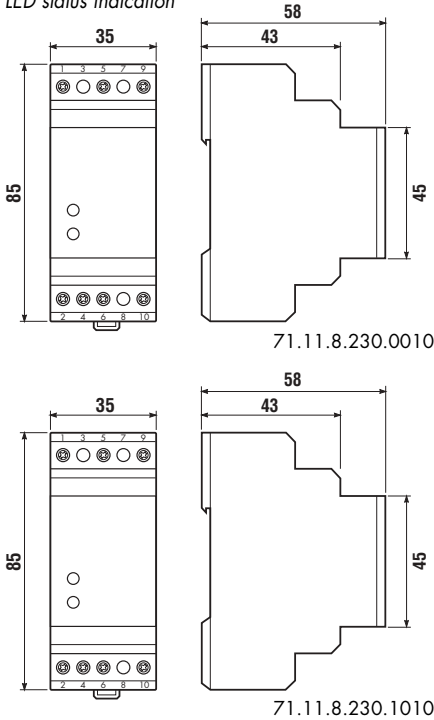


- Designed for industrial applications
- Positive safety logic - make contact opens if the measured value is outside of the acceptable range
- High precision - measured value based on the average of 500 measurements over a 100 ms period
- Industry standard module
- 35 mm rail (EN 50022) mounting
- Switch or link setting of the delay time
- LED status indication



## 71.11.8.230.0010

## 71.11.8.230.1010

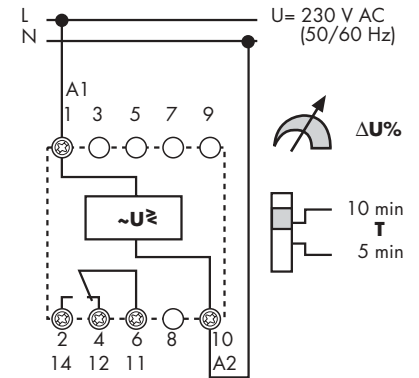
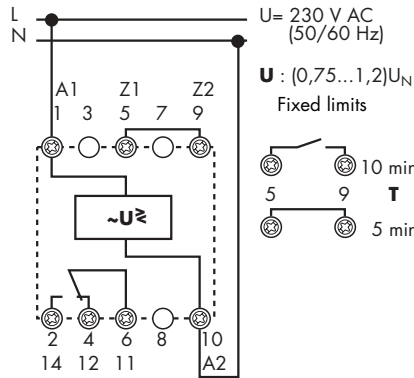


- 1 phase 230 V - line voltage monitoring
- Detects over/under voltage against fixed limits
- Protects against excessive "starts/hour", typically for motor compressors and high-pressure discharge lamps

- 1 phase 230 V - line voltage monitoring
- Detects over and under voltage against adjustable limits
- Protects against excessive "starts/hour", typically for motor compressors and high-pressure discharge lamps

