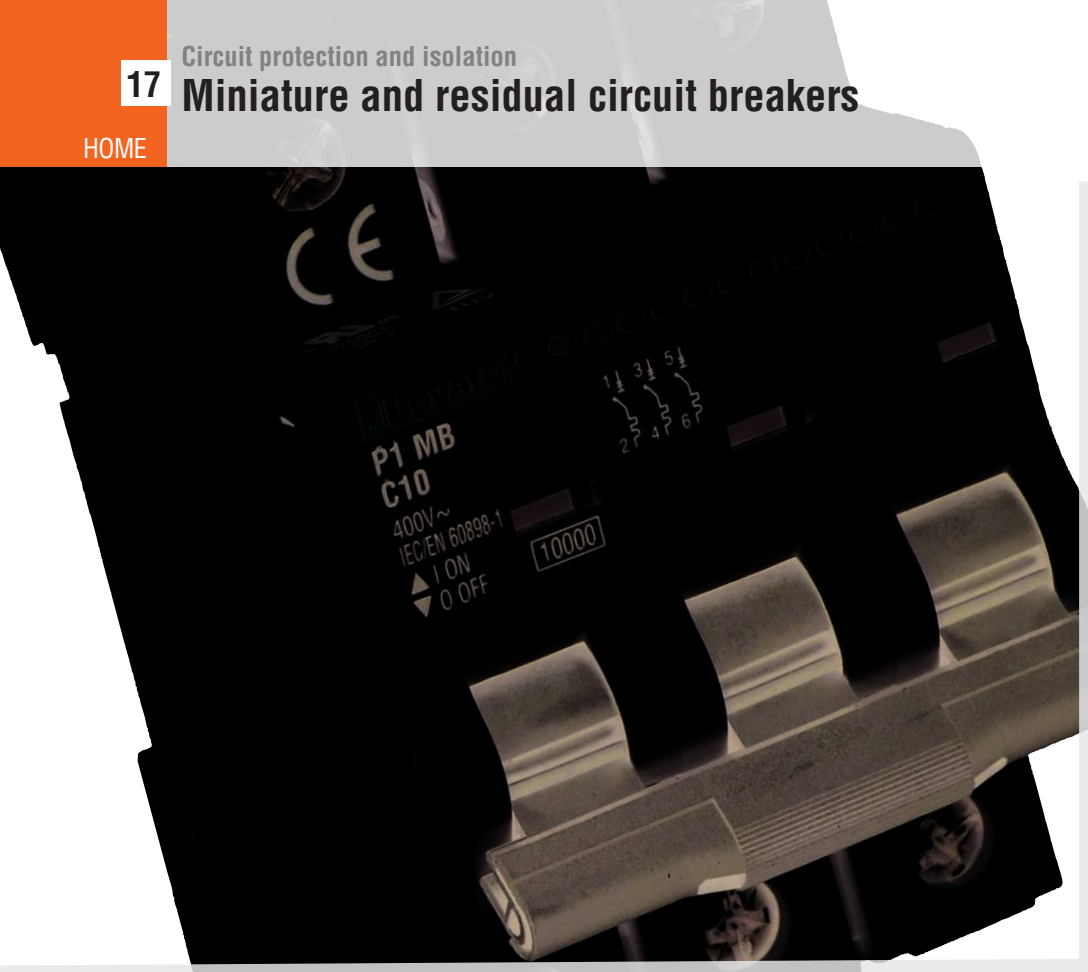
Miniature and residual circuit breakers



- UL 1077 and UL 489 certified versions
- High breaking capacity
- Various trip characteristic curves: Type B, C or D
- Wide 1...125A current range
- Switch disconnectors
- Residuals with trip characteristic curves type A, AC, B and type A selective
- Accessories available.

	Sec. - Page
Miniature circuit breakers 1…63A, UL 1077	
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1P+N - 6kA, 1 module, curve type B and C	17 - 3
1P+N - 6kA, 2 modules, curve type C	17 - 3
2P - 10kA, 2 modules, curve types B, C and D	17 - 4
3P - 10kA, 3 modules, curve types B, C and D	17 - 5
4P - 10kA, 4 modules, curve types B, C and D	17 - 6
Miniature circuit breakers 1…63A, UL 489	
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Page 17-2

MINIATURE CIRCUIT BREAKERS UP TO 63A
- 1P, 1P+N, 2P, 3P and 4P versions
- IEC rated current In: 1...63A
- IEC short-circuit breaking capacity Icn: 10kA (6kA for 1P+N)
- Trip characteristic curve: Type B, C, D
- UL 1077 or UL 489 certified versions.



Page 17-10

MINIATURE CIRCUIT BREAKERS 80...125A
- 1P, 2P, 3P and 4P versions
- IEC rated current In: 80...125A
- IEC short-circuit breaking capacity Icn: 10kA
- Trip characteristic curve: Type C, D
- UL 1077 certified versions.



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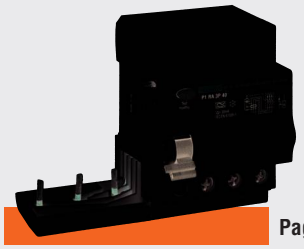
ADD-ON BLOCKS AND ACCESSORIES

- Auxiliary and indicator contacts
- Undervoltage trip releases
- Shunt trip releases
- Connection accessories.



Page 17-13

SWITCH DISCONNECTORS
- 1P, 2P, 3P and 4P versions
- IEC rated current In: 32...125A
- Clear OFF contact status indication
- Auxiliary contact block available.



Page 17-13

RESIDUAL BLOCKS FOR CIRCUIT BREAKERS UP TO 63A
- 2P, 3P and 4P versions
- IEC rated current In: 40 and 63A
- Residual current: 30 and 300mA
- Residual current operating characteristic: Type A.



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RESIDUAL CURRENT OPERATED CIRCUIT BREAKERS 25...80A
- 2P and 4P versions
- IEC rated current In: 25, 40, 63 and 80A
- IEC rated residual operating current IΔn: 30mA and 300mA
- Residual current operating characteristic: Type A, AC, B and type A selective
- Auxiliary contact and signalling contact blocks available.



Page 17-15

RESIDUAL CURRENT OPERATED CIRCUIT BREAKERS WITH OVERCURRENT PROTECTION UP TO 40A
- 1P+N versions
- IEC rated current In: 6...40A
- IEC rated short-circuit capacity Icn: 10kA
- Trip characteristic curve: Type C
- Residual current: 30 and 300mA
- Residual current operating characteristic: Type AC and A
- Auxiliary contact and signalling contact blocks available.

Lovato electric

1P - 10kA (IEC/EN/BS) 1 module



P1MB1P...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Single pole, thermal and magnetic trip type, B-curve characteristic.						
P1MB1PB01	B	1	10	1	12	0.115
P1MB1PB02	B	2	10	1	12	0.115
P1MB1PB03	B	3	10	1	12	0.115
P1MB1PB04	B	4	10	1	12	0.115
P1MB1PB06	B	6	10	1	12	0.115
P1MB1PB08	B	8	10	1	12	0.115
P1MB1PB10	B	10	10	1	12	0.115
P1MB1PB13	B	13	10	1	12	0.115
P1MB1PB16	B	16	10	1	12	0.115
P1MB1PB20	B	20	10	1	12	0.115
P1MB1PB25	B	25	10	1	12	0.115
P1MB1PB32	B	32	10	1	12	0.115
P1MB1PB40	B	40	10	1	12	0.115
P1MB1PB50	B	50	10	1	12	0.115
P1MB1PB63	B	63	10	1	12	0.115
Single pole, thermal and magnetic trip type, C-curve characteristic.						
P1MB1PC01	C	1	10	1	12	0.115
P1MB1PC01V6	C	1.6	10	1	12	0.115
P1MB1PC02	C	2	10	1	12	0.115
P1MB1PC03	C	3	10	1	12	0.115
P1MB1PC04	C	4	10	1	12	0.115
P1MB1PC06	C	6	10	1	12	0.115
P1MB1PC08	C	8	10	1	12	0.115
P1MB1PC10	C	10	10	1	12	0.115
P1MB1PC13	C	13	10	1	12	0.115
P1MB1PC16	C	16	10	1	12	0.115
P1MB1PC20	C	20	10	1	12	0.115
P1MB1PC25	C	25	10	1	12	0.115
P1MB1PC32	C	32	10	1	12	0.115
P1MB1PC40	C	40	10	1	12	0.115
P1MB1PC50	C	50	10	1	12	0.115
P1MB1PC63	C	63	10	1	12	0.115
Single pole, thermal and magnetic trip type, D-curve characteristic.						
P1MB1PD01	D	1	10	1	12	0.115
P1MB1PD01V6	D	1.6	10	1	12	0.115
P1MB1PD02	D	2	10	1	12	0.115
P1MB1PD03	D	3	10	1	12	0.115
P1MB1PD04	D	4	10	1	12	0.115
P1MB1PD06	D	6	10	1	12	0.115
P1MB1PD08	D	8	10	1	12	0.115
P1MB1PD10	D	10	10	1	12	0.115
P1MB1PD13	D	13	10	1	12	0.115
P1MB1PD16	D	16	10	1	12	0.115
P1MB1PD20	D	20	10	1	12	0.115
P1MB1PD25	D	25	10	1	12	0.115
P1MB1PD32	D	32	10	1	12	0.115
P1MB1PD40	D	40	10	1	12	0.115
P1MB1PD50	D	50	10	1	12	0.115
P1MB1PD63	D	63	10	1	12	0.115

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 instantaneous trip characteristics defined as follows:
- B-curve: instantaneous trip 3...5 times In for non-inductive or low inductive loads (heating resistors, generators, very long wire lines)
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed and inductive resistive loads with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Main features include:
- IEC rated current In: 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 MCB left side
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

Operational characteristics
- Dissipation per pole: 3...13W
- IEC rated insulation voltage Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 230/400VAC
- UL 1077 rated operational voltage: 277VAC
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 7.5kA 240V - 5kA 277V.

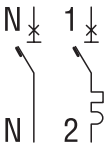
Certifications and compliance

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.

1P+N - 6kA
1 module



P1MB1M...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Single pole + neutral, thermal and magnetic trip type, B-curve characteristic.						
P1MB1MB06	B	6	6	1	12	0.115
P1MB1MB10	B	10	6	1	12	0.115
P1MB1MB16	B	16	6	1	12	0.115
P1MB1MB20	B	20	6	1	12	0.115
P1MB1MB25	B	25	6	1	12	0.115
P1MB1MB32	B	32	6	1	12	0.115
Single pole + neutral, thermal and magnetic trip type, C-curve characteristic.						
P1MB1MC02	C	2	6	1	12	0.115
P1MB1MC04	C	4	6	1	12	0.115
P1MB1MC06	C	6	6	1	12	0.115
P1MB1MC10	C	10	6	1	12	0.115
P1MB1MC13	C	13	6	1	12	0.115
P1MB1MC16	C	16	6	1	12	0.115
P1MB1MC20	C	20	6	1	12	0.115
P1MB1MC25	C	25	6	1	12	0.115
P1MB1MC32	C	32	6	1	12	0.115
P1MB1MC40	C	40	6	1	12	0.115

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:
- B-curve: instantaneous trip 3...5 times In for non-inductive or low inductive loads (heating resistors, generators, very long wire lines)
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Main features include:
- IEC rated current In: 2...40A
- Pole width: 9mm/0.35" (0.5 module)
- Contact status with flag indicator
- Trip characteristic: curve type B and C
- Auxiliary contacts and trip releases mounted on left side
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

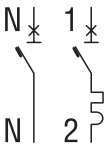
Operational characteristics
- Dissipation per pole: 3...7.5W
- IEC rated insulation voltage Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 230VAC.

Certifications and compliance
Certifications obtained: EAC, TÜV-SUD.
Compliant with standards: IEC/EN/BS 60898-1, IEC/EN/BS 60947-2.

1P+N - 6kA
2 modules



P1MB1N...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Single pole + neutral, thermal and magnetic trip type, C-curve characteristic.						
P1MB1NC01	C	1	6	2	6	0.190
P1MB1NC02	C	2	6	2	6	0.190
P1MB1NC04	C	4	6	2	6	0.190
P1MB1NC06	C	6	6	2	6	0.190
P1MB1NC10	C	10	6	2	6	0.190
P1MB1NC16	C	16	6	2	6	0.190
P1MB1NC20	C	20	6	2	6	0.190
P1MB1NC25	C	25	6	2	6	0.190
P1MB1NC32	C	32	6	2	6	0.190
P1MB1NC40	C	40	6	2	6	0.190
P1MB1NC50	C	50	6	2	6	0.190
P1MB1NC63	C	63	6	2	6	0.190

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

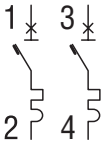
Operational characteristics
- Dissipation per pole: 3...13W
- IEC rated insulation voltage Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 230/400VAC.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60898-1, IEC/EN/BS 60947-2.

2P - 10kA (IEC/EN/BS)
2 modules



P1MB2P...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Two pole, thermal and magnetic trip type, B-curve characteristic.						
P1MB2PB01	B	1	10	2	6	0.230
P1MB2PB02	B	2	10	2	6	0.230
P1MB2PB04	B	4	10	2	6	0.230
P1MB2PB06	B	6	10	2	6	0.230
P1MB2PB10	B	10	10	2	6	0.230
P1MB2PB13	B	13	10	2	6	0.230
P1MB2PB16	B	16	10	2	6	0.230
P1MB2PB20	B	20	10	2	6	0.230
P1MB2PB25	B	25	10	2	6	0.230
P1MB2PB32	B	32	10	2	6	0.230
P1MB2PB40	B	40	10	2	6	0.230
P1MB2PB50	B	50	10	2	6	0.230
P1MB2PB63	B	63	10	2	6	0.230
Two pole, thermal and magnetic trip type, C-curve characteristic.						
P1MB2PC01	C	1	10	2	6	0.230
P1MB2PC01V6	C	1.6	10	2	6	0.230
P1MB2PC02	C	2	10	2	6	0.230
P1MB2PC03	C	3	10	2	6	0.230
P1MB2PC04	C	4	10	2	6	0.230
P1MB2PC06	C	6	10	2	6	0.230
P1MB2PC08	C	8	10	2	6	0.230
P1MB2PC10	C	10	10	2	6	0.230
P1MB2PC13	C	13	10	2	6	0.230
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
P1MB2PC50	C	50	10	2	6	0.230
P1MB2PC63	C	63	10	2	6	0.230
Two pole, thermal and magnetic trip type, D-curve characteristic.						
P1MB2PD01	D	1	10	2	6	0.230
P1MB2PD01V6	D	1.6	10	2	6	0.230
P1MB2PD02	D	2	10	2	6	0.230
P1MB2PD03	D	3	10	2	6	0.230
P1MB2PD04	D	4	10	2	6	0.230
P1MB2PD06	D	6	10	2	6	0.230
P1MB2PD08	D	8	10	2	6	0.230
P1MB2PD10	D	10	10	2	6	0.230
P1MB2PD13	D	13	10	2	6	0.230
P1MB2PD16	D	16	10	2	6	0.230
P1MB2PD20	D	20	10	2	6	0.230
P1MB2PD25	D	25	10	2	6	0.230
P1MB2PD32	D	32	10	2	6	0.230
P1MB2PD40	D	40	10	2	6	0.230
P1MB2PD50	D	50	10	2	6	0.230
P1MB2PD63	D	63	10	2	6	0.230

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:
- B-curve: instantaneous trip 3...5 times In for non-inductive or low inductive loads (heating resistors, generators, very long wire lines)
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

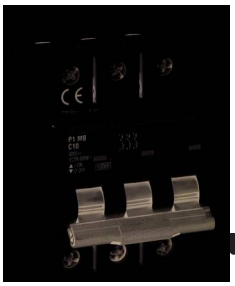
Main features include:
- IEC rated current In: 1...63A
- Pole width: 17.5mm / 0.69”
- Contact status with flag indicator
- Trip characteristic: curve type B, C and D
- Auxiliary contacts and trip releases mounted on left side
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

Operational characteristics
- Dissipation per pole: 3...13W
- IEC rated insulation voltage Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 230/400VAC
- UL 1077 rated operational voltage: 480VAC
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 7.5kA 480V.

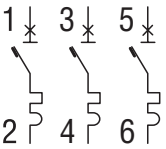
Certifications and compliance

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.

3P - 10kA (IEC/EN/BS)
3 modules



P1MB3P...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Three pole, thermal and magnetic trip type, B-curve characteristic.						
P1MB3PB01	B	1	10	3	4	0.345
P1MB3PB02	B	2	10	3	4	0.345
P1MB3PB04	B	4	10	3	4	0.345
P1MB3PB06	B	6	10	3	4	0.345
P1MB3PB10	B	10	10	3	4	0.345
P1MB3PB13	B	13	10	3	4	0.345
P1MB3PB16	B	16	10	3	4	0.345
P1MB3PB20	B	20	10	3	4	0.345
P1MB3PB25	B	25	10	3	4	0.345
P1MB3PB32	B	32	10	3	4	0.345
P1MB3PB40	B	40	10	3	4	0.345
P1MB3PB50	B	50	10	3	4	0.345
P1MB3PB63	B	63	10	3	4	0.345
Three pole, thermal and magnetic trip type, C-curve characteristic.						
P1MB3PC01	C	1	10	3	4	0.345
P1MB3PC01V6	C	1.6	10	3	4	0.345
P1MB3PC02	C	2	10	3	4	0.345
P1MB3PC03	C	3	10	4	4	0.345
P1MB3PC04	C	4	10	3	4	0.345
P1MB3PC06	C	6	10	3	4	0.345
P1MB3PC08	C	8	10	3	4	0.345
P1MB3PC10	C	10	10	3	4	0.345
P1MB3PC13	C	13	10	3	4	0.345
P1MB3PC16	C	16	10	3	4	0.345
P1MB3PC20	C	20	10	3	4	0.345
P1MB3PC25	C	25	10	3	4	0.345
P1MB3PC32	C	32	10	3	4	0.345
P1MB3PC40	C	40	10	3	4	0.345
P1MB3PC50	C	50	10	3	4	0.345
P1MB3PC63	C	63	10	3	4	0.345
Three pole, thermal and magnetic trip type, D-curve characteristic.						
P1MB3PD01	D	1	10	3	4	0.345
P1MB3PD01V6	D	1.6	10	3	4	0.345
P1MB3PD02	D	2	10	3	4	0.345
P1MB3PD03	D	3	10	4	4	0.345
P1MB3PD04	D	4	10	3	4	0.345
P1MB3PD06	D	6	10	3	4	0.345
P1MB3PD08	D	8	10	3	4	0.345
P1MB3PD10	D	10	10	3	4	0.345
P1MB3PD13	D	13	10	3	4	0.345
P1MB3PD16	D	16	10	3	4	0.345
P1MB3PD20	D	20	10	3	4	0.345
P1MB3PD25	D	25	10	3	4	0.345
P1MB3PD32	D	32	10	3	4	0.345
P1MB3PD40	D	40	10	3	4	0.345
P1MB3PD50	D	50	10	3	4	0.345
P1MB3PD63	D	63	10	3	4	0.345

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:

- B-curve: instantaneous trip 3...5 times In for non-inductive or low inductive loads (heating resistors, generators, very long wire lines)
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Main features include:

- IEC rated current In: 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 Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 230/400VAC
- UL 1077 rated operational voltage: 480VAC
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 7.5kA 480V.

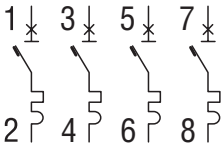
Certifications and compliance

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.

4P - 10kA (IEC/EN/BS)
4 modules



P1MB4P...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
Four pole, thermal and magnetic trip type, B-curve characteristic.						
P1MB4PB01	B	1	10	4	3	0.460
P1MB4PB02	B	2	10	4	3	0.460
P1MB4PB04	B	4	10	4	3	0.460
P1MB4PB06	B	6	10	4	3	0.460
P1MB4PB10	B	10	10	4	3	0.460
P1MB4PB13	B	13	10	4	3	0.460
P1MB4PB16	B	16	10	4	3	0.460
P1MB4PB20	B	20	10	4	3	0.460
P1MB4PB25	B	25	10	4	3	0.460
P1MB4PB32	B	32	10	4	3	0.460
P1MB4PB40	B	40	10	4	3	0.460
P1MB4PB50	B	50	10	4	3	0.460
P1MB4PB63	B	63	10	4	3	0.460
Four pole, thermal and magnetic trip type, C-curve characteristic.						
P1MB4PC01	C	1	10	4	3	0.460
P1MB4PC02	C	2	10	4	3	0.460
P1MB4PC04	C	4	10	4	3	0.460
P1MB4PC06	C	6	10	4	3	0.460
P1MB4PC10	C	10	10	4	3	0.460
P1MB4PC13	C	13	10	4	3	0.460
P1MB4PC16	C	16	10	4	3	0.460
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
Four pole, thermal and magnetic trip type, D-curve characteristic.						
P1MB4PD01	D	1	10	4	3	0.460
P1MB4PD02	D	2	10	4	3	0.460
P1MB4PD04	D	4	10	4	3	0.460
P1MB4PD06	D	6	10	4	3	0.460
P1MB4PD10	D	10	10	4	3	0.460
P1MB4PD13	D	13	10	4	3	0.460
P1MB4PD16	D	16	10	4	3	0.460
P1MB4PD20	D	20	10	4	3	0.460
P1MB4PD25	D	25	10	4	3	0.460
P1MB4PD32	D	32	10	4	3	0.460
P1MB4PD40	D	40	10	4	3	0.460
P1MB4PD50	D	50	10	4	3	0.460
P1MB4PD63	D	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:
- B-curve: instantaneous trip 3...5 times In for non-inductive or low inductive loads (heating resistors, generators, very long wire lines)
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Main features include:
- IEC rated current In: 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 Ui: 440V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 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.

1P - 10kA (IEC/EN/BS)
1 module



P1MB...1P...



Order code	Curve	IEC In	Rat. volt.	N° of DIN mod.	Qty per pkg	Wt
		[A]	[V]	n°	n°	[kg]
One pole, thermal and magnetic trip type, C-curve characteristic.						
P1MBUH1PC01	C	1	277	1	12	0.133
P1MBUH1PC01V6	C	1.6	277	1	12	0.133
P1MBUH1PC02	C	2	277	1	12	0.133
P1MBUH1PC03	C	3	277	1	12	0.133
P1MBUH1PC04	C	4	277	1	12	0.133
P1MBUH1PC05	C	5	277	1	12	0.133
P1MBUH1PC06	C	6	277	1	12	0.133
P1MBUH1PC07	C	7	277	1	12	0.133
P1MBUH1PC08	C	8	277	1	12	0.133
P1MBUH1PC10	C	10	277	1	12	0.133
P1MBUH1PC12	C	12	277	1	12	0.133
P1MBUH1PC13	C	13	277	1	12	0.133
P1MBUH1PC15	C	15	277	1	12	0.133
P1MBUH1PC16	C	16	277	1	12	0.133
P1MBUH1PC20	C	20	277	1	12	0.133
P1MBUH1PC25	C	25	277	1	12	0.133
P1MBUH1PC30	C	30	277	1	12	0.133
P1MBUH1PC32	C	32	277	1	12	0.133
P1MBUL1PC35	C	35	120	1	12	0.133
P1MBUL1PC40	C	40	120	1	12	0.133
P1MBUL1PC50	C	50	120	1	12	0.133
P1MBUL1PC60	C	60	120	1	12	0.133
P1MBUL1PC63	C	63	120	1	12	0.133
One pole, thermal and magnetic trip type, D-curve characteristic.						
P1MBUH1PD01	D	1	277	1	12	0.133
P1MBUH1PD01V6	D	1.6	277	1	12	0.133
P1MBUH1PD02	D	2	277	1	12	0.133
P1MBUH1PD03	D	3	277	1	12	0.133
P1MBUH1PD04	D	4	277	1	12	0.133
P1MBUH1PD05	D	5	277	1	12	0.133
P1MBUH1PD06	D	6	277	1	12	0.133
P1MBUH1PD07	D	7	277	1	12	0.133
P1MBUH1PD08	D	8	277	1	12	0.133
P1MBUH1PD10	D	10	277	1	12	0.133
P1MBUH1PD12	D	12	277	1	12	0.133
P1MBUH1PD13	D	13	277	1	12	0.133
P1MBUH1PD15	D	15	277	1	12	0.133
P1MBUH1PD16	D	16	277	1	12	0.133
P1MBUH1PD20	D	20	277	1	12	0.133
P1MBUH1PD25	D	25	277	1	12	0.133
P1MBUH1PD30	D	30	277	1	12	0.133
P1MBUH1PD32	D	32	277	1	12	0.133
P1MBUL1PD35	D	35	120	1	12	0.133
P1MBUL1PD40	D	40	120	1	12	0.133
P1MBUL1PD50	D	50	120	1	12	0.133
P1MBUL1PD60	D	60	120	1	12	0.133
P1MBUL1PD63	D	63	120	1	12	0.133

General characteristics
These devices comply with the UL 489 standard, mostly used in the North American markets. They are designed to protect feeder circuits, the part of the system from the network supply point to the protection device for a branch circuit. They can also be used on the international market thanks to compliance with the IEC/EN/BS 60947-2 standard.
They have characteristics of tripping instantaneously defined as follows:
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

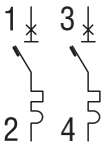
Operational characteristics
- Dissipation per pole: 3...13W
- Rated voltage 1...32A: 277V (UL 489)
- Rated voltage 35...63A: 120V (UL 489)
- Rated insulation voltage Ui: 440V (IEC/EN/BS 60947-2)
- Rated impulse voltage Uimp: 4kV (IEC/EN/BS 60947-2)
- Rated operational voltage Ue: 230/400VAC (IEC/EN/BS 60947-2)
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 10kA.

Certifications and compliance
Certifications obtained: cULus (E481234); EAC.
Compliant with standards: UL 489, IEC/EN/BS 60947-2.

2P - 10kA (IEC/EN/BS)
2 modules



P1MB...2P...



Order code	Curve	IEC In	Rated voltage	N° of DIN mod.	Qty per pkg	Wt
		[A]	[V]	n°	n°	[kg]
Two pole, thermal and magnetic trip type, C-curve characteristic.						
P1MBUH2PC01	C	1	480Y/277	2	6	0.255
P1MBUH2PC01V6	C	1.6	480Y/277	2	6	0.255
P1MBUH2PC02	C	2	480Y/277	2	6	0.255
P1MBUH2PC03	C	3	480Y/277	2	6	0.255
P1MBUH2PC04	C	4	480Y/277	2	6	0.255
P1MBUH2PC05	C	5	480Y/277	2	6	0.255
P1MBUH2PC06	C	6	480Y/277	2	6	0.255
P1MBUH2PC07	C	7	480Y/277	2	6	0.255
P1MBUH2PC08	C	8	480Y/277	2	6	0.255
P1MBUH2PC10	C	10	480Y/277	2	6	0.255
P1MBUH2PC12	C	12	480Y/277	2	6	0.255
P1MBUH2PC13	C	13	480Y/277	2	6	0.255
P1MBUH2PC15	C	15	480Y/277	2	6	0.255
P1MBUH2PC16	C	16	480Y/277	2	6	0.255
P1MBUH2PC20	C	20	480Y/277	2	6	0.255
P1MBUH2PC25	C	25	480Y/277	2	6	0.255
P1MBUH2PC30	C	30	480Y/277	2	6	0.255
P1MBUH2PC32	C	32	480Y/277	2	6	0.255
P1MBUL2PC35	C	35	240	2	6	0.255
P1MBUL2PC40	C	40	240	2	6	0.255
P1MBUL2PC50	C	50	240	2	6	0.255
P1MBUL2PC60	C	60	240	2	6	0.255
P1MBUL2PC63	C	63	240	2	6	0.255
Two pole, thermal and magnetic trip type, D-curve characteristic.						
P1MBUH2PD01	D	1	480Y/277	2	6	0.255
P1MBUH2PD01V6	D	1.6	480Y/277	2	6	0.255
P1MBUH2PD02	D	2	480Y/277	2	6	0.255
P1MBUH2PD03	D	3	480Y/277	2	6	0.255
P1MBUH2PD04	D	4	480Y/277	2	6	0.255
P1MBUH2PD05	D	5	480Y/277	2	6	0.255
P1MBUH2PD06	D	6	480Y/277	2	6	0.255
P1MBUH2PD07	D	7	480Y/277	2	6	0.255
P1MBUH2PD08	D	8	480Y/277	2	6	0.255
P1MBUH2PD10	D	10	480Y/277	2	6	0.255
P1MBUH2PD12	D	12	480Y/277	2	6	0.255
P1MBUH2PD13	D	13	480Y/277	2	6	0.255
P1MBUH2PD15	D	15	480Y/277	2	6	0.255
P1MBUH2PD16	D	16	480Y/277	2	6	0.255
P1MBUH2PD20	D	20	480Y/277	2	6	0.255
P1MBUH2PD25	D	25	480Y/277	2	6	0.255
P1MBUH2PD30	D	30	480Y/277	2	6	0.255
P1MBUH2PD32	D	32	480Y/277	2	6	0.255
P1MBUL2PD35	D	35	240	2	6	0.255
P1MBUL2PD40	D	40	240	2	6	0.255
P1MBUL2PD50	D	50	240	2	6	0.255
P1MBUL2PD60	D	60	240	2	6	0.255
P1MBUL2PD63	D	63	240	2	6	0.255

General characteristics
These devices comply with the UL 489 standard, mostly used in the North American markets. They are designed to protect feeder circuits, the part of the system from the network supply point to the protection device for a branch circuit. They can in any case be used on the international market thanks to compliance with the IEC/EN/BS 60947-2 standard as well.
They have characteristics of tripping instantaneously defined as follows:
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

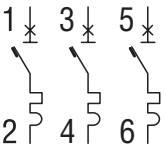
Operational characteristics
- Rated voltage 1...32A: 480Y/277V (UL 489)
- Rated voltage 35...63A: 240V (UL 489)
- Rated insulation voltage Ui: 440V (IEC/EN/BS 60947-2)
- Rated impulse voltage Uimp: 4kV (IEC/EN/BS 60947-2)
- Rated operational voltage Ue: 230/400VAC (IEC/EN/BS 60947-2)
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 10kA.

Certifications and compliance
Certifications obtained: cULus (E481234); EAC.
Compliant with standards: UL 489, IEC/EN/BS 60947-2.

3P - 10kA (IEC/EN/BS)
3 modules



P1MB...3P...



Order code	Curve	IEC In	Rated voltage	N° of DIN mod.	Qty per pkg	Wt
		[A]	[V]	n°	n°	[kg]
Three pole, thermal and magnetic trip type, C-curve characteristic.						
P1MBUH3PC01	C	1	480Y/277	3	4	0.388
P1MBUH3PC01V6	C	1.6	480Y/277	3	4	0.388
P1MBUH3PC02	C	2	480Y/277	3	4	0.388
P1MBUH3PC03	C	3	480Y/277	3	4	0.388
P1MBUH3PC04	C	4	480Y/277	3	4	0.388
P1MBUH3PC05	C	5	480Y/277	3	4	0.388
P1MBUH3PC06	C	6	480Y/277	3	4	0.388
P1MBUH3PC07	C	7	480Y/277	3	4	0.388
P1MBUH3PC08	C	8	480Y/277	3	4	0.388
P1MBUH3PC10	C	10	480Y/277	3	4	0.388
P1MBUH3PC12	C	12	480Y/277	3	4	0.388
P1MBUH3PC13	C	13	480Y/277	3	4	0.388
P1MBUH3PC15	C	15	480Y/277	3	4	0.388
P1MBUH3PC16	C	16	480Y/277	3	4	0.388
P1MBUH3PC20	C	20	480Y/277	3	4	0.388
P1MBUH3PC25	C	25	480Y/277	3	4	0.388
P1MBUH3PC30	C	30	480Y/277	3	4	0.388
P1MBUH3PC32	C	32	480Y/277	3	4	0.388
P1MBUL3PC35	C	35	240	3	4	0.388
P1MBUL3PC40	C	40	240	3	4	0.388
P1MBUL3PC50	C	50	240	3	4	0.388
P1MBUL3PC60	C	60	240	3	4	0.388
P1MBUL3PC63	C	63	240	3	4	0.388
Three pole, thermal and magnetic trip type, D-curve characteristic.						
P1MBUH3PD01	D	1	480Y/277	3	4	0.388
P1MBUH3PD01V6	D	1.6	480Y/277	3	4	0.388
P1MBUH3PD02	D	2	480Y/277	3	4	0.388
P1MBUH3PD03	D	3	480Y/277	3	4	0.388
P1MBUH3PD04	D	4	480Y/277	3	4	0.388
P1MBUH3PD05	D	5	480Y/277	3	4	0.388
P1MBUH3PD06	D	6	480Y/277	3	4	0.388
P1MBUH3PD07	D	7	480Y/277	3	4	0.388
P1MBUH3PD08	D	8	480Y/277	3	4	0.388
P1MBUH3PD10	D	10	480Y/277	3	4	0.388
P1MBUH3PD12	D	12	480Y/277	3	4	0.388
P1MBUH3PD13	D	13	480Y/277	3	4	0.388
P1MBUH3PD15	D	15	480Y/277	3	4	0.388
P1MBUH3PD16	D	16	480Y/277	3	4	0.388
P1MBUH3PD20	D	20	480Y/277	3	4	0.388
P1MBUH3PD25	D	25	480Y/277	3	4	0.388
P1MBUH3PD30	D	30	480Y/277	3	4	0.388
P1MBUH3PD32	D	32	480Y/277	3	4	0.388
P1MBUL3PD35	D	35	240	3	4	0.388
P1MBUL3PD40	D	40	240	3	4	0.388
P1MBUL3PD50	D	50	240	3	4	0.388
P1MBUL3PD60	D	60	240	3	4	0.388
P1MBUL3PD63	D	63	240	3	4	0.388

General characteristics
These devices comply with the UL 489 standard, mostly used in the North American markets. They are designed to protect feeder circuits, the part of the system from the network supply point to the protection device for a branch circuit. They can also be used on the international market thanks to compliance with the IEC/EN/BS 60947-2 standard.
They have characteristics of tripping instantaneously defined as follows:
- C-curve: instantaneous trip 5...10 times In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Operational characteristics
- Rated voltage 1...32A: 480Y/277V (UL 489)
- Rated voltage 35...63A: 240V (UL 489)
- Rated insulation voltage Ui: 440V (IEC/EN/BS 60947-2)
- Rated impulse voltage Uimp: 4kV (IEC/EN/BS 60947-2)
- Rated operational voltage Ue: 230/400VAC (IEC/EN/BS 60947-2)
- Short circuit breaking capacity: IEC/EN/BS 10kA - UL 10kA.

Certifications and compliance
Certifications obtained: cULus (E481234); EAC.
Compliant with standards: UL 489, IEC/EN/BS 60947-2.

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



P2MB1P...



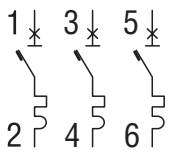


P2MB2P...



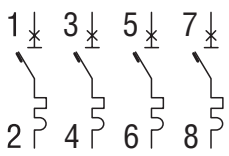


P2MB3P...





P2MB4P...



Order code	Curve	IEC In	IEC Icn	N° of DIN module	Qty per pkg	Wt
		[A]	[kA]	n°	n°	[kg]
One pole, thermal and magnetic trip type, C-curve characteristic.						
P2MB1PC080	C	80	10❶	1.5	9	0.166
P2MB1PC100	C	100	10❶	1.5	9	0.166
P2MB1PC125	C	125	10❶	1.5	9	0.166
Two pole, thermal and magnetic trip type, C-curve characteristic.						
P2MB2PC080	C	80	10	3	4	0.340
P2MB2PC100	C	100	10	3	4	0.340
P2MB2PC125	C	125	10	3	4	0.340
Three pole, thermal and magnetic trip type, C-curve characteristic.						
P2MB3PC080	C	80	10	4.5	3	0.510
P2MB3PC100	C	100	10	4.5	3	0.510
P2MB3PC125	C	125	10	4.5	3	0.510
Four pole, thermal and magnetic trip type, 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
Two pole, thermal and magnetic trip type, D-curve characteristic.						
P2MB2PD100	D	100	10	3	4	0.510
Three pole, thermal and magnetic trip type, D-curve characteristic.						
P2MB3PD080	D	80	10	4.5	3	0.510
P2MB3PD100	D	100	10	4.5	3	0.510
P2MB3PD125	D	125	10	4.5	3	0.510
Four pole, thermal and magnetic trip type, D-curve characteristic.						
P2MB4PD080	D	80	10	6	2	0.510
P2MB4PD100	D	100	10	6	2	0.510
P2MB4PD125	D	125	10	6	2	0.510

❶ Icn at 230V.

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 In for inductive loads (mixed loads, resistive and inductive with low inrush current)
- D-curve: instantaneous trip 10...14 times In for highly inductive loads (loads with high inrush and current such as motors).

Main features include:
- IEC rated current In: 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 Ui: 400V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 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.

Add-on blocks for miniature circuit breakers 1…63A


P1X1011


P1X16…

Order code	Description	Qty per MCB	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contact.				
P1X1011❶	1 changeover contact for P1MB...	1	12	0.040
P1X1011UH	1 changeover contact for P1MBU...	1	12	0.040
Indicator contact for thermal-magnetic trip.				
P1X1311❶	1 changeover contact	1	12	0.040
Undervoltage trip release.				
P1X14230❶	230V 50/60Hz	1	8	0.070
Shunt trip release.				
P1X16230❶	110...415V 50/60Hz	1	8	0.070
P1X16024❶	12...24V 50/60Hz-DC	1	8	0.070

❶ Not suitable for P1MBU...

General characteristics
- Auxiliary and indicator contact width: 9mm/0.35” (0.5 module)
- Undervoltage and shunt trip release width: 18mm/0.71” (1 module)
- Maximum combination: 3 add-on blocks on MCB left side only of which 1 undervoltage or shunt release directly on MCB side and then 2 contacts of which 1 auxiliary and 1 indicator.

Operational characteristics
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational current in AC: 6A 230V; 3A 400V (auxiliary contacts).

Certifications and compliance
Certifications obtained: EAC, cULus (excluding P1X14230 and P1X16024), UL (only P1X14230).
Compliant with standards: IEC/EN/BS 60947-5-1, CSA C22.2 n° 5.

Residual blocks for miniature circuit breakers 1…63A


P1RA2P…


P1RA3P…

Order code	Type	IEC In	IEC IΔn	N° of DIN module	Qty per pkg	Wt
		[A]	[mA]	n°	n°	[kg]
Residual blocks – 2P – type A.						
P1RA2P40A030	A	40	30	2	1	0.160
P1RA2P40A300	A	40	300	2	1	0.160
P1RA2P63A030	A	63	30	2	1	0.160
P1RA2P63A300	A	63	300	2	1	0.160
Residual blocks – 3P – type A.						
P1RA3P40A030	A	40	30	3.5	1	0.205
P1RA3P40A300	A	40	300	3.5	1	0.205
P1RA3P63A030	A	63	30	3.5	1	0.205
P1RA3P63A300	A	63	300	3.5	1	0.205
Residual blocks – 4P – type A.						
P1RA4P40A030	A	40	30	3.5	1	0.230
P1RA4P40A300	A	40	300	3.5	1	0.230
P1RA4P63A030	A	63	30	3.5	1	0.230
P1RA4P63A300	A	63	300	3.5	1	0.230

General characteristics
These devices 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 snap onto the P1MB... series thermal-magnetic circuit breakers; this combination forms a single device to protect people, protect against fire and protect lines.

Operational characteristics
- IEC rated insulation voltage Ui: 400V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated frequency: 50/60Hz
- IEC rated operational voltage Ue: 230/400V
- IEC rated residual current for tripping IΔn: 30mA; 300mA
- Dissipation per pole: 1.6W (40A), 2.7W (63A).

Certifications and compliance
Compliance with standards: IEC/EN/BS 61009-1.
Certifications obtained: TÜV-SUD, EAC.

Add-on blocks for miniature circuit breakers 80…125A


P2X1011


P2X1311

Order code	Description	Qty per MCB	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contact.				
P2X1011	1 changeover contact	1	10	0.040
Indicator contact for thermal-magnetic trip.				
P2X1311	1 changeover contact	1	10	0.040
Shunt trip release.				
P2X16230	110...415V 50/60Hz	1	8	0.070

General characteristics
- Auxiliary and indicator contact width: 9mm/0.35” (0.5 module)
- Shunt trip release width: 17.5mm/0.69” (1 module)
- Maximum combination: 3 add-on blocks on MCB sides of which 1 undervoltage or shunt release on MCB right side and 2 contacts on the left of which 1 auxiliary and 1 indicator.

Operational characteristics
- IEC rated insulation voltage Ui: 500V
- Rated impulse voltage Uimp: 4kV
- Rated operational current in AC: 6A 230V; 3A 400V (auxiliary contacts).

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-5-1.

Accessories for miniature circuit breakers



P1X9033



P1X9133



P1X9201



P1X9210



P1X9202



P1X1810



P2X1810

❶ Suitable for P1MB...
Not suitable for P1MBU...

Order code	Description	Qty per pkg	Wt
		n°	[kg]
P1X9031❶	Single-pole supply busbar	10	0.160
P1X9032❶	Two-pole supply busbar	10	0.320
P1X9033❶	Three-pole supply busbar	10	0.474
P1X9034❶	Four-pole supply busbar	10	0.600
P1X9130❶	Kit of 5 isolating covers for unused busbar terminals	10	0.030
P1X9131❶	End cap for P1X9031	50	0.001
P1X9132❶	End cap for P1X9032	50	0.001
P1X9133❶	End cap for P1X9033	50	0.001
P1X9134❶	End cap for P1X9034	50	0.001
P1X9201❶	Single-pole terminal for busbar supply; conductor cross section 25mm² max.	25	0.010
P1X9210❶	1-pole terminal for supplying busbar; conductor cross section 25mm² max.; left entry	25	0.010
P1X9202❶	Single-pole terminal for busbar supply; conductor cross section 50mm² max.	25	0.022
P1X1810	Padlockable attachment for breaker control lever P1MB...	10	0.001
P2X1810	Padlockable attachment for breaker control lever P2MB...	10	0.002

General and operational characteristics
SINGLE-POLE SUPPLY BUSBAR
- Rated operational voltage Ue: 1000V
- Central point of power supply: 100A max.
- Side point of power supply: 63A max.
- Spacing: 17.8mm/0.70”
- Busbar section: 10mm²
- For paralleling connection
- For 57 modules, 1000mm/39.37” long (57 1P breakers).

TWO-POLE, THREE-POLE AND FOUR-POLE SUPPLY BUSBARS
- Rated operational voltage Ue: 690V
- Central point of power supply: 100A max.
- Side point of power supply: 63A max.
- Spacing: 17.8mm/0.70”
- Busbar section: 10mm²
- For paralleling connection
- Two-pole: for 56 modules, 1000mm/39.37” long (28 2P breakers)
- Three-pole: for 57 modules, 1012mm/39.84” long (19 3P breakers)
- Four-pole: for 56 modules, 1000mm/39.37” long (14 4P breakers).

PADLOCKABLE ATTACHMENT
- Max. padlock diameter 5mm/0.20”
- Padlockable in ON and OFF
- One can be fitted for each pole of the breaker.

UL approved supply busbar



3P18L57S0U50



802150S



802180



ULC...



BRU3V



802307

Order code	Description	Qty per pkg	Wt
		n°	[kg]
Power bars for UL 1077 thermal-magnetic circuit breakers, type P1MB...			
1P18K57S0U50	Single-pole supply busbar	10	0.160
2P18L56S0U50	Two-pole supply busbar	10	0.320
3P18L57S0U50	Three-pole supply busbar	10	0.474
BRB5W	Kit of 5 insulating caps for unused bar terminals	10	0.030
A69	End cap for 1P18K57S0U50	50	0.001
A7	End cap for 2P18L56S0U50 and 3P18L57S0U50	50	0.001
802150S	Single-pole terminal block to supply busbar 1P18K57S0U50; conductor section 10 to 1 AWG	25	0.030
802180	Single-pole terminal block to supply busbar 2P18L56S0U50 and 3P18L57S0U50; conductor section 10 to 1 AWG	10	0.030
Power bars for UL 489 thermal-magnetic circuit breakers, type P1MBU...			
ULC157A18A	Single pole power bar	10	0.160
ULC256A18A	Two pole power bar	10	0.320
ULC357A18A	Three pole power bar	10	0.474
BRU3V	Kit of 3 insulating caps for unused bar terminals	10	0.022
A68	End cap for all ULC... type bars	50	0.001
802307	Single-pole terminal block to power bars; conductor section 14 to 2 AWG	10	0.030

Main features
UL approved power bars are divided into two groups:
- Bars for UL 1077 approved thermal-magnetic circuit breakers;
- Bars for UL 489 approved thermal-magnetic circuit breaker bars.

Both models are supplied 1000mm/39.37” long and can be cut to the desired length. This feature makes it easy to adapt to any combination of installed thermal-magnetic circuit breakers. Special end caps must be applied at the points where the bars are cut, to ensure IP20 protection and to comply with UL standards.

Operational characteristics
POWER BARS FOR UL APPROVED THERMAL-MAGNETIC CIRCUIT BREAKERS
- Maximum rated AC voltage: 600V
- Central power point: 160A max
- Side point for power supply: 80A max
- Spacing: 17.8mm/0.70”
- Bar section: 18mm²
- For parallel connection
- Single pole: for 57 modules, 1000mm/39.37” long (57 1P switches)
- Two pole: for 56 modules, 1000mm/39.37” long (28 2P switches)
- Three pole: for 57 modules, 1012mm/39.84” long (19 3P switches).

Certifications
UL 508 for P18K57... bars (for use with UL 1077 approved thermal-magnetic circuit breakers).
UL 489 for UL... bars (for use with UL 489 approved thermal-magnetic circuit breakers).

Switch disconnectors



P1MS1P...



P1MS2P...



P1MS3P...



P1MS4P...

Order code	Ie	N° of DIN module	Qty per pkg	Wt
	[A]	n°	n°	[kg]
Modular switch disconnectors - 1P.				
P1MS1P032	32	1	12	0.083
P1MS1P040	40	1	12	0.083
P1MS1P063	63	1	12	0.083
P1MS1P100	100	1	12	0.083
P1MS1P125	125	1	12	0.083
Modular switch disconnectors - 2P.				
P1MS2P032	32	2	6	0.170
P1MS2P040	40	2	6	0.170
P1MS2P063	63	2	6	0.170
P1MS2P100	100	2	6	0.170
P1MS2P125	125	2	6	0.170
Modular switch disconnectors - 3P.				
P1MS3P032	32	3	4	0.250
P1MS3P040	40	3	4	0.250
P1MS3P063	63	3	4	0.250
P1MS3P100	100	3	4	0.250
P1MS3P125	125	3	4	0.250
Modular switch disconnectors - 4P.				
P1MS4P032	32	4	3	0.330
P1MS4P040	40	4	3	0.330
P1MS4P063	63	4	3	0.330
P1MS4P100	100	4	3	0.330
P1MS4P125	125	4	3	0.330

General characteristics
These devices are mainly used for disconnection and insulation of power lines and systems. They can also be used to switch various types of resistive and inductive loads.
Main features include:
- IEC rated current In: 32...125A
- Pole width: 17.5mm / 0.69”
- Clear contact status indication
- Wide terminals for easy wiring
- Auxiliary contacts can be mounted on left side and padlockable attachment
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

Operational characteristics
- Utilisation category: AC-22A
- IEC rated insulation voltage Ui: 1000V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational voltage Ue: 1P 230...240V; 2P, 3P, 4P 400...440V
- IEC rated short-time withstand current Icw: 12xIe (for 1 second)
- rated conditional short-circuit current:
- 25kA with gG fuses rated 63A
- 15kA with gG fuses rated 125A.

Certifications and compliance
Certifications obtained: TÜV-Rheinland, EAC.
Compliant with standards: IEC/EN/BS 60947-3.

Add-on blocks for switch disconnectors P1MS...



P1X1011S



P1X1810

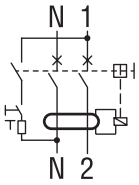
Order code	Description	Qty per breaker	Qty per pkg	Wt
		n°	n°	[kg]
P1X1011S	Auxiliary contact, 1 changeover contact	1	1	0.040
P1X1810	Padlockable attachment for switch control lever P1MS...	1	10	0.001

Operational characteristics (auxiliary contact)
- Utilisation category AC-12: 6A 230V; 3A 400V
- Utilisation category DC-12: 0.4A 250V; 6A 24V.

2P - 2 modules
4P - 4 modules

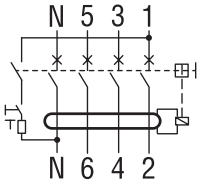


P1RD2P...





P1RD4P...





P1RC4PB...

Order code	Type	IEC In	IEC IΔn	N° of DIN module	Qty per pkg	Wt
		[A]	[mA]	n°	n°	[kg]
Two pole RCCB type AC.						
P1RD2P25AC030	AC	25	30	2	1	0.185
P1RD2P25AC300	AC	25	300	2	1	0.185
P1RD2P40AC030	AC	40	30	2	1	0.185
P1RD2P40AC300	AC	40	300	2	1	0.185
P1RD2P63AC030	AC	63	30	2	1	0.185
P1RD2P63AC300	AC	63	300	2	1	0.185
Two pole RCCB type A.						
P1RD2P25A030	A	25	30	2	1	0.185
P1RD2P25A300	A	25	300	2	1	0.185
P1RD2P40A030	A	40	30	2	1	0.185
P1RD2P40A300	A	40	300	2	1	0.185
P1RD2P63A030	A	63	30	2	1	0.185
P1RD2P63A300	A	63	300	2	1	0.185
Two pole RCCB type A - selective.						
new **P1RD2P40A300S**	A	40	300	2	1	0.185
new **P1RD2P63A300S**	A	63	300	2	1	0.185
Four pole RCCB type AC.						
P1RD4P25AC030	AC	25	30	4	1	0.326
P1RD4P25AC300	AC	25	300	4	1	0.326
P1RD4P40AC030	AC	40	30	4	1	0.326
P1RD4P40AC300	AC	40	300	4	1	0.326
P1RD4P63AC030	AC	63	30	4	1	0.326
P1RD4P63AC300	AC	63	300	4	1	0.326
Four pole RCCB type A.						
P1RD4P25A030	A	25	30	4	1	0.326
P1RD4P25A300	A	25	300	4	1	0.326
P1RD4P40A030	A	40	30	4	1	0.326
P1RD4P40A300	A	40	300	4	1	0.326
P1RD4P63A030	A	63	30	4	1	0.326
P1RD4P63A300	A	63	300	4	1	0.326
Four pole RCCB type A - selective.						
new **P1RD4P40A300S**	A	40	300	4	1	0.326
new **P1RD4P63A300S**	A	63	300	4	1	0.326
Four pole RCCB type B.						
P1RC4P40B030	B	40	30	4	1	0.335
P1RC4P40B300	B	40	300	4	1	0.335
P1RC4P63B030	B	63	30	4	1	0.335
P1RC4P63B300	B	63	300	4	1	0.335
P1RC4P80B030	B	80	30	4	1	0.335
P1RC4P80B300	B	80	300	4	1	0.335

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. Specifically to prevent electric shock, RCCBs must be rated with a rated residual current (IΔn) not exceeding 30mA so that these devices trip in the case of earth/ground fault only. They usually are connected in series with thermal-magnetic breakers which assure short circuit and overcurrent protection too. P1RC types have a IΔn of either 30mA or 300mA and are available with three different versions of residual current tripping, as follows:

Type AC – Tripping for earth/ground fault is ensured "for residual sinusoidal alternating currents, suddenly applied or slowly rising". The symbol identifying Type AC is the following:

Type A – Tripping for earth/ground fault is ensured "for residual sinusoidal alternating currents and pulsating direct currents, suddenly applied or slowly rising". In addition to the protection given by Type AC, this version protects against residual current with pulsating waveform. This can be caused by circuits connected with electronic equipment. The symbol identifying Type A is the following:

Type A selective – in addition to the characteristics of type A, they have a delayed tripping. Installed upstream of a series of lines protected by residual current breakers, it allows the tripping of the downstream ground fault device protection avoiding the tripping of upstream line. The symbol identifying the selective type is: **S**

Type B – tripping is ensured for all conditions already covered by types AC and A. They also ensure tripping for high-frequency leakage currents up to 1000Hz and direct currents. They are particularly suitable for applications with inverters, UPSs and electric vehicle charging stations.
The symbol identifying Type B is the following:

Main features include:
- IEC rated current In: 25A, 40A and 63A
- Versions: 2P and 4P
- Type of operation: AC, A, B and A selective
- Pole width: 17.5mm / 0.69"
- Contact status with flag indicator
- Fixing on 35mm DIN rail (IEC/EN/BS 60715).

Operational characteristics
- Dissipation per pole:
  - 1.1W for P1RC2/4P25... type AC or A
  - 2.9W for P1RC2/4P40... type AC, A or B
  - 7.2W for P1RC2/4P63... type AC, A or B
  - 9.7W for P1RC/4P80... type B
- IEC rated insulation voltage Ui: 400V
- IEC rated impulse voltage Uimp: 4kV
- IEC rated frequency: 50/60Hz
- IEC rated operational voltage Uc: 230VAC for 2P; 230/400VAC for 4P
- IEC rated residual operating voltage Ue: IΔn: 30mA; 300mA
- IEC short-circuit breaking capacity Icn: 10kA
- Tripping delay for type A selective: 150...500ms.

Certifications and compliance
Certifications obtained: TÜV-Rheinland (types AC and A), EAC.
Compliant with standards: IEC/EN/BS 61008-1, IEC/EN/BS 61008-2-1 (all types); IEC/EN/BS 62423 (type B).

Add-on blocks for P1RD...



P1X1011



P1X16...

Order code	Description	Qty per MCB	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contact.				
P1X1011	1 changeover contact	1	12	0.040
Indicator contact for trip.				
P1X1311	1 changeover contact	1	12	0.040
Undervoltage trip release.				
P1X14230	230V 50/60Hz	1	8	0.070
Shunt trip release.				
P1X16230	110...415V 50/60Hz	1	8	0.070
P1X16024	12...24V 50/60Hz-DC	1	8	0.070
Padlockable attachment.				
P1X1810	Padlockable attachment for breaker control lever	1	10	0.001

General characteristics
- Auxiliary and indicator contact width: 9mm/0.35" (0.5 module)
- Undervoltage and shunt trip release width: 18mm/0.71" (1 module)
- Maximum combination: 3 add-on blocks on MCB left side only of which 1 undervoltage or shunt release directly on MCB side and then 2 contacts of which 1 auxiliary and 1 indicator.

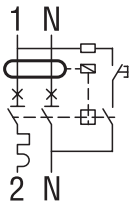
Operational characteristics
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational current in AC: 6A 230V; 3A 400V (auxiliary contacts).

Certifications and compliance
Certifications obtained: EAC, cULus (excluding P1X14230 and P1X16024), UL (only P1X14230).
Compliant with standards: IEC/EN/BS 60947-5-1, CSA C22.2 n° 5.

1P+N - 10kA
2 modules



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
Single pole + neutral RCBO type A.							
P1RE1NC06A030	C	6	10	30	2	1	0.205
P1RE1NC06A300	C	6	10	300	2	1	0.205
P1RE1NC10A030	C	10	10	30	2	1	0.205
P1RE1NC10A300	C	10	10	300	2	1	0.205
P1RE1NC13A030	C	13	10	30	2	1	0.205
P1RE1NC16A030	C	16	10	30	2	1	0.205
P1RE1NC16A300	C	16	10	300	2	1	0.205
P1RE1NC20A030	C	20	10	30	2	1	0.205
P1RE1NC20A300	C	20	10	300	2	1	0.205
P1RE1NC25A030	C	25	10	30	2	1	0.205
P1RE1NC25A300	C	25	10	300	2	1	0.205
P1RE1NC32A030	C	32	10	30	2	1	0.205
P1RE1NC32A300	C	32	10	300	2	1	0.205
P1RE1NC40A030	C	40	10	30	2	1	0.205
P1RE1NC40A300	C	40	10	300	2	1	0.205

General characteristics
These devices both detect and trip in the event of residual current and protect circuits in the case of short circuits and overcurrent. From a practical point of view, they integrate both functions of MCB and RCCB.
They have a C-type trip characteristic (instantaneous trip 5-10 times In) and are used for inductive loads (mixed loads, resistive and inductive with low inrush current).
In addition, they have a rated residual current (IΔn) of either 30mA or 300mA and are available with two different versions of residual current tripping type AC or A as described on page 17-14.
Its main features are:
- IEC rated current In: 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 Ui: 400V
- Rated impulse voltage Uimp: 4kV
- Operating frequency: 50/60Hz
- Rated operational voltage Ue: 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.

