1 - Phase 230 V
Over & Under voltage monitoring relays

71.11.8.230.0010
- Fixed Over & Under voltage detection
- Link selectable 5 or 10 minute lock-out delay

71.11.8.230.1010
- Adjustable Over & Under voltage detection
- Switch selectable 5 or 10 minute lock-out delay

- 35 mm rail (EN 60715) mounting
- LED indication
- Positive safety logic (healthy conditions - output relay energised)

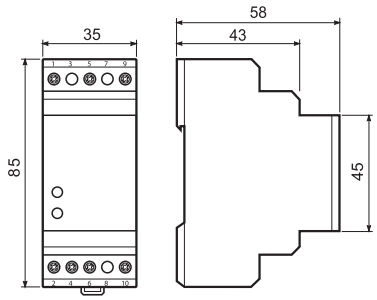
71.11.8.230.0010

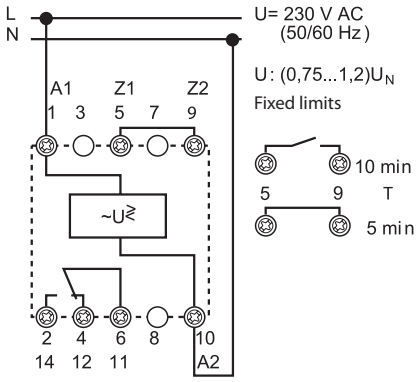
- Fixed - Over/Under voltage limits, (0.75…1.2)U_N respectivity
- Link selectable - 5 min or 10 min delay

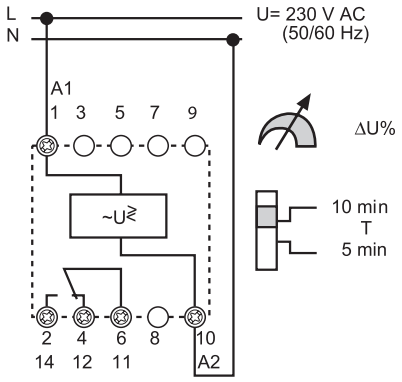
71.11.8.230.1010

- Adjustable - symmetrical Over/Under voltage limits adjustable between ± 5% to ± 20% U_N
- Switch selectable - 5 min or 10 min delay

- Detects and trips on out-of-limits L-N voltage, and protects against excessive "starts/hour" through "power-on" and "lock-out" time delays.
- Typical applications - protection of compressor motors and high pressure discharge lamp circuitry.







Contact specification				
Contact configuration			1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current		A	10/15	10/15
Rated voltage/ Maximum switching voltage		V AC	250/400	250/400
Rated load AC1		VA	2500	2500
Rated load AC15 (230 V AC)		VA	500	500
Single phase motor rating (230 V AC)		kW	0.5	0.5
Breaking capacity DC1: 30/110/220 V		A	10/0.3/0.12	10/0.3/0.12
Minimum switching load		mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material			AgCdO	AgCdO
Supply specification				
Nominal voltage (U_N)		V AC (50/60 Hz)	230	230
		V DC	—	—
Rated power AC/DC		VA (50 Hz)/W	4/—	4/—
Operating range		AC	(0.75…1.2)U_N	(0.8…1.2)U_N
		DC	—	—
Technical data				
Electrical life at rated load AC1		cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Detection levels			Fixed (0.75…1.2)U_N	Adjustable (± 5…± 20)% U_N
Switch-on lock-out time/reaction time			(5 or 10)min/< 0.5 s	(5 or 10)min/< 0.5 s
Fault memory			—	—
Electrical isolation: Supply to Measuring circuits			None - circuits are electrically common	None - circuits are electrically common
Ambient temperature range		°C	–20…+55	–20…+55
Protection category			IP 20	IP 20
Approvals (according to type)			CE EAC	

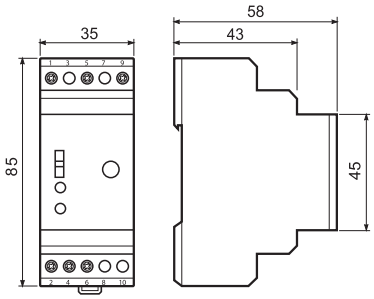
3 - Phase 400 V
Over & Under voltage monitoring relay

71.31.8.400.1010
- Adjustable Over & Under voltage detection
- Switch selectable 5 or 10 minute lock-out delay

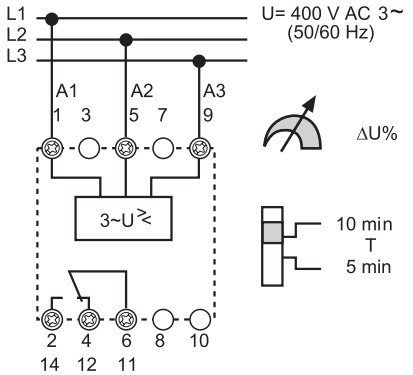
- 35 mm rail (EN 60715) mounting
- LED indication
- Positive safety logic (healthy conditions - output relay energised)

71.31.8.400.1010

- Adjustable - symmetrical Over/Under voltage limits adjustable between ± 5% to ± 20% U_N
- Switch selectable - 5 min or 10 min delay



- Delects and trips on out-of-limits L-L voltage, and protects against excessive "starts/hour" through "power-on" and "lock-out" time delays.
- Typical applications - protection of compressor motors and high pressure discharge lamp circuitry.



