

**SERVICE AND ASSEMBLY INSTRUCTIONS
FOR SUBMERSIBLE PUMP SETS**

1" - EVGU - 16 - 8 - GU - 080

1 1/4" - EVGU - 25 - 6 - GU - 080



ORIGINAL DIRECTIONS FOR USE

RECOMMENDATIONS FOR INSTALLATION OF THE PUMP SET:

- A.** It is necessary to keep the **minimum required inside diameter of delivery pipeline** leading from the pump to a pressure vessel, respectively:

25 mm for the pumps 1"-EVGU-16-8, as a minimum

32 mm for the pumps 1 L" –EVGU-25-6

BE PARTICULAR IN fulfilment of this requirement even in case of using any plastic pipeline!

- B. Size of a pressure vessel** shall be chosen with respect to water requirement and pressure demand, according to the designer's recommendations.
For example, for a family of four, and while using a pressure vessel with a rubber bag, the vessel volume of 80 litres at least can be recommended.
- C. Non-return flap valve** being installed between the pump and a pressure vessel (if it is not a part of the pressure vessel) shall be installed above the water maximum level in a water source. Installation on the pump discharge casing or below water level cannot be recommended!

Right installation, suitable accessories and regular maintenance of the whole system guarantee pump reliability and long service life.

CONTENTS:

1. BASIC PROVISIONS
2. APPLICATION
3. SAFETY
4. TECHNICAL DATA
5. DESCRIPTION OF PUMP SET MAIN PARTS
6. PUMP SET FUNCTIONING
7. MAIN PARTS OF PUMP SET
8. ASSEMBLY
9. ELECTRIC EQUIPMENT
10. DISMANTLING
11. SCOPE OF DELIVERY
12. STORAGE
13. WARRANTY
14. APPENDIX
15. LIST OF AUTHORIZED SERVICE CENTRES
16. NOTES PREPARED TO HELP YOU PREVENT PROBLEMS
AS WELL AS DEAL WITH THEM
17. GUIDELINES ON DISPOSAL OF WASTE
18. SPARE PARTS

1. BASIC PROVISIONS

- Submersible pump set 1" - EVGU-16-8-GU-080
- Submersible pump set 1 ¼" - EVGU-25-6-GU-080

- **Before starting-up fill the motor with clean water**
- **Pump set may be neither started nor run "dry"**
- **During operation it is necessary to keep right sense of rotation**
- **Install a safety valve in delivery pipeline**
- **Provide the motor with overcurrent protection**

2. APPLICATION

Pump set is destined for pumping potable and service water without mechanical impurities out of deep and narrow bore holes and wells up to temperature 35°C and pH ranging from 6.5 to 12. This product is destined for continuous contact with potable water. This appliance is not destined for using by people (including children) whose physical, sensual or mental inabilities or lack of experience and knowledge inhibit from the appliance safe using without supervision and/or instructing in respect of this appliance using by a person who is responsible for their safety.

It is inevitable to watch the children in order to prevent their contact with this appliance.

Unacceptable methods of application

- Pump must not convey other liquids than water
- Pump must not be used in explosion hazard environments
- Pump must not convey water containing acids, lyes, carbon, sea water, chemicals, and so on
- Pump must not work dry or with the opposite sense of rotation
- Pump has got clear purpose of using specified by its name, design and application defined in this section and other purpose of its using cannot be supposed either advisedly, accidentally or due-to ignorance

Noise level

Equivalent level of acoustic pressure A in the distance 1m from the pump set surface (using the weighting filter A) does not exceed the value $L_{pA}=70$ dBa.

3. SAFETY

These Service and Assembly Instructions contain basic instructions that shall be observed within installation, operation and maintenance of these pumps. That is why it is inevitable for competent and responsible workers and service staff learn these Instructions carefully even before the pump installation and putting into operation. Keep this Manual handy for future reference at site.

Not only all above mentioned general safety rules as given in this Clause devoted to safety, but also all specific safety rules given in other Clauses shall be observed.

Safety rules included in these Service and Assembly Instructions, breach of which could be a menace to people, are marked with the symbol



Or in cases covering electric safety they are marked with the symbol



Safety rules that shall be considered due to safety in working of the pump or the pump set and/or protection of the pump itself or the pump set shall be provided with the advice

ATTENTION!

Safety rules, breach of which could endanger quality of human living environment, are marked with the symbol

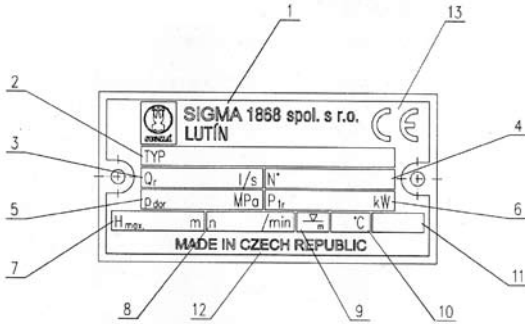


Analysis of residual risks

- Design of this pump is slim, with a small base, that is why there is a serious risk of its overturning from its vertical position
- When handling the pump it is necessary to recheck its disconnecting from the mains and simultaneously prevent its accidental switching-on. There is a risk of injury from rotating parts and electric power due-to unskilled handling.
- This pump shall be transported in its horizontal or a secured position

