

---

# PLEIGER HYDRAULIK

## Operating Instructions

### Radial Piston Motor MO-05 / MO-08



**PLEIGER**



## TABLE OF CONTENTS

1.	Introductions	Page 3
2.	General Operating Data for Standard Motors	Page 4
3.	Safety Advice	Page 4
4.	Information for Installation	Page 5 - 6
5.	Start-up	Page 6 - 8
5.1	Motors with step variable displacement - MOS	Page 7 - 8
5.2	Motors with infinitely variable displacement - MOR	Page 8
5.3	Motors with hydraulic brake - MOB	Page 8
6.	Suitable Pressure Fluid, Filtering and Temperature	Page 9
7.	Spare Parts / After-sales Service	Page 9
8.	Note	Page 10

## **1. Introduction**

The motors are suitable for both directions of rotation in open and closed hydraulic circuits.

During operation in open circuit it has to be observed that a load can be reduced only by means of appropriate check valves. Generally, in case of negative load, it will be necessary to feed the respective low-pressure side to avoid cavitation. Care has to be taken for a sufficient secondary protection with feeding between motor and directional control valve to avoid pressure peaks, excess pressure and low pressure in any phase of operation.

If the motor and the tank are standing on the same level, it will usually be not necessary for operation in open circuit to prepressurize the return line, however, it may be an advantage - depending on working pressure, speed, line routing, line length and cross section of the lines - to improve the smooth running of the motor. If the motor is placed above the tank, it will be necessary to prepressurize so that the return line will not run dry. The drain oil pressure must always be lower (max. 1,5 bar) than the return pressure.

If the motors are not put into operation immediately, they have to be filled up entirely with the mineral oil to be used for operation through the two main connections and the drain oil connection - in case of motors with brake and motors with step variable displacement additionally through the brake lifting connection or the change-over connection. Then all connections have to be closed tightly with plugs.

In case of storing the motors several months please contact our service department for information about the necessary preservation.

Apart from this operation manual, please pay attention to the technical advice and the performance data given in the catalogue.

## **2. General Operating Data for Standard Motors**

	nominal pressure	maximum pressure
MO 125 bis 3750-05	250 bar	275 bar
MO 4500-05	180 bar	210 bar
MO 110 bis 1600-08	210 bar	250 bar
MOS / MOR 3000 bis 3750-05	180 bar	210 bar
MOS / MOR 4500-05	160 bar	180 bar

Maximum pressible speed rates : see catalogue

Maximum pressible drain oil pressure: 1,5 bar

## **3. Safety Advice**

The motors must be operated only in perfect technical condition according to the acknowledged order information in consideration of the operating instructions!

A hydraulic motor as a driving engine has to be regarded in the sense of the EC Machinery Directive as a component not ready for use and, moreover, it must not be put into operation before the complete machine corresponds to the safety requirements of the EC Machinery Directive.

Only trained personnel with experience in hydraulics is allowed to carry out any work at the hydraulic equipment! Connecting lines which will be opened must be without pressure. Spurting oil may cause injuries and fire!

#### **4. Information for Installation**

The motor and the accessory lines have to be installed without stress. Flexible hose lines or pipes can be used which correspond to the requirements of pressure stage, temperature and operating medium. Those machine parts which are connected with the shaft have to be in alignment with the shaft by all means to protect the motor bearings from impermissible load. The mounting surface for the motor must be even and resistant to bending.

Elements for transmission like, for example, couplings have to be mounted and must never be hammered because otherwise the rolling bearings could be damaged.

In order to avoid an accumulation of heat in the motor casing and to maintain the lubrication of all sliding parts, the motor has to be installed in that way that the drain oil connection is pointing upwards and the casing will remain entirely filled. If the motor is installed with the shaft standing upwards, the motor has to be vented and the drain oil line has to be installed upwards - at least on the level of the mounting flange - so that the upper motor bearing will be lubricated.

Motors type MO with constant displacement have to be coupled with at least three oil connections. (More connections will be necessary according to chapter 5.1 and 5.2 for motors type MOS with step variable displacement and motors type MOR with infinitely variable displacement).

pressure connection A : clockwise rotation (B = reverse rotation)\*

pressure connection B : anti-clockwise rotation (A = reverse rotation)\*

drain oil connection L : the highest connection depending on the  
position of installation

\* direction of rotation always with view to the shaft

Before starting the initial operation, the motor casing has to be filled up entirely with clean operating medium through the highest drain oil connection L. For this purpose screw out the respective sealing plug by using a spanner with a female hexagon thread.

Utmost cleanliness is an essential prerequisite for a long service life and perfect function!

Only after a thorough cleaning and flushing of the piping system, the motor has to be coupled at the two main connections after removal of the protective covers.

The drain oil line has to be coupled with the highest drain oil connection of the motor after removal of the respective red plastic plug and has to be laid in that way that the motor casing cannot run dry in any phase of operation. If there is no red plastic plug in the upper connection, it must be replaced by a steel plug.

For treating the shaft sealing with care, the drain oil has to be conducted pressureless and separately to the tank. The cross section of the line should correspond at least to the size of the drain oil connection.

