



### 270153 P1-SP

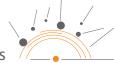
Motor Protection Relay

General	Casing Width (mm)	17,5
	Connections	Screw Terminal
	Network	3Ø with Neutral
	Response Time for Monitoring Any Function	Maks. 250ms
	Type of Output	Relay
	Supply Frequency	35-70Hz
	Control Input Voltage Range	_
	Operating Frequency	35-70Hz
	Protection Class	IP20
	Mounting Type	Panel or Rail
	EMC-EMI	<b>/</b>
	Packing Unit	1
	Weight (g)	69
	Packing Unit	1
	Dimensions	_
Phase Failure	Fixed Delay Time	500ms
Phase Sequence	Fixed Delay Time	500ms
Adjustable/Fixed Unbalanced Protection	Range/Limit	-
	Hysteresis	-
	Delay Time	-
Adjustable Voltage Protection	Upper Limit	-
	Lower Limit	-
	Hysteresis	-

	Delay Time	
Adjustable Current Protection	Upper Limit	-
	Lower Limit	-
	Hysteresis	-
	Delay Time	-
Adjustable Frequency Protection	Upper Limit	-
	Lower Limit	-
	Hysteresis	-
	Delay Time	
Adjustable/Extremely High-Low Voltage Protection	Upper Limit	310VAC (L-N)
	Lower Limit	140VAC (L-N)
	Hysteresis	6VAC
	Delay Time	100ms
PTC Protection	Fixed Delay Time	2000ms
	Threshold	1100Ω
Auxilary Contacts	Туре	1 C/O (SPDT)
	Max. Ratings - AC (for NO Side)	5A/250V; 1250VA
	Max. Ratings - DC (for NO Side)	5A/30VDC: 150W
	Mechanical Lifetime	≥10 <sup>7</sup> operation
	Electrical Lifetime Operations (for NO Side)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)
Supply Voltage	DC	_
	AC	L1-N'den 85-320VAC
Ambient Conditions	Operating Temperature	-20°C +60°C
	Storing Temperature	-40°C +75°C
	Relative Humidity (No Condensation)	Maks. 95% (no condensation)
Power Consumption	DC	_
	AC	<3VA

Avrupa standartlarına uygunluk belgesi - CE Certificate

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## **Defining** a protection relay in simple terms

A protection relay is an automation device that measures electrical values and detects electrical faults.

## Which actions are executed?

Sensing Detection Delaying Protection

A protection relay measures electrical values such as current, voltage, frequency etc. in order to protect your machines.

It can stop your engine from overheating with external PTC sensor.

Electrical network which is connected to your machines is examined continuously. if a fault is detected, the machine is stoped immediately or with time delay by output contacts. After that, any malfunctions can be fixed. This avoids expensive breakdowns, synonymous with production delays and loss of profitability.

## Which markets are they used frequently?

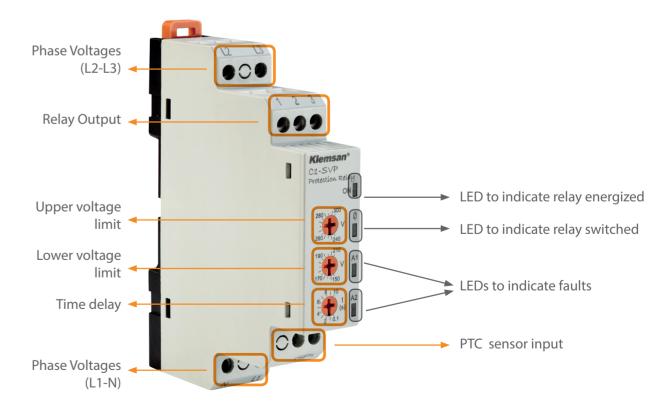
- Industrial machines
- Construction industry
- Stone pits
- Food and agriculture industry
- Water treatment system
- Moving stairs & elevators

## Benefits and Advantages

- First Class quality to fulfill all your monitoring needs
- Quick view of status with leds
- Easy configuration with knobs
- High level of Electromagnetic compatibility (EMC) i.e. maximum immunity to interferences.
- Sleek 17.5mm wide housing and compact design saves panel space.
- Perfect to fit in modular enclosure
- Self-Extinguishing plastic housing
- No auxiliary supply needed
- Preventing overheating thanks to PTC input
- High mechanical endurance
- High accuracy and switching reliability

## **Layout & Mounting**

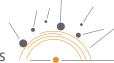
Klemsan protection relays are suitable for snap mounting onto 35mm standards DIN rails.



