

# PRODUCT AND SOLUTIONS FOR PHOTOVOLTAIC APPLICATIONS



## Fuse holders for photovoltaic applications UL Listed/CSA certified up to 1000VDC

Order code	Pole arrangement	Status indicator	DIN size n°

For 10x38mm fuses.  
IEC 32A rated current at 1000VDC.

<b>FB01D1P</b>	1P	—	1
<b>FB01D1PL</b>	1P	YES	1
<b>FB01D2P</b>	2P	—	2
<b>FB01D2PL</b>	2P	YES	2

## Fuses for photovoltaic applications up to 1000VDC

Order code	Rated current I <sub>n</sub>
	[A]

For 10x38mm fuses.  
IEC 30kA breaking capacity at 1000VDC.

<b>FE01D00200</b>	2
<b>FE01D00400</b>	4
<b>FE01D00600</b>	6
<b>FE01D00800</b>	8
<b>FE01D01000</b>	10
<b>FE01D01200</b>	12
<b>FE01D01600</b>	16
<b>FE01D02000</b>	20

## GD series switch disconnectors

Order code	IEC conventional free air thermal current I <sub>th</sub>		IEC rated operational current I <sub>e</sub> DC21B			
	≤800V	1000V	1200V	1500V		
	[A]	[A]	[A]	[A]	[A]	

Switch disconnector complete with black handle.

<b>GD025AT2</b>	25	25	16	—	—
<b>GD025AT3</b>	25	25	25	—	—
<b>GD032AT3</b>	32	32	32	—	—
<b>GD032AT4</b>	32	32	32	25	20
<b>GD040AT3</b>	40	40	32	—	—
<b>GD040AT4</b>	40	40	40	32	25

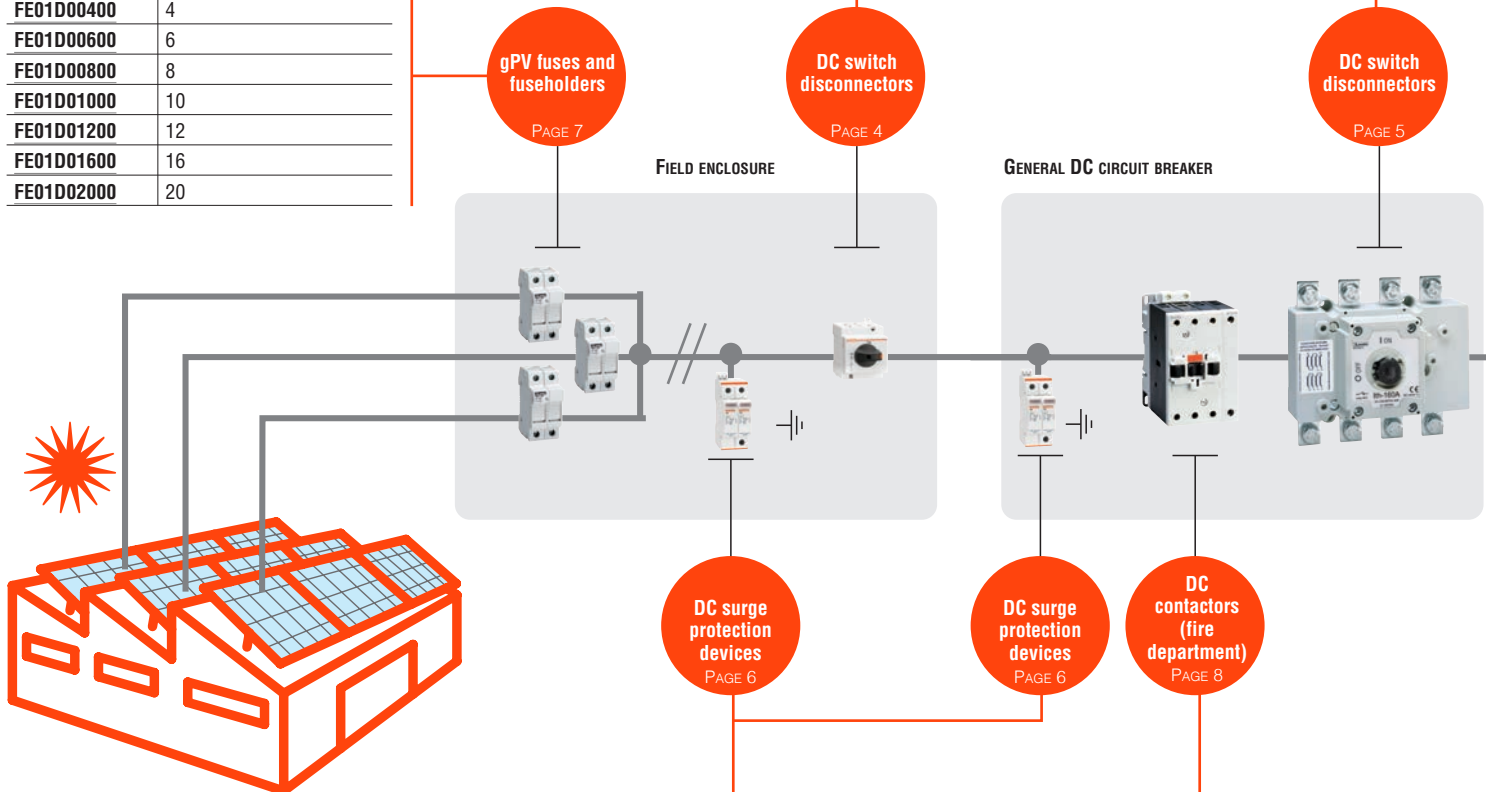
## GE series four-pole switch disconnectors

Order code	IEC conventional free air thermal current I <sub>th</sub>		IEC rated operational current I <sub>e</sub> DC21B		
	[A] (IEC)	[A]	[A]	[A]	[A]
			600V	800V	1000V

Switch disconnector (handle not included).

<b>GE0125DT4</b>	125	125	125	100
<b>GE0250DT4</b>	250	250	250	200
<b>GE0315DT4</b>	315	315	280	250
<b>GE0630DT4</b>	630	630	600	500
<b>GE0800DT4</b>	800	700	630	630
<b>GE1250DT4</b>	1250	1250	1000	850

① Connection of 4 poles in series.



## Surge protection devices type 2 - DC with plug-in cartridge

Order code	Pole arrangement	Relay output (SPDT)	Number of DIN module n°
EN rated voltage U <sub>n</sub> 600VDC.			
<b>SG2DG600M2</b>	+, -, PE	NO	2
<b>SG2DG600M2R</b>	+, -, PE	YES	2
EN rated voltage U <sub>n</sub> 1100VDC.			
<b>SG2DGK10M3</b>	+, -, PE	NO	3
<b>SG2DGK10M3R</b>	+, -, PE	YES	3
<b>SA2EDGK10M3</b>	+, -, PE	NO	3
EN rated voltage U <sub>n</sub> 1500VDC.			
<b>SG2DGK50M3</b>	+, -, PE	NO	3

## Contactors to connect in series for photovoltaic applications BF series

Order code	Poles in series	Operational voltage U <sub>e</sub>			
		400V	600V	800V	1000V
		IEC max current I <sub>e</sub> in DC1 with L/R ≤1ms			
		[A]	[A]	[A]	[A]
<b>BFD6500A...</b>	3	100	75	45	35
<b>BFD8000A...</b>	3	100	80	65	60
<b>BFD80T4A...</b>	4	115	100	76	80
<b>BFD80T4E...</b>	4	115	100	76	80
<b>BFD150T4E...</b>	4	165	165	125	100
<b>BFD230T4E...</b>	4	350	350	300	275

