Air handling unit

Envistar®

Home Concept

Operation and Maintenance Instructions for the Envistar Top

Order no. : .....

Object : .....

Original instructions

IV PRODUKT

Air handling with focus on LCC

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Unit specifications

Size	04 ☐	06 ☐	10 ☐
	16 ☐	21 ☐	
Incl. control	MX ☐		
Excl. control	UC ☐	MK ☐	US ☐
Supply air	M5 ☐	F7 ☐	
	Excl. filter ☐		
Extract air	M5 ☐	F7 ☐	
	Excl. filter ☐		
	☐		
	ATEV ☐		ATTV ☐
Output variant	1 ☐	2 ☐	3 ☐
	☐		
	☐		
	☐		

IV PRODUKT
Air handling with focus on LCC

1 General

1.1 Intended use

Envistar Top air handling unit, version Home Concept, is intended to be used for comfort ventilation in energy-efficient multiple occupation residential buildings.

1.2 Safety precautions

Observe warning labels on the unit as well as the following safety precautions:

Lockable safety switch

WARNING!
High voltage, risk of personal injury.
Before working on/servicing the unit – shut down the unit via the control terminal, then turn the safety switch to the 0 position and lock it.

NB:
The safety switch is not designed for starting/stopping the unit.
Always use the control equipment to start and shut down the unit.

Inspection doors

WARNING!
Positive pressure inside the unit, risk of personal injury.
Allow the pressure to drop before you open the inspection doors.

WARNING!
Rotating fan impeller, risk of personal injury. Shut down the air handling unit and wait at least 3 minutes before you open the inspection doors.

NB:
The doors in front of moving parts should normally be locked; there are no safety guards. Before carrying out work, unlock the doors with the key provided.

Electrical connection

WARNING!
Rotating fan impeller, risk of personal injury. The unit must not be energised until all ducts have been connected.

NB:
Wiring of connections and other electrical work may only be carried out by a qualified electrician or by service personnel recommended by IV Produkt.

1.3 Manufacturer

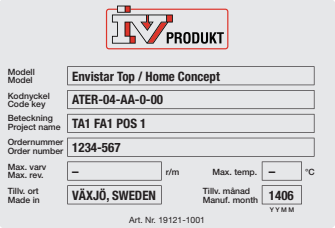
The Envistar air handling units (AHUs) are manufactured by:

IV Produkt AB
Sjöuddevägen 7
SE-350 43 VÄXJÖ

1.4 Designations

Envistar Top is fabricated as a one-piece unit with a model identification label affixed to the front.

All the necessary designations needed for identifying the unit appear on the label.



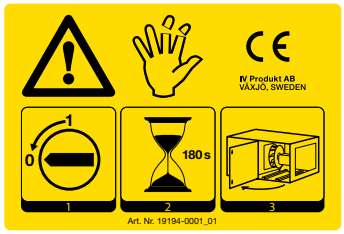
Typical model identification label

1.5 CE marking and EU Declaration of Conformity

The air handling units are CE marked, which means that upon delivery, they conform to applicable provisions in EU Machinery Directive 2006/42/EC as well as to the EU Directives applicable to the type of unit.

As certification confirming that the requirements have been met, we provide an EU Declaration of Conformity, which is available at www.ivprodukt.se.

The CE marking applies to units that IV Produkt AB manufactures and supplies with control equipment mounted on the unit casing.



Typical CE label for air handling units

1.6 Maintenance

Continuous maintenance of this unit can be carried out either by the person normally in charge of maintaining the building or through a contract with a well-reputed service company.

1.7 Extended warranty

In cases in which the equipment delivered falls under a 5-year warranty, in accordance with ABM 07 with supplement ABM-V 07 or in accordance with NL 01 with supplement VU03, the IV Produkt Service and Warranty Manual is supplied with the product.

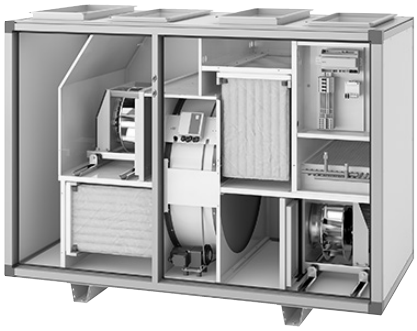
In order to lay claim to an extended warranty, a complete, documented and signed IV Produkt Service and Warranty Manual must be presented.

1.8 Spare parts

Spare parts and accessories for this unit are ordered from your nearest IV Produkt sales representative. Always specify the product code when ordering. The code is stamped on a separate data label, affixed to each component. A separate spare parts list is supplied with the unit.

2 Technical description

2.1 Envistar Top air handling unit



The air handling units in the Envistar Top series are intended for comfort ventilation in buildings.

The Envistar Top is fabricated as a one-piece unit in various sizes as a right- or left-handed version. Duct connections on the top (upwards) and rotors (rotary heat exchangers) are common to all sizes and configurations.

The units are usually supplied with integrated control equipment (incl. control), but can also be obtained without control equipment (excl. control).

2.2 Home Concept version

Home Concept units have specially adapted control equipment and air balancing dampers for the extract air. A filter cabinet for aluminium or carbon filters is available as an option.

3 Wiring instructions and fuse protection

3.1 Air handling unit incl. control

The following wiring instructions apply to units supplied complete with control equipment (code MX).

Safety switch

A safety switch must be fitted and wired on each power supply.

Wiring diagrams

For wiring diagrams for units with control equipment, see the order-unique wiring diagram supplied with the unit.

Unit functions, power supply and fuse protection

The following fuse protection is recommended.

Size 04

Common power supply to all functions.

Output / variant	Ventilation (ATER)	Ventilation (ATER) + Air heater electric (ATEE)	
	-	1	2
Size 04	230 V+N 10 AT	3×400 V+N 16 AT	3×400 V+N 20 AT

Sizes 06, 10 and 16

Common power supply 3×400 V+N to all functions.

Output / variant	Ventilation (ATER)	Ventilation (ATER) + Air heater electric (ATEE)		
	-	1	2	3
Size 06	10 AT	25AT	20 AT	-
Size 10	10 AT	25AT	32AT	-
Size 16	10 AT	25AT	32 AT	40 AT

Size 21

Separate power supply 3×400 V+N to each function.

Output / variant	Ventilation (ATER)	Air heater electric (ATEE)		
	-	1	2	3
Size 21	16AT	16AT	32 AT	40 AT

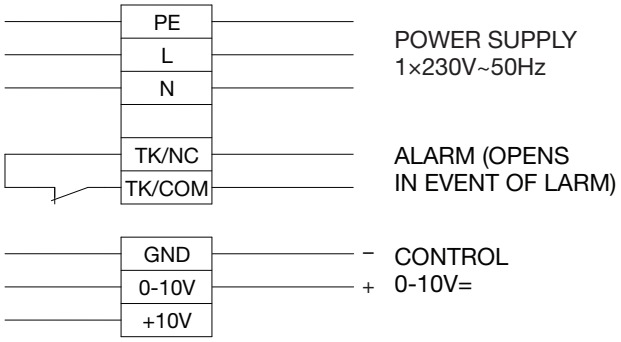
3.2 Components excl. control

The following wiring instructions apply to components supplied without control equipment (code UC, MK or US).

Safety switch

A safety switch should be fitted and wired on each power supply.

