Klemsan®

270256 C1D-SA

Voltage Monitoring Relay

General	Casing Width (mm)	17,5
	Connections	Screw Terminal
	Network	3Ø without Neutral
Phase Failure	Fixed Delay Time	500ms
Phase Sequence	Fixed Delay Time	500ms
Adjustable/Fixed Unbalanced Protection	Range/Limit	±5% => 20%
	Hysteresis	12VAC
	Delay Time	0.1 => 10s
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	510VAC (L-L)
	Lower Limit	240VAC (L-L)
	Hysteresis	6VAC

	Delay Time	100ms
PTC Protection	Fixed Delay Time	-
	Threshold	-
General	Response Time for Monitoring Any Function	Maks. 250ms
	Type of Output	Relay
Auxilary Contacts	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	$\geq 10^7$ operation
	Electrical Lifetime Operations (for NO Side)	$5x10^4$(5A@250VAC) $1x10^5$ (5A@30VDC)
Supply Voltage	DC	—
	AC	L2-L3'den 150-500VAC
General	Supply Frequency	35-70Hz
	Control Input Voltage Range	—
Ambient Conditions	Operating Temperature	-20°C +60°C
	Storing Temperature	-40°C +75°C
	Relative Humidity (No Condensation)	Maks. 95% (no condensation)
General	Operating Frequency	35-70Hz
	Protection Class	IP20
Power Consumption	DC	—
	AC	<4VA
General	Mounting Type	Panel or Rail
	EMC-EMI	✓
	Packing Unit	1
	Weight (g)	70
	Packing Unit	1
	Dimensions	—

Order Info

270256 Voltage Monitoring Relay

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?

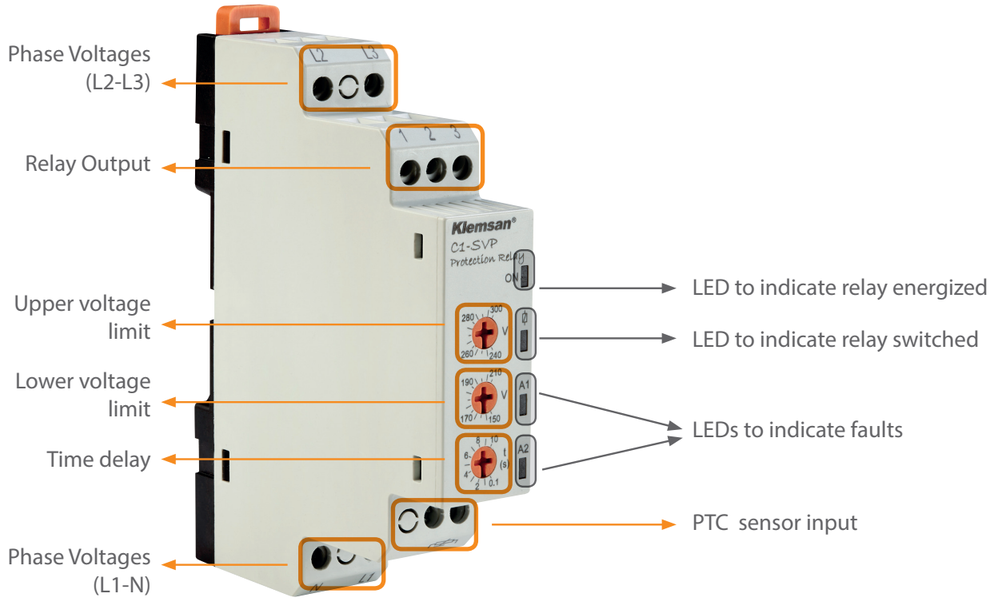
- Industrial machines
- Construction industry
- Stone pits
- Food and agriculture industry
- Water treatment system
- Moving stairs & elevators

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

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
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 aplications.

