Shinhoo®

Mega S PUMPS

Installation and Operation Manual

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CONTENTS.

Warning
This document must be carefully reviewed before proceeding with the installation of the equipment. The equipment must be installed and operated in accordance with the requirements of this document and local codes and regulations.

1. Safety instructions

Warning
This equipment must be operated by personnel with the necessary knowledge and experience.
Persons with physical, mental, visual and hearing disabilities shall not be admitted to operate this equipment. Children should not have access to this equipment.

General information about document

The Data Sheet, Installation and Operating Instructions contain fundamental information that must be observed during installation, operation and maintenance. It is therefore essential that the relevant operating personnel or the user familiarizes themselves with them before installation and commissioning. This document must be permanently available at the place of use of the equipment.

In addition to the general safety instructions in section *1. Safety Notes*, but also the special safety notes in the other sections.

Meaning of symbols and description on the product

Instructions placed directly on the equipment, e.g:

- arrow indicating the direction of rotation,
- designation of the pressure connection for pumped medium supply,

must be compulsorily observed and preserved so that they can be read at any time.

Qualification and training of maintenance personnel

Personnel who carry out operation, maintenance and inspection work as well as installation of the equipment must have the appropriate qualifications for the job. The scope of matters for which the personnel are responsible and which they must supervise, as well as their area of competence, must be precisely defined by the user.

Dangerous consequences of non-observance of the safety instructions

Failure to observe the safety instructions may result in:

- dangerous consequences for human health and life;
- endangering the environment ;
- voiding all warranty claims for damages;
- failure of critical equipment functions;

- ineffectiveness of prescribed maintenance and repair methods;
- a dangerous situation for the health and life of personnel due to electrical or mechanical factors.

Performing work in compliance with safety techniques

The safety instructions in this document, the existing national safety regulations as well as any internal work, operating and safety regulations applicable to the user must be observed during the work.

Safety instructions for the consumer or service personnel

- It is forbidden to dismantle the existing protective guards for moving parts and components when the equipment is located in operation.
- The possibility of electrical hazards must be excluded (for more details, see e.g. the regulations of the local power supply companies).

Safety instructions for maintenance, inspection and installation work

The user must ensure that all maintenance, inspection and installation work is carried out by qualified personnel who are authorized to carry out such work and have been sufficiently familiarized with it through a detailed study of the installation and operating instructions.

All work must always be carried out with the equipment switched off. The shutdown procedure described in the installation and operating instructions must be strictly adhered to.

Immediately after completion of work, all safety and protection devices that have been removed must be reinstalled or switched on again.

Self-conversion and manufacture of spare parts and components

Conversion or modification of the devices may only be carried out in agreement with the manufacturer.
Original spare parts and components as well as components authorized by the manufacturer are designed to ensure reliable operation.

The use of assemblies and parts from other manufacturers may cause the manufacturer to deny liability for any resulting consequences.

Unacceptable operating modes

The operational reliability of the supplied equipment is guaranteed only if it is used according to with functional purpose according to section *6. Scope*. Maximum permissible values specified in
in the technical data must be compulsorily observed in all cases.

2. Transportation and storage

The equipment should be transported in covered wagons, closed cars, by air, river or sea transport.

During transportation, the packed equipment must be securely fastened to the means of transportation to prevent unintentional movement.

Ambient temperature during transportation:
-40 to +70 °C. The maximum designated storage period is 2 (two) years. No preservation is required during the entire storage period.

3. Meaning of symbols and inscriptions

Warning
Failure to observe these instructions can have dangerous consequences for human health.

Warning
Failure to follow these instructions may result in electric shock and have life- and health-threatening consequences.

Warning
Contact with hot surfaces of the equipment can cause burns and serious bodily injury.

Attention

Safety instructions which, if not followed, may cause equipment failure or damage to the equipment.

Guideline

Recommendations or instructions to facilitate work and ensure safe operation of the equipment.