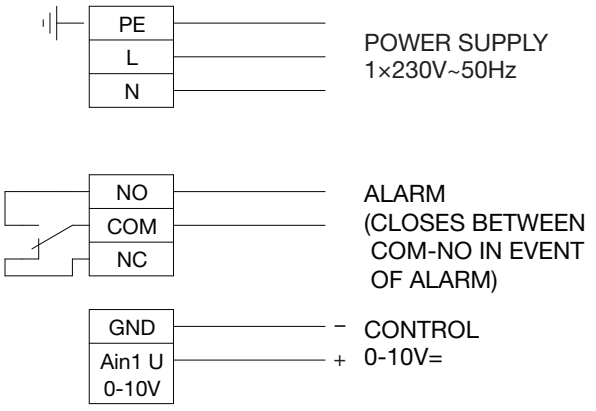
Fan unit, size 04



Rated current	Rec. fuse protection
2.8 A	10 AT

The motor starts/stops on a 0.5 V control signal.

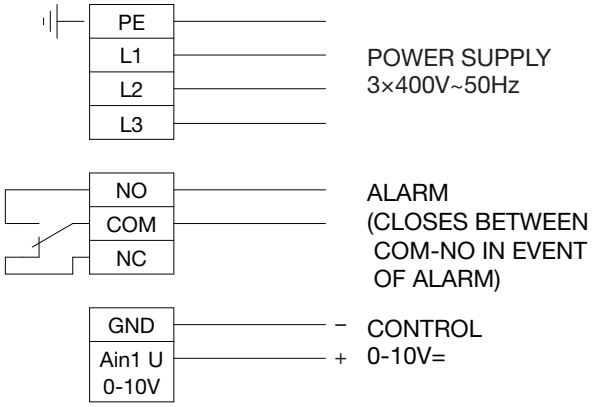
Fan unit, sizes 06 and 10



Size	Rated current	Rec. fuse protection
06	3.1 A	10 AT
10	5.6 A	10 AT

The motor starts/stops on a 0.5 V control signal.

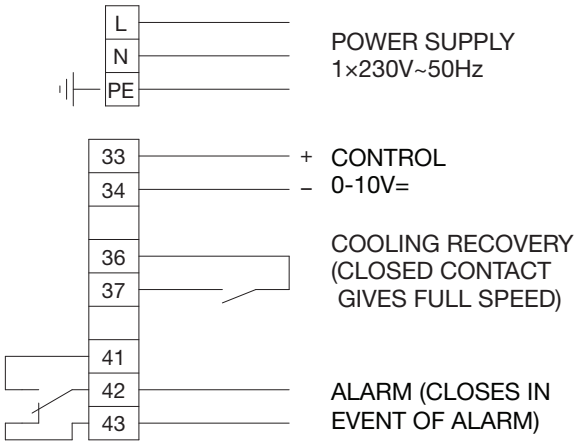
Fan unit, sizes 16 and 21



Size	Rated current	Rec. fuse protection
16	2.9 A	10 AT
21	4.2 A	10 AT

The motor starts/stops on a 0.5 V control signal.

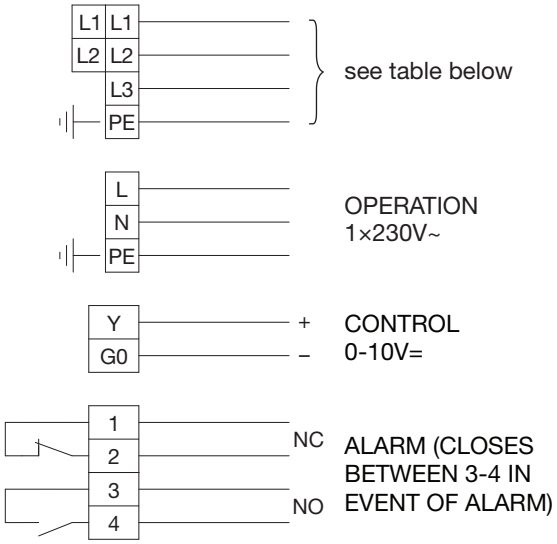
Rotary heat exchanger



Rec. fuse protection
10 AT

contd. Components excl. control (code UC, MK or US)

Air heater electric (code ATEE)



Size	Output variant/Rec. fuse protection		
	1	2	3
04	2×400 V 16 A	2×400 V 16 A	-
06	2×400 V 16 A	3×400 V 16 A	-
10	3×400 V 16 A	3×400 V 25 A	-
16	3×400 V 16 A	3×400 V 25 A	3×400 V 32 A
21	3×400 V 16 A	3×400 V 32 A	3×400 V 40A

4 Operation

4.1 Commissioning unit incl. control

The Envistar Top with rotor (code ATER) is a factory-built one-piece air handling unit which has been tested and documented at the factory. It does not require special commissioning by a certified technician.

Prior to commissioning, the contractor must:

1. Connect the unit to the power supply via a lockable safety switch.

   NB:
   Wiring of connections and other electrical work may only be carried out by a qualified electrician or by service personnel recommended by IV Produkt.

2. Connect the heating/cooling coil.

3. Connect all ducts.

   WARNING!
   Rotating fan impeller. The unit must not be energised until all ducts have been connected.

5 Maintenance instructions

5.1 Service schedule

The service schedule comprises actions and service intervals for functional sections that may be part of the air handling unit. The unit consists of one or more of these functional sections. The sections that pertain to your unit are marked on the list in the table of contents. See page 1.

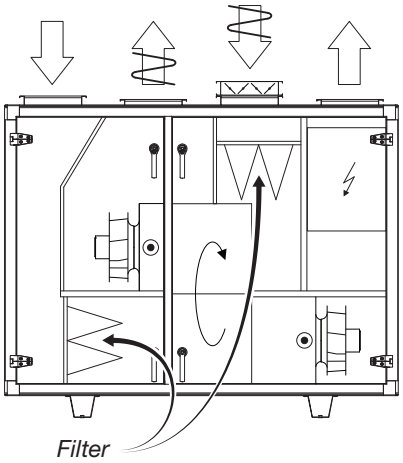
Make copies of the service schedule for future use before you fill in servicing data for the first time.

Service year 20.....-..... for unit no.					**Service performed * (date and signature)**			
Functional section		**Code**	**Recommended action (insp.)**	**Page ref.**	**3 000 h / 6 mths**	**6 000 h / 12 mths**	**9 000 h / 18 mths**	**12 000 h / 24 mths**
					date	date	date	date
	**Filter supply air, extract air**	ATEF	Check pressure drop Change filter if necessary	11	signature	signature	signature	signature
	**Aluminium filter in filter cabinet**	ATET-08F-*size*-AL	Check pressure drop Clean if necessary	13	signature	signature	signature	signature
	**Carbon filter in filter cabinet**	ATET-08F-*size*-BR	Inspection indication Replace if necessary	13	signature	signature	signature	signature
	**Rotary heat exchanger**	ATRR	Visual inspection Check press. balance Check diff. pressure Clean if necessary	16	signature	signature	signature	signature
	**Air heater water**	ATEV, ATTV	Visual inspection Clean if necessary Check function	19	signature	signature	signature	signature
	**Air heater electric**	ATEE	Visual inspection Clean if necessary Check function	20	signature	signature	signature	signature
	**Air cooler water**	-	Visual inspection Check drainage Clean if necessary Check function	21	signature	signature	signature	signature
	**Fan unit**	-	Visual inspection Clean if necessary Check the air flow	22	signature	signature	signature	signature
	**Damper**	ETET-UM, ETET-TR	Visual inspection Clean if necessary Check tightness	25	signature	signature	signature	signature
	**Sound attenuator**	ETET-LD	Visual inspection Clean if necessary	26	signature	signature	signature	signature

** Every 3000 hours of operation or every 6 months, whichever occurs first. More frequent servicing may be required in certain environments.*

5.2 Bag filter (code ATEF)

The air filters in an air handling unit are designed to prevent dust and other impurities from entering the building. They should also protect sensitive components inside the unit, e.g. water coils and heat exchangers, from exposure to impurities.