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;

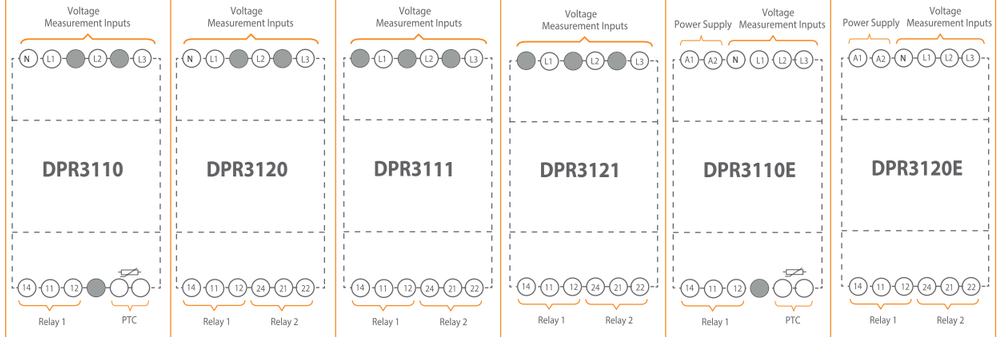
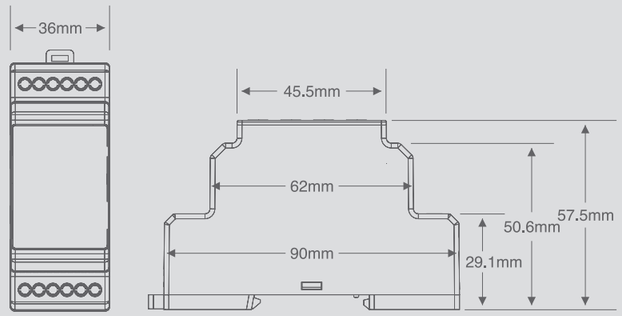
- Undervoltage, overvoltage and frequency monitoring in three-phase AC systems 0...500 V
- Asymmetry, phase sequence, and phase loss monitoring
- Powered by external supply voltage
- Various alarms may be individually enabled/ disabled and assigned to sepa- rate output contacts
- Start-up delay, response 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

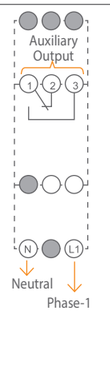
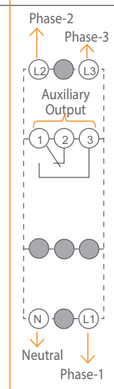
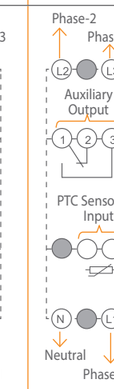
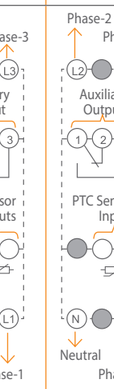
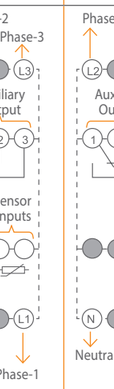
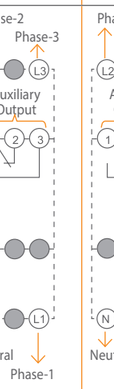
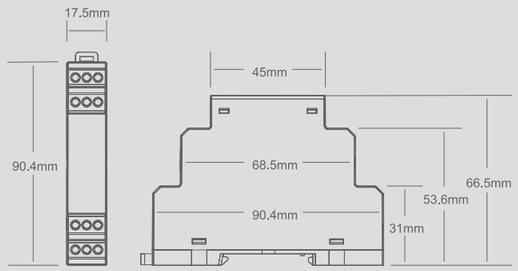
Klemsan digital protection relays are suitable for snap mounting onto 35 mmstandards DIN rails.

