

Installation and Operating Instructions for High pressure-Hydraulic power unit

E 09.751e



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Important

Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.

These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.

Disregarding or misinterpreting these installation and operating instructions invalidates any product liability or warranty by RINGSPANN; the same applies if the product is taken apart or changed.

These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others – either on its own or as part of a machine – to make it accessible to the user.

Safety Notice

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited RINGSPANN agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either RINGSPANN or an accredited RINGSPANN agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

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1. General remarks

1.1 General safety instructions

Please read these installations and operating instructions carefully before installing and operating the Hydraulic power unit. Please refer also to the drawings in the various sections.

All work with and on the hydraulic power unit must be carried out with due care and in terms of the maximum security.

Switch off the hydraulic power unit before you perform any work on the brake.

1.2 Special safety instructions



Danger to life and limb!

During installation, operation and maintenance of the hydraulic power unit, is to ensure that it is secured against accidental activation.

2. Application

The High pressure-Hydraulic power unit is used in RINGSPANN calipers, the:

- hydraulically actuated and released by spring force
(The braking force is generated by hydraulic pressure, the brake is opened by a spring force)
- or
- actuated by spring force and hydraulically released
(The braking force is produced by spring force, the brake is released by hydraulic pressure).

The integrated control of the valve of the unit is specially designed for the brake application.

3. Proper use / specified purpose

The hydraulic unit may only be set up to the maximum allowable pressure range of the brake. The hydraulic unit is designed for maximum 50 cycles/hour.



Caution!

The maximum allowable operating pressure of the connected brake is essential to observe.

The hydraulic unit has been designed for use as an actuating element for RINGSPANN calipers.

Other uses are improper and incompatible with the specified purpose. RINGSPANN assumes no liability for damages resulting from improper use. The risk is assumed by the user alone.

4. Improper use

Operating the hydraulic power unit under higher pressure than that specified in the technical specifications or with other pressure media is prohibited. Unauthorized constructive modifications

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are prohibited. RINGSPANN assumes no liability for damages resulting from improper use. The risk is assumed by the user alone.

5. Condition upon delivery

The hydraulic power unit is delivered tested.

Delivery is as ready for installation element with corresponding adjusted working pressure (and/or working pressure range). The customer can manually set the pressure range on the adjustment screw on the valve on the hydraulic unit in 1100 to pressure p_{max} . (see Appendix A).

6. Technical requirements for safe operation

An attachment of hydraulic power unit of stable and low vibration machine parts to ensure trouble-free operation.

7. Installation of High pressure-Hydraulic power unit

7.1 Safety Instructions for Assembly and Installation



Caution!

For safety reasons, no cable glands, connections or device must be disconnected while the system is pressurized!



Caution!

Leaking hydraulic fluids cause an increased risk of accidents: Because oily surfaces may result in slipping or falling, apparent outer leaks must be prevented by completely removing and/or eliminating them. Working with oily hands may result in an increased risk of injury!



Caution!

The contact of hydraulic fluids with skin may cause diseases and should therefore be avoided by wearing suitable protective gloves or protective skin creams!



Caution!

Hydraulic fluids generally constitute a potential fire hazard. For this reason, leaks must be promptly removed and combustible materials, such as cardboard, containing fluid splatters must be promptly disposed. With hydraulic fluid in conjunction coming materials are hazardous waste!
Near existing sources of ignition should be prohibited!

7.2 Assembly instructions

Unit assembly



Caution!

The unit must not be acted upon by hydraulic pressure when assembling.
The installation position is vertical with motor down.

Prior to mounting, to examine whether the fastening surfaces is absolutely level and clean. The mounting screws are tightened according to the present in an individual case friction values with the specified torque according to VDI 2230.

It is important to ensure the correct installation position and the permissible ambient temperature. Permissible temperature range standard: min. -15 °C; max. +40 °C.

The operating voltage, in particular of the valves is to be noted.



Please note!

Some valves are equipped with a rectifier plug.

Valves must be installed free of tension so as to prevent the jamming of control pistons.

