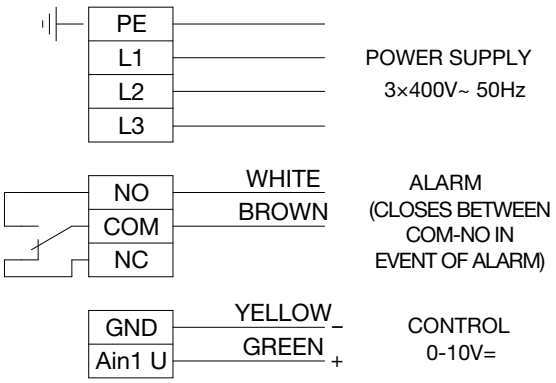
Rec. fuse protection
10AT

Fan sizes 06 and 10



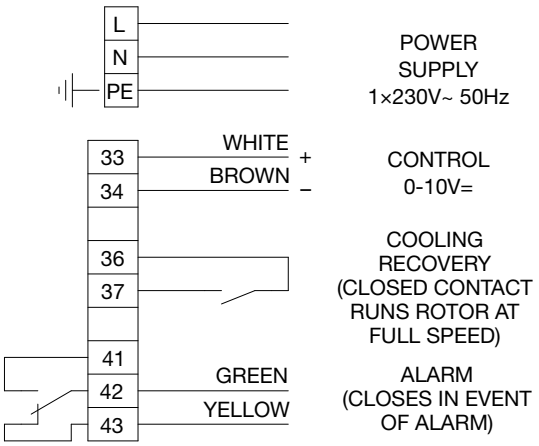
Size	Rec. fuse protection
06	10AT
10	10AT

Fan size 16



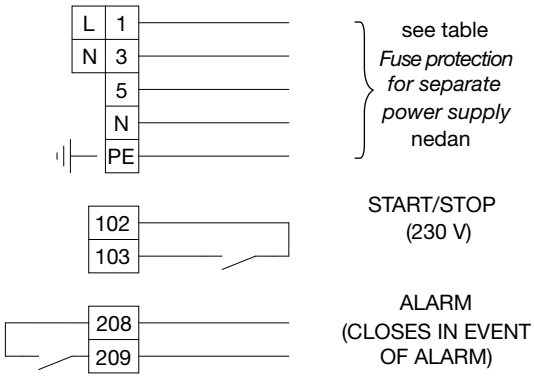
Rec. fuse protection
10AT

Heat recovery rotor



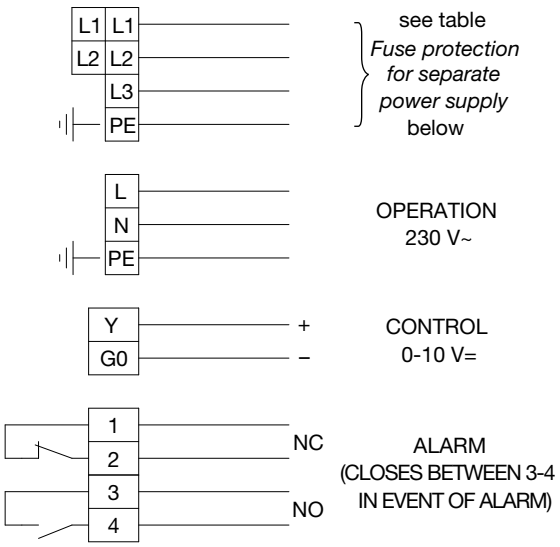
Rec. fuse protection
10AT

StarCooler cooling unit

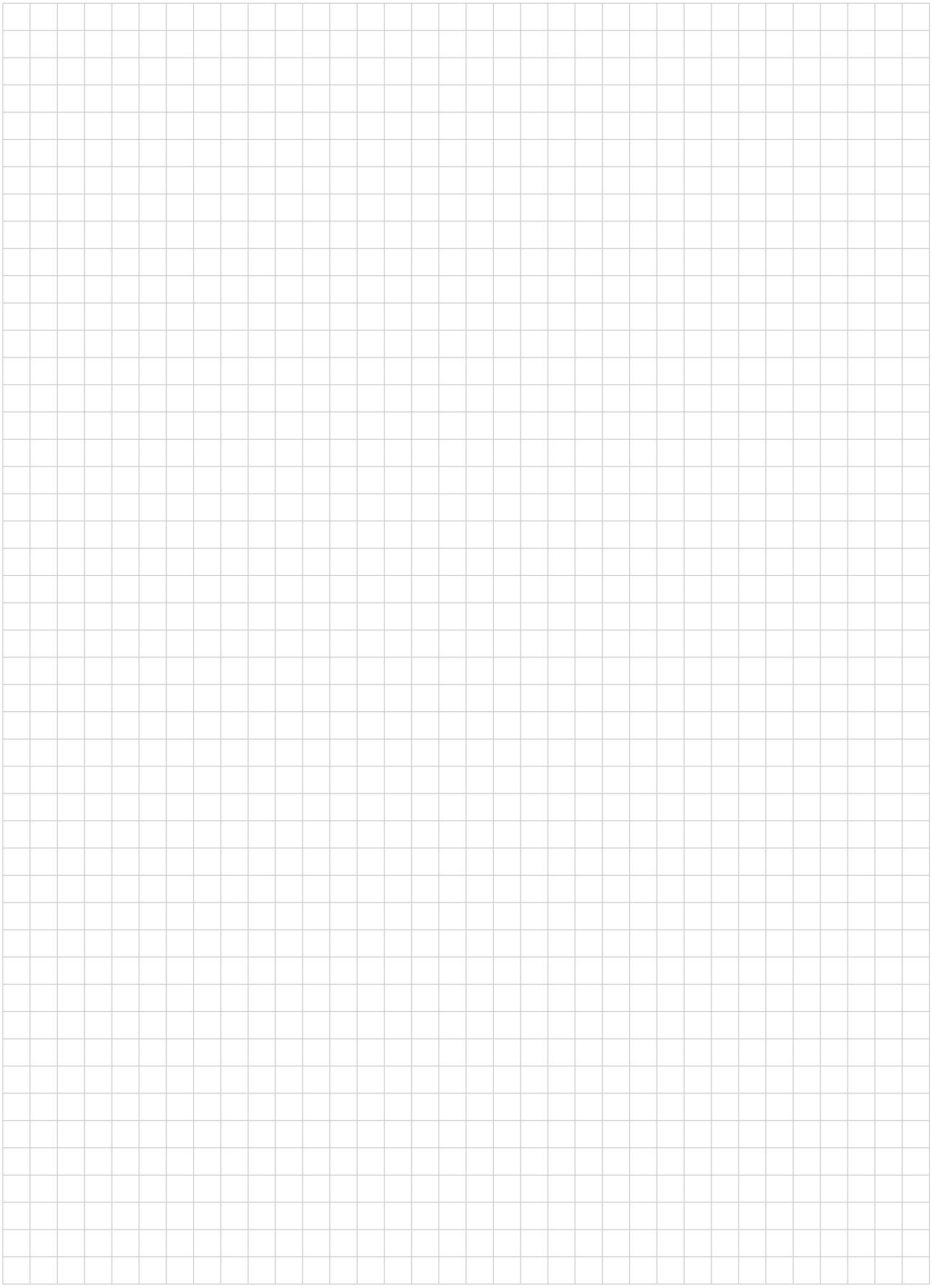


Size	Capacity variant / Rec. fuse protection		
	1	2	3
04	230V+N 10AT	230V+N 10AT	–
06	3×400V+N 10AT	3×400V+N 10AT	–
10	3×400V+N 10AT	3×400V+N 16AT	–
16	3×400V+N 16AT	3×400V+N 20AT	3×400V+N 20AT

Electric air heater (code: ATEE)



Size	Output variant /Rec. fuse protection		
	1	2	3
04	2×400V 16A	2×400V 16A	–
06	2×400V 16A	3×400V 16A	–
10	3×400V 16A	3×400V 25A	–
16	3×400V 16A	3×400V 25A	3×400V 32A



Envistar Compact

The purpose of this product catalogue is to provide information about the products in the Envistar Series and should be regarded as a complement to the IV Produkt Designer product selection software. Always do your sizing work in IV Produkt Designer before placing an order.

Air Handling Unit Description

The Envistar Compact is a one-piece unit produced in 4 different sizes (04, 06, 10 and 16) for airflows ranging from 0.1 to 1.6 m³/s.

All sizes of the unit are available with 8 different connection alternatives to facilitate installation and positioning.

The fans are direct-driven, open-discharge centri-fugal fans with backward-curved blades. The fan motors have built-in speed control and are programmed to meet the applicable operating conditions.

Tappings for airflow measurement are standard. The fan/motor units can be dismantled from the unit casing to make servicing easier.

The Envistar Compact is equipped with a rotary regenerative heat exchanger that recovers heat, cooling energy as well as moisture.

The unit can be supplied in a left-hand or a right-hand version.

The Envistar Top is available in 2 versions: with rotor and with rotor and integrated StarCooler cooling unit.

Filters can be selected in two classes. They are of compact design and are completely disposable by burning.

The air handling unit has as standard built-in control equipment with extensive functionality and communication possibilities.

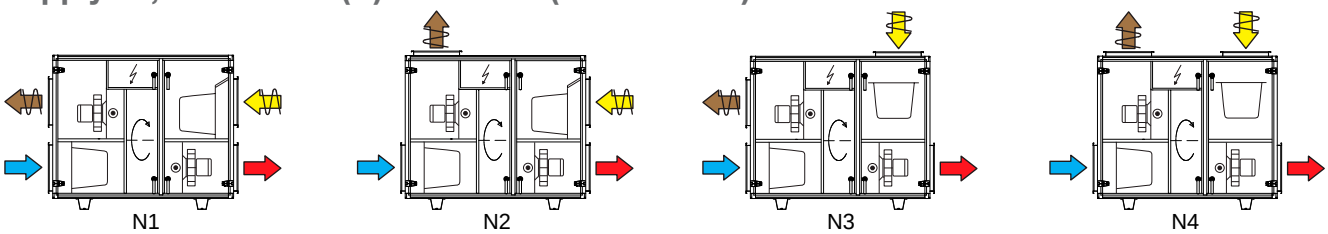
The control equipment is positioned in an enclosed space. For alternative delivery configurations, see page 90. For more information, use the Controls register tab.

Supplementary functions such as dampers, air coolers and sound absorbers are available for installation in the ducting.

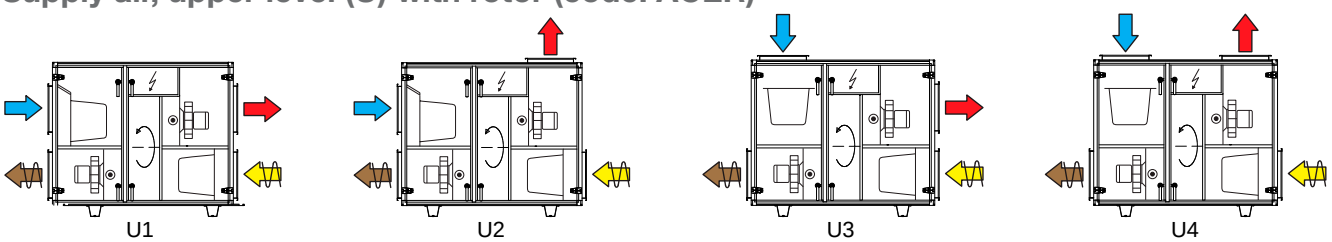
Configurations

The air handling unit is available in 8 different connection options and 4 options for cooling as shown below. All the unit combinations are illustrated with right-hand inspection doors viewed in the direction of supply airflow.

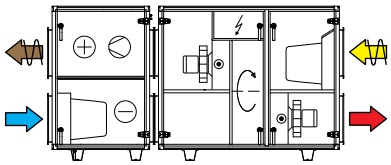
Supply air, lower level (N) with rotor (code: ACER)



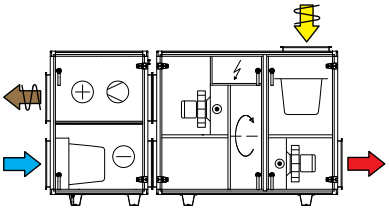
Supply air, upper level (U) with rotor (code: ACER)



Supply air, lower level (N) with rotor (code: ACER) and StarCooler cooling unit (code: ACEC)

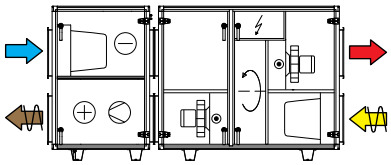


N1-H

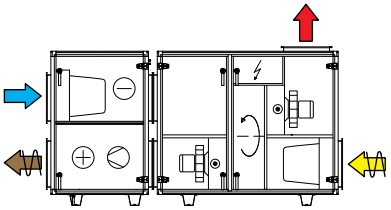


N3-H

Supply air, upper level (U) with rotor (code: ACER) and StarCooler cooling unit (code: ACEC)



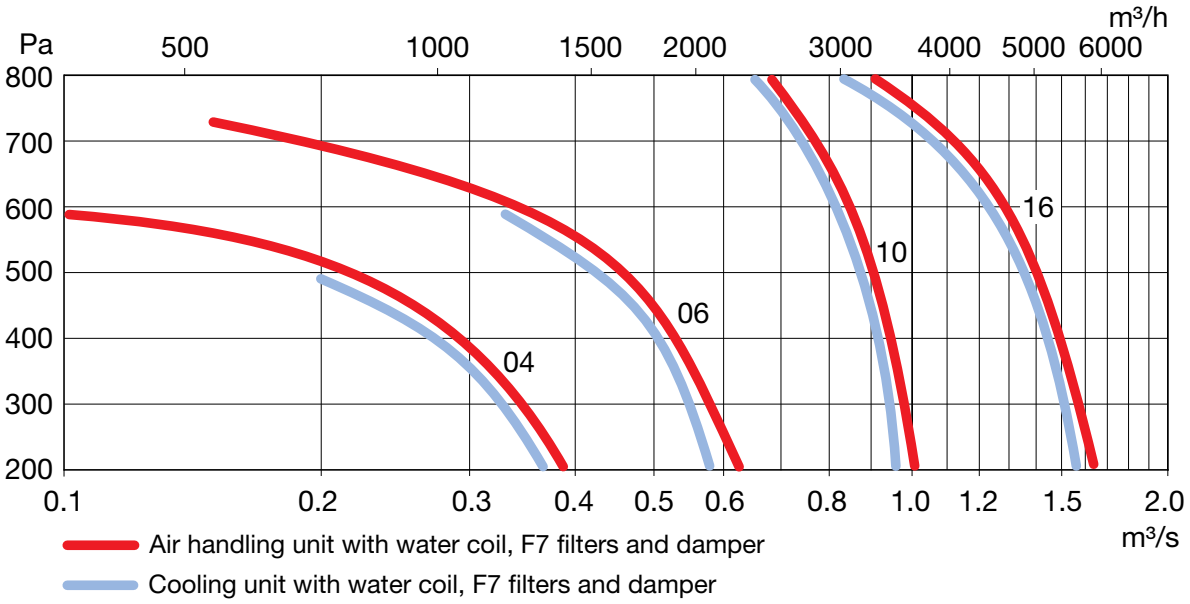
U1-H



U2-H

Outdoor air Supply air Extract air Exhaust air

Available External Pressure



Capacity and Technical Data

Sizes 04 and 06

Size	04	StarCooler 04		06	StarCooler 06	
		Cap. var. 1	Cap. var. 2		Cap. var. 1	Cap. var. 2
Flow range (m³/s) *	0.1–0.38	0.2–0.35	0.25–0.35	0.15–0.62	0.33–0.60	0.43–0.60
Length (mm)	1395	850	850	1515	850	850
Width (mm) **	708	708	708	850	850	850
Height incl. base beams (mm)	1181	1181	1181	1243	1243	1243
Wgt., standard insulation (kg)	200	145	145	245	190	190
Wgt. insul. fire resist. EI 30 (kg)	235	165	165	285	215	215
Duct connections (mm)	Ø 315	Ø 315	Ø 315	500×300	500×300	500×300
Max cap. water heating (kW) ***	16	–	–	14.9	–	–
Electric heater output, var. 1 (kW)	4	–	–	6	–	–
Electric heater output, var. 2 (kW)	6	–	–	10	–	–
Cooling capacity (kW) ****	–	4.6	5.8	–	6.7	8.3
Refrigerant: R134a (kg)	–	1.5	1.5	–	2.5	2.5

Sizes 10 and 16

Size	10	StarCooler 10		16	StarCooler 16		
		Cap. var. 1	Cap. var. 2		Cap. var. 1	Cap. var. 2	Cap. var. 3
Flow range (m³/s) *	0.2–1.00	0.55–0.96	0.70–0.96	0.30–1.6	0.74–1.56	0.90–1.56	1.08–1.56
Length (mm)	1576	850	850	1820	850	850	850
Width (mm) **	980	980	980	1255	1255	1255	1255
Height incl. base beams (mm)	1343	1343	1343	1619	1619	1619	1619
Wgt., standard insulation (kg)	310	245	245	486	310	310	310
Wgt. insul. fire resist. EI 30 (kg)	360	280	280	556	350	350	350
Duct connections (mm)	700×400	700×400	700×400	1000×500	1000×500	1000×500	1000×500
Max cap. water heating (kW) ***	29.4	–	–	50.8	–	–	
Electric heater output, var. 1 (kW)	6	–	–	9	–	–	
Electric heater output, var. 2 (kW)	10	–	–	15.5	–	–	
Electric heater output, var. 3 (kW)	15,5	–	–	25	–	–	
Cooling capacity (kW) ****	–	11.9	14.2	–	16.4	18.2	22
Refrigerant: R134a (kg)	–	3	3	–	6	6	6

* The flow range applies to air handling units with water coil, F7 filters, dampers and a duct pressure of 200Pa.

** The dimensions specified do not include the door handles (65 mm) and hinges (15 mm).

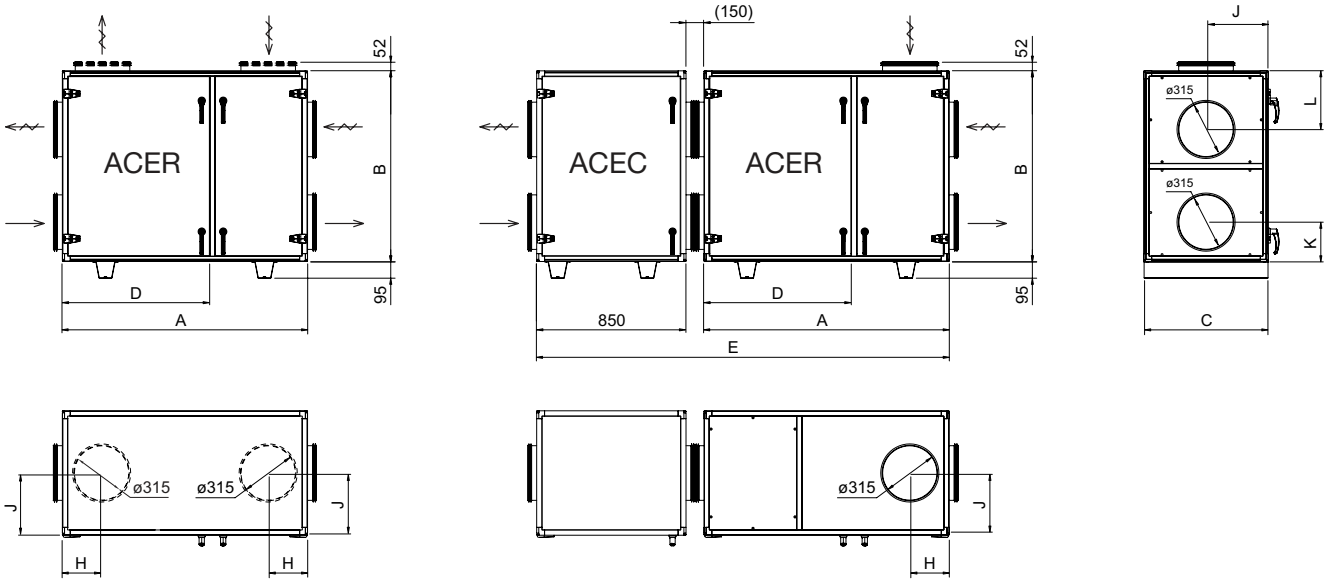
*** Applicable to $t_{supply\ air}$ = +20 °C, water temp. 55-35 °C.

**** Applies to an outdoor air temperature of +26 °C, 50% RH And an extract air temperature of +22 °C.

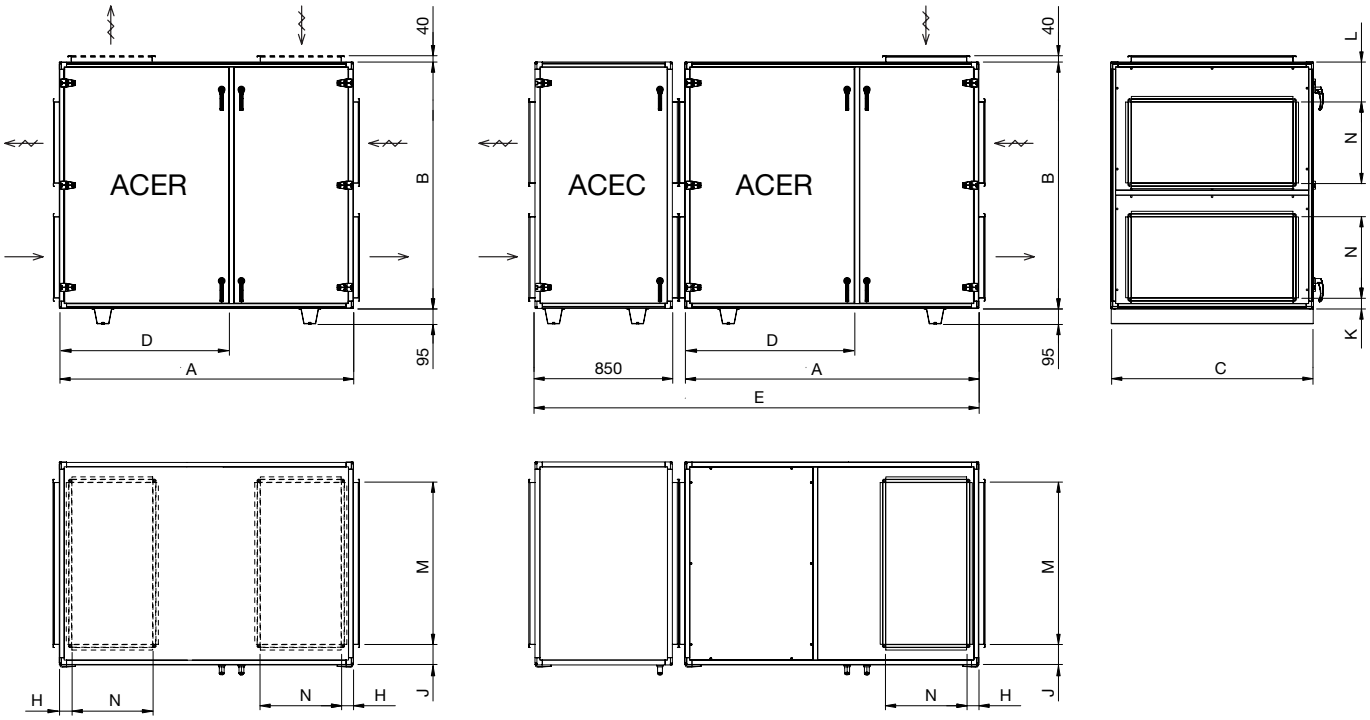
Dimensions and Weights

The widths specified do not include the handles (65 mm) and the hinges (15 mm).

ACER-ACEC 04



ACER-ACEC 06–16



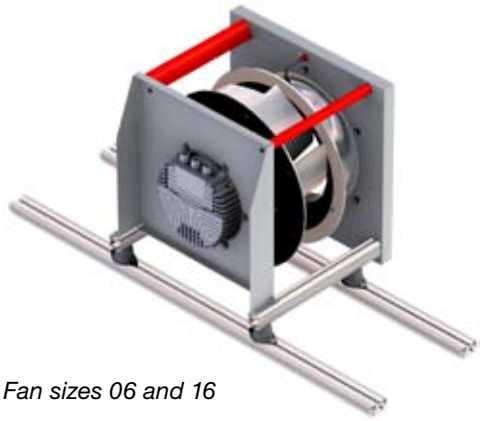
Size	Dimensions (mm)											00 standard insulation ACER / ACEC	E3 insulation, fire resist. EI 30 ACER / ACEC
	A	B	C	D	E	H	J	K	L	M	N		
04	1395	1085	708	809	1708	224	354	224	334	-	-	200 / 145	235 / 165
06	1515	1147	850	869	2445	100	175	80	260	500	300	245 / 190	285 / 215
10	1576	1248	980	900	2506	76	140	66	208	700	400	310 / 245	360 / 280
16	1820	1523	1255	1022	2750	76	128	66	248	1000	500	486 / 310	556 / 350

Air Handling Unit Components

Fans

The Envistar Compact units have direct-driven, vibration-isolated plenum fans with type B-impeller (backward-curved blades). EC motors with built-in electronic speed control system. The airflow rate is variably controlled in response to a 0-10 V signal from a main contral system.

Fan sizes 04 and 06



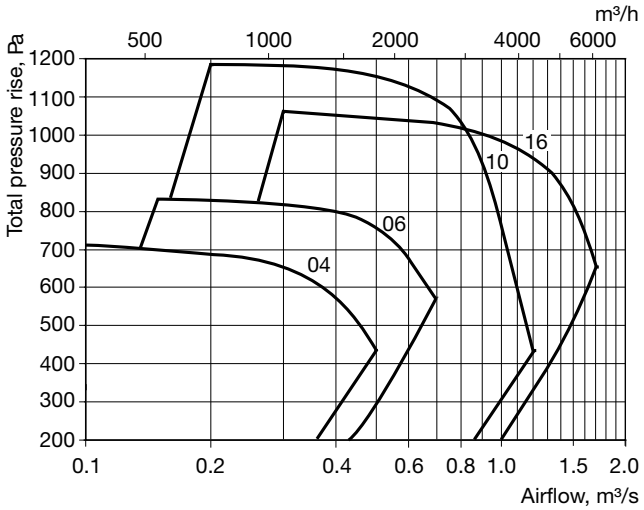
Fan sizes 06 and 16

Electrical Data

Size	Motor output (kW)	Voltage (V)	Rated current (A)	Rec. fuse (AT)
04	0.42	230	2.5	10
06	0.75	230	3.5	10
10	1.5	230	7.0	10
16	1.95	3×400	3.0	10

See also the section: Wiring Diagrams and Fuses.

Fan Performance



Accessory

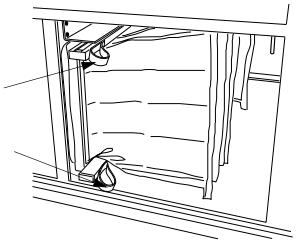
- Flow meter, manometer type (code: ATET-04).

See also the section: Accessories.

Filter (code ACEF)

Tightly pleated class F5 or F7 bag filters.

- The filters are mounted on rails and can be easily withdrawn and replaced. The filters are completely disposable by burning.



- To minimize the risk of leakage, the pressure drop across the filter is utilised to achieve effective tightness.
- Equipped with tappings for differential pressure measurement.

Size	Qty. of filters	Dimensions (mm)		Filter-class	Filter area total (m²)
		Frame	Length		
04	1	650×287	320	F5 F7	1.7 2.2
06	1	790×287	370	F5 F7	2.5 3.1
10	1	892×409	370	F5 F7	4.0 4.9
16	2	592×592	370	F5 F7	2 × 3.3 2 × 4.6

Accessories *See also the section: Accessories.*

- Stainless bottom plate, outd. air intake (code ACET-06)
- Filter guard, U-tube manometer (code MIET-FB 01)
- Filter guard, Kytölä manometer (code MIET-FB 02)
- Filter guard, Magnehelic manometer (code MIET-FB 03)

Heat Recovery Rotor

The heat recovery rotor is a rotary heat exchanger that transfers heat according to the air-to-air principle.

Design

The rotor in the heat exchanger is composed of alternately wound flat and corrugated bands of aluminium foil, forming smooth passages through which the air can flow in laminar manner. This provides low pressure drop and little risk of dust or other impurities collecting inside the air passages.

The rotor is journalled in permanently lubricated, self-aligning ball bearings.

An effective bristled seal is fitted along the periphery of the rotor and between the supply air and extract airflow paths to prevent carry-over.

The rotor is available in four different versions

- NO, normal rotor
- HY, hygroscopic rotor for increased cooling energy and humidity recovery
- NP, normal Plus rotor for higher efficiency
- HP, hygroscopic rotor in the Plus version

An adjustable purging sector enables a continuous purging air flow to blow the rotor clean of impurities.

The rotor is driven by a worm-gear motor with electronic speed control.

Speed Control

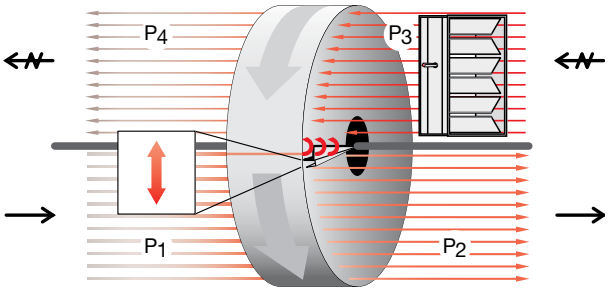
Power transmitted is controlled by means of built-in control equipment. The control unit has ready-to-use functions for purging, speed detector and alarms.

Motor Data

Size	Motor output	Voltage	Rated current	Rec. fuse
04–16	40 W	230 V	0.7 A	10 AT

See also the section: Wiring Diagrams and Fuses.

Purging Operation and Leakage Flow



As its rotor rotates, a certain portion of the extract air is always carried over in the rotary heat exchanger to the supply air and vice versa.

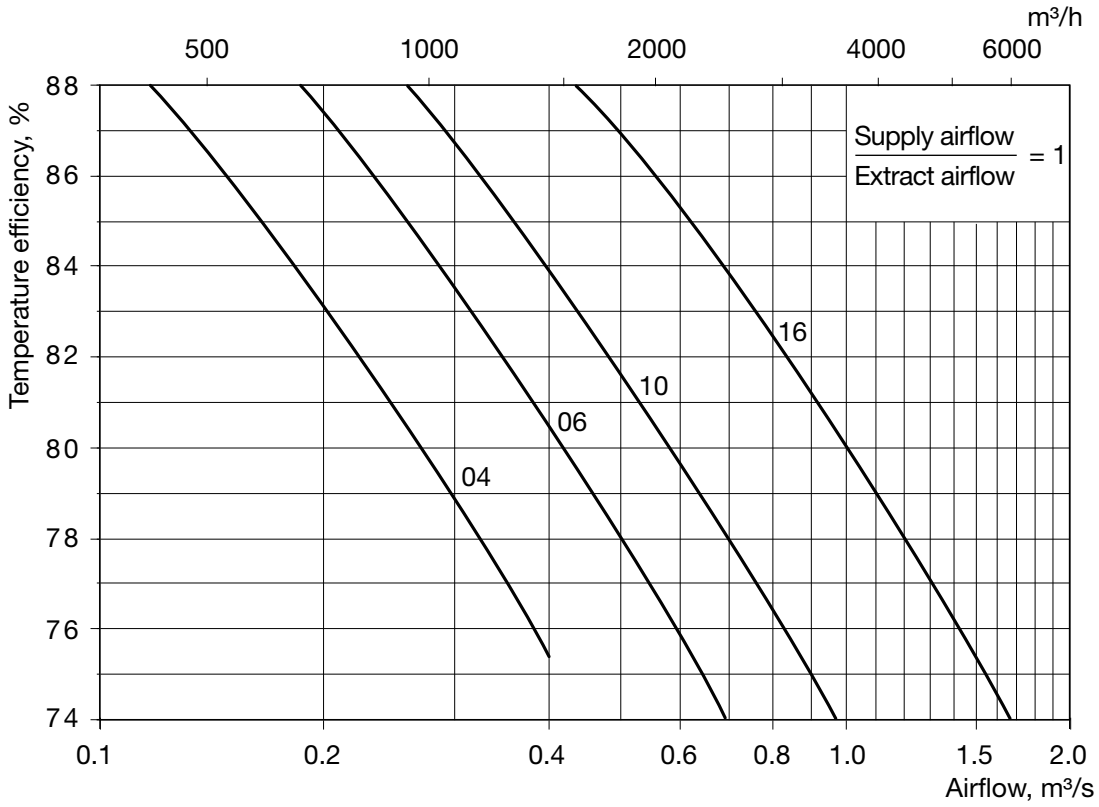
When the purging sector is in use, the rotor is purged with air to clean it and this eliminates transfer of extract air to the supply air.

If the need arises, the trimming damper can be used for achieving the necessary pressure ratio: P2 is greater than P3.

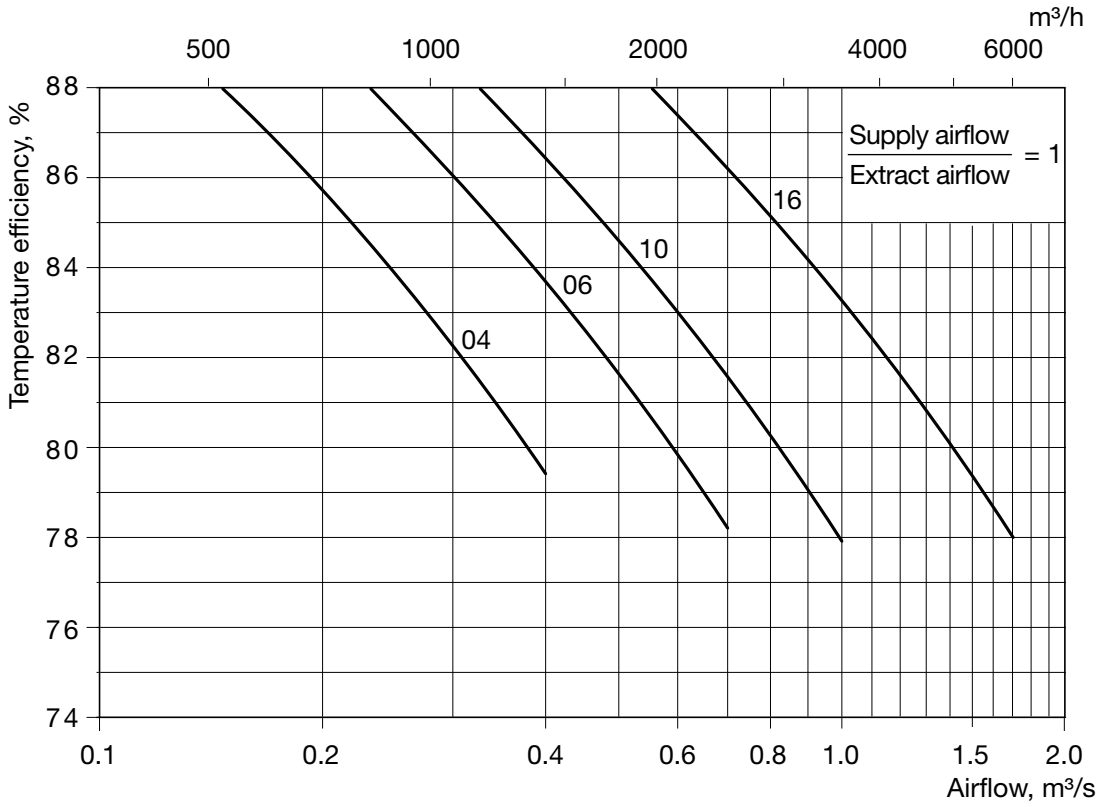
The purging airflow can be adjusted by altering the setting of the adjustable purging sector.

