



# Klemsan®

## 270153 P1-SP

Motor Protection Relay

<b>General</b>	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	✓
	Packing Unit	1
	Weight (g)	69
	Packing Unit	1
Dimensions	—	
<b>Phase Failure</b>	Fixed Delay Time	500ms
<b>Phase Sequence</b>	Fixed Delay Time	500ms
<b>Adjustable/Fixed Unbalanced Protection</b>	Range/Limit	-
	Hysteresis	-
	Delay Time	-
<b>Adjustable Voltage Protection</b>	Upper Limit	-
	Lower Limit	-
	Hysteresis	-

	Delay Time	-
<b>Adjustable Current Protection</b>	Upper Limit	-
	Lower Limit	-
	Hysteresis	-
	Delay Time	-
<b>Adjustable Frequency Protection</b>	Upper Limit	-
	Lower Limit	-
	Hysteresis	-
	Delay Time	-
<b>Adjustable/Extremely High-Low Voltage Protection</b>	Upper Limit	310VAC (L-N)
	Lower Limit	140VAC (L-N)
	Hysteresis	6VAC
	Delay Time	100ms
<b>PTC Protection</b>	Fixed Delay Time	2000ms
	Threshold	1100Ω
<b>Auxiliary Contacts</b>	Type	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)
<b>Supply Voltage</b>	DC	—
	AC	L1-N'den 85-320VAC
<b>Ambient Conditions</b>	Operating Temperature	-20°C +60°C
	Storing Temperature	-40°C +75°C
	Relative Humidity (No Condensation)	Maks. 95% (no condensation)
<b>Power Consumption</b>	DC	—
	AC	<3VA

Avrupa standartlarına uygunluk belgesi - CE Certificate

**Order Info**



## 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?

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.

**Sensing** **Detection**  
**Delaying**  
**Protection**

## Which markets are they used frequently?

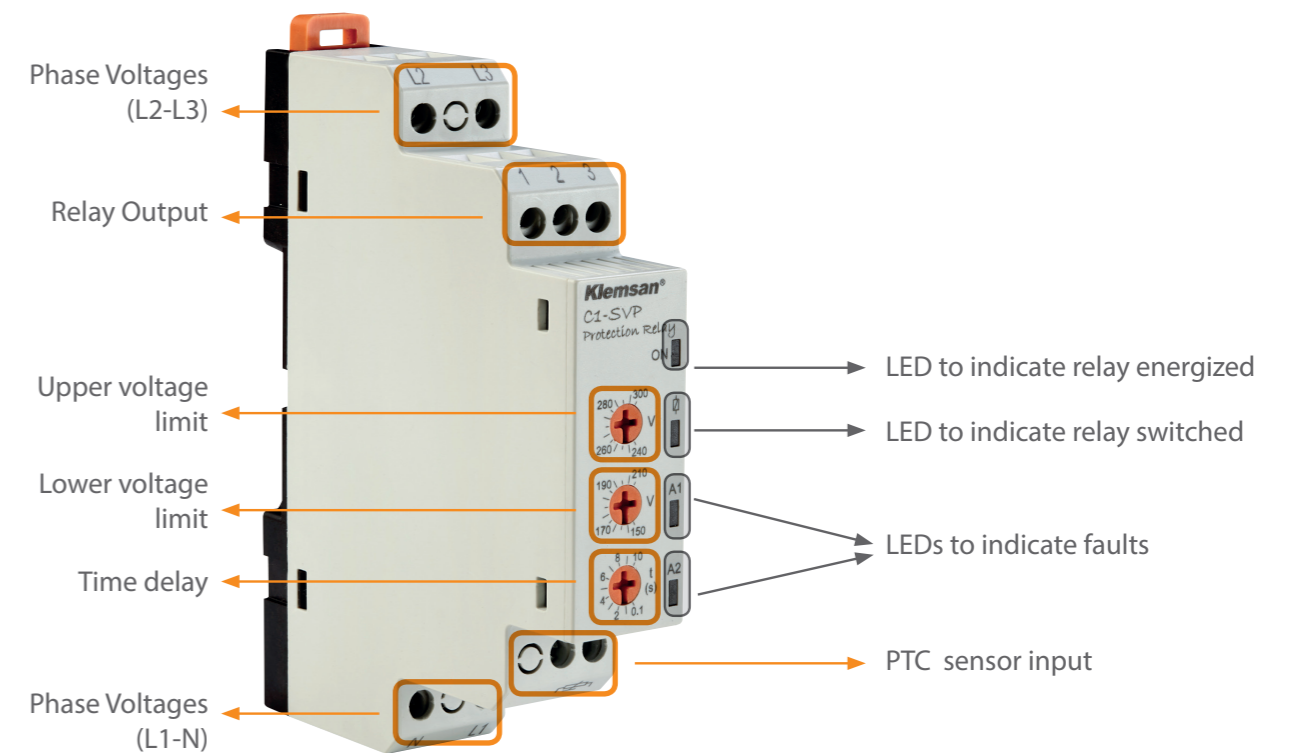
- Industrial machines
- Construction industry
- Stone pits
- Food and agriculture industry
- Water treatment system
- Moving stairs & elevators