Step drills must be perfectly aligned, in order to avoid any distortion of the housing.

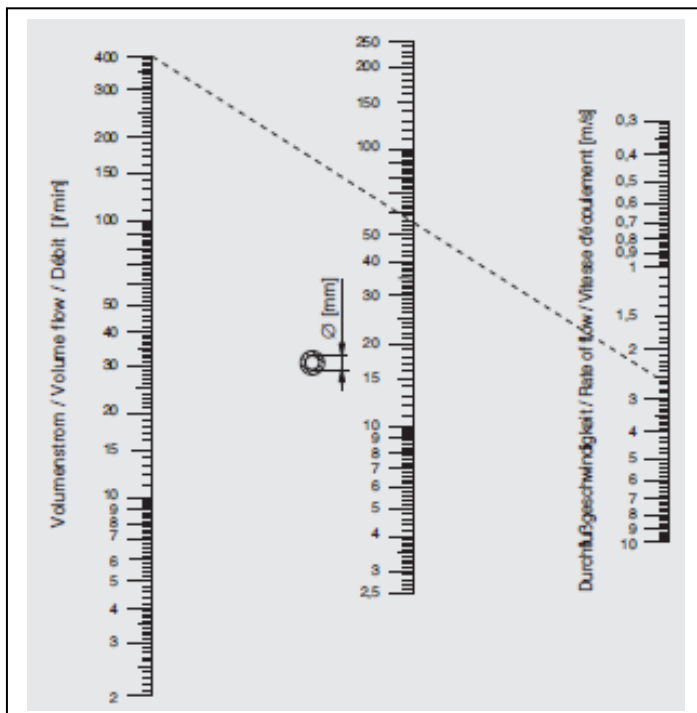
Installation of tubes and pipes

The brake has to be connected to port “Z” G3/8.

When selecting pipes, tubes and connecting parts, make sure you have chosen the adequate wall thickness and the correct material.

Use only seamless precision steel tube in sufficient dimensioning.

The nomogram can be of some help when determining the internal diameter of tube.



Recommended oil flow velocity

| | |
|------------------------------|-----------------|
| Suction lines | 0.5 ... 0.8 m/s |
| Return lines | 2 ... 4 m/s |
| Pressure lines up to 100 bar | 2 ... 4 m/s |
| Pressure lines up to 315 bar | 3...12 m/s |

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Remove scale, sand, dirt and chips from pipes before assembly: welded pipes have to be steeped in corrosive fluid and flushed.

Pipes have to be placed free of stress and in installed way that they cannot transmit vibrations.

Hydraulic hoses have to be mounted free of torsion, they have to be mounted with a sufficient bending radius and always with sag.

The tube connections and the depths of thread have been made to suit screw connections with sealing edges and elastomer seals.



Caution !

Never use hemp and putty for sealing.



Caution!

The thread mustn't be touch the bottom of the bore.

Swivel nuts have to be tightened sufficiently. Please note:

Fix the swivel nut until an increase of the tightening force is achieved. Then tighten the nut for another 1/4 turn, when the fitting metallic sealed; or a 1/2 turn when the fitting elastomer sealed.

8. Start up

8.1 Aggregat

After properly executed installation of the system, the commissioning can be carried out. The following things are to check before:

- Has the tank been cleaned?
- Have the tubes been cleaned and properly installed? (flush pipes and tube lines)
- Have the screw connections and flanges been tightened?
- Have the lines and the wiring been correctly connected according to the mounting and circuit diagrams? Pay special attention to correct voltage and correct connection with solenoid valves. Fluctuations of the operating voltage shouldn't exceed $\pm 5\%$.
- Has the required oil been filled up to the upper oil level mark?

For commissioning, perform the following steps in sequence:

- Is the pressure relief valve completely open?
- Bring the bypass valve - if available - into open center position.
- Does the direction of rotation of the drive motor correspond to the given direction of the arrow on the drive motor? Quickly switch on and check the direction of rotation .
- Open the suction valves - if available - of the pump.
- Start pump and pay attention to noises.
- Switch bypass valve – if available.
- Flush the system, if possible, by short-circuiting the consuming devices. Rinse, until the filters remain clean (Check filters!).