The IV Produkt Designer computer program calculates the leakage air flow and determines whether a trimming damper is needed.

Temperature efficiency, Type NO Rotor (Normal)



Temperature efficiency, Type NP Rotor (Normal Plus)



StarCooler Cooling Unit (code ACEC)

The ECEC StarCooler is a complete cooling unit desiged for cooling the supply air. The cooling unit is incorporated as an individual module into the Envistar Compact air handling unit. The cooling unit contains a cooling circuit, with evaporator and condensor and electric equipment for power and safety – all ready-to-use, wired and factory tested.

The design of the evaporator coil enables condensate runoff to a drip tray without the need for any droplet eliminator. The coil has reinforced fins for increased protection against corrosion.

- 4 unit sizes for airflows ranging from 0.2 to 1.34 m³/s, with cooling capacity from 4.7 to 17 kW.
- 2 capacity tvariants in each size.
- The capacity is regulated by means of a capacity controller.
- Environmentally compatible refrigerant: R134a.
- Labelled with the CE label of approval, tested and documented for ready-to-use cooling installation.
- Designed for easy service, simple to plan into the project and install.
- Can be planned and optimized using the IV Produkt Designer product selection program.

Accessory for the ACEC

- Stainless base plate outdoor air intake (code ACECT-01)

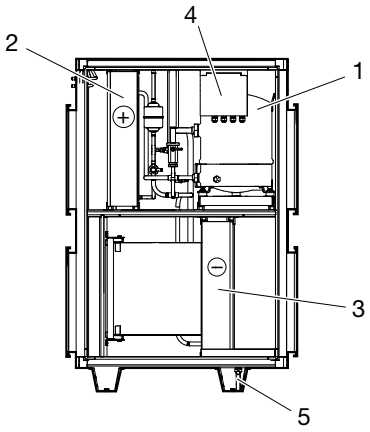
Design

The ACEC StarCooler is designed to operate as a direct expansion system, contains a minimum volume of refrigerant. The compressor circuit chills the supply air as it flows through the evaporator coil. There, the absorbed heat is transferred to a condenser situated in the exhaust air path.

The cooling unit is compact and its casing conforms to Corrosion Resistance Class C4, of a design similar to the other components in the air handling unit series. A lockable cover in the front of the unit is provided enabling access for adjustments and servicing.

The evaporator and the condenser coils have copper tubes and aluminium fins. Stainless steel drip tray with condensate drain connection and integrated water trap made of copper.

The Refrigerant Circuit



1. *Compressor*
2. *Condenser*
3. *Evaporator*
4. *Electrical equipment*
5. *Condensate drain conn., cu Ø 15 mm, with integrated water trap*

The refrigerant circuit contains:

- Fully hermetic scroll-type compressor with sight glass and temperature and current-sensitive phase switch.
- Evaporator coil with drip tray, condenser coil, drying filter, choke for expansion, capacity controller, low and high pressure switches.
- Refrigerant tubing made of copper jointed together by brazing.
- Service connection and refrigerant.

Project Design

The unit can be engineered to handle optional supply and extract airflows within the specified min. and max. permissible flow range. Accurate sizing can be carried out by means of our IV Produkt Designer product selection computer program.

Electrical Equipment

The electrical equipment includes a protective motor switch, contactor and starter for the compressor.

The cooling capacity is controlled by means of external potential-free contacts (230 V). The cooling unit is permitted to start when both fans are running. If a pressure switch or protective motor switch should trip, the compressor will be switched out and a group alarm will be initiated across potential-free contacts.

See also the section: Wiring Diagrams and Fuses.

Commissioning

Cooling units charged with more than 3 kg refrigerant per circuit require commissioning by a certified refrigeration service technician.

Prior to commissioning, the fitter must see to the following:

1. Connect the power and control signal cables for cooling operation.
2. Connect the condensate drain pipework to a drain gulley.
3. Adjust the design airflows on the supply air and extract air sides respectively.

Technical Data for the ACEC

			Size	04		06		10		16		
			Capacity variant	1	2	1	2	1	2	1	2	3
Airflow rate	**min.**	(m^3/s)		0.2	0.25	0.33	0.43	0.55	0.7	0.74	0.9	1.08
	max.	(m^3/s)		0.35	0.35	0.60	0.60	0.96	0.96	1.56	1.56	1.56
Max. permissible cooling capacity *		(kW)		4.6	5.8	6.7	8.3	11.9	14.2	16.4	18.2	22
Power demand, compressor		(kW)		1.15	1.51	1.72	2.17	3.05	3.46	4.00	4.53	5.00
Coefficient of performance		(C.O.P.)		4.0	3.8	3.9	3.8	3.9	4.1	4.1	4.0	4.4
Max. op. current, 1×230V+N 50Hz		(A)		5,3	6,2	-	-	-	-	-	-	-
Max. op. current, 3×400V+N 50Hz		(A)		-	-	3.9	4.7	6.1	7.9	9.3	11.6	13.3
Rec. fuse, 3×400V+N 50Hz		(A)		10	10	10	10	10	16	16	16	20
Refrigerant: R134a		(kg)		1.5	1.5	2.5	2.5	3	3	6	6	6

* Applies to an outdoor air temperature of +26 °C, 50% RH and to an extract air temperature of +22 °C.

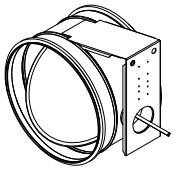
Components for Duct Mounting

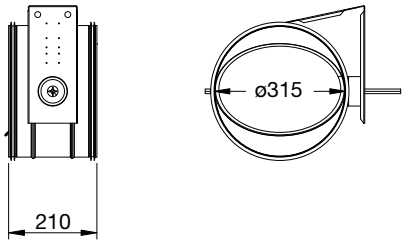
Damper excl. Motor (code: ECET-UM)

The ECET-UM is a duct damper intended for use as a shut-off or control damper. The damper can be connected directly to the unit or in the ducting.

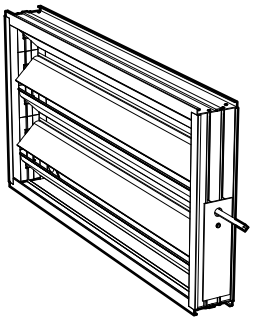
- Permissible temperature: -40 to +80 °C
- Permissible differential pressure: max. 1400 Pa
- Tightness class 3 to SS-EN1751 (VVS AMA-98).

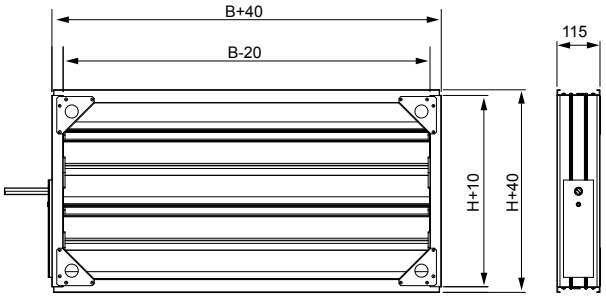
Size 04





Sizes 06, 10 and 16





- Size 04 dampers have circular connections fitted with rubber ring gaskets.
- Sizes 04C* 06, 10 and 16 are designed with rectangular PG connections. The damper blades are driven by ABS-plastic gears and are fitted with tubular gaskets made of fixed silicone rubber to ensure tightness. The dampers are made of aluminium profiles and conform to Corrosion Resist. Class C4.

Dimensions, Weights and Torque

Size	Ø d1 (mm)	B (mm)	H (mm)	Wgt. (kg)	Torque reqd. (Nm)
04	315	–	–	5	2
06	–	500	300	5	3
10	–	700	400	6	4
16	–	1000	500	10	5

Damper with Lever Actuator (code: ECET-TR)

The ECET-TR is a trimming damper that can be installed in the extract air duct, if needed, to ensure correct pressure balance for rotor purging operation. Connected directly to the unit or the ducting.

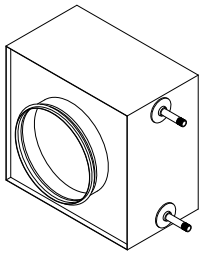
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 are made with rectangular PG connections and have damper blades driven by ABS-plastic gears and are fitted with tubular gaskets made of fixed silicone rubber to ensure tightness. The dampers are made of aluminium profiles; conform to Corrosion Resist. Class C4. and are fitted with tubular gaskets made of fixed silicone rubber to ensure tightness. The dampers are made of aluminium profiled sections and conform to Corrosion Resistance Class C4.
- Permissible temperature: -40 to +80 °C
  Permissible differential pressure: max. 1400 Pa
- Tightness class 3 for rectangular dampers, tightness class 0 for circular dampers to SS-EN1751 (VVS AMA-98)
- Lever actuator

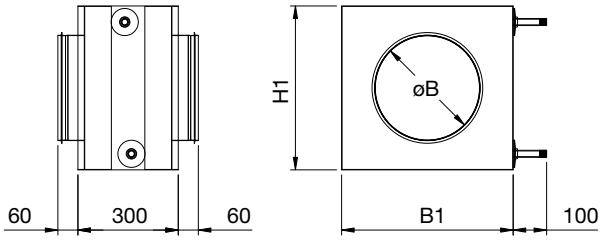
Dimensions and Weights

Size	Dimensions (mm)			Wgt. (kg)
	Ø d1	B	H	
04	315	–	–	5
06	–	500	300	5
10	–	700	400	6
16	–	1000	500	10

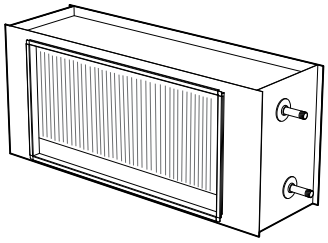
Air Heater, Water (code: ECET-VV)

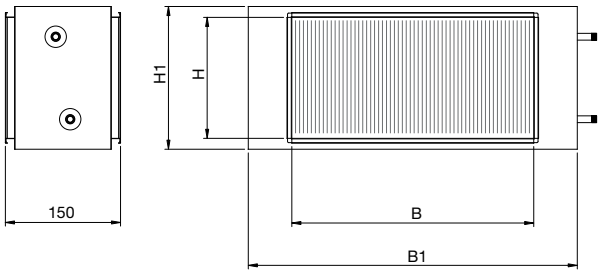
Size 04





Sizes 06–16





The ECET-VV is a built-in finned heat exchanger for heating water. It can be connected directly to the air handling unit or to ducts.

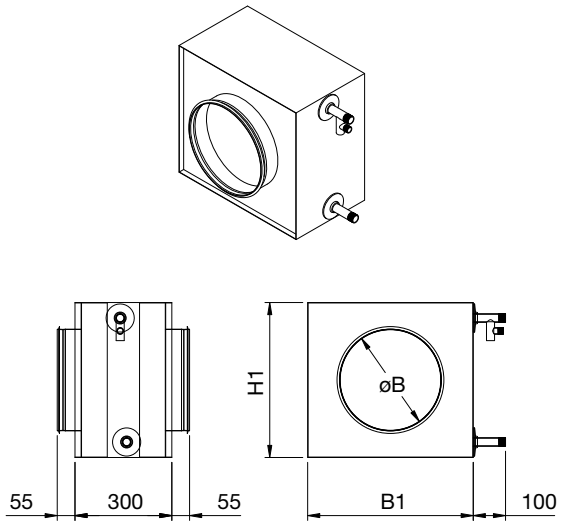
- The casing is made of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections with male threads.
- Max. permissible operating pressure: 15 bar.
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

Dimensions, Connections and Weights

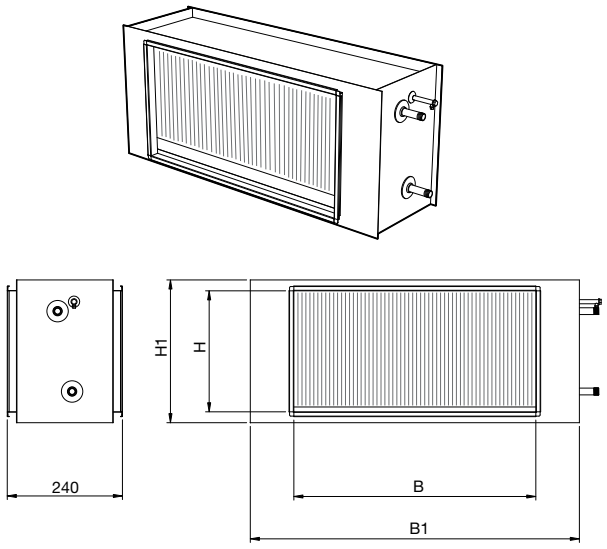
Size	Dimensions (mm)				Cap. var. / pipe conn.		Wgt. (kg)
	B	B1	H	H1	1	2	
04	Ø 315	513	-	490	15	15	10
06	500	620	300	340	15	15	10
10	700	820	400	440	15	15	15
16	1000	1125	500	540	20	25	25

Air Cooler, Water, Thermoguard (code: ECET-TV)

Size 04



Sizes 06–16



The ECET-TV is a built-in finned heat exchanger for chilled water. It can be connected directly to the air handling unit or to ducts.

- The casing is made of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections with male threads.
- Max. permissible operating pressure: 6 bar.
- Type Thermoguard anti-freeze protection.
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

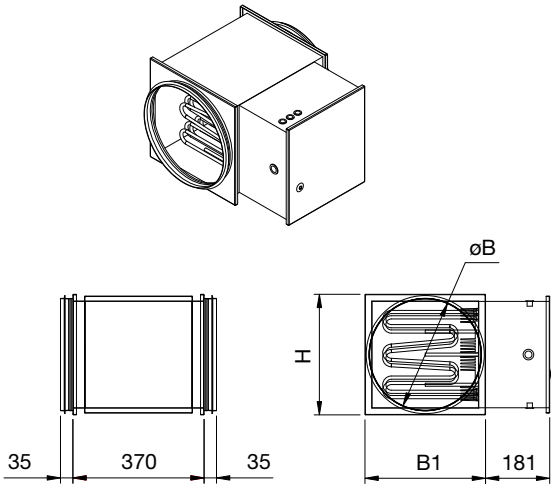
Dimensions and weight

Size	Dimensions (mm)				Cap. var. / pipe conn.		Wgt. (kg)
	B	B1	H	H1	1	2	
04	Ø 315	515	-	490	20	20	10
06	500	685	300	350	20	20	10
10	700	885	400	450	20	20	15
16	1000	1185	500	550	20	20	25

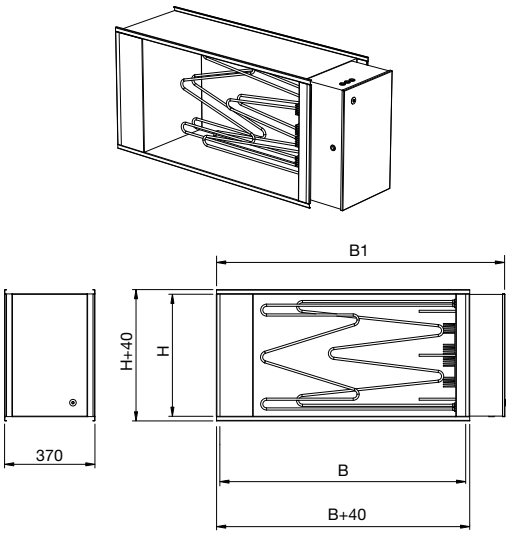
If installed in a cold space, always provide the air heater with the means for relieving the pressure to the return pipe of the heating system. If a 2-way valve is used for controlling the flow, unconditionally fit the valve on the inlet piping.

Electric Air Heater (code: ECET-EV)

Size 04



Sizes 06–16



The ECET-EV is an electric air heater in the high temperature version. It can be connected directly to the air handling unit or to the ducting.

- The casing is made of galvanized sheet steel.
- Contains compl. equipment for output control.
- Requires a separate power supply.
- Has stainless steel tubular heating elements.
- The heaters have double overheating protection devices that interrupt the power if there is risk of overheating. One of the overheating protection devices must be manually reset.
- Degree of protection IP 43 to SS-EN 60529.
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

Dimensions and Weights

Size	Dimensions (mm)			Wgt. (kg)
	B	B1	H	
04	Ø 315	340	340	10
06	500	680	300	10
10	700	880	400	15
16	1000	1185	500	25

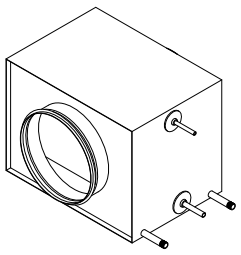
Electrical Data

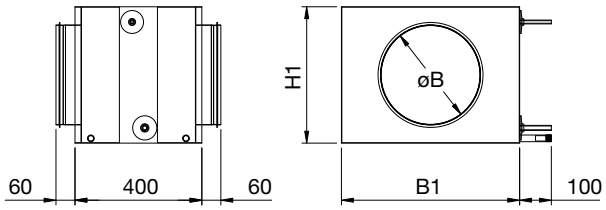
Size	Output variant / req. fuse		
	1	2	3
04	4 kW 2×400V 16A	6 kW 3×400V 10A	–
06	6 kW 3×400V 10A	10 kW 3×400V 16A	–
10	6 kW 3×400V 10A	10 kW 3×400V 16A	15.5 kW 3×400V 25A
16	9 kW 3×400V 16A	15,5 kW 3×400V 25A	25 kW 3×400V 40A

See also the section: Wiring Diagrams and Fuses.

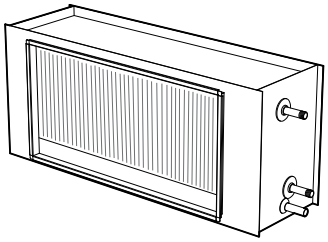
Air Cooler, Direct Expansion (code: ECET-DX)

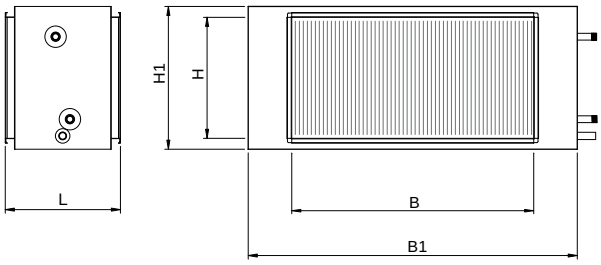
Size 04





Sizes 06–16





The ECET-DX air cooler is a built-in finned exchanger for cooling through direct expansion. Can be connected directly to the air handling unit or to the ducting.

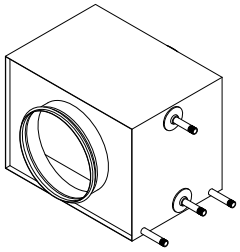
- The casing is made of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections for brazing.
- Max. permisible operating pressure: 23 bar.
- A corrosion-protected drip tray with a 25 mm dia. drain connection is in the bottom of the cooler.
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

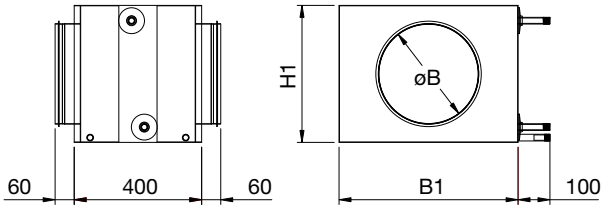
Dimensions and Weights

Size	Dimensions (mm)					Pipe conn. in : ut	Pipe conn.	Wgt. (kg)
	B	B1	H	H1	L			
04	Ø 315	562	-	430	400	12 : 16	12 : 16	30
06	500	780	300	390	580	12 : 16	12 : 16	35
10	700	980	400	490	580	12 : 16	12 : 16	45
16	1000	1154	500	561	240	22 : 28	16 : 22	60

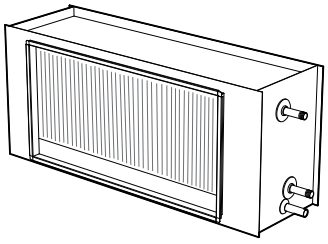
Air Cooler, Water (code: ECET-VK)

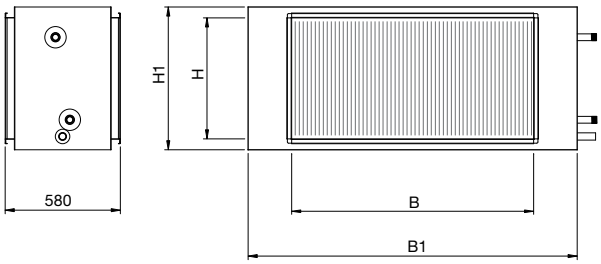
Size 04





Sizes 06–16





The ECET-VK air cooler is a built-in finned exchanger for cooling with water. Can be connected directly to the air handling unit or to the ducting.

- The casing is made of galvanised sheet steel.
- The coi body consists of copper tubes and aluminium fins.

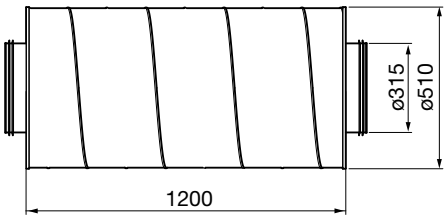
- The headers have pipes connections with male threads.
- Max. permissible operating pressure: 15 bar.
- A corrosion-protected drip tray with a 25 mm dia. drain connection is in the bottom of the cooler.
- Size 04 has circular connections fitted with rubber ring gaskets.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

Dimensions and Weights

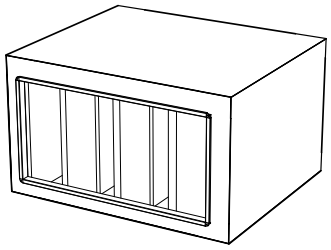
Size	Dimensions (mm)					Pipe conn.	Wgt (kg)
	B	B1	H	H1	L		
04	Ø 315	562	–	430	400	15	30
06	500	780	300	390	580	15	35
10	700	980	400	490	580	20	45
16	1000	1154	500	561	240	20	60

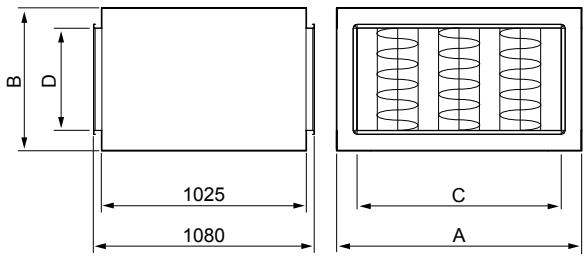
Sound Absorber (code: ECET-LD)

Size 04



Sizes 06–16





The ECET-LD is a duct sound absorber that can be connected directly to the unit or to the ducting.

- The size 04 sound absorber has circular connections fitted with rubber ring gaskets.

  The casing consists of a spiral ventilation duct and an inner jacket made of perforated galvanized sheet steel. The intermediate space is filled with mineral wool and is lined with fibre cloth. The sound absorber has a centre baffle.
- The size 06, 10 and 16 sound absorbers are composed of a casing made of galvanized sheet steel with 200 mm thick baffle elements. The baffle elements are fabricated of mineral wool and are lined with a layer of Cleantech on the air side.
- The baffles are 100 mm distant from one another.
- The baffles have pointed face edges to reduce the pressure drop.
- Sizes 06, 10 and 16 have rectangular connections for PG slip clamp jointing.

Dimensions and Weights

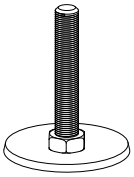
Size	Dimensions (mm)				Wgt. (kg)
	A	B	C	D	
04	Ø 315	–	–	–	25
06	600	400	500	300	35
10	900	500	700	400	50
16	1200	600	1000	500	95

Sound Attenuation (dB)

Frequency band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation 04	7	12	27	39	50	50	45	27
Attenuation 06–16	8	11	19	29	40	35	27	19

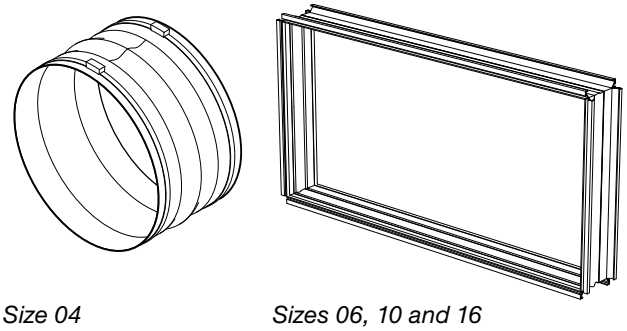
Accesories

Adjustable Foot (code: ECET-01)



Adjustable foot for mounting in base frame.

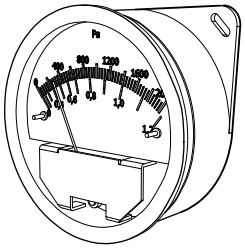
Flexible connection (code: ECET-02)



Size 04 *Sizes 06, 10 and 16*

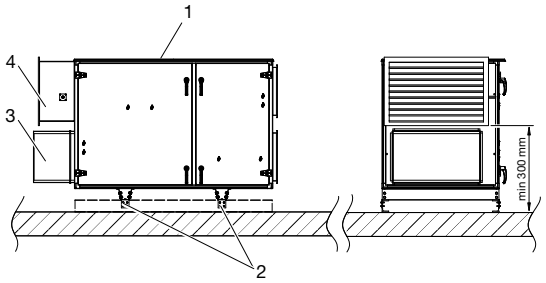
Made of flexible woven fabric for connection to ducting. Length: 110–150 mm.

Flow Meter, Manometer Ttype (code: ECET-04)



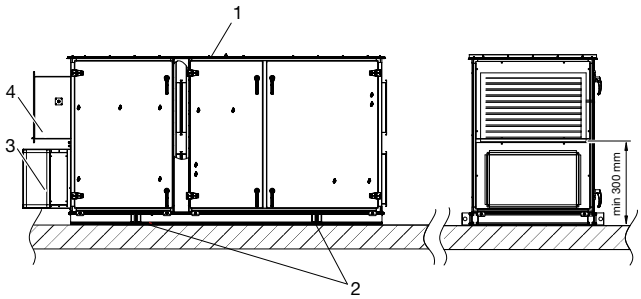
Outdoor Version (code: ACET-05)

Set of additional parts for installing the air handling unit outdoors. If installed on a roof, mount the unit on a frame on a water-tight roof.



Outdoor version for ACER

1. *Roof*
2. *Mounts*
3. *Exhaust air hood for minimizing risk of short-circuit airflow*
4. *Air intake grille made of sheet steel mounted in a sheet steel branch.*



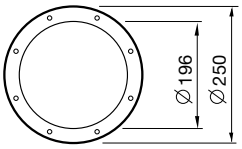
Outdoor version for ACER and the ACEC cooling unit

1. *Roof*
2. *Lifting lug*
3. *Exhaust air hood for minimizing risk of short-circuit airflow*
4. *Air intake grille made of sheet steel mounted in a sheet steel branch.*

Stainless Bottom Plate, Outdoor Air Intake (code: ACET-06)

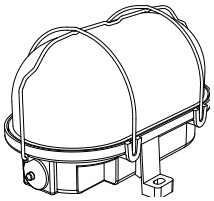
Inspection Door Handle (code: ACET-07)

Inspection Window (code: EMMT-06)



The inspection window consists of inner and outer Plexiglas panes. For casing 00 only (standard insulation).

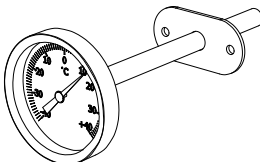
Interior Light Fitting (code: EMMT-07)



The light fitting conforms to Enclosure Class IP 44 and is equipped with aluminium reflector, grooved glass cover and steel wire protection.

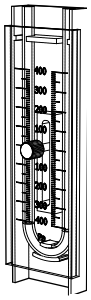
Height = 175, width = 120, depth = 115 mm.

Thermometer (code: EMMT-16)



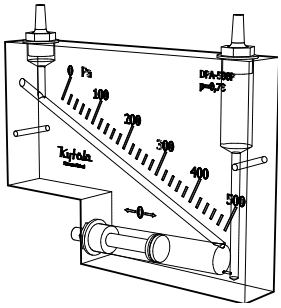
Dial thermometer, insertion type. -40 to +40 °C.

Filter Guard, U-tube manometer (code: MIET-FB 01)



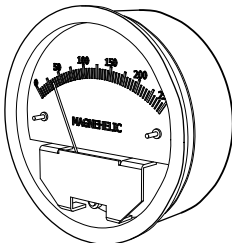
Range of measurement 0±400 Pa

Filter Guard, Kytölä manometer (code: MIET-FB 02)



Range of meas. 0–500 Pa.

Filter Guard, Magnehelic manometer (code: MIET-FB 03)



Range of meas. 0–250 Pa.

Wiring Diagrams and Fuses

Air Handling Unit including Controls

Safety isolating switch

The safety isolating switch must be fitted and wired to each power supply cable.

Electrical wiring diagrams

For a wiring diagrams for air handling units with control equipment, see the order-specific wiring diagram suppplied with the air handling units.

Fuse protection for air handling unit functions

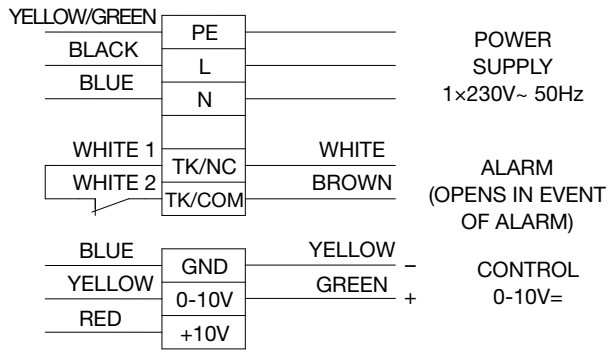
The air handling functions must have separate power supplies; the following fuses are recommended.

Size	Ventilation	Cooling unit			Electric air heater		
		Cap. var. 1	Cap. var. 2	Cap. var. 3	Cap. var. 1	Cap. var. 2	Cap. var. 3
04	230V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	–	2×400V 16A	3×400V 10A	–
06	3×400V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	–	3×400V 10A	3×400V 16A	–
10	3×400V+N 16AT	3×400V+N 10AT	3×400V+N 16AT	–	3×400V 10A	3×400V 16A	3×400V 25A
16	3×400V+N 10AT	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 20AT	3×400V 16A	3×400V 25A	3×400V 40A

Components excludung Controls

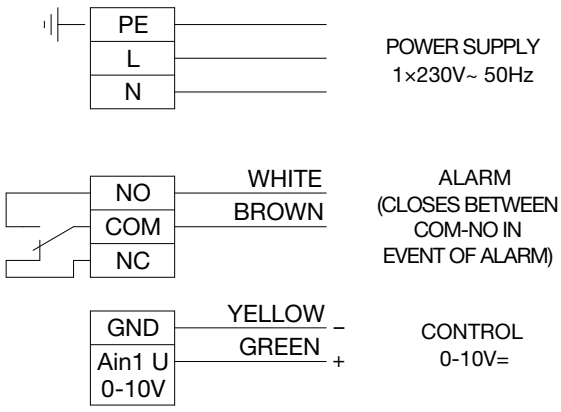
The following wiring instructions apply to air handling units supplied without control equipment.

Fan size 04



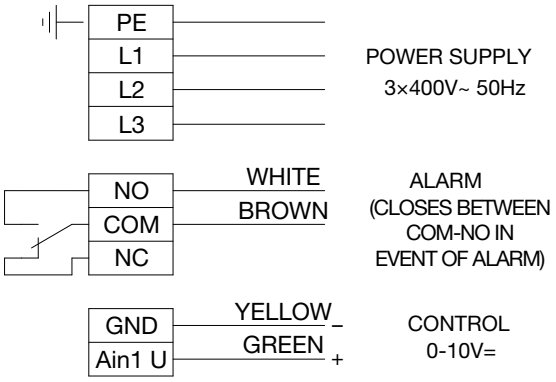
Rec. fuse
10AT

Fan sizes 06 and 10



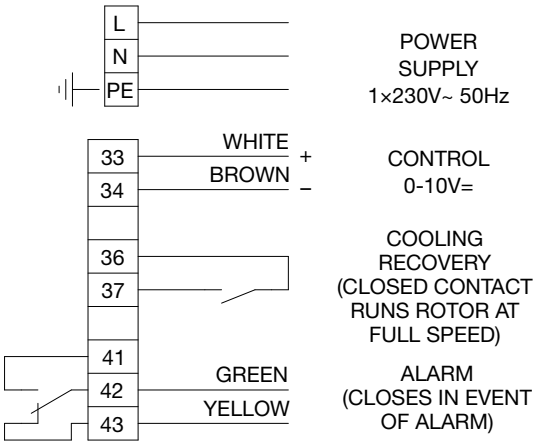
Size	Rec. fuse
06	10AT
10	10AT

Flan size 16



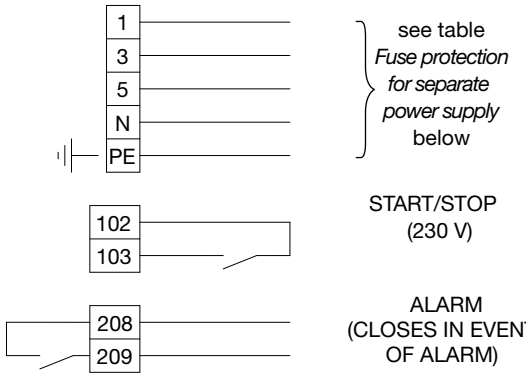
Rec. fuse
10AT

Heat Recovery Rotor



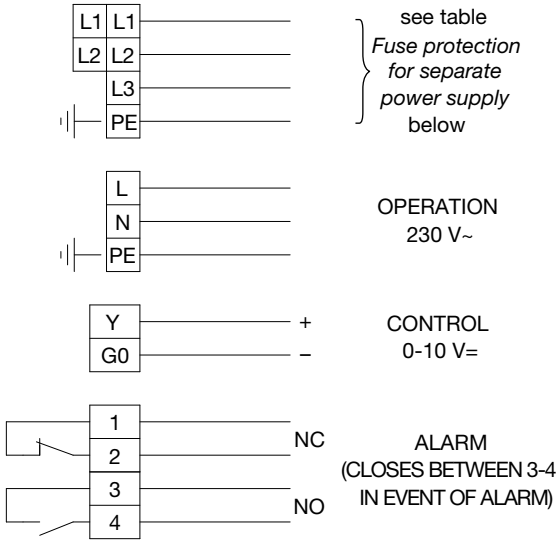
Rec. fuse
10AT

StarCooler Cooling Unit (code: ACEC)



Size	Capacity variant / Rec. fuse		
	1	2	3
04	3×400V+N 10AT	3×400V+N 10AT	–
06	3×400V+N 10AT	3×400V+N 10AT	–
10	3×400V+N 10AT	3×400V+N 16AT	–
16	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 20AT

Electric air Heater (code: ECET-EV)



Size	Capacity variant /Rec. fuse		
	1	2	3
04	2×400V 16A	3×400V 10A	–
06	3×400V 10A	3×400V 16A	–
10	3×400V 10A	3×400V 16A	3×400V 25A
16	3×400V 16A	3×400V 25A	3×400V 40A

Envistar Flex

! The purpose of this product catalogue is to provide information about the products in the Envistar Series and should be regarded as a complement to the IV Produkt Designer product selection software. Always do your sizing work in IV Produkt Designer before placing an order.