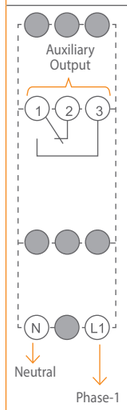
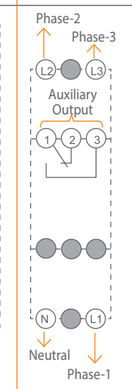
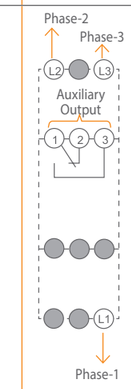
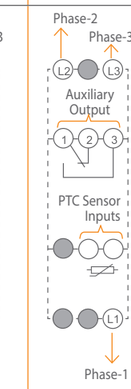
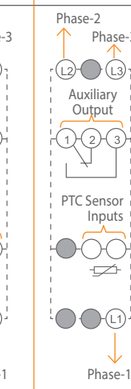
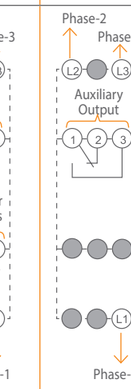
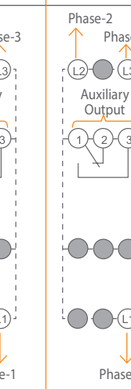
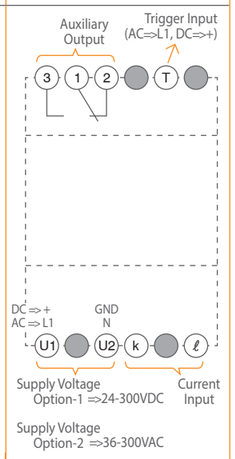
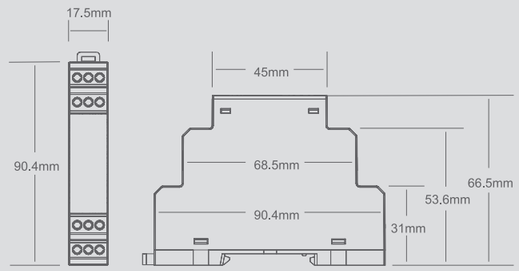
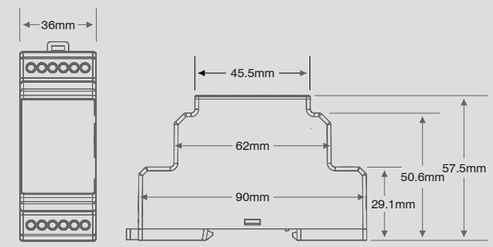
DPR3111

Type			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(mm)			36mm	36mm	36mm	36mm	36mm	36mm
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
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 Unbalanced Protection	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%
		Delay Time	0 - 999 sec	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	0 - 999 V
		Hysteresis	0 - 999 V	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	0 - 999 sec
	Adjustable Frequency Protection	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
		Delay Time	0 - 999 sec	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	-
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary Contacts		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)
		Max Ratings-AC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC	10A / 250VAC
		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
Supply Voltage	External Supply		-	-	-	-	Available	Available
	Supply Voltage	DC	-	-	-	-	-	-
		AC	85..300 V AC	85..300 V 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
Permissible Ambient Temperature		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
		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 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			35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz	35-70Hz
Degree of Protection			IP20	IP20	IP20	IP20	IP20	IP20
Power Consumption		DC	-	-	-	-	-	-
		AC	<4VA	<4VA	<4VA	<4VA	<4VA	<4VA

Type	DPR3110	DPR3120	DPR3111	DPR3121	DPR3110E	DPR3120E
Schematics						
Dimensional Drawings						

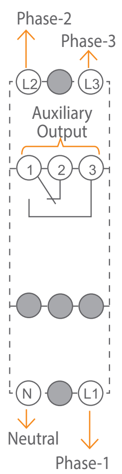
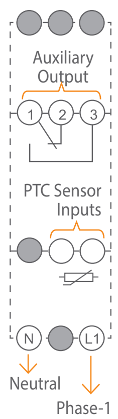
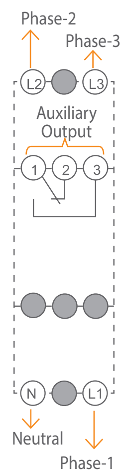
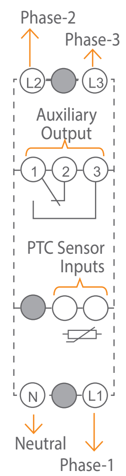
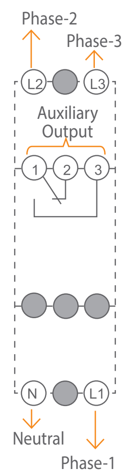
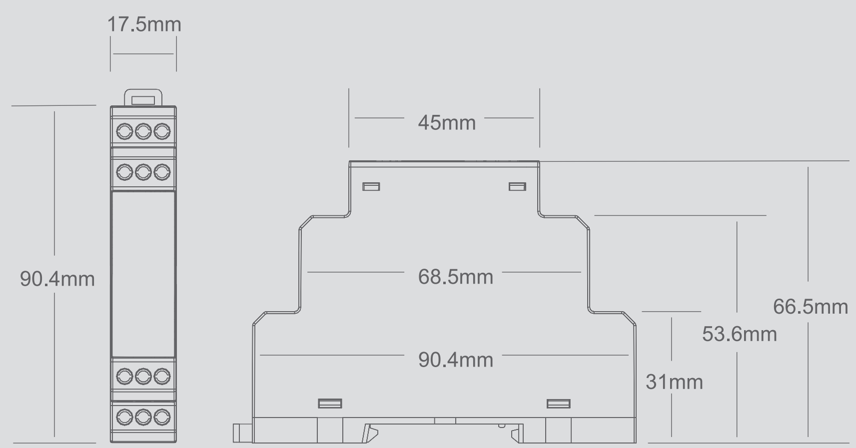
															
