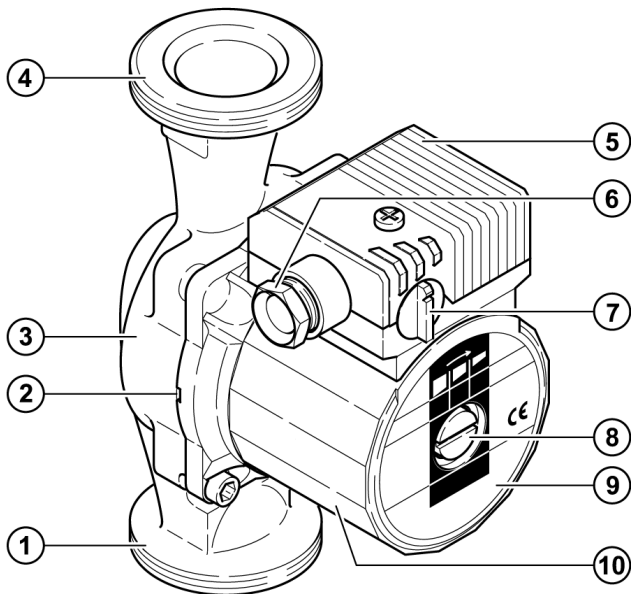
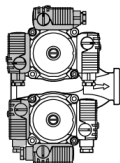
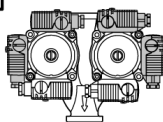
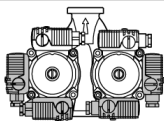
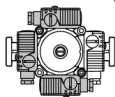
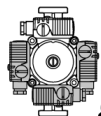
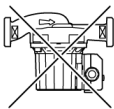
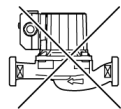


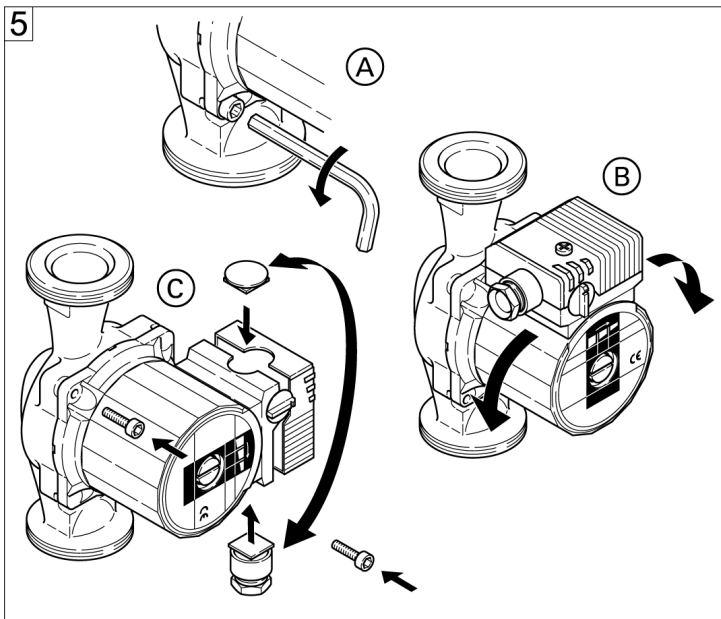
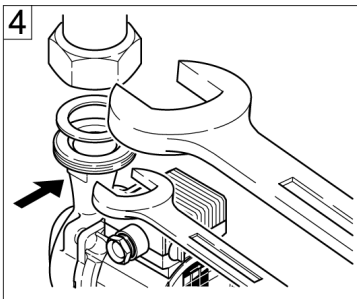
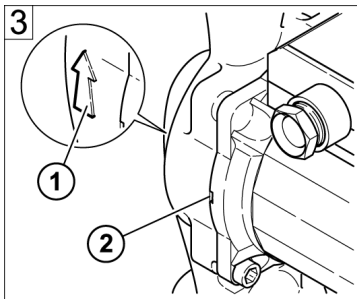