**C1-SVP Protection Relay** 

**Klemsan**®

**Automation** Catalogue



## Overcurrent Protection with Smart MCB



Detect a fault condition and interrupt current flow with adjustable time delay. After the fault is gone, unlike a circuit breaker, smart MCB turns its normal position automaticlly.



**CURRENT PROTECTION** 

**VOLTAGE PROTECTION** 

G1-SA, G1-SAP, G1-A,

V1-S, C1-SVP, ...



**Conveyor Application** 



Detection of overcurrent when conveyor is jamed.



**CURRENT PROTECTION** CPR-16

Generators



Frequency control for generators.



FREQUENCY PROTECTION

F1, DPR3

**Control Panel** 



Control panels must be monitored carefully otherwise the effects of a power outage or voltage drop can be highly harmful for equipments.



**Machine Line** 



Providing phase loss, phase sequence and asymmetry protection for 3 phase aplications.



**MOTOR PROTECTION** P1D-SA, C1-SA ...

M1D-S, M1D-SA, DPR3

**Escalators** 



Detection of unbalanced voltage on motors.



MOTOR PROTECTION C1D-SA, P1-SA, ... D-SA, G1D-SAL M1-SA, M1D-SA, DPR3





Adjustments of over and under voltage limit in order for cranes to operate correctly.



**VOLTAGE PROTECTION** 

V1, V1D, C1-SVP, G1-SA... G1D-SA, DPR3

Temperature Control of Motors



Preventing overheating with external PTC sensor.



**OVERHEAT PROTECTION** C1D-SVP, P1-SAP... M1-SAP, DPR3

Compressors

Detection of phase-loss and sequence in order compressors to work correctly.



**MOTOR PROTECTION** P1-S, C1-SA, ...

DPR3

**Klemsan**® **Automation** Catalogue 37

## **DPR3** Digital Protection Relay

DPR31xx series is a digital protection and monitoring relay designed for three-phase systems measure voltage, frequency and monitors these parameters below:

- Over voltage
- Under voltage
- Over Frequency
- Under Frequency
- Asymmetry
- Sequence
- Phase loss
- PTC error

## **DPR31xx** has many features;

- Undervoltage, overvoltage and frequency monitoring in three-phase AC systems 0...500 V
- Asymmetry, phase sequence, and phase loss monitoring
- Powered by external supply voltage
- Various alarms may be individually enabled/ disabled and assigned to sepa- rate output contacts
- Start-up delay, response delay, delay on release
- Adjustable switching hysteresis
- RMS measurement (AC)
- Digital LCD display with real-time rea-dings and onboard menu.
- Automatic preset function available when first connecting device
- Memory stores last 4 alarm value
- Non-volatile memory for settings
- Continuous self monitoring
- Internal test/reset button
- Two separate SPDT alarm relays
- Normally energized or normally de-ener-gized operation
- Latching or non-latching operation
- Password protection for device setting
- Sealable transparent cover
- Two-module enclosure (36 mm)

## Layout & Mounting

Klemsan digital protection relays are suitable for snap mounting onto 35 mmstandards DIN rails.