4. General information about product

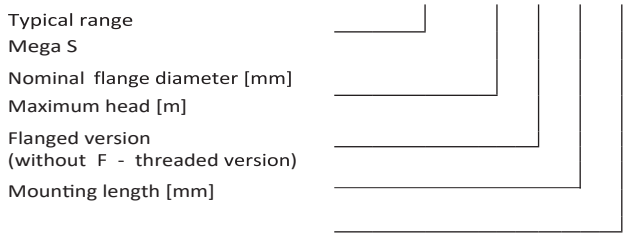
This document applies to the pumps of the MEGA S series. Circulation pumps included in the complete range MEGA S, are equipped with the integrated option of control to ensure that pump performance is matched to the actual system requirements. In many systems this results in significant energy savings, reduced noise from thermostatic control valves and similar fittings, and improved system controllability. The required head can be set on the control panel.

Design

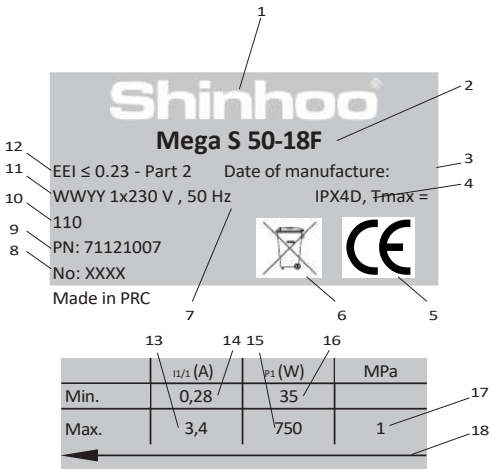
MEGA S pumps have a hermetically sealed rotor, i.e. pump and motor form a single unit without mechanical shaft seal. The bearings are lubricated by the pumped liquid.

Type designation

Example **Mega S 50-18F 280**



Mega S nameplate



Pos.	Name
1	Brand
2	Type designation

Pos.	Name
3	Date of manufacture YYWW, where YY is the year of manufacture, WW is the week of manufacture
4	Maximum fluid temperature
5	Market mark
6	Manipulation sign
7	Degree of protection
8	Country of manufacture
9	Serial number
10	Item
11	Number of phases and mains voltage; rated current frequency
12	Energy Efficiency Index EEI
13	Maximum current consumption
14	Minimum current consumption
15	Minimum power
16	Maximum power
17	Maximum system pressure
18	Direction of rotation

Due to the functioning of the integrated Quality Management System and the integrated q u a l i t y tools, the QA stamp is not indicated on the type plate. Its absence does not affect the quality assurance of the final product and its marketability.

The equipment is not supplied with accessories and tools for adjustments, maintenance and intended use. Use standard tools in accordance with the safety requirements of the manufacturer.

Check valve

If a check valve is installed in the piping system (*1), it must be ensured that the set minimum pump discharge pressure is higher than the valve closing pressure. This is particularly important for the control mode

proportional pressure change (at reduced head in case of minimum flow).

Fig. 1 Check valve

Operation with closed shut-off valves

Mega S pumps can be operated harmlessly for several days with closed shut-off valves and at any speed.
It is recommended to set the control mode to minimum speed to reduce energy consumption. There is no minimum flow requirement.

Attention

The pump inlet and outlet valves must not be closed at the same time to prevent pressure build-up.
The pumped liquid and ambient temperatures must not exceed the specified values.

5. Packing and moving

Packaging

Upon receipt of the equipment, inspect the packaging and the equipment itself for any damage that may have occurred during transportation. Before disposing of the packaging, carefully check for any documents or small parts that may have been left behind. If the equipment received does not match your order, contact to the equipment supplier.

If the equipment is damaged in transit, contact the shipping company immediately and notify the equipment supplier.

The supplier reserves the right to thoroughly inspect possible damage.

For information on disposal of packaging, see section *19. Information on the disposal of packaging.*

Product inspection

Check that the voltage and frequency of the product are the same with on-site voltage and frequency. See section *Mega S nameplate* .