## 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**

## 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 automatically.



**CURRENT PROTECTION**  
CPR-16

## Control Panel



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



**VOLTAGE PROTECTION**  
V1-S, C1-SVP, ...  
G1-SA, G1-SAP, G1-A,  
DPR3

## Escalators



Detection of unbalanced voltage on motors.



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

## Temperature Control of Motors



Preventing overheating with external PTC sensor.



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

## Conveyor Application



Detection of overcurrent when conveyor is jamed.



**CURRENT PROTECTION**  
CPR-16

## Generators



Frequency control for generators.



**FREQUENCY PROTECTION**  
F1, DPR3

## Machine Line



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



**MOTOR PROTECTION**  
P1D-SA, C1-SA ...  
M1D-S, M1D-SA, DPR3

## Cranes



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

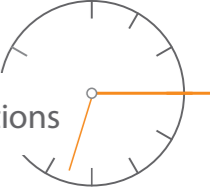
## Compressors



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



**MOTOR PROTECTION**  
P1-S, C1-SA, ...  
DPR3



## 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;

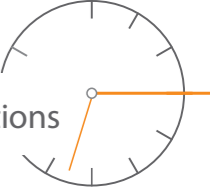
- Undervoltage, overvoltage and frequency monitoring in three-phase AC systems 0...500 V
- Asymmetry, phase sequence, and phase loss monitoring
- Powered by external supply voltage
- Various alarms may be individually enabled/disabled and assigned to separate output contacts
- Start-up delay, response delay, delay on release
- Adjustable switching hysteresis
- RMS measurement (AC)
- Digital LCD display with real-time readings 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-energized 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 mm standards DIN rails.



**DPR3111**



Type	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
<b>Definition</b>	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay	Digital Protection Relay
<b>Order Number</b>	270 600	270 601	270 602	270 603	270 604	270 605
<b>Casing Width(mm)</b>	36mm	36mm	36mm	36mm	36mm	36mm
<b>Connections</b>	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
<b>Network</b>	3Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral
<b>Monitoring Functions</b>	Phase Failure	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
	Phase Sequence	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
Adjustable Unbalanced Protection	Range	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
	Hysteresis	0 - 30%	0 - 30%	0 - 30%	0 - 30%	0 - 30%
	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
Adjustable Voltage Protection	Range	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
	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
Adjustable Frequency Protection	Range	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
	Delay Time	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec	0 - 999 sec
PTC Protection	Threshold	1100Ω	-	1100Ω	-	1100Ω
	Delay Time	0 - 999 sec	-	0 - 999 sec	-	0 - 999 sec
<b>Type of Output</b>	Relay	Relay	Relay	Relay	Relay	Relay
<b>Auxiliary Contacts</b>	Number of Contacts	1	2	1	2	1
	Type	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)	2 C/O (SPDT)	1 C/O (SPDT)
	Max Ratings-AC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC
	Max. Switching Power	1250VA	1250VA	1250VA	1250VA	1250VA
	Electrical Life Time	5x10 <sup>4</sup>	5x10 <sup>4</sup>	5x10 <sup>4</sup>	5x10 <sup>4</sup>	5x10 <sup>4</sup>
<b>Supply Voltage</b>	External Supply	-	-	-	-	Available
	Supply Voltage	DC	-	-	-	-
		AC	85..300 V AC	85..300 V AC	85..300 V AC	85..300 V AC
Supply Frequency	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
<b>Permissible Ambient Temperature</b>	During Operation	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C	-20°C..+70°C
	During Storage	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C	-30°C..+80°C
<b>Relative Humidity</b>	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)	Max.95% (no condensation)
<b>Operating Frequency</b>	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
<b>Degree of Protection</b>	IP20	IP20	IP20	IP20	IP20	IP20
<b>Power Consumption</b>	DC	-	-	-	-	-
	AC	<4VA	<4VA	<4VA	<4VA	<4VA

