PZP-830
Submersible pump
control relay

Purpose

The PZP-830 controller is designed for comprehensive control of 1-phase drives of submersible pumps up to 2.2 kW.

Featuers

» Controlling the water level in the well;
» Overfill protection for the tank to be filled;
» Control of the correctness of the supply voltage;
» Detection of high motor operating current (overload);
» Detection of low motor operating current (dry-running);
» Motor startup control.

Functioning

The controller is adapted to work with 2 (or 3) probes immersed in the well, plus a sensor (for example, a float) with a contact output to signal overfilling of the tank being filled.

Conditions for starting the pump

For the first 4 seconds after the power is turned on, the controller controls the conditions on the basis of which it will decide whether to start the pump:

» whether an operation command (closed external ON/ OFF contact) is issued;
» whether the supply voltage is in the correct range;
» whether the water level in the well exceeds R1;
» whether the sensor does not indicate overfilling of the tank to be filled (open FULL input).

If all the above conditions are met, the pump is started.

> ⚠ If the tank overfill sensor will not be used, the FULL terminals should be shorted.

> ⚠ If the controller is to work only with 2 well fill probes, the higher mounted probe should be connected to both R1 and R2 terminals.

Starting the pump

> ⚠ When the pump is started, inrush currents may occur that are several times higher than the rated value.

To ensure the correct level of motor protection also for this case, 2 additional parameters are programmed in the controller:

» ratio of inrush current to rated current (parameter **P7**);
» duration of motor startup (parameter **P8**).

⚠ When the startup is heavier than that set by parameters P7 and P8, the motor will be stopped.

Pump operation control

During pump operation, the controller continuously checks the parameters of the supply voltage and the current flowing through the motor.

Security configuration is done through settings:

» maximum voltage (parameter **P1**);
» maximum current (parameter **P2**);
» minimum voltage (parameter **P3**);
» minimum current (parameter **P4**);
» current protection tripping delay (parameter **P5**).

If the preset operating conditions are exceeded, the pump will be stopped.

⚠ There is an option of automatic restart in case the operation of the pump is interrupted due to exceeding the set operating conditions (voltage and current). The time to automatic restart can be set by parameter **P6**, while the number of automatic attempts to clear the error is set by parameter **P9**.

Operation cycle

Exceeding the R2 level in the well for the time set by parameter P10 will trigger the pump (taking into account the previously mentioned conditions). The pump will remain on until the tank overflows (FULL sensor opens), or until the water level in the well drops below R1. After shutting down, the controller waits for conditions to be met for the next cycle of operation.

Mounting

1. Turn off the power supply.
2. Fix the relay on a rail in the switchboard.
3. Place liquid level probes in the deep well and connect them to the controller according to the diagram below.
4. Connect the tank fill sensor (for example, float) to the FULL terminals of the controller. If this sensor is abandoned, the FULL terminals must be shorted.
5. Connect the ON/OFF switch to set the work command.

> ⚠ **Under no circumstances should voltage be connected to the ON/OFF and FULL terminals. This can lead to damage to the controller!**

6. Connect the power supply to the L IN (phase wire) and N (neutral wire) terminals.
7. Connect the motor to the L OUT (phase wire) and N (neutral wire) terminals.
8. Ground the motor and pump housing. Failure to ground the motor body can lead to damage to the pump.
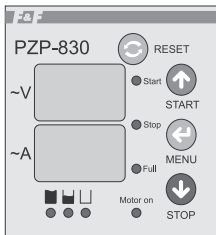
⚠ Not applicable to pumps with double-insulated housing and no access to metal parts.

