



# 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 In
	[A]

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

<b>FE01D0...</b>	2...20
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## Fuse holders for photovoltaic applications up to 1500VDC

Order code	Pole arrangement	Status indicator	DIN size
			n°

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

<b>FB04D1P</b>	1P	—	1
<b>FB04D1PL</b>	1P	YES	1

## Fuses for photovoltaic applications up to 1500VDC

Order code	Rated current In
	[A]

For 10x38mm fuses.  
IEC 10kA breaking capacity at 1500VDC.

<b>FE04D0...</b>	6...20
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For 14x85mm fuses.  
IEC 10kA breaking capacity at 1500VDC.

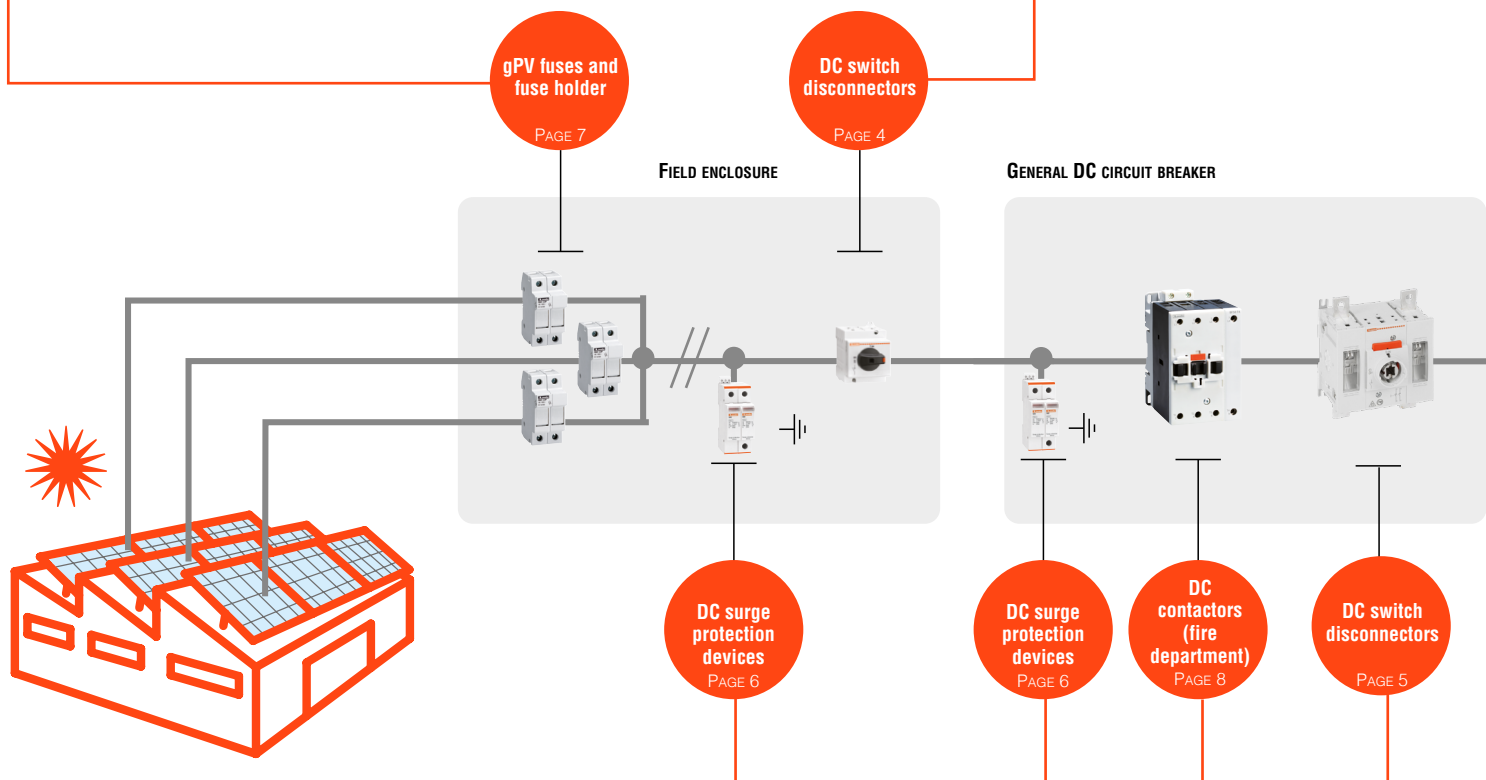
<b>FE05D0...</b>	20...32
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## Switch disconnectors GD series

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DC21B				
			≤800V	1000V	1200V	1500V
	[A]	[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