Add-on blocks for P1RE...



P1X1011



P1X16...

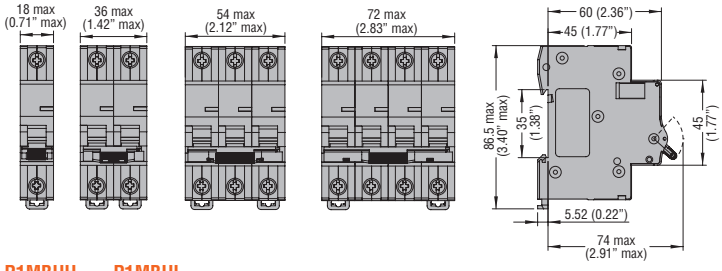
Order code	Description	Qty per MCB	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contact.				
P1X1011	1 changeover contact	1	12	0.040
Indicator contact for trip.				
P1X1311	1 changeover contact	1	12	0.040
Undervoltage trip release.				
P1X14230	230V 50/60Hz	1	8	0.070
Shunt trip release.				
P1X16230	110...415V 50/60Hz	1	8	0.070
P1X16024	12...24V 50/60Hz-DC	1	8	0.070
Padlockable attachment.				
P1X1810	Padlockable attachment for breaker control lever	1	10	0.001

General characteristics
- Auxiliary and indicator contact width: 9mm/0.35" (0.5 module)
- Undervoltage and shunt trip release width: 18mm/0.71" (1 module)
- Maximum combination: 3 add-on blocks on MCB left side only of which 1 undervoltage or shunt release directly on MCB side and then 2 contacts of which 1 auxiliary and 1 indicator.

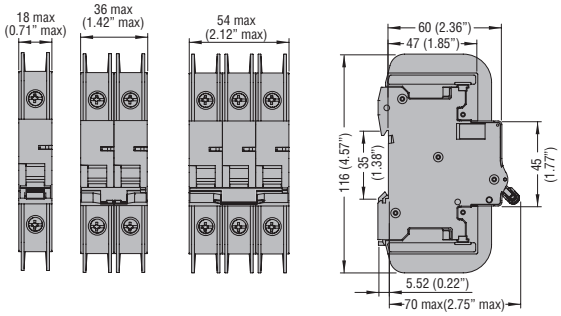
Operational characteristics
- IEC rated impulse voltage Uimp: 4kV
- IEC rated operational current in AC: 6A 230V; 3A 400V (auxiliary contacts).

Certifications and compliance
Certifications obtained: EAC, cULus (excluding P1X14230 and P1X16024), UL (only P1X14230).
Compliant with standards: IEC/EN/BS 60947-5-1, CSA C22.2 n° 5.

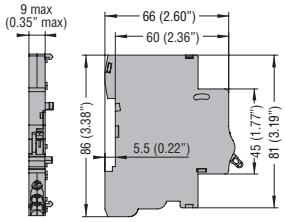
MINIATURE CIRCUIT BREAKERS
P1MB...



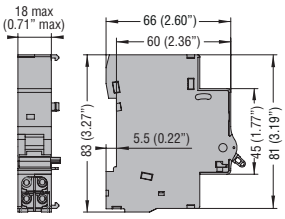
P1MBUH... - P1MBUL....



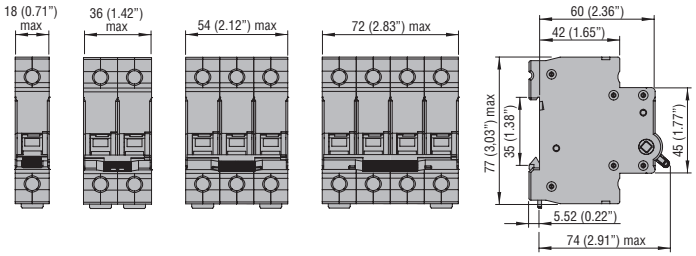
ACCESSORIES
Add-on contacts
P1X1011 - P1X0111S - P1X1011UH - P1X1311



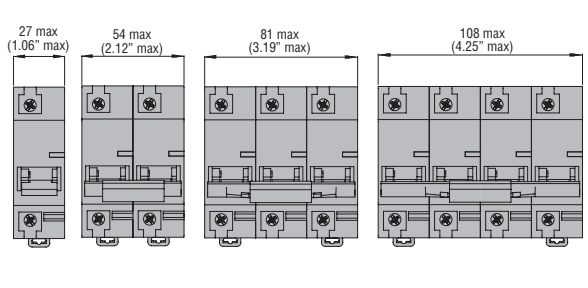
Undervoltage and shunt releases
P1X14230 - P1X16...



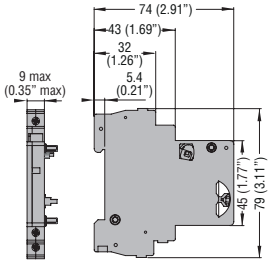
SWITCH DISCONNECTORS
P1MS....



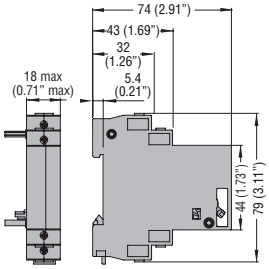
MINIATURE CIRCUIT BREAKERS
P2MB...



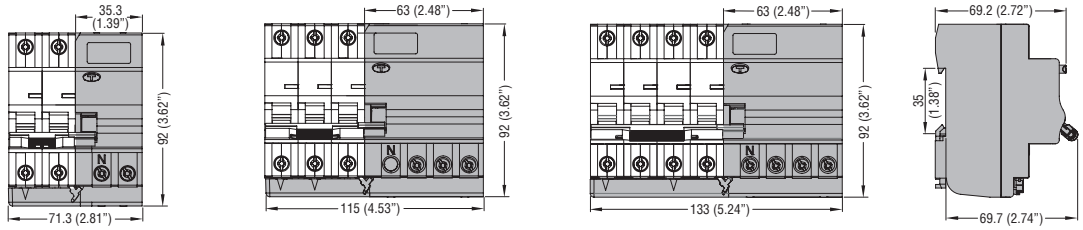
ACCESSORIES
Add-on contacts
P2X1011 - P2X1311



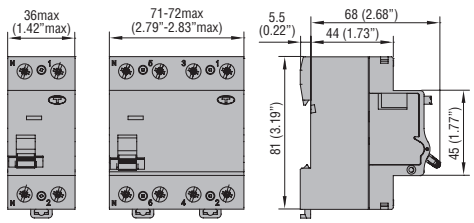
Shunt release
P2X16230



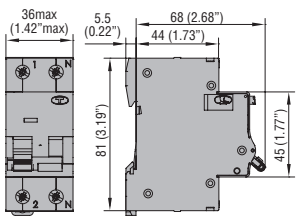
RESIDUAL BLOCKS
P1RA



RESIDUAL CURRENT OPERATED CIRCUIT BREAKERS
P1RD...

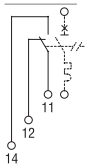


RESIDUAL CURRENT OPERATED CIRCUIT BREAKERS WITH OVERCURRENT PROTECTION
P1RE...

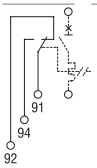


Wiring diagrams

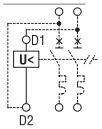
P1X1011 - P1X1011S - P1X1011UH - P2X1011



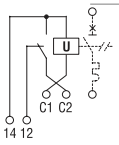
P1X1311 - P2X1311



P1X14230



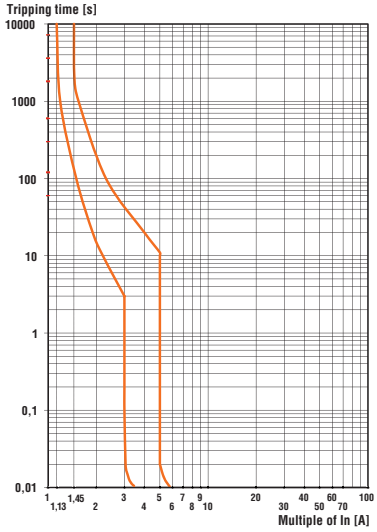
P1X16... - P2X16230



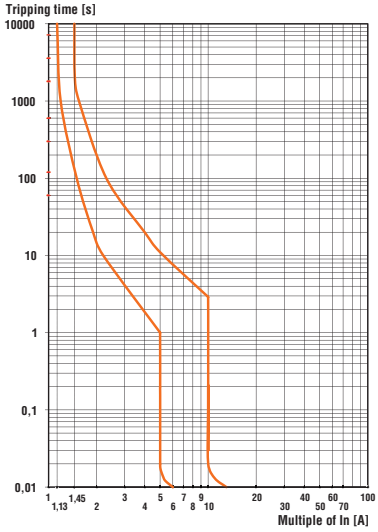
TYPE			P1MB1M...	P1MB1N...	P1MB...P...	P2MB	P1MS...	P1RA	P1RD...	P1RE...
Description			Miniature circuit breakers	Miniature circuit breakers	Miniature circuit breakers	Miniature circuit breakers	Switch disconnectors	Residual blocks	Residual current operated circuit breakers	Residual current operated circuit breakers w/ overcurrent prot.
Standards			IEC/EN/BS 60898, IEC/EN/BS 60947-2	IEC/EN/BS 60898, IEC/EN/BS 60947-2	IEC/EN/BS 60898, IEC/EN/BS 60947-2 UL 1077 - UL 489❶	IEC/EN/BS 60947-2 UL 1077	IEC/EN/BS 60947-3	IEC/EN/BS 61008-1 IEC/EN/BS 61008-2-1	IEC/EN/BS 61008-1 IEC/EN/BS 61008-2-1	IEC/EN/BS 61009-2-1
IEC rated insulation voltage Ui		V	500	230	440	400	1000	400	400	400
IEC rated impulse withstand voltage Uimp		kV	4	4	4	6	4	4	4	4
IEC rated operational voltage Ue	in AC	V	230	230	230 (1P, 1P+N) 230/400 (2P, 3P, 4P)❸	230 (1P) 230/400 (2P, 3P, 4P)	230...240 (1P) 400...440V (2P, 3P, 4P)	230 (2P) 230/400 (3P, 4P)	230 (2P) 230/400(4P)	230
	in DC	V	—	—	80 (1P, 2P)❹	80 (1P) / 125 (2P)❺	—	—	—	—
Rated frequency		Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Maximum rated current		A	40	63	63	125	125	63	63	40
Available rated current for types		A	2, 4, 6, 10, 13, 16, 20, 25, 32, 40	1, 2, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63	1, 1,6, 3, 4, 6, 8, 10, 13, 16, 20, 25, 32, 40, 50, 63❷	80, 100, 125	32, 40, 63, 100, 125	40, 63	25, 40, 63 (80A solo tipo B)	6, 10, 16, 20, 25, 32, 40
Versions			1P+N	1P+N	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P	1P, 2P, 3P, 4P	2P, 3P, 4P	2P, 4P	1P+N
Tripping characteristic		curve	B-C	C	B-C-D	C-D	—	—	—	C
Instantaneous tripping			Curve B: 3...5In Curve C: 5...10In	Curve B: 3...5In Curve C: 5...10In	Curve B: 3...5In Curve C: 5...10In Curve D: 10...14In	Curve C: 5...10In Curve D: 10...14In	—	—	—	Curve C: 5...10In
Residual operation characteristic		type	—	—	—	—	—	A	AC, A, B❼	AC, A
Rated residual current IΔn		mA	—	—	—	—	—	30, 300	30, 300	30, 300
Short circuit capacity (IEC/EN/BS)		kA	6 (Icn/Icu)	6 (Icn/Icu)	10 (Icn/Icu)	10 (Icu)	—	—	10 (Inc)	10 (Icn)
Short circuit capacity (UL 1077) ❻		kA	—	—	7.5 (1P 240V) 5 (1P 277V) 7.5 (2,3,4P 480V)	5	—	—	—	—
Mechanical life		cycle	20,000	20,000	20,000	10,000	7,000	20,000	20,000	20,000
Electrical life		cycle	10,000	10,000	10,000	10,000	1,000	10,000	10,000	10,000
Tightening torque of terminals		Nm	1.1...1.2	1.8...2	1.8...2	3.2...3.5	3.2...3.5	1.8...2	1.8...2	1.8...2
		lb.in	9.7...10.6	16...17.7	16...17.7	28.8...31	28.8...31	16...17.7	16...17.7	16...17.7
		Tool	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2
Conductor section min...max.		mm^2	1...16	1...35	1...35	2.5...50	1...50	1...25	2.5...35	1...16
		AWG	14...6	14...2	14...2	14...1/0	16...1	14...6	14...2	16...3
AMBIENT CONDITIONS										
Temperature	Operating	°C	-40...+70	-40...+70	-40...+70	-40...+70	-25...+70	-25...+60	-25...+60	-25...+60
	Storage	°C	-40...+80	-40...+80	-40...+80	-40...+80	-25...+70	-40...+80	-40...+80	-40...+80
Max. altitude		m	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Pollution degree			2	2	2	3	3	2	2	2
Mounting			35mm DIN rail (IEC/EN/BS 60715)							

TRIP CHARACTERISTICS

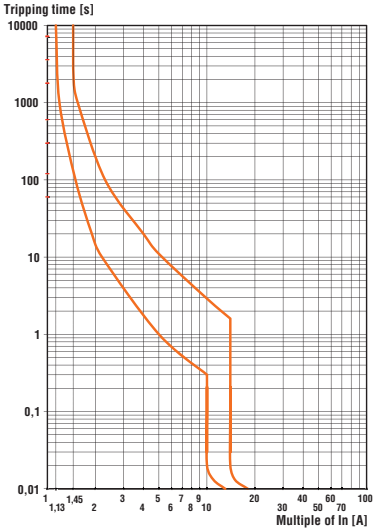
Curve B



Curve C



Curve D



❶ UL489 only P1MBU... version; for the operational voltages for these devices refer to the pages for the chosen product.
❷ For the UL 489, P1MBU... versions, the following rated current currents are also available: 5, 7, 12, 15, 30, 35, 60 A.
❸ For the UL 489, P1MBU... versions to 32A: 1P 277V; 2P and 3P 480Y/277V. From 35 to 63A: 1P 120V; 2P and 3P 240V.
❹ UL 1077 standard: 60VDC (1P) / 125VDC (2P), short circuit capacity 7.5kA. For the UL 489, P1MBU... versions: 60VDC (1P, 2P) / 125VDC (2P), short circuit capacity 10kA
❺ UL 1077 standard: 60VDC (1P, 2P), short circuit capacity 10kA.
❻ For the UL 489, P1MBU..., short circuit capacity 10kA.
❼ Type A selective is alslo available. Tripping delay: 150...500ms.

Surge protection devices



- Protection against overvoltage and high surge conditions caused by direct or indirect lightning strikes
- Version with integrated fuse and “no leakage current” available
- Types with plug-in cartridge provide fast servicing capability
- Visual failure status signalling of single modules
- Versions with or without output for remote SPD status indication
- Versions for data and signal lines
- Versions for photovoltaic applications
- UL-certified versions.

SEC. - PAGE

Surge protection devices for AC system
Type 1 and 2 monoblock Iimp=25kA ..... 18 - 4
Type 1 and 2 with plug-in cartridge Iimp=25kA with integrated fuse ..... 18 - 4
Type 1 and 2 with plug-in cartridge Iimp=12.5kA ..... 18 - 5
Type 1 and 2 monoblock Iimp=12.5kA ..... 18 - 5
Type 1 and 2 with plug-in cartridge Type 1CA/Open-Type 1 UL-certified ..... 18 - 5
Type 2 with plug-in cartridge In=20kA ..... 18 - 6
Type 2 with plug-in cartridge In=5kA ..... 18 - 6
Type 3 with plug-in cartridge Uoc/Icw=10kV/5kA ..... 18 - 6
Type 3 compact versions Uoc/Icw=6kV/3kA ..... 18 - 6

Surge protection devices for data and signal lines
Type C2-D1 ..... 18 - 7

Surge protection devices for photovoltaic applications
Type 1 and 2 with plug-in cartridge Ucpv=1100VDC and 1500VDC ..... 18 - 7
Type 2 with plug-in cartridge Ucpv=600VDC, 1100VDC and 1500VDC ..... 18 - 7

Dimensions ..... 18 - 8
Wiring diagrams ..... 18 - 10
Technical characteristics ..... 18 - 13



Page 18-4

TYPE 1 AND 2 MONOBLOCK Iimp=25kA

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC impulse current Iimp (10/350µs): 25kA
- IEC maximum discharge current Imax (8/20µs): 100kA
- SPD status indicator
- Versions with output for remote status indication
- Version with integrated fuse and “no leakage current” available.



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TYPE 1 AND 2 Iimp=12.5kA

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC impulse current Iimp (10/350µs): 12.5kA
- IEC maximum discharge current Imax (8/20µs):
  - 40kA for versions with plug-in cartridge
  - 50kA for monoblock versions
- Single module status indicator
- Versions with output for remote status indication.



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TYPE 1CA/OPEN-TYPE 1 UL-CERTIFIED WITH PLUG-IN CARTRIDGE

- 3P
- IEC impulse current Iimp (10/350µs): 5...12.5kA
- IEC rated discharge current In (8/20µs): 20kA
- IEC maximum discharge current Imax (8/20µs): 50kA
- Maximum continuous voltage Uc: 300...750VAC
- Versions with output for remote status indication.



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TYPE 2 WITH PLUG-IN CARTRIDGE In=20kA

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC maximum discharge current Imax (8/20µs): 50kA
- IEC rated discharge current In (8/20µs): 20kA
- Single module status indicator
- Versions with or without output for remote status indication.



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TYPE 2 WITH PLUG-IN CARTRIDGE In=5kA

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC maximum discharge current Imax (8/20µs): 15kA
- IEC rated discharge current In (8/20µs): 5kA
- Single module status indicator
- Versions with or without output for remote status indication.



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TYPE 3 WITH PLUG-IN CARTRIDGE Uoc/Icw=10kV/5kA

- 1P+N
- Version with plug-in cartridge:
  - IEC rated current In (8/20µs): 5kA
  - SPD status indicator
  - output for remote status indication
- Acoustic or optical intervention indicator.



Page 18-6

TYPE 3 COMPACT VERSIONS Uoc/Icw=6kV/3kA

- 1P+N
- Compact versions:
  - IEC rated current In (8/20µs): 3kA
  - Combined impulse Uoc: 6kV
- Acoustic or optical intervention indicator.



Page 18-7

TYPE C2-D1 FOR DATA AND SIGNAL LINES In=10kA

- Versions for RS485 and BUS 24VDC lines:
  - C2 rated current In (8/20µs): 10kA
  - D1 impulse current Iimp (10/350µs): 2.5kA
  - Output for remote status indication
- Version for Cat.6 Ethernet line - POE
  - C2 rated current In (8/20µs): 10kA
  - D1 impulse current Iimp (10/350µs): 1kA.
- Versions for telephone line:
  - C2 rated current In (8/20µs): up to 20kA
  - D1 impulse current Iimp (10/350µs): up to 7.5kA
  - Output for remote status indication.



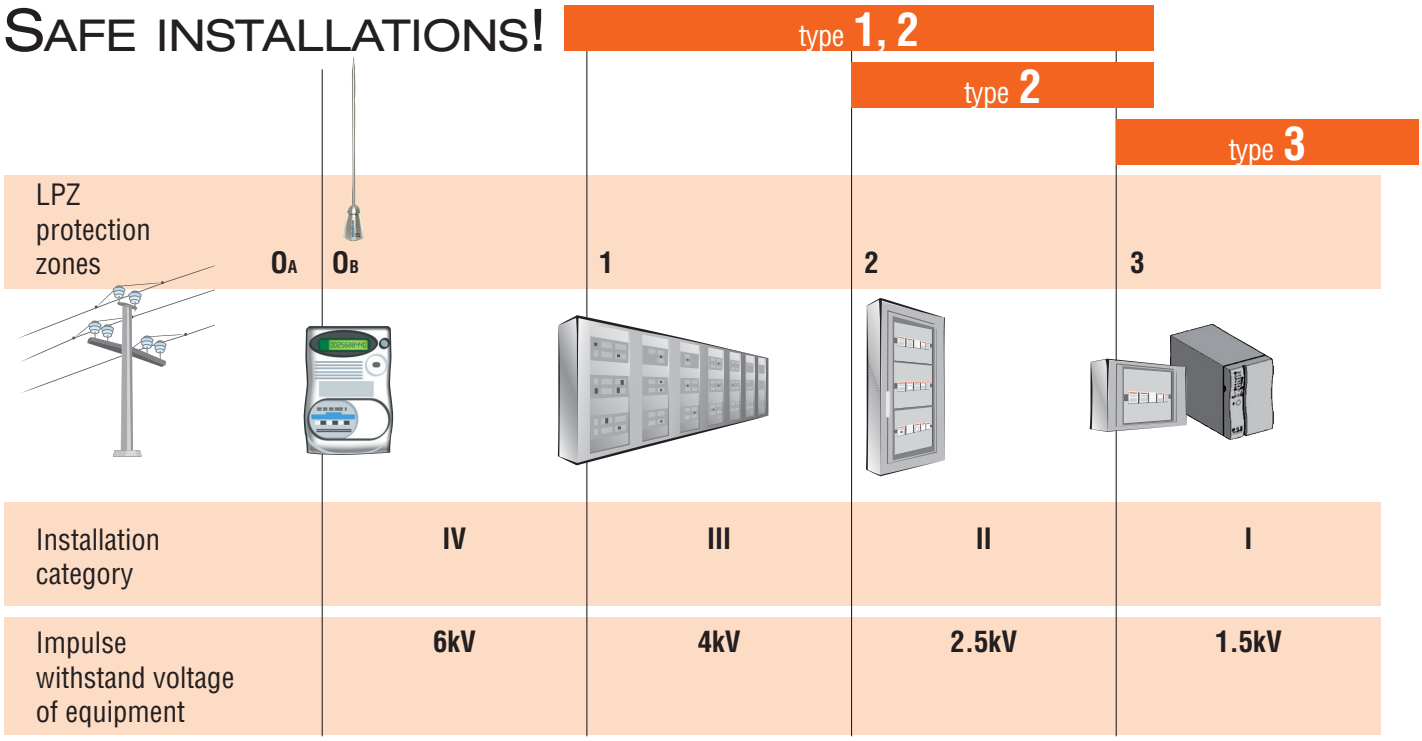
Page 18-7

TYPE 1 AND 2 AND TYPE 2 WITH PLUG-IN CARTRIDGE FOR PHOTOVOLTAIC APPLICATIONS

- Versions with plug-in cartridge: +, -, PE
- IEC maximum operational voltage: 1500VDC
- IEC maximum discharge current Imax (8/20µs): 40kA
- IEC rated discharge current In (8/20µs): 20kA
- Single module status indicator
- Versions with or without output for remote status indication
- Tested according to EN/BS 50539-11.

Lovato electric

SAFE INSTALLATIONS!



SURGE PROTECTION DEVICES

The surge arresters commonly defined as SPD (Surge Protection Devices), are devices designed to protect electric systems and equipment against transient and impulse overvoltage such as those caused by lightning strikes and by electric switching.
Their function is to divert the discharge or impulse current generated by an overvoltage to earth/ground, thereby protecting the equipment downstream.
SPD are installed in parallel with the electric line to be protected. At the mains rated voltage, they are comparable to an open circuit and have a high impedance at their ends.
In the presence of an overvoltage, this impedance falls to very low values, closing the circuit to earth/ground.
Once the overvoltage has ended, their impedance rises again rapidly to the initial value (very high), returning to open loop conditions.
The SA1B and SA0B (monoblock) and SA0 (with plug-in cartridge) type protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed in areas with a high risk of direct lightning strikes, inside main distribution boards or nearby sub-distribution boards.

PROTECTION ZONES

Standards define the LPZs (Lightning Protection Zone), which indicate the different zones at risk. These are distinguished among:

LPZ 0A: Area outside a building not protected by LPS (e.g. lightning rods) where a direct lightning strikes is possible. In this zone, there is total exposure to induced electromagnetic fields.

LPZ 0B: Area outside a building not protected by LPS; therefore, a direct lighting strike is not possible. In this zone zone, there is total exposure to induced electromagnetic fields.

LPZ 1: Area inside a building so protected against direct lightning strikes. In this zone, there is the possibility of very high overvoltages and of induced electromagnetic fields which may be attenuated depending on the degree of screening. This zone must be protected by an SPD type 1 at the boundary with zone LPZ 0A or 0B.

LPZ 2: Area inside a building (e.g. in a room) in which there is the possibility of low overvoltages since they are limited by SPDs installed upstream. This zone must be protected by an SPD type 2 at the boundary with zone LPZ 1.

LPZ 3: Area inside a building (e.g. the system connected to a socket in a room) characterised by very sensitive equipment, in which there is the possibility of very low overvoltages as they are limited by SPDs installed upstream.
This zone must be protected by an SPD type 3 at the boundary with zone LPZ 2.

INSTALLATION CATEGORY

For the correct choice of the SPD, the dielectric strength of the equipment to protect needs to be considered. This level is established by IEC 60664-1 standard.
For a 230/400V installation, it specifies:

Installation category IV: 6kV for devices installed upstream of the distribution board (for example, delivery point with the distribution system)

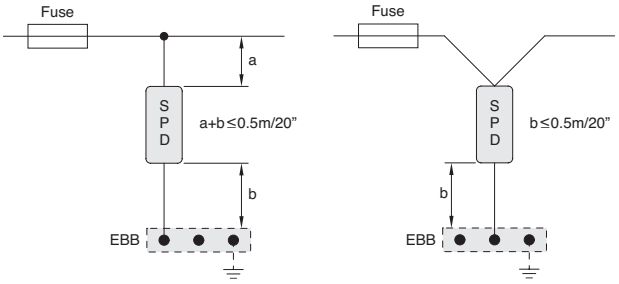
Installation category III: 4kV for devices being part of the fixed system (for example, distribution boards, switching devices, isolators, ducting and their accessories)

Installation category II: 2.5kV for non electric devices (for example, household appliances or electric tools)

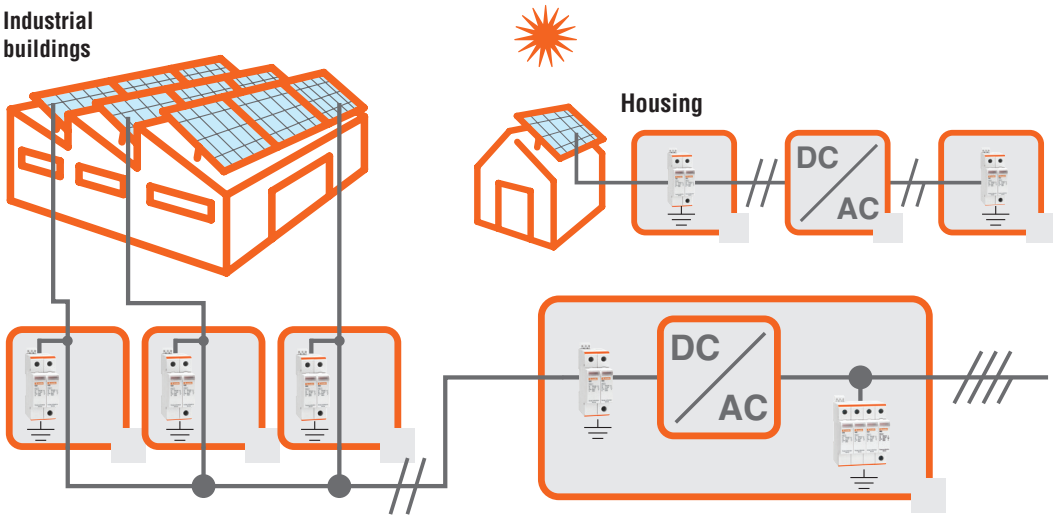
Installation category I: 1.5kV for equipment containing “particularly sensitive” electronic circuits (for example, electronic devices like PCs or TVs).

RECOMMENDATIONS FOR INSTALLATION

For correct installation, it is advisable to make connections between the line and SPD input (phase or neutral terminals) as well as between the SPD output (earth/ground terminal) and the equipotential bonding connection with a maximum 0.5m/20” length of the leads. To reduce the distance, use of the so-called “V connection” is admissible.



For more details, CEI/EN/BS 62305 standards can be consulted.



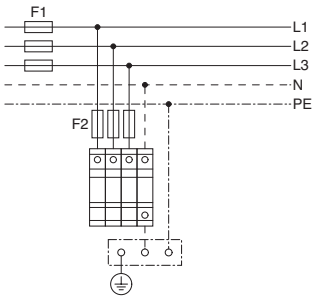
type 2 DC

SURGE PROTECTION DEVICES FOR PHOTOVOLTAIC APPLICATIONS

In photovoltaic applications in a domestic environment or industrial facility or other similar circumstances, equipped with lightning rod systems having a safety distance (S), SPD type 2, suitable for DC duty, can be used to protect the installation. It is advisable to install these devices as close as possible to the photovoltaic panels, consequently in the so-called string boards. If the AC/DC inverter is far away the string boards (indicatively more than 10/33' apart), another SPD type 2 DC needs to be installed next to the inverter on the DC side. Installation of SPD type 2 suitable of AC duty is also required downstream of the inverter on the AC side. For more details, consult specific national standards and/or application guides issued by local authorities for solar systems concerning protection against. The SG2DG... types with plug-in cartridge are suitable for connection in the DC side of a solar installation and offer protection against induced overvoltage conditions. The SG2...A300 type is suitable for installation downstream of the inverter on the AC side and in intermediate panels.

BACKUP PROTECTION

Protection against short circuits of SPDs is provided by overcurrent devices (gL/gG fuses), which should be chosen according to the SPD manufacturer's recommendations.



Fuse size depends on SPD

FOR SA1F34A275R THERE IS NO NEED TO USE ANY BACKUP PROTECTION

SPD COORDINATION

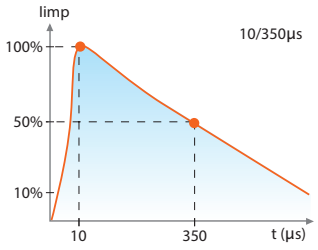
In order to obtain an effective protection against overvoltage, it is advisable to install several SPDs coordinated with one another in cascade connection.
For instance, it is advisable to have a type 1 SPD in the main distribution board, a type 2 in the sub-distribution board and a type 3 SPD near the terminal equipment to be protected.
In this way, the energy originating from an overvoltage gradually decreases as it reaches the equipment to protect

DEFINITIONS AND RATING ACCORDING IEC/EN/BS

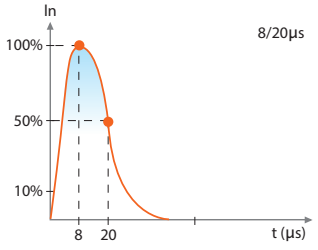
Maximum continuous voltage Uc:
Maximum value of AC or DC voltage that the SPD is capable of permanently withstanding without activating or getting damaged; this is its rated voltage.

Protection level voltage Up:
Maximum value of the voltage between the terminals of the SPD in presence of an impulsive overvoltage. It is a fundamental parameter to correctly choose the SPD; it must be taken into account with regards to the impulse voltage of the equipment to protect.

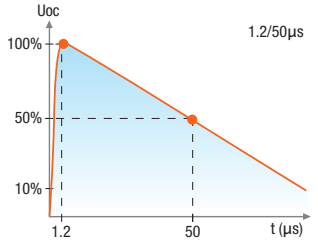
Impulse current Iimp:
Crest value of the current that circulates in the SPD with a 10/350µs waveform (activation must be guaranteed for 20 times without damage). It is used to classify SPDs in test class I.



Rated discharge current In:
Crest value of the current that circulates in the SPD with an (8/20µs waveform (activation must be guaranteed for 20 times without damage). It is used to classify SPDs in test class II.



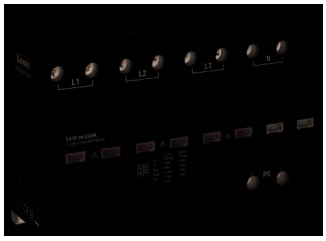
Open circuit discharge voltage Uoc:
Crest value of the no-load discharge voltage delivered by the test generation with a 1.2/50µs waveform simultaneously with a short circuit current of an 8/20µs waveform, applied at the SPD terminals. It is used to classify SPDs in test class III.



Monoblock limp=25kA



SA1B1PA320R



SA1B3NA320R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
MONOBLOCK VERSION. IEC impulse current limp (10/350µs) 25kA per pole.					
SA1B1PA320R	1P	YES	2	1	0.275
SA1B1NA320R	1P+N	YES	4	1	0.390
SA1B2PA320R	2P	YES	4	1	0.395
SA1B3PA320R	3P	YES	6	1	0.595
SA1B3NA320R	3P+N	YES	8	1	0.760
SA1B4PA320R	4P	YES	8	1	0.780

General characteristics
The surge protection device type SA1B combines the performance of SPD type 1 and 2 into a single product.It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed in areas with a high risk of direct lightning strikes, inside main distribution boards or nearby sub-distribution boards.

Operational characteristics
- IEC maximum continuous operating voltage Uc: 320VAC
- IEC maximum discharge current Imax (8/20µs): 100kA per pole
- IEC rated discharge current In (8/20µs): 25kA per pole
- Version with 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	IEC voltage protection level Up	Power installation system
	[V]	[kV] L-N	
SA1B1PA320R	230	<1.4	TN-C, TN-S, TT❶
SA1B1NA320R	230	<1.4/1.3	TT, TN-S
SA1B2PA320R	230	<1.4	TN-S
SA1B3PA320R	230/400	<1.4	TN-C
SA1B3NA320R	230/400	<1.4/1.5	TT, TN-S
SA1B4PA320R	230/400	<1.4	TN-S

❶ Between L-N only.

With plug-in cartridge limp=25kA with integrated fuse and "no leakage current"

new



SA1F34A275R



SAX1FA275

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
				n°	[kg]
VERSION WITH PLUG-IN CARTRIDGE WITH INTEGRATED FUSE AND "NO LEAKAGE CURRENT". Impulse current limp (10/350µs) 25kA per pole.					
SA1F34A275R	3P+N/4P	YES	8	1	1.065
PLUG-IN CARTRIDGE.					
Order code	Description			Q.y per pkg	Wt
				n°	[kg]
SAX1FA275	For SA1F... type			1	0.194

General characteristics
The surge protection device SA1F34A275R combines the performance of SPD type 1 and 2 into a single product.
It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed in areas with a high risk of direct lightning strikes, inside main distribution boards or nearby sub-distribution boards.
This surge protection device is immune to temporary overvoltage (TOV) and stop the flow of current after the trip.
The presence of the integrated fuse does not require any backup protection (see page 18-3).
The "no leakage current" technology allows it to be installed upstream of energy meters as it does not influence the measurement of consumed energy.

Operational characteristics
- IEC maximum continuous operating voltage Uc: 275VAC
- IEC maximum discharge current Imax (8/20µs): 65kA per pole
- IEC rated discharge current In (8/20µs): 25kA per pole
- Versions with or without relay output having changeover contact for remote status indication
- IEC degree protection: IP20.

Compliance
Compliant with standards: IEC/EN/BS 61643-11.

Characteristics

Type	IEC rated voltage Un	IEC voltage protection level Up	Power installation system
	[V]	[kV] L-N	
SA1F34A275R	240	<1.5	TN-C, TN-S, TT

With plug-in cartridge Iimp=12.5kA



SA01PA320R



SA03PA320R



SAX00PA320

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSION WITH PLUG-IN CARTRIDGES. IEC impulse current Iimp (10/350µs) 12.5kA per pole.					
SA01PA320R	1P	YES	1	1	0.195
SA01NA320R	1P+N	YES	2	1	0.365
SA02PA320R	2P	YES	2	1	0.370
SA03PA320R	3P	YES	3	1	0.540
SA03NA320R	3P+N	YES	4	1	0.670
SA04PA320R	4P	YES	4	1	0.670

PLUG-IN CARTRIDGE.

Order code	Description	Qty per pkg	Wt
		n°	[kg]
SAX00PA320	For SA0... type	1	0.100

Monoblock Iimp=12.5kA



SA0B1PA320R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
MONOBLOCK VERSION. IEC impulse current Iimp (10/350µs) 12.5kA per pole.					
SA0B1PA320R	1P	YES	2	1	0.205
SA0B1NA320R	1P+N	YES	2	1	0.155
SA0B2PA320R	2P	YES	2	1	0.230
SA0B3PA320R	3P	YES	3	1	0.330
SA0B3NA320R	3P+N	YES	4	1	0.600
SA0B4PA320R	4P	YES	4	1	0.600

General characteristics
SURGE PROTECTION DEVICES SA0
It has a plug-in cartridge and combines the performance of SPD type 1 and 2 into a single product. It is ideal in all those systems of reduced extent to protect the load side downstream of main circuit breaker to terminal equipment. It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed inside main distribution boards and nearby terminal equipment. The protection cartridges are plug-in and can be easily replaced for quick servicing.

SURGE PROTECTION DEVICES TYPE SA0B
Monoblock version SPD, it combines the performance of SPD type 1 and 2 into a single product. It is ideal in all those systems of reduced extent to protect the load side downstream of main circuit breaker to terminal equipment. It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed inside main distribution boards and nearby terminal equipment.

Operational characteristics
- IEC maximum continuous operating voltage Uc: 300VAC (SA0...); 320VAC (SA0B...)
- IEC maximum discharge current Imax (8/20µs): 40kA per pole (SA0...); 50kA (SA0B...)
- IEC rated discharge current In (8/20µs): 20kA per pole
- Version with relay output having changeover contact for remote status indication
- IEC degree of protection IP20.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 61643-11.

Characteristics

Type	IEC rated voltage Un	IEC voltage protection level Up	Power installation system
	[V]	[kV] L-N	
SA0...1PA...	230	<1.5	TN-C, TN-S, TT❶
SA0...1NA...	230	<1.5	TT, TN-S
SA0...2PA...	230	<1.5	TN-S
SA0...3PA...	230/400	<1.5	TN-C
SA0...3NA...	230/400	<1.5	TT, TN-S
SA0...4PA...	230/400	<1,5	TN-S

❶ Between L-N only.

With plug-in cartridge Type 1CA/Open-Type 1, In=20kA UL-certified



new



SG13PA...RUL

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
				n°	[kg]
VERSION WITH PLUG-IN CARTRIDGE. TYPE 1CA/OPEN-TYPE 1. Rated discharge current In (8/20µs) 20kA per pole.					
SG13PA300RUL	3P	YES	3	1	0.508
SG13PA350RUL	3P	YES	3	1	0.565
SG13PA480RUL	3P	YES	3	1	0.574
SG13PA750RUL	3P	YES	3	1	0.583

General characteristics
SURGE PROTECTION DEVICES TYPES SG13PA...RUL
It has a plug-in cartridge and combines the performance of SPD type 1 and 2 into a single product. It is ideal in all those systems of reduced extent to protect the load side downstream of main circuit breaker to terminal equipment. It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed inside main distribution boards and nearby terminal equipment.

Operational characteristics
- IEC maximum continuous operating voltage Uc: 300...750VAC
- IEC maximum discharge current Imax (8/20µs): 50kA per pole
- IEC rated discharge current In (8/20µs): 20kA per pole
- IEC impulse discharge current Iimp (10/350µs):
  - 12.5kA per pole (SG13PA300RUL and SG13PA350RUL)
  - 10kA per pole (SG13PA480RUL)
  - 5kA per pole (SG13PA750RUL)
- Versions with or without relay output having changeover contact for remote status indication
- IEC degree of protection: IP20.

Certifications and compliance
Certifications: cULus.
Compliant with standards: IEC/EN/BS 61643-11, UL1449 4TH edition.

Type 2 with plug-in cartridge In=20kA



SG2...

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
				n°	[kg]
VERSIONS WITH PLUG-IN CARTRIDGE. Rated discharge current In (8/20µs) 20kA per pole.					
SG21PA300	1P	NO	1	1	0.128
SG21PA300R	1P	YES	1	1	0.135
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
SG23PA300	3P	NO	3	1	0.366
SG23PA300R	3P	YES	3	1	0.376
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

PLUG-IN CARTRIDGE.

Order code	Description	Qty per pkg	Wt
		n°	[kg]
SGX02PA300	For SG2...A300/300R types	1	0.100

Type 2 with plug-in cartridge In=5kA



SG2C...

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSIONS WITH PLUG-IN CARTRIDGE. Rated discharge current In (8/20µs) 5kA per pole.					
SG2C1NA320	1P+N	NO	1	1	0.126
SG2C2PA320	2P	NO	1	1	0.144

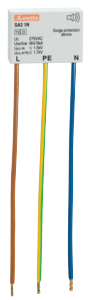
Type 3 with plug-in cartridge Uoc/Icw = 10kV/5kA



SA31NA320R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSIONS WITH PLUG-IN CARTRIDGE. Combined impulse Uoc/Icw (1.2/50µs, 8/20µs) 10kV/5kA.					
SA31NA320R	1P+N	YES	1	1	0.140

Type 3 compact version Uoc/Icw = 6kV/3kA





SA31NA275MS **SA31NA275ML**

Order code	Pole arrange-ment	Intervention signaling	Qty per pkg	Wt
			n°	[kg]
COMPACT VERSION. Combined impulse Uoc/Icw (1.2/50µs, 8/20µs) 6kV/3kA.				
SA31NA275MS	1P+N	Acoustic	1	0.050
SA31NA275ML	1P+N	Optical	1	0.050

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.

SURGE PROTECTION DEVICES TYPE SG2C
They are available in plug-in cartridge version and suitable for installation in residential boards where a 5kA per pole indirect discharge protection is sufficient. They have compact size, 1 module width for two poles.

Operational characteristics
- IEC maximum continuous operating voltage Uc: 300VAC (SG2...); 320VAC (SG2C...)
- IEC maximum discharge current Imax (8/20µs): 50kA per pole (SG2...); 15kA (SG2C...)
- IEC rated discharge current In (8/20µs): 20kA per pole (SG2...); 5kA (SG2C...)
- Versions with or without relay output having changeover contact for remote status indication (SG2...)
- 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	IEC voltage protection level Up	Power installation system
	[V]	[kV] L-N	
SG21PA...	230	<1.5	TN-C, TN-S, TT❶
SG2/SG2C1NA...	230	<1.5	TT, TN-S
SG2/SG2C2PA...	230	<1.5	TN-S
SG23PA...	230/400	<1.5	TN-C
SG23NA...	230/400	<1.5	TT, TN-S
SG24PA...	230/400	<1,5	TN-S

❶ Between L-N only.

General characteristics
SURGE PROTECTION DEVICE TYPE SA3
They are available in plug-in cartridge version for installation on DIN rail or compact version for installation in terminal block or electrical conduct. They are used for protection of end users (electronic devices).
The DIN rail version includes a relay output with exchange contact for status reporting. The compact versions are available with acoustic or light signaling and are provided with pre-wired connectors, length 11cm.

Operational characteristics
- IEC rated voltage Un: 230VAC
- IEC rated current In (8/20µs): 5kA (SA3...A320R), 3kA (SA3...MS, SA3...ML)
- IEC combined impulse Uoc: 10kV (SA3...A320R), 6kV (SA3...MS, SA3...ML)
- IEC protection level Up<1.5kV
- IEC degree of protection IP20.

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

Type C2-D1 for data and signal lines In = 10kA




SASD…VR SASDET6

new



SASDTELIP

Order code	Application	Relay output	Qty per pkg	Wt
			n°	[kg]
Rated current C2 In (8/20µs): 10kA.				
SASD5VR	RS485 - 5VDC	YES	1	0.058
SASDET6	Ethernet Cat.6 - POE	–	1	0.120
SASD024VR	Data lines - BUS 24VDC	YES	1	0.058
SASDTELDIN	Telephone line - 110VDC, for DIN rail installation	YES	1	0.052
SASDTELIP	Telephone - 110VDC, for outdoor installation (IP66)	–	1	0.150

General characteristics
Surge protection device for data lines type RS485 (5VDC), BUS (24VDC e.g. intercom), Ethernet Cat. 6 Power Over Ethernet (POE) and telephone lines (110VDC).
Typically used for protection of televisions, data lines, PCs, video cameras, electronic control units, measuring devices, switches and routers.

Operational characteristics
Types SASD...VR
- IEC rated voltage Un: 5VDC (SASD5VR); 30VDC (SASD024VR)
- C2 rated current In (8/20µs): 10kA
- D1 impulse current limp (10/350µs): 2.5kA
- Bandwidth: 30MHz
- IEC degree of protection: IP20.

TYPE SASDET6
- IEC rated voltage Un: 48VDC (POE)
- C2 rated current In (8/20µs): 10kA
- D1 impulse current limp (10/350µs): 1kA
- Bandwidth: 250MHz
- IEC degree of protection: IP20.

TYPE SASDTELDIN
- IEC rated voltage Un: 110VDC
- C2 rated current In (8/20µs): 10kA
- D1 impulse current limp (10/350µs): 2.5kA
- Bandwidth: 30MHz
- IEC degree of protection: IP20.

TYPE SASDTELIP
- IEC rated voltage Un: 110VDC
- C2 rated current In (8/20µs): 20kA
- D1 impulse current limp (10/350µs): 7.5kA
- Bandwidth: 250MHz
- IEC degree of protection: IP66, suitable for outdoor applications.

Certifications and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 61643-21.

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Type 1 and 2 for photovoltaic application with plug-in cartridge



SG2EDGK10M3R

new

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
EN rated voltage Un 1100VDC.					
SG2EDGK10M3R	+, -, PE	YES	3	1	0.406
EN rated voltage Un 1500VDC.					
SG2EDGK50M3R	+, -, PE	YES	3	1	0.475

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 Ucpv: 600VDC, 1100VDC, 1500VDC
- EN short circuit current rating Iscpv: 30kA for SG2EDGK50..., 11kA for SG2DGK10... and SG2DG..., 9kA for SA2EDG...
- Versions with or without relay output having changeover contact for remote status indication
- IEC degree of protection: IP20.

Type 2 for photovoltaic application with plug-in cartridge




SG2DG600M2… SG2DGK10M3R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		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
SG2DGK50M3R	+, -, PE	YES	3	1	0.454

Characteristics

Type	EN rated voltage Un	EN continuous voltage Ucpv	EN voltage protection level Up
	[VDC]	[VDC]	[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
SG2EDGK50M3R	1500	1500	<4.5
SG2DGK50M3	1500	1500	<5.0
SG2DGK50M3R	1500	1500	<5.0

Certifications and compliance
Certification obtained: EAC.
Compliant with standards: EN/BS 50539-11.

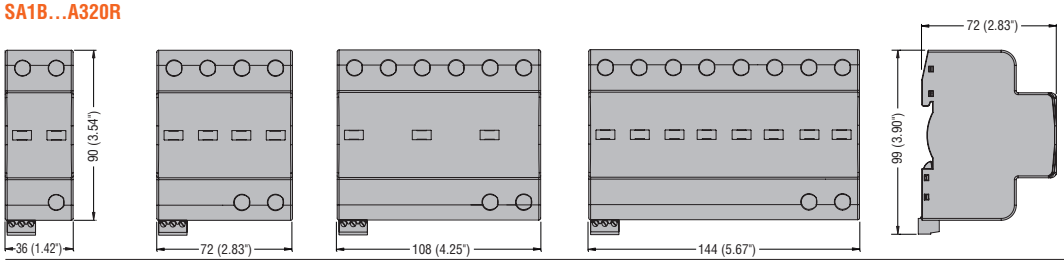
Plug-in cartridge



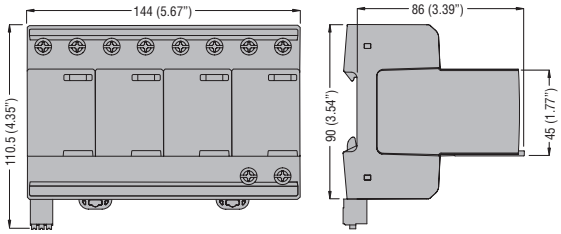
SGX02DG600M2

Order code	Description	Qty per pkg	Wt
		n°	[kg]
SGX02DG600M2	For SG2DG600M2/M2R type	1	0.100
SGX02DK10M3	For SG2DGK10M3/M3R type	1	0.100
SGX02DGK50M3	For SG2DGK50M3R type	1	0.100

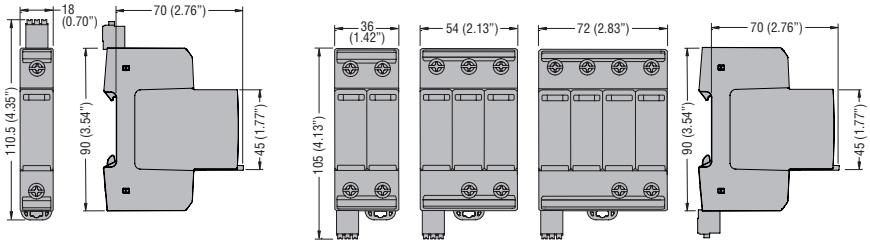
SA1B...A320R



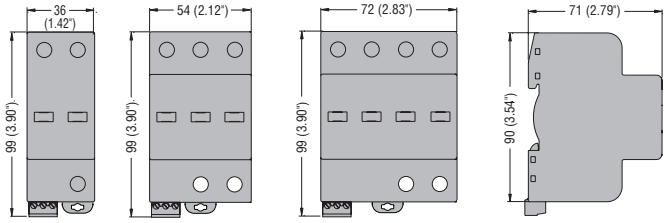
SA1F34A275R



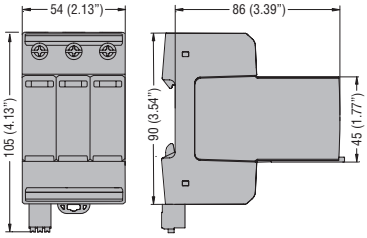
SA0...A320R



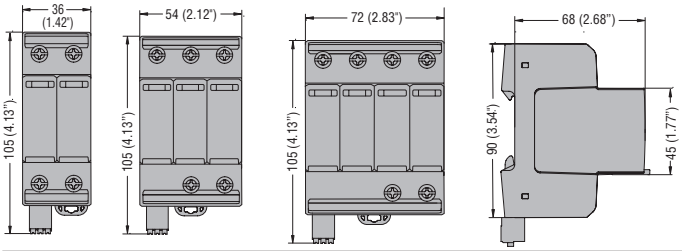
SA0B...A320R



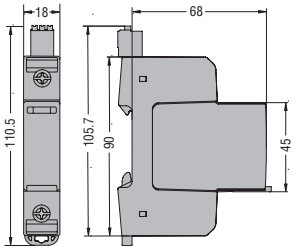
SG13PA...RUL



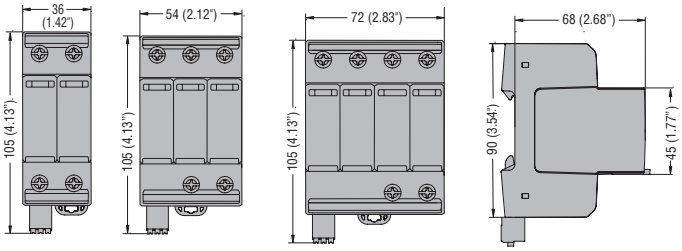
SG2...A300



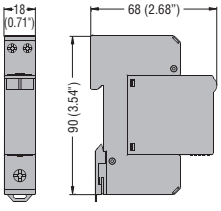
SG21PA300R



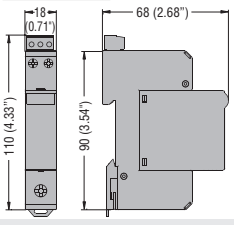
SG2...A300R



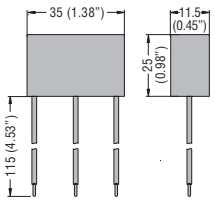
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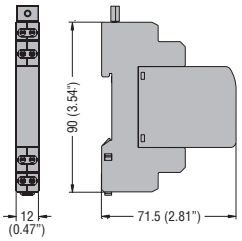
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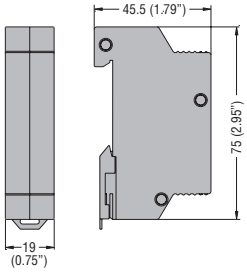
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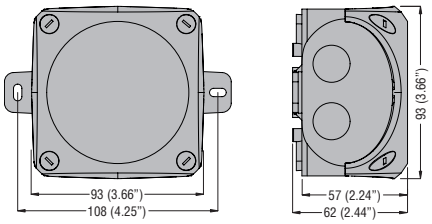
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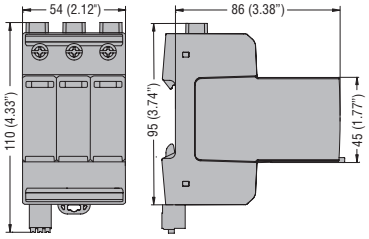
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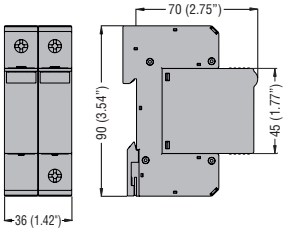
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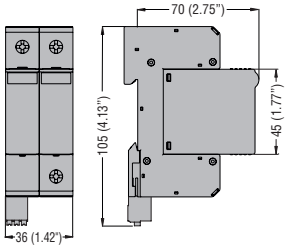
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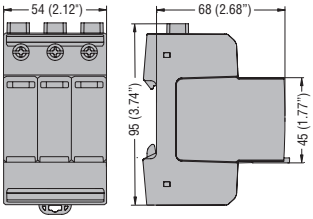
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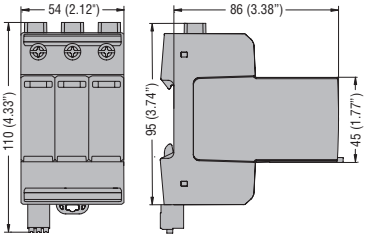
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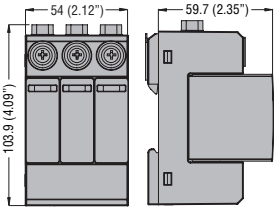
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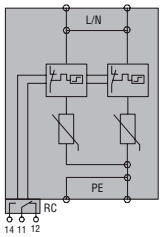
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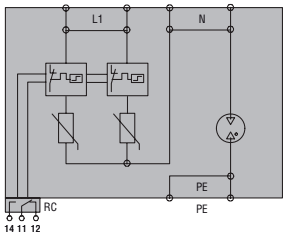
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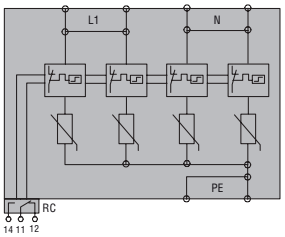
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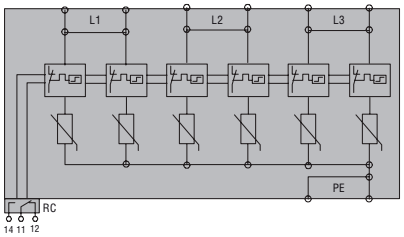
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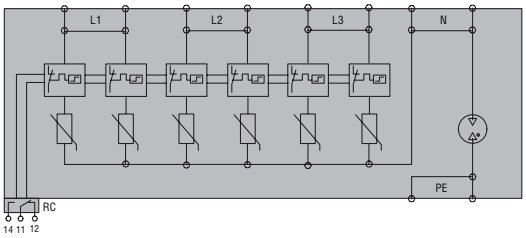
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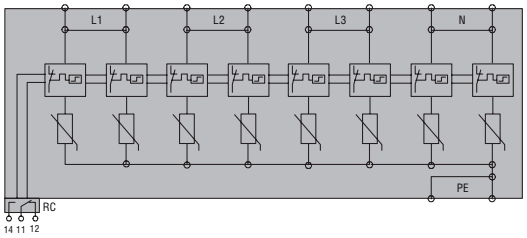
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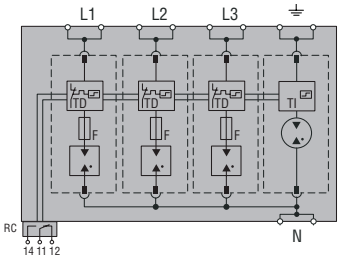
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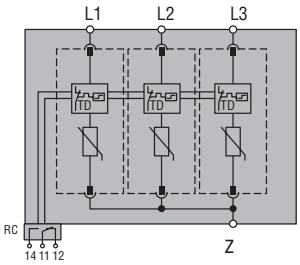
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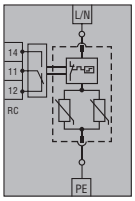
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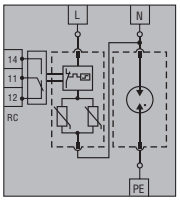
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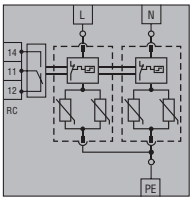
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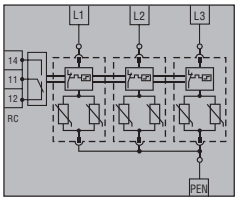
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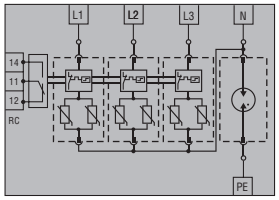
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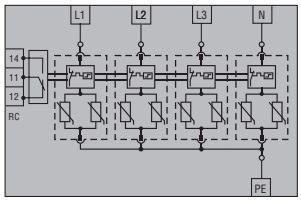
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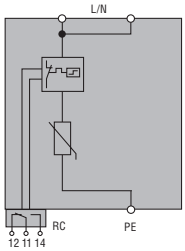
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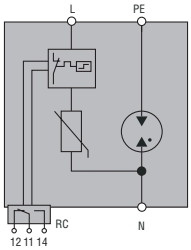
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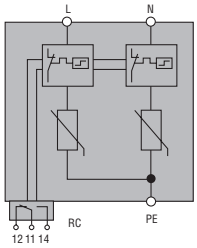
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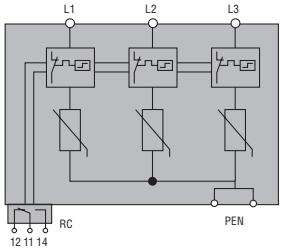
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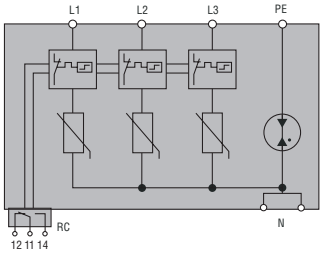
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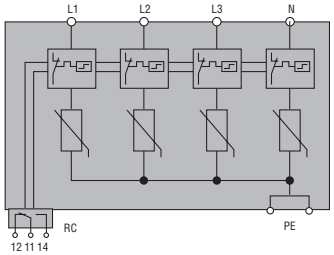
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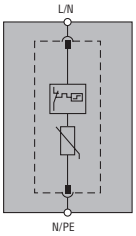
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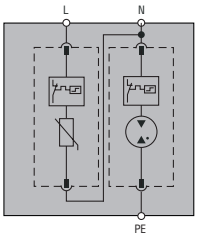
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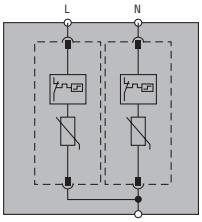
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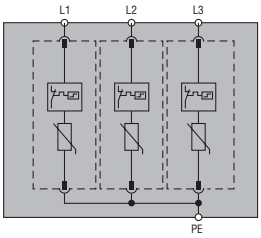
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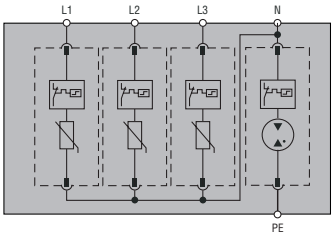
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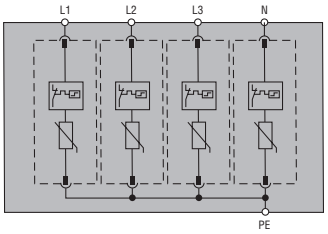
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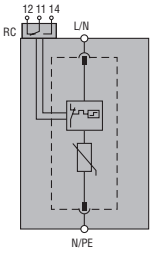
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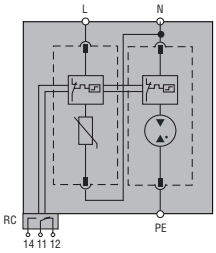
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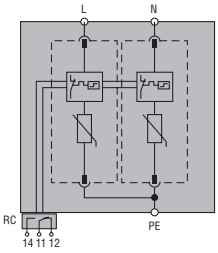
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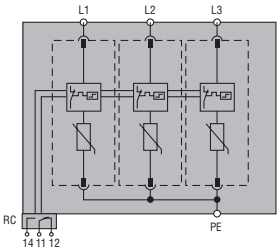
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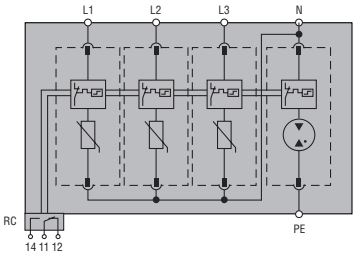
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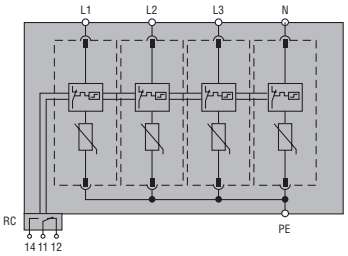
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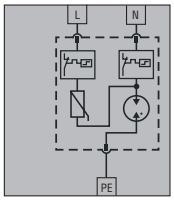
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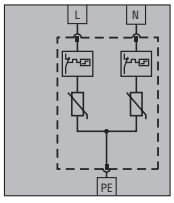
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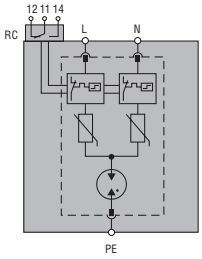
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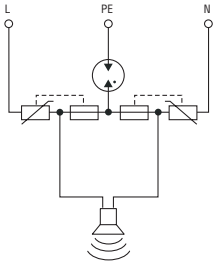
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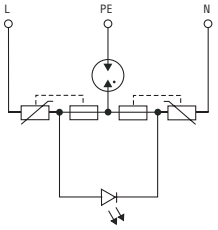
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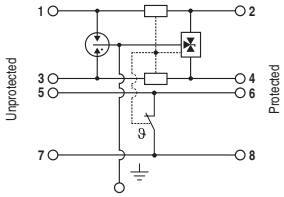
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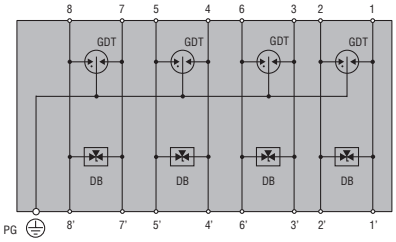
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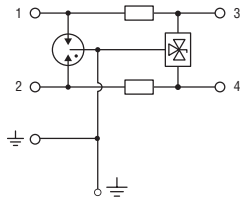
SASD...VR