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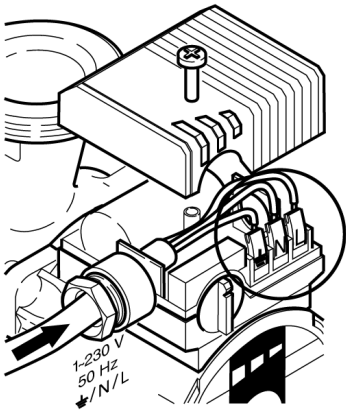


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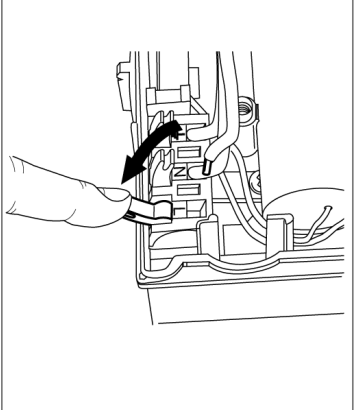




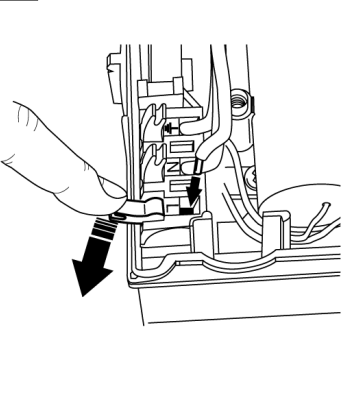
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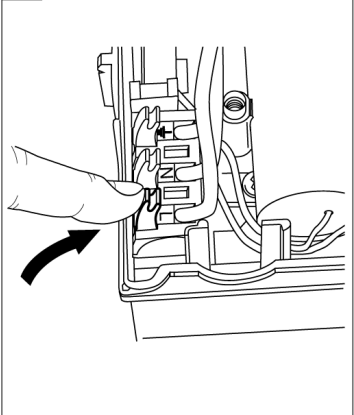
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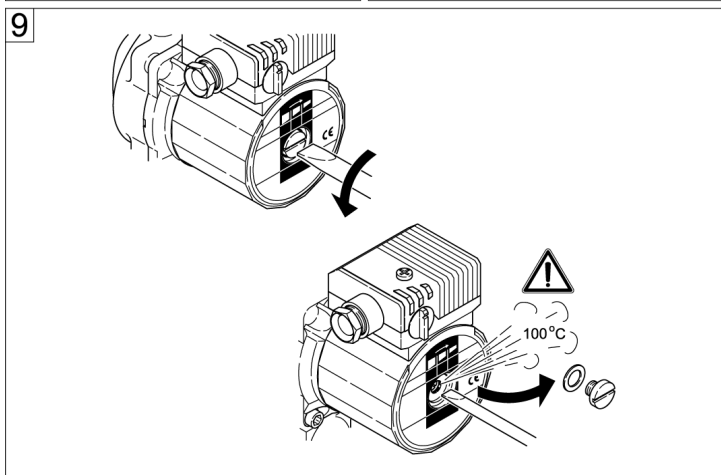
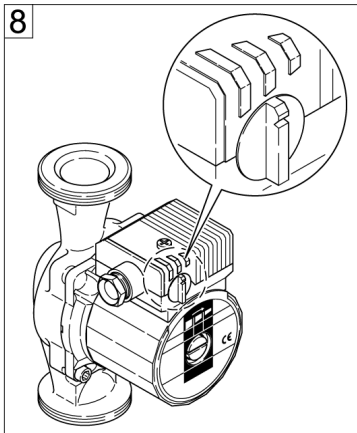
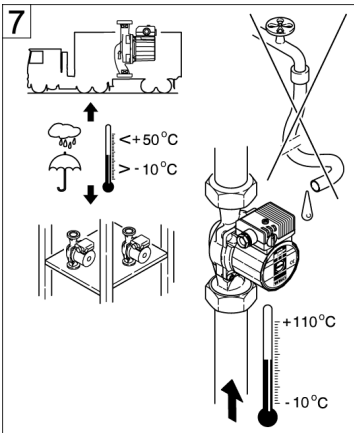