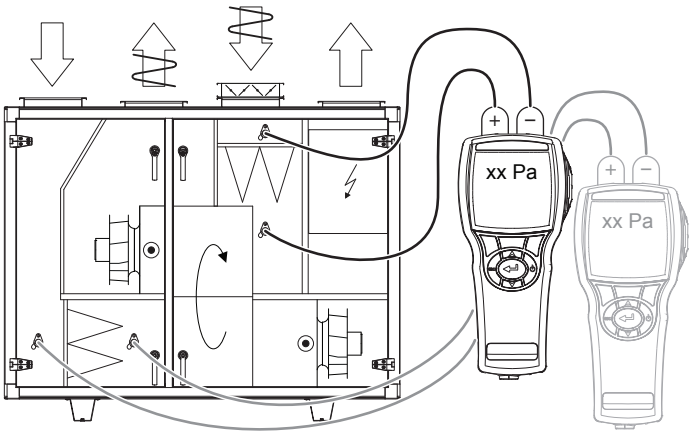


The dust separation efficiency varies considerably between various filter types. The dust collecting efficiency also varies substantially. It is therefore important to use filters of the same quality and capacity when you change them. Separation class is specified with standard designations M5 for medium filters and F7 for fine filters. Higher digits denote a higher collecting efficiency.

The filters are designed for one-time use. If they become fouled, the unit will lose capacity. The filters should therefore be changed if the pressure drop across them exceeds the specified final pressure drop. It is important to stop the unit before changing filters to prevent dust from coming loose and being drawn into the unit. The inside surfaces of the filter sections should therefore also be cleaned when the filters are changed.

Inspection

Check the pressure drops across the filters. A manometer connected to probes is used for these measurements. The probes are connected to each side of the filters.



If the filter has reached its specified final pressure drop, it should be changed. The final pressure drop is specified on the filter section decal (filled in when the air handling unit is put into operation).

FILTERDATA

Filterklass / Filter Class.....
Begynnelsetryckfall
Initial Pressure Drop.....Pa
Sluttryckfall
Final Pressure Drop.....Pa

Art. Nr: 19121-1101_01

Filter data

Size	Filter type	No of filters	Dimensions (mm)		No of bags/ filters	Face area total (m²)
			W × H	Length		
04	Bag filter M5	1	650 × 287	320	7	1,6
	Bag filter F7	1	650 × 287	320	9	1,9
06	Bag filter M5	1	790 × 287	370	8	2,1
	Bag filter F7	1	790 × 287	370	11	2,7
10	Bag filter M5	1	892 × 380	520	8	4,2
	Bag filter F7	1	892 × 380	520	15	6,4
16	Bag filter M5	2	592 × 400	520	6	5,8
	Bag filter F7	2	592 × 400	520	10	9,0
21	Bag filter M5	1	320 × 400	520	4	7,7
		2	592 × 400	520	6	
	Bag filter F7	1	320 × 400	520	6	11,6
		2	592 × 400	520	10	

Filter replacement (ATEF)

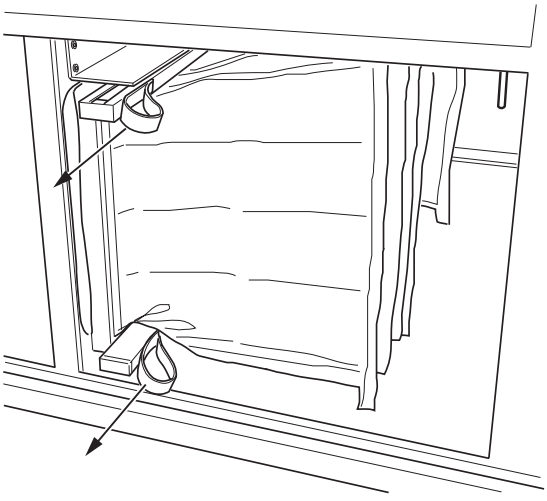
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

NB:
The safety switch is not designed for starting/stopping the unit.
Always use the control equipment to start and shut down the unit.

2. Wait until the fans have stopped, then open the inspection door.

WARNING!
Positive pressure inside the unit, risk of personal injury.
Allow the pressure to drop before you open the inspection doors.

3. Release the eccentric rails.
4. Remove the old filter by pulling it towards you.
5. Clean the filter cabinets.
6. Install the new filter, press in the eccentric rails to engage them and close the inspection door.
7. If there is a non-removable filter monitor: attach the probes on each side of the filter.
8. Start the unit.

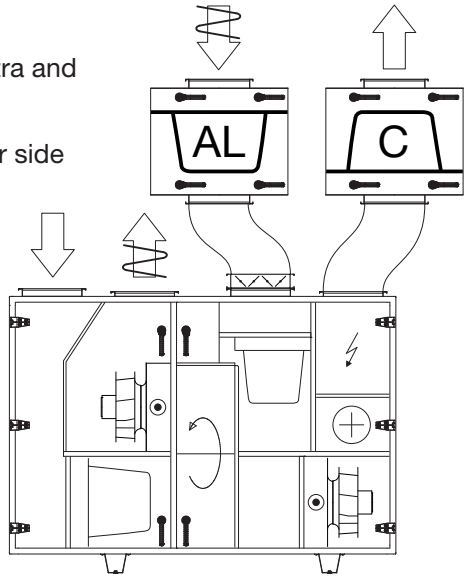


Eccentric rails inside the unit

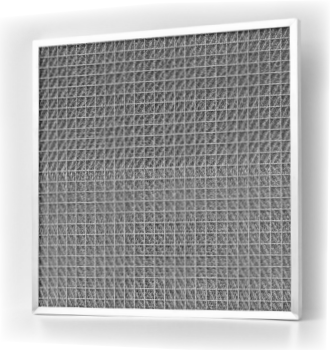
5.3 Filter cabinet (code ATET-08)

The filter cabinet is an optional extra and can be used for

- aluminium filter on the extract air side
- carbon filter on the supply air side



AL - aluminium filter, C - carbon filter, Black Ridge



Aluminium filter

Carbon filter, Black Ridge

The aluminium filter is intended for use where the extract air contains grease particles to avoid grease being sucked into the unit. The filter is a knitted mesh sheet.

The aluminium filter can be cleaned using hot water and a mild detergent.

The carbon filter can be used to remove odours in the form of organic and odorous gases/vapours. The carbon filters are fitted to the supply air side..

The carbon filters are Black Ridge filters, constructed as compact and highly efficient, molecular filters. The filters are designed for one-time use and the filter is combustible in its entirety.

