











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	500msec	
	Phase Sequence	Fixed delay time	-	500msec	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)	240=>300VAC (L-N)
		Lower limit	-	-	-	150=>210VAC (L-N)	150=>210VAC (L-N)	150=>210VAC (L-N)
		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
	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)	310 VAC (L-N)
		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	
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)	1 C/O (SPDT)	
	Max ratings-AC (for NO side)	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	
	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	

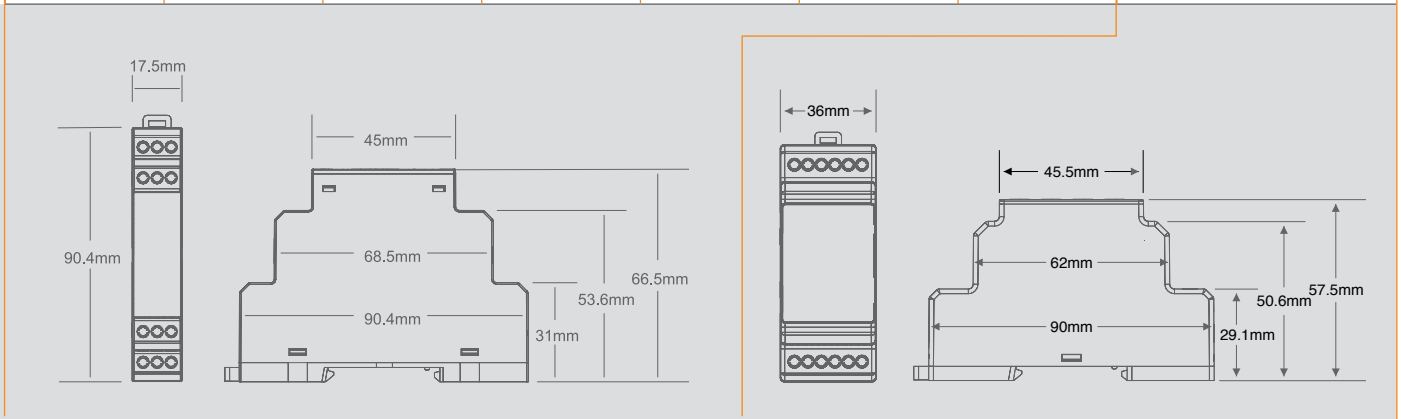
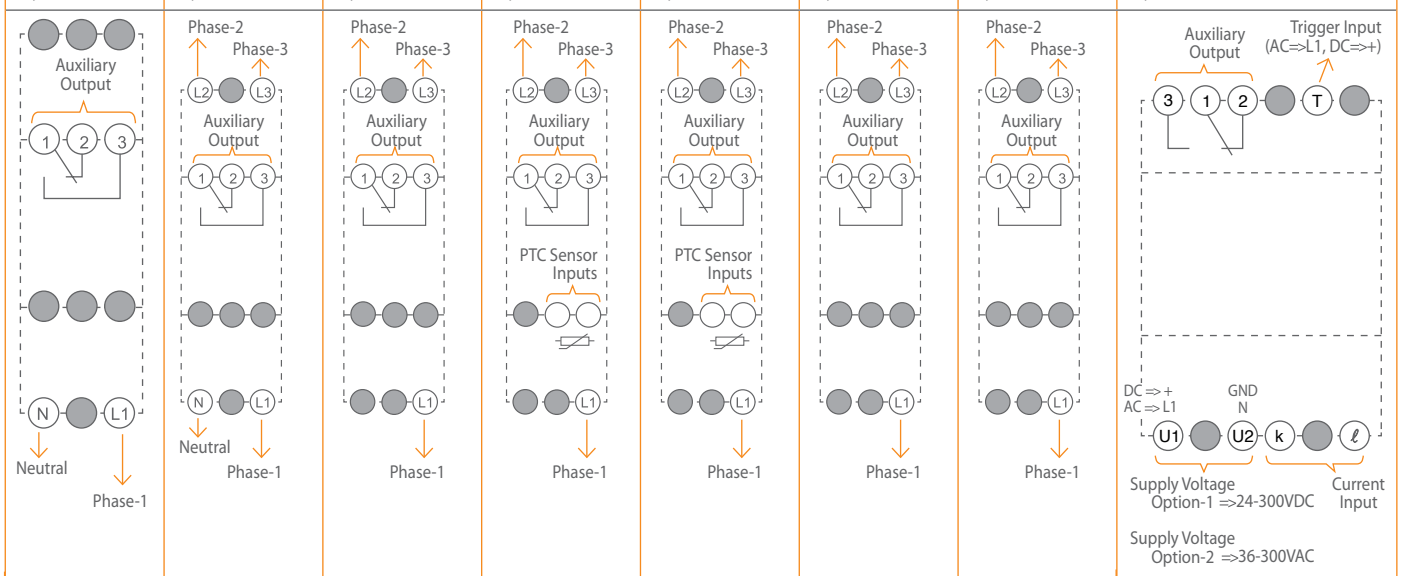


