

3-phase PUMP CONTROLLERS type:

SPT-1/1 ; SPT-1/2 - max.11,5 KW



MANUAL



Manufacturer and distributor :

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1. APPLICATION

The "SPT-1" controller is produced in two versions differing in the dry-running protection system:

- **SPT-1/2 controller** - protects the pump against dry-running with two working probes (S1 – level off; S2 - level of inclusion – probes, e.g. SW-1K – fig. 3). Application mainly for submersible and discharge pumps taking water from the tank.

- **SPT-1/1 controller** - protects the pump against dry-running with one working probe (S1 – off/on level - automatic switching after approx. 50 seconds from re-engagement immersion of this probe). Application as above or for pumps taking water from the pipeline suction (the S1 probe is, for example, a G-3 / A head screwed into a pipe – Fig. 4).

Both types of controllers are designed to supply and control 3-phase pump motors with direct start up to 11.5 KW. The devices perform the following functions:

- protect the pump motor against overload (thermal relay matched to the power pumps),
- have a built-in contactor (matched to the pump power),
- protect the pump motor against 2-phase operation,
- have a 3-position control selector switch: manual operation – 0 – operation automatic (control of external voltage-free NO contact, e.g. pressure switch "LC", Emergency shutdown of the pump is signaled by lighting up one of the three LEDs (with the description: no water, thermals, no phase). The applied signaling system, precisely showing the cause of the failure, allows it to be quickly located and removed.

2. TECHNICAL DATA

- supply voltage - 3 x 400V, 50Hz
- connected pump power – max. 11.5 KW(thermal relays matched to the power of pumps
- weight - approx. 1.5 kg
- dimensions..... - up to 7.5 KW (130 x 200 x 115 width x height x depth)
- above 7.5 KW to 11.5 KW (160 x 200 x 120)
- work position - any
- ambient temp.- 0...50 C
- contactor and relay term. – DANFOSS or EATON
- housing protection class - IP 65

3. DESCRIPTION OF THE STRUCTURE

The device is built in a hermetic plastic housing.

The transparent cover of the device allows you to view the operating status of the device.

The view of the device is shown in Fig. 1

A 3-position control switch "A-0-R" is mounted on the cover.

In the "R" position – manual operation – continuous operation of the pump. In position "A"- automatic operation

– pump operation during short-circuited terminals "1-2" on the upper connection strip. An automatic control element should be connected to these terminals, e.g. a pressure switch installed on the hydrophore or a water level sensor when filling an open tank.

On the circuit board there are the following five LEDs – described on the cover (from the top):

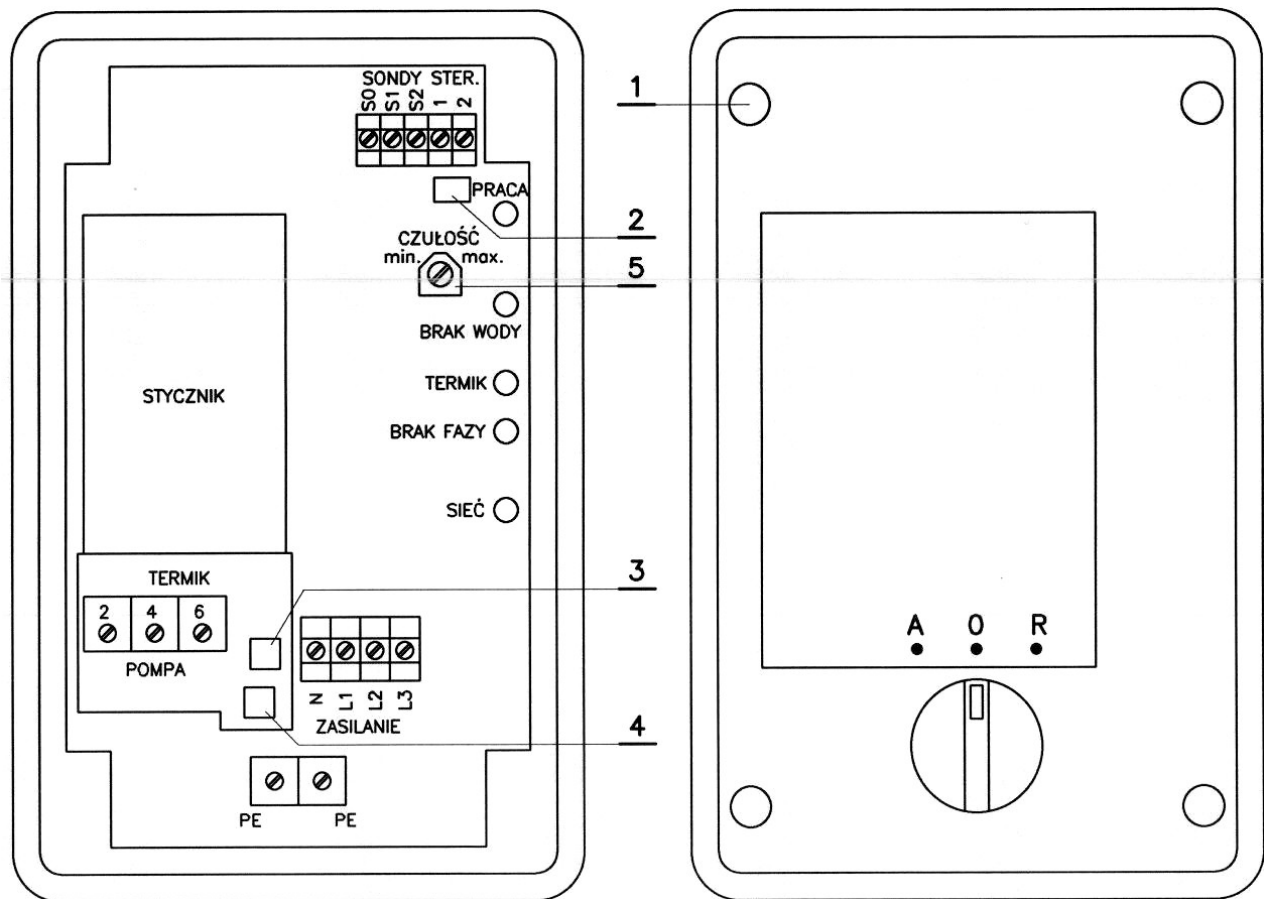
- green - "pump operation"
- red – "lack of water"
- red – "thermal"
- red – "no phase"
- green – "network" (signaling supply voltage)