Inspection

Aluminium filter

Check the pressure drop across the filter. A manometer connected to probes is used for these measurements. The probes are connected to each side of the filter. If the filter has reached its specified final pressure drop, it should be changed. The final pressure drop is specified on the filter section decal (filled in when the air handling unit is put into operation).

FILTERDATA

Filterklass / Filter Class.....
Begynnelsetryckfall
Initial Pressure Drop.....Pa
Sluttryckfall
Final Pressure Drop.....Pa

Art. Nr: 19121-1101_01

Also carry out a visual inspection of the filter for damage and deposits.

Carbon filter

The function and lifespan of the carbon filters depends on the volume of air that passes through and on the molecular density of odorous substances. This means that the time intervals for filter replacement can vary from unit to unit depending on operation mode and the volume of odorous substances in the air.

Units delivered with IV Produkt integrated control equipment are equipped with the control function filter control – FLC (Filter Lifetime Control). FLC indicates when it is time to replace the carbon filter. Indication is through an alarm on the hand-held terminal display.

FLC calculates the volume of air passing through the carbon filters and triggers the alarm for filter replacement when the preset value has been reached.
The volume of air passing through is measured in mega cubic metres (Mm3).
The function does not take into account the odour content of the air, which means that the indication should be regarded as a recommendation for checking the filter function. If no odours pass through, there is no need to replace the filter.

Preset FLC values, as per the table below, are based on max. air flow over 12 months of full-time operation. If required, the value can be lowered in order to:
- change to more frequent filter replacement intervals for max. air flow
- retain the filter replacement interval of 12 months for lower air flows.

To change the value, see separate Climatix control documentation.

Filter data

Aluminium filter

Size	Filter type	No of filters	Dimensions (mm)		Face area total (m^2)
			Frame	Length	
04	Aluminium filter	1	287 × 592	25	0.15
06	Aluminium filter	1	592 × 592	25	0,35
10	Aluminium filter	1 1	287 × 592 592 × 592	25 25	0.5
16	Aluminium filter	2	592 × 592	25	0.7
21	Aluminium filter	1 2	287 × 592 592 × 592	25 25	0.85

Carbon filter

Size	Filter type	No of filters	Dimensions (mm)		Weight (kg)	FLC preset value (Mm^3)
			Frame	Length		
04	Black Ridge	1	287 × 592	292	6	9
06	Black Ridge	1	592 × 592	292	12	19
10	Black Ridge	1 1	287 × 592 592 × 592	292 292	6 12	28
16	Black Ridge	2	592 × 592	292	12+12	38
21	Black Ridge	1 2	287 × 592 592 × 592	292 292	6 12+12	47

Filter replacement (ATET)

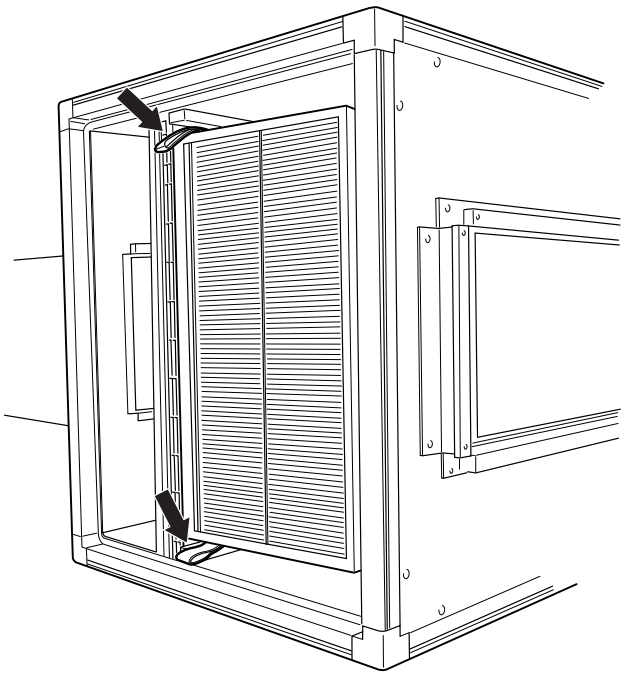
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

   NB:
   The safety switch is not designed for starting/stopping the unit. Always use the control equipment to start and shut down the unit.

2. Wait until the fans have stopped, then remove the inspection door.

   WARNING!
   Positive pressure inside the unit, risk of personal injury. Allow the pressure to drop before you remove the inspection door.

3. Release the eccentric rails.

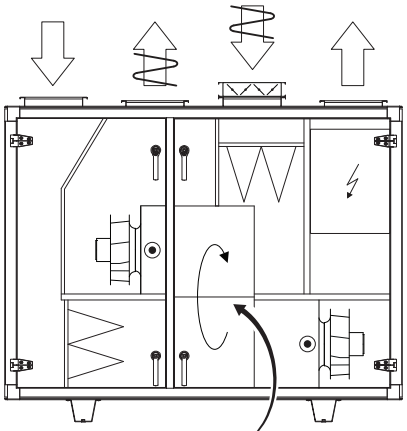


Eccentric rails inside the filter cabinet

4. Remove the old filter by pulling it towards you. Discarded filters should be disposed of correctly. The carbon filters are combustible in their entirety.
5. Clean the filter cabinets.
6. Install the new filter, press in the eccentric rails to engage them and close the inspection door.
7. Reset the filter control function FLC to zero via the hand-held terminal (only applies to units fitted with IV Produkt integrated control equipment).
8. Start the unit.

5.4 Rotary heat exchanger (code ATRR)

The purpose of the heat exchanger is to recover heat from the extract air and transfer this heat to the supply air. This reduces the output required and the energy use.



Rotary heat exchanger

A faulty heat recovery function through reduced recovery efficiency entails increased energy use. This also means that the planned supply air temperature will not be reached when outdoor temperatures are low.

A conceivable reason for reduced recovery efficiency may be that the rotor rotates too slowly because the drive belt is slipping. Rotation should not be lower than 8 RPM during full energy recovery.

It is not usual for the rotor passages to become fouled with dust, since the rotor is normally self-cleaning. However, this might occur if the dust is of a sticky nature. A reduction of the extract air flow, e.g. due to fouling of the extract air filter, entails reduced heat recovery efficiency.

The units are equipped with a control function for the pressure balance over the purge sector, which means that the pressure balance does not have to be inspected or adjusted. For units supplied with IV Produkt integrated control equipment, the function is activated at the factory. For units not supplied with control equipment this function has to be connected to the unit.

Inspection

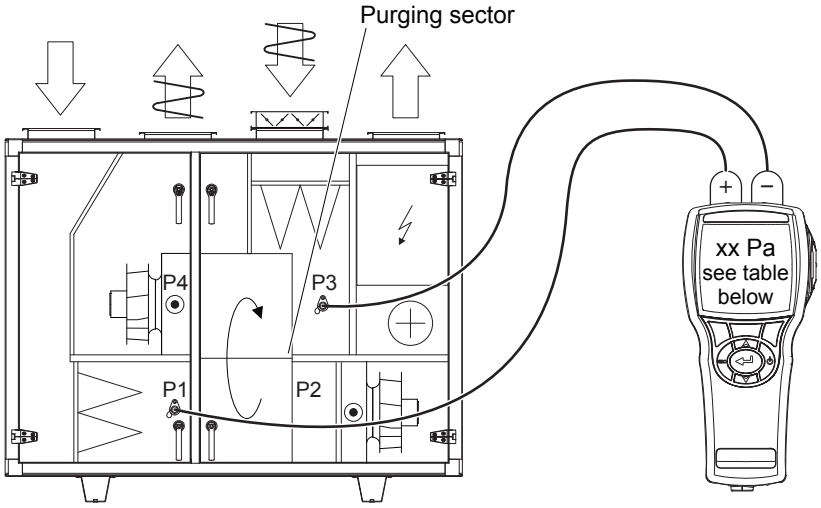
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.
2. Wait until the fans have stopped, then open the inspection door.