6b



6c









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|   |              |           |
|---|--------------|-----------|
| <b>Betriebsanleitung</b>                                | <b>5...</b>  | <b>D</b>  |
| <b>Installation and<br/>operating instructions</b>      | <b>13...</b> | <b>GB</b> |
| <b>Notice de service</b>                                | <b>21...</b> | <b>F</b>  |
| <b>Montage- en<br/>bedieningsvoorschrift</b>            | <b>29...</b> | <b>NL</b> |
| <b>Istruzioni di montaggio,<br/>uso e manutenzione</b>  | <b>37...</b> | <b>I</b>  |
| <b>Istrucciones de instalación<br/>y funcionamiento</b> | <b>45...</b> | <b>E</b>  |
| <b>Instrukcja montażu<br/>i obsługi</b>                 | <b>53...</b> | <b>PL</b> |
| <b>Návod k montáži<br/>a obsluze</b>                    | <b>61...</b> | <b>CZ</b> |

**D CE-Konformitätserklärung**

Hiermit erklären wir, daß dieses Aggregat folgenden einschlägigen Bestimmungen entspricht:

**EG-Maschinenrichtlinien**

89/392/EWG i.d.F.,  
91/368/EWG, 93/44/EWG,  
93/68/EWG

**Elektromagnetische Verträglichkeit**

89/336/EWG i.d.F.  
92/31/EWG, 93/68/EWG

Angewendete harmonisierte Normen,  
insbesondere

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

**GB EC declaration of conformity**

We hereby declare that this unit complies with the following relevant provisions:

**EC machinery directive**  
89/392/EWG in this version,  
91/368/EWG, 93/44/EWG,  
93/68/EWG

**Resistance to electromagnetism**  
89/336/EWG in this version  
92/31/EWG, 93/68/EWG

Applied harmonized standards in  
particular:

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

**F Déclaration de conformité CE**

Par la présente, nous déclarons que cet agrégat satisfait aux dispositions suivantes:

**Directives CEE relatives aux machines** 89/392/CEE,  
91/368/CEE, 93/44/CEE,  
93/68/CEE

**Compatibilité électromagnétique**  
89/336/CEE, 92/31/CEE,  
93/68/CEE

Normes utilisées harmonisées,  
notamment

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

**E Declaración de conformidad CE**

Por la presente declaramos que esta unidad satisface las disposiciones pertinentes siguientes:

**Directivas CE sobre máquinas**  
89/392/CEE,  
91/368/CEE, 93/44/CEE,  
93/68/CEE

**Compatibilidad electromagnética**  
89/336/CEE, 92/31/CEE,  
93/68/CEE

Normas armonizadas utilizadas particularmente

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

**NL EG-verklaring van overeenstemming**

iermede verklaren wij dat deze machine voldoet aan de volgende bepalingen:

**EG-richtlijnen betreffende machines** 89/392/EEG,  
91/368/EEG, 93/44/EEG,  
93/68/EEG

**Elektromagnetische tolerantie**  
89/336/EEG, 92/31/EEG,  
93/68/EEG

Gebruikte geharmoniseerde normen,  
in het bijzonder

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

**I Dichiarazione di conformità CE**

Con la presente si dichiara che le presenti pompe sono conformi alle seguenti direttive di armonizzazione

**Direttiva Macchine CEE**  
89/392/CEE,  
91/368/CEE, 93/44/CEE,  
93/68/CEE

**Compatibilità elettromagnetica**  
89/336/CEE, 92/31/CEE,  
93/68/CEE

Norme armonizzate applicate,  
in particolare

EN 809, EN 50 081-1, EN 50 082-1,  
EN 50 081-2, EN 50 082-2.