Scope of supply

Fig. 2 External view of the MEGA S pump

The box contains the following components:

- Mega S pump
- Safety instructions

Moving

Warning
Local code restrictions for manual lifting and loading and unloading operations must be observed.

Do not lift the equipment by the supply cable.

6. Area of application

The Mega S pump is designed for pumping liquids in the following systems:

- of the heating system;
- systems that utilize geothermal energy;
- solar heating systems.

Pumped fluids

The pump is designed for pumping clean, non-viscous, explosion-proof, solids-free or long-fiber-free liquids that are chemically neutral to the pump materials.
In heating systems, water must meet the requirements of local water quality standards for heating systems.

Glycol

The pump can be used for pumping ethylene glycol and water solutions up to a concentration of 50%.
The use of solutions with a concentration greater than 40% reduces the heat capacity of the fluid and the efficiency of heat transfer. Pump operation is controlled by the function power limitation, which provides protection against overloads.
When pumping glycol solutions, the maximum characteristic and pumping performance is degraded, which depends on the concentration of the solution/glycol as well as on the temperature of the liquid.
To prevent the glycol solution from changing parameters, it is necessary to control the temperature of the fluid above the operating temperature; it is also necessary to reduce the operating time at high temperatures.
The system must be cleaned and flushed before adding glycol solution to the system.
The condition of the glycol solution must be monitored regularly to prevent corrosion or lime scale formation.
If additional dilution of ethylene glycol is required, follow the instructions in the glycol supplier's manual.

Warning
Do not use pumps to pump flammable liquids such as diesel fuel and gasoline.

Warning
Do not use the pump to pump corrosive liquids such as acids and seawater.

Adding additives with density and/or kinematic viscosity higher than that of water to the coolant reduces the pump performance and there is a risk of sludge formation on the working surfaces of the pump, which will reduce the service life of the equipment.

Guideline

7. Principle of action

The operating principle of the MEGA S series pumps is based on increasing the pressure of the liquid moving from the inlet to the outlet. The pressure increase is achieved by transferring mechanical energy from the motor shaft, coupled to the pump shaft, directly to the liquid by means of a rotating impeller. The liquid flows from the inlet to the center of the impeller and further along its vanes. Under the action of centrifugal forces, the velocity of the liquid increases, hence the kinetic energy increases, which is converted into pressure. The spiral chamber (volute) is designed to collect the fluid from the impeller and direct it to the outlet.

8. Mechanical installation

Location installation

The pumps are intended for indoor installation. The pumps must be installed in dry conditions, without danger of getting wet, e.g. from the ambient air.
It is not recommended to install in places such as:

- Indoor swimming pools, as the pump will be exposed to the pool environment.
- Locations with direct and prolonged exposure to the marine atmosphere.
- Rooms containing hydrochloric acid vapor (HCl) in the air, e.g. as a result of leakage from open tanks or when containers are frequently ventilated.

The use of the MEGA S pumps is not prohibited in the respective application areas, but direct installation in rooms is not recommended with the described environment.

The following requirements must be observed to ensure adequate cooling of the motor and electronics:

- The pump must be installed in such a way that it is adequately cooled.
- The ambient temperature must not exceed 40 °C.

Mounting pump

The Mega S series includes pumps with flange and threaded connection.

The pump should be installed in such a way as to avoid misalignment and tension in the piping, which could damage the pump.

The pump can be mounted without additional supports directly on the piping, provided that the piping can support its weight.

Procedure for installing the pump:

1. The arrows on the pump casing show the direction of fluid flow through the pump.
   The direction of fluid flow can be horizontal or vertical, according to the direction of fluid flow the position of the control unit must be changed.
2. Close the shut-off valves and make sure that the system is not pressurized during pump installation.
3. Install the pump with gaskets on the piping.
4. Install bolts, washers and nuts. Size the bolts according to the system pressure.

Mounting position

The pump should always be installed so that the motor shaft is horizontal.

Changing the position of the control unit

The control unit can be rotated in 90° increments. Change the position of the electronic control unit.