Type	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
<b>Schematics</b>						
	<b>DPR3110</b>	<b>DPR3120</b>	<b>DPR3111</b>	<b>DPR3121</b>	<b>DPR3110E</b>	<b>DPR3120E</b>
<b>Dimensional Drawings</b>						



Type	F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S	
<b>Definiton</b>	Frequency monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	
<b>Order Number</b>	270161	270156	270157	270158	270159	270160	
<b>Casing Width(mm)</b>	17.5	17.5	17.5	17.5	17.5	17.5	
<b>Connections</b>	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	
<b>Network</b>	-	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	
<b>Monitoring Functions</b>	Phase Failure	Fixed delay time	-	500msec	500msec	500msec	
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	
	Adjustable Unbalanced Protection	Range	-	± (5% => 20%)	± (5% => 20%)	-	-
		Hysteresis	-	6,9VAC	6,9VAC	-	-
		Delay time	-	0.1=>10sec	0.1=>10sec	-	-
	Adjustable Voltage Protection	Upper limit	-	-	-	240=>300VAC (L-N)	240=>300VAC (L-N)
		Lower limit	-	-	-	150=>210VAC (L-N)	150=>210VAC (L-N)
		Hysteresis	-	-	-	6 VAC	6 VAC
		Delay time	-	-	-	0.1=>10sec for off delay operation	0.1=>10sec for off delay operation
	Adjustable Current Protection	Upper limit	-	-	-	-	-
		Lower limit	-	-	-	-	-
		Hysteresis	-	-	-	-	-
		Delay time	-	-	-	-	-
	Adjustable Frequency Protection	Upper limit	42.5 => 65Hz	-	-	-	-
		Lower limit	40 => 62.5Hz	-	-	-	-
		Hysteresis	0.4Hz	-	-	-	-
		Delay time	1=>10sec	-	-	-	-
	Extremely High-Low Voltage Protection	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)
		Hysteresis	-	6 VAC	6 VAC	6 VAC	6 VAC
Delay time		-	100msec	100msec	100msec	100msec	
PTC Protection	Fixed delay time	-	-	2000msec	2000msec	-	
	Threshold	-	-	1100Ω	1100Ω	-	
<b>Response time for monitoring any function</b>	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	
<b>Type of Output</b>	Relay	Relay	Relay	Relay	Relay	Relay	
<b>Auxiliary contacts</b>	Type	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	
	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	