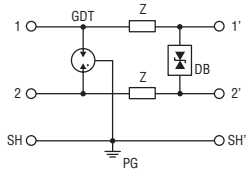
SASDET6



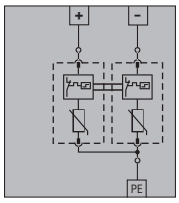
SASDTELDIN



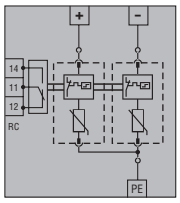
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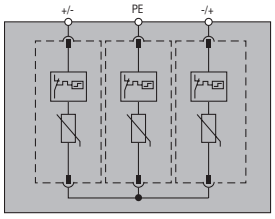
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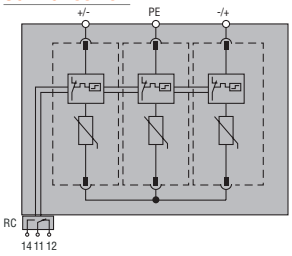
SG2DG600M2R



SG2DGK10M3
SG2DGK50M3
SA2EDGK10M3



SG2DGK10M3R
SG2EDGK10M3R
SG2DGK50M3R



TYPE with relay output		SA1B1PA320R	SA1B1NA320R	SA1B2PA320R	SA1B3PA320R	SA1B3NA320R	SA1B4PA320R	SA1F34A275R
ELECTRICAL PROPERTIES								
SPD per IEC/EN/BS 61643-11		Type 1, 2 (test class I, II)						
IEC rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltage Uc	VAC	320						275
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	25	25 / 50	25 per pole	25 per pole	25 / 100	25 per pole	25 / 100
IEC max impulse current Imax (8/20) (L-N/N-PE)	kA	100	100 / 100	100 per pole	100 per pole	100 / 100	100 per pole	65 / 130
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	25	25 / 50	25 per pole	25 per pole	25 / 100	25 per pole	25 / 100
IEC voltage protection level Up (L-N/N-PE)	kV	<1.4	<1.4 / <1.3	<1.4	<1.4	<1.4 / <1.5	<1.4	<2.1 / <1.5
IEC temporary overvoltage (TOV) withstand Ut (L-N for 5s)	VAC	334						–
IEC temporary overvoltage (TOV) safe fail (L-N for 120min)	VAC	438						442
IEC temporary overvoltage (TOV) withstand (N-PE for 200ms)	VAC	–	1200V / 300A	–	–	–	1200V / 300A	1200V
IEC residual voltage Ures (L-N/N-PE) at 5kA (8/20)	kV	1	1	1	1.1	1.1	1.1	1.2 / 0.3
IEC follow current If (N-PE)	Arms	No	>100	No	No	>100	No	100,000
Tripping time t_a (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25	<100
Thermal isolation protection		Yes						–
Backup protection fuse (gL/gG) in case of main fuse >250A	A min	125 (Iimp=10kA)						**Not needed**
	A max	250						
IEC maximum short circuit current 50Hz	kA	50						100
Status indicator - operating / failure	colour	Green / Red						
CONNECTIONS								
IEC degree of protection		IP20						
Terminal tightening torque	Nm	3						4.5
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)						
RELAY OUTPUT FOR REMOTE STATUS INDICATION								
Type of contact		Changeover (NO/NC)						
Contact capacity	A	0.5A 250VAC; 3A 125VAC; 0.1A 250VDC; 0.2A 125VDC						1A 250VAC; 0.5A 48VDC
Contact terminal tightening torque	Nm	0.25						
Maximum contact conductor section	mm^2	1.5						
AMBIENT CONDITIONS								
Operating temperature		-40...+85°C						
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)						
Material		Thermoplastic, RAL 7035, UL 94 V-0						

TYPE with relay output		SA01PA320R	SA01NA320R	SA02PA320R	SA03PA320R	SA03NA320R	SA04PA320R
ELECTRICAL PROPERTIES							
SPD per IEC/EN/BS 61643-11		Type 1, 2 (test class I, II)					
IEC rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltage Uc	VAC	300					
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	12.5	12.5 / 50	12.5 per pole	12.5 per pole	12.5 / 50	12.5 per pole
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	40	40 / 100	40 per pole	40 per pole	40 / 100	40 per pole
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	20	20 / 50	20 per pole	20 per pole	20 / 50	20 per pole
IEC combined surge Uoc/Isc (1,2/50, 8/20)	kV/kA	10 / 5					
IEC voltage level protection Up (L-N/N-PE)	kV	<1.5					
IEC temporary overvoltage (TOV) withstand Ut (L-N for 5s)	VAC	335					
IEC temporary overvoltage (TOV) withstand (N-PE for 200ms)	VAC	–	–	1200V / 300A	–	1200V / 300A	–
IEC residual voltage Ures (L-N/N-PE) at 5kA (8/20)	kV	0.8	0.8 / 0.2	0.8	0.8	0.8 / 0.2	0.8
IEC follow current If (N-PE)	Arms	No	>100	No	No	>100	No
Tripping time t_a (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
Backup protection fuse (gG) in case of main fuse >160A	A min	125 (Iimp=10kA)					
	A max	160					
IEC maximum short circuit current (50Hz)	kA	25					
Status indicator - operating / failure	colour	– / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	3					
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC)					
Contact capacity	A	0.5A 250VAC; 3A 125VAC; 0.1A 250VDC; 0.2A 125VDC					
Contact terminal tightening torque	Nm	0.25					
Maximum contact conductor section	mm^2	1.5					
AMBIENT CONDITIONS							
Operating temperature		-40...+80°C					
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)					
Material		Thermoplastic, RAL 7035, UL 94 V-0					

TYPE with relay output		SA0B1PA320R	SA0B1NA320R	SA0B2PA320R	SA0B3PA320R	SA0B3NA320R	SA0B4PA320R
ELECTRICAL PROPERTIES							
SPD per IEC/EN/BS 61643-11		Type 1, 2 (test class I, II)					
IEC rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltage Uc	VAC	320					
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	12.5	12.5 / 50	12.5	12.5	12.5 / 50	12.5
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	50	50 / 100	50	50	50 / 100	50
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	20	20 / 50	20	20	20 / 50	20
IEC voltage level protection Up (L-N/N-PE)	kV	<1.5	<1.5 / <1.5	<1.5	<1.5	<1.5 / <1.5	<1.5
IEC temporary overvoltage (TOV) withstand Ut (L-N for 5s)	VAC	334					
IEC temporary overvoltage (TOV) safe fail (L-N for 120min)	VAC	438					
IEC temporary overvoltage (TOV) withstand (N-PE fos 200ms)	VAC	–	–	1200V / 300A	–	1200V / 300A	–
IEC follow current If (N-PE)	Arms	No	>100	No	No	>100	No
Tripping time t_a (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
Backup protection fuse (gL/gG) in case of main fuse >250A	A min	125 (Iimp=10kA)					
	A max	250					
IEC maximum short circuit current (50Hz)	kA	50					
Status indicator - operating / failure	colour	Green / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	3					
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC)					
Contact capacity	A	0.5A 250VAC; 3A 125VAC					
Contact terminal tightening torque	Nm	0.25					
Maximum contact conductor section	mm^2	1.5					
AMBIENT CONDITIONS							
Operating temperature		-40...+85°C					
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)					
Material		Thermoplastic, RAL 7035, UL 94 V-0					

TYPE with relay output		SG13PA300RUL	SG13PA350RUL	SG13PA480RUL	SG13PA750RUL
ELECTRIC PROPERTIES					
SPD per IEC/EN/BS 61643-11		Type 1, 2 (test class I, II)			
SPD per UL1449 5th edition		Type 1CA, Open-Type 1 SPD Listed			
IEC rated voltage Un	VAC	240	277	400	600
IEC maximum continuous voltage Uc/MCOV	VAC	300	350	480	750
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	50			35
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	20			
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	12.5	12.5	10	5
IEC voltage level protection Up (L-N/N-PE)	kV	<1.5	<1.75	<2.1	<3.2
Voltage Protection Rating VPR	V	900	1200	1500	2500
IEC temporary overvoltage (TOV) withstand Ut (L-N for 5s)	VAC	337	403	581	871
IEC temporary overvoltage (TOV) safe fail (L-N for 120min)	VAC	442	529	762	1143
IEC residual voltage Ures at 5kA (8/20)	kV	1.1	1.3	1.5	2.5
IEC follow current t_a	ns	<25			
Thermal isolation protection		Yes	Yes	Yes	Yes
Backup protection fuse (gG) in case of main fuse >315A and Ik<25kA or >250A and Ik<50kA	A max	315A with Isccr=25kA, 250A with Isccr=50kA			250A
	A min	160A			80A
IEC maximum short circuit current 50Hz	kA	25 / 50			50
IEC maximum short circuit current SCCR	kA	150	150	200	150
Status indicator - operating / failure	colour	Green / Red			
CONNECTIONS					
IEC degree of protection		IP20			
Terminal tightening torque	Nm/lbf.in	4.5 / 35			
Maximum conductor section	mm²/AWG	25 (flexible) / 6 - 35 (rigid) / 6			
RELAY OUTPUT FOR REMOTE STATUS INDICATION					
Type of contact		Changeover (NO/NC)			
Contact capacity	A	1A 250VAC; 0.5A 48VDC			
Maximum contact conductor section	mm²/AWG	1.5 / 10			
AMBIENT CONDITIONS					
Operating temperature		-40...+85°C			
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)			
Material		Thermoplastic, RAL 7035, UL 94 V-0			

TYPE without relay output		SG21PA300	SG21NA300	SG22PA300	SG23PA300	SG23NA300	SG24PA300
with relay output		SG21PA300R	SG21NA300R	SG22PA300R	SG23PA300R	SG23NA300R	SG24PA300R
ELECTRICAL PROPERTIES							
SPD per IEC/EN/BS 61643-11		Type 2 (test class II)					
IEC rated voltage Un	VAC	240	240	240	240 / 400	240 / 400	240 / 400
IEC maximum continuous voltage Uc	VAC	300					
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	50	50 / 65	50	50	50 / 65	50
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	20	20 / 40	20	20	20 / 40	20
IEC level protection Up (L-N/N-PE)	kV	<1.5	<1.5 / <1,5	<1.5	<1.5	<1.5 / <1.5	<1.5
IEC temporary overvoltage (TOV) Ut (L-N for 5s)	VAC	337					
IEC follow current If (N-PE)	Arms	No	100	No	No	100	No
Tripping time t_a (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
Backup protection fuse (gG) in case of main fuse >315A and Ik<25kA or >250A e Ik<50kA	A min	125					
	A max	315A with Isccr=25kA, 250A with Isccr=50kA					
IEC maximum short circuit current (50Hz)	kA	25 / 50					
Status indicator - operating / failure	colour	Green / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	4.5					
Maximum conductor section	mm²	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC)					
Contact capacity	A	1A 250VAC; 1A 125VAC; 0.5A 48VDC; 0.5A 24VDC; 0.5A 12VDC					
Maximum contact conductor section	mm²	1.5					
AMBIENT CONDITIONS							
Operating temperature		-40...+85°C					
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)					
Material		Thermoplastic, RAL 7035, UL 94 V-0					

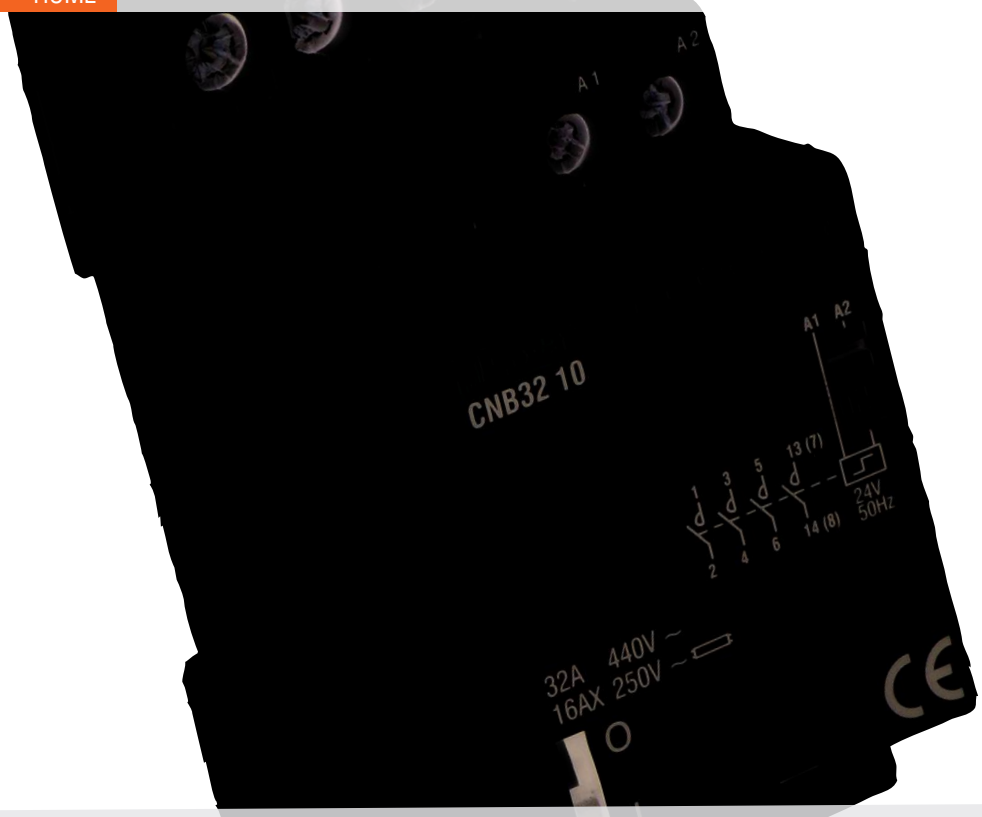
TYPE with relay output		SG2C1NA320	SG2C2PA320
ELECTRICAL PROPERTIES			
SPD per IEC/EN/BS 61643-11		Type 2 (test class II)	
IEC rated voltage Un	VAC	230	
IEC maximum continuous voltage Uc	VAC	320	
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	15/35	15
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	5/20	5
IEC voltage level protection Up	kV	<1.5	
IEC temporary overvoltage (TOV) Ut (L-N for 5s)	VAC	335	
IEC follow current If (N-PE)	Arms	>100	No
Tripping time t_a (L-N/N-PE)	ns	<25 / 100	<25
Thermal isolation protection		Yes	
Backup protection fuse (gG) in case of main fuse >63A	Fusible A	63 gG	
IEC maximum short circuit current (50Hz)	kA	6	
Status indicator - operating / failure	colour	- / Red	
CONNECTIONS			
IEC degree of protection		IP20	
Terminal tightening torque	Nm	0.5 (L,N); 3 (PE)	
Maximum conductor section	mm^2	L,N: 4 (flexible) / 6 (rigid) PE: 25 (flexible) / 35 (rigid)	
AMBIENT CONDITIONS			
Operating temperature		-40...+85°C	
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)	
Material		Thermoplastic, RAL 7035, UL 94 V-0	

TYPE		SA31NA320R	SA31NA275MS	SA31NA275ML
ELECTRICAL PROPERTIES				
SPD per IEC/EN/BS 61643-11		Type 3 (test class III)		
IEC rated voltage Un	VAC	230	230	
IEC maximum continuous voltage Uc	VAC	320	275	
Combined impulse (1.2/50; 8/20) Uoc/Icw	kV/kA	10/5	6/3	
IEC max discharge current Imax (8/20)	kA	10	–	
IEC level protection Up (L-N/N-PE)	kV	<1.5	<1.5 / <1.7	
IEC temporary overvoltage TOV Ut (L-N per 5s)	VAC	337		
Tripping time t_a (L-N/N-PE)	ns	<100ns		
IEC backup protection	A	63A fuse gG (line fuse >63 A)	MCB/B 16A (if >16 A)	
IEC maximum short circuit current (50Hz)	kA	10	1	
Status indicator - operating / failure		Red replace + relay output	Acoustic (buzzer)	Optical (LED)
CONNECTIONS				
IEC degree of protection		IP20		
Terminal tightening torque (L-N / PE)	Nm	0.5 / 3	–	
Maximum conductor section	mm^2	L-N: 4 (flexible) / 6 (rigid); PE: 25 (flexible) / 35 (rigid)	1 (rigid)	
RELAY OUTPUT FOR REMOTE STATUS INDICATION				
Type of contact		Changeover (NO/NC)	–	
Contact capacity	A	0.5A 250VAC; 3A 125VAC	–	
Contact terminal tightening torque	Nm	0.25	–	
Maximum contact conductor section	mm^2	1.5	–	
AMBIENT CONDITIONS				
Operating temperature		-40...+85°C		
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)	Socket circuit, terminal block, electrical conduct	
Material		Thermoplastic, RAL 7035, UL 94 V-0		

TYPE for data and signal lines		SASD5VR	SASD024VR	SASDTELDIN	SASDTELIP	SASDET6
ELECTRICAL PROPERTIES						
SPD per IEC/EN/BS 61643-11		Type D1/C1/C2/C3				
Application		RS485	BUS 24VDC	Telephone line	Telephone line	Ethernet Cat.6, POE
IEC rated voltage Un	VDC	5	30	110	110	48
IEC maximum discharge current Uc	VDC	6	33	170	180	50
C2 rated current In (8/20)	kA	10	10	10	10	10
Maximum discharge current Imax (8/20)	kA	20	20	20	20	10
D1 impulse current limp (10/350)	kA	2.5	2.5	2.5	7.5	1
EN residual voltage Ures at 5kA (8/20)	V	<22	<42	<450	–	–
Protection level Up (L-L)	V	<10	<43	<264	<250	<150
Load current I_L a 25°C	A	1	1	1	0.6	1
Tripping time t_a	ns	<1	<1	<1	–	<1
Line resistance	Ω	1.6...2.0	1.6...2.0	1.6...2.0	1.6...2.0	–
Capacity	pF	50	50	50	20	–
Bandwidth	MHz	30	30	30	250	250, Cat.6
CONNECTIONS						
IEC degree of protection		IP20	IP20	IP20	IP66	IP20
Terminal tightening torque	Nm	0.5	0.5	0.5	(Terminals PCB)	(RJ45 sockets)
Conductor section (L / PE)	mm^2	4 (max) / 6 (min)	4 (max) / 6 (min)	4 (max) / 6 (min)	2.5 (max) / 0.13 (min)	–
RELAY OUTPUT FOR REMOTE STATUS INDICATION						
Type of contact		NC	NC	–	–	–
Contact capacity	A	0.5A 250VAC; 1A 50VDC		–	–	–
Maximum contact conductor section	mm^2	0.3...4	0.3...4	–	–	–
AMBIENT CONDITIONS						
Operating temperature		-40...+80°C	-40...+80°C	-40...+80°C	-25...+40°C	-40...+80°C
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)			Screw	On 35mm DIN rail (IEC/EN/BS 60715)
Material		Thermoplastic, V-0	Thermoplastic, V-0	Thermoplastic, V-0	Polypropylene	Metal

TYPE without relay output		–	–	SG2DG600M2	SG2DGK10M3	SG2DGK50M3	SA2EDGK10M3
with relay output		SG2EDGK10M3R	SG2EDGK50M3R	SG2DG600M2R	SG2DGK10M3R	SG2DGK50M3R	–
ELECTRICAL PROPERTIES							
SPD per IEC/EN/BS 61643-11		Type 1,2 (test class I, II)	Type 1,2 (test class I, II)	Type 2 (test class II)			
IEC rated voltage Un	VDC	1100	1500	600	1100	1500	1100
Maximum continuous voltage Ucpv	VDC	1100	1500	600	1100	1500	1100
IEC impulse current limp (10/350)	kA	6.25	6.25	–	–	–	–
Maximum discharge current Imax (8/20)	kA	40	60	40	40	30	40
Rated discharge current In (8/20)	kA	20	20	20	20	20	20
Protection level Up	kV	<3.8	<4.5	<1.9	<3.8	<5.0	<4.0
EN residual voltage Ures at 5kA (8/20)	kV	–	3.4	1.5	–	–	–
Tripping time t_a	ns	<25					
Thermal isolation protection		Yes					
EN maximum short circuit current Iscpv	kA	11	30	11			9
Status indicator - operating / failure	colour	Green / Red					
CONNECTIONS							
EN degree of protection		IP20					
Terminal tightening torque	Nm	4.5		4.5			2.5
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC)					
Contact capacity	A	1A 250VAC; 1A 125VAC; 0.5A 48VDC; 0.5A 24VDC; 0.5A 12VDC					
Maximum contact conductor section	mm^2	1.5					
AMBIENT CONDITIONS							
Operating temperature		-40...+85°C					
Fixing		On 35mm DIN rail (IEC/EN/BS 60715)					
Material		Thermoplastic, RAL 7035, UL 94 V-0					

Modular contactors and other modular devices



- Two, three and four-pole contactors, 20A to 63A
- Silent during operation or control stage
- Contactors with manual control
- Latching relays
- Add-on auxiliary contacts
- 12VAC or 230VAC bells and buzzers
- 12 to 63VA modular safety transformers
- Modular sockets.

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Modular contactors
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ONE AND TWO-POLE CONTACTORS
- IEC rated current Ith AC1 (400V): 20A and 32A
- IEC rated current AC3 (400V): 9A
- Ideal for domestic and service applications.



Page 19-2

THREE AND FOUR-POLE CONTACTORS
- IEC rated current Ith AC1 (400V): 25A, 32A, 40A and 63A
- IEC rated current AC3 (400V): 8.5A, 22A and 30A
- Ideal for industrial and service applications, such as office buildings, stores, hospitals, hotels, etc.



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ONE AND TWO-POLE CONTACTORS WITH MANUAL CONTROL
- IEC rated current Ith AC1 (400V): 20A and 32A
- IEC rated current AC3 (400V): 9A
- Ideal for functional tests and dual tariff systems in domestic and service applications.



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THREE AND FOUR-POLE CONTACTORS WITH MANUAL CONTROL
- IEC rated current Ith AC1 (400V): 32A
- IEC rated current AC3 (400V): 8.5A
- Ideal for functional tests and dual tariff systems in domestic and service applications.



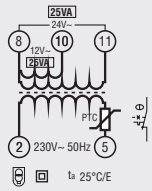
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LATCHING RELAYS
- IEC rated current Ith AC1 (400V): 20A and 32A
- IEC rated current AC3 (400V): 9A and 8.5A
- 2 position hand toggle actuator
- Coil cut-off selector
- Ideal for lights control.



Page 19-5

BELLS AND BUZZERS
- 12VAC or 230VAC power supply
- Ideal for audible signalling in domestic and service applications.



Page 19-5

MODULAR SAFETY TRANSFORMERS
- Power supply primary: 230VAC
- 12VAC or 24VAC output voltages
- Available powers: 15, 25, 40 and 63VA.



Page 19-5

MODULAR SOCKET
- 16A modular socket Italian and German (Schuko) standard.

Lovato electric

Contactors



CN20…
CN3211… - CN3220…



CN25…
CN3210… - CN3201…



CN40…



CN63…

Order code	Rated auxiliary supply voltage	Configuration and number of contacts		Qty per pkg	Wt
	[V]❶	√NO	ŧNC	n°	[kg]
One-pole or two-pole. 1 module. Ith 20A.					
CN2011024❼	24VAC/DC	1	1❸	10	0.135
CN2011220❼	220...230VAC❻	1	1❸	10	0.135
CN2020012❼	12VAC/DC	2	—	10	0.135
CN2020024❼	24VAC/DC	2	—	10	0.135
CN2020220❼	220...230VAC❻	2	—	10	0.135
CN2002024❼	24VAC/DC	—	2	10	0.135
CN2002220❼	220...230VAC❻	—	2	10	0.135
One-pole or two-pole. 1 module. Ith 32A.					
CN3211024❷❼	24VAC/DC	1	1❸	10	0.135
CN3211220❷❼	220...230VAC❻	1	1❸	10	0.135
CN3220012❷❼	12VAC/DC	2	—	10	0.135
CN3220024❷❼	24VAC/DC	2	—	10	0.135
CN3220220❷❼	220...230VAC❻	2	—	10	0.135
Three-pole or four-pole. 2 modules. Ith 25A.					
CN2510024❺	24VAC/DC	4❹	—	5	0.260
CN2510220❺	220...230VAC❻	4❹	—	5	0.260
CN2501024❺	24VAC/DC	3	1❹	5	0.260
CN2501220❺	220...230VAC❻	3	1❹	5	0.260
CN2522220❷	220...230VAC❻	2	2	5	0.260
Three-pole or four-pole. 2 modules. Ith 32A.					
CN3210024❺	24VAC/DC	4	—	5	0,260
CN3210220❺	220...230VAC❻	4	—	5	0,260
CN3201024❺	24VAC/DC	3	1❸	5	0,260
CN3201220❺	220...230VAC❻	3	1❸	5	0,260
Three-pole or four-pole. 3 modules. Ith 40A.					
CN4010024❺	24VAC/DC	4❹	—	5	0.425
CN4010220❺	220...230VAC❻	4❹	—	5	0.425
CN4001024❺	24VAC/DC	3	1❹	5	0.425
CN4001220❺	220...230VAC❻	3	1❹	5	0.425
CN4022220❺	220...230VAC❻	2	2❹	5	0.425
Three-pole or four-pole. 3 modules. Ith 63A.					
CN6310024	24VAC/DC	4❹	—	5	0.425
CN6310220	220...230VAC❻	4❹	—	5	0.425
CN6301024	24VAC/DC	3	1❹	5	0.425
CN6301220	220...230VAC❻	3	1❹	5	0.425
CN6322220	220...230VAC❻	2	2❹	5	0.425

❶ Other voltages on request. Consult Technical support; see contact details on front cover.
❷ 2NC version supplied on request.
❸ The last (NC) pole has the same characteristics as the power pole. It can therefore be used indifferently as an auxiliary or as a NC power contact.
❹ The fourth NO or NC pole has the same characteristics as the power poles; therefore it can be used indifferently as auxiliary or as power contact.
❺ On request can be supplied: 4NC power poles. Consult Technical support; see contact details on front cover.
❻ Can also operate at 220VDC.
❼ No auxiliary contacts can be mounted.

Maximum number of contactors side-by-side

When contactors are mounted side by side and operate in continuous service (1 hour), spacing is needed between equipment to allow appropriate cooling.
9mm spacing is required; there is an accessory, called half-module spacer, order code CNX80, for this specific type of mounting. The following table indicates details of the space needed between each.

Maximum number of contactors to be mounted side-by-side without spacing; the CNX80 spacer is required when the number of pieces is more than the indicated below:

	CN20	CN32	CN25	CN40	CN63
Ambient temperature ≤40°C	3	3	3	3	3
Ambient temperature >40°...55°C	2	2	2	3	2

General characteristics

- DC powered magnetic core system assuring silent operation and noise damping during the control phase
- Overvoltage protection circuit and voltage peak limitation of the magnetic core
- Equipped with 2 or 4 closing contacts of equal capacity permitting use in power or auxiliary circuits
- Operation flag indicator.

Operational characteristics

Type	IEC conventional free-air thermal current Ith, AC1 and AC-7a ≤400V [A]	Operational current AC3 and AC-7b ≤400V [A]	Protection fuse gG (IEC) [A]
One-pole or two-pole.			
CN20...	20	9	20
CN32...	32	9	32
Three-pole or four-pole.			
CN25...	25	8.5	25
CN32...	32	8.5	32
CN40...	40	22	63
CN63...	63	30	80

- Noise level:
  - Closed contactor <20dB
  - Making/breaking operation ≤50dB
- IEC degree of protection: IP20
- Mounting on 35mm DIN rail (IEC/EN/BS 60175).

Operational characteristics of contactor-incorporated auxiliary contacts

Type	IEC insulation voltage Ui	IEC rating (AC15 category)	
		230V	400V
	[V]	[A]	[A]
CN20...	440	6	6
CN25...	440	6	4
CN32...	440	6	4
CN40...	500	6	4
CN63...	500	6	4

Utilisation

- Lighting systems
- Electric home heating
- Heat pumps
- Conditioning
- Ventilation
- Civil installations.

Lighting circuit switching

See pages 19-10 and 11.

Special versions

Contactors with Mirror Contact function, as per IEC/EN/BS 60947-4-1 Standard, Annex F, are available on request. Consult Technical support; see contact details on front cover.

Certifications and compliance

Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, IEC/EN/BS 60947-5-1, IEC/EN/BS 61095.

Contactors with manual control



CNM20... - CNM3220...



CNM3210...

Order code	Rated auxiliary supply voltage	Configuration and number of contacts		Qty per pkg	Wt
	[V]❶	⟍NO	⟍NC	n°	[kg]
One-pole or two-pole. 1 module. Ith 20A.					
CNM2011024❷❻	24VAC/DC	1	1❸	10	0.135
CNM2011220❷❻	220...230VAC❺	1	1❸	10	0.135
CNM2020012❷❻	12VAC/DC	2	—	10	0,135
CNM2020024❷❻	24VAC/DC	2	—	10	0.135
CNM2020220❷❻	220...230VAC❺	2	—	10	0.135
One-pole or two-pole. 1 module. Ith 32A.					
CNM3220012❷❻	12VAC/DC	2	—	10	0.135
CNM3220024❷❻	24VAC/DC	2	—	10	0.135
CNM3220220❷❻	220...230VAC❺	2	—	10	0.135
Three-pole or four-pole. 2 module. Ith 32A.					
CNM3210024❷❻	24VAC/DC	4❹	—	5	0.260
CNM3210220❷❻	220...230VAC❺	4❹	—	5	0.260

❶ Other voltages on request. Consult Technical support; see contact details on front cover.
❷ 2NC version supplied on request.
❸ The last (NC) pole has the same characteristics as the power pole. It can therefore be used indifferently as an auxiliary or as a NC power contact.
❹ The fourth NO or NC pole has the same characteristics as the power poles; therefore it can be used indifferently as auxiliary or as power contact.
❺ Can also operate at 220VDC.
❻ No auxiliary contacts can be mounted.

Maximum number of contactors side-by-side
When contactors are mounted side by side and operate in continuous service (1 hour), spacing is needed between equipment to allow appropriate cooling.
9mm spacing is required; there is an accessory, called half-module spacer, order code CNX80, for this specific type of mounting. The following table indicates details of the space needed between each.

Maximum number of contactors to be mounted side-by-side without spacing; the CNX80 spacer is required when the number of pieces is more than the indicated below:

	CNM20	CNM32
Ambient temperature ≤40°C	3	3
Ambient temperature >40°...55°C	2	2

General characteristics
- DC powered magnetic core system assuring silent operation and noise damping during the control phase
- Overvoltage protection circuit and voltage peak limitation of the magnetic core
- Equipped with 2 or 4 closing contacts of equal capacity permitting use in power or auxiliary circuits
- Operation flag indicator
- Handle functions
  Position A: contactor function.
  Position O: contactor permanently switched off, even in case of coil control voltage is present.
  Position I: contactor closed manually; when the coil is supplied the handle automatically moves to A position.

Operational characteristics

Type	IEC conventional free-air thermal current Ith AC1 and AC-7a ≤400V [A]	Operational current AC3 and AC-7b ≤400V [A]	Protection fuse gG (IEC) [A]
One-pole or two-pole.			
CN20...	20	9	20
CN32...	32	9	32
Three-pole or four-pole.			
CN32...	32	8,5	32

- Noise level:
  • Closed contactor <20dB
  • Making/breaking operation ≤50dB
- IEC degree of protection: IP20
- Mounting on 35mm DIN rail (IEC/EN/BS 60175).

Operational characteristics of contactor-incorporated auxiliary contacts

Type	IEC insulation voltage Ui	IEC rating (AC15 category)	
		230V	400V
	[V]	[A]	[A]
CN20...	440	6	6
CN32...	440	6	4

Utilisation
- Lighting systems
- Electric home heating
- Heat pumps
- Conditioning
- Ventilation
- Civil installations.

Lighting circuit switching
See pages 19-10 and 11.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, IEC/EN/BS 60947-5-1, IEC/EN/BS 61095.

Add-on blocks and accessories for contactors and contactors with manual control



CNH...



CNP2

Order code	Characteristics	Max qty per contactor	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contacts❼.				
CNH11❼	1NO + 1NC	1	1	0.044
CNH20❼	2NO	1	1	0.044
Set for terminal protection (also sealable).				
CNP0	For CN20..., CNM20... and CNM32...	2	1❽	0.001
CNP1	For CN25... and CNM32...	2	1❽	0.002
CNP2	For CN40... and CN63...	2	1❽	0.003
Spacer.				
CNX80	1/2 mod. wide	1	10	0.013

Operational characteristics for auxiliary contacts
- IEC rated insulation voltage: 440VAC
- IEC conventional free air thermal current Ith: 6A
- Minimum switching capacity: 5mA 12V
- Conductor section: 1...2.5mm²
- Maximum tightening torque: 1Nm.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, IEC/EN/BS 60947-5-1, IEC/EN/BS 61095.

❼ Not suitable for CN20..., CN32 11..., CN32 20..., CNM20... and CNM32... modular contactors.
❽ Set of 2 pieces.

Latching relays



CNB20... - CNB3220...



CNB3210...

Order code	Rated auxiliary supply voltage	Configuration and number of contacts		Qty per pkg	Wt
	[V]❶	⅂NO	⊦NC	n°	[kg]
One-pole or two-pole. 1 module. Ith 20A.					
CNB2010230	230VAC	1	—	8	0.135
CNB2011012	12VAC	1	1❷	8	0.135
CNB2011024	24VAC	1	1❷	8	0.135
CNB2011230	230VAC	1	1❷	8	0.135
CNB2020012	12VAC	2	—	8	0.135
CNB2020024	24VAC	2	—	8	0.135
CNB2020230	230VAC	2	—	8	0.135
One-pole or two-pole. 1 module. Ith 32A.					
CNB3220012	12VAC	2	—	8	0.135
CNB3220024	24VAC	2	—	8	0.135
CNB3220230	230VAC	2	—	8	0.135
Three-pole or four-pole. 2 module. Ith 32A.					
CNB3210012	12VAC	4❸	—	4	0.195
CNB3210024	24VAC	4❸	—	4	0.195
CNB3210230	230VAC	4❸	—	4	0.195

❶ Other voltages on request. Consult Technical support; see contact details on front cover.
❷ The last (NC) pole has the same characteristics as the power pole. It can therefore be used indifferently as an auxiliary or as a NC power contact.
❸ The fourth NO or NC pole has the same characteristics as the power poles; therefore it can be used indifferently as auxiliary or as power contact.

General characteristics
- Mechanical system that keeps the contactor in position without the coil being powered
- Includes a manual control system and a switch to lock the coil command
- Equipped with 2 or 4 closing contacts of equal capacity permitting use in power or auxiliary circuits
- Operation flag indicator
- No consumption of the closed electromagnet contactor with considerable advantages in reducing the dissipated heat.

Operational characteristics

Type	IEC conventional free-air thermal current Ith, AC1 and AC-7a ≤400V [A]	Operational current AC3 and AC-7b ≤400V [A]	Protection fuse gG (IEC) [A]
One-pole or two-pole.			
CNB20...	20	9	20
CNB32...	32	9	32
Three-pole or four-pole.			
CNB32...	32	8,5	32

- Noise level:
  - Closed contactor 0dB (mechanically closed)
  - Making/breaking operation ≤50dB
- IEC degree of protection: IP20
- Mounting on 35mm DIN rail (IEC/EN/BS 60175).

Operational characteristics of contactor-incorporated auxiliary contacts

Type	IEC insulation voltage Ui	IEC rating (AC15 category)	
		230V	400V
	[V]	[A]	[A]
CNB20...	440	6	6
CNB32...	440	6	4

Utilisation
- Lighting systems
- Electric home heating
- Heat pumps
- Conditioning
- Ventilation
- Civil installations.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, IEC/EN/BS 60947-5-1, IEC/EN/BS 61095, IEC/EN/BS 60669-1, IEC/EN/BS 60669-2-2.

Add-on blocks and accessories



CNBX...

CNP3

Order code	Characteristics	Max qty per contactor	Qty per pkg	Wt
		n°	n°	[kg]
Auxiliary contacts.				
CNBX11	1NO + 1NC	1	1	0.032
CNBX20	2NO	1	1	0.032
Set for terminal protection (also sealable).				
CNP3	For CNB...	❹	1❺	0.002

❹ To cover all the terminals, mount: 2 pieces for one module latching relay; 2 set of 2 pieces for two module latching relay.
❺ Set of 2 pieces.

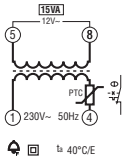
Operational characteristics for auxiliary contacts
- IEC rated insulation voltage: 440VAC
- IEC conventional free air thermal current Ith: 6A
- Minimum switching capacity: 5mA 12V
- Conductor section: 1...2.5mm^2
- Maximum tightening torque: 1Nm.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-5-1, IEC/EN/BS 61095.

Bells and buzzers



CBE... CBZ230A



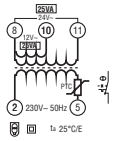
CTRB15VA

Order code	Description	Supply voltage	Output voltage	Qty per pkg	Wt
				n°	[kg]
CBE012A	Modular bell	12	–	1	0.077
CBE230A	Modular bell	230	–	1	0.073
CBZ230A	Modular buzzer	230	–	1	0.063
CTRB15VA	Modular transformer for 15VA bell	230	12	1	0.339

General and operational characteristics
- Sound intensity, distance 1m: buzzer 80dB, bells 84dB
- Power consumption: 10VA (5VA for CBE012A)
- Operating temperature: -10...+55°C (-10...+40°C for CTRB15VA)
- Storage temperature: -40...+80°C
- Conductor section (min...max): 0.5...1.5mm²
- Tightening torque: 0.5Nm
- Screw terminals: M3
- DIN modules: CBE... 1 module; CBZ... 1 module; CTRB15VA 2 modules
- CTRB15VA can only be used for bell power supply (intermittent operation)
- CTRB15VA overload and short circuit protection integrated (PTC).

Certifications and compliance
Certifications obtained: EAC (except CTRB15VA).
Compliant with standards: IEC/EN/BS 62080.

Modular safety transformers



CTRS...

Order code	Power	Supply voltage	Output voltage	Qty per pkg	Wt
				n°	[kg]
CTRS15VA	15	230	12-24	1	0.477
CTRS25VA	25	230	12-24	1	0.582
CTRS40VA	40	230	12-24	1	0.846
CTRS63VA	63	230	12-24	1	1.319

General and operational characteristics
- Safety transformers suitable for continuous operation
- Overload and short circuit protection integrated (PTC)
- Operating temperature: -10...+25°C
- Storage temperature: -40...+70°C
- Conductor section (min...max): 0.5...10mm²
- Tightening torque: 1Nm
- Screw terminals: M4
- DIN modules: CTRS15VA 3 modules; CTRS25VA 3 modules; CTRS40VA 4 modules; CTRS63VA 6 modules.

Reference standards
Compliant with standards: IEC/EN/BS 61558-2-8.

Modular socket



P1X7

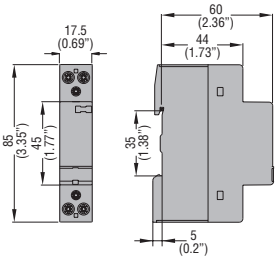
Order code	Description	Qty per pkg	Wt
		n°	[kg]
P1X7	Modular socket Italian and German (Schuko) standard;16A	5	0.123

General and operational characteristics
- Operating temperature: -25...+45°C
- Storage temperature: -40...+75°C
- Max. current: 16A
- Connectable section 1.5...10mm²
- Tightening torque: 1.8Nm
- Fixing on 35mm DIN rail (IEC/EN/BS 60715)
- DIN modules: 2.5.

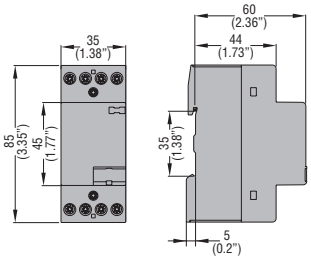
Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/BS 60884-1.

MODULAR CONTACTORS

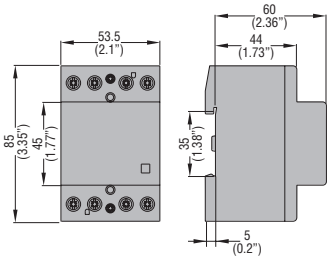
CN20... - CN32... (one-pole - two-pole)



CN25... - CN32... (three-pole - four-pole)

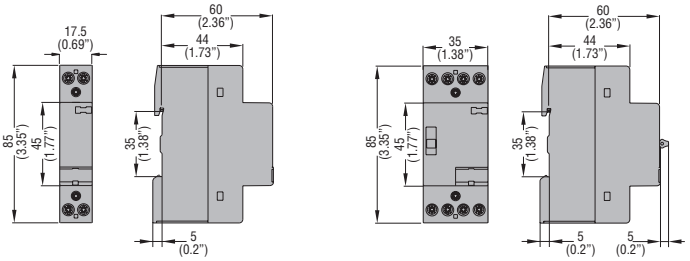


CN40... - CN63... (three-pole - four-pole)



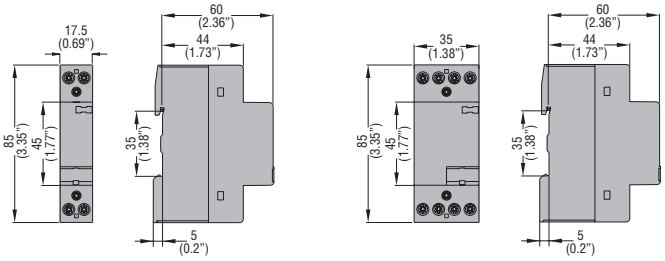
MODULAR CONTACTORS WITH MANUAL CONTROL

CNM20... - CNM32... (one-pole - two-pole) **CNM32...** (three-pole - four-pole)



LATCHING RELAYS

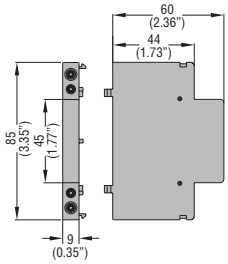
CNB20... - CNB32... (one-pole - two-pole) **CNB32...** (three-pole - four-pole)



ADD-ON BLOCKS AND ACCESSORIES

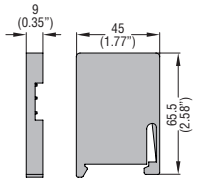
Auxiliary contacts

CNH... - CNBX...



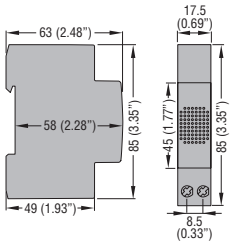
Spacer

CNX80



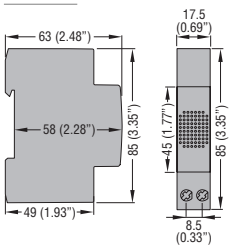
BELLS

CBE...



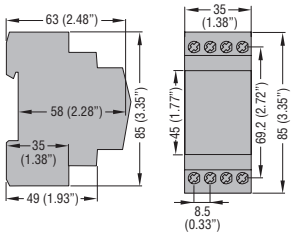
BUZZER

CBZ230A



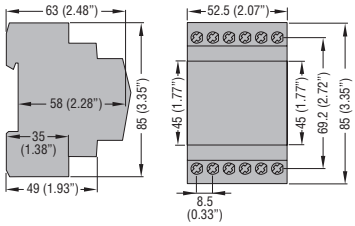
TRANSFORMER FOR BELLS

CTRB15VA

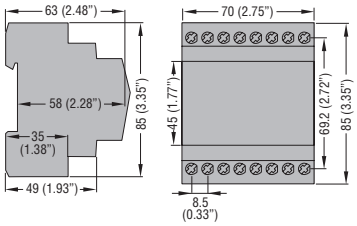


MODULAR SAFETY TRANSFORMERS

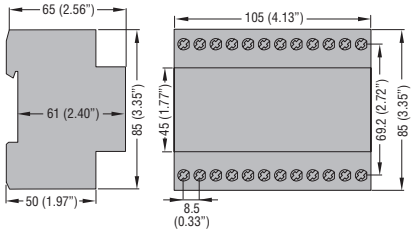
CTRS15VA - CTRS25VA



CTRS40VA

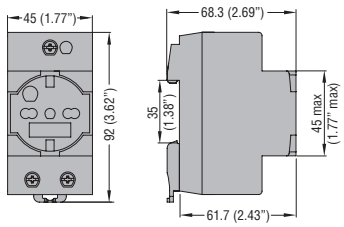


CTRS63VA



MODULAR SOCKET

P1X7

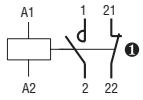


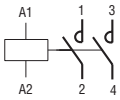
ONE-POLE AND TWO-POLE MODULAR CONTACTORS

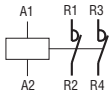
CN2011
CN3211
CNM2011

CN2020
CN3220
CNM2020
CNM3220

CN2002





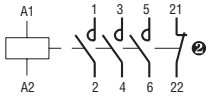


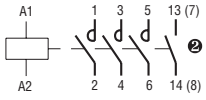
THREE-POLE AND FOUR-POLE MODULAR CONTACTORS

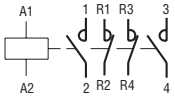
CN2501
CN3201
CN4001
CN6301

CN2510
CN3210
CN4010
CN6310
CNM3210

CN2522
CN4022
CN6322







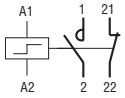
❶ The NC contact has the same characteristics as the power pole contact. Therefore, it can be used indifferently as an auxiliary or as a NC power pole contact.
❷ The fourth pole NO or NC has the same characteristics as the power poles. Therefore, it can be used indifferently as auxiliary or as power pole contact.

LATCHING RELAYS

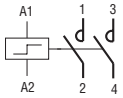
CNB2010



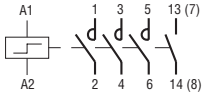
CNB2011



CNB2020
CNB3220



CNB3210



ADD-ON AUXILIARY CONTACTS

CNH11
CNBX11

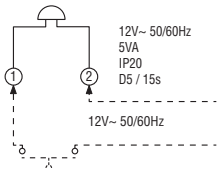


CNH20
CNBX20

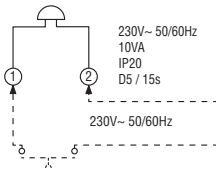


BELLS

CBE012A

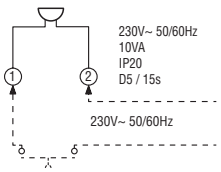


CBE230A



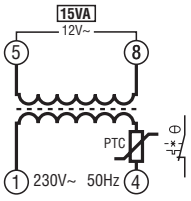
BUZZER

CBZ230A



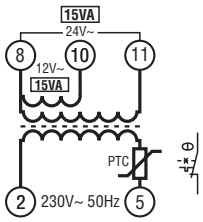
TRANSFORMER FOR BELLS

CTRB15VA

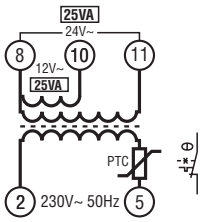


MODULAR SAFETY TRANSFORMERS

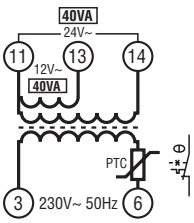
CTRS15VA



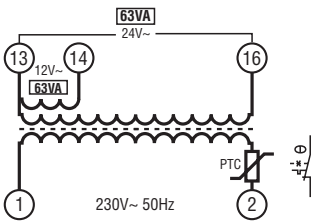
CTRS25VA



CTRS40VA



CTRS63VA



TYPE			CN20... - CNM20...	CN25...	CN32... - CNM32... (one-pole and two-pole)	CN32... - CNM32... (three-pole and four-pole)	CN40...	CN63...
CONTACT CHARACTERISTICS								
IEC conventional free-air thermal current Ith (≤40°C)		A	20	25	32	32	40	63
IEC rated insulation voltage Ui		V	440					
IEC rated impulse withstand voltage Uimp		kV	4					
Minimum switching capacity			17V ≥50mA					
Max fuse size, gG type, for Type 1 coordination, 400V - 3kA		A	25	25	32	32	63	80
Power dissipation for Ith pole		W	1.7	2	2.5	2.5	4	8
Maximum tightening torque for coil terminals		Nm	0.6	0.6	0.6	0.6	0.6	0.6
		lb.in	5.3	5.3	5.3	5.3	5.3	5.3
		Pozidr.	PZ1	PZ1	PZ1	PZ1	PZ1	PZ1
Coil conductor section	min.	mm^2	1					
	max.	mm^2	2.5					
Maximum tightening torque for power terminals		Nm	1.2	1.2	1.2	1,.2	2	2
		lb.in	10.6	10.6	10.6	10.6	18	18
		Tool	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2
Power conductor section	min.	mm^2	1	1	1	1	1.5	1.5
	max.	mm^2	10	10	10	10	16	16
AC/DC CONTROL CIRCUIT								
Average coil consumption in-rush and holding		W	2.5	3	2.5	3	5	5
Operating voltage limits	pick-up	% Us	85...110					
	drop-out	% Us	20...75					
OPERATING TIMES								
Average time	closing NO	ms	15...45	15...45	15...45	15...45	15...20	15...20
	opening NO	ms	25...50	20...70	20...50	20...70	35...45	35...45
LIFE								
Mechanical		cycles	3,000.000	3,000.000	3,000.000	3,000.000	3,000.000	3,000.000
Electrical (in AC3 duty)		cycles	300,000	500,000	500,000	500,000	150,000	150,000
Electrical (in AC1 duty)		cycles	200,000	200,000	150,000	150,000	100,000	100,000
AMBIENT CONDITIONS								
Operating temperature		°C	-5...+55❶					
Storage temperature		°C	-30...+80					

❶ -25...+70°C (2NO or 4NO configuration). When the operating temperature is between +55°C and +70°C, it is compulsory to have a free space of at least 9mm on the side faces of the contactor.