## Surge protection devices

type 1-2 - DC with plug-in cartridge

EN rated voltage Un 1100VDC.				
<b>SG2EDGK10M3R</b>	+, -, PE	SI	3	
EN rated voltage Un 1500VDC.				
<b>SG2EDGK50M3R</b>	+, -, PE	SI	3	

type 2 - DC with plug-in cartridge

Order code	Pole arrangement	Relay output	Number of DIN module
		(SPDT)	n°
EN rated voltage Un 600VDC.			
<b>SE2DG600M2</b>	+, -, PE	NO	2
<b>SE2DG600M2R</b>	+, -, PE	YES	2
EN rated voltage Un 1000VDC.			
<b>SE2DGK00M3</b>	+, -, PE	NO	3
<b>SE2DGK00M3R</b>	+, -, PE	YES	3
EN rated voltage Un 1500VDC.			
<b>SE2DGK50M3</b>	+, -, PE	NO	3

## Contactors to connect in series BF series

Order code	Poles in series	Operational voltage Ue				IEC max current Ie in DC1 with L/R ≤1ms	
		400V	600V	800V	1000V	[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		

## Switch disconnectors GLD series ①

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DCPV1		
		800V	1000V	1500V
	[A]	[A]	[A]	[A]

Direct operating and door coupling versions.  
Separately purchase the handle and shaft extension.

<b>GLD0100T4C3</b>	100	100	100	100
<b>GLD0160T4C3</b>	160	160	160	160
<b>GLD0200T4C3</b>	200	200	200	200
<b>GLD0250T4C3</b>	250	250	250	250
<b>GLD0315T4C3</b>	315	315	315	315

① For biggest size see GE series pag. 5



## Interface protection system units for low, medium and high voltage system

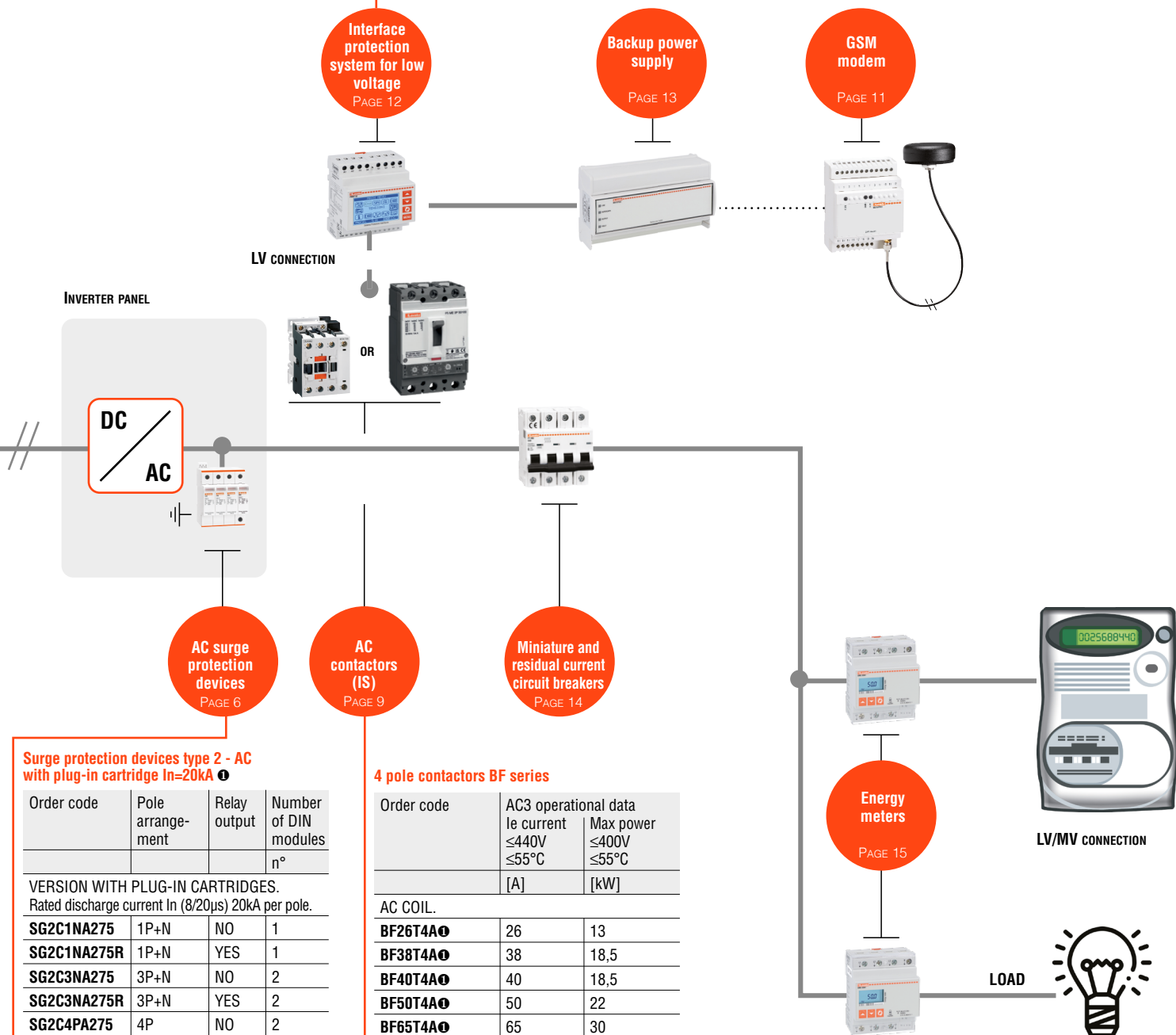
Order code	Compliant with standards
Low, medium, high voltage system.	
<b>PMVF52</b>	CEI 0-21
<b>PMVF60</b>	DEWA DRRG and SEC (Saudi Electricity Company)
<b>PMVF70</b>	ENA G59-3/G99
<b>PMVF81</b>	VDE-AR-N 4105, 4110, 4120 and VDE V 0126-1-1
<b>PMVF90</b>	For systems requiring 3 maximum voltage thresholds