Contact specification		
Contact configuration		1 CO (SPDT)
Rated current/Maximum peak current	A	10/15
Rated voltage/ Maximum switching voltage	V AC	250/400
Rated load AC1	VA	2500
Rated load AC15 (230 V AC)	VA	500
Single phase motor rating (230 V AC)	kW	0.5
Breaking capacity DC1: 30/110/220 V	A	10/0.3/0.12
Minimum switching load	mW (V/mA)	300 (5/5)
Standard contact material		AgCdO
Supply specification		
Nominal voltage (U_N)	V AC (50/60 Hz)	400
	V DC	—
Rated power AC/DC	VA (50 Hz)/W	4/—
Operating range	AC	(0.8…1.2)U_N
	DC	—
Technical data		
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$
Detection levels	V (50/60 Hz)	Adjustable (±5…±20)% U_N
Switch-on lock-out time/reaction time		(5 or 10)min/< 0.5 s
Fault memory		—
Electrical isolation: Supply to Measuring circuits		None – circuits are electrically common
Ambient temperature range	°C	–20…+55
Protection category		IP 20
Approvals (according to type)		CE EAC

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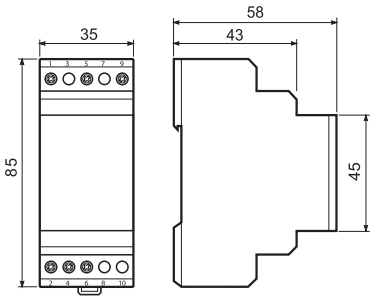
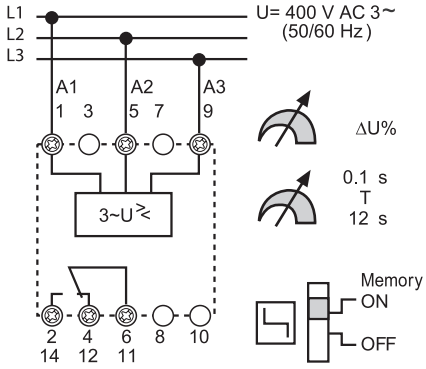
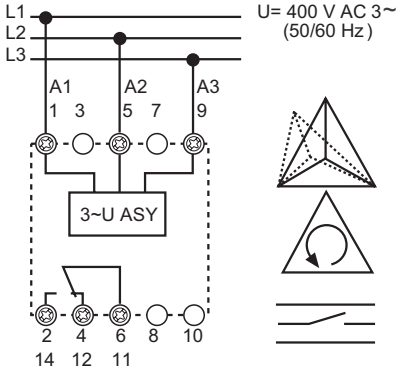
3 - Phase 400 V - Line monitoring relays

71.31.8.400.1021
- Over & Under voltage trip on-delay
- Fault memory

71.31.8.400.2000
- Phase asymmetry
- Phase rotation
- Phase loss

- 35 mm rail (EN 60715) mounting
- LED indication
- Positive safety logic (healthy conditions - output relay energised)



	71.31.8.400.1021	71.31.8.400.2000
		
	• 3 phase 400 V - line voltage monitoring • Detects over and under voltage • Adjustable trip on-delay • Switch selectable fault memory	• 3 phase asymmetry monitoring • Phase rotation monitoring • Phase loss monitoring
	• Under voltage trip level (0.8…0.95)U_N - Adjustable • Over voltage trip level 1.15 U_N - Fixed • Trip delay time (0.1…12)s adjustable • Fault memory, switch selectable • Fault acknowledgement by switch manipulation from ON to OFF and back to ON or power down	• Asymmetry between phases (–5…–20)% U_N adjustable • Detection of the supply voltage U to A1 (1) and/or A2 (5) > 1.11 U_N
		

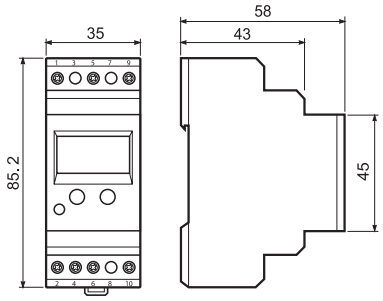
Contact specification				
Contact configuration			1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current		A	10/15	10/15
Rated voltage/ Maximum switching voltage		V AC	250/400	250/400
Rated load AC1		VA	2500	2500
Rated load AC15 (230 V AC)		VA	500	500
Single phase motor rating (230 V AC)		kW	0.5	0.5
Breaking capacity DC1: 30/110/220 V		A	10/0.3/0.12	10/0.3/0.12
Minimum switching load		mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material			AgCdO	AgCdO
Supply specification				
Nominal voltage (U_N)		V AC (50/60 Hz)	400	400
		V DC	—	—
Rated power AC/DC		VA (50 Hz)/W	4/—	4/—
Operating range		AC	(0.8…1.15)U_N	(0.8…1.15)U_N
		DC	—	—
Technical data				
Electrical life at rated load AC1		cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Detection level	U_{min}/U_{max}/Asymmetry		(0.8…0.95)U_N / 1.15 U_N / —	0.8 U_N / 1.11 U_N / (–5…–20)% U_N
Trip on-delay/reaction time			(0.1…12)s/< 0.5 s	—/< 0.5 s
Fault memory - selectable			Yes	—
Electrical isolation: Supply to Measuring circuits			None – circuits are electrically common	None – circuits are electrically common
Ambient temperature range		°C	–20…+55	–20…+55
Protection category			IP 20	IP 20
Approvals (according to type)			CE EAC	

Universal voltage or current detecting and monitoring relay

71.41.8.230.1021 - Voltage monitoring

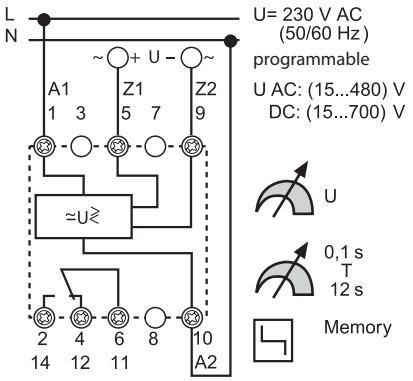
71.51.8.230.1021 - Current monitoring

- Zero voltage memory according to EN 60204-7-5
- Programmable for DC or AC detection level:
  - range detecting: upper and lower value
  - upper set point minus hysteresis range (5…50)% for switch on
  - lower set point plus hysteresis range (5…50)% for switch on
- Fault memory
- Electrical isolation between measuring and supply circuits
- Immune to supply interruptions of < 200 ms
- Wide detecting range:
  - voltage: DC (15…700)V, AC (15…480)V
- 35 mm rail (EN 60715) mounting



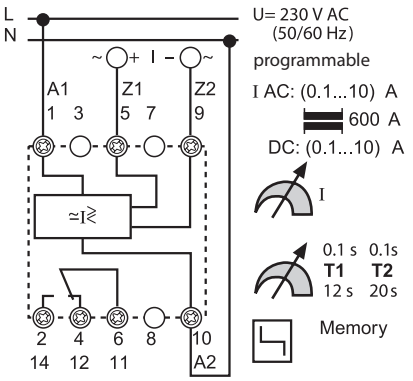
71.41.8.230.1021

- Programmable universal voltage monitoring relay
- AC/DC voltage detection - adjustable
- AC (50/60 Hz) (15…480)V
- DC (15…700)V
- Switch-on hysteresis (5…50)%
- Switch-off delay (0.1…12)s