TYPE			CNB20	CNB32... (one-pole and two-pole)	CNB32... (three-pole and four-pole)
CONTACT CHARACTERISTICS					
IEC conventional free-air thermal current Ith (≤40°C)		A	20	32	32
IEC rated insulation voltage Ui		V	440		
IEC rated impulse withstand voltage Uimp		kV	4		
Minimum switching capacity			≥10V ≥100mA		
Max fuse size, gG type, for Type 1 coordination, 400V - 3kA		A	20	32	32
Power dissipation for Ith pole		W	1.5	3	3
Maximum tightening torque for coil terminals		Nm	0.6	0.6	0.6
		lb.in	5.3	5.3	5.3
		Pozidr.	PZ1	PZ1	PZ1
Coil conductor section	min.	mm^2	1		
	max.	mm^2	4		
Maximum tightening torque for power terminals		Nm	1.2	1.2	1.2
		lb.in	10.6	10.6	10.6
		Pozidr.	PZ2	PZ2	PZ2
Power conductor section	min.	mm^2	1	1	1
	max.	mm^2	10	10	10
CONTROL CIRCUIT					
Coil consumption - In-rush		VA/W	18/13	18/13	7
Max. recommended impulse duration		m/s	50/100		
Min. time between two impulses		m/s	150		
Maximum supply time		h	1		
Operating voltage limits closing		% Us	85...110		
OPERATING TIMES					
Average time	closing NO	ms	5...20		
	opening NO	ms	25...50		
LIFE					
Mechanical		cycles	1,000,000		
Electrical (in AC3 duty)		cycles	100,000		
Electrical (in AC1 duty)		cycles	100,000		
AMBIENT CONDITIONS					
Operating temperature		°C	-25...+55		
Storage temperature		°C	-30...+80		

LIGHTING CIRCUIT SWITCHING

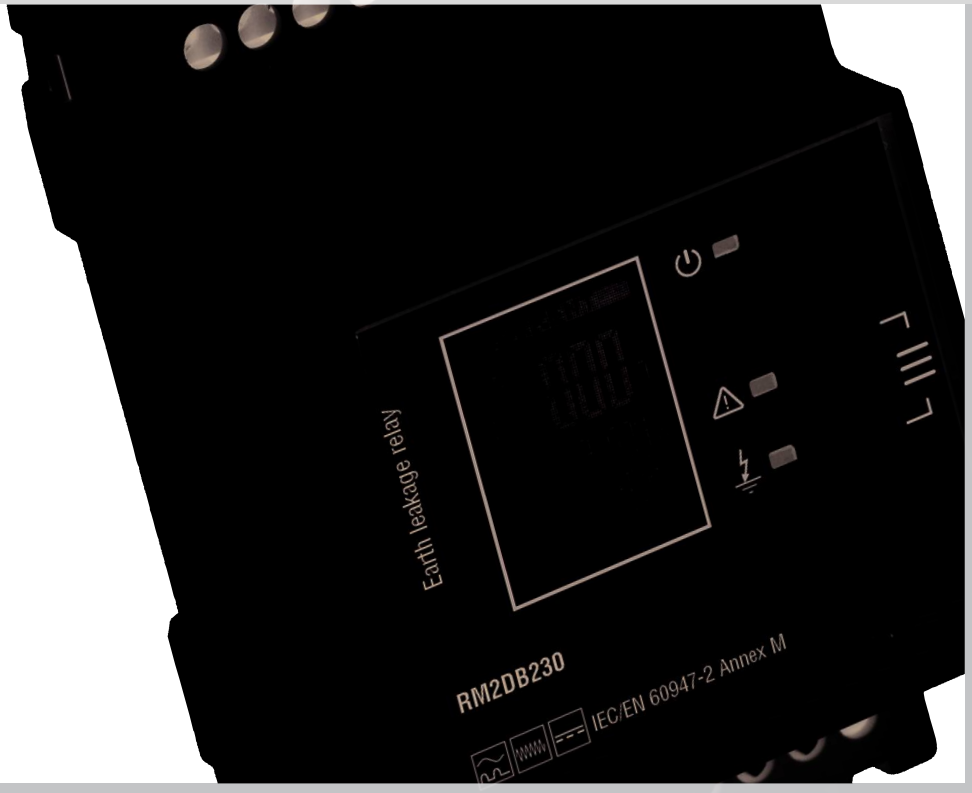
Lamp features	Lamp power	Rated current	Capacitor power	Maximum number [n] of lamps each contactor pole 230V 50Hz				
	[W]	[A]	[µF]	**CN20... - CNM20... CNB20...**	**CN25...**	**CN32... - CNM32... CNB32...**	**CN40**	**CN63**
LED LIGHTING BALLAST	N = number of controlled ballasts❶ In = ballast rated current in mA			N = 2400 / In	N = 3800 / In	N = 4000 / In	N = 11000 / In	N = 18000 / In
INCANDESCENT AND TUNGSTEN HALOGEN	60	0.26	-	33	37	42	67	83
	100	0.44	-	20	22	25	40	50
	500	2.17	-	4	4	5	8	10
	1000	4.35	-	2	2	3	4	5
COMPACT FLUORESCENT (ENERGY SAVING)	3	0.04	-	150	200	250	550	700
	5	0.06	-	90	120	150	330	420
	6	0.07	-	75	100	125	275	350
	7	0.08	-	64	86	107	236	300
	8	0.09	-	56	75	94	206	263
	9	0.1	-	50	67	83	183	233
	10	0.11	-	45	60	75	165	210
	11	0.12	-	41	55	68	150	191
	12	0.13	-	38	50	63	138	175
	13	0.14	-	35	46	58	127	162
	14	0.15	-	32	43	54	118	150
	15	0.16	-	30	40	50	110	140
	16	0.18	-	28	38	47	103	131
	17	0.19	-	26	35	44	97	124
	18	0.2	-	25	33	42	92	117
	20	0.21	-	23	30	38	83	105
	21	0.22	-	21	29	36	79	100
	22	0.23	-	20	27	34	75	95
	23	0.24	-	20	26	33	72	91
	24	0.25	-	19	25	31	69	88
	25	0.26	-	18	24	30	66	84
	26	0.27	-	17	23	29	63	81
	27	0.124	-	17	22	28	61	78
	30	0.15	-	15	20	25	55	70
	50	0.24	-	9	12	15	33	42
	70	0.312	-	6	9	11	24	30
FLUORESCENT not corrected	18	0.37	-	24	30	35	54	86
	25	0.29	-	30	39	45	69	110
	36	0.43	-	20	26	30	47	74
	58	0.67	-	13	17	19	30	48
FLUORESCENT corrected	18	0.19	4.5	7	8	9	49	73
	25	0.15	3.5	9	10	11	63	94
	36	0.29	4.5	7	8	9	49	73
	58	0.46	7	4	5	6	31	47
ELECTRONIC FLUORESCENT BALLAST	14	0.08	-	44	59	64	156	225
	2x14	0.15	-	23	32	34	83	120
	18	0.09	-	39	53	57	139	200
	2x18	0.17	-	21	28	30	74	106
	21	0.11	-	32	43	46	114	164
	2x21	0.22	-	16	22	23	57	82
	28	0.14	-	25	34	36	89	129
	2x28	0.27	-	13	18	19	46	67
	36	0.16	-	22	30	32	78	113
	2x36	0.31	-	11	15	16	40	58
	40	0.21	-	17	23	24	60	86
	2x40	0.42	-	8	11	12	30	43
	58	0.25	-	14	19	20	50	72
	2x58	0.48	-	7	10	11	26	38
	70	0.3	-	12	16	17	42	60
	2x70	0.57	-	6	8	9	22	32
HIGH-PRESSURE MERCURY VAPOUR not corrected	50	0.6	-	14	18	20	38	55
	80	0.8	-	10	13	15	29	42
	125	1.2	-	7	9	10	20	29
	250	2.2	-	4	5	6	10	15
	400	3.3	-	2	3	4	7	10
	700	5.4	-	1	2	3	4	6
	1000	7.5	-	1	1	2	3	4

❶ Usually each LED lamp has one ballast.
In event of one ballast supplies several lamps, the calculation has to consider the number of supplied ballasts.
E.G. If the LED lamp ballast input current is 500mA, (consider CN40=11,000/500=22), the maximum number of ballasts admitted per each pole of CN40 contactor is 22.

LIGHTING CIRCUIT SWITCHING

Lamp features	Lamp power	Rated current	Capacitor power	Maximum number [n] of lamps each contactor pole 230V 50Hz				
	[W]	[A]	[µF]	**CN20... - CNM20... CNB20...**	**CN25...**	**CN32... - CNM32... CNB32...**	**CN40**	**CN63**
HIGH-PRESSURE MERCURY	50	0.3	7	4	5	6	31	47
VAPOUR	80	0.4	8	4	5	5	27	41
corrected	125	0.6	10	3	4	4	22	33
	250	1.2	18	1	2	2	12	18
	400	1.8	25	1	1	1	9	13
	700	3.4	40	0	0	1	5	7
	1000	4.8	60	0	0	0	4	5
METAL HALIDE	35	0.5	-	18	22	28	43	60
not corrected	70	1	-	10	12	14	23	32
	100	1.2	-	8	10	11	19	26
	150	1.8	-	5	7	7	12	18
	250	3	-	3	4	4	7	10
	400	4.6	-	3	3	3	6	9
	600	6.2	-	1	2	2	3	4
	1000	9.7	-	1	1	1	2	3
	2000	12.2	-	0	0	1	1	2
METAL HALIDE	35	0.23	6	5	6	6	36	50
corrected	70	0.42	12	2	3	3	18	25
	100	0.55	12	2	3	3	18	25
	150	0.77	20	1	1	1	11	15
	250	1.26	32	0	1	1	6	9
	400	2	45	0	0	0	5	7
	600	3	65	0	0	0	3	5
	1000	5	85	0	0	0	2	3
	2000	10.5	125	0	0	0	1	2
HIGH-PRESSURE SODIUM	100	1.2	-	7	8	9	25	30
VAPOUR	150	1.8	-	5	6	6	17	22
not corrected	250	3	-	3	4	4	10	13
	400	4.4	-	2	2	2	6	8
	600	6.2	-	1	1	1	4	5
	1000	10.3	-	0	1	1	3	3
HIGH-PRESSURE SODIUM	100	0.55	12	2	3	3	18	2
VAPOUR	150	0.77	20	1	1	2	11	16
corrected	250	1.26	32	0	1	1	6	10
	400	2	45	0	0	0	4	6
	600	2.9	65	0	0	0	3	5
	1000	5.1	100	0	0	0	2	3
LOW-PRESSURE SODIUM	18	0.4	-	22	27	30	71	90
VAPOUR	35	0.6	-	7	9	10	23	30
not corrected	55	0.6	-	7	9	10	23	30
	90	0.9	-	4	5	6	14	19
	135	0.9	-	3	4	5	10	13
	180	0.9	-	3	4	5	10	13
LOW-PRESSURE SODIUM	18	0.35	5	6	7	8	44	66
VAPOUR	35	0.28	20	1	1	2	11	16
corrected	55	0.35	20	1	1	2	11	16
	90	0.55	26	1	1	1	8	12
	135	0.8	40	0	0	1	4	7
	180	1	40	0	0	1	5	8
LOW-PRESSURE SODIUM	35	0.16	-	13	18	21	35	44
VAPOUR	55	0.25	-	8	11	13	22	28
with electronic ballast								

Earth leakage relays



- Versions with type A and type B operating characteristics
- Modular, flush and internal panel mount version, with or without flag indicator, configurable pre-alarm indication and fail safe operation
- Versions with or without display
- Wide range of supply voltages
- Versions with automatic toroid connection control
- Type A and type B toroids
- Adjustable fault current IΔn
- Adjustment and choice of tripping range for both fault current and delay time.

SEC. - PAGE

Type A
Modular version with display, with 1 operation threshold ..... 20 - 2
Modular version with display, with 2 operation thresholds ..... 20 - 2
Modular version, with 1 operation threshold ..... 20 - 2
Flush-mount version with 1 operation threshold ..... 20 - 3
Flush-mount version with 2 operation thresholds ..... 20 - 3
Panel mount version with 1 operation threshold ..... 20 - 3

Type B
Modular version with display, with 2 operation thresholds ..... 20 - 4

Toroidal current transformers ..... 20 - 5
External multiplier ..... 20 - 5
Accessories ..... 20 - 5

Dimensions ..... 20 - 6
Wiring diagrams ..... 20 - 8
Technical characteristics ..... 20 - 10



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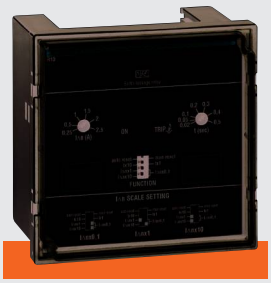
MODULAR VERSION WITH DISPLAY TYPE A
RM1DA, RM2DA type
- Backlit LCD display
- Fault current measurement
- Version with 1 or 2 operation thresholds
- External toroidal transformer
- Adjustable tripping IΔn and delay time
- Version with adjustable third harmonic filter.



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MODULAR VERSION TYPE A
RM1 type
- 1 operation threshold
- External toroidal transformer
- Fixed tripping IΔn and delay time.

RM type
- 1 operation threshold
- External toroidal transformer
- Adjustable tripping IΔn and delay time.



Page 20-3

FLUSH-MOUNT VERSION TYPE A
R1D, R2D, R3D and R4D type
- Version with 1 or 2 operation thresholds.
- External toroidal transformer
- Adjustable tripping IΔn and delay time
- Positive fail safe
- Version with fault current measurement
- Version with digital display
- Version with flag indicator
- Version with shunt tripping circuit.



Page 20-3

COMPACT PANEL MOUNT VERSION TYPE A
RC type
- 1 operation threshold
- Incorporated toroidal transformer
- Adjustable tripping IΔn and delay time
- 35mm to 110mm diameter.



Page 20-4

MODULAR VERSION WITH DISPLAY TYPE B
RM2DB type
- Backlit LCD display
- Measure fault current in AC and DC components
- 2 operation thresholds
- External toroidal transformer
- Adjustable tripping IΔn and delay time
- Harmonics analysis.



Page 20-5

TOROIDAL CURRENT TRANSFORMERS
RT type
- Type A
- Solid core
- 35mm to 210mm diameter.

RTA type
- Type A
- Split core
- 110mm and 210mm diameter.

RTB type
- Type B
- Solid core
- 35mm to 210mm diameter.



Page 20-5

EXTERNAL MULTIPLIER
RX10 type
- 10-fold multiplier.

Modular version with display type A



RM1DA...

new



RM2DA...

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	SPDT	n°	[kg]
1 OPERATION THRESHOLD. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. External CT.				
RM1DA230	230VAC	1	1	0.300
2 OPERATION THRESHOLDS. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. External CT.				
RM2DA230	230VAC	2	1	0.200

General characteristics
- Earth leakage relay type A
- True RMS measurements (TRMS)
- Adjustable third or twenty-first harmonic filter (only for RM2DA230)
- Modular DIN 43880 housing, 2 modules (RM1DA230) or 3 modules (RM2DA230), suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) execution
- 31RT... series external toroid
- Display of the differential current values
- Backlit LCD display with indication of the relay status via display color (green, yellow, red)
- Green power LED indicator (ON)
- Yellow pre-alarm LED indicator (only for RM2DA230)
- Red LED indicator for trip intervention (only for RM2DA230)
- TEST and RESET buttons on the front or remote contact closure (only for RM2DA230)
- 1 (RM1DA230) or 2 (RM2DA230) independent relay outputs, the second output can be set as a pre-alarm threshold
- Operation with positive safety for each relay (settable)
- Digital inputs for test function and remote reset (only for RM2DA230)
- Instantaneous trend graph of the current measurement (only for RM2DA230)
- Fault current intervention event log
- Possibility to protect settings via password
- IEC degree of protection: IP20 terminals, IP40 on front.

ADJUSTMENTS
- Configurable tripping set-point (IΔn): 0.030...30A
- Configurable tripping delay time (t): 0.02...10s.

Certification and compliance
Compliant with standards: RM1DA230: IEC/EN 61010, IEC/EN 61000-6-2 IEC/EN 61000- 6-3, IEC/TR 60755, EN 60947-2 (Annex M). RM2DA230: EN 61326-1:2013-01 EN 61326-2-1:2013-01 EN 61326-2-2:2013-01 EN 61326-2-3:2013-01 EN 61326-2-4:2013-01 EN 61326-2-5:2013-01 EN 60947-2:2017-10 (Annex M) EN 61543/A2:2006-02, EN 61543/A11, EN 61543/A12.

Modular version type A



RM1...



31RM...



31RMT...

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	SPDT	n°	[kg]
1 OPERATION THRESHOLD. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. External CT. Fixed tripping set point and time.				
RM1415	110-240-415V ❶	1	1	0.175
1 OPERATION THRESHOLD. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. External CT.				
31RM48	24-48VAC/DC	1	1	0.190
31RM415	110-240-415V ❶	1	1	0.190
1 OPERATION THRESHOLD. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. Ø28mm/Ø1.1" incorporated CT. Configurable fail safe.				
31RMT415	110-240-415V ❶	2	1	0.375

❶ Supply voltage:
- 110...125VAC (50/60Hz)/DC
- 220...240VAC (50/60Hz)
- 380...415VAC (50/60Hz).

General characteristics
- Earth leakage relay type A
- Configurable fail safe operation for RMT type only
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Modular DIN 43880 housing, 2 modules, with transparent cover, suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715)
- IEC degree of protection: IP20 terminals, IP40 on front with cover.

SETTINGS FOR RM1
- Selectable tripping set-point (IΔn): fixed 0.3A or 0.5A
- Selectable tripping time (t): fixed 0.02s or 0.5s.

ADJUSTMENTS FOR 31RM AND 31RMT
- Configurable tripping set-point (IΔn): 0.025...0.25A, 0.25...2.5A, 2.5...25A, 25...250A (with external multiplier 31RX10 for RM only)
- Configurable tripping delay time (t): 0.02...0.5s, 0.2...5s.

Certification and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-2.

Flush-mount version type A



R1D...



R2D...



R3D...



R4D...

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	SPDT	n°	[kg]
1 OPERATION THRESHOLD. Flush mount. External CT.				
R1D415	110-240-415V ❶	1	1	0.280
2 OPERATION THRESHOLDS. Flush mount. External CT. Fail safe.				
R2D415	110-240-415V❶	2	1	0.395
2 OPERATION THRESHOLDS. Flush mount. External CT. Fail safe. Flag Indicator.				
R3D415	110-240-415V❶	2	1	0.405
2 OPERATION THRESHOLDS. Flush mount. External CT. Fault current measurement. Digital display. Fail safe. Flag indicator.				
R4D415	110-240-415V❶	2	1	0.570

❶ Supply voltage:
– 110...125VAC (50/60Hz)/DC
– 220...240VAC (50/60Hz)
– 380...415VAC (50/60Hz).

General characteristics
R1D415
– Earth leakage relay type A
– Green power LED indicator (ON)
– Red relay tripped LED indicator (TRIP)
– Front TEST and RESET buttons
– Configurable automatic or manual resetting
– Flush mount 96x96mm/3.78”x3.78” housing with transparent cover
– IEC degree of protection: IP20 terminals, IP40 on front with cover.

ADJUSTMENTS FOR R1D
– Configurable tripping set-point (IΔn): 0.025...0.25A, 0.25...2.5A, 2.5...25A, 25...250A (with external multiplier 31RX10)
– Configurable tripping delay time (t): 0.02...0.5s, 0.2...5s.

R2D415 - R3D415 - R4D415
– Earth leakage relay type A
– 2 output relays each with changeover contact, configurable as 2 tripping or 1 tripping and 1 alarm
– Configurable fail safe pre-alarm and operation
– Automatic toroid connection control
– Green power LED indicator (ON)
– Red relay tripped LED indicator (TRIP)
– Red tripping pre-alarm LED indicator (ALARM)
– Front TEST button
– Manual resetting by front RESET button or remote contact closing
– Automatic resetting by remote contact closing or rear jumper connection
– Flag indicator (TRIP MEMORY) (R3D-R4D only)
– Digital fault current measurement and display with configurable tripping value memory (R4D only)
– Shunt tripping circuit operating test (TCS) (R4D only)
– Flush mount 96x96mm/3.78”x3.78” housing with transparent cover
– IEC degree of protection: IP20 terminals, IP40 on front with cover.

ADJUSTMENTS FOR R2D and R3D
– Configurable tripping set-point (IΔn): 0.025...0.25A, 0.25...2.5A, 2.5...25A, 25...250A (with external multiplier 31RX10)
– Pre-alarm set-point: fixed 70%
– Configurable tripping delay time (t): 0.02...0.5s, 0.2...5s.

ADJUSTMENTS FOR R4D
– Configurable tripping set-point (IΔn): 0.03...0.3A, 0.3...3A, 3...30A, 30...300A (with external multiplier 31RX10)
– Pre-alarm set-point: fixed 70%
– Configurable tripping delay time (t): 0.03...0.5s, 0.3...5s.

Certification and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-2.

Panel mount version type A



31RC60...



31RC110...

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	SPDT	n°	[kg]
1 OPERATION THRESHOLD. Compact panel mount. CT incorporated.				
31RC❷48	24-48VAC/DC	1	1	0.485
31RC❷415	110-240-415V ❶	1	1	0.485

❶ Supply voltage:
– 110...125VAC (50/60Hz)/DC
– 220...240VAC (50/60Hz)
– 380...415VAC (50/60Hz).
❷ Replace with the digit of the required diameter (35-60-80-110mm/ 1.38-2.36-3.15-4.33”).

General characteristics
– Earth leakage relay type A
– Green power LED indicator (ON)
– Red relay tripped LED indicator (TRIP)
– Front TEST and RESET buttons
– Configurable automatic or manual resetting
– Compact housing for fixing on panel mounting plate
– IEC degree of protection: IP20 terminals.

ADJUSTMENTS FOR RC
– Configurable tripping set-point (IΔn): 0.025...0.25A, 0.25...2.5A, 2.5...25A
– Configurable tripping delay time (t): 0.02...0.5s, 0.2...5s.

Certification and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-2.

Modular version with display type B



RM2DB...

new

Order code	Rated auxiliary supply voltage	Output contacts	Qty per pkg	Wt
	[V]	SPDT	n°	[kg]
2 OPERATION THRESHOLDS. Modular, 35mm DIN (IEC/EN/BS 60715) rail mounting. External CT.				
RM2DB230	230VAC	2	1	0.200

General characteristics
- Earth leakage relay type B
- True RMS measurements (TRMS)
- Adjustable third or twenty-first harmonic filter (only for RM2DA230)
- Modular DIN 43880 housing, 3 modules, suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) execution
- It can be used with just a single external toroid from the RTB series...
- Display of differential current values, both AC and DC components
- Backlit LCD display with indication of the relay status via display color (green, yellow, red)
- Green power LED indicator (ON)
- Yellow pre-alarm LED indicator
- Red LED indicator for trip intervention
- TEST and RESET buttons on the front or remote contact closure
- 2 independent relay outputs, the second output can be set as a pre-alarm threshold
- Operation with positive safety for each relay (settable)
- Digital inputs for test function and remote reset
- Self-test function to verify the correct connection of the toroidal current transformer
- Possibility to protect settings via password
- IEC degree of protection: IP20 terminals, IP40 on front.

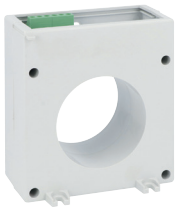
ADJUSTMENTS
- Configurable tripping set-point (IΔn): 0.030...30A
- Configurable tripping delay time (t): 0.02...10s.

Certification and compliance
Compliant with standards: RM2DB230: EN 61326-1:2013-01, EN 61326-2-1:2013-01, EN 61326-2-2:2013-01, EN 61326-2-3:2013-01, EN 61326-2-4:2013-01, EN 61326-2-5:2013-01, EN 60947-2:2017-10 (Annex M), EN 61543/A2:2006-02, EN 61543/A11, EN 61543/A12.

Toroidal current transformers



31RT... 31RT...



RTB...

new

Order code	Diameter	Openable	Qty per pkg	Wt
	[mm/in]		n°	[kg]
Type A.				
31RT35	35/1.38”	No	1	0.200
31RT60	60/2.36”	No	1	0.245
31RT80	80/3.15”	No	1	0.410
31RT110	110/4.33”	No	1	0.400
31RT210	210/8.27”	No	1	1.200
31RTA110	110/4.33”	Yes	1	0.540
31RTA210	210/8.27”	Yes	1	1.820
Type B.				
RTB035	35/1.38”	No	1	0.322
RTB060	60/2.36”	No	1	0.392
RTB080	80/3.15”	No	1	0.602
RTB110	110/4.33”	No	1	0.680
RTB210	210/8.27”	No	1	0.955

Certification and compliance
Certification obtained: EAC (only for 31RT...).
Compliant with standards: IEC/EN/BS 60947-2.

External multiplier



31RX10

Order code	Description	Qty per pkg	Wt
		n°	[kg]
31RX10	10-fold multiplier suitable for R1D, RM, R2D, R3D and R4D types only	1	0.300

General characteristics
– To connect between toroid and relay.

Certification and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-2.

Accessories

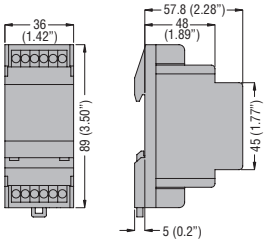


DMXP03

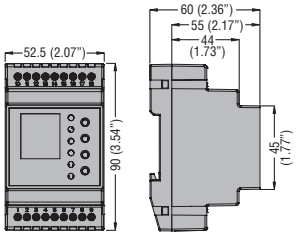
Order code	Description	Qty per pkg	Wt
		n°	[kg]
DMXP03	Panel mounting for 3 modules devices	1	0.052

MODULAR VERSION EARTH LEAKAGE RELAYS

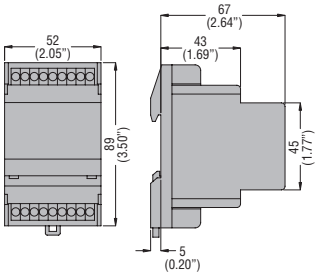
RM1DA230



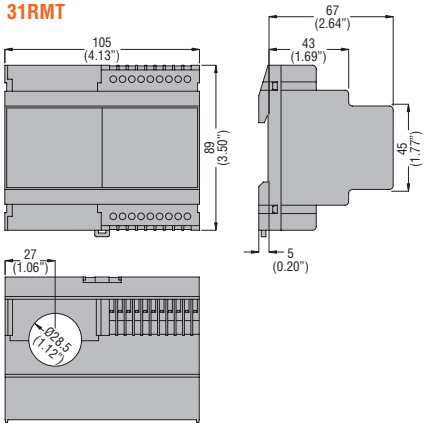
RM2DA230 - RM2DB230



RM1 - 31RM

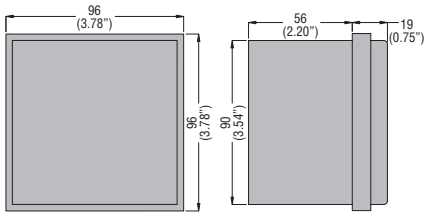


31RMT

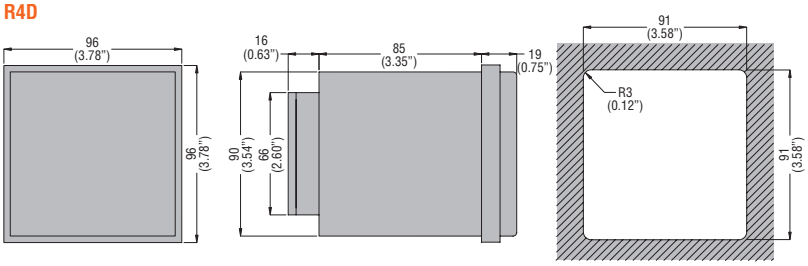


FLUSH-MOUNT VERSION EARTH LEAKAGE RELAYS

R1D - R2D - R3D

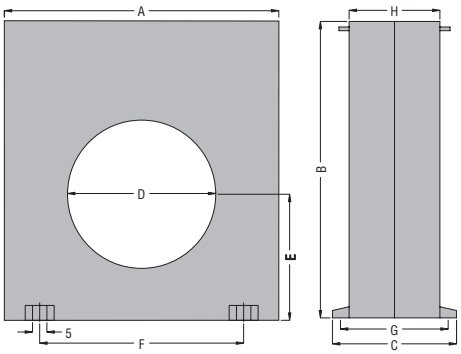


R4D



PANEL MOUNT VERSION EARTH LEAKAGE RELAYS

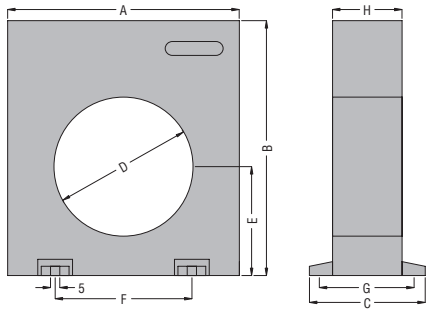
31RC...



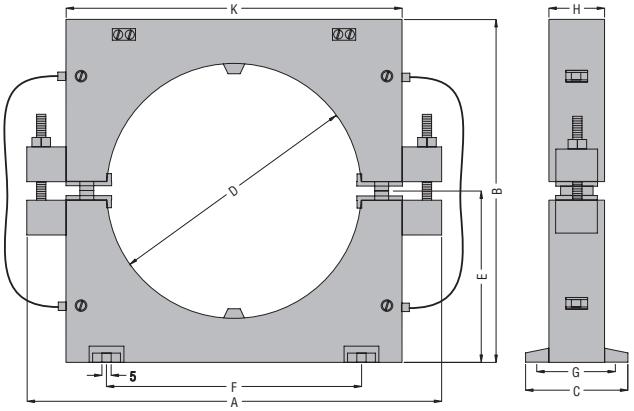
TYPE	A	B	C	D	E	F	G	H
31RC35	100 (3.94")	110 (4.33")	70 (2.75")	35 (1.38")	47 (1.85")	60 (2.36")	60 (2.36")	50 (1.97")
31RC60	100 (3.94")	110 (4.33")	70 (2.75")	60 (2.36")	47 (1.85")	60 (2.36")	60 (2.36")	50 (1.97")
31RC80	150 (5.90")	160 (6.30")	70 (2.75")	80 (3.15")	70 (2.75")	110 (4.33")	60 (2.36")	50 (1.97")
31RC110	150 (5.90")	160 (6.30")	70 (2.75")	110 (4.33")	70 (2.75")	110 (4.33")	60 (2.36")	50 (1.97")

TOROIDAL CURRENT TRANSFORMERS AND EXTERNAL MULTIPLIER

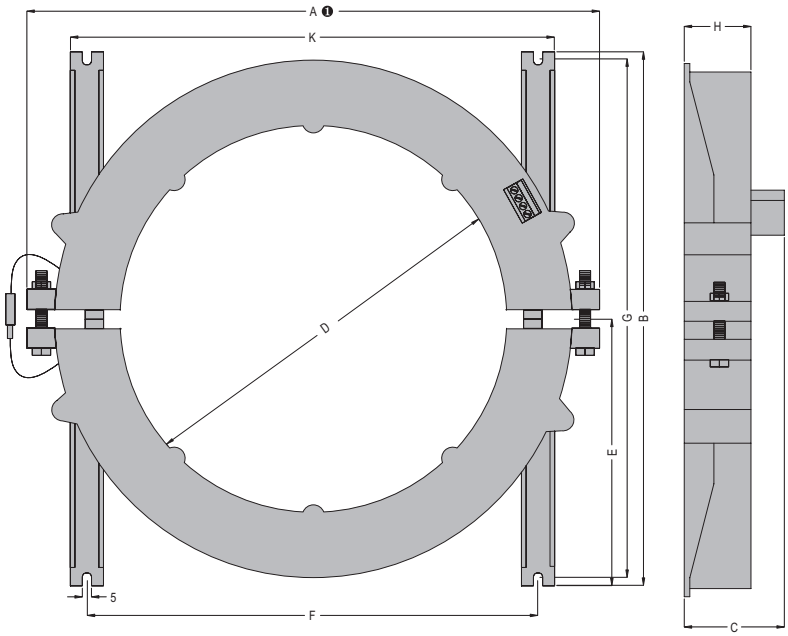
31RT35 - 31RT60 - 31RT80 - 31RT110 - 31RX10
RTB035 - RTB060 - RTB080 - RTB110



31RTA110



31RT210 - 31RTA210 - RTB110

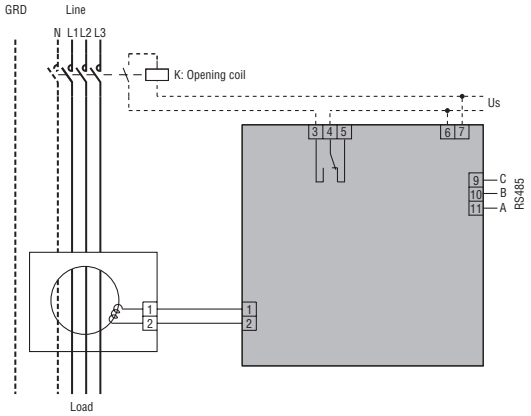


❶ With screws, for 31RTA210 split-core type; fixed structure, without screws, for 31RT210 type.

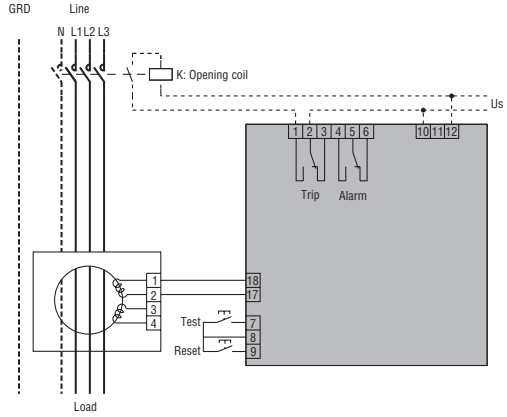
TYPE	A	B	C	D	E	F	G	H	K
31RT35 - RTB035	100 (3.94")	110 (4.33")	50 (1.97")	35 (1.38")	47 (1.85")	60 (2.36")	43 (1.69")	30 (1.18")	—
31RT60 - RTB060	100 (3.94")	110 (4.33")	50 (1.97")	60 (2.36")	47 (1.85")	60 (2.36")	43 (1.69")	30 (1.18")	—
31RT80 - RTB080	150 (5.90")	160 (6.30")	50 (1.97")	80 (3.15")	70 (2.75")	110 (4.33")	43 (1.69")	30 (1.18")	—
31RT110	150 (5.90")	160 (6.30")	50 (1.97")	110 (4.33")	70 (2.75")	110 (4.33")	43 (1.69")	30 (1.18")	—
31RT210 - RTB110	310 (12.20")	290 (11.41")	54 (2.12")	210 (8.27")	145 (5.71")	240 (9.45")	280 (11.02")	36 (1.42")	258 (10.16")
31RTA110	180 (7.09")	150 (5.90")	45 (1.77")	110 (4.33")	75 (2.95")	110 (4.33")	38 (1.50")	25 (0.98")	145 (5.71")
31RTA210	310 (12.20")	290 (11.41")	54 (2.12")	210 (8.27")	145 (5.71")	240 (9.45")	280 (11.02")	36 (1.42")	258 (10.16")
31RX10	100 (3.94")	110 (4.33")	50 (1.97")	—	—	60 (2.36")	43 (1.69")	30 (1.18")	—

EARTH LEAKAGE RELAYS

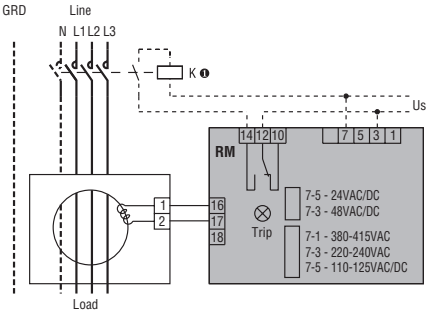
RM1DA230



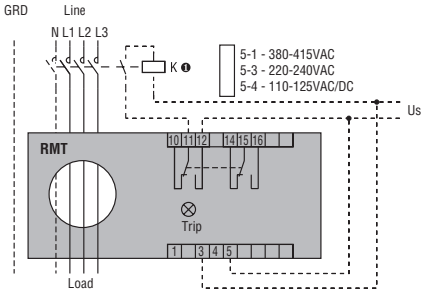
RM2DA230



RM1415 - 31RM...

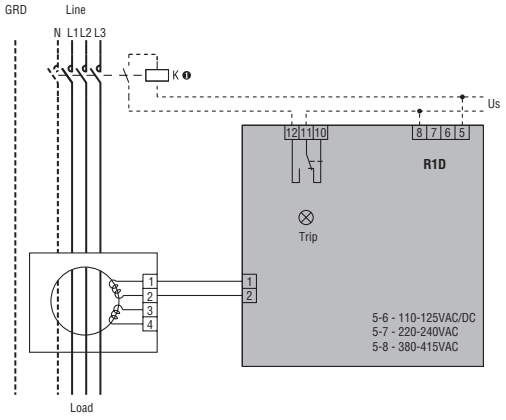


31RMT415

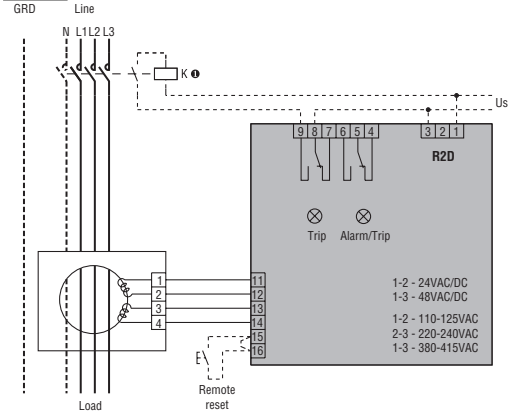


❶ The coil connection can vary depending on the connected type of device (contactor, breaker with shunt trip release or breaker with undervoltage trip release).

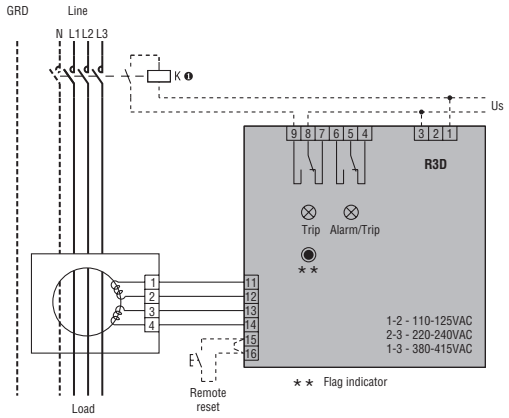
R1D415



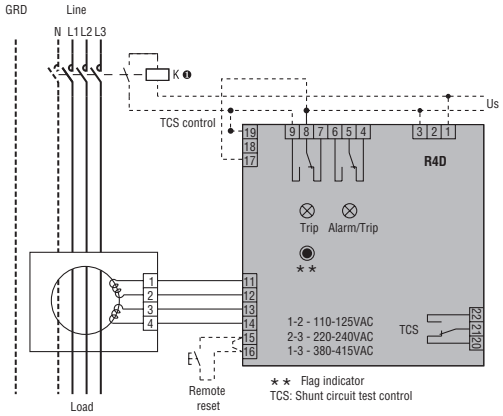
R2D415



R3D415



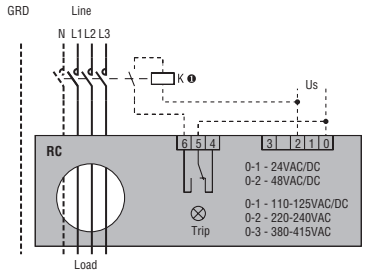
R4D415



❶ The coil connection can vary depending on the connected type of device (contactor, breaker with shunt trip release or breaker with undervoltage trip release).

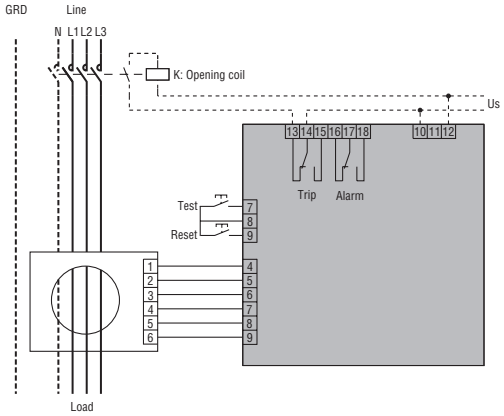
Type	Us	Us wiring	TCS wiring
R4D415	110-125VAC	1-2	17-18
	220-240VAC	2-3	17-18
	380-415VAC	1-3	17-19

31RC...



❶ The coil connection can vary depending on the connected type of device (contactor, breaker with shunt trip release or breaker with undervoltage trip release).

RM2DB230



TYPE	RM1DA230	RM2DA230	R1D❶	R2D❶	R3D❶
DESCRIPTION					
	Modular, 1 operating threshold	Modular, 2 operating thresholds	Flush mount with transparent cover, 1 operating threshold	Flush mount with transparent cover, 2 operating thresholds constant toroid-relay circuit control	Flush mount with transparent cover, 2 operating thresholds constant toroid-relay circuit control
CONTROL CIRCUIT					
Toroidal transformer	External (see types given on page 20-5)				
Adjustments					
Tripping set-point (IΔn)	0.030...30A		0.025...0.25A (x0.1) 0.25...2.5A (x1) 2.5...25A (x10) 25...250A(external multiplier)		
Pre-alarm set-point	Programmable		—	70% IΔn (fixed)	70% IΔn (fixed)
Tripping delay time (t)	0.02...10s		0.02...0.5s (tx1) 0.2...5s (tx10)		
Selection of multiplier for IΔn and t	—	—	By dip-switches		
Resetting	Configurable automatic or manual by button on front	Automatic by remote contact closing or rear jumper connection Manual by button on front or remote contact closing	Configurable automatic or manual by button on front❷	Automatic by remote contact closing or rear jumper connection Manual by button on front or remote contact closing	
Shunt circuit control	—	—	—	—	—
AUXILIARY SUPPLY					
Auxiliary voltage Us (0.85 - 1.1 Us limit)	—	—	—	—	—
	220...240VAC	90...250VAC 120...350VDC	110...125VAC/DC 220...240/380...415VAC	110...125/220...240/380...415VAC	
Rated frequency	50...60Hz				
Power consumption (maximum)	2VA	6VA	4VA		
RELAY OUTPUTS					
State	Configurable normally de-energised or energised	Configurable normally de-energised or energised	Normally de-energised	Configurable normally de-energised or energised	Configurable normally de-energised or energised
Contact arrangement	1 changeover SPDT (trip)	2 changeover SPDT each (configurable: 1 trip and 1 alarm)	1 changeover SPDT (trip)	2 changeover SPDT each (configurable: 2 trip or 1 trip and 1 alarm)	
Rated contact capacity IEC Ith	5A 250VAC				
Mechanical life	$20x10^6$ cycles	$10x10^6$ cycles	$50x10^6$ cycles		
Electrical life	$3x10^5$ cycles				
INSULATION					
Power frequency withstand voltage	2.5kV for 60s				
INDICATIONS					
Auxiliary voltage available (ON)	Green LED	Green LED and green backlight	Green LED		
Relay tripping (TRIP)	Red backlight	Red LED and red backlight	Red LED		
Trip prealarm (ALARM)	Yellow backlight	Yellow LED and yellow backlight	—	Red LED	Red LED
Mechanical (TRIP MEMORY)	—	—	—	—	Flag indicator
Shunt circuit tripping (TCS)	—	—	—	—	—
CONNECTIONS					
Type of terminals	Fixed				
Tightening torque maximum	0.5Nm (4.5lb.in)				
Conductor section min...max	0.2...2.5mm^2 (24...12AWG)				
AMBIENT CONDITIONS					
Operating temperature	-10...+60°C				
Storage temperature	-20...+80°C				
Relative humidity	≤90%	≤95%	≤90%		
HOUSING					
Material	Self-extinguishing polycarbonate				

❶ Type A, sensitive to residual sinusoidal AC and pulsating DC currents.
❷ Remote resetting by removing power for more than 1 second.
❸ Digital display of fault current measurement and tripping value memory.

	R4D❶❸	RM1…❶	31RM…❶	31RMT…❶	31RC…❶	RM2DB…
	Flush mount with display and cover, 2 operating thresholds - constant toroid-relay circuit control	Modular with transparent cover, 1 operating threshold	Modular with transparent cover, 1 operating threshold	Modular with transparent cover, 1 operating threshold	Compact, 1 operating threshold	Modular, 1 operating thresholds
	External (see types given on page 20-5)			Incorporated Ø28mm/1.1”	Incorporated 35-60-80-110mm/ 1.38-2.36-3.15-4.33” standard diameter	External (see types given on page 20-5)
	0.03...0.3A (x0.1) 0.3...3A (x1) 3...30A (x10) 30...300A (external multiplier)	0.3A or 0.5A	0.025...0.25A (x0.1) 0.25...2.5A (x1) 2.5...25A (x10) 25...250A (external multiplier)	0.025...0.25A (x0.1) 0.25...2.5A (x1) 2.5...25A (x10)	0.025...0.25A (x0.1) 0.25...2.5A (x1) 2.5...25A (x10)	0.030...30A
	70% IΔn (fixed)	—	—	—	—	Programmable
	0.03...0.5s (tx1) 0.3...5s (tx10)	0.02s or 0.5s	0.02...0.5s (tx1) 0.2...5s (tx10)	0.02...0.5s (tx1) 0.2...5s (tx10)	0.02...0.5s (tx1) 0.2...5s (tx10)	0.02...10s
		By dip-switches				—
	Automatic by remote contact closing or rear jumper connection Manual by button on front or remote contact closing	Configurable A: Automatic or M: Manual by button on front				Automatic by remote contact closing or rear jumper connection Manual by button on front or remote contact closing
	Yes	—				—
	—	—	24-48VAC/DC	—	24-48VAC/DC	—
	110...125/220...240/ 380...415VAC	110...125VAC/DC 220...240/380...415VAC				90...250VAC 120...350VDC
	50...60Hz					
	4VA	3VA				4VA
	Configurable normally de-energised or energised	Normally de-energised	Normally de-energised	Configurable normally de-energised or energised	Normally de-energised	Configurable normally de-energised or energised
	2 changeover SPDT each (configurable: 2 trip or 1 trip and 1 alarm)	1 changeover SPDT (trip)	1 changeover SPDT (trip)	2 changeover SPDT each (both trip)	1 changeover SPDT (trip)	2 changeover SPDT each (configurable: 1 trip and 1 alarm)
	5A 250VAC					
	$50x10^6$ cycles	$50x10^6$ cycles				$10x10^6$ cycles
	$3x10^5$ cycles					
	2.5kV for 60s					
	Green LED	Green LED				Green LED and green backlight
	Red LED	Red LED				Red LED and red backlight
	Red LED	—				Yellow LED and yellow backlight
	Flag indicator	—				—
	Red LED	—				—
	Removable, plug-in	Fixed				
	0.5Nm (4.5lb.in)					
	0.2...2.5mm² (24...12AWG)					
	-10...+60°C					
	-20...+80°C					
	≤90%					≤95%
	Self-extinguishing polycarbonate					

Time relays



- Modular versions for modular-slot switchboards, mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- Plug-in or flush-mount version
- Version programmable with NFC and APP
- Wide range of functions and time scales
- High accuracy and repeatability of the time settings.

SEC. - PAGE

Modular versions

On delay. Multiscale. Multivoltage ..... 21 - 2
Multifunction. Multiscale. Multivoltage. 1 relay output ..... 21 - 2
Multifunction. Multiscale. Multivoltage. 1 relay output, with NFC and APP ..... 21 - 2
Multifunction. Multiscale. Multivoltage. 2 relay outputs ..... 21 - 3
Recycle, independent timings. Multiscale. Multivoltage ..... 21 - 3
Off delay. Multiscale. Multivoltage ..... 21 - 3
For starting. Multiscale. Multivoltage ..... 21 - 4
For staircase with “zero crossing” load switching ..... 21 - 4

Plug-in and flush-mount version, 48x48mm/1.9x1.9”

On delay. Multiscale. Multivoltage ..... 21 - 5
On delay. Multiscale. Single voltage ..... 21 - 5
Multifunction. Multivoltage. Multiscale ..... 21 - 5
Accessories ..... 21 - 5

Dimensions ..... 21 - 6
Wiring diagrams ..... 21 - 6
Technical characteristics ..... 21 - 10



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MODULAR TIME RELAYS

- Suitable for modular-slot switchboards
- Selectable time ranges and functions with potentiometers on front or via NFC and APP
- LED indication
- Mounting on 35mm DIN rail or screw fixing
- Screw terminals.



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PLUG-IN AND FLUSH-MOUNT TIME RELAYS, 48X48MM

- Flush and internal panel mounting
- Time ranges: 0.05s...10h
- LED indication
- 8 and 11-pin sockets for panel mounting.

On delay time relay. Multiscale. Multivoltage



TMP

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMP	0.1...1s 1...10s 6...60s 1...10min 6min...1h 1...10h 0.1...1 day 1...10 days ON only OFF only	24...48VDC 24...240VAC	1	0.078
TMPA440	0.1...1s 1...10s 6...60s 1...10min	380...440VAC	1	0.078

General characteristics
- Electronic time relay, multiscale, multivoltage. On delay, delay on make, with 1 relay output with 1 changeover contact (SPDT) start at relay energising for TMP
- Electronic time relay, multiscale with 2 normally open (N/O-SPST) contacts with common pole for TMPA440
- Delay time adjustable on front by rotary switch: 10...100%
- Green LED indicator for power on
- Red LED indicator for relay state; flashing for delay and steady when relay energised
- Modular DIN 43880 housing, 1 module suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: EAC; UL Listed, for USA and Canada (cULus - File E93601), CCC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Multifunction time relay. Multiscale. Multivoltage. 1 relay output



TMM1

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMM1	0.1...1s 1...10s 6...60s 1...10min 6min...1h 1...10h 0.1...1 day 1...10 days ON only OFF only	12...240V AC/DC	5	0.086

General characteristics
- Electronic time relay, multifunction, multiscale, multivoltage, with 1 relay output with 1 changeover contact (SPDT)
- Enabling input
- Selectable functions: (a) On delay. (b) Pulse on relay energising with start when energised. (c) Symmetrical flasher starting with OFF. (d) Symmetrical flasher starting with ON. (e) Off delay; relay energising at external contact closing with start on break. (f) Pulse on relay energising with start on external contact closing. (g) Pulse on relay energising with start on external contact opening. (h) On-off delay. Delay on make, with start at external contact closing, and delay at break, with start at external contact opening. (i) Internal ON/OFF trigger with relay contact closing or operating at each closing of an external contact. (j) Pulse generator.
- Delay time adjustable on front by rotary switch: 10...100%
- Green LED indicator for power on
- Red LED indicator for relay state; flashing for delay and steady when relay energised
- Modular DIN 43880 housing, 1 module suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601); EAC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Multifunction time relay. Multiscale. Multivoltage. 1 relay output. Programmable with NFC and APP



TMM1NFC



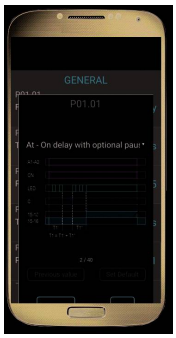
The app can be downloaded from Google Play Store and App Store.

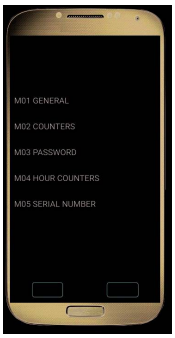
ANDROID APP ON Google play

Available on the App Store

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMM1NFC	0.1s... 999days ON only OFF only	12...240V AC/DC	1	0.086

Simple and intuitive programming with LOVATO NFC App thanks to the graphic interface that displays the selected function and parameters directly on the screen of the smartphone, eliminating the need to consult the manual.





General characteristics
- Electronic time relay, multifunction, multiscale, multivoltage, with 1 relay output with changeover contact (SPDT), with NFC technology and LOVATO NFC App
- Command input for the enabling of the function or to pause the timing
- 40 selectable functions. For details consult the technical manual on the website www.LovatoElectric.com
- NFC connectivity for the programming of the parameters with the LOVATO NFC App freely downloadable from Google Play Store and App Store
- Simple, fast and intuitive programming
- Very high accuracy and repeatability of the settings
- Internal counter which stops the function when the relay output reaches a programmable number of closures
- Possibility to save the program on smartphone or tablet to be copied on others TMM1NFC, even with device powered off
- Possibility to protect the settings with a password
- QR code for the direct connection to the LOVATO Electric website for the download of the technical manual
- Green LED indicator for power on
- Red LED indicator for relay state; flashing for delay and steady when relay energised
- Modular DIN 43880 housing (1 module), suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40), IP20 on terminals.

Certifications and compliance
Certifications: cULus, EAC, CCC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n°14.

Multifunction time relay. Multiscale. Multivoltage. 2 relay outputs



TMM2

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMM2	0.1...1s 1...10s 6...60s 1...10min 6min...1h 1...10h 0.1...1 day 1...10 days ON only OFF only	12...240V AC/DC	1	0.094

General characteristics
- Electronic time relay, multifunction, multiscale, multivoltage
- 2 relay outputs, one with 1 delayed changeover (C/O-SPDT) contact and the other with 1 normally open (N/O-SPST) contact, programmable as instantaneous or delayed
- Enabling input
- Selectable functions: (a) On delay; delay on make with start at relay energising. (b) Pulse on relay energising with start when energised. (c) Flasher starting with OFF interval. Equal timing recycle. (d) Flasher starting with ON interval. Equal timing recycle. (e) Off delay; relay energising at external contact closing with start on break. (f) Pulse on relay energising with start on external contact closing. (g) Pulse on relay energising with start on external contact opening. (h) On-off delay. Delay on make, with start at external contact closing, and delay at break, with start at external contact opening. (i) Internal ON/OFF trigger with relay contact closing or operating at each closing of an external contact. (j) Pulse generator, unequal timing recycle; starting with OFF pulse time and 0.5s ON pulse.
- Delay time adjustable on front by rotary switch: 10...100%
- Green LED indicator for power on
- Red LED indicator for relay state; flashing for delay and steady when relay energised
- Modular DIN 43880 housing, 1 module suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices - Timers; EAC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Recycle time relay, independent timings. Multiscale. Multivoltage



TMPL

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMPL	0.1...1s 1...10s 6...60s 1...10min 6min...1h 1...10h 0.1...1 day 1...10 days 3...30 days 10...100 days	12...240V AC/DC	1	0.082

General characteristics
- Recycle time relay with asymmetrical timings, multiscale, multivoltage
- 1 relay output with 1 changeover contact (SPDT)
- Enabling input of ON (work) or OFF (pause) interval
- Delay time for OFF (pause) interval, adjustable on front by rotary switch: 10...100%
- Delay time for ON (work) interval, adjustable on front by rotary switch: 10...100%
- Green LED indicator for power on
- Red LED indicator for relay state; flashing for delay
- Modular DIN 43880 housing, 1 module; suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices - Timers; EAC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Off delay time relay. Multiscale. Multivoltage



TMD

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMD	0.06...0.6s 0.6...6s 6...60s 18...180s	24...240V AC/DC	1	0.080

General characteristics
- Electronic time relay, multiscale, multivoltage. True off delay; delay on break with start at relay de-energising
- 1 relay output with 1 changeover contact (SPDT)
- Delay time adjustable on front by rotary switch: 10...100%
- Green LED indicator for power on
- Modular DIN 43880 housing, 1 module; suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices - Timers; EAC, CCC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Time relay for starting. Multiscale. Multivoltage

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMST	0.1...1s 1...10s 6...60s 1...10min	24...48VDC 24...240VAC	1	0.090
TMSTA440	0.1...1s 1...10s 6...60s 1...10min	380...440VAC	1	0.090



TMST

General characteristics
- Electronic time relay, multiscale, multivoltage for starting (star-delta, impedance, autotransformer, etc) of induction motors (squirrel cage), 2 separate timings
- 1 relay output with 2 normally open (N/O-SPST) contacts with common pole
- Delay time adjustable on front by rotary switch: 10-100% for star connection
- Starting and transition (20...300ms time scale - from star to delta), time adjustable on front by rotary switch
- Green LED indicator for power on
- Red LED indicator for relay state; flashing during delay and steady at delay lapsing
- Modular DIN 43880 housing, 1 module; suitable for fixing on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices - Timers; EAC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

Time relay for staircase lighting with "zero crossing" load switching

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
TMLSL	0.5...20min	220...240VAC	1	0.090

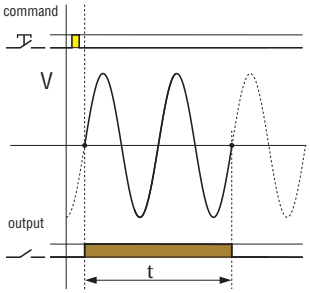


TMLSL

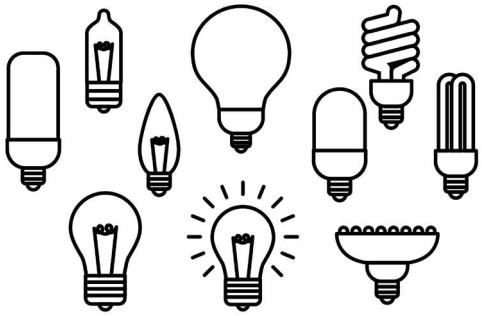
General characteristics
- Electronic time relay for staircase lighting single scale and single voltage
- 1 relay output with 1 powered normally open (N/O-SPST) contact
- Possible connections for 3- or 4-wire systems
- Zero crossing load switching
- Adjustable delay time on the front: 0.5...20min
- Selectable functions:
  - timed lighting + staircase cleaning
  - timed lighting with notice of shutdown + staircase cleaning
  - constant lighting
- Green LED for power presence signalling
- 1 control input can be connected to up to 150 light buttons (<1mA each)
- 1 relay output with normally open contact NO,16A 250VAC
- LED lamp management up to 600W
- QR code included for the direct connection to the LOVATO Electric website for the download of the technical manual
- Modular housing DIN 43880 (1 module), suitable for fixing on 35mm omega profile or screw fixing
- Degree of protection: IP40 on front (if mounted in container and/or electrical panel having IP40), IP20 on terminals.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 61812-1, UL508, CSA C22.2 n°14.