## Backup power supply for interface protection system units

Order code	Description
Backup power supply for interface protection system units PMVF...	
<b>PMVFUPS02</b>	Input 230VAC. Output 230VAC with stored energy 645Ws and power 650VA

## 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



## Surge protection devices type 2 - AC with plug-in cartridge In=20kA ①

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>SG2C1NA275</b>	1P+N	NO	1
<b>SG2C1NA275R</b>	1P+N	YES	1
<b>SG2C3NA275</b>	3P+N	NO	2
<b>SG2C3NA275R</b>	3P+N	YES	2
<b>SG2C4PA275</b>	4P	NO	2
<b>SG2C4PA275R</b>	4P	YES	2

① See complete range at pag. 6

## 4 pole contactors BF series

Order code	AC3 operational data le current ≤440V ≤55°C	Max power ≤400V ≤55°C
	[A]	[kW]
AC COIL.		
<b>BF26T4A①</b>	26	13
<b>BF38T4A①</b>	38	18,5
<b>BF40T4A①</b>	40	18,5
<b>BF50T4A①</b>	50	22
<b>BF65T4A①</b>	65	30
<b>BF80T4A①</b>	80	45
<b>BF95T4A①</b>	95	55
<b>BF115T4A①</b>	115	55
<b>BF150T4A①</b>	150	75

## AC/DC ELECTRONIC COIL.

<b>BF160T4E②</b>	160	75
<b>BF195T4E②</b>	195	90
<b>BF230T4E②</b>	230	110

① 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).

② 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.

## Switch disconnectors GA series



GA040D



GAX42...D

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DC21B <sup>①</sup>	Poles in series 3 poles 500V 4 poles 600V 800V	Qty per pkg	Wt
	[A]	[A]	[A]	[A]	n° [kg]

Switch disconnector complete with black handle.

<b>GA040D</b>	40	12	—	—	1	0.135
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Fourth pole.

<b>GAX42040D</b>	40	—	20	15	1	0.040
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<sup>①</sup> Connection of 4 poles in series.

## Switch disconnectors GD series



GD...

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DCPV1	≤800V	1000V	1200V	1500V	Qty per pkg	Wt
	[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

## Plastic enclosed switch disconnectors IEC/EN/BS IP65



GAZ016DT2



GAZ040DT4

Order code	IEC conventional thermal current Ith	IEC rated operational current Ie DCPV1	≤800V	1000V	1200V	1500V	Qty per pkg	Wt
	[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) and 32A (1200VDC)
- 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 Uimp: 8kV
- Mechanical life:
  - 100,000 cycles GA040D
  - 10,000 cycles GD...
- Operating temperature: -25°C...+55°C
- Storage temperature: -40°C...+70°C
- Degree of protection: IP20 (only for GA040D).

