

# Installation Instructions

Required NPSH refers to water: Specific weight 1 kg/dm<sup>3</sup>, viscosity 1°E at maximum permissible revolutions:

## Operation and Maintenance

Check oil level prior to starting and ensure trouble-free water supply. Oil: Use only 12.5 ounces (0.37 litres) of Giant Oil (p/n 00154) or ISO VG 220 GL4 (e.g. Aral Degol BG220) or SAE 90 GL4 gear oil.

Initial change after 50 operating hours and then every 500 operating hours. In either case change oil every 6 months operation.

**Caution!** When operating in damp places or with high temperature fluctuations.

Oil must be changed immediately, should condensate (frothy oil) occur in the gear box.

Keep NPSH under control.

Max. input pressure 145 PSI (10 bar), maximum suction head -4.35 (-0.3 bar).



### Safety Rules

Pump operation without safety valve as well as any excess in temperature or speed limits automatically voids the warranty. The safety valve must be regulated in accordance with the guidelines for liquid spraying units so that the admissible operating pressure can not be exceeded by more than 10%.

When the pump is in operation, the open shaft end must be covered up by shaft protector (17), the driven shaft side and coupling by a contact protector.

Pressure in discharge line and in pump must be at zero before any maintenance to the pump takes place. Close up suction line. Disconnect fuses to ensure that the driving motor does not get switched on accidentally.

Make sure that all parts on the pressure side of the unit are vented and refilled, with pressure at zero, before starting the pump.

In order to prevent air, or an air/water-mixture being absorbed and to prevent cavitation occurring, the pump-NPSHR, positive suction head and water temperature must be kept under control.

**Cavitation and/or compression of gases lead to uncontrollable pressure-kicks which can ruin pump and unit parts and also be dangerous to the operator or anyone standing nearby.**

Giant Plunger Pumps are suitable for pumping clean water and other non-aggressive or abrasive media with a specific weight similar to water.

**Before pumping other liquids - especially inflammable, explosive and toxic media - the pump manufacturer must under all circumstances be consulted with regard to the resistance of the pump material. It is the responsibility of the equipment manufacture and/or operator to ensure that all pertinent safety regulations are adhered to.**



Please read operating instructions carefully before putting the pump in operation!

**Important!** Do not use grease when renewing the high pressure plunger seals (31/31A). Hot water causes grease to wash off the seal which in turn can jam valves! The new seals should only be oiled lightly before installation.

## Plant Lay-Out

For perfect functioning of the pump, the following points must be adhered to.

### a) Pressure in Suction Side

The stipulated NPSHR is the minimum required pressure above the vapor pressure of the medium and is never to fall short of this figure. Temperature and vapor pressure of the medium, the geodetical height of the location, the flow rate and loss of friction in the suction line, must all be taken into consideration. It may be necessary to install a booster pump (centrifugal pump) in the suction line.

### b) Pulsation

Due to its construction, the plunger pump creates pulsation in the suction and discharge lines. Suction pulsation in particular must be dampened in order to prevent resonance in the suction line which in turn, causes cavitation. Therefore, the pump is never to be connected by a rigid pipe but rather by a flexible hose (not reinforced by steel), and if possible 1.5 to 2 times wider than the suction connection. If a booster pump is used, the hose is to be attached between the booster pump and the high pressure pump.

If several pumps are used, each pump must have its own suction line. If this can't be done, a suction air chamber or a suction flow stabilizer must be installed in front of each pump. The bladder in the stabilizer is to be pretensioned on location.

Depending on the lay-out of the plant, a pressure accumulator may be necessary on the discharge side. This pressure accumulator must be installed right behind the discharge outlet of the high pressure pump. We recommend the use of only one pressure accumulator in the discharge line in order to avoid irritation which could be caused by different pre-tension levels in the accumulators.

Gas-tension in both the suction flow stabilizer and in the pressure accumulator are to be checked regularly.

## Maintenance

**Important!!** To lubricate the high pressure seals, the intermediate casing (48) is filled with high-temperature resistant grease at our works. This means the holes in the valve casing have to be closed with thread plugs (29A) - to be tightened with Loctite 572.

## Supplement Operating Instructions

The supplement operating instructions have been revised to now include the line "cooling water must be descaled to avoid lime formation due to warming" under the heading "Important". In addition, the temperature rating of 50 to 86 °F (10 to 30 °C) has been changed to 68 to 104 °F (20 to 40 °C) to increase safety against fracturing of the ceramic plungers caused by temperature shock.

The plant manufacturer should know that freshwater from the mains is not to be used for the cooling circuit (or alternatively the non-return rinse cooling option). In this case, there is a danger of lime and other contents separating from the water due to the heat and being deposited behind the high pressure seals and in the rinsing chamber. Such deposits lead to reduced seal life.

Normally the pumps on these (steam) boiler units are fed with treated water (condensate). For example, some water can be taken from the condensate container, reduced to 68 to 104 °F (20 to 40 °C) by a cooler, before being fed into cooling connections on the pump. This cooling water can then be led back to the condensate container or into the pump suction line.