Operating Instructions

Brinkmann-Miniature Centrifugal Pumps Series KC21 ... KC60

Contents

1 General

These operating instructions apply to the pumps of the series KC21 ... KC60 with different specifications. The miniature centrifugal pump operate according to the bypass duct principle, with **self-priming function following the initial priming**. They are suitable for pumping thin-bodied fluids.
These operating instructions contain basic information and instructions which must be observed when the pump is being installed, operated or repaired. Therefore it is important that these operating instructions are read by the fitter, the operator and relevant technical personnel before installation and start-up, and they are available at all times at the place where the unit/system is being operated.

Specifications

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Pipe connection	Weight kg	Power kW	Noise level max. dBA / 50Hz
KC21	1,9	22	G $^1/_2$	5,2	0,22	63
KC31	2,9	24	G $^1/_2$	6,0	0,28	63
KC35	3,4	10	G $^1/_2$	5,2	0,22	57
KC45	4,5	13	G $^1/_2$	6,0	0,28	60
KC60	4,6	44	G $^3/_4$	10,5	1,1	65

Measuring of noise level to DIN 45635 at distance of 1m.

Mediums	Water, cooling emulsions, cooling- and cutting-oils
Kinetic viscosity of the medium	.... 12 mm^2/s
Temperature of medium	0 .... 80 °C
Suction height	2 m without foot-located valve 6 m with foot-located valve

2 Safety

See appendix A.

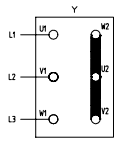
3 Transport and storage

Protect the pump against damage when transporting.
Store pump in dry and protected areas and protect it against penetration of foreign bodies.

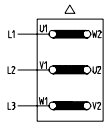
4 Description of product and accessories

Pump and motor form a complete unit. The impeller is fixed on the driving shaft extension. The shaft sealing is effected with a rotary shaft seal in standard versions and a rotary mechanical seal in special **versions -UO12**. The sealing for the case is effected with two gaskets in KC21 to KC31 and with a gasket and O-ring in KC35 to KC60.
The motor is surface cooled and complies with the DIN IEC 34 resp. EN 60034 (IP 55).
Tension voltage and frequency must correspond with the shown specification on the nameplate. The terminal links of the motor are delivered in star connection form the plant. A circuit breaker or overload trip must be provided and the tripping current adjusted to correspond with the motor rated current.
Special electrical or mechanical versions are described in appendix B!

Check the terminal links according to the following wiring diagram.



Star connection
3 x 400 V, 50 Hz
resp. 380-420 V, 50 Hz

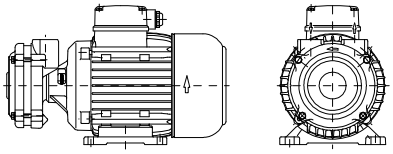


Delta connection
3 x 230 V, 50 Hz
resp. 220-240 V, 50 Hz

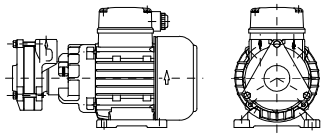
Work on the electrical equipment must only be carried out by a qualified electrician.

The motor must be isolated before any work is carried out.

5 Installation



KC60



KC21…KC45

The pumps can be mounted horizontally or vertically. Be sure that the pipe connections are on the top in the case of horizontal installation. For vertical installation the pump unit must be lower than the motor. Pumps must be mounted securely. The pipework must be installed so that no distortion of the pump can occur. The suction and pressure connections are marked with arrows of the pump body .
Pumps have to be protected against coarse particles.
To obtain the full flow rate it is recommended to choose for the pipework the nominal bore diameter of the pumps cross section for connection. Therfore pipe bends should be used, not pipe angles!
The pipework must be qualified for occuring hydraulic pressure!

6 Start up / Shut down

Start up

Switch off at the mains.
After connection of the terminals close the terminal box.
Briefly start the motor and check the rotation according to the arrow on the top of the motor. **Looking through the fan cover of motor, the fan has to turn clockwise.**
If the direction is incorrect change over two of the power leads.

Shut down

Switch off at the mains.
Open terminal box and disconnect the power leads
Empty out the pump.

The temperature of the medium is not allowed to be higher than 80 °C.

The pumps are not suitable for dry running and conveyance against a closed sliding valve.