### 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.

Strokes of GA...D types (main poles and add-on pole)

	Travel 0→1	0°	30°	60°	90°
GA040D Main poles				60°	
GAX42040D Simultaneous fourth-pole add on				60°	

### Components

Enclosure	Switch disconnector	Handle included with GAZ...
GAZ1	GD025AT2	GAX61
GAZ2 <sup>②</sup>	GD032AT3	GAX61
GAZ2 <sup>②</sup>	GD040AT4	GAX61
GAZ1B	GD025AT2	GAX61B
GAZ2B <sup>②</sup>	GD032AT3	GAX61B
GAZ2B <sup>②</sup>	GD040AT4	GAX61B

<sup>②</sup> For further details contact our Technical support; see contact details on inside front cover.

### 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.



## Switch disconnectors IEC/EN/BS GLD series



GLD...T2C3

## Switch disconnectors UL98B GLD series



GLD...T4C3UL

## Switch disconnectors IEC/EN/BS GE series



GE...DT4

## Direct operating handles



GEX67ND

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DCPV1			Qty per pkg	Wt
		800V	1000V	1500V		
	[A]	[A]	[A]	[A]	n°	[kg]

Direct operating and door coupling versions.  
Separately purchase the handle.

GLD0100T2C3	100	100	100	-	1	1.340
GLD0160T2C3	160	160	160	-	1	1.340
GLD0200T2C3	200	200	200	-	1	1.340
GLD0250T2C3	250	250	250	-	1	1.340
GLD0315T2C3	315	315	250	-	1	1.340
GLD0100T4C3	100	100	100	100	1	2.140
GLD0160T4C3	160	160	160	160	1	2.140
GLD0200T4C3	200	200	200	200	1	2.140
GLD0250T4C3	250	250	250	250	1	2.140
GLD0315T4C3	315	315	315	315	1	2.140

Order code	General purpose current		Qty per pkg	Wt
	1000V	1500V		
	[A]	[A]	n°	[kg]

Direct operating and door coupling versions.  
Separately purchase the handle.

GLD0100T2C3UL	100	-	1	1.340
GLD0200T2C3UL	200	-	1	1.340
GLD0100T4C3UL	100	100	1	2.140
GLD0200T4C3UL	200	200	1	2.140

Order code	IEC conventional free air thermal current Ith	IEC rated operational current Ie DC21B			Qty per pkg	Wt
		220V	800V	1000V		
	[A]	[A]	[A]	[A]	n°	[kg]

Direct operating and door coupling versions.  
Separately purchase the handle.

GE0630DT4	630	630	600	500	1	4.500
GE0800DT4	800	800	630	630	1	4.500
GE1250DT4	1250	1250	1000	850	1	8.900

❶ Connection of 4 poles in series.

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

Direct operating lever handle. Padlockable.  
Rotating type with screw fixing on switch disconnector.

GLX61DB	Black handle for GLD...	1	0.070
GLX61D	Red/Yellow handle for GLD...	1	0.095
GEX67ND	Black handle for GE0630DT4 and GE0800DT	1	0.322
GEX68ND	Black handle for GE1250DT4	1	0.322

### General characteristics

- Up to 315A 1500V DCPV1
- Up to 100A 1000V DCPV2 for GLD0315T2C3 and up to 125A 1500V DCPV2 for GLD0315T4C3
- 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

- IEC rated insulation voltage Ui: 1000V for GLD...T2...; 1500V for GLD...T4...
- Mechanical life: 20,000 cycles.

### Certifications and compliance

Certifications obtained: UL Listed for GLD...UL.  
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS IEC/EN/BS 60947-3, UL98B.

### General characteristics

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

### Operational characteristics

- IEC rated insulation voltage Ui: 1000V
- Mechanical life: 10,000 cycles.

### Certifications and compliance

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

## Type 2 - AC Compact version 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.

SG2C1NA275	1P+N	NO	1	1	0,234
SG2C1NA275R	1P+N	SI	1	1	0,240
SG2C3NA275	3P+N	NO	2	1	0,477
SG2C3NA275R	3P+N	SI	2	1	0,486
SG2C4PA275	4P	NO	2	1	0,496
SG2C4PA275R	4P	SI	2	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: 275VAC for SG2C... and 300VAC for SG2...
- IEC maximum discharge current Imax (8/20μs): 40kA for SG2C... and 50kA for SG2...
- 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
SG2C1NA275...	230	<1.5	TT, TN-S
SG2C3NA275...	230/400	<1.5	TN-S
SG2C4PA275...	230/400	<1.5	TT, TN-S

Type	IEC rated voltage Un [V]	IEC voltage protection level Up [kV] L-N	Power installation system
SG21NA300...	230	<1.5	TT, TN-S
SG22PA300...	230	<1.5	TN-S
SG23NA300...	230/400	<1.5	TT, TN-S
SG24PA300...	230/400	<1.5	TN-S

## 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

## 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
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EN rated voltage Un 1500VDC.

