

- Modular version for modular-slot switchboards, also suitable for rear mounting plate fixing
- Minimum and maximum voltage monitoring relays for single and three-phase systems, with or without neutral
- Voltage asymmetry, phase sequence and phase loss control relays
- Multifunction voltage and frequency monitoring relays with NFC technology and APP
- Frequency monitoring relays
- Minimum and maximum current monitoring relays
- Interface protection system units compliant with Italian standards CEI 0-21, CEI 0-16, DEWA DRRG and G59.

Voltage monitoring relays				
For three-phase systems, without neutral	18	٠ -		4
For three-phase systems, with or without neutral	. 18	} -	í	6
For three-phase systems, with or without neutral				7
Multifunction voltage and frequency monitoring relays, programmable via NFC technology and APP	18	} -	1	8
Frequency monitoring relays	. 18	} -	1	8
Current monitoring relays For single systems For single and three-phase systems				
For single systems	. 18	} -	1	9
For single and three-phase systems	. 18	} -	1	0
Pump protection relays	. 18	} -	1	1
Interface protection system units	18	} -	12	2
Dimensions	18	} -	19	9
Wiring diagrams	18	} -	2	0
Technical characteristics				





Pages 18-4 to 7

VOLTAGE MONITORING RELAYS

- For three-phase systems with or without neutral and single-phase systems
- · Minimum and maximum AC voltage
- Phase loss and incorrect phase sequence
- Asymmetry
- Minimum and maximum frequency.



Page 18-8

MULTIFUNCTION VOLTAGE AND FREQUENCY MONITORING RELAYS

- Voltage and frequency monitoring relays for three-phase systems with or without neutral
- Programmable via NFC technology and APP
- Minimum and maximum AC voltage
- Phase loss, neutral loss and incorrect phase sequence
- Asymmetry
- · Minimum and maximum frequency.



Page 18-8

FREQUENCY MONITORING RELAYS

- For single and three-phase systems
- Minimum frequency
- · Maximum frequency.



Pages 18-9 and 10

CURRENT MONITORING RELAYS

- For single and three-phase systems
- Maximum AC/DC current
- Minimum or maximum AC/DC current
- Minimum and maximum AC/DC current.



Page 18-11

PUMP PROTECTION RELAYS

- For single and three-phase systems
- \bullet Minimum $cos\phi$ for dry running protection
- Maximum AC current
- Phase loss and incorrect phase sequence.



Page 18-12

INTERFACE PROTECTION SYSTEM UNITS

- Compliant with Italian standard CEI 0-21, for low voltage
- Compliant with Italian standard CEI 0-16, for medium voltage
- Compliant with standard SHAMS DUBAI -DRRG (DEWA)
- · Compliant with technical guide G59 (ENA).





Voltage monitoring relays for three-phase systems without neutral









	PMV10	PMV20	PMV30	PMV40	PMV50	PMV70
Modular version	●(1U)	●(2U)	●(2U)	●(2U)	●(2U)	●(2U)
Minimum AC voltage			•		•	•
Maximum AC voltage					•	•
Phase loss	•	•	•	•	•	•
Incorrect phase sequence	•	•	•	•	•	•
Asymmetry				•		•
Page		18	-4		18-5	18-5

Voltage monitoring relays for three-phase systems with or without neutral











	PMV50N	PMV70N	PMV80N	PMV95N
Modular version	●(3U)	●(3U)	●(3U)	●(2U)
Minimum AC voltage	•	•	•	•
Maximum AC voltage	•	•	•	•
Phase loss	•	•	•	•
Neutral loss	•	•	•	•
Incorrect phase sequence	•	•	•	•
Asymmetry		•		•
Minimum frequency			•	•
Maximum frequency			•	•
Programmable via NFC technology and APP				•
Page	18-6	18-6	18-7	18-8

Voltage monitoring relay for single-phase systems



	PMV55
Modular version	●(2U)
Minimum AC voltage	•
Maximum AC voltage	•
Page	18-7

Frequency monitoring relays for single-phase and three-phase systems

	PMF20	
Modular version	●(2U)	
Minimum frequency	•	
Maximum frequency	•	
Page	18-8	

Current monitoring relays for single and three-phase systems





	PMA20	PMA30	PMA40	
Modular version	●(2U)	●(2U)	●(3U)	
Maximum AC/DC current	•			
Minimum or maximum AC/DC current		•		
Minimum and maximum AC/DC current			•	
Page	18-9	18-10		

Pump protection relay for single and three-phase systems



	PMA50
Modular version	●(3U)
$\begin{array}{c} \text{Minimum cos} \phi \text{ for dry running} \\ \text{pump protection} \end{array}$	•
Maximum AC current	•
Phase loss	•
Incorrect phase sequence	•
Page	18-11

Interface protection system units







	PMVF20	PMVF30	PMVF51	PMVF60	PMVF70
CEI 0-21	•		•		
CEI 0-16		•			
DEWA DRRG				•	
G59					•
Page	18-12	18-14	18-13	18-15	18-16

Voltage monitoring relays



For three-phase systems, without neutral



PMV10 A440

9999

3333

999

PMV20...

PMV30...

	to control Ue (phase to phase)	per pkg				
	[V] 50/60Hz	n°	[kg]			
Three-phase system, without neutral. Phase loss and incorrect phase sequence. Instantaneous tr 1 module housing.						
PMV10 A440	208480VAC	1	0.050			
2 modules housing.						
PMV20 A240	100240VAC	1	0.120			
PMV20 A575	208575VAC	1	0.120			
PMV20 A600	380600VAC	1	0.120			

Rated voltage

Order code

Qty Wt

Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, without neutral. Minimum AC voltage. Delayed trip.

Phase loss and incorrect phase sequence. Instantaneous trip.

Thase 1005 and moonroot phase sequence. Instantaneous trip.						
PMV30 A240	208240VAC	1	0.130			
PMV30 A575	380575VAC	1	0.130			
PMV30 A600	600VAC	1	0.130			

General characteristics

- Voltage monitoring relay, self powered, for phase loss and incorrect phase sequence
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing: 1 module for PMV10; 2 modules for PMV20
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

Certifications and compliance

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

General characteristics

- Voltage monitoring relay, self powered, for minimum
- voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue):
- PMV30 A240: 208-220-230-240VAC
- PMV30 A575: 380-400-415-440-460-480-525-575VAC
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
 IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Minimum voltage tripping threshold "V min"

80...95% Ue Tripping time 0.1...20s "Delay"

"Reset delay" Resetting time 0.1...20s.

Certifications and compliance

Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices. Compliant with standards: IÉC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508,

CSA C22.2 n° 14.



Three-phase system, without neutral.

Asymmetry. Delayed trip.

Phase loss and incorrect phase sequence. Instantaneous trin

rnase ioss and incorrect phase sequence. Instalitations trip.						
PMV40 A240 208240VAC 1 0.13						
PMV40 A575	380575VAC	1	0.130			
PMV40 A600	600VAC	1	0.130			

General characteristics

- Voltage monitoring relay, self powered, for asymmetry,
- phase loss and incorrect phase sequence
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
 IEC degree of protection: IP40 on front (only when placed in
- IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Asymmetry" High voltage asymmetry tripping threshold

5...15% Ue

"Delay" Tripping time 0.1...20s "Reset delay" Resetting time 0.1...20s.

Certifications and compliance

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



PMV40...



For three-phase systems, without neutral



PMV50...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, without neutral.

Minimum and maximum AC voltage. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip.

PMV50 A240	208240VAC	1	0.130
PMV50 A575	380575VAC	1	0.130
PMV50 A600	600VAC	1	0.130

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue):
 PMV50 A240: 208-220-230-240VAC
 PMV50 A575: 380-400-415-440-460-480-525-575VAC
- High tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 on terninals.

ADJUSTMENTS

"V max" Maximum voltage tripping threshold

105...115% Ue

"V min" Minimum voltage tripping threshold

80...95% Ue "Delay" for each Tripping time 0.1...20s

"Reset delay" Resetting time 0.1...20s.

Certifications and compliance

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



PMV70...

Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, without neutral.

Minimum and maximum AC voltage and asymmetry. Delayed trip.

rhase ioss and incorrect phase sequence. Instantaneous ti			
PMV70 A240	208240VAC	1	0.130
PMV70 A575	380575VAC	1	0.130
PMV70 A600	600VAC	1	0.130

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, incorrect phase sequence and asymmetry Configurable rated voltage (Ue):
- - PMV70 A240: 208-220-230-240VAC
 PMV70 A575: 380-400-415-440-460-480-525-575VAC
- Excellent tripping accuracy TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT) Modular DIN 43880 housing, 2 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max" Maximum voltage tripping threshold

105...115% Ue

"V min" Minimum voltage tripping threshold

80...95% Ue

"Delay" for each Tripping delay 0.1...20s

"Asymmetry" High voltage asymmetry tripping threshold

5...15% Ue.

Certifications and compliance

Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices. Compliant with standards: IEC/EN 60255-5 IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

Voltage monitoring relays



For three-phase systems with or without neutral



PMV50N...

Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, with or without neutral. Minimum and maximum AC voltage. Delayed trip. Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip.

PMV50N A240	208240VAC	1	0.200
PMV50N A440	380440VAC	1	0.200
PMV50N A600	480600VAC	1	0.200

Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
[V] 50/60Hz	n°	[kg]
	to control Ue (phase to phase)	to control Ue per (phase to phase) pkg

Three-phase system, with or without neutral. Minimum and maximum AC voltage and asymmetry. Delayed trip

Phase loss, neutral loss and incorrect phase sequence. Instantaneous trin

motantanoodo trip.			
PMV70N A240	208240VAC	1	0.200
PMV70N A440	380440VAC	1	0.200
PMV70N A600	480600VAC	1	0.200

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss and incorrect phase sequence
- PMV50N A400: 380-400-415-440VAC (phase-phase)
 PMV50N A440: 380-400-415-440VAC (phase-neutral)
 PMV50N A440: 380-400-415-440VAC (phase-neutral)
 PMV50N A600: 480-525-575-600VAC (phase-phase)
- 277-303-332-347VAC (phase-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection when one of the voltages is <70% rated voltage
- Phase or neutral loss tripping time: 60ms 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Maximum voltage tripping threshold "V max"

105...115% Ue

Minimum voltage tripping threshold "V min'

80...95% Ue

"Delay" for each Tripping time 0.1...20s "Reset Delay" Resetting time 0.1...20s.

Certifications and compliance

Certifications obtained: EAC. Compliant with standards: IEC/EN 60255-5. IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss, incorrect phase sequence and asymmetry
- pnase sequence and asymmetry
 4 configurable rated voltage (Ue):
 PMV70N A240: 208-220-230-240VAC (phase-phase)
 120-127-132-138VAC (phase-neutral)
 PMV70N A440: 380-400-415-440VAC (phase-phase)
 220-230-240-254VAC (phase-neutral)
 PMV70N A600: 480-525-575-600VAC (phase-phase)
 277-303-332-347VAC (phase-neutral)

- Excellent tripping accuracy
 TRMS measurements (True Root Mean Square)
- Phase loss detection when one of the voltages is <70% rated value
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Maximum voltage tripping threshold "V max"

105...115% Ue

"V min" Minimum voltage tripping threshold

80...95% Ue

"Delay" for each Tripping time 0.1...20s

"Asymmetry" High voltage asymmetry tripping threshold

5...15% Ue.

Certifications and compliance

Certifications obtained: EAC. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 nº 14.



PMV70N...



For three-phase systems, with or without neutral



PMV80N...

Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[ka]

Three-phase system, with or without neutral.

Minimum and maximum AC voltage, minimum and maximum frequency. Delayed trip.

Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip.

PMV80N A240	208240VAC	1	0.200
PMV80N A440	380440VAC	1	0.200
PMV80N A600	480600VAC	1	0.200

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage, minimum and maximum frequency, phase loss, neutral loss and incorrect phase sequence
- phase loss, neutral loss and incorrect phase sequence 4 configurable rated voltage (Ue):

 PMV80N A240: 208-220-230-240VAC (phase-phase) 120-127-132-138VAC (phase-neutral)

 PMV80N A440: 380-400-415-440VAC (phase-phase) 220-230-240-254VAC (phase-neutral)

 PMV80N A600: 480-525-575-600VAC (phase-phase) 277-202-232-247VAC (phase-phase) 277-202-232-247VAC (phase-phase)
- 277-303-332-347VAC (phase-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection if one of the voltages is <70% rated
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880, 3 modules
- IEC degree of protection: IP40 on front (only when placed in iP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max" Maximum voltage tripping threshold

105...115% Ue

"V min" Minimum voltage tripping threshold

80...95% Ue

Minimum/maximum frequency tripping "Hz min/max"

threshold 1...10% Tripping time 0.1...20s "V delay Tripping time 0.1...5s. "Hz delay"

Certifications and compliance

Certifications obtained: EAC.

Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508,

CSA C22.2 n° 14.

For single-phase systems



PMV55...

Order code	Rated voltage to control Ue	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Single-phase system.

Minimum and maximum AC voltage. Delayed trip.

PMV55 A240	208240VAC	1	0.125
PMV55 A440	380440VAC	1	0.125

General characteristics

- Voltage monitoring relay, self powered, for minimum and maximum voltage 4 configurable rated voltage (Ue): • PMV55 A240: 208-220-230-240VAC • PMV55 A440: 380-400-415-440VAC

- Excellent tripping accuracy
 TRMS measurements (True Root Mean Square)
 1 relay output with 1 changeover contact (SPDT)
 Modular DIN 43880 housing, 2 modules
 IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Maximum voltage tripping threshold "V max"

105...115% Ue

"V min" Minimum voltage tripping threshold

80...95% Ue

"Delay" for each Tripping time 0.1...20s "Reset delay" Resetting time 0.1...20s.

Certifications and compliance

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

18

Multifunction voltage and frequency monitoring relays. Frequency monitoring relays.

Multifunction voltage and frequency monitoring relays for three-phase systems with or without neutral, with NFC technology and APP

NFC





Order code	Rated voltage to control Ue (phase to phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Three-phase system, with or without neutral.

Minimum and maximum AC voltage, minimum and maximum frequency and asymmetry. Delayed trip.

Phase loss, neutral loss and phase sequence. Instantaneous trip. Programmable via smartphone or tablet with NFC technology and APP.

PMV95N A240 NFC	208240VAC	1	0.130
PMV95N A575 NFC	380575VAC	1	0.130

General characteristics

- Multifunction voltage and frequency monitoring relay, self powered, for minimum and maximum voltage, minimum and maximum frequency, phase loss, neutral loss,
- incorrect phase sequence and asymmetry.

 NFC connectivity for parameter setting with NFC APP, may be downloaded for free from Google Play Store
- Simple, fast and intuitive programming
- Very high accuracy and repeatibility of the settings
- Possibility to save the program on smartphone or tablet to be copied on other PMV95N, even with device powered off
- Possibility to enable or disable individually the functions of interest
- Possibility to protect the settings with a password
- QR code for the direct connection to the LOVATO Electric website for the download of the technical manual
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection if one of the voltages is <70% rated
- 1 relay output with changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

Consult the technical manual on the website www.LovatoElectric.com.

Certifications and compliance

Certifications (pending): cULus, EAC. Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 508, CSA C22.2 n° 14.

Frequency monitoring relay for single and three-phase systems



PMF20...

Order code	Rated voltage Ue	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]

Single and three-phase systems.

Minimum and maximum frequency. Delayed trip. Automatic reset

Matornatio 1000t.			
PMF20 A240	220240VAC	1	0.125
PMF20 A415	380415VAC	1	0.125

General characteristics

- Frequency monitoring relay, self powered, for minimum and maximum control
- Rated frequency selection: 50 or 60Hz
- Tripping threshold for minimum and maximum frequency
- Excellent tripping accuracy
 1 relay output, configurable, with 1 changeover contact
- Modular DIN 43880 housing, 2 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Hz max" Maximum frequency tripping threshold

+1...+10%

"Delay" Tripping time 0.1...20s "Hz min"

Minimum frequency tripping threshold

-1...-10%

"Delay" Tripping time 0.1...20s "Reset delay" Resetting time 0.1...20s

"Mode" Minimum and maximum frequency

Output relay energised at maximum

frequency

· Output relay energised at minimum

frequency

 Output relay de-energised at maximum frequency.

Certifications and compliance

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

For single-phase systems



PMA20 240

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[ka]

Single-phase system. AC/DC maximum current control. Auxiliary AC/DC power supply. Automatic or manual reset.

PMA20 240	5 or 16A	24240V	1	0.121
		AC/DC		

General characteristics

- Current monitoring relay for AC/DC maximum current control, AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current transformer (CT)
 Excellent tripping accuracy
 TRMS current measurements (True Root Mean Square)
 Resetting and inhibition input

- I relay output with 1 changeover contact (SPDT)
 Modular DIN 43880 housing, 2 modules
 IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Maximum current tripping threshold "Imax"

5...100% le

"Hysteresis" Maximum hysteresis thresold

1...50%

"Trip delay" Tripping time 0.1...30s "Inhibition time"

Inhibition delay for external input or at

power up 1...60s

"Aut. reset delay Automatic resetting time 0.1...30s "Mode"

Rated current 5A or 16A

· Relay output normally energised or

de-energised

• Tripping memory (Latch) On or Off.

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.

Current monitoring relays



For single and three-phase systems



PMA30 240

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[ka]

Single and three-phase system.

AC/DC minimum or maximum current control. Delayed trip. Auxiliary AC/DC power supply.

Automatic or manual reset.

PMA30 240 5 or 16A 24240V 1 0.121	A30 240	0.121

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single and three-phase system.				

AC/DC minimum and maximum current control. Delayed trip. Auxiliary AC/DC power supply.

Automatic or manual reset.

PMA40 240	0.02-0.05- 0.25-1-5-	24240V AC/DC	1	0.166
	16A			

General characteristics

- Current monitoring relay for AC/DC minimum or maximum current control; AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current transformer (CT)
 Excellent tripping accuracy
- TRMS current measurements (True Root Mean Square)
- Resetting and inhibition input
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Set point" Minimum or maximum current tripping

threshold 5...100% le

"Hysteresis" Minimum or maximum hysteresis

threshold 1...50%

Tripping time 0.1...30s "Trip delay"

"Inhibition time" Inhibition delay for external input or at

power up 1...60s

Current scale selection: 5A or 16A "Mode"

• Min or max function

• Relay output normally energised or deenergised

. Tripping memory (Latch) On or Off.

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.

General characteristics

- Current monitoring relay for AC/DC minimum and maximum current control, AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- TRMS current measurements (True Root Mean Square)
- Automatic or manual resetting (manual resetting by power removal)
- 2 relay outputs (Min and Max), configurable, each with 1 changeover contact (SPDT)
 Modular DIN 43880 housing, 3 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Maximum current tripping threshold

5...100% le

"Imin" Minimum current tripping threshold 5...100% le

"Trip delay" Minimum and maximum current tripping

time 0.1...30s

"Inhibition time" Inhibition time at power up 1...60s Current scale selection: 20mA, 50mA,

250mA, 1A, 5A or 16A

· Separate or common relay outputs "Mode"

· Relay output normally energised or

de-energised

Tripping memory (Latch) On or Off.

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.



PMA40 240



For single and three-phase systems



PMA50...

Order code	Rated current le	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[ka]

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	220240VAC	1	0.251
PMA50 A415		380415VAC	1	0.251
PMA50 A480		440480VAC	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 modules
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

Minimum $cos\phi$ threshold 0.1...0.99 "Cosφ min"

(under-load/dry running)

"Imax" Maximum (over) current threshold

10...100%le

"Trip delay" Tripping time for minimum $\mbox{cos}\phi$ and

maximum current 0.1...10s "Inhibition time" Inhibition 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.

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.



For low voltage



PMVF 20...

Order code	Rated voltag Control	e Auxiliary	Qty per pkg	Wt
	[//]	[\/]	n°	[ka]

Three-phase system, with or without neutral, in low voltage. Dual threshold minimum and maximum voltage and frequency protection. Flush mount type.

PMVF 20	230VAC 400VAC	100400VAC/ 110250VDC	1	0.568
PMVF 20 D048	400VAC	1248VDC	1	0.580

/oltage threshold per CEI 0-21	Type of protection	Tripping threshold	Tripping time
	Maximum voltage 59.S2	1.15Un	0.2s
	Maximum voltage 59.S1 (moving mean over 10min)	1.10Un	≤ 3\$
	Minimum voltage 27.S1	0.85Un	0.4s
	Minimum voltage 27.S2	0.4Un	0.2s

Frequency threshold per CEI 0-21

Tripping threshold	Tripping time			
w local control c	onditions.			
51.5Hz	0.1s			
47.5Hz	0.1s			
Low external signal and high local control conditions.				
51.5Hz	1s			
47.5Hz	4s			
High conditions for both external signal and local control.				
50.5Hz	0.1s			
49.5Hz	0.1s			
	threshold w local control c 51.5Hz 47.5Hz h local control c 51.5Hz 47.5Hz 47.5Hz ernal signal and 50.5Hz			

NOTE: Low conditions for both external signal and local control are not taken into consideration by the standard.

Order code	Description			
EVENNOION MODULEO FOR DANKE OF				

EXPANSION MODULES FOR PMVF 20.

For independent signal in case of phase power unbalance (LSP).

EXP10 03	2 relay outputs 5A 250VAC	
Communication ports.		
EXP10 180	IEC/EN 61850 interface	
EXP10 10	Opto-isolated USB interface	
EXP10 11	Opto-isolated RS232 interface	
EXP10 12	Opto-isolated RS485 interface	
EXP10 13	Opto-isolated Ethernet interface	
	-	

• IEC/EN 61850 protocol

The EXP10 18 module will be made available only when the competent authorities have established the exact terms of the supervision and control of the specific commands (currently under study as specified in the Italian CEI 0-21 standard).

General characteristics

PMVF 20 interface protection system (IP) unit has been developed according to the Italian CEI 0-21 standard prescriptions. It is used when a local generating system is connected in parallel with the low-voltage electric utility. The controls refer to limits of voltage and frequency monitoring.

In the case when either the voltage or the frequency are out of admissible limits, the SPI must step in by de-energising a relay output so that the interface device (DDI) trips.

PMVF 20 is equipped with 4 inputs having the following functions:

- DDI status feedback
- External signal for frequency selection (communication network malfunction)
- Local control for frequency selection
- Remote tripping (forced DDI opening independent of voltage and frequency values).

Also, there are two relay outputs for:

- DDI opening and closing
- Standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse).

The standby device control is compulsory in installations with more than 20kW and consists of a signal, with a 0.5s delay respect to the DDI opening command, transmitted only if the DDI fails and does not complete the disconnection. By fitting the EXP10 03 expansion module on the PMVF 20, the following functions can be configured as:

- Programmable alarm
- Autonomous signalling in case of phase power unbalance (LSP), only if three CTs are also installed.