WARNING!
Positive pressure inside the unit, risk of personal injury. Allow the pressure to drop before you open the inspection doors.

3. Check that the rotor rotates easily. If it is sluggish, you might have to adjust the bristled sealing strip.
4. Check that the rotor's bristled sealing strip seals against the side plates and that it is not worn. The bristled sealing strip is subject to wear and can be adjusted or replaced if the need arises.
5. Check that the drive belt is properly tensioned and does not slip. If it slips, it will have to be shortened. The rotor speed should not be lower than 8 RPM during full energy recovery.
6. Check that the drive belt is intact and clean.
7. Check that the rotor's inlet surfaces are not covered with dust or other impurities. NB: Avoid touching the rotor inlet and outlet surfaces with your hands or tools.

9. Check the differential pressure across the rotor. The purging sector is factory-installed, set to the maximum open position. Depending on the unit's pressure ratios, the purging sector may need adjustment. An incorrect setting may impair the efficiency. Inspection and adjustment should be carried out as follows:

– Measure and write down the differential pressure between the outdoor air (P1) and the extract air (P3).

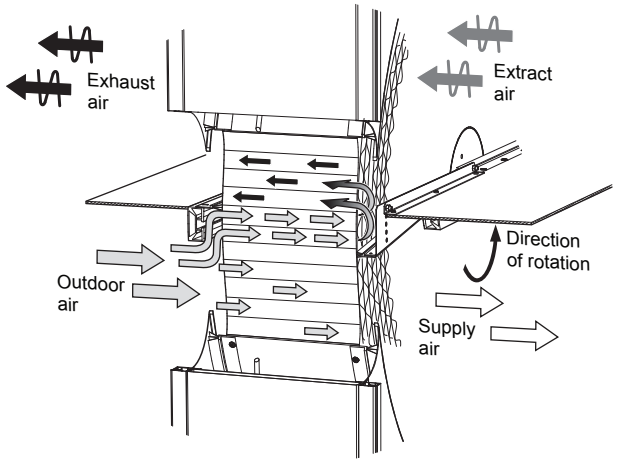


– Read the recommended setting (adjustment hole in the purge sector) from the table below.

	Rotor variant	Adjustment hole in the purging sector		
		3 open*	2 intermediate position	1 closed
Diff. pressure between P1 and P3 (Pa)	Normal	< 300	> 300	-
	Plus	< 400	> 400	-

**maximum open purge sector, preset position from the factory*

– Adjust the purging sector if the need arises. The illustration shows the purging sector set to the maximum open position.



Cleaning

- Remove dust by carefully vacuum cleaning using a soft brush.
- If the rotor surfaces are severely fouled by greasy dust, spray the rotor with water mixed with a dishwashing detergent that will not corrode aluminium. Alternatively, use detergent designed for heat exchangers, e.g. Re-Coilex (see below).
- Compressed air at low pressure (max. 6 bar) can be used for blowing the surfaces clean. To avoid damage, the nozzle should not be held any closer to the rotor than 5–10 mm.

A hygroscopic rotor variant can absorb particles which in some cases give off odours. To prevent odours arising, exercise run the hygroscopic rotor using the integrated control function. If an odour still arises, we recommend cleaning the rotor with e.g. Re-Coilex, see below.

Re-Coilex is a weak alkaline, highly concentrated, special cleaner that is diluted with water and applied liberally with a pressure sprayer, if possible when the unit is in use so that the detergent is sucked through the rotor.

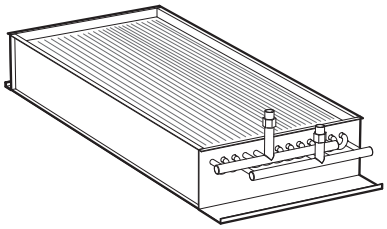
For cleaning it is recommended that the purge sector is fully open and the rotational speed is 8 RPM. This assists with the sucking through of the detergent. Post-rinsing is not normally required.

Re-Coilex is marketed by Resema AB.

Lubrication

The bearings and drive motor are permanently lubricated and do not require additional lubrication.

5.5 Air heater water



Air heater water (code ATEV)

The heating coil (code ATEV) consists of a number of copper tubes with aluminium fins pressed on them. The coil will have impaired capacity if dust forms a coating on the coil surfaces. Not only does this impair the heat transfer capacity of the coil, it also increases the pressure drop on the air side. Even if the ventilation system is fitted with high quality filters, as time passes dust deposits will form on the front edges of the coil fins (at the inlet side). To utilise its full capacity, the coil must be well vented. The pipework should be vented by opening the bleeder screws in pipe connections and/or an air vessel.

Inspection

Check:

1. The coil fins to detect possible mechanical deformity
2. That the water coil is not leaking.

Cleaning

If the fins on the coils are dirty, vacuum them from the inlet side. Alternatively, you can blow them clean with compressed air from the outlet side. If they are particularly dirty, clean them with hot water mixed with dishwashing detergent (that will not corrode aluminium).

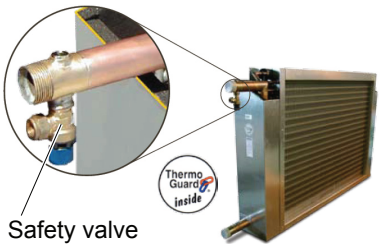
Bleeding

Bleed the heating coil and the pipework if needed. Bleeder screws are on top of the coil or on the tube connections.

Function

Check that the coil is radiating heat. This can be done by temporarily increasing the temperature setting (setpoint).

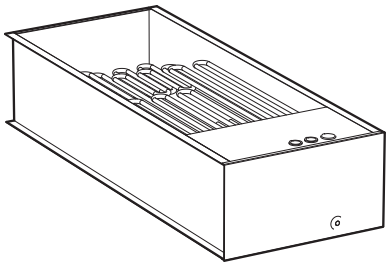
Additional maintenance for ThermoGuard (code ATTV)



1. Regularly check safety valve function (at least once a year). If you see that the valve is leaking, this is normally due to impurities from the pipe system that have accumulated on the valve seat. In normal cases, it is sufficient to carefully turn the valve knob and in this way “flush” the valve seat clean. If the safety valve continues to leak, you will have to replace it with a new one of the same type and with the same opening pressure.
2. Any shut-off valves on the supply or return lines may not be closed if freezing temperatures are likely.
3. If a ThermoGuard coil has frozen, let it thaw completely before restarting operation. If the heat recovery unit is installed upstream of the coil, it is often sufficient to run heat recovery to thaw the coil. If this does not work, some other external heating source will have to be used for thawing the water coil.

   Important! To ensure correct ThermoGuard coil function, the entire coil must be allowed to thaw before returning it to full operation. Make sure that water is circulating in the entire coil when you start it up.