**DPR3111** 

Klemsan® Automation Catalogue

			7 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	7 2 193 2 2 193 2 2 193	7 193 2 2 193 2 2 193 2 2 193	2 193 2 2 193 2 2 193	F 2 193 1 2 193 2 2 193	2 2 193 2 2 193 2 2 193
Туре	Number  Width(mm)  ctions  rk  Phase Failure  Phase Sequuence  Adjustable Unbalanced Protection  Adjustable Voltage Protection  Adjustable Frequency Protection  Protection  Delay Time  Adjustable Frequency Protection  Adjustable Frequency Protection  PTC Protection  FOUTPUT  Threshold Delay Time  And Delay Time  Threshold Delay Time  Threshold Delay Time  Threshold Delay Time  Foutput  Function  Function  Function  Function  Function  Function  External Supply Supply Voltage  DC AC  AC		DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
Definition			Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay
Order Number	•		270 600	270 601	270 602	270 603	270 604	270 605
Casing Width(ı	mm)		36mm	36mm	36mm	36mm	36mm	36mm
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw termina
Network			3Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral
Monitoring Functions	Phase Failure	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Phase Sequuence	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable	Range	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
		Hysteresis	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
	Protection	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable	Range	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Hysteresis	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
	Protection	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Adjustable	Range	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
		Hysteresis	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V	0 - 999 V
	Protection	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
		Threshold	1100Ω	-	1100Ω	-	1100Ω	-
	PTC Protection	Delay Time	0 - 999 sec	-	0 - 999 sec	-	0 - 999 sec	-
Type of Outpu	t	,	Relay	Relay	Relay	Relay	Relay	Relay
,, , , , , , , , , , , , , , , , , , ,		Number of Contacts	1	2	1	2	1	2
		Type	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)
			10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC
Auxiliary Cont	acts	Max. Switching Power	1250VA	1250VA	1250VA	1250VA	1250VA	1250VA
		Mechanical Life Time	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7	≥ 10^7
		Electrical Life Time	5x10^4	5x10^4	5x10^4	5x10^4	5x10^4	5x10^4
	External Supply		-	-	-	-	Available	Available
Supply		DC	-	-	-	-	-	-
Voltage	Supply Voltage	AC	85300 V AC	85300 V AC	85300 V AC	85300 V AC	85300 V AC	85300 V AC
	Supply Frequency		35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Permissible An	117 1 7	During Operation	-20°C+70°C	-20°C+70°C	-20°C+70°C	-20°C+70°C	-20°C+70°C	-20°C+70°C
Temperature		During Storage	-30°C+80°C	-30°C+80°C	-30°C+80°C	-30°C+80°C	-30°C+80°C	-30°C+80°C
Relative Humi	dity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating Free	quency		35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Degree of Prot	tection		IP20	IP20	IP20	IP20	IP20	IP20
		DC	-	-	-	-	-	-
Power Consum	nption	AC	<4VA	<4VA	<4VA	<4VA	<4VA	<4VA

Туре	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
	Voltage Measurement inputs	Voltage Measurement Inputs	Voltage Measurement inputs	Voltage Measurement inputs	Power Supply Measurement Inputs	Power Supply Measurement Inputs
Schematics	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
	Relay 1 PTC	Relay 1 Relay 2	Relay 1 Relay 2	Relay 1 Relay 2	(4-11-12) PTC	Relay 1 Relay 2
Dimensional Drawings		4-36mm→    1000000	62r	nm	57.5mm 50.6mm	



			000					
Туре			F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S
Definiton			Frequency monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay
Order Number			270161	270156	270157	270158	270159	270160
Casing Width(r	mm)		17.5	17.5	17.5	17.5	17.5	17.5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			-	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral
	Phase Failure	Fixed delay time	-	500msec	500msec	500msec	500msec	500msec
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	-	500msec
	Adjustable	Range	-	± (5% => 20%)	± (5% => 20%)	-	-	-
	Unbalanced	Hysteresis	-	6,9VAC	6,9VAC	-	-	-
	Protection	Delay time	-	0.1=>10sec	0.1=>10sec	-	-	-
		Upper limit	-	-	-	240=>300VAC (L-N)	240=>300VAC (L-N)	240=>300VAC (L-N)
	Adjustable	Lower limit	-	-	-	150=>210VAC (L-N)	150=>210VAC (L-N)	150=>210VAC (L-N)
	Voltage Protection	Hysteresis	-	-	-	6 VAC	6 VAC	6 VAC
		Delay time	-	-	-	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation
		Upper limit	-	-	-	-	-	-
Monitoring Functions	Adjustable	Lower limit	-	-	-	-	-	-
	Protection	Hysteresis	-	-	-	-	-	-
		Delay time	-	-	-	-	-	-
		Upper limit	42.5 => 65Hz	-	-	-	-	-
	Adjustable	Lower limit	40 => 62.5Hz	-	-	-	-	-
	Protection Protection	Hysteresis	0.4Hz	-	-	-	-	-
		Delay time	1=>10sec	-	-	-	-	-
		Upper limit	-	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)
	Extremely High-	Lower limit	-	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)
		Hysteresis	-	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC
		Delay time	-	100msec	100msec	100msec	100msec	100msec
	DTC Duri	Fixed delay time	-	-	2000msec	2000msec	-	-
	Adjustable Current Protection  Adjustable Current Protection  Adjustable Frequency Protection  Extremely High- Low Voltage Protection  PTC Protection  Threshold  time for monitoring any function  utput  Upper limit Hysteresis Delay time Upper limit Hysteresis Delay time Fixed delay ti Threshold	Threshold	-	-	1100Ω	1100Ω	-	-
Response time	for monitoring a	ny function	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec
Type of Output	t		Relay	Relay	Relay	Relay	Relay	Relay
		Туре	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)
A		Max ratings-AC (for NO side)	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
Auxiliary conta	acts	Max ratings-DC (for NO side)	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
		Mechanical life time	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations

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V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16
VoltaTge monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Current monitoring relay
270170	270162	270256	270257	270258	270259	270260	270270
17.5	17.5	17.5	17.5	17.5	17.5	17.5	36
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
1Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	-
500msec	500msec	500msec	500msec	500msec	500msec	500msec	-
-	-	500msec	500msec	500msec	-	500msec	-
-	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-
-	-	12 VAC	12 VAC	-	-	-	-
-	-	0.1=>10sec	0.1=>10sec	-	-	-	-
240=>300VAC (L-N)	240=>300VAC (L-N)	-	-	270=>370VAC (L-L)	270=>370VAC (L-L)	270=>370VAC (L-L)	-
150=>210VAC (L-N)	150=>210VAC (L-N)	-	-	400=>500VAC (L-L)	400=>500VAC (L-L)	400=>500VAC (L-L)	-
6 VAC	6 VAC	-	-	6 VAC	6 VAC	6 VAC	-
0.1=>10sec for off delay operation	0.1=>10sec for on delay operation & 0.1=>10sec for off delay operation	-	-	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation	-
-	-	-	-	-	-	-	1=>16AAC
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	5=>20% x Upper limit
-	-	-	-	-	-	-	0.1=>10sec
-	-	-	-	-	-	-	-
-	-	_	-	-	-	-	-
_	_	_	_	_	_	_	_
	-	_					-
310 VAC (L-N)	310 VAC (L-N)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	510 VAC (L-L)	-
140 VAC (L-N)	140 VAC (L-N)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	240 VAC (L-L)	-
6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	-
					100msec		-
100msec	100msec	100msec	100msec	100msec	Toomsec	100msec	-
-		-	2000msec 1100Ω	2000msec 1100Ω	_	_	-
Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 100msec
Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 10A/250V; 1250VA	1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 10A/250V; 1250 VA	1 C/O (SPDT) 16A/250V; 4000VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	-
≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations
_ 10 Operations	_ ro operations	_ 10 operations	_ 10 operations	_ 10 operations	_ 10 operations	_ 10 operations	_ To operations

## **Protection** Management Solutions



Туре		F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S
Auxiliary contacts	Electrical life time operations (for NO side)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)
	DC	-	-	-	-	-	-
Supply Voltage	AC	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N
Supply Frequency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Control Input Voltage Range		-	-	-	-	-	-
Permissible ambient	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
temperature	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C
Relative Humidity		Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
Operating frequency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-	-
rower consumption	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<3VA
Veight(gr)		62	66	70	71	66	66
Permissible mounting position		any	any	any	any	any	any
Schematics		Auxiliary Output Output Output Noutral Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output  N Phase-1	Phase-2 Phase-3 Auxiliary Output  PTC Sensor Inputs  N Neutral Phase-1	Phase-2 Phase-3 Phase-3 Phase-3 Phase-3 Phase-3 Phase-3 Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output  Neutral Phase-1	Phase-2 Phase-3 (12) (13); Auxiliary Output (1) (2) (3); Neutral Phase-1
Dimensional Drawings		9	17.5mm	6	5mm — 8.5mm — 0.4mm	66.5m   53.6mm	 m

