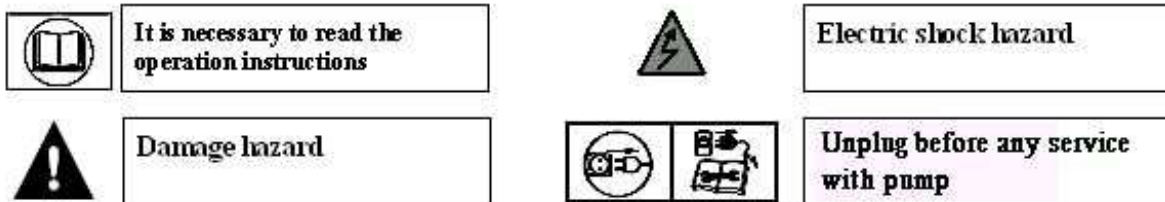









**Operation Instructions for deep-well pumps:
4SD, 4SDm, 4SG, 90QJD, 3ti, 4SKm, 4TP, 90MSC**



   **CAUTION** Read the operation instructions before use. For safety reasons the pump may be operated only by persons who are fully acquainted with operation instructions.

 **CAUTION** The operation instructions constitute the main element of the purchase contract. The user's failure to comply with these instructions is a default of the contract and excludes any claims resulting from potential damage caused by improper use.

  **CAUTION** Non-compliance with these instructions may cause risk to people, the environment or the pump alone.

APPLICATION:

Pumps referred to in these instructions are designed to pump clean water from the drilled deep-water intakes or to increase pressure in water supply systems when the unit is built-up in an air-tight coat.

Pumps can be used in a household (for water supply), at farms (for irrigation), in heat pumping systems, for water supply for industrial systems.



The pumped water must not contain mechanical impurities.

The pump is designed to pump water without solid or grinding parts.

Pumping water which contains sand leads to rapid wear and in consequence to damage. In such case the repair may be performed only against payment.

The foregoing does not refer to pumps 4SD nor 4SDM with increased resistance to sand. For these pumps the permitted content of sand in water may not exceed 5%.

Please remember that lifecycle of the pump with increased resistance to sand will be much shorter if the pump pumps water contaminated with sand. Wear of the elements pumping with sand is not covered by the warranty. It is an operational wear.



The pump is not fit for pumping corrosive, flammable, degrading or explosive substance (e.g. gasoline, nitro solvents, petroleum etc.), food

stuffs, salt water. Damage caused by pumping these types of liquids is not covered by the warranty.



Permitted temperature of the pumped water is 35°C.



The pump is not fit to pump water containing excessive quantity of mineral components causing scale deposits on pumping elements. Using the pump under such conditions leads to premature use of the operating elements. In this case the repair may be performed only against payment.



The pump must not pump water containing oils or petroleum-derivatives.

The pump's operation in such water damages rubber elements e.g. cable and seals and in consequence leads to unsealed of the motor and damage. In this case the repair may be performed only against payment.

INSTALLATION OF THE PUMP:



Before starting any installation action the feed current must be cut off. It must be secured against casual engagement.

Pumps 4SD, 4SDM, 90QJD, 3ti due to their size may be supplied in two parts. One is the hydraulic part of the pump, the other one is the electric motor.

Before assembling the two parts into one unit undo the screws mounting the cable protective strip. Then undo the screws mounting the filter screen and remove it.

Undo and remove the assembly nuts and pads from the motor.

After the motor has been positioned vertically put the hydraulic part on it so that the motor shaft ended with multispline is placed in the pump clutch. In case of problems with composition during the placement, turn the motor shaft in order to adjust the multispline to the motor clutch.

When the hydraulic part is properly placed on the motor, it should be fully based on the upper bearing casing of the motor. Having prepared the unit in this manner, you can start the assembly using nuts and pads.

The nuts must be tightened in a "criss-cross" pattern. The minimal moment for tightening the nuts is 18 Nm.



Inaccurate tightening of the nuts may cause their release during operation and „sinking” of the motor in the borehole.

After the hydraulic part has been mounted on the motor and the feed cable has been placed on the pump, put and tighten the filter screen and then the cable protective strip.



Lowering the pump in the borehole with a protective strip may damage the cable insulation. This may damage the pump or cause electric shock to the operator.



Since the motor needs cooling during operation, the diameter of the borehole where the pump is working may not be greater than the value given below in the table of diameters. The values are given in mm. These diameters depend on the working capacity of a given pump and dimension of pump.