|   |   |
|---|---|
| <p><b>SF CE-standardin mukaisuuksellisesti</b><br/>Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä:</p> <p><b>EY-konedirektiivit</b><br/>89/392/ETY, 91/368/ETY, 93/44/ETY, 93/68/ETY</p> <p><b>Sähkömagneettinen soveltuvuus</b><br/>89/336/ETY, 92/31/ETY, 93/68/ETY</p> <p>Käytetyt yhteensovitetut standardit, erityisesti<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p>                                 | <p><b>S EEC konformitetsdeklaration</b><br/>Härmed förklaras att denna maskin uppfyller följande bestämmelser:</p> <p><b>EEC maskindirektiv</b><br/>89/392/EEC i denna version, 91/368/EEC, 93/44/EEC, 93/68/EEC</p> <p><b>Elektromagnetisk kompatibilitet</b><br/>89/336/EEC i denna version, 92/31/EEC, 93/68/EEC</p> <p>Tillämpade harmoniserade normer, särskilt:<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p>                                 |
| <p><b>H EK. azonosság nyilatkozat</b><br/>Ezennel kijelentjük, hogy az aggregát a megkívánt alanti feltételeknek megfelel:</p> <p><b>EK-Gépirányelvek</b><br/>89/392/EWG, 91/368/EWG, 93/44/EWG, 93/68/EWG</p> <p><b>Elektromagnetikus Összeegyeztethetőség</b><br/>89/336/EWG, 92/31/EWG, 93/68/EWG</p> <p>Alkalmazott, harmonizált normák, különösen az<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p>                                   | <p><b>GR Δήλωση συμμόρφωσης με τους κανονισμούς CE</b><br/>Δηλώνουμε ότι το προϊόν αυτό ικανοποιεί τις ακόλουθες διατάξεις:</p> <p><b>Οδηγίες CEE σχετικά με μηχανήματα</b> 89/392/CEE, 91/368/CEE, 93/44/CEE, 93/68/CEE</p> <p><b>Ηλεκτρομαγνητική συμβατότητα</b> 89/336/CEE, 92/31/CEE, 93/68/CEE</p> <p>Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p>   |
| <p><b>CZ Osvědčení o shodnosti s normami EU</b><br/>Prohlašujeme tímto, že toto zařízení odpovídá následujícím příslušným ustanovením:</p> <p><b>Směrnice o strojírenském zařízení ES</b> 89/392/EHS včetně dodatků, 91/368/EHS, 93/44/EHS, 93/68/EHS</p> <p><b>Elektromagnetická snášenlivost</b> 89/336/EHS včetně dodatků, 92/31/EHS, 93/68/EHS</p> <p>Použité souhlasné normy, zejména:<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p> | <p><b>PL Oświadczenie zgodności EC</b><br/>Niniejszym oświadczamy, że pompa odpowiada następującym właściwym dla niej dyrektywom:</p> <p><b>Wytyczne dla przemysłu maszynowego EC</b> 89/392/EEC w tej wersji, 91/368/EEC, 94/44/EEC, 93/68/EEC</p> <p><b>Odporność elektromagnetyczna EC</b> 89/336/EEC w tej wersji, 92/31/EEC, 93/68/EEC</p> <p>Zastosowano normy zharmonizowane, w szczególności:<br/>EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.</p> |

**RUS** **Заявление о соответствии нормам, действующим в Европейском Сообществе**  
Настоящим документом заявляем, что данная установка соответствует следующим постановлениям: **Директивы ЕС относительно машин и станков 89/392/ЦЕЕ, 91/368/ЦЕЕ, 93/44/ЦЕЕ, 93/68/ЦЕЕ** **Электромагнитная совместимость 89/336/ЦЕЕ, 92/31/ЦЕЕ, 93/68/ЦЕЕ**  
Использовавшиеся гармонизированные стандарты и нормы, в частности **EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.**

**DK** **EF-overensstemmelses-erklæring**

Det erklæres hermed, at dette udstyr er i overensstemmelse med følgende bestemmelser:

**EU maskindirektiver: 89/392/EØF i denne udgave, 91/368/EØF, 93/44/EØF, 93/68/EØF**

**Elektromagnetisk kompatibilitet: 89/336/EØF i denne udgave, 92/31/EØF, 93/68/EØF**

Anvendte harmoniserede normer, især:

**EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.**

**N** **EU-overensstemmelseserklæring**

Det erklæres herved at dette udstyret stemmer overens med følgende bestemmelser:

**EU-direktiver for maskiner 89/392/EEC og følgende, 91/368/EEC, 93/44/EEC, 93/68/EEC**  
**Elektromagnetisk kompatibilitet 89/336/EEC og følgende, 92/31/EEC, 93/68/EEC**

Anvendte harmoniserede normer, i særdeleshed

**EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.**

**TR** **Uygunluk Belgesi**

Aşağıdaki cihazların takibi standartlara uygun olduğunu temin ederiz:

**AB-Makina Standartları 89/392/EWG i.d.F., 91/368/EWG, 93/44/EWG, 93/68/EWG**

**Elektromanyetik Uyumluluk 89/336/EWG i.d.F., 92/31/EWG, 93/68/EWG**

Özellikle kullanılan Normlar

**EN 809, EN 50 081-1, EN 50 082-1, EN 50 081-2, EN 50 082-2.**



Hansjörg Heinrich  
Leiter Entwicklung Kleinsysteme

**KSB** 

KSB Aktiengesellschaft  
Bahnhofplatz 1  
D-91257 Pegnitz

## 1 General Information

These Operating Instructions explain the functions and operation of the pump when installed and ready for use.

The figures referred to in the text can be found on the fold-out page at the front.

### Use as prescribed

The circulating pump (hereafter referred to simply as pump or general unit) is used to pump liquids in pipe systems.



The pump must not be used for handling drinking water or food related liquids.

Its main fields of application are:

- Hot-water heating, various systems,

- Industrial, closed circulating systems.

### Terms (Fig. 1)

- 1 Suction joint
- 2 Condensate outlet
- 3 Pump housing
- 4 Pressure joint
- 5 Terminal box
- 6 Cable entry
- 7 Speed switch
- 8 Ventilation
- 9 Rating plate
- 10 Motor housing

### Rating plate

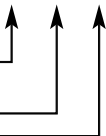
Heating circulating pumps,  
glandless pumps \_\_\_\_\_

Nominal width [mm]

25 (=1"), 30 (=1¼") \_\_\_\_\_

Maximum delivery head [m] x 10 \_\_\_\_\_

Rio C 30 - 40



### Connection and electrical data

Voltage: 1~230V ±10%

Mains frequency: 50Hz

Power consumption

P<sub>max</sub>: Rating plate

Motor speed, max.: Rating plate

Protection category IP: Rating plate

Speed setting: 3 stages

Fitting length: 130/180 mm

Perm. operating pressure, max.: 10 bar  
 Perm. medium temperatures min./max.: -10/+110 °C  
 Perm. ambient temperature max.: +40 °C  
 Min. inlet pressure\* at suction side at

+ 50 °C: 0.05 bar  
 + 95 °C: 0.3 bar  
 + 110 °C: 1.0 bar

\* The values are valid up to 300 m above sea level. For higher elevations add: 0.01 bar/100 m.

The minimum inlet pressure must be maintained in order to avoid cavitation noise!

#### Permissible fluids:

- Heating water acc. to VDI 2035
- Water and water/glycol mixtures in a ratio up to 1:1. Glycol mixtures require a reassessment of pump hydraulic data in line with the increased viscosity and depending on mixing ratios. Only approved makes of additives with corrosion inhibitors must be used in strict compliance with manufacturers' instructions.
- For use of other kinds of fluids consult KSB first.

## 2 Safety

These instructions contains basic reference which must be strictly adhered. It is therefore imperative for the installer and operator to carefully read these instructions prior to installation and commissioning.

Please observe, not only the safety directions under the main heading „safety rules“, but also those added and specially marked under the ensuing headers.