Type			**F1**	**C1-SA**	**C1-SAP**	**C1-SVP**	**V1**	**V1-S**	**V1-M**	**V1-T**	**C1D-SA**	**C1D-SAP**	**C1D-SVP**	**V1D**	**V1D-S**	**CPR-16**
Definiton			Frequency monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	VoltaTge monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Current monitoring relay
Order Number			270161	270156	270157	270158	270159	270160	270170	270162	270256	270257	270258	270259	270260	270270
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	36
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	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	1Ø with neutral	3Ø with neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	3Ø without neutral	-
Monitoring Functions	Phase Failure	Fixed delay time	-	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	500msec	-
	Phase Sequence	Fixed delay time	-	500msec	500msec	500msec	-	500msec	-	-	500msec	500msec	500msec	-	500msec	-
	Adjustable Unbalanced Protection	Range	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-	-	± (5% => 20%)	± (5% => 20%)	-	-	-	-
		Hysteresis	-	6,9VAC	6,9VAC	-	-	-	-	-	12 VAC	12 VAC	-	-	-	-
		Delay time	-	0.1=>10sec	0.1=>10sec	-	-	-	-	-	0.1=>10sec	0.1=>10sec	-	-	-	-
	Adjustable Voltage Protection	Upper limit	-	-	-	240=>300VAC (L-N)	240=>300VAC (L-N)	240=>300VAC (L-N)	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)	150=>210VAC (L-N)	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	-	-	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	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-N)	310 VAC (L-N)	310 VAC (L-N)	310 VAC (L-N)	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)	-
		Lower limit	-	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	140 VAC (L-N)	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)	-
		Hysteresis	-	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	-
		Delay time	-	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	100msec	-
	PTC Protection	Fixed delay time	-	-	2000msec	2000msec	-	-	-	-	-	2000msec	2000msec	-	-	-
		Threshold	-	-	1100Ω	1100Ω	-	-	-	-	-	1100Ω	1100Ω	-	-	-
Response time for monitoring any function			Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 100msec
Type of Output			Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay	Relay
Auxiliary contacts		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)	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	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	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	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	5A/30VDC; 150W	-
		Mechanical life time	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations

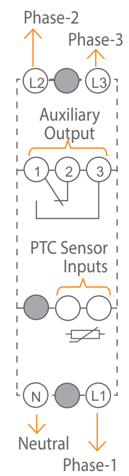
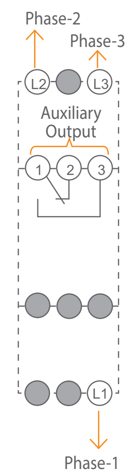
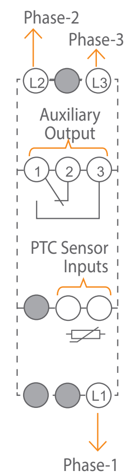
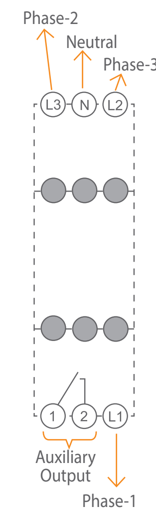
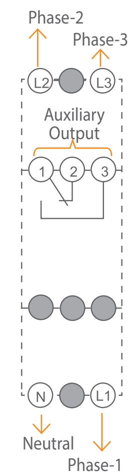
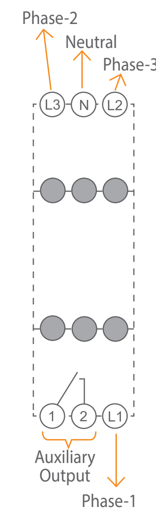
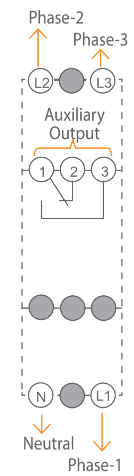
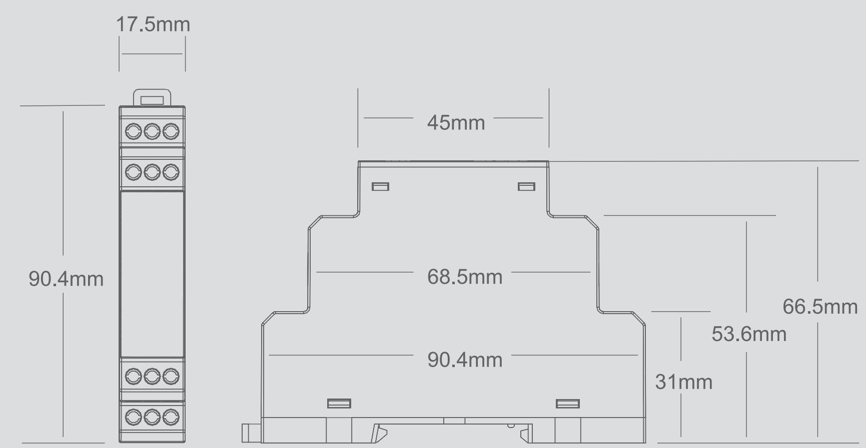
Type		F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S
Auxiliary contacts	Electrical life time operations (for NO side)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)
Supply Voltage	DC	-	-	-	-	-	-
	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
5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	5x10⁴(5A@250VAC) 1x10⁵(5A@30VDC)	1x10⁵
-	-	-	-	-	-	-	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
							
