Operation and Maintenance

Flexomix

Order number:

Project:

Translation of the original instructions

1 Safety precautions

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

1.1 Lockable safety switch

	**WARNING!** **Electrical voltage and rotating fan impeller, risk of injury. Working on/servicing the unit – Shut down the unit via the service switch in the control equipment, 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 service switch in the control equipment to start and shut down the unit.**

1.2 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 unit via the service switch in the control equipment, then turn the safety switch to the 0 position and lock it. Wait at least 3 minutes before opening 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.**

1.3 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.**

1.4 Cooling unit/Revresible heat pump

	**WARNING!** **Hot surfaces, risk of personal injury. Shut down the unit via the service switch in the control equipment, then turn the safety switch to the 0 position and lock it. Wait at least 30 minutes before opening the compressor inspection doors.**

2 General

2.1 Intended use

Flexomix is a modular device series designed for use as an air handling unit for comfort ventilation in buidings.

When installed indoors, the air handling unit must be installed in an area that maintains a temperature between +7 and +30°C, and with a moisture content of <3.5 g/kg in the fan room in winter. The unit, with the exception of FlexoPool, can also be equipped for cold attic or outdoor installations.

Any other use and installation in other environments are prohibited unless specifically permitted by IV Produkt AB.

2.2 Manufacturer

Flexomix air handling units are manufactured by:

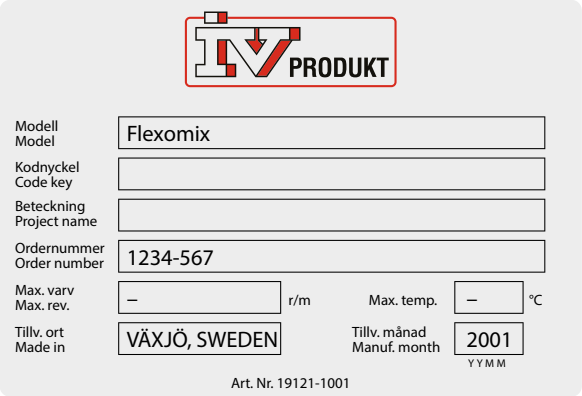
IV Produkt AB
Sjöuddevägen 7
SE-350 43 VÄXJÖ

2.3 Designations

Flexomix air handling units consist of a number of different modules.

Each module is equipped with a model identification label located on the front.

The model identification label shows the order number and the required designations for identifying the module.

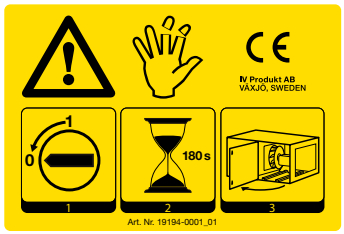


Typical model identification label

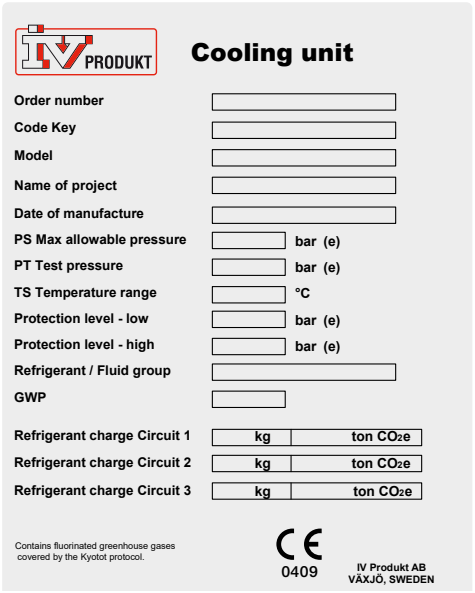
2.4 CE marking and EU Declaration of Conformity

The air handling units and any incorporated cooling 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 other EU Directives applicable to the types of air handling units, e.g. Pressure Equipment Directive PED 2014/68/EU.

As certification confirming that the requirements have been met, we provide an EU Declaration of Conformity, which is available under Documentation at ivprodukt.docfactory.com, or under Order Unique Documentation at docs.ivprodukt.com.



Typical CE label for air handling units



Typical CE label for cooling units

For units without integrated control equipment

The EC declaration applies only to units in the configuration in which they were delivered and installed at the facility in accordance with the accompanying installation instructions. The declaration does not include components that were subsequently added or measures subsequently taken on the unit.

2.5 Maintenance

The ongoing 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.

2.6 Handling of refrigerant

- For refrigerant management of cooling unit EcoCooler (code ECO, ECX), see the separate Operation and Maintenance instruction on docs.ivprodukt.com.
- For refrigerant management of reversible heat pump ThermoCooler HP (code TCH), see the separate Operation and Maintenance instruction on docs.ivprodukt.com.

2.7 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 17 with supplement VU 20, 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.

2.8 Spare parts

Spare parts and accessories for this unit are ordered from your nearest IV Produkt sales representative. When ordering, state the order number and designation. These are stated on a model type plate, affixed to each component. There is a separate spare parts list for the unit, refer to Order Unique Documentation at docs.ivprodukt.com.

2.9 Dismantling and decommissioning

When an air handling unit is to be dismantled, separate instructions must be followed, see Dismantling and decommissioning the AHU under Documentation at ivprodukt.docfactory.com.

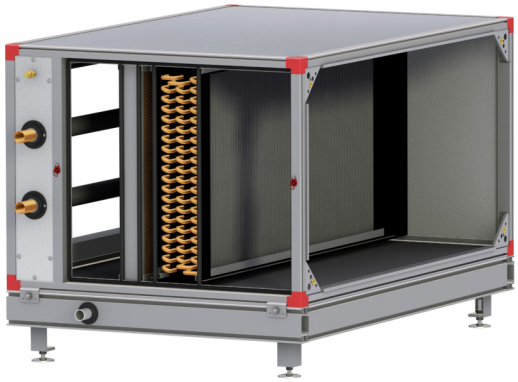
Flexomix service schedule

For relevant function parts, see the order document Technical data under order-unique documentation at docs.ivprodukt.com.

Service year 20 ..... Order. nr ..... Designation								
Comments					Service performed * (date and signature)			
Functional section		Code	Recommended action (insp.)	Incl. in unit	12 mths	24 mths	36 mths	48 mths
					date	date	date	date
	Inlet section	MIE-ID	Visual inspection Clean if necessary	☐	signature	signature	signature	signature
	Mixing section, recirculating unit	EBA, EBB, EBC, EBD, EBE	Visual inspection Clean if necessary	☐	signature	signature	signature	signature
	**Filter supply air, extract air**	MIE-FB/FC ELEF	Check pressure drop Change filter if necessary	☐	signature	signature	signature	signature
	**Rotary heat exchanger**	EXR	Visual inspection Check press. balance Check diff. pressure Clean if necessary	☐	signature	signature	signature	signature
	**Counter-flow/ Plate heat exchanger**	EXM EXP	Visual inspection Clean if necessary Check function	☐	signature	signature	signature	signature
	**Coil recovery**	MIE-CL/ELXF MIE-CL/ELXF	Visual inspection Check drainage Clean if necessary Check function	☐	signature	signature	signature	signature
 H_2O	**Air heater water**	MIE-CL/ELEV MIE-CL/ELTV	Visual inspection Clean if necessary Check function	☐	signature	signature	signature	signature
	**Air heater electric**	MIE-CL/ELEE	Visual inspection Clean if necessary Check function	☐	signature	signature	signature	signature
 H_2O /DX	**Air cooler water/DX**	MIE-CL/ELBC MIE-CL/ELBD	Visual inspection Check drainage Clean if necessary Check function	☐	signature	signature	signature	signature
	**Fan unit**	MIE-FF EFA-FF ELFF	Visual inspection Clean if necessary Check the air flow	☐	signature	signature	signature	signature
	**Damper**	EMT-01	Visual inspection Clean if necessary Check tightness	☐	signature	signature	signature	signature
	**Sound attenuator**	EMT-02 MIE-KL	Visual inspection Clean if necessary	☐	signature	signature	signature	signature
	**Cooling unit, EcoCooler**	ECO/ECX	See separate brochure	☐	signature	signature	signature	signature

**In some environments, service may be needed more often. Replace the filter if the pressure drop across the filter exceeds the specified final pressure drop.*

Exhaust air section (code EAD)



Exhaust air section EAD is placed after the heat recovery unit. The EAD exhaust air section is a complete unit, which in its basic version contains a drip tray and drainage made from materials resistant to corrosive environments.

EAD can be equipped with a water cooling coil to enable energy recovery from the extract air, e.g. in those cases where a heat pump is connected to the unit.

- EAD can be equipped with a heat recovery coil for a heat pump.
- the heat recovery coil has tin-plated copper tubes with epoxy-treated aluminium fins. The casing is in AL plate. Connection pipes and outlets for bleeding and draining are made from copper.
- the heat recovery coil is equipped with a droplet eliminator that is easy to pull out.
- EAD is an inspectable function section equipped with a drip tray and drainage connection (a water trap is not required when the system is equipped with a pressure fan).
- EAD is always supplied with a support.

Pipe connections

Drainage drip tray ext. Ø 32 mm.

For tube connection diameter heat recovery coil, see external document under order-unique documentation at doc.ivprodukt.com.

Operation and maintenance instructions

A coil consists of a number of copper tubes with pressed aluminium fins. The coils 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).

Inspection

- Check the coil fins to detect possible mechanical deformity.
- Check that the coils are not leaking.
- Check the drip tray and drain (clean if necessary).

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. In the event of heavier fouling, you can clean them with warm water mixed with dishwashing detergent that does not corrode aluminium.

Outdoor exhaust air section (code EAU)

with damper

The picture shows EAU-1250 in the configuration with a damper

The EAU outdoor exhaust air section is a functional part that is used to reduce the risk of short-circuiting between outdoor air and exhaust air.

Two different versions of the exhaust hood are available:

- without damper (code -0)
- with damper (code -1).

The following is applicable to the version with a damper:

- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Mixing section (code EBA)

The photo shows the right-hand version, size 190

The EBA mixing section is a functional section with a damper for mixing outdoor air and recirculated air.

- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Mixing section (code EBB)

The EBB mixing section is a unit section with three dampers for mixing extract, return and outdoor air.

- The EBB mixing section has built-in dampers of IV Produkt type KJS.
- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa
- The unit section comes with an inspection door as standard.

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Mixing section (code EBC)

The EBC mixing section is a unit section with three dampers for mixing extract, return and outdoor air.

- The EBC mixing section has built-in dampers of IV Produkt type KJS.
- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of rubber creates a seal between the blades.
- In the configuration with inside shafts, the damper is linked to two shafts.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa
- The EBC mixing section has an inspection door in both the upper and the lower level.

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Mixing section (code EBC)

The EBC mixing section is a unit section with three dampers for mixing extract, return and outdoor air.

- The EBC mixing section has built-in dampers of IV Produkt type KJS.
- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa
- The EBC mixing section has an inspection door in both the upper and the lower level.

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Mixing section (code EBD)

The EBD recirculating unit is a unit section with two dampers intended specifically for recirculated air operation to heat premises at night.

- The EBD mixing section has built-in dampers of IV Produkt type KJS.
- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa
- Recirculating unit EBD has an inspection hatch in both the upper and lower level.

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Recirculating unit (code EBE)

The EBE recirculating unit is a section unit with a damper designed to recirculate air in conjunction with heating premises at night.

To obtain the intended function, it is assumed that the unit will be equipped with shut-off dampers for outdoor air and exhaust air.

The unit section has an inspection door in both the upper and lower level.

- The EBE recirculating unit has a built-in damper of IV Produkt type KJS.
- The damper is manufactured from aluminium profiles and complies with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

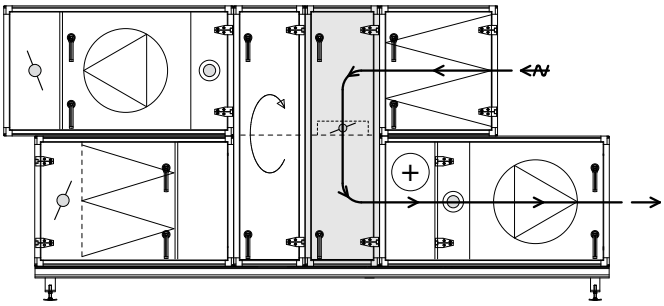
Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.



Schematic diagram – recirculation of air in the recirculating unit (marked in grey).

Angle section (code EKV)

The EKV angle section is used to deflect the air stream for sizes 060–600.

- The angle section is an empty unit section used for 90° vertical deflection.
- The section has an inspection door.
- The unit section can be fitted with a filter (code EKVT-01-a).
- The unit part can be equipped with external duct damper EMT-01.

Filter

The angle section can be equipped with deep-pleated bag filter, carbon filter or knitted aluminium filter.

For filter data, refer to Filter Overview under Documentation at ivprodukt.docfactory.com. For relevant filters, see order-unique documentation at docs.ivprodukt.com (Technical data and parts).

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Filter, Operation and Maintenance

The air filters in a ventilation system are designed to prevent dust and other impurities from entering the building. They should also protect sensitive components inside the unit, e.g. coils and heat recovery units, 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 replace them.

According to guidelines for hygienic design VDI 6022 Part 1: The supply air filter must be class ePM1-50% *(F7) or have a higher filtration capacity.*

The filter is designed for one-time use. If the filter becomes fouled, the unit will lose capacity. The filter should therefore be changed if the pressure drop across it exceeds the specified value.

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 section should therefore also be cleaned when the filter is changed.

Inspection

Check the pressure drop across the filter. The pressure drop is measured with a manometer connected to measurement outlets. The measurement outlets are connected to each side of the filter. If the filter has reached its specified final pressure drop, it must be changed.

Filter replacement

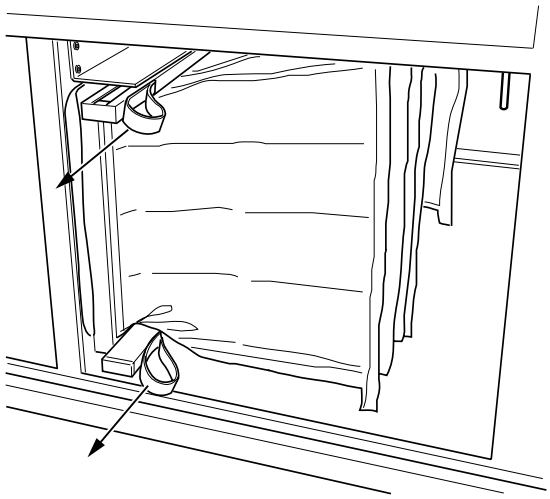
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

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

2. If there is a fixed filter monitor; loosen the necessary measuring hoses for the cover/post in order to open the inspection hatch.
3. Wait until the fans have stopped, then open the inspection hatch.

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

4. Release the eccentric rails.



Eccentric rails

5. Remove the old filter by pulling it towards you.
6. Clean the filter cabinets.
7. Install the new filter, press in the eccentric rails to engage them and close the inspection hatch.
8. If there is a fixed filter monitor, replace the measuring hoses to the measuring outlets on the cover/post.
9. Start the unit.

Cleaning

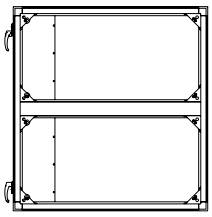
Vacuum and use a damp cloth to wipe clean the inside of the filter section.

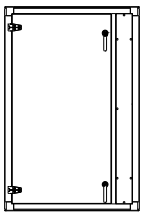
Media section (code EMD)

The media section EMD has a shielded space for electrical and control cabinet installation. The media section has a two-level configuration.

Technical data

Configuration





For size-specific technical data, see the documentation enclosed with the unit/unit section, or see product selection program IV Produkt Designer.

Operation and maintenance

Vacuum and/or wipe all surfaces with a cloth.

Standard module (code EMM)

The photo shows the right-hand version, size 190

Standard module EMM size 060-980 is an insulated unit housing that combines with the selected fitting to form a complete functional section, e.g. for heating, cooling or other functions desired.

The unit's frame comprises extruded and anodised aluminium panels, 50×50 mm.

Covers and panels are of double-plate construction with intermediate insulation.

The panels are aluminium/zinc-treated sheet steel with a protective coating (ALC).

Housing and support meet the requirements for corrosion class C4 according to SS-EN ISO 12944-2. The casing is available in the following configurations:

Type of housing	Insulation	Thermal transmittance class	Thermal bridging class
AA - Standard	Glass wool	T3	TB4
BA - Insulation with fire resistance rating EI 30	Ultimate (stone and glass wool)	T3	TB4
PA - Low-energy ThermoLine	Polyurethane	T2	TB3
PA2 - Low-energy ThermoLine Plus	Polyurethane	T2	TB2

Optional fittings

- Damper fitting (code MIE-KS)
- Inlet fitting (code MIE-ID)
- Filter fitting (code MIE-FB/FC)
- Cooling/heating fitting (code MIE-CL)
- Electric air heater fitting (code MIE-EL)
- Humidifier fitting (code MIE-EF)
- Fan fitting (code MIE-FF)
- Inspection fitting (code MIE-KM)
- Empty section fitting (code MIE-TD)
- Sound attenuator fitting (code MIE-KL)
- Media section fitting (code MIE-MD)

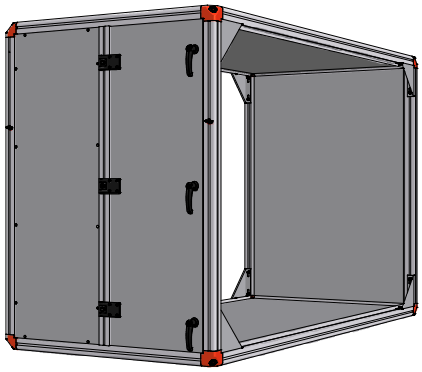
Accessories

- Connection gable (code EMMT-01)
- Connection frame (code EMMT-02)
- Sleeve (code EMMT-03)
- Outdoor version (code EMMT-04)
- Support (code EMMT-05)
- Lifting bracket (code EMMT-08)
- Acid-proof bottom (code. EMMT-09)
- One-piece configuration 060-600 (code EMMT-10)
- Inspection window (code EMMT-11)
- Hygienic sealing (code EMMT-14)
- Bottom drain (code EMMT-15)
- Removable configuration 060-600 (code EMMT-22)
- Cover strip, bottom profile (code EMMT-29)

Operation and maintenance

The standard module requires no maintenance. See separate operation and maintenance instructions for the optional fittings for EMM.

Standard module (code EMM)



Standard module EMM size 1150-3150 is an insulated unit housing that combines with the selected fitting to form a complete functional section, e.g. for heating, cooling or other functions desired.

The unit's frame comprises extruded and anodised aluminium panels, 60×60 mm.

Covers and panels are of double-plate construction with intermediate insulation.

The panels are aluminium/zinc-treated sheet steel with a protective coating (ALC).

Housing and support meet the requirements for corrosion class C4 according to SS-EN ISO 12944-2. The casing is available in the following configurations:

Type of housing	Insulation	Thermal transmittance class	Thermal bridging class
AA - Standard	Glass wool	T3	TB4
BA - Insulation with fire resistance rating EI 30	Ultimate (stone and glass wool)	T3	TB4

Optional fittings

- Damper fitting (code MIE-KS)
- Inlet fitting (code MIE-ID)
- Filter fitting (code MIE-FB)
- Cooling/heating fitting (code MIE-CL)
- Electric air heater fitting (code MIE-EL)
- Humidifier fitting (code MIE-EF)
- Inspection fitting (code MIE-KM)
- Empty section fitting (code MIE-TD)
- Sound attenuator fitting (code MIE-KL)
- Media section fitting (code MIE-MD)
- Outdoor intake fitting (code MIE-IU)

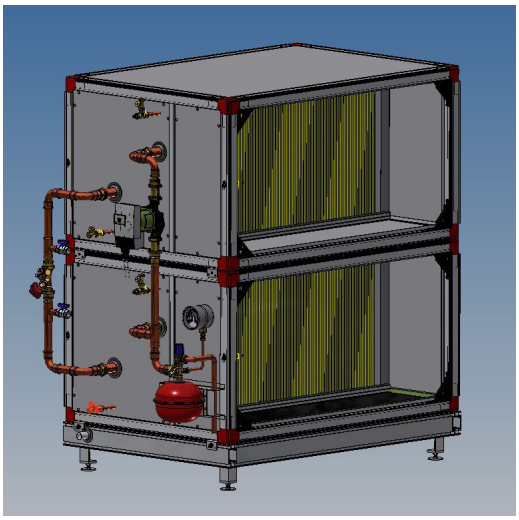
Accessories

- Connection gable (code EMMT-01)
- Connection frame (code EMMT-02)
- Sleeve (code EMMT-03)
- Outdoor sealing, fixed panelling (code EMMT-04)
- Support (code EMMT-05)
- Acid-proof bottom (code. EMMT-09)
- Lifting bracket (code EMMT-12)
- Hygienic sealing (code EMMT-14)
- Bottom drain (code EMMT-15)
- Inspection window (code EMMT-26)

Operation and maintenance

The standard module requires no maintenance. See separate operation and maintenance instructions for the optional fittings for EMM.

Heat recovery section (code EXG)



Heat recovery unit FlexoPool EXG is a recovery unit according to the coil recovery principle, especially designed to withstand corrosive environments.

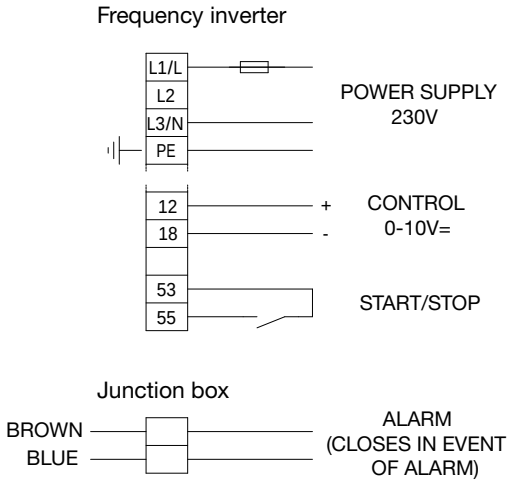
The FlexoPool EXG is constructed and supplied as a complete recovery unit comprising coils for supply air and extract air, including pipe joint with speed controlled pump.

- The system is filled with liquid, bled, adjusted and function tested at the factory.
- The heat transfer is controlled by a variable liquid flow via frequency controlled circulation pump. The circulation pump is located externally on the inspection side of the unit.
- Static pressure in the liquid system is monitored via a test gauge with signalling switch. Falling or rising pressure stops the circulation pump and triggers an alarm.
- Humidity is not recovered from the extract air. However, at low outdoor air temperatures, moisture is precipitated and energy is recovered. The condensate is collected in a drip tray with a drainage connection with ext. Ø 32 mm (a water trap is not required when the system is equipped with a pressure fan).
- The humidity precipitation means there is a risk of ice forming in the extract air coil. The formation of ice is counteracted by regulating the liquid flow in the system via the speed controlled circulation pump.
- The unit is supplied on a support.

Pump motor

Size	Output (W)	Current (A)	Voltage (V)	Rec. fuse protection (AT)
100–600	750	2.2	230	10

Wiring instructions



Operation and maintenance

The coils consist of a number of copper tubes with aluminium fins pressed onto them. The coils 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).

Inspection

- Check the coil fins to detect possible mechanical deformity.
- Check that the coils are not leaking.
- Check that the pressure in pipework holds at least 0.8 bar. Bleed and fill with brine solution if necessary. The circulation pump must be switched off during bleeding and filling.
- Check the drip tray and drain with water trap (clean if necessary).

Cleaning

If the fins on the coil are dirty, vacuum clean from the inlet side. Exercise care when vacuuming, as the fins are thin and can be damaged through careless contact. Alternatively, you can blow them clean with compressed air from the outlet side. In the event of heavier fouling, you can clean them with warm water mixed with dishwashing detergent that does not corrode aluminium. The exhaust air coil must be flushed with warm water at least once a year.

Bleeding

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

Counter-flow heat exchanger (code EXM)

Example EXM size 190

The EXM counter-flow heat exchanger is a complete heat recovery unit with a heat exchanger that works with heat transfer according to the air-air principle.

The counter-flow heat exchanger's task is to recover heat from the extract air and transfer this heat to the supply air so that energy use is minimized.

Counter-flow heat exchangers are of the counter-flow type and are made of aluminium plates. Smooth ducts in the direction of airflow provide a low pressure drop and minimal risk of dust building up.

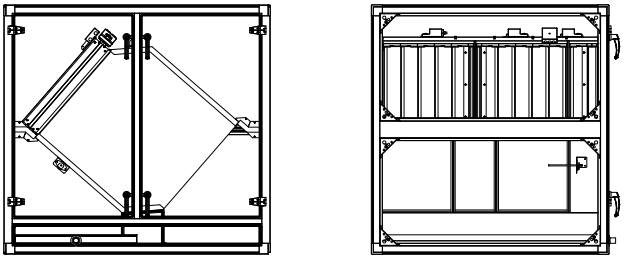
If the counter-flow heat exchanger is malfunctioning, the recovery efficiency is reduced with subsequent increased energy use, and the projected supply air temperature cannot be achieved at low outdoor temperatures.

Possible reasons for reduced recovery efficiency could be the fouling of the heat-exchanging surfaces (fins) or that the bypass damper is not closing completely.

A reduction in the exhaust air flow, e.g. through fouling of exhaust air filters, entails reduced recovery efficiency.

At low temperatures the extract air humidity is precipitated. The condensate is collected in a drip tray with a drainage connection. The humidity precipitation also means there is a risk of ice forming in the exchanger. The formation of ice is counteracted by a frosting function.

Configuration



Example configuration in full block (also available in sections).

Drainage

Connection = ø20 mm

Damper

Damper motors are assembled at the factory.

Functional description, frosting function

The counter-flow heat exchanger may, under certain operating conditions, cause frost and ice formation on the exhaust air side. In order to optimise heat recovery, and avoid freezing, there is a built-in frosting function. The principle is based on the frosting function starting when the temperature of the exhaust air side's coldest surface falls below a certain value.

The freezing process is prevented by reducing heat recovery gradually through regulating dampers on the counter-flow exchanger's Exhaust Air side. The heat recovery damper closes and the bypass damper opens. In this way, the exhaust air temperature is increased and freezing is avoided.

During full heat recovery and when the unit is switched off, the dampers should be fully open (bypass damper closed).

The frosting and bypass functions are preset at the factory and any adjustments may only be performed by IV Produkt.

The bypass and shut-off dampers are of KJS type in tightness class 2 in accordance with SS-EN1751 (VVS AMA-98) and corrosion class C4 in accordance with SS-EN ISO 12944-2.

Counter-flow heat exchangers, operation and maintenance instructions

Inspection

1. Inspect the fins for fouling. Inspection can be carried out through e.g. an inspection door to the filter section.
2. Check the auto defrosting function and make sure that the bypass damper closes securely when defrosting is not in progress.
3. Check the drip tray, drainage and water trap function. A water trap without a non-return value should be filled with water.

Cleaning

Cleaning is recommended by vacuuming, blowing with compressed air and flushing with hot water (if necessary, with the addition of mild detergent that does not corrode aluminium). High pressure flushing must not be directed at the fins.

At operating temperatures below 0°C the heat exchanger assembly must be dry before being commissioned.

Damper, operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Plate heat exchanger (code EXP)

The plate heat exchanger EXP is a complete unit with a plate changer that works with heat transfer according to the air-air principle.

The task of the plate 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.

The plate heat exchanger is of the cross-current type and is composed of aluminium plates that can also be supplied epoxy treated. Smooth ducts in the direction of airflow provide a low pressure drop and minimal risk of dust building up.

Inadequate operation of the plate heat exchanger through reduced recovery efficiency means increased energy use. This also means that the planned supply air temperature will not be reached when outdoor temperatures are low.

Possible reasons for reduced recovery efficiency could be the fouling of the heat-exchanging surfaces, the bypass damper not closing completely, or the extract air filter being dirty.

At low temperatures the extract air humidity is precipitated.
The condensate is collected in a drip tray with a drainage connection. The humidity precipitation also means there is a risk of ice forming in the exchanger. The formation of ice is counteracted by some of the outdoor air flow being bypassed past the exchanger.

Particular attention should be paid to any ice forming in the extract air section of the heat recovery unit. If operational disturbances occur caused by icing, the anti-freeze equipment for the unit undergoes a function check.

The bypass and shut-off dampers are of KJS type in tightness class 2 in accordance with SS-EN1751 (VVS AMA-98) and corrosion class C4 in accordance with SS-EN ISO 12944-2.

Drainage

Size 060-980, 1 pc connection = ø32 mm

Size 1250, 2 pcs connection = ø42 mm

Damper

Damper shaft 12x12 mm

Size	Number of damper motors	Required torque (Nm)
060, 100	1	3
150	1	4
190, 240, 300, 400	1	5
360	1	6
480, 600	1	10
740	2	13
750	2	9
850	2	10
950, 980, 1250	2	11

Plate heat exchanger, operation and maintenance instructions

Inspection

1. Inspect the fins for fouling. Inspection can be carried out through e.g. an inspection door to the filter section.
2. Check the auto defrosting function and make sure that the bypass damper closes securely when defrosting is not in progress.
3. Check the drip tray, drainage and water trap function. A water trap without a non-return value should be filled with water.

Cleaning

Cleaning is recommended by vacuuming, blowing with compressed air and flushing with hot water (if necessary, with the addition of mild detergent that does not corrode aluminium). High pressure flushing must not be directed at the fins.

At operating temperatures below 0°C the heat exchanger assembly must be dry before being commissioned.

Damper, operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.

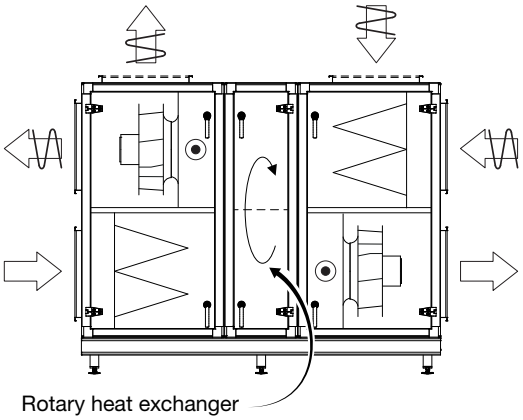
Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Rotary heat exchanger (code EXR)

The rotary heat exchanger EXR is a complete unit with a rotating heat exchanger that works with heat transfer according to the air-air principle.

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.



Rotor control

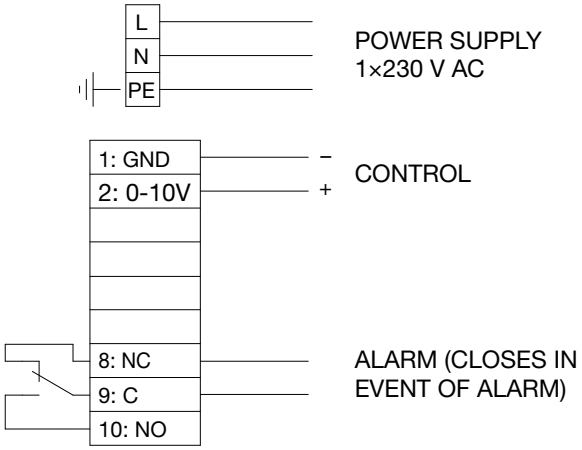
Size	Output	Voltage	Operating temperature
060-150	55 W	1×230 V	-40 °C - +40 °C
190-980	220 W	1×230 V	-40 °C - +40 °C

The rotor control is manufactured by OJ Electronics.

Motor data

Size	Output	Current	Voltage
060-360	55 W	0.6 A	1×230 V
400-600	110 W	1.2 A	1×230 V
740-980	220 W	2.4 A	1×230 V

Wiring instructions



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.

Rotor control function

The control unit and drive motor are component parts of the rotor control. The control unit built into the heat recovery unit comes with complete functions for purging, a rotation monitor, motor protection and an alarm.

A rotation monitor sensor is included as standard. Speed control takes place against a control graph that is almost linear to the temperature efficiency.

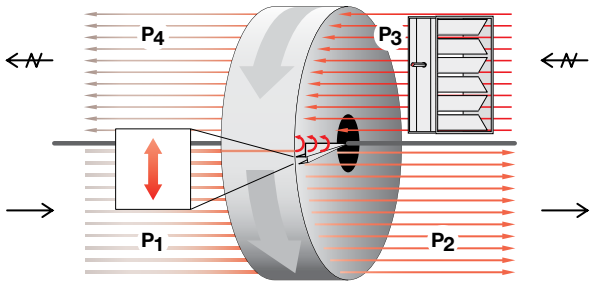
A hygroscopic rotor variant can absorb particles which in some cases give off odours. The particles may be made up of mould spores that bond to the hygroscopic surface. Under certain moisture and temperature conditions, these mould spores may undergo growth that gives off gases with an unwanted odour. To prevent odour, the hygroscopic rotor is “aired” via the extract air by rotating continuously at low speed.

For more information, see Rotor control on the IV Produkt website.

Purging and leakage flow

Rotary heat exchangers always transfer a certain extract air to the supply air or supply air to the extract air by means of co-rotation.

When purging sectors are used, the rotor is purged so that the transfer of extract air to the supply air is eliminated. When installing heat recovery units with purging sectors, the fans must be positioned so that P1>P4 and P2>P3 as shown in the figure.



Trim dampers may possibly be used in order to achieve the necessary pressure balance.

The purging flow is adjusted using the adjustable purging sector. IV Produkt Designer Calculates the leak flow and any trim damper requirement.

Operation and maintenance instructions

Inspection

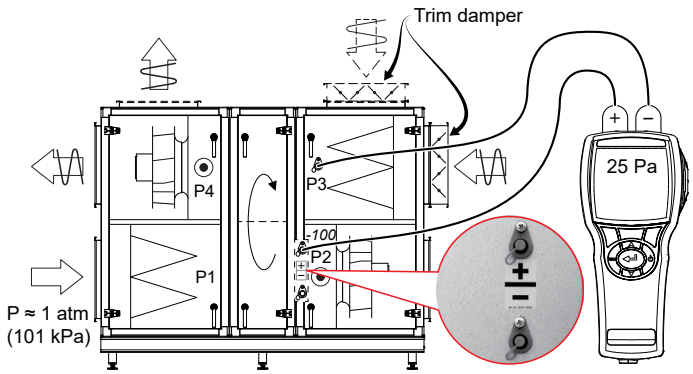
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.
2. Wait until the fans have stopped, then open the inspection door.

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. Rotation 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.
8. Check the pressure balance. To ensure correct function of the purging sector, the negative pressure at P3 should be greater than the negative pressure at P2 (min. diff. 25 Pa). Otherwise an EMT-01 trim damper can be used on the extract air side in order to throttle in the correct pressure balance.

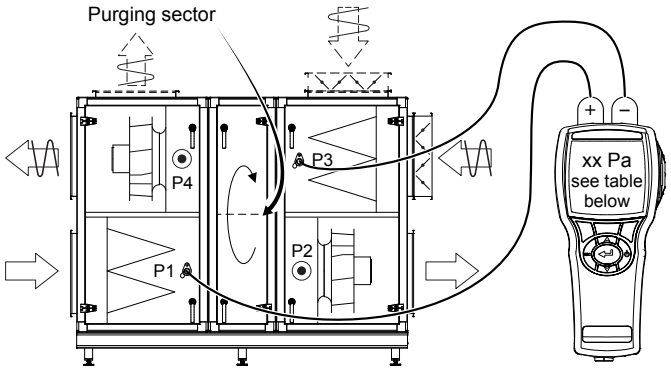
   Example:
   Measurement outlets for P2: Downstream supply air fan (SF) generates negative pressure in relation to the atmospheric pressure (atm), e.g. -100 Pa

   Measurement outlets for P3: Downstream extract air fan (EF) and any trim damper generate greater negative pressure than at P2, e.g. -125 Pa.