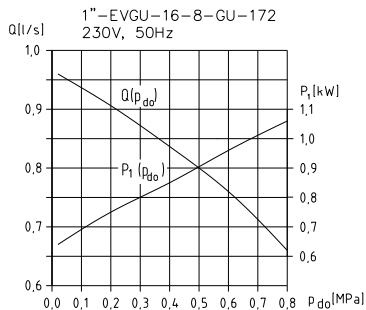
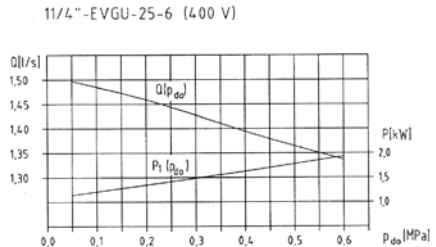
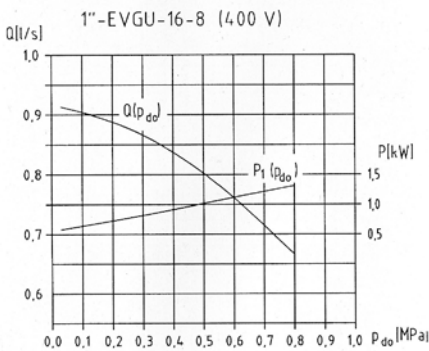
4. TECHNICAL DATA

4.1 Pump Rating Plate



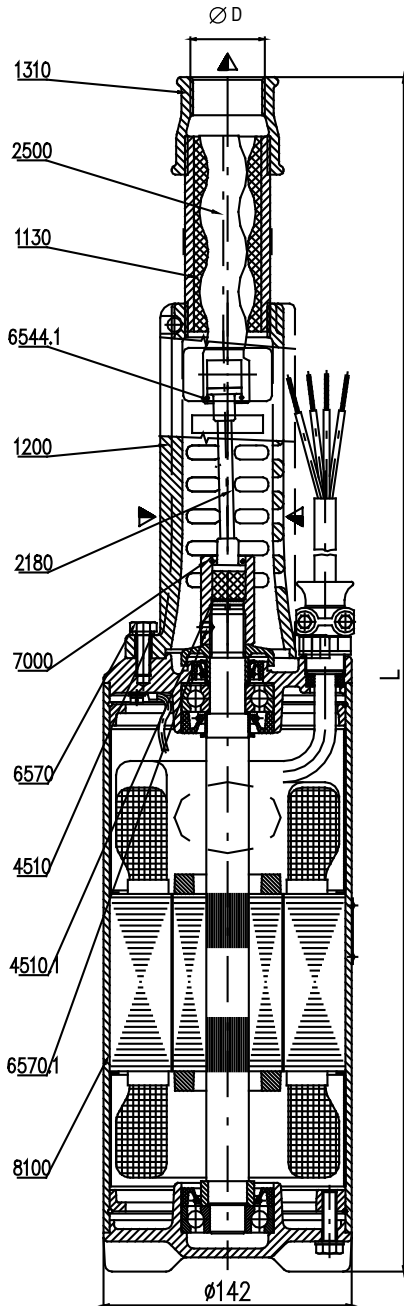
- 1 Producer's Business name and Headquarters
- 2 Type designation
- 3 Rate of flow
- 4 Serial number
- 5 Delivery pressure
- 6 Power demand
- 7 Max. delivery head
- 8 Speed
- 9 Max. depth of submersion
- 10 Temperature of pumped liquid
- 11 Year of production
- 12 Domicile of origin
- 13 Mark of conformity

4.2 Informative characteristics of pumps



Diagrams have been drawn up for density of 1,000 kg.m⁻³

4.3 Pump set main parts



- 1310 Discharge casing
- 1200 Suction casing
- 1130 Stator
- 2500 Helix
- 2180 Connection rod
- 6544.1 Retaining ring
- 4510.1 Washer
- 7000 Coupling
- 6570 Bolt M8x25
- 6570.1 Bolt M6x8
- 4510 Washer 8
- 8100 Electric motor

Type	L	Ø D
1" - EVGU 3ph	680	1"
1" - EVGU 1 ph	640	1"
1 1/4" - EVGU	748	1 1/4"

4.4 Performance Data

Table 1

Pump			1"-EVGU-16-8-GU-080	1"-EVGU-16-8-GU-172	1 1/4"-EVGU-25-6-GU-080
Electric motor	Type		1P 60-112-01	1PJ 60900-01	1P 60-112-06
	Power output	kW	1.1	1.1	2.2
Pump set cable	Type		H07 RN-F *)	H07 RN-F *)	H07 RN-F *)
	Length	m	25 **)	25 **)	25 **)
	Core cross-section	mm ²	1 (15, 25m) 1.5 (35, 50m)	1.5	1.5
Volume rate of flow	Q	l.s ⁻¹	0.67	0.66	1.33
Delivery pressure	p _{do}	MPa	0.8	0.8	0.6
Electric motor speed	n	min ⁻¹	2810	2900	2820
Rated voltage	U	V	400	230	400
Frequency	f	Hz	50	50	50
Rated current of motor	I	A	3.4	8.3	6.4
Circuit-breaker			ESM 1 2,5÷4A		ESM 1 4÷6,3A
Protection starting box				R1PJ 6090	
Max. daily water inlet	hl		50	50	100
Max. submersion under water level	m		30	30	30
Pump set outside diameter	mm		142	142	142
Bore hole smallest diameter	mm		150	150	150
Diameter of delivery connection	D		G 1"	G 1"	G 1 1/4"
Pump set weight with a cable	G	kg	24	24	31

*) It is possible to use another cable, if all parameters are convenient.