Air Handling Unit Description

The Envistar Flex is a flexible air handling unit consisting of 6 block sections that can be combined depending on the air treatment demands made on the ventilation system. Possible unit combinations are shown on pages that follow.

The Envistar Flex is available in 10 sizes for airflows ranging from 0.2 to 10.0 m³/s. Envistar Flex is also available in a version for outdoor installation.

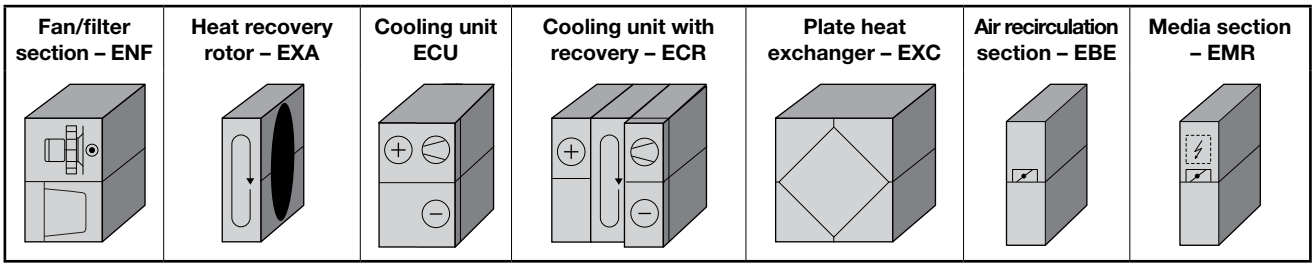
Supplementary functional sections such as air heaters and air coolers are available for mounting in ducts or in a casing in the same version as the block sections, i.e. functional fittings.

The standard unit has built-in controls with a comprehensive functionality and communication possibilities. The control equipment is housed in a separate cubicle.

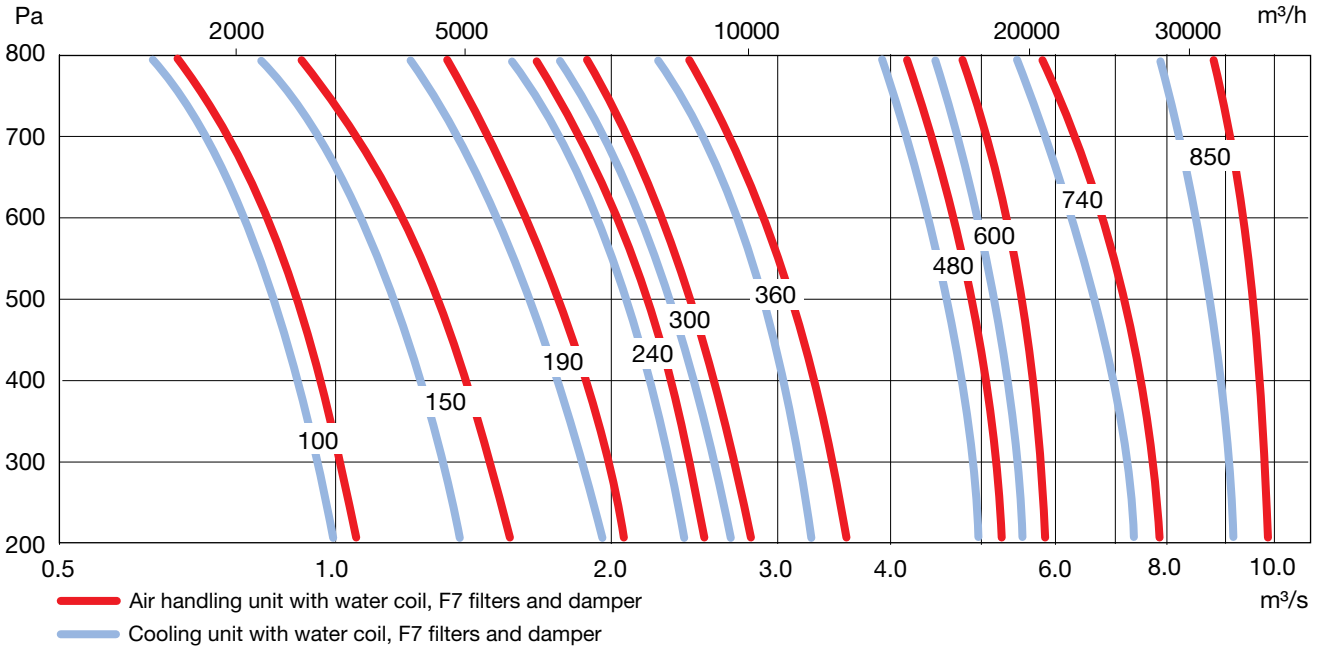
For the sizes up to and including 190, the cubicle is positioned above the supply air fan section. Sizes 240–600 have the cubicle is mounted on a pivotal arm on the end panel.

Sizes 740–850 and the outdoor version have a built-in cubicle in the filter section. For optional delivery configurations see page 90. For more information see the Controls Tab.

Block Sections of the Air Handling Unit



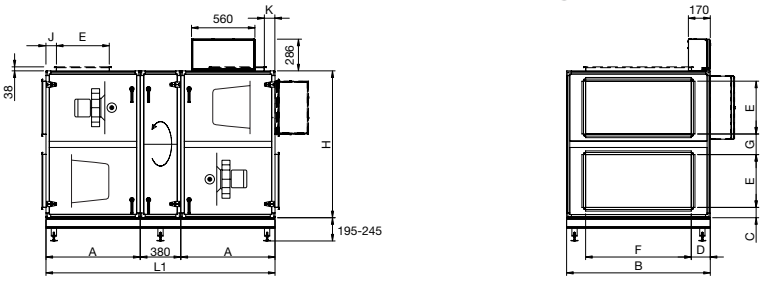
Capacity



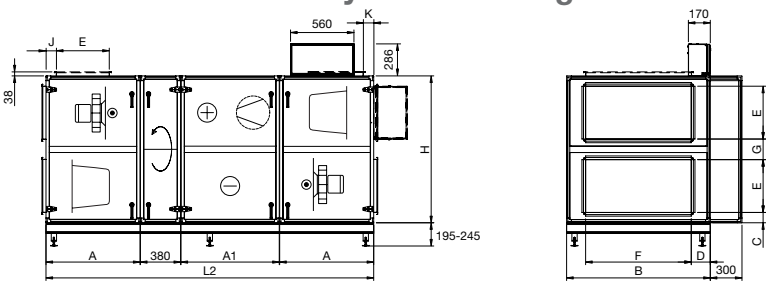
Air Handling Unit Combinations, Dimensions and Weights

All the combinations are illustrated with right-hand inspection side viewed in the direction of airflow. They are available in a one-piece version where all the block sections and functional fittings are mounted on a common base frame.

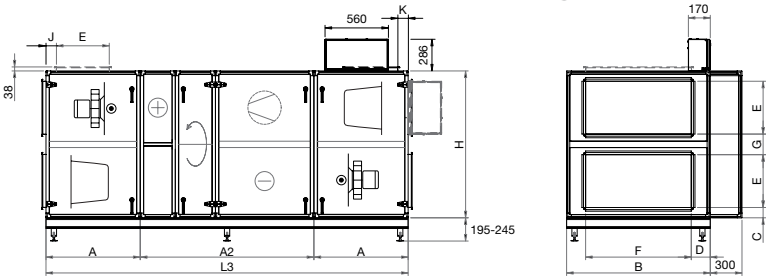
Combination 1 – Rotary heat exchanger



Combination 2 – Rotary heat exchanger and cooling unit



Combination 3 – Rotary heat exchanger and cooling unit with cooling recovery



Location of control equipment cubicle, see page 91.

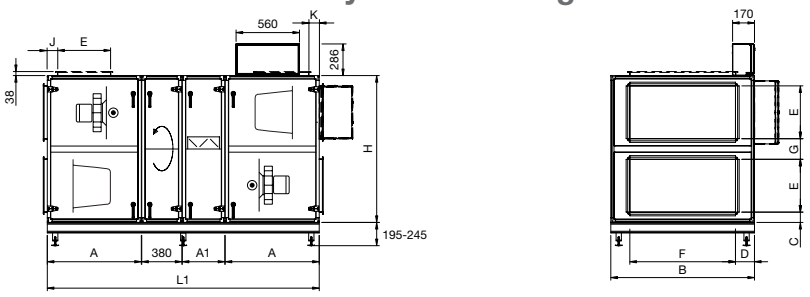
Dimensions (mm)

Size	A [b]	A1 [a]	A2 [a]	B	C	D	E	F	G	H	J	K	L1 [b]	L2 [a, b]	L3 [a, b]
100	630	780	1540	980	105	140	300	700	205	1010	103	103	1640	2420	2800
150	780	780	1540	1080	100	140	500	800	195	1390	98	98	1940	2720	3100
190	890	780	1540	1360	100	180	500	1000	195	1390	98	98	2160	2940	3320
240	890	780	1540	1360	100	180	600	1000	200	1605	102	102	2160	2940	3320
300	890	780	1540	1575	100	190	600	1200	200	1605	102	102	2160	2940	3320
360	1080	780	1540	1575	95	190	800	1200	190	1980	95	95	2540	3320	3700
480	1230	890	1650	1950	95	275	800	1400	190	1980	95	95	2840	3730	4110
600	1230	890	1650	2160	150	280	800	1600	295	2190	148	80	2840	3730	4100
740	1420	970	1810	2480	170	240	900	2000	340	2480	170	102	3220	4190	4650
850	1420	970	1810	2560	185	180	1000	2200	370	2740	52	52	3220	4190	4650

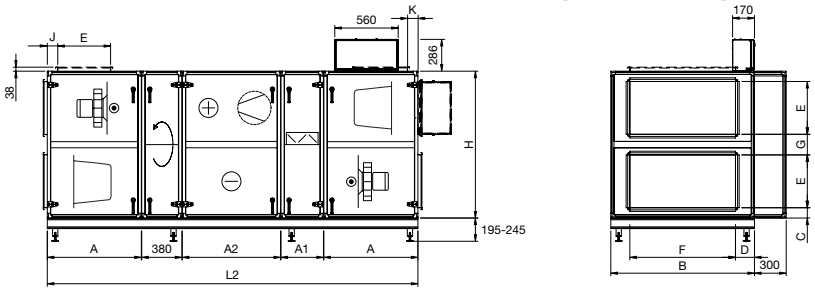
a - Add 110 mm for capacity variant 2 in sizes 300 and 360.

b - For units in the outdoor version, see IV Produkt Designer product selection program for current lengths of fan/filter sections.

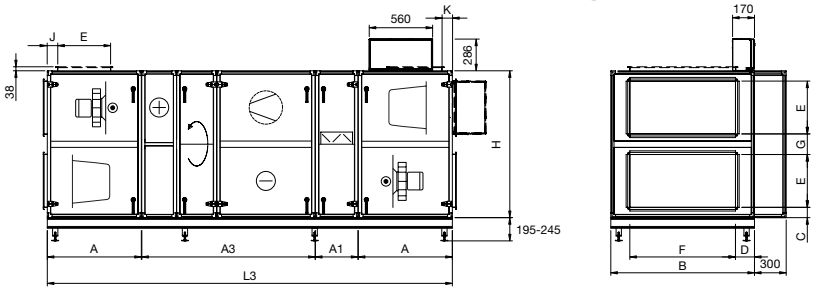
Combination 4 – Rotary heat exchanger and air recirculation section



Combination 5 – Rotary heat exchanger, cooling unit and air recirculation section



Combination 6 – Rotary h. exch., cooling unit with cooling recovery and air recirc. section



Location of control equipment cubicle, see page 91.

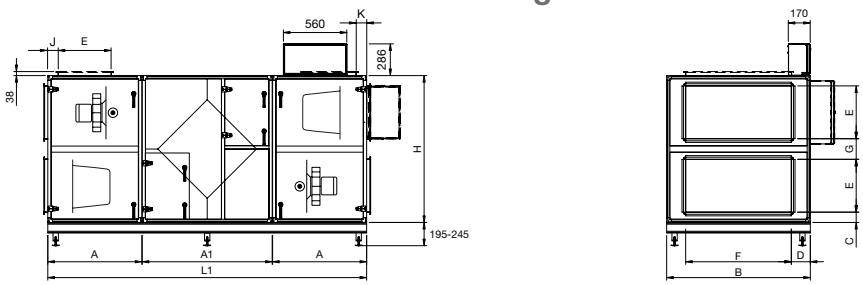
Dimensions (mm)

Size	A [b]	A1	A2 [a]	A3 [a]	B	C	D	E	F	G	H	J	K	L1 [b]	L2 [a, b]	L3 [a, b]
100	630	400	780	1540	980	105	140	300	700	205	1010	103	103	2040	2820	3200
150	780	400	780	1540	1080	100	140	500	800	195	1390	98	98	2340	3120	3500
190	890	400	780	1540	1360	100	180	500	1000	195	1390	98	98	2560	3340	3720
240	890	400	780	1540	1360	100	180	600	1000	200	1605	102	102	2560	3340	3720
300	890	400	780	1540	1575	100	190	600	1200	200	1605	102	102	2560	3340	3720
360	1080	600	780	1540	1575	95	190	800	1200	190	1980	95	95	3140	3920	4300
480	1230	600	890	1650	1950	95	275	800	1400	190	1980	95	95	3440	4330	4710
600	1230	600	890	1650	2160	150	280	800	1600	295	2190	148	80	3440	4330	4710
740	1420	640	970	1810	2480	170	240	900	2000	340	2480	170	102	3480	4450	5290
850	1420	640	970	1810	2560	185	180	1000	2200	370	2740	52	52	3480	4450	5290

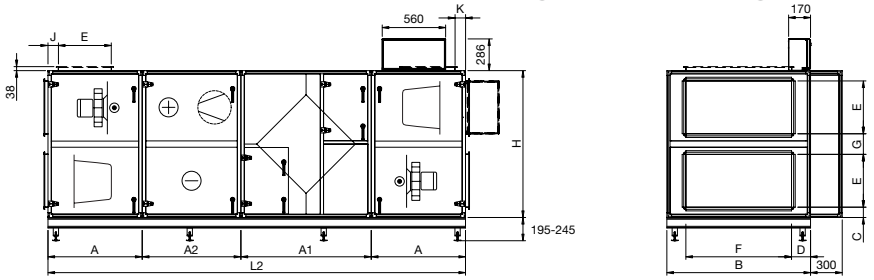
a - Add 110 mm for capacity variant 2 in sizes 300 and 360.

b - For units in the outdoor version, see IV Produkt Designer product selection program for current lengths of fan/filter sections.

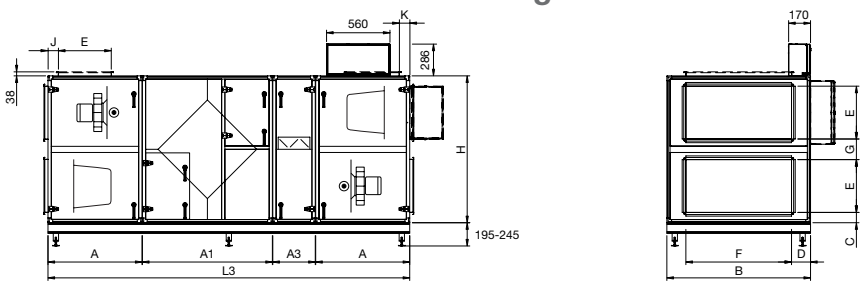
Combination 7 – Plate heat exchanger



Combination 8 – Plate heat exchanger and cooling unit



Combination 9 – Plate heat exchanger and air recirculation section



Location of control equipment cubicle, see page 91.

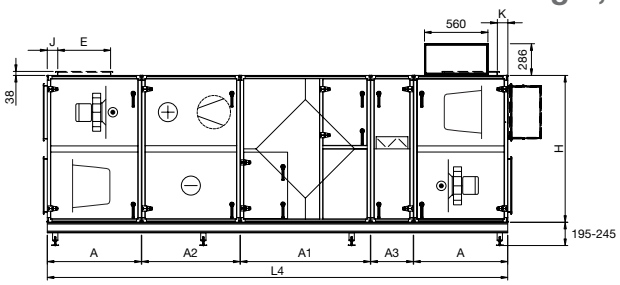
Dimensions (mm)

Size	A [b]	A1	A2 [a]	A3	B	C	D	E	F	G	H	J	K	L1 [b]	L2 [a, b]	L3 [b]
100	630	1080	780	400	980	105	140	300	700	205	1010	103	103	2340	3120	2740
150	780	1230	780	400	1080	100	140	500	800	195	1390	98	98	2790	3570	3190
190	890	1230	780	400	1360	100	180	500	1000	195	1390	98	98	3010	3790	3410
240	890	1530	780	400	1360	100	180	600	1000	200	1605	102	102	3310	4090	3710
300	890	1530	780	400	1575	100	190	600	1200	200	1605	102	102	3310	4090	3710
360	1080	1980	780	600	1575	95	190	800	1200	190	1980	95	95	4140	4920	4740
480	1230	1980	890	600	1950	95	275	800	1400	190	1980	95	95	4440	5330	5040
600	1230	1980	890	600	2160	150	280	800	1600	295	2190	148	148	4440	5330	5040
740	1420	2020	970	640	2480	170	240	900	2000	340	2480	170	170	4860	5830	5500
850	1420	2440	970	640	2560	185	180	1000	2200	370	2740	52	52	5280	6250	5920

a - Add 110 mm for capacity variant 2 in sizes 300 and 360.

b - For units in the outdoor version, see IV Produkt Designer product selection program for current lengths of fan/filter sections.

Combination 10 – Plate heat exchanger, cooling unit and air recirculation section



Location of control equipment cubicle, see page 91.

Dimensions (mm)

Size	A [b]	A1	A2 [a]	A3	B	C	D	E	F	G	H	J	K	L4 [a, b]
100	630	1080	780	400	980	105	140	300	700	205	1010	103	103	3520
150	780	1230	780	400	1080	100	140	500	800	195	1390	98	98	3970
190	890	1230	780	400	1360	100	180	500	1000	195	1390	98	98	4190
240	890	1530	780	400	1360	100	180	600	1000	200	1606	102	102	4490
300	890	1530	780	400	1575	100	190	600	1200	200	1606	102	102	4490
360	1080	1980	780	600	1575	95	190	800	1200	190	1980	95	95	5520
480	1230	1980	890	600	1950	95	275	800	1400	190	1980	95	95	5930
600	1230	1980	890	600	2160	150	280	800	1600	295	2190	148	148	5930
740	1420	2020	970	640	2480	170	240	900	2000	340	2480	170	170	6470
850	1420	2440	970	640	2560	185	180	1000	2200	370	2740	52	52	6890

a - Add 110 mm for capacity variant 2 in sizes 300 and 360.

b - For units in the outdoor version, see IV Produkt Designer product selection program for current lengths of fan/filter sections.

Block Sections, Weights (kg)

		Fan/filter section ENF		Recovery rotor EXA		Cooling unit ECU		Cooling unit w. recovery ECR		Plate heat exchanger EXC		Air recirc. section EBE		Media section EMR	
	Insulation	00	E3	00	E3	00	E3	00	E3	00	E3	00	E3	00	E3
Size	**100**	130	145	100	105	200	228	341	379	150	170	55	65	61	71
	150	185	210	135	140	249	284	454	501	195	220	65	80	72	87
	190	235	270	160	170	286	325	507	559	223	250	75	90	83	98
	240	280	315	170	180	320	362	555	612	285	320	80	95	88	103
	300	300	335	200	210	430	481	701	767	320	360	85	100	94	109
	360	395	450	205	215	507	564	790	834	440	480	110	135	122	147
	480	455	520	290	300	573	635	1005	1087	535	600	125	155	141	171
	600	525	595	335	345	722	790	1214	1305	600	670	140	170	158	188
	740	825	930	465	495	990	1070	1620	1750	715	810	164	196	–	–
	850	935	1050	505	535	1165	1255	1910	2055	725	820	172	208	–	–

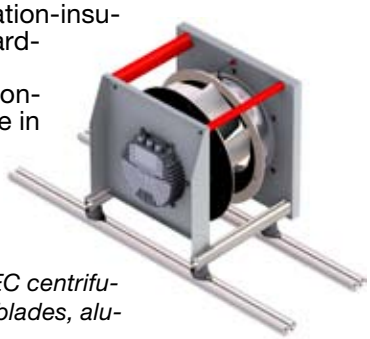
Block Sections

Fan/filter Section (code: ENF)

The ENF fan/filter section is a unit section containing a fan and filter. In the outdoor units, the control cubicle is also housed inside the one fan/filter section.

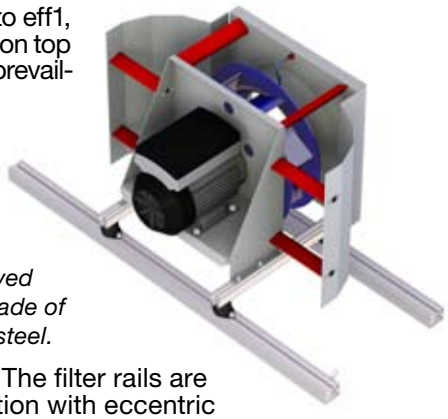
The fans in all the sizes are open-discharge, direct-driven centrifugal fans.

Sizes 100 and 150 have direct-driven vibration-insulated plenum fans with B impeller (backward-curved blades).
EC motors with built-in electronic speed control. Stepless adjustment of the airflow rate in response to a 0-10 V signal fram a main control system.



Direct-driven open-discharge EC centrifugal fan with back-ward curved blades, aluminium impeller.

Sizes 190–850 have integral motors to eff1, i.e. the frequency inverter is mounted on top of the motorn and is fully matched to prevailing operating conditions.



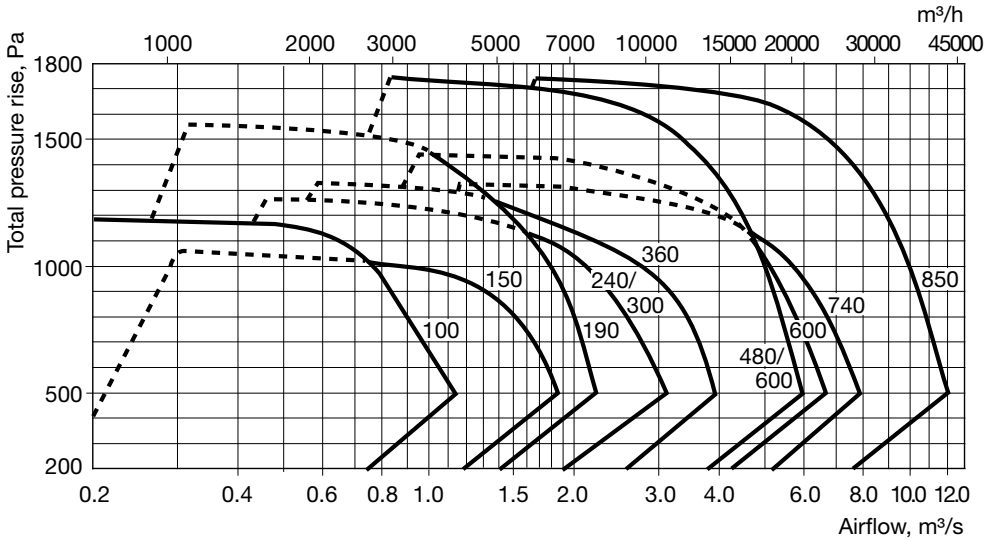
Type Windstrong direct-driven open-discharge centrifugal fan with backward-curved blades, and impeller made of powder-painted sheet steel.

Tappings for airflow measurement are standard.

The fan/motor units are easy to withdraw from the casing to facilitate servicing. The fans are effectively vibration-isolated from the casing by their flexible connection and rubber anti-vibration mountings. Resonant frequency: approx. 8 Hz.

The filter is mounted on rails and can easily be withdrawn and replaced. The filter rails are fitted with effective sealing strips and the filter inserts are locked in position with eccentric rails. Tappings are provided on the unit section for measuring the differential pressure across the filter unit. A Class G4 panel-type prefilter can be selected as an accessory.

Fan Capacity



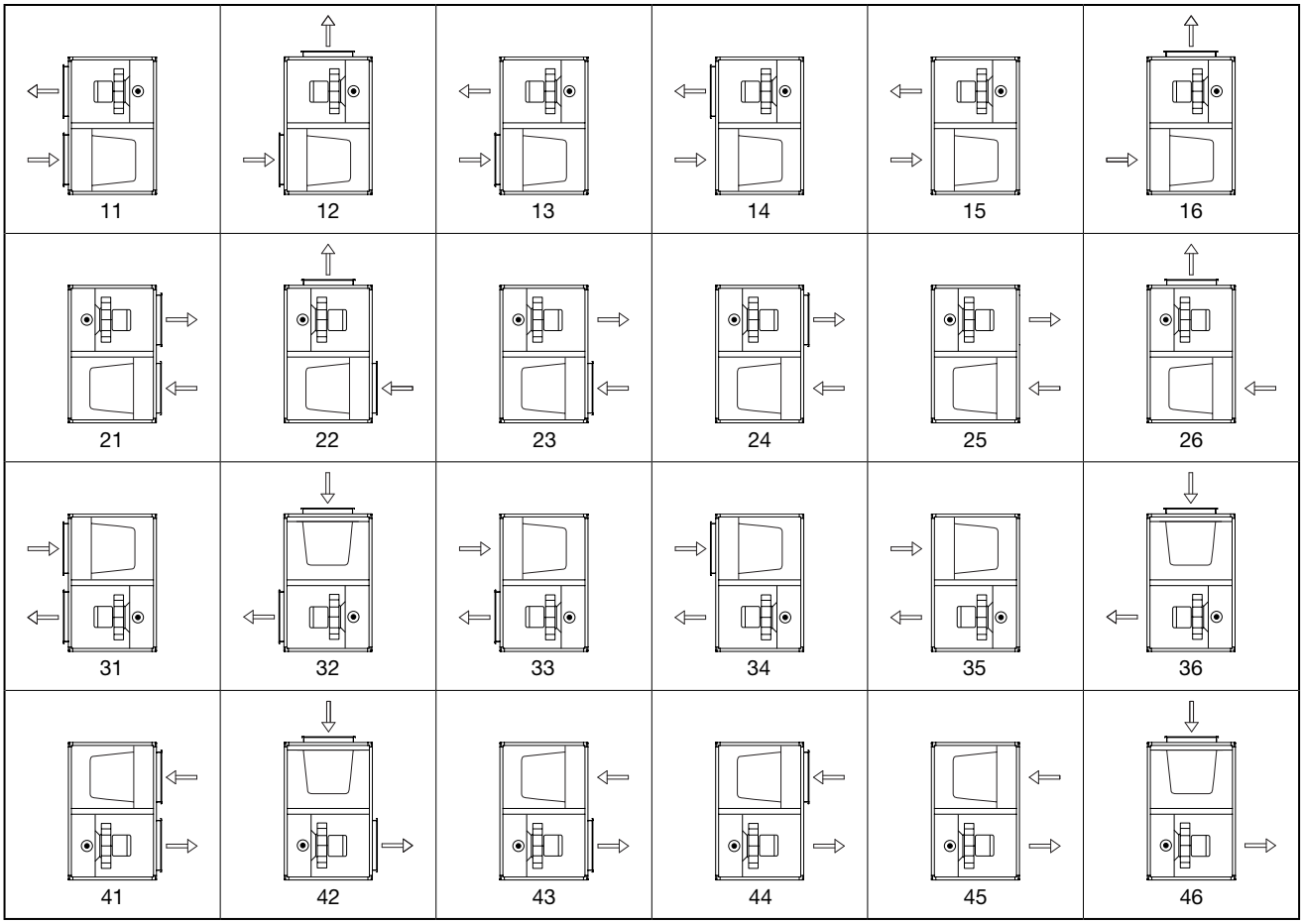
Electrical Data

	Fan variant										
	100-E	150-E	190-0	190-1, 240-0, 300-0	190-2, 240-1, 300-1	190-3, 240-2, 300-2, 360-1	360-2, 480-1, 600-0	480-2, 600-1	480-3, 600-2, 600-3, 740-1, 850-1	740-2, 850-2	850-3
Rated output, (kW)	1.5*	1.95*	1,1	1.5	2.2	3	4	5.5	7.5	2x5.5	2x7.5
Rated curent (A)	7.0	3.0	2.5	3.3	4.7	6.4	8.4	11,1	15.1	2x11.1	2x15.1
Voltage (V)	10	10	10	10	10	10	10	16	16	2x16	2x16
Rec. fuse (AT)	1x230	3x400	3x400	3x400	3x400	3x400	3x400	3x400	3x400	3x400	3x400

* Power input. *See also the section entitled: Wiring Diagrams and Fuses.*

Configuration

The Envistar Flex block sections are available in the following variety of configurations with reference to duct connections, module connections and airflow directions through the connections. For particulars of possible block combinations, see the IV Produkt Designer.



Duct connection

Module connection

Types of Filters

Basic filters, fine filters and panel filters

The Class G4, F6-F9 filters consist of deep-folded filter bags mounted in a plastic frame.

Carbon filters and prefilters

The Class C7 filters consist of deep-folded filter bags containing activated carbon and a Class F7 integrated prefilter. The filters are well suited for minimizing the effect of e.g. cooking odours and exhaust fumes in comfort ventilation systems.

Filter Data, Bag Filters

	Filter modules (quantity, each)			Filter area (m²)		
Size	892×409	592×287	592×592	G4	F6, F7, F8, F9	C7
100	1	–	–	2.4	4.3	–
150	–	1	1	3.6	9.8	8.0
190	–	–	2	4.8	13.0	16.0
240	–	–	2	4.8	13.0	16.0
300	–	1	2	6.0	16.3	19.5
360	–	3	2	8.4	22.9	26.5
480	–	3	3	10.8	29.4	34.5
600	–	4	3	12.0	32.7	38.0
740	–	4	4	14.4	39.0	46.0
850	–	–	8	19.2	52.0	64.0

Filter Data, Panel Filters

	Filter modules (quantity)			Filter area (m²)
Size	736×393	596×292	596×596	P4
100	1	–	–	0.3
150	–	1	1	0.5
190	–	–	2	0.7
240	–	–	2	0.7
300	–	1	2	0.9
360	–	3	2	1.2
480	–	3	3	1.6
600	–	4	3	1.8
740	–	4	4	2.2
850	–	–	8	2.8

.

Accessories

- Flow meter, manometer type (code: ESET-04).
- Stainless base plate, outdoor air intake (code: ESET-06).
- Prefilter (code: ESET-07), filter (code: ELEF).
- Filter guard, U-tube manometer (code: MIET-FB 01)
- Filter guard, Kytölä manometer (code:MIET-FB 02)
- Filter guard, Magnehelic manometer (code: MIET-FB 03)

See also the section: Accessories.

Heat Recovery Rotor (code: EXA)

The heat recovery rotor is a complete unit with rotary heat exchanger that transfers heat according to the air-to-air principle.

Design

The rotor in the heat exchanger is composed of alternately wound flat and corrugated bands of aluminium foil, forming smooth passages through which the air can flow in laminar manner. This provides low pressure drop and little risk of dust or other impurities collecting inside the air passages.

The rotor that is withdrawable from the casing, is journalled in permanently lubricated, self-aligning ball bearings.

An effective bristled seal is fitted along the periphery of the rotor and between the supply air and extract air passages to prevent carry-over.

The rotor is available in four different versions:

- NO, normal rotor
- HY, hygroscopic rotor for enhanced cooling and humidity recovery
- NP, normal Plus-rotor for increased efficiency
- HP, hygroscopic rotor in the Plus version

Epoxy-coated aluminium foil rotors are available for aggressive environments.

Rotor packages polyurethane paint reinforced edges (code: EXAT-01-a) are available as options.

An adjustable purging sector enables a continuous purging air flow to blow the rotor clean of impurities.

The rotor is driven by a worm-gear motor with electronic speed control.

Rotor Control Function

The controller and drive motor are principle components in the rotor controls. The controller, a built-in component of the heat exchanger is pre-programmed with ready-to-use functions for purging operation, rotation supervision, motor protection and alarms.

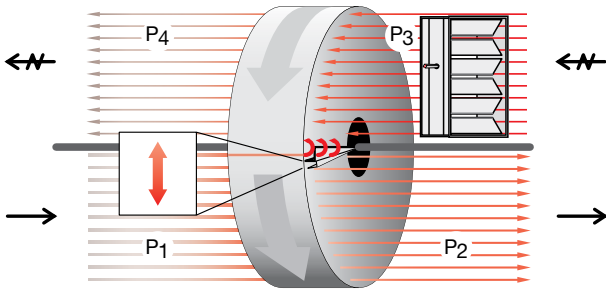
In the size 190–850 units, rotor operation is supervised without any rotation detector for monitoring. The controller controls the motor torque and initiates an alarm if it drops below a preset value. The motor speed is controlled in conformance with a control curve that is practically linear in relation to temperature efficiency.