## Interface protection system for low voltage

Order code	Compliant with standards
Low voltage system.	
<b>PMVF51</b>	CEI 0-21
<b>PMVF60</b>	DEWA DRRG and SEC (Saudi Electricity Company)
<b>PMVF70</b>	ENA G59-3/G99
<b>PMVF80</b>	VDE-AR-N 4105 and VDE V 0126-1-1

## Backup power supply for interface protection unit

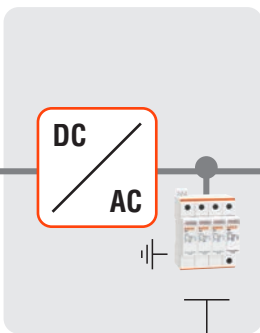
Order code	Description
Backup power supply for interface protection unit PMVF...	
<b>PMVFUPS01</b>	Input 230VAC. Output 230VAC with stored energy 200Wh and power 250VA

## Remote control and monitoring GSM modem via SMS

Order code	Description
GSM modem (modular - 4U). IP69K outside aerial with 2.5m cable. RJ45-USB programming cable (included).	
<b>EXCGSM01</b>	100...240VAC, 1 digital input, 1 analogic input (0...10V, 0...20mA, NTC), 1 relay output, SMS send/receive for remote control and alarm signals



## INVERTER PANEL



**AC surge protection devices**  
PAGE 6

**AC contactors (DDI)**  
PAGE 9

**Miniature and residual current circuit breakers**  
PAGE 14

## Surge protection devices type 2 - AC with plug-in cartridge In=20kA

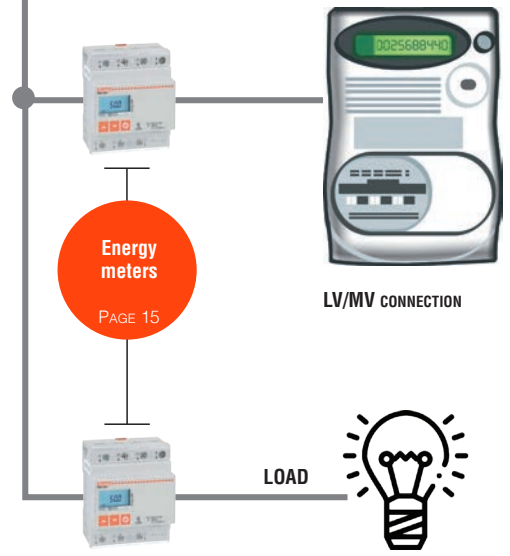
Order code	Pole arrangement	Relay output	Number of DIN modules n°
VERSION WITH PLUG-IN CARTRIDGES. Rated discharge current In (8/20µs) 20kA per pole.			
<b>SG21NA300</b>	1P+N	NO	2
<b>SG21NA300R</b>	1P+N	YES	2
<b>SG22PA300</b>	2P	NO	2
<b>SG22PA300R</b>	2P	YES	2
<b>SG23NA300</b>	3P+N	NO	4
<b>SG23NA300R</b>	3P+N	YES	4
<b>SG24PA300</b>	4P	NO	4
<b>SG24PA300R</b>	4P	YES	4

## 4 pole contactors for photovoltaic applications BF series

Order code	AC3 operational data	
	le current ≤440V ≤55°C [A]	Max power ≤400V ≤55°C [kW]
AC COIL.		
<b>BF26T4A</b> Ⓢ	26	13
<b>BF38T4A</b> Ⓢ	38	18,5
<b>BF40T4A</b> Ⓢ	40	18,5
<b>BF50T4A</b> Ⓢ	50	22
<b>BF65T4A</b> Ⓢ	65	30
<b>BF80T4A</b> Ⓢ	80	45
<b>BF95T4A</b> Ⓢ	95	55
<b>BF115T4A</b> Ⓢ	115	55
<b>BF150T4A</b> Ⓢ	150	75
<b>BF160T4E</b> Ⓢ	160	75
<b>BF195T4E</b> Ⓢ	195	90
<b>BF230T4E</b> Ⓢ	230	110

## Energy meters

PAGE 15



- The order code must be completed with the winding voltage number (50/60Hz) and the winding voltage number followed by 60 if a 60Hz unit.  
The following standard voltages are available:  
- AC 50-60Hz 024 - 048 - 110 - 230 - 400V  
- AC 60Hz 024 60 - 048 60 - 120 60 - 220 60 - 230 60 - 460 60 - 575 60 (V).
- The contactor winding is electronically controlled; it can be either AC or DC powered and has a wide operational range.  
The order code must be completed with the winding voltage number.  
The following standard voltages are available:  
- AC/DC 024 = 24...60VAC/20...60VDC; 110 = 60...130VAC/DC; 230 = 100...250VAC/DC; 400 = 250...500V.

## GA series switch disconnectors



GA040D



GAX42...D

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DC21B			Qty per pkg	Wt [kg]
		3 poles 500V	4 poles 600V	800V		
[A]	[A]	[A]	[A]	[A]	n°	[kg]

Switch disconnector complete with black handle.

<b>GA040D</b>	40	12	—	—	1	0.135
---------------	----	----	---	---	---	-------

Fourth pole.

<b>GAX42040D</b>	40	—	20	15	1	0.040
------------------	----	---	----	----	---	-------

① Connection of 4 poles in series.

## GD series switch disconnectors



GD...

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DC21B				Qty per pkg	Wt [kg]
		≤800V	1000V	1200V	1500V		
[A]	[A]	[A]	[A]	[A]	[A]	n°	[kg]

Switch disconnector complete with black handle.

<b>GD025AT2</b>	25	25	16	—	—	1	0.140
-----------------	----	----	----	---	---	---	-------

<b>GD025AT3</b>	25	25	25	—	—	1	0.180
-----------------	----	----	----	---	---	---	-------

<b>GD032AT3</b>	32	32	32	—	—	1	0.180
-----------------	----	----	----	---	---	---	-------

<b>GD032AT4</b>	32	32	32	25	20	1	0.220
-----------------	----	----	----	----	----	---	-------

<b>GD040AT3</b>	40	40	32	—	—	1	0.180
-----------------	----	----	----	---	---	---	-------

<b>GD040AT4</b>	40	40	40	32	25	1	0.220
-----------------	----	----	----	----	----	---	-------

## IEC/EN/BS IP65 plastic enclosed GAZ series switch disconnectors



GAZ016DT2



GAZ040DT4

Order code	IEC conventional thermal current Ith	IEC rated operational current Ie DC21B				Qty per pkg	Wt [kg]
		≤800V	1000V	1200V	1500V		
[A]	[A]	[A]	[A]	[A]	[A]	n°	[kg]

With red/yellow handle.

<b>GAZ025DT2</b>	25	25	16	—	—	1	0.450
------------------	----	----	----	---	---	---	-------

<b>GAZ032DT3</b>	32	32	32	—	—	1	1.050
------------------	----	----	----	---	---	---	-------

<b>GAZ040DT4</b>	40	40	40	32	25	1	1.050
------------------	----	----	----	----	----	---	-------

With black handle.

<b>GAZ025DT2B</b>	25	25	16	—	—	1	0.450
-------------------	----	----	----	---	---	---	-------

<b>GAZ032DT3B</b>	32	32	32	—	—	1	1.050
-------------------	----	----	----	---	---	---	-------

<b>GAZ040DT4B</b>	40	40	40	32	25	1	1.050
-------------------	----	----	----	----	----	---	-------

### General characteristics

- up to 40A (1000VDC), 32A (1200VDC), 25A (1500VDC)
- modular construction
- Jumpers for connecting the poles in series supplied as standard with disconnectors GD... series
- Available versions:
  - Direct operating
  - Door coupling version. Use switch disconnector with direct actuator and separately purchase the handle and shaft extension for this version.
- Screw or 35mm DIN rail fixing
- Padlockable in 0 position with no extra accessory.

