

# Hydraulik-aggregates

## Otto-Hydraulics

# Operating manual

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## 1 General information of this operating manual

This operating manual applies to all aggregates of Otto-Hydraulics.

The user is solely responsible for the use of these instructions and fully accepts the corresponding risk. Otto Hydraulics GmbH & Co KG (hereinafter referred to as OH) shall not be responsible for exceptional and indirect damage or for accidental and consequential damage deriving from the use of this manual or from the use of the product or due to inexperience in the use of the manual or the product.

OH shall not be responsible, and also not towards third parties, for bad or improper installation, maintenance or repair of the product or for the use of non-original spare parts.

To ensure the correct use of the aggregate, OH requests to follow the instructions and recommendations of this manual.

The manual is intended for users with competent personnel specialization in the areas of hydraulics, electrics and mechanics. This manual cannot take the place of professional and skilled personnel. The user must ensure that his

personnel is familiarized with this operating manual and that they understand the instructions contained therein.

**Caution!** The hydraulic aggregate and its components may only be assembled, installed, started up and serviced by trained and competent personnel.



The operator is responsible for the choice of aggregate and accessories. It is therefore important for the operator to examine any problems associated with his special application by using appropriate analyses and trials.

**Caution!** The operator is also responsible for the installation of safety systems and the mounting of warning notices, as required in the applicable directives.



## 2 Usage and application information for the hydraulic aggregate

The aggregates are designed for operating with impetuses, in doing so its usually switches on an E-Motor to provoke a hydraulic pump. So for example a load can be lifted through one or more hydraulic cylinders. Normally the lifting speed is determined by the dimensions of the hydraulic cylinder, by the rotational speed of the electric motor and by the working volume of the

installed hydraulic pump. The particular applications have to be settled before the projection of the aggregate and they have to be documented and noted clearly.

The hydraulic aggregate shall only be used for the settled application stated above.

**Caution!** During operation and starting up of the hydraulic aggregate, make sure that:



- the aggregate is not exposed to mechanical oscillations and vibrations that could cause hydraulic medium to leak from the filling neck.
- the aggregate is not operated in an extremely dusty environment.
- the system parts to be connected to the aggregate, such as hydraulic cylinders, pipe and hose lines, are absolutely clean inside.
- the hydraulic medium used to fill the system must be absolutely clean.

### 3 Operating mode

The Aggregat may only be operated in intermittent operation as given in the specific documentation of the aggregate.

**Caution!** Continuous operation leads, if the aggregate isn't intended for such operations, to overheating and can cause damage, e.g.: Motor burnout, evaporation of hydraulic medium, leakage of poisonous vapours and melting of plastic parts



### 4 Safety instructions

The hydraulic aggregate has been designed and built according to current acknowledged state-of-the-art technology. It complies with existing laws and directives. The operator is responsible for the integration of the aggregate in his machine or system. The machine or the system in which the aggregate will be installed may only be prepared, started up and serviced by well-trained personnel. The following describes several dangerous states which can occur during operation. Sometimes a potentially hazardous situation appears to be normal, but it should not be underestimated.

Likewise, it should not be underestimated that excessive trust and measures which have become habitual could lead to a decline in the ability to perceive dangerous situations.

**Caution!** Unpredictable liquid splashes and leakages that are hot enough to



cause burns can occur during starting up, normal operation, during maintenance, adjustment work, system venting and while switching from valves or control units.

**Caution!**

Hydraulic medium can be hazardous to health, contact with skin and eyes can cause serious damage. The instructions contained in the safety data sheets of the hydraulic medium manufacturer regarding protection of personnel and safety must be obeyed.

**Caution!**

Hydraulic medium can be harmful to the environment. It is therefore recommended to place the aggregate in a spill tray to prevent environmentally harmful liquid from leaking and causing pollution.

**Caution!**

The intentional or unintentional manipulation of valves, accessories or components is not permitted. Opening a regulating valve can cause e.g. a load to drop unhindered or may release a clamped structure.