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- Exhausting of the system, if possible, by short-circuiting the consuming devices, if possible at the highest point. Actuate the directional valves. Slowly increase pressure. Increase set values of pressure relief valves. Ventilation is guaranteed if there is no oil foam in the tank, if there are no jerky movements by the consuming devices and no unusual noises.
- Check the functions of the system without exercising pressure. Run the system manually if possible.
- After reaching the operating temperature check the system under pressure.
- Slowly increase pressure.
- Constantly watch the control and measuring equipment.
- Pay attention to unusual noises
- Watch oil level, if necessary add more oil
- Check setting of pressure relief valves by applying pressure or by slowing down the system.
- Leak test
- Switch off drive unit
- Tighten all screw connections, even if they do not leak.



Caution!

Only tighten the connections if the system is no pressurized.

Complete performance test of the system. Compare the measured values with the permissible or required data (pressure).



Please note!

Jerky movements may indicate unnoticed inclusion of air.
The system is completely exhausted, if all functions are performed jerk-free and the system runs smoothly.

The insulation of the standard motors corresponds to the insulation class F according to the VDE regulations 0530. The admissible ambient temperature is 40 °C.

8.2 Switching sequence to control the brake

Valve "0600" must be closed. Now the electric pump "0150" must be switched on. The hydraulic pressure increases, the brake gets activated and the pressure switch "1100" send a signal as soon as the preset pressure is reached. Now the electric pump "0150" must be switched off. Valve "0600" keeps power supplied and the brake keeps activated. In case of pressure decrease the pressure switch "1100" send a signal and the electric pump "0150" has to be switched on again till the pressure switch "1100" send the signal "pressure reached".
To switch off the brake valve "0600" has to be switched off.

9. Maintenance

9.1 Pressure fluid

Pressure fluid level

If the oil level drops below the required fluid level (and therefore drops below the fluid volume) the operating temperature rises, air collects, which can then lead to failure of the pump due to cavitation.



Caution!

Check the fluid level daily on every operating day.

Temperature

For the pressure medium recommended temperature range of -10 °C to +70 °C should be maintained if possible. Independently thereof an oil temperature of +70 °C should not be exceeded. In order to guarantee constant response characteristics of the system, the oil temperature should be kept at a constant value $\pm 5\%$. In a sudden strong increase in temperature the system must be turned off immediately and determine the cause of the temperature increase.

Ageing of pressure fluid

The following table provides information about the condition of the hydraulic fluid by simple visual assessment.

| Result | Contamination | possible cause |
|-----------------------------------|--------------------|--|
| Dark color | Oxidation products | Overheating; oil change not carried out (possible penetration of oil from connected units) |
| Milky turbidity | Water or foam | Intrusion of water; air inlet |
| Water separation | Water | Intrusion of water, e. g. cooling agent |
| Air bubbles | Air | Air access, e. g. due to lack of oil, leaky suction line |
| Drifting or settled contamination | Solid impurities | Wear, dirt, ageing products |
| Smell of burnt oil | Ageing products | Overheating |

Changing of pressure fluid

The first oil change has to be performed directly after the start up. Provided normal operating conditions and regular filter changes, oil changes are necessary every 2000 – 3000 operating hours.

9.2 Filter

The fineness of the filter is used 90 μm .

Filters without contamination indicators have to be changed for the first time after the first start up. Then the filters have to be checked every 250 operating hours and, if necessary, changed. Filters with contamination indicators have to be checked daily after the operating temperature is reached.

Depending on the environmental conditions, the performance of ventilation filters has to be checked and, if necessary, the filters exchanged.

9.3 Flexible tubes

Flexible tubes are to be examined at least once annually for their work-safe condition by experts. The use duration of the flexible tubing should not exceed 6 years. Also with appropriate storage

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and permissible operating the flexible tubes have a natural ageing. Thus its storage time and use duration are limited.