Motor Data

Size	Output (W)	Current (A)	Voltage (V)	Fuse (AT)
100–150	40	0.33	1 × 230	10
190–360	40	0.7	1 × 230	10
480–600	100	1.3	1 × 230	10
740-850	160	1.7	1 × 230	10

See also the section: Wiring Diagrams and Fuses.

Purging Operation and Leakage Flow



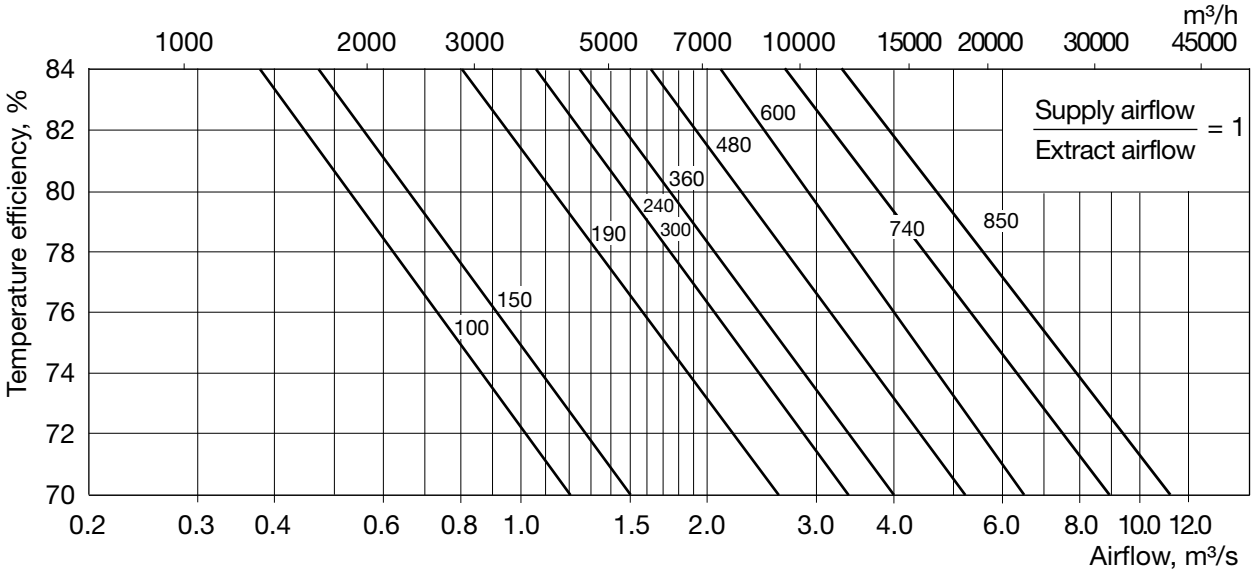
As its rotor rotates, the rotary heat exchanger always carries a certain amount of extract air over to the supply air and vice versa.

When the purging sector is in use, the rotor is cleaned with purged air and this eliminates transfer of extract air to the supply air. If the need arises, the trimming damper can be used for achieving the necessary pressure ratio P2>P3.

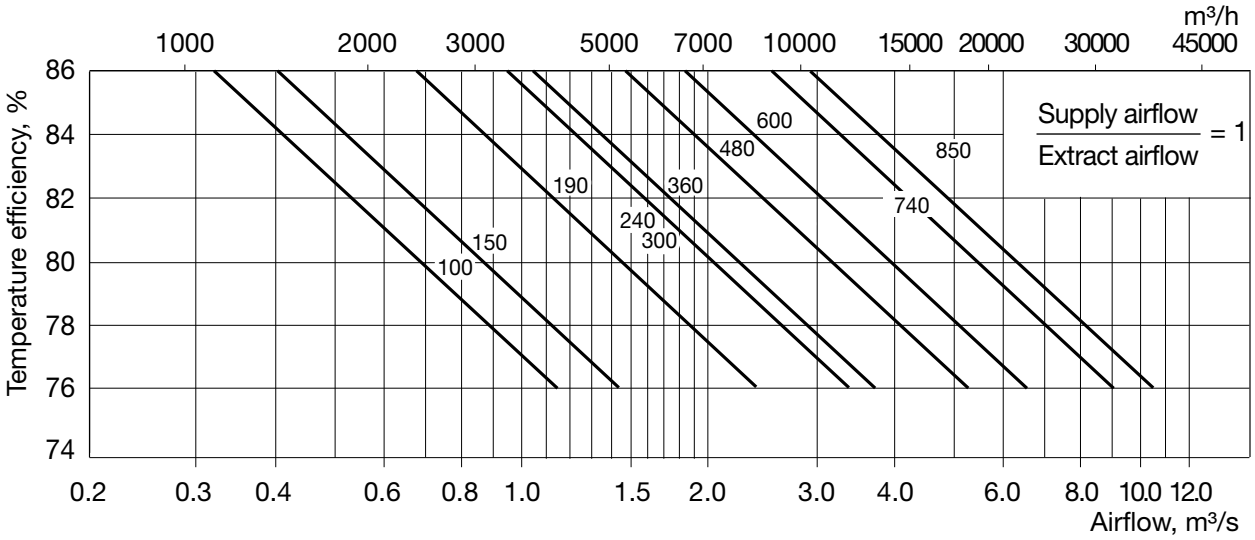
The flow can be adjusted by changing the setting of the adjustable purging sector.

IV Produkt Designer calculates the leakage air flow and whether a trimming damper is required.

Temperature Efficiency, Type NO Rotor (Normal)



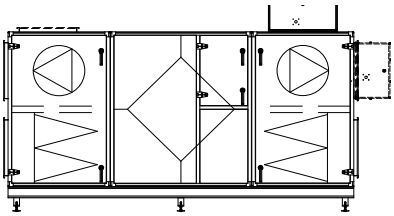
Temperature Efficiency, Type NP Rotor (Normal Plus)



Option

- Edge-reinforced rotor (code EXAT-01-a)

Plate Heat Exchanger (code: EXC)



The EXC plate heat exchanger is a complete unit with a plate heat exchanger that transfers heat according to the air-to-air principle.

Design

The heat exchanger is of cross-flow type and is composed of aluminium sheets that are also available with an epoxy coating. The flat passages in the direction of airflow enable low pressure drop and little risk of dust deposits inside the cube.

The heat exchanger has two different plate spacings per unit size: Normal and Plus.

A special jointing technique makes the exchanger extremely tight and minimizes the risk of leakage between the supply air and extract air paths. Pressed surface enlargements in the direction of airflow provide large heat transfer surfaces and stability that permits large pressure differentials.

Moisture is not recovered from the extract air. Low outdoor temperatures, however, cause moisture precipitation from the extract air and this releases energy. Condensate is collected in a drip tray with a Ø 20 mm drain connection.

Under normal humidity and temperature conditions the temperature efficiency of the exchanger increases by approx. 3 % units.

Moisture precipitation also prompts the risk of ice forming inside the exchanger. To counteracted icing, a portion of the outdoor air is allowed to by-pass the heat exchanger.

The by-pass and shut-off dampers are of type KJS and conform to Tightness Class 2 to SS-EN1751 (VVS AMA-98) and Corrosion Resistance Class C4.

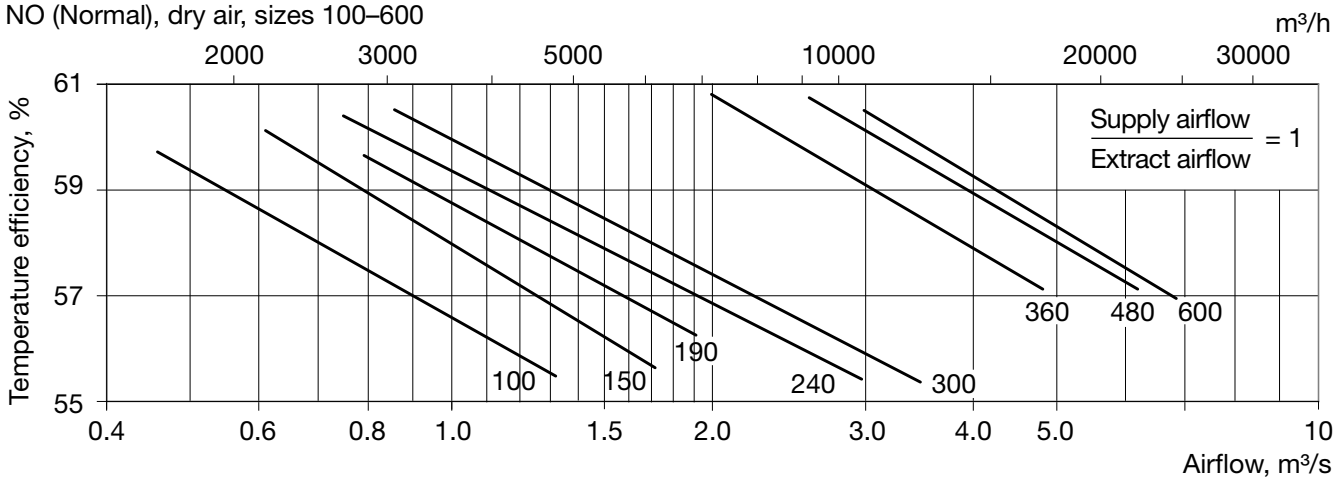
By-pass Damper

Size	100	150	190–300	360	480–600	740	850
Torque reqd. (Nm)	3	4	5	6	10	11	2×12*

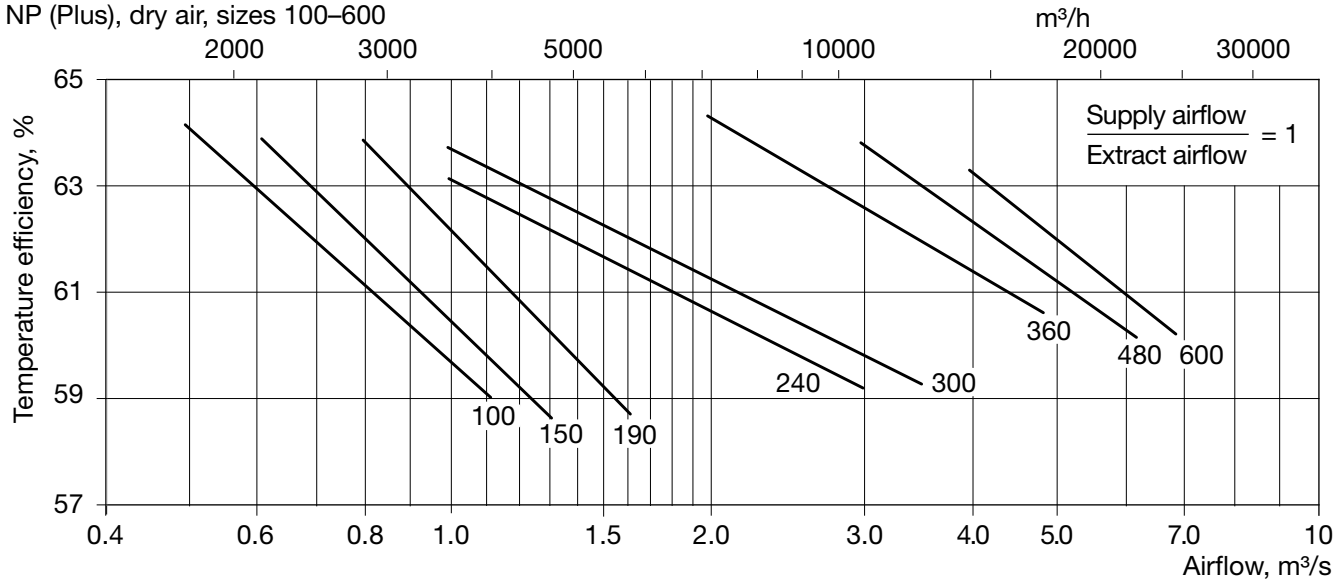
** 2 damper motors are required.*

Temperature Efficiency

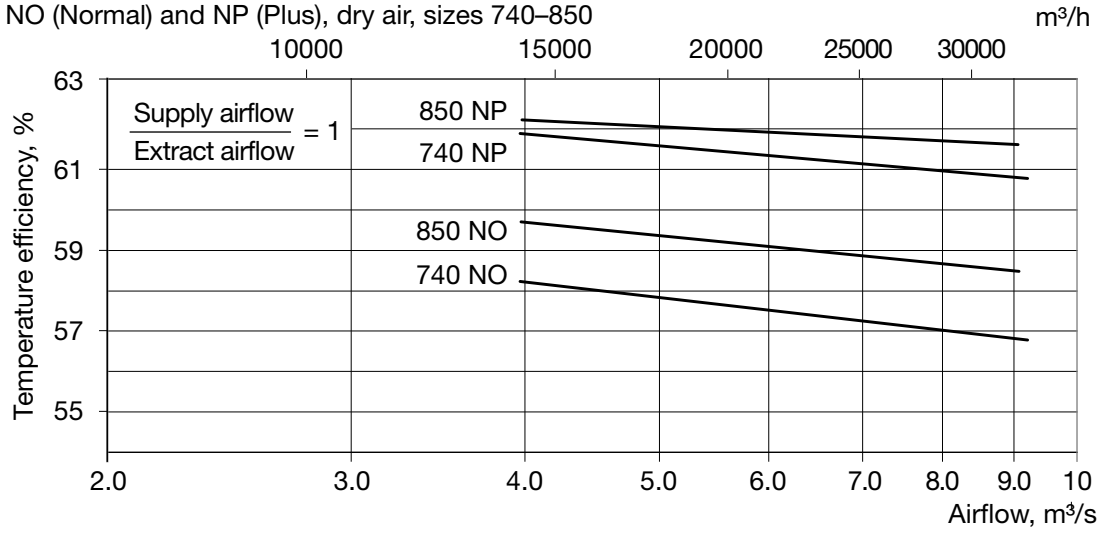
NO (Normal), dry air, sizes 100–600



NP (Plus), dry air, sizes 100–600



NO (Normal) and NP (Plus), dry air, sizes 740–850



StarCooler Cooling Unit (code: ECU)

The type ECU StarCooler is a complete cooling unit designed for cooling supply air. The cooling unit contains a cooling circuit with evaporator and condenser coils, electrical equipment for power and safety – all ready-to-use, wired and factory tested.

The standard, unit is equipped with the ACA (Automatic Cooling Adjustment) function. This function increases operational reliability and enables cooling operation for variable airflow within a wide flow range.

As an option for extremely high outdoor and indoor temperatures, capacity variants 2 and 3 can be equipped with WCC (Water-Cooled Condenser).

The design of the evaporator coil enables condensate runoff to a drip tray without droplet eliminator. The coil has reinforced fins for increased protection against corrosion.

- 10 unit sizes for airflows ranging from 0.3–8.5 m³/s, with cooling capacity from 14 to 145 kW for $t_{outdoor}$ air + 26 °C. RH 50% and $t_{extract}$ air +22 °C.
- 2 capacity variants for sizes 300 – 600.
- 3 capacity variants for sizes 740 – 850.
- Cooling capacity controlled in 3 steps.
- Environmentally compatible refrigerant: R407C.
- CE labelled, tested and documented cooling installation.
- Designed for easy service, simple to plan and install.
- Can be planned and optimized using the IV Produkt Designer product selection program.

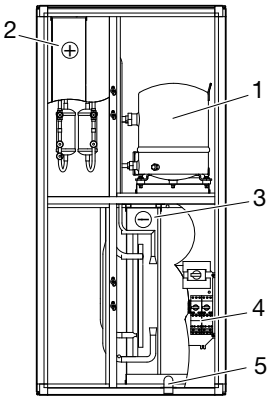
Design

The StarCooler has a direct-acting cooling system, DX, that uses less than 5 kg of refrigerant per circuit. The evaporator heat chilled by the compressor is transferred to a condenser in the exhaust air path.

A lockable cover in the front of the unit is provided enabling access for adjustments and servicing. Removable covers for inspecting the coils, compressors, etc. are provided on the unit. The compressors are anti-vibration isolated and mounted on withdrawable compressor plates.

The casing pf the cooling unit is of the same design as the other functional sections. The evaporator and condenser coils have of copper tubes and aluminium fins. The drip trays are made of stainless steel and have plastic condensate drain connections.

The Refrigerant Circuit



1. Compressor *2. Condenser*
3. Evaporator *4. Electrical equipment*
5. Condensate drain conn. Ø 32 mm

The refrigerant circuit consists of the following:

- Fully hermetic piston compressor with sight glass and temperature and current-sensitive phase switch.
- Evaporator coil with drip tray, condenser coil, drying filter, choke for expansion, low and high pressure switches, pressure protection equipment.
- In-service pressure switch with restarting function for controlling the ACA function.
- Copper refrigerant tubing jointed together by brazing.
- Service connections and refrigerant.

Project Design

The unit can be engineered to handle optional supply and extract airflows within the specified min. and max. permissible flow range. Accurate sizing is carried out in the IV Produkt Designer product selection program.

Electrical Equipment

The electrical equipment includes a protective motor switch, contactors and a controller for the compressors. The cooling capacity is controlled by means of external 0-10 VDC inputs on external contact closure (24 V potential-free).

In response to low airflow and an extract air temperature higher than 50 °C, a pressure switch in cooling circuit 1 reduces the cooling capacity. Automatic restart via a stepping switch with delayed switch in.

If a pressure switch or protective motor switch should trip, the compressor will be switched out and a group alarm will be initiated across potential-free contacts.

See also the section: Wiring Diagrams and Fuses.

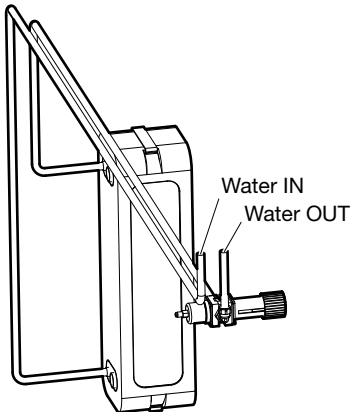
Commissioning

Cooling units charged with more than 3 kg refrigerant per circuit require commissioning by a certified refrigeration service technician.

Prior to commissioning, the fitter must see to the following:

1. Connect the power and control signal cables for cooling operation.
2. Connect the condensate drain pipework to a drain gulley.
3. Adjust the design airflows on the supply air and extract air sides.
4. Connect the cold main water supply and the drain pipework from the condenser, if a water-cooled condenser is used.

Water-cooled Condenser, WCC



Water-cooled condenser with mech. pressure-controlled water-saving valve mounted inside unit.
Connect condensor preferably to the mains water supply; max. permissible water flow 0.3 l/s at 30 kPa.
Connection on water side, Cu, 15 mm conn.

Technical Data, 100–480

Size			100	150	190	240	300		360		480	
Capacity variant			1	1	1	1	1	2	1	2	1	2
Airflow rate	min.	(m^3/s)	0.32	0.54	0.71	0.82	0.97		1.22		1.54	
	max.	m^3/s)	0.95	1.61	2.12	2.47	2.92		3.65		4.63	
Max. cooling capacity*		(kW)	13.5	21.9	28.8	37.9	40.8	54.0	49.6	66.7	80.6	99.7
Power required by compressor		(kW)	2.8	5.2	6.5	7.9	8.9	14.2	11.3	17.1	16.1	24.9
Coefficient of cooling performance		(C.O.P)	4.9	4.2	4.4	4.8	4.6	3.8	4.4	3.9	5.0	4.0
Number of compressors		(st)	2	2	2	2	2	2	2	2	2	2
Number of control steps		(st)	3	3	3	3	3	3	3	3	3	3
Max. operating current, 3×400V+N 50Hz		(A)	7.7	14.4	17.4	19.8	22.6	33.9	28.4	39.2	35.2	49.7
Rec. fuse protection, 3×400V+N 50Hz		(A)	16	20	25	25	32	50	40	50	50	63
Refrigerant: R407C	Circuit 1	(kg)	1.5	2.2	2.8	3.4	3.5	6.8	5.5	8.5	7.2	9.2
	Circuit 2	(kg)	1.9	2.9	3.5	3.7	4.7	6.5	5.5	7.5	9.2	9.5

* Applicable to $t_{outdoor\ air}$ +26 ˚C, RH 50% and $t_{extract\ air}$ +22 ˚C.

Technical Data, 600–850

Size			600		740			850		
Capacity variant			1	2	1	2	3	1	2	3
Airflow rate	min.	(m^3/s)	1.93		2.45			2.82		
	max.	m^3/s)	5.76		7.34			8.47		
Max. cooling capacity*		(kW)	89.8	114	92.3	100	126	112	124	145
Power required by compressor		(kW)	18.0	29.2	18.8	23.3	34.9	21.5	29.4	40.3
Coefficient of cooling performance		(C.O.P)	5.0	3.9	4.9	4.3	3.6	5.2	4.2	3.6
Number of compressors		(st)	2	3	3	3	3	4	4	4
Number of control steps		(st)	3	3	3	3	3	3	3	3
Max. operating current, 3×400V+N 50Hz		(A)	42.5	64.5	46.5	57.2	77.5	58.4	70.4	93.0
Rec. fuse protection, 3×400V+N 50Hz		(A)	63	80	63	80	100	80	80	125
Refrigerant: R407C	Circuit 1	(kg)	7.4	9.5	7.8	7.8	9.9	8.7	8.7	9.8
	Circuit 2	(kg)	9.5	10.0	5.9	5.9	7.4	7.1	7.1	7.5
	Circuit 3	(kg)	–	–	5.9	5.9	7.4	7.1	7.1	7.0

* Applicable to $t_{outdoor\ air}$ +26 ˚C, RH 50% and $t_{extract\ air}$ +22 ˚C.

StarCooler Cooling Unit with Cooling Energy Recovery (code: ECR)

The type ECR StarCooler is a complete cooling unit, intended for cooling the supply air. The unit has a built-in rotary exchanger for recovering cooling energy in sequence with the cooling unit. This provides maximal energy utilization and low power consumption. Besides the rotary exchanger, the cooling unit consists of a cooling circuit with evaporator and condenser coils, electrical equipment for power and safety – all ready-to-use, wired and factory tested.

As standard, the unit is equipped with the ACA (Automatic Cooling Adjustment) function. This function provides increased operational reliability and enables variable airflow cooling operation within a wide flow range.

As an option for extremely high outdoor and indoor temperatures, capacity variants 2 and 3 can be equipped with WCC (Water-Cooled Condenser).

The design of the evaporator coil enables condensate runoff to a drip tray without droplet eliminator. The coil has reinforced fins for increased protection against corrosion.

The unit can be supplied in a split version to facilitate transport at the site.

The rotary exchanger can be selected in all sizes in the standard or plus rotor version, with or without hygroscopic surfaces, making it possible to optimize the total capacity.

If heating is required, the rotary heat exchanger operates in sequence with the reheater for recovering energy from the extract air.

- 10 unit sizes for airflows ranging from 0.3–8.5 m³/s, with cooling capacity from 18 to 187 kW for $t_{outdoor\ air}$ + 26 °C. RH 50% and $t_{extract\ air}$ +22 °C.
- 2 capacity variants for sizes 300 – 600.
- 3 capacity variants for sizes 740 – 850.
- Cooling capacity controlled in 3 steps plus cooling energy recovery.
- Environmentally compatible refrigerant: R407C.
- CE labelled, tested and documented cooling installation.
- Designed for easy service, simple to plan and install.
- Can be planned and optimized via the IV Produkt Designer product selection program.

Design

The StarCooler has a direct-acting cooling system, DX, that uses less than 5 kg of refrigerant per circuit. Under cooling conditions when the outdoor temperature is higher than the indoor temperature, the rotary exchanger operates in sequence with the cooling unit to cool the supply air. In this case, the rotor transfers heat and moisture from the outdoor air to the exhaust air, which reduces the cooling load from the active cooling unit.

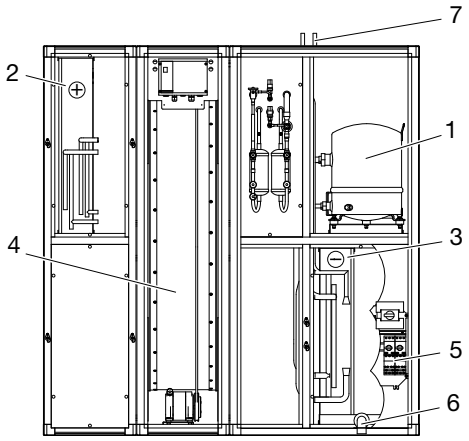
The evaporator heat chilled by the compressor is transferred to a condenser in the extract air path.

A lockable cover in the front of the unit is provided enabling access for adjustments and servicing. Doors and removable covers for inspecting the coils, compressors, and the rotary exchanger are provided on the unit. The compressors are anti-vibration isolated and mounted on withdrawable compressor base plates.

The casing pf the cooling unit is of the same design as the other functional sections. The evaporator and condenser coils have of copper tubes and aluminium fins. The drip trays are made of stainless steel and have plastic condensate drain connections.

The size 100–360 units are supplied without stand. The other sizes are supplied on a stand with legs and adjustable feet.

The Refrigerant Circuit



1. Compressor *2. Condenser*
3. Evaporator *4. Rotary heat exchanger*
5. Electrical equipm. *6. Condensate drain conn. Ø 32 mm*
7. Connections for water-cooled condenser (optional)

The refrigerant circuit consists for the following:

- Fully hermetic piston compressors with sight glass and temperature and current-sensitive phase switch.
- Evaporator coil with drip tray, condenser coil, drying filter, choke for expansion, low and high pressure switches, pressure protection equipment.
- In-service pressure switch with restarting function for controlling the ACA function.
- Copper refrigerant tubing jointed together by brazing.
- Service connections and refrigerant.

Project Design

The unit can be engineered to handle optional supply and extract airflows within the specified min. and max. permissible flow range. Accurate sizing is carried out in the IV Produkt Designer product selection program.

Electrical Equipment

The electrical equipment includes a main switch, protective motor switch, contactors and a equipment for controlling the compressors. The cooling capacity is controlled by means of external 0-10 V DC inputs. The cooling unit is permitted to start when both fans are operating by means of external contact closure (24 V potential-free).

If the airflow rate is low and the exhaust air temperature is higher than 50 °C, a pressure switch in cooling circuit 1 reduces the cooling capacity. Automatic restart via a stepping switch with delayed switch in.

If a pressure switch or protective motor switch should trip, the compressor will be switched out and a group alarm will be initiated across potential-free contacts.

The rotary heat exchanger consists of an electronic controller, drive motor, rotation detector, motor protection and alarm. Connect the equipment to a 0–10 V control signal and a 1×230 V power supply, 6 AT fuse protection.

See also the section: Wiring Diagrams and Fuses.

Commissioning

Cooling units must be commissioned by a certified refrigeration service technician.

Prior to commissioning, the fitter must see to the following:

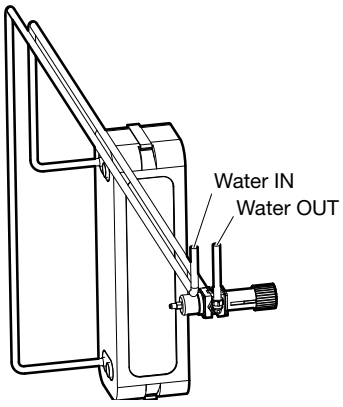
Cooling Unit:

1. Connect the power across a main switch and wire control signal cables for cooling operation.
2. Connect a water trap and install condensate drain pipework to a drain gulley.
3. Adjust the design airflows on the supply air and extract air sides.
4. Connect the cold main water supply and the drain pipework from the condenser, if a water-cooled condenser is fitted.

Rotary Heat Exchanger:

Connect power and control signal to the controller.

Water-cooled Condenser, WCC



Water-cooled condenser with mech. pressure-controlled water-saving valve mounted inside unit. Connect condensor preferably to the mains water supply; max. permissible water flow 0.3 l/s at 30 kPa. Connection on water side, 15 mm conn., Cu.

Technical Data, 100–480

Size			100	150	190	240	300		360		480	
Capacity variant			1	1	1	1	1	2	1	2	1	2
Airflow rate	min.	(m^3/s)	0.32	0.54	0.71	0.82	0.97		1.22		1.54	
	max.	m^3/s)	0.95	1.61	2.12	2.47	2.92		3.65		4.63	
Max. cooling capacity*		(kW)	18.2	28.6	38.6	49.2	54.4	70.9	65.5	86.5	106	129.0
Rated power reqd. by compressors		(kW)	2.6	4.9	6.1	7.5	8.4	13.6	10.7	16.3	15.3	23.9
Nom. coeff. of cooling performance		(C.O.P)	6.9	5.8	6.3	6.6	6.5	5.2	6.1	5.3	6.9	5.4
Number of compressors		(st)	2	2	2	2	2	2	2	2	2	2
No. control steps (inkl. cooling recov.)		(st)	4	4	4	4	4	4	4	4	4	4
Max. drive current, 3×400V+N 50Hz		(A)	7.7	14.4	17.4	19.8	22.6	33.9	28.4	39.2	35.2	49.7
Rec. fuse protection, 3×400V+N 50Hz		(A)	16	20	25	25	32	50	40	50	50	63
Refrigerant: R407C	Circuit 1	(kg)	1.5	2.2	2.8	3.4	3.5	6.8	5.5	8.5	7.2	9.2
	Circuit 2	(kg)	1.9	2.9	3.5	3.7	4.7	6.5	5.5	7.5	9.2	9.5

* Applicable to $t_{outdoor\ air}$ +26 °C, RH 50% and $t_{extract\ air}$ +22 °C and standard rotor in the hygroscopic version (HY).

Technical Data, 600–850

Size			600		740			850		
Capacity variant			1	2	1	2	3	1	2	3
Airflow rate	min.	(m^3/s)	1.93		2.45			2.82		
	max.	m^3/s)	5.78		7.34			8.47		
Max. cooling capacity*		(kW)	118	148	121	132	162	146	161	187
Rated power reqd. by compressors		(kW)	17.1	27.4	18.1	22.0	32.5	20.5	27.7	38.1
Nom. coeff. of cooling performance		(C.O.P)	6.9	5.4	6.7	6.0	5.0	7.1	5.8	4.9
Number of compressors		(st)	2	3	3	3	3	4	4	4
No. control steps (inkl. cooling recov.)		(st)	4	4	4	4	4	4	4	4
Max. drive current,, 3×400V+N 50Hz		(A)	42.5	64.5	46.5	57.2	77.5	58.4	70.4	93.0
Rec. fuse protection, 3×400V+N 50Hz		(A)	63	80	63	80	100	80	80	125
Refrigerant: R407C	Circuit 1	(kg)	7.4	9.5	7.8	7.8	9.9	8.7	8.7	9.8
	Circuit 2	(kg)	9.5	10.0	5.9	5.9	7.4	7.1	7.1	7.5
	Circuit 3	(kg)	–	–	5.9	5.9	7.4	7.1	7.1	7.0

* Applicable to $t_{outdoor\ air}$ +26 °C, RH 50% and $t_{extract\ air}$ +22 °C and standard rotor in the hygroscopic version (HY).

Air Recirculation Section (code: EBE)

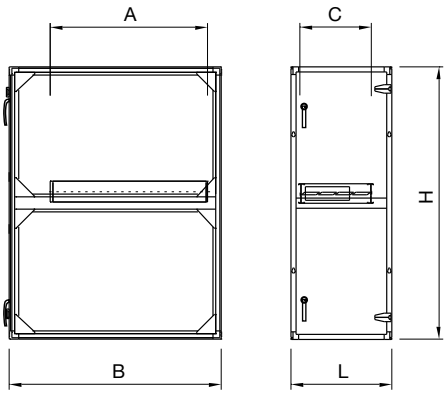
The EBE air recirculation section is a unit section with a damper and is used for recirculating air to heat the premises at night.

The air handling unit must be equipped with dampers for shutting off the extract air and the exhaust air to be able to achieve the function intended.

The unit section is equipped with inspection covers for access to the upper and the lower levels.

- The damper is made of aluminium profiled sections and meets the provisions of Corrosion Resistance Class C4.
- The damper blades are driven by ABS-plastic gears and fitted with tubular gaskets made of fixed silicone rubber to ensure tightness.
- Tightness Type 3 to SS-EN1751 (VVS AMA-98) is standard.
- Permissible temperature range: -40 to +80 ˚C.
- Permissible differential pressure: 1400 Pa max.
- Spindle dimensions: 12 × 12 mm.
- Torque required: max. 7 Nm.

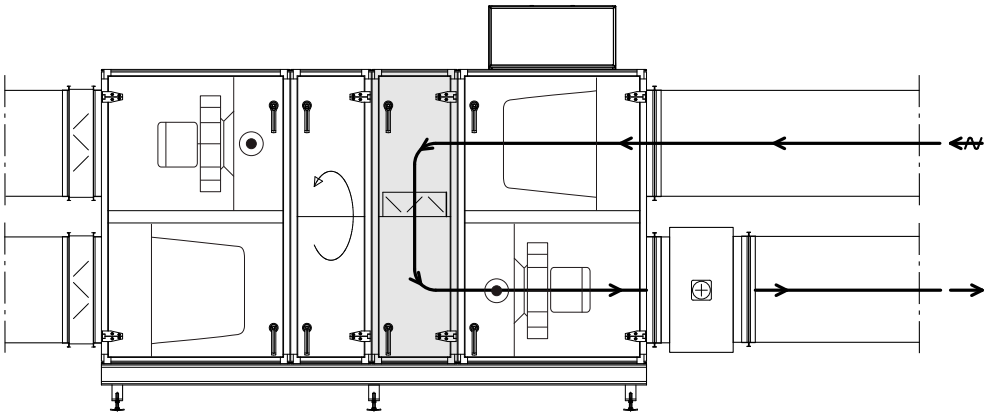
Dimensions and Weights



Size	Dimensions (mm)					Wgt. (kg)*	Torque reqd.** (Nm)
	L	B	H	A	C		
100	402	980	1010	700	300	55	2
150	402	1080	1390	800	300	65	3
190	402	1360	1390	1000	300	75	3
240	402	1360	1610	1000	300	80	3
300	402	1580	1610	1200	300	85	3
360	602	1580	1980	1200	500	110	4
480	602	1950	1980	1400	500	125	4
600	602	2160	2190	1600	500	140	6
740	642	2480	2480	2000	500	165	7
850	642	2560	2740	2200	500	175	7

* The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

** 1 damper motor is required (12×12 mm damper spindle)



Air recirculation path through the air recirculation section (shaded grey).