1. Close the pump inlet and outlet gate valves;
2. Remove the four bolts securing the stator to the volute. While doing so, hold the stator from falling without removing it from the pump.
3. Without removing the stator from the volute , rotate on the shaft axis so that the cable glands point downward;
4. Align the mounting bolt holes; Install the mounting bolts in the holes and tighten them crosswise;
5. Carefully open the gate valves, first on the suction line, then on the pressure line.

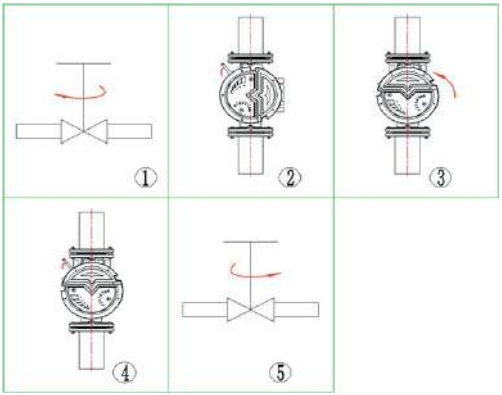


Fig. 3 Procedure for changing the position of the control unit

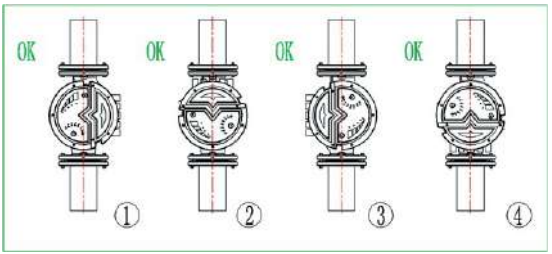


Fig. 4 Possible positions of the control unit

Thermal insulation

When carrying out thermal insulation measures, it is forbidden to apply thermal insulation to the pump head in order to avoid damage to the electrical unit.

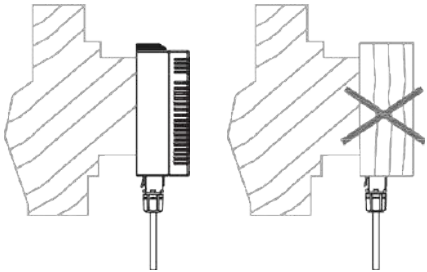


Fig. 5 Thermal insulation of the MEGA S pump

Warning
Provision must be made to protect personnel from injury and to prevent equipment damage from fluid escaping from the pump during maintenance work.

9. Connection of electrical equipment

Make electrical connections and install protection in accordance with local codes and regulations. Make sure that the operating voltage and current frequency correspond to the rated data on the rating plate.

Warning
Disconnect the power supply before installing the unit.

Warning
The pump must be connected to an external switch, minimum contact gap: 3 mm on all poles.
Earthing or grounding must be used as protection against electric shock in case of indirect contact.
Versions with plug connection:
In case of insulation damage, the short-circuit current can be a pulsating direct current. When installing the pump, observe local codes and regulations regarding the selection of residual current devices (RCDs/ RCDTs).

- The pump must be connected to an external mains switch.
- External protection of the pump motor is not required.

Guideline

The number of starts and stops of the pump by applying and disconnecting the supply voltage must not exceed four times i n one hour.

Voltage power supply

1x230V, 50 Hz, protective earth (PE).
Voltage tolerances assume some fluctuations in the mains voltage. Do not use voltage tolerances to connect pumps to mains voltages other than those indicated on the rating plate.
Do not connect the pump to a voltage regulator or UPS with non-sinusoidal output voltage.

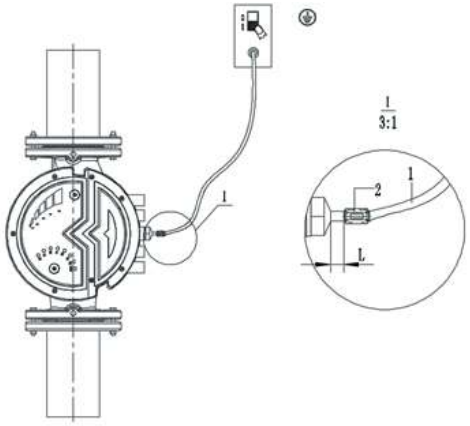


Fig. 6 Electrical connection

10. Commissioning

All products are subjected to acceptance testing at the factory. No additional testing is required at the installation site.

