

mark[®]

Technical manual **EN**

MARK TANNER FBA (ULTRA)

0662551



Read this document before installing the appliance

Warning

Incorrect installation, adjustment, alteration, repair or maintenance work may lead to material damage or injury. All work must be carried out by certified, qualified professionals. If the appliance is not positioned in accordance with the instructions, the warranty shall be rendered void. This appliance is not intended for use by children or persons with a physical, sensory or mental handicap, or who lack the required experience or expertise, unless they are supervised or have been instructed in the use of the appliance by somebody who is responsible for their safety. Children must be supervised to ensure that they do not play with the appliance.

EN

Index

| | | |
|-----------|---|-----------|
| 1 | Intended use | 4 |
| 2 | Safety | 5 |
| 3 | Receiving of the goods | 6 |
| | 3.1 Damage in transport | 6 |
| | 3.2 Transport packaging | 6 |
| 4 | Mounting | 6 |
| | 4.1 Ceiling mounting | 6 |
| | 4.2 Mounting suction accessories | 7 |
| | 4.3 Roof mounting | 7 |
| | 4.4 Louvre adjustment | 7 |
| | 4.5 Connection cables | 8 |
| | 4.6 Air valve and drain valve | 9 |
| 5 | Electrical connection | 9 |
| 6 | Switchgear | 10 |
| 7 | Commissioning | 13 |
| 8 | Cooling | 15 |
| | 8.1 Air heater for heating and cooling | 15 |
| | 8.2 Specifications condensate pump | 15 |
| | 8.3 Electrical connection condensate pump | 16 |
| | 8.4 Mounting | 16 |
| | 8.5 Commissioning | 16 |
| | 8.6 Maintenance | 16 |
| 9 | Maintenance | 16 |
| | 9.1 Warranty | 16 |
| | 9.2 Motor | 17 |
| | 9.3 Heat exchanger | 17 |
| | 9.4 Air filter | 17 |
| 10 | Decommissioning - Disassembly | 17 |
| | 10.1 Decommissioning | 18 |
| | 10.2 Disassembly Tanner FBA | 18 |
| | 10.3 Disassembly Tanner FBA Ultra | 18 |
| | 10.4 Disassembly Tanner FBA-K Ultra | 19 |
| | 10.5 Removal and destruction | 19 |

I Intended use

Tanner FBA (Ultra) is a waterfed hanging air heater for ventilation and air-conditioning in:

- Office spaces
 - Meeting and exhibition areas
 - Recreational areas
 - Industrial and manufacturing buildings
 - Greenhouses
 - Shops, supermarkets, shopping areas
- with a ceiling height of about 2,5 to 5 meter.

Tanner FBA devices are suitable for:

Transport of air that is:

- Dust free
- Without harmful substances
- Non-aggressive
- Non-corrosive
- Not flammable

Purification of air for:

- Filtering
- Heating
- Cooling

Consultation with or consent of the manufacturer is necessary for different type of use.

Tanner FBA devices that are used for transporting flammable or explosive gasses, vapors, mists or dusts must be specifically designed. Standard Tanner FBA devices may not be used in hazardous areas without appropriate adjustments to the technical specifications.

2 Safety

Before assembly, commissioning and/or maintenance we refer to this technical manual. Failure to comply with the technical manual can cause personal harm and malfunction of the device.



Note:

The Tanner FBA device may only be maintained when:

- The isolation switch is connected;
- There is no power connection;
- Electrically operated and/or rotating parts are protected against restarting (isolation switch);
- The rotating part has stopped;
- The components have been cooled down to room temperature.



Note:

Only qualified personnel should perform maintenance on the electrical components. Consider the local regulations! Changes or additions to the device invalidate the declaration of conformity from the manufacturer.

Meaning of the symbols used in this manual:

If there is no compliance with the instructions in this manual, it creates:



- Danger to the lives of persons;
- Damage to the unit.



Risk of the electrical components.



Warning of hazardous or harmful actions.



Guidelines or references that are important for the functioning of the device.



Information and advice.

3 Receiving of the goods

3.1 Transport damage

Unpack the goods in the presence of the driver and check for completeness and damage with the delivery slip. Transport damage must be acknowledged by the transporter (date and signature)! A late complaint will be rejected by insurance.