Media Section (code: EMR)

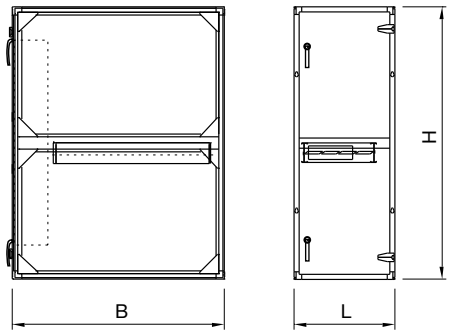
The EMR media section, sizes 100-600, is a unit section used for units in the outdoor version with recirculated air. The section has a shielded space designed for electrical and control equipment cubicle installation and is equipped with a damper for the recirculation of air for heating the building at night.

The intended air recirculation function requires that the unit be equipped with shut-off dampers in the outdoor air and exhaust air ducts.

The shielded electrical and control cubicle space is fitted with an inspection cover for access to both the upper and lower levels of the section.

- The damper is made of aluminium profiles and meets the provisions of corrosion resistance class C4.
- The damper blades are driven by ABS-plastic gears and fitted with tubular gaskets made of fixed silicone rubber to ensure tightness.
- Tightness class 3 to SS-EN1751(VVS AMA-98) is standard.
- Permissible temperature: -40 to +80 ˚C.
- Permissible differential pressure: 1400 Pa, max.
- Spindle dimension: 12 × 12 mm.
- Torque required: max. 7 Nm.

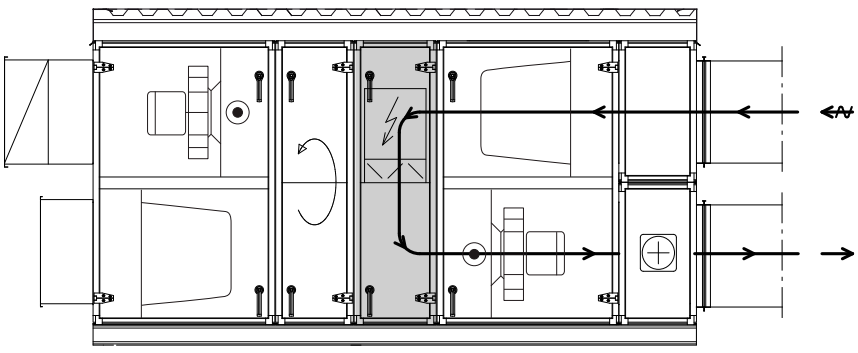
Dimensions and Weights



Size	Dimensions (mm)			Wgt. (kg)*	Torque reqd.** (Nm)
	L	B	H		
100	402	980	1010	55	2
150	402	1080	1390	65	3
190	402	1360	1390	75	3
240	402	1360	1610	80	3
300	402	1580	1610	85	3
360	602	1580	1980	110	4
480	602	1950	1980	125	4
600	602	2160	2190	140	6

* The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

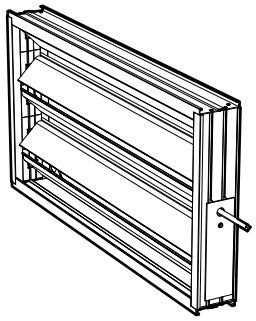
** 1 damper motor is required (12×12 mm damper spindle)

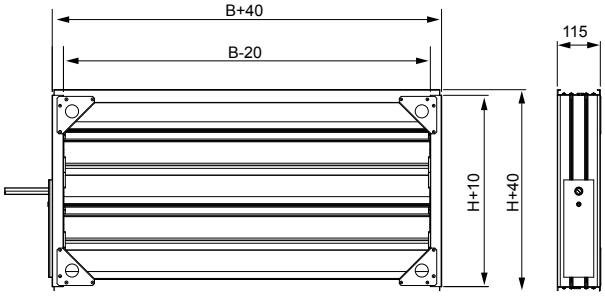


Air recirculation path through the media section (shaded grey).

Components for Duct Mounting

Damper excl. Motor (code: EMT-01)





The EMT-01 is a duct damper designed for use as a shut-off or control damper. Can be connected directly to the air handling unit or in the ductwork.

- The louvre damper is made of aluminium profiled sections and meets the provisions of Corrosion Resistance Class C4.
- The damper blades are driven by ABS-plastic gears and fitted with tubular gaskets made of fixed silicone rubber to ensure tightness.
- Permissible temperature range: -40 to +80 °C
  Permissible differential pressure: max. 1400 Pa
- Tightness Type 3 to SS-EN1751 (VVS AMA-98).

Dimensions, Weights and Torque

Size	B (mm)	H (mm)	Wgt. (kg)	Torque reqd. (Nm)
100	700	300	6	4
150	800	500	8	5
190	1000	500	9	5
240	1000	600	11	6
300	1200	600	13	6
360	1200	800	16	7
480	1400	800	18	8
600	1600	800	22	9
740	2000	900	28	10
850	2200	1000	29	13

Damper with Lever Actuator (code: ESET-TR)

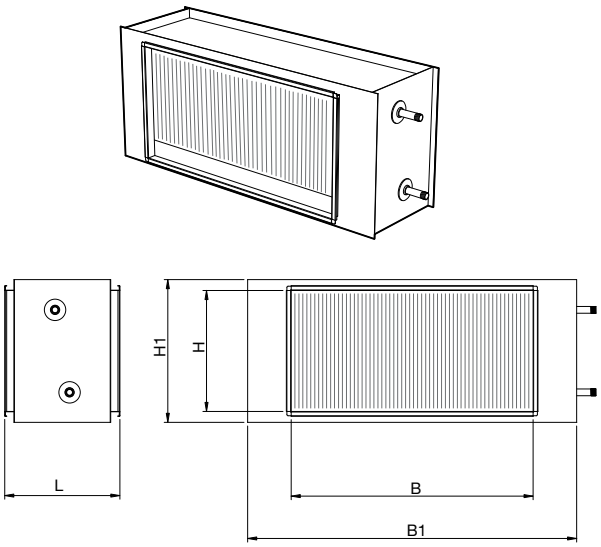
The ESET-TR is a trimming damper that, if needed, can be mounted in the extract air duct to ensure correct pressure balance for the rotor purging operation. Can be connected directly to the air handling unit or in the ductwork.

- The louvre damper is made of aluminium profiled sections and meets the provisions of Corrosion Resistance Class C4.
- The damper blades are driven by ABS-plastic gears and fitted with tubular gaskets made of fixed silicone rubber to ensure tightness.
- Permissible temperature range: -40 to +80 °C
  Permissible differential pressure: max. 1400 Pa
- Tightness Type 3 to VVS AMA-98.
- Lever actuator

Dimensions and Weights

Size	B (mm)	H (mm)	Wgt. (kg)
100	700	300	6
150	800	500	8
190	1000	500	9
240	1000	600	11
300	1200	600	13
360	1200	800	16
480	1400	800	18
600	1600	800	22
740	2000	900	28
850	2200	1000	29

Air Heater for Water (code: ESET-VV)



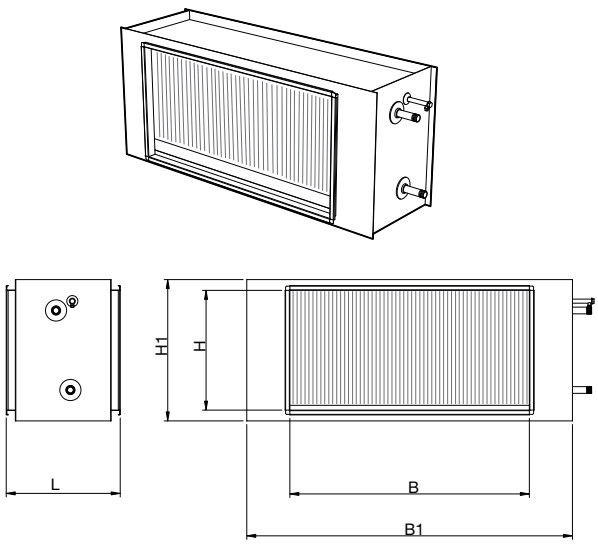
The ESET-VV is a built-in finned-tube heat exchanger for hot water. Can be connected directly to the air handling unit or in the ductwork.

- The casing consists of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections with male threads.
- Max. permissible operating pressure 15 bar.
- The air heater is made with rectangular PG slip clamp joints.

Dimensions, Connections and Weights

Size	Dimensions (mm)					Cap. var. / pipe conn.		Wgt. (kg)
	B	B1	H	H1	L	1	2	
100	700	820	300	340	150	20	20	15
150	800	920	500	540	150	20	25	20
190	1000	1360	500	590	380	20	25	35
240	1000	1360	600	690	380	20	25	40
300	1200	1570	600	690	380	25	25	45
360	1200	1570	800	890	380	25	25	60

Air Heater for Water, Thermoguard (code: ESET-TV)



The ESET-TV is a built-in finned-tube heat exchanger for hot water with type Thermoguard frost damage protection. Can be connected directly to the air handling unit or in the ductwork.

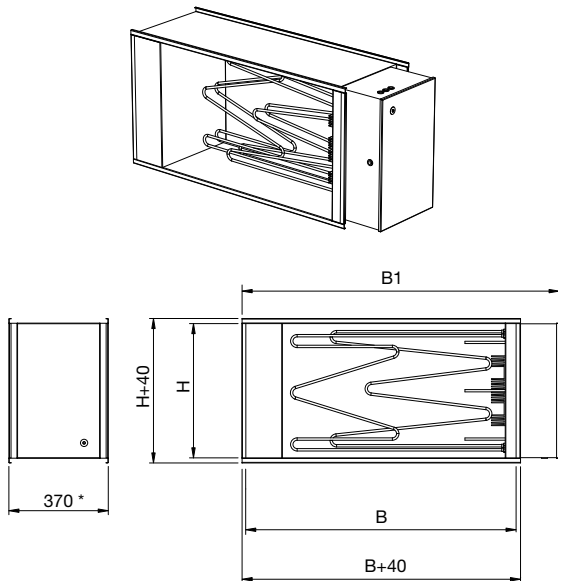
- The casing consists of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections with male threads.
- Max. permissible operating pressure 6 bar.
- The air heater is made with rectangular PG slip clamp joints.
- Type Thermoguard frost damage protection.

Dimensions, Connections and Weights

Size	Dimensions (mm)					Cap. var. / pipe conn.		Wgt. (kg)
	B	B1	H	H1	L	1	2	
100	700	885	300	355	245	15	15	15
150	800	985	500	540	245	15	20	20
190	1000	1365	500	590	380	15	25	35
240	1000	1365	600	690	380	20	25	40
300	1200	1570	600	690	380	20	32	45
360	1200	1570	800	880	380	25	32	60

If installed in a cold space, always provide the air heater with the means for relieving the pressure to the return pipe of the heating system. If a 2-way valve is used for controlling the flow, unconditionally fit the valve on the inlet pipework.

Electric Air Heater (code: ESET-EV)



* Size 100, capacity variant 3 = 500 mm
Size 300, capacity variant 4 = 500 mm
Size 360, capacity variant 4 = 500 mm

The ESET-EV is a built-in electric air heater of high-temperature design. Can be connected directly to the air handling unit or in the ducting.

- The casing consists of galvanized sheet steel.
- Fully equipped for controlling the heating output.
- Requires a separate power supply.
- Tubular stainless steel heating elements.
- The heaters have double thermal overload protection that switch off the power if overheating is likely. One of them must be manually reset.
- Degree of protection IP 43 to SS-EN 60529.
- The air heater has rectangular PG slip-clamp connections.

Dimensions and Weights

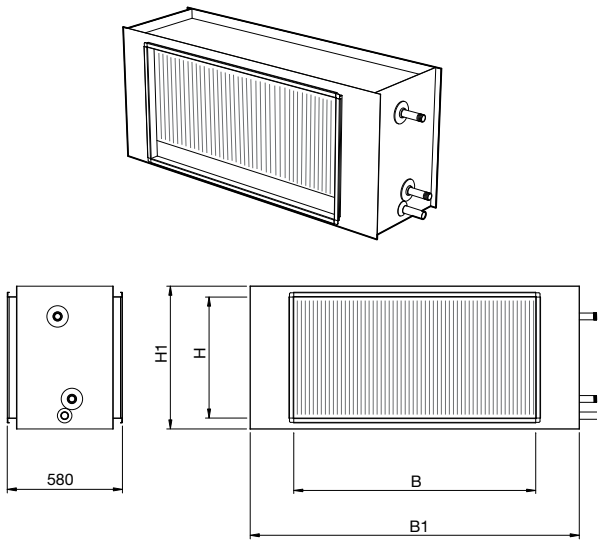
Size	Dimensions (mm)			Wgt. (kg)
	B	B1	H	
100	700	900	300	20
150	800	1020	500	25
190	1000	1180	500	35
240	1000	1180	600	45
300	1200	1405	600	50
360	1200	1405	800	60

Electrical Data

Size	Capacity variant / Output /Rec. fuse			
	1	2	3	4
100	6.0 kW 10A	13.5 kW 20A	27.0 kW 40A	–
150	6.5 kW 10A	15.5 kW 25A	25.0 kW 40A	39.0 kW 63A
190	10.0 kW 16A	21.5 kW 40A	34.5 kW 50A	54.0 kW 80A
240	13.5 kW 20A	27.0 kW 40A	47.0 kW 80A	72.0 kW 125A
300	15.0 kW 25A	30.0 kW 50A	49.5 kW 80A	84.0 kW 125A
360	18.0 kW 32A	36.0 kW 63A	60.0 kW 100A	100.0 kW 160A

See also the section: Wiring Diagrams and Fuses.

Air Cooler for Water (code: ESET-VK)



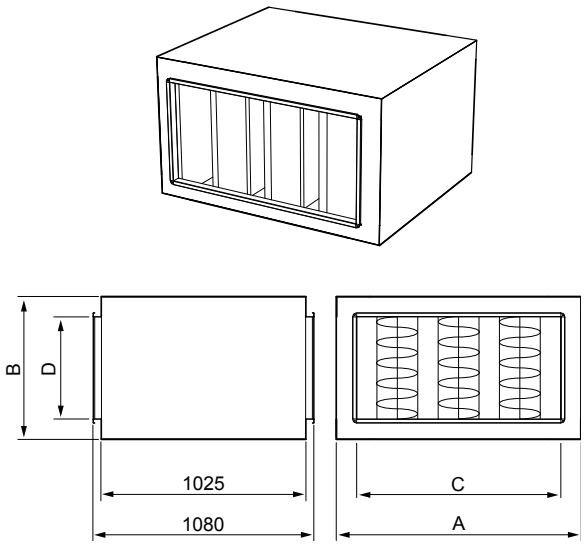
The ESET-VK VK air cooler is a built-in finned-tube heat exchanger for cooling with water. Can be connected directly to the air handling unit or in the ductwork.

- The casing consists of galvanized sheet steel.
- The coil body consists of copper tubes and aluminium fins.
- The headers have pipe connections with male theads.
- Max. permissibe operating pressure: 15 bar.
- A corrosion-resistant drip tray with a Ø 25 mm drain connection is situated on the bottom.
- The air cooler has rectangular PG slip-clamp connections.

Dimensions, Connections and Weights

Size	Dimensions (mm)				Pipe conn.	Wgt. (kg)
	B	B1	H	H1		
100	700	980	300	415	20	40
150	800	1080	500	590	25	50
190	1000	1360	500	590	32	60
240	1000	1360	600	690	25	65
300	1200	1570	600	690	32	75
360	1200	1570	800	890	32	85

Sound Absorber (code: EMT-02)



The EMT-02 is a duct sound absorber that can be connected directly to the air handling unit or in the ductwork.

- The sound absorber consists of a casing made of galvanized sheet steel with 200 mm thick baffle elements. The baffle elements are made of mineral wool and have a layer of Cleantech on the air side.
- The baffle elements are spaced 100 mm apart.
- The baffles have pointed edges for min. pressure drop.

Dimensions and Weights

Size	Dimensions (mm)				Wgt. (kg)
	A	B	C	D	
100	900	400	700	300	65
150	900	600	800	500	85
190	1200	600	1000	500	95
240	1200	700	1000	600	105
300	1500	700	1200	600	130
360	1500	900	1200	800	145
480	1800	900	1400	800	160
600	1800	1000	1600	800	175
740	2100	1000	2000	900	214
850	2400	1100	2200	1000	251

Sound Attenuation (dB)

Frequency band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation	8	11	19	29	40	35	27	19

Functional Fittings

As an alternative to duct-connected functions, the Envistar Flex can be coupled up to functions in unit casings on the supply and extract air sides. For more information about the casing, see Overview.

This provides insulated casings for post-treatment functions, greater coil capacity and cleanable sound absorbers.

The functions required are mounted inside a common modular casing. Alternatively, each section can also be supplied as a separate unit, depending on the space available and the air intake dimensions.

Unit Casing (code: EMM)

Length and Weight, Sizes 100-600

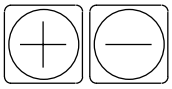
Module (mm)	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Size	**Weight (kg)***														
100	20	30	35	40	45	55	60	65	70	80	85	90	100	105	110
150	25	35	40	50	55	65	70	80	85	95	100	110	115	125	135
190	30	35	45	55	65	70	80	90	100	105	115	125	135	140	150
240	30	40	50	60	65	75	85	95	105	115	125	130	140	150	160
300	35	45	55	65	75	85	95	105	115	125	125	145	155	165	175
360	35	45	55	65	75	90	100	110	120	130	145	155	165	175	185
480	40	50	65	75	85	100	110	125	140	150	165	175	185	200	210
600	40	55	70	85	95	110	125	140	150	165	180	198	205	220	235
	Length (mm)														
	330	480	630	780	930	1080	1230	1380	1530	1680	1830	1980	2130	2280	2430

Length and Weight, Sizes 740-850

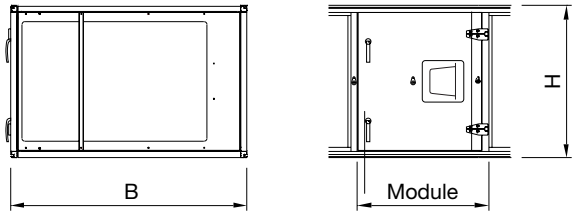
Module (mm)	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Size	**Weight (kg)***														
740	55	70	85	100	115	135	150	165	180	195	210	225	240	255	275
850	60	75	90	105	120	145	160	175	190	205	220	235	250	270	290
	Längd (mm)														
	370	520	670	820	970	1120	1270	1420	1570	1720	1870	2020	2170	2320	2470

* The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

Functions in the EMM Unit Casing

	Functional fitting	Module
	**MIE-FB/FC** The filter fitting consists of mounting rails for filters and casing front panel. The fitting is available in two versions; FB for bag filters or AL filters and FC for panel filters.	10, 15 or 20 depending on the size of unit and type of flter.
	**MIE-CL Coil Function (water and DX)** Coils made of copper tubes and aluminium fins. Air heater for water (code: ELEV), Air cooler for water type Thermoguard (code: ELTV), Air cooler, water (code:ELBC) and air cooler DX (code:ELBD).	10, 15, 20 Varies depending on the capacity variant.
	**MIE-EL Electric Air Heater Function (EI)** Air heaters with steel heating rods, ELEE-HS (high temperature with equipment for capacity control).	15, 20, 25, 35 Varies depending on the capacity variant.
	**MIE-KM Inspection Function** Inspection doors hung on hinges.	10, 15, 20 Varies according to need.
	**MIE-TD Empty Section** For special functions (e.g. for steam lances) or spacing.	10–80 Varies according to need.
	**MIE-KL Silencer Function** Withdrawable baffle elements made of mineral wool covered with cleanable woven fabric (Cleantech).	20, 30, 40, 50, 60 Varies depending on the desired sound attenuation.

Filter Fitting (code: MIE-FB/FC)



The filter fitting consists of mounting rails for securing the filters and a front casing panel. The fitting is designed for incorporation into a standard module(code EMM).

The fitting is available in two versions, FB for bag filters or AL filters and FC for panel filters:

FB can be fitted with:

- Synthetic filter, deep-folded, plastic frame, Class G4, F6, F7.
- Deep-folded bag filter with plastic frame, Class F6 to F9.
- Carbon filter, Class C7, with integrated prefilter to Class F7.
- Aluminium filter, knitted.

FC can be fitted with:

- Panel filter, Class G4 (code P4).

The following applies to both versions:

- The filters are mounted in rails and can be easily withdrawn and replaced.
- The filter rails made of acid-proof, stainless steel are available.
- The filter rails are fitted with effective sealing strips.
- The type FB filter inserts can be locked in position by means of an eccentric rails.
- Measurement tapping are provided for connection of a differential pressure gauge.

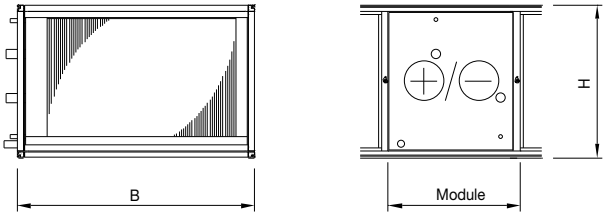
Dimensions and Weights

Size	Module (mm)*			Dimensions (mm)		Wgt. (kg)**
	10	15	20	B	H	
100	300	450	600	980	505	10
150	300	450	600	1080	695	10
190	300	450	600	1360	695	15
240	300	450	600	1360	805	15
300	300	450	600	1580	805	20
360	300	450	600	1580	990	25
480	300	450	600	1950	990	35
600	300	450	600	2160	1095	40
740	300	450	600	2480	1240	50
850	300	450	600	2560	1370	55

* Module 10 for panel filter P4, module 15 for Filter Class G4 and AL as well as F6-F9 size 100, module 20 for other types of filters.

** The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

Air cooler/heater (code: MIE-CL/ ELEV/ELTV/ELBC/ELBD)



The fitting is designed for:

- air heater for water (code ELEV)
- air heater for water, w. Thermoguard (code ELTV)
- air cooler for water (code ELBC)
- DX air cooler, direct expansion (code ELBD)

The fitting consists of mointing rails and casing front for incorporation into a standard module (code EMM).

- The coil body consists of copper tubes and aluminium fins with the following spacing:

ELEV, capacity variant 00	6 mm
ELEV, capacity variant 01, 04	2 mm
ELEV, capacity variant 02, 03	2.5 mm
ELBC, ELBD	2 alt. 3 mm
ELTV	1.6–3 mm

- Headers with pipe conn. 25 mm and smaller, are made of copper, those with larger connections are made of steel. They have male-threaded pipe connections and connections for venting and drainage. The ELEV also has a connection for an insertion sensor.*
- The ELBC and ELBD have stainless drip tray with a Ø 32 mm drain connection. Droplet eliminators are required for air velocities more than 2.8 m/s.
- The ELBC can be selected with long or short coupling (water path), making it possible to optimize the coil on the water side.
- The ELTV air heater has type Thermoguard anti-frost protection. If installed in a cold space, always provide the air heater with the means for relieving the pressure to the return pipe of the heating system. If a 2-way valve is used for controlling the flow, unconditionally fit the valve on the inlet piping.
- Max. permissible operating pressure:

ELEV, ELBC	1.6 MPa (16 atö)
ELBD	2.2 MPa (22 atö)
ELTV	0.6 MPa (6 atö)

- Max. permissible operating temperature:

ELEV	150 °C
ELTV	100 °C

* Does not apply to size 100 in cap. variant 00 and 01.

Dimensions

Size	Module (mm)			Dimensions (mm)	
	10	15	20	B	H
100	300	450	600	980	505
150	300	450	600	1080	695
190	300	450	600	1360	695
240	300	450	600	1360	805
300	300	450	600	1580	805
360	300	450	600	1580	990
480	300	450	600	1950	990
600	300	450	600	2160	1095
740	300	450	600	2480	1240
850	300	450	600	2560	1370

Type of Module

Size	Version / Capacity variant				
	ELEV, ELTV	ELBC			ELBD
	00–04	02–04	06	08	02–04
100	10	10	15	15	10
150	10	10	15	15	10
190	10	10	15	15	10
240	10	15	15	20	15
300	10	15	15	20	15
360	10	15	15	20	15
480	10	15	15	20	15
600	10	15	15	20	15
740	10	15	15	20	15
850	10	15	15	20	15

MIE-CL Accessories

- Air purging valve (code MIET-CL 01)
- Drain valve (code MIET-CL 02)
- T-pipe for anti-frost protection and venting/drainage (code MIET-CL 03)

See also section: Accessories.

ELBD Accessories

- 3 capacity steps (code ELBDT-01)

See also section: Accessories.

Weights (kg)

	Version /capacity variant																
	ELEV					ELTV				ELBC					ELBD		
Size	00	01	02	03	04	00	01	02	03	02	03	04	06	08	02	03	04
100	15	15	20	25	30	10	10	15	20	20	25	30	35	45	20	25	30
150	20	25	30	40	40	10	15	20	25	30	40	45	60	60	30	40	45
190	25	30	35	45	50	15	20	25	30	35	45	50	70	85	35	45	50
240	25	30	40	50	55	15	20	30	35	50	60	65	95	115	50	60	65
300	30	35	45	60	65	20	25	35	45	55	70	70	105	130	55	70	70
360	30	40	55	70	75	25	30	45	55	65	80	85	125	150	65	80	85
480	35	45	65	80	90	25	35	55	65	80	95	95	150	165	80	95	95
600	45	55	80	105	110	30	45	65	90	95	120	130	185	225	95	120	130
740	55	60	80	105	140	40	60	85	110	95	120	145	200	250	95	120	145
850	75	75	110	145	160	45	60	85	100	115	150	185	250	320	115	150	185

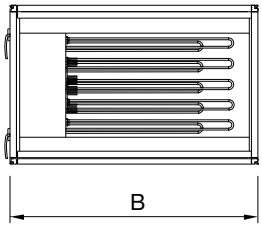
Pipe Connections

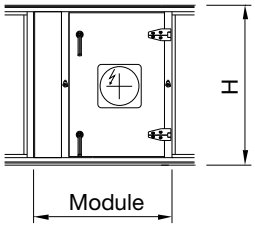
	Version / Capacity variant																					
	ELEV					ELTV				ELBC										ELBD		
										Short coil length					Long coil length					Conn. in : out		
Size	00	01	02	03	04	00	01	02	03	02	03	04	06	08	02	03	04	06	08	02	03	04
100	15	15	25	25	25	20	20	20	20	25	25	25	25	32	25	25	25	25	25	5/8":28	5/8":28	5/8":28
150	25	25	25	32	32	20	20	20	25	25	25	32	32	32	25	25	25	32	32	5/8":28	7/8":28	7/8":34
190	25	25	25	32	32	20	20	20	32	32	32	32	50	50	25	32	32	32	32	5/8":28	7/8":34	7/8":41
240	25	25	25	32	32	20	20	25	32	25	32	32	50	50	25	25	32	32	32	7/8":34	7/8":34	7/8":41
300	25	25	32	50	32	20	20	25	40	32	50	50	50	50	25	32	32	50	50	7/8":34	7/8":34	7/8":41
360	25	25	32	50	50	32	20	32	50	32	50	50	80	80	32	32	50	50	50	7/8":41	7/8":41	7/8":54
480	25	32	32	50	50	32	25	40	50	32	50	50	80	80	32	32	50	50	50	7/8":41	1 1/8:54	7/8":54
600	25	25	50	50	50	32	25	40	65	80	80	80	80	80	50	50	80	80	80	7/8":41	1 1/8:54	1 1/8:54
740	32	32	50	50	80	32	50	65	80	80	80	80	2× 80	80	50	50	80	80	80	7/8":41	7/8":54	7/8":54
850	32	32	50	50	80	40	40	50	65	80	80	2× 80	2× 80	2× 80	50	50	80	80	80	2× 7/8":54	7/8":54	7/8":54

Water Volume (l)

Size	ELEV, ELBC capacity variant								ELTV capacity variant			
	00	01	02	03	04	06	08	10	00	01	02	03
100	2	2	3	5	6	9	11	14	1.2	2.2	4.2	5.3
150	3	3	5	8	10	15	20	25	2.1	3.8	5.7	7.7
190	4	4	7	10	13	20	26	33	2.6	4.8	7.2	10.1
240	4	4	8	12	16	24	32	40	3.4	6	9	12.3
300	5	5	10	14	18	28	37	46	4.2	7	10.5	14.6
360	6	6	12	17	23	35	46	57	6.5	9.4	14.9	21.2
480	8	8	15	22	29	44	58	73	7.6	12	18.8	25.5
600	10	10	18	28	37	55	74	92	9.2	15	23.2	34.5
740	12	12	25	35	53	72	92	112	10.4	22.1	33.7	45.7
850	14	14	29	40	59	82	105	128	13	22.3	33.8	38.4

Electric Air Heater (code: MIE-EL/ELEE)





Fitting, MIE-EL

The electric air heater fitting consists of mounting rails, inspection cover and front casing panel, and is adapted for the ELEE electric air heater. The fitting is designed for incorporation into an EMM modular section.

Air heater, ELEE

The ELEE is an electric air heater in the high temperature version with integrated equipment for capacity control.

- Requires a separate power supply.
- The heating rods consist of stainless tubular elements.
- The heaters have double thermal overload protections that switch off the power if overheating is likely. One of them must be manually reset.
- Degree of protection IP 43 to SS-EN 60529.
- Available in several capacity variants per size. Other capacities are available to special order.

Dimensions

Size	Module (mm)				Dim. (mm)	
	15	20	25	35	B	H
100	450	600	750	1050	980	505
150	450	600	750	1050	1080	695
190	450	600	750	1050	1360	695
240	450	600	750	1050	1360	805
300	450	600	750	1050	1580	805
360	450	600	750	1050	1580	990
480	450	600	750	1050	1950	990
600	450	600	750	1050	2160	1095
740	450	600	750	1050	2480	1240
850	450	600	750	1050	2560	1370

Type of Module

Size	Capacity variant				
	01	02	03	04	05
100	15	15	15	20	25
150	15	15	20	20	25
190	15	15	20	25	25
240	15	20	20	25	25
300	15	20	20	25	25
360	15	20	20	25	–
480	15	20	25	–	–
600	15	20	25	–	–
740	30	30	30	–	–
850	30	30	30	–	–

Weight (kg)

Size	Capacity variant				
	01	02	03	04	05
100	25	30	35	40	50
150	40	45	50	60	75
190	45	50	60	75	100
240	50	55	65	95	120
300	55	60	75	105	140
360	55	65	80	120	–
480	70	80	110	–	–
600	75	90	130	–	–
740	100	115	135	–	–
850	110	135	155	–	–

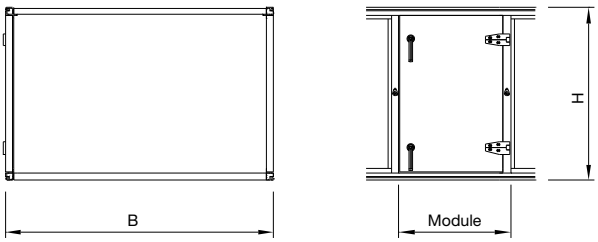
See also the section: Wiring Diagrams and Fuses.

Electrical Data

Size	Min. airflow (m^3/s)	Output variant	Total output (kW)	Rated current (A) for 3×400V~50Hz
100	0,33	01 02 03 04 05	5.0 9.0 19.0 34.0 54.0	7.2 13.0 27.4 49.1 77.9
150	0,5	01 02 03 04 05	7.5 15.0 27.0 47.0 67.5	10.8 21.7 39.0 67.8 97.4
190	0,63	01 02 03 04 05	9.0 17.0 39.0 67.5 90.0	13.0 24.5 56.3 97.4 129.9
240	0,77	01 02 03 04 05	13.0 24.0 47.0 81.0 120.0	18.8 34.6 67.8 117.0 173.2
300	1,0	01 02 03 04 05	15.0 27.0 54.0 98.0 135.0	21.7 39.0 77.9 141.5 196.0
360	1,2	01 02 03 04	17.0 34.0 67.5 120.0	24.5 49.1 97.4 173.2
480	1,6	01 02 03	24.0 47.0 92.0	34.6 67.8 132.8
600	2,0	01 02 03	27.0 54.0 116.0	39.0 77.9 167.4
740	3,3	01 02 03	48.0 86.0 135.0	69.3 124.1 196.0
850	3,9	01 02 03	54.0 96.0 135.0	77.8 138.2 196.0

See also the section: Wiring Diagrams and Fuses.

Inspection (code: MIE-KM)



The fitting consists of a front casing panel in the form of an inspection cover. The fitting is designed for incorporation into an EMM modular section.

Dimensions

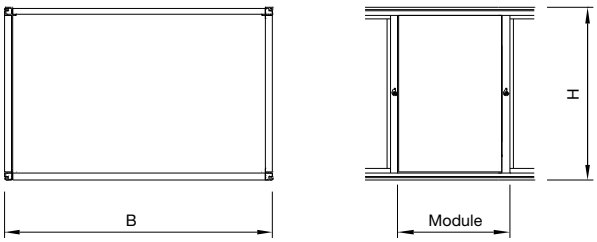
Size	Module (mm)			Dim. (mm)	
	10	15	20	B	H
100	300	450	600	980	505
150	300	450	600	1080	695
190	300	450	600	1360	695
240	300	450	600	1360	805
300	300	450	600	1575	805
360	300	450	600	1575	990
480	300	450	600	1950	990
600	300	450	600	2160	1095
740	300	450	600	2480	1240
850	300	450	600	2020	1370

Weights (kg)

Size	Module (mm)		
	10	15	20
100	5	5	5
150	5	5	5
190	5	5	5
240	5	5	5
300	5	5	5
360	5	5	10
480	5	5	10
600	5	5	10
740	10	10	15
850	10	15	15

The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

Empty Section (code: MIE-TD)



The fitting consists of a fixed front casing panel. The fitting is designed for incorporation into an EMM modular section.