SG2EDGK50M3R	+, -, PE	YES	3	1	0,406
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### General characteristics

The surge protection devices type SG2EDG... and SE2DG... with plug-in cartridge for photovoltaic applications are 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 Ucpv: 600VDC, 1100VDC, 1500VDC
- EN short circuit current rating Iscpv: 11kA for SG2EDG... and SE2DG..., 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 Ucpv [VDC]	EN voltage protection level Up [kV]
SG2EDGK10M3R	1100	1100	<3.8
SG2EDGK50M3R	1500	1500	<3.8
SE2DG600M2	600	670	<2.2
SE2DG600M2R	600	670	<2.2
SE2DGK00M3	1000	1060	<4.2
SE2DGK00M3R	1000	1060	<4.2
SE2DGK50M3	1000	1060	<4.2

### Certifications and compliance

Certification obtained: EAC.

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

## Type 2 - DC with plug-in cartridge



SG2DG600M2...



SG2DGK10M3R

Order code	Pole arrangement	Relay output	Number of DIN modules	Qty per pkg	Wt
			n°	n°	[kg]

EN rated voltage Un 600VDC.

SE2DG600M2	+, -, PE	NO	2	1	0,320
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SE2DG600M2R	+, -, PE	YES	2	1	0,325
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EN rated voltage Un 1000VDC.

SE2DGK00M3	+, -, PE	NO	3	1	0,396
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SE2DGK00M3R	+, -, PE	YES	3	1	0,406
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EN rated voltage Un 1500VDC.

SE2DGK50M3	+, -, PE	NO	3	1	0,444
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## Fuse holders for photovoltaic applications UL Listed / CSA certified up to 1000V



FB01D... FB01D1PL

## Fuses for photovoltaic applications up to 1000VDC



FE01D...

## Accessories



FBX00

FBX01

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

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

FB01D1P	1P	—	1	12	0.064
FB01D1PL	1P	YES	1	12	0.065
FB01D2P	2P	—	2	6	0.127
FB01D2PL	2P	YES	2	6	0.130

Order code	Rated current I <sub>e</sub>	Qty per pkg	Wt
	[A]	n°	[kg]

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

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

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

### Operational characteristics

- IEC rated voltage U<sub>n</sub>: 1000VDC
- IEC rated current I<sub>n</sub>: 32A
- IEC utilisation category: DC20B 1000VDC
- Suitable for IEC fuse class: gPV
- IEC degree of protection: IP20.

### Certifications and compliance

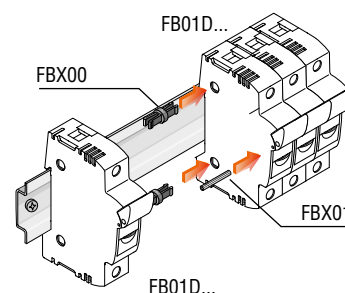
Certifications obtained: UL Listed for USA (UL - File E366062) and CSA certified for Canada (File 252040 class 3211), EAC.  
Compliant with standards: IEC/EN/BS 60269-1, IEC 60269-2, IEC/EN/BS 60947-1, IEC/EN/BS 60947-3, UL 4248-1, UL 4248-18, CSA C22.2 n° 4248-1, CSA C22.2 n° 4248-18.

### Operational characteristics

- IEC rated voltage U<sub>n</sub>: 1000VDC
- IEC rated current I<sub>n</sub>: 2...20A
- IEC fuse class: gPV.

### Certifications and compliance

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



## Fuse holders for photovoltaic applications up to 1500V



FB04D1P

FB04D1PL

## Fuses for photovoltaic applications up to 1500VDC



FE05D...

FE04D...

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

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

FB04D1P	1P	No	6	0.109
FB04D1PL	1P	Yes	6	0.110

Order code	Rated current I <sub>e</sub>	Qty per pkg	Wt
	[A]	n°	[kg]

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

FE04D006	6	10	0.019
FE04D010	10	10	0.019
FE04D015	15	10	0.019
FE04D020	20	10	0.019

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

FE05D020	20	5	0.031
FE05D025	25	5	0.031
FE05D032	32	5	0.031

### Operational characteristics

- IEC rated voltage U<sub>n</sub>: 1500VDC
- IEC rated current I<sub>n</sub>: 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.

### Operational characteristics

- IEC rated voltage U<sub>n</sub>: 1500VDC
- IEC rated current
  - I<sub>n</sub>: 6...20A for 10x85mm version
  - I<sub>n</sub>: 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

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



BFD80T4...