**) The pump can be delivered also with cable lengths 15, 35 or 50m

Start protection box (1"-EVGU-16_-GU-172)			R1PJ 6090	
Breaking current ***)	I _{ist}	A	9	
Run capacitor	Voltage capacity	µF/V	60/450	
Motor starting capacitor	Voltage capacity	µF/V	120/250	
Size (width x height x depth)	L	mm	250 x 195 x 95	
Spacing of mounting holes	L	mm	190 x 135	
Cable entries			2xPg13,5	

***) Recommended prefixed protection – fuses 16gG, circuit breaker B 16A.

5. DESCRIPTION OF PUMP SET

MAIN PARTS

1. Electric motor of EVGU pumps is asynchronous, squirrel-cage and its design is adapted for works under water level.

Stator winding of a three-phase motor is constructed from PVC insulated copper wire. As for a single-phase motor, its stator winding is constructed from copper enamelled wire and it is filled up with insulation mixture.

Rotor stamping is forced on the shaft that is carried in ball bearings. Bearings are grease-lubricated and sealed with the shaft lock rings. There is a groove at the shaft end-face serving for the rotor protection from rotating during a coupling mounting and dismounting.

The motor rear shield is provided with a flange with four threaded holes securing connection with the pump. In the shield there is even a threaded hole for the cable entry. The funnelled cable entry protects the cable

from pulling-out. In the shield there is also a hole sealed with a plug being provided with a sieve. This is destined for filling the motor with water and can be also used as a “breathing hole”.

ATTENTION!

The three-phase motor interior must be filled with clean water before its putting into operation.

Sense of the motor rotation is to the right (clock-wise) when viewing from the pump side.

2. Pump is of progressive cavity type consisting of the following main parts:

- Stator (1130) consists of steel pipe with scorched rubber lining with a cavity shaped as a double start thread;
- Helix (2500) screw-shaped;
- Connection rod (2180) with rubber joints;
- Suction casing (1200) with holes destined for supply of a pumped liquid and with two ring lugs for the pump set suspension;
- Discharge casing (1310) with an inner thread for screwing on the delivery pipeline.

6. PUMP SET FUNCTIONING

Turning motion of the motor shaft (8100) is transmitted by means of the clutch (7000) and the connection rod (2180) with rubber joints onto the pump helix (2500). When the helix is rotating some closed spaces are created in the stator cavity thanks to which a liquid can be delivered from the suction casing (1200) to the discharge casing (1310).

On principle, the volume delivered depends only on the stator helix dimensions, and speed.

Liquid pressure generated by the pump is adapted immediately to back-pressure in the delivery pipeline and it can attain to a high-risk pressure value resulting in a failure of the pump, an electric motor or other equipment.

CAUTION!

That is why it is forbidden to:

1. Use a throttle valve for controlling flow rate, because flow rate throttling may increase back pressure and cause the electric motor over-pressure.
2. Put the pump into operation with the delivery pipeline being closed. Even during operation it is not permitted to close the delivery pipeline or increase pressure in any way above allowable values, that is: 0.8 MPA for 1"-EVGU and 0.6 MPA for 1 1/4" – EVGU.

It is inevitable to protect the pump set from the pressure excessive rise by means of suitable protection of the electric motor and a safety valve.

Determination of delivery pressure p_{d0} (Fig. 2).

This pressure with the pump set 1"-EVGU-16-8 cannot exceed the value 0.8 MPA (80m of water column), and with the pump set 1 1/4"-EVGU-25-6 it cannot exceed the value 0.6 MPA (60m of water column).

Delivery pressure p_{d0} facilitates overcoming:

- a) Vertical distance z_{vg} (total static head of the pump equipment on the discharge side of water level at the lowest water-level stage in a well up to the highest spot where water is transported);
- b) Resistances p_{zv} generating within water flowing through the straight pipeline, elbows, bends, pipe fittings and fixtures built in the delivery pipeline;
- c) Overpressure p_p for jetting-up (A) or in the pressure vessel (B).

$$p_{d0} = p_p + p_{zv} + z_{vg}$$

When determining the pipeline length due to calculation of losses to the pump discharge branch (not only to water level in a water source).

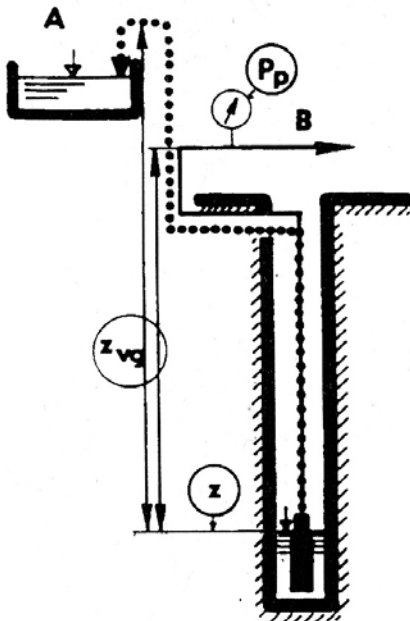


Fig 2

EXAMPLE: (for 1 1/4"-EVGU)

Vertical distance z_{vg} is 25 m, the p_p measured by a pressure gauge is 0.15 MPA. Overall length of pipeline 1 1/4" (from the pump branch to the jetting-up) is 65 m and it has got 5 bends. Resistances are obtained from the Table 2.

$$p_p = (6.5 \cdot 0.022) + (5.0 \cdot 0.0026) = 0.143 + 0.013 = 0.1443 \text{ MPA}$$

$$p_{d0} = p_d + p_{zv} + z_{vg} = 0.15 + 0.1443 + 0.25 = 0.5443 \text{ MPA}$$

If the detected pressure is lower than the allowed pressure 0.6 MPA, the resulting state is satisfactory. If the calculated pressure exceeds the value 0.6 MPA, it is necessary to reduce it with using a pipeline of larger inside diameter.