Flexible tubes have to protected against environmental influences e.g. strong ultraviolet radiation, solvents, detergents, fuels and lubricants, or a high ozone concentration.

The flexible tube must be changed after expiration of the use duration from experts.

9.4 Pumps

The pumps used are automatically lubricated by the hydraulic oil and therefore need no maintenance. Maintenance is thus limited to the unconditional keeping the clean hydraulic oil.

Occur during operation high noises on, then do the following for finding the root cause

- Check electric drive motor (e. g. ventilator)
- Check suction and pressure lines
- Check pump for wear, if necessary clean filter or exchange cartridge
- Check fluid level in the tank (too low?)
- If there are air inclusions, exhaust

10. Pressure media

In order to ensure the faultless performance, operational reliability, working life and economy are to use during normal operating conditions HLP hydraulic oils to DIN 51524. The oils listed in the table below satisfy these conditions.

| Certification according to DIN 51502 | HLP 46 |
|--------------------------------------|--|
| Panolin ¹ | HLP Synth 46 |
| Eni (Agip) | Agip OSO-46 Agip ARNICA-46 Agip PRECIS HLP 46 |
| ARAL | ARAL Vitam GF 46* |
| BP | BP Energol HLP-HM 46 BP Energol HLP-D 46 BP Bartran 46* |
| Castrol | Hyspin AWS 46 Hyspin ZZ 46* Tribol 943 AW-46* |
| ESSO | NUTO H 46 |
| FINA | FINA HYDRAN 46 FINA HYDRAN HLP-D 46 |
| FUCHS-DEA | RENOLIN MR15 VG 46 RENOLIN B 15 VG 46 RENOLIN ZAF B 46 HT* |
| Mobil | Mobil DTE 25 Mobil SHC 525 |
| SHELL | Shell Tellus S2 M 46 Shell Tellus S3 M 46* |
| Chevron (TEXACO) | Rando HD 46 Clarity Hydraulic oil AW 46* |
| Valvoline | Ultramax HLP-46 |
| TOTAL | Azolla ZS 46 Azolla AF 46* |