BFD150T4E

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-clip.

BFD6500A	75	35	1	1.020
BFD8000A	80	60	1	1.020

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-clip.

BFD80T4A	100	80	1	1.100
----------	-----	----	---	-------

AC/DC COIL.

Terminals: double lug-clip.

BFD80T4E	100	80	1	1.100
BFD150T4E	165	100	1	2.550

- 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.

### 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

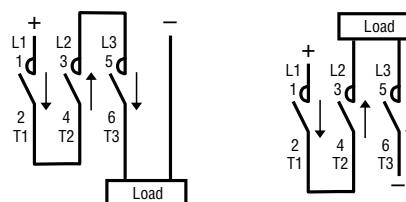
Type	Poles in series	IEC operational voltage Ue			
		400V	600V	800V	1000V
		IEC max current Ie in DC1 with L/R ≤1ms with 4 poles in series			
		[A]	[A]	[A]	[A]
BFD6500A...	3	100	75	45	35
BFD8000A...	3	100	80	65	60
BFD80T4A...	4	115	100	90	80
BFD80T4E...	4	115	100	90	80
BFD150T4E...	4	165	165	125	100

### Certification and compliance

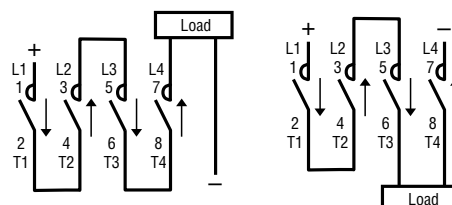
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

### Wiring diagrams

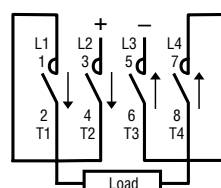
Three-pole contactor BFD6500..., BFD8000...



Four-pole contactors BFD80T4...



Four-pole contactors BFD150T4E...



## Four-pole contactors for photovoltaic applications BF series



BF09AT4A...BF18T4A



BF95T4A...BF150T4A



BF160T4E...BF230T4E



B265T4E...BF400T4E

Order code	AC3 Current I <sub>e</sub> ≤440V ≤55°C	Max power ≤400V ≤55°C	Qty per Pkg	Wt
	[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>BF265T4E</b>	265	132	1	6.135
<b>BF330T4E</b>	330	160	1	6.135
<b>BF400T4E</b>	400	200	1	6.135
<b>11B500400</b>	520	290	1	20.91
<b>11B630400</b>	630	335	1	21.88

- ❶ 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).
- ❷ 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.
- ❸ 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 48 - 60 - 110...125 (indicate 110) - 220...240 (indicate 220) - 380...415 (indicate 380) - 440...480V (indicate 440).  
Example: 11B500400110 for contactor B500, four poles, without auxiliary contacts and with 110-125VAC/DC coil.

Other voltages available on request.

### General characteristics

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

The Italian CEI 0-21 standard, prescribes that contactors used as ISS 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	6.5

Average consumption at ≤20°C				BF160T4E BF195T4E BF230T4E	BF265T4E BF330T4E BF400T4E	B500400 B630400
AC/DC coil	in-rush	VA/W	160...230	160...320	400	
		holding	VA/W	1,5...3,0	3,5...8,0	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 0-16 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 Control	Auxiliary	Qty per pkg	Wt
	[V]	[V]	n°	[kg]

Medium-voltage system.  
Dual threshold minimum and maximum voltage and frequency protection.

Flush mount type 96x96mm/3.78x3.78".

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

Order code	Description
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### EXPANSION MODULES FOR PMVF30.

For auto reclosing management of automatic circuit breaker (IS).

EXP1003	2 relay outputs 5A 250VAC
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### Communication ports.

EXP1010	Opto-isolated USB interface
EXP1011	Opto-isolated RS232 interface
EXP1012	Opto-isolated RS485 interface
EXP1013	Opto-isolated Ethernet interface
EXP1018	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 IS opening fails or malfunctions.

### Automatic IS reclosing

Whenever an automatic circuit breaker is used as the IS, 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, PMVF30 must step in by de-energising a relay output so that the interface switch (IS) trips.

PMVF30 is equipped with inputs having the following functions:

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

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

- IS opening
- Programmable (either as factory default for standby device opening or to set up as auto reclosing if the IS 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).

EXCGSM01	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
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### 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 Italian standard CEI 0-21 For low voltage



PMVF52



EXM10...