Type	V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16	
<b>Definiton</b>	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Current monitoring relay	
<b>Order Number</b>	270170	270162	270256	270257	270258	270259	270260	270270	
<b>Casing Width(mm)</b>	17.5	17.5	17.5	17.5	17.5	17.5	17.5	36	
<b>Connections</b>	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	
<b>Network</b>	1Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	-	
<b>Monitoring Functions</b>	Phase Failure	Fixed delay time	-	500msec	500msec	500msec	500msec	-	
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	500msec	-	
	Adjustable Unbalanced Protection	Range	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-
		Hysteresis	-	12 VAC	12 VAC	-	-	-	-
		Delay time	-	0.1=>10sec	0.1=>10sec	-	-	-	-
	Adjustable Voltage Protection	Upper limit	240=>300VAC (L-N)	240=>300VAC (L-N)	-	-	270=>370VAC (L-L)	270=>370VAC (L-L)	270=>370VAC (L-L)
		Lower limit	150=>210VAC (L-N)	150=>210VAC (L-N)	-	-	400=>500VAC (L-L)	400=>500VAC (L-L)	400=>500VAC (L-L)
		Hysteresis	6 VAC	6 VAC	-	-	6 VAC	6 VAC	6 VAC
		Delay time	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
	Adjustable Current Protection	Upper limit	-	-	-	-	-	-	1=>16AAC
		Lower limit	-	-	-	-	-	-	-
		Hysteresis	-	-	-	-	-	-	5=>20% x Upper limit
		Delay time	-	-	-	-	-	-	0.1=>10sec
	Adjustable Frequency Protection	Upper limit	42.5 => 65Hz	-	-	-	-	-	-
		Lower limit	40 => 62.5Hz	-	-	-	-	-	-
		Hysteresis	0.4Hz	-	-	-	-	-	-
		Delay time	1=>10sec	-	-	-	-	-	-
	Extremely High-Low Voltage Protection	Upper limit	-	310 VAC (L-N)	310 VAC (L-L)	310 VAC (L-L)	310 VAC (L-L)	310 VAC (L-L)	-
		Lower limit	-	140 VAC (L-N)	140 VAC (L-L)	140 VAC (L-L)	140 VAC (L-L)	140 VAC (L-L)	-
		Hysteresis	-	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	-
Delay time		-	100msec	100msec	100msec	100msec	100msec	-	
PTC Protection	Fixed delay time	-	-	2000msec	2000msec	-	-	-	
	Threshold	-	-	1100Ω	1100Ω	-	-	-	
<b>Response time for monitoring any function</b>	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 100msec	
<b>Type of Output</b>	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	
<b>Auxiliary contacts</b>	Type	1 C/O (SPDT)	1 C/O (SPDT)	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	10A/250V; 1250 VA	16A/250V; 4000VA	
	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	≥ 10 <sup>7</sup> operations	





Type		F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S		
Auxiliary contacts	Electrical life time operations (for NO side)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)		
	Supply Voltage	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 temperature	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		
	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	-	-	-	-	-	-		
	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<3VA		
Weight(gr)		62	66	70	71	66	66		
Permissible mounting position		any	any	any	any	any	any		
Schematics									
Dimensional Drawings									

V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16
5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	1x10 <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	-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	-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	any	any	any
							Supply Voltage Option-1 =>24-300VDC Supply Voltage Option-2 =>36-300VAC



Type		P1-A	P1-P	P1-S	P1-SP	P1-SA	
<b>Definiton</b>		Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	
<b>Order Number</b>		270150	270151	270152	270153	270154	
<b>Casing Width(mm)</b>		17.5	17.5	17.5	17.5	17.5	
<b>Connections</b>		Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	
<b>Network</b>		3Ø with neutral	1Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	
<b>Monitoring Functions</b>	Phase Failure	Fixed delay time	500msec	-	500msec	500msec	
	Phase Sequence	Fixed delay time	-	-	500msec	500msec	
	Fixed Unbalanced Protection	Limit	± 20%	-	-	-	± 20%
		Hysteresis	3% x Un ≈ 6,9VAC	-	-	-	3% x Un ≈ 6,9VAC
		Delay time	500msec	-	-	-	500msec
	Extremely High-Low Voltage Protection	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)
		Hysteresis	6 VAC	-	6 VAC	6 VAC	6 VAC
		Delay time	100msec	-	100msec	100msec	100msec
	PTC Protection	Fixed delay time	-	2000msec	-	2000msec	-
Threshold		-	1100Ω	-	1100Ω	-	
<b>Response time for monitoring any function</b>		Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	
<b>Type of Output</b>		Relay	Relay	Relay	Relay	Relay	
<b>Auxiliary contacts</b>	Type	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	
	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	
	Electrical life time operations (for NO side)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	
<b>Supply Voltage</b>		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	
<b>Supply Frequency</b>		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	
<b>Permissible ambient temperature</b>	During operation	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C	
	During storage	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	-40 to +75 °C	
<b>Relative Humidity</b>		Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	Max. 95% (no condensation)	
<b>Operating frequency</b>		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	