							
V1-M	V1-T	C1D-SA	C1D-SAP	C1D-SVP	V1D	V1D-S	CPR-16
VoltaTge monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Current monitoring relay
270170	270162	270256	270257	270258	270259	270260	270270
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	100msec	-
-	-	-	2000msec	2000msec	-	-	-
-	-	-	1100Ω	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)	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)
10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	10A/250V; 1250VA	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

Type		F1	C1-SA	C1-SAP	C1-SVP	V1	V1-S
<b>Auxiliary contacts</b>	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)
<b>Supply Voltage</b>	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
<b>Supply Frequency</b>		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
<b>Control Input Voltage Range</b>		-	-	-	-	-	-
<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
	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
<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>		35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz	35-70 Hz
<b>Degree of protection</b>		IP20	IP20	IP20	IP20	IP20	IP20
<b>Power consumption</b>	DC	-	-	-	-	-	-
	AC	<3VA	<3VA	<3VA	<3VA	<3VA	<3VA
<b>Weight(gr)</b>		62	66	70	71	66	66
<b>Permissible mounting position</b>		any	any	any	any	any	any
<b>Schematics</b>							
<b>Dimensional Drawings</b>							










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





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)	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)	
<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	

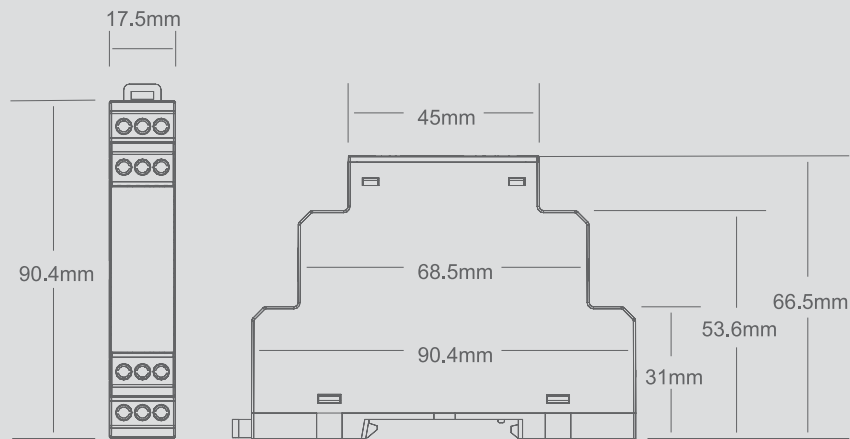


						
P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay	Motor protection relay
270155	270254	270255	270400	270401	270402	270403
17.5	17.5	17.5	17.5	17.5	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 °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						

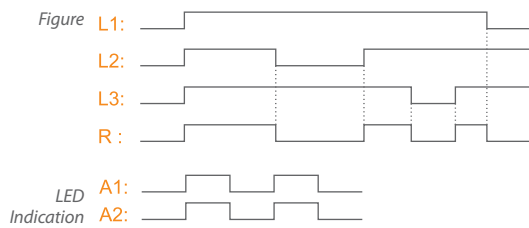


P1-SAP	P1D-SA	P1D-SAP	P1-SU 230A	P1-SU 230C	P1-SU 115A	P1-SU 115C
IP20	IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-	-
<3VA	<4VA	<4VA	<13VA	<13VA	<4.5VA	<4.5VA
any	any	any	any	any	any	any
69	70	74	59	59	59	59





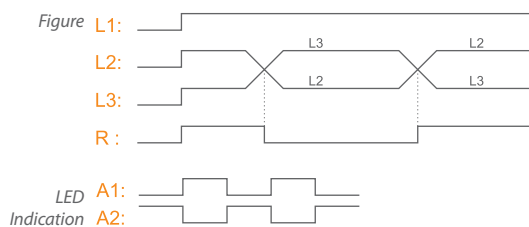
## Phase Failure / Off delay operation



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.