71.51.8.230.1021

- Programmable universal current monitoring relay
- Usable with current transformer 50/5, 100/5, 150/5, 250/5, 300/5, 400/5 or 600/5
- AC/DC current detection - adjustable
- AC(50/60 Hz) (0.1…10)A with current transformer to 600 A
- DC (0.1…10)A
- Switch-on hysteresis (5…50)%
- Switch-off delay (0.1…12)s
- Start delay (0.1…20)s



Contact specification			
Contact configuration		1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current	A	10/15	10/15
Rated voltage/ Maximum switching voltage	V AC	250/400	250/400
Rated load AC1	VA	2500	2500
Rated load AC15 (230 V AC)	VA	500	500
Single phase motor rating (230 V AC)	kW	0.5	0.5
Breaking capacity DC1: 30/110/220 V	A	10/0.3/0.12	10/0.3/0.12
Minimum switching load	mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material		AgCdO	AgCdO
Supply specification			
Nominal voltage (U_N)	V AC (50/60 Hz)	230	230
	V DC	—	—
Rated power AC/DC	VA (50 Hz)/W	4/—	4/—
Operating range	AC	(0.85…1.15)U_N	(0.85…1.15)U_N
	DC	—	—
Technical data			
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Detection levels	AC(50/60 Hz)/DC	(15…480)V/(15…700)V	(0.1…10)A at transducer to 600 A/(0.1…10)A
Switch-off/reaction/Start delay		(0.1…12)s/< 0.35 s/< 0.5 s	(0.1…12)s/< 0.35 s/(0.1…20)s
Switch-on level of the detecting level	%	5…50	5…50
Fault memory - programmable		Yes	Yes
Electrical isolation: Supply to Measuring circuits		Yes	Yes
Ambient temperature range	°C	–20…+55	–20…+55
Protection category		IP 20	IP 20
Approvals (according to type)		CE EAC	

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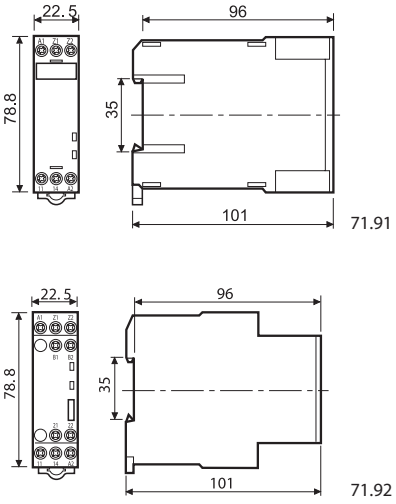
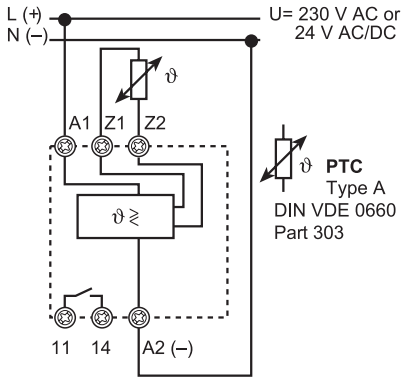
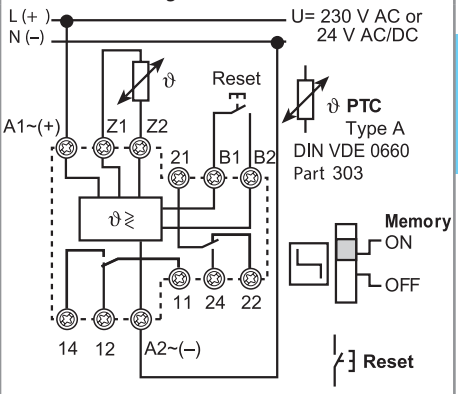
Thermistor temperature sensing relays for industrial applications

71.91 - 1 Pole, without fault memory

71.92 - 2 Pole, with fault memory

- Overload protection according EN 60204-7-3
- Positive safety logic - make contact opens if the measured value is outside of the acceptable range
- Industry standard module
- LED status indication
- 35 mm rail (EN 60715) mounting



	71.91.x.xxx.0300	71.92.x.xxx.0001
		
	• Thermistor relay • 1 Pole normally open contact • 24 V AC/DC, or 230 V AC supply	• Thermistor relay with fault memory • 2 Pole changeover contacts • 24 V AC/DC, or 230 V AC supply
	• Temperature detection with PTC • PTC short circuit detection • PTC wire breakage detection	• Temperature detection with PTC • Fault memory - switch selectable • Reset by Reset button or supply interruption • PTC short circuit detection • PTC wire breakage detection
		

Contact specification				
Contact configuration			1 NO (SPST-NO)	2 CO (DPDT)
Rated current/Maximum peak current		A	10/15	10/15
Rated voltage/ Maximum switching voltage		V AC	250/400	250/400
Rated load AC1		VA	2500	2500
Rated load AC15 (230 V AC)		VA	500	500
Single phase motor rating (230 V AC)		kW	0.5	0.5
Breaking capacity DC1: 30/110/220 V		A	10/0.3/0.12	10/0.3/0.12
Minimum switching load		mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material			AgCdO	AgCdO
Supply specification				
Nominal voltage (U_N)		V AC (50/60 Hz)	230	230
		V AC/DC	24	24
Rated power AC/DC		VA (50 Hz)/W	1/0.5	1/0.5
Operating range		AC	(0.85…1.15)U_N	(0.85…1.15)U_N
		DC	—	—
Technical data				
Electrical life at rated load AC1		cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
PTC detecting:	Short circuit/Temperature OK		< 20 Ω/>20 Ω…< 3 kΩ	< 20 Ω/> 20 Ω…< 3 kΩ
	Reset/PTC break		< 1.3 kΩ/> 3 kΩ	< 1.3 kΩ/> 3 kΩ
Delay time/activaction time			—/< 0.5 s	—/< 0.5 s
Fault memory - switch selectable			—	Yes
Electrical isolation: Supply to Measuring circuits			Yes	Yes
Ambient temperature range		°C	–20…+55	–20…+55
Protection category			IP 20	IP 20
Approvals (according to type)			CE EAC	

Ordering information

Example: Universal voltage monitoring relay with LCD display for AC/DC voltage detection, 1 CO (SPDT) contact rated 10 A 250 V, supply voltage 230 V, programmable delay time and fault memory.