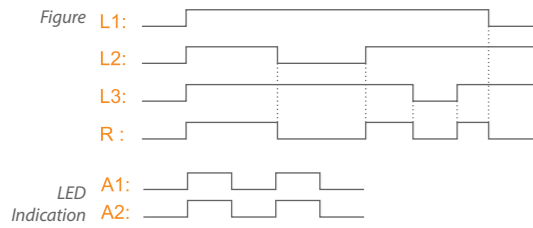


Type		P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C	
<b>Definiton</b>		Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	
<b>Order Number</b>		270155	270254	270255	270400	270401	270402	270403	
<b>Casing Width(mm)</b>		17.5	17.5	17.5	17.5	17.5	17.5	17.5	
<b>Connections</b>		Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	
<b>Network</b>		3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	
<b>Monitoring Functions</b>	Phase Failure	Fixed delay time	500msec	500msec	<1sec	<1sec	<1sec	<1sec	
	Phase Sequence	Fixed delay time	-	-	500msec	500msec	<1sec	<1sec	
	Fixed Unbalanced Protection	Limit	± 20%	-	-	-	-	-	± 20%
		Hysteresis	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
		Delay time	500msec	500msec	500msec	<1sec	<1sec	<1sec	<1sec
	Extremely High-Low Voltage Protection	Upper limit	310 VAC (L-N)	510 VAC (L-L)	510 VAC (L-L)	-	-	-	-
		Lower limit	140 VAC (L-N)	240 VAC (L-L)	240 VAC (L-L)	-	-	-	-
		Hysteresis	6 VAC	6 VAC	6 VAC	-	-	-	-
		Delay time	100msec	100msec	100msec	-	-	-	-
	PTC Protection	Fixed delay time	-	-	2000msec	-	-	-	-
Threshold		-	-	1100Ω	-	-	-	-	
<b>Response time for monitoring any function</b>		Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec	
<b>Type of Output</b>		Relay	Relay	Relay	Relay	Relay	Relay	Relay	
<b>Auxiliary contacts</b>	Type	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)	
	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	10A/250V; 1250 VA	
	Max ratings-DC (for NO side)	5A/30VDC; 150W	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	≥ 10 <sup>7</sup> operations	
	Electrical life time operations (for NO side)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	5x10 <sup>4</sup> (5A@250VAC) 1x10 <sup>5</sup> (5A@30VDC)	
<b>Supply Voltage</b>		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	
<b>Supply Frequency</b>		35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	
<b>Permissible ambient temperature</b>	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	-20 to +60 °C	
	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	-40 to +75 °C	
<b>Relative Humidity</b>		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)	
<b>Operating frequency</b>		35-70 Hz	35-70 Hz	35-70 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	



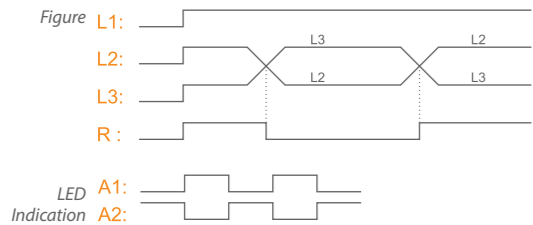
Type	P1-A	P1-P	P1-S	P1-SP	P1-SA	P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
Degree of protection	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-	-	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<4VA	<4VA	<13VA	<13VA	<4.5VA	<4.5VA
Permissible mounting position	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												
Dimensional Drawings												

Phase Failure / Off delay operation



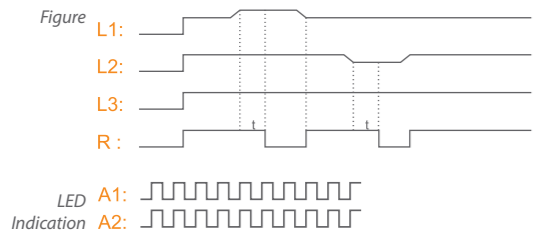
if a phase failure occurs the output relay de-energizes in 500msec. The fault is indicated by flashing LED A1 and LED A2 simultaneously. The output relay re-energizes automatically as soon as the voltage returns to the tolerance range.

