Bedienungsanleitung

Bürstenloser Motor
für Fass-, Behälter-
und Containerpumpen

Typ FBM 4000 Ex

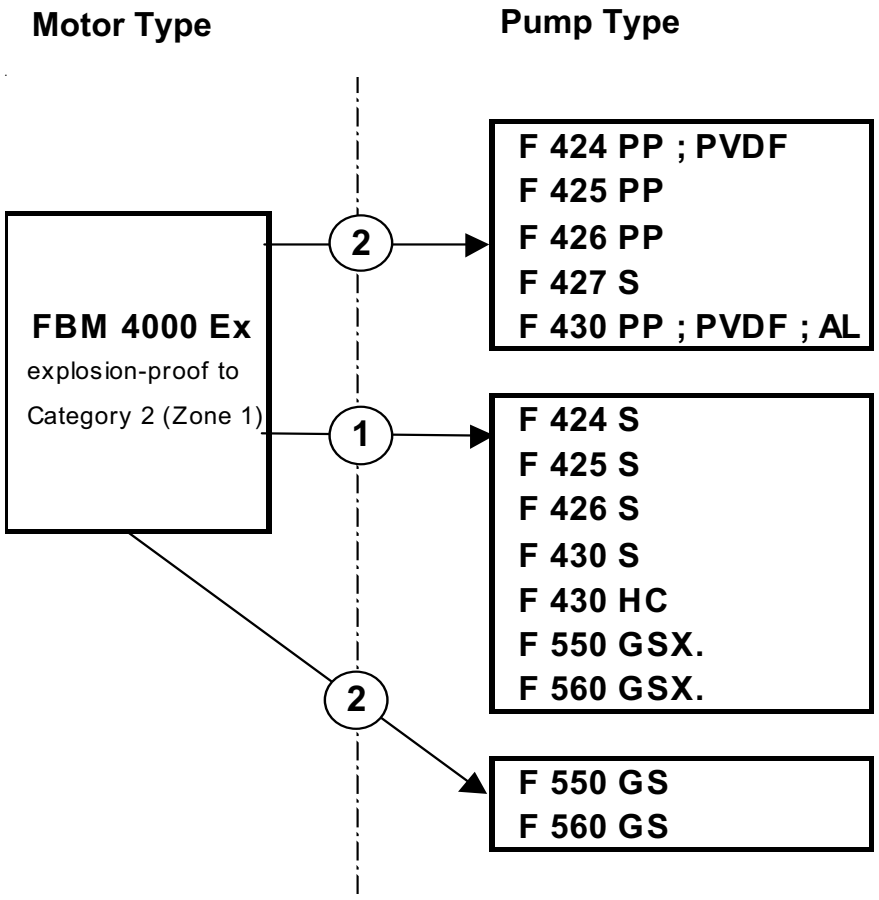
ab Serien-Nr. 400 00146

Possible Motor - Pump combinations

- **Only use motor and pumps in the following combinations.**

(1) **In hazardous locations only use explosion-proof electric motors which are approved for category 2 (ZONE 1) or compressed air motors. For transferring flammable liquids only use pumps which are approved for category 1 (ZONE 0).**

(2) **In hazardous locations only use explosion-proof electric motors which are approved for category 2 (ZONE 1) or compressed air motors. Do not use pump for transferring flammable liquids.**



Technical data

Jet-proof to IP 55
Protection class I
Voltage 220-240 V / 50-60 Hz
Rated voltage 230 V / 50 Hz
Absorbed power at rated load P1 = 600 W
Absorbed current at rated load I1 = 4,2 A
Speed at rated load n_{RATED} = 9200 min $^{-1}$
Maximum speed n_{MAX} = 12000 min $^{-1}$
Minimum speed n_{MIN} = 5000 min $^{-1}$

Functional description of motor

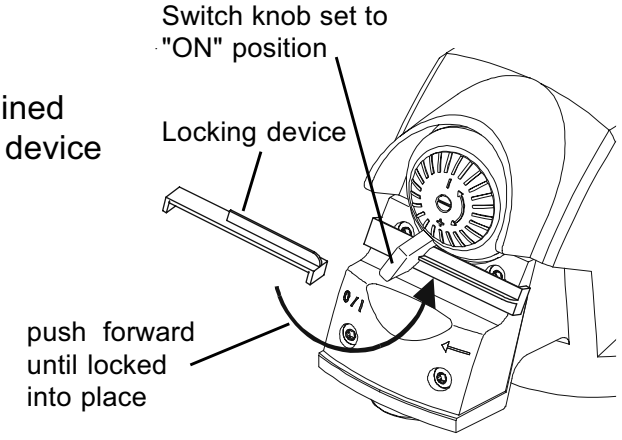
The FBM 4000 Ex is a brushless drive motor for barrel and container pumps. On/Off-switching of the motor, power output, speed and possible overloading (exceeding of temperature limits) are electronically monitored in order to avoid damage to the motor.