Series

Type
1 = 1 phase AC line monitoring
3 = 3 phase AC line monitoring
4 = AC/DC universal- Voltage detection
5 = AC/DC universal- Current detection
9 = Thermistor relay (temperature monitoring with PTC thermistor)

No. of poles
1 = 1 CO (SPDT) types 71.11, 31, 41, 51
1 = 1 NO (SPST-NO) type 71.91
2 = 2 CO (DPDT) type 71.92

Supply version
0 = AC(50/60 Hz)/DC
8 = AC (50/60 Hz)

Supply voltage
024 = 24 V AC/DC
230 = 230 V
400 = 400 V

Additional functions
0 = Basic function
1 = Adjustable detection value
2 = Adjustable: Asymmetry, phase loss, phase rotation

Special versions
0 = No fault memory
1 = Fault memory

Options
0 = No delay time
1 = Two selectable delay times
2 = Adjustable delay times

Contact circuit
0 = CO (nPDT)
3 = NO (nPST-NO)

E

Technical data

Insulation					
Insulation according to EN 61810-1			insulation rated voltage	V	250
			rated impulse withstand voltage	kV	4
			pollution degree		3
			over-voltage category		III
Dielectric strength (A1, A2, A3, B1, B2), and contact terminals (11, 12, 14) and terminals (Z1, Z2)		V AC	2500		
		kV (1.2/50 µs)	6		
Dielectric strength at open contact		V AC	1000		
EMC specifications					
Type of test			**Reference Standard**		
Electrostatic discharge	contact discharge		EN 610004-2		8 kV
	air discharge		EN 610004-2		8 kV
Radio-frequency electromagnetic field (80…1000)MHz			EN 610004-3		3 V/m
Fast transients (burst) (5-50 ns, 5 kHz) on (A1, A2, A3, B1, B2) and (Z1, Z2)			EN 610004-4		2 kV
Surges (1.2/50 µs) on (A1, A2, A3, B1, B2) and (Z1, Z2)	common mode		EN 610004-5		4 kV
	differential mode		EN 610004-5		4 kV
Radio-frequency common mode (0.15 ÷ 80 MHz) to A1 - A2			EN 610004-6		10 V
Radiated and conducted emission			EN 55022		class B
Other data					
Voltage and current values at terminals Z1 Z2	Type 71.11		Link for time range	V / mA	230 V/—
	Type 71.91, 71.92		PTC temperature measurement	V / mA	24 V/2.4
Maximum length of wiring to the Supply terminals/ Measuring terminals	Type 71.11, 71.31		Contact bridge for time range	m	150/—
	Type 71.41		Voltage measurement	m	150/50
	Type 71.51		Current measurement	m	150/50
(Wiring capacitance no greater than 10 nF/100 m)	Type 71.91, 71.92		PTC temperature measurement	m	50/50
Measuring principle	Type 71.11, 71.31, 71.41, 71.51, 71.91, 71.92		The measured value is the arithmetical average of 500 individual measurements taken over a 100 ms period. Interruptions less than < 200 ms are ignored.		
Safety logic	Type 71.11, 71.31, 71.41, 71.51, 71.91, 71.92		Positive safety logic - When the value being monitored lies within the acceptable area, the make contact is closed.		
Reaction time (following the application of the supply voltage)	Type 71.11, 71.31, 71.41, 71.51, 71.91, 71.92		≤ 0.5 s		
Power lost to the environment	without contact load	W	4		
	with rated current	W	5		
Permitted storage temperature range		°C	–40…+85		
Protection category			IP 20		
Screw torque		Nm	0.8		
Max. wire size			solid cable		standed cable
		mm²	0.5…(2 x 2.5)		(2 x 1.5)
		AWG	20…(2 x 14)		(2 x 16)

E

Functions

Monitoring relay	Times												Times			Supply voltage			Module width		Contact conf.
	1-phase 230 V, Under/Overvoltage	3-phase 400 V, Under/Overvoltage	3-phase 400 V, Phase/Symmetry	3-phase 400 V, Phase loss	3-phase 400 V, Phase	DC voltage (15…700)V Under and Over voltage monitoring	AC voltage (15…484)V Under and Over voltage monitoring	DC current (0.1…10)A Under and Over current monitoring	AC current (0.1…10)A (for to 600 A with current transformers) Under and Over current monitoring	Thermistor relay (PTC)	Adjustable	Fault memory for 71.41 and 71.51	Delay time 5/10 min	Delay time (0.1…12)s adjustable	Power-up activation time delay (0.1…20)s - starting inrush current suppression	24 V AC/DC	230 V AC	400 V AC	35 mm wide	22.5 mm wide	Relay contact, 250 V AC/10 A
71.11.8.230.0010	•												•				•		•		**1 CO SPDT**
71.11.8.230.1010	•										•		•				•		•		**1 CO SPDT**
71.31.8.400.1010		•									•		•					•	•		**1 CO SPDT**
71.31.8.400.1021		•									•	•		•				•	•		**1 CO SPDT**
71.31.8.400.2000			•	•	•						•							•	•		**1 CO SPDT**
71.41.8.230.1021	•					•	•				•	•		•			•		•		**1 CO SPDT**
71.51.8.230.1021								•	•		•	•		•	•		•		•		**1 CO SPDT**
71.91.0.024.0300										•	•					•				•	**1 NO SPST-NO**
71.91.8.230.0300										•	•						•			•	**1 NO SPST-NO**
71.92.0.024.0001										•	•	•				•				•	**2 CO DPDT**
71.92.8.230.0001										•	•	•					•			•	**2 CO DPDT**
Current transformer	**Source as required**																				

Explanation of relay marking and LED/LCD display

Monitoring relay without LCD-display	
ON	LED green steady light: supply voltage is on and measuring system is active.
DEF	Default: the detected value is outside of the acceptable range (asymmetric is shown by the LED ASY). LED red flashing: delay time is running, see the function diagram. LED red steady light: output relay is off, contact 11-14 (6-2) is open.
ASY	Phase asymmtery is outside of the predefined range. LED steady light: output relay is turned off, contact 11-14 (6-2) is open.
LEVEL	Selected range as % value.
TIME	Delay time min (minutes) or s (seconds).
MEMORY ON	Fault memory switched on: the state of the output relay after the accurrence of a fault –contact 11-14 (6-2) open– will be maintained, monitored value returns to within acceptable limits. Fault reset is made by switch manipulation from ON to OFF to ON, or by power down (71.31.8.400.1021 & 71.92.x.xxx.0001), or by operating of the "RESET" (71.92.x.xxx.0001).
MEMORY OFF	Fault memory turned off: the sate of the output contatcts will only remain in the "fault" condition –contact 11-41 (6-2) open– while the monitored value is outside of the acceptable limits. When the monitored value returns within the acceptable limits the contact will revert to the energised state. Monitored equipment will start again automatically.