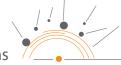
V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16
5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	1×10 <sup>5</sup>			
-	-	-	-	-	-	-	24-300 VDC
85-320VAC from L1-N	85-320VAC from L1-N	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	150-500VAC from L2-L3	36 -300VAC
35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
-	-	-	-	-	-	-	Same with supply voltage
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C			
-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C			
Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-	-	<1W
<3VA	<3VA	<4VA	<4VA	<4VA	<4VA	<4VA	<3VA
62	66	70	75	75	70	70	95
any	any	any	any	any Phase-2	any Phase-2	any Phase-2	any
Auxiliary Output Output  N-U1 Neutral Phase-1	Phase-3  Auxiliary Output  1 2 3  N  Neutral Phase-1	Phase-3  Phase-3  Auxiliary  Output  1 2 3	Phase-3  Auxiliary  Output  PTC Sensor Inputs  Inputs  Phase-1	Phase-3  Phase-3  Auxiliary  Output  PTC Sensor  Inputs  Phase-1	Phase-3  Auxiliary Output  1 2 3	Phase-3  Auxiliary Output  1 2 3	Auxiliary Output $Auxiliary Output$ $Auxiliary Output$ $Auxiliary Output$ $Ac \Rightarrow L1, DC \Rightarrow +$ $Ac \Rightarrow L1$ $Ac \Rightarrow L2$ $Ac \Rightarrow L1$ $Ac \Rightarrow L2$ $Ac$
90.4mm		68.5mm 90.4mm	53.6mm	66.5mm	-36mm →	4- 45.5mm - 62mm - 90mm - 90mm - 100	50.6mm 57.5mm 29.1mm

**Protection** Management Solutions



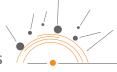
			000	OOO Removed to the second seco		390		
Туре			P1-A	P1-P	P1-S	P1-SP	P1-SA	
Definiton			Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	
Order Number			270150	270151	270152	270153	270154	
Casing Width(n	nm)		17.5	17.5	17.5	17.5	17.5	
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	
Network			3Ø with neutral	1Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	
	Phase Failure	Fixed delay time	500msec	-	500msec	500msec	500msec	
	Phase Sequence	Fixed delay time	-	-	500msec	500msec	-	
	Fived	Limit	± 20%	-	-	-	± 20%	
	Unbalanced	Hysteresis 3% x Un ≈ 6,9VAC -		-	-	-	3% x Un ≈ 6,9VAC	
	Protection	Delay time	500msec	-	-	-	500msec	
Monitoring Functions		Upper limit	310 VAC (L-N)	-	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	
		Lower limit	140 VAC (L-N)	-	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	
				-	6 VAC	6 VAC	6 VAC	
		Delay time	100msec	-	100msec	100msec	100msec	
		Fixed delay time - 2000msec		2000msec	-	2000msec	-	
	PTC Protection	Threshold	-	1100Ω	-	1100Ω	-	
Response time	for monitoring a	ny function	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	
Type of Output			Relay	Relay	Relay	Relay	Relay	
		Туре	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	
		Max ratings-AC (for NO side)	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	
Auxiliary conta	ects	Max ratings-DC (for NO side)	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	
		Mechanical life time	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	
	Fixed Unbalanced Protection  Fixed Unbalanced Protection  Delay ti  Upper I  Lower I  Lower I  Hystere  Delay ti  PTC Protection  Fixed delay ti  PTC Protection  Threshe  conse time for monitoring any function of Output  Type  Max rat (for NO Max rat (for NO Mechani Electric operatic side)  Delay ti  Hystere  Delay ti  Fixed delay ti  Type  Max rat (for NO Mechani Electric operatic side)	Electrical life time operations (for NO side)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	
Supply Voltage			85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	85-320VAC from L1-N	
Supply Freque	ncy		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	
Permissible am temperature	bient	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	
Temperature		During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	
Relative Humid	lity		Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	
Operating freq	uency		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	