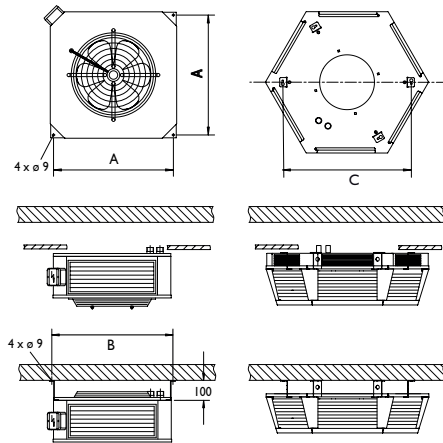
3.2 Transport packaging

The transport packaging has been quantitatively reduced to the absolute minimum to transport the quality parts without damage. The material is fully recyclable. The disposal costs are for the recipient of the goods. It is also possible to return the packaging material. The costs for transport of these are for the recipient of the goods. Please note that the packaging may not be contaminated and must be separated into groups.

4 Mounting

4.1 Ceiling mounting

Fastening the FBA device to the ceiling must be done with officially approved fasteners. In the dimensioning of the fastening the following unit weights should be taken into account.



| Type | A (mm) | B (mm) | C (mm) | Weight (kg) | With outlet nozzle |
|-----------|--------|--------|--------|-------------|--------------------|
| 621 + 626 | 568 | 612 | | 22,5 | 27,5 |
| 631 + 636 | 568 | 612 | | 25,0 | 30,0 |
| 721 + 726 | 718 | 762 | | 30,5 | 38,0 |
| 731 + 736 | 718 | 762 | | 32,5 | 40,0 |
| 821 + 826 | 818 | 862 | | 37,0 | 47,0 |
| 831 + 836 | 818 | 862 | | 39,0 | 49,0 |
| 625-6 | | | 835 | 38,0 | |
| 635-6 | | | 835 | 40,0 | |
| 635-6 K | | | 835 | 56,0 | |
| 725-6 | | | 935 | 44,0 | |
| 735-6 | | | 935 | 47,0 | |
| 735-6-K | | | 935 | 63,0 | |
| 825-6 | | | 1095 | 49,0 | |
| 835-6 | | | 1095 | 54,0 | |
| 835-6-K | | | 1095 | 68,0 | |
| 834-6-D | | | 1095 | 68,0 | |

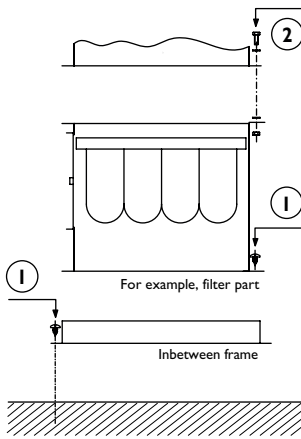
Installation procedure:

1. Mark the distance to the ceiling and drill.
2. For connection assemble possible required bends.
3. Mount the FBA device with fasteners (for concrete including consoles)

For FBA devices with cooling:

Mount device horizontally. If possible, provide a gentle slope (1°) for the condensation drain (located inside the unit in the drain).

4.2 Mounting suction accessories



On the FBA device accessories can be mounted on the suction side. For this, an intermediate frame is required.

Connection of each component:

On a frame profile a sealing strip of 8x3mm has to be adhered per connection flange.

1 = tapping screw 6,3 x 1 3

2 = hex M 6x16

with sealing washer, spring washer and nut.

Note:

It is possible to place the accessories in the outside air. In this case, provide the heat exchanger of a frost protection thermostat. All channels that carry outside air inside the building should be insulated on the outside to prevent condensation!

4.3 Roof mounting

The mounting of roof accessories - raincover or channels - can be performed at the scene. Slabs are not included.

4.4 Louvre adjustment

When adjusting the louvres of the FBA devices the following must be observed.

- The devices should be mounted at a height of 2.5m to fall outside the danger zone (contact protection).
- Setting of the louvres must be done when the unit is turned off.
- All louvres of the FBA devices can be separately set. See example [2].

Additional information for the FBA Ultra:

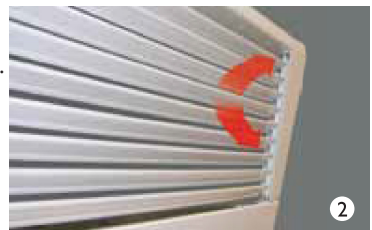
- For maintenance the louvre is removable. See example [3].