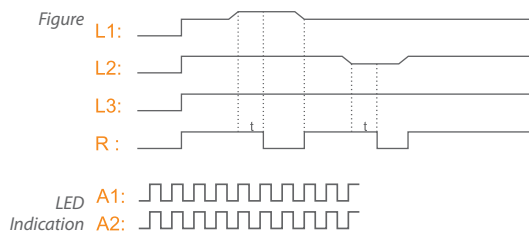
## Phase Sequence Error / Off delay operation



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.

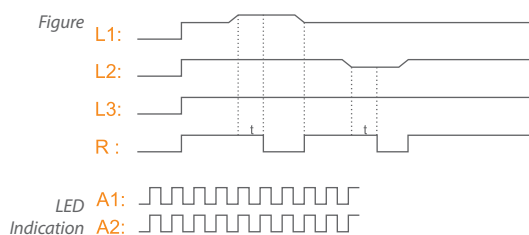
## Adjustable Unbalance Protection / Off delay operation



If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage ( $\%5 \Rightarrow \%20$ ), 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  $3\% \times U_n$  the output relay re-energizes automatically.

## Fixed Unbalance Protection / Off delay operation

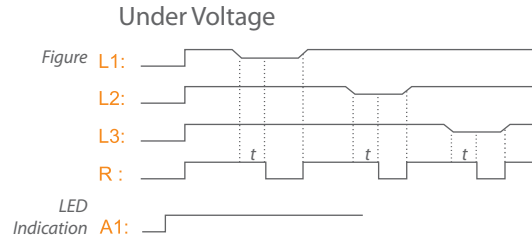
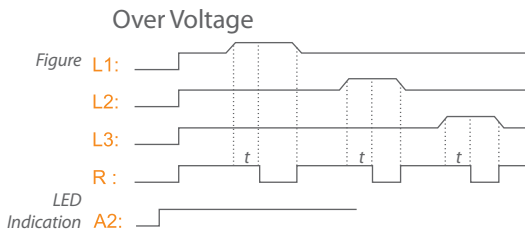


If the voltage to be monitored exceeds or falls below the set phase unbalance threshold percentage ( $\%20$ ), the output relay de-energizes after time delay (2sec). The fault is indicated by flashing LED A1 and LED A2 quickly and simultaneously.

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

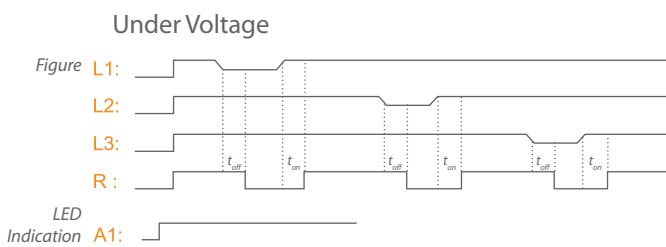
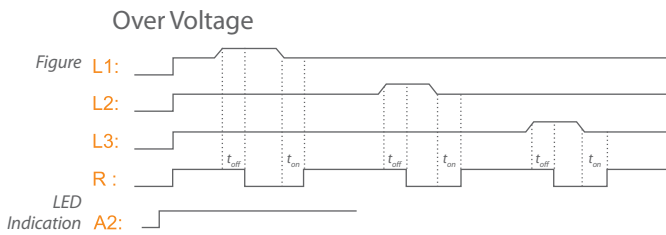


Adjustable Voltage Protection / Off delay operation



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.

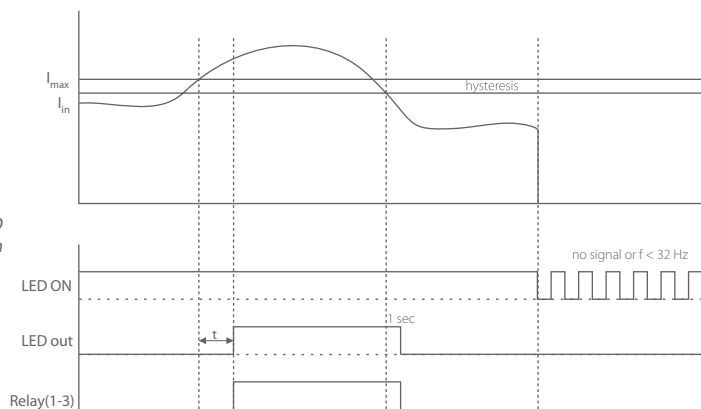
Adjustable Voltage Protection / On-Off delay operation (Available only for V1-T)