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).

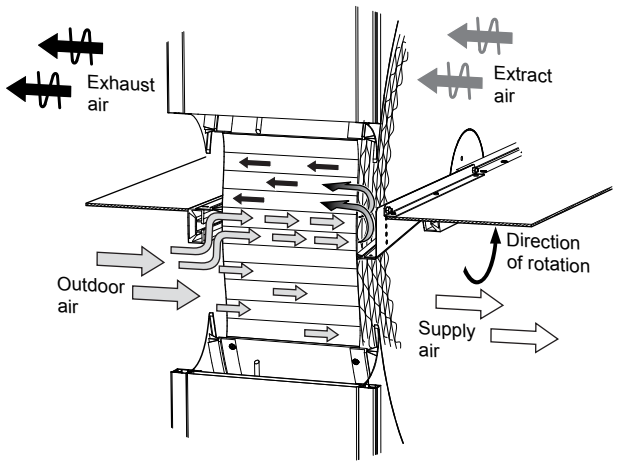


- Read the rec. setting (adjustment hole in the purging sector) from the table below.

	Rotor variant	Adjustment hole in the purging sector				
		5 open*	4	3	2	1 closed
Diff. pressure between P1 and P3 (Pa)	NO, NE, HY, HE, EX	< 200	200 – 400	400–600	> 600	–
	NP, NX, HP	< 300	300–500	500–700	> 700	–

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

- Adjust the purging sector if the need arises. The picture shows the purging sector set to the maximum open position (schematic diagram).



Cleaning

- Remove dust by carefully vacuum cleaning using a soft brush.
- In the event of severe contamination and heavy-duty dirt, the rotor can be sprayed with a mild, alkaline detergent.
- Compressed air at low pressure (max. 6 bar) can be used for blowing the rotor 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: see the information under ”Funktion rotorstyrning” sid 2. If any odour persists, we recommend cleaning the rotor with a mild, alkaline detergent.

Apply copious amounts of the detergents using a pressure spray, if possible when the unit is operational 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.

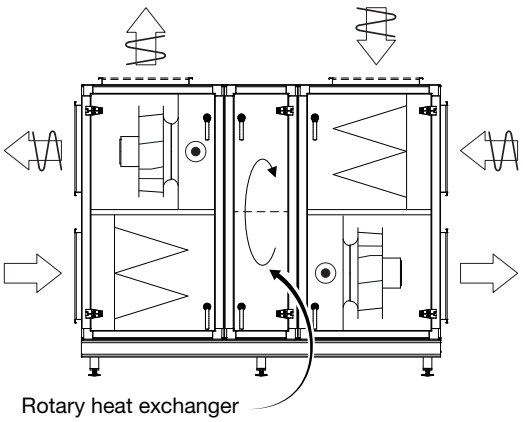
Lubrication

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

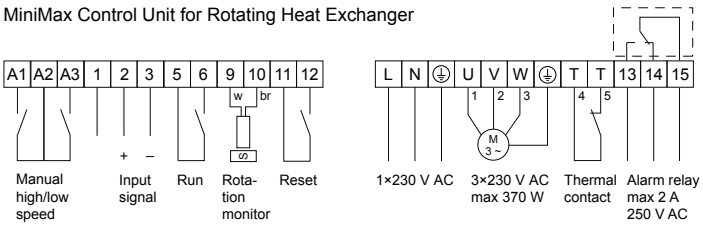
Rotary heat exchanger (code EXR)

The rotary heat exchanger EXR is a complete unit with a rotating heat exchanger that works with heat transfer according to the air-air principle.

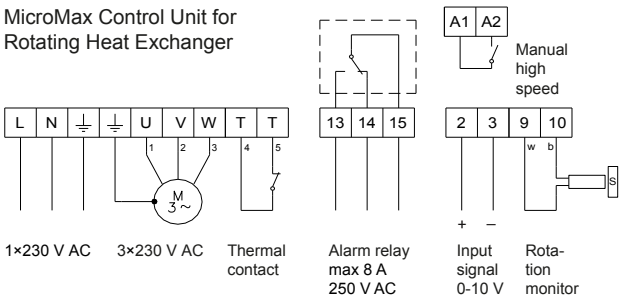
The purpose of the heat exchanger is to recover heat from the extract air and transfer this heat to the supply air. This reduces the output required and the energy use.



Wiring instructions



D1 - IBC control MiniMax



D1/D2 - IBC control MicroMax370/750

Motor data

Size	Rotor diameter	Output	Current	Voltage
1150, 1250, 1540, 1550	D1	650 W	2.8 A	1×230 V
1950, 2050	D1	370 W	1.7 A	1×230 V
1150, 1250, 1540	D2	370 W	1.7 A	1×230 V
2240, 2550, 3150	D1	750 W	3.5 A	1×230 V
1550, 1950, 2050, 2240, 2550, 3150	D2	750 W	3.5 A	1×230 V

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.

Rotor control function

The control unit and drive motor are component parts of the rotor control. The control unit built into the heat recovery unit comes with complete functions for purging, a rotation monitor, motor protection and an alarm.

A rotation monitor sensor is included as standard. Speed control takes place against a control graph that is almost linear to the temperature efficiency.

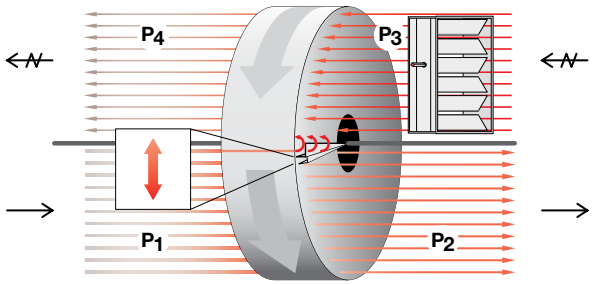
A hygroscopic rotor variant can absorb particles which in some cases give off odours. The particles may be made up of mould spores that bond to the hygroscopic surface. Under certain moisture and temperature conditions, these mould spores may undergo growth that gives off gases with an unwanted odour. To prevent odour, the hygroscopic rotor is “aired” via the extract air by rotating continuously at low speed.

For more information, see Rotor control on the IV Produkt website.

Purging and leakage flow

Rotary heat exchangers always transfer a certain extract air to the supply air or supply air to the extract air by means of co-rotation.

When purging sectors are used, the rotor is purged so that the transfer of extract air to the supply air is eliminated. When installing heat recovery units with purging sectors, the fans must be positioned so that P1>P4 and P2>P3 as shown in the figure.



Trim dampers may possibly be used in order to achieve the necessary pressure balance.

The purging flow is adjusted using the adjustable purging sector. IV Produkt Designer Calculates the leak flow and any trim damper requirement.

Operation and maintenance instructions

Inspection

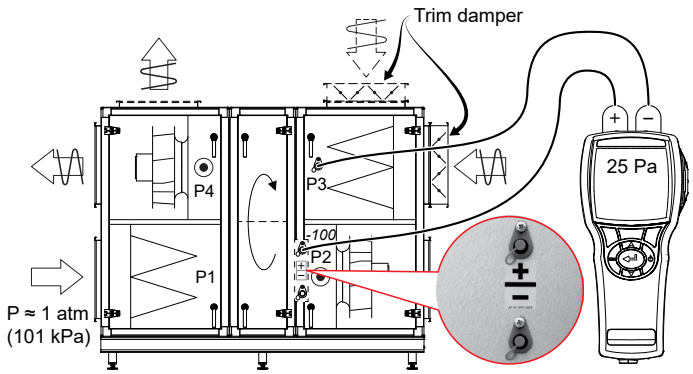
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.
2. Wait until the fans have stopped, then open the inspection door.

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. Rotation 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.
8. Check the pressure balance. To ensure correct function of the purging sector, the negative pressure at P3 should be greater than the negative pressure at P2 (min. diff. 25 Pa). Otherwise an EMT-01 trim damper can be used on the extract air side in order to throttle in the correct pressure balance.

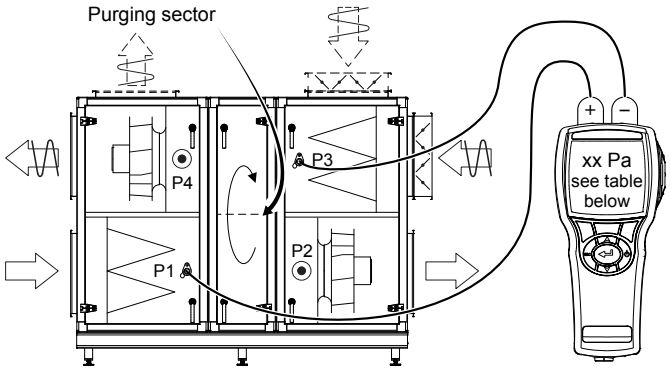
   Example:
   Measurement outlets for P2: Downstream supply air fan (SF) generates negative pressure in relation to the atmospheric pressure (atm), e.g. -100 Pa

   Measurement outlets for P3: Downstream extract air fan (EF) and any trim damper generate greater negative pressure than at P2, e.g. -125 Pa.



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).

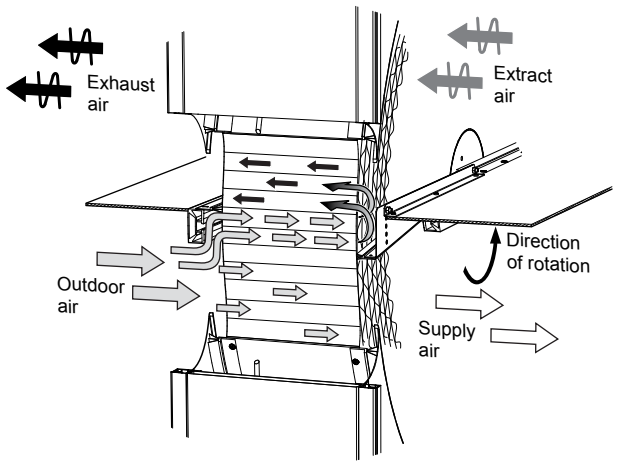


- Read the rec. setting (adjustment hole in the purging sector) from the table below.

	Rotor variant	Adjustment hole in the purging sector				
		5 open*	4	3	2	1 closed
Diff. pressure between P1 and P3 (Pa)	NO, NE, HY, HE, EX	< 200	200 – 400	400–600	> 600	–
	NP, NX, HP	< 300	300–500	500–700	> 700	–

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

- Adjust the purging sector if the need arises. The picture shows the purging sector set to the maximum open position (schematic diagram).



Cleaning

- Remove dust by carefully vacuum cleaning using a soft brush.
- In the event of severe contamination and heavy-duty dirt, the rotor can be sprayed with a mild, alkaline detergent.
- Compressed air at low pressure (max. 6 bar) can be used for blowing the rotor 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: see the information under ”Funktion rotorstyrning” sid 2. If any odour persists, we recommend cleaning the rotor with a mild, alkaline detergent.

Apply copious amounts of the detergents using a pressure spray, if possible when the unit is operational 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.

Lubrication

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

Cooling/heating fitting (code MIE-CL)

The cooling/heating fitting consists of assembly rails and a housing front section for integration into the standard module (code EMM).

The fitting is designed for:

- air heater water (code ELEV)
- air heater water, ThermoGuard type (code ELTV)
- air heater steam (code ELES)
- air cooler water (code ELBC)
- air cooler DX direct expansion (code ELBD)
- heat recovery coil, supply air (code EDXT)
- heat recovery coil, extract air (EDXF)

- Pipe connections up to and including 25 mm are made of copper, larger connections of steel. They have an outside thread connection and are fitted with outlets for bleeding and draining. ELEV also has an outlet for an immersion detector.
- ELBC, ELBD and EDXF have stainless drip trays with Ø32 mm drainage connection. Droplet eliminator is required at air speed >2.8 m/s.
- The ELTV air heater has ThermoGuard frost protection When installed in cold areas, the air heater must always be allowed to relieve the pressure to the heating system's return line. When a two-way valve is used for flow control, the valve must always be fitted to the intake pipe.

- Max. operating pressure:

ELEV, ELBC, EDXT, EDXF	1.6 MPa (16 atm)
ELBD	2.2 MPa (22 atm)
ELES	1.0 MPa (10 atm)
ELTV	0.6 MPa (6 atm)

- Max. operating temperature:

ELEV	100 ˚C	EDXT/EDXF	100 ˚C
ELES	185 ˚C	ELTV	100 ˚C

For output variant, water volume and other technical data, see the product selection program IV Product Designer and the order document Technical data under order-unique documentation at docs.ivprodukt.com.

Accessories

- Air valve (code MIET-CL-01)
- Drain valve (code MIET-CL-02)
- T-pipe for frost protection and bleeding/draining (code MIET-CL-03)
- Water trap (code MIET-CL-04)
- Lid for external pipe connections (code MIET-CL-05-a)

Operation and maintenance

Air heater, water heating

The heating coil 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 the coil fins to detect possible mechanical deformity.
- Check that the 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. In the event of heavier fouling, you can clean them with warm water mixed with dishwashing detergent that does 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.

Check function

Check that the heat circulation is working: This can be done by temporarily increasing the temperature setting (setpoint).

Additional maintenance for ThermoGuard

The safety valve's function must be checked regularly (at least once a year). If you see that a valve is leaking, this is normally due to impurities from the pipe system that have accumulated on the actual 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.

Any shut-off valves on the supply or return lines may not be closed if freezing temperatures are likely.

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.

Air cooler, waterborne cooling

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, and in some cases there is a droplet eliminator downstream of the cooling coil which prevents drops of water accompanying the air stream.

Inspection

- Check the coil fins to detect possible mechanical deformity.
- Check that the coil is not leaking.
- Check that cooling energy is uniformly distributed across the coil surfaces (in operation).
- Check the drip tray and drain with water trap (clean if necessary).
- Check 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. In the event of heavier fouling, you can clean them with warm water mixed with dishwashing detergent that does not corrode aluminium.

Bleeding

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

Check function

Check that the water circulation is working. This can be done by temporarily reducing the temperature setting (setpoint).

Air cooler, direct expansion

The cooling coil consists of a number of copper tubes with aluminium fins pressed onto them. The coil's surfaces must be clean in order to achieve the maximum cooling power and good operating economy. Seriously fouled coils reduce the air flow and impair the heat transmission, which can compromise the cooling compressors' operation.

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). If the fins are fouled, they must be cleaned with a vacuum cleaner. As an alternative, you can carefully blow them clean from the outlet side or rinse them with warm water.

NB: When using warm water to rinse the cooling coil for direct expansion, the cooling system must be drained (performed by cooling engineer). If this is not done, there is a major risk of explosion.

A drip tray with drain is located under the cooling coil for removing evaporation water, and there is sometimes a droplet eliminator downstream of the cooling coil which prevents drops of water accompanying the air stream.

Inspection

- Check the coil fins.
- The drip tray and drain with water trap should be checked carefully and cleaned if necessary.
- A water trap without a non-return value should be filled with water.

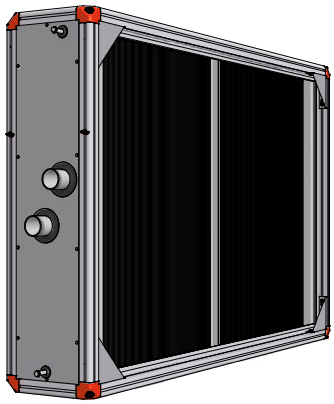
Cleaning

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. In the event of heavier fouling, you can clean them with warm water mixed with dishwashing detergent that does not corrode aluminium.

NB: When using warm water to rinse the cooling coil for direct expansion, the cooling system must be drained (performed by cooling engineer). If this is not done, there is a major risk of explosion.

Clean the drip tray and drain if required.

Cooling/heating fitting (code MIE-CL)



The cooling/heating fitting consists of assembly rails and a housing front section for integration into the standard module (code EMM).

The fitting is designed for:

- air heater water (code ELEV)
- air cooler water (code ELBC)
- heat recovery coil, supply air (code EDXT)
- heat recovery coil, extract air (EDXF)

- The steel pipe connections have an outside thread connection and are fitted with outlets for bleeding and draining. ELEV also has an outlet for an immersion detector (frost protection).
- ELBC and EDXF have stainless drip trays with Ø32 mm drainage connection. Droplet eliminator is required at air speed >2.8 m/s.
- Max. operating pressure:
  ELEV, ELBC, EDXT, EDXF 1.6 MPa (16 atm)
- Max. operating temperature:
  ELEV, EDXT, EDXF 100 ˚C

For output variant, water volume and other technical data, see the product selection program IV Product Designer and the order document Technical data under order-unique documentation at docs.ivprodukt.com.

Accessories

- Air valve (code MIET-CL-01)
- Drain valve (code MIET-CL-02)
- T-pipe for frost protection and bleeding/draining (code MIET-CL-03)
- Water trap (code MIET-CL-04)
- Lid for external pipe connections (code MIET-CL-05-a)

Operation and maintenance instructions

The coil consists of a number of copper tubes with pressed aluminium fins. 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.

A drip tray with drain is located under the cooling coil for collecting and removing evaporation water, and in some cases there is a droplet eliminator downstream of the cooling coil which prevents drops of water accompanying the air stream.

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. In the event of severe contamination, clean with a mild, alkaline detergent.

Bleeding

If necessary, bleed coil and pipework.
Bleeder screws are on top of the coil or on the tube connections.

Check function

Check that the water circulation is working. This can be done by temporarily reducing the temperature setting (setpoint).

Inspection air heater, water heating

- Check the coil fins to detect possible mechanical deformity.
- Check that the coil is not leaking.

Inspection air cooler. waterborne cooling

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

Humidifier fitting (code MIE-EF)

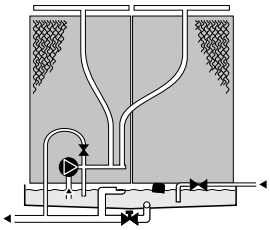
The configuration is chosen together with an evaporative humidifier (code EFEF) with cold humidifier surfaces that can also be used for evaporative cooling. The fitting consists of a humidifier block, water reservoir, water distribution system and housing front section for integration into the standard module (code EMM).

- The water reservoir is made from stainless steel. Spraybars and pipe parts are made from PVC plastic.
- The humidifier is made from a specially impregnated composite material.
- Two humidifier configurations are available: circulating water or direct water.
  A droplet eliminator is also available.
- The humidifier is available withtwo different humidification rates: max 85% (FA5-85, FA6-85) or max 95% (FA6-95).
- A pump is included as standard for humidifiers using circulating water.

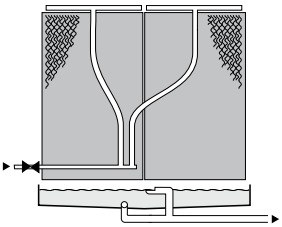
Accessories for fitting

- Damper motor installed (code KJST-04) (size 150-980)
- Water trap (code MIET-CL-04)
- Solenoid valve (code MIET-EF-01)

Configuration humidifier



Circulating water



Direct water

Water consumption

Direct water (size 060-980)

Total water consumption (T) (l/min) in direct water:

Size	Configuration	
	FA5	FA6-85/95
060	2.0	-
100	2.8	-
150	-	6.3
190	-	8.0
240	-	8.5
300, 360	-	10.0
400, 480, 600	-	12.0
740	-	15.0
750	-	12.0
850	-	15.0
950	-	12.0
980	-	18.0

Circulating water (size 150-980)

The total water consumption is determined by the amount of evaporated and bled-off water respectively. To calculate the water consumption, see Munters FA6 Technical manual at docs.ivprodukt.com.

Electrical data circulation pump (size 150-980)

Enclosure class IP54.

Size	Configuration	Voltage 3-phase (V)	Output (W)	Rated current Δ / Y (A)
150	FA6-85 FA6-95	Δ230/Y400	49	0.26/0.15
190, 240, 300, 360, 400, 480, 600, 750	FA6-85	Δ230/Y400	49	0.26/0.15
	FA6-95	Δ230/Y400	75	0.38/0.22
740, 850	FA6-85	Δ230/Y400	75	0.38/0.22
	FA6-95	Δ230/Y400	140	0.71/0.41
950	FA6-85 FA6-95	Δ230/Y400	75	0.38/0.22
980	FA6-85	Δ230/Y400	75	0.38/0.22
	FA6-95	Δ230/Y400	140	0.71/0.41

Operation and maintenance instructions

The purpose of the air humidifier is to add moisture to an air flow. One operation case is to add moisture to the supply air, another is to add moisture to the extract air in order to reduce the air temperature before the air passes through e.g. a rotary heat exchanger (evaporative cooling).

Faulty function leads to a lower humidification rate.

If the humidifier is to be out of service for a longer period of time, the humidifier blocks must be removed, cleaned and stored in a suitable space.

Size 060-100

Check:

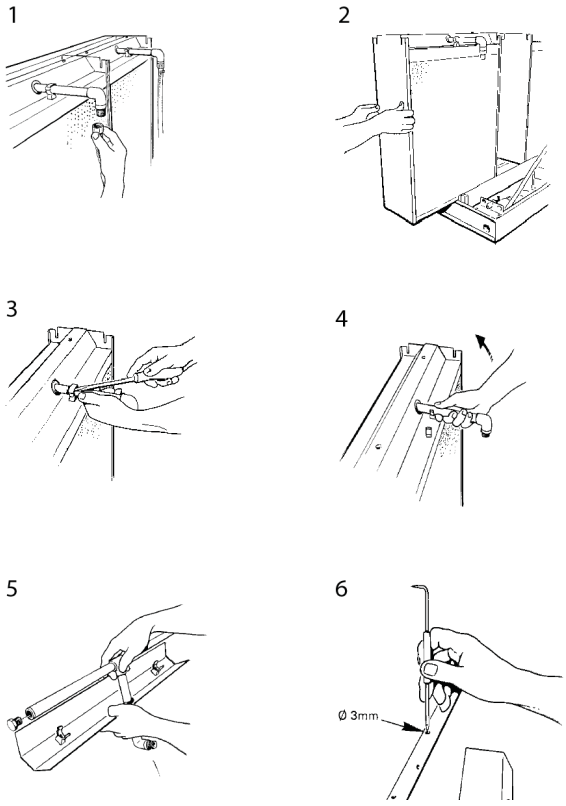
1. that the humidifier surface is equally damp on both sides; if not, clean the sprayer above the humidifier cartridge
2. that the humidifier cartridges are clean; if not, clean them
3. the drainage and water trap function.

Cleaning

Stop the water supply and leave the fans running for approximately 30 minutes so that the humidifier dries. The humidifier cartridges are relatively fragile when wet and should be handled with care.

To clean the humidifier cartridges and spraybar:

1. detach the coupling (pos. 1) and pull out the modules (pos. 2)
2. undo the clamp (pos. 3) and lift up the sprayplate (pos. 4)
3. take the spraybar out from the sprayplate and remove the cleaning hole plugs (pos. 5)
4. clean the holes in the spraybar (pos. 6) and rinse the bar and cartridges clean.



Size 150-980

For instructions on the humidifier, see Munters FA6, operation and maintenance at docs.ivprodukt.com.

Electric air heater fitting (code MIE-EL)

MIE-EL coil fitting is designed for electric air heater (code ELEE). The fitting consists of assembly rails, inspection doors and a housing front section for integration into the standard module (code EMM).

The electric air heater (code ELEE) is an electric heater in a high-temperature design.

- The heating rods consist of stainless pipe elements
  SS 2337 / AISI 321.
- The heater has double over-temperature guards that cut the power if there is a risk of overheating. One of the guards is reset manually.
- Protection IP43 in accordance with SS-EN 60529.
- There are up to five output variants per size available as standard. Other outputs may, however, be supplied to specification.
- Also available with integrated control equipment (HS) for power control in sizes 060-980, 1250 och 1540.

Fuse

For recommended external fuse, please refer to the product selection program IV Product Designer and the order document Technical data under order-unique documentation at docs.ivprodukt.com.

Size 060

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	0.2	2.0	5.0	2.9
02	0.2	3.4	8.5	4.9
03	0.2	6.0	15.1	8.7
04	0.2	10.0	25.1	14.4
05	0.2	15.0	37.7	21.7

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	2	–	–	–
02	3.4	–	–	–
03	6	–	–	–
04	10	–	–	–
05	15	–	–	–

Size 150

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	0.50	4.0	10.0	5.8
02	0.50	7.5	18.8	10.88
03	0.50	12.0	30.1	17.38
04	0.50	21.0	52.7	30.38
05	0.50	36.0	90.4	52.0

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	4	–	–	–
02	7.5	–	–	–
03	12	–	–	–
04	21	–	–	–
05	2.4	4.8	9.6	19.2

Size 100

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	0.33	3.0	7.5	4.3
02	0.33	5.0	12.6	7.2
03	0.33	8.0	20.1	11.5
04	0.33	13.0	32.6	18.7
05	0.33	23.0	57.7	33.2

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	3	–	–	–
02	5	–	–	–
03	8	–	–	–
04	13	–	–	–
05	23	–	–	–

Size 190

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	0.63	6.0	15.1	8.7
02	0.63	11.0	27.6	15.9
03	0.63	17.0	42.7	24.5
04	0.63	30.0	75.3	43.3
05	0.63	54.0	135.6	77.9

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	6	–	–	–
02	11	–	–	–
03	17	–	–	–
04	2.0	4.0	8.0	16.0
05	3.6	7.2	14.4	28.8 2×14.4*

*Applicable to 230V

Size 240

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	0.80	7.0	17.6	10.1
02	0.80	13.0	32.6	18.8
03	0.80	24.0	60.2	34.6
04	0.80	40.0	100.4	57.7
05	0.80	60.0	150.6	86.6

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	7	–	–	–
02	13	–	–	–
03	24	–	–	–
04	2.7	5.3	10.7	21.3
05	4.0	8.0	16.0	32.0 2×16.0*

*Applicable to 230V

Size 360

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	1.2	10.0	25.1	14.4
02	1.2	15.0	37.7	21.7
03	1.2	27.0	67.8	39.0
04	1.2	54.0	135.6	77.9
05	1.2	90.0	225.9	129.9

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	10	–	–	–
02	15	–	–	–
03	1.8	3.6	7.2	14.4
04	3.6	7.2	14.4	28.8 2×14.4*
05	6.0	12.0	24.0	2×24.0

*Applicable to 230V

Size 300

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	1.0	8.0	20.1	11.5
02	1.0	15.0	37.7	21.7
03	1.0	27.0	67.8	39.0
04	1.0	45.0	113.0	65.0
05	1.0	75.0	188.3	108.3

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	8	–	–	–
02	15	–	–	–
03	1.8	3.6	7.2	14.4
04	3.0	6.0	12.0	24.0
05	5.0	10.0	20.0	40.0 2×20.0*

*Applicable to 230V

Size 480

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	1.6	13.0	32.6	18.8
02	1.6	24.0	60.2	34.6
03	1.6	40.0	100.4	57.7
04	1.6	70.0	175.7	101.0
05	1.6	120.0	301.2	173.2

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	13	–	–	–
02	24	–	–	–
03	2.7	5.3	10.7	21.3
04	4.7	9.3	18.7	37.3 2×18.7*
05	8.0	16.0	32.0 2×16.0*	2×32.0 4×16.0*

*Applicable to 230V

Size 600

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	2.0	15.0	37.7	21.7
02	2.0	27.0	67.8	39.0
03	2.0	45.0	113.0	65.0
04	2.0	81.0	203.3	116.9
05	2.0	145.0	364.0	209.3

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	15.0	–	–	–
02	1.8	3.6	7.2	14.4
03	3.0	6.0	12.0	24.0
04	5.4	10.8	21.6	2×21.6
05	9.7	19.3	38.7 2×19.3*	2×38.7 4×19.3*

*Applicable to 230V

Size 750

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	2.87	18.0	45.2	26.0
02	2.87	27.0	67.8	39.0
03	2.87	54.0	135.6	77.9
04	2.87	90.0	225.9	129.9
05	2.87	162.0	406.7	233.8

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	18	6.4	12.8	25.6
02	1.8	3.6	7.2	14.4
03	3.6	7.2	14.4	28.8 2×14.4*
04	6.0	12.0	24.0	2×24.0
05	10.8	21.6	2×21.6	4×21.6

*Applicable to 230V

Size 740

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	3.26	20.0	50.2	28.9
02	3.26	34.0	85.3	49.1
03	3.26	54.0	135.6	77.9
04	3.26	103.0	258.6	148.7
05	3.26	180.0	451.8	259.8

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	20	-	–	–
02	2.3	4.5	9.1	18.1
03	3.6	7.2	14.4	28.8 2×14.4*
04	6.9	13.7	27.5 2×13.7*	2×27.5 4×13.7*
05	12.0	24.0	2×24.0	4×24.0

*Applicable to 230V

Size 850

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	3.81	22.0	55.2	31.7
02	3.81	39.0	97.9	56.3
03	3.81	60.0	150.6	86.6
04	3.81	120.0	301.2	155.9
05	3.81	210.0	527.1	294.4

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	22	–	–	–
02	2.6	5.2	10.4	20.8
03	4.0	8.0	16.0	32.0 2×16.0*
04	8.0	16.0	32.0 2×16.0*	2×32.0 4×16.0*
05	14.0	28.0 2×14.0*	2×28.0 4×14.0*	4×28.0 8×14.0*

*Applicable to 230V

Size 950

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	3.58	22.0	55.2	31.7
02	3.58	39.0	97.9	56.3
03	3.58	60.0	150.6	86.6
04	3.58	108.0	271.1	155.9
05	3.58	204.0	512.1	294.4

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	22	–	–	–
02	2.6	5.2	10.4	20.8
03	4.0	8.0	16.0	32.0 2×16.0*
04	7.2	14.4	28.8 2×14.4*	2×28.8 4×14.4*
05	13.6	27.2 2×13.6*	2×27.2 4×13.6*	4×27.2 8×13.6*

*Applicable to 230V

Size 1150

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×400V~50Hz
01	4.5	72	104
02	4.5	130	188
03	4.5	187	270
04*	4.5	245	354

* Not available in variant HS

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	4.8	9.6	16.2	38.4
02	8.7	17.3	34.7	2 × 34.7
03	12.5	25.0	2 × 25.0	4 × 25.0
04	16.3	32.7	2 × 32.7	4 × 32.7

Size 980

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×230V~50Hz	Rated current (A) at 3×400V~50Hz
01	4.61	27.0	67.8	39.0
02	4.61	54.0	135.6	77.9
03	4.61	81.0	203.3	116.9
04	4.61	150.0	376.5	216.5
05	4.61	226.0	564.8	326.2

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	1.8	3.6	7.2	14.4
02	3.6	7.2	14.4	28.8 2×14.4*
03	5.4	10.8	21.6	2×21.6
04	10.0	20.0	40.0 2×20.0*	2×40.0 4×20.0*
05	15.0	30.0 2×15.0*	2x30.0 4×15.0*	4×30.0 8×15.0*

*Applicable to 230V

Size 1250

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW) (no. of steps × output)	Rated current (A) at 3×400V~50Hz
01	4.8	72 (3 × 24)	104
02	4.8	136 (5 × 27)	196
03	4.8	192 (8 × 24)	276
04	4.8	256 (16 × 16)	369

Power stage HT (without control system)

Power variant	Min. air flow (m^3/s)	Total output (kW)	Power step (kW)			
			1	2	3	4
01	4.8	68	4.5	9.1	18	36
02	4.8	136	9.1	18	36	2 × 36
03	4.8	180	12	24	2	4 × 24
04	4.8	240	16	32	2 × 32	4 × 32

Size 1540

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW) (no. of steps × output)	Rated current (A) at 3×400V~50Hz
01	6.0	90 (4 × 22.6)	130
02	6.0	160 (8 × 20.0)	230
03	6.0	211 (8 × 26.4)	304
04	6.0	320 (16 × 20.0)	461

Power stage HT (without control system)

Power variant	Min. air flow (m^3/s)	Total output (kW)	Power step (kW)			
			1	2	3	4
01	6.0	85	6.1	11.3	23	2 × 23
02	6.0	170	11.3	23	2 × 23	4 × 23
03	6.0	255	17	34	2 × 34	4 × 34
04	6.0	340	23	2 × 23	4 × 23	8 × 23

Size 1550

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×400V~50Hz
01	5.9	96	139
02	5.9	173	250
03	5.9	250	361
04*	5.9	323	466

* Not available in variant HS

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	6.4	12.8	25.6	2 × 25.6
02	11.5	23.0	2 × 23.0	4 × 23.0
03	16.7	33.3	2 × 33.3	4 × 33.3
04	21.5	43.0	2 × 43.0	4 × 43.0

Size 1950

Electrical data

Power variant	Min. air flow (m^3/s)	Total output (kW)	Rated current (A) at 3×400V~50Hz
01	7.7	132	191
02	7.7	238	344
03	7.7	343	495
04*	7.7	450	650

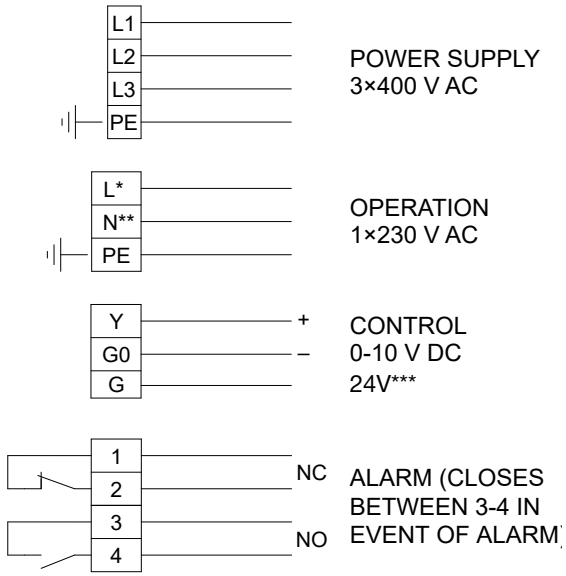
* Not available in variant HS

Power stage HT (without control system)

Power variant	Power step (kW)			
	1	2	3	4
01	8.8	17.6	35.2	2 × 35.2
02	15.9	31.7	2 × 31.7	4 × 31.7
03	22.8	2 × 22.8	4 × 22.8	8 × 22.8
04	30.0	2 × 30.0	4 × 30.0	8 × 30.0

Wiring instructions

Electric heater HS (with integrated control)



** L can be designated 7 on certain models*

** N can be designated 8 on certain models*

**** 24V connection on certain models*

Electric heater HT (without control)

Ø 1 Ø 2	Overheat protection with automatic reset.
Ø 3 Ø 4	Overheat protection with manual reset.
Ø 5 Ø 6 Ø 7	Connecting the first step (1) 3×400 V
Ø Ø Ø	Connecting the second step (2) 3×400 V
Ø Ø Ø	Connecting the third step (3) 3×400 V
Ø Ø Ø	Connecting the fourth step (4) 3×400 V

Power steps are connected continuously, starting with terminal no. 5.

Operation and maintenance

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

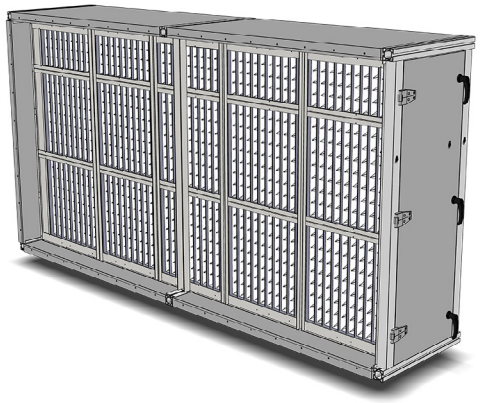
1. Simulate reduced required output by temporarily lowering the temperature setting (setpoint), so that all the electric output steps (contactors) switch out.
2. Then sharply increase the setpoint setting and check that the electric output steps switch in.
3. Restore the temperature setting.
4. Stop 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.