Pictures:

[1] Louvre adjustment FBA

[2] Louvre adjustment FBA Ultra

[3] Removable frame with louvres FBA (Ultra)



4.5 Connecting cables



Do not turn the connector

(This will destroy the heat exchanger. No warranty.)

Attach the heating supply lines to the supply & return of the heat exchanger with a suitable tool. Make use of a gate valve for the heat exchanger so you can easily reach this during later maintenance work.

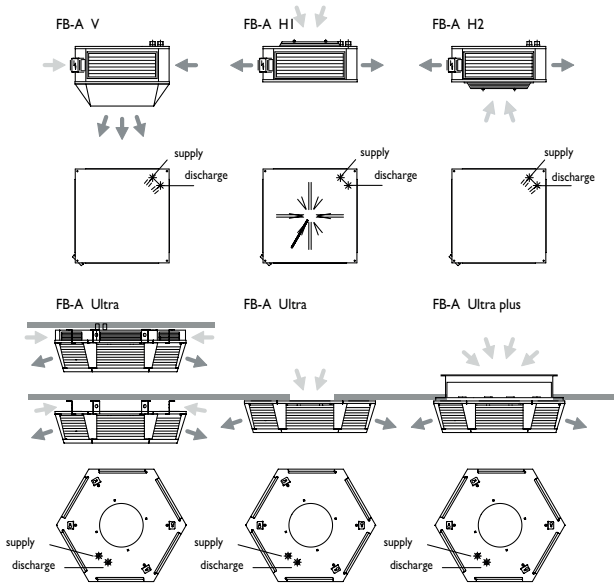


Remove the protective caps from the connecting lines.



Note: The connection of any bends should be done before the mounting of the device.

Note: Connect the discharge and feed as on the following photos.



Frost protection of the heat exchanger

When decommissioning the frost protection thermostat should be connected to the air outlet side of the heat exchanger.

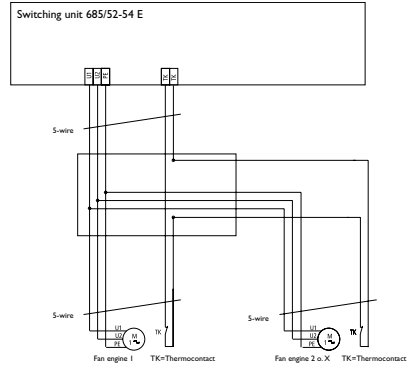
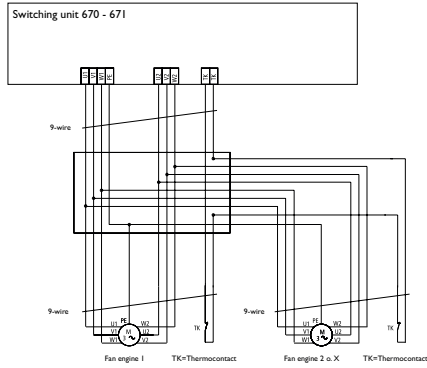
4.6 Air valve and drain valve

When using an air valve, you must make sure that it is mounted at the highest point. Attach the drain valve to the lowest point in the supply line, so a complete emptying is possible. For the drain on the heat exchanger, see chapter 10.2. Blow the drain valve with compressed air to empty it completely.

Note! After loosening the screw (completely), apply sealant to the threads and tighten the screw again.

5 Electrical connection

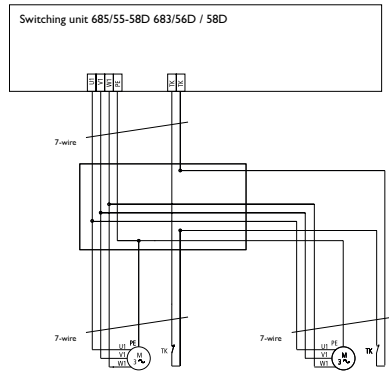
Parallel connection of FBA devices



Junction box and wiring on the spot!

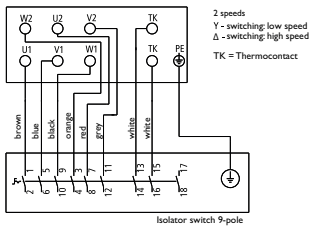
Note! The maximum number of fan motors on a switching unit are indicated in the table on the next page.