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

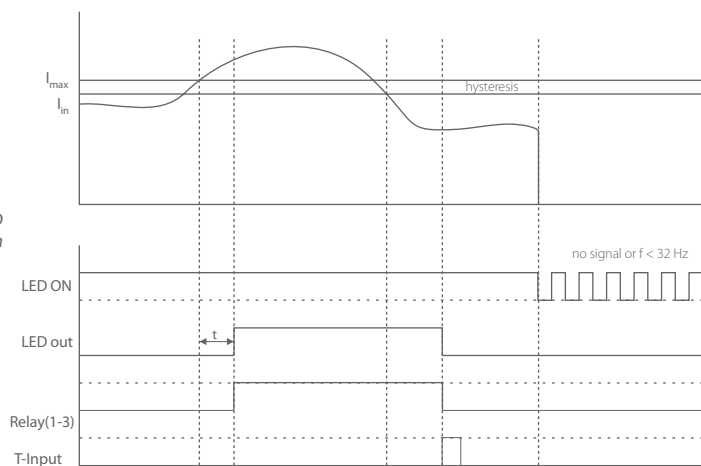
Figure & LED Indication



### 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



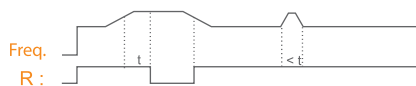
### MANUAL MODE

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 automatically.

## Adjustable Frequency Protection / Off delay operation

### Over Frequency

Figure

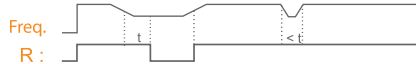


LED Indication



### Under Frequency

Figure



LED Indication

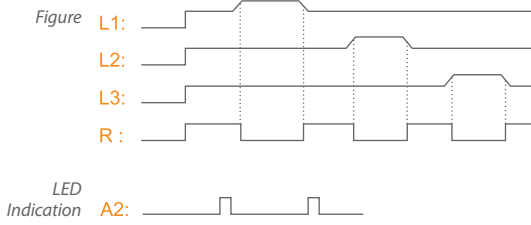


If the frequency to be monitored exceeds or falls below adjusted high limit or low limit value, the output relays de-energizes after time delay(1-10s). The fault type is indicated by LEDs A1 or A2 with constant light. As soon as the frequency returns to the tolerance range, taking into account a fixed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



Extremely High-Low Voltage Protection / Off delay operation

Over Over Voltage

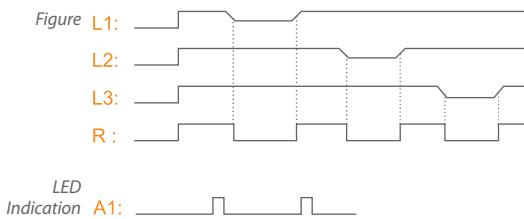


If the voltage to be monitored exceeds 310VAC for star connection device or 510VAC for delta connection device, output relay de-energizes immediately.

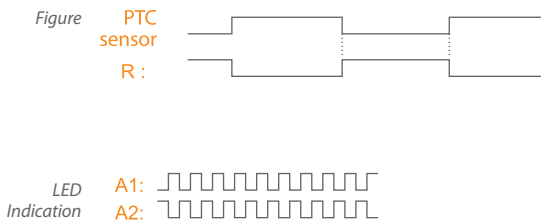
If the voltage to be monitored falls below 140VAC for star connection device or 240VAC for delta connection device, output relay de-energizes immediately.

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.

Under Under Voltage



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.