Operational characteristics

- Auxiliary voltage:
 PMVF 20: 100...400VAC/110...250VDC
 PMVF 20 D048: 12...48VDC
- Voltage inputs:
- 400VAC (three-phase connection)
- 230VAC (single-phase connection)
 Relay outputs 5A 250VAC AC1 / 5A 30VDC
- 4 digital inputs
- Current inputs (optional): Use via CTs with selectable /5A or /1A secondary Support of EXP series communications ports (USB,
- RS232, RS485, Ethernet) see section 30
- Parameter configuration and remote control (only with comunication expansion module) with software Synergy and Xpress
- Housing: Flush mount 96x96mm/3.78x3.78"
- IEC degree of protection: IP65 on front; IP20 on terminals
- Predisposed for IEC/EN 61850 signal supervision using expansion or external module.

Reference standards

Compliant with standards: Italian CEI 0-21, IEC/EN 60255-5, IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3

Note for Italian CEI 0-21 standard:

According to standard prescriptions, once the installation is completed, the interface protection must be tested by the installer using a relay test box which controls the trip thresholds and timing.

Supervision and energy management Synergy software See section 29.

Configuration and remote control software Xpress See section 29.



Interface protection system units compliant with Italian standard CEI 0-21



For low voltage



Voltage threshold per CEI 0-21

PMVF 51

Order code	Rated voltage Control Auxiliary		Qty per pkg	Wt
	[V]	[V]	n°	[kg]

Three-phase system with or without neutral in low voltage. Dual threshold minimum and maximum voltage and frequency protection.

Modular type with 2 relay outputs.

PMVF 51	230VAC	100240VAC/	1	0.470
	400VAC	110250VDC		

Type of protection	Tripping threshold	Tripping time
Maximum voltage 59.S2	1.15Un	0.2s
Maximum voltage 59.S1 (moving mean over 10min)	1.10Un	≤ 3s
Minimum voltage 27.S1	0.85Un	0.4s
Minimum voltage 27.S2	0.4Un	0.2s

Frequency threshold per CEI 0-21

Type of protection	Tripping threshold	Tripping time
High external signal and lov	v local control c	onditions.
Maximum frequency 81>.S2	51.5Hz	0.1s
Maximum frequency 81<.S2	47.5Hz	0.1s
Low external signal and hig	h local control c	onditions.
Maximum frequency 81>.S2	51.5Hz	1s
Minimum frequency 81<.S2	47.5Hz	4s
High conditions for both external signal and local contro		
Maximum frequency 81>.S1	50.5Hz	0.1s
Minimum frequency 81<.S1	49.5Hz	0.1s

NOTE: Low conditions for both external signal and local control are not taken into consideration by the standard.

Order code	Description		
EXPANSION MODULES FOR PMVF 51. Communication ports.			
EXM10 10	Opto-isolated USB interface		
EXM10 11	Opto-isolated RS232 interface		
EXM10 12	Opto-isolated RS485 interface		
EXM10 13	Opto-isolated Ethernet interface		
EXM10 180	IEC/EN 61850 interface		
Inputs and outp	uts.		
EXM10 01	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC		

• IEC/EN 61850 protocol

The EXM10 18 module will be made available only when the competent authorities have established the exact terms of the supervision and control of the specific commands (currently under study as specified in the Italian CEI 0-21 standard).

General characteristics

PMVF 51 interface protection system (IP) unit has been developed according to the Italian CEI 0-21 standard prescriptions. Each is used when a local solar generating system is connected in parallel with the low-voltage electric utility. The controls refer to limits of voltage and frequency monitoring.

In the case when either the voltage or the frequency are out of admissible limits, the SPI must step in by de-energising a relay output so that the interface device (DDI) trips.

PMVF 51 is equipped with 4 inputs having the following functions:

- DDI status feedback
- External signal for frequency selection (communication network malfunction)
- Local control for frequency selection
- Remote tripping (forced DDI opening, independent of voltage and frequency values).

Also, there are two relay outputs for:

- DDI opening and closing
- Standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse).

The standby device control is compulsory in installations with more than 20kW and consists of a signal, with a 0.5s delay respect to the DDI opening command, transmitted only if the DDI failed and did not complete the disconnection. PMVF 51 also has two additional relay outputs to configure as:

- Programmable alarm
- Autonomous signalling in case of phase power unbalance (LSP), only if three CTs are also installed.

Operational characteristics

- Auxiliary voltage: 100...240VAC/110...250VDC Voltage inputs:

- 400VAC (three-phase connection)
 230VAC (single-phase connection)
 Relay outputs 5A 250VAC AC1 / 5A 30VDC
- 4 digital inputs
- Current inputs (optional): Use via CTs with selectable /5A or /1A secondary Support of EXM series communications inputs (USB,
- RS232, RS485, Ethernet) see section 30
- Modular housing: 6 modules
- Parameter configuration and remote control (only with comunication expansion module) with software Synergy and Xpress
- Degree of protection for both: IP40 on front; IP20 on terminals
- Predisposed for IEC/EN 61850 signal supervision using expansion or external module.

Reference standards

Compliant with standards: Italian CEI 0-21, IEC/EN 60255-5, IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3.

Note for Italian CEI 0-21 standard:

According to standard prescriptions, once the installation is completed, the interface protection must be tested by the installer using a relay test box which controls the trip thresholds and timing.

Supervision and energy management Synergy software See section 29.

Configuration and remote control software Xpress See section 29.



EXM10...

Interface protection system units compliant with Italian standard CEI 0-16



For medium voltage



[V] Medium-voltage system. Dual threshold minimum and maximum voltage and

Rated voltage

Control

Qty Wt

per pkg

n°

[kg]

frequency protection. Flush mount type.

Order code

PMVF 30	Measure- ments via	100400VAC/ 110250VDC	1	0.566
PMVF 30 D048	VTs in MV or direct in LV	1248VDC	1	0.566

Auxiliary

[V]

PMVF 30...

Voltage threshold per CEI 0-16

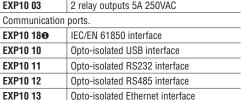
Type of protection	Tripping threshold	Tripping time
Maximum voltage 59.S2	1.2Un	0.6s
Maximum voltage 59.S1 (moving mean over 10min)	1.1Un	≤ 38
Minimum voltage 27.S1	0.85Un	0.4s
Minimum voltage 27.S2	0.3Un	0.2s
Maximum residual voltage 59.V0 (59N)	5% √3 Un	25s

Frequency threshold per CEI 0-16 Frequency protection at voltage choice

Type of protection	Tripping threshold	Tripping time
Configuration in standard co	onditions.	
Maximum frequency 81>.S2	51.5Hz	1s
Minimum frequency 81<.S2	47.5Hz	4s
Limited configuration in case of local control or voltage choice condition.		
Maximum frequency 81>.S1	50.2Hz	0.15s
Minimum frequency 81<.S1	49.8Hz	0.15s
- Voltage choice functions		
Maximum residual voltage 59.V0 (59N)	5% √3 Un	-
Minimum direct sequence voltage 27.Vd	70% Un	-
Maximum inverse sequence voltage 59.Vi	15% Un	-
Voltago 00.VI		

EXPANSION MODULES FOR PMVF 30 AND PMVF 30 D048. For auto reclosing management of automatic circuit breaker (DDI).		
EXP10 03 2 relay outputs 5A 250VAC		
Communication ports.		
EXP10 180	IEC/EN 61850 interface	
EXP10 10	Opto-isolated USB interface	

Description



• IEC/EN 61850 protocol

Order code

The EXP10 18 module will be made available only when the competent authorities have established the exact terms of the supervision and control of the specific commands (currently under study as specified in the Italian CEI 0-16 standard).

General characteristics

PMVF 30 interface protection system (IP) unit has been developed according to the Italian CEI 0-16 standard prescriptions. It is used when a local generating system is connected in parallel with the medium-voltage utility distribution grid. The controls refer to limits of voltage and frequency monitoring.

In the case when either the voltage or the frequency are out of admissible limits, the SPI must step in by de-energising a relay output so that the interface device (DDI) trips.

PMVF 30 is equipped with inputs having the following functions:

- DDI status feedback
- Interface protection system exclusion
- Local control
- Remote tripping (forced DDI opening, independent of voltage and frequency values).

In addition, there are two relay outputs to configure as:

- Programmable (either as factory default for standby device opening or to set up as auto reclosing if the DDI is an automatic circuit breaker).

Standby device opening

In installations with more than 400kW, the standard specifies there must be a command signal, that releases another standby device, given within 1 second whenever the DDI opening fails or malfunctions.

Automatic DDI reclosingWhenever an automatic circuit breaker is used as the DDI, the PMVF 30 is capable of controlling both the opening (according to the installation conditions indicated in the Italian CEI 0-16 standard) and the auto reclosing. The auto reclosing function includes defining the number of attempts and the time interval between an attempt and the following one as well as generating an alarm if the closing operation does not take place.

This function can be carried out through a programmable output of the PMVF 30 (unless it is already used for the standby device operation) or by installing an EXP10 03 expansion module.

Operational characteristics

- Auxiliary voltage:
 - PMVF 30: 100...400VAC/110...250VDC
- PMVF 30 D048: 12...48VDC
- Voltage inputs (connection via VTs in MV or directly in LV end):
 - Primary: 400...150,000V
 - Secondary: 50...500V (for voltage/frequency); 50...150V (for residual voltage measurement)
- Relay outputs 5A 250VAC AC1 / 5A 30VDC
- 4 digital inputs
- 3 current inputs (for optional measuring): Use via CTs with selectable /5A or /1A secondary
- Support of EXP series communications puts (USB, RS232, RS485, Ethernet); see section 30
- Housing: Flush mount 96x96mm/3.78x3.78
- Parameter configuration and remote control (only with comunication expansion module) with software Synergy
- Degree of protection: IP65 on front; IP20 on terminals
- Predisposed for IEC/EN 61850 signal supervision using expansion or external module.

Reference standards

Compliant with standards: Italian CEI 0-16; IEC/EN 60255-5, IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN

Supervision and energy management Synergy software See section 29.

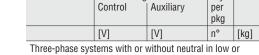
Configuration and remote control software Xpress See section 29.



Interface protection system unit compliant with standard SHAMS DUBAI - DRRG (DEWA)







Rated voltage

Order code

new

medium voltage

Dual threshold minimum and maximum voltage and frequency protection. ROCOF and Vector shift. Modular type.

PMVF 60	230VAC	100240VAC/	1	0.470
	400VAC	110250VDC		

Qty Wt

PMVF 60

Voltage threshold

Tripping threshold	Tripping time
1.15Un	0.2s
1.10Un	≤ 3s
0.85Un	0.4s
0.4Un	0.2s
	1.15Un 1.10Un 0.85Un

Frequency threshold

Type of protection	Tripping threshold	Tripping time
Maximum frequency 81>-2	OFF	0.1s
Maximum frequency 81>-1	52.5Hz	0.1s
Minimum frequency 81>-1	47.5Hz	4s
Minimum frequency 81>-2	OFF	4s
ROCOF	OFF	_
Vector shift	OFF	_

Order code	Description	
EXPANSION MODULES FOR PMVF 60. Communication ports.		
EXM10 10	Opto-isolated USB interface	
EXM10 11	Opto-isolated RS232 interface	
EXM10 12	Opto-isolated RS485 interface	
EXM10 13	Opto-isolated Ethernet interface	
EXM10 180	IEC/EN 61850 interface	
Inputs and outputs.		
EXM10 01	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC	



EXM10...

• IEC/EN 61850 protocol

The EXM10 18 module will be made available only when the competent authorities have established the exact terms of the supervision and control specific commands.

General characteristics

PMVF 60 interface protection (IP) system unit has been developed according to the Engineering recommendation SHAMS DUBAI - DRRG (DEWA) prescriptions. Each is used when a local generating system is connected in parallel with the low and medium voltage electric utility. The controls refer to limits of voltage and frequency monitoring.

