

## Operating and Maintenance Instructions

This instruction manual should be read before installation and starting pump operation. Each JESCO pump is designed, tested and supplied according to the data specified in the order. If the operating conditions change at a later date (e.g. other medium, viscosity, temperature, supply conditions, etc.), we must examine, and if necessary, confirm in each case if the pump can be operated without modification. For damages which occur due to incorrect use or nonobservance of this instruction manual, we take no liability.

### General

#### Pump description

VTP-BBF vertical immersion pumps are normal-suction, single-level, plastic centrifugal pumps in a vertical design.

The pumps of this series have been developed according to the requirements of the chemical industry and are mainly used to convey liquids which are pure or with a low solid content, acid or alkaline, and with a low viscosity, from **depressurized** tanks.

The sealing between the spiral housing and the delivery pipe is ensured by a labyrinth seal. The drive motor (basic version according to IEC) is equipped with an extended shaft.

Prior to shipment each pump is subject to a functional test including measurement of the flow rate, head and the power consumption of the motor.

Each pump has a label with the pump data and another one with the respective motor data. Please refer to these labels when contacting us.

#### Transportation und storage

No particular precautions are required for the transportation and storage of plastic centrifugal pumps under normal conditions. At an ambient temperature under  $-10\text{ }^{\circ}\text{C}$ , it is necessary to protect all pump parts from impact stress by appropriate packing. The connection (delivery side) and the suction opening of the pump must be closed. The pump must be stored so that the delivery pipe of the pump is not stressed.

When starting up a pump which has been stored for several years, the following measures must be taken.

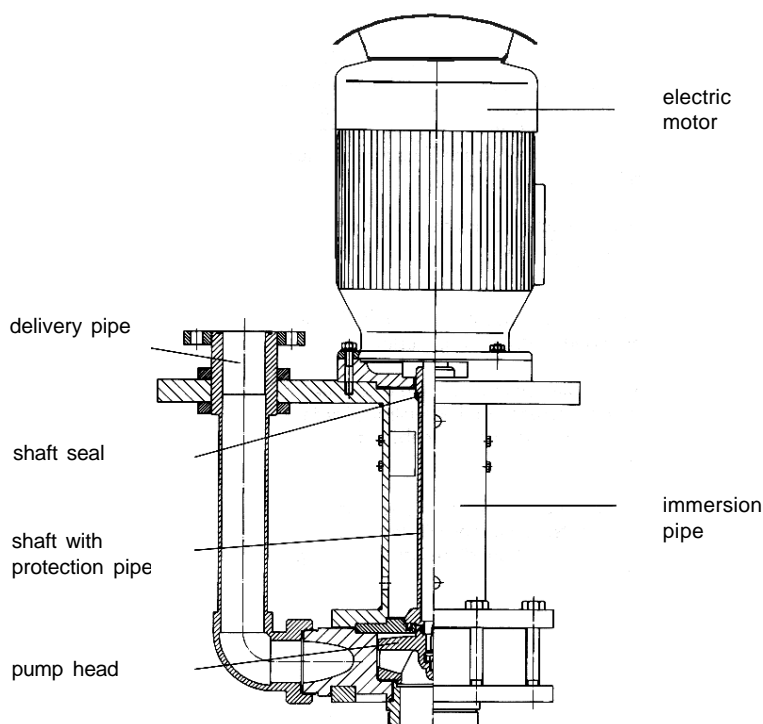
Test the elastomer seals for elasticity  
- replace if necessary.

#### Warranty

Prior to shipment each pump is subject to a functional test including measurement of flow rate, head and power consumption of the motor. A warranty regarding material resistance can only be given if the exact operating conditions were known during the design phase of the device.

Not included in the warranty are all sealing elements and wear part as well as damages which result from nonobservance of these operating and maintenance instructions.

Our «General Sales Conditions» have priority.



**General safety information**

- The operational safety of the pump is only warranted when the pump is used as intended.
- All the equipment to protect against accidental contact (coupling guard) must be mounted before operation of the pump.
- Leakage of environmentally hazardous media must be disposed of according to the legal requirements.
- Take the dangers of mounting and dismounting into consideration. Make sure that the pump stands securely. Check that the parts are fastened to prevent falling. Support or adjust loose parts.
- Connecting flanges, drilled holes and other openings on the pump must be closed during transportation and storage.