Filter fitting (code MIE-FB)



The filter fitting consists of securing rails for filters and a housing front section. The fitting is adapted for integration into the standard module (code EMM).

The filter fitting can be equipped with deep-pleated bag filters, carbon filters or knitted aluminium filters.

The following is applicable to fittings:

- The filters are mounted on rails and can easily be removed and replaced.
- Filter slide rails are available in acid-proof, stainless steel.
- The filter slide rails are equipped with effective sealing strips.
- The filter inserts are locked with eccentric rails.
- Measurement outlets are available for connecting differential pressure gauges (filter monitors).

For filter data, see Filter overview under Documentation at ivprodukt.docfactory.com. For relevant filters, see order-unique documentation at docs.ivprodukt.com (Technical data and parts).

Filter section accessories

- Filter monitor, U-tube manometer (code MIET-FB-01)
- Filter monitor, Kytölä manometer (code MIET-FB-02)
- Filter monitor, Magnehelic manometer (code MIET-FB-03)

Operation and maintenance

The air filters in a ventilation system are designed to prevent dust and other impurities from entering the building. They should also protect sensitive components inside the unit, e.g. coils and heat recovery units, 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 replace them.

According to guidelines for hygienic design VDI 6022 Part 1: The supply air filter must be class ePM1-50% (F7) or have a higher filtration capacity.

The filter is designed for one-time use. If the filter becomes fouled, the unit will lose capacity. The filter should therefore be changed if the pressure drop across it exceeds the specified value.

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 section should therefore also be cleaned when the filter is changed.

Inspection

Check the pressure drop across the filter. The pressure drop is measured with a manometer connected to measurement outlets. The measurement outlets are connected to each side of the filter. If the filter has reached its specified final pressure drop, it must be changed.

Filter replacement

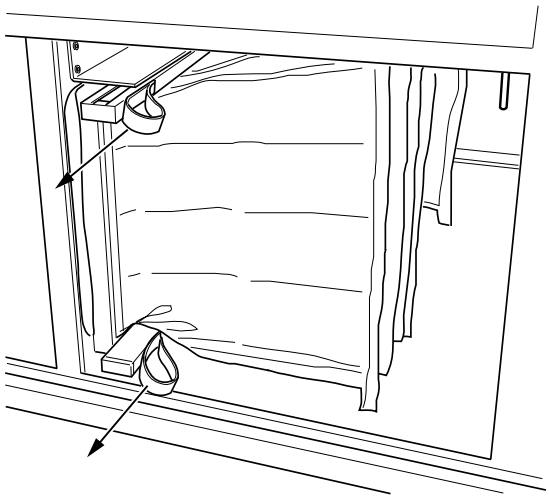
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

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

2. If there is a fixed filter monitor; loosen the necessary measuring hoses for the cover/post in order to open the inspection hatch.
3. Wait until the fans have stopped, then open the inspection hatch.

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

4. Release the eccentric rails.



Eccentric rails

5. Remove the old filter by pulling it towards you.
6. Clean the filter cabinets.
7. Install the new filter, press in the eccentric rails to engage them and close the inspection hatch.
8. If there is a fixed filter monitor, replace the measuring hoses to the measuring outlets on the cover/post.
9. Start the unit.

Cleaning

Vacuum and use a damp cloth to wipe clean the inside of the filter section. The aluminium filter can be cleaned using hot water and a mild alkaline detergent. The carbon filters are designed for one-time use and are combustible in their entirety.

Filter fitting (code MIE-FB/FC)

The filter fitting consists of securing rails for filters and a housing front section.

The fitting is adapted for integration into the standard module (code EMM).

The configuration is available in two variants:

- FB for deep-pleated bag filters, carbon filters or knitted aluminium filters.
- FC for panel filter.

For both versions:

- The filters are mounted on rails and can easily be removed and replaced.
- Filter slide rails are available in acid-proof, stainless steel.
- The filter slide rails are equipped with effective sealing strips.
- The model FB filter inserts are locked with eccentric rails.
- Measurement outlets are available for connecting differential pressure gauges.

For filter data, see Filter overview under Documentation at ivprodukt.docfactory.com. For relevant filters, see order-unique documentation at docs.ivprodukt.com (Technical data and spare parts).

Filter section accessories

- Filter monitor, U-tube manometer (code MIET-FB-01)
- Filter monitor, Kytölä manometer (code MIET-FB-02)
- Filter monitor, Magnehelic manometer (code MIET-FB-03)

Operation and maintenance instructions

The air filters in a ventilation system are designed to prevent dust and other impurities from entering the building. They should also protect sensitive components inside the unit, e.g. coils and heat recovery units, 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 replace them.

According to guidelines for hygienic design VDI 6022 Part 1: The supply air filter must be class ePM1-50% (F7) or have a higher filtration capacity.

The filter is designed for one-time use. If the filter becomes fouled, the unit will lose capacity. The filter should therefore be changed if the pressure drop across it exceeds the specified value.

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 section should therefore also be cleaned when the filter is changed.

Inspection

Check the pressure drop across the filter. The pressure drop is measured with a manometer connected to measurement outlets. The measurement outlets are connected to each side of the filter. If the filter has reached its specified final pressure drop, it must be changed.

Filter replacement

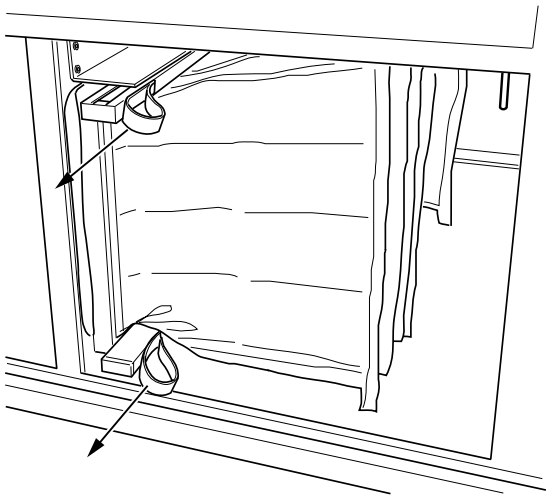
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

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

2. If there is a fixed filter monitor; loosen the necessary measuring hoses for the cover/post in order to open the inspection hatch.
3. Wait until the fans have stopped, then open the inspection hatch.

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

4. Release the eccentric rails.



Eccentric rails

5. Remove the old filter by pulling it towards you.
6. Clean the filter cabinets.
7. Install the new filter, press in the eccentric rails to engage them and close the inspection hatch.
8. If there is a fixed filter monitor, replace the measuring hoses to the measuring outlets on the cover/post.
9. Start the unit.

Cleaning

Vacuum and use a damp cloth to wipe clean the inside of the filter section. The aluminium filter can be cleaned using hot water and a mild alkaline detergent. The carbon filters are designed for one-time use and are combustible in their entirety.

Inlet fitting (code MIE-ID)

The MIE-ID fitting is designed to be used for inlets of outdoor air or extract air. The fitting consists of dampers, assembly rails for filter cassettes, connection gable and a housing front section for integration into the standard module (code EMM).

MIE-ID equipped with deep-pleated bag filters, carbon filters or knitted aluminium filters.

- The damper is manufactured from aluminium profiles and complies with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa
- The filters are mounted on rails and can easily be removed and replaced.
- Filter slide rails are available in acid-proof, stainless steel.
- The filter slide rails are equipped with effective sealing strips.
- The model FB filter inserts are locked with eccentric rails.
- Measurement outlets are available for connecting differential pressure gauges.
- The inlet is fitted as standard with a connection gable.

Accessories for fitting

- Damper motor installed (code KJST-04) (size 060-980)
- Manual control (code KJST-03) (Size1150-3150)
- Set of filters (code ELEF)

Filter section accessories

- Filter monitor, U-tube manometer (code MIET-FB-01)
- Filter monitor, Kytölä manometer (code MIET-FB-02)
- Filter monitor, Magnehelic manometer (code MIET-FB-03)

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Filter

For filter data, see Filter overview under Documentation at ivprodukt.docfactory.com. For relevant filters, see order-unique documentation at docs.ivprodukt.com (Technical data and spare parts).

Damper, Operation and Maintenance Instructions

The function of the dampers is to control, block and divert the air.

Faulty function gives rise to disturbances that may result in serious problems. For example, if the outdoor air damper does not close completely when the unit stops, the air heating coil is likely to freeze.

If the damper is leaking, this results in increased energy consumption because of leaks caused by thermal buoyancy forces.
If the exhaust gas damper is leaking, the ventilation effect is impaired and the air is heated for no benefit.

If the outdoor air damper does not open fully, the air flow is reduced.

Inspection

1. Check function of the actuator.
2. Check the dampers for tightness when they are closed. If they are not sealed, adjust the damper actuator to make the damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Filter, Operation and Maintenance Instructions

The air filters in a ventilation system are designed to prevent dust and other impurities from entering the building. They should also protect sensitive components inside the unit, e.g. coils and heat recovery units, 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 replace them.

According to guidelines for hygienic design VDI 6022 Part 1: The supply air filter must be class ePM1-50% *(F7) or have a higher filtration capacity.*

The filter is designed for one-time use. If the filter becomes fouled, the unit will lose capacity. The filter should therefore be changed if the pressure drop across it exceeds the specified value.

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 section should therefore also be cleaned when the filter is changed.

Inspection

Check the pressure drop across the filter. The pressure drop is measured with a manometer connected to measurement outlets. The measurement outlets are connected to each side of the filter. If the filter has reached its specified final pressure drop, it must be changed.

Filter replacement

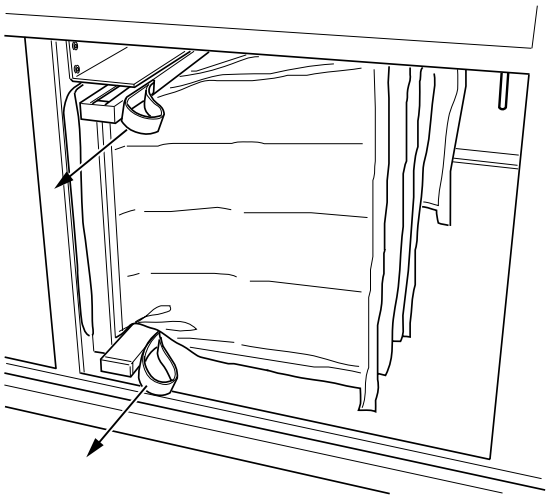
1. Shut down the unit via the control terminal and lock the safety switch in the 0 position.

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

2. If there is a fixed filter monitor; loosen the necessary measuring hoses for the cover/post in order to open the inspection hatch.
3. Wait until the fans have stopped, then open the inspection hatch.

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

4. Release the eccentric rails.



Eccentric rails

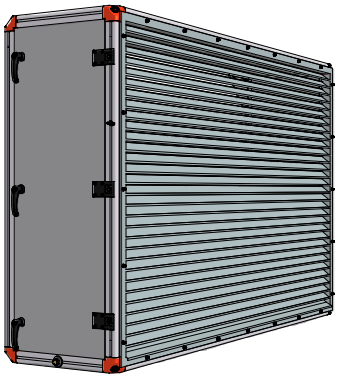
5. Remove the old filter by pulling it towards you.
6. Clean the filter cabinets.
7. Install the new filter, press in the eccentric rails to engage them and close the inspection hatch.
8. If there is a fixed filter monitor, replace the measuring hoses to the measuring outlets on the cover/post.
9. Start the unit.

Cleaning

Vacuum and use a damp cloth to wipe clean the inside of the filter section.

Outdoor intake fitting (code MIE-IU)

configuration with damper



Inlet fitting MIE IU comprises an inspection section provided with intake louvres and drainage.

It is designed primarily for outdoor air intake when set up outdoors. The fitting is designed for integration into the standard module (code EMM).

- The louvre can be removed from the outside.
- Drainage connection ø15 mm.

Two different versions of the exhaust hood are available:

- without damper (code -0)
- with damper (code -1).

The following is applicable to the version with a damper:

- The dampers are manufactured from aluminium profiles and comply with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).
- Permitted temperature: -40 to +80˚C.
  Permitted differential pressure: max. 1.400 Pa

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance instructions

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 damper tight.
3. Check the sealing strips.
4. Check the function of the drainage.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Sound attenuator fitting (code MIE-KL)

The MIE-KL fitting consists of pointed baffle elements. The fitting is designed for integration into the standard module (code EMM).

- The sound attenuators are 200 mm thick baffle elements.
- The baffle material, which is mineral wool, is clad on the outside with washable fabric. The material is type-approved for internal cladding of ventilation ducts.
- In configuration UB (extendible), the baffles are mounted on rails and can easily be pulled out for cleaning.
- In configuration EB (non-extendible), the baffled are permanently mounted.
- Permitted temperature: 50°C max.
- To minimise the pressure drop, the baffles are pointed.
- Sound attenuators are available in five different module lengths, depending on the damping performance required.

Integral attenuation (dB)

Configuration	Module length	Octave band intermediate 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

Operation and maintenance

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

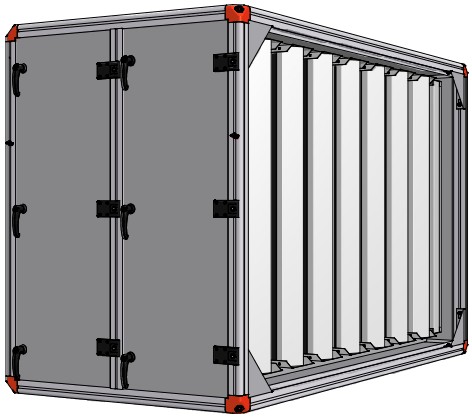
Inspection

Check that the baffle elements are intact and have clean surfaces; if not, they must be repaired and cleaned.

Cleaning

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

Sound attenuator fitting (code MIE-KL)



The MIE-KL fitting consists of pointed baffle elements and sliding rails. The fitting is designed for integration into the standard module (code EMM).

- The sound attenuators are 200 mm thick baffle elements.
- The baffle material, which is mineral wool, is clad on the outside with washable fabric. The material is type-approved for internal cladding of ventilation ducts.
- The baffles are mounted on rails and can easily be pulled out for cleaning.
- Permitted temperature: 50˚C max.
- To minimise the pressure drop, the baffles are pointed.
- Sound attenuators are available in four different module lengths, depending on the damping required.

Integral attenuation (dB)

Module length	Octave band intermediate frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
40	6	9	15	27	40	33	28	14
60	7	10	19	31	42	36	31	17
70	7	12	23	35	44	39	33	19
80	8	14	26	39	46	41	35	22

Operation and maintenance

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

Inspection

Check that the baffle elements are intact and have clean surfaces; if not, they must be repaired and cleaned.

Cleaning

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

Inspection fitting (code MIE-KM)

The configuration consists of a housing front section in the form of an inspection hatch. An air distributor can be installed as an accessory. The fitting is designed for integration into the standard module (code EMM).

Operation and maintenance

Vacuum and/or wipe all surfaces with a damp cloth.

Damper fitting (code MIE-KS)

The MIE-KS fitting is intended for use as a regulating slide valve or shut-off damper. The fitting consists of a damper and housing front section for integration into the standard module (code EMM).

- The multiple-leaf damper is manufactured from aluminium profiles and complies with the requirements for corrosion class C4 in accordance with SS-EN ISO 12944-2.
- The damper blades are powered by plastic cogwheels and a hose gasket made of silicon rubber creates a seal between the blades.
- Permitted pressure: -40 to +80 °C
  Permitted differential pressure: max. 1400 Pa
- Tightness class 3 in accordance with SS-EN1751 (VVS AMA-98).

Accessories

- Manual control (KJST-03)
- Damper motor installed (code KJST-04) (size 060-980)

Damper

For damper data, see Damper overview under Documentation at ivprodukt.docfactory.com.

Operation and maintenance

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 damper tight.
3. Check the sealing strips.

Cleaning

Clean the damper blades with a cloth. In the event of stubborn dirt, use a mild, alkaline detergent.

Media section fitting (code MIE-MD)

The fitting consists of a shielded compartment for electrical and control equipment with a door that opens. The fitting is adapted for integration into the standard module (code EMM).

For size-dependent technical data, see the product selection program IV Product Designer and the order document Technical data under order-unique documentation at docs.ivprodukt.com.

Operation and maintenance

Vacuum and/or wipe all surfaces with a damp cloth.

Empty section fitting (code MIE-TD)

The fitting can be used special functions (e.g. steam spear) or for filling. The fitting consists of a fixed housing front section and is intended for integration into the standard module (code EMM).

For size-dependent technical data see the product selection program IV Product Designer and the order document Technical data under order-unique documentation at docs.ivprodukt.com.

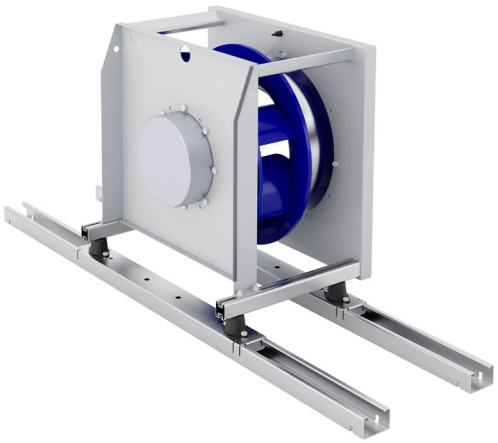
Accessories

- Drip tray (code MIET-TD-01-a)

Operation and maintenance

Vacuum and/or wipe all surfaces with a damp cloth.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

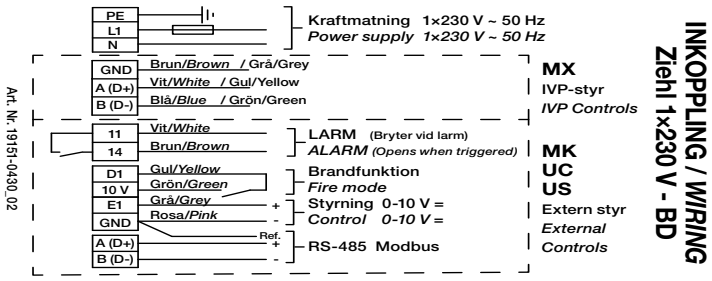
Applies to fan code

- ELFF-025Z-EC01-0050-1-x-x (0.5 kW)
- ELFF-025Z-EC01-0078-1-x-x (0.78 kW)

Technical data

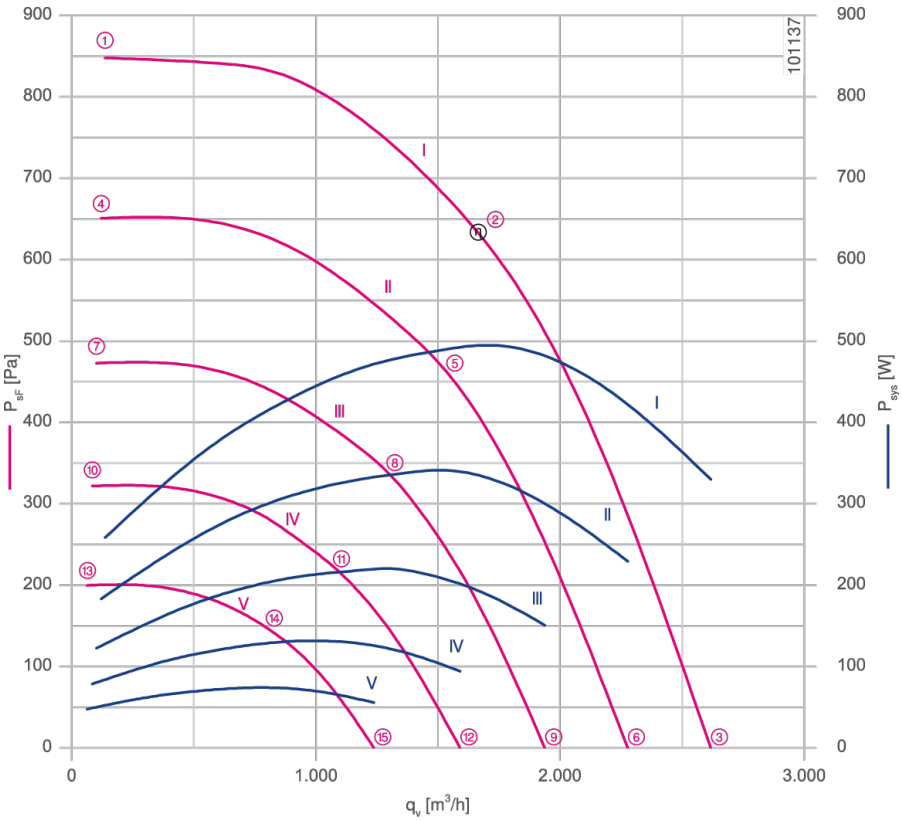
- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 025Z = ZIEHL-ABEGG diameter 250 mm, K-factor = 60.0
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

Output (kW)	Rated current (A)
0.5	2.18
0.78	3.39



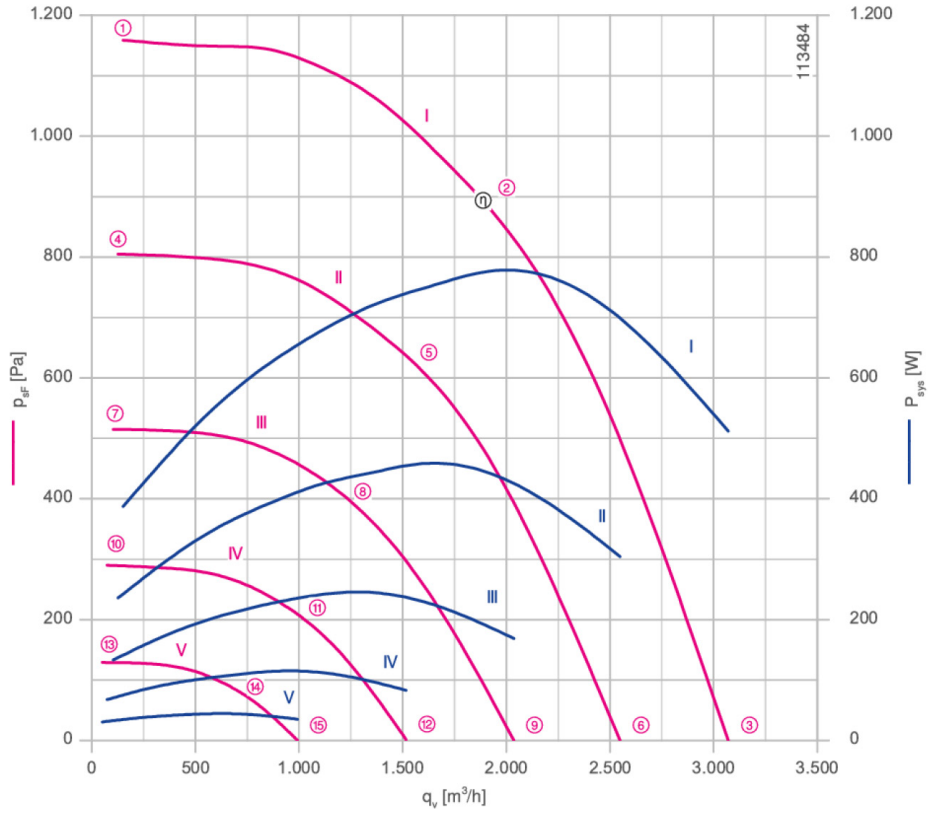
Fan impeller ELFF-025Z-EC01-0050-1-x-x (0.5 kW)

K-factor 60.0



Fan impeller ELFF-025Z-EC01-0078-1-x-x (0.78 kW)

K-factor 60.0



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

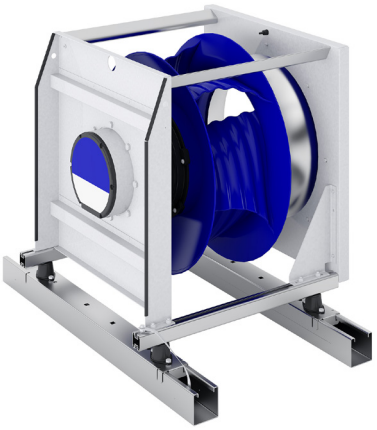
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

Applies to fan code

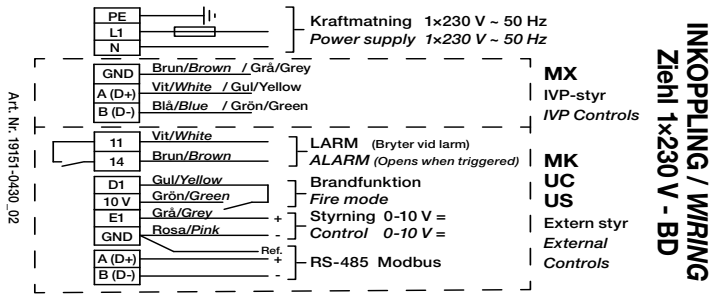
- ELFF-025Z-EC01-0050-2-F-x (0.5 kW)
- ELFF-025Z-EC01-0078-2-F-x (0.78 kW)

Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 025Z = ZIEHL-ABEGG diameter 250 mm, K-factor = 53.73
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

Output (kW)	Rated current (A)
0.5	2.5
0.78	4.0

Wiring instructions

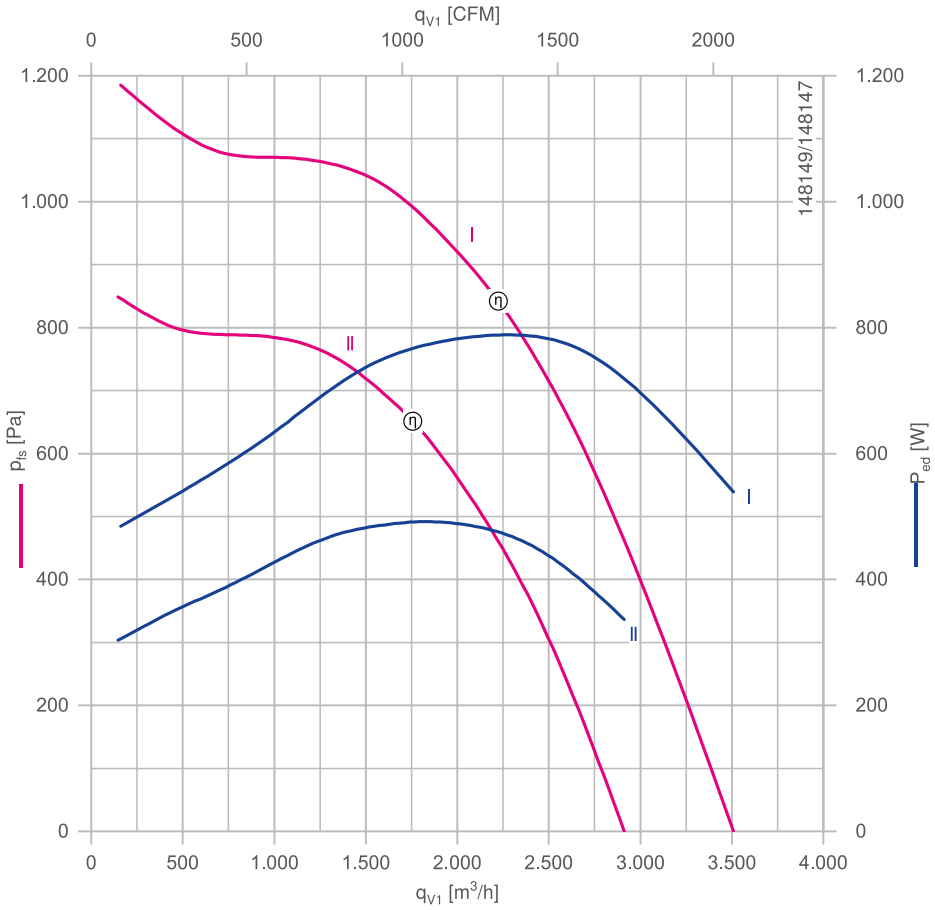


Fan impeller

ELFF-025Z-EC01-0050-2-F-x (0.5 kW) (II)

ELFF-025Z-EC01-0078-2-F-x (0.78 kW) (I)

K-factor 53.73



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

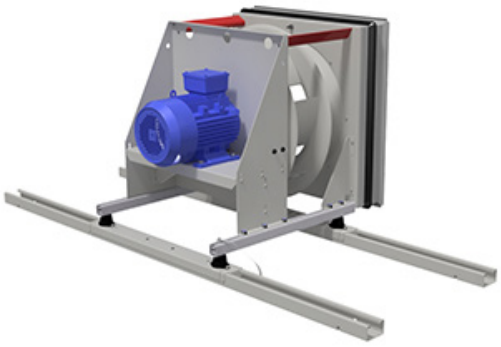
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-025Z-I3S1-0037-1-F-x (0.37 kW)
- ELFF-025Z-I3S1-0055-1-F-x (0.55 kW)

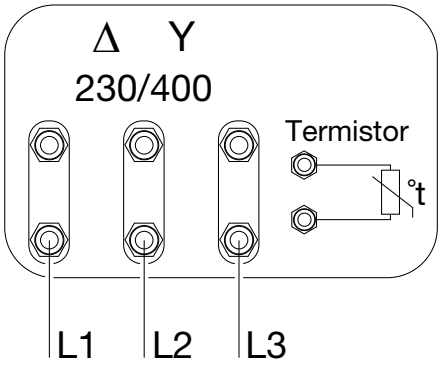
Technical data

- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 025C = ZIEHL-ABEGG diameter 250 mm, K-factor = 60.0
- Output below refers to shaft output

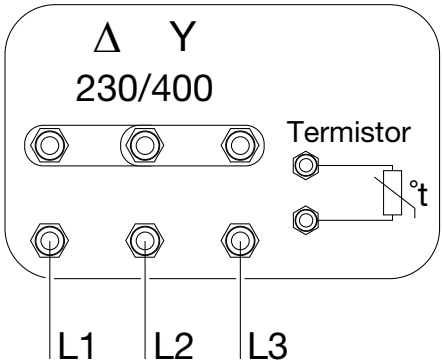
Output (kW)	Rated current (A) at power supply (voltage)	
	3×230V~ 50Hz	3×400V~ 50Hz
0.37	1.74	1.00
0.55	2.43	1.40

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)

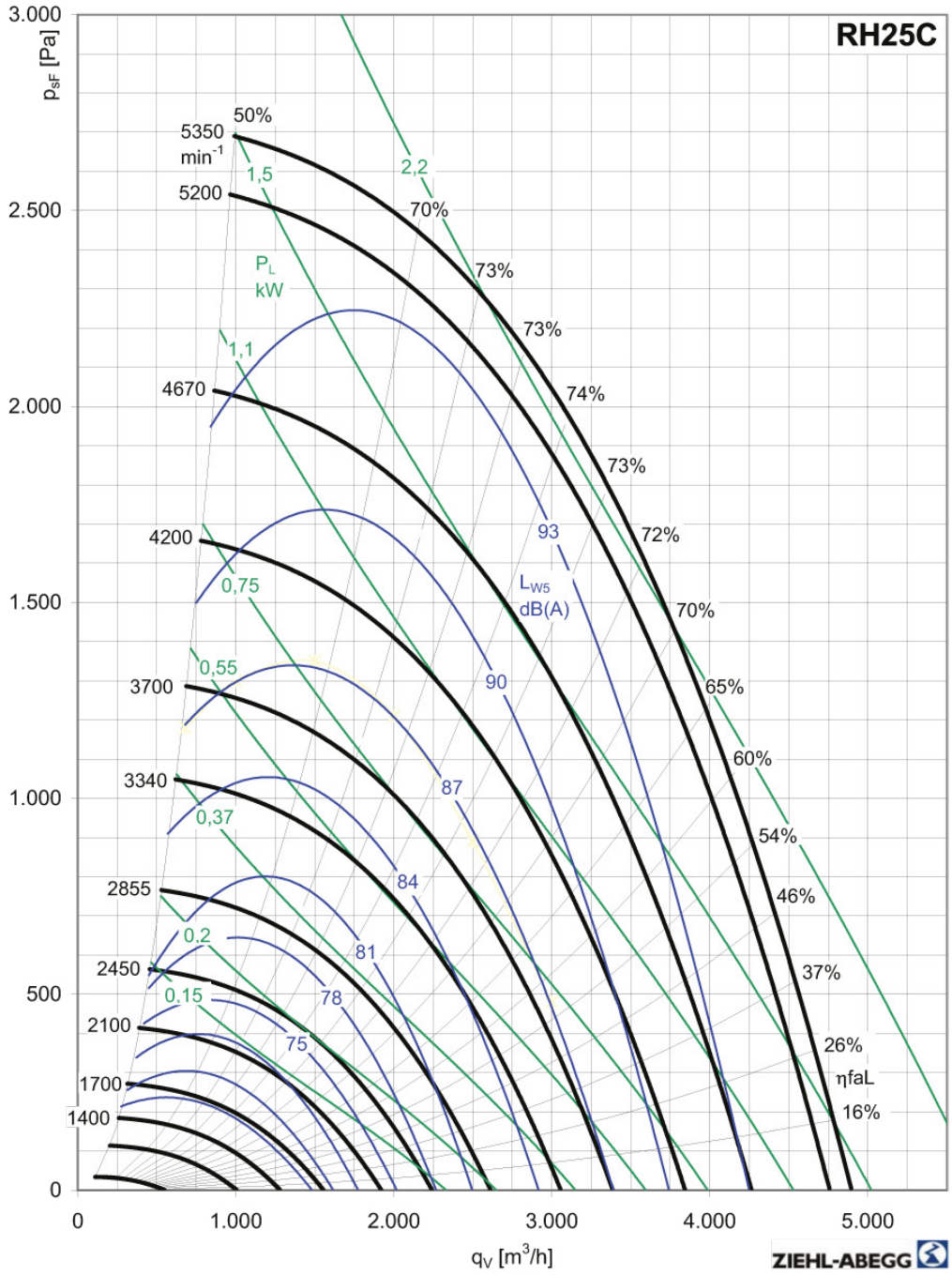


3×400V fan impeller 025-071, Y-coupling (star coupling)



Fan impeller 025C

K-factor 60.0



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

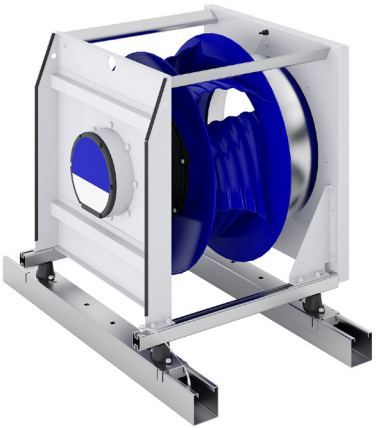
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

Applies to fan code

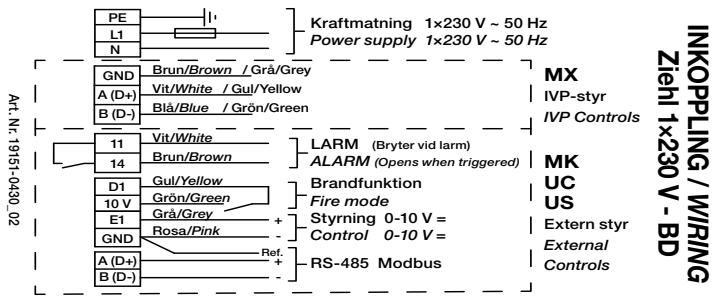
- ELFF-028Z-EC01-0078-2-F-x (0.78 kW)

Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 028Z = ZIEHL-ABEGG diameter 280 mm, K-factor = 42.35
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

Output (kW)	Rated current (A)
0.78	4.0

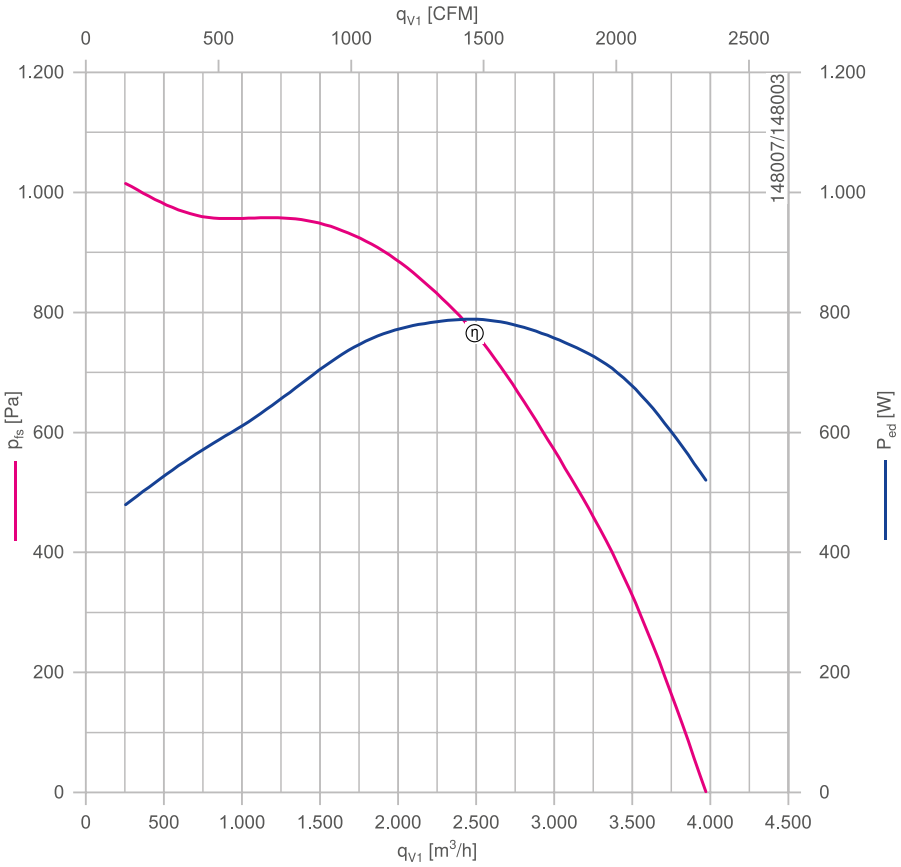
Wiring instructions



Fan impeller

ELFF-028Z-EC01-0078-2-F-x (0.78 kW)

K-factor 42.35



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

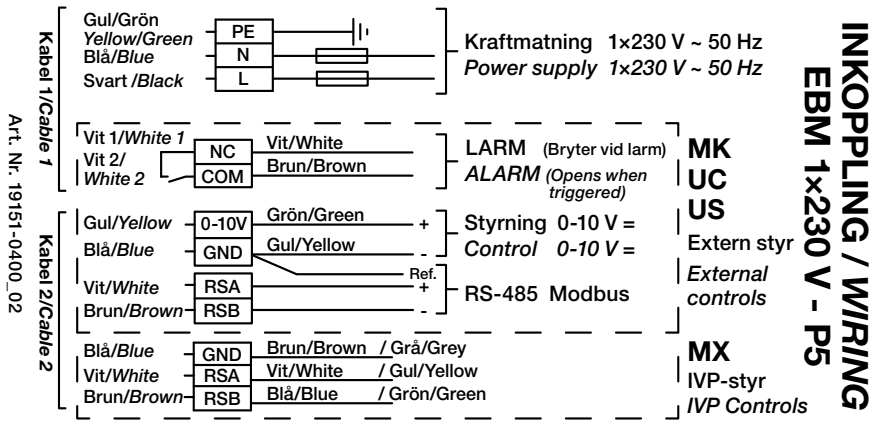
- ELFF-028E-EC01-0075-2-F-x (0.75 kW)
- ELFF-028E-EC01-0105-2-F-x (1.05 kW)

Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 028E = ebm-papst diameter 280 mm, K-factor = 46.75
- Output below refers to infed electrical power

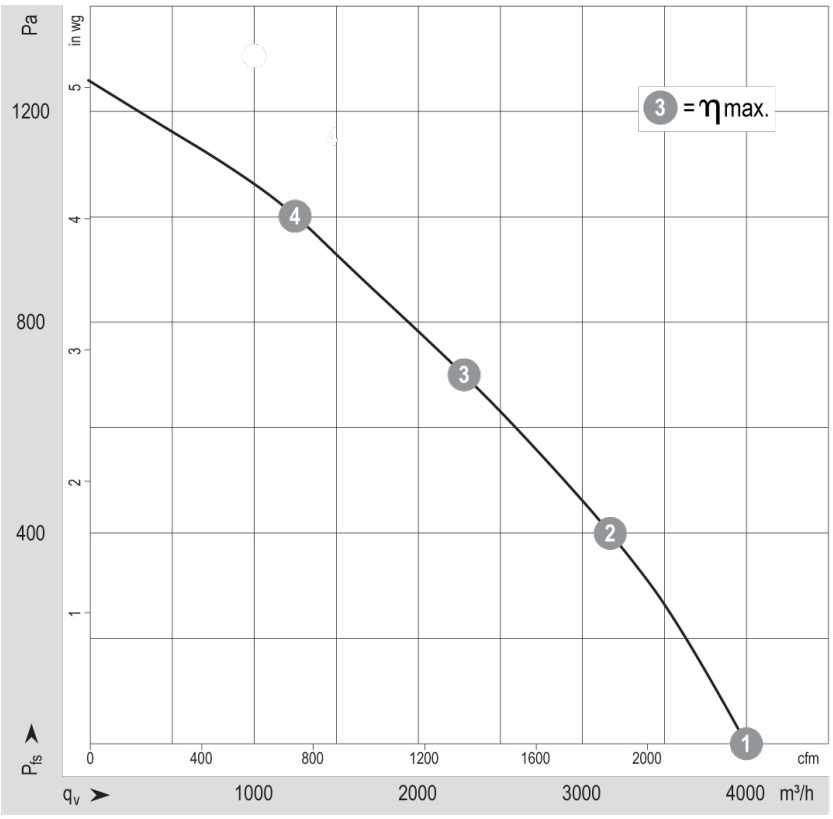
Output (kW)	Rated current (A)
0.75	3.3
1.05	1.6

Wiring instructions



Fan impeller ELFF-028E-EC01-0075-2-F-x (0.75 kW)

K-factor 46.75



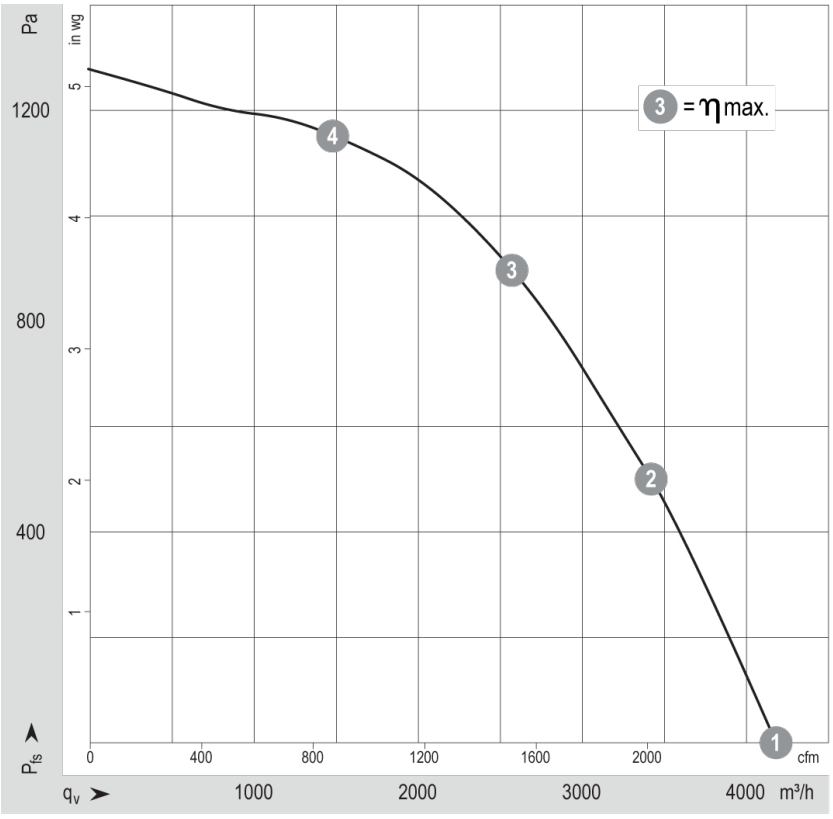
	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	3260	0,64	2,81	87
2	3115	0,73	3,18	82
3	3000	0,75	3,30	77
4	3180	0,72	3,15	82

ELFF-028E-EC01-0075-2-F-0
R3G 280-PR04-I1
0,75 kW

ebmpapst

Fan impeller ELFF-028E-EC01-0105-2-F-x (1.05 kW)

K-factor 46.75



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	3400	0,74	1,17	88
2	3400	0,96	149	83
3	3400	1,05	160	80
4	3400	0,93	143	85

ELFF-028E-EC01-0105-2-F-0
R3G 280-PS10-J1
1,05 kW

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

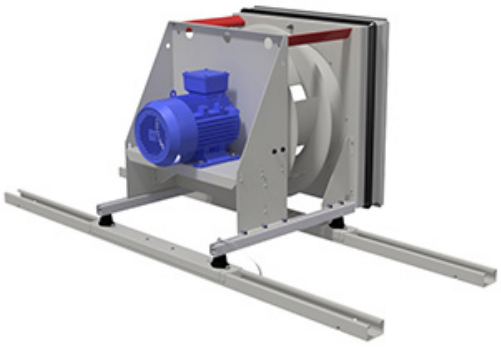
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-028G-I3S1-0075-1-F-x (0.75 kW)
- ELFF-028G-I3S1-0110-1-F-x (1.1 kW)
- ELFF-028G-I3S1-0150-1-F-x (1.5 kW)

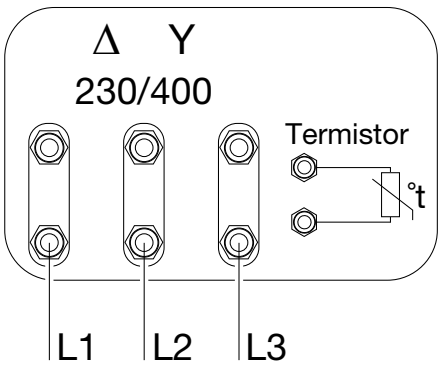
Technical data

- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 028G = Gebhardt diameter 280 mm, K-factor = 35.3
- Output below refers to shaft output

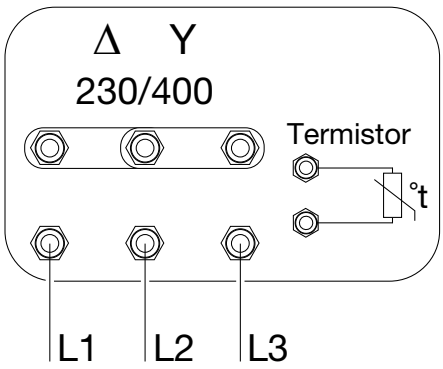
Output (kW)	Rated current (A) at power supply (voltage)	
	3×230V~ 50Hz	3×400V~ 50Hz
0.75	3.3	1.9
1.1	4.0	2.3
1.5	5.4	3.1

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)

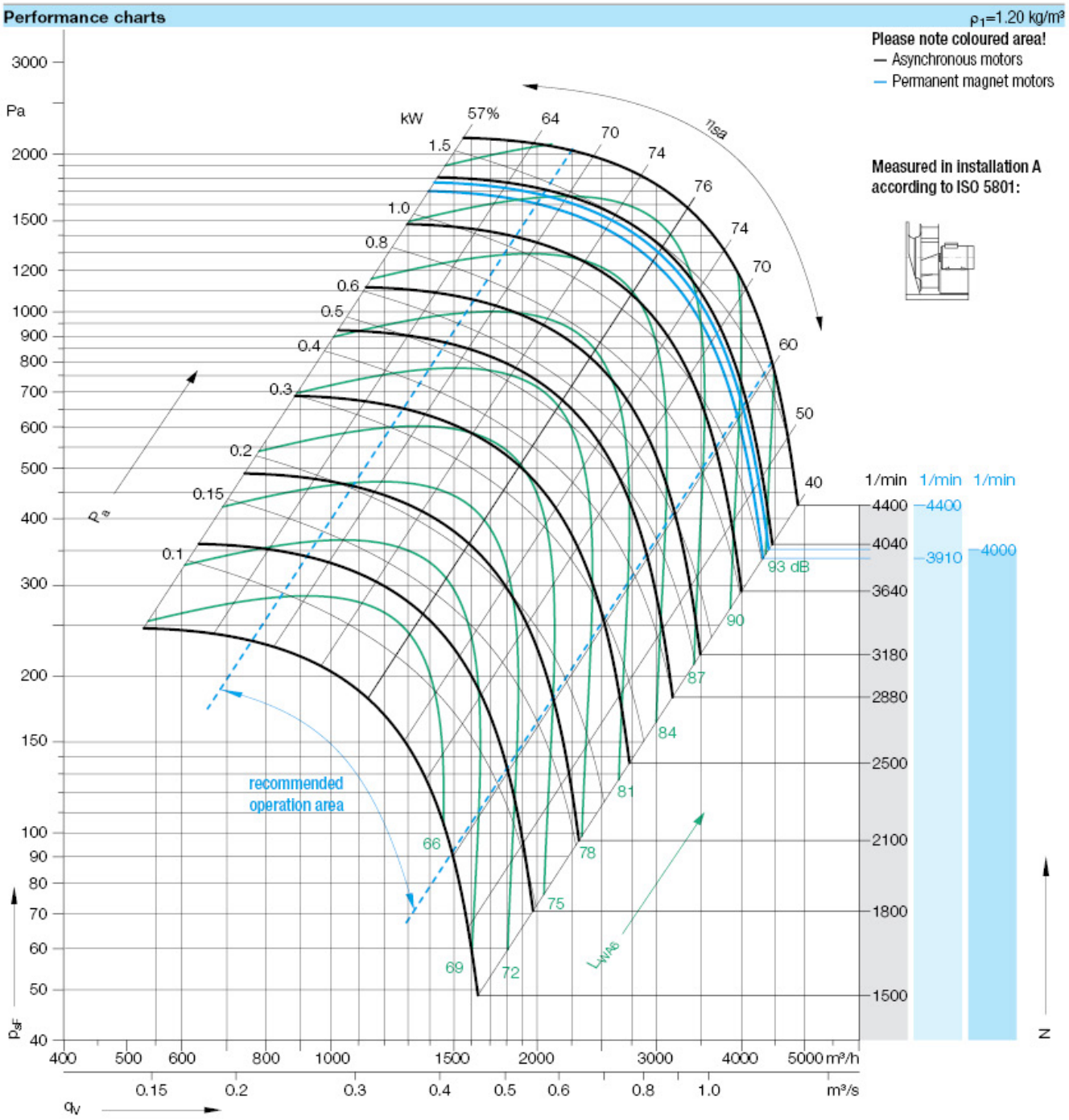


Fan impeller 028G

K-factor 35.3

NICOTRA Gebhardt

RLM E6-2528



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

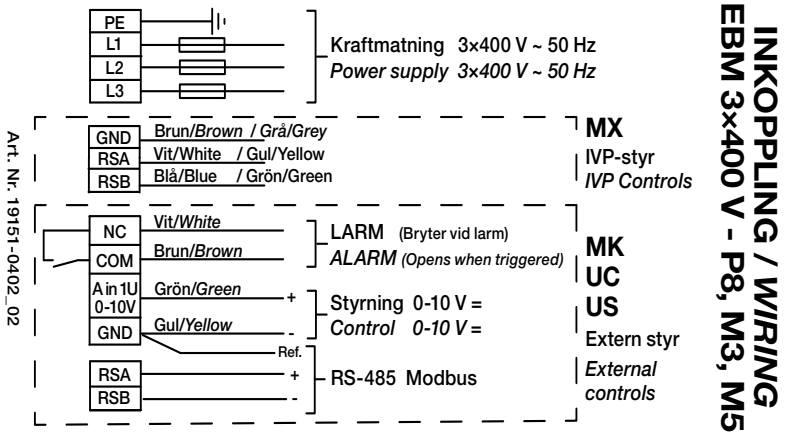
- ELFF-031E-EC01-0123-2-F-x (1.23 kW)

Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 031E = ebm-papst diameter 310 mm, K-factor = 31.03
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power

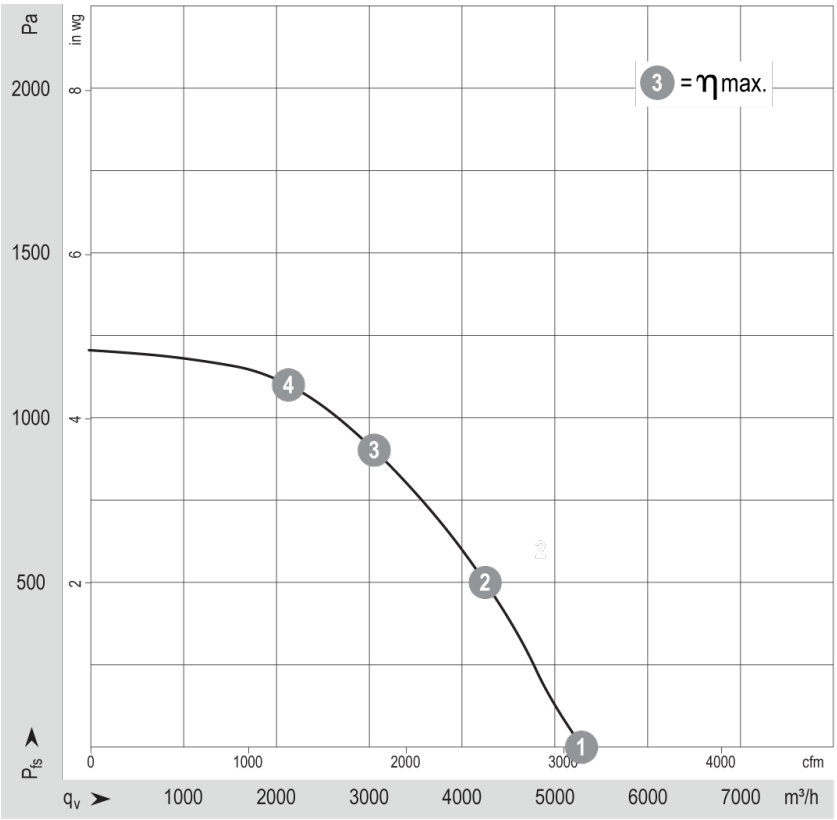
Output (kW)	Rated current (A)
1.23	1.9

Wiring instructions



Fan impeller ELFF-031E-EC01-0123-2-F-x (1.23 kW)

K-factor 31.03



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	3010	0,67	1,06	92
2	3010	1,05	1,61	84
3	3010	1,23	1,90	78
4	3010	1,19	1,82	85

ELFF-031E-EC01-0123-2-F-0
R3G 310-PT08-J1
1,23 kW

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

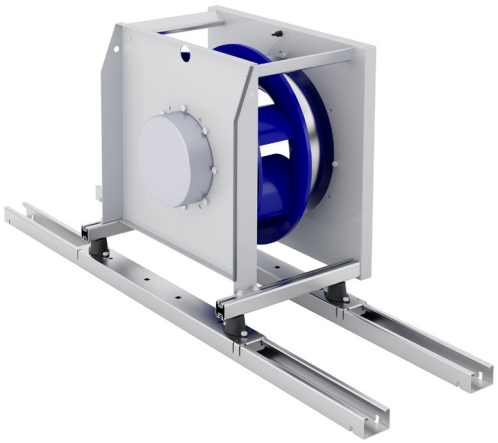
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

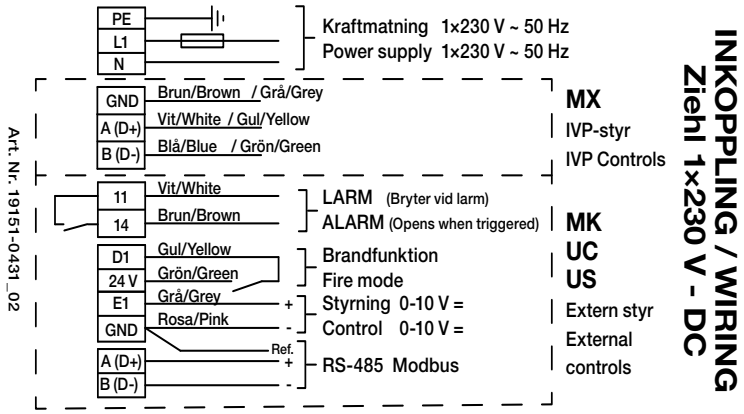
Applies to fan code

- ELFF-31Z-EC01-0078-1-F-x (0.78 kW)
- ELFF-31Z-EC01-0135-1-F-x (1.35 kW)

Technical data

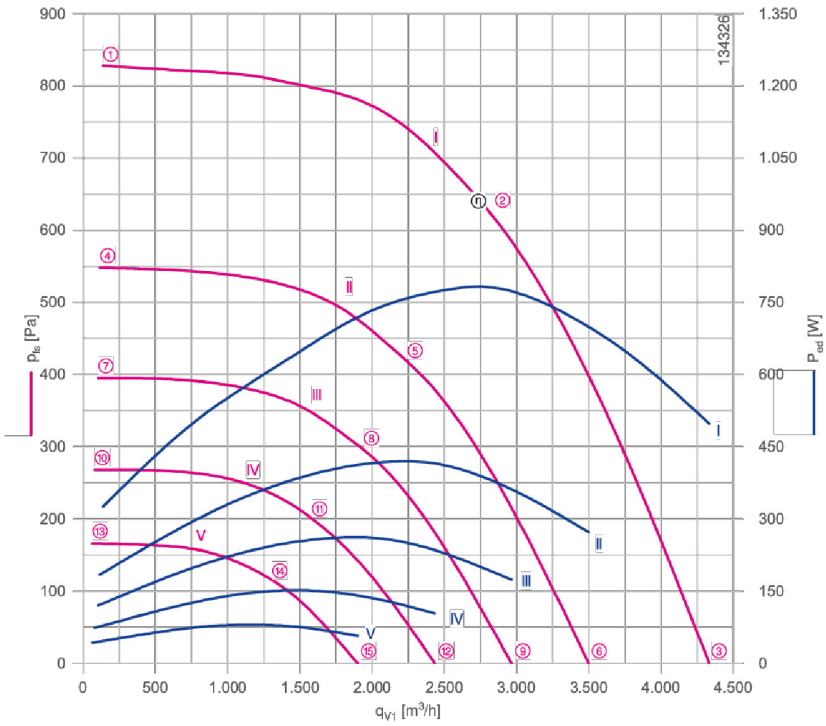
- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 031Z = ZIEHL-ABEGG diameter 310 mm, K-factor = 37.89
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

Output (kW)	Rated current (A)
0.78	3.39
1.35	5.83



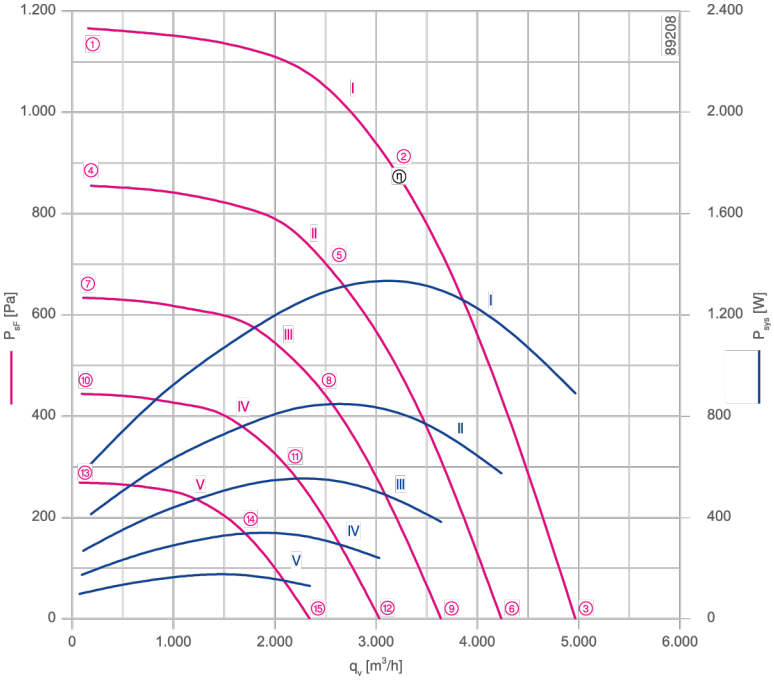
Fan impeller ELFF-031Z-EC01-0078-1-F-x (0.78 kW)

K-factor 37.89



Fan impeller ELFF-031Z-EC01-0135-1-F-x (1.35 kW)

K-factor 37.89



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

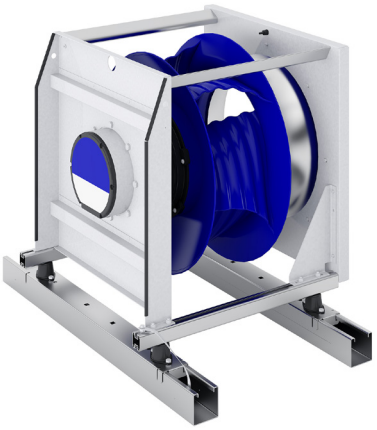
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC02)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

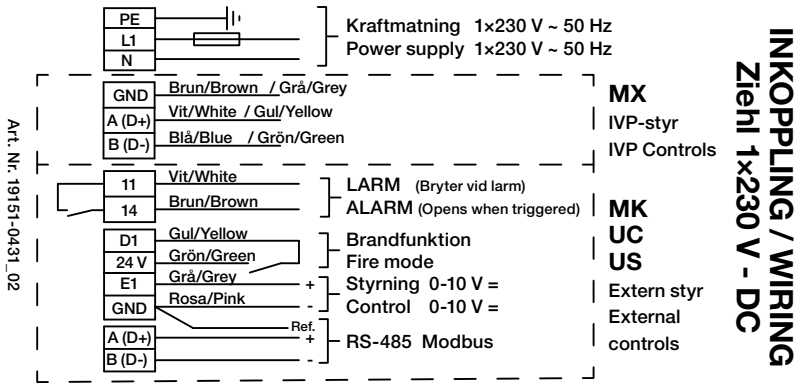
Applies to fan code

- ELFF-31Z-EC02-0130-2-F-x (1.30 kW)

Technical data

- Motor type EC02 = EC motor with built-in electronic speed control.
- Fan impeller 031Z = ZIEHL-ABEGG diameter 310 mm, K-factor = 33.96
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

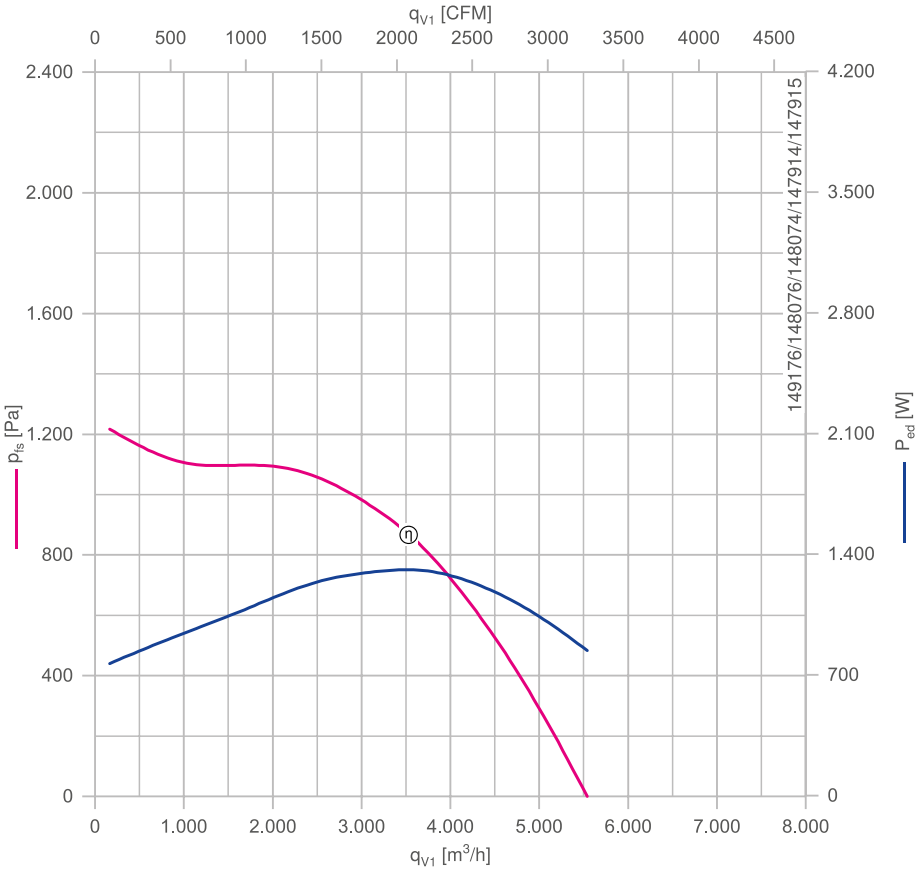
Output (kW)	Rated current (A)
1.30	6.6



Fan impeller

ELFF-031Z-EC02-0130-2-F-x (1.30 kW)

K-factor 33.96



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

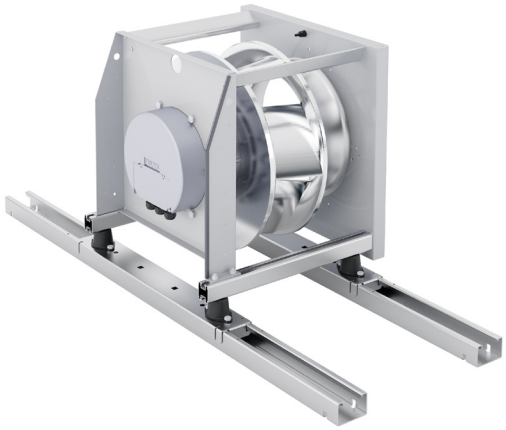
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-035E-EC01-0110-2-F-x (1.1 kW)
- ELFF-035E-EC01-0190-2-F-x (1.9 kW)

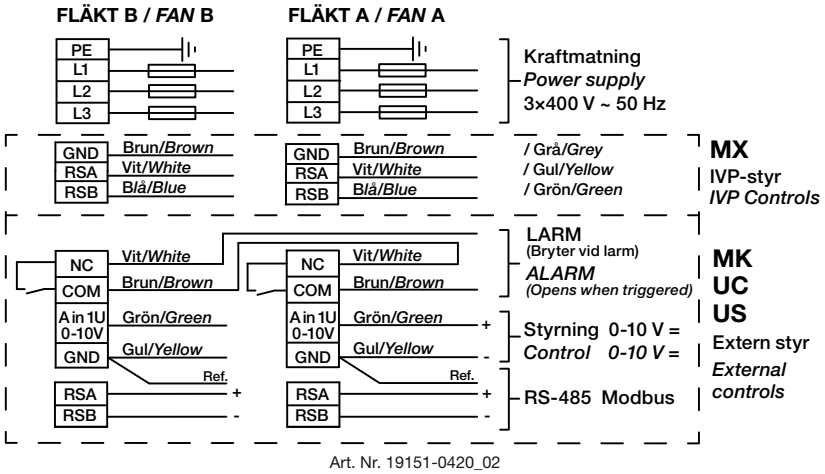
Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 035E = ebm-papst diameter 350 mm,K-factor = 24.32K-factor dual fans = 12.16
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power.