Table 2

	Delivery pipeline diameter	MPA
For every 10m of straight pipeline there are losses p_{zv}	1"	0.08
	1 1/4"	0.022
	1 1/2"	0.0062
Resistance of 1pc of the bend 90° in the length of straight pipeline	1"	0.00056
	1 1/4"	0.00026
	1 1/2"	0.001

7. MAIN PARTS OF PUMP SET

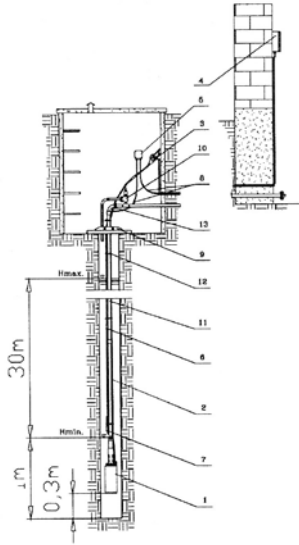


Fig. 3

- 1 - PUMP
- 2 - POWER CABLE
- 3 - PLUGS, SOCKETS
- 4 - PROTECTION AND CONTROL CABINET *)
- 5 - DISTRIBUTION BOX
- 6 - PROBE OF WATER UPPER LEVEL
- 7 - PROBES OF WATER LOWER LEVEL
- 8 - CABLES OF WATER LEVEL CONTROLLER
- 9 - CARRYING CLIP
- 10 - SAFETY VALVE
- 11 - DELIVERY PIPELINE
- 12 - CLAMPING STRIP
- 13 - FLANGE
- 14 - NON-RETURN FLAP VALVE, VALVE

Positions 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 are not included in the scope of standard deliveries!

*) As for the pump of the workmanship version "172" (single-phase) there is a start protection box, that is a part of standard deliveries

8. ASSEMBLY

Before the pump set assembly and installation it is necessary:

1. When installing the pump set into a borehole it is necessary to re-inspect the borehole along its whole length with lowering a check cylinder or a check pipe of diameter 145 mm and of length 750 mm. This cylinder or the pipe must pass through the whole borehole without any resistance. In this way we can determine a borehole depth,

perhaps even the water level depth in the borehole. Minimum diameter of a borehole for the pump set shall be 150 mm.

2. Length of pipeline and a cable shall be prepared according to the borehole or a water well depth and the minimum water level depth. It is necessary to choose sufficiently robust pipeline, with rigid joints in view of weight of pipeline, the pump set and water. It is recommended to use new pipeline with well-screwed thread joints or reinforced flanges. Pipeline shall be cleaned properly before dismantling and remains of scale and other impurities are to be removed too. Burrs caused by cutting or threading are to be removed by a file, as well as metal chips and fillings. Pipeline shall be rinsed with water.
3. To suspend the pump set together with pipeline into a dug well it is necessary to prepare and wall in steel transverse girders (Fig. 4) so as they are able to accept load safely. It is recommended to place the girders so as they do not prevent access into the well. As for dug wells, it is necessary to lean the assembly clip against the casing upper edge that must be in the same depth as pipeline outside the well. In such a case it is useful to extend the borehole in its diameter up to the required depth and make well casing with the aid of big centres, as with dug wells (Fig. 5).

CAUTION!

Pipeline of smooth surface and uniform cross-section between the pump and a safety valve shall be without stop valves.

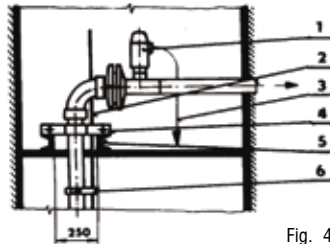


Fig. 4

- 1 - Safety valve
- 2 - Cable
- 3 - Drain
- 4 - Clip
- 5 - Girder
- 6 - Self-gripping strip
- 7 - Casing

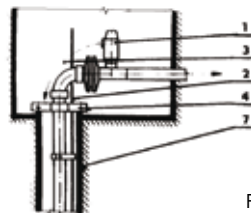


Fig. 5

Preparation of pump set operation
Remove the self-adhesive label "For continuous contact with potable water!"

CAUTION!



While handling the pump (carrying, helix turning-over, dismantling) it is necessary to disconnect it from mains to prevent mains connection by mistake! Fill the motor with clean /fresh water! For this purpose the pump set shall be placed in the vertical position with its discharge branch upwards, the sealing screw of filling hole in the motor flange, as well as the filter cartridge are to be removed, then the motor can be filled with fresh water through a suitable funnel. Wait until water gets to all places then incline the motor of 15° so as the filling hole would be in the highest point and re-fill the motor. Before refilling shake up the pump set gently so as air can leak more easily. After refilling insert the filter cartridge into the hole and drive the sealing screw.

CAUTION!

After finishing electrical installation re-check the right sense of the pump set rotation. Pour water into the discharge casing (Fig. 6).

CAUTION!



Before inserting a tool into the helix cavity and manual turning-over for several times it is inevitable to re-check the pump set disconnecting from mains. There is a real risk of accident due to the tool shooting up at unexpected starting-up! Insert a suitable (flat, square or triangular) tool into the helix cavity (Fig. 7) and turn it perhaps for four times to the left, then remove the tool. The helix is "severed" from the stator (namely after long-lasting storage). Re-fill water into the discharge casing and put into operation for a short time.

If the sense of rotation is not correct no water is flowing out of the pump discharge branch, so there is a real risk of the pump damage. If the sense of the pump set rotation is correct (that is according to the rotation arrow being placed on the pump set) water is flowing out of the discharge branch (Fig. 8). Electric motor is to be disconnected from mains and phase connections are to be designed due to next connection.



- Interventions into electrical systems, as well as exchange of any of two phases may be carried out solely by a person properly qualified in electrical engineering!