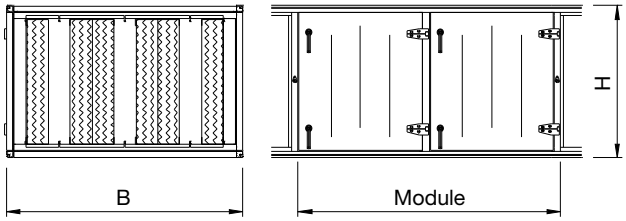
Dimensons

Size	Module (mm)																B (mm)	H (mm)
	05	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80		
100	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	980	505
150	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1080	695
190	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1360	695
240	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1360	805
300	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1575	805
360	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1575	990
480	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	1950	990
600	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2160	1095
740	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2480	1240
850	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2560	1370

Weights (kg)

Size	Module (mm)															
	05	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
100	5	5	5	5	5	5	5	10	10	10	10	10	15	15	15	15
150	5	5	5	5	5	5	10	10	10	15	15	15	15	20	20	20
190	5	5	5	5	5	10	10	10	10	15	15	15	15	20	20	20
240	5	5	5	5	10	10	10	10	15	15	15	20	20	20	20	25
300	5	5	5	5	10	10	10	10	15	15	15	20	20	20	20	25
360	5	5	5	10	10	10	15	15	15	20	20	25	25	25	25	30
480	5	5	5	10	10	10	15	15	15	20	20	25	25	25	25	30
600	5	5	5	10	10	15	15	15	20	20	25	25	25	30	30	30
740	10	10	15	15	20	20	25	25	30	30	35	35	40	40	45	50
850	10	10	20	20	20	25	25	30	35	35	40	45	45	50	55	55

Sound Absorber (code: MIE-KL)



The MIE-KL fitting consists of pointed-edge baffle elements. The fitting is designed for incorporation into an EMM modular section.

- The sound attenuators are 200 mm thick baffle elements.
- The baffle elements are made of mineral wool and are externally covered with cleanable woven fabric. The material is type-approved for use as lining inside ventilation ducts.
- In the UB version, (withdrawable) the baffles are mounted on rails and can be easily withdrawn for cleaning.
- In the EB version, non-withdrawable) the baffles are fixed in their positions.
- Max permissible temperature: 50 °C.
- The edges of the baffles are pointed to minimize pressure drop.
- The silencer is available in five different modular lengths to meet demands on sound attenuation.

Integral Attenuation (dB)

Version	Length of module	Octave band, mid frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
UB	20	5	7	12	23	38	30	27	13
	30	6	10	18	30	41	35	30	16
	40	7	11	20	32	43	37	31	17
	50	8	12	25	38	46	41	35	21
	60	10	16	30	44	49	44	38	24
EB	20	5	7	12	23	38	30	27	13
	30	6	10	18	30	41	35	30	16
	40	8	13	23	36	45	39	33	20
	50	9	15	28	42	48	43	37	23
	60	10	19	33	47	50	46	40	26

Dimensions

Size	Module (mm)					Dim. (mm)	
	20	30	40	50	60	B	H
100	600	900	1200	1500	1800	980	505
150	600	900	1200	1500	1800	1080	695
190	600	900	1200	1500	1800	1360	695
240	600	900	1200	1500	1800	1360	805
300	600	900	1200	1500	1800	1580	805
360	600	900	1200	1500	1800	1580	990
480	600	900	1200	1500	1800	1950	990
600	600	900	1200	1500	1800	2160	1095
740	600	900	1200	1500	1800	2480	1240
850	600	900	1200	1500	1800	2560	1370

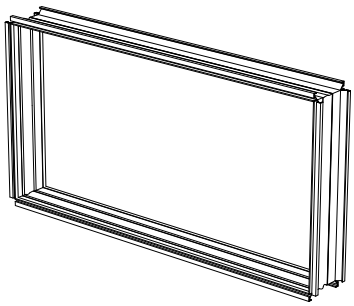
Weights (kg)

Size	Module with UB baffles				
	20	30	40	50	60
100	25	40	50	80	90
150	35	55	65	105	115
190	40	65	80	130	145
240	45	75	90	145	160
300	55	85	105	170	190
360	65	100	125	200	225
480	75	120	145	235	265
600	90	145	180	290	325
740	120	160	240	280	315
850	145	190	290	335	380

The specified weights refer to a casing with standard insulation. For a casing with insulation to Fire Resistance Class EI30, use the IV Produkt Designer product selection software for calculating the weight.

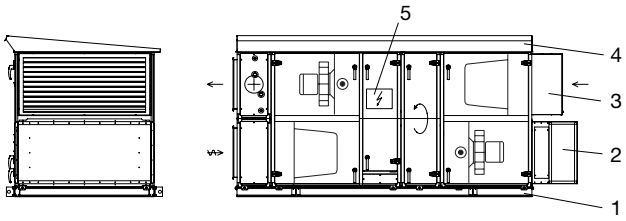
Accessories

Flexible connection (code: EMMT-03)



Made of flexible woven fabric for connection to ducting.
Length 110–150 mm.

Outdoor version (code: EMMT-04)



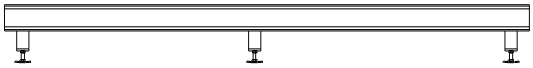
1. Base frame
2. Exh. air hood, optional
3. Intake grille, optional
4. Roof
5. Fan/filter section with built-in control cubicle

Supplementary kit for AHU installation outdoors. To install a roof, place the unit on a support frame or legs, on a water-tight roof. Connections cannot be arranged at the bottom.

Sizes 100–600 in the version with integrated controls are made with lengthened fan/filter section in which control equipment is then fitted. For units with air recirculation function, the Media section (code: EMR) is used instead of a lengthened fan/filter section.

- Roof made of plastic-coated profiled sheet steel.
- Optional extra exhaust air hood (code EMMT-04T-a-b-FD). For minimizing short-circuiting airflow effect.
- Optional extra exhaust air hood (code EMMT-04G-a-b). Air intake grille used for separating rain water and snow from the outdoor air.
- Base frame in most cases made of extruded natural anodised aluminium profiles. Height 100 mm. The frame has grooves for lifting lugs.
- For length, width, height and base frame dim. use IV Produkt Designer product selection software.

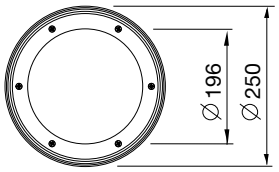
Base frame (code: EMMT-05)



Base frame for use as a support for air handling units, block sections and functional fittings.

- The base frame consists of extruded anodised aluminium profiled sections to be bolted together. The legs have adjustable feet.
- Height: 195–245 mm.
- Calculate the appropriate length and width in the IV Produkt Designer product selection software.

Inspection window (code: EMMT-06)

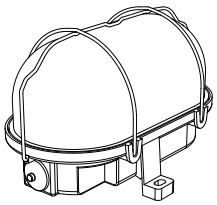


The inspection window consists of an inner and outer pane of Plexiglas. For 00 casings only (standard insulation) and module lengths greater than 10.

EMMT-06 = sizes 100–600

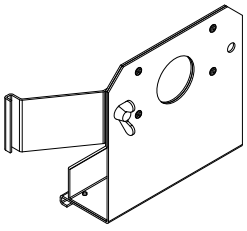
EMMT-11 = sizes 740–850

Interior light fitting (code: EMMT-07)



The light fitting is supplied installed inside the relevant unit sections with 2 metres long cable inside the fitting. On/off switches should be arranged with the other light switches in the fan room.

- The light fitting consists of a polykarbonate base with aluminium reflector and a grooved glass cover with steel wire protection.
- Enclosure Class IP44.
- Height: 175 mm, Width: 120 mm, Depth 115 mm.

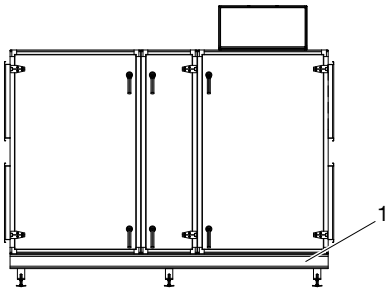


Lifting lug (code: EMMT-08)

The lifting lug is designed to be pushed into the appropriate slot in the aluminium profiled section, fit the load safety device and the module is ready for lifting.

Supplied in sets of 4 lifting lugs.

One-piece version (code EMMT-10)

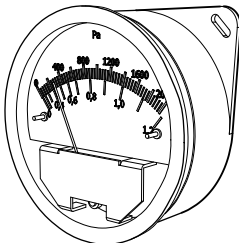


1. EMMT-05 Base frame

The Envistar Flex up to and including size 600 are available in a one-piece version.

- The functional sections of the air handling unit are supplied mounted and secured to the EMMT-05 base frame. Max. length: 6000 mm (sizes 100-360), 5000 mm (sizes 480-600)
- Length, width and height: use the IV Produkt Designer product selection software.

Flow meter, manometer type (code ESET-04)

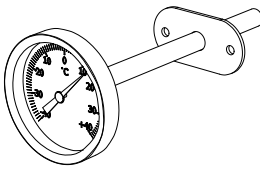


Stainless base plate, outd. air intake (code ESET-06)

Prefilter, outdoor air (code ESET-07).

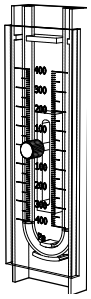
Panel filter, Class G4

Thermometer (code EMMT-16)



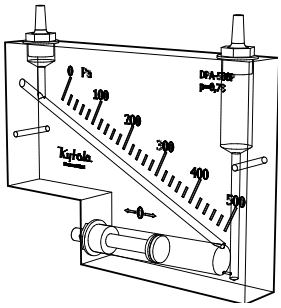
Dial thermometer, insertion type: -40 to +40 °C.

Filter guard, U-tube manometer (code MIET-FB 01)



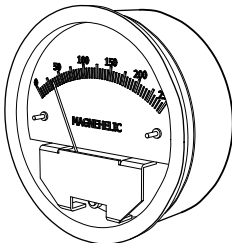
Range of measurement: 0±400 Pa

Filter guard, Kytölä manometer (code MIET-FB 02)



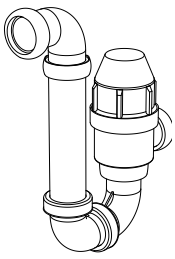
Range of meas: 0–500 Pa.

Filter guard, Magnehelic manometer (code MIET-FB 03)



Range of measurement: 0–250 Pa.

Water trap (code MIET-CL 04)



For condensate in the drain pipe-work.
Made of plastic with built-in non-return valve.

Wiring Diagrams and Fuses

Air handling units including control system

Safety isolating switch

A safety isolating switch should be installed and wired across the mains power supply cable.

Wiring diagrams

For wiring diagrams for the air handling unit with control equipment, see the wiring diagrams that accompany the air handling units when they are delivered.

Fuse protection for unit functions

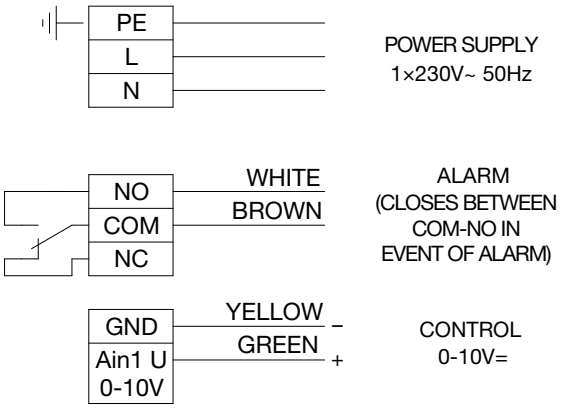
The unit functions have a common power supply. The following fuses are recommended.

Size	Fan variant / Rec. fuse protection					Cooling unit / Rec. fuse protection			Electric air heater
	E	0	1	2	3	Cap. var. 1	Cap. var. 2	Cap. var. 3	
100	230V+N 16AT	–	–	–	–	3×400V+N 16AT	–	–	For electric air heaters see recommended fuses on the following pages.
150	3×400V+N 10AT	–	–	–	–	3×400V+N 20AT	–	–	
190	–	3×400V+N 10AT	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 25AT	–	–	
240	–	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 16AT	–	3×400V+N 25AT	–	–	
300	–	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 16AT	–	3×400V+N 32AT	3×400V+N 50AT	–	
360	–	–	3×400V+N 16AT	3×400V+N 25AT	–	3×400V+N 40AT	3×400V+N 50AT	–	
480	–	–	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 40AT	3×400V+N 50AT	3×400V+N 63AT	–	
600	–	3×400V+N 25AT	3×400V+N 32AT	3×400V+N 40AT	3×400V+N 40AT	3×400V+N 63AT	3×400V+N 80AT	–	
740	–	–	3×400V+N 40AT	3×400V+N 63AT	–	3×400V+N 63AT	3×400V+N 80AT	3×400V+N 100AT	
850	–	–	3×400V+N 40AT	3×400V+N 63AT	3×400V+N 80AT	3×400V+N 80AT	3×400V+N 80AT	3×400V+N 125AT	

Components excluding controls

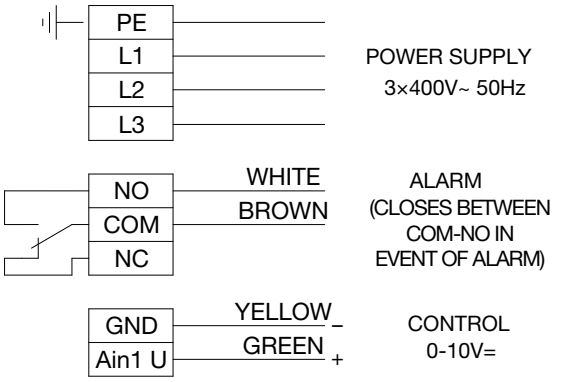
The following wiring diagrams apply to air handling unists supplied without controll equipment.

Fan/filter section, size 100 (code: ENF)



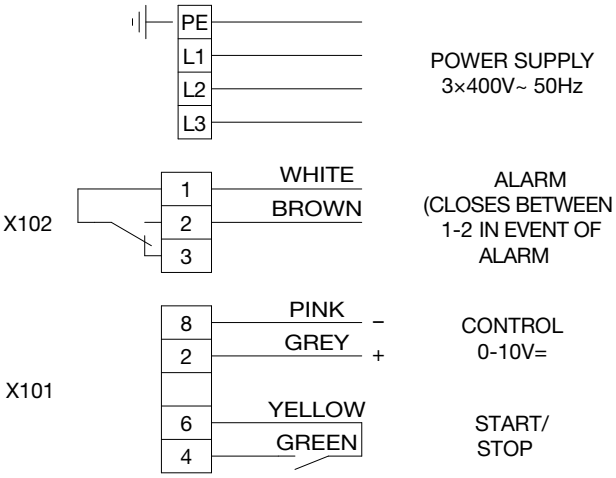
Rec. fuse protection
10AT

Fan/filter section, size 150 (code: ENF)



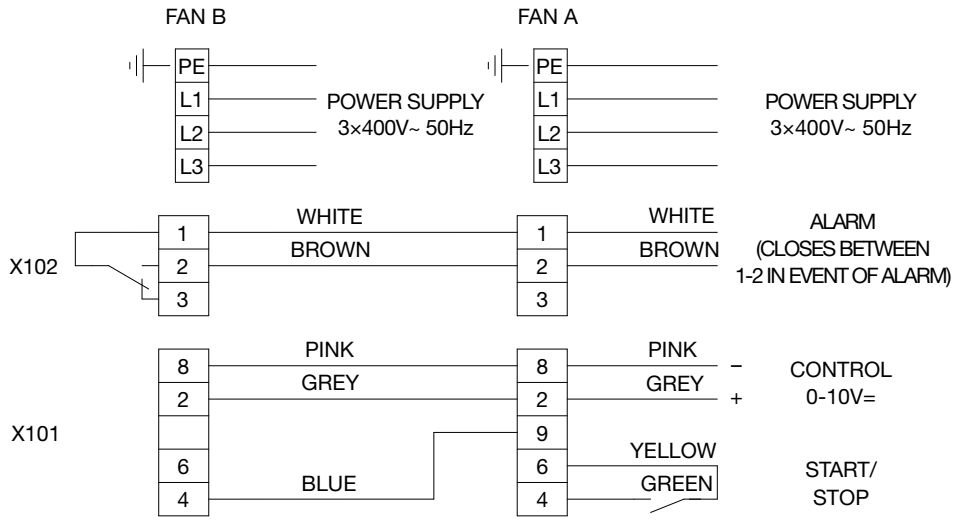
Rec. fuse protection
10AT

Fan/filter section, sizes 190-600, 740-1, 850-1 (code: ENF)



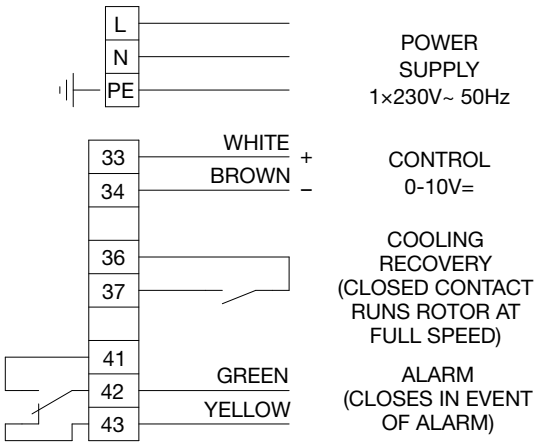
Size	Fan variant / Rec. fuse protection			
	0	1	2	3
190	3×400V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	3×400V+N 10AT
240	3×400V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	–
300	3×400V+N 10AT	3×400V+N 10AT	3×400V+N 10AT	–
360	–	3×400V+N 10AT	3×400V+N 10AT	–
480	–	3×400V+N 10AT	3×400V+N 16AT	3×400V+N 16AT
600	3×400V+N 10AT	3×400V+N 16AT	3×400V+N 16AT	3×400V+N 16AT
740	–	3×400V+N 16AT	se nästa sida	–
850	–	3×400V+N 16AT	se nästa sida	se nästa sida

Fan/filter section, sizes 740-2, 850-2, 850-3 (code: ENF)



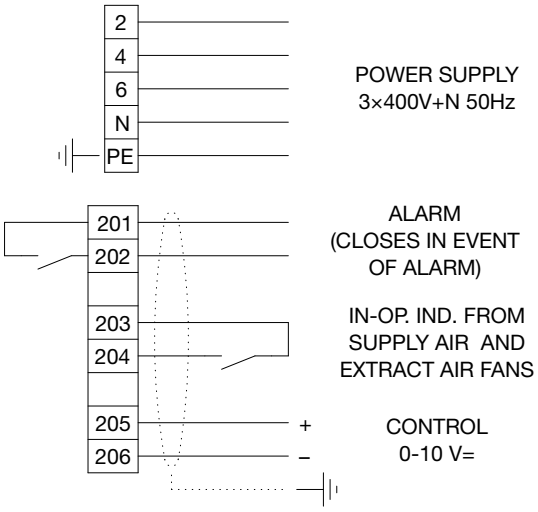
Rec. fuse protection
2 × 16AT

Heat recovery rotor (code: EXA)



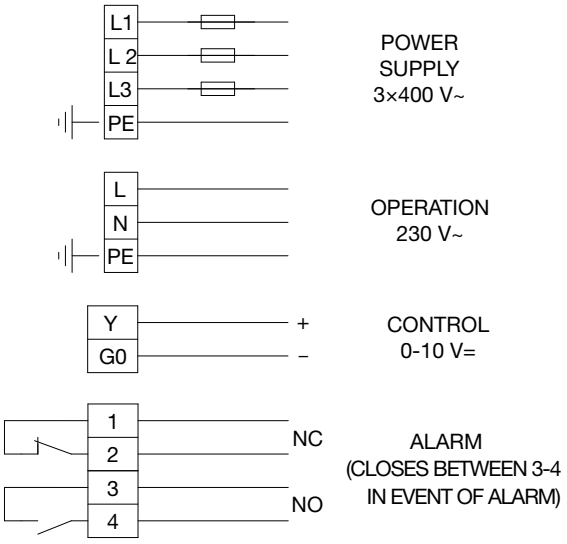
Rec. fuse protection
10AT

StarCooler cooling unit (code: ECU) and StarCooler with cooling recovery (code: ECR)



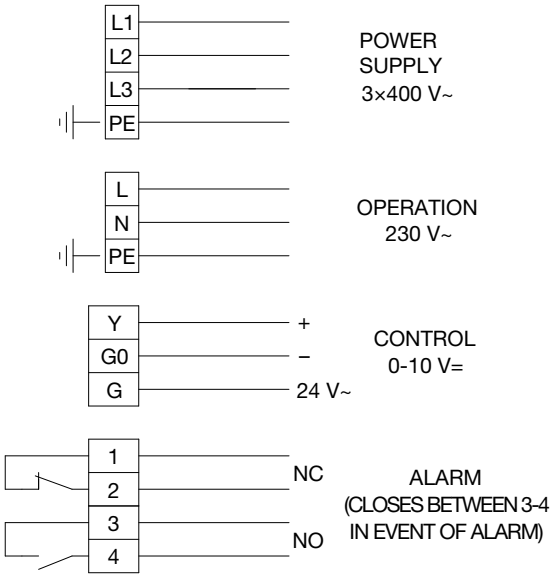
Size	Capacity variant / rec. fuse protection		
	01	02	03
100	3×400V+N 16A	–	–
150	3×400V+N 20A	–	–
190	3×400V+N 25A	–	–
240	3×400V+N 25A	–	–
300	3×400V+N 32A	3×400V+N 50A	–
360	3×400V+N 40A	3×400V+N 50A	–
480	3×400V+N 50A	3×400V+N 63A	–
600	3×400V+N 63A	3×400V+N 80A	–
740	3×400V+N 63A	3×400V+N 80A	3×400V+N 100A
850	3×400V+N 80A	3×400V+N 80A	3×400V+N 125A

Electric air heater ≤ 27 kW (code: ESET-EV)



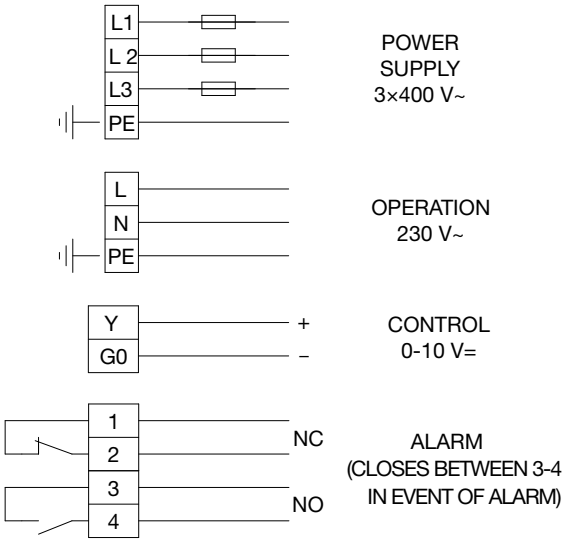
Size	Output variant / rec. fuse protection		
	1	2	3
100	3×400V+N 10A	3×400V+N 20A	3×400V+N 40A
150	3×400V+N 10A	3×400V+N 25A	3×400V+N 40A
190	3×400V+N 16A	3×400V+N 40A	–
240	3×400V+N 20A	3×400V+N 40A	–
300	3×400V+N 25A	–	–
360	3×400V+N 32A	–	–

Electric air heater ≥ 30 kW (code: ESET-EV)



Size	Output variant / Rec. fuse protection			
	1	2	3	4
100	–	–	–	–
150	–	–	–	3×400V+N 63A
190	–	–	3×400V+N 50A	3×400V+N 80A
240	–	–	3×400V+N 80A	3×400V+N 125A
300	–	3×400V+N 50A	3×400V+N 80A	3×400V+N 125A
360	–	3×400V+N 63A	3×400V+N 100A	3×400V+N 160A

Electric air heater (code: MIE-EL/ELEE)



Size	Output variant /Rec. fuse protection		
	01	02	03
100	3×400V+N 10A	3×400V+N 16A	3×400V+N 32A
150	3×400V+N 16A	3×400V+N 25A	3×400V+N 40A
190	3×400V+N 16A	3×400V+N 25A	3×400V+N 63A
240	3×400V+N 20A	3×400V+N 40A	3×400V+N 80A
300	3×400V+N 25A	3×400V+N 40A	3×400V+N 80A
360	3×400V+N 25A	3×400V+N 50A	3×400V+N 100A
480	3×400V+N 35A	3×400V+N 80A	3×400V+N 160A
600	3×400V+N 40A	3×400V+N 80A	3×400V+N 200A
740	3×400V+N 80A	3×400V+N 160A	3×400V+N 200A
850	3×400V+N 80A	3×400V+N 160A	3×400V+N 200A

Size	Output variant / Rec. fuse	
	04	05
100	3×400V+N 50A	3×400V+N 80A
150	3×400V+N 80A	3×400V+N 100A
190	3×400V+N 100A	3×400V+N 160A
240	3×400V+N 125A	3×400V+N 200A
300	3×400V+N 160A	3×400V+N 200A
360	3×400V+N 200A	–

Controls

The purpose of this product catalogue is to provide information about the products in the Envistar Series and should be regarded as a complement to the IV Produkt Designer product selection software. Always do your sizing work in IV Produkt Designer before placing an order.

Control Equipment

General

A Siemens Climatix controller is available for incorporation into the Envistar air handling unit.

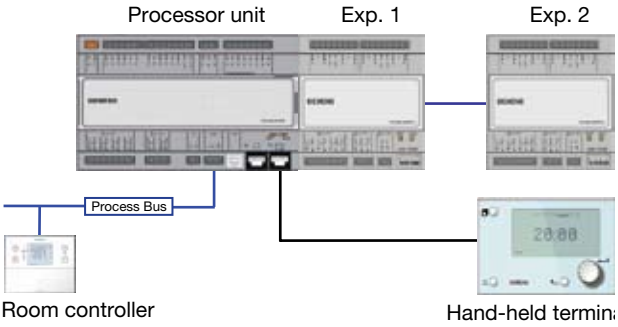
With the integrated control equipment, you obtain a complete, programmed and performance tested air handling unit with project-matched, ready-to-commission schedules.

The control equipment offers airflow and temperature optimization as well as simple-to-manage supervision.

All information is displayed in plain text via a hand-held micro terminal.

The control equipment can be equipped with a local room controller and extra hand-held micro terminals.

Up to 4 different climate zones can be controlled via external expansion modules and various smoke /fire functions are available.



System overview, Siemens Climatix

Delivery Options

As an option, the Envistar can be delivered without control equipment as follows:

- Without control equipment and cabling.
- Without control equipment, with cabling from the heat exchanger, fans and cooling unit, if required, to the connection unit.

  Top 04, 06, 10; cabling wired to the row of wiring terminals inside the air handling unit.

  Compact 04, 06, 10, 16; cabling wired to the row of wiring terminals inside the air handling unit.

  Envistar Flex and Top 16; a connection unit is mounted on top of the air handling unit.

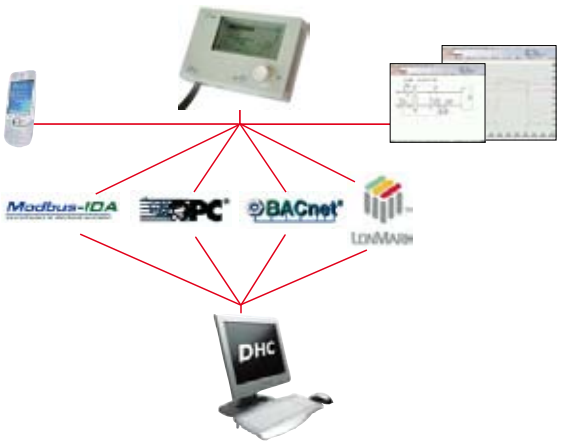
  The connection unit for the cooling section is inside the section's electric junction box.
- Control equipment without microprocesor unit.

  The air handling unit is equipped with control functions as selected in IVP Designer, however IV Produkt's processor unit is dismantled and replaced by row(s) of wiring terminals.

  The controls contractor supplies the microprocessor in its own enclosure, programs the system and wires cables to the row(s) of wiring terminals stated above.

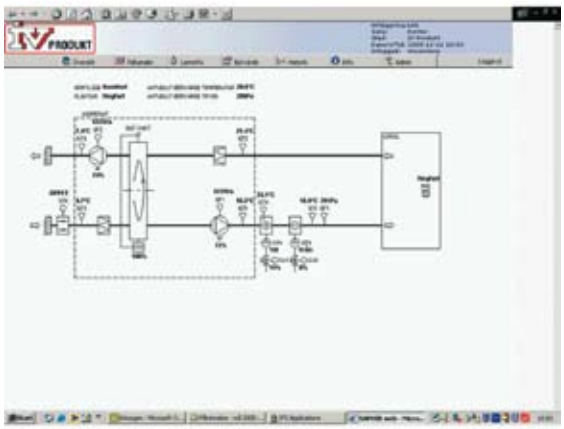
  IV Produkt encloses documents (wiring diagram) and a basic diagram of where/how wiring is thought to be carried out.

Communication



The control equipment has a processor unit with extensive functionality and several possibilities for communication:

- Modbus RTU RS-485 and TCP/IP (standard)
- Webserver in text format via TCP/IP (standard)
- BACnet via TCP/IP
- LON Works
- OPC via TCP/IP or modem
- SMS alarm via GSM modem
- Web server with dynamic flow chart via TCP/IP or modem

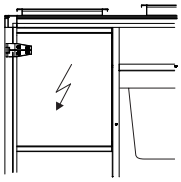


Typical flow chart from webservers

Location of the control cubicle

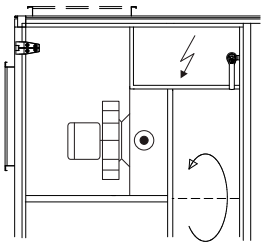
The location of the control cubicle in the various air handling units is shown below.

Top



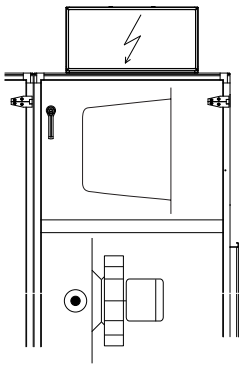
Location inside the Envistar Top in the left-hand version.

Compact

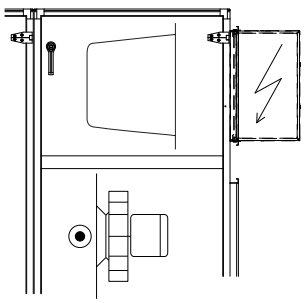


Location inside the Envistar Compact right-hand version, supply air in bottom level.

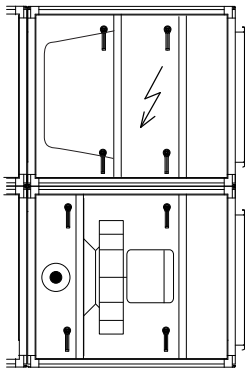
Flex



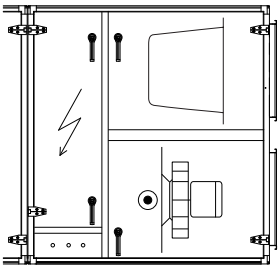
Location on top of the Envistar Flex, sizes 100, 150 and 190 by the end duct connection.



Location on the side of the Envistar Flex, sizes 240–600.
Also applies to 150–190 for top connection to ducting.



Location inside the Envistar Flex, sizes 740 and 850.



Location inside the Envistar Flex, sizes 100–600 outdoor version.

Norms and Standards

The air handling units that are supplied with factory-fitted control equipment, are ready for commissioning and are CE marked.

With regard to electrical and control equipment, the air handling units conform to, among others, the provisions of the following standards:

EN 60204-1, ELSÄK 2008:1 (electical safety), SS-EN 60529 and SS 436 4000

EMC Directive 2004/108/EG, EN 61000-6-2, EN 61000-6-3

Low Voltage Directive 2006/95/EG.

Ambient Conditions

The ambient temperature by the controller must be within the range of -25 to +55 ˚C.

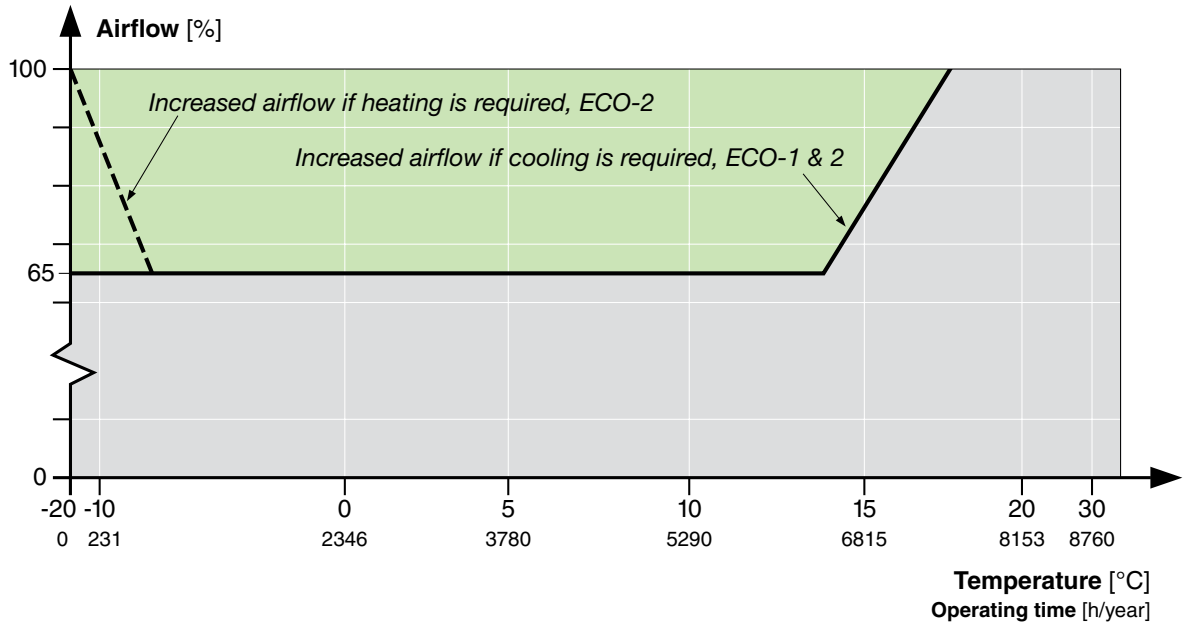
Safety Isolating Switch, Top/Compact

A safety isolating switch should be mounted and wired to each power supply point.

Functions

The controller makes it possible to control the following functions:

Temperature Control



ECO-1 Energy-optimized Control

- Energy-optimized supply and extract air control respectively; increases the airflow rate if cooling is required. The control function saves energy by season-compensating the airflow. The unit then operates at a lower airflow than what the cooling scenario requires.
- The unit switches between supply and extract air control depending on the preset outdoor temperature and according to the preset time.
- In parallel with temperature control in the cooling scenario, an airflow control function increases the airflow according to the preset basic flow if the extract air temperature exceeds the preset setpoint by more than 0.5°C (adjustable).
- Active cooling starts up after the preset max. airflow for a cooling load has been reached.
- Supply air control
  The supply air temperature sensor communicates with the controller to maintain a constant supply air temperature by means of sequential control. The supply air setpoint is outdoor air compensated according to a preset curve. An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.
- Extract air control
  The extract air temperature sensor communicates with the controller to maintain a constant extract air temperature by means of sequential control. The extract air setpoint is outdoor air compensated according to a preset curve. An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.