Monitoring relay with LCD-display			
SET/RESET	Relay 71.41 and 71.51. Sets and resets the programmable values - see operating in the packing.		
SELECT	Relay 71.41 and 71.51. Selects the desired parameter for programming - see operating instructions.		
DEF	Default, LED red steady or flashing.		
PROG Modus	Enter the programming mode by simultaneously pressing the buttons "SET/RESET" and "SELECT" for 3 seconds. The word "prog" is shown for 1 second. "SELECT" allows the choise of "AC" or "DC", and is confirmed with "SET/RESET". Successively pressing the button "SELECT" brings up the choises of Up, or Up_{Lo}. The appropriate choise is made by pressing the "SET/RESET" button. The next step will program the appropriate values and the selection of the fault memory function (which is selected with a "YES" or "NO"). If all programming steps are completed the display will read "end".		
Short programmin instruction	After repeatedly pressing the "SET/RESET" button the measured value will be displayed, or "0" appears if nothing is connected to Z1 and Z2 (5 and 9). If the programming is brocken off before "end" is shown in the display the previous program will remain unchanged after an interruption of the supply voltage.		
Program query	Pushing the "SELECT" button for at least 1 second, enters the "program inquiry mode". The programmed mode and the values are shown on the repeated pressing of the "SELECT" button.		
Flashing M (memory)	Fault memory has had effect (fault acknowledgement and reset is made by a 1 second press of the "SET/RESET" button).		
LCD-display	V = volt A = amp Up = upper limit (with hysteresis in down direction) Lo = lower limit (with hysteresis in up direction) Up_{Lo} = upper and lower limit - range detecting	Level = value Hys = hysteresis M = memory (fault) Yes = yes - with memory no = no - without memory	$t_1 = T_1$ - time during which short-time fulctuations are not taken into account $t_2 = T_2$ - (monitoring relay 71.51) the time during which inrush currents are not taken into a account

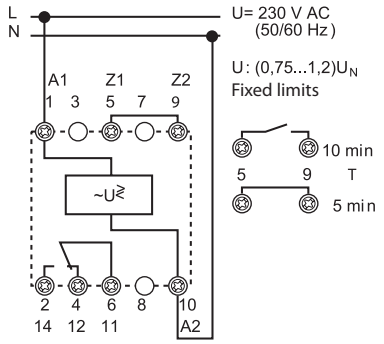
E

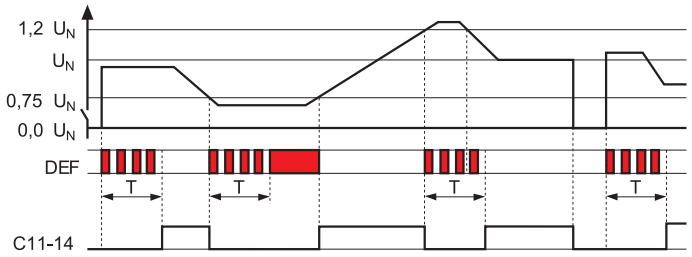
LED/LCD status announcement/advice

Type	Starting mode	Normal operation	Abnormal mode		Reset
71.11.8.230.0010 **71.11.8.230.1010** **71.31.8.400.1010**	After connecting T = 5 or 10 min 11-14 open	Normal operation Set point is OK 11-14 is closed	Time T runs Set point is immaterial 11-14 is open **Will close after T, if set point is OK**	After expiry of T Set point is not OK 11-14 is open **Will close, if set point is OK**	
71.31.8.400.1021 **Memory OFF** ON / OFF		Normal operation Set point is OK 11-14 is closed	Time T runs Set point is not OK 11-14 is closed	After expiry of T Set point is not OK 11-14 is open **Will close, if set point is OK**	
71.31.8.400.1021 **Memory ON** ON / OFF		Normal operation Set point is OK 11-14 is closed	Time T runs Set point is not OK 11-14 is closed	After expiry of T Set point is not OK 11-14 is open **Will not close at RESET**	After expiry of T Set point is OK 11-14 is open **Will close at RESET**
71.31.8.400.2000		Normal operation Set point is OK 11-14 is closed	Supply voltage to A1(1) and/or A2(5) is missing 11-14 is open **Will close if supply voltage restored and set point OK** Incorrect phase rotation or phase failure or voltage A1(1) and/ot A2(5) is > 1.11 U_N 11-14 is open **Will close, if set point is OK**	Phase asymmetry 11-14 is open **Will close, if set point is OK**	
71.41.8.230.1021 **Memory OFF**		**Measured value displayed** Normal operation Set point is OK 11-14 is closed	**Measured value displayed** Time T runs, Set point is not OK 11-14 is closed	**Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will close, if set point is OK**	
71.41.8.230.1021 **Memory ON**		**Measured value displayed** Normal operation Set point is OK 11-14 is closed	**Measured value displayed** Time T runs, Set point is not OK 11-14 is closed	**M in the display flashes** **Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will not close at RESET**	**M in the display - static** **Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will close at RESET**
71.51.8.230.1021 **Memory OFF**	**Measured value displayed** Time T2 runs, Set point immaterial 11-14 is closed	**Measured value displayed** Normal operation Set point is OK 11-14 is closed	**Measured value displayed** Time T runs, Set point is not OK 11-14 is closed	**Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will close, if set point is OK**	
71.51.8.230.1021 **Memory ON**	**Measured value displayed** Time T2 runs, Set point immaterial 11-14 is closed	**Measured value displayed** Normal operation Set point is OK 11-14 is closed	**Measured value displayed** Time T runs, Set point is not OK 11-14 is closed	**M in the display flashes** **Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will not close at RESET**	**M in the display - static** **Measured value displayed** After expiry of T Set point is not OK 11-14 is open **Will close at RESET**
71.91.x.xxx.0300		Normal operation Set point is OK 11-14 is closed	Temperature to high or PTC line break or PTC short circuit 11-14 is open **Will close, if set point is OK**		
71.92.x.xxx.0001 **Memory OFF**		Normal operation Set point is OK 11-14 is closed	Temperature to high or PTC line break or PTC short circuit 11-14 is open **Will close, if set point is OK**		
71.92.x.xxx.0001 **Memory ON** ON / OFF ON / OFF		Normal operation Set point is OK 11-14 is closed	Temperature to high or PTC line break or PTC short circuit 11-14 is open		Temperature is OK 11-14 is open **Will close at RESET**