"ZERO CROSSING" LOAD SWITCHING - IDEAL FOR LED LAMPS



The time relay for staircase TMLSL uses "zero crossing" technology for load switching, which consists of monitoring the sinusoidal mains voltage and inserting the load at the exact instant in which the voltage passes through zero.
This has several advantages:
- reduction of the inrush current generated when the lamp is activated, which can reach very high values, especially in the increasingly popular LED lamps
- protection of the lamp and extension of the electrical life
- protection of the time relay contact from the risk of sticking
- reduction of consumption.



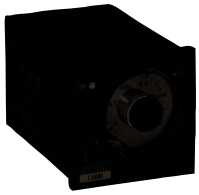
Time relay



31L48TP...



31L48TPB...



31L48M...

Order code	Time of scale range	Rated auxiliary supply voltage	Qty per pkg	Wt
		[V]	n°	[kg]
Time relay on delay. Multiscale and multivoltage.				
31L48TPS240	0.3...780s	24VAC/DC 110VAC 220...240VAC	1	0.124
31L48TPM240	18s...780min		1	0.124
Time relay on delay. Multiscale and single voltage.				
31L48TPBM24	0.05s...10min	24VAC/DC	1	0.124
31L48TPBM240		220...240VAC	1	0.124
Time relay, multifunction, multivoltage and multiscale.				
31L48MM240	0.05s...10min	24...240V AC/DC	1	0.135
31L48MH240	0.05min...10h		1	0.135

Accessories for 48x48mm/1.9x1.9” time relay



HR7XS1



31L48P8



HR7XS2



31L48P11



31L48AP

Order code	Description	Qty per pkg	Wt
		n°	[kg]
HR7XS1	8-pin socket for screw fixing or on 35mm DIN rail (IEC/EN/BS 60715) of time relay type L48T....	10	0.061
31L48P8	8-pin socket for the door-mounting of time relay type 31L48T... with accessory 31L48AP. Screw terminals.	10	0.040
HR7XS2	11-pin socket for screw fixing or on 35mm DIN rail (IEC/EN/BS 60715) of time relay type 31L48M....	10	0.064
31L48P11	11-pin socket for the door-mounting of time relay type L48M... with accessory 31L48AP. Screw terminals.	10	0.048
31L48AP	Flush door mounting bracket	10	0.012

NOTE: max. conductor section for sockets: 2x2.5mm²/2x14AWG.
Tightening torque: 0.8Nm/7.1lb.in.

General characteristics

TIME RELAY 31L48TP...
- Electronic time relay, multiscale, multivoltage. On delay, delay on make with start at relay energising
- 1 relay output with 1 changeover contact (SPDT)
- Delay time adjustable on front by rotary knob
- Time range selected by dip switches:
  31L48TPS: 0.3...3s; 1.2...12s; 10...100s; 7.8...780s.
  31L48TPM: 18s...3min; 72s...12min; 10...100min; 78...780min
- LED indicators for power on and relay state
- Plug-in housing with 8-pin socket, HR7XS1 or 31L48P8 with accessory 31L48AP
- Flush door-mounting bracket 31L48AP available
- IEC protection degree: IP40 on front and IP20 at terminals.

Time range setting

	A B 1 0	A B 1 0	A B 1 0	A B 1 0
31L48TPS	0.3…3s	1.2…12s	10…100s	7.8…780s
31L48TPM	18s…3min	72s…12min	10…100min	78…780min

TIME RELAY 31L48TPB...
- Electronic time relay, multiscale, single voltage, on delay function
- 2 relay outputs, each with 1 changeover contact (SPDT), configurable either delay on make or instantaneous
- Delay time adjustable on front by rotary knob
- Time range selected by dip switches: 0.05...1s; 0.1...10s; 0.6s...1min; 6s...10min
- LED indicators for power on and relay state
- Plug-in housing with 8-pin socket, HR7XS1 or 31L48P8 with accessory 31L48AP
- Flush door-mounting bracket 31L48AP available
- IEC protection degree: IP40 on front and IP20 at terminals.

Time range setting

	A B 1 0	A B 1 0	A B 1 0	A B 1 0
31L48TPB	0.05…1s	0.1…10s	0.6s…1min	6s…10min

TIME RELAY 31L48M...
- Electronic time relay, multiscale, multivoltage, multifunction
- Selectable functions: On delay, delay on make with start at relay energising. Pulse on relay energising with start on energising. Flasher, starting with OFF interval. Flasher, starting with ON interval. Time relay resetting is possible on closing of external contact (R) connected to terminals 7-6. Possible time relay stopping storing elapsed time on closing of external contact (M) connected to terminals 7-5 and then restarting time on its opening. See diagrams on page 21-9
- 2 relay outputs, each with 1 changeover contact; both delayed (SPDT)
- Delay time adjustable on front by rotary knob
- Time range selected by dip switches:
  31L48MM: 0.05...1s; 0.1...10s; 0.6s...1min; 6s...10min
  31L48MH: 0.05...1min; 0.1...10min; 0.6min...1h; 1min...10h
- LED indicators for power on and relay state
- Plug-in housing with 11-pin socket, HR7XS2 or 31L48P11 with accessory 31L48AP
- Flush door-mounting bracket 31L48AP available
- IEC protection degree: IP40 on front and IP20 at terminals.

Time range setting

	A B 1 0	A B 1 0	A B 1 0	A B 1 0
31L48MM	0.05…1s	0.1…10s	0.6s…1min	6s…10min
31L48MH	0.05…1min	0.1…10min	0.6min…1h	1min…10h

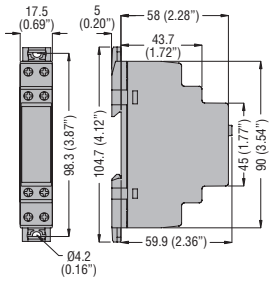
SOCKETS HR7X... AND 31L48...
- 8-pin and 11-pin version
- Screw fixing or on DIN rail for HR7X..., flush mount for 31L48... with accessory 31L48AP
- Screw terminals
- Ratings: 10A - 250VAC.

Certifications and compliance

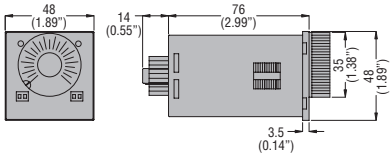
Certifications obtained: cURus (for 31L48... and HR7X... type), CSA (for HR7X... type), EAC.
Compliant with standards: IEC/EN/BS 61810-1 (for HR7X... type), IEC/EN/BS 61812-1, UL508, CSA C22.2 n° 14.

TIME RELAYS

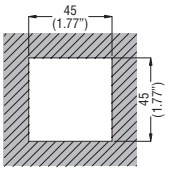
TM...



31L48...

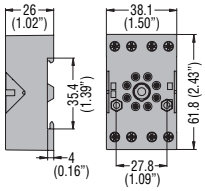


Cutout

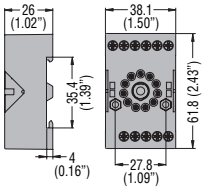


ACCESSORIES - SOCKETS

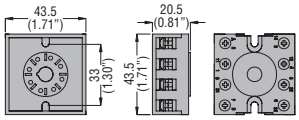
HR7XS1



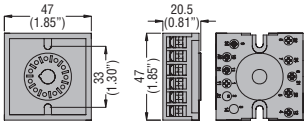
HR7XS2



31L48P8

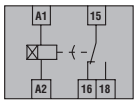


31L48P11

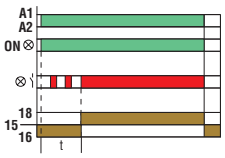


Wiring diagrams

TMP

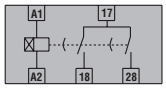


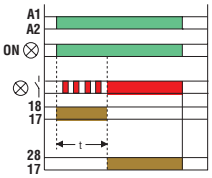
On delay. Delay on make, with start at relay energising



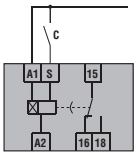
TMPA440

On delay. Delay on make, with start at relay energising



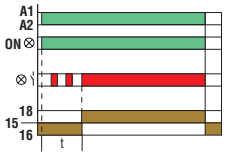


TMM1



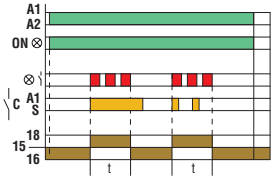
On delay. Delay on make, with start at relay energising





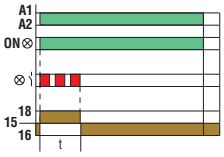
Pulse on relay energising with start at external contact closing





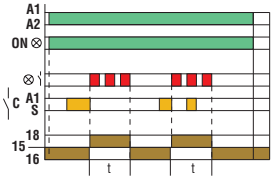
Pulse on relay energising with start on energising





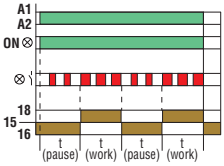
Pulse on relay energising with start at external contact opening





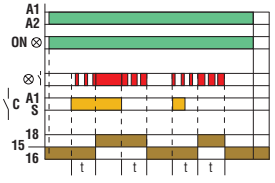
Flasher, starting with OFF (pause) interval. Equal timing recycle





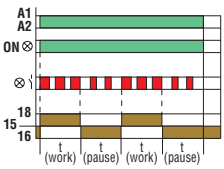
On-Off delay. Delay on make, with start at external contact closing, and delay at break, with start at external contact opening





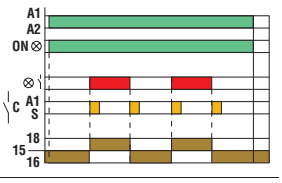
Flasher, starting with ON (work) interval. Equal timing recycle





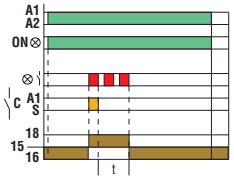
Internal ON/OFF trigger. Relay contact either closes or opens at each external contact closing





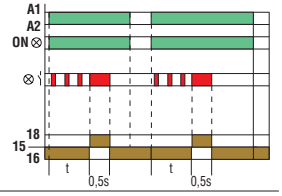
Off delay. Relay energising at external contact closing with start on break



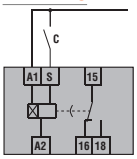


Pulse generator. Unequal timing recycle, starting with OFF pulse time and 0.5sec ON time



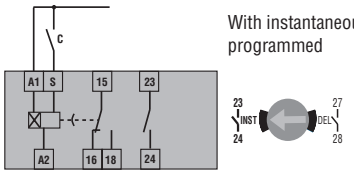


TMM1NFC

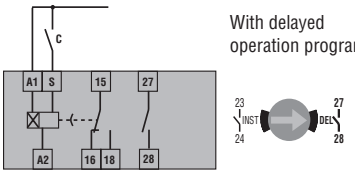


For operational diagrams see instruction manual I562 on the website www.LovatoElectric.com, section download/technical instruction.

TMM2

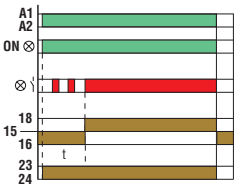


With instantaneous operation programmed

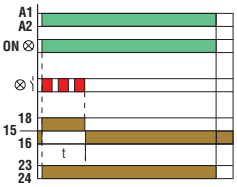


With delayed operation programmed

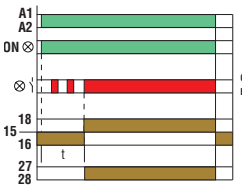
On delay. Delay on make, with start at relay energising



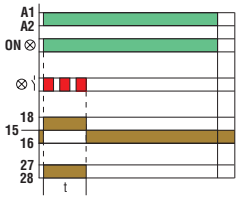
Pulse on relay energising with start on energising



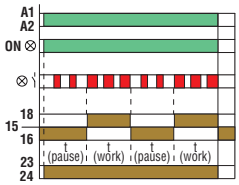
On delay. Delay on make, with start at relay energising



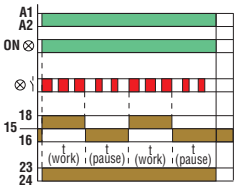
Pulse on relay energising with start on energising



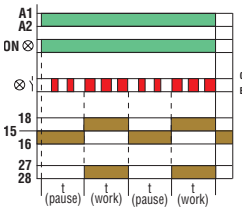
Flasher, starting with OFF (pause) interval. Equal timing recycle



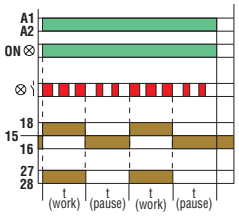
Flasher, starting with ON (work) interval. Equal timing recycle



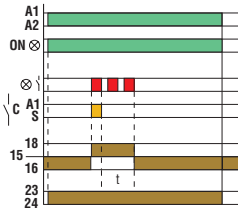
Flasher, starting with OFF (pause) interval. Equal timing recycle



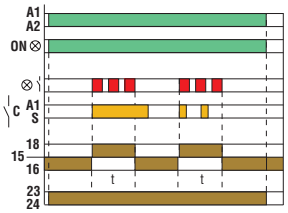
Flasher, starting with ON (work) interval. Equal timing recycle



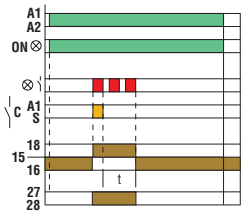
Off delay. Relay energising at external contact closing with start on break



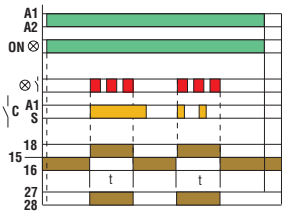
Pulse on relay energising with start on external contact closing



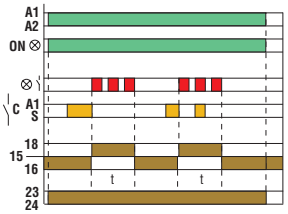
Off delay. Relay energising at external contact closing with start on break



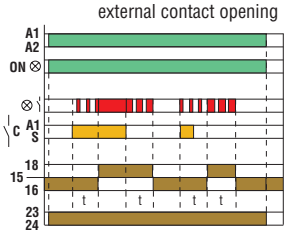
Pulse on relay energising with start on external contact closing



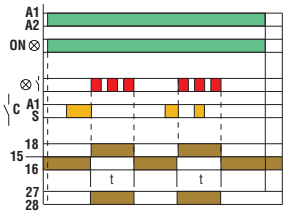
Pulse on relay energising with start on external contact opening



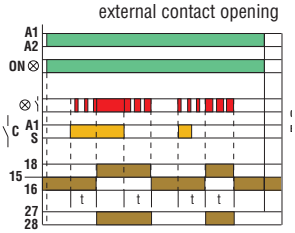
On-off delay. Delay make, with start at external contact closing and delay at break, with start at external contact opening



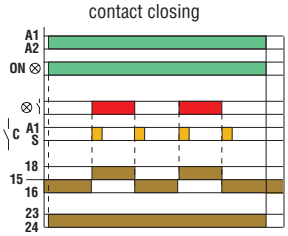
Pulse on relay energising with start on external contact opening



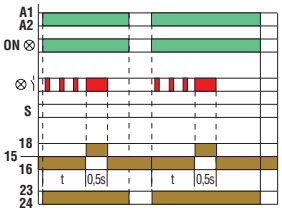
On-off delay. Delay make, with start at external contact closing and delay at break, with start at external contact opening



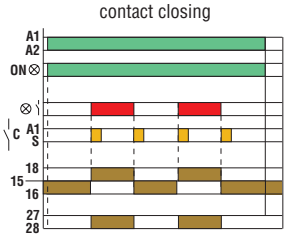
Internal trigger ON/OFF. Relay contact either closes or opens at each external contact closing



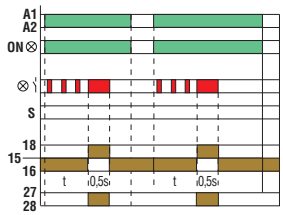
Pulse generator. Unequal timing recycle, starting with ON pulse time



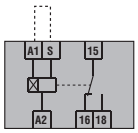
Internal trigger ON/OFF. Relay contact either closes or opens at each external contact closing



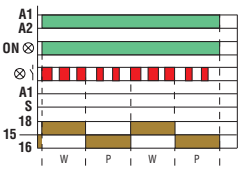
Pulse generator. Unequal timing recycle, starting with ON pulse time



TMPL

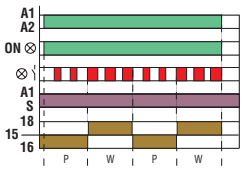


Flasher, starting with ON interval.
Equal timing recycle, ON first



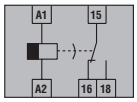
W = Work (ON)
P = Pause (OFF)

Flasher, starting with OFF interval.
Equal timing recycle, OFF first

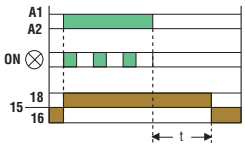


W = Work (ON)
P = Pause (OFF)

TMD

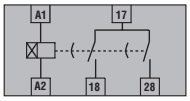


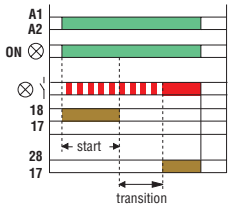
True off delay. Delay on break, starting at relay de-energising



TMST

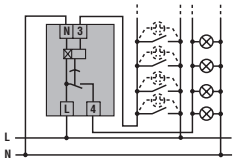
For starting



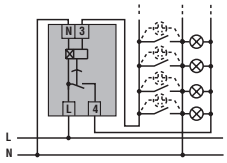


TMLSL

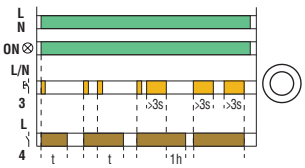
4-wire connection



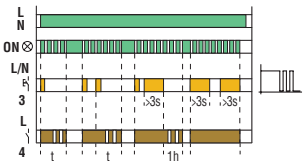
3-wire connection



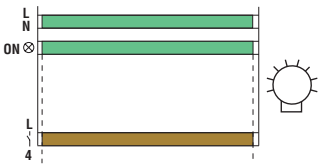
Timed lighting + staircase cleaning



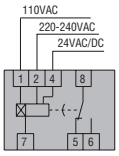
Timed lighting with shutdown notice + staircase cleaning



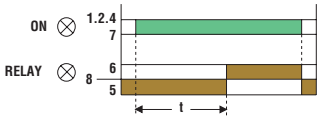
Constant lighting



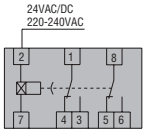
31L48TP...



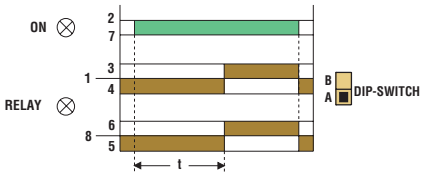
On delay

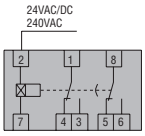


31L48TPB...

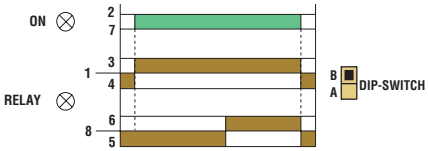


On delay with both instantaneous c/o contacts

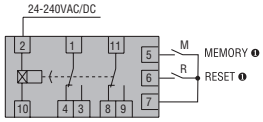




On delay with one instantaneous c/o contact and one late-break c/o contact

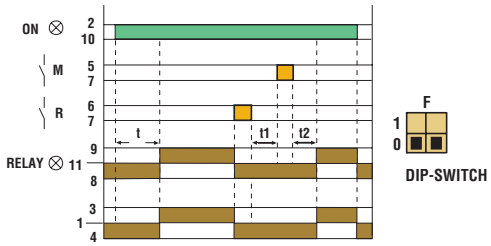


31L48M...

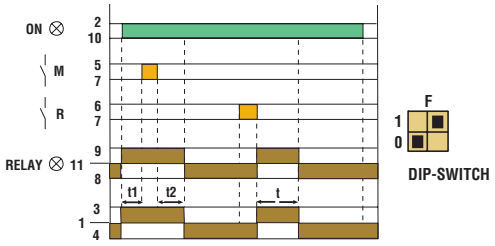


T (preset time) = T1+T2
❶ Contacts "M" and "R" are to be voltage free (dry).

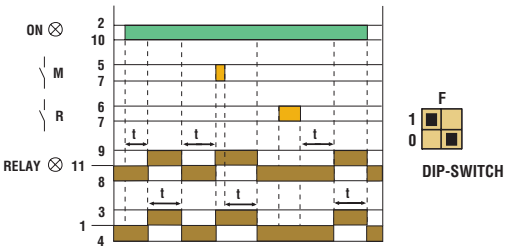
On delay



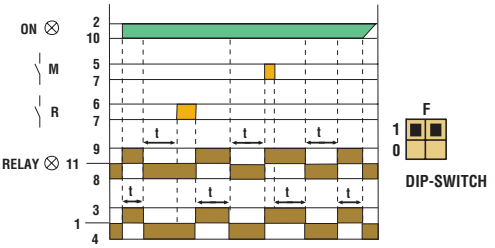
Pulse on relay energising with start on energising



Flasher starting with OFF



Flasher starting with ON



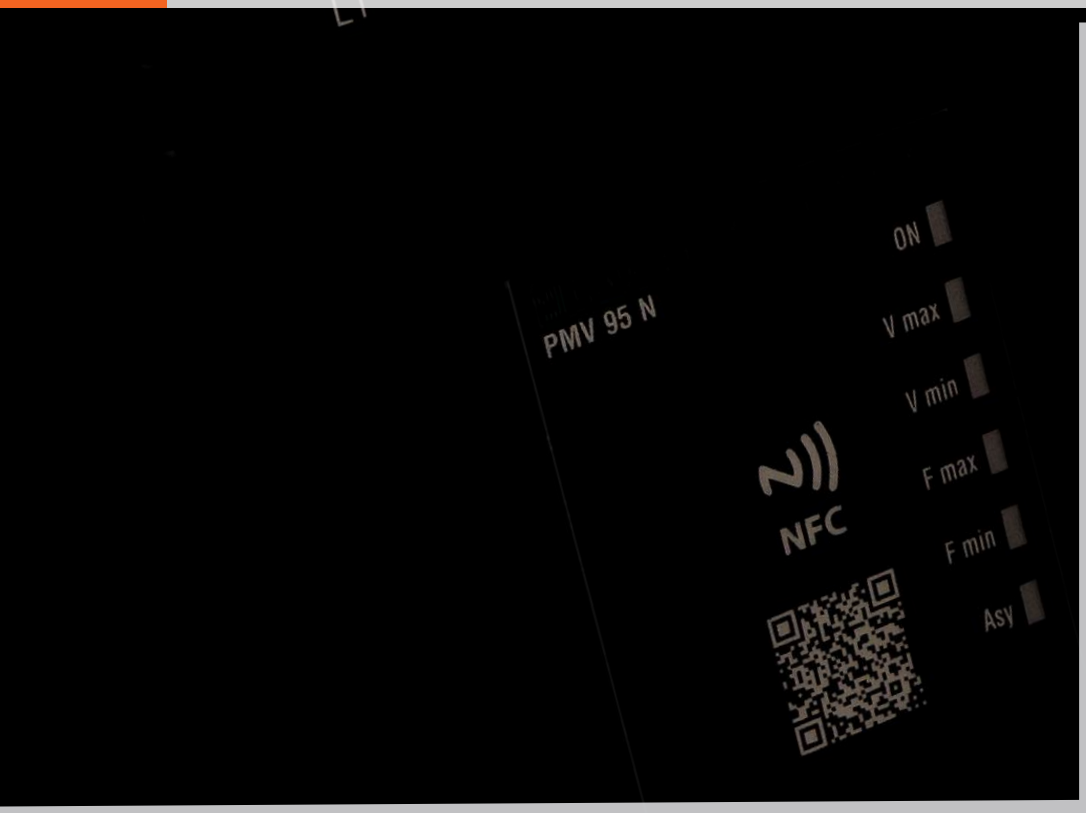
TYPE	TMP	TMPA440	TMM1 - TMM2	TMM1NFC	TMPL	TMD	TMST	TMLSL
DESCRIPTION								
	On delay	On delay	Programmable multifunction	Programmable multifunction with NFC	Asymmetrical recycle	True off delay	For starting	Staircase illumination
	Multiscale	Multiscale	Multiscale	Multiscale	Multiscale	Multiscale	Multiscale	Single scale
	Multivoltage	Single voltage	Multivoltage	Multivoltage	Multivoltage	Multivoltage	Multivoltage	Single voltage
CONTROL CIRCUIT								
Rated auxiliary supply voltage Us	24...48VDC 24...240VAC	380...440VAC	12...240VAC/DC			24...240VAC/DC	24...48VDC 24...240VAC 380...440VAC	220...240VAC
Rated frequency	50/60Hz							
Operating voltage range	0.85...1.1Us							
Power consumption (maximum)	1.2VA/0.8W max (24...48VAC/DC) 16VA/0.9W max (110...240VAC)	19VA/1.7W max	TM M1: 0.6VA/0.3W max (12...48VAC/DC) 1.6VA/1.2W max (110...240VAC/DC) TM M2: 1.1VA/0.8W max (12...48VAC/DC) 1.8VA/1.2W max (110...240VAC/DC)	0.6VA/0.3W max (12...48VAC/DC) 1.6VA/1.2W max (110...240VAC/DC)	0.6VA/0.3W max (12...48VAC/DC) 1.6VA/1.2W max (110...240VAC/DC)	0.1VA/0.1W (24...48VAC/DC) 1.1VA/0.8W (110...240VAC/DC)	1.2VA/0.8W max (24...48VAC/DC) 1.6VA/0.9W max (110...240VAC)❶	❸
TIMING CIRCUIT								
Time setting range	Multiscale 0,1...1s 1...10s 6s...60s 1...10min 6min...1h 1...10h 0.1...1day 1...10days ON only OFF only	Multiscale 0,1...1s 1...10s 6s...60s 1...10min	Multiscale 0,1...1s 1...10s 6s...60s 1...10min 6min...1h 1...10h 0.1...1day 1...10days ON only OFF only	Multiscale 0,1s...999h programmabile con tecnologia NFC e APP	Multiscale 0.1...1s 1...10s 6s...60s 1...10min 6min...1h 1h...10h 0.1...1day 1...10days 3...30days 10...100days	Multiscale 0.06...0.6s 0.6...6s 6s...60s 18s...180s	Multiscale 0.1...1s 1...10s 6s...60s 1...10min	Single scale 0.5...20min
Setting accuracy	< ±9%			0	< ±19%			❸
Repeat accuracy	< ±0.1%	< ±0.5%	< ±0.5% - < ±0.2%	< ±0.1%	< ±0.2%	< ±0.5%		❸
Influence of voltage variation	< ±0.01%							❸
Average variation of set delays related to +20°C condition at –20°C	< ±0.2%							❸
Minimum power time	—	—	—	—	—	≥ 200ms	—	—
Minimum ON time	—	—	25ms (no maximum limit)			—	—	≥ 60ms (no max lim.)
Resetting time during timing	≥ 100ms	≥ 100ms	≥ 100ms	≥ 100ms	≥ 100ms	—	≥ 100ms	❸
Resetting time elapsed time	≥ 50ms	≥ 50ms	≥ 50ms	≥ 50ms	≥ 50ms	—	≥ 50ms	—
Immunity time for microbreakings	≤ 50ms	—	≤ 25ms - ≤ 15ms	≤ 25ms	≤ 25ms	—	≤ 40ms❷	❸
RELAY OUTPUTS								
Contact arrangement	1 delayed changeover	2 delayed changeover	TMM1: 1 delayed changeover TM M2: 1 inst./delayed N/O + 1 delayed c/o	1 delayed changeover	1 delayed changeover	1 delayed changeover	2 delayed N/O	1 delayed N/O
Maximum switching voltage	250VAC							
IEC conventional free air thermal current (Ith)	8A	8A	8A	8A	8A	5A	8A	16A
UL/CSA designation	B300							—
Electrical life (with rated load)	10^5 cycles							
Mechanical life	$30x10^6$ cycles							
Tightening torque maximum	max. 0.8Nm (7lb.in; 7...9lb.in per UL)							
Conductor section min-max	0.2...4mm² (24...12AWG; 12...18AWG per UL)							
INSULATION (input-output)								
IEC rated insulation voltage	250V							
IEC rated impulse withstand voltage	4kV							
IEC power frequency withstand voltage	2kV							
AMBIENT CONDITIONS								
Operating temperature	–20...+60°C							
Storage temperature	–30...+80°C							
Housing material	Self-extinguishing polyamide							

❶ For 380...440VAC types: 19VA/1.7W max. ❷ Used at 24...48VDC or 24...240VAC; ≤30ms at 380...440VAC. ❸ Consult Technical support for information; see contact details on front cover.
NOTE: N/O = normally open / SPST c/o = changeover / SPDT; inst. = instantaneous.

TYPE		31L48TP...	31L48TPB...	31L48M...
DESCRIPTION				
		On delay	On delay	Programmable multifunction
		Multiscale	Multiscale	Multiscale
		Multivoltage	Single voltage	Multivoltage
CONTROL CIRCUIT				
Rated supply voltage Us		24VAC/DC❶	24VAC/DC❶	24...240VAC/DC❶
		110VAC❶	220...240VAC❶	
		220...240VAC❶		
Rated frequency		50...60Hz		
Operating voltage range		0.85...1.1 Us		
Power consumption (maximum)		6VA		
TIMING CIRCUIT				
Time setting range		31L48TPS... Multiscale 0.3...3s 1.2...12s 10...100s 7.8...780s	Multiscale 0.05...1s 0.10...10s 0.6s...1min 6s...10min	31L48MM... Multiscale 0.05...1s 0.1...10s 0.6s...1min 6s...10min
		31L48TPM... Multiscale 18s...3min 72s...12min 10...100min 78...780min		31L48MH... Multiscale 0.05...1min 0.1...10min 0.6min...1h 1min...10h
Setting accuracy		±5%		
Repeat accuracy		±0.5%		
Influence of voltage variation		±0.5%		
Average variation of set delays in related to 20°C condition	at –10°C	+2%		
	at +60°C	–3%		
Minimum ON time		—		
Resetting time	during operation	≥ 0.1s	≥ 0.1s	≥ 0.1s
	elasped time	≥ 65ms	≥ 65ms	≥ 65ms
Immunity time for microbreakings		≤ 40ms	≤ 40ms	≤ 40ms
RELAY OUTPUTS				
Number of relays		1	2	2
Contact arrangement		1 delayed c/o	2 del. or 1 inst. + 1 del. c/o	2 delayed c/o
Maximum switching voltage		250V		
IEC conventional free air thermal current (Ith)		5A		
UL/CSA designation		B300		
Electrical life (with rated load)		10^5 cycles		
Mechanical life		$30x10^6$ cycles		
CONNECTIONS				
Tightening torque maximum		—		
Conductor section (min-max)		—		
INSULATION (input-output)				
IEC rated insulation voltage Ui		250V		
IEC power frequency withstand voltage Uimp		—		
IEC power frequency withstand voltage		2kV		
AMBIENT CONDITIONS				
Operating temperature		–10...+60°C		
Storage temperature		–30...+80°C		
Housing material		Self-extinguishing polyamide		

❶ Other voltages on request.
NOTE: del. = delayed inst. = instantaneous c/o = changeover/SPDT

Monitoring relays



- Modular versions suitable for different types of installations, DIN rail, screw fixing or switchboard, also suitable for rear mounting plate fixing
- Minimum and maximum voltage monitoring relays for single and three-phase systems, with or without neutral
- Voltage asymmetry, phase sequence and phase loss control relays
- Multifunction voltage and frequency monitoring relays with NFC technology and APP
- Frequency monitoring relays
- Minimum and maximum current monitoring relays
- Insulation monitoring relays
- Interface protection system units compliant with standards CEI 0-21, CEI 0-16, DEWA DRRG, ENA G98/G99, VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120, VDE V 0126-1-1, SEC (Saudi Electricity Company).

	Sec. - Page
Voltage monitoring relays	
For three-phase systems, without neutral	22 - 4
For three-phase systems, with or without neutral	22 - 6
For single-phase systems	22 - 7
Multifunction voltage and frequency monitoring relays, programmable via NFC technology and APP	**22 - 8**
Frequency monitoring relays	**22 - 9**
Current monitoring relays	
For single-phase systems	22 - 9
For single and three-phase systems	22 - 10
Pump protection relays	**22 - 11**
Insulation monitoring relays	**22 - 11**
Interface protection system units	**22 - 12**
Accessories	**22 - 16**
Dimensions	**22 - 18**
Wiring diagrams	**22 - 19**
Technical characteristics	**22 - 22**



Pages 22-4 to 7

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



Page 22-8

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



Page 22-9

FREQUENCY MONITORING RELAYS
- For single and three-phase systems
- Minimum frequency
- Maximum frequency.



Pages 22-9 and 10

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



Page 22-11

PUMP PROTECTION RELAYS
- For single and three-phase systems
- Minimum cosφ for dry running protection
- Maximum AC current
- Phase loss and incorrect phase sequence.



Page 22-11

INSULATION MONITORING RELAYS
- Insulation monitoring for IT network up to 230VAC
- Front LEDs for trip and status indication operation
- Test pushbutton
- Adjustable intervention threshold.



Page 22-12

INTERFACE PROTECTION SYSTEM UNITS
- Compliant with Italian standard CEI 0-21, for low voltage
- Compliant with Italian standard CEI 0-16, for medium voltage
- Compliant with standard SHAMS DUBAI - DRRG (DEWA)
- Compliant with technical guide SEC (Saudi Electricity Company)
- Compliant with technical guide ENA G98/G99
- Compliant with technical guide VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120 and VDE V 0126-1-1.

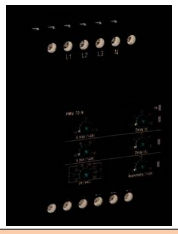
Voltage monitoring relays for three-phase systems without neutral






	PMV10	PMV20	PMV30	PMV40	PMV50	PMV70
Modular version	●(1U)	●(2U)	●(2U)	●(2U)	●(2U)	●(2U)
Minimum AC voltage			●		●	●
Maximum AC voltage					●	●
Phase loss	●	●	●	●	●	●
Incorrect phase sequence	●	●	●	●	●	●
Asymmetry				●		●
Page	22-4				22-5	22-5

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



	PMV50N	PMV70N	PMV80N	PMV95N
Modular version	●(3U)	●(3U)	●(3U)	●(2U)
Minimum AC voltage	●	●	●	●
Maximum AC voltage	●	●	●	●
Phase loss	●	●	●	●
Neutral loss	●	●	●	●
Incorrect phase sequence	●	●	●	●
Asymmetry		●		●
Minimum frequency			●	●
Maximum frequency			●	●
Programmable via NFC technology and APP				●
Page	22-6	22-6	22-7	22-8

Voltage monitoring relay for single-phase systems



	PMV55
Modular version	●(2U)
Minimum AC voltage	●
Maximum AC voltage	●
Page	22-7

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



	PMF20
Modular version	●(2U)
Minimum frequency	●
Maximum frequency	●
Page	22-9

Current monitoring relays for single and three-phase systems





	PMA20	PMA30	PMA40
Modular version	●(2U)	●(2U)	●(3U)
Maximum AC/DC current	●		
Minimum or maximum AC/DC current		●	
Minimum and maximum AC/DC current			●
Page	22-9	22-10	22-10

Pump protection relay for single and three-phase systems



	PMA50
Modular version	●(3U)
Minimum cosφ for dry running pump protection	●
Maximum AC current	●
Phase loss	●
Incorrect phase sequence	●
Page	22-11

Insulation monitoring relay



	PMIB1A230
Modular version	●(3U)
Adjustable low insulation intervention threshold	●
Page	22-11

Interface protection system units





	PMVF3000	PMVF52	PMVF61	PMVF71	PMVF81	PMVF90
CEI 0-21		●				
CEI 0-16	●					
DEWA DRRG			●			
SEC (Saudi Electricity Company)			●			
ENA G98/G99				●		
VDE-AR-N 4105					●	
VDE V 0126-1-1					●	
For systems requiring 3 maximum voltage thresholds						●
Page	22-13	22-12	22-15	22-15	22-14	22-15

For three-phase systems, without neutral



PMV10A440

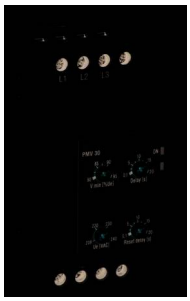


PMV20…

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, without neutral. Phase loss and incorrect phase sequence. Instantaneous trip. 1 module housing.			
PMV10A440	208...480VAC	1	0.050
2 modules housing.			
PMV20A240	100...240VAC	1	0.120
PMV20A575	208...575VAC	1	0.120
PMV20A600	380...600VAC	1	0.120

General characteristics
- Voltage monitoring relay, self powered, for phase loss and incorrect phase sequence
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing: 1 module for PMV10; 2 modules for PMV20
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.



PMV30…

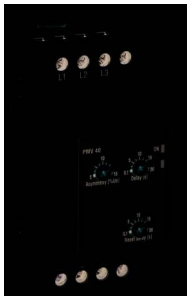
Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, without neutral. Minimum AC voltage. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip.			
PMV30A240	208...240VAC	1	0.130
PMV30A575	380...575VAC	1	0.130
PMV30A600	600VAC	1	0.130

General characteristics
- Voltage monitoring relay, self powered, for minimum voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue):
  - PMV30A240: 208-220-230-240VAC
  - PMV30A575: 380-400-415-440-460-480-525-575VAC
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay"	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.



PMV40…

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, without neutral. Asymmetry. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip.			
PMV40A240	208...240VAC	1	0.130
PMV40A575	380...575VAC	1	0.130
PMV40A600	600VAC	1	0.130

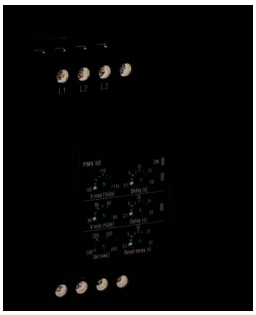
General characteristics
- Voltage monitoring relay, self powered, for asymmetry, phase loss and incorrect phase sequence
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Asymmetry"	High voltage asymmetry tripping threshold 5...15% Ue
"Delay"	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

For three-phase systems, without neutral



PMV50...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, without neutral. Minimum and maximum AC voltage. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip.			
PMV50A240	208...240VAC	1	0.130
PMV50A575	380...575VAC	1	0.130
PMV50A600	600VAC	1	0.130

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss and incorrect phase sequence
- Configurable rated voltage (Ue):
  - PMV50A240: 208-220-230-240VAC
  - PMV50A575: 380-400-415-440-460-480-525-575VAC
- High tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 on terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay" for each	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601) as Auxiliary Devices; EAC.
Compliant to standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.



PMV70...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, without neutral. Minimum and maximum AC voltage and asymmetry. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip.			
PMV70A240	208...240VAC	1	0.130
PMV70A575	380...575VAC	1	0.130
PMV70A600	600VAC	1	0.130

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, incorrect phase sequence and asymmetry
- Configurable rated voltage (Ue):
  - PMV70A240: 208-220-230-240VAC
  - PMV70A575: 380-400-415-440-460-480-525-575VAC
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Control of phase-to-phase voltages
- Phase loss detection if one of the voltages is <70% rated value
- Phase loss tripping time: 60ms
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay" for each	Tripping delay 0.1...20s
"Asymmetry"	High voltage asymmetry tripping threshold 5...15% Ue.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

For three-phase systems with or without neutral



PMV50N...

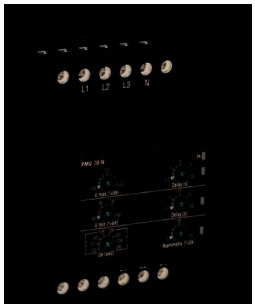
Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, with or without neutral. Minimum and maximum AC voltage. Delayed trip. Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip.			
PMV50NA240	208...240VAC	1	0.200
PMV50NA440	380...440VAC	1	0.200
PMV50NA600	480...600VAC	1	0.200

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss and incorrect phase sequence
- 4 configurable rated voltages (Ue):
  - PMV50NA240: 208-220-230-240VAC (phase-to-phase) 120-127-132-138VAC (phase-to-neutral)
  - PMV50NA440: 380-400-415-440VAC (phase-to-phase) 220-230-240-254VAC (phase-to-neutral)
  - PMV50NA600: 480-525-575-600VAC (phase-to-phase) 277-303-332-347VAC (phase-to-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection when one of the voltages is <70% rated voltage
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay" for each	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.



PMV70N...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, with or without neutral. Minimum and maximum AC voltage and asymmetry. Delayed trip. Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip.			
PMV70NA240	208...240VAC	1	0.200
PMV70NA440	380...440VAC	1	0.200
PMV70NA600	480...600VAC	1	0.200

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage, phase loss, neutral loss, incorrect phase sequence and asymmetry
- 4 configurable rated voltages (Ue):
  - PMV70NA240: 208-220-230-240VAC (phase-to-phase) 120-127-132-138VAC (phase-to-neutral)
  - PMV70NA440: 380-400-415-440VAC (phase-to-phase) 220-230-240-254VAC (phase-to-neutral)
  - PMV70NA600: 480-525-575-600VAC (phase-to-phase) 277-303-332-347VAC (phase-to-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection when one of the voltages is <70% rated value
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay" for each	Tripping time 0.1...20s
"Asymmetry"	High voltage asymmetry tripping threshold 5...15% Ue.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

For three-phase systems, with or without neutral



PMV80N...

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, with or without neutral. Minimum and maximum AC voltage, minimum and maximum frequency. Delayed trip. Phase loss, neutral loss and incorrect phase sequence. Instantaneous trip.			
PMV80NA240	208...240VAC	1	0.200
PMV80NA440	380...440VAC	1	0.200
PMV80NA600	480...600VAC	1	0.200

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage, minimum and maximum frequency, phase loss, neutral loss and incorrect phase sequence
- 4 configurable rated voltages (Ue):
  - PMV80NA240: 208-220-230-240VAC (phase-to-phase) 120-127-132-138VAC (phase-to-neutral)
  - PMV80NA440: 380-400-415-440VAC (phase-to-phase) 220-230-240-254VAC (phase-to-neutral)
  - PMV80NA600: 480-525-575-600VAC (phase-to-phase) 277-303-332-347VAC (phase-to-neutral)
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection if one of the voltages is <70% rated value
- Phase or neutral loss tripping time: 60ms
- 2 relay outputs, each with 1 changeover contact (SPDT)
- Modular DIN 43880, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Hz min/max"	Minimum/maximum frequency tripping threshold ±1...10% rated frequency
"V delay"	Tripping time 0.1...20s
"Hz delay"	Tripping time 0.1...5s.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

For single-phase systems



PMV55...

Order code	Rated voltage to control Ue	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Single-phase system. Minimum and maximum AC voltage. Delayed trip.			
PMV55A127	110...127VAC	1	0.125
PMV55A240	208...240VAC	1	0.125
PMV55A440	380...440VAC	1	0.125

General characteristics
- Voltage monitoring relay, self powered, for minimum and maximum voltage
- 4 configurable rated voltages (Ue):
  - PMV55A127: 110-115-120-127VAC
  - PMV55A240: 208-220-230-240VAC
  - PMV55A440: 380-400-415-440VAC
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"V max"	Maximum voltage tripping threshold 105...115% Ue
"V min"	Minimum voltage tripping threshold 80...95% Ue
"Delay" for each	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

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

Order code	Rated voltage to control Ue (phase-to-phase)	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Three-phase system, with or without neutral. Minimum and maximum AC voltage, minimum and maximum frequency and asymmetry. Delayed trip. Phase loss, neutral loss and phase sequence. Instantaneous trip. Programmable via smartphone or tablet with NFC technology and App.			
PMV95NA240NFC	208...240VAC	1	0.130
PMV95NA575NFC	380...575VAC	1	0.130



PMV95N...



The App can be downloaded from Google Play Store and App Store.

ANDROID APP ON Google play

Available on the App Store

8 protection functions in a single product, with possibility to enable or disable individually the functions of interest.
- maximum voltage
- minimum voltage
- maximum frequency
- minimum frequency
- asymmetry
- phase loss
- neutral loss
- incorrect phase sequence

Compact dimensions
Suitable for three-phase systems with or without neutral. It comes in a 2 DIN module modular housing

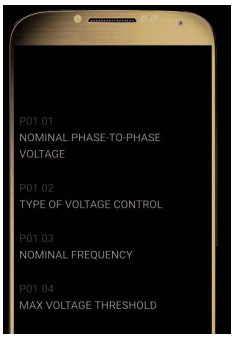
Excellent accuracy of settings with digital setting of time and tripping thresholds.

Repeatability of settings, with possibility to save the programming on the smartphone to be copied in fast way on other relays without risk of error.

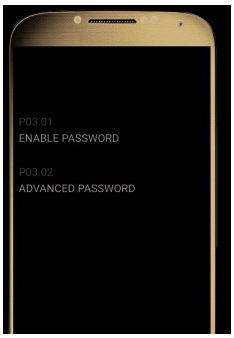


Simple and intuitive programming thanks to the graphic interface of the LOVATO NFC App that shows on the display of the smartphone the functions and parameters without need to consult the technical manual.





Protection of settings with a password.



General characteristics
- Multifunction voltage and frequency monitoring relay, self powered, for minimum and maximum voltage, minimum and maximum frequency, phase loss, neutral loss, incorrect phase sequence and asymmetry.
- NFC connectivity for parameter setting with LOVATO NFC App, freely downloadable from Google Play Store and App Store
- Simple, fast and intuitive programming
- Very high accuracy and repeatability of the settings
- Possibility to save the program on smartphone or tablet to be copied on other PMV95N, even with device powered off
- Possibility to enable or disable individually the functions of interest
- Possibility to protect the settings with a password
- QR code for the direct connection to the website www.LovatoElectric.com for the download of the technical manual
- Excellent tripping accuracy
- TRMS measurements (True Root Mean Square)
- Phase loss detection if one of the voltages is <70% rated value
- 1 relay output with changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals
- Adjustments: consult the technical manual on the website www.LovatoElectric.com.

Certifications and compliance
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

Frequency monitoring relays for single and three-phase systems



PMF20...

Order code	Rated voltage Ue	Qty per pkg	Wt
	[V] 50/60Hz	n°	[kg]
Single and three-phase systems. Minimum and maximum frequency. Delayed trip. Automatic reset.			
PMF20A240	220...240VAC	1	0.125
PMF20A415	380...415VAC	1	0.125

General characteristics
- Frequency monitoring relay, self powered, for minimum and maximum control
- Rated frequency selection: 50 or 60Hz
- Tripping threshold for minimum and maximum frequency
- Excellent tripping accuracy
- 1 relay output, configurable, with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Hz max"	Maximum frequency tripping threshold 101...110% rated frequency
"Delay"	Tripping time 0.1...20s
"Hz min"	Minimum frequency tripping threshold 90...99% rated frequency
"Delay"	Tripping time 0.1...20s
"Reset delay"	Resetting time 0.1...20s
"Mode"	• Minimum and maximum frequency with output relay normally energised • Maximum frequency with output relay normally energised • Minimum frequency with output relay normally energised • Maximum frequency with output relay normally de-energised.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

Current monitoring relay for single-phase systems



PMA20240

Order code	Rated current Ie	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single-phase system. AC/DC maximum current control. Auxiliary AC/DC power supply. Automatic or manual reset.				
PMA20240	5 or 16A	24...240V AC/DC	1	0.121

General characteristics
- Current monitoring relay for AC/DC maximum current control
- AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- TRMS current measurements (True Root Mean Square)
- Resetting and inhibition input
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Imax"	Maximum current tripping threshold 5...100% Ie
"Hysteresis"	Maximum hysteresis threshold 1...50%
"Trip delay"	Tripping time 0.1...30s
"Inhibition time"	Inhibition delay for external input or at power up 1...60s
"Aut. reset delay"	Automatic resetting time 0.1...30s
"Mode"	• Rated current 5A or 16A • Relay output normally energised or de-energised • Tripping memory (latch) ON or OFF.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Modular ampere monitoring relays; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

Current monitoring relays for single and three-phase systems



PMA30240

Order code	Rated current Ie	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single and three-phase system. AC/DC minimum or maximum current control. Delayed trip. Auxiliary AC/DC power supply. Automatic or manual reset.				
PMA30240	5 or 16A	24...240V AC/DC	1	0.121

General characteristics
- Current monitoring relay for AC/DC minimum or maximum current control
- AC/DC multivoltage auxiliary power supply
- Automatic or manual reset.
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- TRMS current measurements (True Root Mean Square)
- Resetting and inhibition input
- 1 relay output with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 2 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Set point"	Minimum or maximum current tripping threshold 5...100% Ie
"Hysteresis"	Minimum or maximum hysteresis threshold 1...50%
"Trip delay"	Tripping time 0.1...30s
"Inhibition time"	Inhibition delay for external input or at power up 1...60s
"Ie"	Current scale selection: 5A or 16A
"Mode"	• Min or max function • Relay output normally energised or de-energised • Tripping memory (latch) ON or OFF.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Modular ampere monitoring relays; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.



PMA40240

Order code	Rated current Ie	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single and three-phase system. AC/DC minimum and maximum current control. Delayed trip. Auxiliary AC/DC power supply. Automatic or manual reset.				
PMA40240	0.02-0.05-0.25-1-5-16A	24...240V AC/DC	1	0.166

General characteristics
- Current monitoring relay for AC/DC minimum and maximum current control
- AC/DC multivoltage auxiliary power supply
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- TRMS current measurements (True Root Mean Square)
- Automatic or manual resetting (manual resetting by power removal)
- 2 relay outputs (Min and Max), configurable, each with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

"Imax"	Maximum current tripping threshold 5...100% Ie
"Imin"	Minimum current tripping threshold 5...100% Ie
"Trip delay"	Minimum and maximum current tripping time 0.1...30s
"Inhibition time"	Inhibition time at power up 1...60s
"Ie"	Current scale selection: 20mA, 50mA, 250mA, 1A, 5A or 16A
"Mode"	• Separate or common relay outputs • Relay output normally energised or de-energised • Tripping memory (latch) ON or OFF.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Modular ampere monitoring relays; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

For single and three-phase systems



PMA50...

Order code	Rated current Ie	Auxiliary supply voltage	Qty per pkg	Wt
	[A]	[V]	n°	[kg]
Single and three-phase systems. Maximum AC current and minimum cosφ. Delayed trip. Phase loss and incorrect phase sequence. Instantaneous trip. Auxiliary AC power supply. Automatic or manual reset.				
PMA50A240	5 or 16A	220...240VAC	1	0.251
PMA50A415		380...415VAC	1	0.251
PMA50A480		440...480VAC	1	0.251

General characteristics
- Pump protection relay against dry running
- Auxiliary AC power supply
- Motor under-load and over-current control
- Direct connection up to 16A max or by current transformer (CT)
- Excellent tripping accuracy
- Voltage control range 80...660VAC
- Current control range 0.1...16A
- Resetting and enabling consent input
- 1 relay output relay with 1 changeover contact (SPDT)
- Modular DIN 43880 housing, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715) or screw fixing via pull out tabs
- IEC degree of protection: IP40 on front (only when placed in IP40 enclosure or control board); IP20 at terminals.

ADJUSTMENTS

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

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus - File E93601), as Auxiliary Devices - Modular ampere monitoring relays; EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 508, CSA C22.2 n° 14.

Insulation monitoring relay for AC IT systems

new



PMIB1A230

Order code	Rated voltage	Limit threshold	Qty per pkg	Wt
	[V]		n°	[kg]
For IT networks up to 230VAC. 1 adjustable intervention threshold.				
PMIB1A230	230VAC	1	1	0.200

General characteristics
The PMIB1A230 insulation monitoring relay is a device that allows the monitoring of the insulation towards earth of alternating current networks up to 230VAC isolated from earth (IT systems).
The insulation resistance is checked by applying a continuous component measurement signal between the insulated line and earth. By detecting the leakage current generated towards earth it is possible to measure the level of insulation.
On the front there are the TEST and RESET buttons, as well as the device powered (ON) and low insulation trip (TRIP) signals.
The intervention threshold is adjustable via a frontal potentiometer.
- Auxiliary power supply: 230VAC
- Insulation control of IT networks up to 230VAC
- Intervention threshold settable via front potentiometer
- LED signaling of ON and TRIP
- Dedicated buttons for the RESET and TEST function
- Dedicated inputs for the remote RESET and TEST function
- 250VAC 5A AC1 changeover relay output for signaling the intervention
- Modular DIN 43880 housing, 3 modules
- Mounting on 35mm DIN rail (IEC/EN/BS 60715)
- Degree of protection: IP40 on the front; IP20 on the terminals.

ADJUSTMENTS:
Intervention threshold: 25...100kOhm.

To indicate the low insulation signal, a dry changeover output is available.

Certifications and compliance
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61557-8, IEC/EN/BS 61326-1.

For low voltage



PMVF52

new

Order code	Rated voltage Control	Auxiliary	Qty per pkg	Wt
	[V]	[V]	n°	[kg]
For single-phase and three-phase systems with and without low voltage neutral. Dual threshold minimum and maximum voltage and frequency protection. Modular (4U).				
PMVF52	230VAC 400VAC	24...240VAC/ 24...240VDC	1	0.326

Voltage threshold for CEI 0-21.

Type of protection	Tripping threshold	Tripping time
Maximum voltage 59.S2	1.15Un	0.2s
Maximum voltage 59.S1 (moving mean over 10min)	1.10Un	≤ 3s
Minimum voltage 27.S1	0.85Un	1.5s
Minimum voltage 27.S2	0.15Un	0.2s

Frequency threshold for CEI 0-21.

Type of protection	Tripping threshold	Tripping time
High external signal and low local control conditions.		
Maximum frequency 81>.S2	51.5Hz	0.1s
Minimum frequency 81<.S2	47.5Hz	0.1s
Low external signal and high local control conditions.		
Maximum frequency 81>.S2	51.5Hz	1s
Minimum frequency 81<.S2	47.5Hz	4s
High conditions for both external signal and local control.		
Maximum frequency 81>.S1	50.2Hz	0.1s
Minimum frequency 81<.S1	49.8Hz	0.1s

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

Expansion modules

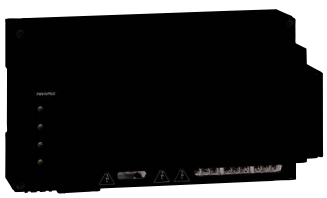


EXM10...