## **5. Start-up**

After having completely deaerated the hydraulic system, start up the motor with the lowest setting of the pressure relief valve. Only if the oil is without air bubbles, adjust the definite rates of pressure and speed. During the start-up procedure, change over the displacement of the motors type MOS and MOR several times so that air can escape from the change-over system. The maximum permissible rates of pressure and speed of the motors must not be exceeded. Motors being used at low ambient temperatures have to be operated with low output as long as the heat of the motor casing corresponds to the working temperature. Only then the motor should be operated with maximum output and speed.

The maximum working temperature of + 70° C must not be exceeded in any case. Greater differences in temperature between motor temperature and oil temperature have to be avoided.

After the test run, retighten all connections, screw joints etc. at working temperature.

When starting up, check and clean the filters in short intervals; then clean them regularly.

The quality of the hydraulic fluid should frequently be checked especially during the first time after start-up.

Depending on the operating conditions, the first oil change should be done as soon as possible. For further oil changes contact the oil supplier. The oil supplier will also give assistance concerning survey and analysis of the oil; make use of this service. In case of strongly discoloured or dirty oil contact the oil supplier even before the next stipulated maintenance is due.

## **5.1 Motors with step variable displacement - MOS**

By pressurizing the change-over connection U1 (control pressure = load pressure, but min. 40 bar, max. 250 bar and U2 without pressure) the motor will operate at full displacement, i.e. with a correspondingly low speed and maximum torque with a constant pump flow.

By pressurizing the change-over connection U2 (control pressure = load pressure, but min. 40 bar, max. 250 bar and U1 without pressure) the motor will operate with a small displacement and a correspondingly higher speed and reduced torque.

In case of a breakdown of the control pressure at the change-over connections U1 and U2, the motor will automatically change over to large displacement.

For the series MOS-05 the displacement can be changed over during operation and standstill.

For the series MOS-08 the change-over must not be carried out during standstill in any case.

## **5.2 Motors with infinitely variable displacement - MOR**

The supply of control pressure is effected through the connection Px (control pressure = load pressure, but min. 40 bar, max. 250 bar). In case of proportional solenoids without current, the motor changes over to maximum displacement. By increasing the current of the solenoid (max. 1,3 A), the motor will be infinitely adjusted to minimum displacement with existing control pressure. The time of adjustment mainly depends on the control pressure and load pressure.

The adjustment of displacement can also be effected with existing control pressure at standstill or during operation.

## **5.3 Motors with hydraulic brake - MOB**

Due to internal drain oil, the motor yields to load during standstill. Absolute standstill can be achieved only for motors with a built-on hydraulically released multi-disk brake (MOB / MOSB). The brake serves as a stopping brake and is not suitable for dynamic braking action because then the multi-disk would be destroyed.

In case of a built-on hydraulic brake care has to be taken that the port for brake lifting will always be without pressure and that the existing control boring will not be closed because only then the braking torque will have full effect.

## **6. Suitable Pressure Fluid, Filtering and Temperature**

We recommend to use pressure fluids on the basis of mineral oil acc. to group HLP, DIN 51524, part 2.

The range of viscosity should be within 20 mm<sup>2</sup>/s and 150 mm<sup>2</sup>/s, however it may be increased up to 700 mm<sup>2</sup>/s for a short time when starting up. The ideal viscosity, after attaining the working temperature, is about 40 mm<sup>2</sup>/s. Considering the permissible viscosity of the pressure fluid, the temperature is within the range of -25° C and + 70° C.

Service life, function and operational safety are decisively influenced by an effective filtering. Therefore we recommend a minimum purity of class 10 acc. to NAS 1638 with  $\beta_{25} \geq 75$  or even better.

## **7. Spare Parts / After-sales Service**

In case of motor trouble which cannot be eliminated by simple means and in case of replacing defective parts, please contact the central service department of the manufacturer:

Pleiger Maschinenbau GmbH & Co. KG  
Service Department  
Postfach 32 63  
D-58423 Witten  
Phone: 02324 / 398-205 or -209  
Fax: 02324 / 398-380

Repair work must be carried out only in the manufacturer's plant and in authorized expert machine shops.

## **8. Note**

The particulars given in this operation manual, in catalogues or in the form of other information by Pleiger Maschinenbau GmbH & Co. KG, its branches, sales offices or agencies are for users with expert knowledge.

The information in this manual and our technical advice for application in word, in writing and by tests are given to the best knowledge. They shall be applied, however, only as hints without obligation, also with reference to any protective rights of third parties. The advice does not relieve you from examining our advisory hints and our products by yourself with regard to their suitability for the intended procedures and purposes. Application and use of our products and those products manufactured by you on the basis of our technical advice for application are beyond our possibilities of control and, therefore, exclusively belong to your responsibility. The sale of our products is subject to our General Terms and Conditions of Sale and Delivery.



**Pleiger Maschinenbau  
GmbH & Co KG**

**Postfach 32 63  
D-58423 Witten**

**☎ +49 / (0) 2324 398-0  
Fax +49 / (0) 2324 398-380**