### Operational characteristics

- Rated insulation voltage for GA...D and GD...: Ui: 1000V (pollution degree 3)
- Rated insulation voltage for GD...: Ui: 1500V (pollution degree 2)
- Rated impulse withstand voltage Uimp: 8kV
- Mechanical life:
  - 100,000 cycles GA040D
  - 10,000 cycles GD...
- Degree of protection: IP20.

### Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (cULus - File E93602) as Manual Motor Controllers, to UL508/CSA C22.2 n° 14 for GA040D and GAX42040D; EAC for GA...D.

Compliant with standards: IEC/EN/BS 60947-3, IEC/EN/BS 60947-1, UL60947-4-1.

### Components

Enclosure	Switch disconnector	Handle included with GAZ...
GAZ1	GD025AT2	GAX61
GAZ2	GD032AT3	GAX61
GAZ2	GD040AT4	GAX61
GAZ1B	GD025AT2	GAX61B
GAZ2B	GD032AT3	GAX61B
GAZ2B	GD040AT4	GAX61B

### General characteristics

- Enclosure material: ABS
- Possible accessories to mount afterwards, if any required:
  - GAX30 to provide shielded cable connection continuity (e.g. with static converters)
- Padlockable handles
- Sealable cover
- Tightening torque for cover screws:
  - GAZ025...: 1.3Nm/16lb.in
  - Other types: 1.5Nm/13lb.in.
- Degree of protection: IP65
- Cable entry:
  - GAZ025... types: PG16/M25 and PG13.5/M20 knockouts
  - GAZ032... and GAZ040... types: PG16/M25 and PG29/M32 knockouts.

### Certifications and compliance

Certifications obtained: EAC  
Compliant with standards: IEC/EN/BS 60947-3, IEC/EN/BS 60947-1.

## GE series switch disconnectors



GE...DT4

Order code	IEC conventional free air thermal current Ith [A] (IEC)	IEC rated operational current Ie DC-21B			Qty per pkg n°	Wt [kg]
		600V [A]	800V [A]	1000V [A]		

Separately purchase the handles.

<b>GE0125DT4</b>	125	125	125	100	1	1.900
<b>GE0250DT4</b>	250	250	250	200	1	2.000
<b>GE0315DT4</b>	315	315	280	250	1	4.000
<b>GE0630DT4</b>	630	630	600	500	1	4.500
<b>GE0800DT4</b>	800	700	630	630	1	4.500
<b>GE1250DT4</b>	1250	1250	1000	850	1	8.900

① Connection of 4 poles in series.

### General characteristics

- Up to 850A, 1000VAC
- Screw fixing
- Padlockable in 0 position with no extra accessory.

### Operational characteristics

- IEC rated insulation voltage Ui: 1000V
- Mechanical life:
  - 20,000 cycles for GE0125DT4, GE0250DT4, GE0315DT4
  - 10,000 cycles for GE0630DT4, GE0800DT4, GE1250DT4.

### Certifications and compliance

Certifications obtained: EAC.  
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-3.

## Direct operating handles



GEX67ND

Order code	Characteristics	Qty per pkg n°	Wt [kg]
------------	-----------------	----------------	---------

DIRECT OPERATING LEVER HANDLE. PADLOCKABLE. Rotating type with screw fixing on switch disconnector. Complete with shaft extension.

<b>GEX66ND</b>	115mm black handle for GE0125DT4, GE0250DT4 and GE0315DT4	1	0.216
<b>GEX67ND</b>	143mm black handle for GE0630DT4 and GE0800DT4	1	0.322
<b>GEX68ND</b>	396mm black handle for GE1250DT4	1	0.328

## RATINGS

### USE IN CATEGORY DC-21B

Product to be purchased and connected	Operating voltage Ue						
	500V	600V	750V	800V	850V	900V	1000V
	Maximum operating voltage						
	[A]	[A]	[A]	[A]	[A]	[A]	[A]

### 4 POLES IN SERIES

GE0125DT4	125	125	125	125	125	125	<b>100</b>
GE0250DT4	250	250	250	250	240	220	<b>200</b>
GE0315DT4	315	315	290	280	270	260	<b>250</b>
GE0630DT4	630	630	630	600	600	600	<b>500</b>
GE0800DT4	700	700	650	630	630	630	<b>630</b>
GE1250DT4	1250	1250	1050	1000	940	870	<b>850</b>

## Type 2 - AC With plug-in cartridge In=20kA



SG2...

Order code	Pole arrangement	Relay output	Number of DIN modules	Qty per pkg	Wt
			n°	n°	[kg]
VERSION WITH PLUG-IN CARTRIDGES. Rated discharge current In (8/20µs) 20kA per pole.					
SG21NA300	1P+N	NO	2	1	0.234
SG21NA300R	1P+N	YES	2	1	0.240
SG22PA300	2P	NO	2	1	0.252
SG22PA300R	2P	YES	2	1	0.266
SG23NA300	3P+N	NO	4	1	0.477
SG23NA300R	3P+N	YES	4	1	0.486
SG24PA300	4P	NO	4	1	0.496
SG24PA300R	4P	YES	4	1	0.505

### General characteristics

SURGE PROTECTION DEVICES TYPE SG2  
They are available in plug-in cartridge version and they are suitable for installation in secondary boards and in terminal equipment.

They ensure protection against overvoltages conditions. The protection cartridges are plug-in and can be easily replaced for quick servicing. SG2 surge arresters are immune to temporary overvoltages (TOV) and block the circulation of the subsequent network current after the intervention.

### Operational characteristics

- IEC maximum continuous operating voltage Uc: 300VAC
- IEC maximum discharge current I<sub>max</sub> (8/20µs): 50kA per pole
- IEC rated discharge current In (8/20µs): 20kA per pole
- Versions with or without relay output having changeover contact for remote status indication
- IEC degree of protection: IP20.

### Certifications and compliance

Certification obtained: EAC.  
Compliant with standards: IEC/EN/BS 61643-11.

### Characteristics

Type	IEC rated voltage Un [V]	IEC voltage protection level Up [kV] L-N	Power installation system
SG21NA300...	230	<1.5	TT, TN-S
SG2PA300...	230	<1.5	TN-S
SG23NA300...	230/400	<1.5	TT, TN-S
SG24PA300...	230/400	<1.5	TN-S

## Type 1 and 2 - DC with plug-in cartridge



SG2EDGK10M3R

Order code	Pole arrangement	Relay output	Number of DIN modules	Qty per pkg	Wt
			n°	n°	[kg]
EN rated voltage Un 1100VDC.					
SG2EDGK10M3R	+, -, PE	YES	3	1	0.406

### General characteristics

The surge protection device type SG2EDG..., SG2DG... and SA2EDG... with plug-in cartridge for photovoltaic applications is suitable for installation on the direct-current end of a photovoltaic installation and protects against induced overvoltage conditions.

The protection cartridges are plug-in and can be easily replaced for quick servicing.

### Operational characteristics

- EN maximum continuous voltage U<sub>cpv</sub>: 600VDC, 1100VDC, 1500VDC
- EN short circuit current rating I<sub>scpv</sub>: 11kA for SG2EDG... and SG2DG..., 9kA per SA2EDG...
- Versions with or without relay output having changeover contact for remote status indication
- EN degree of protection: IP20.

### Characteristics

Type	EN rated voltage Un [VDC]	EN continuous voltage U <sub>cpv</sub> [VDC]	EN voltage protection level Up [kV]
SG2DG600M2	600	600	<1.9
SG2DG600M2R	600	600	<1.9
SG2DGK10M3	1100	1100	<3.8
SG2DGK10M3R	1100	1100	<3.8
SG2EDGK10M3R	1100	1100	<3.8
SA2EDGK10M3	1100	1100	<4.0
SG2DGK50M3	1500	1500	<5.0

### Certifications and compliance

Certification obtained: EAC.  
Compliant with standards: IEC/EN/BS 50539-11.