The cable dimensions are an approximation.

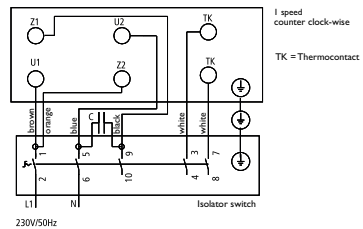


Isolator switch

Engine 001



Engine 003

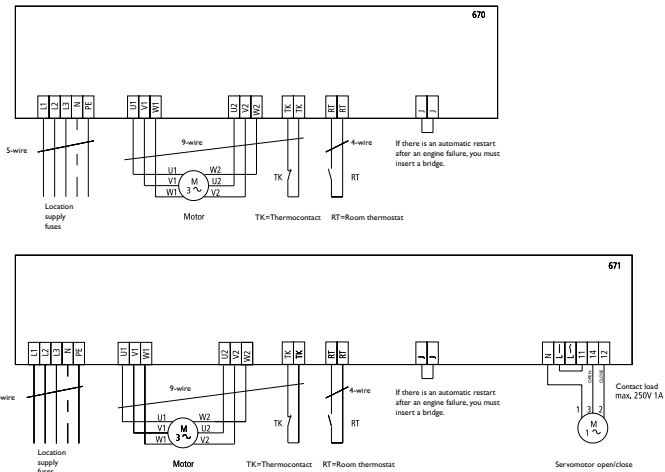


Maximum number of FBA devices on a switching device

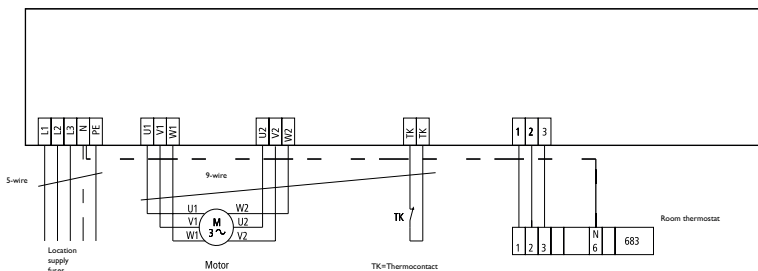
| Switchgear | FBA 601 | FBA 701 | FBA 801 | FBA 603 | FBA 703 | FBA 803 |
|------------|---------|---------|---------|---------|---------|---------|
| 670 | 50 | 20 | 14 | | | |
| 671 | 50 | 20 | 14 | | | |
| 676 | 50 | 20 | 14 | | | |
| 685 / 52E | | | | 7 | 1 | 1 |
| 685 / 53E | | | | 15 | 3 | 3 |
| 685 / 54E | | | | 24 | 6 | 5 |
| 685 / 55D | 5 | 2 | 1 | | | |
| 685 / 56D | 10 | 4 | 2 | | | |
| 685 / 57D | 20 | 8 | 5 | | | |
| 685 / 58D | 35 | 14 | 10 | | | |

6 Switchgear

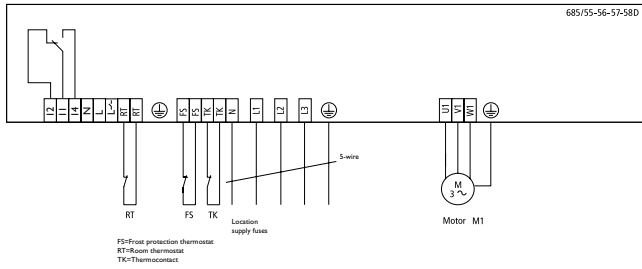
Switching device, 2 speeds 400V (Engine 001)