- ***On/Off-switching***

The motor may be operated in ***normal mode*** or in ***indirect mode***.

In ***normal mode*** the motor will be switched on and off by actuating the switch knob.

Indirect mode:
The switch knob will be maintained in "ON" position by the locking device supplied with the motor (remote control of the motor).



In indirect mode the motor will re-start automatically after a power failure.

Functional description of motor

- ***Temperature monitoring***

The temperature of the field coil as well as of the electronic control unit are monitored. If the relevant temperature limits are exceeded, the motor will be switched off automatically. As soon as the motor has cooled down, it can be switched on again.

- ***Speed monitoring***

The motor always aims to run at the maximum speed.
If this is not possible, the speed will be reduced automatically until a steady state will have been reached. If the speed drops below the minimum speed, the motor will be switched off automatically.

- ***Power monitor circuit***

If the power supply will be too low or too high, the motor cannot be switched on.

- ***Power failure in normal mode***

After a power failure the motor has to be switched on again.
This prevents from an unintentional re-starting.

- ***If the motor does not start:***

The switch knob may have been actuated too shortly.
It takes at least 20 seconds until the motor may be re-started.

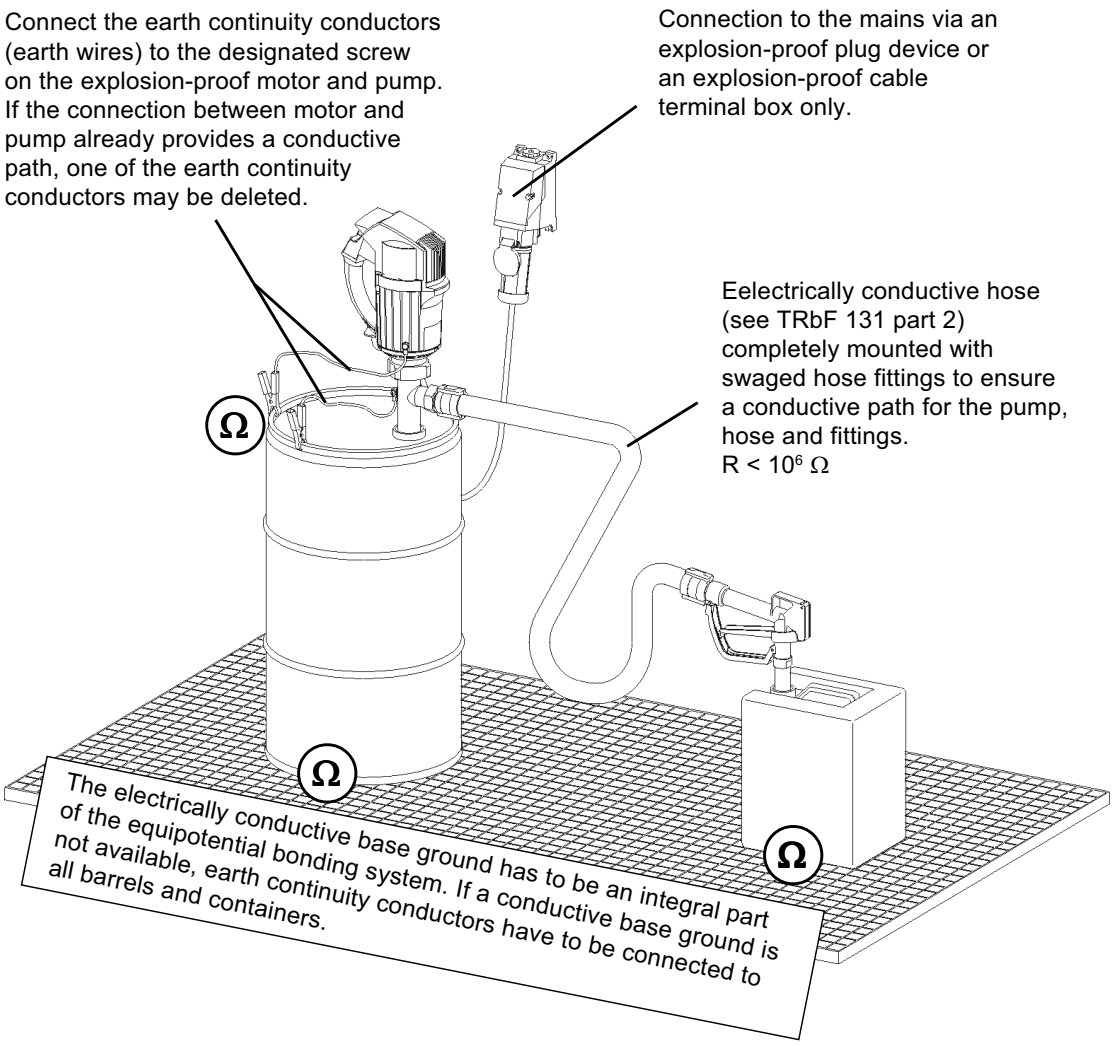
Speed monitoring has switched off the motor automatically.
It takes at least 20 seconds until the motor may be re-started.