## Type 2 - DC with plug-in cartridge



SG2DG600M2...

Order code	Pole arrangement	Relay output	Number of DIN modules	Qty per pkg	Wt
			n°	n°	[kg]
EN rated voltage Un 600VDC.					
SG2DG600M2	+, -, PE	NO	2	1	0.320
SG2DG600M2R	+, -, PE	YES	2	1	0.325
EN rated voltage Un 1100VDC.					
SG2DGK10M3	+, -, PE	NO	3	1	0.396
SG2DGK10M3R	+, -, PE	YES	3	1	0.406
SA2EDGK10M3	+, -, PE	NO	3	1	0.329
EN rated voltage Un 1500VDC.					
SG2DGK50M3	+, -, PE	NO	3	1	0.444



SG2DGK10M3R

## Fuse holders for photovoltaic applications UL Listed / CSA certified up to 1000V



FB01D... FB01D1PL

Order code	Pole arrangement	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]

For 10x38mm fuses.  
IEC 32A rated current at 1000VDC.

<b>FB01D1P</b>	1P	—	1	12	0.064
<b>FB01D1PL</b>	1P	YES	1	12	0.065
<b>FB01D2P</b>	2P	—	2	6	0.127
<b>FB01D2PL</b>	2P	YES	2	6	0.130

### Operational characteristics

- IEC rated voltage  $U_n$ : 1000VDC
- IEC rated current  $I_n$ : 32A
- IEC utilisation category: DC20B 1000VDC
- Suitable for IEC fuse class: gPV
- IEC degree of protection: IP20.

### Certifications and compliance

Certifications obtained: UL Listed for USA (UL - File E366062) and CSA certified for Canada (File 252040 class 3211), EAC.  
Compliant with standards: IEC/EN/BS 60269-1, IEC 60269-2, IEC/EN/BS 60947-1, IEC/EN/BS 60947-3, UL 4248-1, UL4248-18, CSA C22.2 n° 4248-1, CSA C22.2 n° 4248-18.

## Fuses for photovoltaic applications up to 1000VDC



FE01D...

Order code	Rated current $I_e$	Qty per pkg	Wt
	[A]	n°	[kg]

10x38mm fuses.  
IEC 30kA breaking capacity at 1000VDC.

<b>FE01D00200</b>	2	10	0.008
<b>FE01D00400</b>	4	10	0.008
<b>FE01D00600</b>	6	10	0.008
<b>FE01D00800</b>	8	10	0.008
<b>FE01D01000</b>	10	10	0.008
<b>FE01D01200</b>	12	10	0.008
<b>FE01D01600</b>	16	10	0.008
<b>FE01D02000</b>	20	10	0.008

### Operational characteristics

- IEC rated voltage  $U_n$ : 1000VDC
- IEC rated current  $I_n$ : 2...20A
- IEC fuse class: gPV.

### Certifications and compliance

Certifications obtained: EAC.  
Compliant with standards: IEC/EN/BS 60269-6.

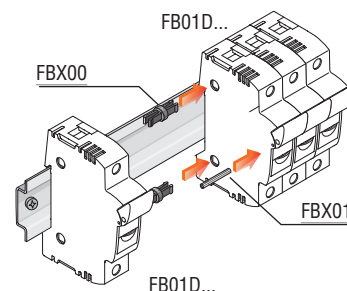
## Accessories



FBX00

FBX01

Order code	Description	Qty per pkg	Wt
	[A]	n°	[kg]
<b>FBX00</b>	Coupling clip for 10x38, 14x51 and 22x58mm sizes	100	0.003
<b>FBX01</b>	Coupling pin for 10x38mm size	100	0.005



## Fuse holders for photovoltaic applications up to 1500V



FB04D1P

FB04D1PL

Order code	Pole arrangement	Status indicator	Qty per pkg	Wt
			n°	[kg]

10x85mm and 14x85mm fuses.  
IEC 32A rated current at 1500VDC.

<b>FB04D1P</b>	1P	No	6	0.109
<b>FB04D1PL</b>	1P	Yes	6	0.110

### Operational characteristics

- IEC rated voltage  $U_n$ : 1500VDC
- IEC rated current  $I_n$ : 32A
- IEC utilisation category: DC20B 1500VDC
- Suitable for IEC fuse class: gPV
- IEC degree of protection: IP20.

### Certifications and compliance

Compliant with standards: IEC/EN/BS 60947-3.

## Fuses for photovoltaic applications up to 1500VDC



FE05D...

FE04D...

Order code	Rated current $I_e$	Qty per pkg	Wt
	[A]	n°	[kg]

10x85mm fuses.  
IEC 10kA breaking capacity at 1500VDC.

<b>FE04D006</b>	6	10	0.019
<b>FE04D010</b>	10	10	0.019
<b>FE04D015</b>	15	10	0.019
<b>FE04D020</b>	20	10	0.019

14x85mm fuses.  
IEC 10kA breaking capacity at 1500VDC.

<b>FE05D020</b>	20	5	0.031
<b>FE05D025</b>	25	5	0.031
<b>FE05D032</b>	32	5	0.031

### Operational characteristics

- IEC rated voltage  $U_n$ : 1500VDC
- IEC rated current
- $I_n$ : 6...20A for 10x85mm version
- $I_n$ : 20...32A for 14x85mm version
- Suitable for IEC fuse class: gPV.

### Certifications and compliance

Compliant with standards: IEC/EN/BS 60269-6.

**3 pole contactors to connect in series for photovoltaic applications**  
BF series



BFD6500A - BFD8000A

Order code	Operational current at 600V in DC1 ≤55°C with 3 poles in series		Qty per pkg	Wt
	600V	1000V		
	[A]	[A]	n°	[kg]
AC COIL. Terminals: double lug clamp.				
<b>BFD6500A</b>	75	35	1	1.020
<b>BFD8000A</b>	80	60	1	1.020

**4 pole contactors to connect in series for photovoltaic applications**  
BF series



BFD80T4...

Order code	Operational current at 600V in DC1 ≤55°C with 4 poles in series		Qty per pkg	Wt
	600V	1000V		
	[A]	[A]	n°	[kg]
AC COIL. Terminals: double lug-clamp.				
<b>BFD80T4A</b>	100	80	1	1.100
AC/DC COIL. Terminals: double lug-clamp (screw-nut for BFD230T4E).				
<b>BFD80T4E</b>	100	80	1	1.100
<b>BFD150T4E</b>	165	100	1	2.550
<b>BFD230T4E</b>	350	275	1	4.000



BFD150T4E



BFD230T4E...

**General characteristics**

The contactors are specifically made with magnetic elements in the arc extinction chambers to obtain high DC load operational capabilities. They are used to disconnect and isolate the load between the photovoltaic panel and the AC/DC inverter.

For add-on contact blocks, accessories and spare parts, consider indications of the corresponding standard contactors without the D letter in the code.

**Italian Fire Department Directives**

These directives provide for a disconnecting device for all current-carrying elements, that can be operated by remote control switch, placed in an easily reached and marked position, in order to safely isolate each part of the installation within the fire system compartment including the photovoltaic (PV) generator.

As an alternative, the PV generator must be installed, either externally of the fire system compartment or internally but in a dedicated compartment with adequate fire-resistant features. For such function, specifically designed contactors for on-load use in IEC DC1 duty up to 1000VDC are available.