ATTENTION

The particle-size in the medium is not allowed to be bigger than 1 mm

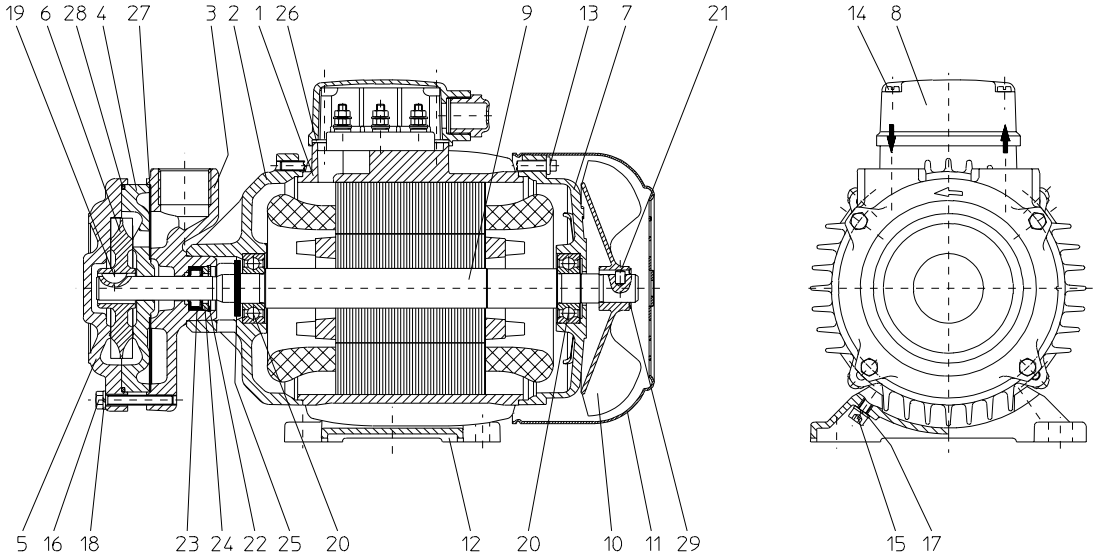
7 Servicing and Maintenance

The surface of the motor must be kept free of dirt.
The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance. Spare parts are readily available from stock.

8 Trouble shooter's guide

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed	Check fuses, terminals and supply leads
Motor does not start, humming noise.	One of the supply leads has failed Impeller faulty Motor bearing faulty	See above Replace impeller Replace bearing
Pump does not pump	Pump is empty Suction height too great liquid level too low Pump mechanism faulty Pipe blocked	Fill up the pump Reduce the suction height Fill up liquid replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller Pump mechanism silted up Worn pump mechanism	Change over two power supply leads Clean pump mechanism Replace pump mechanism
Power consumption is too high	Lime or other deposits mechanical friction	See above repair pump

9 Spare parts list for miniature centrifugal pumps series KC21 ... KC60



Item	Description		Item	Description	
1	Stator with terminal board		16	Hexagon head cap screw	DIN 931
2	End shield		17	Spring washer	DIN 127
3	Thing annexed		18	Spring washer	DIN 127
4	Canal cover		19	Woodruff key	DIN 6888
5	Intake cover		20	Ball bearing	DIN 625
6	Impeller		21	Parallel pin / KC60	DIN 7
7	End shield		22	Locking ring	DIN 472
8	Terminal box		23	Rotary shaft seal	
9	Shaft with rotor		24	Supporting ring	
10	Fan		25	Splash ring	
11	Fan cover		26	Gasket	
12	Stator base		27	Gasket	
13	Stud bolt with bond		28	Gasket / KC21...KC31	
14	Socket head cap screw	DIN 84	28	O-ring / KC35...KC60	
15	Slotted cheese head screw	DIN 912	29	Retaining ring / KC60	

In the special version **-UO12,** a rotary mechanical seal is used instead in positions 23 and 24.

Spare parts are available from the supplier.
Standard commercially available parts are to be purchased in accordance with the model type.
The ordering of spare parts should contain the following details:

1. **Pumptype**
   e.g. KC60
2. **Pump No.**
   e.g. 01987100
   The date of the construction year is a component of the pumps type number.
3. **Voltage, Frequency and Power**
   Take item 1, 2 and 3 from the nameplate
4. **Spare part with item No.**
   e.g. Impeller item No. 6

Tightening torques for screwed connections

Thread - ∅	**M4**	**M5**		
Strength classes	4.8	4.8	A2-70	8.8
Tightening torque (Nm)	**1** Nm Item. 14	**2** Nm Item.13	**5** Nm Item. 16	**2** Nm Item. 15

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Subject to change without prior notice.