Order code	Rated voltage Control	Auxiliary	Qty per pkg	Wt
	[V]	[V]	n.	[kg]
Low voltage system. Dual threshold minimum and maximum voltage and frequency protection. Modular type with 2 relay outputs.				
PMVF52	230VAC 400VAC	24...240VAC/ 24...240VDC	1	0.470

Order code	Description
EXPANSION MODULES FOR PMVF51. Communication ports.	
EXM1010	Opto-isolated USB interface
EXM1011	Opto-isolated RS232 interface
EXM1012	Opto-isolated RS485 interface
EXM1013	Opto-isolated Ethernet interface
EXM1018	IEC/EN/BS 61850 interface
Inputs and outputs.	
EXM1001	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).

### Caratteristiche generali

PMVF52 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, PMVF52 must step in by de-energising a relay output so that the interface switch (IS) trips.

PMVF52 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).

PMVF52 is equipped with 5 inputs having the following functions:

- IS status feedback
- External signal for frequency selection (communication network malfunction)
- Local control for frequency selection
- Remote tripping (forced IS opening, independent of voltage and frequency values)
- 5° programmable input.

Also, there are three relay outputs for:

- IS opening and closing
- Standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse)
- 3° programmable output.

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 IS opening command, transmitted only if the IS failed and did not complete the disconnection.

### Operational characteristics

- Auxiliary voltage: 24...240VAC/24...240VDC
- Voltage inputs:
  - 400VAC (three-phase connection)
  - 230VAC (single-phase connection)
- Relay outputs
  - OUT1: 8A 250VAC, 8A 30VDC
  - OUT2: 5A 250VAC, 5A 30VDC
  - OUT3: 2A 250VAC, 2A 30VDC
- 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.

## Backup power supply for interface protection system units



PMVFUPS02

### Compatibility:

- Compatible with contactors (IS or backup function) with standard AC or electronic coil.
- Compatible with undervoltage trip releases (IS or backup function) of moulded case circuit breakers.

Order code	Description	Qty per pkg	Wt
Backup power supply for interface protection system units PMVF...			
PMVFUPS02	Input 230VAC. Output 230VAC with stored energy 645Ws and power 650VA	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. PMVFUPS02 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: 650VA
- Accumulated energy: 645Ws
- Accumulation time: 60s
- 9U modular housing
- Operating temperature: -5...+ 50°C
- Degree of protection IP20.

### Reference standards

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

## Fow low, medium and high voltage



PMVF...

Order code	Rated voltage		Qty per pkg	Wt
	Control	Auxiliary		
	[V]	[V]	n°	[kg]
Three-phase systems with or without neutral. Dual threshold minimum and maximum voltage and frequency protection. R.O.C.O.F and Vector shift. Modular type with three relay outputs.				
<b>PMVF81</b>	230VAC 400VAC	24...240VAC/ 24...240VDC	1	0.470
For systems requiring 3 maximum voltage thresholds.				
<b>PMVF90</b>	Programmable	24...240VAC/ 24...240VDC	1	0.326

### General characteristics

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 Interface Protection (IP) must step in by de-energising a relay output so that the interface switch (IS) trips.

PMVF81 and PMVF90 are equipped with 5 inputs having the following functions:

- IS status feedback
- R.O.C.O.F or Vector shift delay
- disabling signal
- remote tripping (forced IS opening, independent of voltage and frequency values)
- programmable.

Also, there are 3 relay outputs for:

- IS opening and closing
- backup device opening: PMVF81 is able to manage as backup both a contactor or a breaker (pulse or continuous type).
- programmable (default: global alarm).

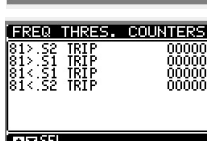
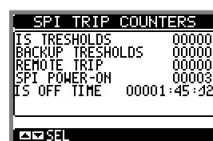
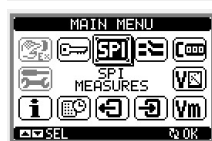
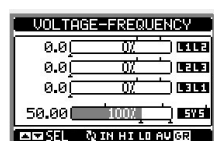
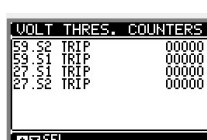
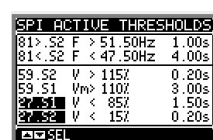
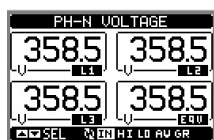
The backup device consists of a signal contemporary or delayed respect to the IS opening command, transmitted only if the IS failed and did not complete the disconnection.