**Caution!**

All installation, maintenance, disassembly and replacement work on the hydraulic aggregate and its components may only be done in compliance with the safety instructions. During this work the hydraulic system must be depressurized (pressure 0) and the drives that are powered by the aggregate must be relieved (load 0).

**Caution!**

All electrical connections must be installed by competent personnel.

**Caution!**

Before beginning maintenance or repair work, the aggregate must be disconnected from all electrical power supplies for the electric and other electrically powered devices.



**Caution!** Parts of the hydraulic aggregate can become so hot that it can burn the skin. Observe the respective identification.



**Caution!** The aggregate has to be mounted into the machine / the environment, that maintenance work can be handled, easily.



The following is recommended for repair and maintenance work:

- use safety equipment such as protective goggles, gloves and safety shoes
- work in a clean environment
- use tools, equipment and facilities that are clean and in a good condition. Work under best possible safety conditions
- use of oil-absorbing media

## 5 Identification of aggregate

The aggregate is identified by a nameplate.

The following important information is visible on the nameplate:

- Manufacturer information
- Order number
- Type number
- Output of electric motor
- Hydraulic operating pressure
- Discharge rate of hydraulic pump
- Utilised hydraulic medium
- Container content
- Operating voltage of electric motor
- Control voltage of solenoid valves
- Year of manufacture (Year of construction)
- W-No.: (Serial number)

The individual aggregate can be clearly allocated by the data visible on the nameplate. In case of service, the W-No. is particularly important because it identifies all of the installed components.

## 6 Applied directives and standards

### Machinery Directive 2006/42/EG

The machine or system into which the incomplete machine (hydraulic aggregate) will be incorporated may only then be put into operation if it has been determined that the machine or system complies with the provisions of the Machinery Directive.

EN 982

Niederspannungsrichtlinie 2006/95/EG

## 7 Operating limits

- max. pressure: see nameplate
- max. volumetric flow: see nameplate
- min. temperature operating medium: - 10°C
- max. temperature operating medium: + 70°C
- min. ambient temperature: - 10°C
- max. ambient temperature: + 40°C

## 8 Storage

The aggregate must be treated with caution.

The aggregate should be stored in an environment that is not exposed to dust and direct sunlight. The ambient temperature should be between -10°C and +40°C.

## 9 Operating medium

For the operating of the hydraulic-aggregate, hydraulic oil of DIN 51524 Part 2, is appropriate

Suitable viscosity: 10 cst - 380 cst

If the operator would like to deviate from this specification, he may only do so after consultation with OH. The aggregate must be filled absolute via micro filter, filter fineness 20µm

## 10 Installation

### 10.1 Mechanical installation

Attention must be paid to greatest possible cleanliness during installation of the aggregate.

The aggregate must be set up at a location with easy access in case of inspection and maintenance work. The set-up site must be selected appropriately to provide protection from falling parts.

The aggregate should be securely fastened to the set-up site and situated as far from sources of noise and vibration as possible.

### 10.2 Connection of electric motor

The electric motor must only be electrically connected with the screwed cable glands at the terminal boxes provided by the manufacturer.

It is important to check, whether the motor is connected correctly as given by the manufacturers specifications.

It is important to check, whether the motor is an AC or DC Motor.

If AC Motors are used it is important to check whether it is a 1-phase or 3-phase Motor

**Caution!**  The terminal box of the electric motor contains metal components which have a hazardous high voltage charge. After the motor has been connected electrically, ensure the immediate closure of the terminal box with the terminal box cover.

**Caution!**  When connecting the electric motor, comply with the appropriate instructions in the electric motor operating instructions. The electric motor operating instructions are part of this operating manual and have been enclosed as such.

### 10.3 Connection of the solenoid valves

The solenoid valves are to be electrically connected via the device plug screwed to the magnetizing coil by means of suitable cable.

#### 10.4 Hydraulic connection

The hydraulic connections are identified by the letters "Z1" and "Z2". The screwed in adapters have a bore hole shape X as per DIN 3582/ISO 1179-1, ISO 9974-1. The connections of the hydraulic pressure supply are: threaded stems as per DIN 3853/ISO8434 with bore shape W as per DIN 3861.