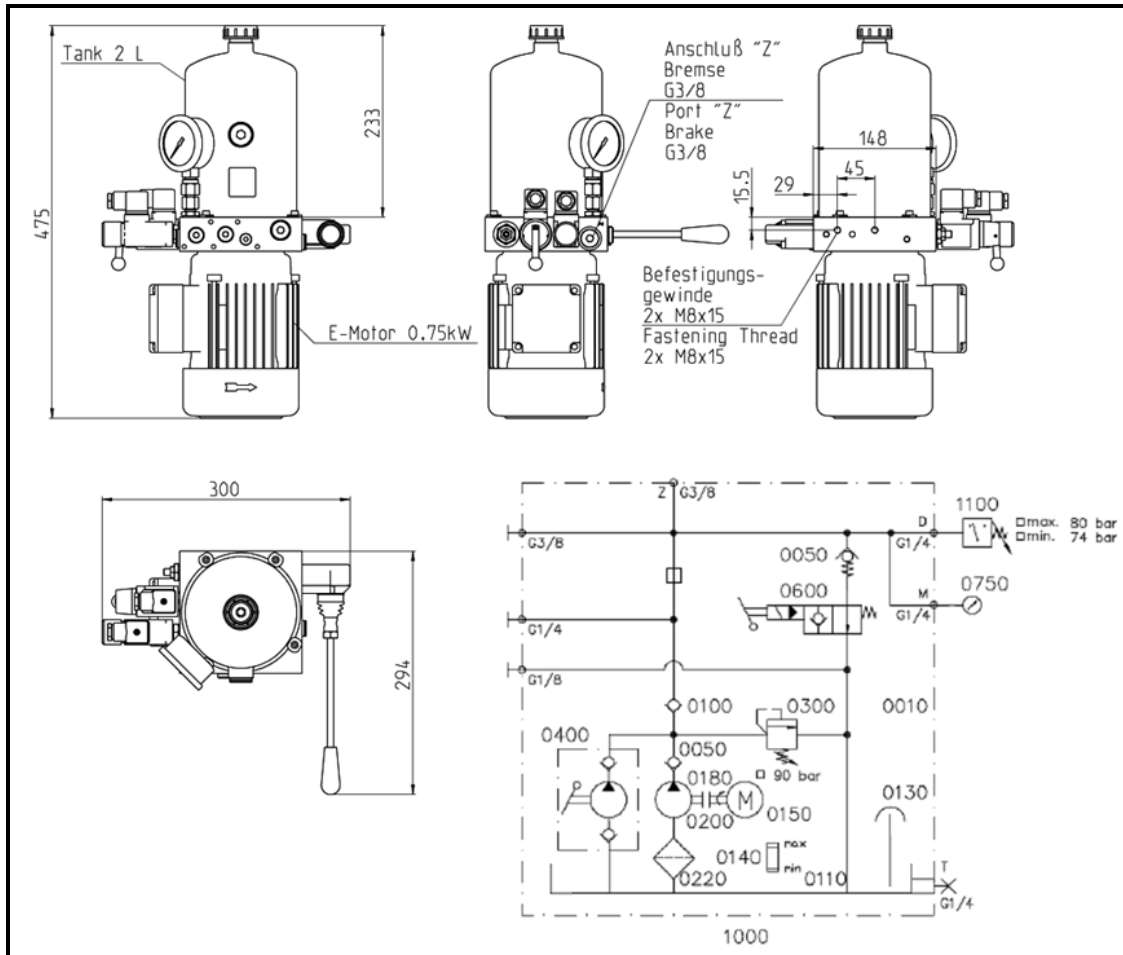
¹ biodegradable

* free of heavy metals

11. Appendix

11.1 Appendix A – Dimensions and technical data hydraulic power units

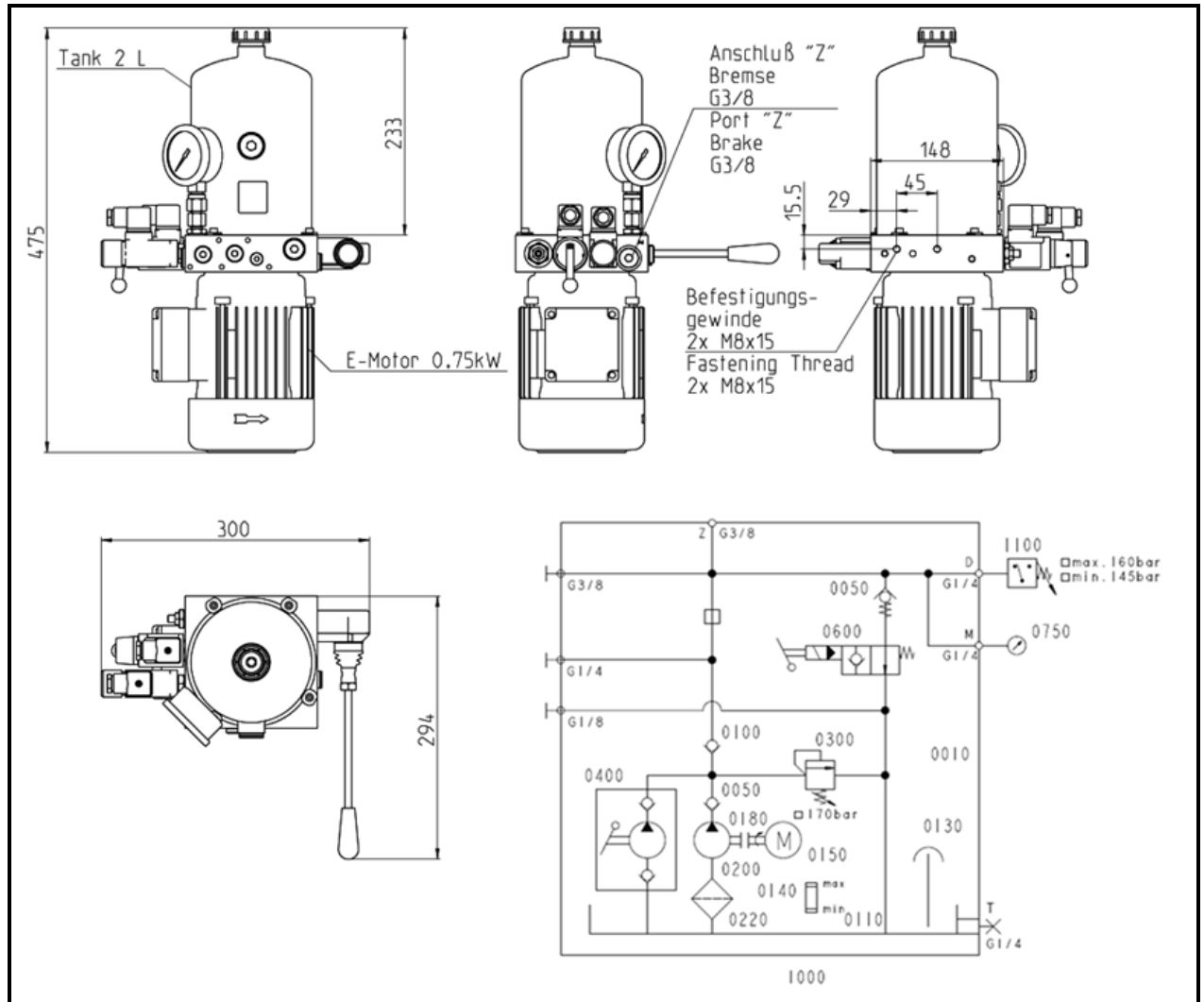
Hydraulic power unit 3515-000026-000000



Technical specifications:

| | | |
|-------------|------------------------|--|
| Power unit: | max. 50 cycles/hour | |
| E-motor: | Nominal capacity P: | 0,75 kW |
| | Voltage range U: | 220-240/380-420V bei 50 Hz 254-280/440-480V bei 60 Hz |
| | Rated speed n: | 2800 min ⁻¹ |
| | Direction of rotation: | from fan side right |
| | Electrical protection: | IP55 according DINN 40050 |
| Pump: | Rated speed n: | 2800 min ⁻¹ |
| | pressure pmax.: | 90 bar |
| | Displacment: | 4,4 l/min |
| Tank: | Volume V: | 2 liter |
| Valve: | Valve power supply U: | 24 V/DC |