5.6 Air heater electric (code ATEE)



Air heater electric (code ATEE)

The heating coil consists of “unsheathed” electric heating rods. A substantial accumulation of dust or other impurities on the heating rods will cause them to overheat. This could shorten their service life. This might also entail an odour of burnt dust and, in the worse case, the risk of fire. Overheated electric heating rods may become deformed or loosen from their suspension fasteners and heat the air unevenly.

Inspection

Check that the electric heating rods are correctly positioned and that they are not deformed in any way.

Cleaning

Vacuum or wipe surfaces with a moist cloth to remove any dust or impurities.

Function

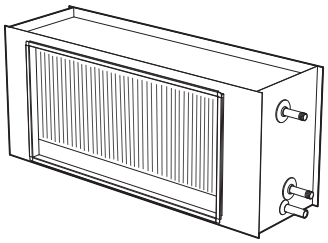
1. Simulate reduced required output by temporarily lowering the temperature setting (setpoint), so that all the electric output steps (contactors) switch out.
2. Then sharply increase the setpoint setting and check that the electric output steps switch in.
3. Restore the temperature setting.
4. Stop the air handling unit (NB: Do not break the circuit with the safety switch). All the electric output steps should switch out (i.e. the contactors in the OFF position). Stopping the unit may be delayed approx. 2–5 minutes to allow the fans to cool the heat energy stored in the air heater.

The electric heater is equipped with dual temperature limiters. The one that resets itself automatically should be set to 70°C.

The overheat protection with manual reset interrupts operation when the heater reaches approx. 120°C and is located on the cover panel on the side of the heater. **Determine the cause of overheating and take corrective action before you reset the protection device.**

Please note that the risk of overheating increases as the air flow through the unit decreases. The air speed should not be lower than 1.5 m/s.

5.7 Air cooler water



Air cooler water

The cooling coil consists of a number of copper tubes with aluminium fins pressed onto them. The coil will have impaired capacity if dust forms a coating on the coil surfaces.
Not only does this impair the heat transfer capacity of the coil, it also increases the pressure drop on the air side.

Even if the ventilation system is fitted with high quality filters, as time passes dust deposits will form on the front edges of the coil fins (at the inlet side).
A drip tray with drain is located under the cooling coil for collecting and removing evaporation water.

Inspection

Check:

1. The coil fins to detect possible mechanical deformity
2. That the water coil is not leaking
3. That cooling energy is uniformly distributed across the coil surfaces (in operation)
4. The drip tray and drain with water trap (clean if necessary)
5. That the water trap (without non-return valve) is filled with water.

Cleaning

If the fins on the coil are dirty, vacuum clean from the inlet side. Alternatively, you can blow them clean with compressed air from the outlet side. If they are severely fouled, you can clean them with warm water mixed with dishwashing detergent that will not corrode aluminium.

Bleeding

Bleed the cooling coil and the pipe connections if needed. Bleeder screws are on top of the coil or on the tube connections.

Function

Check that the coil is emitting cooling energy. This can be done by temporarily lowering the temperature setting (setpoint).

5.8 Fan unit

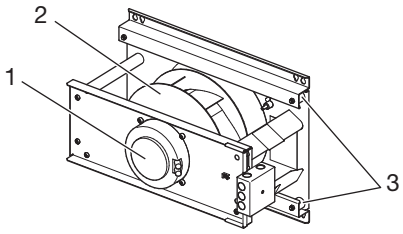
The purpose of the fans is to transport air through the system, i.e. the fan must overcome the flow resistance in air terminals, air ducts and the unit.

The fan speed is regulated to provide correct air flow. If the fans generate a lower air flow, this will impair the function of the ventilation system.

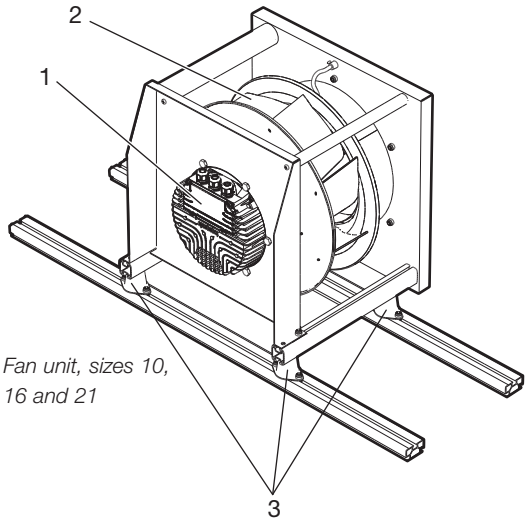
- If the supply air flow is too low, the system will be out of balance, causing poor room climate.
- If the extract air flow is too low, the ventilation capacity will be unsatisfactory. Imbalance may also force moist air out into the building structure.
  One reason why the fans are generating too little air flow may be that impurities have collected on the fan impeller blades.

WARNING!
High voltage, risk of personal injury.
Before working on/servicing the unit – shut down the unit via the control terminal, then turn the safety switch to the 0 position and lock it.

WARNING!
Rotating fan impeller, risk of personal injury. Shut down the air handling unit and wait at least 3 minutes before you open the inspection doors.



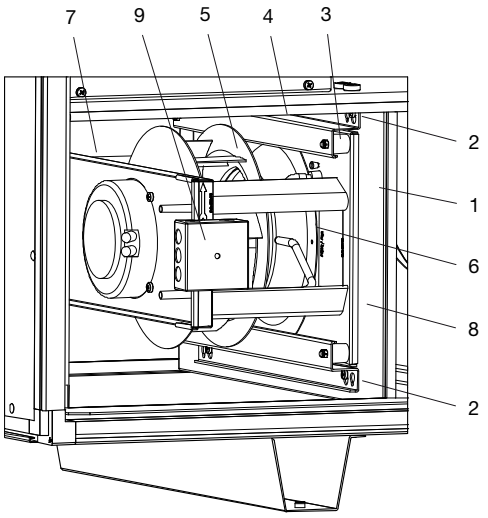
Fan unit, sizes 04 and 06



Fan unit, sizes 10, 16 and 21

1. EC motor with control unit
2. Fan impeller
3. Anti-vibration mounting

Fan, sizes 04 and 06

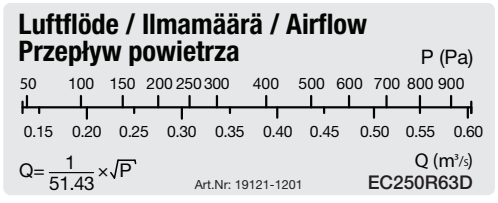


Fan unit, sizes 04 and 06

1. Connection plate
2. Screws (suspension)
3. Anti-vibration mounting
4. Anti-vibration support
5. Fan impeller with motor
6. Inlet cone
7. Fan support, upper
8. Fan support, lower
9. Junction box