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P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
270155	270254	270255	270400	270401	270402	270403
17.5	17.5	17.5	17.5	17.5	17.5	17.5
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral
500msec	500msec	500msec	<1sec	<1sec	<1sec	<1sec
500msec	-	500msec	<1sec	<1sec	<1sec	<1sec
± 20%	± 20%	± 20%	-40%	-40%	-40%	-40%
3% x Un ≈ 6,9VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC	3% x Un ≈ 12VAC
500msec	500msec	500msec	<1sec	<1sec	<1sec	<1sec
310 VAC (L-N)	510 VAC (L-L)	510 VAC (L-L)	-	-	-	-
140 VAC (L-N)	240 VAC (L-L)	240 VAC (L-L)	-	-	-	-
6 VAC	6 VAC	6 VAC	-	-	-	-
100msec	100msec	100msec	-	-	-	-
2000msec	-	2000msec	-	-	-	-
1100Ω	-	1100Ω	-	-	-	-
Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec
Relay	Relay	Relay	Relay	Relay	Relay	Relay
1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 NO (SPST)	1 C/O (SPDT)	1 NO (SPST)	1 C/O (SPDT)
10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA
5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W
≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations	≥ 10 <sup>7</sup> operations
5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)
85-320VAC from L1-N	150-500VAC from L2-L3	150-500VAC from L2-L3	180-265VAC from L3-N	180-265VAC from L3-N	90-150VAC from L3-N	90-150VAC from L3-N
35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
-40 to +75 ℃	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 ℃	-40 to +75 ℃	-40 to +75 °C
Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)
35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz

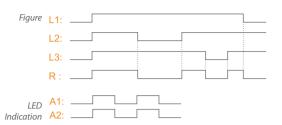


Туре		P1-A	P1-P	P1-S	P1-SP	P1-SA	P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-S
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
D	DC	-	-	-	-	-	-	-	-	-	-	-	-
Power consumption	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<3VA	<4VA	<4VA	<13VA	<13VA	<4.5VA	<4.5VA
Permissible mounting positio	n	any	any	any	any	any	any	any	any	any	any	any	any
Weight(gr)		66	65	65	69	65	69	70	74	59	59	59	59
Schematics		Phase-2 Phase-3 (12) (3); Auxiliary Output (1) (2) (3) Neutral Phase-1	Auxiliary Output  1 2 3  PTC Sensor Inputs  Neutral Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output  1 2 3	Phase-2 Phase-3 Phase-3 Auxiliary Output  1 2 3 PTC Sensor Inputs  Neutral Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output  1 2 3	Phase-2 Phase-3 Phase-3 Auxiliary Output  1 2 3 PTC Sensor Inputs  Neutral Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output  1 2 3	Phase-2 Phase-3 Phase-3 Auxiliary Output  PTC Sensor Inputs Phase-1	Phase-2 Neutral Phase-3 (13 N 12)  Auxiliary Output Phase-1	Phase-2 Phase-3 Phase-3 Auxiliary Output 1 2 3 Neutral Phase-1	Phase-2 Neutral Phase-3 (3) N (2)  Auxiliary Output Phase-1	Phase Au: Out Neutra
Dimensional Drawings		90.4mm		68.5mm — 90.4mm —		66.5mm 53.6mm		90.4mm	7.5mm	68.5mm 90.4mm	31mm	66.5mm 53.6mm	

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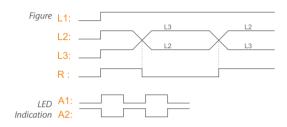
#### Phase Failure / Off delay operation



if a phase failure occurs the output relay de-energizes in 500msec.

The fault is indicated by flashing LED A1 and LED A2 simultaneously. The output relay re-energizes automatically as soon as the voltage returns to the tolerance range.

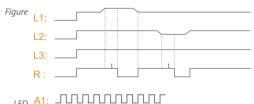
#### Phase Sequence Error / Off delay operation



If a phase sequence error occurs the output relay deenergizes in 500msec.

The fault is displayed by alternated flashing of the LEDs A1 and A2. The output relay re-energizes automatically as soon as the phase sequence is correct again.