Phase Sequence Error / Off delay operation



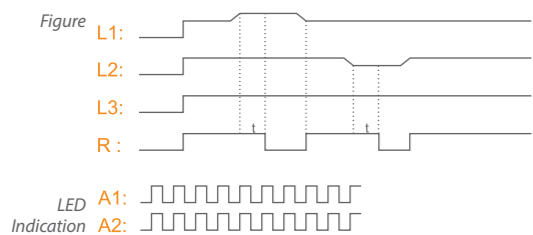
If a phase sequence error occurs the output relay de-energizes in 500msec. The fault is displayed by alternated flashing of the LEDs A1 and A2. The output relay re-energizes automatically as soon as the phase sequence is correct again.

Adjustable Unbalance Protection / Off delay operation



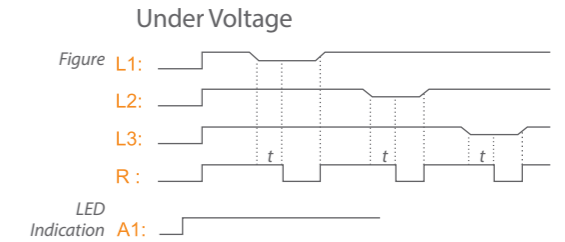
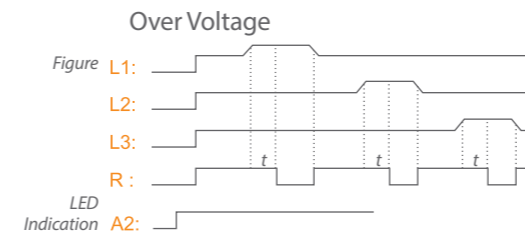
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage(%5=>%20), the output relay de-energizes after time delay(0.1-10s). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

Fixed Unbalance Protection / Off delay operation



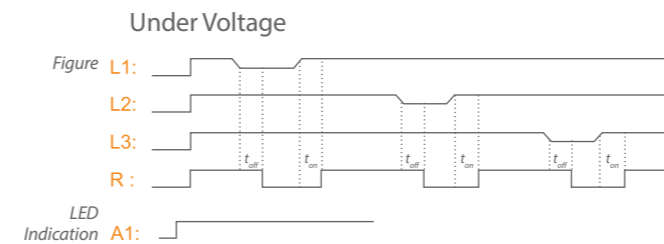
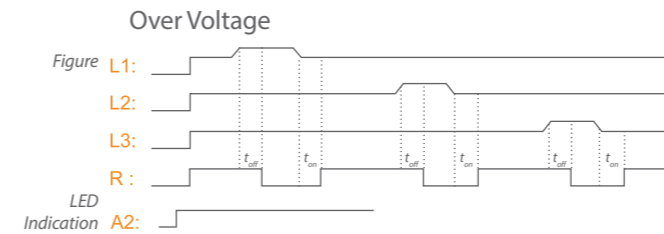
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%20), the output relay de-energizes after time delay(2sec). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously. As soon as the voltage returns to the tolerance range, taking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

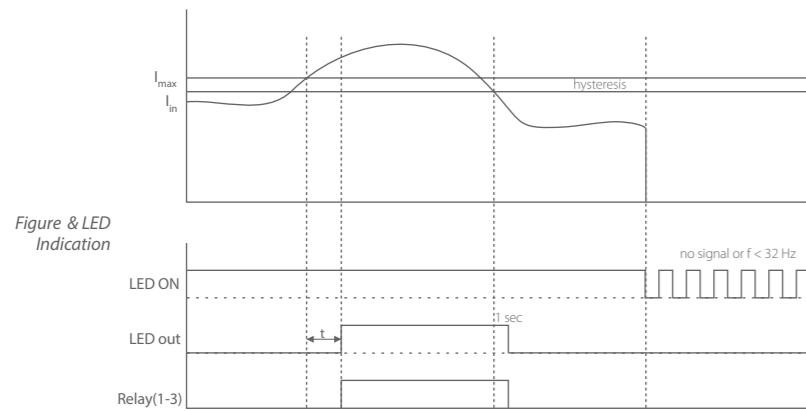
Adjustable Voltage Protection / On-Off delay operation (Available only for V1-T)



If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after  $t_{off}$  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 re-energizes after  $t_{on}$  time delay(0.1-10s).