Functions

Type 71.11.8.230.0010



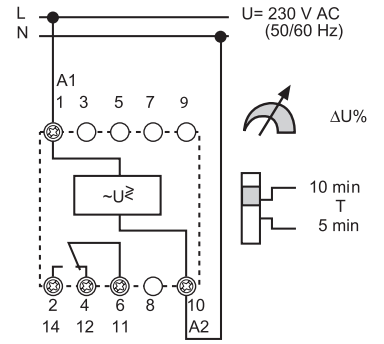


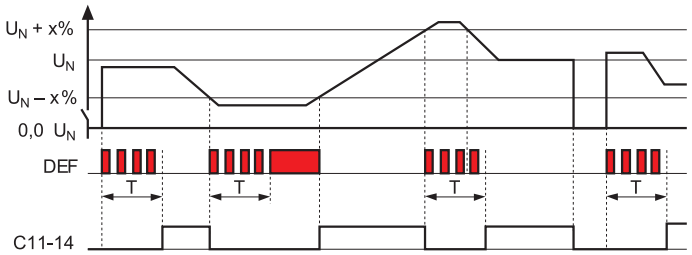
Switch off
Immediately if monitored value is outside of the set points.

Switch on
After expiry of the time T and if monitored value is within the set points.

C = output contact
Normally open 11-14 (6-2) closed.

Type 71.11.8.230.1010



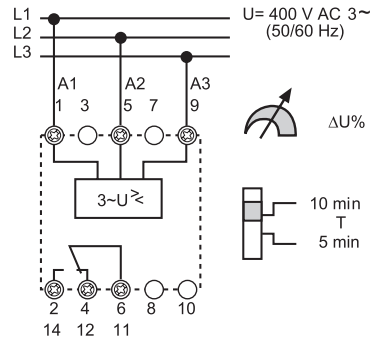


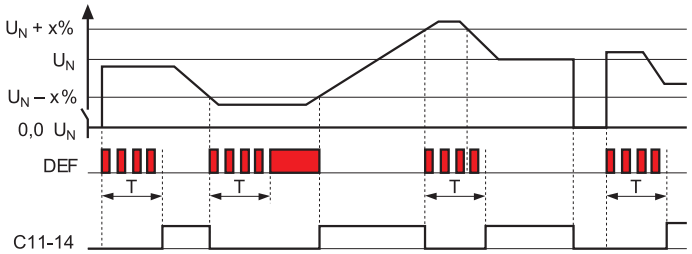
Switch off
Immediately if monitored value is outside of the set points.

Switch on
After expiry of the time T and if monitored value is within the set points.

C = output contact
Normally open 11-14 (6-2) closed, all values within the set points.

Type 71.31.8.400.1010



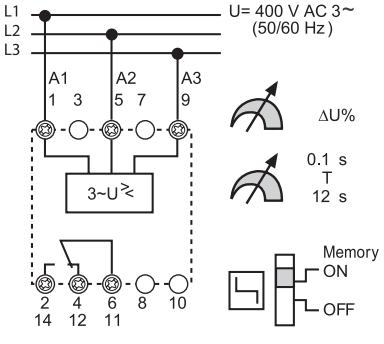


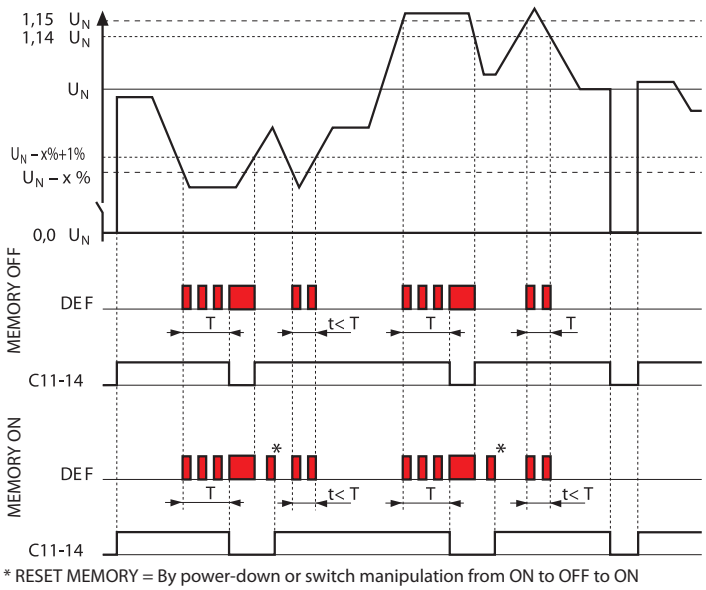
Switch off
Immediately if monitored value is outside of the set points.

Switch on
After expiry of the time T and if monitored value is within the set points.

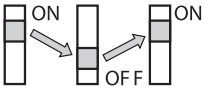
C = output contact
Normally open 11-14 (6-2) closed.

Type 71.31.8.400.1021





* RESET MEMORY = By power-down or switch manipulation from ON to OFF to ON



Switch off
If monitored value is outside of the set points and time T has elapsed.

Switch on - MEMORY OFF
Immediately monitored value returns within limits (off-set by 1% hysteresis).

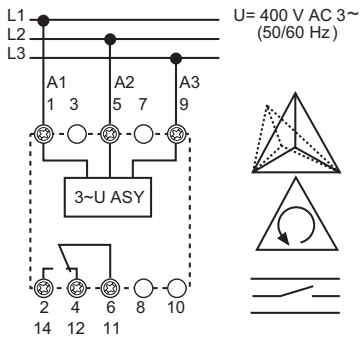
Switch on - MEMORY ON
As above, but subject to the RESET operation having been actioned.