#### 11 Start-up procedure

The direction of rotation of the motor has to be checked. In its delivered state, the pressure control valve is pre-set to the pressure value shown on the nameplate. Before starting up, ensure that the oil container is filled with oil.

After the system has been started up and the first movements of the lifting device have been executed, the system must be vented. Air accumulates at the highest points in the system, where it can be discharged through (ideally) previously installed ventilating valves. If the lines between the aggregate and drive are not very long, the system will vent automatically through repeated operation. This venting operation should occur during the idle state of the drive.

After this start-up procedure, the system is filled with hydraulic medium, the fluid level in the aggregate container has dropped accordingly and fluid should be refilled. After several operating hours, the system fluid level must be checked again and refilled as necessary.

#### 12 Maintenance instructions

Reliable operation of the hydraulic aggregate also depends on correct maintenance. Shortly after start-up it should be ensured that all screws and hydraulic couplings are firmly tightened. Pulsations and vibrations could have loosened the screws or screw connections.

It is necessary to keep the hydraulic aggregate clean in order to more easily discern leakages. To clean, use only a clean dry cloth; never use solvents or other cleaning agents.

**Caution!** Before beginning maintenance or repair work, the aggregate must be disconnected from all electrical power supplies for the electric motor and other electrically powered devices. Depressurize all parts of the system.



We recommend the following control intervals:

- 1 week after start-up
- 4 weeks after start-up
- subsequently every 3 months

During the controls, the following should be inspected

- Fluid level in container  
Here it is important that all drives with differential surface, e.g. hydraulic cylinders, are in a retracted position during the reading.
- Condition of hydraulic fluid and hydraulic fluid change  
pay attention here to colour (darkened), smell and milkiness; in the event of these changes replace the hydraulic fluid. The hydraulic fluid should be analysed once a year or, if this is not possible, the oil should be replaced. When changing the hydraulic fluid, comply with the laws for handling water-polluting service fluids. The cylinders in the system must be in a retracted position, if possible. Only new and clean hydraulic oil HLP may be filled as per DIN 51524 Part 2. We recommend filling in oil of the same brand and the same type.
- Temperature: The maximum oil temperature of 80°C may not be exceeded. If the operating time
- too high or too low motor supply voltage
- oil leakage in the aggregate or in the entire system.
- external leakage  
All components, joints and connections must be examined for signs of external leakage. Screws, screw connections and pipe connections must be tightened as necessary, defective seals must be replaced.
- Annotations concerning replacement of filter elements  
  
In general filters, return filters and pressure filters are equipped with single-use elements. These need to be replaced against new ones, after their dirt absorption capacity is depleted. The worn elements must be disposed as hazardous waste.  
  
Please find below our recommendations for the proper time for exchange of filter elements:  
  
If filters are equipped with optical and electrical maintenance indicators, filter elements need to be replaced when the indicator changes colour from green to red. In case the indicator consists of a pressure gauge, the filter condition can be read by the orientation of the indicator pointer, when reaching the red area the element must be replaced.  
  
Electrical maintenance indicators generate an electrical signal which needs to be evaluated.  
  
Please note, most indicator systems give a meaningful value only when there is

an oil flow through the filter.

If no maintenance indicator is available, the first element replacement shall take place after commissioning of the hydraulic system.

Afterwards we recommend to exchange the filterelements after 500 operating hours or once a year according to which occurs first.

### 13 Disassembly and disposal

When the hydraulic aggregate is to be put out of operation and scrapped, the remaining hydraulic medium must be carefully drained from all aggregate parts. The hydraulic oil must be disposed of according to existing provisions, regulations and laws.

The hydraulic aggregate to be scrapped should be dismantled into its individual parts and the various materials disposed of separately in accordance with existing provisions. The disassembly should be carried out by competent personnel; there are no exceptional hazards as long as suitable tools and facilities are used.

- subject to change -