**Operational characteristics**

Use in IEC DC1 duty

Type	Poles in series	IEC operational voltage Ue			
		400V	600V	800V	1000V
		IEC max current Ie in DC1 with L/R ≤1ms with 4 poles in series			
		[A]	[A]	[A]	[A]
BFD6500A...	3	100	75	45	35
BFD8000A...	3	100	80	65	60
BFD80T4A...	4	115	100	76	80
BFD80T4E...	4	115	100	76	80
BFD150T4E...	4	165	165	125	100
BFD230T4E...	4	350	350	300	275

**Certification and compliance**

Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

- ① Complete with coil voltage digit if 50/60Hz or with voltage digit followed by 60 if 60Hz. Standard voltages are:  
 - AC 50/60Hz 024 / 048 / 110 / 230 / 400V  
 - AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).
- ② The contactor coil is controlled electronically; it can have either an AC or a DC supply and has a wide operating range.  
 Complete the order code with coil voltage digit.  
 Standard voltages are:  
 - AC/DC 024 = 20...48V; 110 = 60...110V; 230 = 100...250V.
- ③ The contactor coil is controlled electronically; it can have either an AC or a DC supply and has a wide operating range.  
 Complete the order code only with the digit of the coil voltage.  
 Standard voltages are:  
 - AC/DC 024 = 24...60VAC/20...60VDC; 110 = 60...130VAC/DC; 230 = 100...250VAC/DC; 400 = 250...500V.



## Four-pole contactors for photovoltaic applications BF series



BF09AT4A...BF18T4A



BF95T4A...BF150T4A



BF160T4E...BF230T4E



B2504...B4004

Order code	AC3	Max power	Qty per Pkg	Wt
	Current Ie ≤440V ≤55°C			
	[A]	[kW]	n°	[kg]
AC COIL.				
<b>BF26T4A</b> Ⓜ	26	13	1	0.508
<b>BF38T4A</b> Ⓜ	38	18,5	1	0.508
<b>BF40T4A</b> Ⓜ	40	18,5	1	1.240
<b>BF50T4A</b> Ⓜ	50	22	1	1.240
<b>BF65T4A</b> Ⓜ	65	30	1	1.240
<b>BF80T4A</b> Ⓜ	80	45	1	1.240
<b>BF95T4A</b> Ⓜ	95	55	1	2.420
<b>BF115T4A</b> Ⓜ	115	55	1	2.420
<b>BF150T4A</b> Ⓜ	150	75	1	2.420
<b>BF160T4E</b> Ⓜ	160	75	1	4.000
<b>BF195T4E</b> Ⓜ	195	90	1	4.000
<b>BF230T4E</b> Ⓜ	230	110	1	4.000
<b>11B250400</b> Ⓜ	265	140	1	11.19
<b>11B310400</b> Ⓜ	320	170	1	11.19
<b>11B400400</b> Ⓜ	420	225	1	11.19
<b>11B500400</b> Ⓜ	520	290	1	20.91
<b>11B630400</b> Ⓜ	630	335	1	21.88

① Complete order code with coil voltage digit or voltage digit followed by 60 if 60Hz.

Standard voltages are as follows:

- AC 50-60Hz 024 - 048 - 110 - 230 - 400V

- AC 60Hz 024 60 - 048 60 - 120 60 - 220 60 - 230 60 - 460 60 - 575 60 (V).

② The contactor coil is controlled electronically; it can have either an AC or a DC supply and has a wide operating range.

Complete the order code only with the digit of the coil voltage.

Standard voltages are:

- AC/DC 024 = 24...60VAC/20...60VDC; 110 = 60...130VAC/DC; 230 = 100...250VAC/DC; 400 = 250...500V.

③ The coil of the contactor can be powered indifferently in AC or DC.

Complete the order code only with the digit of the coil voltage. Standard voltages are:

- AC/DC 24 / 48 / 60 / 110-125 (indicate 110)

- AC/DC 24 - 48 - 60 - 110...125 (indicate 110) - 220...240 (indicate 220) - 380...415 (indicate 380) - 440...480V (indicate 440).

Example: 11B250400110 for contactor B250, four poles, without auxiliary contacts and with 110-125VAC/DC coil.

**The 24VAC/DC voltage is not possible for B500...B6301000 contactors.**

Other voltages available on request.

### General characteristics

In photovoltaic systems, contactors are used with the function of DDI (Interface Device) between the DC/AC inverter output and the line.

The Italian CEI 0-21 standard, June 2012 edition, prescribes that contactors used as DDIs must have dimensions corresponding to the AC-3 utilisation category.

### Operational characteristics

Average consumption at ≤20°C			BF26T4A BF38T4A	BF50T4A BF65T4A BF80T4A	BF95T4A BF115T4A BF150T4A
50/60Hz coil powered at	50Hz	in-rush VA	75	210	300
		holding VA	9	15	20
	60Hz	in-rush VA	70	195	275
		holding VA	6,5	13	17
Dissipation at 50Hz			W	2.5	5

Average consumption at ≤20°C			BF160T4E BF195T4E BF230T4E	B250400 B310400 B400400	B500400 B630400
AC/DC coil	in-rush	VA/W	160...230	300	400
	holding	VA/W	160...230	10	18

### Certifications and compliance

Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

## Compliant with Italian standard CEI 0-21 For low voltage



PMVF51



EXM10...



PMVF20...



EXP1003

Order code	Rated voltage		Qty per pkg	Wt
	Control	Auxiliary		
	[V]	[V]	n.	[kg]
Low voltage system. Dual threshold minimum and maximum voltage and frequency protection. Modular type with 2 relay outputs.				
<b>PMVF51</b>	230VAC 400VAC	100...240VAC/ 110...250VDC	1	0.470

Order code	Description
EXPANSION MODULES FOR PMVF51. Communication ports.	
<b>EXM1010</b>	Opto-isolated USB interface
<b>EXM1011</b>	Opto-isolated RS232 interface
<b>EXM1012</b>	Opto-isolated RS485 interface
<b>EXM1013</b>	Opto-isolated Ethernet interface
<b>EXM1018</b>	IEC/EN/BS 61850 interface
Inputs and outputs.	
<b>EXM1001</b>	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC

### IEC/EN/BS 61850 protocol

The EXM1018 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).

Order code	Rated voltage		Qty per pkg	Wt
	Control	Auxiliary		
	[V]	[V]	n.	[kg]
Low voltage system. Dual threshold minimum and maximum voltage and frequency protection. Flush mount type 96x96mm/3.78x3.78".				
<b>PMVF20</b>	230VAC 400VAC	100...400VAC/ 110...250VDC	1	0.568
<b>PMVF20D048</b>		12...48VDC	1	0.580

Order code	Description
EXPANSION MODULES FOR PMVF20. For independent signal in case of phase power unbalance (LSP).	
<b>EXP1003</b>	2 relay outputs 5A 250VAC
Communication ports.	
<b>EXM1010</b>	Opto-isolated USB interface
<b>EXM1011</b>	Opto-isolated RS232 interface
<b>EXM1012</b>	Opto-isolated RS485 interface
<b>EXM1013</b>	Opto-isolated Ethernet interface
<b>EXM1018</b>	IEC/EN/BS 61850 interface

### IEC/EN/BS 61850 protocol

The EXP1018 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).

### Caratteristiche generali

PMVF... 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, PMVF... must step in by de-energising a relay output so that the interface device (DDI) trips.

PMVF51 is certified for use in single and three phase systems, where it is required in presence of storage systems connected in parallel to the distribution network and to the photovoltaic inverter on the AC side (presence of multiple energy generators simultaneously or exceeding the threshold of 11.08kW overall).

PMVF... 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.