## Display

### PLANT MEASURES

### MAIN MENU' - SYNOPTIC

### DIAGNOSTIC - COLLECTION OF STATISTICAL DATA



## Accessories



PMVFUPS02

Order codes	Description
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 61850 interface
Inputs and outputs.	
<b>EXM1001</b>	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC
Modem.	
<b>EXCGSM01</b>	Remote control and monitoring GSM modem via SMS
Backup power supply for interface protection system units PMVF...	
<b>PMVFUPS02</b>	Input 230VAC. Output 230VAC with stored energy 645Ws and power 650VA

### 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.

For details see page 10.

For details see page 13.

### Operational characteristics

- Auxiliary voltage: 24...240VAC/24...240VDC
- Voltage inputs range: 50-500000VAC
- Relay outputs:
  - OUT1: 8A 250VAC, 8A 30VDC
  - OUT2: 5A 250VAC, 5A 30VDC
  - OUT3: 2A 250VAC, 2A 30VDC
- Relay can be password protected to prevent parameters being altered
- 5 digital inputs
- Programmable rated voltage, programmable voltage and frequency thresholds and delays
- Support of EXM series communications modules (USB, RS232, RS485, Ethernet)
- Modular housing: 4 modules
- Parameter configuration and remote control (only with communication expansion module) with software **Xpress** and **Synergy**
- Degree of protection: IP40 on front; IP20 on terminals
- Predisposed for IEC/EN 61850 signal supervision using expansion or external module
- Event log (128 events with time reference):
  - interface protection trip events;
  - password interaction events;
  - commands execution;
  - system events.

### Reference standards

Compliant with standards VDE-AR-N 4105, VDEAR-N 4110, VDE-AR-N 4120 and IEC/EN 61010-1 only PMVF81. PMVF90 and PMVF81 IEC/EN 61000-6-2, IEC/EN 61000-6-4 application guides.

### PMVF81



Germany: VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120



South Africa: VDE-AR-N 4105



Poland: VDE-AR-N 4105



Australia: VDE-AR-N 4105



Switzerland: NA/EEA-NE7 – CH 2020



Chile: VDE-AR-N 4105, VDE V 0126-1-1



France: VDE V 0126-1-1



Romania: VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120

### PMVF90



Slovakia - Czech Republic: systems requiring 3 maximum voltage thresholds.

**Compliant with standards ENA G59-3/G99, SHAMS DUBAI - DRRG STANDARDS (DEWA), SEC (Saudi Electricity Company)**



PMVF...

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

## 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.



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.

**Backup power supply for interface protection system units**



PMVFUPS02

Order code	Description	Qty per pkg	Wt
Backup power supply for interface protection system units PMVF...			
<b>PMVFUPS02</b>	Input 230VAC. Output 230VAC with stored energy 645Ws and power 650VA	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. PMVFUPS02 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: 650VA
- Accumulated energy: 645Ws
- Accumulation time: 60s
- 9U modular housing
- Operating temperature: -5...+ 50°C
- Degree of protection IP20.

## Reference standards

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

## Compatibility:

- Compatible with contactors (IS or backup function) with standard AC or electronic coil.
- Compatible with undervoltage trip releases (IS or backup function) of moulded case circuit breakers.



## Miniature circuit breakers 1...63A

### 2P, 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<sub>n</sub> for inductive loads (mixed loads, resistive and inductive with low inrush current)

Main features include:

- IEC rated current I<sub>n</sub>: 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<sub>i</sub>: 440V
- IEC rated impulse voltage U<sub>imp</sub>: 4kV
- IEC rated operational voltage U<sub>e</sub>: 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

### 4P - 10kA



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<sub>n</sub>: 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<sub>i</sub>: 400V
- IEC rated impulse voltage U<sub>imp</sub>: 4kV
- IEC rated operational voltage U<sub>e</sub>: 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<sub>n</sub>: 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<sub>i</sub>: 400V
- Rated impulse voltage U<sub>imp</sub>: 4kV
- Operating frequency: 50/60Hz
- Rated operational voltage U<sub>e</sub>: 230VAC
- Rated residual operating voltage IΔn: 30mA; 300mA
- IEC short-circuit breaking capacity Icn: 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
Maximum current	40A	40A	40A	40A	40A	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°C❶❸	●	●	●	●	●	●	●
MID version -25...70°C❷		●					
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.



## SOLUTIONS FOR PHOTOVOLTAIC APPLICATIONS



ENERGY AND AUTOMATION

### **LOVATO ELECTRIC S.P. A.**

via Don E. Mazza, 12  
24020 Gorle (Bergamo), ITALY  
tel +39 035 4282111  
[info@LovatoElectric.com](mailto:info@LovatoElectric.com)

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



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