CAUTION!

- Due to testing sense of rotation the pump set cannot run for more than 2 seconds!



Fig. 6

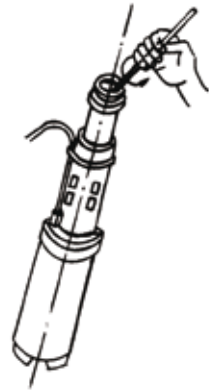


Fig. 7

PUMP SET INSTALLATION INTO WATER SOURCE

After preparing everything according to the previous paragraphs the assembly can be commenced:

1. Connect the pipe to the pump set discharge branch; an assembly clip serving for catching the pulley block rope is to be attached to the pipe another end and it can be lowered to the borehole edge or to the well girders. Another tube with second assembly clip can be attached to its end. After catching pulley block by second clip the first clip can be unlocked and the pump can be lowered into the well together with both pipes. This procedure of connecting other pipes is to be repeated until the pump set is located in the required depth. In such a case that the single sections of pipes are longer than 3m, it is necessary to carry out assembly of the pipe single sections in two steps (assembly clip is to be placed in the middle of the pipe).

CAUTION!

Seal all joints thoroughly! Vertical pipeline from the pump set is to be provided with right-hand threads!

For lowering the pump set into a well it is possible to use a suspension eye / holding tackle on the suction casing. This suspension eye /holding tackle can be used even for the pump set protection when using some plastic delivery piping.

2. If the pump shall be lowered to the well bottom it is necessary to suspend it in such a manner to reach the motor lower edge positioning 30cm from the bottom, at least. During operation the

pump shall be wholly submerged under water level. If there is little water in a well, it is possible to mount the pump horizontally, "lying down" (Fig. 9), however it is inevitable to:

- a) Prime the motor thoroughly with water with filling hole in its highest position;
- b) Guarantee sufficient inside diameter of the well;
- c) Protect the cable from damage when lowering into a well.

3. If there is a risk of water lack or insufficiency in a well it is necessary to protect the pump set e.g. by an electrode interlocking device.

4. Cable can be attached to the vertical delivery piping in successive steps, using self-gripping strips. If the pipeline is connected with flanges, it is fastened in either side of a flanged joint and with longer sections of single delivery pipeline also in the middle of it. It is recommended to provide every flange by a groove for cable that is protected from damage during assembly in this manner. During assembly it is necessary to prevent striking the pump set against girders or other obstacles in the well.



During assembly it is not allowed to pull at the cable or use it for the pump set carrying or tugging; the cable cannot be damaged due to impact or jamming!
Cable upper end cannot get into touch with water!

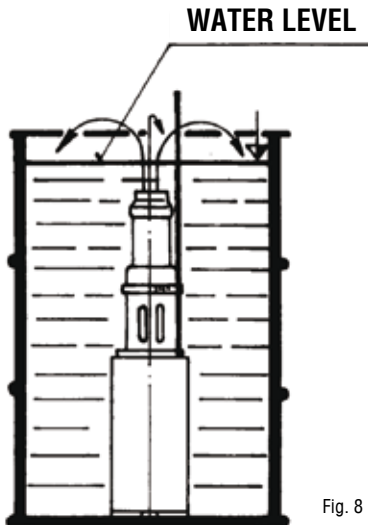
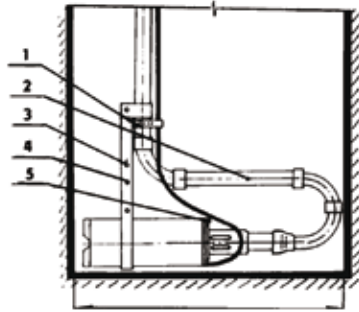


Fig. 8



Minimum inner diameter of well = 900mm – 1"-EVGU-16
 1000mm – 1 ¼"-EVGU-25

- 1 – Self-gripping strip
- 2 – Pipe
- 3 – Screw
- 4 – Clamp
- 5 – Vent

Fig. 9

CAUTION!

5. Attachment of vertical pipeline in a well to delivery pipeline outside the well is recommended to be realized with the aid of a flange or screwed fitting. It brings advantage of easy mounting and dismantling.

6. Outside the well it is necessary to put the piping in freeze safe depth (perhaps from 110 to 130cm). It is advantageous to place the piping into a channel built from burnt bricks, according to the Fig. 10. The channel is to be covered with soil to prevent its deformation or shift. Air gap of such a channel is very good insulation, so the pipeline can be put even in a smaller depth. Another advantage is an easy access to piping for repair, dismantling, and so on. Outside the well the delivery piping is put with a flat gradient from the well and in the straight line, without useless bends



Fig. 10

9. ELECTRIC EQUIPMENT

9.1 In General

As a part of electric equipment of the pumps 1"-EVGU-16-8-GU-080 and 1 ¼"-ECGU-25-6-GU-080 there is a three-phase electric motor with a lead-in (service) cable

As a part of electric equipment of the pump 1"-EVGU-16-8-GU-172 there is a single-phase electric motor with a lead-in (service) cable and a start protection box. The box connection is illustrated in the Fig. 12.

9.2 Pump connection



Pump can be connected only to mains whose values of voltage and frequency conform with the data in the electric motor rate plate. Electrical equipment assembly can be carried out only by people qualified in electrical engineering. Before lowering the pump into a borehole it is necessary to recheck the pump set and a cable whether they were not damaged during transportation.

The pump set must be disconnectable from the mains with the aid of a device that is provided with opening contacts at all poles, so the complete disconnection is secured in terms of overvoltage of the Category III. This equipment must be installed into a stationary line in accordance with all regulations valid for lines and it must be accessible.