9. Turn on the power the power to the switchboard.

Wiring diagram
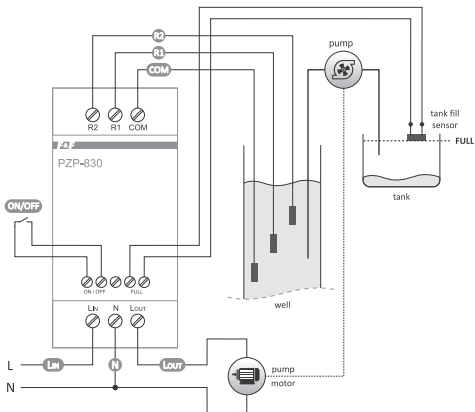
Control panel

↑	Sets the controller in the ready-to-run state (**START**). In menu mode, it allows you to move from one parameter to another. In edit mode, it increases the value of the edited parameter.
↓	Turns off the controller (**STOP**). In menu mode, it allows you to move from one parameter to another. In edit mode, it decreases the value of the edited parameter.
←	After pressing the button (**MENU**), the controller displays the menu with parameters. In edit mode, pressing the button saves the new parameter value and exits the menu.
↻	In case of an error, pressing the button (**RESET**) clears the error and allows the pump to restart.. In menu display and parameter editing mode, pressing the button exits the menu without saving parameter changes.

Display

The controller is equipped with a 2-element, 3-digit LED display. During normal operation, the upper display shows the current value of the supply voltage, and the lower display shows the current value of the motor current. In menu and configuration mode, the upper display indicates the parameter number, and the lower display indicates the parameter value.

LED indicators

Start	The controller in the working or ready state.
Stop	Controller off, in **Stop** mode, the pump will not be switched on.
Full	Tank fill signaling.
Motor on	Signaling that the pump motor is switched on.
The water level in the well	
	Below the minimum level (R1).
	Between the minimum level (R1) and the upper level.
	Above the upper level (R2).

Parameters

No.	Function	Range	Default
P1	Voltage limitation - upper level	230÷270 V	245 V
P2	Current limitation – upper level. **Not applicable to engine startup!**	1÷30 A	5 A
P3	Voltage limitation - lower level.	150÷210 V	160 V
P4	Current limitation – lower level.	0÷30 A	0 A
P5	Current protection tripping delay. **Not applicable to engine startup!**	0÷850 s	2 s
P6	Delay until automatic restart in case of error. If set to OFF, the error can only be cleared by pressing the RESET button.	OFF÷850 s	OFF
P7	Inrush current limitation. The inrush current value is set as a multiple of the upper current limit (P2).	1÷10	3
P8	Duration of motor startup. For the duration of motor startup, the upper current limit is set to the level set in parameter P7.	0÷850 s	10 s

No.	Function	Range	Default
P9	Number of automatic restarts in case of error. If the number of restarts set here is exceeded, resetting the fault and restarting the controller will be possible by pressing the RESET button. **This feature requires setting parameter P6 to a value different from OFF.**	OFF÷199	OFF
P10	The time from when the water level in the well exceeds R2 until the pump is started.	0÷850 min.	0 min.
P11	Probe immersion indicator R2 (upper display) and R1 (lower display). If the value is less than 230, it means that the probe is immersed in water. A higher value means no contact with water.	–	–
P12	Status memory. 1 – When the power is turned on, the state of the controller as it was at the time of the power failure is restored. 0 – When the power is turned on, the controller is set to (STOP) mode.	0÷1	1

power supply	150÷270 V AC
maximum load current	
resistive load (AC-1)	30 A / 250 V AC
motor inductive load (AC-3)	10 A / 250 V AC
contact	separated 1×NO
current measuring range	1÷30 A
sensitivity	50 kΩ
LED indication	water level, pump operation, device status
display	2× 3-digit LED display (voltage and current indicator, configuration)
power consumption	6 VA
working temperature	-20÷55°C
terminal	
power supply and motor	10 mm² screw terminals
control inputs	2,5 mm² screw terminals
dimensions	60×115×94 mm
mounting	on TH-35 rail/panel mount
ingress protection	IP20
external probe	
float probe	PZP
immersion probe	PZ2

⚠️ Probes are not available in the set together with the PZP-830 relay. The selected probe(s) must be ordered separately.

Warranty

F&F products are covered by a 24-month warranty from the date of purchase. The warranty is only valid with proof of purchase. Contact your dealer or contact us directly.

CE declaration

F&F Filipowski L.P. declares that the device is in conformity with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.

The CE Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found www.fif.com.pl on the product subpage.