Dry-running protection for submersible pumps or tank water intake pumps can be implemented in the following three versions:

Dry-running protection for submersible pumps or pumps that draw water, e.g. from a pipeline, works as follows depending on the type of controller:

- **SPT-1/1 controller** - operation with one working probe "S1" - switching off the pump after the liquid level drops below the "S 1" probe and switching on again after approx. 50 seconds after re-immersion of the "S1" probe in water. The reference probe "So" (installed below the working probe) closes the electrical circuit and does not measure any level. In the case of a well, you can dispense with the installation of this probe and connect the metal housing of the well or the "N" or "PE" terminal of the power grid to terminal no. "1" of the controller. In the case of a pipeline, the reference probe may be the metal housing of the installed measuring head, e.g. type G-3/A"

- **SPT-1/2 controller** - work with two working probes - pump shutdown after the liquid level drops below the lower probe (S 1) and automatic re-activation after immersion of the upper probe (S2). Reference probe "So" in the case of wells – current comments as in the case of SPT-1/1.



Driver after removing the cover of the controller cover

Fig.1. View of the controller after removing the transparent cover and cover with switch control

1. one of the four screws of the cover (rotation to the left by about 180 ° to open the cover)
2. detachable plug of the cable to the switch on the cover, (the plug fits into the socket only in one position – it is recommended to disconnect and remove the cover during installation work).
3. Thermal relay manual reset button,
4. blue cap – automatic reset of thermals,
5. sensitivity adjustment potentiometer of input probes "S1" and "S2",

The built-in water level sensor has a control knob to change the input sensitivity of the working probes (S1, S2). Access to adjustment with a small screwdriver (Fig. 1 item 5), after removing the cover. In most applications, this adjustment is unnecessary (factory setting to max. sensitivity). Reducing sensitivity by turning to the left is advisable, for example, in the case of probes in deep wells (probes touch wet structures and well casings).

Two-phase protection protects the motor against phase absence and asymmetry individual voltages exceeding 40V - the state of incorrect power supply is indicated by a red LED "no phase".

The installed thermal relay should be set to 1.1 In (In- motor rated current). The activation of the thermal relay and the emergency shutdown of the pump is signaled by the ignition of the red "thermal" diode. When the temperature of the thermals decreases, the pump will be automatically switched on. It is possible to select the "thermal lock" option by pulling out the blue cap under the red button (Fig. 1 item 4) of deleting the thermal. Activation of the thermals will cause permanent shutdown of the pump - manual unlocking with the red button on the thermals (Fig. 1 item 3).

4. ELECTRICAL ASSEMBLY

Fig. 2 shows an example of connecting a device with a pressure switch "LC" and two working probes "S1" and "S2" in a well. The controller should be powered from a switchboard with separate short-circuit protection adapted to the pump power (e.g. S-303 switches), it is also recommended to use a residual current circuit breaker.

