PF

THREE PHASE Pump Protection Relay without Level Sensors

THREE PHASE PUMP PROTECTION

Underload protection by cos φ

- ***Eliminates need for level sensors to detect dry running.***
- ***For 3-phase motors from 1 to 630 A and over. Cable feed through relay itself.***
- ***Precise motor heating and cooling memory, reproduces its thermal image.***
- ***Visual indication of tripping cause.***
- ***Adjustable reset time for cos φ.***

Suitable for 3-phase submersible pumps, petrol station pumps, and other type of pumps and systems where running without load is critical (dry well, broken transmission belt, etc.).

The great advantage of these relays is that, by using the motor itself as a sensor and without requiring any external detectors, they monitor the cos φ of the motor and stop it before a breakdown caused by dry running, cavitation or closed valve occurs.

PF

PROTECTION FUNCTIONS

- $I>$ Overload
- **cos** φ Underload
- Phase imbalance or phase loss
- Phase sequence

WITHOUT LEVEL SENSORS

WITHOUT LEVEL SENSORS

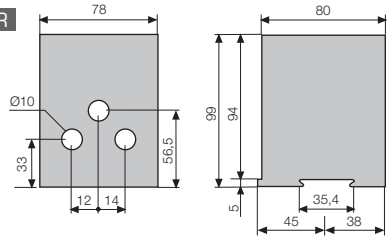
MODELS			PF 16-R	PF 47-R
Adjustment range Motor 400 V 50/60 Hz	I_B (A)		4 - 16,6	16 - 47,5
	CV		3 - 10	10 - 30
	kW		2,2 - 7,5	7,5 - 22
Adjustment range Motor 230 V 50/60 Hz	I_B (A)		4 - 16,6	16 - 47,5
	CV		1,5 - 5,5	5,5 - 15
	kW		1,1 - 4	4 - 11
Code — according to the relay voltage supply (+15% -10%) ac: 50/60 Hz	400/440 Vac	3-phase (motor)	**12165**	**12167**
	230 Vac	3-phase (motor)	**12173**	**12168**
For I_N of the motor below the minimum setting I_B			Pass the cables several times (n) through the holes in the relay I_B = n x I_N	
For I_N of the motor above the maximum setting I_B			Use 3 CT .../5 and the relay PF16-R	
External display module (optional)			ODPF	

CHARACTERISTICS	
Thermal memory / Overload trip	Yes / From 1,1 x I_B
Maximum motor nominal voltage	440 Vac
Trip classes (IEC 947-4-1)	10 - 20 - 30
Phase sequence protection	Yes
Phase imbalance protection	Over 40%. Tripping time < 3s
Underload protection by cos φ / Trip delay	cos φ adjustable from 0,15 to 1,0 / adjustable from 5 to 45s
Reset mode for protection against dry running	cos φ automatic (adjustable) and remote. More info in page 110
Reset mode for other protection functions	$I>$ Manual, remote and automatic. More info in page 110
Signalling LED's	4 LED's: ON + $I>$ + **cos** φ +
Output contacts	1 relay with 1 NO + 1 NC
Switching power	I_{th}: 5A; AC15 - 250V - 2A; DC13 - 30V - 2A
Terminals: Max. section / screw torque	2,5 mm², No. 22 - 12AWG / 20Ncm, 1.8 LB - IN
Power consumption	1,5W - 12 VA (230 Vac) - 20 VA (400 Vac)
Protection degree / weight / mounting	IP20 / 0,5 kg / DIN rail
Storage temperature	-30°C +70°C
Operating temperature / max. altitude	-15°C +60°C / 1000m; -15°C +50°C / 3000m
Standards	IEC 255, IEC 947, IEC 801, EN 50081-2
	CE

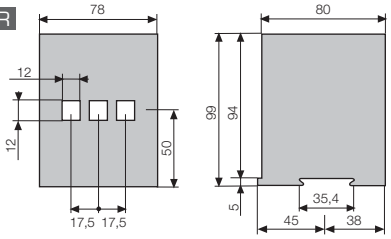
Settings and curves, see pages 105 to 111.

DIMENSIONS PS RELAY (mm)

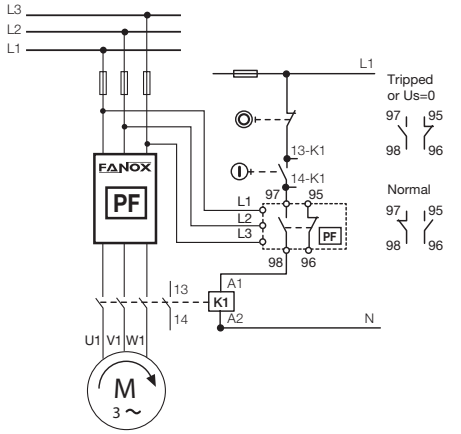
PF 16-R



PF 47–R



WIRING DIAGRAM



EXTERNAL DISPLAY MODULE

By means of this plug-in optional accessory, the relay status can be seen and reset from the exterior of the electrical panel board.

Easy to install. Size of a Ø22 mm push button.

Suitable for motor control centres (MCC) and panel boards.

This optional display module is mounted externally, e.g. on the panel door or a draw-out unit in a motor control centre (MCC) and connected to the relay by a flat cable (length 2 meters).

The module has the appropriate LED's to signal the trip cause and a reset push-button.

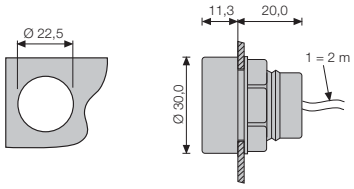
Weight: 0,05 kg.

Protection degree: IP50

ODPF

Model	Code	Relay type
ODPF	**12555**	PF

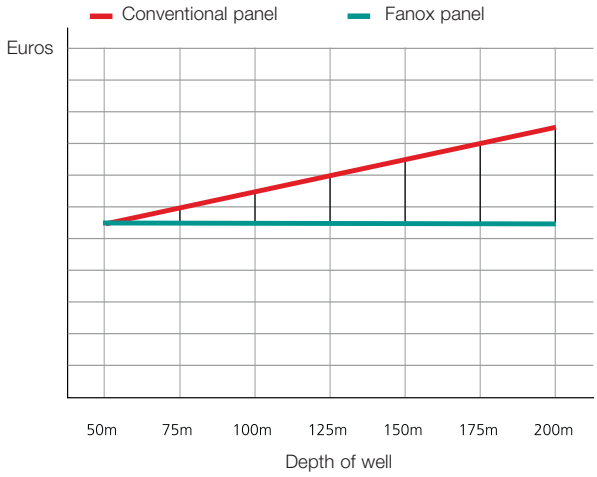
DIMENSIONS ODPF MODULE (mm)



"The PS and PF electronic relays have been specially designed to provide complete protection for both single and three phase pumps and any other system where dry running is a critical factor."

Fanox panel	Conventional panel
Electronic relay	Thermal relay Level electrode relay as well as Level electrodes Level electrode wiring

COST COMPARISON



The graph shows that with FANOX SOLUTION you can save up to 35% of the cost of a pump protection system.