The temperature monitoring has switched off the motor.
First cool down the motor (approx. 6 minutes), before starting it again.

In indirect mode, the locking device first has to be removed,
before the motor may be re-started after 20 seconds.

Any attempt to re-start the motor within the 20 seconds will increase the waiting time by another 20 seconds.

Before starting operation in hazardous locations



Ω Remove paint and dirt from all connection points of earth continuity conductors and containers to the electrically conductive base ground to ensure good conductivity.

⚠ The use of the commutator motor in combination with the pump requires a complete and definite equipotential bonding. An equipotential bonding consists in an electrically conductive connection between the motor and the pump according to EN 50 014:1994-03 Paragraph 15 and DIN VDE 0165:1991-02 Paragraph 5.3.3.
The pump has to be arranged in a way that no friction and impinge sparks form and that the operating conditions ensure safe operation.

For use in hazardous locations

- **Only use explosion-proof electric motors which are approved for category 2 (ZONE 1) or compressed air motors.**

- **Observe the EC-Type-Examination Certificate or the Certificate of Conformity.**

- **The explosion-proof motor has to be outside the container.**

- **If the electrical socket or terminal box is positively located outside the hazardous area, connection to explosion-proof equipment must not be undertaken.**

- **For transferring flammable liquids class IIA and IIB as well as temperature classes T1 to T4, only use pumps which are approved for category 1 (ZONE 0).**

- **Only clean the power supply cable outside of the hazardous area.**

The installation and operation must comply with the relevant Health & Safety Regulations. (In the Federal Republic of Germany these are "TRbF" and also "BG Chemie").

Testing / Repair

- Regularly check motors according to the relevant national safety regulations and/or rules for prevention of accidents (In the Federal Republic of Germany e.g. BGV A2 (VBG 4)).

- Repairs to explosion-proof motors should be carried out by the manufacturer or an authorized repair depot only.

Safety instructions - Pump

- **Only use the pump for its intended purpose.**
- **Never leave the pump unattended.**
- **The pump has to be used in vertical position only.**
- **When pumping liquids which contain solid particles in suspension, a suction strainer must be used.**
- **Install the pump in a way which ensures that it cannot fall into the container.**
- **Only use the pump with a suitable hose.**
- **Ensure that the hose is securely fixed to the hosetail.**
- **Regularly check motor, pump, hose and connections to ensure safe operation.**
- **The pump should not be immersed deeper into the liquid than the outlet connection.**

- **Comply with all relevant safety instructions.**
  Wear appropriate protective clothing.
  (Face shield, protective gloves, etc.).

- **Comply with the operating instructions of the pump.**
- **Never operate the pump dry.**
- **The pump should not be exposed to the weather.**
- **Before removing the motor from the pump:**
  Completely drain pump, flexible hose and hand tap.
  The container must not be under pressure.
- **Clean after each operation.**
- **Never store the motor in areas in which corrosive vapours exist.**
- **Regularly check motors according to the relevant national safety regulations and/or rules for prevention of accidents. (In the Federal Republic of Germany e.g. BGV A2 (VBG 4)).**

- **Power supply must include a fault current breaker.** Dirt accumulation, high humidity or material damage on the motor housing may lead to dangerous current surges.

Starting operation

- Make sure that the supply voltage corresponds to the voltage indicated on the name plate.
- Put the motor onto the pump.

- Never operate the pump unless the union nut between pump and motor has been firmly tightened by hand.

- Immerse the pump into the liquid and secure it in a vertical position by the use of a compression gland or a container clamp.
- Always check the power supply cable for damage before starting operation.
- Keep solvents away from the power supply cable.
- Insert the plug.
- Switch on the motor.
- The speed may be regulated by the adjustment knob (control of delivery rate).