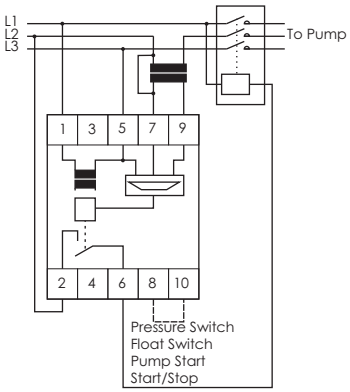
DPP3

Pump Protection Relay Three Phase

Description

Advanced pump protection relay to safeguard against damage to borehole pumps. The unit is easily calibrated and then monitors all important pump characteristics. All parameters are saved in non-volatile memory to be available even after power loss. A re-start delay ensures the borehole replenishing before pumping starts again.

Wiring Diagram



FEATURES

- High resolution analogue microprocessor
- Automatic diagnosis of pump
- Fixed start-up delay (10 sec)
- Front face calibration / reset button
- Monitors over and under current
- Three retries for over current
- Under current (dry running) restart delay
- Monitors over and under voltage
- Detects phase reversal (three phase unit)
- Security input to control pump
- Modular 35.5mm DIN rail mountable
- High current 16A SPST output relay
- LED indication for faults
- LED indication for power supply ON

Input Specifications

Current Input	Pin 7 & 9
Measuring Ranges	1 - 15 A
Over current limit	12 %
	17 % (extended)
Recovery Time	15 sec
	(3 attempts then permanent OFF)
Under current limit	8 %
	12 %
Recovery Time	2 hrs
Maximum	
Overload current	20 A (30 sec)
Voltage Input	Pin 1, 3
Measuring Range	180 - 260 VAC DPP1
	320 - 460 VAC DPP3
Over / Under voltage	± 15 %
limit	± 20 % (extended)
Hysteresis	5 %

Supply Specifications

Power Supply AC Type	110, 230, 400V
(Galvanic)	525V ± 10%
	50 / 60 Hz ± 5Hz
Isolation	4kV
Consumption	± 3VA
	± 6VA 525 Vz ± 5Hz

Output Specifications

Relay Output	SPDT
Rated Isolation Voltage	6000 VAC (contact / electric) 1000 VAC (contact / contact)
Nominal Rate in Ac1 (Ag-Ni)	4000 VA
Rated Current	16A
Rated Voltage	250V
Mechanical Life	$10x10^6$ cycles
Electrical Life	$110x10^3$ cycles (at max load)
Operating Frequency	≤ 1800 cycles/h

General Specifications

Power ON Delay	≤ 300 ms
Power OFF Delay	≤ 200 ms
Indication for	
Power Supply ON	LED green
Over Voltage	LED yellow
Under Voltage	LED red
Environment	
Degree Of Protection	IP 20
Operating Temperature	-10 to + 50°C
Storage Temperature	-50 to + 85°C
Weight	200g

DPP3

Pump Protection Relay

	POWER LED	STATUS LED	RELAY LED
Over voltage	Flashing	On	Off
Under voltage/Phase loss	On	Flashing	Off
Under Current	Flashing	Off	Off
Over Current	Off	Flashing	Off
Phase Reversal	Flashing	Flashing	Off
Contact 8 & 9 open	On	Off	Off
Startup delay	On	Off	Flashing
Pump Running OK	On	Off	On
Uncalibrated	Flashing	Flashing	Flashing

Mode of Operations

The unit will monitor the following parameters and respond as mentioned in each section.

Voltage sensing:

The relay will release if the supply voltage exceeds or fall below 15% of the set limit stored during calibration. If the voltage returns to within 15% of the set value the relay will automatically operate, starting the pump.

Underloading sensing:

If there is a loss of any phases supplied to the unit the relay will release. If any two phases are reversed the relay will release. The relay will automatically operate if the sequence is restored or the phase loss is corrected.

Overloading sensing:

If the current exceeds the set limit stored during calibration the relay will release after a one second delay. The relay will restart after a 10 second pause. If an over current condition is detected three consecutive times the unit will trip permanently until the power is removed and reapplied.

Phase Failure / Sequence:

The unit will detect a loss of load but detecting the increase in angular lag between the voltage and the current. The under load will release the relay after a 10 seconds delay. The relay will remain off for the recovery time, after which the unit will restart the pump.

The unit can be calibrated from an un-calibrated state (all LED flashing) by pressing the front cover 'SET' button. The unit can be reset (not re-calibrated) from a latched fault state by pressing the 'SET' button. This can only be done three times in 15 minutes. This limit on restarts applies to non-latching faults. To re-calibrate the unit, the 'SET' button has to be pressed when the supply is applied to the unit until the POWER LED stops flashing.

Operation Diagram