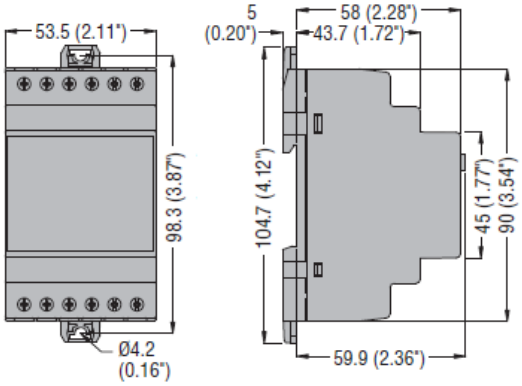
Lovato electric

ENERGY AND AUTOMATION

Order code	Rated current Ie	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single and three-phase systems. Maximum AC current and minimum cosφ. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip. Auxiliary AC power supply. Automatic or manual reset.				
PMA50 A240	5 or 16A	220-240VAC	1	0.251
PMA50 A415		380-415VAC	1	0.251
PMA50 A480		440-480VAC	1	0.251



General characteristics

- Pump protection relay against dry running, auxiliary AC power supply
- Motor under-load and over-current control
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- Voltage control range 80-660VAC
- Current control range 0.1-16A
- Resetting and enabling consent input
- 1 relay output relay with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 module
- IEC protection degree: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

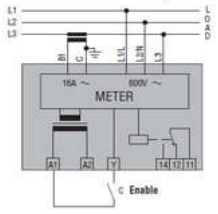
ADJUSTMENTS

"Cosφ min"	Minimum cosφ threshold 0.1-0.99 (under-load/dry running)
"Imax"	Maximum (over) current threshold 10-100%Ie
"Trip delay"	Tripping time for minimum cosφ and maximum current 0.1-10s
"Inhibition time"	Tripping delay for external input or at power up 1-60s
"Aut. reset delay"	Automatic reset time OFF-100min
"Mode"	• Rated current 5A or 16A • Single or three phase • External reset On or Off.

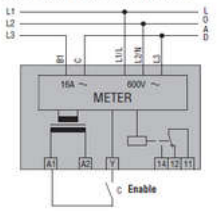
Pump protection - motor under-load/over-current monitoring