In the case when either the voltage or the frequency are out of admissible limits, the IP must step in by de-energising a relay output so that the interface switch (IS) trips. PMVF 60 is equipped with 4 inputs having the following functions:

- IS status feedback
- External signal for frequency selection
- Disabling signal
- Remote tripping (forced IS opening, independent of voltage and frequency values).

Also, there are two relay outputs for:

- IS opening and closing
- Backup device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable

The backup device consists of a signal contemporary or with a 0.5s delay respect to the IS opening command, transmitted only if the IS failed and did not complete the disconnection. PMVF 60 also has two additional relay outputs to configure

- Autonomous signalling in case of phase power unbalance (LSP), only if three CTs are also installed
- Programmable alarm.

Operational characteristics

- Auxiliary voltage: 100...240VAC/110...250VDC
- Voltage inputs:

- 400VAC (three-phase connection)
 230VAC (single-phase connection)
 Relay outputs 250VAC 5A (AC1) / 30VDC 5A
- Relay can be password protected to prevent parameters being altered
- 4 digital inputs
- Current inputs (optional): via CTs with selectable /5A or
- /1A secondary
 Programmable rated voltage, programmable voltage and frequency thresholds and delays
- Support of EXM series communications modules (USB, RS232, RS485, Ethernet) see section 30
- Modular housing: 6 modules
- Parameter configuration and remote control (only with comunication expansion module) with software Synergy and Xpress
- Degree of protection: IP40 on front; IP20 on terminals
- Predisposed for IEC/EN 61850 signal supervision using expansion or external module 0.

Reference standards

Compliant with standards: SHAMS DUBAI - DRRG (DEWA), IEC/EN 60255-5, IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-4

Supervision and energy management Synergy software

Configuration and remote control software Xpress See section 29.

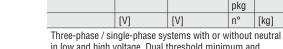
18

Interface protection system unit compliant with G59 (ENA) technical guide

Rated voltage







Control

Order code

in low and high voltage. Dual threshold minimum and maximum voltage and frequency protection, ROCOF and Vector shift. Modular type.

Auxiliary

Qty Wt

per

PMVF 70	230VAC	100240VAC/	1	0.470
	400VAC	110250VDC		

PMVF 70

Type of protection	Tripping threshold	Tripping time
Maximum voltage O/V ST.2	1.19Un	0.5s
Maximum voltage O/V ST.1	1.14Un	1s
Minimum voltage U/V ST.1	0.87Un	2.5s
Minimum voltage U/V ST.2	0.8Un	0.5s

Frequency threshold

Type of protection	Tripping threshold	Tripping time
Maximum frequency O/F ST.2	52Hz	0.5s
Maximum frequency O/F ST.1	51.5Hz	90s
Minimum frequency U/F ST.1	47.5Hz	20s
Minimum frequency U/F ST.2	47Hz	0.5s
ROCOF	OFF	_
Vector shift	OFF	-

	Order code	Description
EXPANSION MODULES FOR PMVF 70. Communication ports.		
	EXM10 10	Opto-isolated USB interface
	EXM10 11	Opto-isolated RS232 interface
	EXM10 12	Opto-isolated RS485 interface
	EXM10 13	Opto-isolated Ethernet interface
	Inputs and outputs.	
	EXM10 01	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC



EXM10...

General characteristics

PMVF 70 interface protection (IP) system unit has been developed according to the Engineering recommendation G59 (ENA) prescriptions. It is used when a local generating system is connected in parallel with the low and high voltage electric utility. The controls refer to limits of voltage and frequency monitoring.

In the case when either the voltage or the frequency are out of admissible limits, the IP must step in by

de-energising a relay output so that the interface switch (IS)

trips.
PMVF 70 is equipped with 4 inputs having the following functions:

- IS status feedback
- ROCOF/Vector shift delay
- Disabling signal
- Remote tripping (forced IS opening, independent of voltage and frequency values).

Also, there are two relay outputs for:

- IS opening and closing
- Backup device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable

The backup device consists of a signal contemporary or with a 0.5s delay respect to the IS opening command, transmitted only if the IS failed and did not complete the disconnection. PMVF 70 also has two additional relay outputs to configure

- Autonomous signalling in case of phase power unbalance (LSP), only if three CTs are also installed
- Programmable alarm.

Operational characteristics

- Auxiliary voltage: 100...240VAC/110...250VDC
- Voltage inputs:

- 400VAC (three-phase connection)
 230VAC (single-phase connection)
 Relay outputs 5A 250VAC AC1 / 5A 30VDC
- Relay can be password protected to prevent parameters being altered
- 4 digital inputs
- Current inputs (optional): via CTs with selectable /5A or
- /1A secondary Programmable rated voltage, programmable voltage and frequency thresholds and delays Support of EXM series communications modules (USB,
- RS232, RS485, Ethernet). See section 30
- Modular housing: 6 modules
- Parameter configuration and remote control (only with comunication expansion module) with software Synergy
- Degree of protection: IP40 on front; IP20 on terminals

Reference standards

Compliant with standards: Engineering recommendation G59 (ENA), IEC/EN 60255-5, IEC/EN 61010-1, IEC/EN 61000-6-2, ÌEC/EN 61000-6-4.

Supervision and energy management Synergy software See section 29.

Configuration and remote control software Xpress

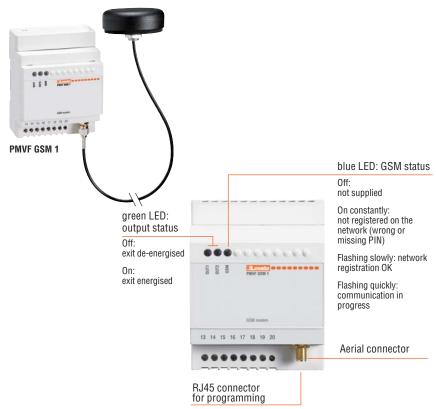
GSM modem for remote disconnection signal management

Accessories

Compliant with Italian CEI 0-16 Standard, paragraph 8.8.6.5 and annex M, resolution 421/2014 of the AEEGSI

Order Description code GSM Modem (modular - 4U). IP69K exterior aerial with 2.5 m cable. RJ45-USB programming cable (included)

9.5...35VDC/9.5...27VAC



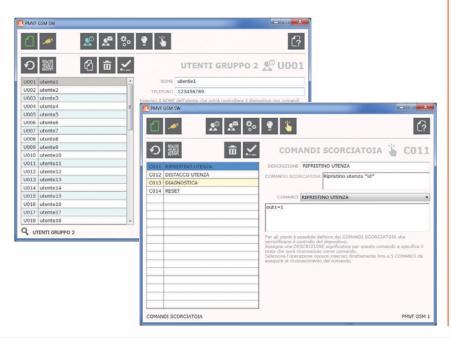
PMVF GSM 1

Software

To configure the PMVF GSM 1 modem (using the RJ45-USB programming cable included), the PMVF GSM SW software must be used. This can be downloaded for free from the www.LovatoElectric.com website. The software allows you to set:

- the users enabled to exchange messages with the modem
- the active customer code (POD)
- the functions assigned to the digital outputs and input
- the texts of the SMS associated with the commands.

Configuration is also possible off-line, creating a file to transfer to the modem at another time.



Application requirements

The Italian CEI 0-16 Standard, in paragraph 8.8.6.5 and annex M, prescribes that electricity production systems powered by wind or the sun through photovoltaics with a power equal to or greater than 100kW, connected to or to be connected to medium-voltage networks, have a GSM modem.

The modem must be able to receive the signals sent by the electricity distributor for the management of generation disconnection.

Functional characteristics

- Connection to the GSM network for sending and receiving SMS messages
- Programmable message texts
- Control output controlled by SMS for sending of intertripping signal to the protection interface
- Digital input for receiving the status of the Interface Device (DDI) and sending of successful DDI opening and closing
- POD management (active user code)
- Management of the list of caller IDs (CLI) up to 50 callers enabled
 - Detection of mobile network coverage
- Full compatibility with medium-voltage PI LOVATO Electric PMVF 30: no software/hardware updates or programming
- Compatibility with third-party PIs where the remote disconnection signal is transmitted via digital input (dry

For additional information contact our Technical support Tel. + 39 035 4282422; E-mail: service@LovatoElectric.com.

Operational characteristics

MODEM

- 35mm DIN (IEC/EN 60715) rail fixing
- 4 modules
- Supply: 9.5...35VDC / 9.5...27VAC Consumption: 200mW (5W peak)
- 2 digital outputs 3A 250VAC 1 self-supplied digital input

- 1 self-supplied digital hipput Housing for 3V and 1.8V SIM card SIM PIN management Certified according to FCC rules, part 15
- Back-up battery 320mAh (3.7 V)
- Operating temperature: 0...+45°C; -30...+60°C with back-up battery disconnected (for disconnection procedure consult the manual supplied with the product)
- Protection rating: IP40 on front; IP20 on terminals.

- Quad band 850/900/1800/1900MHz
- Exterior IP69K
- 2.5m cable
- Fixing via M10 hole:
- · with adhesive seal
- · with threaded pin and nut.

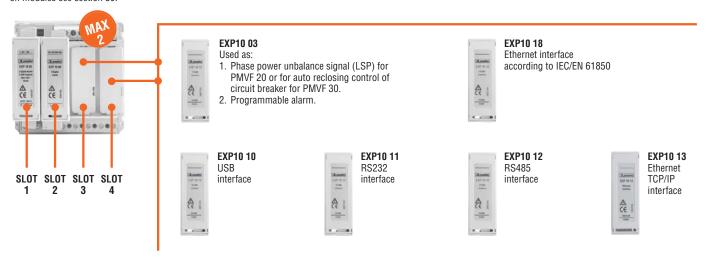
Compliant with standards: IEC/EN 60950-1 (≤2013-05); EN 50385; EN 301 489-7 V1.3.1; EN 301 489-1 V1.9.2; EN 301 511 V9.0.2

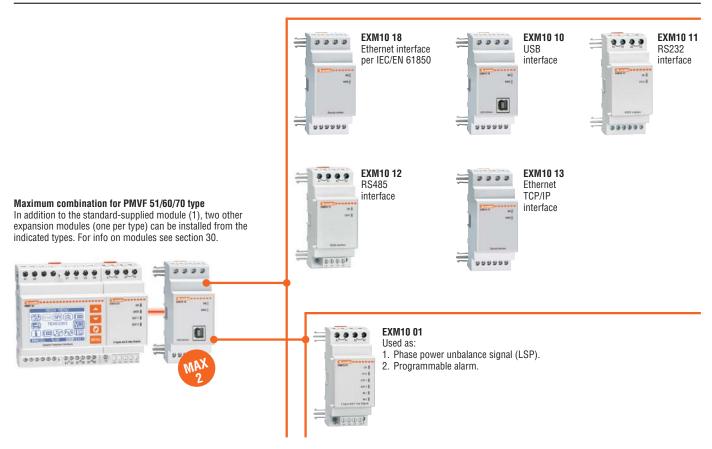
Maximum combination for PMVF



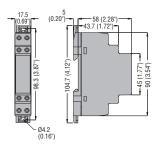
Maximum combination for PMVF 20 and PMVF 30 types

In addition to the two standard-supplied modules, another two expansion modules (one per type) can be installed from the following indicated below. For further information on modules see section 30.

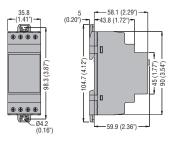




MONITORING RELAYS PMV10...