The method of connecting the wires is as follows:

- to terminals no.: "N : L1:L2:L3" - supply voltage 3 x 400 V
- for terminals thermal "2:4:6" - pump supply wire,
- to terminal "PE" - PE supply and pump wire (if any),
- to terminal "So" - reference probe "So". In the case of a deep well, the "So" terminal can be left unconnected – without a probe – the circuit will close through the ground. In the case of metal tanks, the reference probe may be the tank housing.
- to terminal "S1" - lower working probe "S 1",
- to terminal "S2" - upper working probe "S2" (applies only to the SPT- for terminals "1-2"
- for terminals "1-2" – e.g. pressure switch "LC" controlling the automatic operation of the pump (shorted terminals – the pump works during automatic operation)

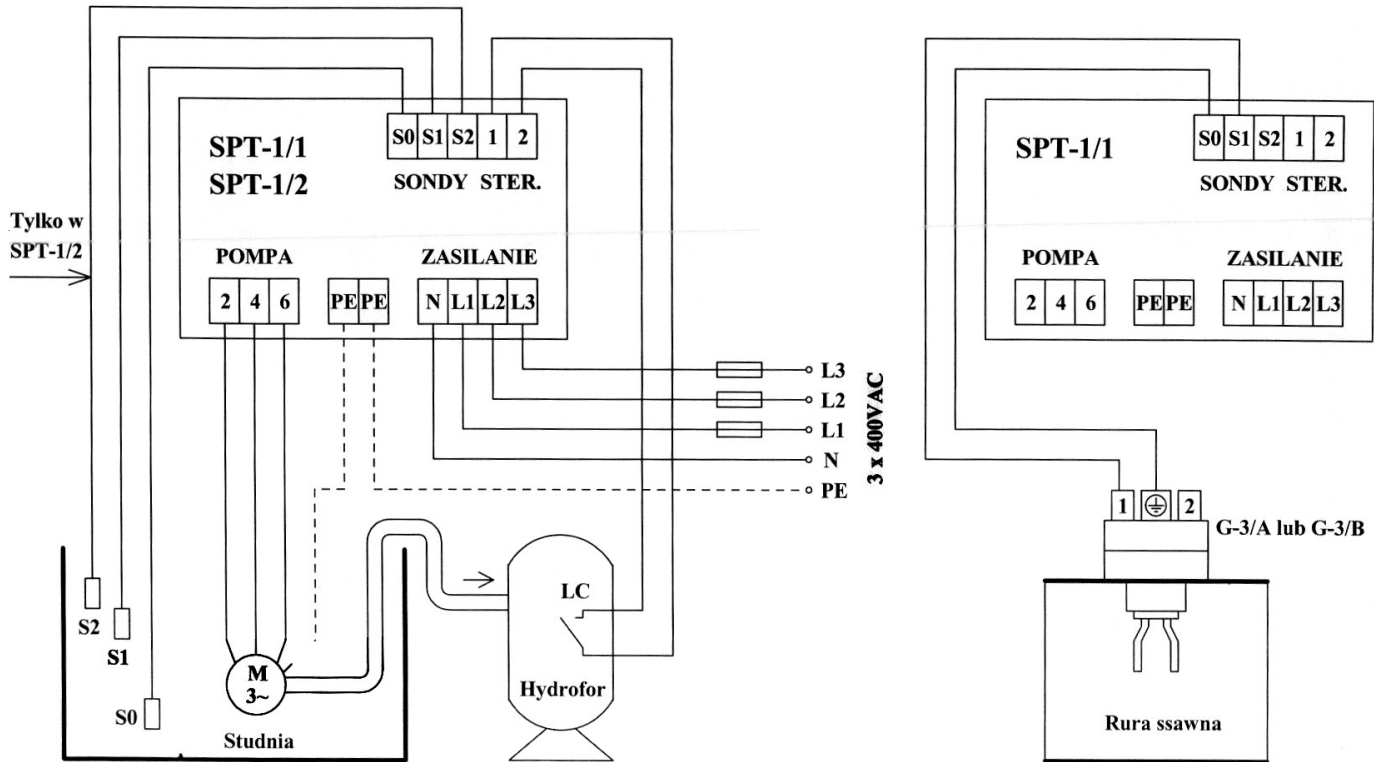
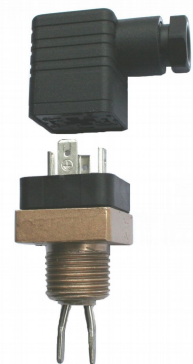


Fig.2. Exemplary diagram of connection of the "SPT-1/1" and "SPT-1/2" controllers
Probes so; S1; S2 – hanging on wires, e.g. SW-1K/... m (fig.3)

Figure 2 on the right shows the method of connecting the screw head (1/2' thread) on the suction pipeline to protect the pump against dry-running – for the SPT-1/1 controller.
If you do not use the dry running function (no probes), bridge the terminals "So – S1- S2" (So-S1 for the SPT-1/1 controller).



Fig.3 Conductivity probe type SW-1K/... m
(cable length 3....100m) Fig.



4 Screw head "G-3/A"

Warranty – 12 months from the date of purchase.

The company sells by mail order