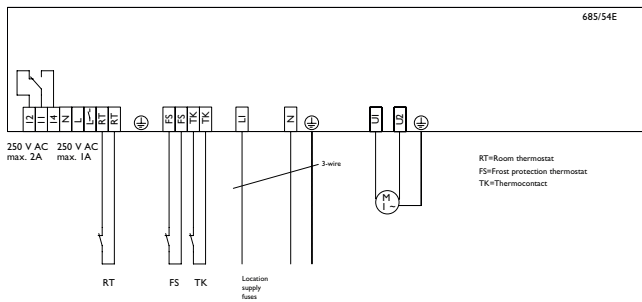
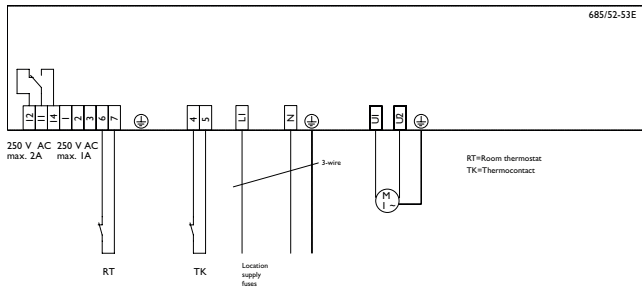
Automatic switching point, 2 speeds 400V (Engine 001)



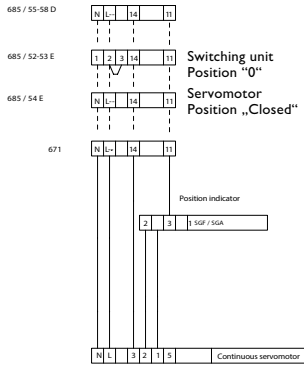
5-speed switching device, 5 speeds 400V (Engine 001)



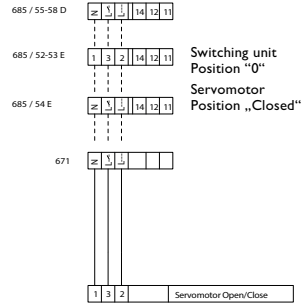
5-speed switching device, 5 speeds 230V (Engine 003)



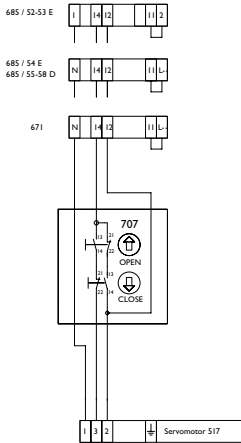
Switchgear with servomotor 515



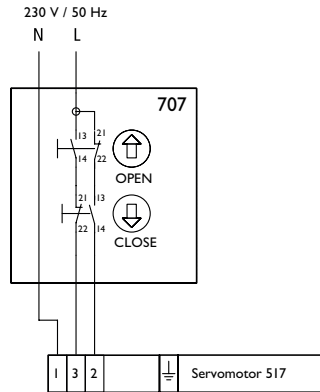
Switchgear with actuator on/off 517



Switchgear with control unit 707 and actuator on/off 517



Switchgear with room thermostat



7 Commissioning

The nominal power is indicated on the nameplate. AC motors that have been designed for a nominal power of 400V can be used in the range of 400V + 6 / -10% in accordance with DIN/IEC 38. Also in accordance with this, single-phase motors can be used in the range of 230V 6+/-10%. Connection EVA ethylene vinyl acetate 4 GJ1 according to VDE 0208 / 3.69. This cable is approved for supply voltages up to 500V, the thermal resistance has a maximum of 120 °C. The line structure corresponds with VDE 0282 part 804.

All engines have a protection by means of thermal contacts. Exceeding the temperature limit of 135 °C (for example, due to high ambient temperature or heating with high water temperatures) will set these into action and turn off the engine.



This engine protection is only achieved with our own switching gear. Using other brands will end the warranty of the engine.

Important: switching capacity: 10 A with cos φ = 1,0
 6 A with cos φ = 0,6

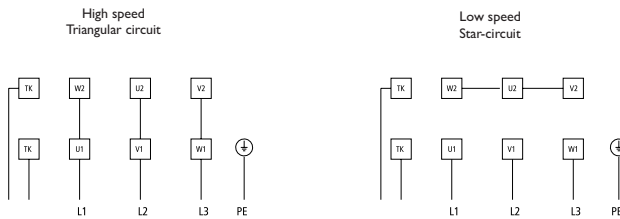
Voltage: 250 V

Voltage power: 2000 V eff.

If the engine protection is in operation, the engine can only be set to zero after cooling down and returning of the selector, if the switching unit is in operation (except switching unit 670,1). After connection, check the direction of rotation of the fan. The fan runs well when air comes out of the frame. Changing the direction of rotation can be done by interchanging the two phases. When connecting the switching units and engines, local regulations must be taken into account.