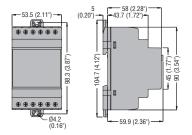


PMV... - PMV95N... - PMF20 PMA20... - PMA30...



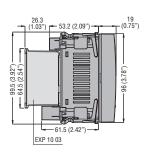
Cutout

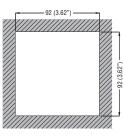
PMV50N... - PMV70N... - PMV80N... - PMA40... PMA50...



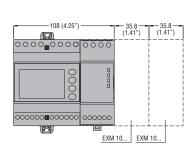
INTERFACE PROTECTION SYSTEM UNITS FOR LOW VOLTAGE

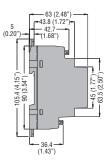






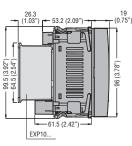
PMVF 51 - PMVF 60 - PMVF 70

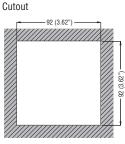




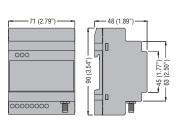
INTERFACE PROTECTION SYSTEM UNIT FOR MEDIUM VOLTAGE







GSM MODEM FOR REMOTE DISCONNECTION SIGNAL **PMVF GSM 1**



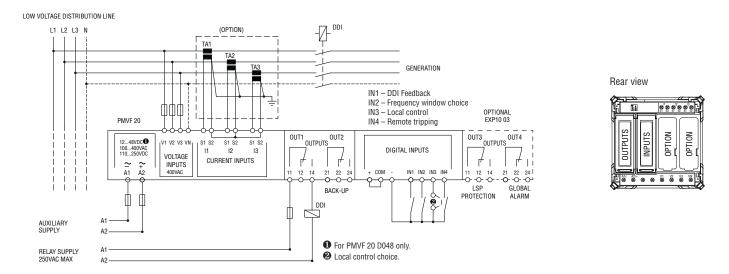
Wiring diagrams



Interface protection system units compliant with Italian CEI 0-21 standard - For low voltage

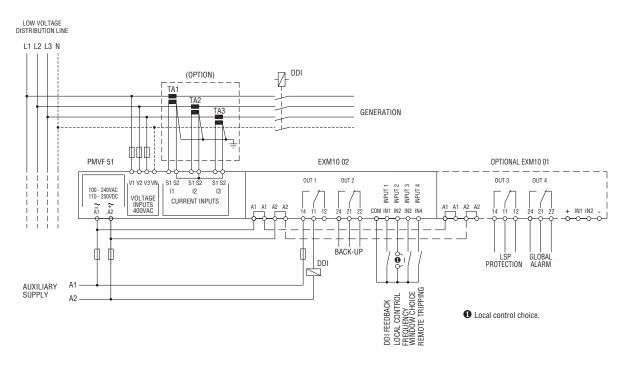
PMVF 20...

Three-phase connection



Interface protection system units compliant with Italian CEI 0-21 standard - For low voltage

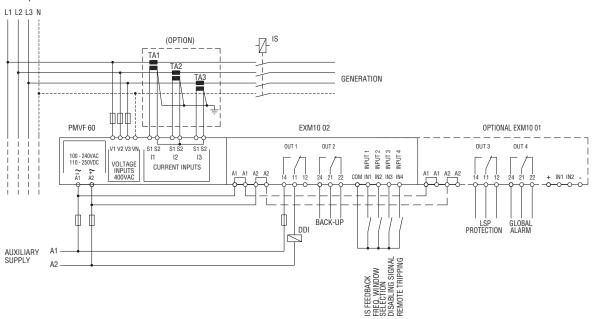
Three-phase connection





Interface protection system units compliant with standard SHAMS DUBAI - DRRG (DEWA)

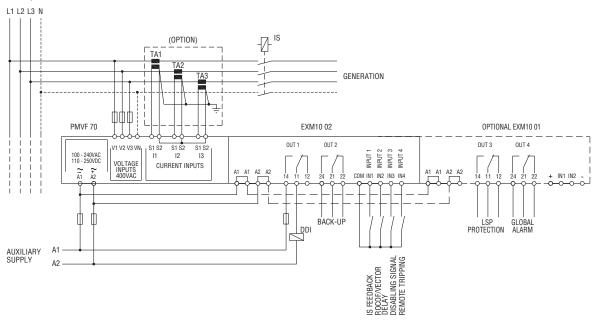
Three-phase connection



Interface protection system units compliant with technical guide G59 (ENA)

PMVF 70

Three-phase connection



18

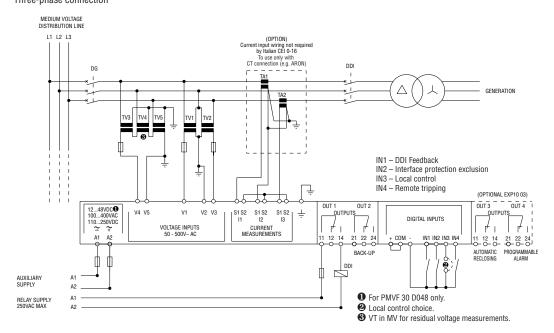
Wiring diagrams



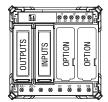
Interface protection system units compliant with Italian CEI 0-16 standard - For medium voltage

PMVF 30...

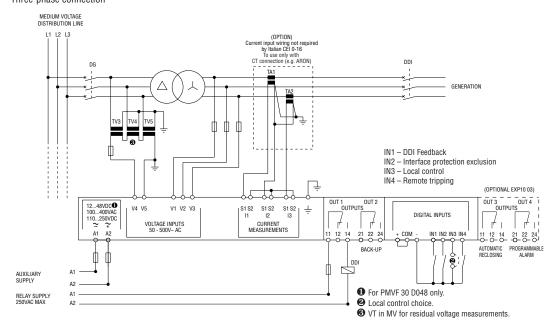
Connection through VTs in Medium Voltage Three-phase connection



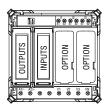
Rear view



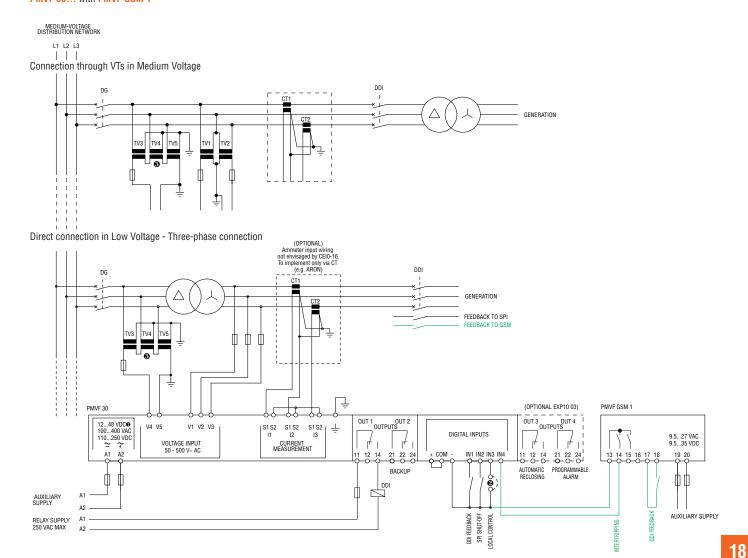
Direct connection in Low Voltage Three-phase connection



Rear view



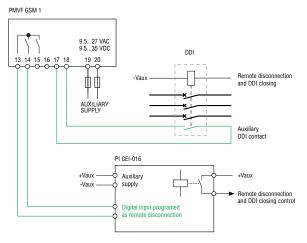
Interface protection system units compliant with Italian CEI 0-16 standard - For medium voltage PMVF 30... with PMVF GSM 1



- For PMVF 30 D048 only.
 Local control choice.
 VT in MV for residual voltage measurements.

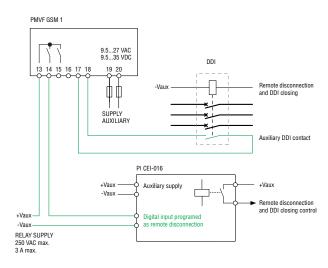
The connections coloured in GREEN, in addition to the GSM Modem, represent the only wiring necessary for the adaptation.

PMVF GSM 1 modem wiring diagram with other interface protections (PI) with self-supplied remote disconnection input



The connections coloured in GREEN, in addition to the GSM Modem, represent the only wiring necessary for the adaptation.

PMVF GSM 1 modem wiring diagram with other interface protections (PI) with remote disconnection input to be supplied





Technical characteristics Voltage monitoring relays



TYPE Single phas	e PMV55	_	_	_	_	
Three phas	e <u> </u>	PMV10	PMV20	PMV30	PMV40	
Three phase with/without neutra	al —	_	_	_	_	
DESCRIPTION			<u> </u>	•		
	Minimum and maximum AC voltage	Phase loss and incorrect phase sequence		Minimum AC voltage, phase loss and incorrect phase sequence	Asymmetry, phase loss and incorrect phase sequence	
CONTROL CIRCUIT						1
Rated voltage	208240VAC	208480VAC	100240VAC	208240VAC	208240VAC	
to control (Ue)	380440VAC		208575VAC	380575VAC	380575VAC	
			380600VAC	600VAC	600VAC	
Maximum voltage set-point	105115% Ue	_	_	_	_	
Minimum voltage set-point	8095% Ue	_	_	8095% Ue	_	
Asymmetry set-point	_	_	_	_	515%Ue	
Minimum and maximum frequency set-point	_		_	_	_	
Tripping time	0.120s	6	60ms	0.1.	20s	
Resetting time	0.120s (0.5s at power up)		0.5s	*****	20s power up)	
Resetting hysteresis	3%		5%	-	%	
Instantaneous tripping for Ue	<70% Ue configured	Umin<	70% Umax	<70% Ue configured	<70% minimum Ue	
Repeat accuracy	< ±0.1%	<	±1%	< ±0.1%	< ±0.1%	
POWER SUPPLY						
Auxiliary voltage (Us)			Self powered			
Operating range	0.71.2Ue 0.851.1Ue 0.71.2Ue					
Frequency			50/60Hz ±5%			
Power consumption (maximum)	10VA (208240VAC) ① 17VA (380440VAC) ①	17VA (380440VAC)				
Power dissipation (maximum)	1.5W	1.5W 2.2W 2.5W				
RELAY OUTPUTS						
Number of relays			1			
Relay state	Normally energised De-energises at tripping					
Contact arrangement	1 changeover SPDT					
Rated operational voltage	250VAC					
Maximum switching voltage	400VAC					
Conventional free-air thermal current (Ith)	8A					
UL/CSA and IEC/EN 60947-5-1 designation	B300					
Electrical life (with rated load)	10⁵ cycles					
Mechanical life	30x10 ⁶ cycles					
Indications	1 green LED for power on and tripping 2 red LEDs for tripping		D for power on tripping	and tr	for power on ripping for tripping	
CONNECTIONS	2 TOU LLUS TOT HIPPHING	<u> </u>		I IEU LED	ioi uipping	
Terminal tightening torque		0.	.8Nm (7lbin; 79lbin per UL	/CSA)		
(maximum) Conductor section minmax		0.2 10m	m² (2412AWG; 1812 AW	G ner III /CSA)		
INSULATION (input-output)		0.24.0111	III (2412AVVQ, 1012 AVV	a per objookj		
IEC rated insulation voltage Ui	440VAC	480VAC		600VAC		
IEC rated impulse withstand voltage Uim		1000710	6kV	0001/10		
IEC power frequency withstand voltage	·		4kV			
AMBIENT CONDITIONS			111.4			
Operating temperature			-20+60°C			
Storage temperature			-30+80°C			
HOUSING	<u> </u>					1
Material			Self-extinguishing polyami	de		

Power consumption (maximum) at 50Hz.
 Contact our Technical support Tel. + 39 035 4282422; E-mail: service@LovatoElectric.com.