Before commissioning, the system must be flushed, filled with operating liquid and vented. The pump inlet must be pressurized to the required pressure.

The pump removes the accumulated air inside by itself, at the same time it is necessary to remove the air at the highest point of the system in which the pump is used.

11. Operation

Refer to section *15 for* operating conditions. *Technical data*.

Control panel

Warning
To avoid burns, only the control panel should be touched.

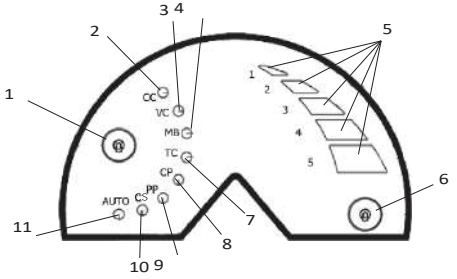


Fig. 7 Control panel elements

The pump control panel consists of the following elements:

Pos.	Description
1	Control mode switch key
2	Light indication of operation mode under control of 4-20 mA analog signal
3	Light indication of operation mode under control of 0-10 V analog signal
4	Light indication of Modebus communication mode
5	Speed indication light
6	Speed change key
7	Light indication of the operating mode by temperature sensor
8	Light indication of constant pressure mode
9	Light indication of proportional pressure mode
10	Light indication of constant speed mode
11	Light indication of automatic operation mode

Selecting the control mode

The pump has several control modes. The control mode is selected by pressing the button on the control panel, see Fig7，pos. 1. 1. The selected control mode is indicated by light fields
on the control panel.

Brief description of the modes of control

Number of times the mode button is pressed	Customization	Assignment
0 (Preset by default)	AUTO Mode	The pump operating point will move up or down along one of the automatically selected curves depending on the required flow rate in the system. The head (pressure) decreases when the required flow in the system decreases and increases when it increases. The pump automation selects the curve independently, no manual adjustment is required.
1	CS 1-3	The pump runs on one of the 3 constant characteristic curves, i.e. at a constant speed.
2	PP 1-3	The pump duty point will move up or down along one of the 3 proportional pressure change control mode curves depending on the desired flow rate in the system. The head (pressure) decreases as the system flow rate decreases and increases as the system flow rate increases.

Number of times the mode button is pressed	Customization	Assignment
3	CP 1-2	The pump duty point will be removed or approached along one of 2 control mode curves with a constant pressure value depending on the required flow rate in the system. The head (pressure) remains constant regardless of the required flow rate in the system.
6	VC	The pump regulates its speed according to the level range of the 0-10 V analog input signal.

Guideline ***Factory setting of the control mode: AUTO (self-regulating mode).***

Proportional pressure change control mode (PP1-3)

The proportional pressure change control mode adjusts the pump capacity to the required flow rate in the system, but within the limits of the selected operating characteristic curve - PP1, PP2, PP3. See Fig. *8*.

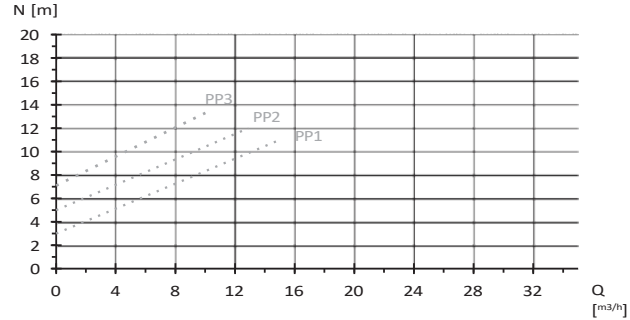


Fig. 8 Control mode curves of proportional pressure change.

Depending on the pump unit size, between one and nine proportional pressure control mode curves are available.