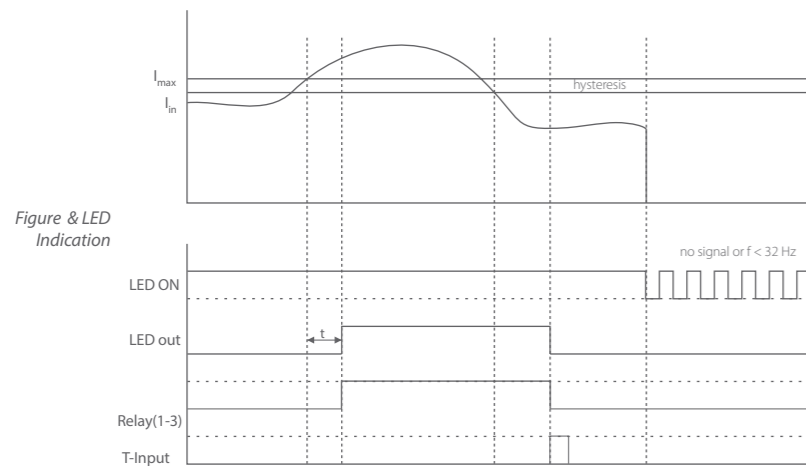


Adjustable Current Protection / On delay operation



**AUTOMATIC MODE**

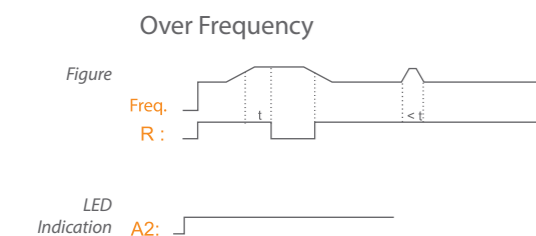
If the current to be monitored exceeds adjusted high limit value, the output relay de-energizes after time delay(0.1-10s). As soon as the current returns to the tolerance range, taking into account adjusted hysteresis (5-20%) and 1 second safety time, the output relay re-energizes automatically.



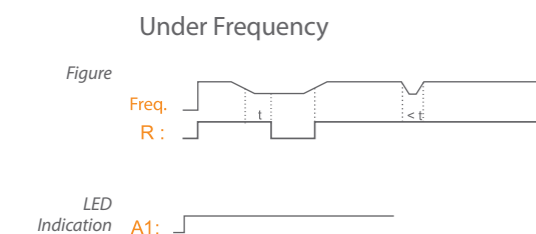
**MANUAL MODE**

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 automatically.

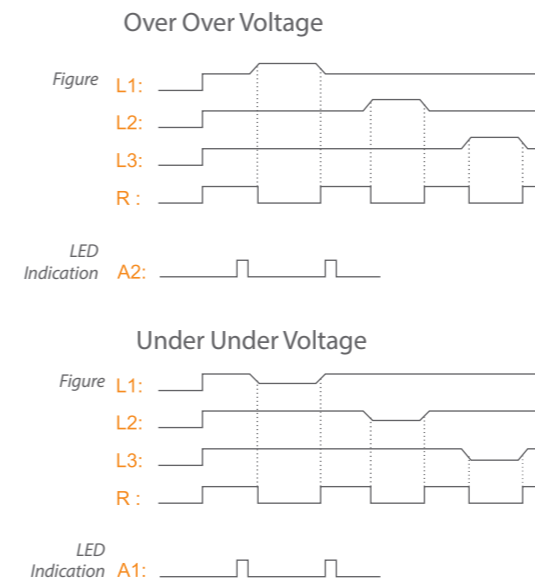
Adjustable Frequency Protection / Off delay operation



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

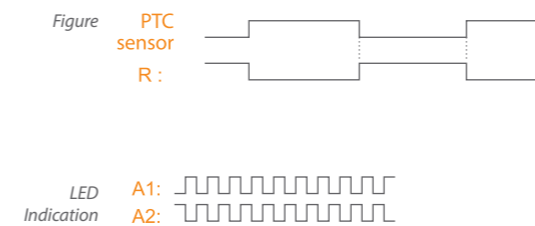


If the voltage to be monitored exceeds 310VAC for star connection device or 510VAC for delta connection device, output relay de-energizes immediately.

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 function, 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.