18 Monitoring relays
Technical characteristics
Voltage monitoring relays



PMVS0
Milimum and macinium Milimum M
Minimum and maximum
AC voltage, phase loss and incorrect phase sequence and asymmetry entre loss and correct phase sequence and asymmetry entre loss and sequence and asymmetry expenses and sequence and asymmetry entre loss and sequence and asymmetry entre loss and sequence and asymmetry entre loss and sequence and asymmetry expenses and asymmetry expenses and sequence and asymmetry expenses and asymmetry e
AC voltage, phase loss and incorrect phase sequence and asymmetry entre loss and correct phase sequence and asymmetry entre loss and sequence and asymmetry expenses and sequence and asymmetry entre loss and sequence and asymmetry entre loss and sequence and asymmetry entre loss and sequence and asymmetry expenses and asymmetry expenses and sequence and asymmetry expenses and asymmetry e
Incorrect phase sequence Incorrect phase sequence Incorrect phase sequence Incorrect phase sequence Incorrect phase sequence and asymmetry Incorrect
and asymmetry phase sequence sequence and asymmetry incorrect phase sequence phase sequence and asymmetry incorrect phase sequence and asymmetry 208240VAC 208240VAC 208240VAC 208240VAC 300575VAC 300575VAC 30040VAC 30040VAC 30040VAC 30040VAC 30040VAC 300575VAC 30040VAC 30040VAC 30040VAC 30040VAC 30040VAC 30040VAC 30040VAC 30040VAC 300575VAC 30000VAC 40000VAC 40
208240VAC 208240VAC 208240VAC 208240VAC 208240VAC 380440VAC 480600VAC 480600VAC 480600VAC 480600VAC 480600VAC 480600VAC 480500VAC 490VAC 9 2 changeover SPDT 1 changeover SPD 1 1 changeover SPD 1 1 changeover SPD 1 2 changeover SPD 1 1 changeover SPD 1 2 changeover SPD 1 1 changeover SPD 1 1 changeover SPD 1 2 changeover SPD 1 2 changeover SPD 1 1 changeover SPD 1 2 changeover SPD 1 3 changeover SPD 1 2 changeover SPD 1 3 changeover SPD 1 4 changeover SPD 1 4 changeover SPD 1 4 changeover SPD 1 4
380479VAC 380440VAC 380440VAC 380440VAC 380440VAC 380440VAC 600VAC 480600VAC 4806000VAC 4806000VAC 4806000V
380479VAC 380440VAC 380440VAC 380440VAC 380440VAC 380440VAC 600VAC 480600VAC 4806000VAC 4806000VAC 4806000V
SOUVAC
10515% Ue 10515% Ue 10515% Ue 10515% Ue 8095% Ue 9095% UE 90
8095% Ue 80
— — — — — — 110% rated frequency 110% rated fre
0.120s
0.120s 0.5s 0.120s 0.5s 0.5s 0.130s 3% 3% 3% 3% 3% 3% 3%
0.120s 0.5s 0.120s 0.5s 0.5s 0.130s 3% 3% 3% 3% 3% 3% 3%
(0.5s at power up) 3% 3% 3% 3% 3% 3% 3% 3% 3% 3% 0.5% freq. programmable
3% 3% 3% 3% 3% 0.5% freq. programmable
< ±0.1%
Self powered 0.71.2Ue 50/60Hz ±5% 27VA max ●
0.71.2Ue 50/60Hz ±5% 11VA (208240VAC)
0.71.2Ue 50/60Hz ±5% 11VA (208240VAC)
11VA (208240VAC)
11VA (208240VAC)
30VA (380575VAC) ● 19VA (600VAC) ● 2.5W 1.9W max ● 1 1 2 1 1 Normally energised De-energises at tripping 1 changeover SPDT 2 changeover SPDT 1 changeover SPDT 250VAC 400VAC 8A B300 10 ⁵ cycles 1 green LED for power on and tripping 2 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 3 red LEDs for tripping 1 green LED for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 4 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping
19VA (600VAC) 2.5W
2.5W 1.9W max 2 1 1 1 2 2 1 Normally energised De-energises at tripping 1 changeover SPDT 2 changeover SPDT 1 changeover SPD 400VAC 8A B300 10° cycles 1 green LED for power on and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 4
1 1 2 1 1 Normally energised De-energises at tripping 2 changeover SPDT 1 changeover SPDT 2 changeover SPDT 250VAC 400VAC 8A B300 105 cycles 30x106 cycles 1 green LED for power on and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red
Normally energised De-energises at tripping 1 changeover SPDT 2 changeover SPDT 1 changeover SPD 250VAC 400VAC 8A B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 1 changeover SPD 2 changeover SPDT 1 changeover SPD 1 changeover S
Normally energised De-energises at tripping 1 changeover SPDT 2 changeover SPDT 1 changeover SPD 250VAC 400VAC 8A B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 1 changeover SPD 2 changeover SPDT 1 changeover SPD 1 changeover S
De-energises at tripping 1 changeover SPDT 2 changeover SPDT 1 changeover SPDT 250VAC 400VAC 8A B300 10 ⁵ cycles 1 green LED for power on and tripping a red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 changeover SPDT 2 changeover SPDT 1 changeover spondard 1 ch
1 changeover SPDT 2 changeover SPDT 1 changeover SPD 250VAC 400VAC 8A B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 changeover SPDT 1 changeover SPDT 1 changeover SPDT 1 changeover SPDT 1 green S
250VAC 400VAC 8A B300 10 ⁵ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 2 red LEDs for tripping 4000 red 1000
400VAC 8A B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 4
B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs for
B300 10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs for
10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs for tripp
10 ⁵ cycles 30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 4 red LEDs for tripping 5 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs for tripp
30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs
30x10 ⁶ cycles 1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 5 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 6 red LEDs for tripping 7 red LEDs for tripping 8 red LEDs for tripping 9 red LEDs
1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 5 red LEDs for tripping
1 green LED for power on and tripping and tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping 5 red LEDs for tripping
and tripping and tripping and tripping 5 red LEDs for tripping 2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping
2 red LEDs for tripping 3 red LEDs for tripping 2 red LEDs for tripping
0.8Nm (7lbin; 79lbin per UL/CSA - PMVN excluded)
0.8Nm (7lbin; 79lbin per UL/CSA - PMVN excluded)
0.24.0mm ² (2412AWG; 1812 AWG per UL/CSA - PMVN excluded)
600VAC
6kV
4kV
I
−20 ±60°C
-20+60°C -30_480°C
-20+60°C -30+80°C