Type			G1-A	G1-SA	G1-SAP	G1D-SA	
<b>Definiton</b>			Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	
<b>Order Number</b>			270136	270130	270131	270140	
<b>Casing Width(mm)</b>			17.5	17.5	17.5	17.5	
<b>Connections</b>			Screw terminal	Screw terminal	Screw terminal	Screw terminal	
<b>Network</b>			3Ø with neutral	3Ø with neutral	3Ø with 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	
	Adjustable Unbalanced Protection	Range		± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF	± (5% => 20%)/ OFF
		Hysteresis		3% x Un ≈ 6,9VAC	3% x Un ≈ 6,9VAC	3% x Un ≈ 6,9VAC	3% x Un ≈ 12 VAC
		Delay time		0.1=>10sec	0.1=>10sec	0.1=>10sec	0.1=>10sec
	Adjustable Voltage Protection	Upper limit		+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF	+ (5% => 20%)/OFF
		Lower limit		-(5% => 20%)/OFF	-(5% => 20%)/OFF	-(5% => 20%)/OFF	-(5% => 20%)/OFF
		Hysteresis		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
	PTC Protection	Fixed delay time		-	-	2000msec	-
Threshold			-	-	1100Ω	-	
<b>Response time for monitoring any function</b>			Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	
<b>Type of Output</b>			Relay	Relay	Relay	Relay	
<b>Auxiliary contacts</b>	Number of relay						
	Type		1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	
	Max. Ratings -AC		10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	10A/250V; 1250 VA	
	Max. Switching Power		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	
	Electrical Life Time		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)	



G1D-SA-L	G1-TU	G1-SV	G1-SAT	G1-SVP	G1D-SV
Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay	Voltage monitoring relay
270141	270138	270139	270137	270180	270145
17.5	17,5	17,5	17,5	17,5	17,5
Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal	Screw terminal
3Ø without neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø with neutral	3Ø without neutral
500msec	500msec	500msec	500msec	500msec	500msec
500msec	-	500msec	500msec	500msec	500msec
± (5% => 20%)/ OFF	-	-	± (5% => 20%)/ OFF	-	-
3% x Un ≈ 6,9VAC	-	-	3% x Un ≈ 6,9VAC	-	-
0.1=>10sec	-	-	ton: 1=>15min, toff: 0.1=>10sec	-	-
+ (5% => 20%)/OFF	-	240V..300V	+ (5% => 20%)/OFF	240V..300V	400V..500V
-(5% => 20%)/OFF	< Un X 0,75	150V..210V	-(5% => 20%)/OFF	150V..210V	270V..370V
6 VAC	6 VAC	6 VAC	6 VAC	6 VAC	6 VAC
0.1=>10sec for off delay operation	ton: 1=>15min, toff=0.5sec	toff: 0.1=>10sec	ton: 1=>15min, toff: 0.1=>10sec	toff: 0.1=>10sec	toff: 0.1=>10sec
-	-	-	-	2000msec	-
-	-	-	-	1100Ω	-
Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec	Max. 250msec
Relay	Relay	Relay	Relay	Relay	Relay
	1	1	1	1	1
1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	1 C/O (SPDT)	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
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
5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>5</sup> (5A@30VDC)	5×10 <sup>4</sup> (5A@250VAC) 1×10 <sup>4</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>4</sup> (5A@30VDC)

Type		G1-A	G1-SA	G1-SAP	G1D-SA
Supply Voltage	DC	-	-	-	-
	AC	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	380-480VAC ±25% from L1-L3
Supply Frequency		50-60Hz	50-60Hz	50-60Hz	50-60Hz
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
	During storage	-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)
Operating frequency		50-60Hz	50-60Hz	50-60Hz	50-60Hz
Degree of protection		IP20	IP20	IP20	IP20
Power consumption	DC	-	-	-	-
	AC	<3VA	<3VA	<3VA	<4VA
Weight(gr)		66	66	70	70
Permissible mounting position		any	any	any	any
Schematics					
Dimensional Drawings					



G1D-SA-L	G1-TU	G1-SV	G1-SAT	G1-SVP	G1D-SV
-	-	-	-	-	-
190-230VAC ±25% from L1-L3	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	230VAC ±25% from L3-N	380 .. 480V AC, ±%25
50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz
-	-	-	-	-	-
-20 to +60 °C	-20 to +60 °C	-20°C..+70°C	-20 to +60 °C	-20°C..+70°C	-20°C..+70°C
-40 to +75 °C	-40 to +75 °C	-30°C..+80°C	-40 to +75 °C	-30°C..+80°C	-30°C..+80°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)
50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz	50-60Hz
IP20	IP20	IP20	IP20	IP20	IP20
-	-	-	-	-	-
<4VA	<3VA	<3VA	<3VA	<3VA	<4VA
75	66	66	66	70	66
any	any	any	any	any	any

