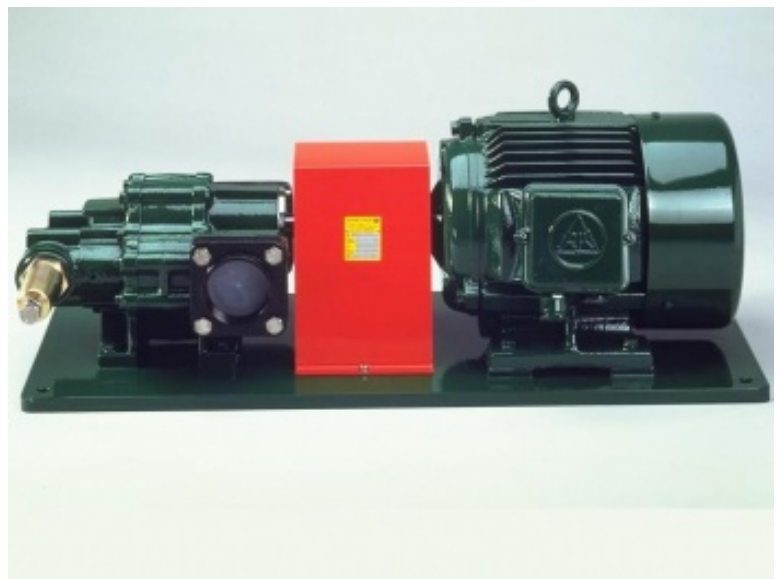


# Operating and maintenance manual

**BG - BZ - BX - MX series**



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*Dynamiek in  
vloeistoftechniek*

## **Bedu Pompen B.V.**

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# USE AND MAINTENANCE OF THE GEAR PUMPS

## INTRODUCTION

**This operation and maintenance handbook has been drawn up according to EEC 89/392 and UNI EN 292/2.**

Like all volumetric pumps, the gear pump has a suction capability and the Bedu pumps, in normal conditions will generate about 7 metres of suction lift.

Ensure that gears do not operate when dry. Before running the pump for the first time or after long stationary periods it is advisable to fill the gear spaces with liquid through one of the ports and to rotate the pump by hand. This also makes it possible to establish if friction in the pump is uniform.

It is recommended that an overload cutout set as 10% above the motor current be installed in the control circuit.

In bare shaft pumps used on low pressures without relief valve and with packing seal the rotation may be in either direction and therefore the symbols SUCTION and DELIVERY are not indicated on the ports.

If there is a relief valve, mechanical seal or canalization for high pressure the rotation must be indicated by the arrows.

The pump operating temperature in normal working conditions is up to 80° C.

In special pump version, working temperatures of 180° C may be achieved.

Liquids to be pumped must not contain abrasive or solid suspensions as this will greatly reduce the pump life.

We recommend a filter of 100 microns should be installed in the suction line if solids may be present.

When pumps are installed in parallel the suction lines should be adequately separated to prevent unnecessary turbulence.

### DECLARATION OF INCORPORATION FOR SUPPLY OF BARE SHAFT PUMPS

Bedu Pompen B.V. declares, under its own responsibility, that pumps series B, F, FM, FT, MX, N, WPP, WPL, CP, CPP, CMP, CM, DMP, AM5 have been designed in accordance with the 98/37/EC Directive.

They cannot be put into operation before the pumping sets have been correctly assembled and declared in accordance with the following Directives:

98/37/EC, 93/68/EC, 73/23/EC, 89/336/EC.



Marco Breunissen  
Directeur



Ron Bijen  
Directeur

# **CHAPTER 1**

## **INSTALLATION**

### **1.1 - LOCATION**

Locate the pump as near of supply as possible to reduce determinial pipe friction.

Many pump system deliver below the rated capacity of the pump because they are not properly piped. Pipe friction, suction lift, discharge head, vacuum and total pressure should be competed for the specific liquid being handled, and the desired flow rate.

The pipe diameters should be adequate to ensure to that pipe friction losses do not exceed the pump limits, especially when handling viscous liquids.

Avoid wherever possible, sudden restrictions such as changes in pipe sizes, globe valves, undersized strainers or sharp elbows.

The inlet line should be at least as large as the pump intake, and as straight as possible. It is important that there are no air lerks in the intake line. the use of ceck valves in the inlet line is generally not recommended wiht a self priming, positive displacement pump and can cause considerable trouble.

If a valve is closed in the discharge line while the pump is operating it forces liquid to recirculate through the relief valve causing the liquid to heat up and expand so should only be done for very short periods.