ECO-2 Energy-optimized Control

- Energy-optimized extract air control increases the airflow rate if cooling or heating is required.

  The control function saves energy by season-compensating the airflow. The unit then operates at a lower airflow than what the cooling or the heating scenario requires.
- Active cooling starts up after the preset max. airflow for a cooling load has been reached.
- If heating is required, the airflow rate is increased in parallel with temperature control if the extract air temperature is not reached.
- The extract air temperature sensor maintains a constant extract air temperature by means of sequential control.

  The supply air temperature sensor communicates with the controller to restrict the supply air temperature within min. and max. limits.

  The extract air setpoint is outdoor air compensated according to a preset curve. An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.

Temperature Control (contd.)

Supply air control

- The supply air temperature sensor keeps the supply air temperature constant by means of sequential control.
- The supply air setpoint is outdoor air-compensated according to a preset curve. An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.

Extract air control

- The extract air temperature sensor keeps the extract air temperature constant by means of sequential control.
- The supply air temperature sensor restricts the supply air temperature within min. and max. limits. The extract air setpoint is outdoor air-compensated according to a preset curve.
- An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.

Room control, Alt.-1

- The room air temperature sensor keeps the room air temperature constant by means of sequential control.
  The supply air temperature sensor communicates with the controller to restrict the supply air temperature within min. and max.limits.
- The room setpoint is outdoor air compensated according to a preset curve. An alarm is initiated after a preset time if the supply air temperature deviates from the calculated setpoint.

Room control, Alt.-2

- Two room temperature sensors transmit a mean value to the controller which keeps the room air constant by means of sequential control. For more info., see Alt.-1.

Control optimization, Lindinvent

- The supply air temperature is controlled from Lindinvent's active supply air diffuser system for demand-controlled ventilation.

FRTR Extract air related supply air control

- The supply air temperature is controlled to the relevant setpoint by means of sequential control. The set point is compensated according to a preset curve by the preset extract air temperature. If the heating capacity from the unit air heater is insufficient, the fans are controlled to decrease the supply airflow.

Airflow

The flow is regulated by controlling the fans by means of the control variants below. The setpoints for 1 to 3 speeds can be entered via the hand-held micro terminal. A time schedule is used for switching between the speeds.

Fixed fan speed: 1 to 3 speeds

- Fixed fan speed on the SF and EF.

SF, EF Pressure control

- Maintains constant pressure in the SF and EF ducts. The pressure to the supply and extract air ducts is kept constant via pressure sensors and speed control of the fans.
- The setpoints for 1 to 3 speeds can be entered via the hand-held micro terminal. A time schedule is used for switching between the speeds.

SF, EF Pressure control and flow supervision

Maintains constant pressure in the SF and EF ducts by means of SF, EF flow supervision.

SF Pressure control with slave control of EF and flow supervision

- Maintains constant pressure in the SF duct and slave-controls the EF airflow by means of SF, EF flow supervision. The pressure in the supply air duct is kept constant via pressure sensors and speed control of the fans.
- The airflow from the supply air fan slave-controls the airflow of the extract air fan via speed controlling the fan to balance the airflow in the premises. The function also makes it possible to offset the setpoint for compensating the purging airflow.
- The setpoints for 1 to 3 speeds can be entered via the hand-held micro terminal. A time schedule is used for switching between the speeds.

EF Pressure control with slave control of SF and flow supervision

- Maintains constant pressure in the EF duct and slave-controls the SF airflow by means of SF, EF flow supervision. The pressure in the extract air duct is kept constant via pressure sensors and speed control of the fans.
- The airflow from the extract air fan slave-controls the airflow of the supply air fan via speed controlling the fan to balance the airflow in the premises. The function also makes it possible to offset the setpoint for compensating the purging airflow.
- The setpoints for 1 to 3 speeds can be entered via the hand-held micro terminal. A time schedule is used for switching between the speeds.

Airflow (contd.)

SF, EF Flow control and flow supervision

- Keeps the airflow from the SF and EF constant. The airflow in the air handling unit is kept constant via sensors in each fan inlet and by controlling the speed of the fans.
- The setpoints for 1 to 3 speeds can be entered via the hand-held micro terminal. A time schedule is used for switching between the speeds.

Air quality (CO_2) control of the fans

- When the CO_2-sensor (room or duct sensor) reading exceeds the preset limit values, the fans are accelerated to increase the airflow rate.

Recovery


The capacity of the heat exchanger is controlled and supervised as follows:

Rotary heat exchanger

- The capacity of the heat exchanger is controlled in sequence with the heating and cooling coil. The internal controller of the heat exchanger controls the speed of rotation and thus the efficiency on energy recovery.

Supervision for preventing frost formation in the rotary heat exchanger

- When the moisture in the extract air exceeds the preset value, the heat exchanger is controlled to maintain a preset exhaust air temperature.

Supervision of heat exchanger efficiency

- The temperature efficiency is measured across the heat exchanger when the control signal is 100%. Initiates an alarm if the efficiency is below the alarm limit.

Min. limitation of the exhaust air temperature in the rotary heat exchanger

- When the temperature in the exhaust air drops below the preset value, the controller decelerates the rotor to a lower speed of rotation.

Plate heat exchanger

- The capacity of the heat exchanger is controlled in sequence with the heating and cooling coil. A humidity sensor mounted in the extract airflow measures whether there is any risk of freezing.

  If there is risk of frosting, the controller reduces the heat recovery/controls a damper to make the supply air by-pass the exchanger thus limiting the exhaust air temperature to a minimum, in order to prevent frosting.

Supplementary heating

The supplementary heating capacity is regulated and supervised as follows:

Electric air heater

- The output of the air heater is regulated in sequence with the heat exchanger and cooling coil.
- The necessary control equipment for regulating the output is integrated into the air heater.
- The fans continuous to run to cool the air heater after the air handling unit has been switched off.

Air heater for hot water

- The capacity of the air heater is regulated in sequence with the heat exchanger and cooling coil.
- A frost guard sensor is supplied with air heater for water. The sensor forces the valve to close if there is risk of freezing and then stops the air handling unit, and keeps the air heater warm when the unit is idle.

Intermittent night heating

- The air handling unit starts up at night during the winter months to check whether the premises need to be heated. If so, the unit continues to operate until the preset extract air temperature is reached.
- Can be selected either with outdoor air or recirculated air (requires an air recirculation section).

Cooling

The following cooling functions are available:

StarCooler (code: ECU)

- The capacity of the cooling unit is regulated in sequence with the heat exchanger and the heating coil.

StarCooler with cooling energy recovery (code: ECR)

- The capacity of the cooling unit is regulated in sequence with the heat exchanger and the heating coil. The heat exchanger is controlled up to max. speed of rotation for cooling energy recovery.

Waterborne cooling

- The capacity of the cooling coil is controlled in sequence with the heat exchanger and the heating coil.

DX cooling in 1 step

- 1 step cooling is controlled in sequence with the heat exchanger and the heating coil. Normally-open, potential-free contact, max. 230 V.

DX cooling in 2-3 steps

- 2-3 step cooling is controlled in sequence with the heat exchanger and the heating coil. Normally-open, potential-free contacts, max. 230 V.

Night cooling

- The air handling unit starts up at night to cool the premises with outdoor air when the preset outdoor air and extract air temperatures are reached.

Cooling energy recovery via rotary heat exchanger

- If cooling is required and the outdoor air temperature exceeds that of the extract air by the preset difference, the heat exchanger starts at full speed. Must not be enabled with StarCooler (code: ECU).

Filters

SF/EF filter guards. An alarm is initiated when the pressure exceeds the preset value on each filter guard.

Other Control Functions

The following other control functions, among others, are available:

Control via yearly timer

The weekly program is a seven day program for starting and stopping and for 2 to 3 speed operation with provision for controlling the unit with various weekend programs.

Operation status information

The following operation status information can be easily read in the hand-held micro terminal.

The actual temperature in the supply air, extract air and outdoor air as well as operating status, fan status, current setpoints and output signals.

Circulation pump for the heating coil

The circulation pump stops when there is no heating load. When the unit is idle the pump is exercised.

The control equipment can be supplemented with an undercurrent alarm, STD06 (1-phase) or overcurrent alarm STD07 (3-phase) for alarm indication.

Circulation pump for the cooling coil

The circulation pump stops when there is no cooling load. When the unit is idle the pump is exercised.

The control equipment can be supplemented with an undercurrent alarm, STD06 (1-phase) or overcurrent alarm STD07 (3-phase) for alarm indication.

Operating time measurement

The total number of operating hours can be read in the hand-held micro terminal. Alarm indication according to the number of preset hours.

Alarms and In-service Indication

Indicated well visible on the hand-held micro terminal. The following events give rise to an indication:

- Deviation from the supply air temperature setpoint.
- Deviation in differential pressure/airflow.
- Alarm from rotary heat exchanger, cooling unit, electric air heater, Frost protection guard, supply air/extract air fan, sensor error, filter guards and external smoke/fire detectors etc. Group alarms and operating mode indication are wired to wiring terminals inside the air handling unit for future connection. The 50 most recent events via alarm history.

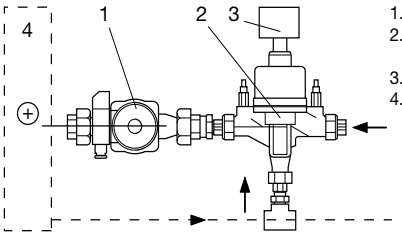
Accessories

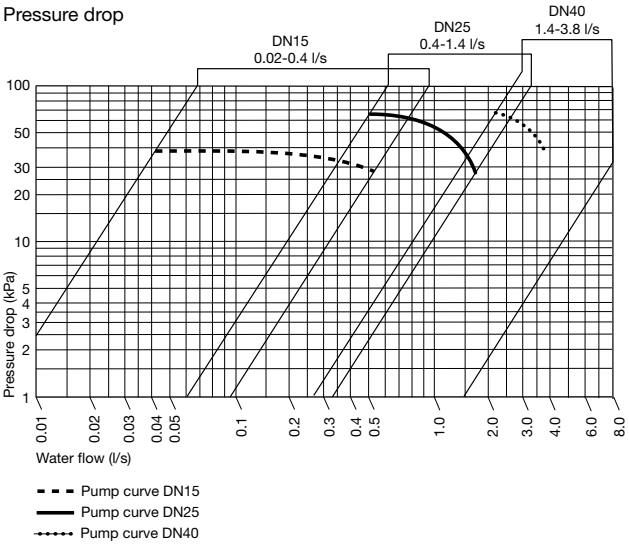
(See also the section: Ordering key, Control functions/ Accessories)

- Readable main switch (code: STF-01)
- Timer, 1-5 hours (code: STF-02)
- Operating mode control (code: STF-03-1, STF-03)
- External stop of air handling unit (code: STF-04)
- Occupancy detector (code: STF-05)
- Air quality sensor (CO_2), fans (code: STF-06)
- Filter guards, SF, EF (code: STG-01)
- Room controller (code: STG-02)
- Supervision, frosting rot. HXCH (code: STG-03)
- Min. limit. exh. air temp. rot. HXCH (code: STG-04)
- Efficiency measurement, HXCH (code: STG-05)
- Customized wiring diagram (code: STG-06)
- Hand-held micro terminal cable (code: STG-07)
- Extra hand-held micro terminal (code: STG-08)
- Transformer (code: STG-09)
- Pipework package (code: STD-05)

  For water heating with variable flow on primary side. The pump is sized for managing a water flow on the secondary side with up to 30kPa liquid pressure drop across the air heater. The system pressure on the primary side should be the pressure drop across the control valve in the fully open position.

  The 3-way valve has adjustable kvs-value that can be changed during operation. Valve actuator: 0-10V. On installation supplement the pipework package with shut-off valves (not included in the supply).





Smoke and Fire

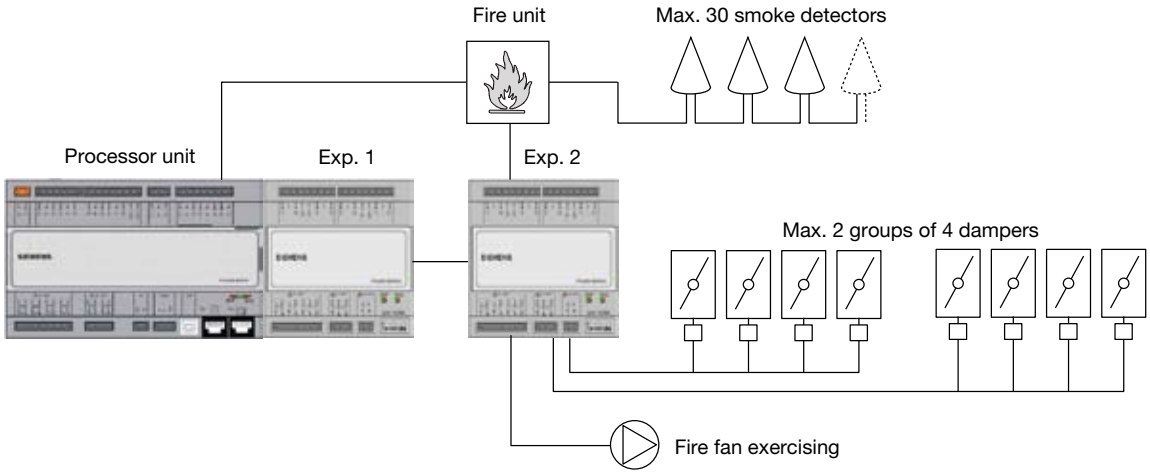
See each STH code, page 104.

Supervisory unit for controlling and supervising dampers with fire and/or fire gas function as well as smoke detectors. Fan control in the event of a fire where the following fan control systems can be selected with alarm. Fir fan exercising with pressure guard supervision.

- SF/EF stop, SF stop/EF operation, SF operation/EF stop, SF operation/EF operation
- Control of fire damper, SF shut off
- Control of fire damper, EF shut off
- Control of fire damper, SF shut off
- Control of fire damper, EF shut off

Examples with 2 damper groups

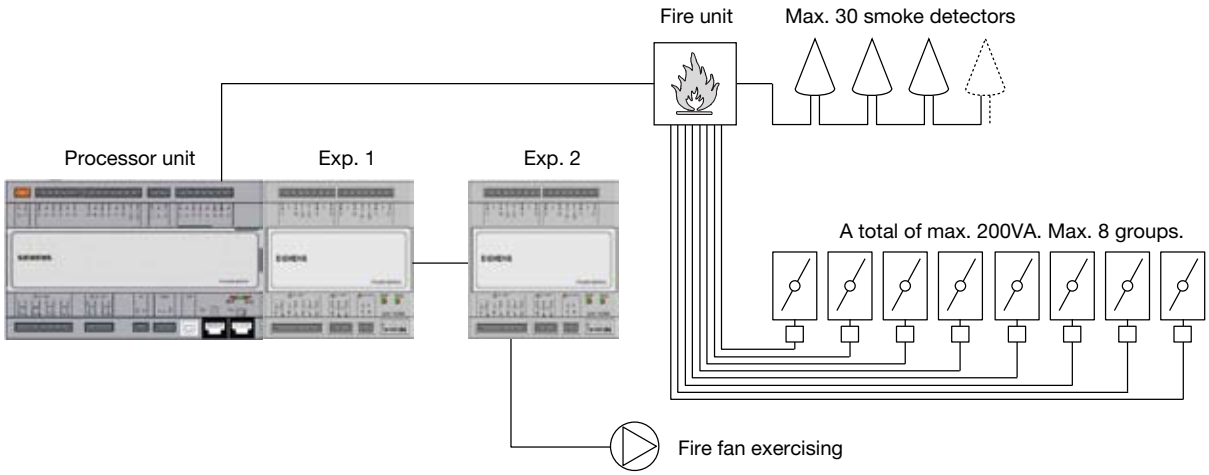
- Fire damper exercising, 1 group, max. 4 damper actuators, 24 VAC.
- Fire damper exercising, 2 groups, max. 8 damper actuators, 24 VAC.



Ex. Up to 4 dampers and 4 smoke detectors divided into 2 groups. The unit can also handle exercising fire dampers and fire fans.

Example with max. 8 damper groups

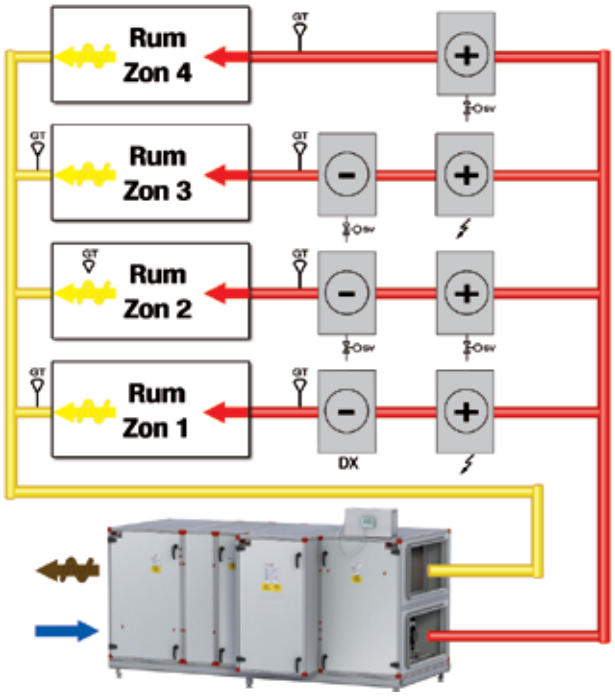
- Fire damper exercising, 8 groups, max. 200VA



Ex. Up to 16 dampers and 30 smoke detectors divided into max. 8 groups.

Zone Control

The control equipment can be supplemented with components for controlling 4 different zones if several different temperature zones are required in a ventilation system.



Each zone can control one or two air heat exchangers (coils), for example air heaters or air coolers.

As a alternative, Zone 1 can also be used for controlling a pre-heating coil on the outdoor air side.

Temperature Control

Temperature control for each zone can be selected as follows:

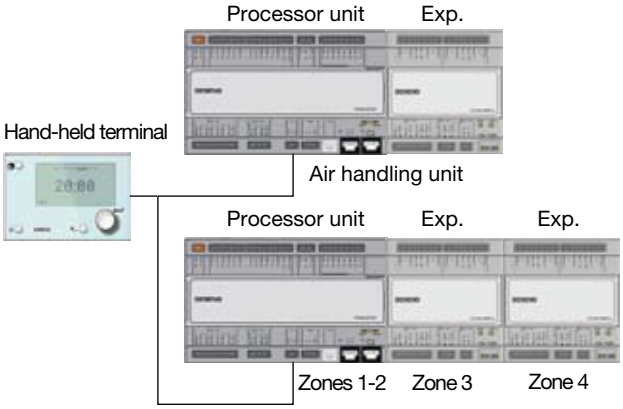
- Supply air control
- Extract air control
- Room control

Control valves

A control valve and valve actuator can be supplied for each zone coil. See our IV Produkt Designer product selection program for selecting appropriate valves.

Other Zone Functions

Example of 4 zones



Exercising of the circulation pumps for the various zone air heater/air cooler is controlled automatically. The pumps are exercised when the air handling unit is idle.

A frost guard in the form of a heat maintaining function and alarm limits for air heaters for hot water are individually controlled for each zone.

If an electric air heater is selected, there is an alarm for an overheating protection device.

Code Key, Control Functions/Accessories

The control equipment can be supplemented with functions/accessories for enhanced functionality as follows.

Control

Code	Function	Description
STA-01	ECO-1 Energy-optimized control	Supply air control in winter, extract air control in summer, and an airflow rate increase prior to cooling.
STA-02	ECO-2 Energy-optimized control	Energy-optimized extract air control with flow compensation in heating and cooling scenarios.
STA-03	Supply air control	Maintains a constant temperature in the supply air duct.
STA-04	Extract air control	Maintains a constant temperature in the extract air duct with restriction of the supply air temperature within min. and max. limits.
STA-05	Room control	Maintains a constant temperature in the premises with restriction of the supply air temperature within min. and max. limits.
STA-06	Control optimization, LindinVent	Control communication with LindinVent's type TTD Ceiling air diffusers.
STA-07	Extract air Related Supply air control, FRTR	The supply air temperature is regulated in relation to the extract air temperature.

Airflow

Code	Function	Description
STB-01	Fixed fan speed, 1 to 3 speeds	Fixed SF and EF speeds.
STB-02	SF, EF pressure control	The pressure in supply and exhaust air ducts is kept constant via pressure sensors and speed control of fans. The set points for 1 to 3 speeds can be set via hand-held terminal. Switching between speeds takes place via time schedule.
STB-03	SF, EF pressure control and flow supervision	The pressure in supply and exhaust air ducts is kept constant via pressure sensors and speed control of fans. The airflow is supervised on SF, EF. The function also makes compensation possible. The set points for 1 to 3 speeds can be set via hand-held terminal. Switching between speeds takes place via time schedule.
STB-04	SF pressure control with slave control of EF and flow supervision	The pressure in supply duct is kept constant via pressure sensors and speed control of the fan. The airflow from the supply air fan slave-controls the airflow on the extract air fan via speed control of the fan to balance the airflow in the premises. The function also makes it possible to offset the setpoint for compensating the purging airflow. The setpoints for 1 - 3 speeds can be set in the hand-held terminal. Switching between speeds takes place via time schedule.
STB-05	EF pressure control with slave control of SF and flow supervision	The pressure in extract duct is kept constant via pressure sensors and speed control of the fan. The airflow from the extract air fan slave-controls the airflow on the supply air fan via speed control of the fan to balance the airflow in the premises. The function also makes it possible to offset the setpoint for compensating the purging airflow. The setpoints for 1 - 3 speeds can be set in the hand-held terminal. Switching between speeds takes place via time schedule.
STB-06	SF, EF flow control and flow supervision	Maintains constant airflow from the SF and EF. The airflow in the air handling unit is kept constant via sensors in each fan inlet and speed control of the fans. The setpoints for 1 to 3 speeds can be set on the hand-held terminal. Switching between speeds takes place via time schedule.

Dampers

Code	Function	Description
STC-01	Outdoor air damper actuator, ON/OFF, spring return	Outdoor air damper opens at the preset time before starting the AHU and closes when the unit stops. If the power fails, the spring return device closes the damper (24 VAC).
STC-02	Exhaust air damper actuator, ON/OFF, spring return	Exhaust air damper opens at the preset time before starting the AHU and closes when the unit stops. If the power fails, the spring return device closes the damper (24 VAC).
STC-03	Extract air damper actuator, ON/OFF, spring return	Extract air damper opens at the preset time before starting the AHU and closes when the unit stops. If the power fails, the spring return device closes the damper (24 VAC).
STC-10	Damper actuator ON/OFF, spring return, supplied separately	ON/OFF 24 VAC, spring return. The damper actuator must be mounted on the damper.

Heating

Code	Function	Description
STD-01	Frost guard, water heat, strap-on sensor	The frost guard takes over control of the heating valve if freezing is likely. Stops the air handling unit in the event of an alarm.
STD-02	Frost guard, waterborne heating, insertion sensor	The frost guard takes over control of the heating valve if freezing is likely. Stops the air handling unit in the event of an alarm.
STD-03	Valve with actuator for heating coil	2 or 3-way valve including actuator for controlling the water heating coil.
STD-04	Actuator for valve for heating coil	For control of the SQS65 or SQX62 valve actuator for waterborne heating.
STD-05	Pipework package	Pipework package with valves, actuators, circ.pump, max. pressrue drop coil, 30 kPa.
STD-06	Undercurrent alarm, 1-phase, circulation pump, heating	Undercurrent protection mounted in enclosure for alarm indication of circ. pump, heating circuit, max 1.5 A.
STD-07	Motor group, 3-phase, circ. pump, heating, max. 3A	Motor group for controlling and alarm indication of circ. pump, heating circuit (supplied separately, power supply from control equipment).
STD-08	El. heating, built-in controls	Control of the electric air heater with built-in controls, 0-10 VDC.
STD-09	Intermittent night heating	Starts the air handling unit at night for heating the premises.

Cooling

Code	Function	Description
STE-01	Built-in StarCooler cooling unit	Control and supervision of built-in cooling unit. StarCooler is a built-in cooling unit. Its capacity is controlled in sequence with the heat exchanger and heating coil.
STE-02	Built-in StarCooler cooling unit with cooling energy recovery	Control and supervision of built-in cooling unit with cooling energy recovery exchanger. StarCooler is a built-in cooling unit. Its capacity is controlled in sequence with the heat exchanger and heating coil. The heat exchanger is controlled to max. speed for cooling recovery. Applicable to Envistar Top and Envistar Flex air handling units.
STE-03	Waterborne cooling	Control of external valve actuator, 0-10 VDC, for waterborne cooling.
STE-04	Valve with actuator for cooling coil	2 or 3-way valve including actuator for controlling the water heating coil.
STE-05	Actuator for valve for cooling coil	For control of the SQS65 or SQX62 valve actuator for waterborne heating.
STE-06	Undercurrent alarm, 1-phase, circulation pump, cooling	Undercurrent protection mounted in enclosure for alarm indication of circ. pump, heating circuit, max 1.5 A.
STE-07	Motor group, 3-phase, circ.pump, cooling max 3A	Motor group for controlling and alarm indication of circ. pump, heating circuit (supplied separately, power supply from control equipment).

Contd. Cooling

Code	Function	Description
STE-08	DX cooling in 1 step	Control of 1 cooling step (potential-free normally-open contact, max. 230V 2A). 1 step cooling is controlled in sequence with the heat exchanger and heating coil. Normally-open, potential-free contact, max. 230 V.
STE-09	DX cooling in 2-3 steps	Control of 2-3 cooling steps (potential-free normally-open contacts, max. 230V 2A). 2-3 step cooling is controlled in sequence with the heat exchanger and heating coil. Normally-open, potential-free contact, max. 230 V.
STE-10	Night cooling with outdoor air	The AHU is started at night for cooling the premises with outdoor air. The AHU starts up at night during the summer months to detect whether the premises needs to be cooled with outdoor air. If night cooling is needed, the AHU continues to operate until the preset extract air temperature is reached.

Control

Code	Function	Description
STF-01	Readable main switch (Load separator)	Readable main switch fitted on the air handling unit.
STF-02	Timer, 1-5 hours	Prolonged AHU operation 1-5 hours, fans running at the selected speed.
STF-03	Mode control of forcing damper, interlocking el. heater, for instance	Various external operating mode control systems via potential-free, normally-open contact, max. 230V 2A.
STF-04	Externtal stop, air handling unit	The AHU is stopped via external potential-free contact by a fire alarm, for instance.
STF-05	Occupancy detector	When the occupancy detector is enabled, the AHU starts at the selected fan speed. The AHU returns to normal operation at the time preset on the detector.
STF-06	Air quality (CO_2) control, fans	Increases the SF, EF speed if the air quality is poor (CO2). When the CO_2 sensor (room or duct sensor) reading exceeds the preset limit value the airflow rate is increased.

Other Accessories

Code	Function	Description
STG-01	Filter guards, SF, EF	Alarm on excessive pressure across filters on SF, EF. When the pressure exceeds the preset value on each filter guard, an alarm is initiated.
STG-02	Room controller with, among others, readings, setp. displ., timer	Temp. setpoint displacement, temp. supervision, timer function, alarm supervision, operating time control.
STG-03	Supervision, frosting on heat exch.	When the humidity exceeds the preset value, the heat exchanger is controlled to maintain the preset exhaust air temperature.
STG-04	Min. limitation, exhaust air temperature, rotary heat exchanger	When the temperature in the exhaust air is below the preset value, the heat exchanger is controlled to operate at a lower rotor speed.
STG-05	Efficiency measurement, heat exchanger	The efficiency is measured across the heat exchanger and if the efficiency is too low, an alarm is initiated.
STG-06	Customised wiring diagram (symbols used)	The symbols denoting sensors, actuators, etc. are changed to agree with the client's specifications.
STG-07	Longer hand-held micro terminal cable	Longer cable for the hand-held terminal. Must not be lengthened near parallel power supply cables.
STG-08	Extra hand-held micro terminal	For external location in the premises, max. 25 meters, The cable must not be lengthened near parallel power supply cables.
STG-09	Transformer 3*230V	For supplying power to ventilation AHU for 3*230V mains voltage.

Smoke and Fire

Code	Function	Description
STH-01	Smoke detector, SF, duct mounting	Smoke detector, SF, initiates an alarm if there is smoke in the supply air duct. If the smoke detector trips, the AHU is stopped and an alarm is initiated. The smoke detector for duct mounting is of optical type. The detector must allways be wired to a control unit.
STH-02	Smoke detector, EF, duct mounting	Smoke detector, EF, initiates an alarm if there is smoke in the supply air duct. If the smoke detector trips, the AHU is stopped and an alarm is initiated. The smoke detector for duct mounting is of optical type. The detector must allways be wired to a control unit.
STH-03	Control unit smoke detector	Control unit for smoke detectors. The control unit is mounted in the control equipm. cubicle or in a separate enclosure for stopping the AHU and controlling smoke/combustion gas dampers, if required. Several smoke detectors (max. 30 units) can be wired to one control unit.
STH-04	Fan control in event of a fire	Various fan control systems for smoke/fire alarms. • Stop SF/EF, Stop SF/Operate EF, Operate SF/Stop EF, Operate SF/Operate EF • Control of fire damper, SF, shut off • Control of fire damper, EF, shut off • Control of fire damper, SF, evacuation • Control of fire damper, EF, evacuation
STH-05	Fire damper exercising 1 group, max. 4 damper actuators	Exercising of max. 4 damper actuators, 24 VAC, group alarm on a fault. At preset times the fire/compbustion gas dampers are exercised once every 48 hours. The AHU is stopped while this takes place. An alarm is initiated if any of the dampers has jammed (common alarm). If other makes of damper are supplied, they must have end position contacts and be for 24 VAC.
STH-06	Fire damper exercising 2 groups, max. 8 damper actuators	Exercising of max. 8 damper actuators, 24 VAC, group alarm on a fault. At preset times the fire/compbustion gas dampers are exercised once every 48 hours. The AHU is stopped while this takes place. An alarm is initiated if any of the dampers has jammed (common alarm). If other makes of damper are supplied, they must have end position contacts and be for 24 VAC.
STH-07	Fire damper exercising 8 groups, max. 200VA	Exercising of max. 8 damper groups, 24 VAC, individual alarm on a fault. Max. load: 200 VA. To be externally mounted.
STH-08	Control, fire damper, SF shut off excl. motor	On a smoke alarm from control unit, the fire damper in the supply air duct closes. Damper motor not included. The motor should be supplied in 24 VAC version with spring return and end position contacts.
STH-09	Control, fire damper, EF shut off excl. motor	On a smoke alarm from control unit, the fire damper in the extract air duct closes. Damper motor not included. The motor should be supplied in 24 VAC version with spring return and end position contacts.
STH-10	Control, fire damper, SF evacuation excl. motor	On a smoke alarm from control unit, the fire damper in the supply air duct closes. Damper motor not included. The motor should be supplied in 24 VAC version with spring return and end position contacts.
STH-11	Control, fire damper, EF evacuation excl. motor	On a smoke alarm from control unit, the fire damper in the extract air duct closes. Damper motor not included. The motor should be supplied in 24 VAC version with spring return and end position contacts.
STH-12	Fire fan exercising with pressure guard supervision	Exercising of fire fan (start signal potential-free, normally open contact, max. 24V) and pressure guard supervision.

Communication

Code	Function	Description
STI-01	Communication, LON	An open protocol to EN-14908 and connection via 78k Baud TP/FT-10. An open protocol with standard profile according to LON Works with 64 fixed SNVT:s.
STI-02	Communication, OPC	An open protocol for communication to Windows-based supervisory system. The communication card has a built-in OPC server for connection via TCP/IP or modem.
STI-03	Communication, WEB	Web server that enables the supervision of temperatures, flows, output signals and the logging of values etc. Changes in setpoints and time schedules. Forwarding of alarms via email. Dynamic and customized flow chart with values is saved in a built-in memory, presented by the built-in web server (no superior system is required, only an ordinary web browser such as Internet Explorer). Connection via TCP/IP or modem.
STI-04	Communication, SMS	Alarms, name of vent. system, date and time in plain text on mob. tel. with connection to GSM modem. SMS message is transmitted via a GSM modem to optional mobile telephone numbers. Typical alarm: From: +4670 123 456 Alarm: Class A Date: 2005-12-24 Time: 15:00 Info: Alarm Smoke/Fire Place: LA01, Knightsbridge, London
STI-05	Communication, BACnet	An open protocol according to B-AAC Profile and connection via Ethernet 10/100 Mbit. An open protocol for communication to supervisory system via TCP/IP or modem.
	Modbus RTU and TCP/IP included as standard	An open protocol via RS-485 and TCP/IP.
	Web server in text format included as standard TCP/IP	Web server in text format where among others temperatures, operating status, output signals, changes in setpoints, time schedules can be read and alarms can be reset.

Zones

Code	Function	Description
Zone 1 control/ Preheat		
Z1TR	Supply air control	Maintains a constant temperature in the supply air duct.
Z1FR	Extract air control	Maintains a constant temperature in the extract air duct with restriction of the supply air temperature within min. and max. limits.
Z1RR	Room control	Maintains a constant temperature in the premises with restriction of the supply air temperature within min. and max. limits.
Z1FV	Pre-heating	Maintains a constant temperature downstream of the preheating coil.
Zone 2 control		
Z2TR	Supply air control	Maintains a constant temperature in the supply air duct.
Z2FR	Extract air control	Maintains a constant temperature in the extract air duct with restriction of the supply air temperature within min. and max. limits.
Z2RR	Room control	Maintains a constant temperature in the premises with restriction of the supply air temperature within min. and max. limits.
SZ11	Zone control 1 heating/ preheating	Controlling and regulating the heating in Zone 1.
SZ12	2 or 3-way valve with actuator for heating coil 1	2 or 3-way valve including actuator for controlling the heating coil.