18 Monitoring relays Technical characteristics Current monitoring relays



DESCRIPTION Single-phase maximum current maximum current monitoring ACDC multiscale Single-phase minimum or maximum current monitoring ACDC multiscale ACDC multiscale	TYPE		PMA20	PMA30	PMA	4 0
Single-phase Single-phase Single-phase Single-phase maximum current monitoring ACPCC multiscale ACPCC multiscale		<u> </u> N	THINEU	I MAOU	1 1117	
Rated trequency 50° 16A 0.02-0.05-0.25-1-5-16A Rated requency 50°60Hz ±5% 50° 00A - 1A inputs 16A input Comedian capacity 5 le for 1s 16A ke 10ms 10Bk for 10Bk f	DESCRIPTION	V	maximum current minimum or maximum minimum and maximi monitoring current monitoring current monitoring		d maximum onitoring	
Substitution Subs	CONTROL CII	RCUIT				
Sin for 1s 150 for 1s 15	Rated current	to be monitored le	5 or	16A	0.02 - 0.05 - 0.2	25 - 1 - 5 - 16A
Sile for 1's 100 for 10ms	Rated frequer	псу	50/60Hz ±5%			
160A for 10ms	Overload cap	acity			50mA - 1A inputs	16A input
Tripping values			160A fo	or 10ms	10le for 10ms	160A for 10ms
Tripping time	Connection			Direct or by current transformer		
Inhibition time Resetting hysteresis 150% 33% fixed	Adjustment	Tripping values	5100% f.s.			
Resetting National Resetting National Resetting National Natio		Tripping time				
Resetting		Inhibition time		160s		
External input Resetting / Inhibition — Repeat accuracy ±1% with constant parameters AUXILIARY SUPPLY Auxiliary supply voltage Us 24240VAC/DC Operating range 0.851 Us Rated frequency 50/60Hz ±5% Power consumption (maximum) 3.2VA 7VA Power dissipation (maximum) 1.6W 1.7W Power of relays 1 2 Relay OUTPUTS 1 2 Number of relays 1 2 Relay state Normally energised / de-energised (selectable) Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC LEC conventional free air thermal current this 8A UL/CSA and IE/CEN 60947-5-1 8B300 designation 10° cycles Within rated load) 10° cycles Mechanical life 30x10 ⁶ cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 2 power on/inhibition 2 red LEDs for maximin tripping CONNECTIONS Tight en in LED for power on/inhibition 1 red LED for trip			1!	50%	3% fi	xed
Repeat accuracy	Resetting					
Auxiliary supply voltage Us 24240VAC/DC Operating range 0.851.1 Us Rated frequency 50/60Hz ±5% Power consumption (maximum) 1.6W 1.7W RELAY OUTPUTS Number of relays 1 2 Relay state Normally energised / de-energised (selectable) Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC Maximum switching 400VAC Voltage 10° cycles (with rated load) With a feed of the power on/finibition 1 red LED for power on/finibition 1 red LED for tripping 1 green LED for power on/finibition 1 red LED for tripping 2 red LEDs for max/min tripping CONNECTIONS Tightening torque 0.8Nm (7lbin; 79lbin per UL/CSA) IRSULATION (input-output) IEC rated insulation voltage Ui IEC power frequency witstand voltage Ui IEC green feed in pulse withstand voltage Ui IEC green feed in pulse withstand voltage Ui IEC green feed in pulse withstand voltage Ui IEC rated insulation voltage Ui IEC rated insulation voltage Ui IEC green feed in pulse withstand voltage Uimp IEC person frequency witstand voltage Uimp IEC person frequency under the person of the person	External input	t	Resetting ,	/ Inhibition	_	
AUXILIARY SUPPLY Auxiliary supply voltage Us Operating range Rated frequency Fower consumption (maximum) RELAY OUTPUTS Number of relays Rates arrangement Rated operational voltage Maximum switching voltage LEC conventional free air thermal current life current life Current life (with rade load) Mechanical life (with rade load) Mechanical life (with rade load) Reconnections 1 green LED for power on/inhibition 1 red LED for tripping CONNECTIONS Tightening torque maximum CONNECTIONS Tightening torque maximum MISULATION (input-output) LEC rated insulation voltage Ui LEC rated impulse withstand voltage Ui LEC power frequency AMBIENT CONDITIONS Tightening torque MISULATION (input-output) LEC rated impulse withstand voltage Uimp LEC power frequency witstand voltage Uimp LEC power frequency AMBIENT CONDITIONS AMBIENT CONDITIONS AMBIENT CONDITIONS ALL 24.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	Repeat accura	acy		±1% with constant parameters	<u>'</u>	
Operating range 0.851.1 US Rated frequency 50/60Hz ±5% Power consumption (maximum) 3.2VA 7VA Power dissipation (maximum) 1.6W 1.7W RELAY QUITPUTS ***********************************	AUXILIARY S	UPPLY		·		
Operating range 0.851.1 US Rated frequency 50/60Hz ±5% Power consumption (maximum) 3.2VA 7VA Power dissipation (maximum) 1.6W 1.7W RELAY QUITPUTS ***********************************						
Rated frequency S0/60Hz ±5%						
Power consumption (maximum) 3.2VA 7VA Power dissipation (maximum) 1.6W 1.7W Petual dissipation (maximum) 1.6W 1.7W RELAY OUTPUTS To consume the control of relays 1 2 Relay state Normally energised / de-energised (selectable) Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC Maximum switching 400VAC voltage 400VAC 400VAC IEC conventional free air thermal current lth 8A 500 UL/CSA and IEC/EN 60947-5-1 8300 4664 designation 10° cycles 600 Indications 1 green LED 70° cycles Indications 1 green LED for power on/inhibition power on/inhibition power on/inhibition 2 red LEDs for max/min tripping 2 red LEDs for max/min tripping CONNECTIONS 1 green LED for power on/inhibition 1 red LED for tripping 2 red LEDs for max/min tripping Conductor section minmax 0.8Mm (71bin; 79lbin per UL/CSA) INSULATION (input-output) 415VAC IEC rated insulation voltage Ui 4kV IEC r		· ·				
Power dissipation (maximum) 1.6W 1.7W RELAY OUTPUTS Total Page 1.7W Number of relays 1 2 Relay state Normally energised / de-energised (selectable) Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC Amaximum switching 400VAC Voltage 8A Conventional free air thermal current lth B300 Conventional free lth B300 Conventional free lth B300 Conventional free lth B100 Conventional free lth </td <td colspan="2">Power consumption (maximum)</td> <td colspan="2"></td> <td>Δ</td>	Power consumption (maximum)				Δ	
Number of relays 1 2		' '				
Number of relays 1 2 Relay state Normally energised / de-energised (selectable) Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC Maximum switching voltage 400VAC IEC conventional free air thermal current lth 8A UL/CSA and IEC/EN 60947-5-1 designation B300 Electrical life (with rated load) 10° cycles Mechanical life 30x10° cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 1 green LED for power on/inhibition 2 red LEDs for max/min tripping CONNECTIONS Tightening torque maximum 0.8Mm (7lbin; 79lbin per UL/CSA) INSULATION (input-output) 4LV IEC rated insulation voltage Uin 4LV IEC rated inpulse withstand voltage Uinp 4kV IEC grade impulse withstand voltage Uinput withstand voltage Uinput perperature 2.5kV Operating temperature -20+60°C Storage temperature -30+80°C		,				
Relay state				1	2	
Contact arrangement 1 changeover contact SPDT each Rated operational voltage 250VAC Maximum switching voltage 400VAC voltage IEC conventional free air thermal current Ith 8A LUCSA and IEC/EN 60947-5-1 designation B300 Electrical life (with rated load) 10° cycles Mechanical life 30x10° cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 2 red LEDs for max/min tripping CONNECTIONS 1 red LED for tripping 2 red LEDs for max/min tripping CONNECTIONS 0.8Nm (7lbin; 79lbin per UL/CSA) maximum 0.8Nm (7lbin; 79lbin per UL/CSA) MINSULATION (input-output) 4.15VAC IEC rated insulation voltage Ui 415VAC IEC rated insulation voltage Uimp 4kV IEC power frequency withstand voltage Uimp 4kV IEC power frequency withstand voltage Uimp temperature -20+60°C Storage temperature -20+60°C Storage temperature -30+80°C		, 0	Normally energised / de-energised (selectable)			
Rated operational voltage		nement				
Maximum switching voltage IEC conventional free air thermal current Ith UL/CSA and IEC/EN 60947-5-1 designation Electrical life (with rated load) Mechanical life 30x10° cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 2 red LEDs for max/min tripping CONNECTIONS Tightening torque maximum Conductor section minmax 0.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp EC rated impulse withstand voltage Uimp AMBIENT CONDITIONS Operating temperature -20+60°C Storage temperature -20+80°C		•				
current Ith B300 designation B300 Electrical life (with rated load) 10° cycles Mechanical life 30x10° cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 2 red LEDs for max/min tripping CONNECTIONS Tightening torque maximum 0.8Nm (7lbin; 79lbin per UL/CSA) RODICTIONS (input-output) 0.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) 415VAC IEC rated insulation voltage Ui 4kV IEC rated impulse withstand voltage Uimp 4kV IEC power frequency withstand voltage Uimp 2.5kV AMBIENT CONDITIONS 2.5kV Operating temperature -20+60°C Storage temperature -30+80°C		-				
Designation Control	IEC convention	onal free air thermal	8A			
(with rated load) Mechanical life 30x106 cycles Indications 1 green LED for power on/inhibition 1 red LED for tripping 1 green LED for power on/inhibition 2 red LEDs for max/min tripping CONNECTIONS Tightening torque maximum 0.8Nm (7lbin; 79lbin per UL/CSA) Conductor section minmax 0.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) 415VAC IEC rated insulation voltage Uinp 4kV IEC power frequency withstand voltage Uimp 4kV IEC power frequency withstand voltage Uimp 2.5kV AMBIENT CONDITIONS -20+60°C Storage temperature -20+60°C Storage temperature -30+80°C	UL/CSA and I designation	EC/EN 60947-5-1				
Indications 1 green LED for power on/inhibition 1 red LED for tripping CONNECTIONS Tightening torque maximum Conductor section minmax O.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp AkV IEC power frequency withstand voltage Uimp AMBIENT CONDITIONS Operating temperature -20+60°C Storage temperature -30+80°C	`	,	·			
for power on/inhibition 1 red LED for tripping CONNECTIONS Tightening torque max/min tripping Conductor section minmax Conductor section minmax O.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) IEC rated insulation voltage Ui EC rated impulse withstand voltage Uimp 4kV IEC power frequency withstand voltage Uimp AMBIENT CONDITIONS Operating temperature -20+60°C Storage temperature -30+80°C		fe				
Tightening torque maximum Conductor section minmax O.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp IEC power frequency withstand voltage Uimp IEC power frequency withstand voltage Uimp AMBIENT CONDITIONS Operating temperature Tightening torque O.8Nm (7lbin; 79lbin per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) ALSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA)	Indications		for power on/inhibition power on/inhibition		nhibition	
Tightening torque maximum Conductor section minmax O.24.0mm² (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp IEC power frequency withstand voltage Uimp IEC power frequency withstand voltage Uimp AMBIENT CONDITIONS Operating temperature Tightening torque O.8Nm (7lbin; 79lbin per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA) INSULATION (input-output) ALSU (2412AWG; 1812 AWG per UL/CSA) AHSU (2412AWG; 1812 AWG per UL/CSA)	CONNECTION	IS			•	· -
INSULATION (input-output) IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp IEC power frequency withstand voltage AMBIENT CONDITIONS Operating temperature Storage temperature -20+60°C Storage temperature -30+80°C	Tightening to maximum	rque		0.8Nm (7lbin; 79lbin per UL/CSA)		
IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp EC power frequency withstand voltage AMBIENT CONDITIONS Operating temperature Ctorage temperature Torage temperature 44V 2.5kV 2.5kV -20+60°C Storage temperature -30+80°C	Conductor se	ction minmax	0.24.0mm² (2412AWG; 1812 AWG per UL/CSA)			
IEC rated insulation voltage Ui IEC rated impulse withstand voltage Uimp EC power frequency withstand voltage AMBIENT CONDITIONS Operating temperature Ctorage temperature Torage temperature 44V 2.5kV 2.5kV -20+60°C Storage temperature -30+80°C	INSULATION	(input-output)		·		
IEC rated impulse withstand voltage Uimp IEC power frequency withstand voltage voltage AMBIENT CONDITIONS Operating temperature Storage temperature -20+60°C Storage temperature -30+80°C		· · · /	415VAC			
IEC power frequency withstand voltage AMBIENT CONDITIONS Operating temperature -20+60°C Storage temperature -30+80°C	IEC rated imp	ulse withstand voltage Uimp				
Operating temperature -20+60°C Storage temperature -30+80°C						
Storage temperature -30+80°C	AMBIENT CO	NDITIONS				
	Operating ten	nperature		−20+60°C		
	Storage temp	erature		−30+80°C		
	HOUSING					

Self-extinguishing polyamide

Material

Monitoring relays Technical characteristics Pump protection and phase shift monitoring relays



TYPE		PMA50
DESCRIPTION		F IIIAJU
DESCRIPTION		Single and three-phase pump protection (motor under-load and over-current control) monitoring for max AC current, min $\cos\phi$, phase loss and incorrect phase sequence
CURRENT AND	D COSφ CONTROL CIRCUIT	
Rated current	le	5 or 16A
Rated frequenc	су	50/60Hz ±5%
Overload capa	city	5le for 1s 160A for 10ms Constant 16A
Connection		Direct or by current transformer
Adjustments	End-scale value	5 or 16A
	Tripping for MAX current	10100le
	Tripping for cosφ	0.10.99 cosφ (MIN)
	Tripping delay	0.110s
	Inhibition time	160s
	Automatic resetting delay	OFF100min
External input		Consent for running/resetting
Repeat accura	су	±1% with constant parameters
VOLTAGE CON	ITROL CIRCUIT	
Voltage measu	uring range (Ue)	80660VAC
Tripping time f	for phase loss	60ms
AUXILIARY SU	JPPLY	
Auxiliary suppl	ly voltage Us	220240VAC
		380415VAC (maximum voltage for UL/CSA)
		440480VAC
Operating rang	ge	0.851.1 Us
Frequency rang	ge	50/60Hz ±5%
Power consum	nption (maximum)	4.5VA
Power dissipat	tion (maximum)	2.3W
RELAY OUTPU	JTS	
Number of rela	ays	1
Relay state		Normally energised, de-energises at tripping
Contact arrang	gement	1 changeover contact SPDT each
Rated operatio		250VAC
Maximum swit	tching voltage	400VAC
IEC convention	nal free air thermal current Ith	A8
UL/CSA and IE	EC/EN 60947-5-1 designation	B300
Electrical life (With rated load)	10 ⁵ cycles
Mechanical life	9	30x10 ⁶ cycles
Indications		1 green LED for power on/inhibition 2 red LEDs for minimum/maximum tripping
CONNECTIONS	S	
Tightening tord	que maximum	0.8Nm (7lbin)
Conductor section minmax		0.24.0mm² (2412AWG; 1812 AWG per UL/CSA)
INSULATION (
	C rated insulation voltage Ui 600VAC	
	rated impulse withstand voltage Uimp 6kV	
IEC power freq	power frequency withstand voltage 2.5kV	
AMBIENT CON	IDITIONS	
Operating temp	perature	−20+60°C
Storage tempe	Storage temperature -30+80°C	
HOUSING		
Material		Self-extinguishing polyamide

18 Monitoring relays Technical characteristics Frequency monitoring relay



TYPE		PMF20	
DESCRIPTION		Single-phase minimum and maximum frequency control	
	ONTROL CIRCUIT		
Rated frequenc		50 or 60Hz selectable	
Operating frequ	,	4070Hz	
Adjustment	MAX tripping	101110% operating frequency	
,	MIN tripping	9099% operating frequency	
	Resetting hysteresis	0.5%	
	Inhibition time	0.120s	
	Reset delay	0.120s	
Resetting	,	Automatic	
Repeat accurac	V	< ±0.1%	
AUXILIARY SU	•		
Auxiliary supply	v voltage Us	220240VAC	
, , , ,	,	380415VAC	
Operating range	e	0.851.1 Us	
Rated frequenc		50/60Hz	
	ption (maximum)	10VA (220240VAC); 17VA (380415VAC)	
Power dissipati	. , ,	1.5W	
RELAY OUTPU	, ,		
Number of rela	VS	1	
Relay state	, -	Normally energised, de-energises at tripping €	
Contact arrange	ement	1 changeover contact SPDT	
Rated operation		250VAC	
Maximum swite	ching voltage	400VAC	
IEC convention	al free air thermal current Ith	8A	
UL/CSA and IE	C/EN 60947-5-1 designation	B300	
Electrical life (v	vith rated load)	10 ⁵ cycles	
Mechanical life	,	30x10 ⁶ cycles	
Indications		1 green LED for power on/tripping 2 red LEDs for min-max tripping	
CONNECTIONS			
Tightening torq	ue maximum	0.8Nm (7lbin)	
Conductor sect	ion min-max	0.24.0mm² (2412AWG)	
INSULATION (i	nput - output)		
IEC rated insula	ation voltage Ui	575VAC	
IEC rated impu	C rated impulse withstand voltage Uimp 6kV		
IEC power frequency withstand voltage		4kV	
AMBIENT CON	DITIONS		
Operating temp	erature	−20+60°C	
Storage temper	rature	−30+80°C	
HOUSING			
Material		Self-extinguishing polyamide	

Normally de-energised, energises at tripping with MAX function configured.