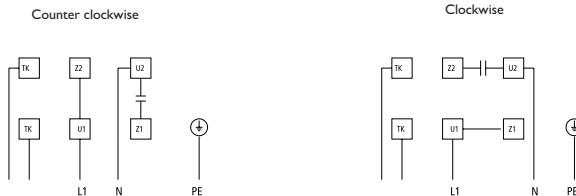
Engine 001 / Engine 005 / Engine 006

Engine with 2 speeds through Δ/Y switch with thermo contact, turn direction through switching two phases. Without the bridge when using a speed switch.



Engine 003

Engine 1 with speed and operational condenser with thermo contacts, change for rotation see circuit.



Connection isolating switch see chapter 6.2.

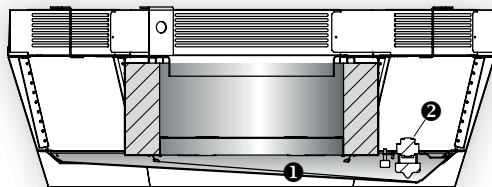


Electrical work may only be done by a qualified installer.

- An isolator switch must be installed on every device in order to shut off the engine.
- Only turn on the engines when the outlet and protective louvres have been opened.
- Connection of engines, switches and other electrical accessories should be done in accordance with the relevant standards (VDE 0100, EMC-act, rules of RU).
- For speed control a frequency converter cannot be used, since this may lead to slower speeds and increased heating of the engine. The engines are controlled by means of voltage, which is controllable through transformer controllers or phase control in the speed range.
- Ambient temperature up to 40 °C.

8 Cooling

8.1 Air heaters for heating and cooling



Units FBA-K Ultra 630, 730 and 830 are suitable for cooling also. In this case a unit is equipped with an additional drip tray [1] and a condensate pump [2]. The units are fully connected with hoses and electrical wiring.

In addition to the electrical connection a condensate drain can be installed.

The condensate pump has been designed according to the capacity tables. External heads of the condensate connection must be complied in accordance with the technical data.

The condensate pump lies in the drip tray. In the inlet of the pump a round filter has been inserted. See figure [2]. The condensate pump is designed for continuous use. For maintenance and cleaning the condensate pump is easily accessible through the removable louvre grill [3].

Condensate drain

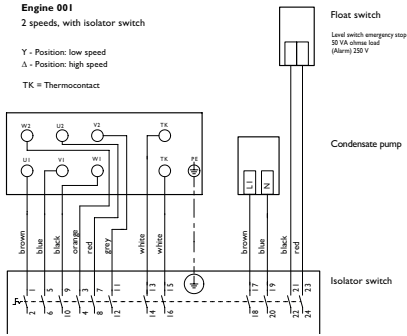
A condensate drain can be applied locally. The condensate drain can be adjusted with a pressure hose (inner diameter of 6mm). Think of the kink-free bends and frost-free operation!

8.2 Specifications condensate pump

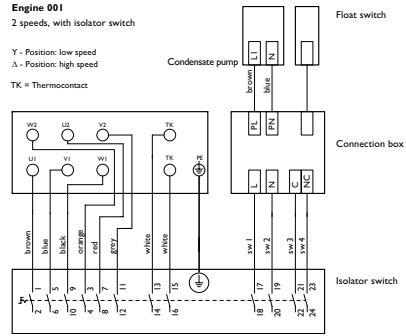
| | |
|---|--------|
| Max. power | 45 l/h |
| Max. temperature of liquid | 0,5m |
| Allowed max. temp. on-site back-up system | 35 °C |
| Power | 230V |
| Prestation | 13W |
| | 100mA |
| Soundlevel L PA | 30 dB |



8.3 Electrical connection condensate pump



Pump running time (standard)



Pump float switch (special)

8.4 Mounting



The FBA Ultra must be installed absolutely horizontal or with a slight slope of 1 mm for the condensate pump.

8.5 Commissioning

Free the condensate tray of dust and other contaminants. Before commissioning, the operation of the condensate pump must be checked. For this, remove the removable louvers, pour distilled water into the tray and remove the pump. Only after making sure that the pump is working properly, the device can be put into operation.