Order code	Description
Communication ports.	
EXM1010	Opto-isolated USB interface
EXM1011	Opto-isolated RS232 interface
EXM1012	Opto-isolated RS485 interface
EXM1013	Opto-isolated Ethernet interface
EXM1018❶	IEC/EN/BS 61850 interface
Inputs and outputs.	
EXM1001	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC

❶ **IEC 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).

Backup power supply



PMVFUPS02

new

Order code	Description	Qty per pkg	Wt
		n°	[kg]
PMVFUPS02	Input 230VAC Output 230VAC with stored energy 800Ws and power 650VA	1	0.450

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

General characteristics
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 device (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)
- 5th programmable input.

Also, there are 3 relay outputs for:
- IS opening and closing
- standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse)
- 3rd programmable input.

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)
- Relays output:
  OUT1: 8A 250VAC, 8A 30VDC
  OUT2: 5A 250VAC, 5A 30VDC
  OUT3: 2A 250VAC, 2A 30VDC
- Predisposed for IEC/EN/BS 61850 signal supervision using expansion EXM1018 or external module
- Expandable with up to 2 module EXM... by optical interface
- Event log (128 events with time reference):
  - interface protection interventions
  - action on password
  - command execution
  - system events
- Parameter configuration and remote control (only with communication expansion module) with software Synergy and Xpress
- Housing: modular (4 modules)
- Mounting on 35mm DIN rail or screw fixing
- Degree of protection for both: IP40 on front; IP20 on terminals.

Reference standards
Compliant standard: Italian CEI 0-21, IEC/EN/BS 60255-27, IEC/EN/BS 60255-26.

General characteristics for PMVFUPS02
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.
- power supply: 230VAC, 50Hz
- output voltage: 230VAC, 50Hz
- output power: 650VA
- accumulated energy: 800Ws
- accumulation time: 60s
- Housing: modular (9 modules)
- Mounting on 35mm DIN rail or screw fixing
- operating temperature: -5...+50°C
- degree of protection IP20 on front and terminals.

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

For medium voltage



PMVF3000

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 with standard cutout dimensions 92x92mm/3.62x3.62”				
PMVF3000	Measure-ments via VTs in MV or direct in LV	100...240VAC/ 110...250VDC	1	0.389

new

Voltage threshold for CEI 0-16

Type of protection	Tripping threshold	Tripping time
Maximum voltage 59.S2	1.2Un	0.6s
Maximum voltage 59.S1 (moving mean over 10min)	1.1Un	≤ 3s
Minimum voltage 27.S1	0.85Un	0.4s
Minimum voltage 27.S2	0.15Un	0.2s
Maximum residual voltage 59.V0 (59N)	5% Urn	25s

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

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

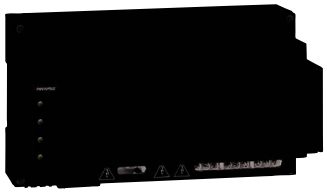


EXP10...

Order code	Description
EXPANSION MODULES FOR PMVF3000. For auto reclosing management of automatic circuit breaker (IS).	
EXP1003	2 relay outputs 5A 250VAC
Communication ports.	
EXP1010	Opto-isolated USB interface
EXP1011	Opto-isolated RS232 interface
EXP1012	Opto-isolated RS485 interface
EXP1013	Opto-isolated Ethernet interface
EXP1018❶	IEC/EN/BS 61850 interface

❶ 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).

Backup power supply



PMVFUPS02

new

Order code	Description	Qty per pkg	Wt
		n°	[kg]
PMVFUPS02	Input 230VAC Output 230VAC with stored energy 800Ws and power 650VA	1	0.450

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

General characteristics
PMVF3000 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 (IS) trips.
PMVF3000 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).

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 PMVF3000 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 PMVF3000 (unless it is already used for the standby device operation) or by installing an EXP1003 expansion module.

Operational characteristics
– Auxiliary voltage: 100-240VAC/110-250VDC
– 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
– Built-in Ethernet communication port
– Expandable with up to 2 module EXP...
– Parameter configuration and remote control with software Synergy and Xpress
– Housing: Flush mount 118x96mm/4.64x3.78”, cutout 92x92mm/3.62x3.62”.
– Degree of protection: IP65 on front; IP20 on terminals
– **Predisposed for IEC/EN/BS 61850 signal supervision using expansion or external module❶.**

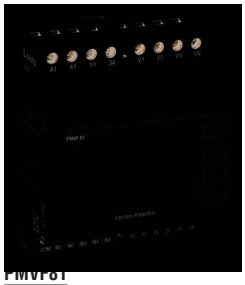
Reference standards
Compliant with standards: Italian CEI 0-16; IEC/EN/BS 60255-27, IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

Synergy: supervision and Energy management software with remote and configuration capabilities.

Xpress: free software for Energy management controlling one device only.
See section 36.

General characteristics for PMVFUPS02
See page 22-12.

For low, medium and high voltage



PMVF81

Order code	Rated voltage Control	Auxiliary	Qty per pkg	Wt
	[V]	[V]	n°	[kg]
For single-phase and three-phase systems with and without low voltage neutral. Dual threshold minimum and maximum voltage and frequency protection. R.O.C.O.F and Vector shift. Modular type (4U).				
PMVF81	Programmable	24...240VAC/ 24...240VDC	1	0.326

new

Voltage threshold (default for VDE-AR-N 4105).

Type of protection	
Maximum voltage threshold 2	●
Maximum voltage threshold 1	● (10 min. avg)
Minimum voltage threshold 1	●
Minimum voltage threshold 2	Optional set to OFF

Frequency threshold (default for VDE-AR-N 4105).

Type of protection	
Maximum frequency threshold 2	●
Maximum frequency threshold 1	Optional set to OFF
Minimum frequency threshold 1	Optional set to OFF
Minimum frequency threshold 2	●

Expansion modules

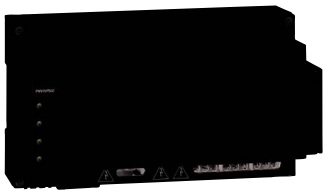


EXM10...

Order code	Description
Communication ports.	
EXM1010	Opto-isolated USB interface
EXM1011	Opto-isolated RS232 interface
EXM1012	Opto-isolated RS485 interface
EXM1013	Opto-isolated Ethernet interface
EXM1018❶	IEC/EN/BS 61850 interface
Inputs and outputs.	
EXM1001	2 digital opto-isolated inputs and 2 relay outputs 5A 250VAC

❶ **IEC 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).

Backup power supply



PMVFUPS02

new

Order code	Description	Qty per pkg	Wt
		n°	[kg]
PMVFUPS02	Input 230VAC Output 230VAC with stored energy 800Ws and power 650VA	1	0.450

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

General characteristics
PMVF81 interface protection system (IP) unit has been developed according to VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120 and VDE V 0126-1-1 standards.
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, PMVF81 must step in by de-energising a relay output so that the interface device (IS) trips.
PMVF81 is equipped with 5 inputs having the following functions:
- IS status feedback
- R.O.C.O.F./Vector shift delay
- disabling tripping
- remote tripping (forced IS opening independent of voltage and frequency values).
- programmable.

Also, there are 3 relay outputs for:
- IS opening and closing
- standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse)
- 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.

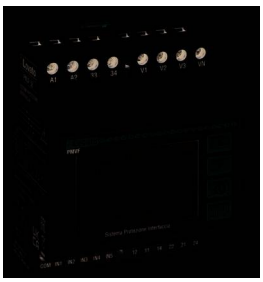
Operational characteristics
- Auxiliary voltage: 24...240VAC/24...240VDC
- Voltage inputs: 100-500000VAC (with VT)
- Relays output:
  OUT1: 8A 250VAC, 8A 30VDC
  OUT2: 5A 250VAC, 5A 30VDC
  OUT3: 2A 250VAC, 2A 30VDC
- The device can be password protected to prevent parameters from being altered
- 5 digital input
- Programmable voltage rating, voltage thresholds, frequency and delays
- Support of EXM series communication port (USB, RS232, RS485, Ethernet)
- Predisposed for IEC/EN/BS 61850 signal supervision using expansion EXM1018 or external module
- Expandable with up to 2 module EXM... by optical interface
- Event log (128 events with time reference):
  • interface protection interventions
  • action on password
  • command execution
  • system events
- Parameter configuration and remote control (only with communication expansion module) with software Synergy and Xpress
- Housing: modular (4 modules)
- Mounting on 35mm DIN rail or screw fixing
- Degree of protection: IP40 on front; IP20 on terminals.

Reference standards
Compliant standard VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120, IEC/EN 61010-1, IEC/EN 61000-6-2 and IEC/EN 61000-6-4.

Synergy: supervision and Energy management software with remote and configuration capabilities.

Xpress: free software for Energy management controlling one device only.
See section 36.

General characteristics for PMVFUPS02
See page 22-12.



PMVF...

new

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).				
PMVF61	Programmable	24...240VAC/ 24...240VDC	1	0.326
Compliant with standards G98/G99.				
PMVF71	Programmable	24...240VAC/ 24...240VDC	1	0.326
For systems requiring 3 maximum voltage thresholds (E.g.: Czech Republic and Slovakia).				
PMVF90	Programmable	24...240VAC/ 24...240VDC	1	0.326

Voltage threshold

Protection type	PMVF61	PMVF71	PMVF90
Maximum voltage threshold 3			●
Maximum voltage threshold 2	●	●	●
Maximum voltage threshold 1	● (10 min. average)	●	●
Minimum voltage threshold 1	●	●	●
Minimum voltage threshold 2	●	●	●

Frequency threshold

Protection type	PMVF61	PMVF71	PMVF90
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	●	●

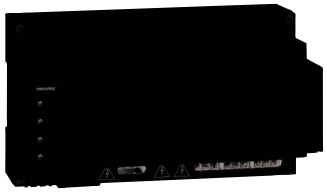


EXM10...

Order code	Description
Communication ports.	
EXM1010	Opto-isolated USB interface
EXM1011	Opto-isolated RS232 interface
EXM1012	Opto-isolated RS485 interface
EXM1013	Opto-isolated Ethernet interface
EXM1018❶	IEC/EN/BS 61850 interface
Inputs and outputs.	
EXM1001	2 digital inputs, opto-isolated and 2 relay outputs, rated 5A 250VAC

❶ **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).

Backup power supply



PMVFUPS02

new

Order code	Description	Qty per pkg	Wt
		n°	[kg]
PMVFUPS02	Input 230VAC Output 230VAC with stored energy 800Ws and power 650VA	1	0.450

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

General characteristics
PMVF... interface protection system (IPS) 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 IPS must step in by de-energising a relay output so that the interface device (IS) trips.
PMVF... is equipped with 5 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 3 relay outputs for:
- IS opening and closing
- standby device opening (programmable: retentive normally energised, retentive normally de-energised or adjustable pulse)
- 3rd programmable input.

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.

Operational characteristics
- Auxiliary voltage: 24...240VAC/24...240VDC
- Voltage inputs: 100-500000VAC (with VT)
- Relays output:
  OUT1: 8A 250VAC, 8A 30VDC
  OUT2: 5A 250VAC, 5A 30VDC
  OUT3: 2A 250VAC, 2A 30VDC
- The device can be password protected to prevent parameters from being altered
- 5 digital input
- Programmable voltage rating, voltage thresholds, frequency and delays
- Support of EXM series communication port (USB, RS232, RS485, Ethernet)
- Predisposed for IEC/EN/BS 61850 signal supervision using expansion EXM1018 or external module
- Expandable with up to 2 module EXM... by optical interface
- Event log (128 events with time reference):
  • interface protection interventions
  • action on password
  • command execution
  • system events
- Parameter configuration and remote control (only with communication expansion module) with software Synergy and Xpress
- Housing: modular (4 modules)
- Mounting on 35mm DIN rail or screw fixing
- Degree of protection: IP40 on front; IP20 on terminals.

Reference standards
Compliant with standards: DEWA DRRG (PMVF61); SEC (PMVF61); ENA G98/G99 (PMVF71); IEC/EN/BS 60255-27; IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

Synergy: supervision and Energy management software with remote and configuration capabilities.

Xpress: free software for Energy management controlling one device only.
See section 36.

General characteristics for PMVFUPS02
See page 22-12.

22

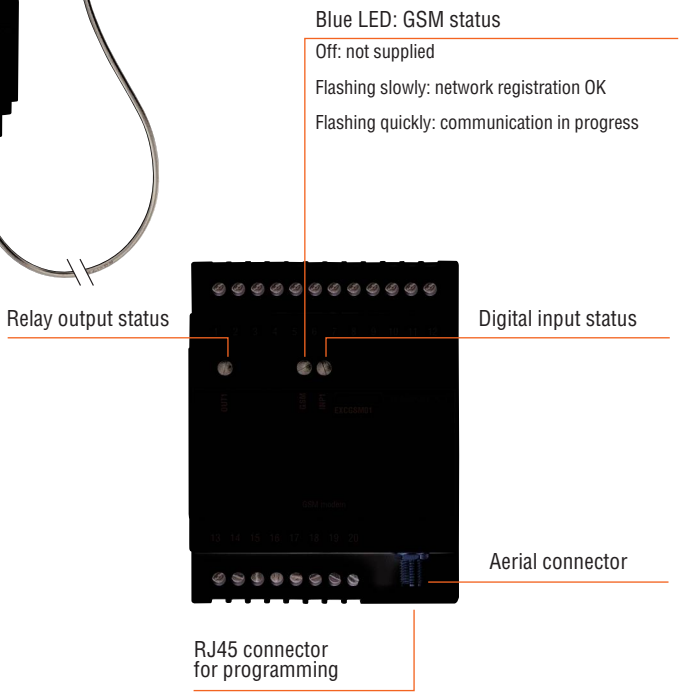
Remote control and monitoring GSM modem via SMS

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

Order code	Description
	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



EXCGSM01



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) 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).

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.

Functional characteristics
- Connection to the GSM network for sending and receiving SMS messages
- Programmable message texts
- Command output piloted by SMS or internal logic, for example to send the remote disconnection command to the interface device CEI 0-16
- Programmable digital input, for example to detect the status of the Interface Switch (IS) and sending of successful IS opening and closing SMSs
- POD management (active user code)
- Management of the list of caller IDs (CLI) up to 5000 callers enabled
- Detection of mobile network coverage
- Full compatibility with medium-voltage PI LOVATO Electric PMVF30: no software/hardware updates or programming required
- **Compatibility with third-party PIs where the remote disconnection signal is transmitted via digital input (dry contact)**
  For additional information contact our Technical support Tel. + 39 035 4282422; E-mail: service@LovatoElectric.com.

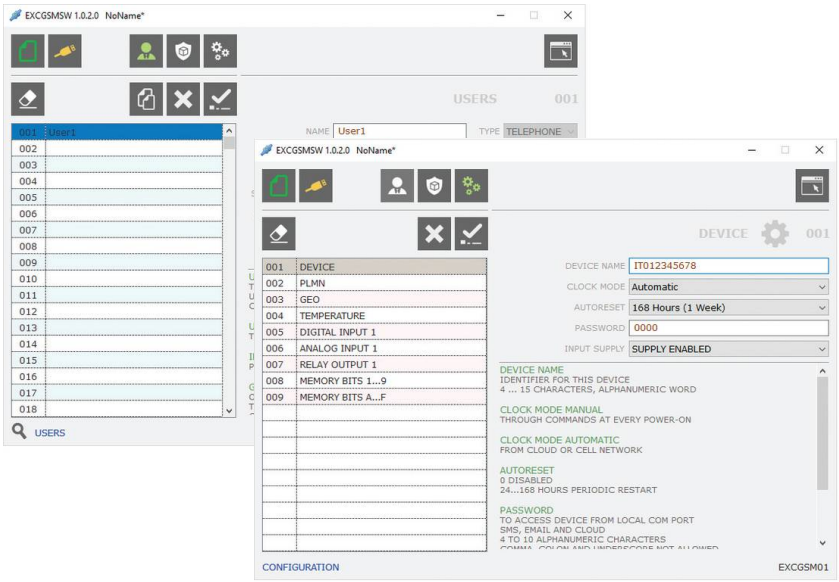
Operational characteristics
MODEM
- Supply: 100...240VAC
- Consumption: 5VAC
- 1 digital output 3A 250VAC
- 1 self-supplied digital input
- 1 analog input 0...10V, 0...20mA, NTC
- Housing for 3V and 1.8V SIM card
- SIM PIN management
- Temperature sensor
- Update time, sunrise and sunset via GSM network
- Position update via GSM
- Certified according to FCC rules, part 15B
- Housing: modular (4 modules)
- Mounting on 35mm DIN rail
- Operating temperature: -20...+60°C
- Protection rating: IP40 on front; IP20 on terminals.

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.

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

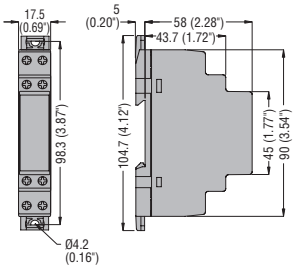
Software

To configure the EXCGSM01 modem (using the RJ45-USB programming cable included), the EXCGSMSW software must be used. This can be downloaded for free from the www.LovatoElectric.com website.
The software allows you to set:
– the users enabled to exchange messages with the modem
– the identifier of the modem, for example the active customer code (POD) in CEI 0-16 applications;
– the functions assigned to the digital output and input and to analog input;
– the texts of the SMS associated with the commands
– the logic of the actions taken following the SMS arrival, change of input status, alarm situations.
Configuration is also possible off-line, creating a file to transfer to the modem at another time.

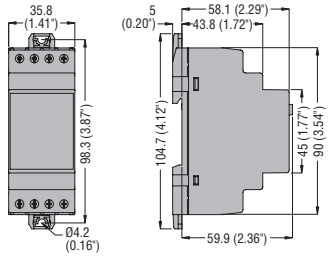


MONITORING RELAYS

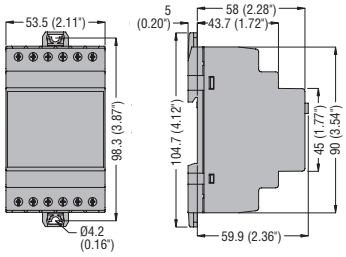
PMV10...



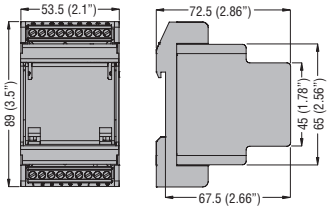
PMV20... - PMV95N... - PMF20
PMA20... - PMA30...



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

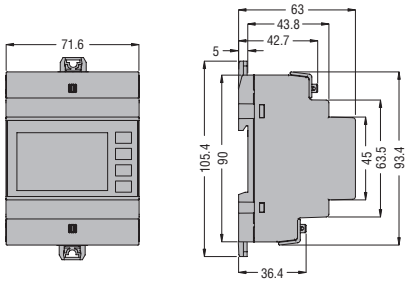


PMIB1A230



INTERFACE PROTECTION SYSTEM UNITS

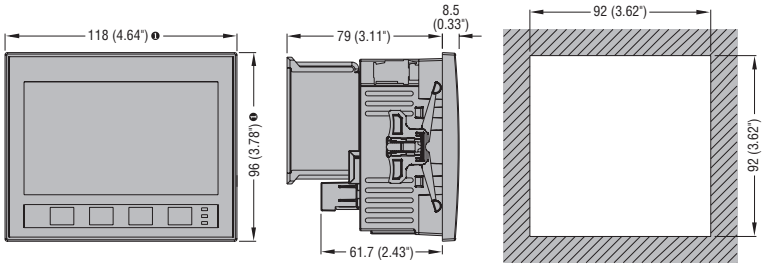
PMVF52 - PMVF61 - PMVF71 - PMVF81 - PMVF90



INTERFACE PROTECTION SYSTEM UNIT

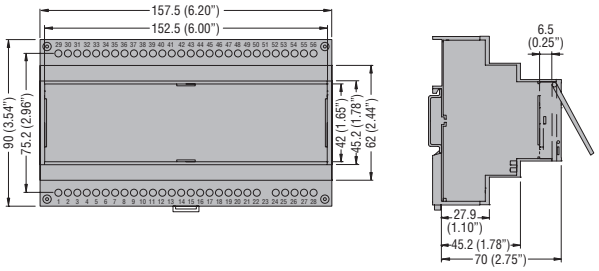
PMVF3000

Cutout



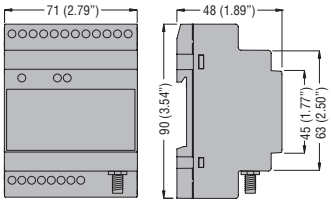
BACKUP POWER SUPPLY

PMVFUPS02

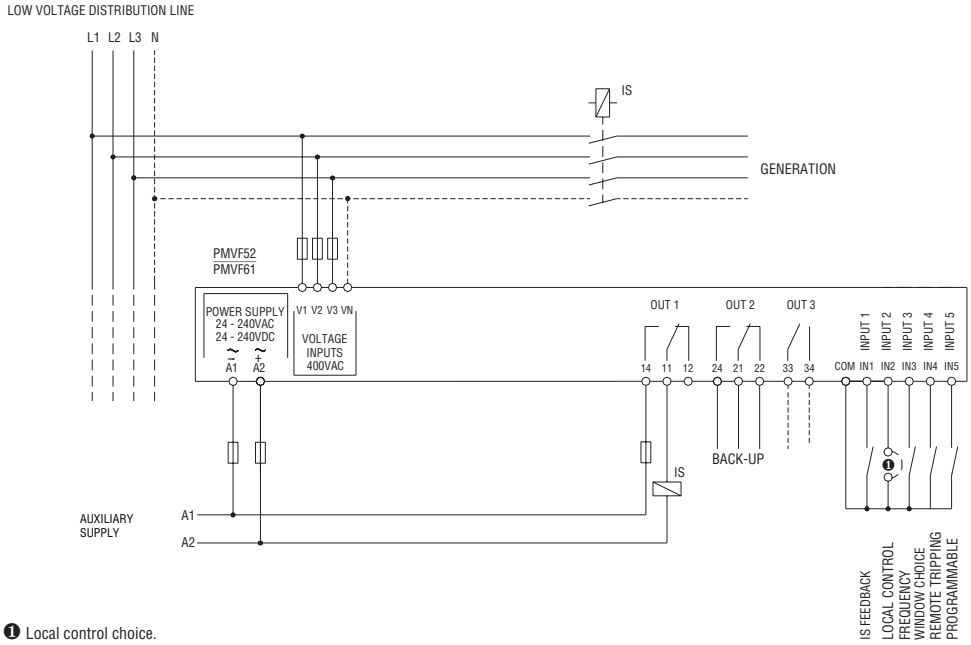


GSM MODEM FOR REMOTE DISCONNECTION SIGNAL

EXCGSM01

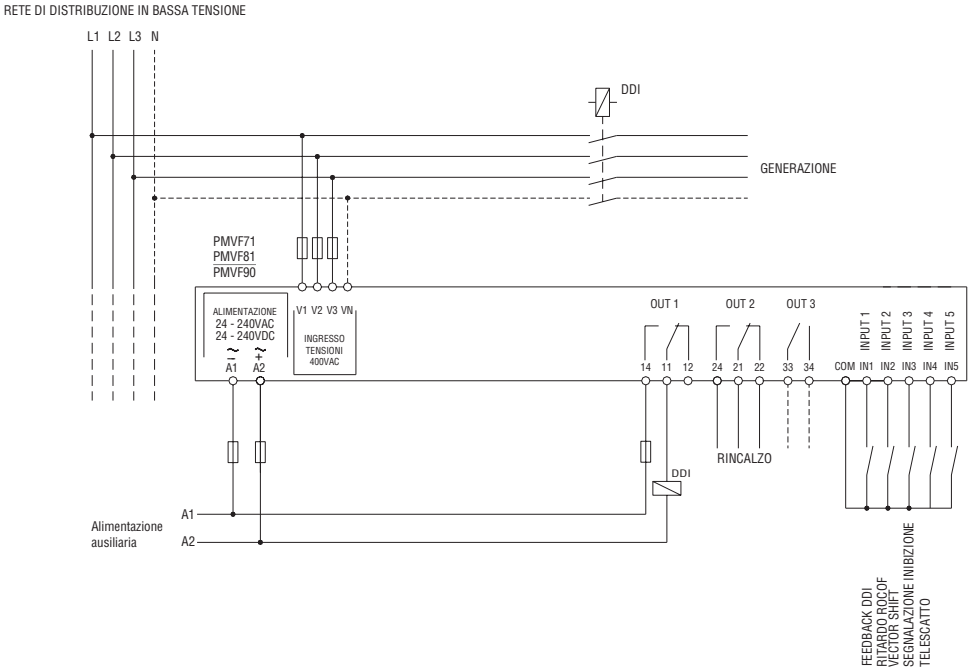


PMVF52 - PMVF61
Three-phase connection



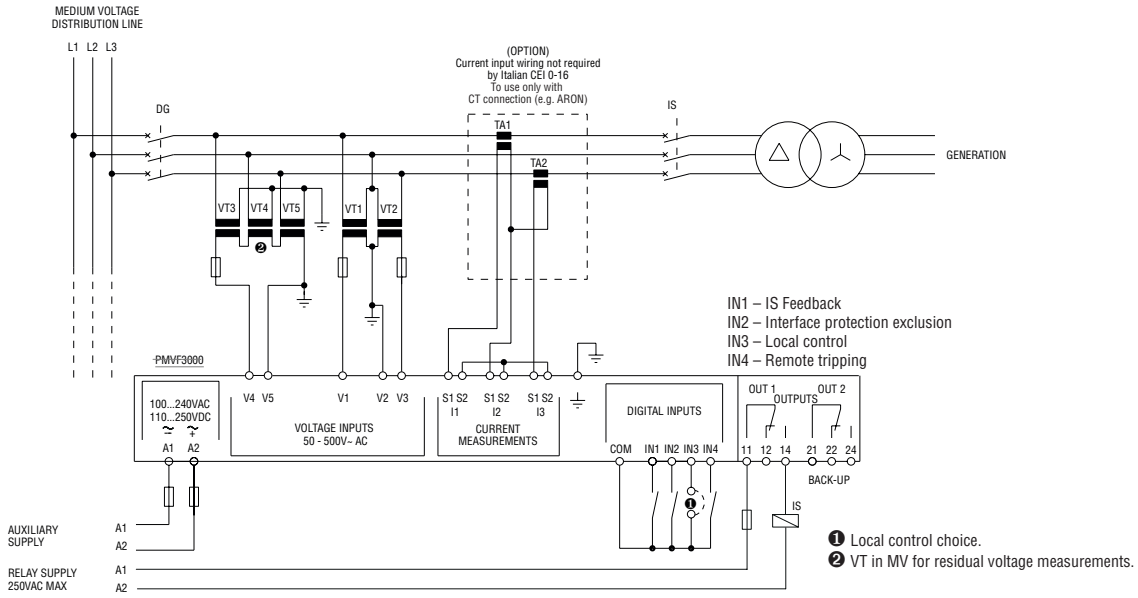
❶ Local control choice.

PMVF71 - PMVF81 - PMVF90
Three-phase connection



PMVF3000

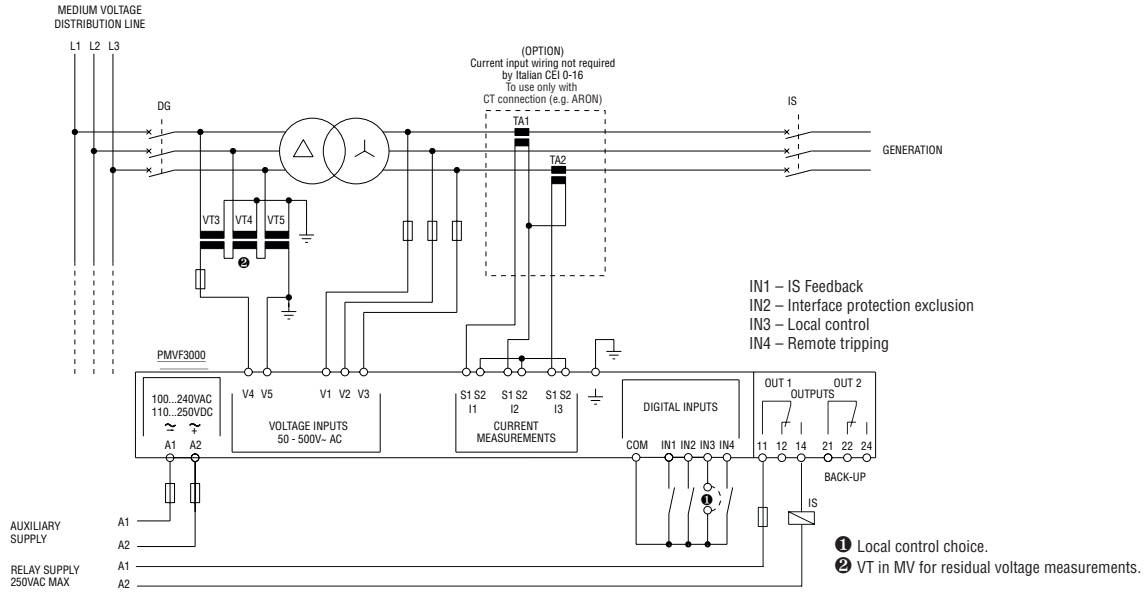
Connection through VTs in Medium Voltage
Three-phase connection



IN1 – IS Feedback
IN2 – Interface protection exclusion
IN3 – Local control
IN4 – Remote tripping

❶ Local control choice.
❷ VT in MV for residual voltage measurements.

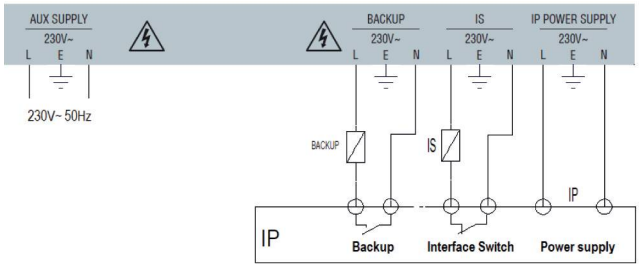
Direct connection in Low Voltage
Three-phase connection



IN1 – IS Feedback
IN2 – Interface protection exclusion
IN3 – Local control
IN4 – Remote tripping

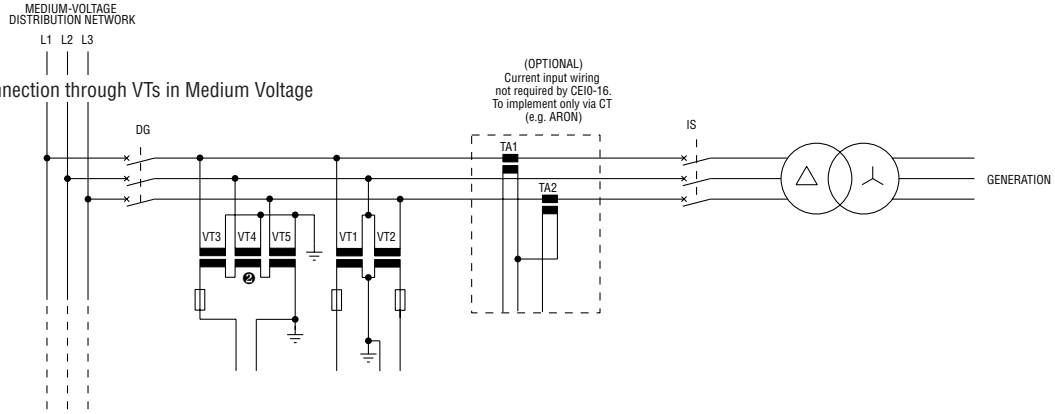
❶ Local control choice.
❷ VT in MV for residual voltage measurements.

PMVFUPS02

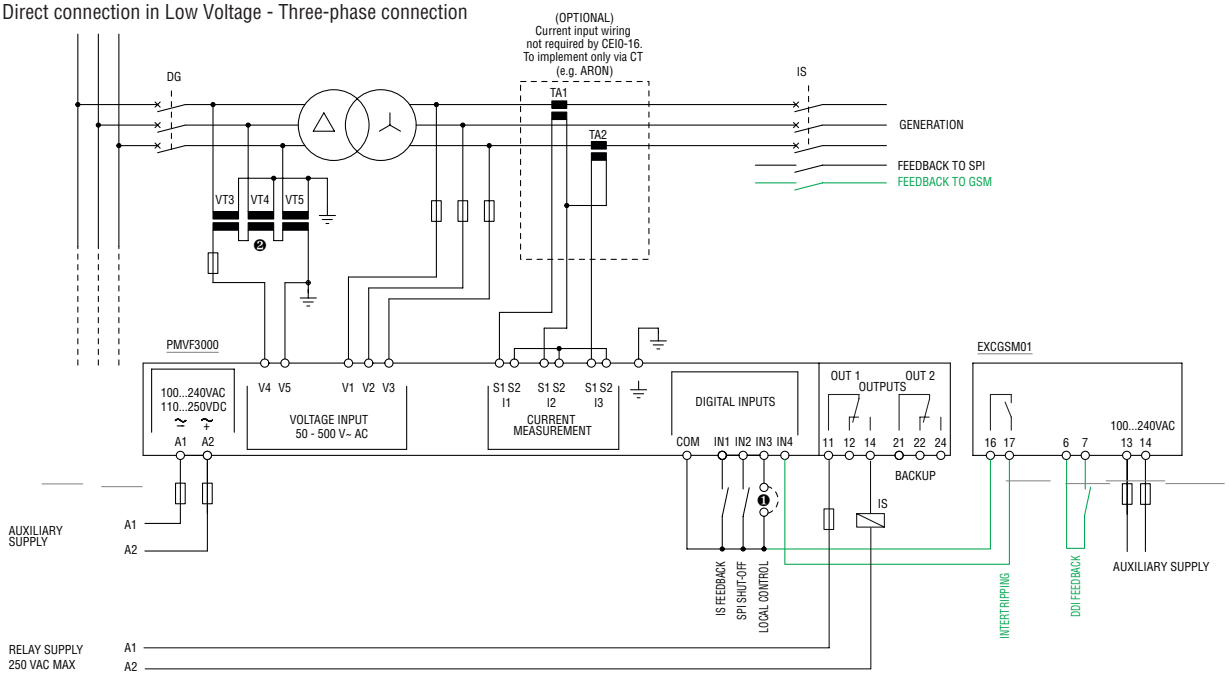


PMVF3000 with EXCGSM01

Connection through VTs in Medium Voltage



Direct connection in Low Voltage - Three-phase connection

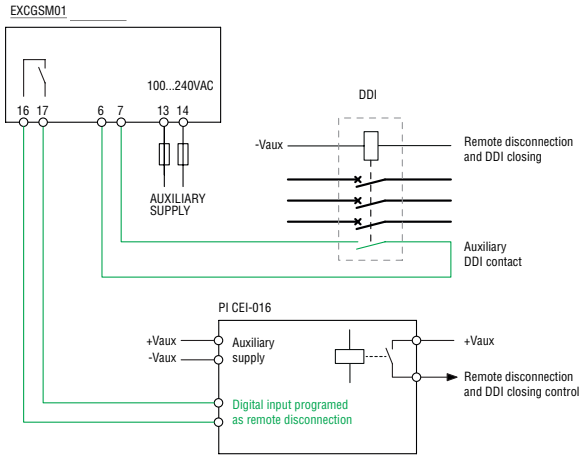


❶ Local control choice.
❷ VT in MV for residual voltage measurements.

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

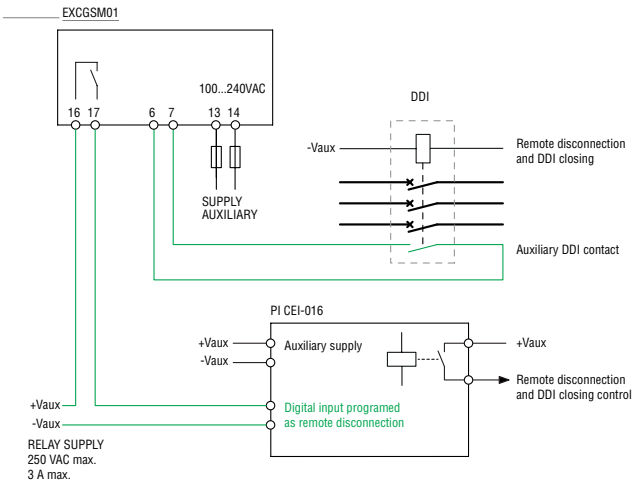
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EXCGSM01 modem wiring diagram with other interface protections (PI) with self-supplied remote disconnection input



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

EXCGSM01 modem wiring diagram with other interface protections (PI) with remote disconnection input to be supplied



TYPE	Single phase	**PMV55**	—	—	—	—	
	Three phase	—	**PMV10**	**PMV20**	**PMV30**	**PMV40**	
	Three phase with/without neutral	—	—	—	—	—	
DESCRIPTION							
		Minimum and maximum AC voltage	Phase loss and incorrect phase sequence		Minimum AC voltage, phase loss and incorrect phase sequence	Asymmetry, phase loss and incorrect phase sequence	
CONTROL CIRCUIT							
Rated voltage to control (Ue)		110...127VAC	208...480VAC	100...240VAC	208...240VAC		
		208...240VAC		208...575VAC	380...575VAC		
		380...440VAC		380...600VAC	600VAC		
Maximum voltage set-point		105...115% Ue	—	—	—	—	
Minimum voltage set-point		80...95% Ue	—	—	80...95% Ue	—	
Asymmetry set-point		—	—	—	—	5...15% Ue	
Minimum and maximum frequency set-point		—	—	—	—	—	
Tripping time		0.1...20s	60ms		0.1...20s		
Resetting time		0.1...20s (0.5s at power up)	0.5s		0.1...20s (0.5s at power up)		
Resetting hysteresis		3%	5%		3%		
Instantaneous tripping for Ue		<70% Ue configured	Umin<70% Ue		<70% Ue configured	<70% Ue configured	
Repeat accuracy		< ±0.1%	< ±1%		< ±0.1%	< ±0.1%	
POWER SUPPLY							
Auxiliary voltage (Us)		Self powered					
Operating range		105...115% Ue	—	—	—	—	
Frequency		0.7...1.2Ue	0.85...1.1Ue		0.7...1.2Ue		
Power consumption (maximum)		10VA (208...240VAC)❶ 17VA (380...440VAC)❶	20VA❶	28VA❶	11VA (208...240VAC)❶ 30VA (380...575VAC)❶ 19VA (600VAC)❶		
Power dissipation (maximum)		1.5W	2.2W	2.5W			
RELAY OUTPUTS							
Number of relays		1					
Relay state		Normally energised De-energises at tripping					
Contact arrangement		1 changeover SPDT					
Rated operational voltage		250VAC					
Maximum switching voltage		400VAC					
Conventional free-air thermal current (Ith)		8A					
UL/CSA and IEC/EN/BS 60947-5-1 designation		B300					
Electrical life (with rated load)		10^5 cycles					
Mechanical life		$30x10^6$ cycles					
Indications		1 green LED for power on and tripping 2 red LEDs for tripping	1 green LED for power on and tripping		1 green LED for power on and tripping 1 red LED for tripping		
CONNECTIONS							
Terminal tightening torque (maximum)		0.8Nm (7lb.in; 7...9lb.in for UL/CSA)					
Conductor section min...max		0.2...4.0mm² (24...12AWG; 18...12AWG for UL/CSA)					
INSULATION (input-output)							
IEC rated insulation voltage Ui		440VAC	480VAC	600VAC			
IEC rated impulse withstand voltage Uimp		6kV					
IEC power frequency withstand voltage		4kV					
AMBIENT CONDITIONS							
Operating temperature		–20...+60°C					
Storage temperature		–30...+80°C					
HOUSING							
Material		Self-extinguishing polyamide					

❶ Power consumption (maximum) at 50Hz.

	—	—	—	—	—	—
	PMV50	**PMV70**	—	—	—	—
	—	—	**PMV50N**	**PMV70N**	**PMV80N**	**PMV95N**
	Minimum and maximum AC voltage, phase loss and incorrect phase sequence	Minimum and maximum AC voltage, phase loss incorrect phase sequence and asymmetry	Minimum and maximum AC voltage, phase loss neutral loss and incorrect phase sequence	Minimum and maximum AC voltage, phase loss neutral loss, incorrect phase sequence and asymmetry	Minimum and maximum AC voltage and frequency, phase loss, neutral loss and incorrect phase sequence	Minimum and maximum AC voltage and frequency, phase loss, neutral loss, incorrect phase sequence and asymmetry
	208...240VAC	208...240VAC	208...240VAC	208...240VAC	208...240VAC	208...240VAC
	380...575VAC	380...575VAC	380...440VAC	380...440VAC	380...440VAC	380...575VAC
	600VAC	600VAC	480...600VAC	480...600VAC	480...600VAC	—
	105...115% Ue	105...115% Ue	105...115% Ue	105...115% Ue	105...115% Ue	105...115% Ue
	80...95% Ue	80...95% Ue	80...95% Ue	80...95% Ue	80...95% Ue	80...95% Ue
	—	5...15% Ue	—	5...15% Ue	—	5...15% Ue
	—	—	—	—	±1...10% rated frequency	±1...10% rated frequency
	0.1...20s				0.1...20s / 0.1...5s freq.	0.1...30s
	0.1...20s (0.5s at power up)	0.5s	0.1...20s (0.5s at power up)	0.5s	0.5s	0.1...30s (0.5s at power up)
	3%	3%	3%	3%	3% / 0.5% freq.	1...5%
	<70% Ue configured					
	< ±0.1%					
	Self powered					
	0.7...1.2Ue					
	50/60Hz ±5%		50/60Hz ±10%			
	11VA (208...240VAC)❶ 30VA (380...575VAC)❶ 19VA (600VAC)❶		27VA			30VA
	2.5W		1.9W			2.5W
	1		2			1
	Normally energised De-energises at tripping					
	1 changeover SPDT		2 changeover SPDT			1 changeover SPDT
	250VAC					
	400VAC					
	8A					
	B300					
	10^5 cycles					
	$30x10^6$ cycles					
	1 green LED for power on and tripping 2 red LEDs for tripping	1 green LED for power on and tripping 3 red LEDs for tripping	1 green LED for power on and tripping 2 red LEDs for tripping	1 green LED for power on and tripping 3 red LEDs for tripping		1 green LED for power 5 red LEDs for tripping
	0.8Nm (7lb.in; 7...9lb.in for UL/CSA - PMV50N/70N/80N excluded)					
	0.2...4.0mm^2 (24...12AWG; 18...12AWG for UL/CSA - PMV50N/70N/80N excluded)					
	600VAC					
	6kV					
	4kV					
	–20...+60°C					
	–30...+80°C					
	Self-extinguishing polyamide					

TYPE		PMF20
DESCRIPTION		Single-phase minimum and maximum frequency control
FREQUENCY CONTROL CIRCUIT		
Rated frequency		50 or 60Hz selectable
Operating frequency range		40...70Hz
Adjustment	MAX tripping	101...110% operating frequency
	MIN tripping	90...99% operating frequency
	Resetting hysteresis	0.5%
	Inhibition time	0.1...20s
	Reset delay	0.1...20s
Resetting		Automatic
Repeat accuracy		< ±0.1%
AUXILIARY POWER SUPPLY		
Rated supply voltage Ue		220...240VAC
		380...415VAC
Operating range		0.85...1.1Ue
Rated frequency		50/60Hz
Power consumption (maximum)		10VA (220...240VAC); 17VA (380...415VAC)
Power dissipation (maximum)		1.5W
RELAY OUTPUTS		
Number of relays		1
Relay state		Normally energised, de-energises at tripping❶
Contact arrangement		1 changeover contact SPDT
Rated operational voltage		250VAC
Maximum switching voltage		400VAC
IEC conventional free air thermal current Ith		8A
UL/CSA and IEC/EN/BS 60947-5-1 designation		B300
Electrical life (with rated load)		10^5 cycles
Mechanical life		$30x10^6$ cycles
Indications		1 green LED for power on/tripping 2 red LEDs for min-max tripping
CONNECTIONS		
Tightening torque maximum		0.8Nm (7lb.in)
Conductor section min-max		0.2...4.0mm² (24...12AWG)
INSULATION (input - output)		
IEC rated insulation voltage Ui		575VAC
IEC rated impulse withstand voltage Uimp		6kV
IEC power frequency withstand voltage		4kV
AMBIENT CONDITIONS		
Operating temperature		–20...+60°C
Storage temperature		–30...+80°C
HOUSING		
Material		Self-extinguishing polyamide

❶ Normally de-energised, energises at tripping with $\overline{\text{MAX}}$ function configured.

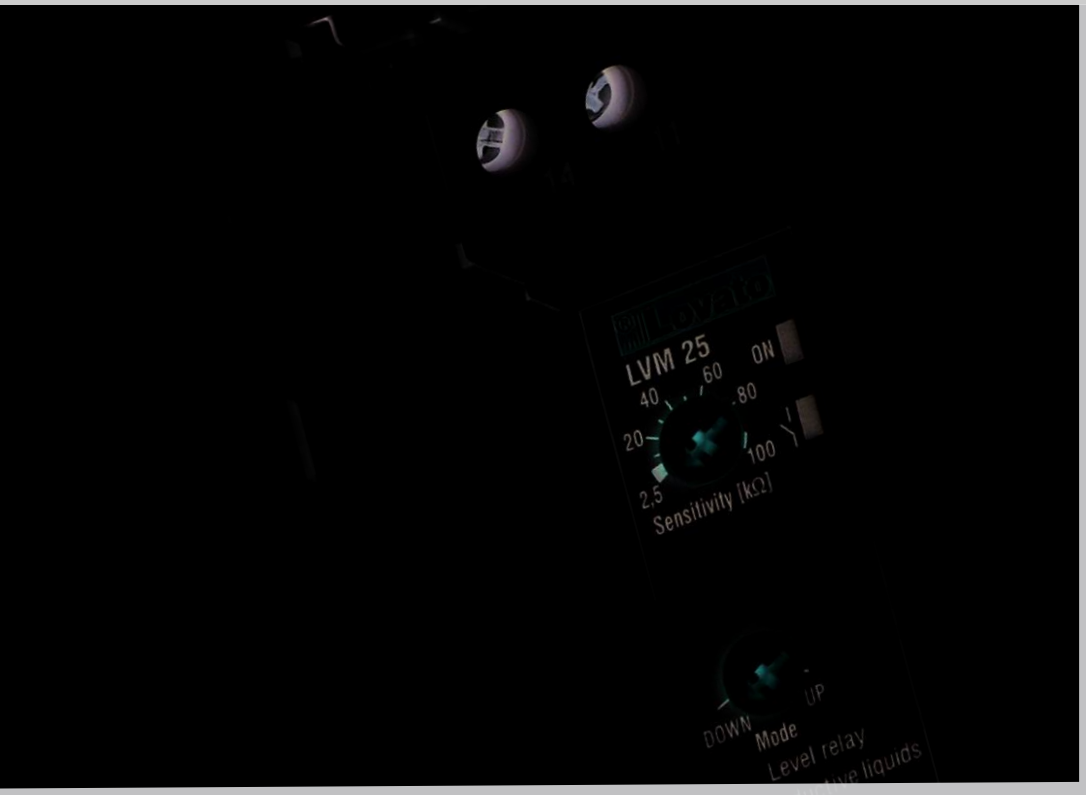
TYPE		PMA20	PMA30	PMA40	PMA50
DESCRIPTION					
		Single-phase maximum current monitoring AC/DC multiscale	Single-phase minimum or maximum current monitoring AC/DC multiscale	Single-phase minimum or maximum current monitoring AC/DC multiscale	Single and three-phase pump protection (motor under-load and over-current control) monitoring for max AC current, min cosφ, phase loss and incorrect phase sequence
CONTROL CIRCUIT					
Rated current		5 or 16A		0.02 - 0.05 - 0.25 - 1 - 5 - 16A	5 or 16A
Rated frequency		50/60Hz ±5%			
Overload capacity		5 Ie for 1s 160A for 10ms Constant 16A		50mA - 1A inputs: 5 Ie for 1s 10Ie for 10ms Constant 2Ie	16A input: 5 Ie for 1s 160A for 10ms Constant 16A	5Ie for 1s 160A for 10ms Constant 16A
Connection		Direct or by current transformer			
Current monitoring relays adjustments	Tripping values	5...100% f.s.			—
	Tripping time	0.1...30s			—
	Inhibition time	1...60s			—
	Resetting hysteresis	1...50%		3% fixed	—
Pump protection relays adjustments	End-scale value	—			5 or 16A
	Tripping for MAX current	—			10...100Ie
	Tripping for cosφ	—			0.1...0.99 cosφ (Min)
	Tripping delay	—			0.1...10s
	Inhibition time	—			1...60s
	Automatic resetting delay	—			OFF...100min
Resetting		Automatic or manual			—
External input		Resetting or inhibition		—	Consent for running/resetting
Repeat accuracy		±1% with constant parameters			
VOLTAGE CONTROL CIRCUIT					
Voltage measuring range (Ue)		—			80...660VAC
Tripping time for phase loss		—			60ms
AUXILIARY SUPPLY					
Auxiliary supply voltage Us		24...240VAC/DC			220...240VAC
					380...415VAC
					440...480VAC
Operating range		0.85...1.1Us			
Rated frequency		50/60Hz ±5%			
Power consumption (maximum)		3.2VA		7VA	4.5VA
Power dissipation (maximum)		1.6W		1.7W	2.3W
RELAY OUTPUTS					
Number of relays		1		2	1
Relay state		Normally energised / de-energised (selectable)			Normally energised, de-energises at tripping
Contact arrangement		1 changeover contact SPDT each			
Rated operational voltage		250VAC			
Maximum switching voltage		400VAC			
IEC conventional free air thermal current Ith		8A			
UL/CSA and IEC/EN/BS 60947-5-1 designation		B300			
Electrical life (with rated load)		10^5 cycles			
Mechanical life		30x10^6 cycles			
Indications		1 green LED for power on/inhibition 1 red LED for tripping		1 green LED for power on/inhibition 2 red LEDs for max/min tripping	
CONNECTIONS					
Tightening torque maximum		0.8Nm (7lb.in; 7...9lb.in per UL/CSA)			
Conductor section min...max		0.2...4.0mm² (24...12AWG; 18...12AWG per UL/CSA)			
INSULATION (input-output)					
IEC rated insulation voltage Ui		415VAC			600VAC
IEC rated impulse withstand voltage Uimp		4kV			6kV
IEC power frequency withstand voltage		2.5kV			
AMBIENT CONDITIONS					
Operating temperature		–20...+60°C			
Storage temperature		–30...+80°C			
HOUSING					
Material		Self-extinguishing polyamide			

TYPE	**PMIB1A230**
DESCRIPTION	
	Insulation monitoring relay
VOLTAGE CONTROL CIRCUIT	
Voltage measuring range	207...253VAC
Adjustable intervention threshold	25...100kOhm
AUXILIARY SUPPLY	
Auxiliary supply voltage Us	220...240VAC
Operating range	0.85...1.1Us
Rated frequency	50/60Hz ±5%
Power consumption (maximum)	3VA
Power dissipation (maximum)	1.5W
RELAY OUTPUTS	
Number of relays	1
Relay state	Normally energised, de-energises at tripping
Contact arrangement	1 changeover contact SPDT each
Rated operational voltage	250VAC
Maximum switching voltage	250VAC
IEC conventional free air thermal current Ith	5A
Electrical life (with rated load)	$3x10^5$ cycles
Mechanical life	$50x10^6$ cycles
Indications	1 green LED for power on/inhibition 1 red LED for tripping
CONNECTIONS	
Tightening torque maximum	0.5Nm (4.5lb.in)
Conductor section min...max	0.2...2.5mm^2 (24...12AWG)
INSULATION (input-output)	
IEC rated insulation voltage Ui	600VAC
IEC rated impulse withstand voltage Uimp	4kV
IEC power frequency withstand voltage	2.5kV
AMBIENT CONDITIONS	
Operating temperature	–10...+60°C
Storage temperature	–20...+70°C
HOUSING	
Material	Self-extinguishing polycarbonate

TYPE	PMVF52	PMVF61 - PMVF71 - PMVF81 - PMVF90	PMVF3000
AUXILIARY POWER SUPPLY			
Rated control supply voltage Us	24...240VAC / 24...240VDC	24...240VAC / 24...240VDC	100...240VAC / 110...250VDC
Operating limits	22...264VAC / 22...264VDC	22...264VAC / 22...264VDC	90...264VAC / 93.5...300VDC
Frequency	45...55Hz	45...55Hz	45...55Hz
Power consumption max	6.2VA	6.2VA	15VA
Power dissipation max	2W	2W	6W
Micro-breaking immunity	240VAC 50Hz ≤2000ms 240VDC ≤1000ms 24VAC 50Hz ≤30ms 24VDC ≤15ms	240VAC 50Hz ≤2000ms 240VDC ≤1000ms 24VAC 50Hz ≤30ms 24VDC ≤15ms	≤50ms
Overload category	III	III	III
VOLTAGE INPUTS			
Rated operating voltage	400VAC L-L; 230VAC L-N 50Hz	400VAC L-L; 230VAC L-N 50Hz	50...500VAC (for voltages/frequency) / 50...150V (for residual voltage measurement)
Measuring range	40...480VAC L-L; 23...277VAC L-N	without VT: 10...520VAC L-L; 5...300VAC L-N with VT: 100...500000VAC L-L; 57...290000VAC L-N	400-150,000V (VT primary)
Frequency range	45...55Hz	45...55Hz - 45...66 (for PMVF61)	45...55Hz
Overload category	IV	IV	IV
CURRENT INPUTS (OPTIONAL)			
Rated operational current Ie	–	–	1A or 5A in AC programmable
Measuring range	–	–	For 1A scale: 0.01...1.2A; for 5A scale: 0.01...6A
Type of input	–	–	Shunts powered by external current transformer (low voltage) 5A max.
Type of measurement	–	–	RMS
Overload capacity	–	–	±100% Ie
Overload peak	–	–	50A for 1 second
RELAY OUTPUTS			
Number of outputs	3❶	3❶	2
Type of output	2 changeover contact and 1 output NO	2 changeover contact and 1 output NO	1 changeover contact/SPDT each
Rated operating voltage	250VAC	250VAC	250VAC
IEC/EN/BS 60947-5-1 designation	OUT1: 8A 250VAC, 8A 30VDC OUT2: 5A 250VAC, 5A 30VDC OUT3: 2A 250VAC, 2A 30VDC	OUT1: 8A 250VAC, 8A 30VDC OUT2: 5A 250VAC, 5A 30VDC OUT3: 2A 250VAC, 2A 30VDC	5A 250VAC AC1 / B300, 5A 30VDC
Overload category	III	III	III
DIGITAL INPUTS			
Number and type of inputs	4 positive (PNP)	4 positive (PNP)	4 negative (NPN)
Input voltage	5VDC output from the common	5VDC output from the common	24VDC isolated
Input current	6mA	6mA	7mA
SUPPLY/VOLTAGE MEASURING CIRCUIT CONNECTIONS			
Type of terminal	Screw - fixed	Screw - fixed	Screw - fixed
Number of terminals	–	–	2 for power supply; 5 for voltage control
Conductor section (min...max)	0.2...4mm² (24...12AWG)	0.2...4mm² (24...12AWG)	0.2...4.0mm² (24...12AWG)
Tightening torque	0.8Nm (7lb.in)	0.8Nm (7lb.in)	0.8Nm (7lb.in)
CURRENT MEASURING CIRCUIT CONNECTIONS			
Type of terminal	–	–	Screw - fixed
Number of terminals	–	–	6 for external CT connections
Conductor section (min...max)	–	–	0.2...4mm² (24...12AWG)
Tightening torque	–	–	0.44Nm (4lb.in)
RELAY OUTPUT CONNECTIONS			
Type of terminals	Screw - fixed	Screw - fixed	Screw - removable
Conductor section (min...max)	0.2...2.5mm² (24...12AWG)	0.2...2.5mm² (24...12AWG)	0.2...2.5mm² (24...12AWG)
Tightening torque	0.44Nm (4lb.in)	0.44Nm (4lb.in)	0.5Nm (4.5lb.in)
INPUT CONNECTIONS – Input terminals			
Type of terminals	Screw - fixed	Screw - fixed	Screw - removable
Conductor section (min...max)	0.2...2.5mm² (24...12AWG)	0.2...2.5mm² (24...12AWG)	0.2...1.5mm² (28...14AWG)
Tightening torque	0.44Nm (4lb.in)	0.44Nm (4lb.in)	0.18Nm (1.7lb.in)
INPUT CONNECTIONS – COM and auxiliary voltage terminals			
Type and (number) of terminals	Screw - fixed	Screw - fixed	Screw - removable
Conductor section (min...max)	0.2...2.5mm² (24...12AWG)	0.2...2.5mm² (24...12AWG)	0.2...2.5mm² (24...12AWG)
Tightening torque	0.44Nm (4lb.in)	0.44Nm (4lb.in)	0.5Nm (4.5lb.in)
HOUSING			
Material	Polyamide	Polyamide	Polyamide
Version	Modular 4U	Modular 4U	Flush

❶ Single insulation between the two outputs. Both outputs must use the same voltage group.