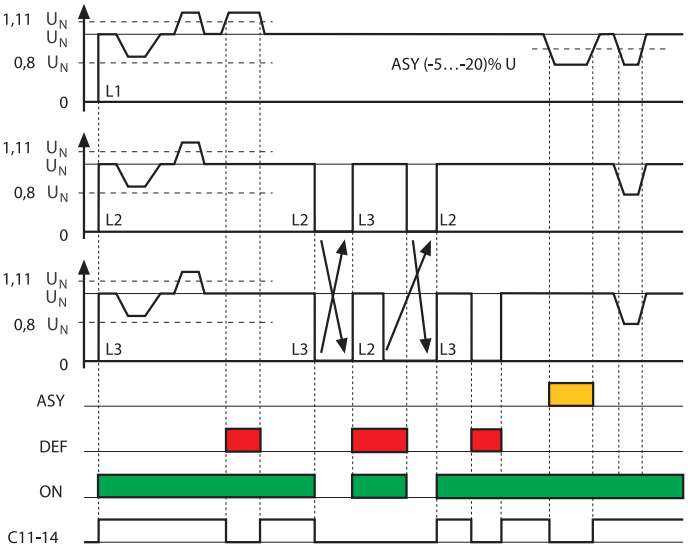
RESET
By Memory switch manipulation from ON to OFF and back to ON, or power down.

C = output contact
Normally open 11-14 (6-2) closed.

Functions

Type 71.31.8.400.2000





Switch off
Phase asymmetry
Incorrect phase rotation
Phase loss

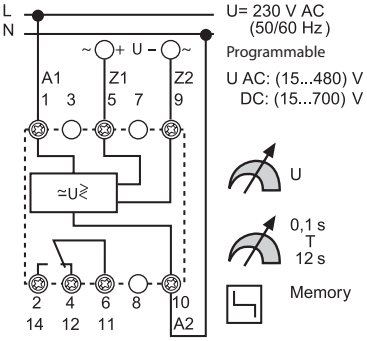
LED • ASY yellow
Phase asymmetry

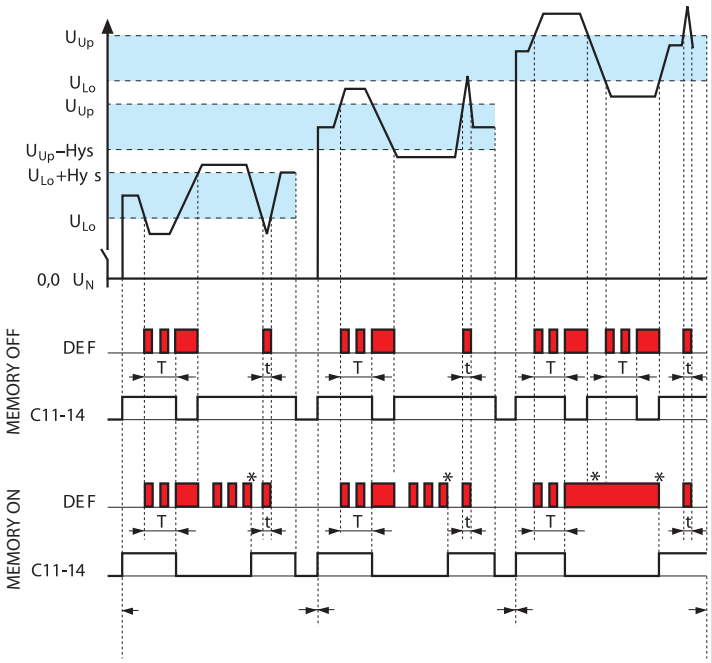
LED • DEF red
Voltage to A1 (1) and/or A2 (5) > 1.11 U_N

LED • ON green
Monitoring system is active and 400 V supply voltage is connected to 1-5 or A1-A2.

C = output contact
Normally open 11-14
(6-2) closed.

Type 71.41.8.230.1021





* RESET MEMORY = Pressing "SET/RESET" > 1 s

Switch off
U_{Lo} – mode
If the monitored value is less than the lower-limit and, time T has expired.

U_{Up} – mode
If the monitored value is higher than the upper limit, and time T has expired.

U_{Lo} U_{Up} – mode
If the monitored valueof voltage is outside of the upper or lower voltage limits, and time T has expired.

Voltage dips < T do not result in output relay switching off.

Switch on
U_{Lo} or U_{Up} – modes
When passing the hysteresis value.

U_{Lo} U_{Up} – mode
When passing the U_{Lo} or U_{Up} value.

RESET MEMORY
Pressing "SET/RESET" > 1 sec.

C = output contact
Normally open 11-14
(6-2) closed.

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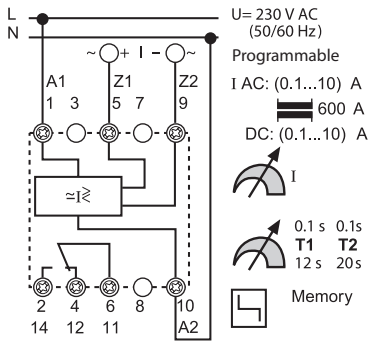
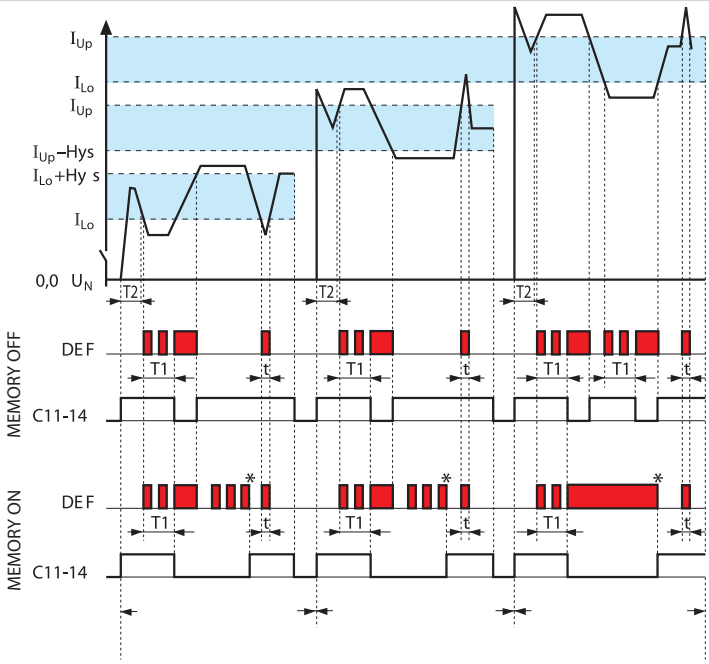
Functions

Type 71.51.8.230.1021





* RESET MEMORY = Pressing "SET/RESET" > 1 s

Switch off

I_{Lo} – mode
If the monitored value is less than the lower-limit and, time T1 has expired.