#### **1.1.1 FOUNDATION**

When installing pumps units built onto baseplates, care should be taken to ensure that the base is not twisted out of shape when anchor bolts are tightened and pipes are connected. Shims may be needed under the base before tightening the anchor bolts.

#### **1.1.2. ALIGNMENT**

Where bare shaft pumps are to be installed they must be connected to the driver by a suitable flexible coupling and aligend as shown below.

Where complete pump sets are supplied the alignment of the pump to the motor or geared motor is often disturbed in transit and must be checked before the pump is put into operation on units where flexible couplings are used the coupling guard must be removed and a straight edge laid across the two hubs. The maximum offset should be less than 0.380 mm.

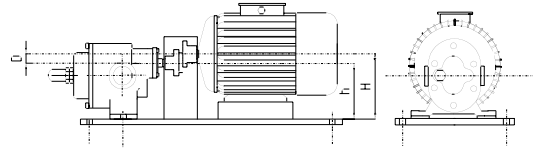
With a feeler gauge check the angular alignment of the coupling halves in four places at 90 degree increments around the coupling. This should not vary by more than 0.500mm.

Check the alignment of the pipes to the pump to avoid strains which might case damage to the pump or later cause misalignment. To check, unbolt flanges and ensure that pipes do not spring away or drop down. After pumps have been in opration for a few weeks rechegek alignment.

If the client must make alignment at later stage then some basic rules must be followed to ensure correct functioning.

The fundamental operations are:

- Accurately measure the height of the pump axis (h) and the height of the engine axis (H).

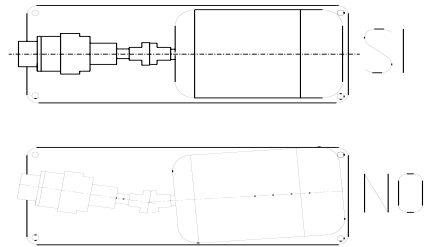


**Fig. 1.1.1.A**

- Calculate the difference:

$$D = h - H$$

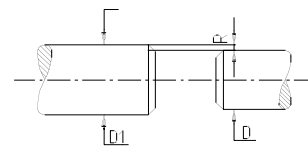
- Prepare alluminium (or steel) shims of thickness **D**.



**Fig. 1.1.1.B**

- Install on a single level base ensuring that the engine and pump are on the same level (fig. 1.1.A), positioning the shims where necessary (either under the feet of the pump or under the feet of the engine).

- Check that the axes of the two shafts coincide, measuring the two diameters by difference



**Fig. 1.1.1.C**

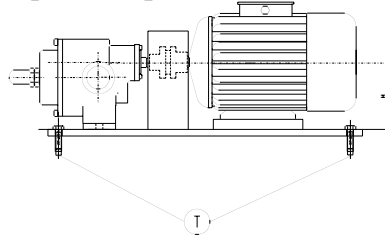
(Fig. 1.1.1.C.); i.e. accurately measure **R**

$$D1 = 2R + d$$

If these are not exactly the same then place metal sheets shims below the missing parts until the whole is completely level.

- Check that the pump and engine axes are perfectly coaxial (fig. 1.1.B) because any displacement would provoke a radial component causing fatigue stress which would damage both pump and engine.- **The engine block must be fixed (T) onto a rigid support which guarantees a level base** (Fig. 1.1.1.E); otherwise the engine block would be put

understresscausing the consequent displacement of the axes.



**Fig. 1.1.1.E**

- Before closing the butt strap, **manually rotate the engine pump coupling** to check that no part increases the friction and stress.
- **Connect the piping to the pump inlets.**
- **Connect the engine to the power supply.**
- **Open the suction and delivery valves.**
- **Turn on the power supply for a moment** to check that the pump rotates in the direction indicated by the arrow on the pump.
- **Start up the pump** and ensure that the pump engages immediately after start up.

### **1.1.3 GUARDS**

Guards must be fitted to comply with the latest European standard EN 349 to protect all moving parts.

**It is obligatory** to place a guard on the flexible coupling. This guard must be made installed so that it is impossible to have access, either on purpose or by mistake, to the flexible coupling. This guard must be firmly screwed onto the unit.

### **1.1.4 CONNECTION TO POWER SUPPLY**

Connect the engine to the mains, taking care that the engine voltage and plant voltage are compatible.

Start up the pump. Make sure that the rotation direction is correct and that the flow of liquid is regular and uniform after the pump has engaged.





















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