#### Safety marks contained in these instructions

Safety rules contained herein which, if not complied with, may be dangerous to persons are specially highlighted by the following danger symbols:



Danger from electrical causes:



Safety references which, if not complied with, may cause damage to the pump / installation or impair its functions are highlighted by the word:

**ATTENTION!**

#### Staff training

The personnel installing the pump / unit must have the appropriate qualifications for this work.

### **Dangers from non-observance of safety rules**

Non-observance of safety reference may cause personal injury or damage to the pump or installation. Failure to comply with the safety references could invalidate warranty and/or damage claims.

In particular, non-compliance may, for example, cause the following dangerous situations:

- Failure of important pump or unit functions,
- Causing personal injury due to electrical or mechanical causes.

### **Safety rules for the operator**

Local regulations for the prevention of accidents must be observed.

Dangers caused by electrical energy must be excluded. Local or general regulations [e.g. IEC, VDE, etc.] and directives from local energy supply companies are to be followed.

### **Safety rules for inspection and installation work**

The operator must ensure that all inspection and installation work is carried out by authorised and qualified specialists who have carefully studied these instructions.

Work on the pump/unit must be carried out only with the machine switched off and at complete standstill.

### **Unauthorized modification and manufacture of spare parts**

Alterations to the pump or installation may only be carried out with the manufacturer's agreement.

The use of original spare parts and accessories authorised by the manufacturer will ensure safety. The use of any other parts may invalidate claims invoking the liability of the manufacturer for any consequences.

### **Unauthorised operating methods**

The operating safety of the pump or installation supplied can only be guaranteed if it is used in accordance with paragraph 1 of the operating instructions. Under no circumstances should the limit values given in the data sheet be exceeded.

## **3 Transport/Interim storage**

**ATTENTION!** The pump contains electronic components and must be protected against moisture from outside and mechanical damage (shock / impact) (Fig. 7). It must not be exposed to temperatures outside the range -10 °C to +50 °C. (Fig. 7).

## 4 Description of pump/accessories

### Products delivered

- Complete pump
- 2 flat gaskets,
- Installation and operating instructions

### Pump description

In the wet-running pump all rotating parts are surrounded by the flow medium, including the motor rotor.

A shaft seal, which would be subject to wear and tear, is not required. The pumping medium lubricates the friction bearing and cools both bearing and rotor.

No **motor overload protection** is required.

Even the maximum overload current cannot damage the motor. The motor operates non-overloading.

### Speed setting (Fig. 8)

The speed of the pump can be adjusted with a 3-position rotary button. In position 3 the speed is approx. 40...50 % of the maximum speed with the power consumption being reduced to 50 %.

## 5 Assembly/ Installation

### Installation

**ATTENTION!** Installation and service by qualified personnel only!

- Assembly should only take place once all welding and soldering work and the rinsing of the pipe network has been completed. Dirt can have an adverse effect on the functioning of the pump.
- The pump must be installed in an easily accessible position to facilitate inspection or replacement.
- It is recommended that shut-off devices be fitted before and after the pump. This will save having to drain and refill the system if the pump needs replacing. The fittings are to be installed so that any water that escapes cannot drip onto the pump motor or terminal box.
- When installed into the flow pipe of an open-vented system, the open safety vent must be connected to the system on the inlet side of the pump.
- Pump to be mounted with the shaft in the horizontal plane in such a way that it is not stressed by the pipework. (Installation positions in Fig. 2).



- An arrow on the pump casing indicates the direction of flow (fig. 3, pos.1).
- Secure the pump against twisting by using a spanner (fig. 4).
- In order to attain the correct terminal box position the motor housing can be turned once the motor fastening screws have been loosened (Fig. 5).

**ATTENTION!** Do not damage the flat gasket. If necessary use a new gasket:  $\varnothing 86 \times \varnothing 76 \times 2.0$  mm EP.

**ATTENTION!** For units which are to be insulated, only the pump housing may be insulated. The motor and condensate openings must remain free (fig. 3, pos. 2).