PMA50

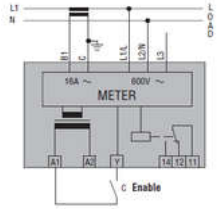
Three-phase connection by CT



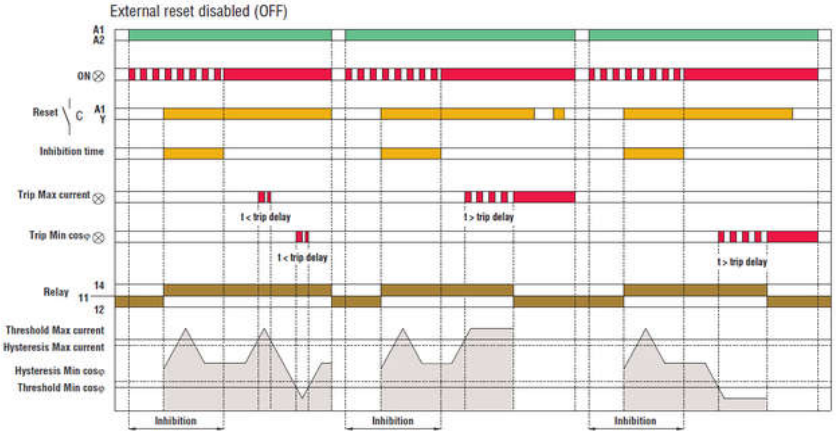
Three-phase direct connection



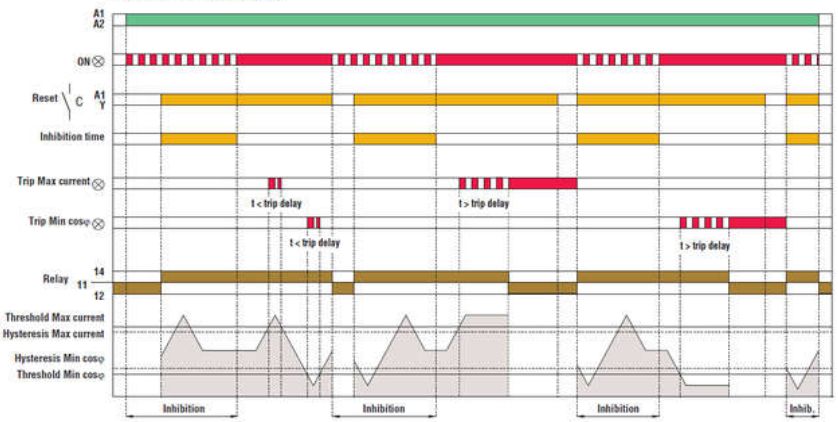
Single-phase connection by CT



External reset disabled (OFF)



External reset enabled (ON)



Operation			
Mode	Ie	Connection	External reset
A	5A	1 phase	OFF
B			ON
C		3 phase	OFF
D			ON
E	16A	1 phase	OFF
F			ON
G		3 phase	OFF
H			ON

Certifications and compliance
Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Modular ampere monitoring relays.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Lovato electric

ENERGY AND AUTOMATION

TYPE		PMA50	PMA60
DESCRIPTION			
		Single and three-phase pump protection (motor under-load and over-current control) monitoring for max AC current, min cosφ, phase loss and incorrect phase sequence	Single and three-phase shift control for minimum and maximum cosφ monitoring
CURRENT AND COSφ CONTROL CIRCUIT			
Rated current Ie		5 or 16A	16A
Rated frequency		50/60Hz ±5%	
Overload capacity		5Ie for 1s 160A for 10ms Constant 16A	
Connection		Direct or by current transformer	
Adjustments	End-scale value	5 or 16A	16A
	Tripping for MAX current	10-100Ie	—
	Tripping for cosφ	0.1-0.99 cosφ (MIN)	0.1-0.99 cosφ (MIN and MAX)
	Tripping delay	0.1-10s	0.1-30s
	Inhibition time	1-60s	1-60s
	Automatic resetting delay	OFF-100min	—
External input		Consent for running/resetting	—
Repeat accuracy		±1% with constant parameters	
VOLTAGE CONTROL CIRCUIT			
Voltage measuring range (Ue)		80...660VAC	
Tripping time for phase loss		60ms	
AUXILIARY SUPPLY			
Auxiliary supply voltage Us		220-240VAC	
		380-415VAC (maximum voltage for UL/CSA)	
		440-480VAC	
Operating range		0.85-1.1 Us	0.85-1.1 Us
Frequency range		50/60Hz ±5%	50/60Hz ±5%
Power consumption (maximum)		4.5VA	4.4VA
Power dissipation (maximum)		2.3W	2.4W
RELAY OUTPUTS			
Number of relays		1	2
Relay state		Normally energised, de-energises at tripping	Normally energised / de-energised (ON-OFF) (configurable)
Contact arrangement		1 changeover contact SPDT each	
Rated operational voltage		250VAC	
Maximum switching voltage		400VAC	
IEC conventional free air thermal current Ith		8A	
UL/CSA and IEC/EN 60947-5-1 designation		B300	
Electrical life (With rated load)		10^5 cycles	
Mechanical life		$30x10^6$ cycles	
Indications		1 green LED for power on/inhibition 2 red LEDs for minimum/maximum tripping	
CONNECTIONS			
Tightening torque maximum		0.8Nm (7lbin; 7-9lbin per UL/CSA)	
Conductor section min-max		0.2-4.0mm² (24-12AWG; 18-12 AWG per UL/CSA)	
INSULATION (input-output)			
IEC rated insulation voltage Ui		600VAC	
IEC rated impulse withstand voltage Uimp		6kV	
IEC power frequency withstand voltage		2.5kV	
AMBIENT CONDITIONS			
Operating temperature		–20...+60°C	
Storage temperature		–30...+80°C	
HOUSING			
Material		Self-extinguishing polyamide	