Output (kW) *	Rated current (A) *
1.1	1.7
1.9	3.0

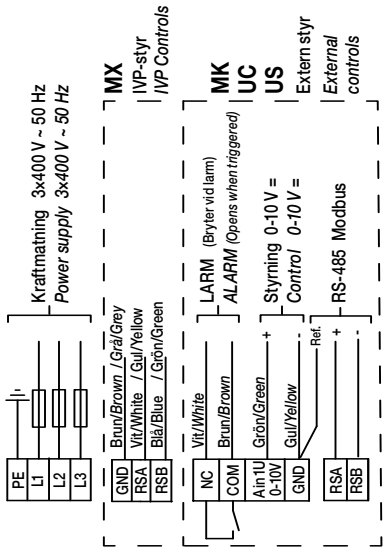
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×EBM 3×400 V - M3, M5



Art. Nr. 19151-0420_02

INKOPPLING / *WIRING*
EBM 3×400 V - P8, M3, M5

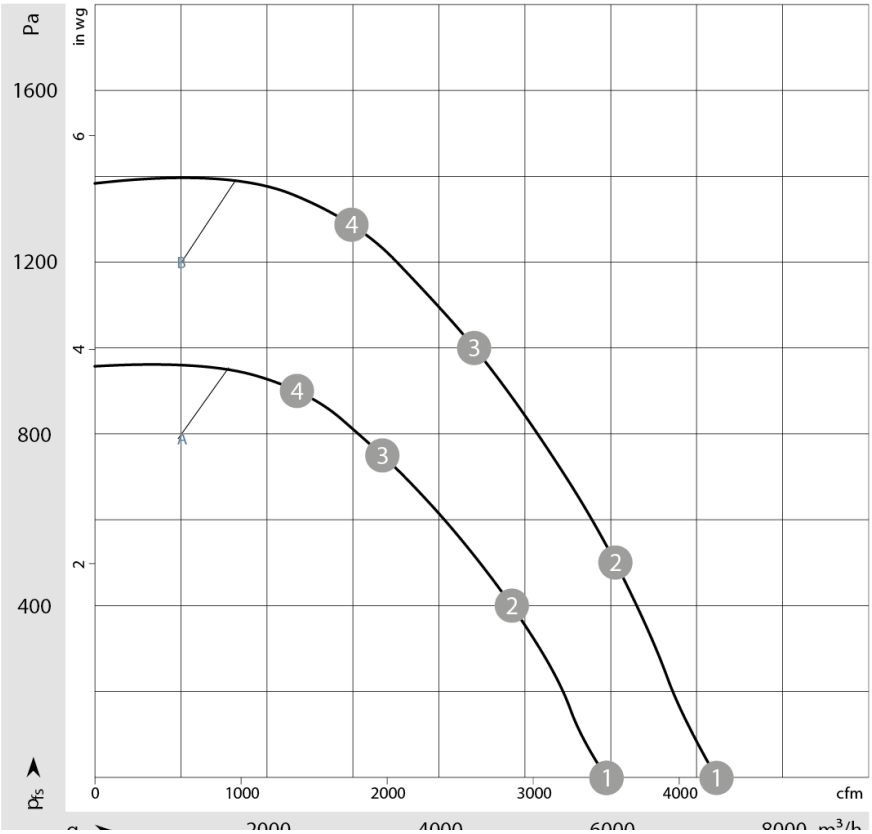


Fan impeller ELFF-035E-EC01-0110-2-F-x (1.1 kW) / ELFF-035E-EC01-0190-2-F-x (1.9 kW)

K-factor 24.32

K-factor dual fans 12.16

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
A	2400	0,62	0,98	87
A	2400	0,97	1,49	78
A	2400	1,10	1,70	76
A	2400	1,07	1,65	80
B	2870	1,05	1,69	92
B	2870	1,58	2,46	85
B	2870	1,90	3,00	81
B	2870	1,89	2,92	86

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

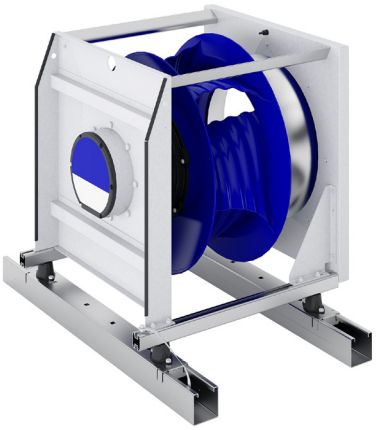
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC02)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

Applies to fan code

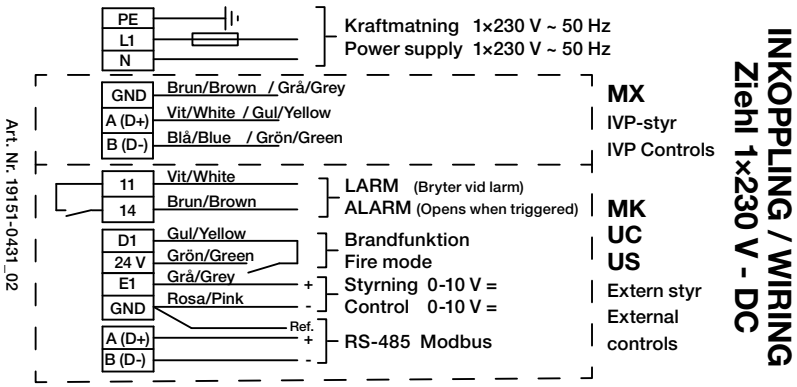
- ELFF-035Z-EC02-0135-2-F-x (1.35 kW)
- ELFF-035Z-EC02-0250-2-F-x (2.50 kW)

Technical data

- Motor type EC02 = EC motor with built-in electronic speed control.
- Fan impeller 035Z = ZIEHL-ABEGG diameter 350 mm, K-factor = 25.71
  K-factor dual fans = 12.86
- Supply = 1×230V~ 50Hz
- Output below refers to infed electrical power

Output (kW) *	Rated current (A) *
1.35	6.8
2.50	4.0

* Double values for dual fan



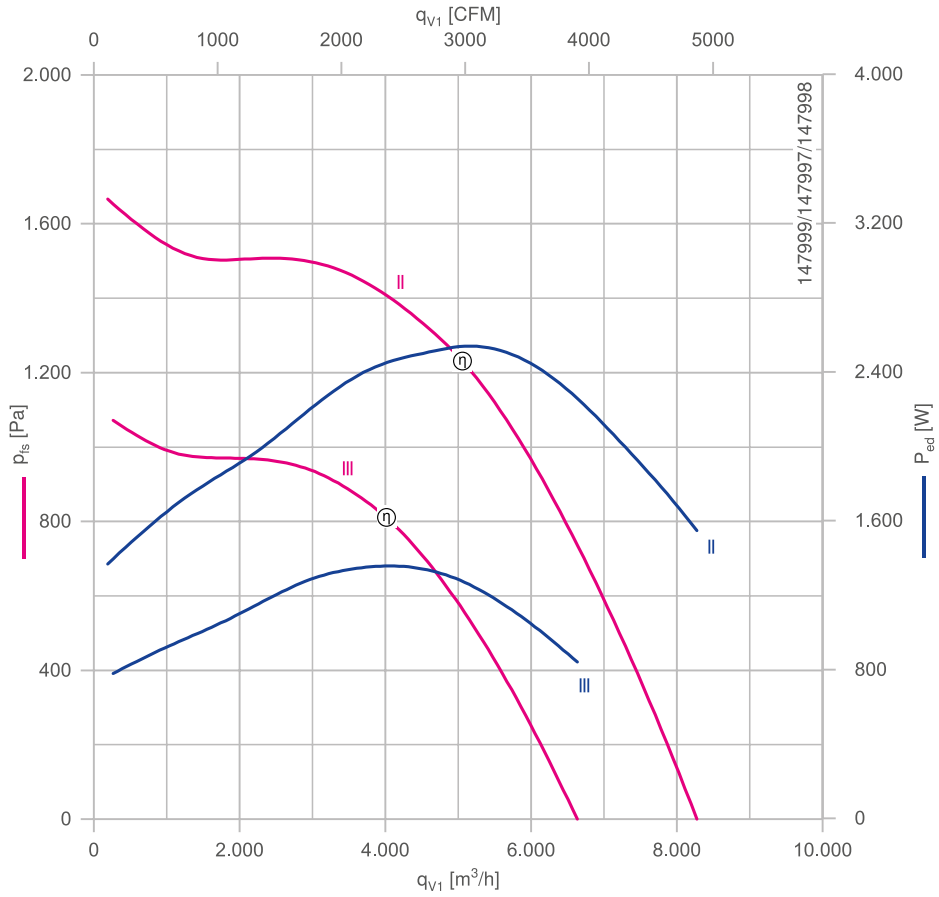
Fan impeller

ELFF-035Z-EC02-0135-2-F-x (1.35 kW) (III)

ELFF-035Z-EC02-0250-2-F-x (2.50 kW) (II)

K-factor25.71
K-factor dual fans 12.86

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

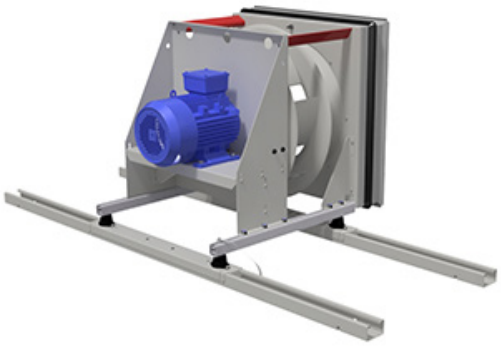
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-035G-I3S1-0110-1-F-x (1.1 kW)
- ELFF-035G-I3S1-0150-1-F-x (1.5 kW)
- ELFF-035G-I3S1-0220-1-F-x (2.2 kW)
- ELFF-035G-I3S1-0300-1-F-x (3.0 kW)

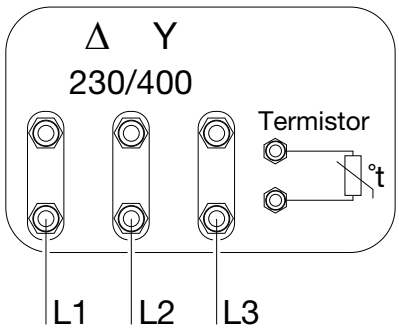
Technical data

- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 035G = Gebhardt diameter 350 mm, K-factor = 26.31
- Output below refers to shaft output

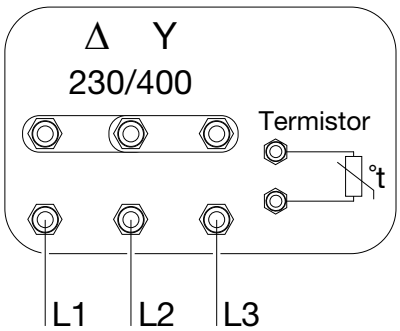
Output (kW)	Rated current (A) at power supply (voltage)	
	3×230V~ 50Hz	3×400V~ 50Hz
1.1	4.40	2.53
1.5	5.70	3.30
2.2	7.48	4.30
3.0	9.82	5.65

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)

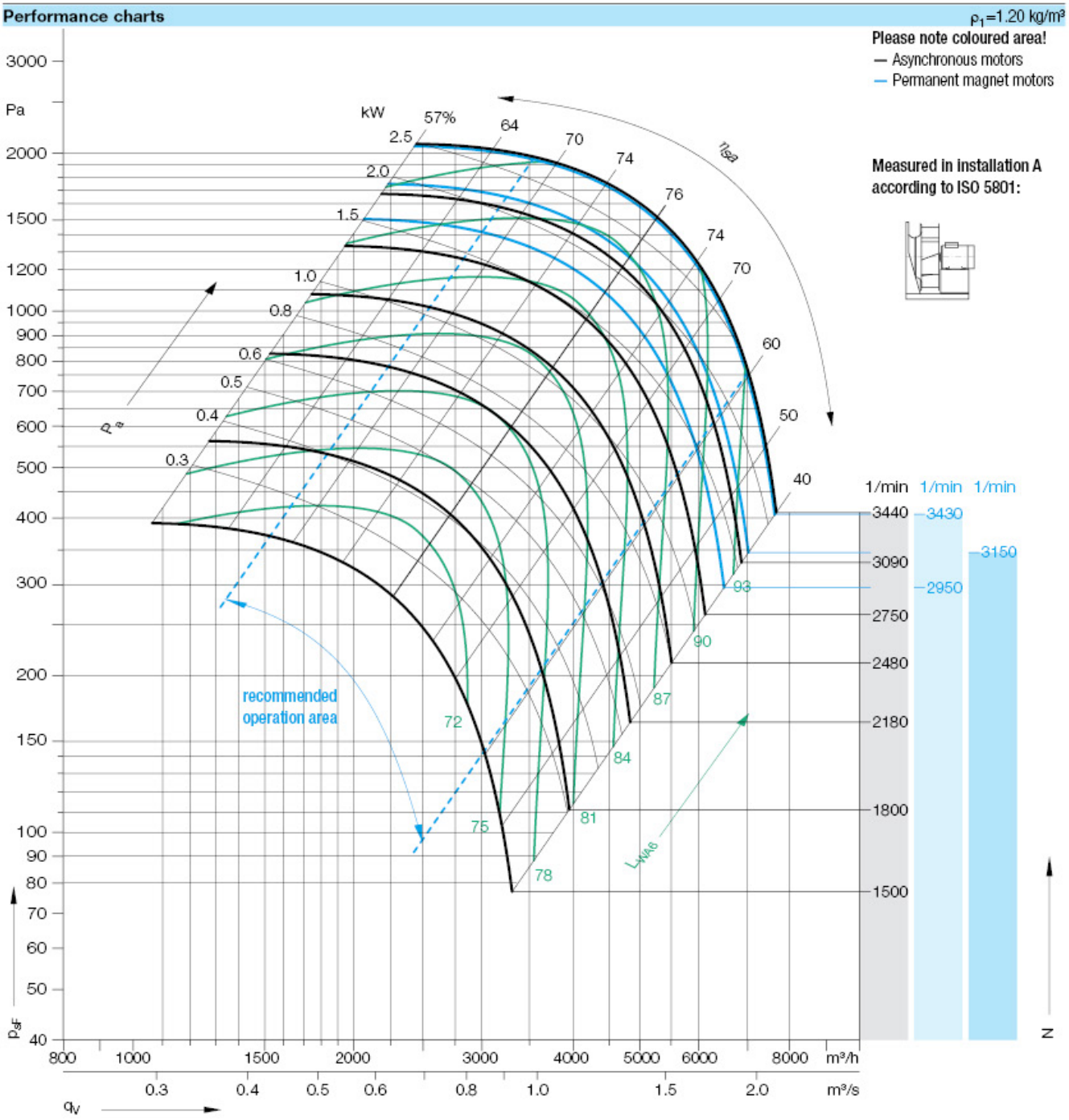


Fan impeller 035G

K-factor 26.31

NICOTRA Gebhardt

RLM E6-3135



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-040E-EC01-0250-2-F-x (2.5 kW)
- ELFF-040E-EC01-0335-2-F-x (3.35 kW)

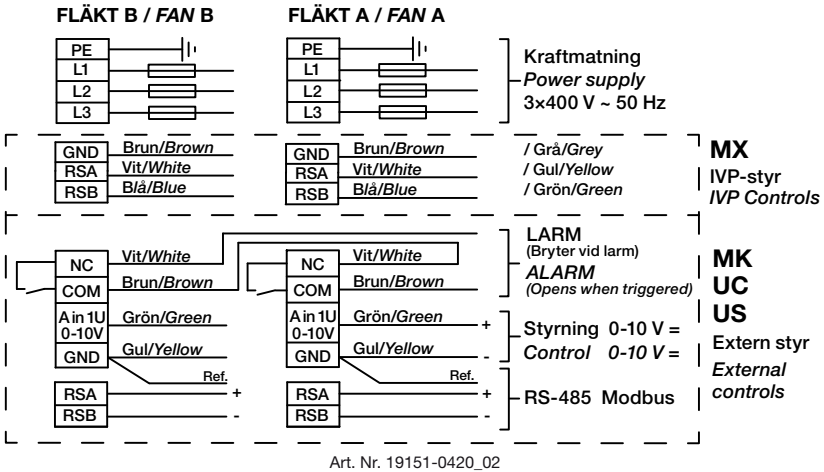
• Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 040E = ebm-papst diameter 400 mm, K-factor = 19.15K-factor dual fans = 9.58
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power.

Output (kW) *	Rated current (A) *
2.5	3.8
3.35	5.2

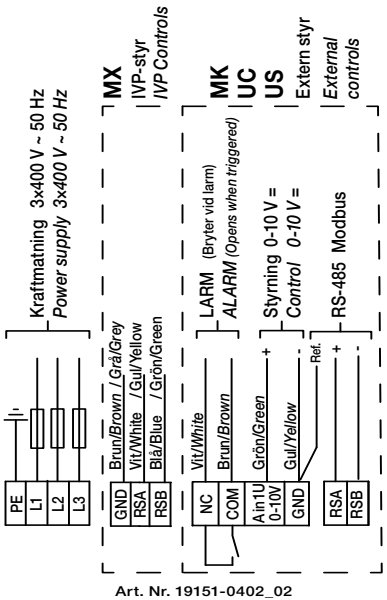
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×EBM 3×400 V - M3, M5



Art. Nr. 19151-0420_02

INKOPPLING / *WIRING*
EBM 3×400 V - P8, M3, M5

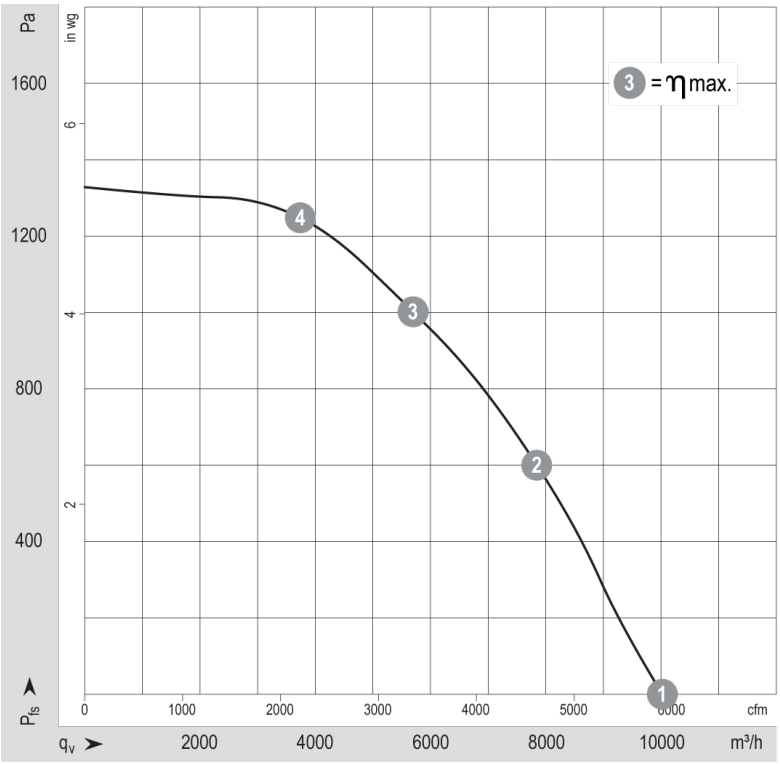


Art. Nr. 19151-0402_02

Fan impeller ELFF-040E-EC01-0250-2-F-x (2.5 kW)

K-factor 19.15
K-factor double factor 9.58

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	2450	1,32	2,07	96
2	2450	2,21	3,38	85
3	2450	2,50	3,80	82
4	2450	2,34	3,57	86

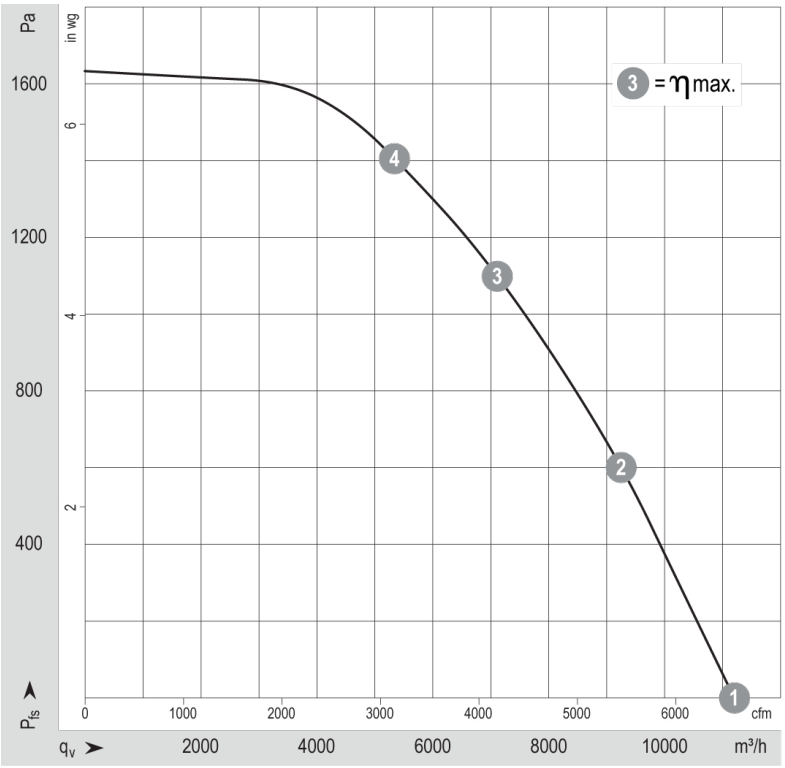
ELFF-040E-EC01-0250-2-F-0
R3G 400-PI92-01
2,50 kW

ebmpapst

Fan wheel ELFF-040E-EC01-0335-2-F-x (3.35 kW)

k-factor 19.15
K-factor double factor 9.58

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	2750	1,85	2,90	100
2	2750	2,83	4,35	90
3	2750	3,29	5,04	85
4	2750	3,35	5,20	86

ELFF-040E-EC01-0335-2-F-0
R3G 400-PA27-71
3,35 kW

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

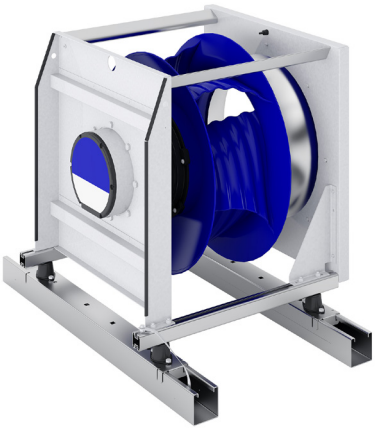
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC02)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

Applies to fan code

- ELFF-040Z-EC02-0250-2-F-x (2.50 kW)
- ELFF-040Z-EC02-0370-2-F-x (3.70 kW)

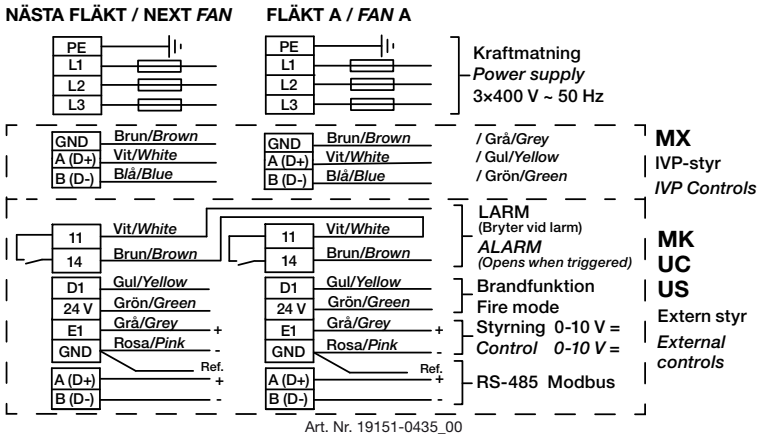
Technical data

- Motor type EC02 = EC motor with built-in electronic speed control.
- Fan impeller 040Z = ZIEHL-ABEGG diameter 400 mm, K-factor = 20.00
  K-factor dual fans = 10.00
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power

Output (kW) *	Rated current (A) *
2.50	4.0
3.70	5.8

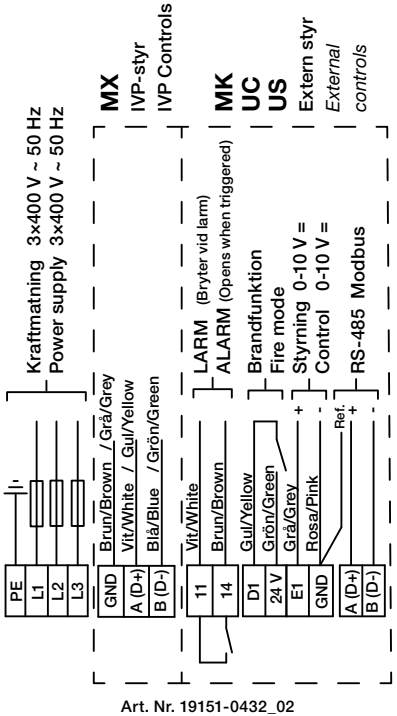
* Double values for dual fan

INKOPPLING FLERA FLÄKTAR / *WIRING SEVERAL FANS*
ZIEHL 3×400 V - DC, DG, GG



Art. Nr. 19151-0435_00

INKOPPLING / WIRING
Ziehl 3×400 V - DC, DG



Art. Nr. 19151-0432_02

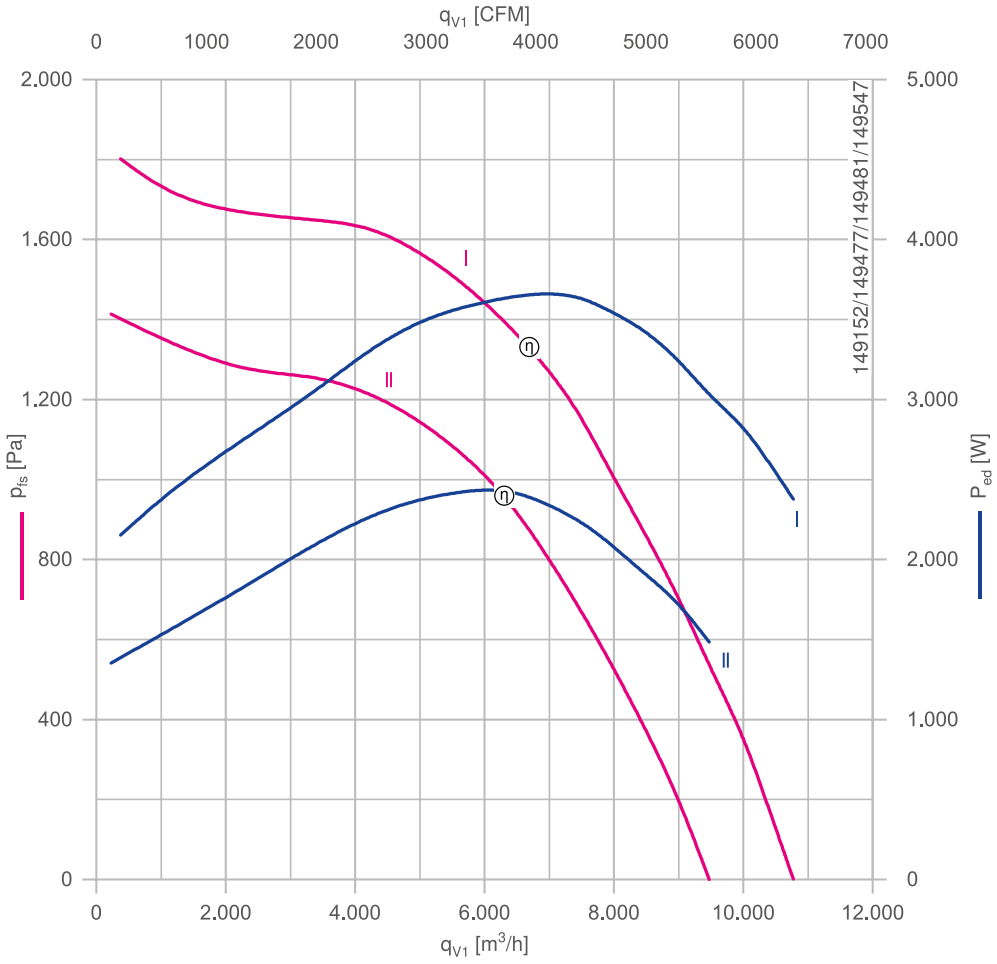
Fan impeller

ELFF-040Z-EC02-0250-2-F-x (2.50 kW) (II)

ELFF-040Z-EC02-0370-2-F-x (3.70 kW) (I)

K-factor20.00
K-factor dual fans 10.00

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

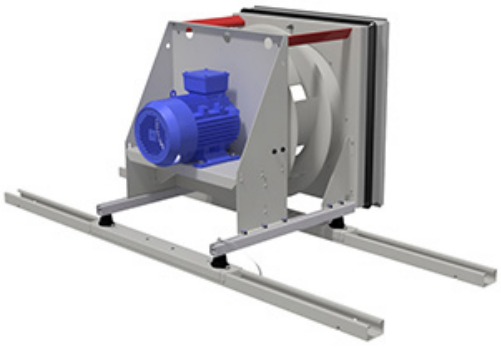
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-040G-I3S1-0110-1-F-x (1.1 kW)
- ELFF-040G-I3S1-0150-1-F-x (1.5 kW)
- ELFF-040G-I3S1-0220-1-F-x (2.2 kW)
- ELFF-040G-I3S1-0300-1-F-x (3.0 kW)
- ELFF-040G-I3S1-0400-1-F-x (4.0 kW)

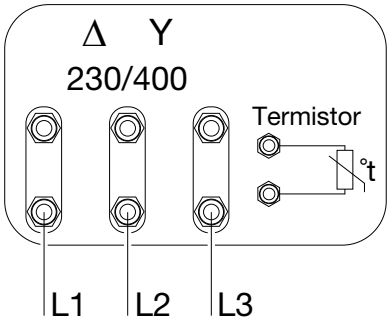
Technical data

- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 040G = Gebhardt diameter 400 mm, K-factor = 21.79
- Output below refers to shaft output

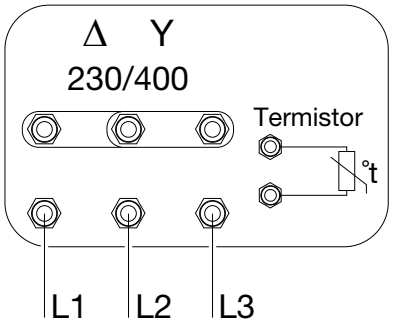
Output (kW)	Rated current (A) at power supply (voltage)	
	3×230V~ 50Hz	3×400V~ 50Hz
1.1	4.40	2.53
1.5	5.70	3.30
2.2	8.17	4.70
3.0	10.4	6.00
4.0	13.0	7.45

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)

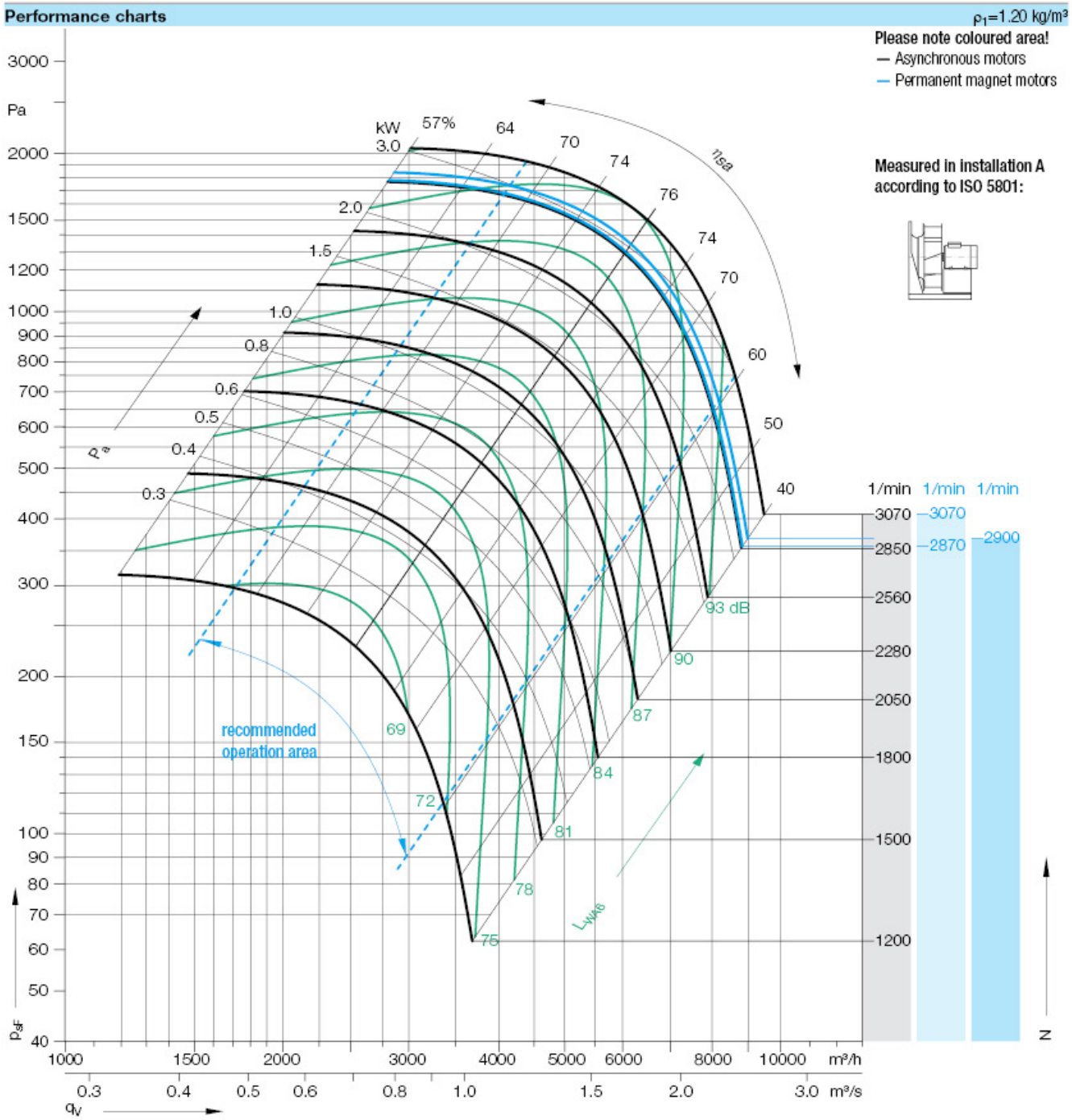


Fan impeller 040G

K-factor 21.79

NICOTRA Gebhardt

RLM E6-3540



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

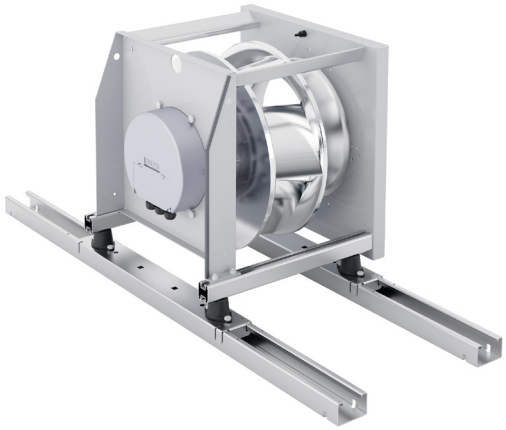
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-045E-EC01-0174-2-F-x (1.74 kW)
- ELFF-045E-EC01-0290-2-F-x (2.9 kW)

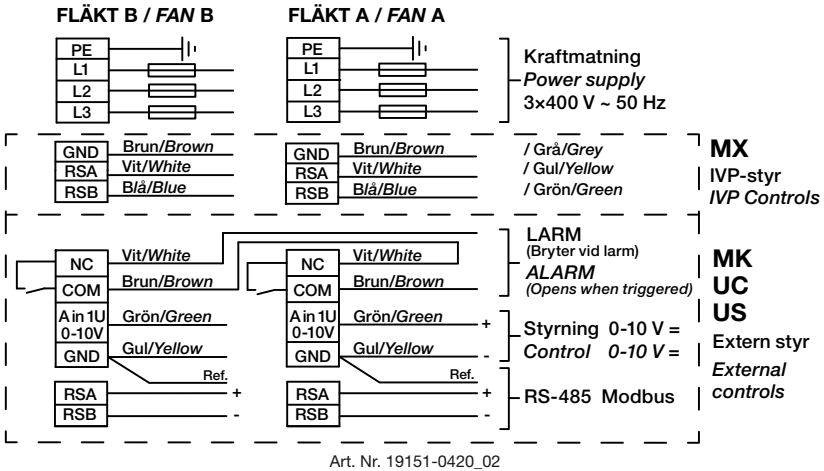
• Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 045E = ebm-papst diameter 450 mm, K-factor = 15.0K-factor dual fans = 7,0
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power.