The selection of the appropriate control mode for proportional pressure change depends on the system parameters
and the desired flow rate. See *Control Mode Selection Guidelines*.

Control mode with constant pressure value (CP1-3)

The constant pressure control mode adjusts the pump capacity to the required flow rate in the system, but within the limits of the selected operating characteristic curve - CP1, CP2, CP3. See *9*.

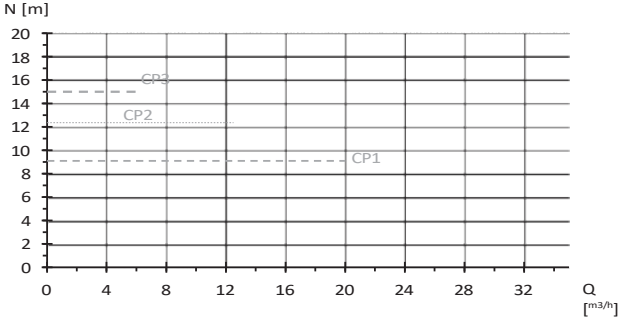


Fig. 9 Control mode curves with constant pressure value.

Depending on the pump unit size, between one and nine constant pressure control curves are available.

Selecting the appropriate constant pressure control mode depends on system parameters and desired flow rate. See *Control Mode Selection Guidelines*.

Fixed speed control mode (C1-3)

In this control mode, the pump runs at a fixed speed regardless of the required flow rate in the system. The pump operates within the selected operating characteristic curve - C1, C2, C3. See Fig. *10*.

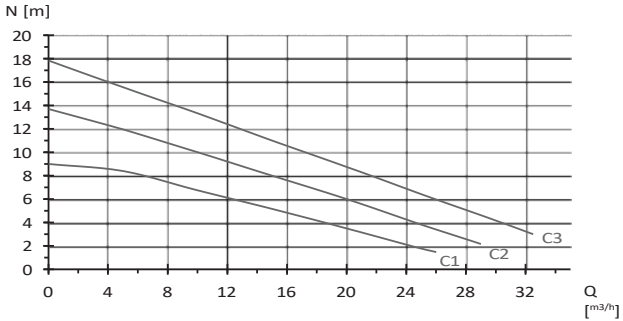


Fig. 10 Control mode curves at fixed speed.

Depending on the pump unit size, between one and nine fixed speeds are

4-20mA analog signal control

When the pump is in 4-20mA control mode, the pump adjusts the pump's operation according to the current range of the input analog signal.

Modbus communication control

When the electric pump is in Modbus control mode, the electric pump adjusts the running status of the pump according to the data collected by the communication.

10-Gear temperature control

When the pump is in temperature control mode, the pump can change its operating status at any time according to different temperature settings.

available.

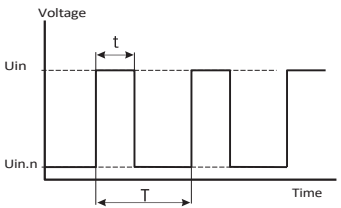
Selecting the appropriate control mode for fixed speed depends on the system parameters and the desired flow rate. See section *Guidelines for selecting a control mode*.

Pump operation by PWM signal

The pumps of the Mega S series can be controlled by a PWM signal from an external controller, e.g. boiler controller, smart home controller, etc. The pump also sends the PWM output signal itself to possible control and monitoring devices to monitor the status of the pump (running or stopping, power consumption).

The characteristics of the PWM input signal for pump control and the output signal from the pump are given in the table:

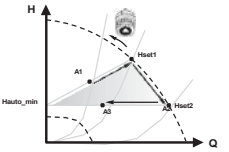
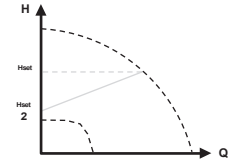
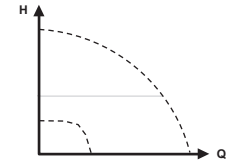
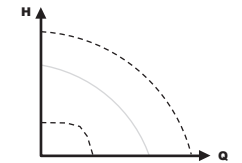
Parameter	**Symbol**	**Significance**
Frequency range of the PWM control signal	fvx	100-4000 Hz
PWM control signal voltage range (high level)	Uin.n	4-24 B
PWM control signal voltage (low level)	Uin.n	≤1 B
Current strength of the PWM control signal (high level)	Ivx	≤10 mA
Fill factor of the PWM control signal	d	0-100 %
Frequency of the PWM output signal from the pump	fвыхвых	75 Hz±5%
Fill factor of the PWM output signal from the pump	d	0-100 %