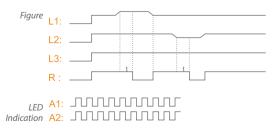
#### Adjustable Unbalance Protection / Off delay operation



LED A1: JJJJJJJJJJJJ Indication A2: JJJJJJJJJJJ If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%5=>%20), the output relay de-energizes after time delay (0.1-10s). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

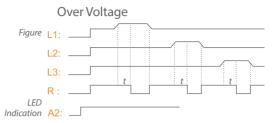
#### Fixed Unbalance Protection / Off delay operation

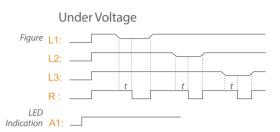


If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%20), the output relay de-energizes after time delay(2sec). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

#### Adjustable Voltage Protection / Off delay operation

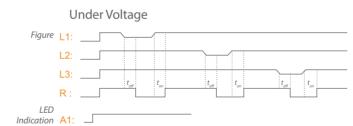




If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after time delay(0.1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes automatically.

#### Adjustable Voltage Protection / On-Off delay operation (Available only for V1-T)

# 

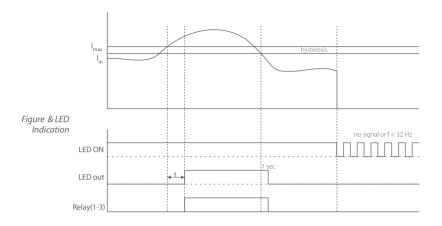


If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after  $t_{\rm off}$  time delay(0.1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay reenergizes after  $t_{\rm on}$  time delay(0.1-10s).

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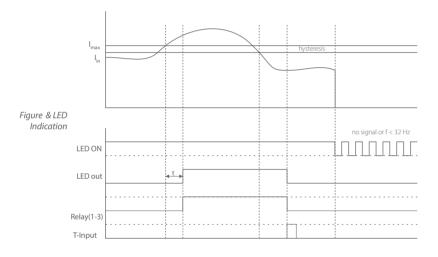
## S

#### Adjustable Current Protection / On delay operation



#### **AUTOMATIC MODE**

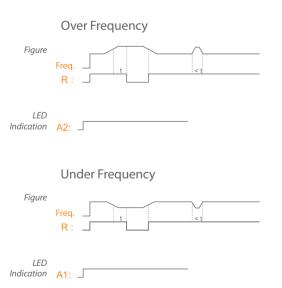
If the current to be monitored exceeds adjusted high limit value, the output relay de-energizes after time delay(0.1-10s). As soon as the current returns to the tolerance range, taking into account adjusted hysteresis (5-20%) and 1 second safety time, the output relay re-energizes automatically.



#### MANUAL MODE

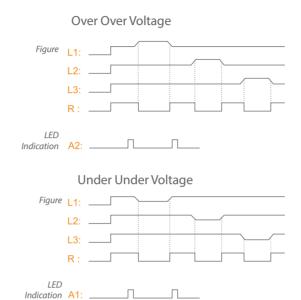
If the current to be monitored exceeds adjusted high limit value, the output relay de-energizes after time delay(0.1-10s). After the current returns to the tolerance range, taking into account adjusted hysteresis (5-20%) and 1 second safety time, the output relay waits till trigger input is applied. After that it re-energizes automaticlly.

#### Adjustable Frequency Protection / Off delay operation



If the frequency to be monitored exceeds or falls below adjusted high limit or low limit value, the output relays de-energizes after time delay(1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the frequency returns to the tolerance range, taking into account a fixed hysteresis of 0.4kHz, the output relay re-energizes automatically.

#### Extremely High-Low Voltage Protection / Off delay operation



If the voltage to be monitored exceeds 310VAC for star connection device or 510VAC for delta connection device, output relay de-energizes immediately.

If the voltage to be monitored falls below 140VAC for star connection device or 240VAC for delta connection device, output relay de-energizes immediately.

The fault type is indicated by LEDs A1 or A2 with blinking. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 6VAC, the output relay re-energizes automatically.

#### PTC Protection / Off delay operation



 In order to use this fuction, PTC temperature sensors must be connected to the relay's PTC input. Under normal operating conditions the PTC resistance is below the response threshold. If the motor heats up excessively, it means resistance value is increased, the output relay de-energizes after 2 seconds delay.

The output relay re-energizes automatically as soon as the motor heat turns back to its normal operating conditions.

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