18 Monitoring relays Technical characteristics Interface protection system units



TYPE		PMVF 20	PMVF 20 D048	
AUXILIARY POWER S	SUPPLY	I MIVI 20	1 III VI 20 DU40	
Rated control supply		100400VAC/110250VDC	1248VDC	
Operating limits	voltage US	90440VAC/93.5300VDC	970VDC	
Frequency		4555Hz	970VD0	
Power consumption	AC aupply	6VA at 110VAC; 8VA at 230VAC; 11VA at 400VAC	_	
Power consumption	AC supply DC supply	25mA at 110VDC; 11mA at 250VDC	250mA at 12VDC; 120mA 24VDC; 62mA at 48VDC	
Power dissipation	AC supply	2.7W at 110VAC; 3W at 220V; 3.9W at 400VAC	230111A dt 12VDG, 120111A 24VDG, 02111A dt 40VDG	
rowei uissipatioii	DC supply	2.6W at 110VAC, 5W at 250V, 5.5W at 400VAC	3W at 12VDC; 2.9W at 24VDC; 3W at 48VDC	
Micro-breaking immu		≤50ms at 110VAC; ≤200ms at 230VAC	≤ 15ms at 12VDC; ≤30ms at 24VDC; ≤70ms at 48VDC	
Overload category	iiity			
VOLTAGE INPUTS		III	III	
Maximum rated opera	ating voltage	400VAC L-L; 230	N/AC N 50H2	
Measuring range	illing voltage	20480VAC L-L;		
Frequency range		20400VAC L-L,		
Overload category		43		
CURRENT INPUTS (0	DTIONAL	IV		
Rated operational cur		1A or 5A in AC	programmable	
Measuring range	I GIIL IG	For 1A scale: 0.011.2A		
Type of input		Shunts powered by external current	,	
Type of measurement		Shums powered by external current		
		±209		
Overload capacity Overload peak				
Burden (per phase)		50A for 1 second ≤0.6W		
RELAY OUTPUTS				
Number of outputs		2		
		1 changeover cor		
Type of output Rated operating voltage	90	1 changeover con 250\		
UL/CSA and IEC/EN 6	-	5A 250VAC AC1 /F	-	
Overload category	0947-3-1 designation	JA ZJUVAU AUT /I		
DIGITAL INPUTS		ll ll		
Number and type of ir	anute	4 negativ	o (NIPM)	
Input voltage	ίμαιδ	24VDC i	` '	
Input current		24VBC1		
	SUPPLY/VOLTAGE MEASURING CIRCUIT CONNECTIONS			
Type of terminals Screw - removable				
Conductor section (m	in may)			
Tightening torque	IIIIIIax)	0.22.5mm² (2412 AWG) 0.5Nm (4.5lbin)		
	CURRENT MEASURING CIRCUIT CONNECTIONS			
Type of terminals	AC OTTOOTT OUTINEOT	Screw -	fixed	
Number of terminals		6 for external C		
Conductor section (m	in max)	0.24mm² (2610 AWG)		
Tightening torque		0.2411111 (2 0.8Nm	,	
RELAY OUTPUT CON	NECTIONS	0.011111	(CIMIT)	
Type of terminals	*50110140	Screw - re	movable	
Conductor section (m	in max)	0.22.5 mm² (2412 AWG)		
Tightening torque		0.5Nm (4.5 lbin)		
	INPUT CONNECTIONS – Input terminals			
	/pe of terminals Screw - removable			
Conductor section (m	in max)	Screw - removable 0.21.5 mm ² (2814 AWG)		
Tightening torque	IIIunj	0.21.3 mm² (2814 AWG) 0.18Nm (1.7lbin)		
INPUT CONNECTIONS – COM and auxiliary voltage terminals				
Type of terminals	O Olivi aliu auxillal y	Screw - re	movahle	
Conductor section (m	in may)	0.22.5 mm² (
	шШах)	,	,	
HOUSING	htening torque 0.5Nm (4.5lbin)			
Material		Dalva	mida	
Version		Polyamide Flush mount 96x96mm / 3.78x3.78"		
A @ 1 9 1 0 1 1		riusii iiioufit 96x9t	JIIIII / J. / UAJ. / U	

18 Monitoring relays Technical characteristics Interface protection system units



TVDF		DMVF 54 DMVF 50 DMVF 70		
TYPE		PMVF 51 - PMVF 60 - PMVF 70		
AUXILIARY POWER SUPP		400 040/40/40 050/100		
Rated control supply voltage	ge us	100240VAC/110250VDC		
Operating limits		85264VAC/93.5300VDC		
Frequency		4555Hz		
· —	Supply	4.6VA at 110VAC; 12.5VA at 230VAC		
	C supply	23mA at 110VDC; 11mA 250VDC		
	Supply	2.5W at 110VAC; 2.7W at 230VAC		
DC	C supply	2.3W at 110VDC; 2.5W at 250VDC		
Micro-breaking immunity		≤50ms at 100VDC; ≤200ms at 240VDC		
Overload category				
VOLTAGE INPUTS				
Maximum rated operating	voltage	400VAC L-L; 230VAC L-N 50Hz		
Measuring range		20480VAC L-L; 10276VAC L-N		
Frequency range		4555Hz		
Overload category		IV		
CURRENT INPUTS (OPTIO	NAL)			
Rated operational current I		1A or 5A in AC programmable		
Measuring range		For 1A scale: 0.011.2A; for 5A scale: 0.016A		
Type of measurement		RMS		
Overload capacity		±20% le		
Overload peak		50A for 1 second		
Burden (per phase)		≤0.6W		
RELAY OUTPUTS				
Number of outputs		20		
Type of output		1 changeover contact/SPDT each		
Rated operating voltage		250VAC		
UL/CSA and IEC/EN 60947	7-5-1 decignation	For NO contact: 5A 250VAC AC1/C300;		
UL/USA allu ILU/LIN 00347	-3-1 designation	5A 30VDC		
		For NC contact: 2A 250VAC AC1 / C300;		
-		2A 30VDC		
Overload category				
DIGITAL INPUTS				
Number and type of inputs	3	4 positive (PNP)		
Input voltage		12VDC isolated		
Input current		7mA		
SUPPLY/VOLTAGE MEASURING CIRCUIT CONNECTIONS				
Type of terminals		Screw - removable		
Conductor section (minn	nax)	0.24mm² (2412 AWG)		
Tightening torque		0.8Nm (4.5lbin)		
CURRENT MEASURING CIRCUIT CONNECTIONS				
Type of terminals		Screw - fixed		
Number of terminals		6 for external CT connections		
Conductor section (minn	nax)	0.22.5mm² (2412 AWG)		
Tightening torque		0.44Nm (4lbin)		
	RELAY OUTPUT CONNECTIONS			
Type of terminals				
	nductor section (minmax) 0.22.5 mm² (2412 AWG)			
Tightening torque		0.44Nm (4lbin)		
INPUT CONNECTIONS – Input terminals				
	ipat torrilliais	Screw - removable		
Type of terminals		0.22.5 mm² (2412 AWG)		
Conductor section (minmax)		· · ·		
Tightening torque 0.5Nm (4.5lbin)				
HOUSING Palvarida				
Material		Polyamide Modulor 611		
Version		Modular 6U		

[•] Single insulation between the two outputs. Both outputs must use the same voltage group.

18 Monitoring relays Technical characteristics Interface protection system units



TYPE	PMVF 30	
AUXILIARY POWER SUPPLY	FWVF 30	
	400, 400\/00\/00\/00	
Rated control supply voltage Us	100400VAC/110250VDC	
Operating limits	90440VAC/93.5300VDC	
Frequency	4555Hz	
Power consumption AC supply	7.5VA at 110VAC; 10VA at 230VAC; 14VA at 400VAC	
DC supply	35mA at 110VDC; 14mA at 250VDC	
Power dissipation AC supply	4W at 110VAC; 4.2W at 220V; 5W at 400VAC	
DC supply	3.8W at 110VAC; 4W at 250VDC	
Micro-breaking immunity	≤30ms at 110VAC ; ≤140ms at 230VAC	
Overload category	III	
VOLTAGE INPUTS		
Maximum rated operating voltage	50500VAC (for voltages/frequency) / 50150V (for residual voltage measurement)	
Measuring range (Un)	400-150,000V (VT primary)	
Frequency range	4555Hz	
Overload category	IV	
CURRENT INPUTS (OPTIONAL)		
Rated operational current le	1A or 5A in AC programmable	
Measuring range	For 1A scale: 0.011.2A; for 5A scale: 0.016A	
Type of input	Shunts powered by external current transformer (low voltage) 5A max.	
Type of measurement	RMS	
Overload capacity	±100% le	
Overload peak	50A for 1 second	
Burden (per phase)	≤0.3W	
RELAY OUTPUTS		
Number of outputs	2	
Type of output	1 changeover contact/SPDT each	
Rated operating voltage	250VAC	
UL/CSA and IEC/EN 60947-5-1 designation	5A 250VAC AC1 /B300; 5A 30VDC	
Overload category		
DIGITAL INPUTS	III.	
Number and type of inputs	4 negative (NPN)	
	24VDC isolated	
Input voltage Input current	Z4VDC Isolateu 7mA	
SUPPLY/VOLTAGE MEASURING CIRCUIT C		
Type of terminals	Screw - removable	
Number of terminals	2 for power supply; 5 for voltage control	
Conductor section (minmax)	0.22.5mm² (2412 AWG)	
Tightening torque	0.5Nm (4.5lbin)	
CURRENT MEASURING CIRCUIT CONNECT		
Type of terminal	Screw - fixed	
Number of terminals	6 for external CT connections	
Conductor section (minmax)	0.24mm² (2610 AWG)	
Tightening torque	0.8Nm (7lbin)	
RELAY OUTPUT CONNECTIONS	7	
Type and (number) of terminals	Screw – removable (3)	
Conductor section (minmax)	0.22.5 mm ² (2412 AWG)	
Tightening torque	0.5Nm (4.5 lbin)	
INPUT CONNECTIONS – Input terminals		
Type and (number) of terminals	Screw – removable (4)	
Conductor section (minmax)	0.21.5 mm² (2814 AWG)	
Tightening torque	0.18Nm (1.7lbin)	
INPUT CONNECTIONS – COM and auxiliary voltage terminals		
Type and (number) of terminals	Screw – removable (3)	
Conductor section (minmax)	0.22.5 mm² (2412 AWG)	
Tightening torque	0.5Nm (4.5lbin)	
HOUSING	. , ,	
Material	Polyamide	
Version	Flush mount 96x96mm / 3.78x3.78"	