### Electrical connection



Electrical connection must be carried out by a qualified and licensed electrician in strict conformity to ruling national conditions and local regulations (e.g. VDE regulations in Germany).

- According to Part 1 of the VDE 0730, the pump must be connected to the electrical supply by a solid wire equipped with a plug connection or an all-pole switch.
- The width of the contact gap must be at least 3 mm.
- To guarantee protection against dripping water and the strain relief of the PG screwed joint, a connecting cable of suitable external diameter is to be used (e.g. H 05 VV-F 3 G 1.5).
- When using the pump in units where the water temperature exceeds  $90^{\circ}\text{C}$ , a connecting cable with corresponding heat resistance must be used.
- The supply cable must be laid in such a way that it never touches the pipework and/or the pump and motor casing.
- Check that the mains current and voltage comply with the data on the rating plate.
- Make mains connection as shown in Fig. 6.
- The connecting cable can be fed through the PG screwed joint either to the left or right. If necessary, the blind plug and PG screwed joint are to be exchanged. If the terminal box is positioned on the side, always insert the PG screwed joint from below (Fig. 5)
- Pump/installation must be earthed in compliance with regulations.

## 6 Operation

### System filling and venting

The pump may need venting e.g. if the heating and pump are working but the heating element remains cold. If there is air in the pump chamber, the pump will not pump water.

Carefully fill the unit with water.

Solar thermal systems must be filled with ready for use mixtures. The pump must not be used to mix the medium in the system.

The pump is normally vented automatically after a short operational period. Short-term dry running will not damage the pump. If it becomes necessary to vent the pump, please observe the following procedure:

- Switch off pump,



#### **Risk of burning if the pump is touched!**

Depending on the operating condition of the pump and/or installation (fluid temperature) the pump/motor can become very hot.

- Close the valve on the discharge side.



#### **Risk of scalding!**

Depending on the fluid temperature and the system pressure, if the vent screw is completely loosened hot liquid or vapour

can escape or even shoot out at high pressure.

- Carefully loosen and fully remove the vent plug with a suitable screwdriver (Fig. 9).
- Carefully push pump shaft back several times with screwdriver.
- Protect all electrical parts against the leaking water.
- Switch-on pump.

#### **ATTENTION!**

It is possible that the pump blocks with the vent plug open, depending on the system pressure.

- After 15...30 s tighten the vent plug.
- Re-open isolating valve,

### Speed setting

If the rooms cannot be sufficiently heated, the speed of the pump may be too low. In this case you will need to switch to a higher speed.

If, on the other hand, the pump is set at too high a speed, flow noise may occur in the lines and in particular at throttled thermostatic valves. This can be rectified by switching to a lower speed.

The speed is changed by means of a rotary button at the terminal box. 3 represents the lowest and 1 the highest speed.

## 7 Maintenance

The pump is maintenance-free.

## 8 Problems, Causes and Remedies

### Motor is switched on but fails to run:

- Check electrical fuses,
- Check voltage of pump (observe rating plate data),
- Check capacitor size (observe rating plate data!).
- Motor is blocked, e.g. by deposits from the heating water.
- Remedies: Fully remove vent plug, check and if necessary rectify free running of pump rotor by turning the slotted end of the shaft with a screwdriver (Fig. 9).



At high water temperatures and system pressure close isolating valves before and after the pump. First, allow pump to cool down

### Noisy pump operation

- Cavitation due to insufficient inlet pressure.
- Remedies: increase system pressure within the permissible range.
- Check speed setting, if necessary switch to a lower speed.

**If the fault cannot be rectified, contact your nearest KSB Customer Service.**

## 9 Spare parts

All rating plate data must be stated when ordering spare parts.

**Subject to technical alterations!**



**KSB Aktiengesellschaft**

Postfach 13 61 · 91253 Pegnitz · Bahnhofplatz 1 · 91257 Pegnitz (Deutschland)

Tel. +49(92 41)7 10 · Fax +49(92 41)71 17 93 · [www.ksb.de](http://www.ksb.de)