T - signal period t - pulse time
d=t/Tx100% - fill factor

Fig. 11 Characteristics of the PWM signal

Recommendations for selecting the control mode

AUTO • Recommended for most heating systems. • During operation, the pump performs an automatic adjustment in accordance with the actual a characteristic of the system.	
Proportional pressure • Used in systems with relatively high pressure losses in the distribution pipelines. • The pump head will increase in proportion to the flow rate in the system to compensate for the high pressure losses in the distribution piping.	
Constant pressure • It is recommended to use this control mode in systems with relatively low pressure losses. • The pump maintains a constant head independent of the flow rate in the system.	
Permanent characteristic • The pump can be switched to fixed speed operation, i.e. operation similar to that of an unregulated pump. • The desired speed can be set as a percentage of the maximum speed speeds in the range from minimum to 100%.	

The equipment is immune to electromagnetic interference corresponding to the conditions of use according to the section

6. Application area and is intended for use in low energy, commercial areas and production areas in conditions where the level of electromagnetic field strength/electromagnetic radiation does not exceed the maximum permissible level.

12. Maintenance

Maintenance of the pump should include: checking every 3 months the integrity of the electrical cable and the electrical block. It is also necessary to check the integrity of the inlet and outlet connections of the pump at the same regular intervals.

13. Decommissioning

In order to take the pumps out of service, the mains switch must be set to the "Disconnected" position.

Attention

All electrical lines upstream of the mains switch are permanently energized. Therefore, the mains switch must be locked out to prevent accidental or unauthorized activation of the equipment.

14. Low temperature protection

Attention

If the pump is not operated during cold weather, the necessary measures should be taken to prevent damage from low temperatures.

Guideline

Adding additives to the coolant with a density and/or kinematic viscosity higher than water reduces pump performance.

Guideline

When the ambient temperature is below 0 °C, the following conditions must be met:

- ***Pumped liquid temperature +5 °C.***
- ***The pumped liquid contains glycol.***
- ***The pump is running and won't stop.***
- ***For twin pumps, shift operation with a switching interval of 24 hours is mandatory.***

15. Technical data

Dimensions and weight
See Shinhoo catalog. Circulation pumps with wet rotor.

Power supply voltage
1x230 B, 50 Hz.

Motor protection
External protection of the pump motor is not required.

Degree of protection
IPX4D.

Insulation class
H.

Leakage current
The line filter of the pump generates an earth leakage output current < 3.4 mA during operation.

Relative humidity
95% maximum.

Ambient temperature range
0 to +40 °C.
During transportation: -20 to +70 °C.

Temperature class
TF110.

Liquid temperature
Continuous operation: -10 to +110 °C.

Sound pressure level
The sound pressure level depends on the power input and does not exceed 55 dB (A). The measurement uncertainty characteristic (parameter K) is 3 dB.

Maximum system pressure

Attention

The sum of the pump inlet pressure and the pressure at closed shut-off valves must be less than the maximum allowable system pressure.

The maximum permissible system pressure is stated on the nameplate of the pump: PN 10: 10 bar / 1.0 MPa

Attention

Do not use the pump at system pressures higher than those indicated on the rating plate under normal operating conditions.

Minimum inlet pressure

To prevent cavitation noise and bearing damage during operation, a minimum pressure must be maintained at the suction connection of the pump. The table below shows the minimum inlet pressure values.

Guideline

The relative minimum pressures are specified for pumps installed u p to 300 m above sea level. For pumps installed above 300 m above sea level, the required relative inlet pressure must be increased by 0.01 bar or 0.001 MPa for every 100 m of altitude. The MEGA S pump may only be used up to an altitude of 2000 m above sea level.