I_{Up} – mode
If the monitored value is higher than the upper limit, and time T1 has expired.

I_{Lo} I_{Up} – mode
If the monitored value of voltage is outside of the upper or lower limits, and time T1 has expired.

Inrush current < T2 is ignored

Current dips < T1 do not result in output relay switching off.

Switch on

I_{Lo} or I_{Up} – modes
When passing the hysteresis value.

I_{Lo} I_{Up} – mode
When passing the I_{Lo} or I_{Up} value.

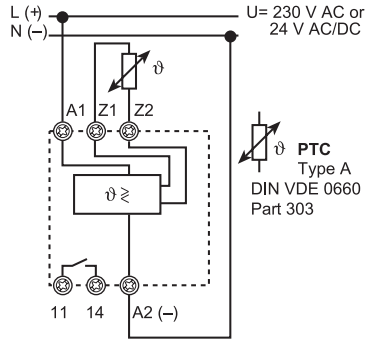
RESET MEMORY

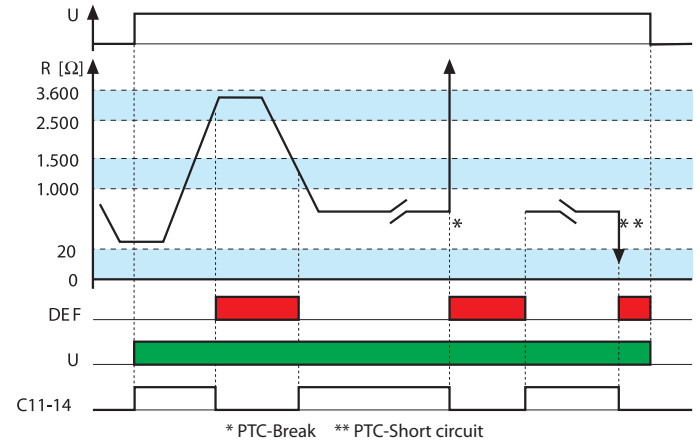
Pushing "SET/RESET" > 1 sec.

C = output contact

Normally open 11-14 (6-2) closed.

Type 71.91.x.xxx.0300





* PTC-Break ** PTC-Short circuit

Switch off

– Thermistor line break
– Over temperature R_{PTC} > (2.5…3.6)kΩ
– Thermistor line short circuit ($R_{PTC\simeq}$< 20 Ω)
– Loss of supply

Switch on

Temperature within limits
R_{PTC} > (1.0…1.5)kΩ on power-up.
(1…1.5)kΩ on cooling.

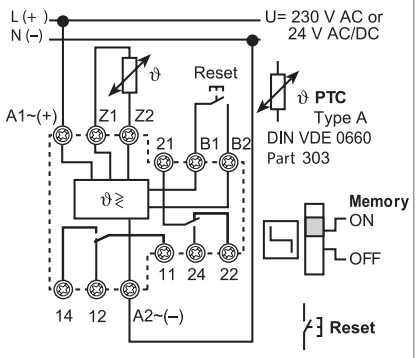
C = output contact

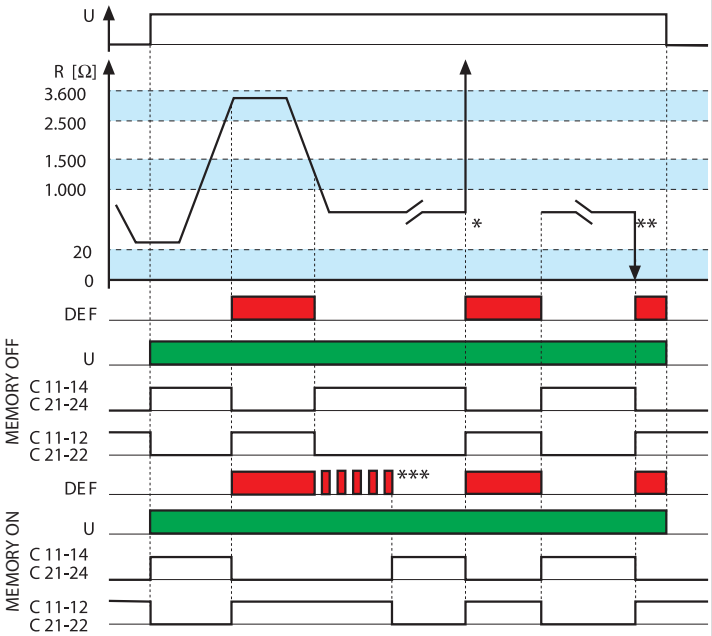
Normally open
11-14 Closed when temperature within limits.

E

Functions

Type 71.92.x.xxx.0001





* PTC-Break ** PTC-Short circuit

*** RESET MEMORY = Operate the RESET key, or interrupt the supply.

Switch off
– Thermistor line break
– Over temperature
R_{PTC} > (2.5…3.6)kΩ,
– Thermistor line short circuit (R_{PTC} < 20 Ω)
– Loss of supply

Switch on
Temperature within limits
(20 Ω…2.5 kΩ)
on power-up.
R_{PTC} > (1…1.5)kΩ on cooling.

Select
MEMORY OFF
If monitored value is expected to cross the resetting threshold.

Select
MEMORY ON
If monitored value is expected to remain within limits.

RESET MEMORY
Operate the RESET key, or interrupt the supply.

C = output contact
Normally open 11-14 (21-24)
Closed when temperature within limits.

Normally closed 11-22 (21-22)
Closed when temperature outside limits/Power off.

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