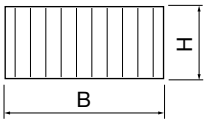
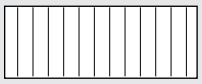
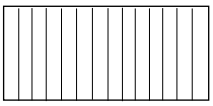
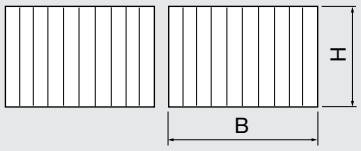
Contd. Zones

Code	Function	Description
SZ13	Zone control 1, cooling	Control and regulation of cooling in Zone 1.
SZ14	2 or 3-way valve with actuator for cooling coil 1	2 or 3-way valve including actuator for controlling the cooling coil.
SZ21	Zone control 2, heating	Control and regulation of heating in Zone 2.
SZ22	2 or 3-way valve with actuator for heating coil 2	2 or 3-way valve including actuator for controlling the heating coil.
SZ23	Zone control 2, cooling	Control and regulation of cooling in Zone 2.
SZ24	2 or 3-way valve with actuator for cooling coil 2	2 or 3-way valve including actuator for controlling the cooling coil.
Zone 3 control		
Z3TR	Supply air control	Maintains/ a constant temperature in the supply air duct.
Z3FR	Extract air control	Maintains a constant temperature in the extract air duct with restriction of the supply air temperature within min. and max. limits.
Z3RR	Room control	Maintains a constant temperature in the premises with restriction of the supply air temperature within min. and max. limits.
Zone 4 control		
Z4TR	Supply air control	Maintains a constant temperature in the supply air duct.
Z4FR	Extract air control	Maintains a constant temperature in the extract air duct with restriction of the supply air temperature within min. and max. limits.
Z4RR	Room control	Maintains a constant temperature in the premises with restriction of the supply air temperature within min. and max. limits.
SZ31	Zone control 3, heating	Control and regulation of heating in Zone 3.
SZ32	2 or 3-way valve with actuator for heating coil 3	2 or 3-way valve including actuator for controlling the heating coil.
SZ33	Zone control 3, cooling	Control and regulation of cooling in Zone 3.
SZ34	2 or 3-way valve with actuator for cooling coil 3	2 or 3-way valve including actuator for controlling the cooling coil.
SZ41	Zone control 4, heating	Control and regulation of heating in Zone 4.
SZ42	2 or 3-way valve with actuator for heating coil 4	2 or 3-way valve including actuator for controlling the heating coil.
SZ43	Zone control 4, cooling	Control and regulation of cooling in Zone 4.
SZ44	2 or 3-way valve with actuator for cooling coil 4	2 or 3-way valve iincluding actuator for controlling the cooling coil.

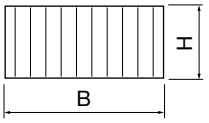
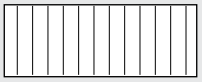
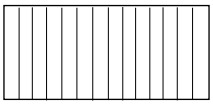
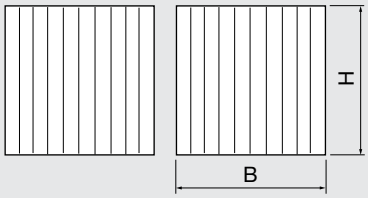
Filter Overview

Filters, Cross Section and Number of Filters

Envistar Top

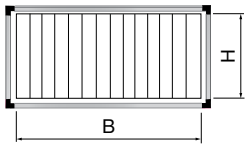
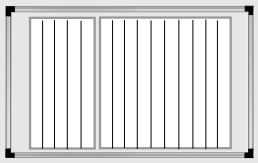
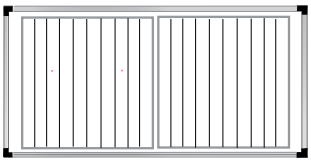
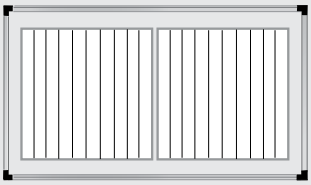
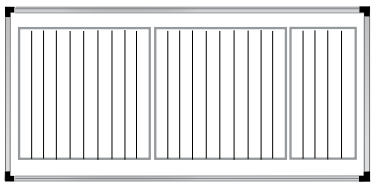
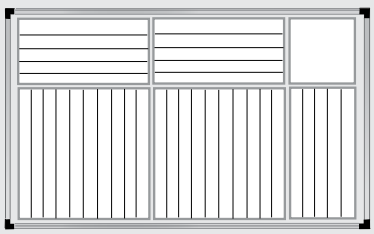
Unit size	Type of filter	No. of filters	Dimensions (mm)		Total filter area (m²)	Filter arrangement
			B × H	Length		
04	Bag filter F5–F7	1	650×287	320	F5 = 1.7 F7 = 2.2	
06	Bag filter F5–F7	1	790×287	370	F5 = 2.5 F7 = 3.1	
10	Bag filter F5–F7	1	892×380	520	F5 = 5.3 F7 = 6.4	
16	Bag filter F5–F7	2	592×400	520	F5 = 2 × 3.3 F7 = 2 × 4.5	

Envistar Compact

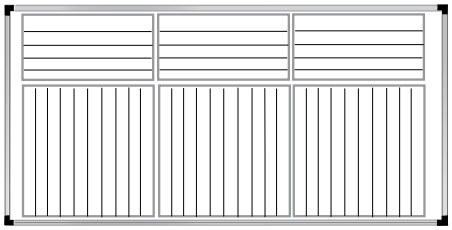
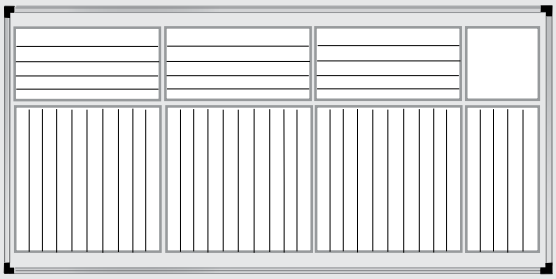
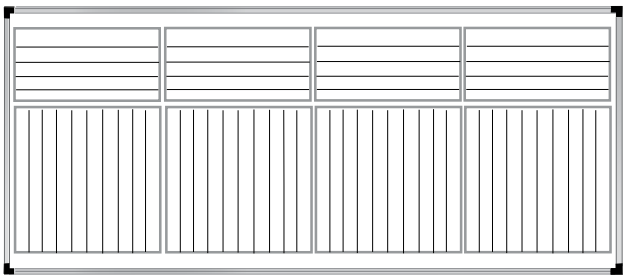
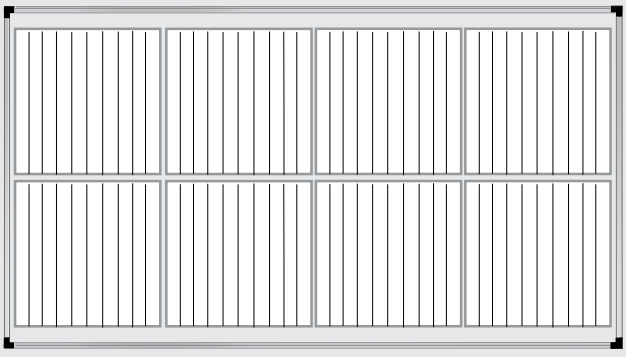
Unit size	Type of filter	No. of filters	Dimensions (mm)		Total filter area (m²)	Filter arrangement
			B × H	Length		
04	Bag filter F5–F7	1	650 × 287	320	F5 = 1.7 F7 = 2.2	
06	Bag filter F5–F7	1	790 × 287	370	F5 = 2.5 F7 = 3.1	
10	Bag filter F5–F7	1	892 × 409	370	F5 = 4.0 F7 = 4.9	
16	Bag filter F5–F7	2	592 × 592	370	F5 = 2 × 3.3 F7 = 2 × 4.6	

Filters, Cross Section and Number of Filters

Envistar Flex

Unit size	Type of filter	No. of filters	Dim. (mm) B × H	Dim. (mm) Length	Total filter area (m²)	Filter arrangement
100	Bag filter G4	1	892 × 409	360	2.4	
	Bag filter F6–F9	1	892 × 409	380	4.3	
	Panel filter P4	1	736 × 393	48	0.3	
	Aluminium filter	1	736 × 409	25	0.4	
	Carbon filter C7	–	–	–	–	
150	Bag filter G4	1 1	287 × 592 592 × 592	360 360	3.6	
	Bag filter F6–F9	1 1	287 × 592 592 × 592	535 535	9.8	
	Panel filter P4	1 1	292 × 596 596 × 596	48 48	0.5	
	Aluminium filter	1 1	287 × 592 592 × 592	25 25	0.5	
	Carbon filter C7	1 1	287 × 592 592 × 592	292 292	8.0	
190	Bag filter G4	2	592 × 592	360	4.8	
	Bag filter F6–F9	2	592 × 592	535	13.0	
	Panel filter P4	2	596 × 596	48	0.7	
	Aluminium filter	2	592 × 592	25	0.7	
	Carbon filter C7	2	592 × 592	292	16.0	
240	Bag filter G4	2	592 × 592	360	4.8	
	Bag filter F6–F9	2	592 × 592	535	13.0	
	Panel filter P4	2	596 × 596	48	0.7	
	Aluminium filter	2	592 × 592	25	0.7	
	Carbon filter C7	2	592 × 592	292	16.0	
300	Bag filter G4	1 2	287 × 592 592 × 592	360 360	6.0	
	Bag filter F6–F9	1 2	287 × 592 592 × 592	535 535	16.3	
	Panel filter P4	1 2	292 × 596 596 × 596	48 48	0.9	
	Aluminium filter	1 2	287 × 592 592 × 592	25 25	0.9	
	Carbon filter C7	1 2	287 × 592 592 × 592	292 292	19.5	
360	Bag filter G4	3 2	287 × 592 592 × 592	360 360	8.4	
	Bag filter F6–F9	3 2	287 × 592 592 × 592	535 535	22.9	
	Panel filter P4	3 2	292 × 596 596 × 596	48 48	1.2	
	Aluminium filter	3 2	287 × 592 592 × 592	25 25	1.2	
	Carbon filter C7	3 2	287 × 592 592 × 592	292 292	26.5	

Contd. Filters, Cross Section and No. of Filters

Unit size	Type of filter	No. of filters	Dimensions (mm) B × H	Dimensions (mm) Length	Total filter area (m²)	Filter arrangement
480	Bag filter G4	3 3	287 × 592 592 × 592	360 360	10.8	
	Bag filter F6–F9	3 3	287 × 592 592 × 592	535 535	29.4	
	Panel filter P4	3 3	292 × 596 596 × 596	48 48	1.6	
	Aluminium filter	3 3	287 × 592 592 × 592	25 25	1.5	
	Carbon filter C7	3 3	287 × 592 592 × 592	292 292	34.5	
600	Bag filter G4	4 3	287 × 592 592 × 592	360 360	12.0	
	Bag filter F6–F9	4 3	287 × 592 592 × 592	535 535	32.7	
	Panel filter P4	4 3	292 × 596 596 × 596	48 48	1.8	
	Aluminium filter	4 3	287 × 592 592 × 592	25 25	1.7	
	Carbon filter C7	4 3	287 × 592 592 × 592	292 292	38	
740	Bag filter G4	4 4	287 × 592 592 × 592	360 360	14.4	
	Bag filter F6–F9	4 4	287 × 592 592 × 592	535 535	39.0	
	Panel filter P4	4 4	292 × 596 596 × 596	48 48	2.2	
	Aluminium filter	4 4	287 × 592 592 × 592	25 25	2.0	
	Carbon filter C7	4 4	287 × 592 592 × 592	292 292	46.0	
850	Bag filter G4	8	592 × 592	360	19.2	
	Bag filter F6–F9	8	592 × 592	535	52.0	
	Panel filter P4	8	596 × 596	48	2.8	
	Aluminium filter	8	592 × 592	25	2.8	
	Carbon filter C7	8	592 × 592	292	64.0	

Ordering Key

The purpose of this product catalogue is to provide information about the products in the Envistar Series and should be regarded as a complement to the IV Produkt Designer product selection software. Always do your sizing work in IV Produkt Designer before placing an order.

Envistar Top

Air Handling Unit and Unit Components

Air handling unit (code: ATER, ATCR)

ATER -b-c-d-0-00
ATCR -b-c-d-e-00

b - Size	04, 06, 10, 16
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
d - Rotor	NO = Normal HY = Hygroscopic NP = Normal Plus HP = Hygroscopic Plus
e - Cap. variant Cooling unit	0 = Without cooling unit 1 = Capacity variant 1 (sizes 04-16) 2 = Capacity variant 2 (sizes 04-16) 3 = Capacity variant 3 (size 16)

Accessory:

ATET-04 -a	Flow meter, manometer type
a - Size	04, 06, 10, 16

Specify the inspection side when ordering.

Electric wiring (code: ATEK)

ATEK -a-b

a - Size	04, 06, 10, 16
b - Cooling unit	0 = Without 1 = With

Filter (code: ATEF)

ATEF -a-b

a - Size	04, 06, 10, 16
b - Filter class	F5, F7

Accessories:

ATET-06 -a	Stainless bottom plate. outdoor air intake
a - Size	04, 06, 10, 16
MIET-FB -a	Filter guard
a - Type	01 = Manometer, U-tube 02 = Manometer, Kytölä 03 = Manometer, Magnehelic

Air heater for water (code: ATEV, ATTV)

ETEV -a-b	**Air heater for water**
ETTV -a-b	**Air heater for water, Thermoguard**
a - Size	04, 06, 10, 16
b - Capacity variant	1, 2

Electric air heater (code: ATEE)

ATEE -a-b

a - Size	04, 06, 10, 16
b - Output variant	1 = sizes 04, 06, 10 2 = sizes 04, 06, 10 3 = size 16

Components for Duct Mounting

Shut-off damper (code: ETET-UM)

ETET-UM -a

a - Size	04, 04C*, 06, 10, 16

Trim damper (code: ETET-TR)

ETET-TR -a

a - Size	04, 04C*, 06, 10, 16

Sound absorber (code: ETET-LD)

ETET-LD -a-b

a - Size	04, 04C*, 06, 10, 16
b - Type	1, 2 = size 04 2 = sizes 04C*, 06, 10, 16

** Refers to ATCR-04 with rectangular duct connections.*

Accessories

Adjustable foot (code: ETET-01)

For mounting in base frames, set of 4 feet.

Flexible connection (code: ETET-02)

Flexible woven fabric, l = 110–150 mm.

ETET-02 -a

a - Size	04, 04C*, 06, 10, 16

Inspection Door Handle (code: ATET-07)

ATET-07 a-b-c-0

a - Size	04, 06, 10, 16
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Panel type	01 = Inspection door, small 02 = Inspection door, large

Inspection window (code: EMMT-06)

Plexiglas, not for E3 casing (Insulation, fire resistance class EI 30)

Interior light fitting (code: EMMT-07)

IP 44, with wire protection.

Thermometer (code: EMMT-16)

Dial thermometer, insertion type, -40 to +40 °C.

Water trap (code: MIET-CL 04)

Plastic, built-in non-return valve

** Refers to ATCR-04 with rectangular duct connections.*

Envistar Compact

Air Handling Unit and Unit Components

Air handling unit (code: ACER)

ACER -a-b-c-d-00

a - Size	04, 06, 10, 16
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Rotor	NO = Normal HY = Hygroscopic NP = Normal Plus HP = Hygroscopic Plus
d - Configuration	U1, U2, U3, U4, N1, N2, N3, N4

Accessory:

ACET-04 -a	Flow meter, manometer type
a - Size	04, 06, 10, 16

Specify the inspection side when ordering.

Electric wiring (code: ACEK)

ACEK -a-b

a - Size	04, 06, 10, 16
b - Cooling unit	0 = Without 1 = With

Filter (code: ACEF)

ACEF -a-b

a - Size	04, 06, 10, 16
b- Filter class	F5, F7

Accessories:

ACET-06 -a-b	Stainless base plate, outdoor air intake (for air handling unit without ACEC)
a - Size	04, 06, 10, 16
b - Supply air	U = Upper level N = Lower level
MIET-FB -a	Filter guard
a - Type	01 = Manometer, U-tube 02 = Manometer, Kytölä 03 = Manometer, Magnehelic

StarCooler cooling unit (code: ACEC)

ACEC -a-b-c-d-e-f

a - Size	04, 06, 10, 16
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Capacity variant	1, 2 (sizes 04-10) 3 (size 16)
d - Voltage	40 = 3×400V, 50Hz
e - Supply air	U = Upper level N = Lower level
f - Inspection side	H = Right-hand V = Left-hand

Accessory:

ACECT-01-a-b	Stainless base plate, outdoor air intake
a - Size	04, 06, 10, 16
b - Supply air	U = Upper level N = Lower level

Components for Duct Mounting

Damper (code: ECET-UM, -TR)

ECET-UM -a	**Damper excl. motor**
ECET-TR -a	**Damper with lever actuator**
a - Size	04, 06, 10, 16

Air heater for water (code: ECET-VV, -TV)

ECET-VV -a-b	**Air heater for water**
ECET-TV -a-b	**Air heater for water, Thermoguard**
a - Size	04, 06, 10, 16
b - Capacity variant	1, 2

Electric air heater (code: ECET-EV)

ECET-EV -a-b

a - Size	04, 06, 10, 16
b - Output variant	1, 2 (sizes 04-16) 3 (sizes 10, 16)

Air cooler, direct expansion (code: ECET-DX)

ECET-DX -a-b-c-d

a - Size	04, 06, 10, 16
b - Capacity variant	3
c - Number of stages	1, 2
d - Inspection side	H = Right-hand V = Left-hand

Air cooler for water (code: ECET-VK)

ECET-VK -a-b

a - Size	04, 06, 10, 16
b - Capacity variant	3

Sound absorber (code: ECET-LD)

ECET-LD -a

a - Size	04, 06, 10, 16

Accessories

Outdoor unit version (code: ACET-05)

Kit consisting of supplementary parts for installing the air handling unit outdoors.

ACET-05 -a-b

a - Size	04, 06, 10, 16
b - Version	0 = For air handling unit without ACEC 1 = For air handling unit with ACEC

Inspection Door Handle (code: ACET-07)

ACET-07 a-b-c-0

a - Size	04, 06, 10, 16
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Panel type	01 = Inspection door, small 02 = Inspection door, large 03 = Inspection door, ACEC cooling module

Adjustable foot (code ECET-01)

For mounting in base frames, set of 4 feet.

Flexible connection (code ECET-02)

Flexible woven fabric, l = 110–150 mm.

ECET-02 -a

a - size	04, 06, 10, 16

Inspection window (code: EMMT-06)

Plexiglas, not for E3 casing (Insulation, fire resistance class EI 30)

Interior light fitting (code: EMMT-07)

IP 44, with wire protection.

Thermometer (code: EMMT-16)

Dial thermometer, insertion type, -40 to +40 °C.

Water trap (code: MIET-CL 04)

Plastic, built-in non-return valve

Envistar Flex

Block Sections

Fan section, supply air (code: ENF)

ENF -a-b-c-d

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Fan variant	E = 100, 150 0,1,2,3 = 190 0,1,2 = 240-300 1,2 = 360 1,2,3 = 480 0,1,2,3 = 600 1,2 = 740 1,2,3 = 850
d - El. equipm.cubicle inside the section	00 = Without 01 = With (100–600 outdoor version only, 740-850)

ENFT-01 -a-b-c	Set of connections
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Connection no.	01, 02, 03, 04, 04, 05
ENFT-02	Swinging bracket, set (sizes 100-190)
ESET-04 -a-b	Flow meter, manometer type
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Fan variant	E = 100, 150 0,1,2,3 = 190 0,1,2 = 240-300 1,2 = 360 1,2,3 = 480 0,1,2,3 = 600 1,2 = 740 1,2,3 = 850
ESET-06 -a-b	Stainless bottom plate. outdoor air intake
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Supply air	U = Upper level N = Lower level
ESET-07 -a	Prefilter (supply air only)
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
ELEF -a-b	Filter
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Filter class	P4, G4,P6, F7, F8, F9, C7
MIET-FB -b	Filter guard
b - Type	01 = Manometer, U-tube 02 = Manometer, Kytölä 03 = Manometer, Magnehelic

Electric wiring (code: ESEK)

ESEK -a-b-c-d-e-f-g

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Version	11 = Unit 12 = Block 13 = Block module (sizes 240-600) 14 = Outdoor
c - Heat recov. rotor (code EXA)	R = With U = Without
d - Plate heat exch. (code EXC)	P = With U = Without
e - Cooling unit (code ECU)	C = With U = Without
f - Cool. unit, cool. recovery (code ECR)	R = With U = Without
g - Air recirc. section (code EBE)	B = With U = Without

Heat recovery rotor (code EXA)

EXA -a-b-c

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Rotor type	NO = Normal HY = Hygroscopic NP = Normal Plus HP = Hygroscopic Plus EX = Epoxy

Accessory:

EXAT-01-a	Edge-reinforced rotor (For rotor type NO/NP only)

Plate heat exchanger (code EXC)

EXC -a-b-c

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Plate exch. type	A = Aluminium B = Epoxy
d - version	NO = Normal NP = Plus

StarCooler cooling unit (code: ECU)

ECU -a-b-c-d-e-f-g

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Capacity variant	10 = 1 (sizes 100–850) 20 = 2 (sizes 300–850) 30 = 3 (sizes 740–850)
d - Water-cooled condenser	0 = Without 1 = With (cap.var. 2 and 3 only)
e - Voltage	40 = 3×400V+N, 50Hz
f - Supply air	U = Upper level N = Lower level
g - Inspection side	H = Right-hand V = Left-hand

StarCooler cooling unit with cooling energy recovery (code: ECR)

ECR -a-b-c-d-e-f-g-h

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Capacity variant	10 = 1 (sizes 100–850) 20 = 2 (sizes 300–850) 30 = 3 (sizes 740–850)
d - Water-cooled condenser	0 = Without 1 = With (cap.var. 2 and 3 only)
e - Voltage	40 = 3×400V+N, 50Hz
f - Rotor	NO = Normal HY = Hygroskopisk NP = Normal Plus HP = Hygroskopisk Plus
g - Supply air	U = Upper level N = Lower level
h - Inspection side	H = Right-hand V = Left-hand

Accessory:

ECRT-01 -a-c	Split version
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
c - Capacity variant	10 = 1 (sizes 100–850) 20 = 2 (sizes 300–850) 30 = 3 (sizes 740–850)

Air recirculation section (code: EBE)

EBE -a-b

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

Media section (code EMR)

EMR -a-b-c-1

a - Size	100, 150, 190, 240, 300, 360, 480, 600
b - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
c - Air recirc. damper	0 = Without 1 = With

Components for Duct Mounting

Damper (code: EMT-01, ESET-TR)

EMT-01 -a	**Damper excl. motor**
ESET-TR -a	**Damper with lever actuator**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850

Air heater for water (code: ESET-VV, -TV)

ESET-VV -a-b	**Air heater for water**
ESET-TV -a-b	**Air heater for water, Thermoguard**
a - Size	100, 150, 190, 240, 300, 360
b - Capacity variant	1, 2

Electric air heater (code: ESET-EV)

ESET-EV -a-b

a - Size	100, 150, 190, 240, 300, 360	
b - Output variant	1, 2, 3	(size 100)
	1, 2, 3, 4	(sizes 150, 190, 240, 300, 360)

Air cooler for water (code: ESET-VK)

ESET-VK -a-3

a - Size	100, 150, 190, 240, 300, 360

Sound absorber (code: EMT-02)

EMT-02 -a

a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850

Functional Fittings

Unit casing (code: EMM)

EMM -a-b-c	
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

Filter fitting (code: MIE-FB)

MIE-FB -a-b-c-d	**Bag filter fitting**
MIE-FC -a-b-c-d	**Panel filter fitting**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	10 = for FC panel filter 15 = for filter classes AL, G4, F6-F9 size 100 20 = for other types and sizes of filter
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
d - Filter rails	ST = Standard SF = Acid-proof stainless steel
ELEF -a-b	**Set of filters**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Filter class	AL, G4, P4, F6-F9, C7 sizes 150-850

Accessories for set of filters:

MIET-FB-01	**Filter guard, U-tube manometer**
MIET-FB-02	**Filter guard, Kytölä manometer**
MIET-FB-03	**Filter guard, Magnehelic manometer**

Air cooler/heater (code: MIE-CL/ELEV/ELBC/ELBD)

MIE-CL -a-b-c	**Fitting**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	10, 15, 20
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

Accessories:

MIET-CL 01	Air purging valve
MIET-CL 02	Drain valve
MIET-CL 03	T-pipe for anti-frost protection and venting/drainage

ELEV -a-b	**Air heater for water**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Capacity variant	00, 01, 02, 03, 04
ELTV -a-b-c	**Air heater, water, Thermoguard**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Capacity variant	00, 01, 02, 03, 04
c - Connection side	H = Right-hand V = Left-hand
ELBC -a-b-c-d-e-f	**Air cooler for water**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Capacity variant	02, 03, 04, 06, 08
c - Coil length	1 = Short coil length 2 = Long coil length
d = Fin spacing	20 = 2.0 mm 30 = 3.0 mm
e = Droplet eliminator	0 = Without 1 = With
f - Connection side	H = Right-hand V = Left-hand

ELBD -a-b-c-d-e-f	**Air cooler, DX**
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Capacity variant	02, 03, 04
c - Coil length	To be computed.
d = Fin spacing	20 = 2.0 mm 30 = 3.0 mm
e = Droplet eliminator	0 = Without 1 = With
f - Connection side	H = Right-hand V = Left-hand

Accessory:

ELBDT-01 -a	Number of cap. stages, DX air cooler
a - No. of cap. stages	1, 2, 3

Electric air heater (code: MIE-EL/ELEE)

MIE-EL -a-b-c	Fitting
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	15, 20, 25, 35
c - Front	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

ELEE -a-b -HS	Electric air heater
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Output variant	01, 02, 03 = 100-850 04 = 100-360 05 = 100-300

Inspection (code: MIE-KM)

MIE-KM -a-b-c	Fitting
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	10, 15, 20
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

Accessory:

MIET-KM-01-a	Air distributor

Empty section (code: MIE-TD)

MIE-TD -a-b-c	Fitting
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30

Accessory:

MIET-TD-01-a	Drip tray

Sound absorber (code: MIE-KL)

MIE-KL -a-b-c-d	Fitting
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Module	20, 30, 40, 50, 60
c - Casing	00 = Standard insulation E3 = Insulation, fire resistance class EI 30
d - Type of baffles	EB = Non-withdrawable baffles UB = Withdrawable baffles

Accessories

Flexible connection (code: EMMT-03)

Flexible woven fabric, l = 110–150 mm.

EMMT-03 -a	
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850

Outdoor version (code: EMMT-04)

EMMT-04 -a-b-c	Outdoor unit version
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - No. of levels	1, 2
c - Number of delivery units	01, 02, 03, 04, 05, 06, 07, 08, 09, 10

Accessory:

EMMT-04T -a-b	Avluftshuv
a - Size	060, 100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Fan type	FD

EMMT-04G -a-0	Exterior wall grille
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850

Base frame (code: EMMT-05)

EMMT-05 -a-b	
a - Size	100, 150, 190, 240, 300, 360, 480, 600, 740, 850
b - Length interval	0, 1, 2, 3, 4, 5 0 = 0–1000, 1 = 1000–2000 etc.

Inspection window (code: EMMT-06, EMMT-11)

Plexiglas, not for E3 casing (Insulation, fire resistance class EI 30)

EMMT-06	sizes 100–600
EMMT-11	sizes 740, 850

Interior light fitting (code EMMT-07)

IP 44, with wire protection.

Lifting lug (code EMMT-08)

For aluminium profiled sections.

One-piece version (code: EMMT-10)

EMMT-10 -a-b

a - Size	100, 150, 190, 240, 300, 360, 480, 600
f - Number of delivery units	01, 02, 03, 04, 05, 06, 07, 08, 09, 10

Thermometer (code: EMMT-16)

Dial thermometer, insertion type, -40 to +40 °C.

Water trap (code: MIET-CL 04)

Plastic, built-in non-return valve.

Control Equipment

Top, Compact and Flex

a-b-c-d

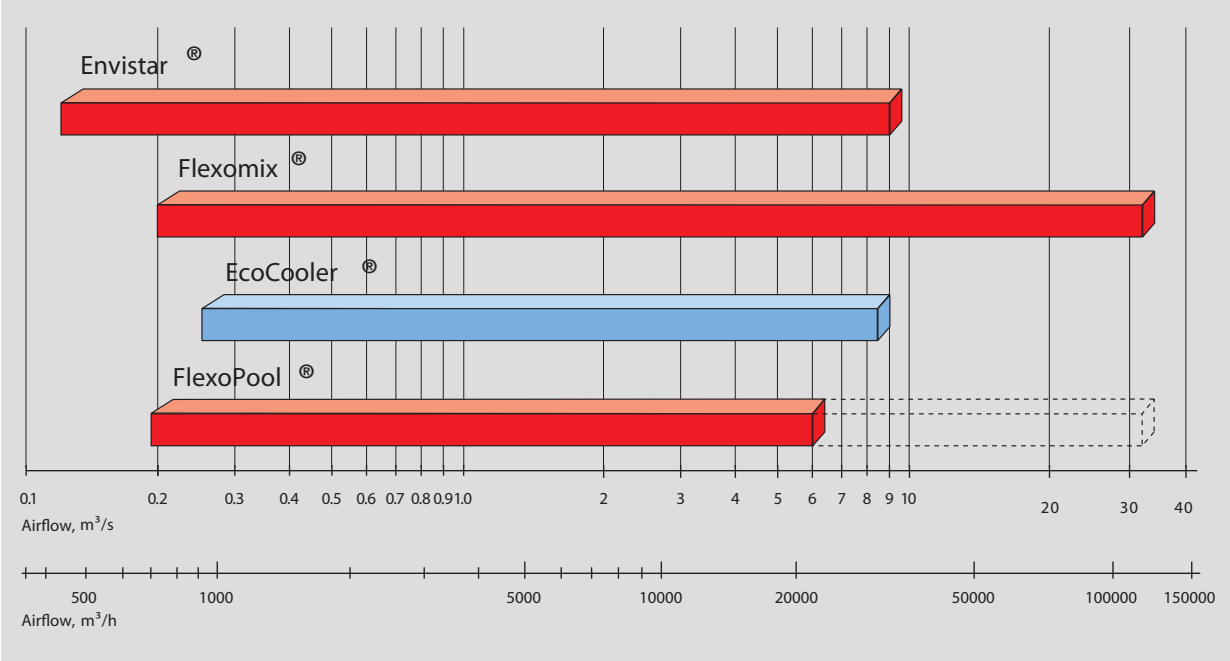
a - Air handling unit	CST = Top CSC = Compact CSF = Flex 100-600 indoor unit CSU = Flex 100-600 outdoor unit CSM = Flex 740-850
b - Motor control system	V110 = Speed controlled, 1-phase, 10A-230V V111 = Speed controlled, 1-phase, 10A-230V V310 = Speed controlled, 3-phase, 10A-400V V311 = Speed controlled, 3-phase, 10A-400V V316 = Speed controlled, 3-phase, 16A-400V V616 = Speed controlled, 2*3-phase, 16A-400V
c - Heat recovery	R = Rotary heat exchanger P = Plate heat exchanger
d - Control system	CX = Siemens Climatix 600 UC = Control equipment to wiring terminal, without processor unit MK = Without control equipment, with cabling (fans and rotor are wired to wiring terminals) US = Without control equipment and without cabling.

** See also Ordering Key: Control Functions/Accessories.*

The Air Handling Units by IV Produkt

IV Produkt's air handling units are flexible, designed to suit many different requirements in both public and private businesses. You can easily combine unit sections and find a total solution in our range of products.

An overview of IV Produkt's range of air handling units.



Envistar is a total solution and can be supplied in the one-piece unit version or as Modules. Available in 3 different models - The Top, Compact and Flex, which in turn are available in various sizes. The Siemens Climatix controller with a variety of different functions and several different communication options is available in the Envistar.

Flexomix is a Modular air handling unit that enables you to decide the version you want delivered. The units are available in 20 sizes and can be operated with any of 4 different types of energy recovery.

EcoCooler is a complete, stepless and speed-controlled cooling unit as an option for our Envistar Flex and Flexomix series. EcoCooler is available with or without cooling energy recovery. Requires no installations outdoors and is CE marked. It is an economical, reliable solution and is simple to install.

FlexoPool is a complete dehumidification plant for indoor swimming pools and water parks.

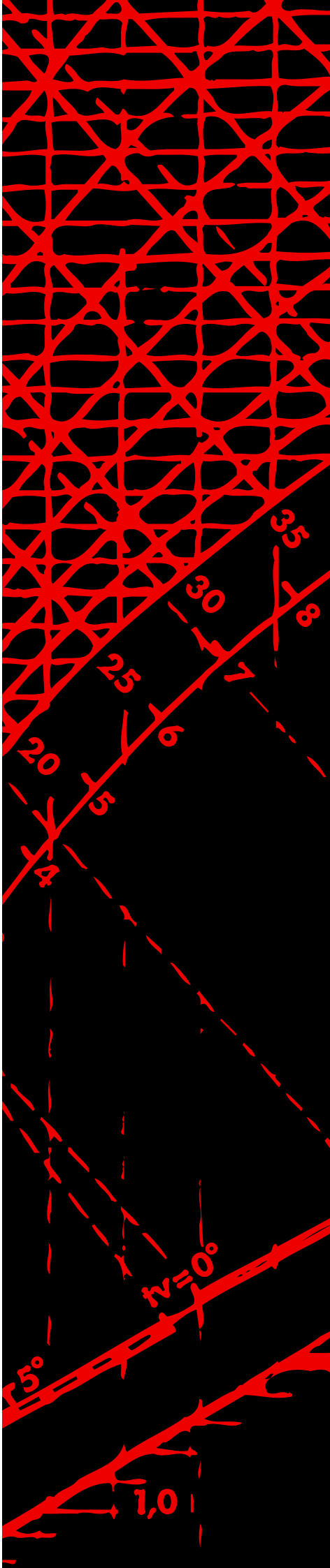
IV Produkt Designer is our product selection software for selecting air handling units.

For more information visit **www.ivprodukt.se**

Eurovent
Envistar and Flexomix AHUs are Eurovent certificated and can always meet energy class A according to 2009 classification. Our product series are tested by Eurovent to EN 1886 and EN 13053. All data presented in our specifications are verified by an independent laboratory.

EUROVENT CERTIFIED PERFORMANCE
AHU N°: 05.07.300 and AHU N°: 00.09.027
Range: Envistar and Flexomix
www.eurovent-certification.com

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



PRODUKT

Air handling with the focus on LCC

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