

Pump protection relays (Without level sensors)

THREE PHASE PUMP PROTECTION

Underload protection by $\cos \varphi$

- 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 $\cos \varphi$.

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 $\cos \varphi$ of the motor and stop it before a breakdown caused by dry running, cavitation or closed valve occurs.

PF



PROTECTION FUNCTIONS

- $I >$ Overload
- $\cos \varphi$ Underload
- Δ Phase imbalance or phase loss
- (R) Phase sequence

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	2 - 10	10 - 30
	kW	1,5 - 7,5	7,5 - 22
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 $I_B = n \times I_N$	
For I_N of the motor above the maximum setting I_B		Use 3 CT .../5 and the relay P 19	
External display module (optional)		ODPF	

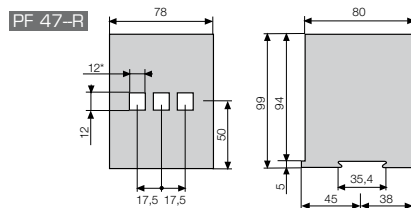
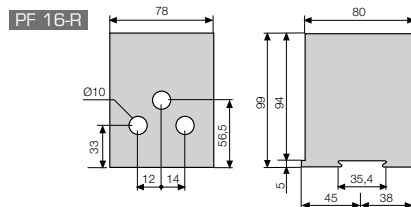
CHARACTERISTICS

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 $\cos \varphi$ / Trip delay	$\cos \varphi$ adjustable from 0,15 to 1,0 / adjustable from 5 to 45s
Reset mode for protection against dry running	$\cos \varphi$ automatic (adjustable) and remote. More info in page 28
Reset mode for other protection functions	$I >$ Δ (R) Manual, remote and automatic. More info in page 28
Signalling LED's	4 LED's: ON + $I >$ + $\cos \varphi$ + Δ (R)
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 mm ² , 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
Operation temperature / max. altitude	-15°C +60°C / 1000m; -15°C +50°C / 3000m
Standards	IEC 255, IEC 947, IEC 801, EN 50081-2

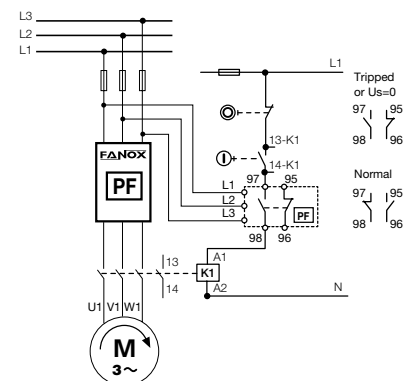


Settings and curves, see pages 24 to 29.

DIMENSIONS PS RELAY (mm)



WIRING DIAGRAM (mm)





ELECTRONIC PROTECTION & CONTROL OF MOTORS, GENERATORS AND PUMPS

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

RESET MODULE

For reset mode between 75 and 525 minutes, is necessary to incorporate the PF-RM timer module to FANOX electronic protection relays.

This optional module, is installed close to the PF relay and is connected to the relay by a flat cable.

It allows to multiply the reset time adjusted in the relay (x1, x2, x3, x4, x5, x6, x7).

Weight: 0,12 kg.

Protection degree: IP50

ODPF



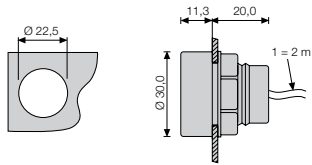
Model	Code	Relay type
ODPF	12555	PF

PF-RM



Model	Code	Relay type
PF-RM	12169	PF

DIMENSIONS ODPF MODULE (mm)



DIMENSIONS PF-RM RESET MODULE (mm)