Level controls and float switches



- Level monitoring relays for electrically conductive liquids
- Modular and plug-in versions
- Adjustable 2.5...200kΩ sensitivity
- Single and three-pole probes
- Float switches
- Start-up priority change relays.

	Sec. - Page
Level monitoring relays	
Modular version for conductive liquids	23 - 3
Plug-in version for conductive liquids	23 - 5
Probes, electrode holders and electrodes	**23 - 6**
Accessories	**23 - 6**
Float switches	**23 - 7**
Float switches for grey water	23 - 7
Float switches for drinking water	23 - 8
Float switches for dirty water	23 - 8
Start-up priority change relays	
Modular version for 2 motors	23 - 9
Plug-in version for 2 motors	23 - 9
Modular version for 3 or 4 motors	23 - 10
Dimensions	**23 - 11**
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Technical characteristics	**23 - 16**



Page 23-3

LEVEL CONTROL RELAYS
- For conductive liquids
- Single, dual or multivoltage
- Emptying or filling functions
- Multifunctions
- Automatic reset
- Modular and plug-in versions.



Page 23-6

PROBES, ELECTRODES AND ELECTRODE HOLDERS
- Single pole
- Three pole.



Page 23-7

FLOAT SWITCHES
- Versions for grey water, drinking water and dirty water
- Versions with PVC and Neoprene cable
- Emptying or filling functions.



Page 23-9

START-UP PRIORITY CHANGE RELAYS
- Versions for 2, 3 or 4 motors
- Single or multivoltage
- Modular and plug-in versions.

Description	 LEVEL CONTROL RELAYS						 START-UP PRIORITY CHANGE RELAYS			
	LVM20	LVM25	LVM30	LVM40	LV1E	LV2E	LVMP05	LVMP10	CSP2E	LVMP30
Modular version	●(2U)	●(1U)	●(3U)	●(3U)			●(1U)	●(3U)		●(4U)
Plug-in version					● (8 pin)	● (11 pin)			● (11 pin)	
3 detecting electrodes (MIN, MAX and COM)	●	●	●		●	●				
5 detecting electrodes (MIN1, MAX1, MIN2, MAX2 and COM)				●						
Sensitivity adjustment 2.5...50kΩ	●		●							
Sensitivity adjustment 2.5...100kΩ		●								
Sensitivity adjustment 2.5...200kΩ				●						
Fixed sensitivity: 7...8kΩ					●	●				
Adjustable sensitivity full-scale value 25-50-100-200 kΩ				●						
Separate sensitivity adjustment for MAX probe (foam detection)				●						
Emptying function	●	●	●	●	●	●				
Filling function		●	●	●						
Emptying function with MIN and/or MAX alarm				●						
Filling function with MIN and/or MAX alarm				●						
Emptying function with pump priority change				●						
Filling function with pump priority change				●						
Tank filling, well drawing functions and alarm				●						
Filling-emptying adjustment selector		●	●							
Programming selector for 5 different functions				●						
Start-up priority change for 2 motors							●			
Start-up priority change for 2 motors. Possible starting of stand-by motor								●	●	
Start-up priority change for 3 or 4 motors										●
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Some permitted liquid substances				Liquid substances not permitted
Type of liquid	**Resistivity kΩcm**	**Type of liquid**	**Resistivity kΩcm**	
Drinking water	5...10	Milk	~1	• Purified water • Deionised water • Petrol • Oil • Liquid gases • Paraffin • Ethylene glycol • Paints • Liquids with a high percentage of alcohol
Well water	2...5	Whey	~1	
River water	2...15	Fruit juices	~1	
Rainwater	15...25	Vegetable juices	~1	
Sludge	0.5...2	Soups	~1	
Seawater	~0.03	Wine	~2.2	
Salt water	~2.2	Beer	~2.2	
Natural/hard water	~5	Coffee	~2.2	
Chlorinated water	~5	Suds	~18	
Condensed water	~18			

N.B. The resistivity values in the table are purely indicative.

Single-voltage relay



LVM20...

Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz	⅂'	n°	[kg]
Emptying function. Automatic reset.				
LVM20A024	24VAC	1 C/O (SPDT)	1	0.215
LVM20A127	110...127VAC	1 C/O (SPDT)	1	0.215
LVM20A240	220...240VAC	1 C/O (SPDT)	1	0.215
LVM20A415	380...415VAC	1 C/O (SPDT)	1	0.215



LVMKIT20A...

new

Order code	Description	Qty per pack	Wt
		n°	[kg]
Level control relay LVM20 and 11SN1 electrodes kit.			
LVMKIT20A024	Level control relay LVM20A024 and two 11SN1 probes	1	0.340
LVMKIT20A240	Level control relay LVM20A240 and two 11SN1 probes	1	0.340

Operational characteristics
- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...50kΩ adjustable sensitivity
- Double insulation between each supply, electrodes and output relay circuits
- Fixed probe signal delay: <1s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (2 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, EAC, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 no. 14.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Multi-voltage relay





LVM25240

LVMKIT25

Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz	⅂'	n°	[kg]
Emptying or filling functions. Automatic reset.				
LVM25240	24...240VAC/DC	1 C/O (SPDT)	1	0.095

Order code	Description	Qty per pack	Wt
		n°	[kg]
Level control relay LVM25240 and 11SN1 electrodes kit.			
LVMKIT25	Level control relay LVM25240 and two 11SN1 probes	1	0.192

Operational characteristics
- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...100kΩ adjustable sensitivity
- Insensitivity to stray electrode-cable capacitance
- Programming selector for emptying or filling function with fail-safe operation
- Double insulation between each supply, electrodes and output relay circuits
- Fixed probe signal delay: <1s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (1 module)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4, UL508, CSA C22.2 n° 14.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Dual-voltage relay



LVM30...

Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz	⅂'	n°	[kg]
Emptying or filling functions. Automatic reset.				
LVM30A240	24/220...240VAC	2 C/O (SPDT)	1	0.315
LVM30A415	110...127VAC 380...415VAC	2 C/O (SPDT)	1	0.315

Operational characteristics
- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...50kΩ adjustable sensitivity
- Programming selector for emptying or filling function with fail-safe operation
- Double insulation between each supply, electrodes and output relay circuits
- Adjustable probe signal delay: 1...10s or pump start delay: 0...300s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (3 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Single-voltage multifunction relay



LVM40...

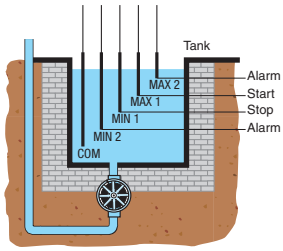
Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz	❶	n°	[kg]
Multifunction. Automatic reset.				
LVM40A024	24VAC	1+1NO	1	0.278
LVM40A127	110...127VAC	1+1NO	1	0.278
LVM40A240	220...240VAC	1+1NO	1	0.278
LVM40A415	380...415VAC	1+1NO	1	0.278

❶ Two relay outputs; one with C/O (SPDT) and one with N/O (SPST).

FUNCTIONS

A- Emptying with MIN and/or MAX alarms.

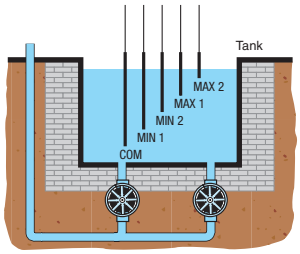
B- Filling with MIN and/or MAX alarms.



EXAMPLE OF EMPTYING OPERATION
To achieve this type of operation, two electrodes are used to control the liquid between the fixed limits using MIN1 and MAX1 and two alarm levels using MIN2 and MAX2. When one of the alarm electrodes is wet, the alarm relay is de-energised.
The alarm can be caused by pump malfunction, insufficient pump delivery capacity, MAX control level failure or MIN level electrode shorted.
With a proper connection, only the MIN alarm or MAX alarm can be activated or neither of the two can be activated so the relative output contacts can be used for pump control.

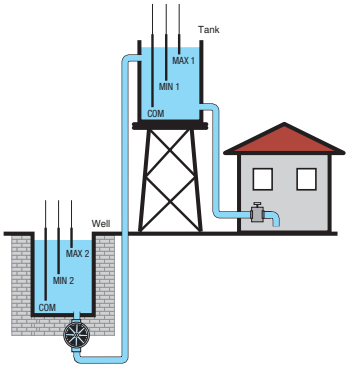
C- Emptying with pump priority change.

D- Filling with pump priority change.



EXAMPLE OF EMPTYING OPERATION
This operation is obtained by using four electrodes positioned at four different levels and two relay outputs to control two pumps. For example, one can place the four electrodes, MIN1, MIN2, MAX1 and MAX2, in increasing order from the lowest to the highest levels and must control the tank emptying. Usually the level is controlled between the MIN1 and MAX1 levels by starting one of the two pumps. This case is different so the pumps can be maintained at the best efficiency and optimise their wear.
When the liquid wets the MAX2 level and because the first pump is faulty or else a higher delivery capacity is needed, the second stand-by pump is activated to back up the first pump. When the liquid lowers and no longer wets the MIN2 level, the second pump is stopped and then when the MIN1 level is no longer wet, the first pump is stopped too.

E- Tank filling and well drawing with alarm.



EXAMPLE
Two electrodes are used in this operation to control the tank level and another two for the well. One relay is used to activate the pump while the other for dry running / no water alarm.
When the well liquid wets the MAX2 level and the liquid wets the MIN1 tank level, the tank-filling pump is activated.
When the tank MAX1 level is wet, the pump is stopped.
During the tank filling, the pump could stop before the MAX1 level is wet because the well MIN2 level is no longer wet.
Should the tank MIN1 level no longer be wet at which the pump should restart but the well MIN2 level is also no longer wet, then the alarm relay is de-energised.

Operational characteristics
- Use with 5 sensing electrodes, MIN1, MAX1, MIN2, MAX2 and COM
- 2.5...200kΩ adjustable sensitivity
- Adjustable sensitivity full-scale value: 25-50-100-200kΩ
- Separate sensitivity adjustment of MAX electrodes for foam detection
- Insensitivity to stray electrode-cable capacitance
- Programming selector for 5 different functions:
  - Emptying function and alarms (pos. A)
  - Filling function and alarms (pos. B)
  - Emptying function with pump priority start-up change (pos. C)
  - Filling function with pump priority start-up change (pos. D)
  - Well draining and tank filling and alarms (pos. E)
- Double insulation between each supply, electrodes and output relay circuits
- Adjustable probe signal delay: 1...10s
- Adjustable pump start delay: 0...30min
- Green LED indicator for power on
- Red LED indicators for output relay and electrode state
- Modular DIN 43880 housing (3 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Single-voltage relay



31LV1E...

Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz		n°	[kg]
Emptying function. Automatic reset.				
31LV1E24	24VAC	1 C/O (SPDT)	1	0.263
31LV1E110	110...120VAC	1 C/O (SPDT)	1	0.263
31LV1E230	220...240VAC	1 C/O (SPDT)	1	0.263
31LV1E400	380...415VAC	1 C/O (SPDT)	1	0.263

Operational characteristics
- Used with 3 sensing electrodes, MIN, MAX and COM
- 7...8kΩ fixed sensitivity
- Red LED indicator for output relay state
- Max. relay-electrode cable length: 500m/547yd single-core, double insulated cables
- Mounting on 35mm/1.38" (IEC/EN/BS 60715) DIN rail or 8-pin plug-in housing
- 8-pin plug-in housing (socket 31S8, see page 23-6)
- IEC degree of protection: IP30.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Dual-voltage relay



31LV2E...

Order code	Auxiliary supply voltage	Type of output contact	Qty per pack	Wt
	[V] 50/60Hz		n°	[kg]
Emptying function. Automatic reset.				
31LV2E48	24/48VAC	1 C/O (SPDT)	1	0.266
31LV2E220	110...120VAC/ 220...240VAC	1 C/O (SPDT)	1	0.266
31LV2E400	220...240VAC/ 380...415VAC	1 C/O (SPDT)	1	0.266

Operational characteristics
- Used with 3 sensing electrodes, MIN, MAX and COM
- 7...8kΩ fixed sensitivity
- Red LED indicator for output relay state
- Max. relay-electrode cable length: 500m/547yd single-core, double insulated cables
- Mounting on 35mm/1.38" (IEC/EN/BS 60715) DIN rail or 11-pin plug-in housing
- 11-pin plug-in housing (socket 31S11, see page 23-6)
- IEC degree of protection: IP30.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27.

Probes and electrode holders
Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Probes and electrode holders


11SN1


31SCM...


31CGL125...

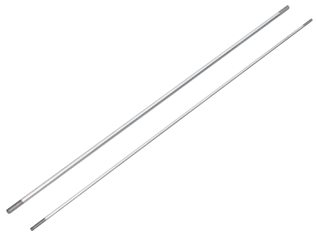

31PS31


31PS3S

Order code	Probe included	Probe length	Qty per pack	Weight
		[mm/in]	n°	[kg]
Single pole electrodes.				
11SN1	Yes	100❶/3.9”	10	0.050
31SCM04	Yes	43/1.7”	1	0.060
31SCM50	Yes	500/19.7”	1	0.115
31SCM100	Yes	1000/39.4”	1	0.162
31CGL1253	Yes	327/12.9”	1	0.126
31CGL1255	Yes	500/19.7”	1	0.158
31CGL1257	Yes	700/27.6”	1	0.208
31CGL12510	Yes	1000/39.4”	1	0.281
Three pole electrode.				
31PS31	Yes	300/11.8”	1	0.120
Electrode holder (for 3 rod probes).				
31PS3S	No	—	1	0.184

❶ Total electrode length.

Electrodes


31ASTA...

Order code	Rod probe length	Qty per pack	Weight
	[mm/in]	n.	[kg]
For 31SCM... probes.			
31ASTA460MM4	460/18.11”	1	0.053
31ASTA960MM4	960/37.8”	1	0.103
For 31PS3S electrode holder.			
31ASTA460MM6	460/18.11”	1	0.100
31ASTA960MM6	960/37.8”	1	0.210

General characteristics
11SN1 SINGLE POLE PROBES
A single pole probe used for level control in wells or storage tanks. It comprises of an AISI 303 stainless steel electrode, a plastic (PPOX) holder and a cable gland.
A seal ring and the tightening of the cable gland PG7 prevent water from entering the cable terminal connector and causing its oxidation.
Cable connection: screw.
The external cable diameter must be 2.5 to 6mm/Ø0.1 to 0.24” to warrant perfect sealing.
Maximum connection cable section: 2.5mm^2.
Maximum operating temperature: +60°C.
Application: tanks and deep wells.

31SCM... PROBES
A single pole probe used for level control on boilers, autoclaves and in general where pressure (10bar maximum) and high temperature (+100°C maximum) are present. It comprises of an AISI 303 stainless steel electrode embedded in an aluminium oxide body and a 3/8” GAS threaded metal support holder.
Cable connection: threaded rod with nut.
Application: tanks, pressurised tanks and boilers.

31CGL125... PROBES
A single pole probe with AISI 302 electrode, used for level control on boilers and autoclaves and in general wherever pressure is maximum up to 10bar.
Maximum operating temperature: +180°C.
Threaded coupling: 3/8” GAS.
Cable connection: threaded rod with nut.
Application: tanks, pressurised tanks and boilers.

31PS31 PROBE
A small electrode holder, complete with three AISI 304 stainless steel probes.
Particularly suited to small containers whenever pressure is maximum up to 2bar.
Maximum operating temperature: +70°C.
Threaded coupling: 1/2” GAS.
Faston termination; related lugs supplied.
Application: tanks and automatic dispensers.

31PS3S ELECTRODE HOLDER
A thermoset resin electrode holder to be used with three probes (rod probes to be ordered separately) and complete with terminal cover.
Maximum operating temperature: +100°C.
2” GAS threaded coupling.
Cable connection: screw.
Application: tanks.

ELECTRODES
Stainless steel AISI 304 electrodes with 4M or 6M threaded extremity suitable as extensions for 31SCM... probe or as rod probe for 31PS3S electrode holder.

Certification and compliance
Certification obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27.

Accessories


31RE213


31S8


31S11


31RE014

Order code	Description	Qty per pack	Weight
		n°	[kg]
31RE213	Coupler unit for 31SCM... with electrode extension ASTA...MM4	1	0.008
31S8	8-pin socket for screw fixing or mounting on 35mm/1.38” DIN rail (IEC/EN/BS 60715), used with LV1E... relay. Screw terminals	10	0.061
31S11	11-pin socket for screw fixing or mounting on 35mm/1.38” DIN rail (IEC/EN/BS 60715), used with LV2E... and CSP2E... relays. Screw terminals	10	0.064
31RE014	Relay-socket retention bracket; 31S8 or 31S11 types only	10	0.001

Operational characteristics
SOCKETS FOR INSTALLING PLUG-IN LEVEL CONTROL RELAYS.
– Max. wire section for sockets: 2x2.5mm^2/2x14AWG
– Tightening torque: 0.8Nm/7.1lb.in
– Ratings: 10A - 400VAC.

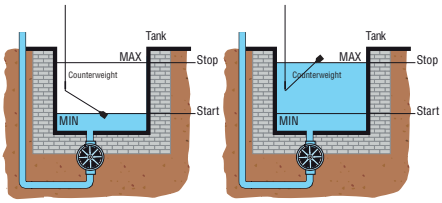
Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 61984, IEC/EN/BS 61210, IEC/EN/BS 60999-1.

For grey water



Order code	Cable material	Cable length	Counter-weight included	Qty per pack	Wt
		[m]		n.	[kg]
LVFSP1W03	PVC	3	Yes	1	0.610
LVFSP1W05	PVC	5	Yes	1	0.830
LVFSP1W10	PVC	10	Yes	1	1.410
LVFSP1W15	PVC	15	Yes	1	1.930
LVFSP1W20	PVC	20	Yes	1	2.380
LVFSN1W03	Neoprene	3	Yes	1	0.640
LVFSN1W05	Neoprene	5	Yes	1	0.880
LVFSN1W10	Neoprene	10	Yes	1	1.510
LVFSN1W15	Neoprene	15	Yes	1	2.080
LVFSN1W20	Neoprene	20	Yes	1	2.480

Filling function

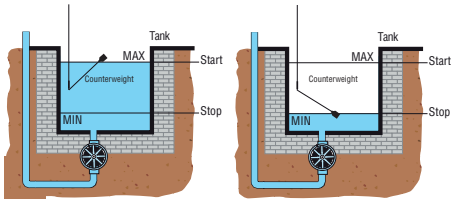


This function is achieved by connecting the black and blue float terminals. The level regulator contact closes the lower circuit at minimum level and opens the circuit when the float switch reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



Start Stop

Emptying function



This function is achieved by connecting the black and brown float switch terminals. The level regulator contact closes the upper circuit at maximum level and opens the circuit when the float switch reaches the lower minimum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



Start Stop

General characteristics
Float switches are used in the automation of electrical equipment, such as: pumps, solenoid valves, alarms, motorised sluice gates, etc. All versions feature an internal changeover contact operated in accordance with the level of liquid where the float is located. The cables used are high-quality and offer excellent mechanical or chemical resistance over time.
The cables are 3x1 type, that is 3 wires with section 1mm^2. This allows the user to choose the filling and emptying function during regulator wiring.
They are used for the civil and industrial control of levels of grey water, e.g. rainwater, groundwater or cooling water from industry. They are available with PVC and neoprene cables of various lengths.

Operational characteristics
- Upper switching angle: 30° ±5°
- Lower switching angle: 30° ±5°
- 130g external counterweight included
- Float casing material: polypropylene
- Cable A05 VV-F3X1 (PVC) available in lengths of 3, 5, 10, 15 and 20m/3.28, 5.47, 10.94, 16.40 and 21.87yd and cable H07 RN-F3X1 (Neoprene) available in lengths of 3, 5, 10, 15 and 20m/3.28, 5.47, 10.94, 16.40 and 21.87yd
- Rated cable diameter: 9mm/0.35” (PVC and Neoprene)
- Relay with changeover contact 10(8)A 250VAC 50/60Hz
- Maximum installation depth: 20m/21.26yd
- Maximum pressure: 2bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- IEC degree of protection: IP68
- Insulation class: II.

Certifications and compliance
Certifications: TÜV-SUD.
Compliant with standards: IEC/EN/BS 60730-1, IEC/EN/BS 60730-2-15.

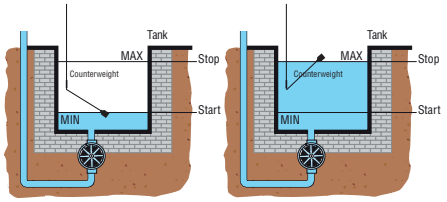
For drinking water



LVFSA1D...

Order code	Cable material	Cable length	Counter-weight included	Qty per pkg	Wt
		[m]		n.	[kg]
LVFSA1D03	PVC ACS+AD8	3	Yes	1	0.630
LVFSA1D05	PVC ACS+AD8	5	Yes	1	0.850
LVFSA1D10	PVC ACS+AD8	10	Yes	1	1.430
LVFSA1D15	PVC ACS+AD8	15	Yes	1	1.950
LVFSA1D20	PVC ACS+AD8	20	Yes	1	2.400

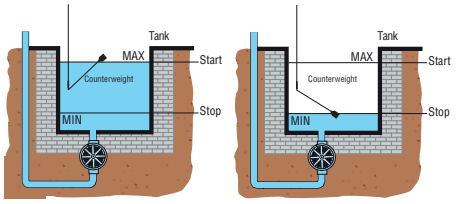
Filling function



This function is achieved by connecting the black and blue float switch terminals. The level regulator contact closes the lower circuit at minimum level and opens the circuit when the float switch reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



Emptying function



This function is achieved by connecting the black and brown float switch terminals. The level regulator contact closes the upper circuit at maximum level and opens the circuit when the float switch reaches the lower minimum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



General characteristics
Float switches LVFSA1D type are suitable for drinking water and foodstuffs applications such as aqueducts, fountains, aquariums, drinks, fish hatcheries, swimming pools, etc.
They are realised with a non-toxic polypropylene outer shell, a stainless steel untreated sphere, and an AD8 cable with health certification ACS (Attestation de Conformité Sanitaire) with outer sheath with PVC suitable for drinkable water immersion and use with food products.
They are provided with stainless steel counterweight AISI 316.
All versions, which differ in the length of the cable, feature an internal changeover contact operated in accordance with the level of liquid where the float is located.
The cables are 3x1 type, that is 3 wires with section 1mm^2. This allows the user to choose the filling and emptying function during regulator wiring.

Operational characteristics
- Upper switching angle: 30° ±5°
- Lower switching angle: 30° ±5°
- Stainless steel counterweight AISI 316 included
- Float casing material: polypropylene
- PVC cable ACS + AD8 certified
- Microswitch with changeover contact: 10(8)A 250VAC 50/60Hz
- Maximum installation depth: 20m/21.87yd
- Maximum pressure: 2bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- Degree of protection: IP68
- Insulation class: II.

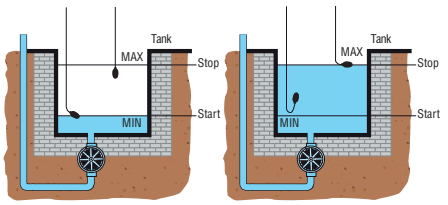
Certifications and compliance
Certifications: Health certification ACS (Attestation de Conformité Sanitaire) for the cable.
Compliant with standards: IEC/EN/BS 60730-1, IEC/EN/BS 60730-2-15.

For dirty water

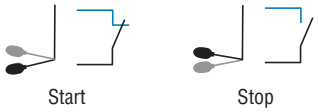


Order code	Cable material	Cable length	Counter-weight	Qty per pkg	Wt
		[m]		n.	[kg]
LVFSN1B05	Neoprene	5	Internal	1	1.250
LVFSN1B10	Neoprene	10	Internal	1	1.860
LVFSN1B15	Neoprene	15	Internal	1	2.460
LVFSN1B20	Neoprene	20	Internal	1	3.060

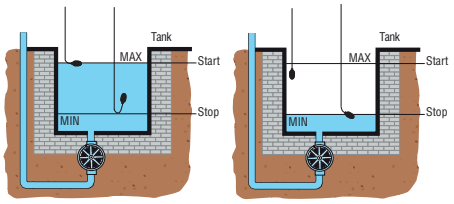
Filling function❶



This function uses two float switches and is achieved by connecting the black and blue float switch terminals. The MIN and MAX levels can be adjusted by varying the position of the float switches.



Emptying function❶



This function uses two float switches and is achieved by connecting the black and brown float switch terminals. The MIN and MAX levels can be adjusted by varying the position of the float switches.



❶ It is possible to use even a single float for black water, adjusting the level in a fixed range of 10cm max, a solution which is not advisable for turbulent waters.

General characteristics
These float switches are used for the civil and industrial control of levels of dirty water, e.g. sewage or waste water from industry. The float switches comprises of a one-piece external blow-moulded polypropylene casing, with fixed internal counterweight located in the cable exit area.
The regulator contact is positioned centrally in its own watertight chamber. This is insulated from the external casing by injecting closed-cell foam. This solution further increases protection against moisture leakage and heat insulates the watertight chamber housing the contact, eliminating the creation of condensation.

Operational characteristics
- Upper switching angle: 30° ±5°
- Lower switching angle: 20° ±5°
- Internal counterweight
- Float casing material: polypropylene
- Cable H07 RN-F3X1 (Neoprene) available in lengths of 5, 10, 15 and 20m/5.47, 10.94, 16.40 and 21.87yd
- Rated cable diameter: 9mm/0.35”
- Relay with changeover contact 10(4)A 250VAC 50/60Hz
- Maximum installation depth: 100m/109.36yd
- Maximum pressure: 10bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- IEC degree of protection: IP68
- Insulation class: II.

Certifications and compliance
Certifications: TÜV-SUD.
Compliant with standards: IEC/EN/BS 60730-1. IEC/EN/BS 60730-2-15.



Priority change relays for 2 motors Modular version



LVMP05



LVMP10...

Order code	Auxiliary supply voltage	Type of output contacts	Qty per pack	Weight
	[V]	≀	n°	[kg]
2 outputs. AC and DC supply voltage.				
LVMP05	24/48VDC 24...240VAC	2NO with same common	1	0.090
2 outputs. AC supply voltage. Possible starting of stand-by motor.				
LVMP10A024	24VAC	2 NO (SPST)	1	0.250
LVMP10A127	110...127VAC	2 NO (SPST)	1	0.250
LVMP10A240	220...240VAC	2 NO (SPST)	1	0.250
LVMP10A415	380...415VAC	2 NO (SPST)	1	0.250

General characteristics
Priority change relays are designed to balance the operating time and hence the wear of pumps, compressors, generators, when two units, primary and stand-by, are installed.

Operational characteristics
- Operating limits: 0.85...1.1 Ue
- Connection: permanent
- Green LED indicator for power on
- Red LED indicators for output relay state 1 for LVMP05, 2 for LVMP10
- Modular DIN 43880 housing (1 module LVMP05, 3 modules LVMP10)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Automatic starting control, EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

Priority change relays for 2 motors Plug-in version



31CSP2E...

Order code	Auxiliary supply voltage	Type of output contacts	Qty per pack	Weight
	[V]	≀	n°	[kg]
2 outputs. AC supply voltage. Possible starting of stand-by motor.				
31CSP2E24	24VAC	2 NO (SPST)	1	0.150
31CSP2E110	110VAC	2 NO (SPST)	1	0.150
31CSP2E220	220VAC	2 NO (SPST)	1	0.150
31CSP2E230	230...240VAC	2 NO (SPST)	1	0.150

General characteristics
Priority change relays are designed to balance the operating time, and hence the wear of pumps, compressors, generators, when two units, primary and stand-by, are installed.

Operational characteristics
- Operating limits: 0.85...1.1 Ue
- Connection: permanent
- Voltage applied to input contacts: 15VDC not insulated at power supply
- Input contacts current consumption: about 1mA.
- 11-pin plug-in housing (see socket 31S11)
- IEC degree of protection: IP30.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

Priority change relays for 3 or 4 motors Modular version



LVMP30...

new

Order code	Auxiliary supply voltage	Type of output contacts	Qty per pack	Weight
	[V]		n°	[kg]
4 outputs. AC supply voltage.				
LVMP30A024	24VAC	4	1	0.250
LVMP30A240	100...240VAC	4	1	0.242

General characteristic
The LVMP30... priority change relays manage the alternation between 3 or 4 motors, with the purpose of making homogeneous operating time and wear. They are typically used in pumping systems where there may be 3 or 4 pumps to be controlled alternately. The presence of the keyboard with display allows to set up the system configuration quickly and easily, by selecting the number of motors to control, the setting of motor switch-on and switch-off delays, and to monitor the number of starting and the operating hours for each motor.

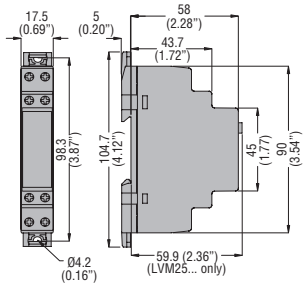
FUNCTIONS
- Management of alternation between 3 or 4 motors
- 5 digital inputs for liquid level signaling (enable + 4 levels)
- 1 digital input to enable the operation with latch (every time a motor is activated, it remains active until the liquid drops below the minimum level probe)
- 4 relay outputs with NO contact for motor control
- Possibility to set motor switch-on and switch-off delays
- Monitoring of the number of starts and the operating hours of each motor.

Operational characteristics
- Operating limits:
  - LVMP30A024: 20.4...28.8VAC (47...63Hz)
  - LVMP30A240: 85...265VAC (47...63Hz)
- Connection: permanent
- Modular DIN 43880 housing (4 modules)
- IEC degree of protection: IP20.

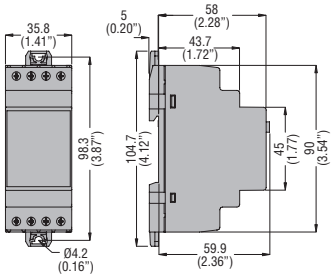
Certifications and compliance
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN/BS 61131-2, UL508, CSA C22.2 n°142.

LEVEL CONTROL AND START-UP PRIORITY CHANGE RELAYS

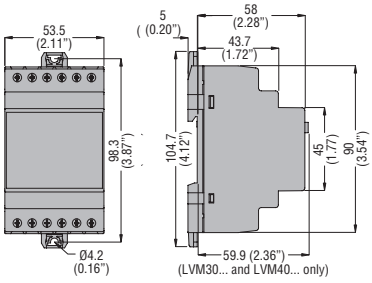
LVM25... - LVMP05



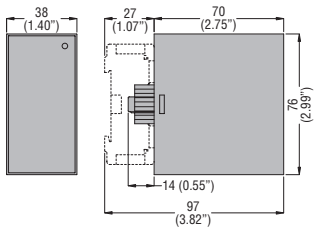
LVM20...



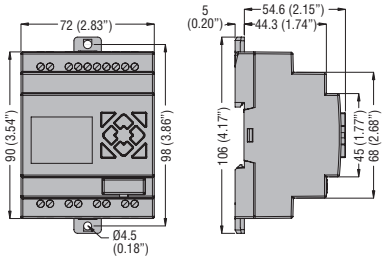
LVM30... - LVM40... - LVMP10



31LV1E... - 31LV2E... - 31CSP2E...

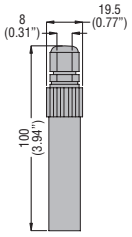


LVMP30...

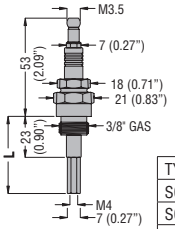


PROBES AND ELECTRODE HOLDERS FOR CONDUCTIVE LIQUIDS

11SN1

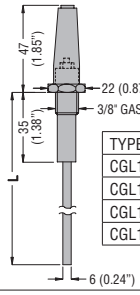


31SCM...



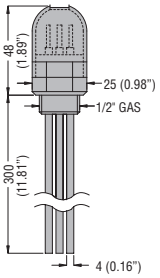
TYPE	L
SCM04	43 (1.69")
SCM50	500 (19.68")
SCM100	1000 (39.37")

31CGL125...

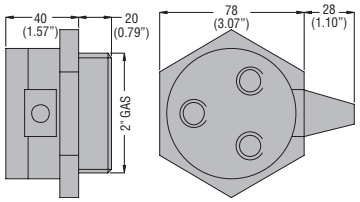


TYPE	L
CGL1253	327 (12.87")
CGL1255	500 (19.68")
CGL1257	700 (27.55")
CGL12510	1000 (39.37")

31PS31

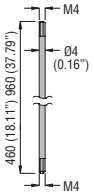


31PS3S

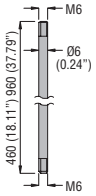


ELECTRODES

31ASTA460MM4
31ASTA960MM4

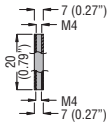


31ASTA460MM6
31ASTA960MM6



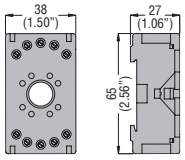
Coupler unit

31RE213

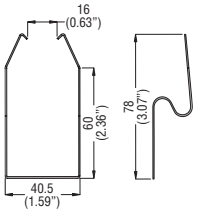


ACCESSORIES

31S8 - 31S11

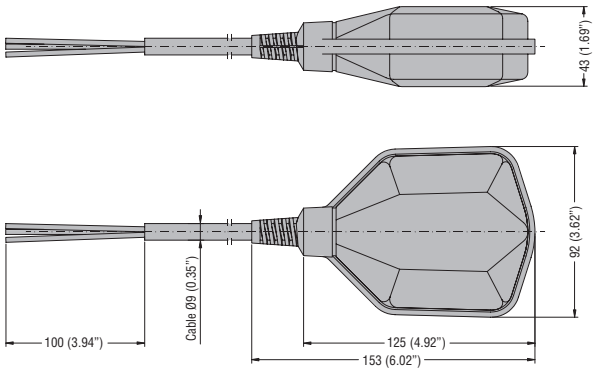


31RE014

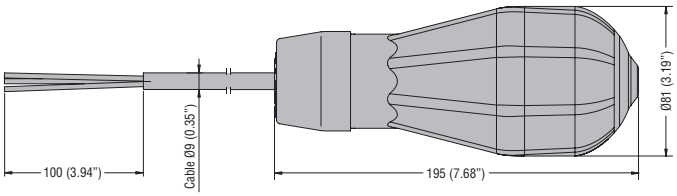


FLOAT SWITCHES

LVFS...W...
LVFS...D...

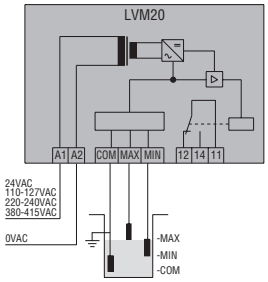


LVFSN1B...

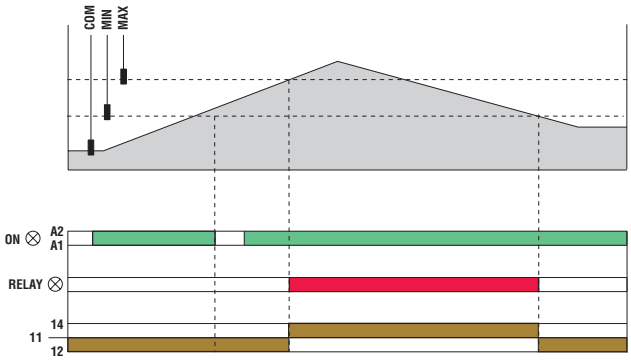


Emptying function

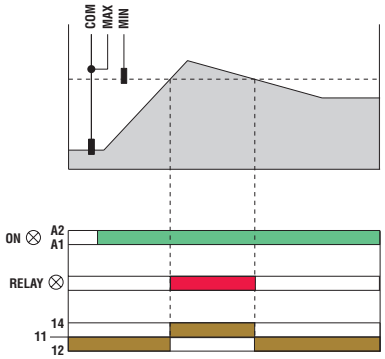
LVM20



Emptying function with 3 electrodes

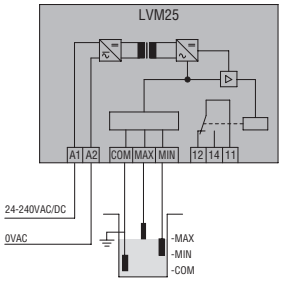


Emptying function with 2 electrodes

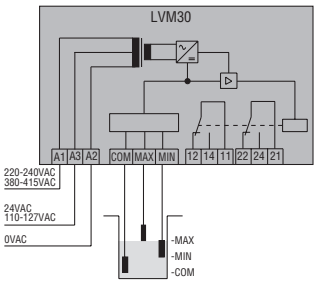


Emptying or filling functions

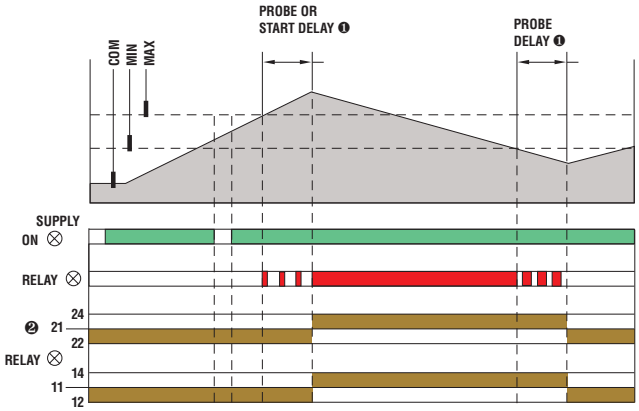
LVM25



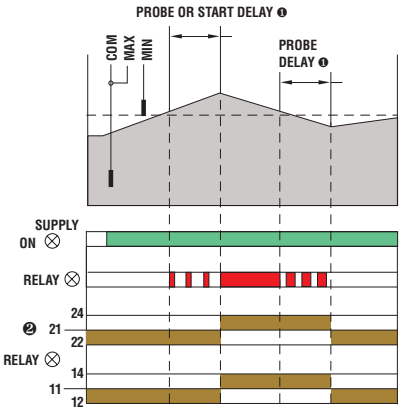
LVM30



Emptying function (DOWN)
Connection with 3 electrodes

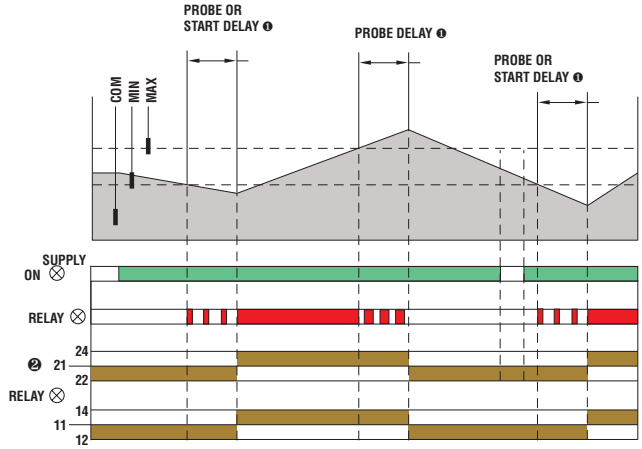


Connection with 2 electrodes

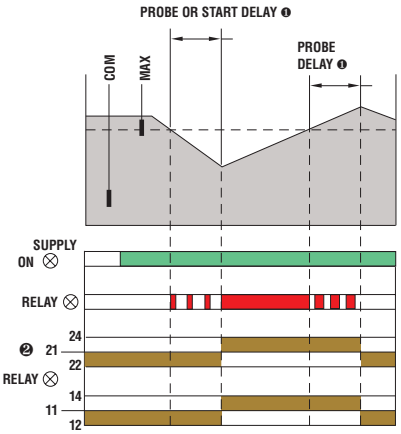


❶ Delay for LVM30 only.
❷ Changeover contact (SPDT) for LVM30 only.

Filling function (UP)
Connection with 3 electrodes



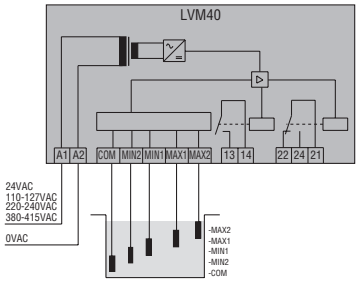
Connection with 2 electrodes



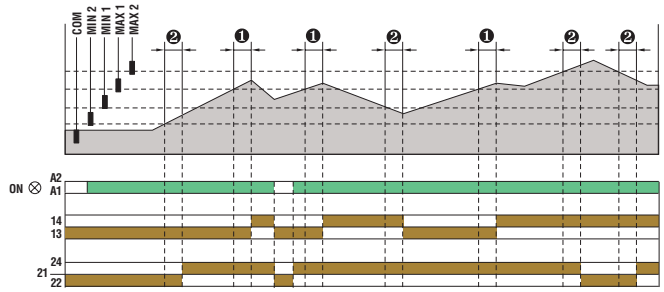
❶ Delay for LVM30 only.
❷ Changeover contact (SPDT) for LVM30 only.

Multifunctions.

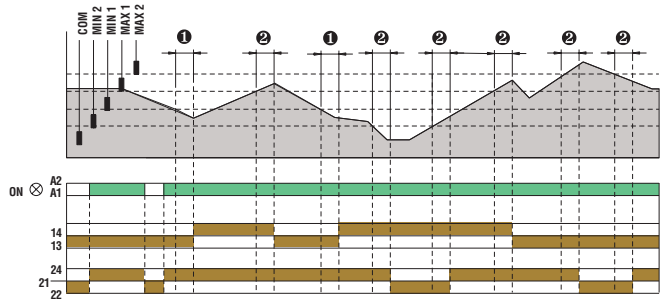
LVM40



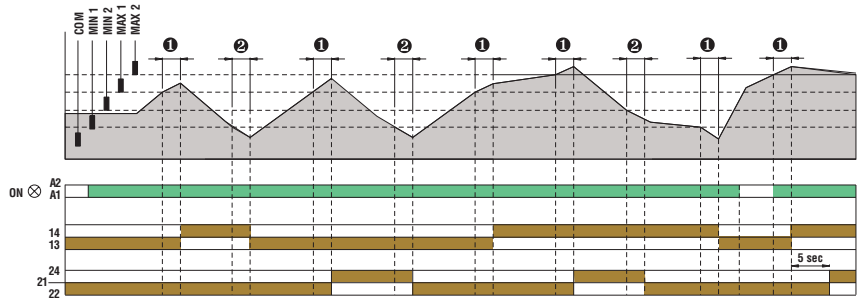
Emptying function + alarms



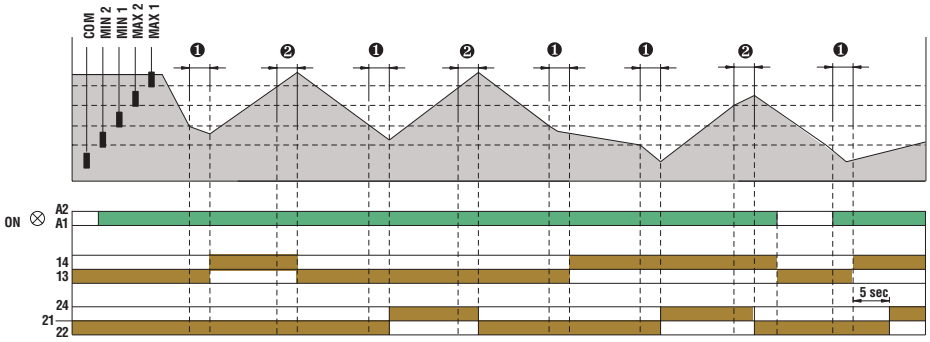
Filling function + alarms



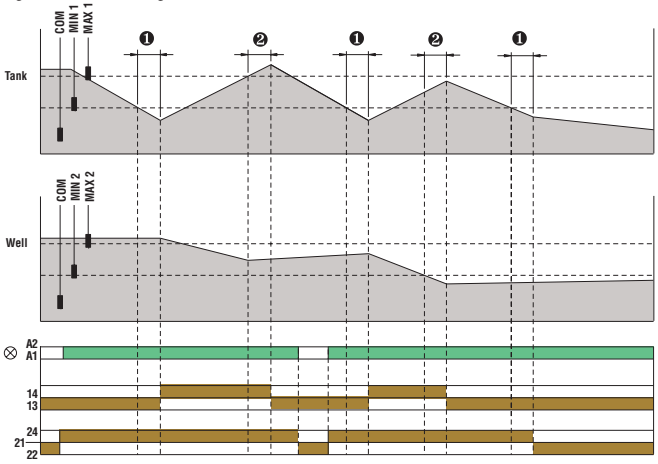
Emptying function + pump change



Filling function + pump change



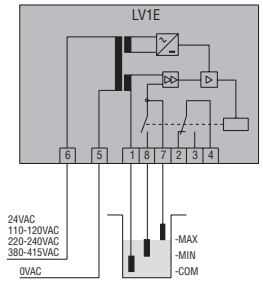
Filling tank and draining well function + alarm



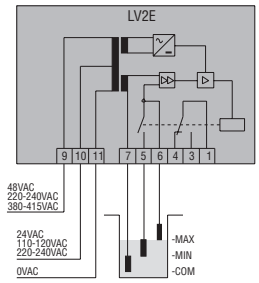
❶ Probe delay + start delay.
❷ Probe delay.

Emptying function

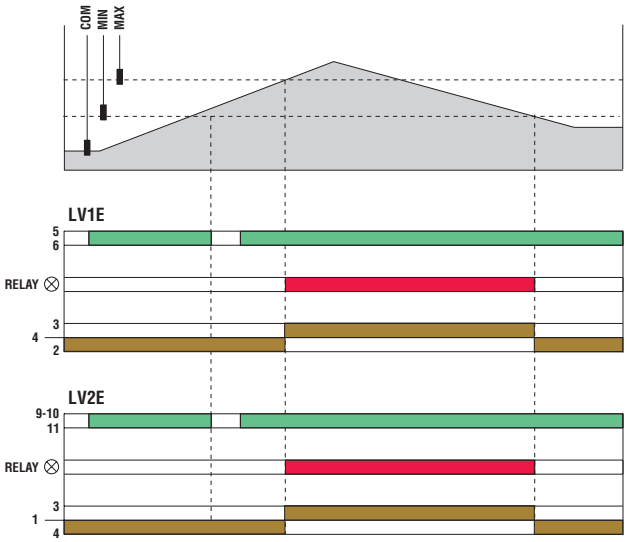
31LV1E



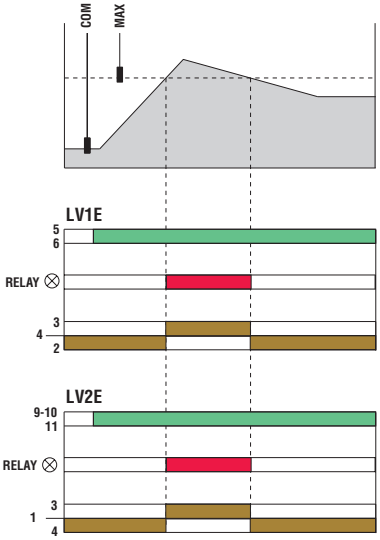
31LV2E



Emptying function with 3 electrodes

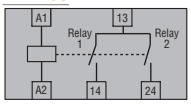


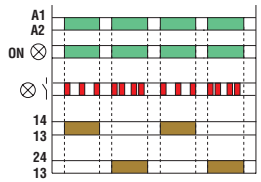
Emptying function with 2 electrodes



Priority change relays

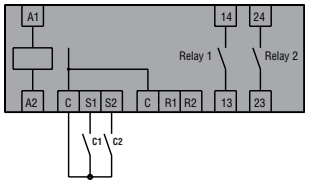
LVMP05



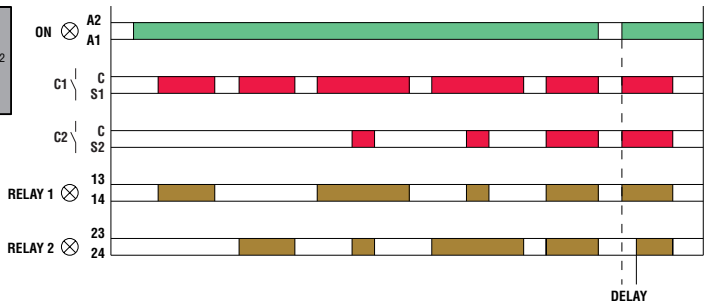


LVMP10

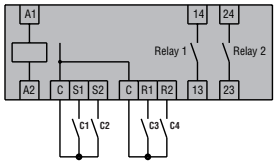
2-wire connection



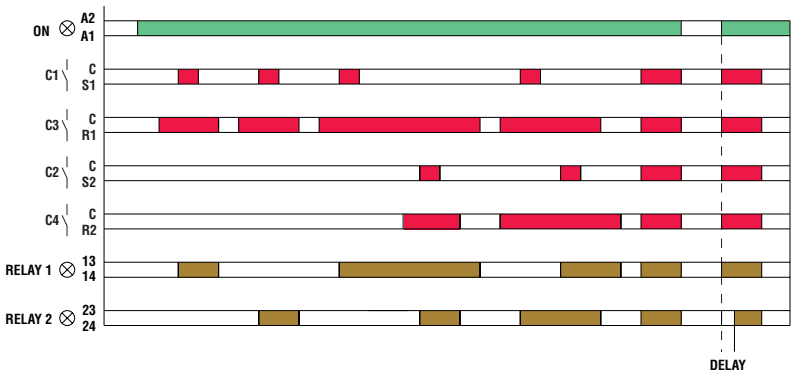
C1 = Primary
C2 = Secondary / Standby



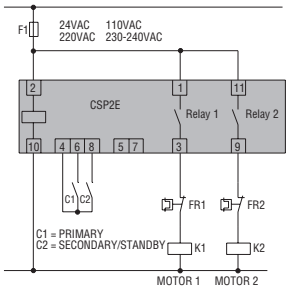
3-wire connection



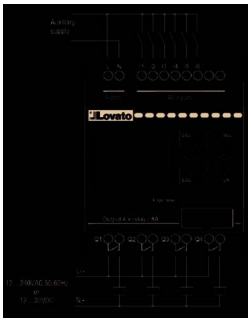
C1 = Start Primary
C2 = Start Standby
C3 = Stop Primary
C4 = Stop Standby



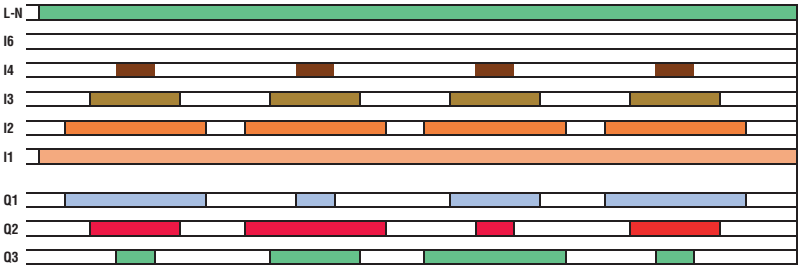
31CSP2E



LVMP30...



3-motor operation, without latch



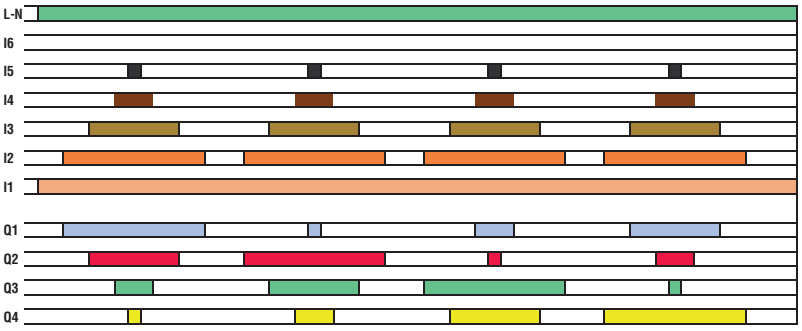
I1 = Minimum level (enable)
I2 = Start motor 1
I3 = Start motor 2
I4 = Start motor 3
I6 = Latch enable

Q1 = Motor 1
Q2 = Motor 2
Q3 = Motor 3

3-motor operation, with latch



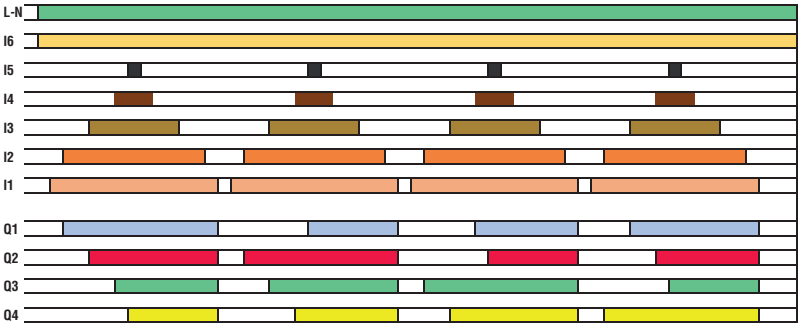
4-motor operation, without latch



I1 = Minimum level (enable)
I2 = Start motor 1
I3 = Start motor 2
I4 = Start motor 3
I5 = Start motor 4
I6 = Latch enable

Q1 = Motor 1
Q2 = Motor 2
Q3 = Motor 3
Q4 = Motor 4

3-motor operation, with latch



TYPE	LVM20…	LVM25…	LVM30…	LVM40…
DESCRIPTION				
	Modular			
	Automatic reset			
	Single voltage	Multi voltage	Dual voltage	Single voltage
Function	Emptying function	Emptying or filling function	Emptying or filling function	Multifunctions
Operating principle	Electrical conductivity of liquids			
AUXILIARY SUPPLY				
Rated supply voltage Us	24VAC	24...240VAC/DC	24/220...240VAC	24VAC
	110...127VAC		110...127/380...415VAC	110...127VAC
	220...240VAC			220...240VAC
	380...415VAC			380...415VAC
Operating voltage range	0.85...1.1 Us; 50/60Hz ±5%			
Power consumption (maximum)	3.5VA	3VA	5.5VA	4.5VA
Power dissipation (maximum)	1.8W	1.2W	2.8W	2.8W
LEVEL ELECTRODES				
Number of connectable electrodes	3	3	3	5
Type of electrode	Electrode and electrode holders: SN1 / SCM / CGL / PS31 / PS3S or similar			
Electrode voltage	7.5VAC	10Vpp	7.5VAC	10Vpp
Sensitivity	2.5...50kOhm	2.5...100kOhm	2.5...50kOhm	2.5...200kOhm
TIME DELAYS				
Tripping time (minimum)	≤ 600ms	≤ 1s	1s	1s
Resetting time (minimum)	≤ 750ms	≤ 1s	1s	1s
Probe tripping delay	—	—	OFF...10s	1...10s
Relay energising delay	—	—	OFF...300s	0...30min
RELAY OUTPUTS				
Number of relays	1	1	2	2
Relay state	Normally de-energised, energises at tripping			
Contact arrangement	1 changeover / SPDT	1 changeover / SPDT	2 changeover / SPDT each	1 changeover / SPDT and 1 with 1 N/O - SPST
Rated utilisation voltage	250VAC			
Maximum switching voltage	400VAC			
IEC conventional free air thermal current Ith	8A			
UL/CSA and IEC/EN/BS 60947-5-1 designation	B300			
Electrical life (with rated load)	10^5 cycles			
Mechanical life	$30x10^6$ cycles			
Indications	1 green LED for power on 1 red LED for relay state	1 green LED for power on 1 red LED for relay state	1 green LED indicator for power on 1 red LED for relay state	1 green LED indicator for power on 2 red LEDs for relay state 2 red LEDs for probe state
INSULATION				
IEC rated insulation voltage Ui	415VAC	250VAC	415VAC	415VAC
IEC rated impulse withstand voltage Uimp	6kV	6kV	6kV	6kV
IEC power frequency withstand voltage	4kV	4kV	4kV	4kV
Double insulation Supply/relay/electrode	≤ 250VAC	≤ 250VAC❶	≤ 250VAC	≤ 250VAC
CONNECTIONS				
Tightening torque maximum	0.8Nm (7lb.in; 7-9lb.in for UL/CSA)			
Conductor section min-max	0.2...4mm² (24...12AWG; 18...12AWG for UL/CSA)			
AMBIENT CONDITIONS				
Operating temperature	–20...+60°C			
Storage temperature	–30...+80°C			
HOUSING				
Material	Self-extinguishing polyamide			
Typical configuration (examples)	LVM20 + n° 3 SN1 electrodes LVM30 + n° 3 SN1 electrodes		LVM25 + n° 3 SN1 electrodes LVM40 + n° 5 SN1 electrodes	
Maximum cable length	❸			

❶ Double insulation between supply, electrodes and output relay circuit.
❷ Voltage applied to input contacts, not insulated at power supply.
❸ Consult Technical support for more information; see contact Tel. +39 035-4282422 - E-mail: service@LovatoElectric.com.