The following functions can be handled by the programmable outputs if the PMVF20 is equipped with a EXP1003 expansion module, or PMVF51 with EXM1001:

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

### Operational characteristics

- Auxiliary voltage:
  - PMVF20: 100...400VAC/110...250VDC
  - PMVF20D048: 12...48VDC
  - PMVF51: 100...400VAC/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
- Parameter configuration and remote control (only with communication 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/BS 61850 signal supervision using expansion or external module.**

### Reference standards

Compliant with standards: Italian CEI 0-21, IEC/EN/BS 60255-27, IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

## Compliant with Italian standard CEI 0-16 For medium voltage



PMVF30...



EXP10...

### IEC/EN/BS 61850 protocol

The EXP1018 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).

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

Medium-voltage system.  
Dual threshold minimum and maximum voltage and frequency protection.  
Flush mount type 96x96mm/3.78x3.78".

<b>PMVF30</b>	Measurements via VTs in MT or direct in LV	100...400VAC/ 110...250VDC	1	0.566
<b>PMVF30D048</b>		12...48VDC	1	0.566

Order code	Description
------------	-------------

EXPANSION MODULES FOR PMVF30.  
For auto reclosing management of automatic circuit breaker (DDI).

<b>EXP1003</b>	2 relay outputs 5A 250VAC
----------------	---------------------------

Communication ports.

<b>EXP1010</b>	Opto-isolated USB interface
<b>EXP1011</b>	Opto-isolated RS232 interface
<b>EXP1012</b>	Opto-isolated RS485 interface
<b>EXP1013</b>	Opto-isolated Ethernet interface
<b>EXP1018</b>	IEC/EN/BS 61850 interface

### 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 reclosing

Whenever an automatic circuit breaker is used as the DDI, the PMVF30 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 PMVF30 (unless it is already used for the standby device operation) or by installing an EXP1003 expansion module.

### General characteristics

PMVF30 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, PMVF... must step in by de-energising a relay output so that the interface device (DDI) trips.

PMVF30 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:

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

### Operational characteristics

- Auxiliary voltage:
  - PMVF30: 100...400VAC/110...250VDC
  - PMVF30D048: 12...48VDC
- Voltage inputs (connection via VTs in MV or directly in LV end):
  - Primary: until 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
- Parameter configuration and remote control (only with communication expansion module) with software **Synergy** and **Xpress**
- Housing: Flush mount 96x96mm/3.78x3.78"
- Degree of protection: IP65 on front; IP20 on terminals
- **Predisposed for IEC/EN/BS 61850 signal supervision using expansion or external module.**

### Reference standards

Compliant with standards: Italian CEI 0-16; IEC/EN/BS 60255-27, IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

## Remote control and monitoring GSM modem via SMS

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



EXCGSM01

Order code	Description	Qty per pkg	Wt
		n°	[kg]

GSM Modem (modular - 4U).  
IP69K outside aerial with 2.5m cable.  
RJ45-USB programming cable (included).

<b>EXCGSM01</b>	100...240VAC, 1 digital input, 1 analogic input (0...10V, 0...20mA, NTC), 1 relay output, SMS send/receive for remote control and alarm signals	1	0.340
-----------------	---	---	-------

### Use with CEI 0-16

The CEI 0-16 standard in paragraph 8.8.6.5 and in attachment M prescribes that the electricity production plants powered by wind or solar photovoltaic sources with power greater than or equal to 100kW, connected or to be connected to medium voltage grids, are equipped with GSM modem. Thanks to this modem it is possible to manage the disconnection of the generation through the messages sent by the energy distributor.

### AERIAL

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

### General characteristics

With EXCGSM01 it is possible to remotely operate a relay output and obtain information on the system by sending programmable SMS.

Using the configuration software (downloaded for free from [www.LovatoElectric.com](http://www.LovatoElectric.com)) the user can control the relay output and both the digital and analog inputs.

The logic is based on events (for example, the activation of the digital input or the arrival of an SMS with specific text), to which the user can decide specific actions (reply either by SMS or voice message, or by switching the relay output).

### Reference standards

Compliant with electrical safety standards: EN/BS 62368, EN/BS 62311.

**Compliant with standards ENA G59-3/G99, SHAMS DUBAI - DRRG STANDARDS (DEWA), VDE-AR-N 4105, VDE V 0126-1-1, SEC (Saudi Electricity Company)**



PMVF...

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

Dual threshold minimum and maximum voltage and frequency protection, R.O.C.O.F. and Vector shift. Modular type.

Compliant with standards DEWA DRRG and SEC (Saudi Electricity Company).

<b>PMVF60</b>	Programmable	100...240VAC/ 110...250VDC	1	0.470
---------------	--------------	-------------------------------	---	-------

Compliant with standards ENA G59-3/G99.

<b>PMVF70</b>	Programmable	100...240VAC/ 110...250VDC	1	0.470
---------------	--------------	-------------------------------	---	-------

Compliant with standards VDE-AR-N 4105 and VDE V 0126-1-1.

<b>PMVF80</b>	Programmable	100...240VAC/ 110...250VDC	1	0.470
---------------	--------------	-------------------------------	---	-------

### Voltage threshold

Protection type	PMVF60	PMVF70	PMVF80
Maximum voltage threshold 2	●	●	●
Maximum voltage threshold 1	● (10 min. average)	●	● (10 min. average)
Minimum voltage threshold 1	●	●	●
Minimum voltage threshold 2	●	●	●

### Frequency threshold

Protection type	PMVF60	PMVF70	PMVF80
Maximum frequency threshold 2	Optional set to OFF	●	●
Maximum frequency threshold 1	●	●	Optional set to OFF
Minimum frequency threshold 1	●	●	Optional set to OFF
Minimum frequency threshold 2	Optional set to OFF	●	●



EXM10...

Order code	Description
EXPANSION MODULES FOR PMVF...	
Communication ports.	
<b>EXM1010</b>	Opto-isolated USB interface
<b>EXM1011</b>	Opto-isolated RS232 interface
<b>EXM1012</b>	Opto-isolated RS485 interface
<b>EXM1013</b>	Opto-isolated Ethernet interface
<b>EXM1018</b>	IEC/EN/BS 61850 interface
Inputs and outputs.	
<b>EXM1001</b>	2 digital inputs, opto-isolated and 2 relay outputs, rated 5A 250VAC

#### IEC/EN/BS 61850 protocol

The EXP1018 module will be made available only when the competent authorities have established the exact terms of the supervision and control of the specific commands.

### General characteristics

PMVF... interface protection system (IP) units have been developed in order to be used when a local generating system is connected in parallel with the 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 PI must step in by de-energising a relay output so that the interface device (IS) trips.

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

- IS status feedback
- R.O.C.O.F./Vector shift delay or external signal for frequency selection (communication network malfunction)
- Disabling signal
- Remote tripping (forced IS opening, independent of voltage and frequency values).

Also, there are two relay outputs for:

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

The backup device consists of a signal contemporary or delayed respect to the IS opening command, transmitted only if the IS failed and did not complete the disconnection.

PMVF... also has two additional relay outputs (EXM1001) to configure as:

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

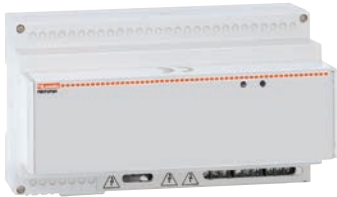
### Operational characteristics

- Auxiliary voltage: 100...240VAC/110...250VDC
- Voltage inputs: max 400VAC
- 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 ports (USB, RS232, RS485, Ethernet) see section 31
- Parameter configuration and remote control (only with communication expansion module) with software **Synergy** and **Xpress**
- Modular housing (6 modules)
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- Degree of protection for both: IP40 on front; IP20 on terminals

### Reference standards

Compliant with standards: DEWA DRRG (PMVF60); SEC (PMVF60); ENA G59-3/G99 (PMVF70); VDE-AR-N 4105, VDE V 0126-1-1 (PMVF80); IEC/EN/BS 60255-27; IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

## Backup power supply for interface protection unit



**PMVFUPS01**

Order code	Description	Qty per pkg	Wt
Backup power supply for interface protection unit PMVF...			
<b>PMVFUPS01</b>	Input 230VAC. Output 230VAC with stored energy 200Ws and power 250VA	1	0.500

### General characteristics

CEI 0-21 and CEI 0-16 standards require an auxiliary power supply to feed the interface protection (IP), the interface switch (IS) and the backup switch for at least 5 seconds in the event of a power failure. PMVFUPS01 guarantees the necessary energy by accumulating it in capacitors, thus avoiding the use of batteries that require maintenance.