This pump is to be always protected from over-current and cut-off. Over-current protection must be set to rated (breaking) current of the electric motor (the pump).

For three-phase pumps the best protection can be achieved by setting the over-current protection element to the value of the actually measured current consumption at the working place, but no more than to the value given in the table 1 or on the electric motor rating plate. Examples of connection are illustrated in the Figure 11.

For the single-phase pump 1st-EVGU-16-8-GU-172, its over-current protection is secured in a start protection box to the fixed value. The control and protection cabinet is to be installed on a vertical surface with the aid of two or four bolts with spacing M4, according to the table in the section “Performance data”. Examples of connection are illustrated in the Figure 12.

If it is not possible to guarantee enough water in a well, it is necessary to install e.g. electrode locking device to avoid running the pump dry. Examples of wiring are illustrated in the Figure 13.

9.3 Protection from hazardous touch voltage

Pump protection from hazardous touch voltage shall be provided according to the standard CSN 33 2000-4-41 and associated standards (as for an installation site), namely it is a protection by automatic, self-actuated disconnection from a source. In particularly hazardous spaces it is possible to realize protection by protective bonding or by an earth-leakage circuit breaker. It is necessary to use an earth-leakage circuit breaker with time delay / lag of 10 ms, at least (with the “G” and/or “S” designation).

9.4 Putting into operation

Before putting the pump into operation it is necessary to carry out a check (a revision) of electrical

systems, namely:

- **measurement of insulation resistance (it must be greater than 20MΩ)**
- **recheck of correct set-up of overcurrent protection**
- **recheck of security of protection from hazardous touch voltage**

Single-phase pump starting-up can be realized with the aid of a rocker switch located on the cabinet face board with positions 0 and I. After getting the pump electric motor under voltage – the position I, the switch green backlight is turned on. The position 0 is destined for its switching-off.

With the pump first putting into operation it is recommended to re-check supply pressure, ampere load and keep the pump in operation for 10 min. at least, in order to remove all impurities out of the pipeline or a water source.



Pump can be put into operation solely with the pipeline being fully open!

9.5 Operation and Servicing

With regard to the motor service life it is recommended not to exceed the number of switching operations 18-times / hour – divided equally. Minimum time of stand-still after switching-off shall be 90 seconds.

If the single-phase pump is disconnected from the mains due-to overload, there is the reset push button of the thermal circuit breaker for unlocking the off-state, but only after the circuit breaker cooling-down (ca. 1 min.) and after removing the cause of overload.

Pump set can be operated even by people without any qualification in electrical engineering.



If any failures or defects were found either in electrical installation or in the pump, it is necessary to switch the pump off and inform a specialist in electrical engineering about these failures or defects

If power supply has been damaged it must be replaced by the producer, a service engineer or other responsible and qualified person to prevent any dangerous conditions.

9.6 Maintenance

It is recommended to inspect and re-check the electrical installation regularly, every six months, at least.

In particular it is necessary to check terminals re-tightening, including a protective earth conductor, protection from hazardous touch voltage and the equipment insulation characteristics – it must

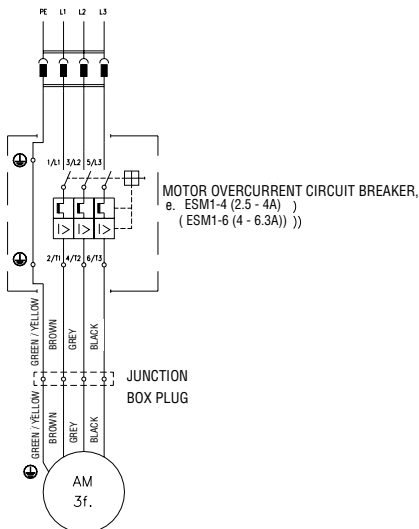
be greater than 2MΩ. If the insulation resistance is lower, it is necessary to dismantle the pump set and send it for repair.



Manipulation and repairs on the pump set and accessories can be carried out solely when the pump set is switched-off and when operating conditions are safe.

Pump set is to be checked continuously, whether there is any noise, vibration and current take-off. After the lapse of 6,000 operating hours it is recommended to:

- re-fill the electric motor, or replace radial lip sealing rings “gufero” and bearings;
- re-check condition of components and elements of the hydraulic part due to their wear, replace them, if necessary



ELECTRIC MOTOR 1P60-112-01, 1.1kW, 400V, 50Hz
(1P60-112-06, 2.2kW, 400V, 50Hz)

Example of wiring diagram for connecting the circuit breaker to the pump. Fig. 11

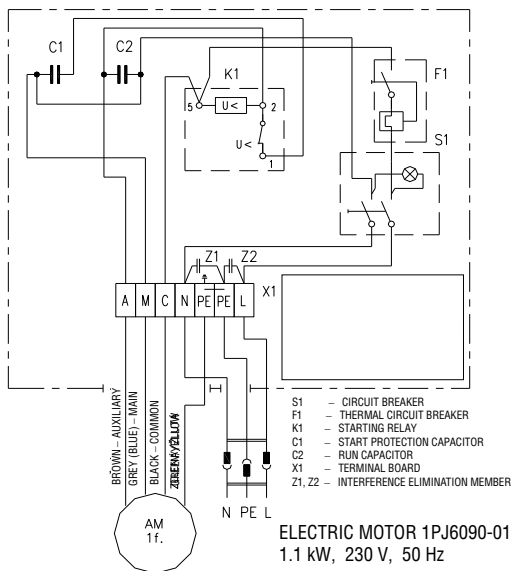


Fig.12
Example of the schematic wiring diagram of the single-phase pump with a start protection cabinet

11. SCOPE OF DELIVERY

Standard scope

- Pump in fully-assembled state, with a cable
- as for the single-phase pump, the start protection cabinet is an integral part of standard deliveries

On request:

- Clip DN 25 for 1"-EVGU or DN 32 for 1 ¼" EVGU
- Self-gripping strips

12. STORAGE

This pump set is to be protected from direct sunlight and solar radiation, frost, sudden changes of temperature, excessive humidity, impurities and various chemical impacts.