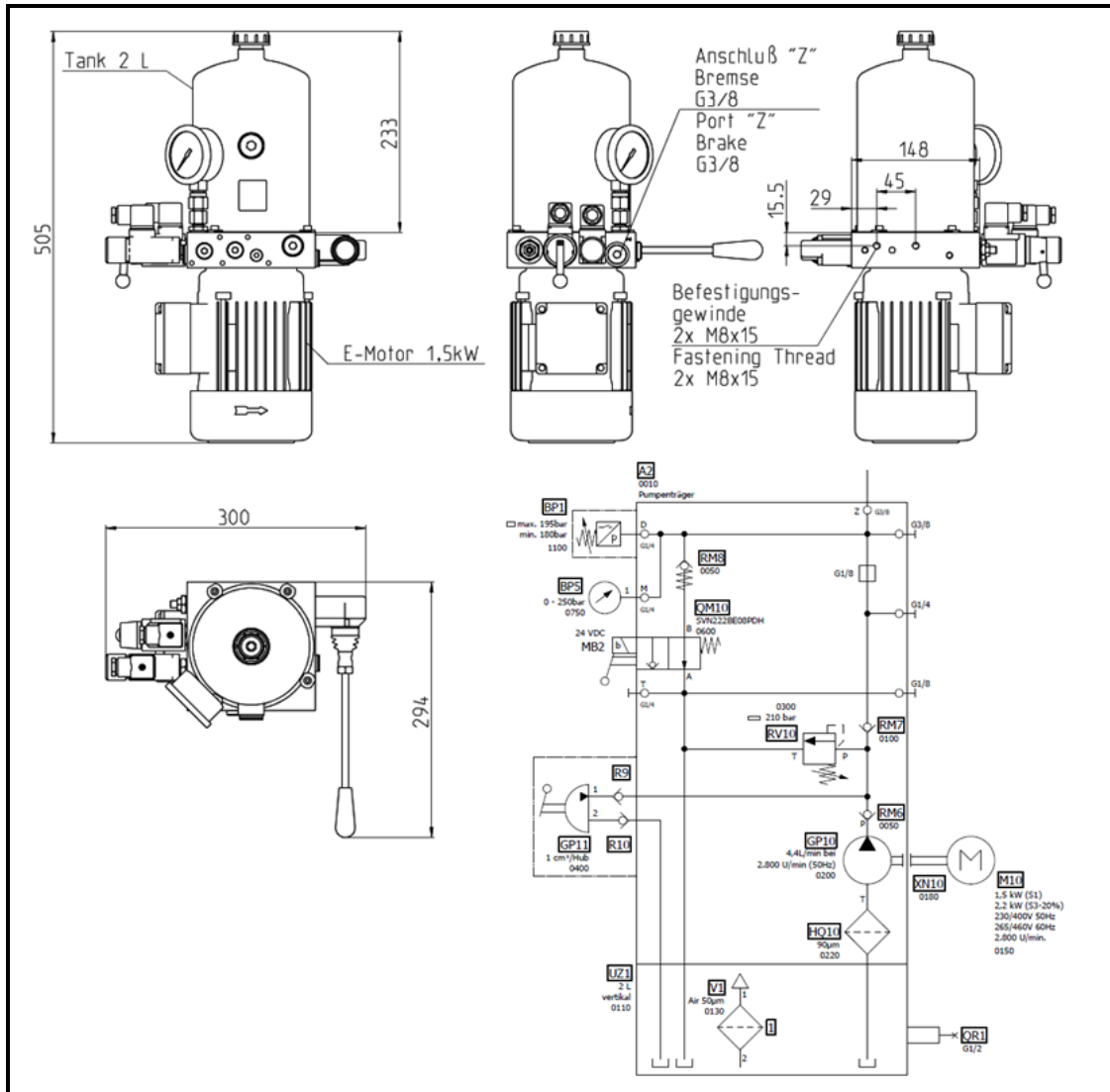
Hydraulic power unit 3515-000025-000000



Technical specifications:

| | |
|-------------|---|
| Power unit: | max. 50 cycles/hour |
| E-motor: | Nominal capacity P: 1,5 kW |
| | Voltage range U: 220-240/380-420V bei 50 Hz 254-280/440-480V bei 60 Hz |
| | Rated speed n: 2800 min ⁻¹ |
| | Direction of rotation: from fan side right |
| | Electrical protection: IP55 according DINN 40050 |
| Pump: | Rated speed n: 2800 min ⁻¹ |
| | pressure pmax.: 170 bar |
| | Displacment: 4,4 l/min |
| Tank: | Volume V: 2 liter |
| Valve: | Valve power supply U: 24 V/DC |