### Operational characteristics

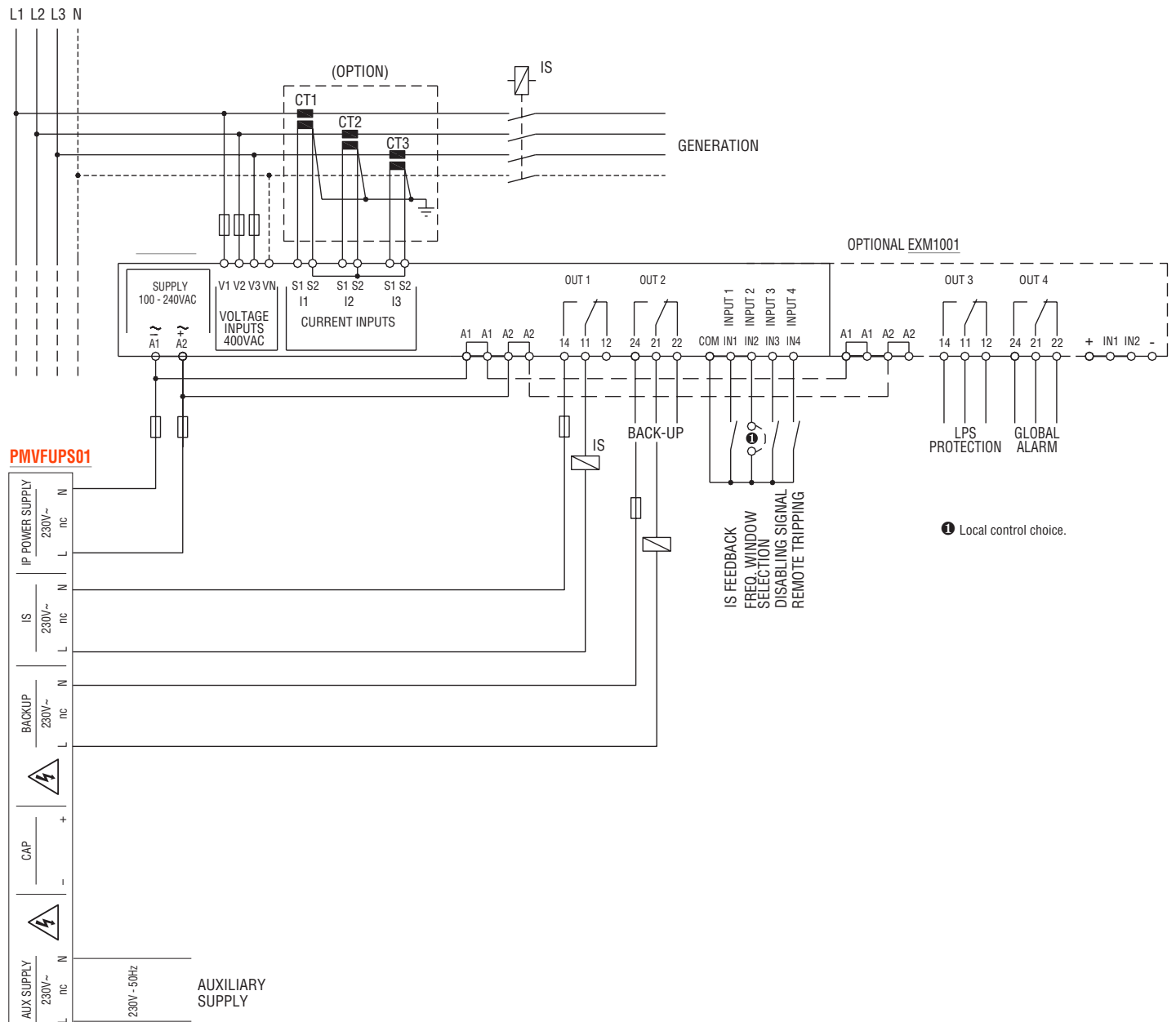
- Power supply: 230VAC, 50Hz
- Output voltage: 230VAC, 50Hz
- Output power: 250VA
- Accumulated energy: 200Ws
- Accumulation time: 15s
- 9U modular housing
- Operating temperature: -5...+ 55°C
- Degree of protection IP20.

### Reference standards

Compliant with standards: IEC/EN/BS 61010-1.

## WIRING DIAGRAMS

Three-phase connection



## Miniature circuit breakers 1...63A

### 1P, 2P, 3P and 4P - 10kA (IEC/EN/BS)



P1MB4P...

Order code	Curve	IEC In	IEC Icn	Mod. DIN	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Miniature circuit breakers – 2P – C-curve characteristic.						
P1MB2PC16	C	16	10	2	6	0.230
P1MB2PC20	C	20	10	2	6	0.230
P1MB2PC25	C	25	10	2	6	0.230
P1MB2PC32	C	32	10	2	6	0.230
P1MB2PC40	C	40	10	2	6	0.230
Miniature circuit breakers – 4P – C-curve characteristic.						
P1MB4PC20	C	20	10	4	3	0.460
P1MB4PC25	C	25	10	4	3	0.460
P1MB4PC32	C	32	10	4	3	0.460
P1MB4PC40	C	40	10	4	3	0.460
P1MB4PC50	C	50	10	4	3	0.460
P1MB4PC63	C	63	10	4	3	0.460

#### General characteristics

These devices are used to protect against short circuits and overloads of wiring installations and loads in panel boards, office buildings, stores and similar applications.

Their purpose is circuit protection, circuit isolation and load operation controls. They have characteristics of instantaneous trip defined as follows:

- C-curve: instantaneous trip 5...10 times  $I_n$  for inductive loads (mixed loads, resistive and inductive with low inrush current)

Main features include:

- IEC rated current  $I_n$ : 1...63A
- Pole width: 17.5mm / 0.69"
- Contact status with flag indicator
- Trip characteristic: curve type B, C and D
- Auxiliary contacts and trip releases mounted on left side
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

#### Operational characteristics

- Dissipation per pole: 3...13W
- IEC rated insulation voltage  $U_i$ : 440V
- IEC rated impulse voltage  $U_{imp}$ : 4kV
- IEC rated operational voltage  $U_e$ : 230/400VAC
- UL 1077 rated operational voltage: 480VAC
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 7.5kA 480V.

#### Certifications and compliance

Certifications obtained: cURus (E369585); EAC; TÜV-Rheinland. Compliant with standards: IEC/EN/BS 60898-1, IEC/EN/BS 60947-2, UL 1077, CSA C22.2 n°235.

## Miniature circuit breakers 80...125A



P2MB4P...