**Attention:** Eyebolts on pump parts and motors must not be used to lift the completely assembled pump or the entire pump unit. The eyebolts are only for lifting the detached single parts during assembly and disassembly.

**EC - machine directive**

- Any work on the complete pump unit may only be done by authorized specialists.
- According to the Machine Directive 89/392/EEC, these pump units are not regarded as machines; they can, however, be built into installations which are regarded as machines. In such cases, observe the following note.



«We distinctly emphasize that operation is prohibited until it has been confirmed that the machine (plant) into which these products have been built corresponds to the requirements of the EC Machine Directive 89/392/EEC. A respective declaration of conformity may be requested».

**Assembly and installation****Assembly of the complete pump unit**

Each complete pump unit is carefully aligned and tested before leaving the factory. When installed in a system, the complete unit must be fastened on a flat, stable surface (tank cover or bracket) with the respective mounting holes.

**Laying the pipes****Nominal diameters**

The nominal diameter of the pipe must not be smaller than the pump connection. For short pipes, the nominal diameter should be large enough to ensure least flow resistance. For long pipes, the most economical nominal diameter must be determined in each case.

**Changes in diameter or direction**

Sudden changes in the diameter or direction as well as extremely sharp bends should be avoided. Flange seals must not protrude inwards.

**Support und flange mounting**

The pipe should be connected to the pump without stress. It should be supported near the pump and should be screwed on easily to prevent tension. After loosening the screws, the flanges must neither be tilted nor separated and may not press against each other.

Any tension which may occur at the pipes (e.g. temperature influences, etc.) should be kept from the pump body by taking appropriate measures - such as installing compensators.

**Cleaning the pipes before assembly**

Before final assembly all the pipe parts and valves should be cleaned carefully.

**Delivery pipes****Delivery pipe diameters**

Delivery pipe diameters should be dimensioned so that the flow rate is in the range of 1-3 m/s. The optimum pipe diameter within this range must be determined in each individual case.

**Valves in the delivery pipe****Shut-off valve**

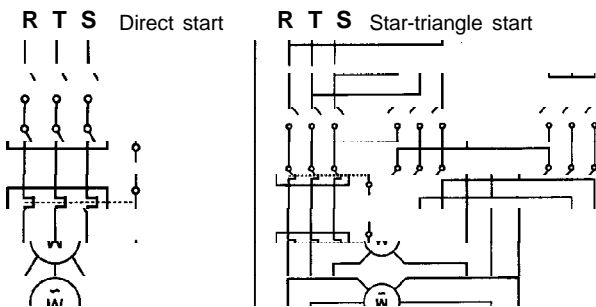
A shut-off valve should be integrated in the delivery pipe close to the pump so that the flow rate can be regulated.

**Back stop**

For long delivery pipes or higher pressures, a back stop must be installed. Thus, the pump is mechanically relieved and the medium conveyed cannot run back in the case of a standstill. This prevents damaging pressure impacts on the pump and foot valve.

**Electrical connection**

The electric motor mounted on the pump should be connected according to the wiring instructions printed on the inside cover of the terminal box. In addition to the usual fuses, each pump motor must be protected with a thermoswitch (see diagram). The external electrical connection must be done by a specialist according to the local regulations.


**Commissioning**
**Prior to operation**

- Remove any particles (solid matter) from the pipe.
- Check pipe for leaks (pressure test).
- Check if there is any stress on the pipe connections to the pump
- Check direction of rotation of complete unit (see direction of rotation)
- Remove delivery and suction stops
- Fill tank before starting operation (minimum level)

**Direction of rotation**

The direction of rotation of the motor must coincide with the directional arrow on the motor housing. The motor can be switched on briefly to check the direction of rotation. A wrong direction of rotation reduces the capacity and might damage the pump.

**Start-up**

Before start-up, check again if the system and the pump have been satisfactorily filled and vented.

**Motor switch-on**
**Shut-off valve on delivery side**

Immediately after start-up, the shut-off valve on the delivery side must be slightly opened so that, when the pump is started, the delivery line is properly vented.