8.6 Maintenance

Regularly (at least every six months) and before the cooling down period, the condensate tray must be subjected to a visual inspection. Existing deposits (dust, mud, vermin, etc.) must be removed. For a correct operation of the pump, the round filter that is placed in the supply of the pump must be cleaned or replaced regularly. The frequency for cleaning and replacing the filter depends on the operating conditions. After an extended period, the filter must definitely be cleaned or if necessary replaced.

In the absence of maintenance the warranty expires!

9 Maintenance

9.1 Warranty

Our warranty does not cover damage caused by improper use or maintenance. Moreover, experience shows that with increasing age of the products, lack of maintenance leads to greater damage.



Inspections of the safety equipment should only be performed by trained and qualified personnel! Please contact the service department of your supplier.

In addition, regular maintenance is required for:

- VDI 6022 - Hygienic standards for ventilation and air-conditioning
- VDI 3801 - Exploitation of air conditioning systems
- VDMA 24186 - Performance program for maintenance of air conditioning and other technical equipment in buildings, air handling units and equipment
- AMEV - Recommendation - Maintenance 85

We refer to the above regulations in the checklists where recommendations are done for the maintenance intervals! For maintenance and repair of HVAC-systems according to VDI 6022 an education in accordance with category B (hygienic education) is required.

Maintenance intervals of the unit

The application period for the following items cannot be prescribed. The regular maintenance and cleaning of the device depends only on the degree of soiling. This depends on the degree of dust in the external or ambient air.

9.2 Engine

The engine is maintenance free. Occasionally it should be dried and made dust free.

9.3 Heat exchanger

Clean the heat exchanger by blowing compressed air onto it. Take care of oil-containing dust with an oil-soluble detergent. Use a steam cleaner to remove sticky surface.



Note! Use low pressure as well as an intermediate distance to the heat exchanger of at least 300mm.

9.4 Air filter

In case of contaminated filter with a resistance of 150Pa it can be removed from the filter section. Ordinary dust can be removed by knocking it off. Do not use solvents as gasoline, fuel oil, etc.

Always make sure of an adequate substitute. When installing a filter from a different manufacturer take the suppliers rules into account.



Note! When replacing the filter it must have a P3-class. Dirty filters can lead to an increased health risk.

10 Decommissioning - Disassembly

10.1 Decommissioning

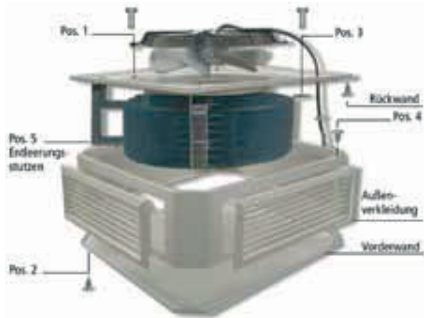
- Control louvres with recirculation mode - Shutdown air valve control to prevent hypothermia and danger of frostbite.
- Close all valves.
- Shut circulation pumps off.
- Empty luminaires with danger of frost. Blow the heat exchanger and piping connections empty with compressed air. Run the fan until all surfaces are dry.
- Drain the float switch and outlet pump.
- Turn off the isolator switch and shut down the installation.



Recommissioning:

- Perform a visual inspection for damage.
- Slowly fill the emptied parts - carefully remove the air.
- Open all valves.
- Press the main switch.
- Turn the system on.

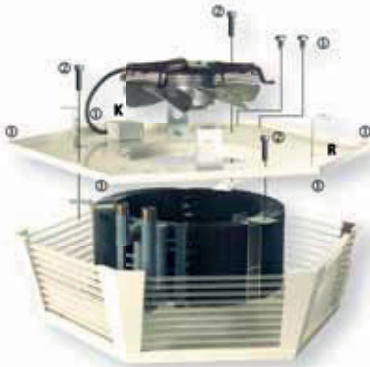
10.2 Disassembly Tanner FBA



1. Turn off the main switch and lock it.
2. Remove the power supply and the electrical connection in the junction box.
3. Close the hot water supply.
4. Loosen the screws on position 2 (4x) and remove the front wall.
5. Empty position 5 by opening the discharge pipe.
6. Disassemble the heating medium.
7. Loosen the ceiling screws and remove the unit.
8. Disassemble the rear wall after screws on position 4 (4x), position 3 (3x) and if necessary position 1 (3x) have been removed and remove the engine.