Type of pump	Working capacity									
	1 m ³ /h = 17 l/min	2 m ³ /h = 33 l/min	3 m ³ /h = 50 l/min	4 m ³ /h = 67 l/min	5 m ³ /h = 83 l/min	7 m ³ /h = 117 l/min	10 m ³ /h = 167 l/min	15 m ³ /h = 250 l/min	20 m ³ /h = 333 l/min	25 m ³ /h = 416 l/min
3ti	101mm	121 mm	138 mm							
90QJD, 90MSC	109 mm	128 mm	144 mm							
4SD, 4SDM,4SG	114 mm	132 mm	148 mm	162 mm	175 mm	199 mm	230 mm	274 mm	312 mm	345 mm



Using the pump in a well of a diameter greater than the one given in the table might overheat and damage the motor. If the diameter of the well where the pump is to be working is greater than the diameter given in the table, the pump must be installed in a special coat which enforces proper cooling. The concept of the coat has been shown in the figure.





The pump must be installed above the filter of the well. The minimal distance between the upper edge of the last part of the filter and the lower edge of the motor may not be less than 30 cm.



The pump may not dry run, without water. Dry run damages the equipment. In this case the repair may be performed only against payment.

To prevent potential dry run the pump must be installed at such depth so that the lowest dynamic level of the water (water level established during continuous pumping at free outflow) is at least 2 m above the liquid feed port of the pump.

If the efficiency of the well prevents such assembly (the well is not as efficient as the pump) then choose an option from the following:

- install smaller pump
- install a valve for constant reduction of the flow on the delivery pipeline,
- install a safety device against dry run to control the level of water table and in case of dry run to cut off the power supply to the unit.



When lowering the pump into the well make sure that the feed cable of the pump is in at least 2m mounted to the delivery pipe with plastic bands. At a great depth where the pump is installed the cable which is not mounted to the delivery pipe may break reason high weight of cable.



It is recommended to lift the pump additionally at a steel line so that in case of self-rewinding of the delivery pipeline the unit does not sink in the well.



Right over the pump install a non-return valve to protect the equipment against the impact of the returning water. The non-return valve installed on the pump is an auxiliary valve, it may not be treated as the main valve.



The pump's motor is filled with an environment-friendly oil. In case of a motor breakdown the oil might be released to the well.



Before lowering the pump into a new well, the user should make sure whether the drilling company which executed the well has cleaned it by pumping the water out. When executing the well the water inside the protective pipe and inside the filter is contaminated with sludge and sand.

Pumping the water containing sand reduces significantly the lifecycle of deep-well pumps.



When setting the pressure switch and choosing the capacity of pressure vessel it is necessary to comply with the rule that the pump motor may not switch on more often than 30 times per hour. More frequent switching on might overload and damage the motor.

ELECTRIC CONNECTION:

The electric network from which the pump is to be supplied should have nominal values as given in the date plate of the motor.



The pump must be connected to the network with active earthing. The manufacturer and the warrantor is released from liability for damages to people or objects resulting from the missing proper earthing.



The electrical network feeding the pump must be fitted with an installation over-current motor switch securing the motor against overload. To ensure proper protection of the motor, the switch should be set for the winding current absorption given on the data plate in Ampere [A].

The pump may work without such switch but in case of damage caused by overload, the costs of repair be covered by user.



The electric installation feeding the pump should be fitted with a residual current device (RCD) of nominal operating current of I_n not grater than 30 mA. The manufacture and the warranter is released from any liability for damages caused to people or objects resulting to feeding the pump without proper switch.



Pumps 4SDM, MSC reason short length of cable are supplied with separate control box equipped with capacitor, overload protector and switch ON/OFF. Control box must be connect to pump cable. Method of connections are showed in inside cover of control box. Cable with electric plug is connected in factory. User must connect only cable from motor.



People and animals must not remain in water where the pump is running.



In case of damage to insulation of the feed cable it is forbidden to use the pump. In such situation contact the warranter to replace the cable. Mechanical damage is not covered by warranty. Using the pump with damaged insulation of the cable may lead at least to flooding of the motor, in the worst case to electric shock.



Before starting the pump check the voltage at the cable end. Note that at farther parts of the cable at its end the supply voltage decreases. Permitted decrease of voltage for the applied motors is $\pm 6\%$.