As for storage and servicing and maintenance of rubber products there is the Standard CSN 63 0001.

13. WARRANTY

Time duration of the warranty is given in the contract of purchase and in the certificate of warranty.

However, the producer does not answer for damages caused by incorrect and unprofessional servicing, the pump set overload or due to non-observance or breach of instructions given in these Service and assembly instructions.

During warranty period it is possible to carry out the pump dismantling solely with the agreement with the producer.

The warranty does not cover defects and failures incurred due to wear and tear, external failure causes or during transportation.

14. APPENDIX

CAUTION!

- When removing troubles of power supply system the phase sequence changeover may happen (even for a short time). Thereby the opposite sense of rotation may happen with the three-phase pump and there is a real danger of the pump failure**
- The most frequent defect is the pump rubber stator rubbing-out. The main cause of it is the pump running dry even for a short time (for several seconds). Prevent from water dropping below the pump (lower than under minimum liquid level – Fig. 3). If there is a small water supply/inflow in a well it is recommended to protect the pump from running dry with the aid of an interlocking device.**
- All parts of this pump set are replaceable. Spare parts are available in factory outlets or in speciality-line stores. Mounting and servicing can be carried out in the producer's service departments or in service centres.

- In serious and complicated cases it is necessary to furnish information about the pump set placing and positioning, as well as about its assembly, because the pump set reliable operation depends not only on well-done assembly but also on correct placing and positioning, as well as on design.
- Installation, checks and reviews, as well as the pump set repairs are to be given in charge of specialists/professionals – authorized service centres.
- Pipeline to the pump set is not an integral part of deliveries. Electrode interlocking device is not also included into the delivery scope (pump set protection from running dry in case of water deficiency in a well).

15. LIST OF AUTHORIZED SERVICE CENTRES

List of authorized service centres is given in the certificate of warranty.

16. NOTES PREPARED TO HELP YOU PREVENT PROBLEMS AS WELL AS DEAL WITH THEM

PROBLEM	CAUSE OF PROBLEM	MEASURES
1. Pump is running but no water and/or little water is delivered.	a) Water shortage in a well or the pump is not submerged sufficiently under the water level, so air leakage can happen.	a) Lower down the pump or deepen the well. Pump cannot operate dry – stator rubber will be burnt out.
	b) Damaged rubber cartridge of stator.	b) Send for repair, replace the stator by a new one.
	c) Pump opposite direction of rotation.	c) Inspection and repair of the pump is inevitable. Carry out interchanging any of two phases. This can be realized solely by a person properly qualified in electrical engineering.
	d) Partial or total clogging of suction inlets / holes.	d) It is necessary to pull the pump out of the source and clean it.
	e) Leakage of delivery pipeline (either joints leakage or it has become leaky due to corroding processes and water flows through it back to a well or to soil).	e) Mend the pipeline joints sealing, replace leaky pipes (that is even the line placed underground).
	f) Excessive wear of the pump functional parts.	f) Send the pump set for repair or replace damaged parts by new ones.
	g) Excessive supply pressure (higher than 0.6MPa with 1¼"-EVGU and 0.8MPa with 1"-EVGU)	Re-check entire supply pressure of the pump and reduce resistances in pipeline, if possible (e.g. by choice of greater diameter of pipeline). If it is not possible to reduce supply pressure, it is necessary to choose other pump with higher supply pressure.
2. Pump cannot be started up.	a) Absence of current in electrical power network, it is dead.	a) Notify the nearest distribution plant of this failure.
	b) Fault in power supply from mains.	b) Inspect and re-check, repair.
	c) Fault in the pump electric motor.	c) Send for repair.

d) Pump helix got stuck (however, this fault may happen only with the first starting-up, or after long operational shutdown).

d) It stands to reason that instructions relating to the pump installation into a well given in this Manual were not observed. So it is necessary to pull the pump and pipeline out of the well. (More detailed information can be found in the Clause 8 "Assembly").

e) Broken connection rod or damaged rubber joints.

e) Send the pump for repair or replace the connection rod by a new one.

f) Pump has been clogged with settle sludge originating from water and from delivery pipeline.

f) Remove impurities and ensure free rotation of the helix in the stator.

g) Opened contact of a thermal circuit breaker due-to overload of the pump (the electric motor).

g) After the circuit breaker cooling-down and after removal cause of the pump overload it is necessary to depress the reset push button on the front board of the start protection box.

h) Fault of the start protection capacitor or a relay

h) Start protection box must be sent for repair.

3. Pump is running noisily (buzzing) and power consumption is excessive.

a) Some of the phases of stator winding have been short-circuited or broken up.

a) Recheck in turn all motor phases, using an ampere meter. If the motor is in good condition the current values in all phases are approximately equal.

b) Winding insulation has been damaged and fault current is passing through the protective bonding/guard circuit.

b) Re-check insulation with the aid of an inductor. Insulation value shall be always higher than $0.5M\Omega$ in hot conditions, and $2M\Omega$ in cold conditions.

c) Bearings have been worn-out or damaged.

c) It is recommended to send the pump for repair.

d) Clamping bolts of the pump or of the motor have been loosened.

d) Re-tighten the screws and bolts uniformly.