Output (kW) *	Rated current (A) *
1.74	2.7

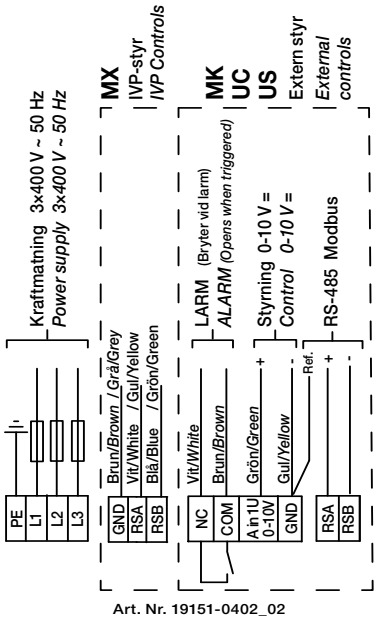
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×EBM 3×400 V - M3, M5



Art. Nr. 19151-0420_02

INKOPPLING / *WIRING*
EBM 3×400 V - P8, M3, M5



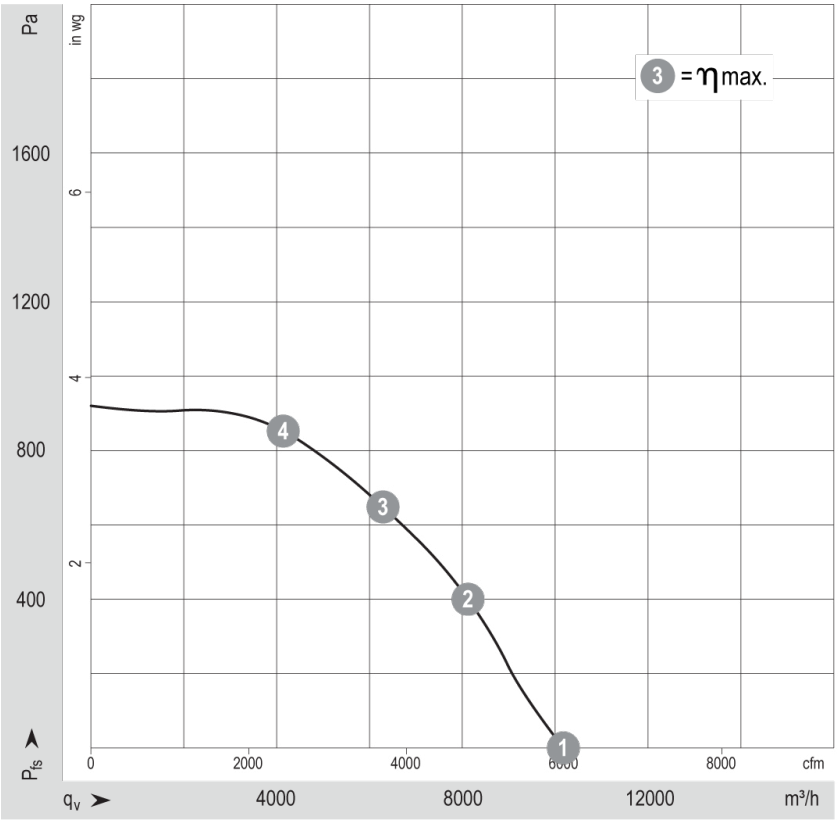
Art. Nr. 19151-0402_02

Fan impeller ELFF-045E-EC01-0174-2-F-x (1.74 kW) / ELFF-045E-EC01-0290-2-F-x (2.9 kW)

K-factor 15.0

K-factor double fans 7.0

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_{WA} dB(A)
1	1790	1,00	1,61	91
2	1790	1,53	2,38	82
3	1790	1,74	2,70	77
4	1790	1,66	2,57	82

ELFF-045E-EC01-0174-2-F-0
R3G 450-PI86-01
1,74 kW

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

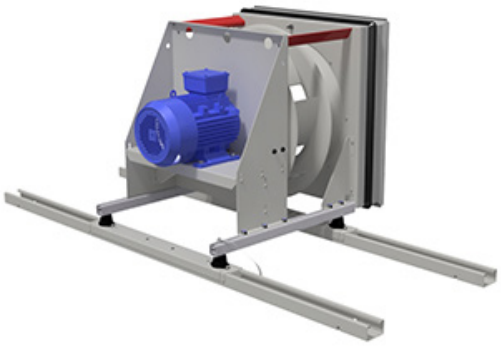
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-045G-I3S1-0110-1-F-x (1.1 kW)
- ELFF-045G-I3S1-0150-1-F-x (1.5 kW)
- ELFF-045G-I3S1-0220-1-F-x (2.2 kW)
- ELFF-045G-I3S1-0300-1-F-x (3.0 kW)
- ELFF-045G-I3S1-0400-1-F-x (4.0 kW)

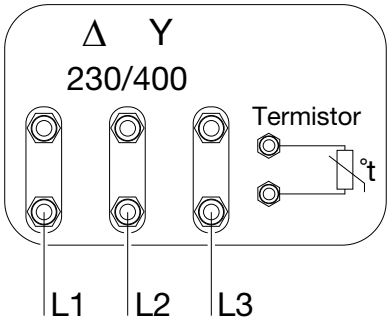
Technical data

- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 045G = Gebhardt diameter 450 mm, K-factor = 18.0
- Output below refers to shaft output

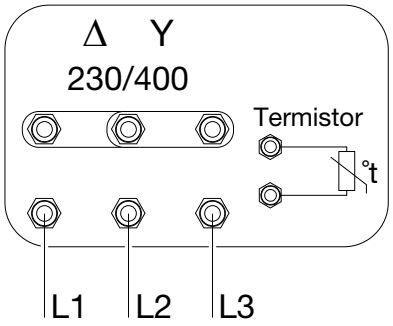
Output (kW)	Rated current (A) at power supply (voltage)	
	3×230V~ 50Hz	3×400V~ 50Hz
1.1	4.40	2.53
1.5	5.70	3.30
2.2	7.83	4.50
3.0	10.4	6.00
4.0	14.2	8.15

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)



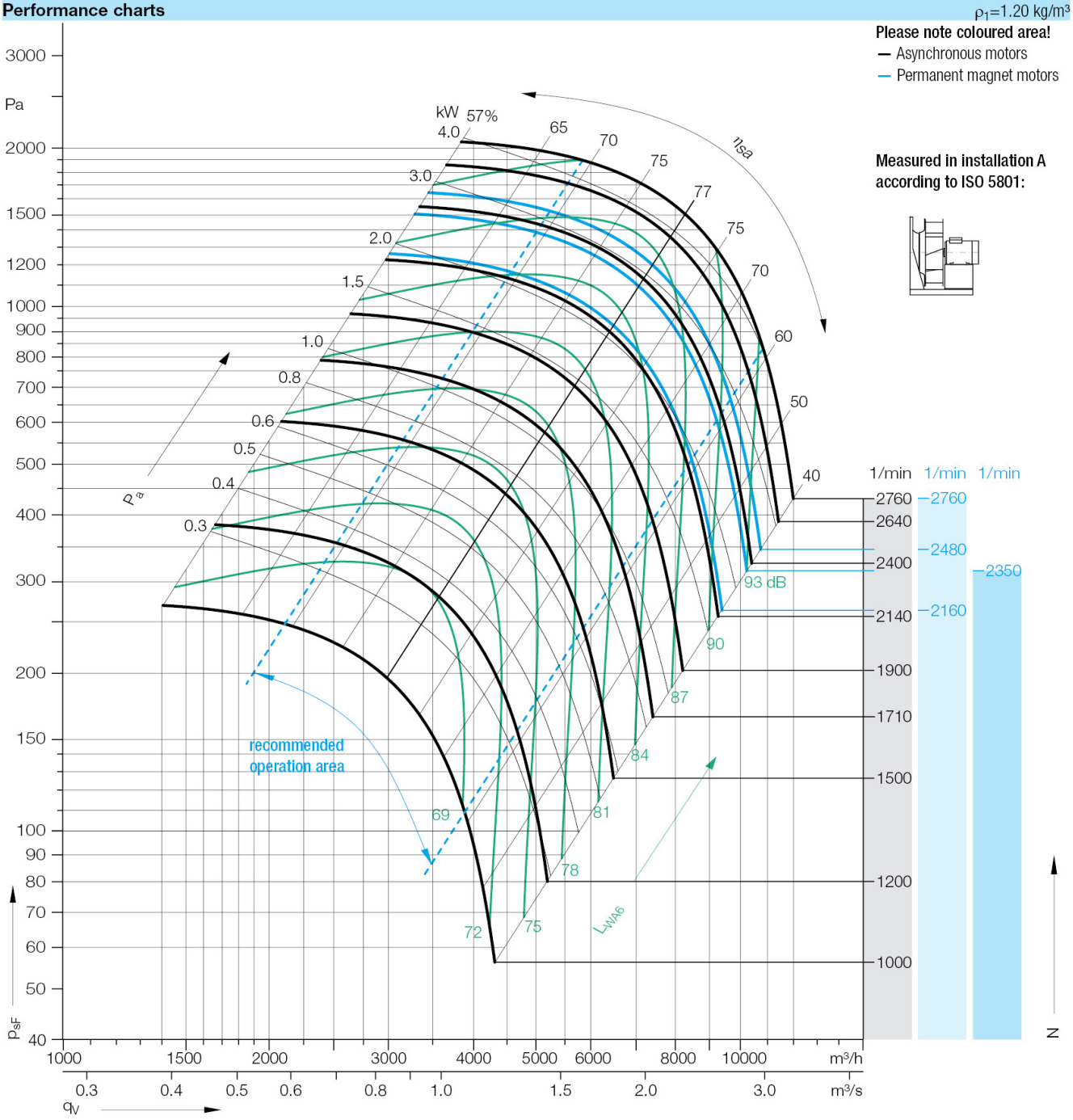
Fan impeller 045G

K-factor 18.0

NICOTRA Gebhardt

RLM E6-4045

Performance charts ρ_1=1.20 kg/m³



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

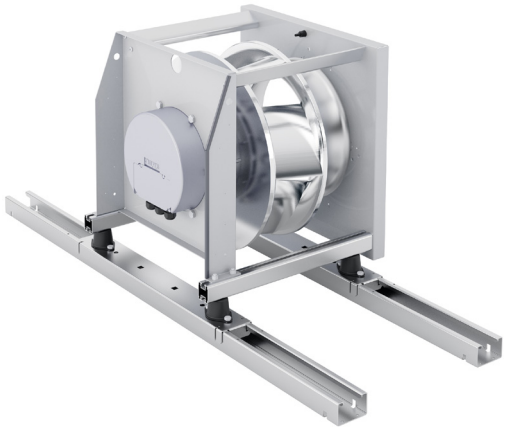
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-050E-EC01-0345-2-F-x (3.45 kW)
- ELFF-050E-EC01-0570-2-F-x (5.7 kW)

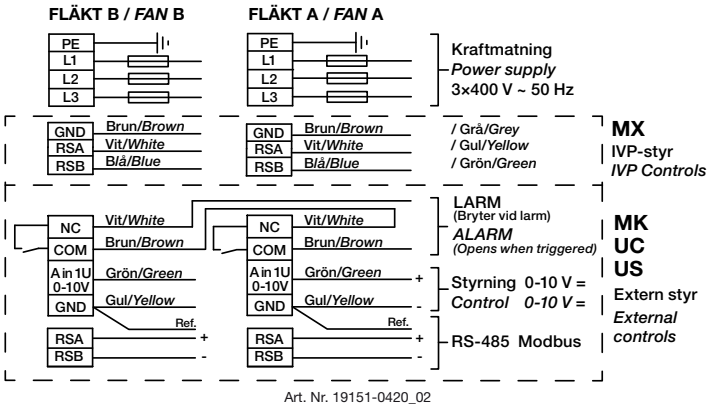
Technical data

- Motor type EC01 = EC motor with built-in electronic speed control.
- Fan impeller 050E = ebm-papst diameter 500 mm, K-factor = 12.81K-factor dual fans 6.41
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power.

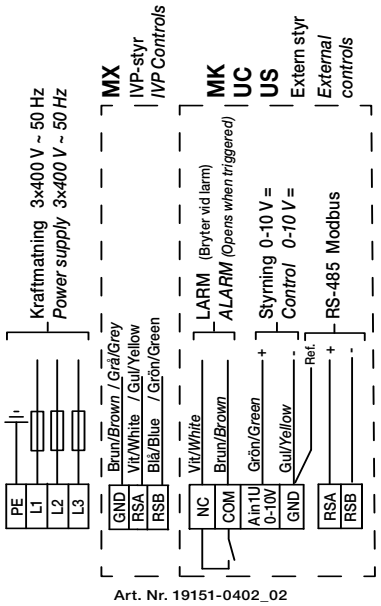
Output (kW) *	Rated current (A) *
3.45	5.3
5.7	9.0

* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×EBM 3×400 V - M3, M5



INKOPPLING / *WIRING*
EBM 3×400 V - P8, M3, M5

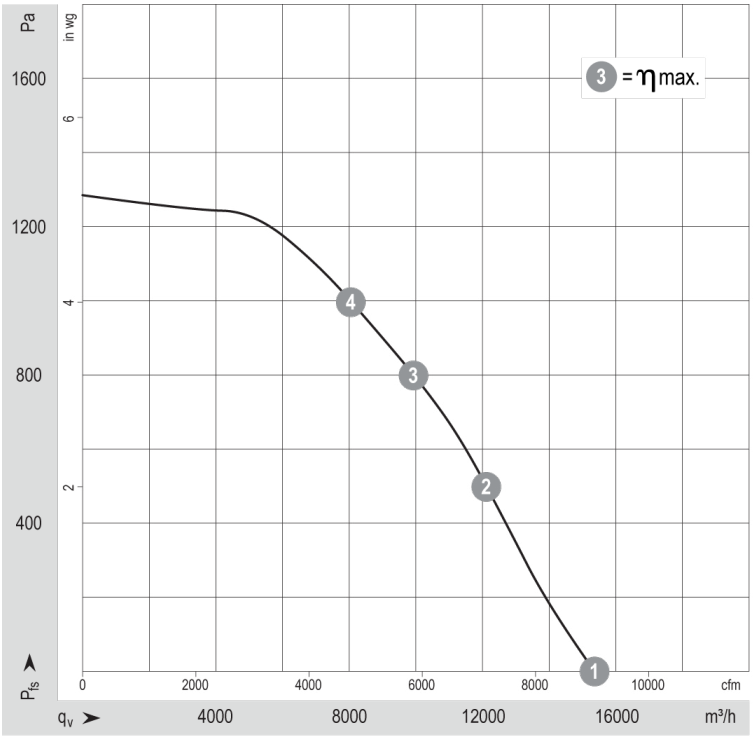


Fan impeller ELFF-050E-EC01-0345-2-F-x (3.45 kW)

K-factor 12.81

K-factor dual fans 6.41

NB: The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_WA dB(A)
1	1910	1,98	3,09	102
2	1910	2,92	4,49	92
3	1910	3,38	5,19	86
4	1910	3,45	5,30	53

ELFF-050E-EC01-0345-2-F-0
R3G 500-PA23-71
3,45 kW

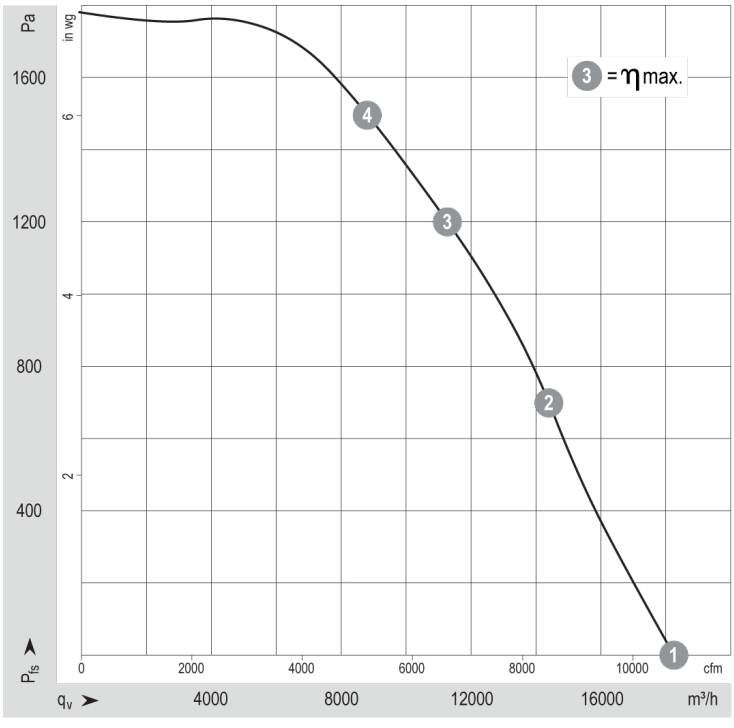
ebmpapst

Fan impeller ELFF-050E-EC01-0570-2-F-x (5.7 kW)

K-factor 12.81

K-factor dual fans 6.41

NB: The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.



	n rpm	P_{ed} kW	I A	L_WA dB(A)
1	2250	3,24	5,05	105
2	2250	4,86	7,47	95
3	2250	5,70	9,00	88
4	2250	5,70	8,74	87

ELFF-050E-EC01-0570-2-F-0
R3G 500-PB33-01
5,70 kW

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

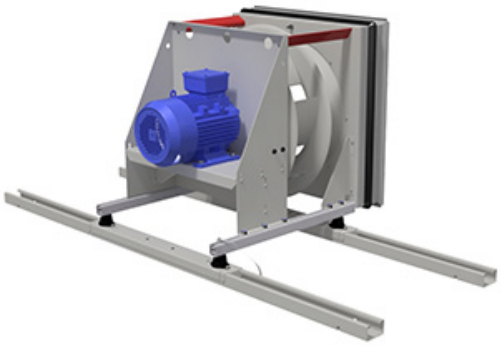
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-050G-I3S1-0150-1-F-x (1.5 kW)
- ELFF-050G-I3S1-0220-1-F-x (2.2 kW)
- ELFF-050G-I3S1-0300-1-F-x (3.0 kW)
- ELFF-050G-I3S1-0400-1-F-x (4.0 kW)

Technical data

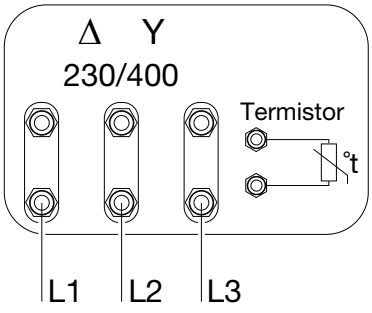
- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 050G = Gebhardt diameter 500 mm, K-factor = 14.68K-factor dual fans = 7.34
- Output below refers to shaft output.

	Rated current (A) at power supply (voltage) *	
Output (kW) *	3×230V~ 50Hz	3×400V~ 50Hz
1.5	5.70	3.30
2.2	7.83	4.50
3.0	10.4	6.00
4.0	14.2	8.15

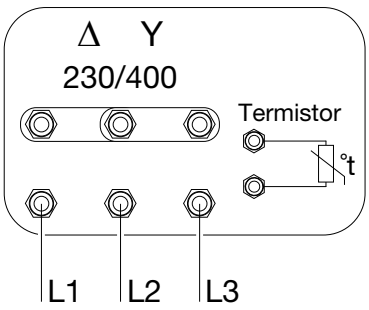
* Double values for dual fan.

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)



Fan impeller 050G

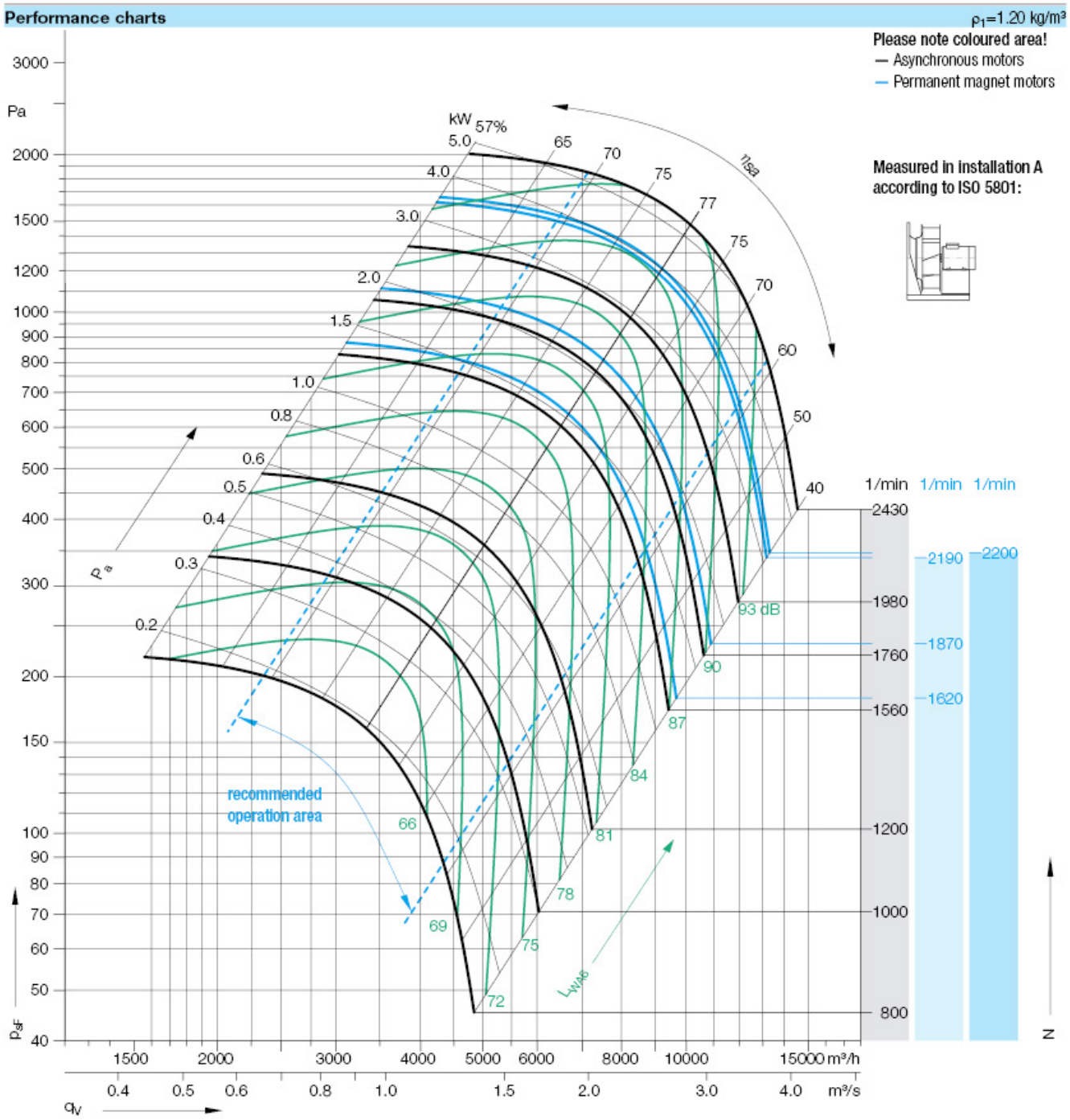
K-factor 14.68

K-factor dual fans 7.34

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-4550



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

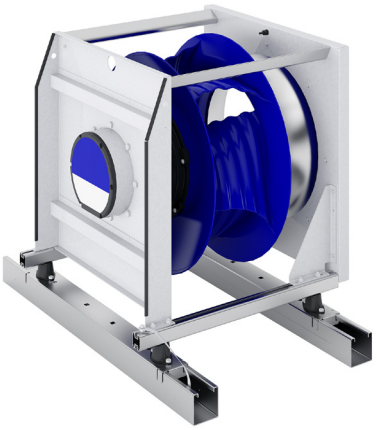
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC02)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- To facilitate service, the fan and motor unit is mounted on slide rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively insulated against vibration from the housing with a non-vibrating outlet connector and rubber springs that are designed according to the fan's operating conditions.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in corrosion class C4.

Applies to fan code

- ELFF-056Z-EC02-0340-2-F-x (3.40 kW)
- ELFF-056Z-EC02-0520-2-F-x (5.20 kW)

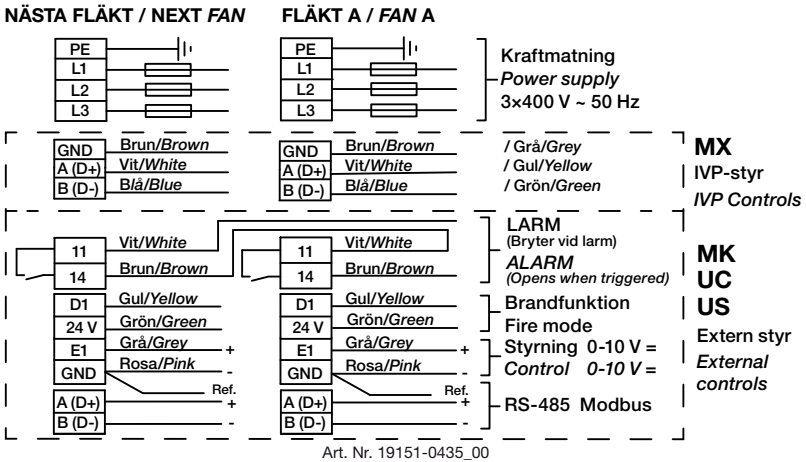
Technical data

- Motor type EC02 = EC motor with built-in electronic speed control.
- Fan impeller 056Z = ZIEHL-ABEGG diameter 560 mm, K-factor dual fans = 5.07
  K-factor triple fans = 3.38
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power

Output (kW) *	Rated current (A) *
3.4	5.4
5.2	8.2

* Double the value for dual fan, triple the value for triple fan

INKOPPLING FLERA FLÄKTAR / *WIRING SEVERAL FANS*
ZIEHL 3×400 V - DC, DG, GG



Art. Nr. 19151-0435_00

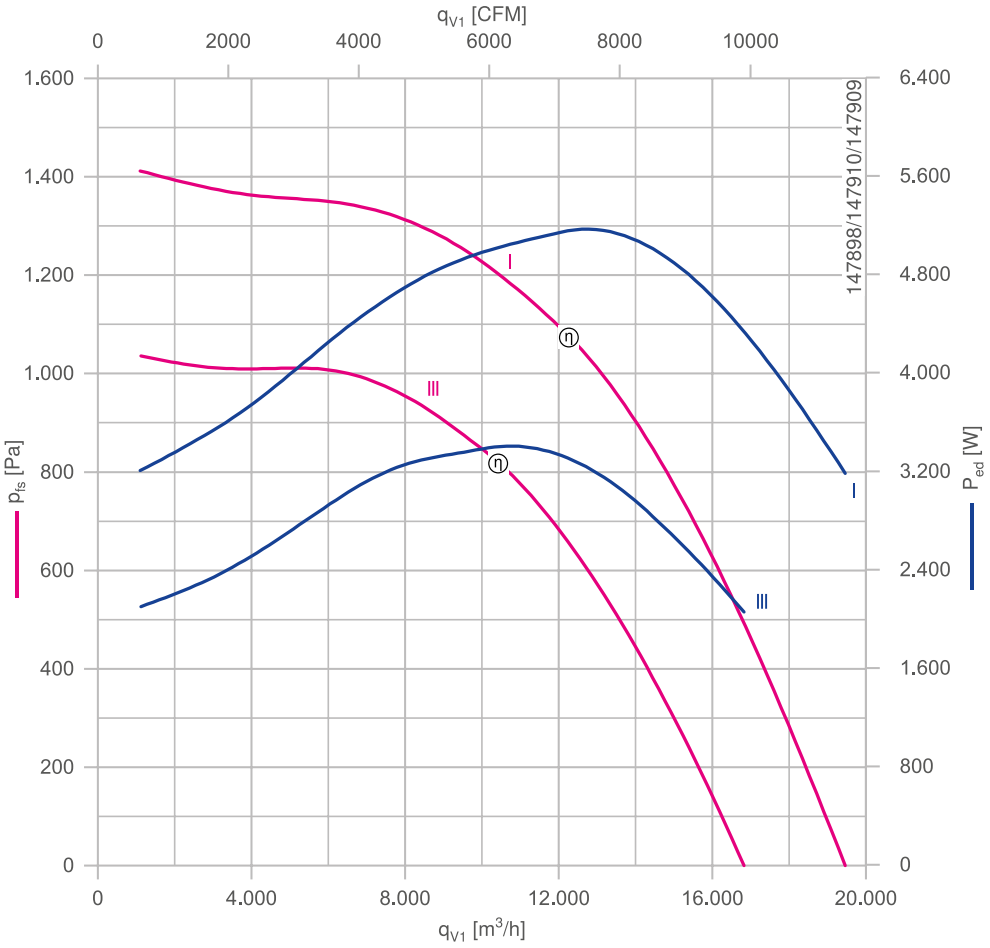
Fan impeller

ELFF-056Z-EC02-0340-2-F-x (3.40 kW) (III)

ELFF-056Z-EC02-0520-2-F-x (5.20 kW) (I)

K-factor dual fans 5.07
K-factor triple fans = 3.38

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans. Triple fan provides triple airflow.



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the extract air flow is too low, the ventilation capacity will be poor. Imbalance may also force moist air out into the building structure.
  If the extract air is too low, this will cause increased energy usage if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a centrifugal fan is rotating in the wrong direction, the air flow will still go the right way, but with a considerable reduction in capacity. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

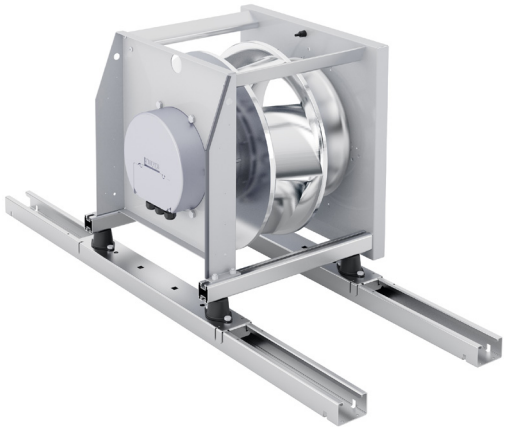
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
2. Check that the fan impeller rotates easily, is in balance and does not vibrate. Also check that the fan impeller is clear of 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 impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type EC01)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-056E-EC01-0330-2-F-x (3.3 kW)
- ELFF-056E-EC01-0500-2-F-x (5.0 kW)

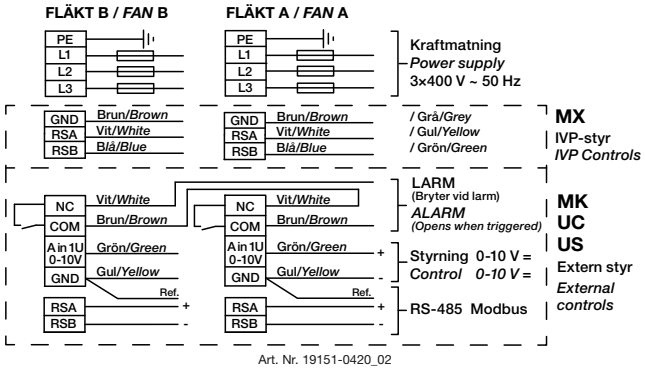
• Technical data

- Motor type EC01 = ebm-papst motor with built-in electronic speed control.
- Fan impeller 056E = ebm-papst, diameter 560 mm, K-factor = 10.34K-factor dual fans = 5.17
- Supply = 3×400V~ 50Hz
- Output below refers to infed electrical power.

Output (kW) *	Rated current (A) *
3.3	5.1
5.0	7.7

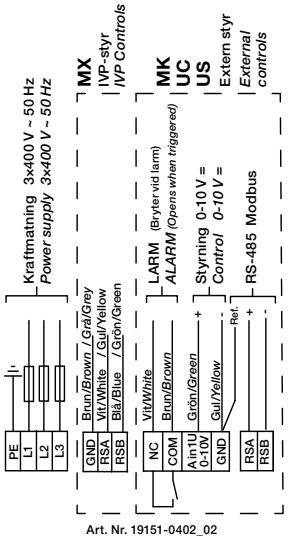
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×EBM 3×400 V - M3, M5



Art. Nr. 19151-0420_02

INKOPPLING / *WIRING*
EBM 3×400 V - P8, M3, M5



Art. Nr. 19151-0402_02

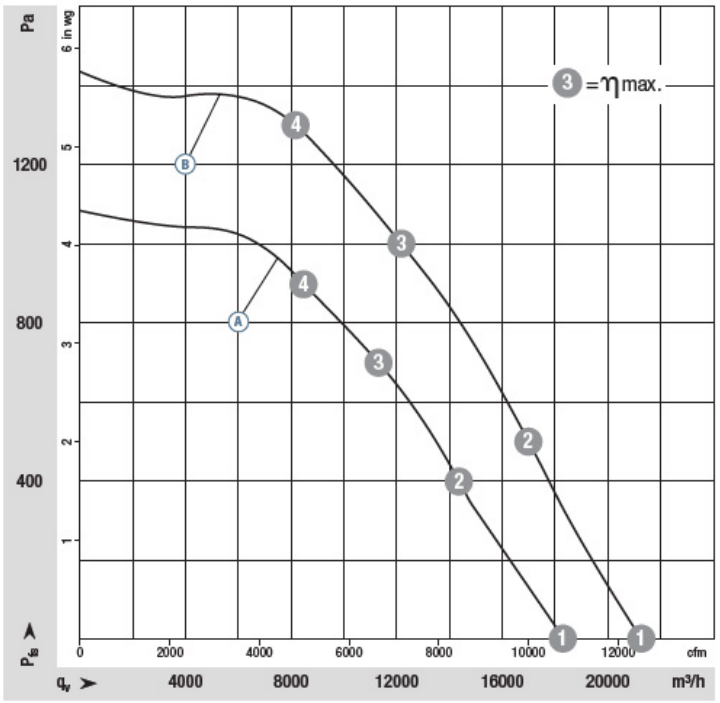
Fan impeller 056E

K-factor 10.34

K-factor dual fans 5.17

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

Curves:



		n rpm	P_{ed} kW	I A	L_{WA} dB(A)
A	1	1540	1,83	2,88	97
A	2	1540	2,81	4,32	88
A	3	1540	3,30	5,10	82
A	4	1540	3,23	4,95	82
B	1	1760	2,79	4,36	101
B	2	1760	4,25	6,52	92
B	3	1760	5,00	7,70	84
B	4	1760	4,79	7,32	87

Air performance measured according to: ISO 5801, installation category A, with ebm-papst inlet ring without contact protection. Intake-side sound level: Lw_A according to ISO 13347, Lp_A measured at 1 m distance from fan axis. The values given are only applicable under the specified measuring conditions and may differ depending on the installation conditions. In the event of deviation from the standard configuration, the parameters must be checked in installed condition. See Page 98 ff for detailed information.

ebmpapst

Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Resetting the overheat protection

1. Cut the power supply to the fan motor.
2. Wait for at least 1 minute.
3. Close the power supply to the fan motor.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

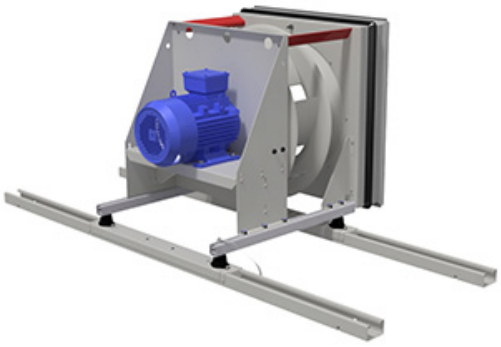
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-056G-I3S1-0300-1-F-x (3.0 kW)
- ELFF-056G-I3S1-0400-1-F-x (4.0 kW)
- ELFF-056G-I3S1-0550-1-F-x (5.5 kW)

Technical data

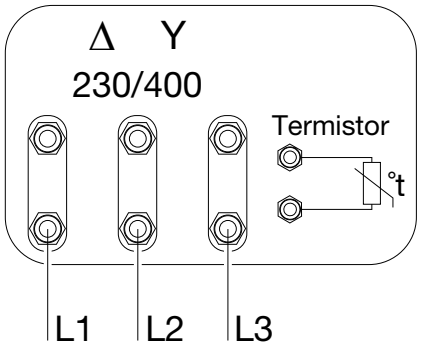
- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 056G = Gebhardt diameter 560 mm, K-factor = 11.52K-factor dual fans = 5.76
- Output below refers to shaft output.

Output (kW) *	Rated current (A) at power supply (voltage) *	
	3×230V~ 50Hz	3×400V~ 50Hz
3.0	10.4	6.0
4.0	13.8	7.9
5.5	19.3	11.1

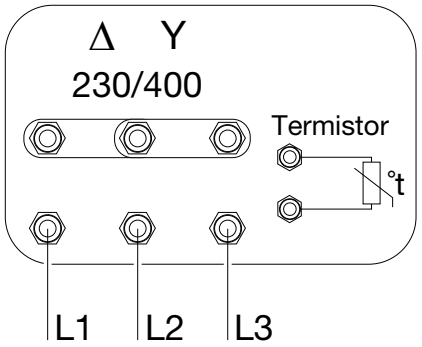
* Double values for dual fan.