	31LV1E...	31LV2E...	LVMP05	LVMP10	31CSP2E	LVMP30
	Plug-in		Modular	Modular	Plug-in	Modular with display
	Automatic resetting		—	—	—	—
	Single voltage	Dual voltage	Multistage	Single voltage	Single voltage	Multi voltage
	Emptying function		Priority change for two motors			Priority change for 3-4 motors
	Electrical conductivity of liquids		—			—
	24VAC	24/48VAC	24/48VDC 24....240VAC	24VAC	24VAC❷	24VAC
	110...120VAC	110...120VAC/220...240VAC		110...127VAC	110VAC❷	100...240VAC
	220...240VAC	220...240VAC/380...415VAC		220...240VAC	220VAC❷	
	380...415VAC			380...415VAC	230/240VAC❷	
	0.8...1.1 Us; 50/60Hz					20.4...28.8VAC (LVMP30A024) 50/60Hz ±5% 85...265VAC (LVMP30A240) 50/60Hz ±5%
	5.5VA		1.6VA	4.8VA	5VA	—
	2.8W		0.9W	3W	3W	7.5W
	3		—	—	—	—
	Electrode and electrode holders: SN1 / SCM / CGL / PS31 / PS3S / or similar		—	—	—	—
	9VAC (voltage between probes)		—	—	—	—
	7...8 kΩ fixed		—	—	—	—
	≤ 50ms		—	—	—	—
	≤ 100ms		—	—	—	—
	—		—	—	—	—
	—		—	—	—	—
	1		2	2	2	4
	Normally de-energised, energises at tripping					
	1 changeover contact / SPDT		2 N/O with same common	2 N/O - SPST	2 N/O - SPST	4 N/O
	220VAC		250VAC	250VAC	250VAC	250VAC
	380VAC		—	—	—	265VAC
	5A		8A	8A	5A	8A
	B300		B300	B300	B300	—
	$2.5x10^5$ cycles		10^5 cycles	10^5 cycles	10^5 cycles	10^5 cycles
	$50x10^6$ cycles		$30x10^6$ cycles	$30x10^6$ cycles	$30x10^6$ cycles	—
	1 red LED for relay state		1 green LED for power on 1 red LED for relay state	1 green LED for power on 2 red LED for relays state	1 green/red LED for relay state	Display for monitoring motor status, number of starts and working hours
	415VAC		250VAC	415VAC	250VAC	❸
	5kV		4kV	4kV	4kV	❸
	2kV		2kV	2.5kV	2.5kV	❸
	—		—			—
	—		0.8Nm (7lb.in; 7-9lb.in for UL/CSA)		—	0.6Nm (5.3lb.in)
	—		0.2...4.0mm² (24...12AWG; 18...12AWG for UL/CSA)		—	0.14...2.5mm² (26...14AWG)
	-20...+60°C					-20...+55°C
	-30...+80°C					-40...+70°C
	Self-extinguishing polycarbonate		Self-extinguishing polyamide	Self-extinguishing polyamide	Self-extinguishing polycarbonate	Polyamide
	LV1E + n° 3 SN1 electrode LV2E + n° 2 SN1 electrodes + reset button		—	—	—	—
	500m/547yd single-core, double insulated cables		—	—	—	—

General purpose relays



- Electromechanical and SSR (solid state relay) versions
- AC or DC coils
- Sockets with screw, Push-in or PIN for Printed Circuit Board terminals
- Relays with LED state indicator and mechanical actuator
- Parallel busbars and surge suppressor filters
- Power relays with Atex certificate.

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HR10
- Slim electromechanical relay
- Socket width 6.2mm
- 1 changeover contact
- Ith rated current 6A
- Sockets with built-in LED
- Sockets with screw or Push-in terminals
- Control voltage from 12 to 230VAC/DC
- 20 poles parallel busbars
- Available version with relay and base ready assembled.



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HR20
- Slim solid state relay (SSR)
- Socket width 6.2mm
- 1 solid-state (SSR) output
- Output current 2A in AC and 4A in DC
- Sockets with built-in LED
- Sockets with screw or Push-in terminals
- Control voltage 24VDC
- 20 poles parallel busbars
- High switching speed
- Theoretically infinite electrical life
- Zero crossing.



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HR30
- Miniature relay
- Socket width 15.8mm
- 1 or 2 changeover contacts
- Ith rated current:
  – 1 contact: 10A (16A on PCB)
  – 2 contacts: 8A
- AC or DC control voltage
- Sockets with screw, Push-in or pins for PCB terminals
- 8 poles parallel busbars
- Small dimensions
- Can be used for direct mounting on PCB
- Snap-on surge suppressor filters
- Available version with relay and base ready assembled.



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HR40
- Miniature relay in clear enclosure
- Socket width 15.8mm
- 1 or 2 changeover contacts
- Ith rated current:
  – 1 contact: 10A (16A on PCB)
  – 2 contacts: 10A
- AC or DC control voltage
- Sockets with screw, Push-in or pins for PCB terminals
- 8 poles parallel busbars
- Clear enclosure for contacts visibility
- Can be used for direct mounting on PCB
- Snap-on surge suppressor filters.



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HR50
- Miniature relay with LED status indicator and mechanical and status indication
- Socket width 15.8mm
- 1 or 2 changeover contacts
- Ith rated current:
  – 1 contact: 10A (16A on PCB)
  – 2 contacts: 8A
- Mechanical test actuator with latch option
- AC or DC control voltage
- Sockets with screw, Push-in or pins for PCB terminals
- 8 poles parallel busbars
- Can be used for direct mounting on PCB
- Snap-on surge suppressor filters
- Available version with relay and base ready assembled.



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HR60
- Industrial relay with LED status indicator and mechanical actuator
- Socket width 27mm
- 2 or 4 changeover contacts
- Ith rated current:
  – 2 contacts: 7A
  – 4 contacts: 5A
- LED and mechanical status indicator
- Mechanical test actuator with latch option
- AC or DC control voltage
- Sockets with screw or Push-in terminals
- Snap-on surge suppressor filters
- Available version with relay and base ready assembled.



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HR70
- Industrial relay with LED status indicator and mechanical actuator
- Socket width 38mm
- 8-pin and 11-pin industrial relay
- 2 or 3 changeover contacts
- Ith rated current: 10A
- LED and mechanical state indicator
- Mechanical test actuator with latch option
- Versions with AC or DC control.



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HR80
- Power relays with Atex certificate
- In rated current 30A
- 2 normally open or 2 changeover contacts
- Faston terminals
- Screw fixing.

Lovato electric

Relays		Code	Contacts	Rated current	Control voltage	Sockets
SLIM RELAYS		**HR101CE012**	1 C/O	6A	12VAC/DC	**HR1XS024** - **HR1XS024S**❶
		HR101CE024	1 C/O	6A	24VAC/DC	
		HR101CE060	1 C/O	6A	110...125VAC/DC❷	**HR1XS110** - **HR1XS110S**❶
					220...240VAC/DC❷	**HR1XS230** - **HR1XS230S**❶
		HR201AS024	1 SSR	2A (AC)	24VDC	**HR1XS024** - **HR1XS024S**❶
		HR201DS024	1 SSR	4A (DC)	24VDC	
MINIATURE RELAYS		**HR301CD012**	1 C/O	16A❸	12VDC	Max 10A
		HR301CD024	1 C/O	16A❸	24VDC	
		HR301CD048	1 C/O	16A❸	48VDC	
		HR301CA024	1 C/O	16A❸	24VAC	
		HR301CA110	1 C/O	16A❸	110...120VAC	
		HR301CA230	1 C/O	16A❸	230VAC	
		HR302CD012	2 C/O	8A	12VDC	
		HR302CD024	2 C/O	8A	24VDC	
		HR302CD048	2 C/O	8A	48VDC	
		HR302CA024	2 C/O	8A	24VAC	
		HR302CA110	2 C/O	8A	110...120VAC	
		HR302CA230	2 C/O	8A	230VAC	
MINIATURE RELAYS CLEAR ENCLOSURE		**HR401CD012**	1 C/O	16A❸	12VDC	
		HR401CD024	1 C/O	16A❸	24VDC	
		HR401CA024	1 C/O	10A	24VDC	
		HR401CA110	1 C/O	10A	110VAC	
		HR401CA230	1 C/O	10A	230VAC	
		HR402CD012	2 C/O	10A	12VDC	
		HR402CD024	2 C/O	10A	24VDC	
		HR402CA024	2 C/O	5A	24VDC	
		HR402CA110	2 C/O	5A	110VAC	
		HR402CA230	2 C/O	5A	230VAC	
MINIATURE RELAYS WITH LED STATE INDICATOR AND MECHANICAL ACTUATOR		**HR501CD012**	1 C/O	16A❸	12VDC	
		HR501CD024	1 C/O	16A❸	24VDC	
		HR501CD048	1 C/O	16A❸	48VDC	
		HR501CD110	1 C/O	16A❸	110VDC	
		HR501CA024	1 C/O	16A❸	24VAC	
		HR501CA110	1 C/O	16A❸	110...120VAC	
		HR501CA230	1 C/O	16A❸	230VAC	
		HR502CD012	2 C/O	8A	12VDC	
		HR502CD024	2 C/O	8A	24VDC	
		HR502CD048	2 C/O	8A	48VDC	
		HR502CD110	2 C/O	8A	110VDC	
		HR502CA012	2 C/O	8A	12VAC	
		HR502CA024	2 C/O	8A	24VAC	
		HR502CA110	2 C/O	8A	110...120VAC	
		HR502CA230	2 C/O	8A	230VAC	
INDUSTRIAL RELAYS WITH LED STATE INDICATOR AND MECHANICAL ACTUATOR		**HR602CD012**	2 C/O	7A	12VDC	
		HR602CD024	2 C/O	7A	24VDC	
		HR602CD048	2 C/O	7A	48VDC	
		HR602CA012	2 C/O	7A	12VAC	
		HR602CA024	2 C/O	7A	24VAC	
		HR602CA110	2 C/O	7A	110...120VAC	
		HR602CA230	2 C/O	7A	230VAC	
		HR604CD012	4 C/O	5A	12VDC	
		HR604CD024	4 C/O	5A	24VDC	
		HR604CD048	4 C/O	5A	48VDC	
		HR604CA012	4 C/O	5A	12VAC	
		HR604CA024	4 C/O	5A	24VAC	
		HR604CA110	4 C/O	5A	110...120VAC	
		HR604CA230	4 C/O	5A	230VAC	
8-PIN AND 11-PIN INDUSTRIAL RELAYS WITH LED STATE INDICATOR AND MECHANICAL ACTUATOR		**HR702CD024**	2 C/O	10A	24VDC	8-pin
		HR702CD048	2 C/O	10A	48VDC	
		HR702CD110	2 C/O	10A	110VDC	
		HR702CA024	2 C/O	10A	24VAC	
		HR702CA110	2 C/O	10A	110...120VAC	
		HR702CA230	2 C/O	10A	230VAC	
		HR703CD024	3 C/O	10A	24VDC	11-pin
		HR703CD048	3 C/O	10A	48VDC	
		HR703CD110	3 C/O	10A	110VDC	
		HR703CA024	3 C/O	10A	24VAC	
		HR703CA110	3 C/O	10A	110...120VAC	
		HR703CA230	3 C/O	10A	230VAC	





HR5XS21
Screw terminals.
Contact terminals all on upper side.



HR5XS22
Screw terminals.



HR5XS21S
Push-in terminals.



HR5XS21P
PIN terminals.
For Printed Circuit Board.



HR6XS21
Screw terminals.
Contact terminals on upper side.



HR6XS22
Screw terminals.



HR6XS41S
Push-in terminals.



HR6XS41
Screw terminals.
Contact terminals on upper side.



HR6XS42
Screw terminals.



HR6XS41S
Push-in terminals.



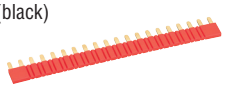
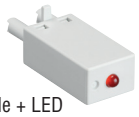
HR7XS1
Screw terminals.



HR7XS2
Screw terminals.

Code	Retaining clips	Code	Marker tags	Code	Parallel busbars	Code	Surge suppressor filters
	Included in the socket	HR1X30		HR1X9020 (black)	20 poles 		
		HR1X3016 (strip with 16 tags)		HR1X9120 (red)			
	HR3X88❻ 						
	HR3X86❺ 						
	HR5X88❻ 	HR5X30❻		HR5X9008 (black) ❹	8 poles 	Resistor - Capacitor HR6X77024 6...24VAC/DC HR6X77230 110...230VAC/DC	
	HR5X86❺ 					Diode + LED HR6X78024 6...24VDC	
	HR5X87❻ 			HR5X9002❼	2 poles 		
	HR6X88 (for screw terminal sockets) 						
	HR6X89 (for Push-in terminal sockets) 	HR6X30		HR5X9002❼	2 poles 		
	HR6X87 						
	HR7X87 						

❶ Final S in code indicates Push-in terminals.
❷ Voltage dependent on selected relay socket; rated insulation voltage only for relay 60VDC.
❸ Rated current if the relay is soldered directly onto the board; with socket the maximum current is 10A.
❹ For sockets with screw terminals.
❺ Only mounting on socket HR5XS21P.
❻ Not suitable for HR5XS21P socket.
❼ Bus jumper for A2 terminal; for Push-in terminals sockets only.

Relay and base ready assembled		Code	Contacts	Rated current	Terminals	Control voltage	Code	Marker tags	Code	Parallel busbars	Code	Surge suppressor filters
ASSEMBLED SLIM RELAYS		**HRA101CE024**	1 C/O	6A	screw	24VAC/DC		**HR1X30**		20 poles		
		HRA101CE024S	1 C/O	6A	push-in	24VAC/DC		**HR1X3016** (strip with 16 tags)		**HR1X9020** (black)		
										**HR1X9120** (red)		
ASSEMBLED MINIATURE RELAYS		**HRA302CD024K4**	2 C/O	8A	screw	24VDC		**HR5X30**		8 poles		Resistor - Capacitor **HR6X77024** 6...24VAC/DC **HR6X77230** 110...230VAC/DC
		HRA302CD024K5❸	2 C/O	8A	push-in	24VDC				**HR5X9008** (black)❷		
ASSEMBLED MINIATURE RELAYS WITH LED STATE INDICATOR AND MECHANICAL ACTUATOR		**HRA502CD024K4**	2 C/O	8A	screw	24VDC				**HR5X9002❼** 2 poles		Diode + LED **HR6X78024** 6...24VDC
		HRA502CA024K4	2 C/O	8A	screw	24VAC						
		HRA502CA230K4	2 C/O	8A	screw	230VAC						
		HRA502CD024K3	2 C/O	8A	push-in	24VDC						
		HRA502CD024K5❸	2 C/O	8A	push-in	24VDC						
ASSEMBLED INDUSTRIAL RELAYS WITH LED STATE INDICATOR AND MECHANICAL ACTUATOR		**HRA604CD024K4**	4 C/O	5A	screw	24VDC		**HR6X30**				
		HRA604CA024K4	4 C/O	5A	screw	24VAC						
		HRA604CA230K4	4 C/O	5A	screw	230VAC						
		HRA604CD024K3	4 C/O	5A	push-in	24VDC						
ASSEMBLED POWER RELAYS WITH ATEX CERTIFICATE		**HR8020D012**	2NO	30A	faston	12VDC						
		HR8020A024	2NO	30A	faston	24VAC						
		HR8020A120	2NO	30A	faston	110/120VAC						
		HR8020A230	2NO	30A	faston	230VAC						
		HR802CD012	2 C/O	30A	faston	12VDC						
		HR802CA024	2 C/O	30A	faston	24VAC						
		HR802CA120	2 C/O	30A	faston	110/120VAC						
		HR802CA230	2 C/O	30A	faston	230VAC						

❶ Final S in code indicates Push-in terminals.
❷ For sockets with screw terminals.
❸ Kit complete with diode filter + LED HR6X78024.

Slim relays



HRA10...



HR10...



HR20...

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Slim electromechanical relay and base ready assembled.					
HRA101CE024	24VAC/DC	1 C/O	6	Screw terminals	10
HRA101CE024S	24VAC/DC	1 C/O	6	Push-in terminals	10
Slim electromechanical relays.					
HR101CE012	12VDC	1 C/O	6	12VAC/DC control when on HR1XS024 or HR1XS024S socket	20
HR101CE024	24VDC	1 C/O	6	24VAC/DC control when on HR1XS024 or HR1XS024S socket	20
HR101CE060	60VDC	1 C/O	6	110...125VAC/DC control when on HR1XS110 or HR1XS110S socket. 220...240VAC/DC control when on HR1XS230 or HR1XS230S socket	20
Slim SSR (solid state relay) relays.					
HR201AS024	24VDC	1 SSR	2	Output 24...280VAC	20
HR201DS024	24VDC	1 SSR	4	Output 3...28VDC	20

General characteristics
Slim-type relays have a reduced width that permits considerable optimisation of space. All sockets are equipped with supply indicator LED and retain/release clips. The availability of electromechanical and solid-state (SSR) versions permits the installation of the most technically suitable solution in accordance with system requirements. The socket terminals can be screw or Push-in type.
The parallel busbars make for quick wiring.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Relay control voltage: 12, 24, 60VDC
- Relay control voltage + socket: 12, 24, 110...125, 220...240VAC/DC
- Max controllable power in AC-1: 1500W
- Max controllable power in AC-15: 360VA.

Certifications and compliance
Certifications obtained: cURus, CSA, EAC, VDE for electromechanical relays HR10..., cURus, TÜV for SSR relay HR20....
Compliant with standards: IEC/EN/BS 61810-1 for electromechanical relays, IEC/EN/BS 62314 for SSR.

Sockets



HR1XS... HR1XS...S

Order code	Control voltage	Terminals	Description	Qty per pkg
	AC/DC			no.
Sockets for relays.				
HR1XS024	12...24V	Screw	Use with relay HR101CE012, HR101CE024 and HR20...	10
HR1XS110	110...125V	Screw	Use with relay HR101CE060	10
HR1XS230	220...240V	Screw	Use with relay HR101CE060	10
HR1XS024S	12...24V	Push-in	Use with relay HR101CE012, HR101CE024 and HR20...	10
HR1XS110S	110...125V	Push-in	Use with relay HR101CE060	10
HR1XS230S	220...240V	Push-in	Use with relay HR101CE060	10

General characteristics
HR1X... sockets are equipped with supply indicator LED and retain/release clips. The socket terminals can be screw or Push-in type. Parallel busbars can be fitted to the sockets, for quick wiring. These busbars plug-in, on both the screw and Push-in sockets, leaving the cable entry terminals free.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Relay control voltage: 12, 24, 60VDC
- Relay control voltage + socket: 12, 24, 110...125, 220...240VAC/DC
- Green indication LED
- Fitting on DIN rail
- Operating temperature: HR1XS024 -40...+70°C, HR1XS110 and HR1XS230 -40...+55°C.

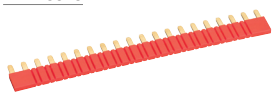
Certifications and compliance
Certifications obtained: cURus, CSA, EAC, VDE for electromechanical relay HR10..., cURus, TÜV for SSR relay HR20....
Compliant with standards: IEC/EN/BS 61810-1 for electromechanical relays, IEC/EN/BS 62314 for SSR.

Accessories

HR1X30...



HR1X9020



HR1X9120

Order code	Description	Qty per pkg
		no.
HR1X30	Marker tags	100
HR1X3016	Marker tags - strip with 16 tags	20
HR1X9020	20-pole parallel busbar - black	10
HR1X9120	20-pole parallel busbar - red	10

Miniature relays



HRA30...



HR30...

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Miniature relay and base ready assembled.					
HRA302CD024K4	24VDC	2 C/O	8	Screw terminals with retain/release clip	5
HRA302CD024K5	24VDC	2 C/O	8	Push-in terminals with retain/ release clip and suppressor filter	5
Miniature relays.					
HR301CD012	12VDC	1 C/O	16	Fitting on socket HR5XS2... (max 10A)	20
HR301CD024	24VDC	1 C/O	16		20
HR301CD048	48VDC	1 C/O	16		20
HR301CA024	24VAC	1 C/O	16		20
HR301CA110	110/120VAC	1 C/O	16		20
HR301CA230	230VAC	1 C/O	16		20
HR302CD012	12VDC	2 C/O	8	Fitting on socket HR5XS2...	20
HR302CD024	24VDC	2 C/O	8		20
HR302CD048	48VDC	2 C/O	8		20
HR302CA024	24VAC	2 C/O	8		20
HR302CA110	110/120VAC	2 C/O	8		20
HR302CA230	230VAC	2 C/O	8		20

General characteristics
Miniature relays have compact dimensions but high functional performance. It's the ideal device for those looking for a cost-effective solution without compromising performance.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Relay control voltage: 12, 24 and 48VDC - 24, 110/120 and 230VAC, 50/60Hz
- Max controllable power in AC-1 (1C/2C): 4000/2000W
- Max controllable power in AC-15 (1C/2C): 300/150VA
- Maximum current (1C/2C): 16A/8A.

Certifications and compliance
Certifications obtained: cURus, CSA, EAC, VDE (VDE except for HR301CA...).
Compliant with standards: IEC/EN/BS 61810-1.

Sockets



HR5XS21



HR5XS22



HR5XS21S



HR5XS21P

Order code	Description	Qty per pkg
		no.
Sockets for relays (supplied without retain/release clip). Terminal layout see page 24-11.		
HR5XS21	Screw terminals, contact terminals all on upper side. Fitting on DIN rail or with screws	10
HR5XS22	Screw terminals. Fitting on DIN rail or with screws	10
HR5XS21S	Terminals with **Push-in technology**. Fitting on DIN rail or with screws	10
HR5XS21P	PIN terminals for Printed Circuit Board	40

General characteristics
HR5X... series sockets can have screw or Push-in terminals for quick wiring. A socket with pins for PCB is also available. Screw terminals are available in 2 versions: with contact terminals separated from the coil terminals or with NC contact terminals near the coil terminals.
Surge suppressor filters, parallel busbars and tags for writing can be snap-fitted to the sockets.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Maximum current: 10A
- Terminal layout see page 24-10
- Operating temperature: -40...+70°C.

Certifications and compliance
Certifications obtained:
- Screw terminal sockets: cURus, CSA, EAC
- Push-in terminal sockets: cURus, EAC
- PIN terminal sockets: cURus

Compliant with standards: IEC/EN/BS 61810-1.

Accessories



HR3X88



HR3X86



HR6X78024

HR5X30



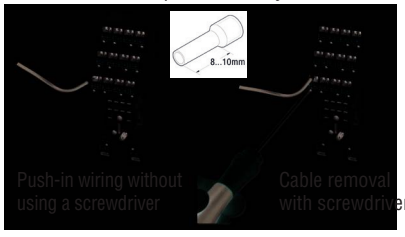
HR5X9002



HR5X9008

Order code	Description	Qty per pkg
		no.
HR3X88	Retain/release clip. Not suitable for HR5XS21P socket	10
HR3X86	Retaining clip. Only mounting on socket HR5XS21P	10
HR5X30	Marker tags	100
HR6X78024	Plug-in surge suppressor filters. 6...24VDC (diode) with LED	10
HR6X77024	Plug-in surge suppressor filters. 6...24VAC/DC (RC)	10
HR6X77230	Plug-in surge suppressor filters. 110...230VAC/DC (RC)	10
HR5X9008	8-pole parallel busbar - black - for sockets with screw terminals	10
HR5X9002	Bus jumper for A2 terminals; for Push-in terminal sockets only	10

HR5XS21S socket with Push-in technology
Push-in wiring without using a screwdriver for cables with end lugs. They guarantee fast wiring and clamping force maintained over time even in the presence of vibrations and/or shocks. To connect cables without end lug and for cables removal, a screwdriver needs to push the handy buttons.



Miniature relays clear enclosure



HR40...

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Miniature relays clear enclosure.					
HR401CD012	12VDC	1 C/O	16	Mounting on HR5XS2... socket (max 10A)	50
HR401CD024	24VDC	1 C/O	16		50
HR401CA024	24VAC	1 C/O	10	Mounting on HR5XS2... socket	50
HR401CA110	110VAC	1 C/O	10		50
HR401CA230	230VAC	1 C/O	10		50
HR402CD012	12VDC	2 C/O	10	Mounting on HR5XS2... socket	50
HR402CD024	24VDC	2 C/O	10		50
HR402CA024	24VAC	2 C/O	5	Mounting on HR5XS2... socket	50
HR402CA110	110VAC	2 C/O	5		50
HR402CA230	230VAC	2 C/O	5		50

Miniature relays with LED state indicator and mechanical actuator

new



HRA50...



HR50...

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Miniature relay and base ready assembled with LED state indicator and mechanical actuator (supplied with retain/release clip).					
HRA502CD024K4	24VDC	2 C/O	8	Screw terminals	5
HRA502CA024K4	24VAC	2 C/O	8		5
HRA502CA230K4	230VAC	2 C/O	8		5
HRA502CD024K3	24VDC	2 C/O	8	Push-in terminals	5
HRA502CD024K5 ❶	24VDC	2 C/O	8		5
Miniature relays with LED state indicator and mechanical actuator.					
HR501CD012	12VDC	1 C/O	16	Mounting on HR5XS2... socket (max 10A)	10
HR501CD024	24VDC	1 C/O	16		10
HR501CD048	48VDC	1 C/O	16		10
HR501CD110	110VDC	1 C/O	16		10
HR501CA024	24VAC	1 C/O	16		10
HR501CA110	110/120VAC	1 C/O	16		10
HR501CA230	230VAC	1 C/O	16		10
HR502CD012	12VDC	2 C/O	8	Mounting on HR5XS2... socket	10
HR502CD024	24VDC	2 C/O	8		10
HR502CD048	48VDC	2 C/O	8		10
HR502CD110	110VDC	2 C/O	8		10
HR502CA012	12VAC	2 C/O	8		10
HR502CA024	24VAC	2 C/O	8		10
HR502CA110	110/120VAC	2 C/O	8		10
HR502CA230	230VAC	2 C/O	8		10

Sockets



HR5XS21



HR5XS22



HR5XS21S



HR5XS21P

Order code	Description	Qty per pkg
		no.
Sockets for relays (supplied without retain/release clip). Terminal layout see page 24-11.		
HR5XS21	Screw terminals, contact terminals all on upper side. Fitting on DIN rail or with screws	10
HR5XS22	Screw terminals. Fitting on DIN rail or with screws	10
HR5XS21S	Terminals with **Push-in technology**. Fitting on DIN rail or with screws	10
HR5XS21P	PIN terminals for Printed Circuit Board	40

Accessories



HR5X86



HR5X87



HR5X88



HR5X30



HR5X9008



HR6X78024



HR5X9002

Order code	Description	Qty per pkg
		no.
HR5X86	Metal retaining clip. Only mounting on HR5XS21P socket	10
HR5X87	Metal retaining clip. Not suitable for HR5XS21P socket	20
HR5X88	Plastic retaining clip. Not suitable for HR5XS21P socket	10
HR5X30	Marker tags	100
HR6X78024	Plug-in surge suppressor filters. 6...24VDC diode with LED	10
HR6X77024	Plug-in surge suppressor filters. 6...24VAC/DC (RC)	10
HR6X77230	Plug-in surge suppressor filters. 110...230VAC/DC (RC)	10
HR5X9008	8-pole parallel busbar - black	10
HR5X9002	Bus jumper for A2 terminals; for Push-in terminal sockets only	10

General characteristics
HR40... and HR50... miniature relays have reduced dimensions and, in addition to the high electrical performance. HR40... has a clear enclosure that allow contacts visibility for wear and tear check. HR50... is equipped with the following functions: LED to indicate voltage on the coil, mechanical contact state indicator and mechanical test actuator. The mechanical actuator is particularly useful for performing functional tests; it can also keep the relay closed continuously.

Operational characteristics
- Rated insulation voltage: 250V (400V with pollution degree 2)
- Relay control voltage:
  - HR40...: 12 and 24VDC
  - HR40...: 24, 110 and 230VAC 50/60Hz
  - HR50...: 12, 24 and 48VDC
  - HR50...: 12, 24, 110/120 and 230VAC 50/60Hz
- Max AC-1 controllable power (1C/2C):
  - HR40...3840/2500W (version with DC coil)
  - HR40...2500W/1250W (version with AC coil)
  - HR50...: 4000/2000W
- Max AC-15controllable power: 150VA
- Maximum current (1C/2C):
  - HR40...: 16A/10A (version with DC coil)
  - HR40...: 10A/5A (version with AC coil)
  - HR50...: 16A/8A.

Certifications and compliance
Certifications obtained: HR401CD... cURus; HR402CD... cURus, TüV; HR40...CA... cURus, TüV; HR501C... and HR502C... cURus, CSA, EAC, VDE.
Note: HR502CA012 no certification.
Compliant with standards: IEC/EN/BS 61810-1.

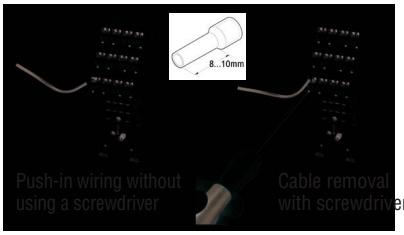
General characteristics
HR5X... series sockets can have screw or Push-in terminals for quick wiring. A socket with pins for PCB is also available. Screw terminals are available in 2 versions: with contact terminals separated from the coil terminals or with NC contact terminals near the coil terminals.
Surge suppressor filters, parallel busbars and tags for writing can be snap-fitted to the sockets intended for DIN rail mounting.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Maximum current: 10A
- Terminal layout see page 24-10
- Operating temperature: -40...+70°C.

Certifications and compliance
Certifications obtained:
- Screw terminal sockets: cURus, CSA, EAC
- Push-in terminal sockets: cURus, EAC
- PIN terminal sockets: cURus

Compliant with standards: IEC/EN/BS 61810-1.

HR5XS21S socket with Push-in technology
Push-in wiring without using a screwdriver for cables with end lugs. They guarantee fast wiring and clamping force maintained over time even in the presence of vibrations and/or shocks. To connect cables without end lug and for cables removal, a screwdriver needs to push the handy buttons.



❶ With suppressor filter.

Industrial relays with LED state indicator and mechanical actuator



HRA60...



HR60...

new

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Industrial relay and base ready assembled with LED state indicator and mechanical actuator.					
HRA604CD024K4	24VDC	4 C/O	5	Screw terminals with retain/release clip	5
HRA604CA024K4	24VAC	4 C/O	5		5
HRA604CA230K4	230VAC	4 C/O	5		5
HRA604CD024K3	24VDC	4 C/O	5	Push-in terminals with retain/release clip	5
Industrial relays with LED state indicator and mechanical actuator.					
HR602CD012	12VDC	2 C/O	7	Fitting on socket HR6XS2...	10
HR602CD024	24VDC	2 C/O	7		10
HR602CD048	48VDC	2 C/O	7		10
HR602CA012	12VAC	2 C/O	7		10
HR602CA024	24VAC	2 C/O	7		10
HR602CA110	110/120VAC	2 C/O	7		10
HR602CA230	230VAC	2 C/O	7		10
HR604CD012	12VDC	4 C/O	5	Fitting on socket HR6XS4...	10
HR604CD024	24VDC	4 C/O	5		10
HR604CD048	48VDC	4 C/O	5		10
HR604CA012	12VAC	4 C/O	5		10
HR604CA024	24VAC	4 C/O	5		10
HR604CA110	110/120VAC	4 C/O	5		10
HR604CA230	230VAC	4 C/O	5		10

General characteristics
HR60... type industrial relays are available in 2/4-changeover-contact versions. They are equipped with LEDs that indicate control voltage, a mechanical contact state indicator and a mechanical actuator. The actuator is particularly useful for performing functional tests; it can also keep the relay closed continuously.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Relay control voltage: 12, 24 or 48VDC - 12, 24, 110/120 and 230VAC, 50/60Hz
- Max controllable current in AC-1 (2C/4C): 7/5A
- Maximum current (2C/4C): 7A/5A.

Certifications and compliance
Certifications obtained: cURus, CSA, EAC, VDE.
Compliant with standards: IEC/EN/BS 61810-1.

Sockets



HR6XS21



HR6XS41



HR6XS42



HR6XS41S

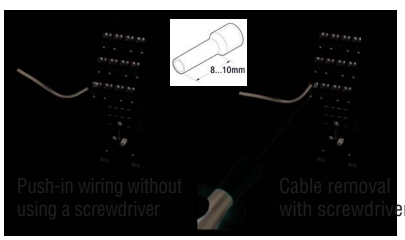
Order	Description	Qty per pkg
		no.
Sockets for relays (supplied without retain/release clip) for fitting on DIN rail or with screws. Terminal layout see page 24-11.		
For relays with 2 changeover contacts.		
HR6XS21	Screw terminals, contact terminals all on upper side	10
HR6XS22	Screw terminals	10
HR6XS41S	Terminals with **Push-in technology**	10
For relays with 4 changeover contacts.		
HR6XS41	Screw terminals, contact terminals all on upper side	10
HR6XS42	Screw terminals	10
HR6XS41S	Terminals with **Push-in technology**	10

General characteristics
HR6X... series sockets have screw terminals and are supplied in two versions for relays with 2 or 4 contacts. Surge suppressor filters and tags for writing can be plugged in to the sockets.
They can be fixed on DIN rail or with screws.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Maximum current: 10A
- Terminal layout see page 24-10 and 11
- Operating temperature: -40...+70°C

Certifications and compliance
Certifications obtained: cURus, CSA, EAC (CSA only for screw terminal sockets).
Compliant with standards: IEC/EN/BS 61810-1.

HR6XS41S socket with Push-in technology
Push-in wiring without using a screwdriver for cables with end lugs. They guarantee fast wiring and clamping force maintained over time even in the presence of vibrations and/or shocks. To connect cables without end lug and for cables removal, a screwdriver needs to push the handy buttons.



Accessories



HR6X88



HR6X87

HR5X30



HR6X78024



HR5X9002

Order	Description	Qty per pkg
		no.
HR6X87	Metal retaining clip	20
HR6X88	Plasic retain/release clip for sockets with Push-in terminals	20
HR6X89	Plasic retain/release clip for sockets with screw terminals	20
HR6X30	Marker tag for sockets with screw terminals	100
HR5X30	Marker tag for sockets with Push-in terminals	100
HR6X78024	Plug-in surge suppressor filters. 6...24VDC diode with LED	10
HR6X77024	Plug-in surge suppressor filters. 6...24VAC/DC (RC)	10
HR6X77230	Plug-in surge suppressor filters. 110...230VAC/DC (RC)	10
HR5X9002	Bus jumper for A2 terminals; for Push-in terminal sockets only	10

8-pin and 11-pin industrial relays with LED state indicator and mechanical actuator



HR70...

Order code	Control voltage	Contacts	Rated current	Description	Qty per pkg
			[A]		no.
Industrial relays with LED state indicator and mechanical actuator. 8-pin type.					
HR702CD024	24VDC	2 C/O	10	Fitting on socket HR7XS1	10
HR702CD048	48VDC	2 C/O	10	Fitting on socket HR7XS1	10
HR702CD110	110VDC	2 C/O	10	Fitting on socket HR7XS1	10
HR702CA024	24VAC	2 C/O	10	Fitting on socket HR7XS1	10
HR702CA110	110/120VAC	2 C/O	10	Fitting on socket HR7XS1	10
HR702CA230	230VAC	2 C/O	10	Fitting on socket HR7XS1	10
Industrial relays with LED state indicator and mechanical actuator. 11-pin type.					
HR703CD024	24VDC	3 C/O	10	Fitting on socket HR7XS2	10
HR703CD048	48VDC	3 C/O	10	Fitting on socket HR7XS2	10
HR703CD110	110VDC	3 C/O	10	Fitting on socket HR7XS2	10
HR703CA024	24VAC	3 C/O	10	Fitting on socket HR7XS2	10
HR703CA110	110/120VAC	3 C/O	10	Fitting on socket HR7XS2	10
HR703CA230	230VAC	3 C/O	10	Fitting on socket HR7XS2	10

General characteristics
HR70... type industrial relays are available in 2 or 3 changeover versions. They are equipped with LEDs that indicate control voltage, mechanical contact state indicator and mechanical actuator. The actuator is particularly useful for performing functional tests; it can also keep the relay closed continuously.
HR70... has high electrical endurance performance and lends itself to the most heavy-duty applications.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Relay control voltage: 24 and 48VDC- 24, 110/120 and 230VAC, 50/60Hz
- Maximum current: 10A.

Certifications and compliance
Certifications obtained: cURus, CSA, EAC.
Compliant with standards: IEC/EN/BS 61810-1.

Sockets



HR7XS1



HR7XS2

Order code	Description	Qty per pkg
		no.
Sockets for relays (supplied without retaining clip), for fitting on DIN rail or with screws. Terminal layout see page 24-11.		
HR7XS1	8-pin for HR702C... Screw terminals	10
HR7XS2	11-pin for HR703C... Screw terminals	10

General characteristics
HR7X... series sockets have screw terminals and are supplied in two versions for relays with 2 or 3 contacts (8-pin – 11-pin).
They can be fixed on DIN rail or with screws.

Operational characteristics
- Rated insulation voltage: 250V
- Rated impulse withstand voltage: 4kV
- Maximum current: 10A
- Operating temperature: -40...+70°C.

Certifications and compliance
Certifications obtained: cURus, CSA, EAC.
Compliant with standards: IEC/EN/BS 61810-1.

Accessories



HR7X87

Order code	Description	Qty per pkg
		no.
HR7X87	Metal retaining clip	20

Power relays with Atex certificate



HR80...

	Order code	Control voltage	Contacts	Rated current	Characteristics	Qty per pkg
				[A]		no.
new	**HR8020D012**	12VDC	2 NO	30	Faston terminals. Screw fixing	20
	HR8020A024	24VAC	2 NO	30	Faston terminals. Screw fixing	20
new	**HR8020A120**	110/120VAC	2 NO	30	Faston terminals. Screw fixing	20
	HR8020A230	230VAC	2 NO	30	Faston terminals. Screw fixing	20
new	**HR802CD012**	12VDC	2 C/O	30❶	Faston terminals. Screw fixing	20
	HR802CA024	24VAC	2 C/O	30❶	Faston terminals. Screw fixing	20
new	**HR802CA120**	110/120VAC	2 C/O	30❶	Faston terminals. Screw fixing	20
	HR802CA230	230VAC	2 C/O	30❶	Faston terminals. Screw fixing	20

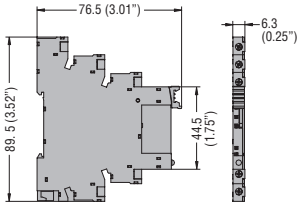
❶ 3A for NC contact.

General characteristics
The HR80... power relays, thanks to the Atex certification, are particularly suitable for refrigeration systems that use propane gas.
The compact structure and the front Faston terminals make them easy to install even in small spaces and speed up wiring.

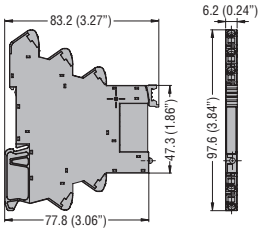
Operational characteristics
- Rated insulation voltage: 250V (277V for UL)
- Rated impulse withstand voltage:
  - 4kV between contacts and coil
  - 1.5kV between open contacts
  - 2kV between poles
- Max current 30A for NO contacts; 3A for NC contacts
- Faston terminals 6.3x0.8mm
- Atex classification: II 3 G Ex nC IIC Gc.

Certifications and compliance
Certifications obtained: cURus, VDE, Atex (TUV).
Compliant with standards: IEC/EN/BS 61810-1.

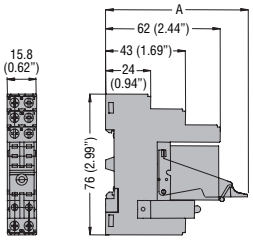
HRA10... - HR10... - HR20 with socket HR1XS...



HRA101CE024S with socket HR1XS...S

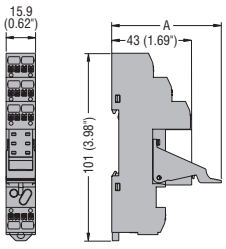


HR30... - HRA30... - HR40... - HR50... HRA50... with socket HR5XS21



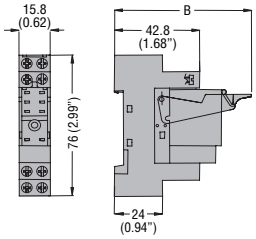
A: 64mm (2.52") with HR3X88
75mm (2.95") with XR5X88

HR30... - HRA30... - HR40... - HR50... HRA50... with socket HR5XS21S



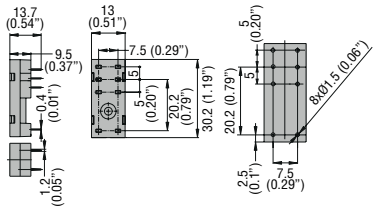
A: 60mm (2.36") with HR3X88
70mm (2.75") with XR5X88

HR30... - HR40... - HR50... with socket HR5XS22

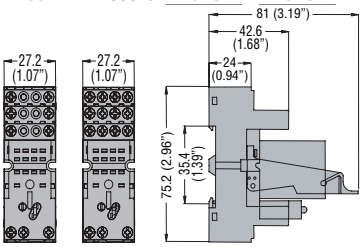


B: 57.5mm (2.26") with HR3X88
68mm (2.68) with XR5X88

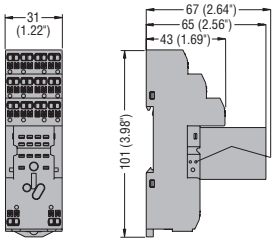
HR5XS21P



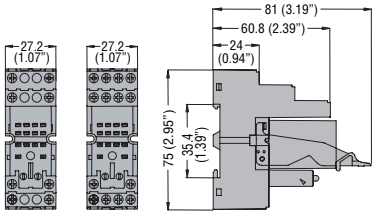
HR60... with socket HR6XS21 - HR6XS41



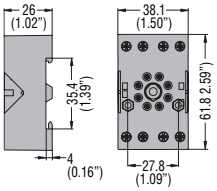
HR602C... - HR604C... with socket HR6XS41S



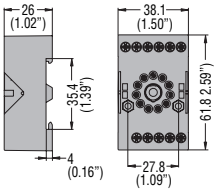
HR60... - HRA60... with socket HR6XS22 - HR6XS42



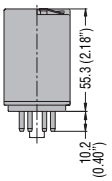
HR7XS1



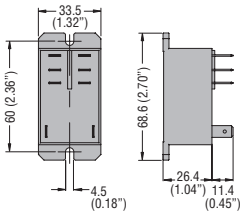
HR7XS2



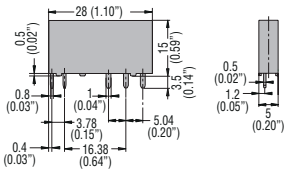
HR702C... - HX703C...



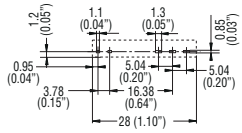
HR8020... - HX802C...



HR10 - HR20



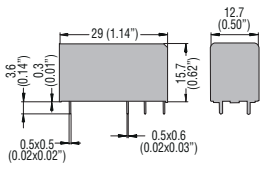
PCB layout



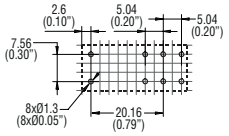
Connections
1 changeover contact



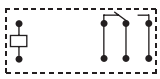
HR30



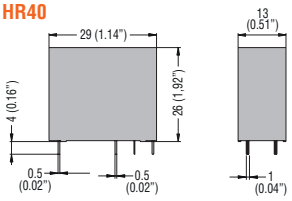
PCB layout



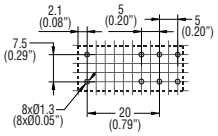
Connections
1 changeover contact



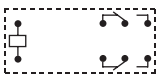
HR40



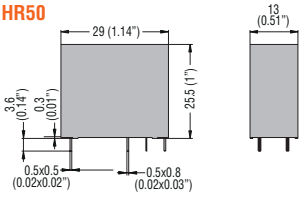
PCB layout



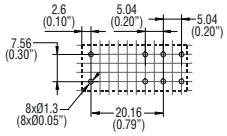
2 changeover contacts



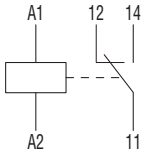
HR50



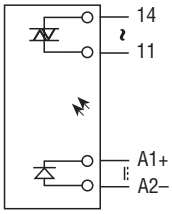
PCB layout



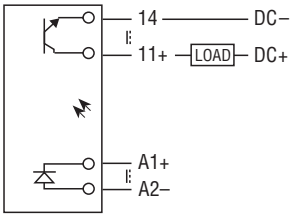
HR101C..., HRA101C...



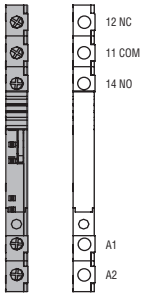
HR201A...



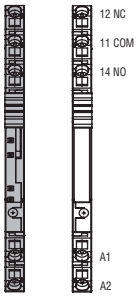
HR201D...



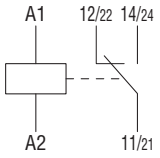
HR1XS...



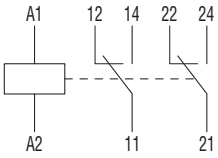
HR1XS...S



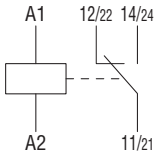
HR301C...



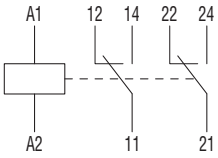
HR302C... - HRA302C...



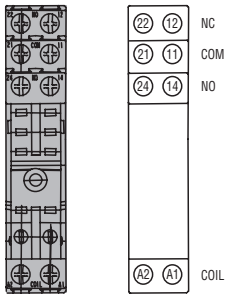
HR401C... - HR501C...



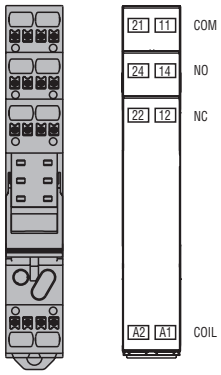
HR402C... - HR502C... - HRA502C...



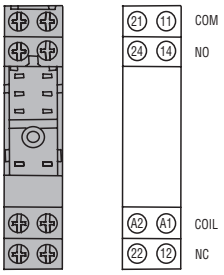
HR5XS21



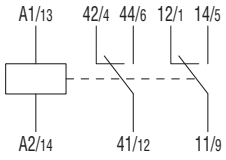
HR5XS21S



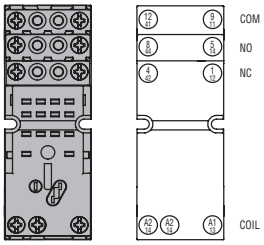
HR5XS22



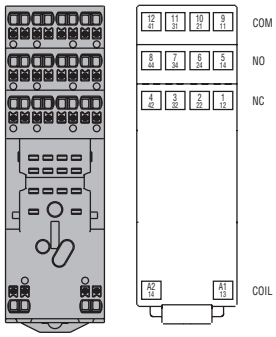
HR602C... - HRA602C...



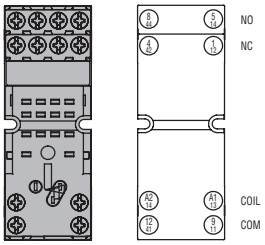
HR6XS21



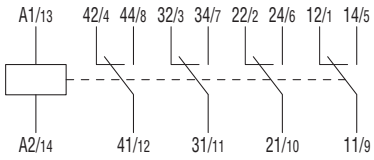
HR6XS41S



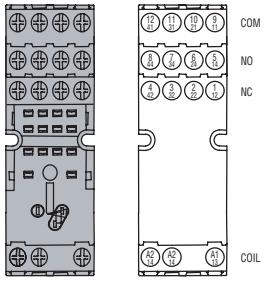
HR6XS22



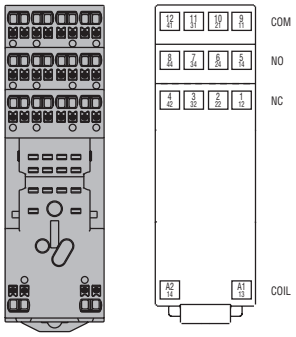
HR604C...



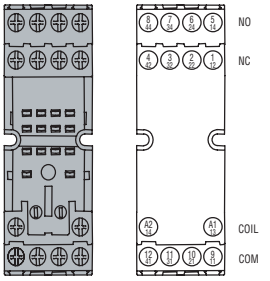
HR6XS41



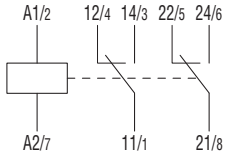
HR6XS41S



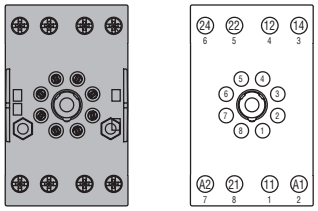
HR6XS42



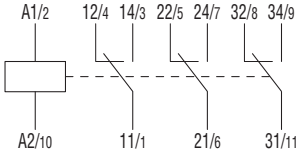
HR702C...



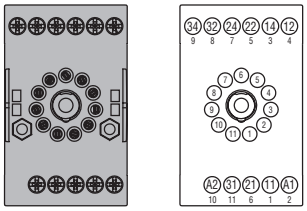
HR7XS1



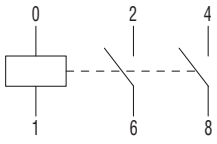
HR703C...



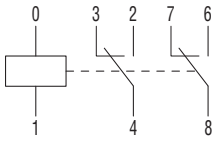
HR7XS2



HR8020...



HR802C...



Type		HRA10.. HR10...	HR201AS024	HR201DS024	HR301C...	HR302C...	HR401CD...	HR402CD...
CHARACTERISTICS OF THE CONTACTS								
Contact configuration		1 C/O	1 static	1 static	1 C/O	2 C/O	1 C/O	2 C/O
Rated insulation voltage Ui	V	250	2500 (in/out)	2500 (in/out)	250	250	250	250
Rated impulse withstand voltage Uimp	kV	4	4	1.5	6	6	4	5
Conventional free air thermal current Ith	A	6	2	4	16❷	8	16❷	10
Maximum instantaneous current	A	20 (500ms)	40 (10ms)	48 (10ms)	60❶	20❶	60	26
Rated operating voltage AC1	VA	1500	❹	–	4000	2000	4000	2500
Rated operating voltage AC15 (230VAC)	VA	360	❹	–	300❶	150❶	500	400
Single-phase motor control (230VAC)	kW	0.186	❹	–	0.4	0.2	0.37	0.3
Rated operating voltage DC1: 30/110/220V	A	6 / 0.2 / 0.12	–	❺	12 / 0.3 / 0.1	8 / 0.3 / 0.1	10 / 0.3 / 0.12	8 / 0.3 / 0.12
Minimum switching load	V / mA	5 / 100	24 / 100	3 / 20	5 / 100		5 / 100	
Contact impedance	mΩ	100	–	–	100		100	
Contact material		Ag/Ni	–	–	Ag/SnO_2		Ag/SnO_2	
Max socket terminal tightening torque	Nm	0.5			0.6		0.6	
Socket screw tightening tool (cross / flat blade)		Phillips 0 / 3.5mm			Phillips 1 / 4.5mm❸		Phillips 1 / 4.5mm❸	
Wire section on sockets with screw or Push-in terminals (min...max)	mm^2	0.5...1.5			0.5...2.5		0.5...2.5	
	AWG	20...16			20...14		20...14	
OPERATING TIMES								
Closing	ms	≤8	10	0.3	< 10		< 15	
Opening	ms	≤4	10	0.3	< 5		< 5	
ENDURANCE								
Mechanical	Cycles	10,000,000	Theoretically infinite		10,000,000		10,000,000	
Electrical with load AC1	Cycles	30,000❶	Theoretically infinite		50,000❶		100,000❶	
COIL CHARACTERISTICS								
Average coil consumption AC (50/60Hz) at 20°C	VA	0.2	–	–	0.9		–	–
Average coil consumption DC at 20°C	W	0.2	–	–	0.45		0.7	0.5
Operating range closing	(% Un)	≥75	80...120	80...120	70...110AC / 75...110DC		75...110	75...110
opening	(% Un)	≥5			20...55AC / 10...30DC		10...30	10...30
Maximum cycle frequency	cycles/h	10,000	>100,000	>100,000	3,600		3,600	3,600
AMBIENT CONDITIONS								
Operating temperature	°C	-40...+70	-30...+80		-40...+85		-40...+85	
Storage temperature	°C	-40...+80	-30...+100		-40...+85		-40...+85	
Fitting position		Any						
OTHER CHARACTERISTICS								
Indicator LED		Yes (on the socket)			No		No	
Mechanical contact position indicator		No			No		No	
Mechanical test actuator		No			No		No	
Socket fixing		On 35mm DIN rail			On 35mm DIN rail and with screws			

❶ NO contact.
❷ Maximum socket current of 10A.
❸ 2.5mm flat blade for versions with Push-in terminals.
❹ 2A output 24...280VAC.
❺ 4A output 3...28VDC.

	HR401CA...	HR402CA...	HR501C...	HR502C...	HR602C...	HR604C...	HR702C...	HR703C...	HR8020...	HR802C...
	1 C/O	2 C/O	1 C/O	2 C/O	2 C/O	4 C/O	2 C/O	3 C/O	2 NO	2 C/O
	250	250	250		250		250		250	
	4	4	6		4		6		4	
	10	5	16❷	8	7	5	10	10	30	30 NO (3 NC)
	–	–	20❶	10❶	–	–	–	–	–	–
	2500	1250	4000	2000	1750	1250	2500	2500	–	–
	–	–	150❶	150❶	150❶	150❶	500	500	–	–
	0.25	0.12	0.1	-	0.37	0.37	1.2	1.2	2.2	2.2
	–	–	12 / 0.3 / 0.1	8 / 0.3 / 0.1	12 / 0.3 / 0.1	8 / 0.3 / 0.1	10 / - / -	10 / - / -	–	–
	5 / 100		5 / 100		5 / 100		5 / 100		–	
	50		100		100		100		50	
	Ag/SnO_2		Ag/Ni		Ag/Ni		Ag/Ni		Ag/SnO_2	
	0.6		0.6		0.6		0.6		–	
	Phillips 1 / 4.5mm❸		Phillips 1 / 4.5mm❸		Phillips 1 / 4.5mm		Phillips 1 / 4.5mm		–	
	0.5...2.5		0.5...2.5		0.5...2.5		0.5...2.5		–	
	20...14		20...14		20...14		20...14		–	
	< 20		< 15		< 25		< 30		25	
	< 10		< 15		< 25		< 30		25	
	10,000,000		10,000,000		20,000,000		5,000,000		5,000,000	
	100,000❶		30,000❶		50,000❶	100,000	100,000		100,000	
	1		1		1.7		3		4	
	–		0.4		1.1		1.5		1.7	
	80...110		70...110AC / 75...110DC		70...110AC / 75...110DC		70...110AC / 75...110DC		80...110	
	> 10		20...55AC / 10...30DC		20...55AC / 10...30DC		20...55AC / 10...30DC		20...55	
	1,800		3,600		3,600		3,600		360	
	-40...+85		-40...+70		-40...+70		-40...+55		-40...+85	
	-40...+85		-40...+85		-40...+80		-40...+70		-40...+85	
	Any									
	No		Yes		Yes		Yes		No	
	No		Yes		Yes		Yes		No	
	No		Yes		Yes		Yes		No	
	On 35mm DIN rail and with screws		On 35mm DIN rail and with screws		On 35mm DIN rail and with screws		On 35mm DIN rail and with screws		Screw fixing on 35mm DIN rail with HRX889 accessory	