							

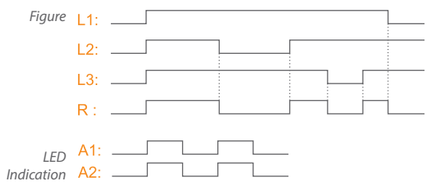
Type			P1-A	P1-P	P1-S	P1-SP	P1-SA
Definiton			Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
Order Number			270150	270151	270152	270153	270154
Casing Width(mm)			17.5	17.5	17.5	17.5	17.5
Connections			Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Network			3Ø with neutral	1Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral
Monitoring Functions	Phase Failure	Fixed delay time	500msec	-	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	-
Response time for monitoring any function			Max.250msec	Max.250msec	Max.250msec	Max.250msec	Max.250msec
Type of Output			Relay	Relay	Relay	Relay	Relay
Auxiliary contacts	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		≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
	Electrical life time operations (for NO side)		5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(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 Frequency			35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
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
	During storage		-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)
Operating frequency			35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz

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
≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations	≥ 10^7 operations
5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(5A@30VDC)	5×10^4(5A@250VAC) 1×10^5(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 °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)
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
Degree of protection		IP20	IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<3VA
Permissible mounting position		any	any	any	any	any
Weight(gr)		66	65	65	69	65
Schematics						
Dimensional Drawings						

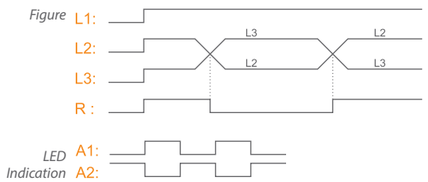
P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
IP20	IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-	-
<3VA	<4VA	<4VA	<13VA	<13VA	<4.5VA	<4.5VA
any	any	any	any	any	any	any
69	70	74	59	59	59	59
						
						

Phase Failure / Off delay operation



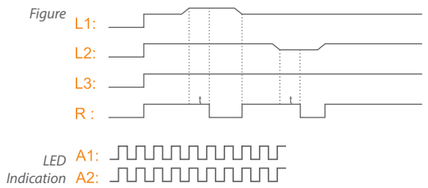
if a phase failure occurs the output relay de-energizes in 500msec.
The fault is indicated by flashing LED A1 and LED A2 simultaneously. The output relay re-energizes automatically as soon as the voltage returns to the tolerance range.

Phase Sequence Error / Off delay operation



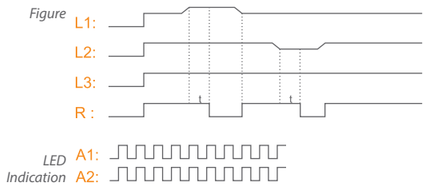
If a phase sequence error occurs the output relay de-energizes in 500msec.
The fault is displayed by alternated flashing of the LEDs A1 and A2. The output relay re-energizes automatically as soon as the phase sequence is correct again.