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)



Fan impeller 056G

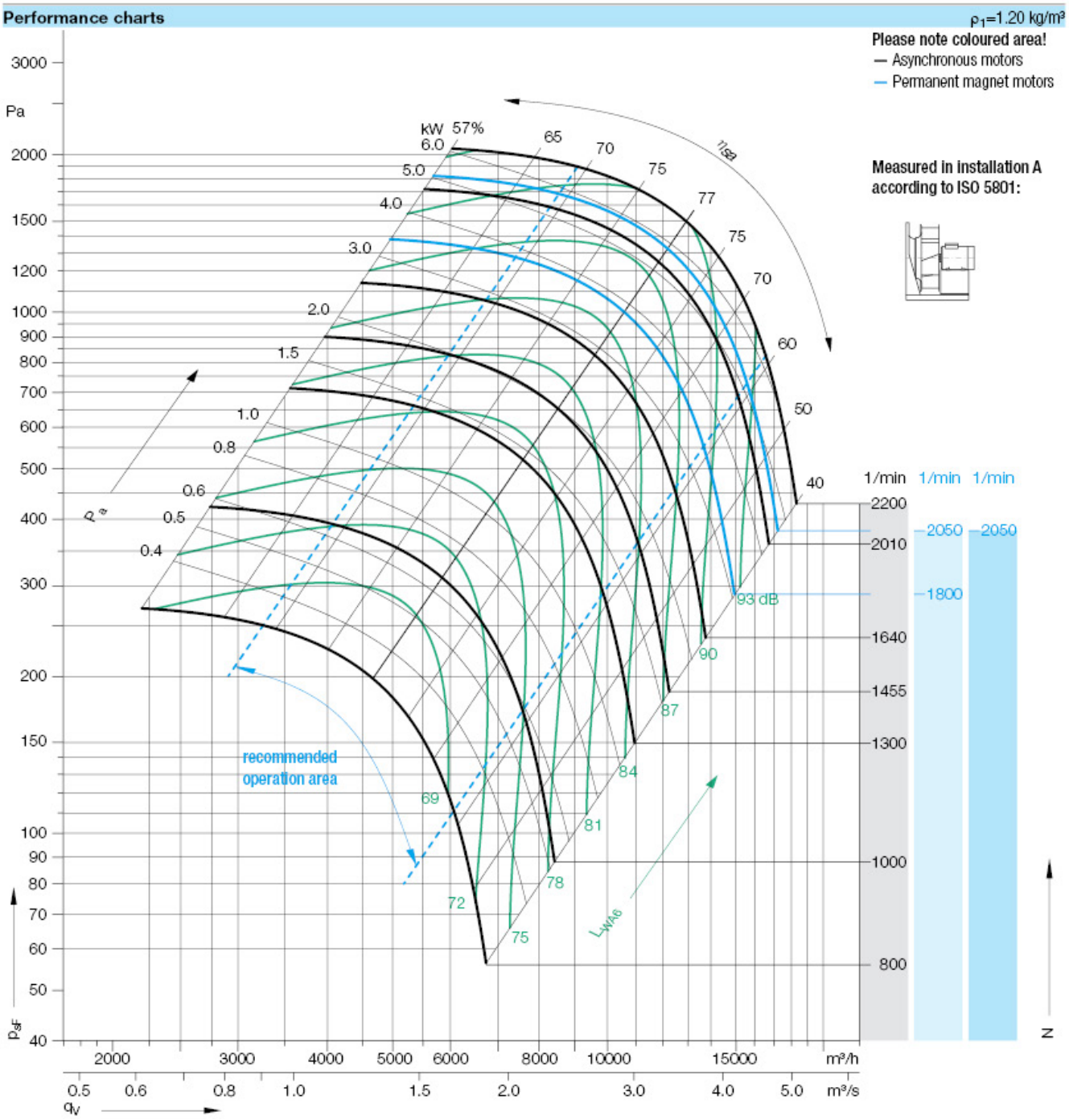
K-factor 11.52

K-factor dual fans 5.76

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-5056



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

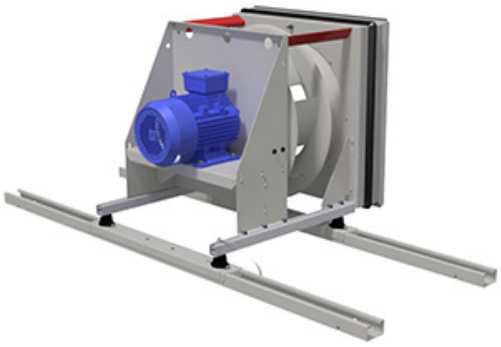
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-063G-I3S1-0400-1-F-x (4.0 kW)
- ELFF-063G-I3S1-0550-1-F-x (5.5 kW)
- ELFF-063G-I3S1-0750-1-F-x (7.5 kW)
- ELFF-063G-I3S1-1100-1-F-x (11.0 kW)

Technical data

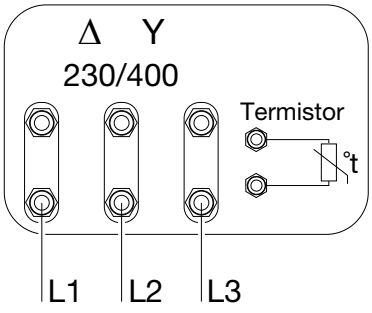
- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 063G = Gebhardt diameter 630 mm, K-factor = 9.0K-factor dual fans = 4.5
- Output below refers to shaft output.

Output (kW) *	Rated current (A) at power supply (voltage) *	
	3×230V~ 50Hz	3×400V~ 50Hz
4.0	13.8	7.9
5.5	18.6	10.7
7.5	24.9	14.3
11.0	36.4	20.9

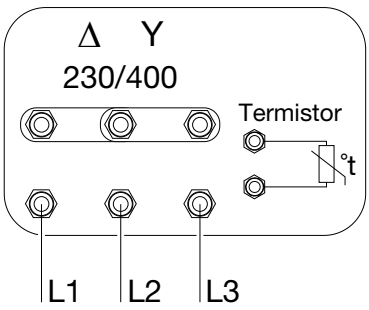
* Double values for dual fan.

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)



Fan impeller 063G

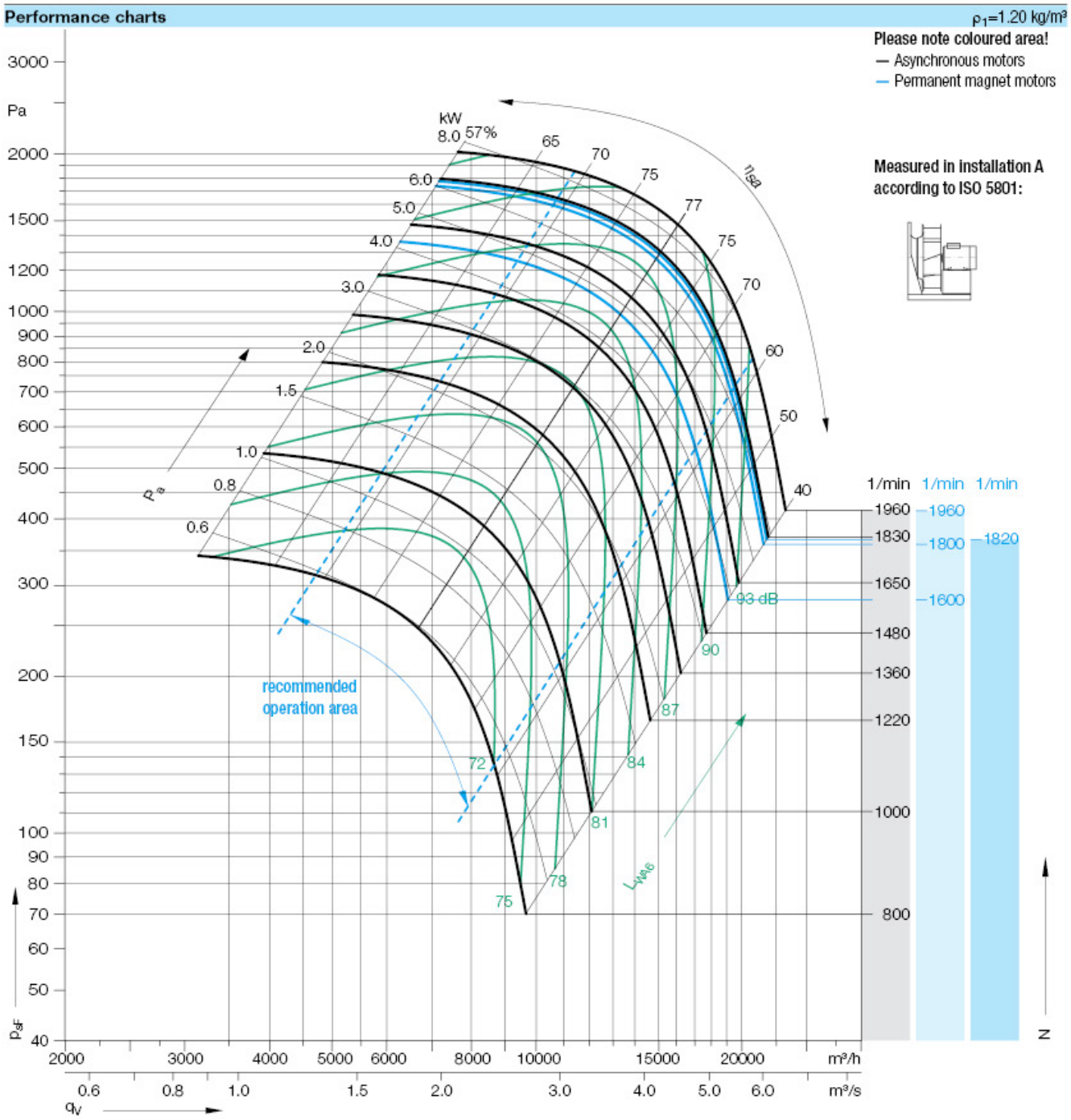
K-factor 9.0

K-factor dual fans 4.5

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-5663



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

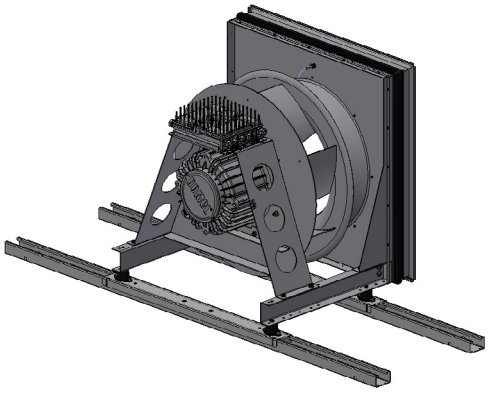
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type PFJ1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-063G-PFJ1-0430-1-F-x (4.3 kW)
- ELFF-063G-PFJ1-0650-1-F-x (6.5 kW)

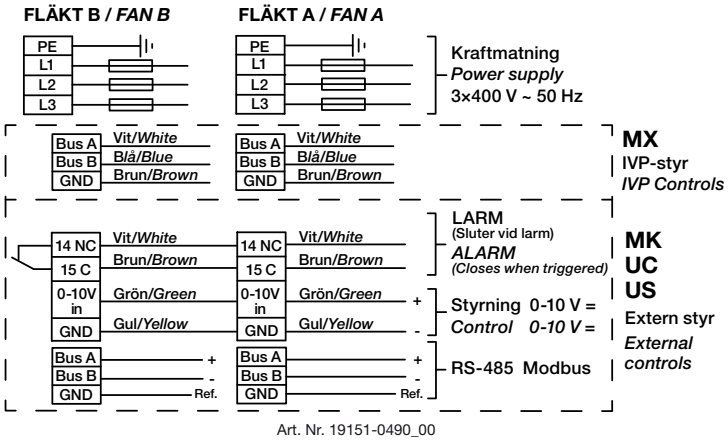
Technical data

- Engine type PFJ1 = Domel motor in accordance with efficiency class IE4 with built-in frequency inverter from OJ Electronics.
- Fan impeller 063G = Gebhardt diameter 630 mm, K-factor = 9.0K-factor dual fans = 4.5
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

Output (kW) *	Rated current (A) *
4.3	5.4
6.5	12.2

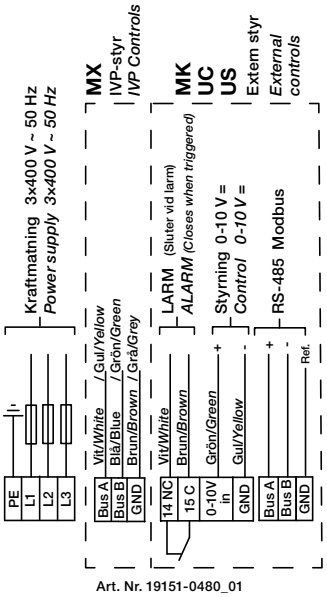
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×OJ-DV 3×400 V



Art. Nr. 19151-0490_00

INKOPPLING / *WIRING*
OJ-DV 3×400 V



Art. Nr. 19151-0480_01

Fan impeller 063G

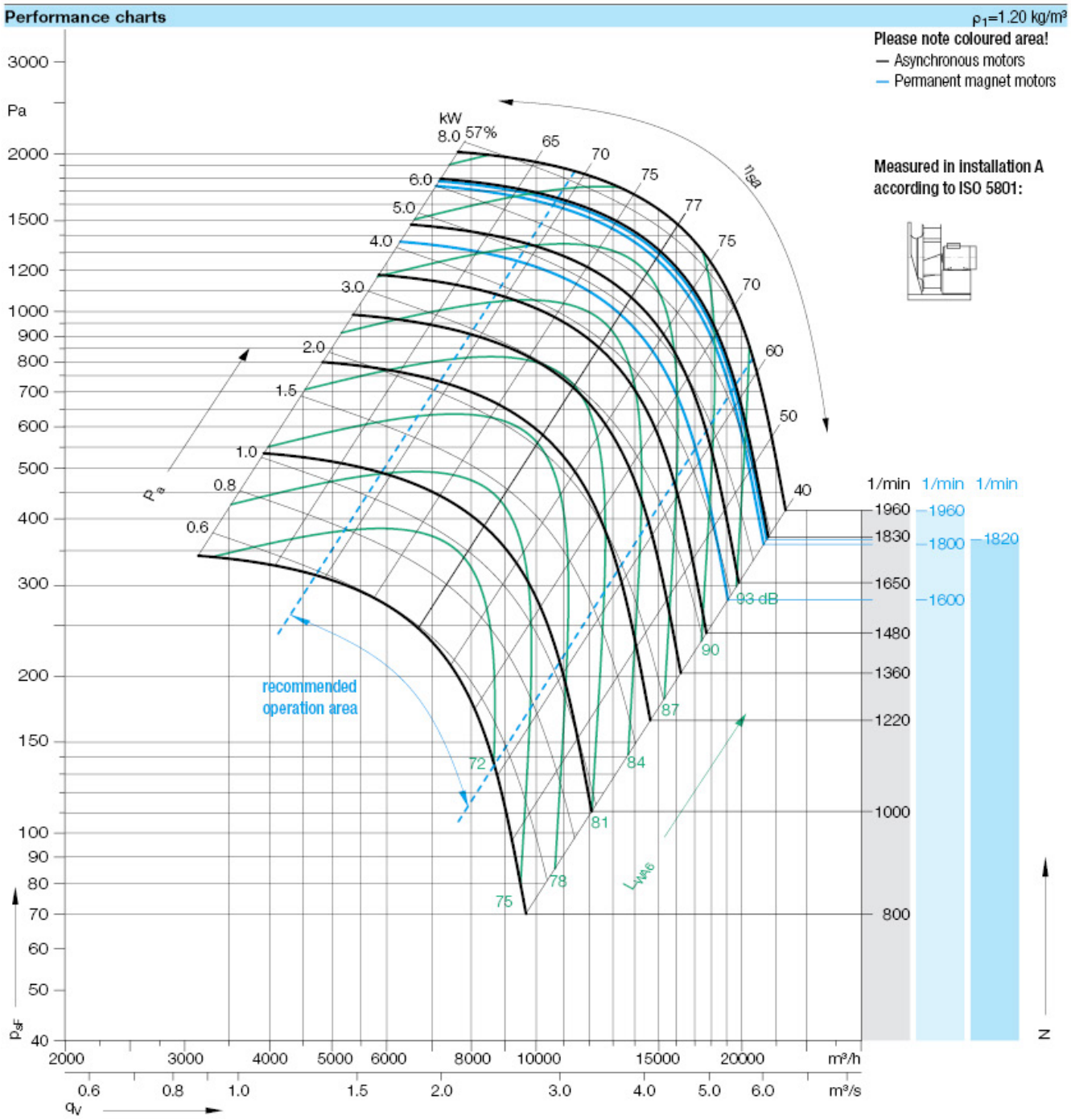
K-factor 9.0

K-factor dual fans 4.5

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-5663



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

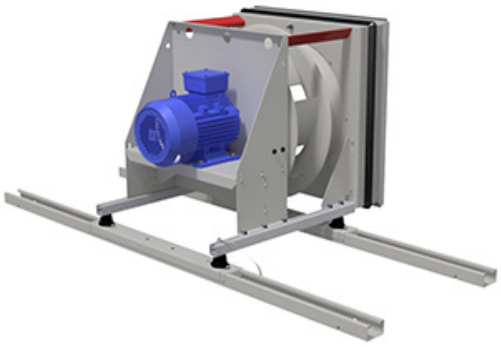
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-071G-I3S1-0550-1-F-x (5.5 kW)
- ELFF-071G-I3S1-0750-1-F-x (7.5 kW)
- ELFF-071G-I3S1-1100-1-F-x (11.0 kW)

Technical data

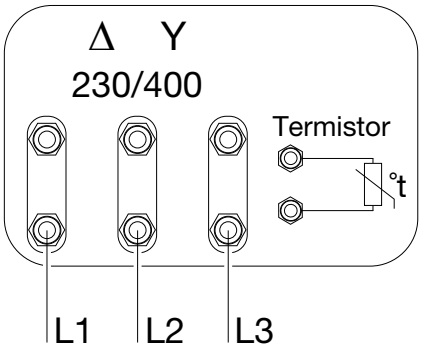
- Motor type I3S1 = motor in accordance with efficiency class IE3 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 071G = Gebhardt diameter 710 mm, K-factor = 7.24K-factor dual fans = 3.62
- Output below refers to shaft output.

Output (kW) *	Rated current (A) at power supply (voltage) *	
	3×230V~ 50Hz	3×400V~ 50Hz
5.5	20.9	12.0
7.5	24.9	14.3
11.0	36.4	20.9

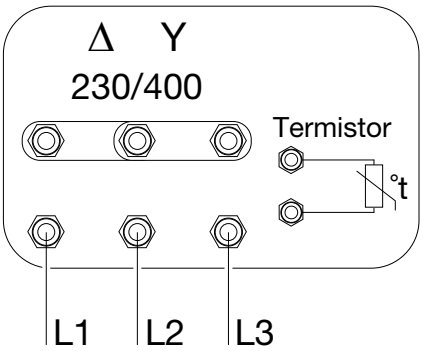
* Double values for dual fan.

Wiring instructions

3×230V fan impeller 025-071, D-coupling (triangular coupling)



3×400V fan impeller 025-071, Y-coupling (star coupling)



Fan impeller 071G

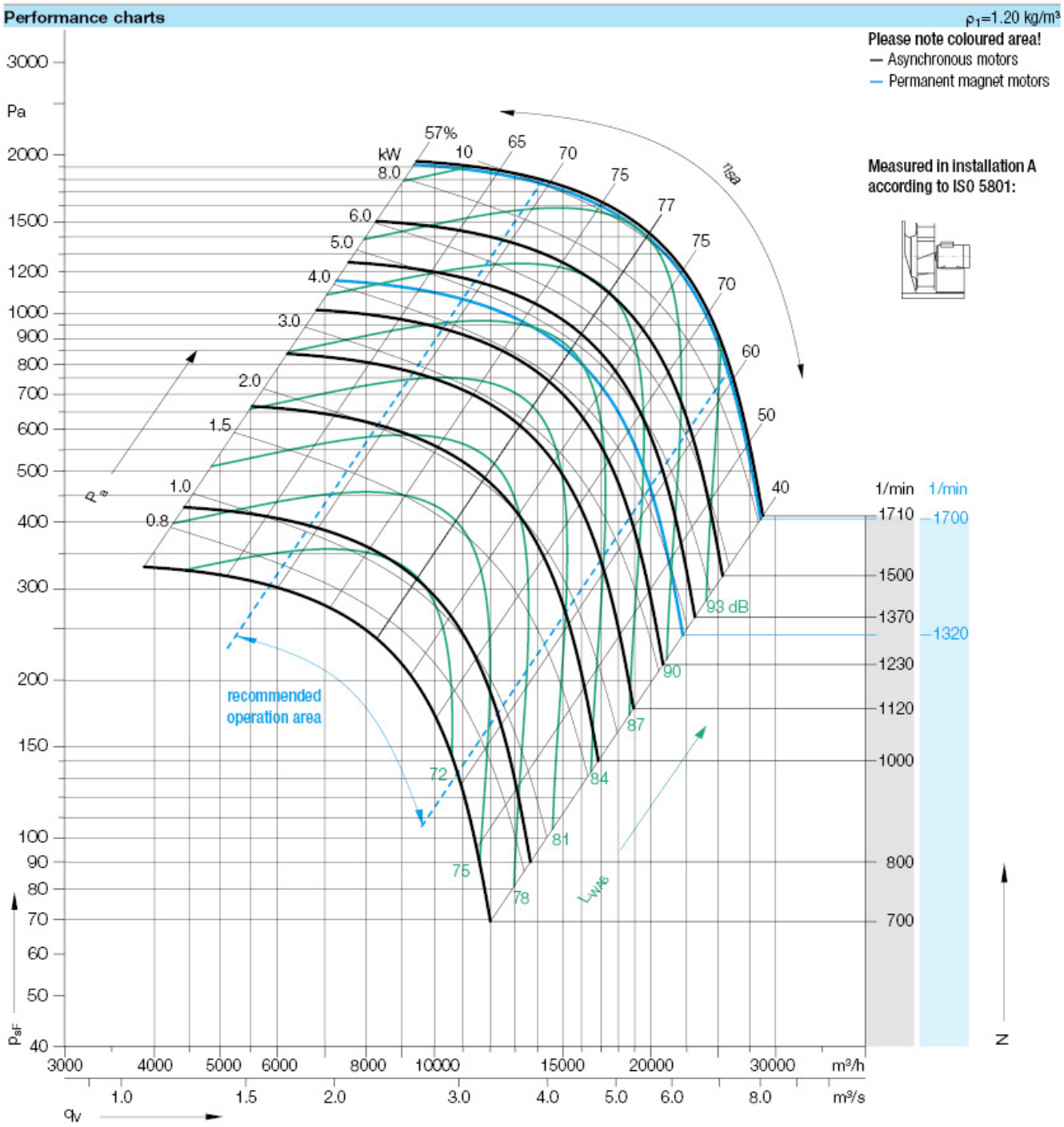
K-factor 7.24

K-factor dual fans 3.62

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-6371



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

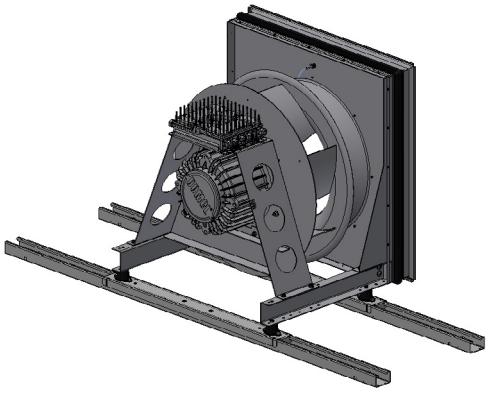
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven fan ELFF (motor type PFJ1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-071G-PFJ1-0650-1-F-x (6.5 kW)

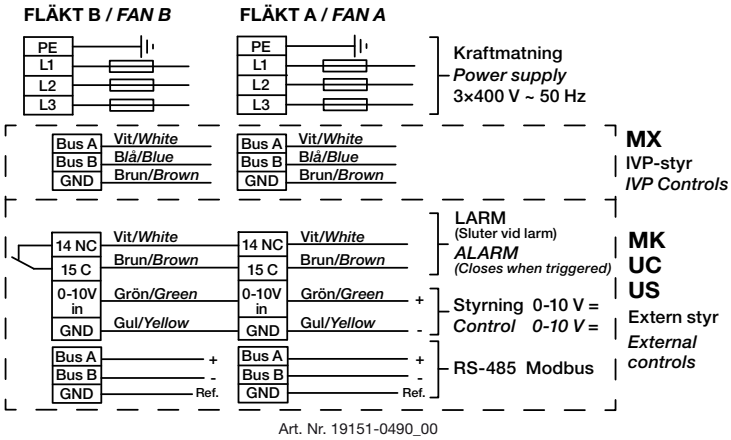
Technical data

- Engine type PFJ1 = Domel motor in accordance with efficiency class IE4 with built-in frequency inverter from OJ Electronics.
- Fan impeller 071G = Gebhardt diameter 710 mm, K-factor = 7.24K-factor dual fans = 3.62
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

Output (kW) *	Rated current (A) *
6.5	11.5

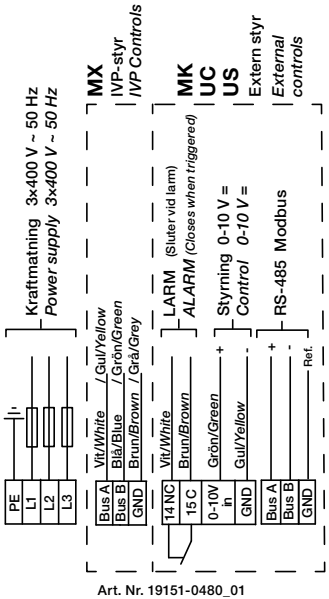
* Double values for dual fan.

INKOPPLING DUBBELFLÄKT / *WIRING DOUBLE FAN*
2×OJ-DV 3×400 V



Art. Nr. 19151-0490_00

INKOPPLING / *WIRING*
OJ-DV 3×400 V



Art. Nr. 19151-0480_01

Fan impeller 071G

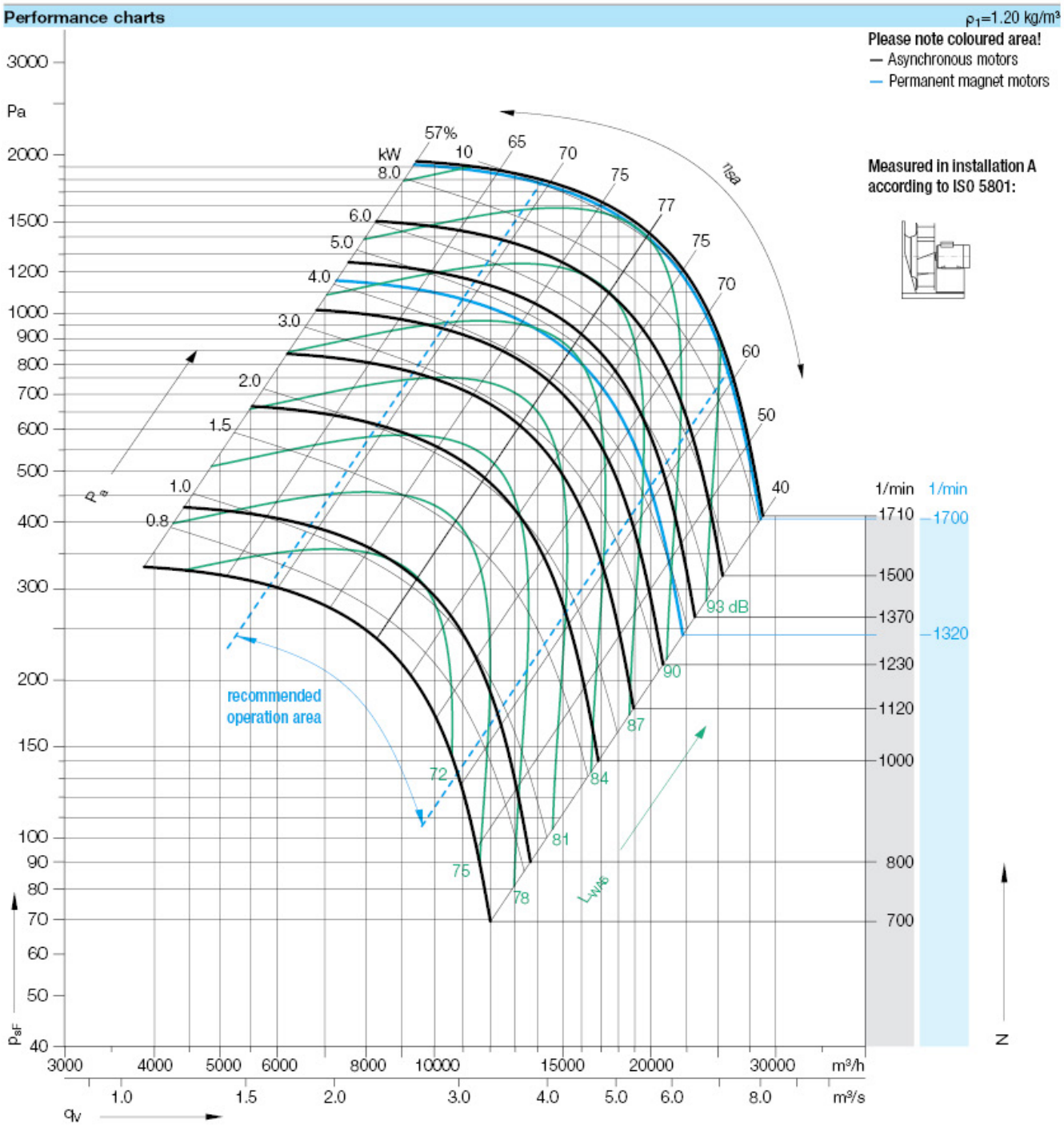
K-factor 7.24

K-factor dual fans 3.62

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-6371



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

The picture shows examples of direct driven fan ELFF (motor type I3S1/I2S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-080G-IxS1-0550-1-F-x (5.5 kW)
- ELFF-080G-IxS1-0750-1-F-x (7.5 kW)
- ELFF-080G-IxS1-1100-1-F-x (11.0 kW)
- ELFF-080G-IxS1-1500-1-F-x (15.0 kW)
- ELFF-080G-IxS1-1850-1-F-x (18.5 kW)

Technical data

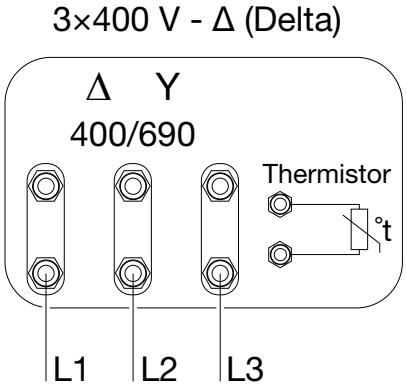
- Motor type I3S1/I2S1 = motor in accordance with efficiency class IE3/I2S1 for connection to external frequency inverters. The motors are fitted with a thermistor.
- Fan impeller 080G = Gebhardt diameter 800 mm, K-factor = 5.69K-factor dual fans = 2.85
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

Output (kW) *	Rated current (A) * I3S1	Rated current (A) * I2S1
5.5	11.0	12.0
7.5	14.5	16.1
11.0	20.7	22.5
15.0	25.6	28.0
18.5	33.2	33.7

* Double values for dual fan.

Wiring instructions

D-coupling 3×400V



Fan impeller 080G

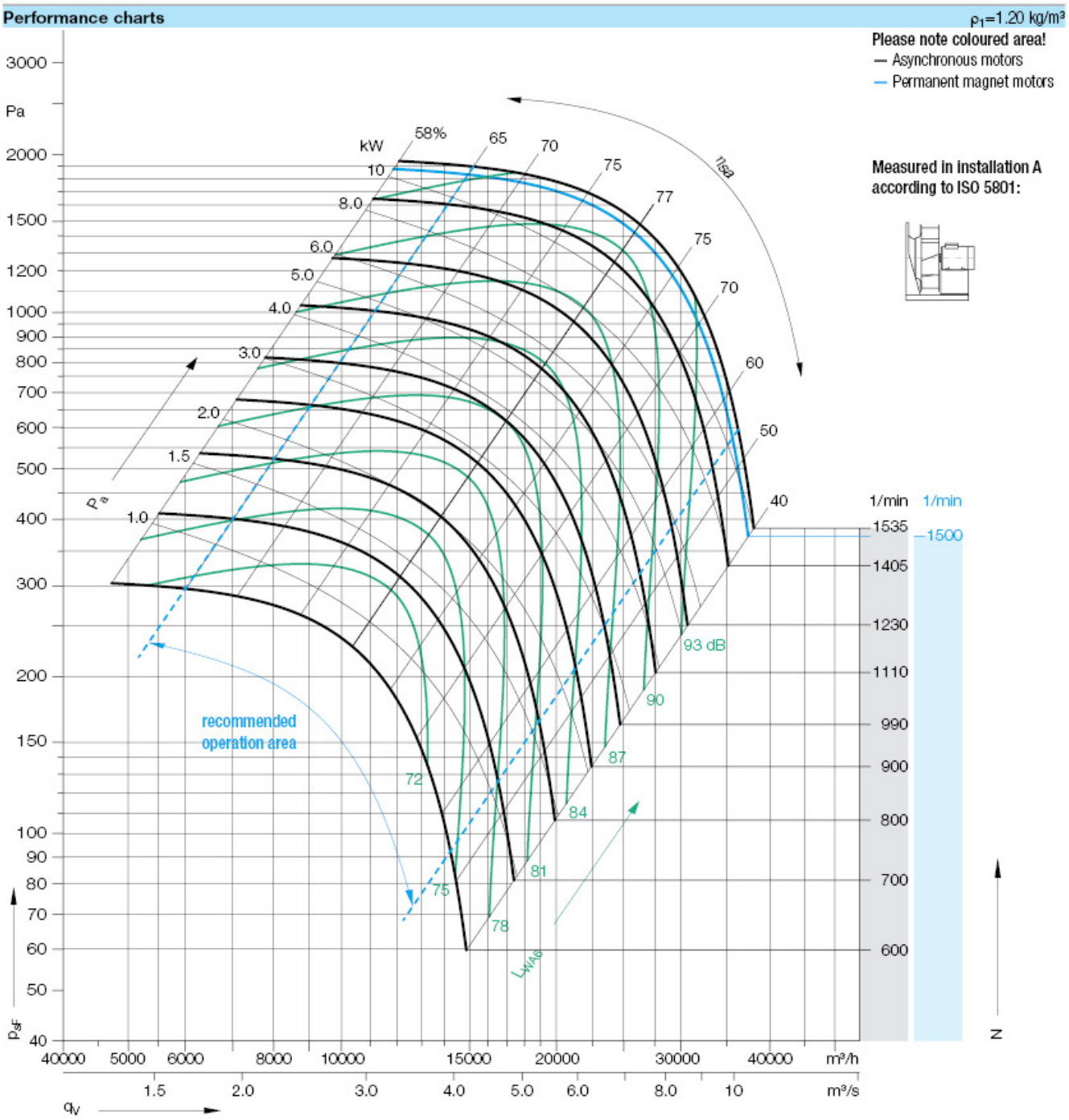
K-factor 5.69

K-factor dual fans 2.85

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-7180



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-080G-PSE1-1100-1-F-x (11.0 kW)
- ELFF-080G-PSE1-1500-1-F-x (15.0 kW)

Technical data

- PSE1 = PM motor corresponding to efficiency class IE4 for connection to external frequency inverter.
- Fan impeller 080G = Gebhardt diameter 800 mm, K-factor = 5.69K-factor dual fans = 2.85
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

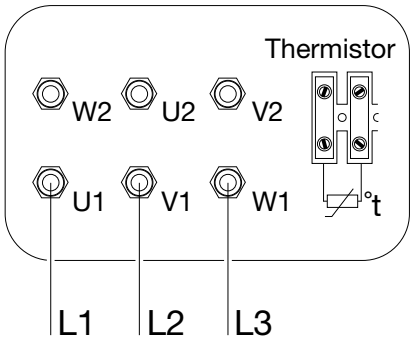
Output (kW) *	Rated current (A) *
11.0	23.2
15.0	28.1

* Double values for dual fan.