**Insufficient venting**

If the head does not increase with a higher speed, turn off the pump and vent once more.

**Adjusting output values**

After reaching operating speed, open the shut-off valve on the delivery side as far as necessary to reach the required output values.

**Operation with closed shut-off valve**

Longer operation with a closed shut-off valve on the delivery side should be avoided by all means because, in addition to heating the medium conveyed, it might damage the pump.

**Motor switch-off**
**Delivery pipe**

If a non-return valve has been built into the delivery pipe, the shut-off valve can remain open. If there is no non-return valve in the delivery pipe, the shut-off valve must be closed.

**Motor**

Switch motor off.

**Switching the pump on again**

Before switching the pump on again, check if the pump shaft has stopped. If the shut-off valve in the delivery pipe leaks or is not completely closed, the backflow of the medium could cause the pump shaft to turn backwards.

**Changing the operating data**
**Higher density of the medium conveyed**

If the density of the medium conveyed is higher than indicated in the order or during the design phase of the pump, it is absolutely necessary to make sure the motor is not overloaded.

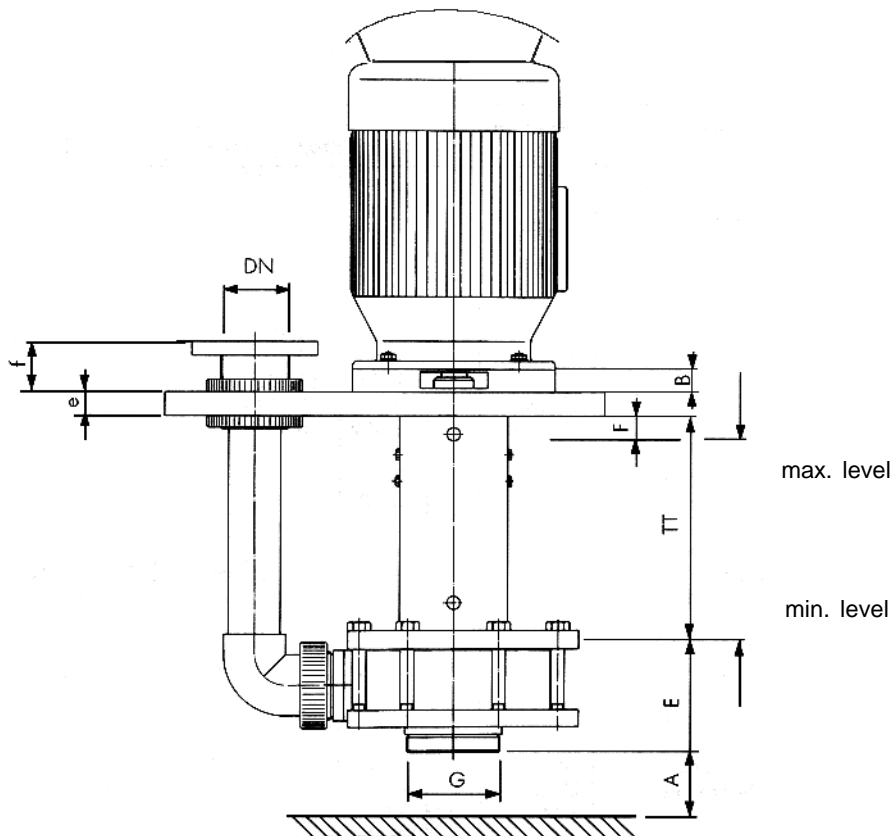
**For longer interruptions in operation**

If, in the case of longer interruption, the concentration may change or the medium may crystallize, the pump must be drained and rinsed with a preservative liquid.