17. GUIDELINES ON DISPOSAL OF WASTE

Directions to disposal of waste generating during life cycle of the pump (by course of § 10, Cl. 3 of the Law of Wastes No. 185/2001 of the Code of Law, as amended).

1. Household appliances

Sort of waste	Code ¹⁾	Category	Method of disposal
Paper and cardboard packages	15 01 01	0	Other waste - Utilizable waste – through sorted refuse collection in communities it is necessary to hand it over to a person authorized to waste disposal.
	20 01 36	0	Entirely worn-out electric devices shall be passed (free of charge) in a place destined for it (collection spot). In no case it may be disposed together with normal mixed municipal waste! ³⁾

2. Součásti čerpadel pro průmysl

Sort of waste	Code ¹⁾	Category	Method of disposal
Waste of electrical and electronic devices - scrapped/ disabled parts	16 02 14	0	Other waste – Utilizable waste – after sorting it is necessary to hand it over to a person authorized for purchase of waste or secondary raw material.
Paper and/or cardboard packages	15 01 01	0	
Other scraped devices – metallic components of pumps (without any oil remains)	17 04 07	0	
Other scraped devices – non-metallic components of pumps (e.g. of carbon, carbide, ceramics)	16 02 16	0	Other waste – it is necessary to collect and hand it over to a waste dump operator.
Other scrapped materials – rubber elements of pumps	16 02 16	0	Other waste – it is necessary to collect and hand it over to disposal in a waste incineration plant.
Wood packing	15 01 03	0	
Plastic packages– foil of PE	15 01 02	0	
Small plastic things ²⁾	16 02 16	0	
Other motor, gearbox and/or lubrication oils	13 02 08	N	Hazardous waste – it is necessary to collect and hand it over to disposal by an authorized person.
Solvents and their mixtures with preservative products (except of organic-decomposable)	14 06 01	N	
	14 06 02		
	14 06 03		

¹⁾ See the Public Notice No. 381/2001 of the Code of Law, in which the Catalogue of waste was published

0 – Other waste

N – Hazardous waste

²⁾ **ATTENTION!** Polytetrafluoroethylene (Teflon, PTFE) shall not be incinerated elsewhere than in a waste incineration plant due to their toxicity!

³⁾



This device cannot be handled as household refuse. The product shall be disposed by handing it over to a collection spot destined for recycling of electrical and electrotechnical devices and equipment. In order to gain more detailed information on this product recycling it is necessary to contact staff of a collection facility, or the staff of the store where you have bought this product.

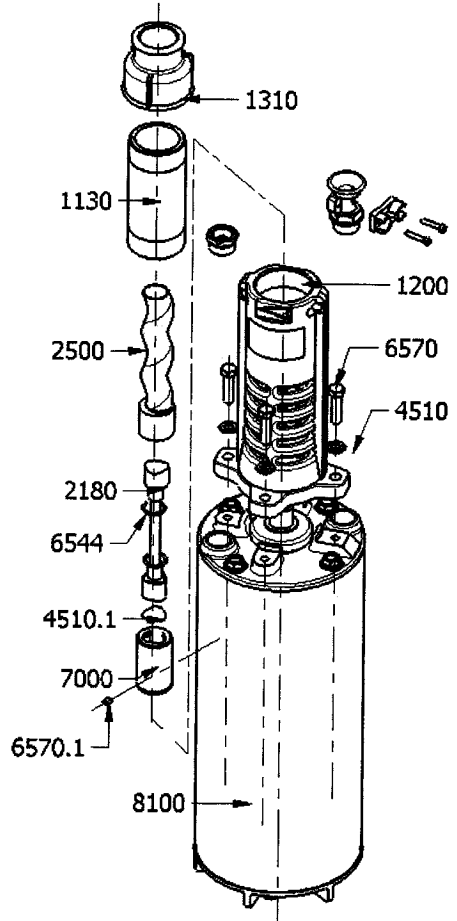
18. SPARE PARTS

1"-EVGU-16-8-GU-080, -172* Table 3

Pos.	Name	Drawing. No.	Pcs
1130	Stator	V 737606	1
1200	Suction casing	V 745423	1
1310	Socket 1" x 1	CSN 13 8237.1	1
2180	Connection rod	V 402884	1
2500	Helix	V 724521	1
4510	Washer 8	CSN 02 1740	4
4510.1	Washer	V 114510	1
6544	Retaining ring	3152385857670	2
6570	Bolt M8x25	CSN 02 1103	4
6570.1	Bolt M6x8	CSN 02 1185	1
7000	Clutch	V 535700	1
8100	Electric motor	1P60-112-01	1
		*1PJ6090-01	

1 1/4"-EVGU-25-6-GU-080 Table 4

Pos.	Name	Drawing. No.	Pcs
1130	Stator	V 723076	1
1200	Suction casing	V 739907	1
1310	Discharge casing	V 587168	1
2180	Connection rod	V 402258 2731111077340	1
2500	Helix	V 746475	1
4510	Washer 8	CSN 02 1740	4
4510.1	Washer	V 400945	1
6544	Retaining ring	3152382000220	2
6570	Bolt M8x25	CSN 02 1103	4
6570.1	Bolt M6x8	CSN 02 1185	1
7000	Clutch	V 402257	1
8100	Electric motor	1P60-112-01	1



When ordering spare parts it is necessary to give the serial number of the pump marked in the rating plate, the pump type, positions and component number.

We reserve the right to alter data, text and illustrations without prior notification.

SIGMA 1868 spol. s r.o.

Jana Sigmunda 79
783 50 Lutín
Czech Republic
Tel.: +420 585 651 302
Fax: +420 585 651 339
www.sigma1868.cz

TD 51502	0511
----------	------