Wiring instructions

3×400V

3×400 V - Δ (Delta)



Fan impeller 080G

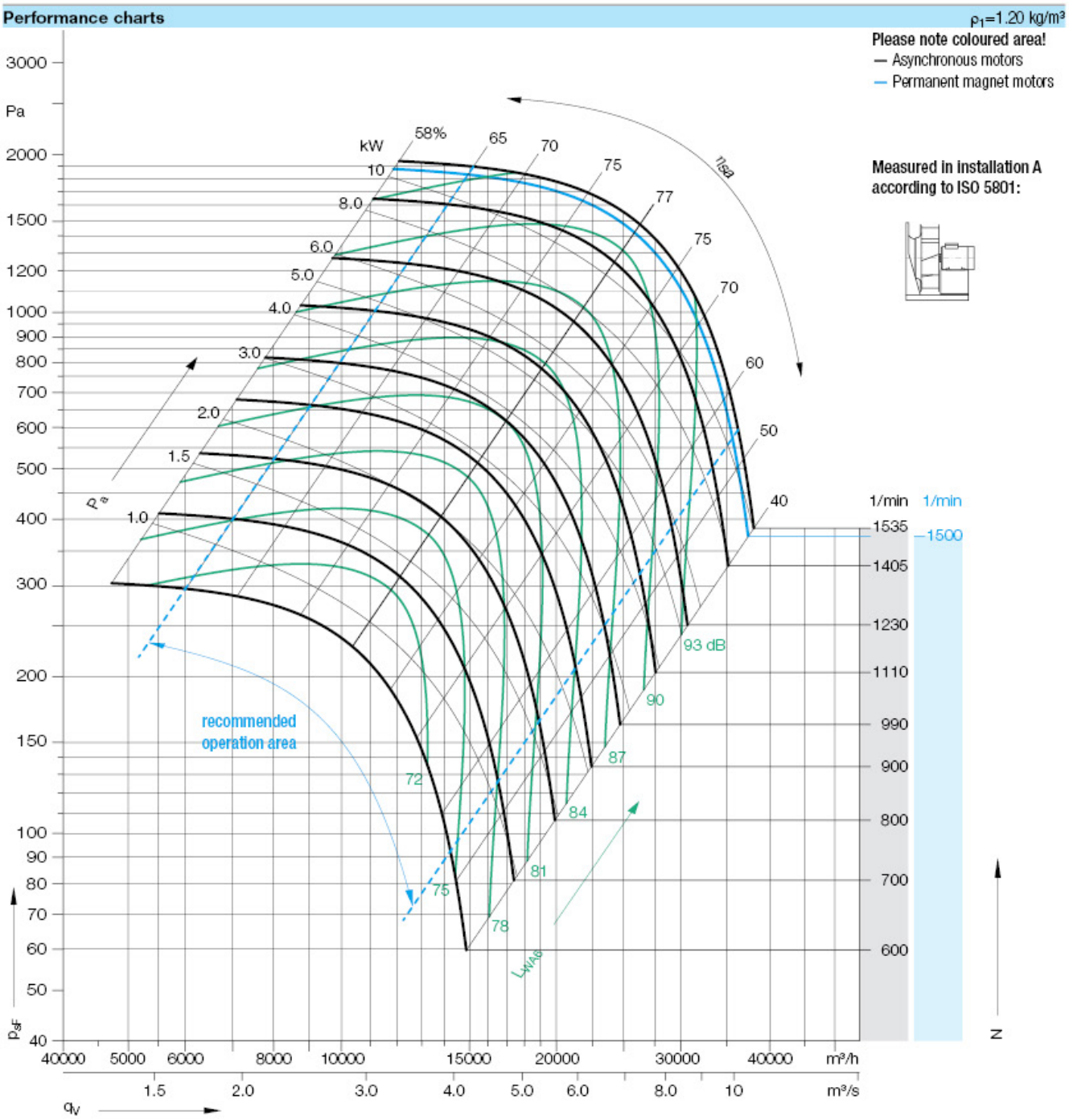
K-factor 5.69

K-factor dual fans 2.85

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-7180



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

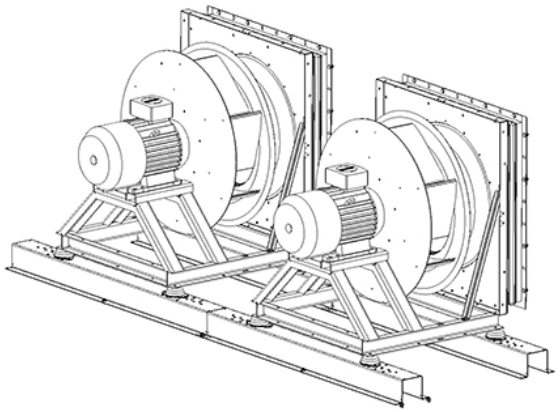
Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)



This picture shows an example of direct driven dual fans ELFF

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-080G-PSM1-1100-1-F-x (2 pcs 11.0 kW)
- ELFF-080G-PSM1-1500-1-F-x (2 pcs 15.0 kW)

Technical data

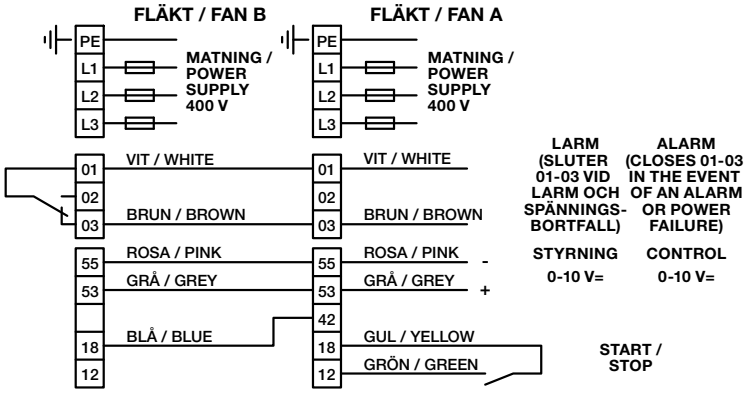
- PSM1 = PM motor corresponding to efficiency class IE4 connected to external frequency inverter.
- Fan impeller 080G = Gebhardt diameter 800 mm, K-factor dual fans = 2.85
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output

Output (kW)	Rated current (A)
2 × 11.0	2 × 23.2
2 × 15.0	2 × 28.1

Wiring instructions

3×400V

INKOPPLING DUBBELFLÄKT / WIRING DOUBLE FAN
FCM 106 / FC 101



Art. Nr. 19151-0058_01

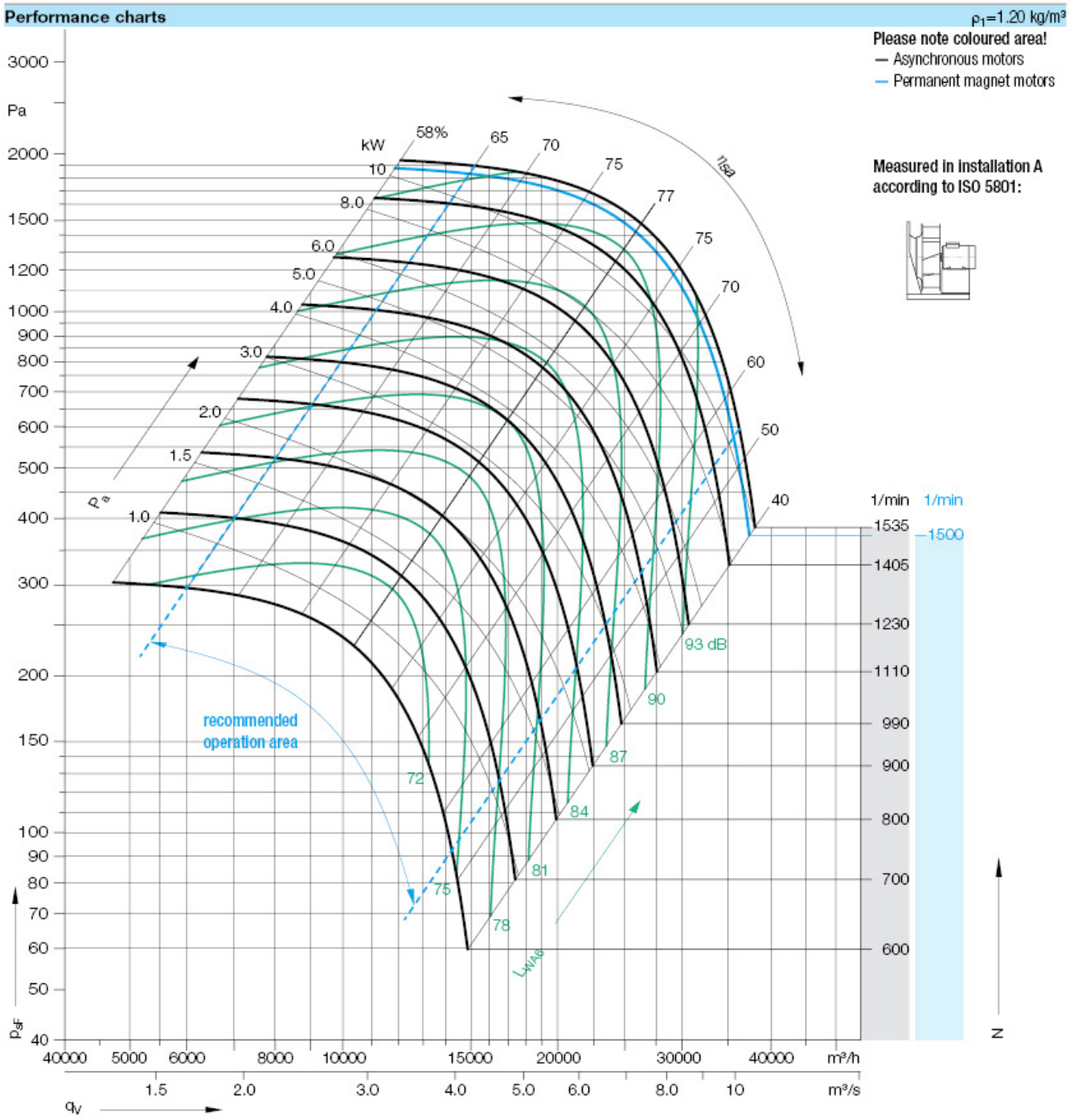
Fan impeller 080G

K-factor dual fans 2.85

NB: The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-7180



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

The picture shows examples of direct driven fan ELFF (motor type I3S1/I2S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-090G-IxS1-0550-1-F-x (5.5 kW)
- ELFF-090G-IxS1-0750-1-F-x (7.5 kW)
- ELFF-090G-IxS1-1100-1-F-x (11.0 kW)
- ELFF-090G-IxS1-1500-1-F-x (15.0 kW)
- ELFF-090G-IxS1-1850-1-F-x (18.5 kW)
- ELFF-090G-IxS1-2200-1-F-x (22.0 kW)

Technical data

- Motor type I3S1/I2S1 = motor in accordance with efficiency class IE3/IE2 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 090G = Gebhardt diameter 900 mm, K-factor = 4.44K-factor dual fans = 2,22
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

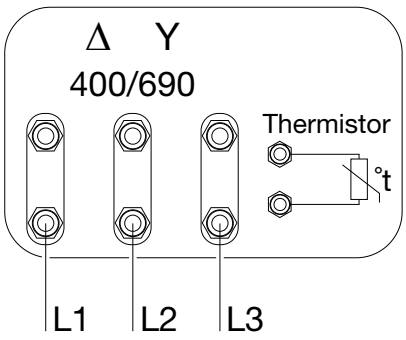
Output (kW) *	Rated current (A) * I3S1	Rated current (A) * I2S1
5.5	-	13.3
7.5	14.5	16.1
11.0	20.7	22.5
15.0	28.6	30.0
18.5	34.3	36.5
22.0	38.4	39.0

* Double values for dual fan.

Wiring instructions

D-coupling 3×400V

3×400 V - Δ (Delta)



Fan impeller 090G

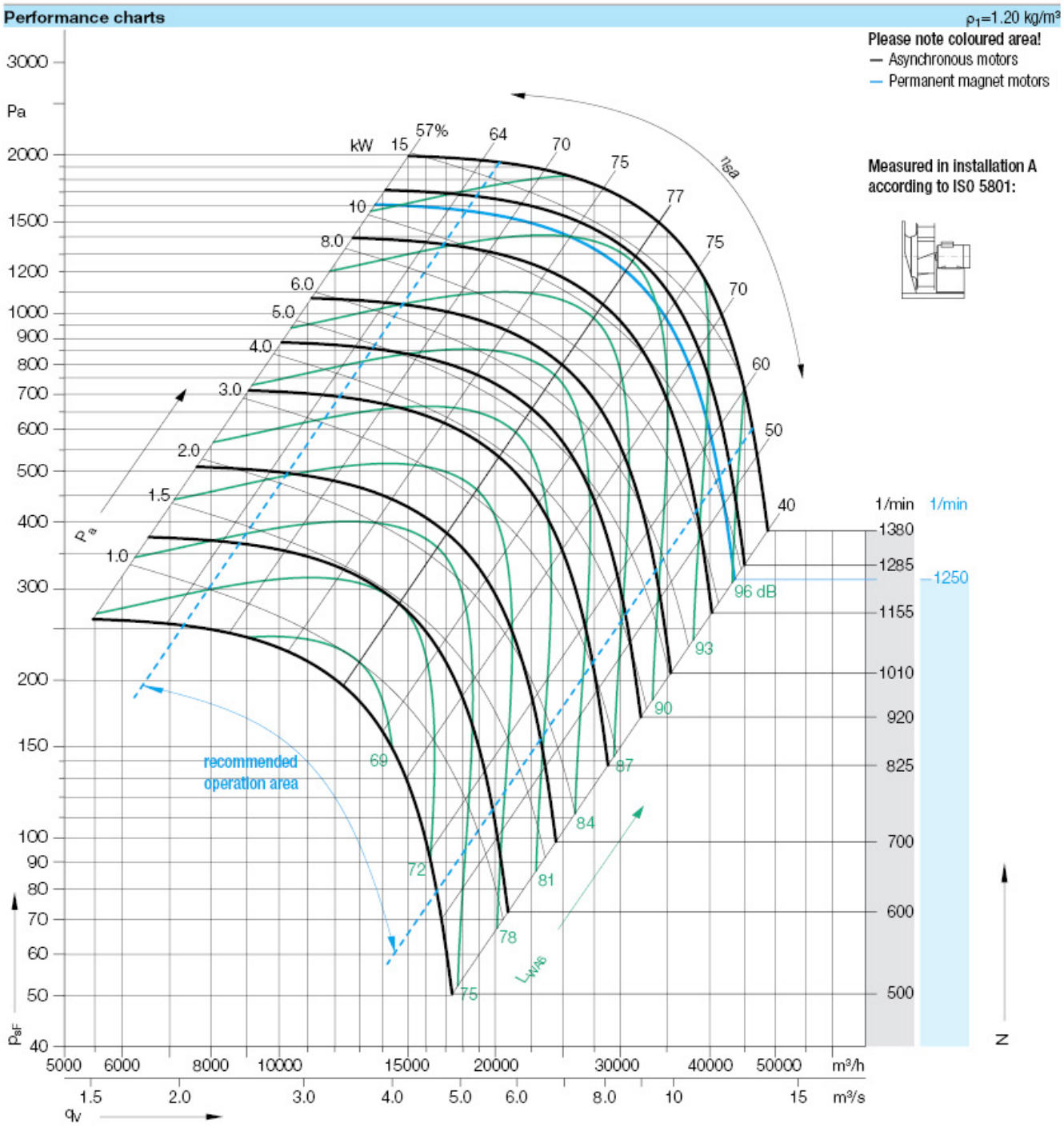
K-factor 4.44

K-factor dual fans 2.22

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-8090



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

This picture shows an example of direct driven fan ELFF (motor type I3S1)

General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Applies to fan code

- ELFF-090G-PSE1-1500-1-F-x (15.0 kW)
- ELFF-090G-PSE1-1850-1-F-x (18.5 kW)

Technical data

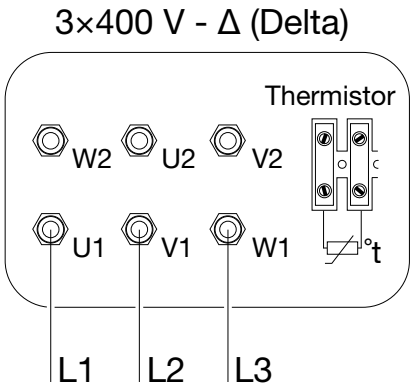
- PSE1 = PM motor corresponding to efficiency class IE4 for connection to external frequency inverter.
- Fan impeller 090G = Gebhardt diameter 900 mm, K-factor = 4.44K-factor dual fans = 2,22
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

Output (kW) *	Rated current (A) *
15.0	31.8
18.5	35.3

* Double values for dual fan.

Wiring instructions

3×400V



Fan impeller 090G

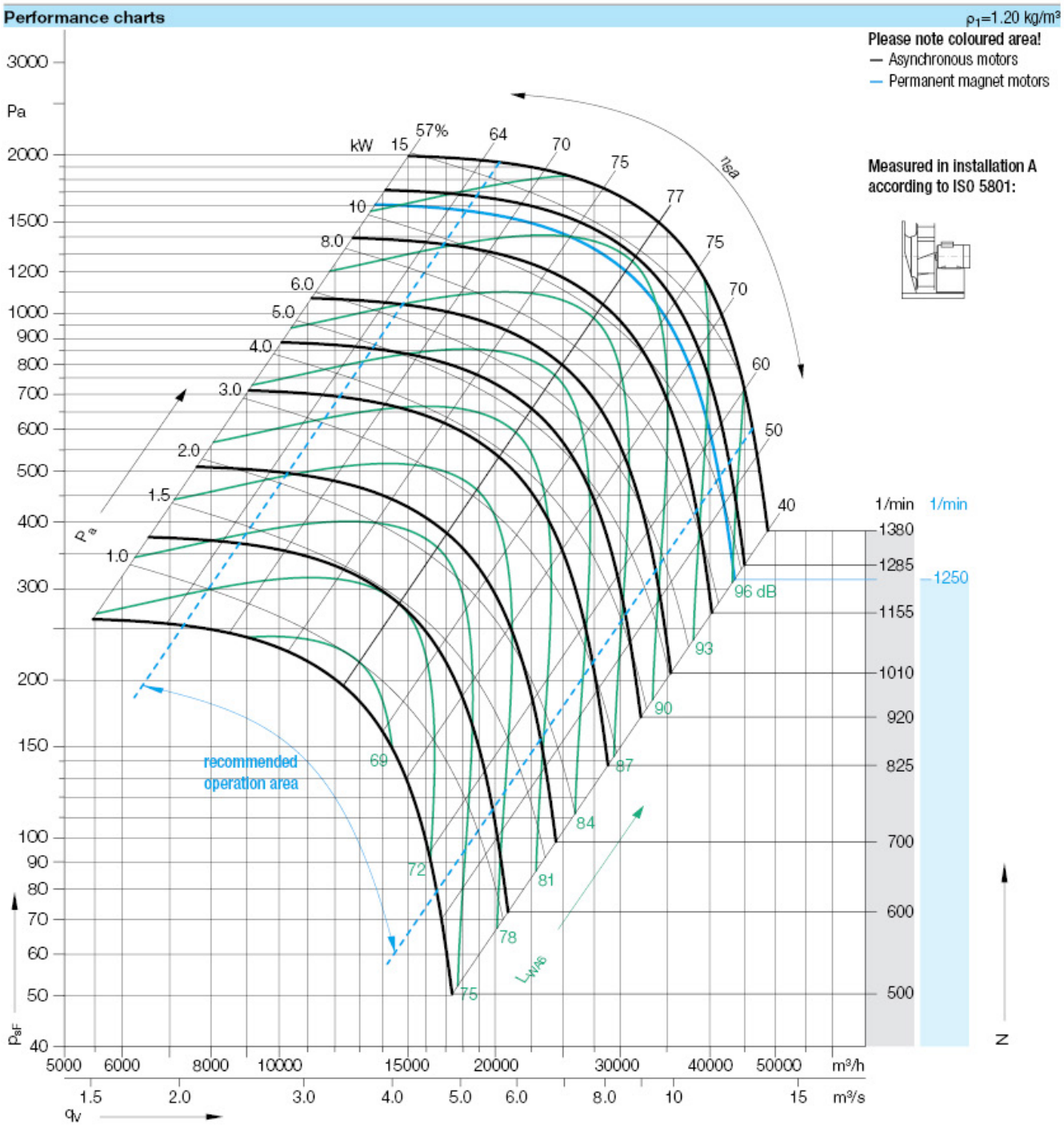
K-factor 4.44

K-factor dual fans 2.22

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-8090



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

The picture shows examples of direct driven fan ELFF (motor type I3S1/I2S1)

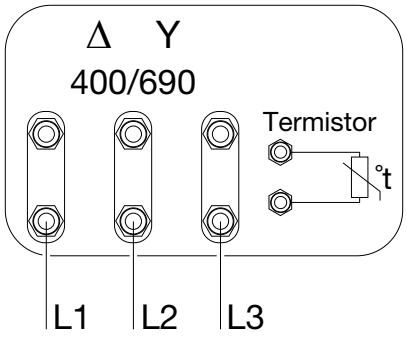
General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Wiring instructions

D-coupling 3×400V



Applies to fan code

- ELFF-100G-IxS1-0550-1-F-x (5.5 kW)
- ELFF-100G-IxS1-0750-1-F-x (7.5 kW)
- ELFF-100G-IxS1-1100-1-F-x (11.0 kW)
- ELFF-100G-IxS1-1500-1-F-x (15.0 kW)
- ELFF-100G-IxS1-1850-1-F-x (18.5 kW)
- ELFF-100G-IxS1-2200-1-F-x (22.0 kW)
- ELFF-100G-IxS1-3000-1-F-x (30.0 kW)

Technical data

- Motor type I3S1/I2S1 = motor in accordance with efficiency class IE3/IE2 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 100G = Gebhardt diameter 1000 mm, K-factor = 3.5K-factor dual fans = 1.75
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output.

Output (kW) *	Rated current (A) * I3S1	Rated current (A) * I2S1
5.5	-	13.3
7.5	-	17.3
11.0	20.7	22.5
15.0	28.6	31.0
18.5	34.3	36.0
22.0	40.1	42.5
30.0	54.9	55.6

* Double values for dual fan.

Fan impeller 100G

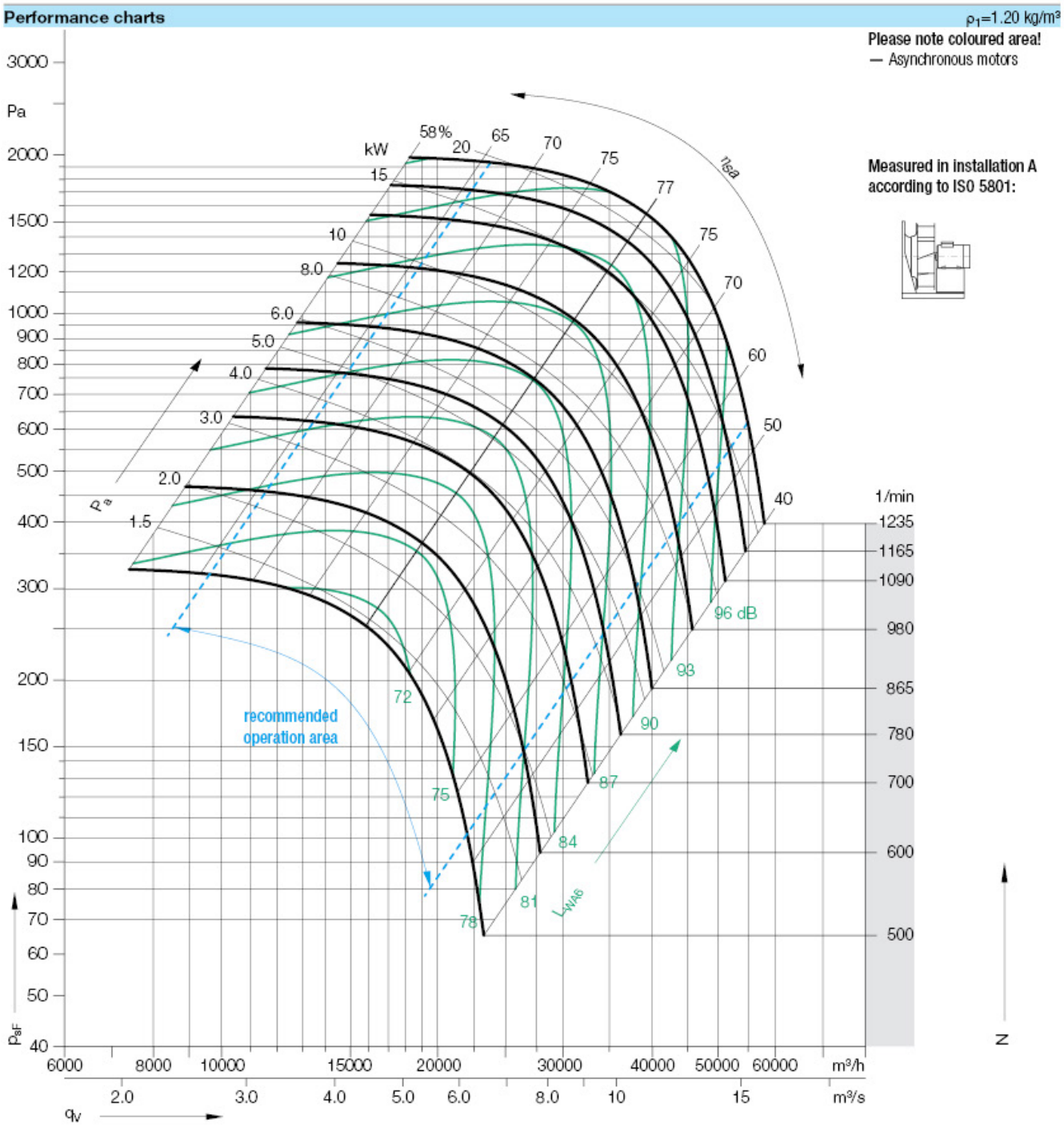
K-factor 3.51

K-factor dual fans 1.75

NB! The fan chart shows the air flow for a single fan. Twice the air flow is achieved for dual fans.

NICOTRA Gebhardt

RLM E6-9010



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Direct driven fan (code ELFF)

The picture shows examples of direct driven fan ELFF (motor type I3S1/I2S1)

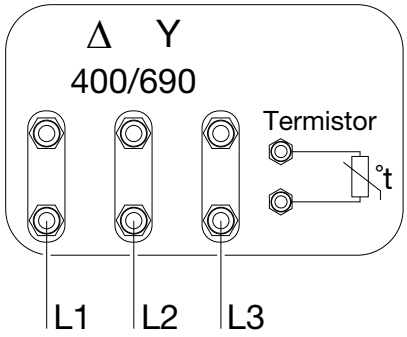
General

The direct driven ELFF fan is fitted in unit section EMM with fitting MIE-FF for horizontal outlet or unit section EFA-FF for vertical outlet.

- For ease of service, the fan and motor unit is mounted on sliding rails (up to and including fan impeller size 071).
- To ensure sufficient cooling for the motor, the air temperature should not exceed 50˚C.
- The fan and motor are very effectively vibration insulated against the housing with a vibration-suppression outlet sleeve and rubber suspension dimensioned depending on the operating conditions of the fan.
  The normal resonance frequency is 7-10 Hz.
- The configuration of some of the components in the fan systems is not in compliance corrosion class C4.

Wiring instructions

D-coupling 3×400V



Applies to fan code

- ELFF-112G-IxS1-1500-1-F-x (15.0 kW)
- ELFF-112G-IxS1-1850-1-F-x (18.5 kW)
- ELFF-112G-IxS1-2200-1-F-x (22.0 kW)
- ELFF-112G-IxS1-3000-1-F-x (30.0 kW)
- ELFF-112G-IxS1-3700-1-F-x (37.0 kW)

Technical data

- Motor type I3S1/I2S1 = motor in accordance with efficiency class IE3/IE2 for connection to external frequency inverter. The motors are fitted with a thermistor.
- Fan impeller 112G = Gebhardt diameter 1120 mm, K-factor = 2.74
- Supply = 3×400V~ 50Hz
- Output below refers to shaft output

Output (kW)	Rated current (A) I3S1	Rated current (A) I2S1
15.0	-	32.1
18.5	-	37.8
22.0	40.1	40.6
30.0	54.9	55.6
37.0	69.0	69.8

Fan impeller 112G

K-factor 2.74

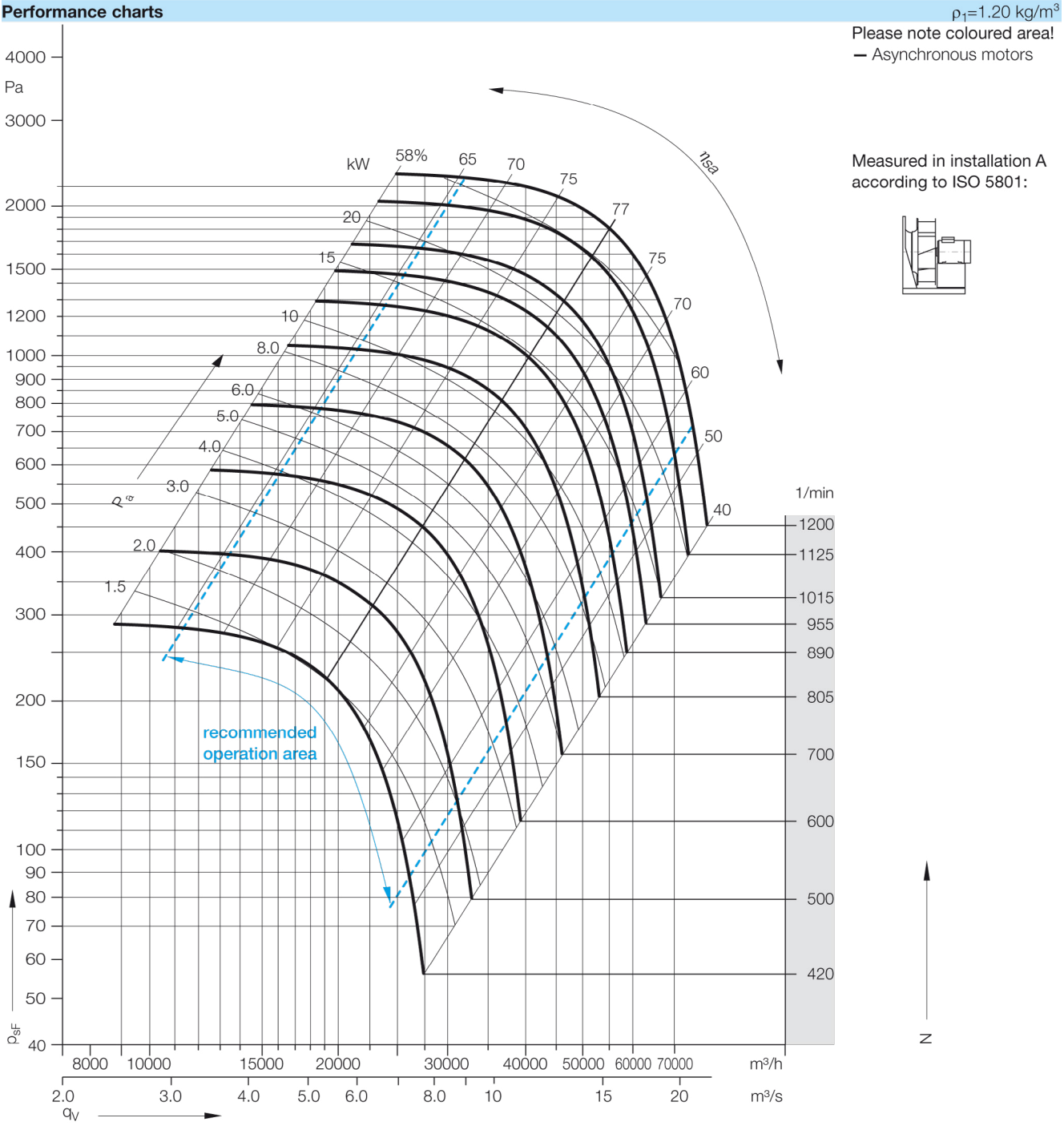
NICOTRA Gebhardt

RLM E6-1011

Performance charts ρ_1=1.20 kg/m³

Please note coloured area!
— Asynchronous motors

Measured in installation A
according to ISO 5801:



Operation and maintenance instructions

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

The fan speed is regulated to provide correct air flow. If the fan generates 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, which may cause problems with draughts. The ventilation capacity is too low, which can result in a poor climate in the room.
- If the exhaust air flow is too low, the ventilation effect will be poor. Imbalance may also force moist air out into the building structure.
  Too low exhaust air flow increases energy use if heat recovery is installed. One reason why the fan generates too little air may be that impurities have collected on the fan impeller blades.
- If a radial fan has the wrong direction of rotation, the air flow goes in the right direction but with a large capacity reduction. Check the direction of rotation.

Actions

Before starting work, stop the unit using its switch, and then turn the main circuit breaker to the 0 position. There may be two main circuit breakers if there are dual motors.

WARNING!
High voltage and rotating fan impeller, 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.

Access to fan

(up to and including fan impeller size 071)

Access to the fan takes place via the inspection door.

Remove one end of the fan assembly's earth braid. Loosen the screws and the pins/screws and pull out the fan units (fan and motor are mounted on rails).

Where necessary remove the centre bar and fixed door.

(from fan impeller size 080)

The fans are firmly mounted and access takes place through an inspection door/s.

Inspection

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. Check that the fan impellers are firmly mounted and that they have not shifted sideways towards the inlet cones.
5. 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.
6. Check the mounting screws as well as the suspension devices and support.
7. Check that the gaskets on the connection plates around the connection openings are intact and firmly fitted.
8. Check that the measurement tubes are securely fitted on each measurement outlet.
9. Remount the fan units.
10. Check the air flows by measuring Δp at the connections for flow measurement. Δp is used to obtain the air flow in a diagram on the unit. Read the pressure difference Δp on the measuring tube. Go into Δp in the diagram that is on the unit, find the relevant unit size and read the flow.

Cleaning

1. Make the fan unit accessible as described in the previous section entitled “Access to fan”.
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. For sizes up to 071, remount the fan units.

Air handling with focus on LCC

You are welcome to contact us

Switchboard:	+46 (0)47 075 88 00	
Control support:	+46 (0)47 075 89 00	styr@ivprodukt.se
Service:	+46 (0)47 075 89 99	service@ivprodukt.se
Spare parts:	+46 (0)47 075 88 00	spareparts@ivprodukt.com

Visit us at:	**www.ivprodukt.com**
Documentation for your unit:	docs.ivprodukt.com
Technical documentation:	docs@ivprodukt.se