Order code	Curve	IEC In	IEC Icn	Mod. DIN	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Miniature circuit breakers - 4P - C-curve characteristic.						
P2MB4PC080	C	80	10	6	2	0.680
P2MB4PC100	C	100	10	6	2	0.680
P2MB4PC125	C	125	10	6	2	0.680

#### General characteristics

- IEC rated current  $I_n$ : 80...125A
- Pole width: 27mm / 1.06"
- Contact status with flag indicator
- Trip characteristic: curve type C and D
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

#### Operational characteristics

- Dissipation per pole: 15...20W
- IEC rated insulation voltage  $U_i$ : 400V
- IEC rated impulse voltage  $U_{imp}$ : 4kV
- IEC rated operational voltage  $U_e$ : 230/400VAC (230VAC 1P version)
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 5kA 240V (1P) - 5kA 480V (2-3-4P).

#### Certifications and compliance

Certifications obtained: cURus (E369585); EAC; TÜV-Rheinland. Compliant with standards: IEC/EN/BS 60898-1, IEC/EN/BS 60947-2, UL 1077, CSA C22.2 n°235.

## Residual current operated circuit breakers 1P+N - 10kA



P1RE1N...

Order code	Curve	IEC In	IEC Icn	IEC IΔn	Mod. DIN	Qty per pkg	Wt
		[A]	[kA]	[mA]	n°	n°	[kg]
Single pole + neutral RCBO type AC.							
P1RE1NC06AC030	C	6	10	30	2	1	0.205
P1RE1NC06AC300	C	6	10	300	2	1	0.205
P1RE1NC10AC030	C	10	10	30	2	1	0.205
P1RE1NC10AC300	C	10	10	300	2	1	0.205
P1RE1NC16AC030	C	16	10	30	2	1	0.205
P1RE1NC16AC300	C	16	10	300	2	1	0.205
P1RE1NC20AC030	C	20	10	30	2	1	0.205
P1RE1NC20AC300	C	20	10	300	2	1	0.205
P1RE1NC25AC030	C	25	10	30	2	1	0.205
P1RE1NC25AC300	C	25	10	300	2	1	0.205
P1RE1NC32AC030	C	32	10	30	2	1	0.205
P1RE1NC32AC300	C	32	10	300	2	1	0.205
P1RE1NC40AC030	C	40	10	30	2	1	0.205
P1RE1NC40AC300	C	40	10	300	2	1	0.205

#### General characteristics

These RCCBs are intended for the protection of people against indirect contact (electric shock) and of installations against fire hazards due to a persistent earth/ground fault current. They also protect against short circuit and overcurrent.

From a practical point of view, they integrate both functions of MCB and of RCCB.

Its main features are:

- IEC rated current  $I_n$ : 6...40A
- Version: 1P+N
- Contact status with flag indicator
- Double control lever to distinguish the residual current tripping from short circuit or overcurrent tripping
- Trip characteristic: curve type C
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

#### Operational characteristics

- Dissipation per pole: 3...13W
- Rated insulation voltage  $U_i$ : 400V
- Rated impulse voltage  $U_{imp}$ : 4kV
- Operating frequency: 50/60Hz
- Rated operational voltage  $U_e$ : 230VAC
- Rated residual operating voltage  $I_{Δn}$ : 30mA; 300mA
- IEC short-circuit breaking capacity  $I_{cn}$ : 10kA

#### Certifications and compliance

Certifications obtained: TÜV Rheinland, EAC. Compliant with standards: IEC/EN/BS 61009-1, IEC/EN/BS 61009-2-1.

## Single-phase direct connection energy meters



Type	DMED100T1	DMED110T1	DMED111	DMED112	DMED115T1	DMED120T1	DMED121	DMED122	DMED130LM
Maximum current	40A	40A	40A	40A	40A	63A	63A	63A	63A
Display									
Vertical, no backlight	●	●	●	●					
Horizontal, backlight					●	●	●	●	●
Measurements									
kWh	●	●	●	●	●	●	●	●	●
kW with average and max demand		●	●	●	●	●	●	●	●
kvarh, kvar, V, I, Hz, PF, total and partial hour counter		●	●	●		●	●	●	●
Interface									
Pulse output	●								
Programmable output (pulses/thresholds)		●			●	●			
Built-in Modbus-RTU (RS485)			●				●		
Built-in M-Bus				●				●	
MID version -25...55°C❶	●	●	●	●		●	●	●	
MID version -25...70°C❷			●						
Load management									●
Compatibility with Synergy and Xpress software			●				●		

## Three-phase energy meters



Type	DMED300T2	DMED301	DMED302	DMED305T2	DMED330	DMED332	DMED310T2
Maximum current	80A	80A	80A	TA /5 o TA /1	TA /5 o TA /1	TA /5 o TA /1	TA /5
Connection type							
Direct	●	●	●				
Via CT				●	●	●	●
Interface							
Programmable output (pulses/thresholds)	●			●			●
Built-in Modbus-RTU (RS485)		●			●		
Built-in M-Bus			●			●	
Expandability							
Communication (RS485, Ethernet, USB)							●
Relay outputs for load disconnection							●
Data memory (Data logger)							●
MID version -25...55°C❶❷	●	●	●	●	●	●	●
MID version -25...70°C❸		●					
cULus version (ANSI C12.20)❹	●	●					
Compatibility with Synergy and Xpress software		●			●		●

❶ For MID versions add "MID".  
 ❷ For MID7 versions add "MID7".  
 ❸ For UL versions add "UL".  
 ❹ UTF certified versions available on request.

# ■ PRODUCTS AND SOLUTIONS FOR PHOTOVOLTAIC APPLICATIONS



[www.LovatoElectric.com](http://www.LovatoElectric.com)

## LOVATO ELECTRIC S.P. A.

via Don E. Mazza, 12  
24020 Gorle (Bergamo), ITALY

tel +39 035 4282111  
info@LovatoElectric.com

- **LOVATO ELECTRIC S.P.A.**  
ITALY  
[www.LovatoElectric.com](http://www.LovatoElectric.com)
- **LOVATO ELECTRIC LTD**  
UNITED KINGDOM  
[www.Lovato.co.uk](http://www.Lovato.co.uk)
- **LOVATO ELECTRIC CORPORATION**  
CANADA  
[www.Lovato.ca](http://www.Lovato.ca)
- **LOVATO ELECTRIC INC**  
UNITED STATES  
[www.LovatoUsa.com](http://www.LovatoUsa.com)
- **LOVATO ELECTRIC GmbH**  
GERMANY  
[www.LovatoElectric.de](http://www.LovatoElectric.de)
- **LOVATO ELECTRIC S.L.U**  
SPAIN  
[www.LovatoElectric.es](http://www.LovatoElectric.es)
- **LOVATO ELECTRIC. S.R.O.**  
CZECH REPUBLIC  
[www.LovatoElectric.cz](http://www.LovatoElectric.cz)
- **LOVATO ELECTRIC SP. Z O.O.**  
POLAND  
[www.LovatoElectric.pl](http://www.LovatoElectric.pl)
- **LOVATO ELEKTRIK LTD**  
TURKEY  
[www.LovatoElectric.com.tr](http://www.LovatoElectric.com.tr)
- **LOVATO ELECTRIC ME FZE**  
UNITED ARAB EMIRATES  
[www.LovatoElectric.ae](http://www.LovatoElectric.ae)
- **ООО Ловато Электрик**  
RUSSIA  
[www.LovatoElectric.ru](http://www.LovatoElectric.ru)
- **LOVATO ELECTRIC CO LTD**  
CHINA  
[www.LovatoElectric.cn](http://www.LovatoElectric.cn)
- **LOVATO ELECTRIC SRL**  
ROMANIA  
[www.LovatoElectric.ro](http://www.LovatoElectric.ro)
- **LOVATO ELECTRIC SAS**  
FRANCE  
[www.LovatoElectric.fr](http://www.LovatoElectric.fr)
- **LOVATO ELECTRIC AG**  
SWITZERLAND  
[www.LovatoElectric.ch](http://www.LovatoElectric.ch)

Follow us