In order to avoid excessive drop of the voltage select proper cable according to the motor power, length of the cable. See the table below to choose the right cable:

		Maximum length of the cable in meter depend of diameter separately wire of cable						
Voltage 1 phase	Power of motor [kW]	1 mm ²	1,5 mm ²	2,5 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²
230-240 V	0,37	50	75	125				
230-240 V	0,55	40	58	94	150			
230-240 V	0,75	30	46	74	121	174		
230-240 V	1,1	21	32	50	86	125	215	
230-240 V	1,5		22	37	62	90	155	245
230-240 V	2,2			30	45	67	115	180



Non-compliance with the above instructions on selection of cable reduces the voltage excessively and in consequence overloads and damage the motor.

The pump is originally fitted with a short section of the cable. Depending on the user's needs the cable is extended. Water tight connections of cables must be executed by a person having proper knowledge and experience. The user should commission the assembly to a well driller company or can do it in a store he bought the pump.



Non-professional connection and insulation of the cables may cause that the residual current devices will knock out, the motor will be flooded or the user may suffer electric shock.

STORAGE:

Clean pump must be stored in a dry place.



Make sure that the pump is placed on even surface on entire length. The pump's support in one or several points may bend the pump and cause damage.

EQUIPMENT DISPOSAL:



The used product must be disposed as waste exclusively in selective waste collection organized by the Public Network of Electric and Electronic Waste Collection Points. The consumer may return the used equipment to the distributor of electric equipment, at least free of charge and directly provided that the equipment is of the right type and the same functionality as the newly purchased one.

DECLARATION OF CONFORMITY EC (Module A):

PHU DAMBAT

address: Gawartowa Wola 38, 05-085 KAMPINOS, POLAND

Pursuant to the act of 30th August 2002 on conformity system (Journal of Laws of 2004 No. 204, item 2087) with full responsibility we declare that the pumps are from series 4SG, 4SDm, 4SD, 90QJD, 3ti, 4SKm, 4TP, 90MSC

to which this declaration refers comply with the following directives of the European Parliament and Council, relating to:

- 1) machines no. 98/37/EC (norms applied: PN-EN292-1:1991, PN-EN292-2-1991/A1:1995, PN-EN 809:1999/AC:2004)
- 2) electromagnetic compatibility no. 89/336/EEC (norms applied: PN-EN 55014-1:2004, PN-EN 61000-3-2:2004)
- 3) electric equipment applied within certain limits of voltage no. 73/23/EEC (norms applied: PN-EN 60335-1:2004, PN-EN 60335-2-41:2005)

Adam Jastrzębski

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POTENTIAL PROBLEMS DURING OPERATION AND SOLUTIONS:

Symptom:	Possible cause:	Solution to the problem:
The pump is not running	The security device against dry run has been engaged	Wait until the quantity of water in the well is sufficient so the pump is switched on automatically.
	The security device against over-current has been engaged	Wait until the motor cools down and switch on the pump. Check the cause of the overload. Remove the cause.
	No power supply	Make sure the electric plug of the pump is properly inserted in electric socket. Check the corks at home and all installation switches which may cut off the power supply from the network Check if power supply is ensured near your house – the power company may have cut off power in a larger area.
The pump keeps switching on and off	A break in one wire of the feed cable	Check resistance between the cable wires
	Incorrect voltage or drop during start-up	Check voltage
The pump is running but is not feeding water or is feeding too little water	The filter screen is blocked at suction	Disconnect the pump from electrical supply. Take the pump out of the well and clean the filter
	Incorrect direction of the motor revolution (Valid only for 3 phase motor)	Change the two veins of the feed cable on the feeding strip (only for three-phase motors)
	Too high resistance during the flow through the delivery pipe (hose).	Check if the permitted lifting height for this specific type of pump is not exceeded. The lifting height to be generated by the pump depends on the level difference between water table in the well the water is pumped out and the level at which the water is pumped, the length of the delivery pipe (hose) and its diameter. If resistance is too high for this specific type of pump replace
	Sand in the pump (dirty water)	Remove sand from the pump. Clean the
	Supply voltage is too low	Check the supply voltage
Frequent switching on and off the pump	Too little water in the well	Check the pump's position. The pump's fuel feed port should be at least 2 m from the lowest dynamic level of water table.
	Pressure vessel is too small	Replace the vessel with a bigger one
	No airbag in the pressure vessel	Check the air pressure in the vessel. Add if necessary. If the situation repeats often check if the diaphragm in the vessel is not broken
	The difference between the switching on and switching off pressure at pressure switch is too small	Adjust the switch
	Suspended non-return valve	Take the pump out and replace the valve.