Mega S	Liquid temperature		
	75 °C	95 °C	110 °C
	Inlet pressure [bar] / [MPa]		
Mega S 40-20F	0.90 / 0.09	1.40 / 0.14	2.0 / 0.20
Mega S 50-10F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 50-12F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 50-15F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 50-18F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 65-8F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 65-10F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 65-12F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
Mega S 80-8F	0.80 / 0.80	1.30 / 0.13	1.90 / 0.19

16. Troubleshooting

Pump malfunctions are indicated by flashing of the speed indicator:

Fault indication	**Fault Description**
Indicators 5 flash simultaneously 1 time	Increased voltage
Indicators 5 blinks 2 times simultaneously	Reduced voltage
Indicators 5 flashes 3 times simultaneously	Current overload
Indicators 5 flashes 4 times simultaneously	Internal malfunction. Contact to a representative manufacturer
Indicators 5 blinks 5 times simultaneously	Impeller blocked
Indicators 5 blinks 6 times simultaneously	Reduced load
Indicators 5 flashes 7 times simultaneously	Overheating

Guideline

The pump must be completely de-energized before correcting the fault. The pump can only be connected to the mains after the fault has been rectified.

17. Disposal of product

The main criterion for the limit state of a product is:

1. Failure of one or more component parts that cannot be repaired or replaced;
2. Increased repair and maintenance costs resulting in uneconomic operation.

This product, as well as assemblies and parts, must be assembled and disposed of in accordance with local environmental regulations.

18. Manufacturer service

ANHUI SHINHOO CANNED MOTOR PUMP CO., LTD
Address:No.1 Yanglin Road, Hi-tech Development Zone, Hefei, Anhui, P.R. China(230088)
The terms and conditions of equipment sales are determined by the terms of the contracts.

The service life of the equipment is 10 years. At the end of the designated service life, the operation of the equipment can be continued after a decision has been made
the possibility of prolongation of this indicator. Operation of the equipment for purposes other than the requirements of this document is not allowed. Work to extend the service life of the equipment must be carried out
in accordance with the requirements of the legislation without reducing the requirements of safety for life and health of people
and environmental protection.

The warranty period for Shinhoo equipment terminates after the expiration of 24 months following the month of manufacture of the equipment.

19. Information on the disposal of packaging

General information on labeling any type of packaging			
 The packaging is not intended to come into contact with foodstuffs			
Packing material		**Name of packaging / packaging aids**	**Letter designation of the material from which the packaging/ packaging aids are made**
Paper and cardboard (corrugated cardboard, paper, other cardboard)		Boxes/boxes, liners, gaskets, liners, liners, grates, retainers, packing material	 PAP
Wood and wood-based materials (wood, cork)		Boxes (board, plywood, fiberboard), pallets, laths, removable sides, strips, laths, clamps	 FOR
Plastic	(low-density polyeth-ylene)	Pouches, bags, foils, pouches, bubble wrap, retainers	 LDPE

Packing material		Name of packaging / packaging aids	Letter designation of the material from which the packaging/ packaging aids are made
Plastic	(high-density polyethylene)	Sealing gaskets (made of film materials), including air gaskets. bubble wrap, clamps, stuffing material	 HDPE
	(polystyrene)	Sealing gaskets made of foamed plastics	 PS
Combination packaging (paper and cardboard/plastic)		Skin type packaging	 C/PAP

Please pay attention to the marking of the packaging itself and/or the packaging aids (if applied by the packaging manufacturer).

If necessary, in order to save resources and environmental performance, the manufacturer may reuse the packaging and/or packaging aids.

The packaging, packaging aids and the materials from which they are made are subject to change at the manufacturer's discretion. Please contact the manufacturer of the finished product listed in section *18 for* the latest information. *Manufacturer. Service life of* this Data Sheet, Installation Manual and operation.
Please specify the article number when inquiring equipment.

Shinhoo®

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