Inspection

1. Remove one end of the fan assembly's earth braid. Remove the screws (position 2) in the connection plate (position 1) and unhook the fan unit from the key holes in the anti-vibration supports (position 4), both upper and lower.
2. Check that the fan impeller with motor (position 5) rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clean from any accumulation of particles. Imbalance may be due to a coating or damage to the fan impeller blades.
3. Listen to the sound from the motor bearings. If the bearings are in good condition, you will hear a slight purring sound. A scraping or pounding sound may mean that the bearings are damaged and service is then required.
4. Check that the fan impeller with motor (position 5) is firmly mounted in the upper fan support (position 7) and that it has not shifted sideways toward the inlet cone (position 6). Also check to make sure that the inlet cone is properly secured.
5. The fan unit is mounted on the connection plate by means of rubber anti-vibration mountings (position 3) between the lower fan support (position 8) and the anti-vibration supports (position 4). Check that the anti-vibration mountings are intact and are firmly fitted.
6. Check that the gasket on the connection plate (position 1) around the connection opening is intact and is firmly fitted.
7. Check that the measurement tubes are securely fitted on each measurement outlet.
8. Check that the edge protection on the upper fan support (position 7) is firmly mounted and protects the cables that are wired to the junction box (position 9).
9. Reinstall the fan unit by hooking in on the key holes in the anti-vibration supports (position 4), both upper and lower, and secure the screws (position 2) in the connection plate (position 1).
10. Check the air flows by
    – reading the flow display on the Climatix hand-held unit for unit incl. control (code MX)
    – measuring Δp in the connections (measurement outlets) for flow measurement +/- for unit excl. control (code UC, MK or US).
    Use the unit's air flow label and see which flow corresponds to the measured Δp; see the example below.

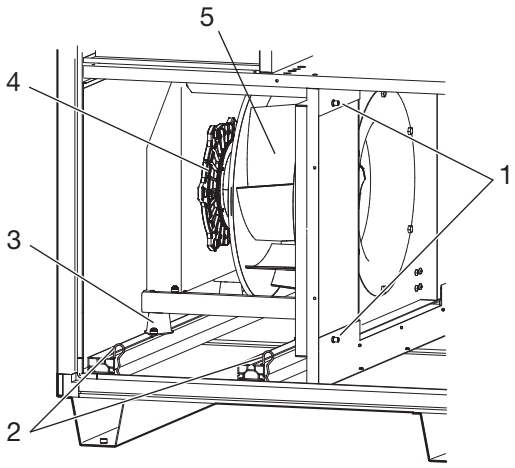


Cleaning

1. Follow item 1 under *Inspection*.
2. Wipe the fan impeller blades to remove any coatings. Use an environmentally friendly degreasing agent.
3. The external surfaces of the motor must be kept clean. Remove any dust, dirt and oil. Clean with a dry cloth. If they are severely fouled, use an environmentally friendly degreasing agent. The motor is likely to overheat inside if thick layers of dirt prevent air from entering the motor to cool the stator structure.
4. Vacuum clean inside the unit so that particles will not be blown out into the duct system.
5. Clean the other parts in the same way as the fan impeller. Check that the inlet cones are securely mounted.
6. Follow item 9 under *Inspection.*

Fan, sizes 10, 16 and 21

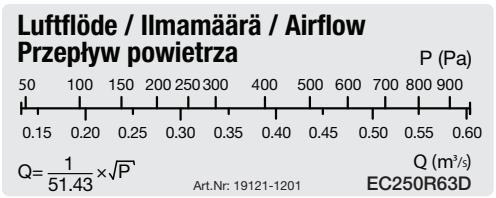
Inspection



Fan unit, sizes 10, 16 and 21

1. Screws, fan unit
2. Pins
3. Anti-vibration mounting
4. Motor
5. Fan impeller

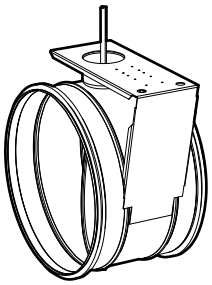
1. Remove one end of the fan assembly's earth braid. Remove the screws (position 1) and the pins (position 2). Pull out the fan units (fan and motor are mounted on slide rails).
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clean from any accumulation of particles. Imbalance may be due to a coating or damage to the fan impeller blades.
3. Listen to the sound from the motor bearings. If the bearings are in good condition, you will hear a slight purring sound. A scraping or pounding sound may mean that the bearings are damaged and service is then required.
4. The fan impeller and motor are mounted on a support fitted with rubber anti-vibration mountings. Check that the anti-vibration mountings are securely mounted and are intact.
5. Check the mounting bolts as well as the suspension devices and support.
6. Check that the gasket on the connection plate around the connection opening is intact and is firmly fitted.
7. Check that the measurement tubes are securely fitted on each measurement outlet.
8. Remount the fan units.
9. Check the air flows by
   – reading the flow display on the Climatix hand-held unit for unit incl. control (code MX)
   – measuring Δp in the connections (measurement outlets) for flow measurement +/- for unit excl. control (code UC, MK or US.
   Use the unit's air flow label and see which flow corresponds to the measured Δp; see the example below.



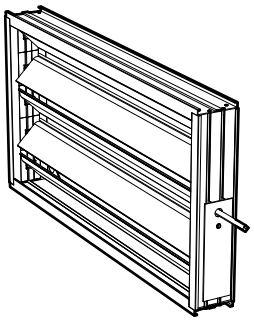
Cleaning

1. Follow items 1–7 under *Inspection*.
2. Wipe the fan impeller blades to remove any coatings. Use an environmentally friendly degreasing agent.
3. The external surfaces of the motor must be kept clean. Remove any dust, dirt and oil. Clean with a dry cloth. If they are severely fouled, use an environmentally friendly degreasing agent. The motor is likely to overheat inside if thick layers of dirt prevent air from entering the motor to cool the stator structure.
4. Vacuum clean the air handling unit so that particles will not be blown out into the duct system.
5. Clean the other parts in the same way as the fan impellers. Check that the inlet cones are securely mounted.
6. Remount the fan units.

5.9 Damper (code ETET-UM, ETET-TR)

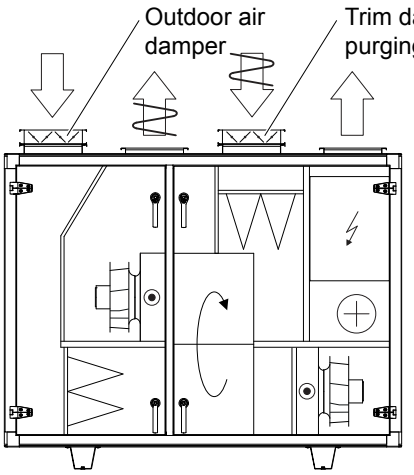


Size 04



Size 06–21

The purpose of the dampers is to regulate the air flow. Faulty function gives rise to disturbances that may result in serious problems.



- If the outdoor damper does not;
  – Open completely this reduces the air flow
  – Close completely when the unit stops, the heating coil is likely to freeze
  – Seal properly (leaks) this will result in increased energy use.
- If the trim damper for rotor purging function is not working, or is not correctly adjusted, any odours in the extract air may be transferred to the supply air via the rotor.

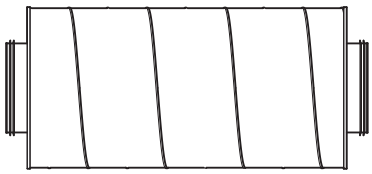
Inspection

1. Check the function of the damper actuator.
2. Check the dampers for tightness when they are closed. If they are not sealed, adjust the damper actuator to make the dampers tight (does not apply to trim dampers).
3. Check the sealing strips.
4. If the damper is not working, check that there are no screws penetrating the drive mechanism/damper blades to interfere with damper function.