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.

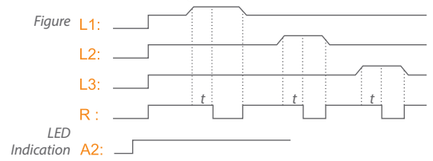
Fixed Unbalance Protection / Off delay operation



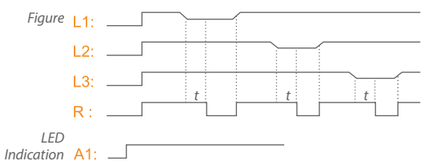
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage (%20), the output relay de-energizes after time delay(2sec). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.
As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 3%xUn the output relay re-energizes automatically.

Adjustable Voltage Protection / Off delay operation

Over Voltage



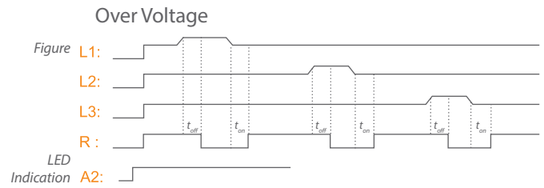
Under Voltage



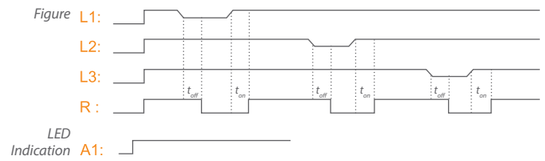
If the voltage to be monitored exceeds or falls below adjusted high limit or low limit value, the output relay de-energizes after time delay(0.1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis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

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

Over Voltage



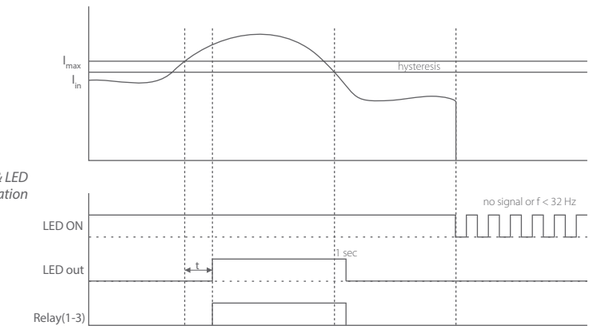
Under Voltage



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

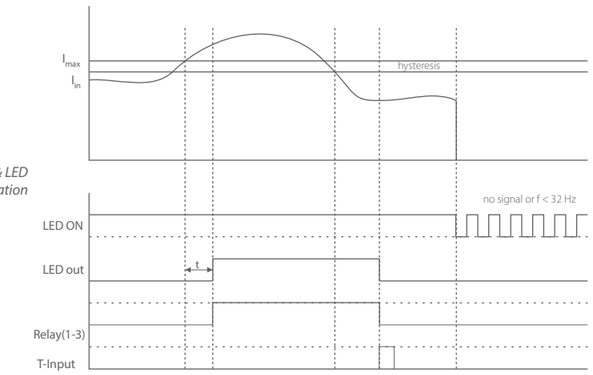
Figure & LED Indication



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.

Figure & LED Indication



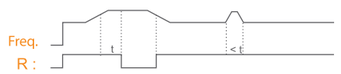
MANUAL MODE

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

Over Frequency

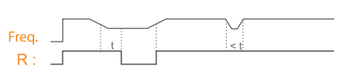
Figure



LED Indication

Under Frequency

Figure



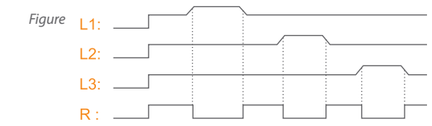
LED Indication

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

Over Over Voltage

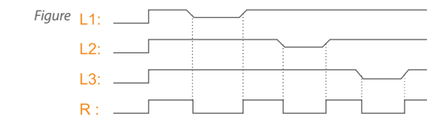
Figure



LED Indication

Under Under Voltage

Figure



LED Indication

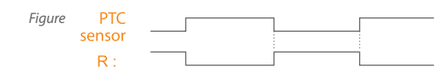
If the voltage to be monitored exceeds 310VAC for star connection device or 510VAC for delta connection device, output relay de-energizes immediately.

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

Figure



LED Indication

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.