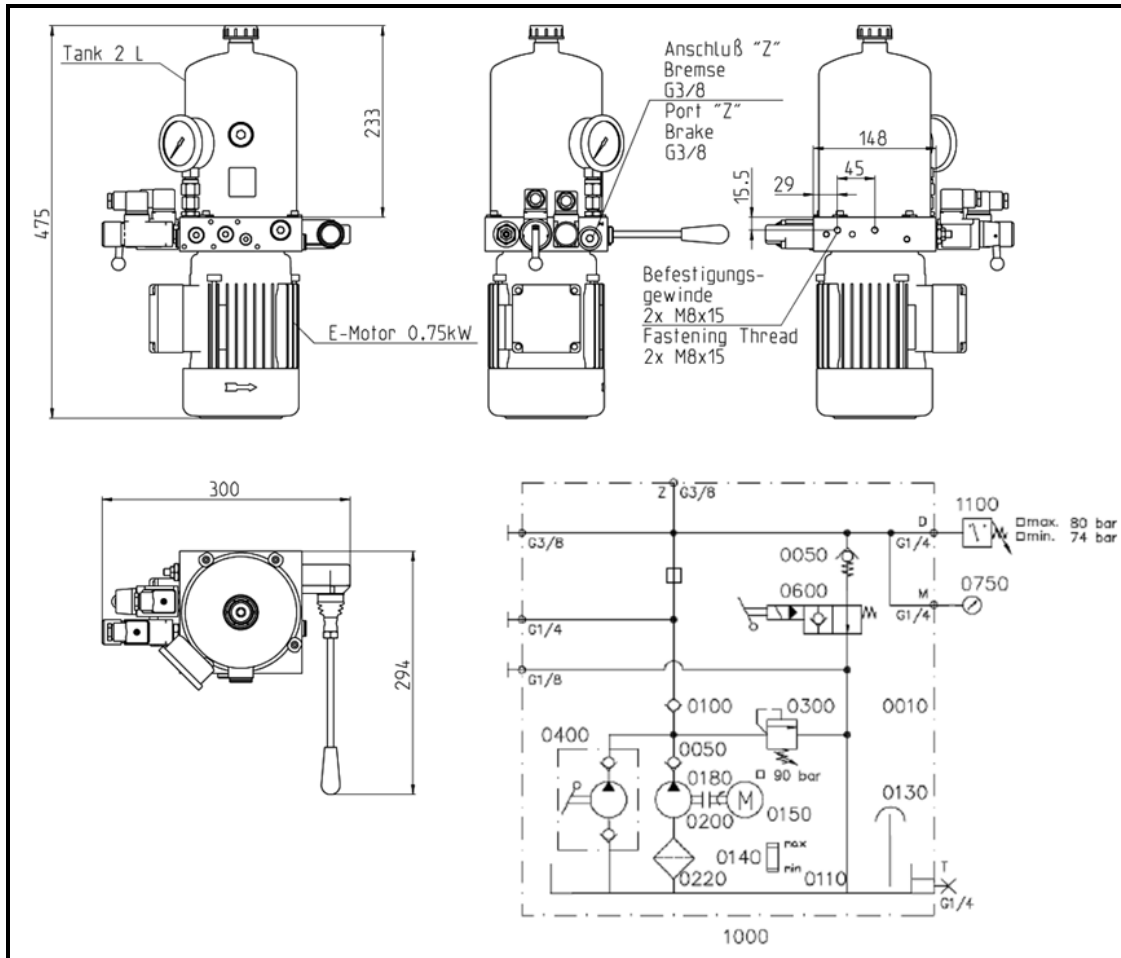
Hydraulic power unit 3515-000034-000000



Technical specifications:

| | |
|-------------|--|
| Power unit: | max. 50 cycles/hour |
| E-motor: | Nominal capacity P: 1,5 kW |
| | Voltage range U: 220-240/380-420V bei 50 Hz |
| | 254-280/440-480V bei 60 Hz |
| | Rated speed n: 2800 min ⁻¹ |
| | Direction of rotation: from fan side right |
| | Electrical protection: IP55 according DINN 40050 |
| Pump: | Rated speed n: 2800 min ⁻¹ |
| | pressure pmax.: 210 bar |
| | Displacement: 4,4 l/min |
| Tank: | Volume V: 2 liter |
| Valve: | Valve power supply U: 24 V/DC |

Hydraulic power unit 3515-000035-000000



Technical specifications:

| | |
|-------------|---|
| Power unit: | max. 50 cycles/hour |
| E-motor: | Nominal capacity P: 0,75 kW Voltage range U: 220-240/380-420V bei 50 Hz 254-280/440-480V bei 60 Hz Rated speed n: 2800 min ⁻¹ Direction of rotation: from fan side right Electrical protection: IP55 according DINN 40050 |
| Pump: | Rated speed n: 2800 min ⁻¹ pressure pmax.: 90 bar Displacment: 4,4 l/min |
| Tank: | Volume V: 2 liter |
| Valve: | Valve power supply U: 230 V/AC |