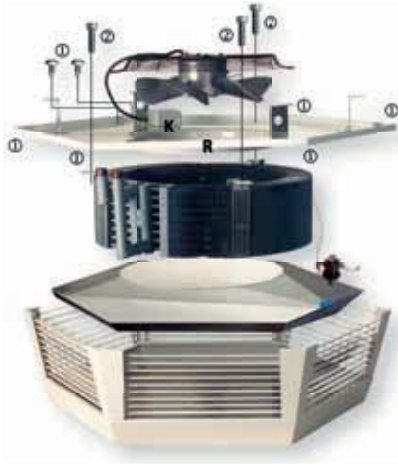
9. Pull the heat exchanger from the unit.
10. Move both halves by moving vertically.

10.3 Disassembly Tanner FBA Ultra



1. Turn off the main switch and lock it.
2. Remove the power supply and electrical connection in the junction box "K".
3. Close the hot water supply.
4. Disassemble the heating medium.
5. Loosen the ceiling screws and remove the unit.
8. Remove the sheet metal screws [1] (12x).
9. Remove rear "R" with attached fan, unit is now still attached to rear wall.
10. Remove fixing screws [2] (3x) for heater.
11. Remove the heater and the mounting plates.

10.4 Disassembly FBA-K Ultra



1. Turn off the main switch and lock it.
2. Remove the power supply and electrical connection in the junction box "K".
3. Close the hot water supply.
4. Remove the condensate hose.
5. Disassemble the heating medium.
6. Loosen the ceiling screws and remove the unit.
7. Loosen the grid on the left and right of the pump.
8. Remove the pump from the holder plates.
9. Remove the sheet metal screws [1] (12x).
10. Remove rear with attached fan, unit is now still attached to rear wall.
11. Remove fixing screws [2] (3x) for heater.
12. Remove the heater and the mounting plates.

EN

10.5 Removal and destruction

To disassemble the air heater it must be without power. All power cables must be removed by a qualified electrician.



More-over, all fluid-carrying parts must be completely empty. This must be done by a professional company that properly drains the water with anti-freeze.



After that, the air heater can be disassembled at the scene. This should also be carried out by a specialised company that has knowledge of the environmentally friendly removal of parts.



In the handling of dust-sensitive components (filters) and parts of mineral wool it is wise to wear appropriate respiratory protection.

Destruction

In our FBA devices, the following material is used:

Housing and attachments:

- Galvanized steel
- Stainless steel 1.4301
- Aluminum AlMg
- Copper

Sealants:

- Polyurethane waste code: 55908, 080404

Isolation material:

- Mineral wool waste code: 31416
- Soundproofing

All materials can be disposed through the appropriate waste collection services.

MARK BV

BENEDEN VERLAAT 87-89
VEENDAM (NEDERLAND)
POSTBUS 13, 9640 AA VEENDAM
TELEFOON +31 (0)598 656600
FAX +31 (0)598 624584
info@mark.nl
www.mark.nl

MARK EIRE BV

COOLEA, MACROOM
CO. CORK
P12 W660 (IRELAND)
PHONE +353 (0)26 45334
FAX +353 (0)26 45383
sales@markeire.com
www.markeire.com

MARK BELGIUM b.v.b.a.

ENERGIELAAN 12
2950 KAPELLEN
(BELGIË/BELGIQUE)
TELEFOON +32 (0)3 6669254
FAX +32 (0)3 6666578
info@markbelgium.be
www.markbelgium.be

MARK DEUTSCHLAND GmbH

MAX-PLANCK-STRASSE 16
46446 EMMERICH AM RHEIN
(DEUTSCHLAND)
TELEFON +49 (0)2822 97728-0
TELEFAX +49 (0)2822 97728-10
info@mark.de
www.mark.de

MARK POLSKA Sp. z o.o

UL. KAWIA 4/16
42-200 CZĘSTOCHOWA (POLSKA)
PHONE +48 34 3683443
FAX +48 34 3683553
info@markpolska.pl
www.markpolska.pl

S.C. MARK ROMANIA S.R.L.

STR. KOS KAROLY NR. 1 A
540297 TARGU MURES
(ROMANIA)
TEL/FAX +40 (0)265-266.332
info@markromania.ro
www.markromania.ro