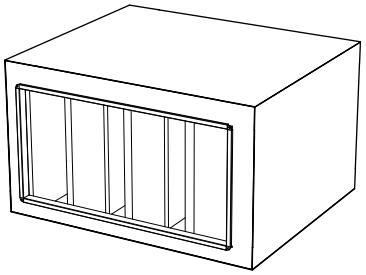
Cleaning

Clean the damper blades with a cloth. If they are severely fouled, an environmentally friendly degreasing agent can be used.

5.10 Sound attenuator (code ETET-LD)



Size 04



Size 06–21

The purpose of the sound attenuator is to reduce the sound power level in the system.

Inspection

Check that the baffle elements are intact and have clean surfaces. Take action if necessary.

Cleaning

Vacuum and/or wipe all surfaces with a damp cloth. If more intense cleaning is needed, do so with rotating nylon brushes.

6 Ordering keys

6.1 Air handling unit and unit components

Unit (code ATER, ATCR)

ATER -b-c-d-00
ATCR -b-c-d-00

b - Size	04, 06, 10, 16, 21
c - Casing	AA = Standard (class T3) PA = ThermoLine low energy (class T2) BA = Insulation to fire resistance rating EI 30
d - Output variant cooling unit	0 = Without cooling unit

Accessories:

ATET-04 -a	Flow meter, manometer type
a - Size	04, 06, 10, 16, 21

Inspection side is specified upon ordering.

Rotor (code ATRR)

ATRR -b-c

b - Size	04, 06, 10, 16, 21
c - Rotor variant	NO = Normal HY = Hygroscopic NP = Normal Plus HP = Hygroscopic Plus EX = Epoxy

Electrical connection (code ATEK)

ATEK -a-b

a - Size	04, 06, 10, 16, 21
b - Cooling unit	0 = Without 1 = With

Filter (code ATEF)

ATEF -a-b

a - Size	04, 06, 10, 16, 21
b - Filter class	M5, F7

Accessories:

ATET-06 -a	Rotation monitor
a - Size	04, 06, 10, 16, 21
MIET-FB -a	Filter monitor
a - Type	01 = U-tube manometer 02 = Kytölä manometer 03 = Magnehelic manometer

Air heater water (code ATEV, ATTV)

ATEV -a-b	**Air heater water**
ATTV -a-b	**Air heater water, ThermoGuard**
a - Size	04, 06, 10, 16, 21
b - Output variant	01, 02, 03 = ATEV 1, 2 = ATTV

Air heater electric (code ATEE)

ATEE -a-b

a - Size	04, 06, 10, 16, 21
b - Output variant	1 = Sizes 04, 06, 10, 16, 21 2 = Sizes 04, 06, 10, 16, 21 3 = Sizes 16, 21

6.2 Components for duct installation

Shut-off damper excl. motor (code ETET-UM)

ETET-UM -a

a - Size	04, 06, 10, 16, 21

Trim damper incl. manual control (code ETET-TR)

ETET-TR -a

a - Size	04, 06, 10, 16, 21

Sound attenuator (ETET-LD)

ETET-LD -a-b

a - Size	04, 06, 10, 16, 21
b - Type	1, 2 = Size 04 2 = sizes 06, 10, 16, 21

Filter cabinet (code ATET-08)

ATET-08 -b-c-d

b - Size	04, 06, 10, 16, 21
c - Casing	AA = Standard (class T3) PA = ThermoLine low energy (class T2) BA = Insulation to fire resistance rating EI 30
d - Filter slide rails	ST = Standard
ATET -08F -b-c	**Set of filters**
b - Size	04, 06, 10, 16, 21
c - Filter class	AL = Aluminium BR = Carbon filter, Black Ridge

6.3 Accessories

Adjustable foot (code ETET-01)

For installation on a base frame, set of 4 feet.

Sleeve (code ETET-02)

Flexible woven fabric, l = 110–150 mm.

ETET-02 -b

a - Size	04, 06, 10, 16, 21

Inspection door handle (code ATET-07)

ATET-07 -b-c-d-0

a - Size	04, 06, 10, 16, 21
c - Casing	AA = Standard (class T3) PA = ThermoLine low energy (class T2) BA = Insulation to fire resistance rating EI 30
d - Panel type	01 = Inspection door, small 02 = Inspection door, large

Return air damper (code ATET-09)

ATET-09 -b-1

a - Size	04, 06, 10, 16, 21

Inspection window (code EMMT-06)

Plexiglass, for standard casing.

Inside light fitting (code EMMT-07)

IP 44, with protective grille.

Thermometer (code EMMT-16)

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

Water trap (code MIET-CL 04)

Plastic, built-in non-return valve.

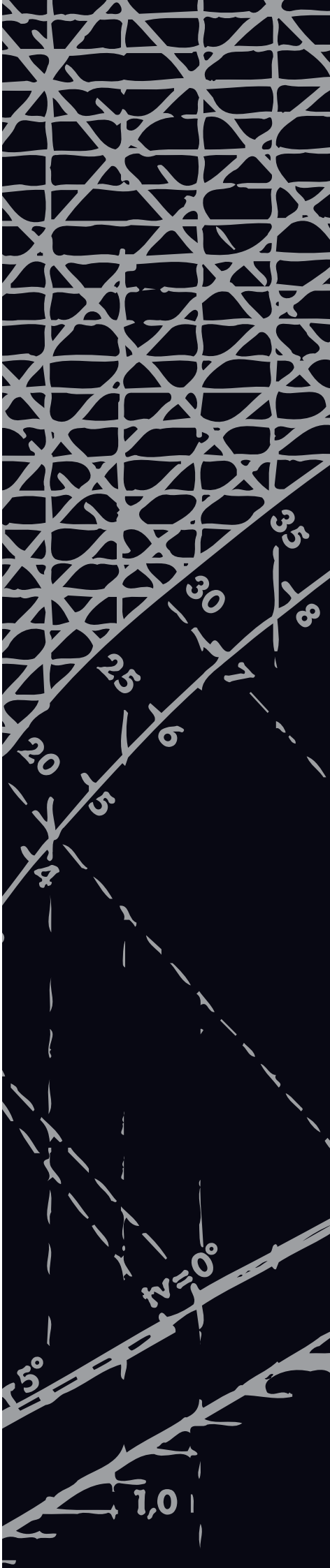
6.4 Control equipment

-a-b-c-d

a - Air handling unit	MST = Top MSC = Compact MSF = Flex 100–600 indoor MSU = Flex 100–600 outdoor MSM = Flex 740-850 MSE = Extract air unit
b - Motor control	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 V320 = Speed controlled 3-phase 20A-400V V616 = Speed controlled 2×3-phase 16A-400V
c - Energy recovery	R = Rotary heat exchanger P = Plate heat exchanger M = Counter-flow heat exchanger B = Run-around coils H = Heat pump
d - Control system	UC = Control equipment wired to terminals, without controller unit (DUC) MK = Without control equipment with cabling (fans and rotor wired to terminals) US = Without control equipment and cabling MX = Siemens Climatix Modbus HS = Special heat exchanger control system

Change history

110927.01	Issue 1
120217.02	Addition of Top size 21, rated current, fan motors, new output variants for air heater water, updated service schedule.
130318.03	Updating of rated current and filter data. Addition of earth braid fan installation.
140822.04	New casing and Modbus. Method for cleaning the rotor more detailed. Updated filter data.



Air handling with focus on LCC

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