Order-No.:BE7100 ENGLISCH

10 Mounting instructions for exchanging the rotary shaft seal:

1) Disconnect the pump from the power supply. Check up the marks on the pump unit.

2) Loosen hexagon head cap screws (16).

3) Loosen and remove intake cover (5) from the canal cover (4). Remove the gasket (28) at KC21 and KC31, or the O-ring at KC35 to KC60.

4) Push impeller (6) with help of two screwdrives from the shaft (9). Set the screwdrivers between the impeller (6) and the canal cover (4).

5) Remove woodruff key (19) from the shaft (9) and remove the canal cover (4). Remove gasket (27).

6) Remove fan cover (11), retaining ring (29) KC60 and fan (10) from shaft (9). Remove parallel pin (21) KC60.

7) Loosen stud bolts (13) and remove stator (1) with end shield (7).

8) Push shaft (9) with ball bearing (20) out of end shield (2).

9) Take retaining ring (22) and the supporting ring (24) out of thing annexed (3).

10) Remove rotary shaft seal (23).

    Clean pump components before re-assembling. Position of the rotary shaft seal (23) may be exchanged with the supporting ring (24), if necessary, to ensure contact of the new sealing lip with unused surface.

11) Fill the rotary shaft seal (23) with grease (1/3 of the volume) and press it, with a drift, flat into the thing annexed (3).

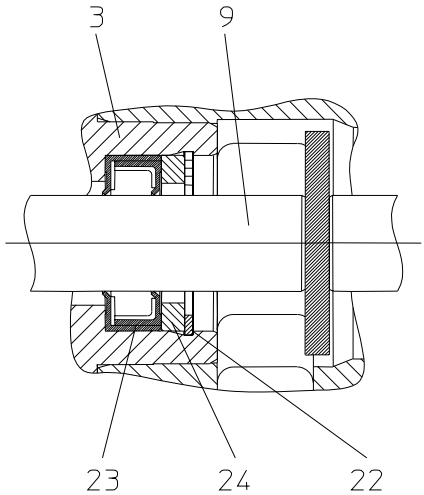
12) The remaining assembly occurs in reverse order of item 3) to 9). If required, exchange the o-ring (28), gaskets (27,28) and impeller (6) .

13) Screw the hexagon head cap screws (16). **Check up the tightening torque!**

14) After having completed the assembly, possible distortions can be eliminated by light tap upon intake cover (5) with a plastic hammer.

15) Reconnect pump to the electrical supply. **Fill up the pump!**

Check direction of rotation.



11 Mounting instructions for exchanging the rotary mechanical seal:

1) Disconnect the pump from the power supply. Check up the marks on the pump unit.

2) Loosen hexagon head cap screws (16).

3) Loosen and remove intake cover (5) from the canal cover (4). Remove the gasket (28) at KC21 and KC31, or the O-ring at KC35 to KC60.

4) Push impeller (6) with help of two screwdrives from the shaft (9). Set the screwdrivers between the impeller (6) and the canal cover (4).

5) Remove woodruff key (19) from the shaft (9) and remove the canal cover (4). Remove gasket (27). Remove locking ring (22) and the rotating mechanical seal assembly (24a-24d).

6) Remove the stationary mechanical seal part (24e-24f) from the thing annexed (3).
Clean pump parts and seat surfaces of all seals!

   The rotary mechanical seal (24) should be replaced completely. If required, renew gasket (27,28) or O-ring (28) and impeller (6).

7) Fit new rotary mechanical seal:

   The running surfaces of the rotary mechanical seal must be free from dirt and grease.
Wet the packing (24f) with water containing washing-up liquid and press the stationary rotary mechanical seal part (24e-24f) into the thing annexed (3). Push the rotary mechanical seal part (24a-24d) onto the pump shaft (9) and secure with locking ring (22).

8) The remaining assembly occurs in reverse order of item 3) to 5).

9) Screw the hexagon head cap screws (16). **Check up the tightening torque!**

10) After having completed the assembly, possible distortions can be eliminated by light tap upon intake cover (5) with a plastic hammer.

11) Reconnect pump to the electrical supply. **Fill up the pump!**

Check direction of rotation.