**Maintenance**

Maintenance of the complete pump unit is limited to regular inspection of the following points:

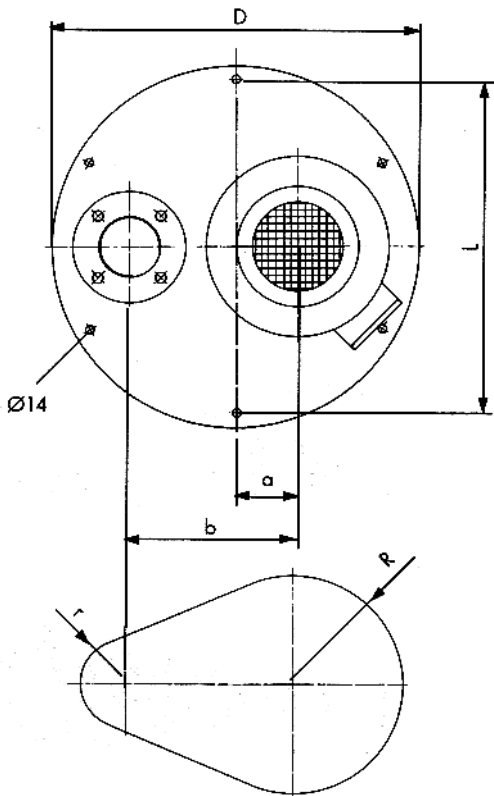
- Does the pump reach the required capacity (flow rate/head)?
- Does the pump or the motor emit any unusual noises or vibrations?
- Is the motor heat normal?

**Dimensions of centrifugal pump**


Pumpegrösse	DN	E + TT	A	B	E	F	G	e	f
15 - 85	15	300	20	60	90	30	G 1 1/4	25	50
20 - 120	20	300/400	25	90	122	30	G 2 1/4	25	50
25 - 135	25	300/400	32	90	122	30	G 2 1/4	25	50
32 - 125	32	Flange DIN 2501/PN10 Selectable immersion depth 300, 400, 500 mm	55	35	110	35	G 3	25	50
32 - 160	32		55	35	110	35	G 3	30	50
40 - 125	40		65	35	110	40	G 3 1/2	30	50
40 - 160	40		65	35	120	40	G 3 1/2	35	50
50 - 125	50		80	35	131	40	G 4	35	75
50 - 160	50		80	35	131	40	G 4	35	60
65 - 125	65		100	35	160	40	G 4 1/2	35	70
65 - 160	65		100	35	160	40	G5	35	70
65 - 200	65		100	35	144	40	G5	35	70

Immersion depth=E+TT

**Dimensions of tank opening**



min. required  
tank opening

Pumpegröße	D	L	R	r	b	a
15 - 85	370	340	68	35	120	30
20 - 120	380	350	102	40	165	40
25 - 135	400	370	107	45	175	53
32 - 125	445	415	140	45	196	50
32 - 160	482	450	145	45	216	52
40 - 125	472	438	146	53	204	54
40 - 160	500	466	153	53	225	52
50 - 125	600	510	148	63	232	73
50 - 160	560	526	173	63	255	71
65 - 125	600	550	180	73	274	100
65 - 160	650	600	190	73	293,5	100
65 - 200	660	630	200	73	318,5	113

### Troubleshooting

The following chart is intended to help evaluate any possible problems and their reasons. Should failures occur, which are not included or which cannot be remedied with the proposals given here, we recommend to contact your supplier.

Failure	Cause	Remedy
Pump does not convey	Direction of rotation of motor is wrong  The actual back pressure is greater than the max. pump pressure  Stop on the suction and delivery connections has not been removed	Interchange the 2 supply mains.  Wrong pump size has been chosen. Use larger pump.  Remove stop.
Pump conveys too little	Shut-off valve in delivery pipe has not been completely opened  Blockage in pipe or impeller  Geodetic head too high May need larger impeller/inquire  Pipe resistance higher than expected  Viscosity of the medium conveyed is higher than expected	Open shut-off valve completely.  Clean pipe and remove impeller, if required.  Wrong pump size has been chosen Request impeller or larger pump  Install pipe with larger diameter, Use larger Impeller or larger pump / inquire  Dilute or preheat (observe max. working temperature).
Pump conveys too much	The system head is less than the pump head	- throttle the shut-off valve on the delivery side - install smaller impeller - possibly use smaller pump
Motor overloaded	Pump conveys too much  Particles in the pump  Density or viscosity of the medium conveyed is too high	See "Pump conveys too much".  Open the pump and clean it.  Check flow data. Mount larger motor.