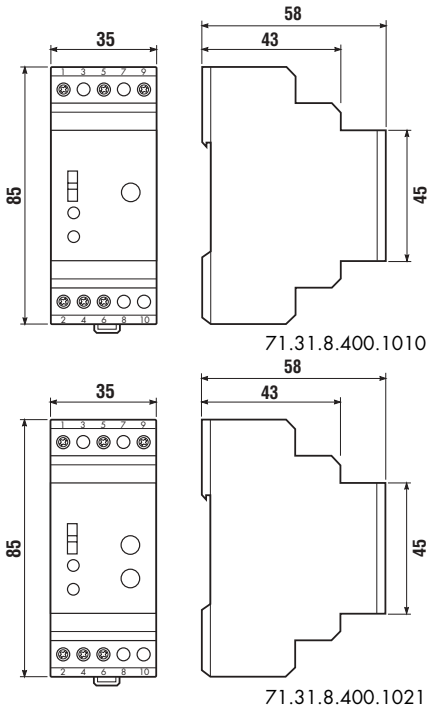
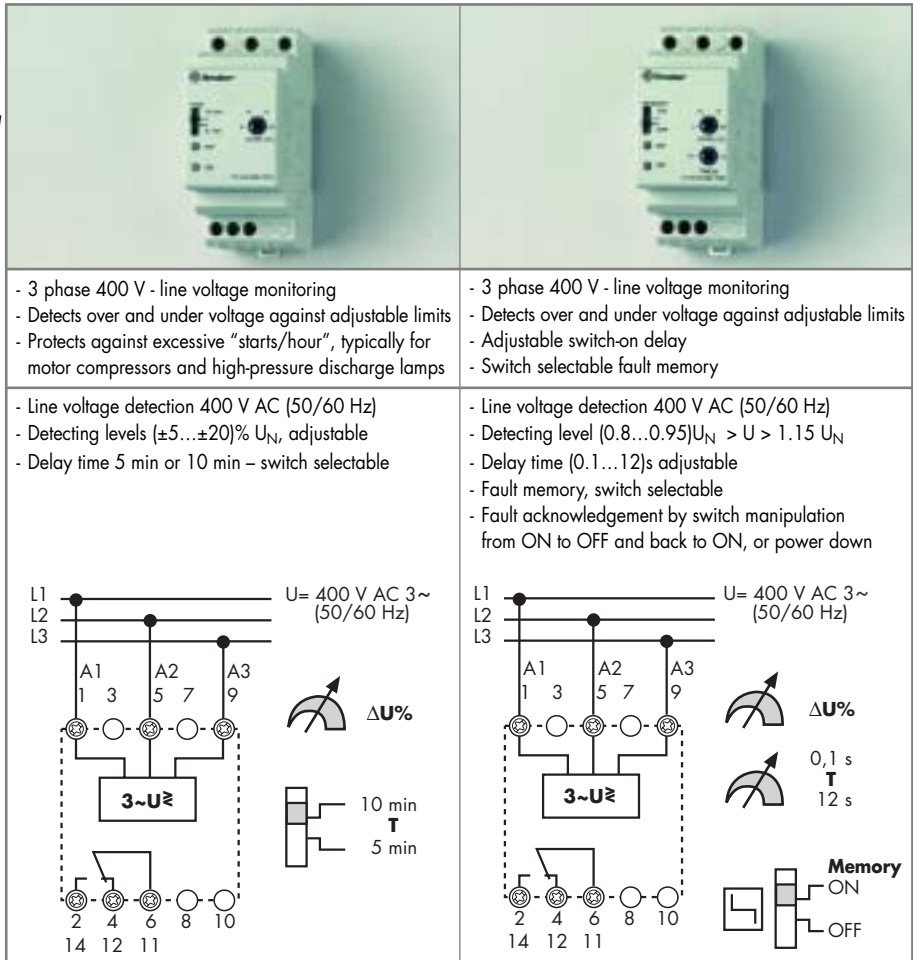
- Line voltage detection 230 V AC (50/60 Hz)
- Detection levels  $(0.75...1.2)U_N$ , fixed
- Delay time 5 min or 10 min - link selectable

- Line voltage detection 230 V AC (50/60 Hz)
- Detection levels  $(\pm 5... \pm 20)\% U_N$ , adjustable
- Delay time 5 min or 10 min - switch selectable



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 in AC1	VA	2,500	2,500
Rated load in AC15 (230 V AC)	VA	500	500
Single phase motor rating (230 V AC)	kW	0.5	0.5
Breaking capacity in DC1: 30/110/220V	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		$(0.75...1.2)U_N$	$(\pm 5... \pm 20)\% U_N$
Switch-on delay time/reaction time		$(5 - 10) \text{ min} / < 0.5 \text{ s}$	$(5 - 10) \text{ min} / < 0.5 \text{ s}$
Fault memory		—	—
Electrical isolation: Supply to Measuring circuits		None - circuits are electrically common	None - circuits are electrically common
Insulation according to EN 61810-1 ed. 2		6 kV	6 kV
Ambient temperature range	°C	-20...+55	-20...+55
Protection category		IP20	IP20
Approvals (according to type):			

- Designed for industrial applications
- Positive safety logic - make contact opens if the measured value is outside of the acceptable range
- High precision - measured value based on the average of 500 measurements over a 100 ms period
- Industry standard module
- 35 mm rail (EN 50022) mounting
- Adjustable setting of the detecting levels
- LED status indication


**71.31.8.400.1010**
**71.31.8.400.1021**


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 in AC1	VA	2,500	2,500
Rated load in AC15 (230 V AC)	VA	500	500
Single phase motor rating (230 V AC)	kW	0.5	0.5
Breaking capacity in DC1: 30/110/220V	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	$(0.8...1.2)U_N$	$(0.8...1.15)U_N$
	DC	—	—
Technical data			
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Detection level		$(\pm 5... \pm 20)\% U_N$	$(-5...-20)\% U_N \dots (1.15)U_N$ fixed
Switch-on delay/Switch-off delay/reaction time		$(5 - 10)\text{min} / < 0.5 \text{ s}$	$(0.1...12)\text{s} / < 0.5 \text{ s}$
Fault memory - selectable		—	Yes
Electrical isolation: Supply to Measuring circuits		None – circuits are electrically common	None – circuits are electrically common
Insulation according to EN 61810-1 ed. 2		6 kV	6 kV
Ambient temperature range	°C	-20...+55	-20...+55
Protection category		IP20	IP20
Approvals (according to type):			

**71**

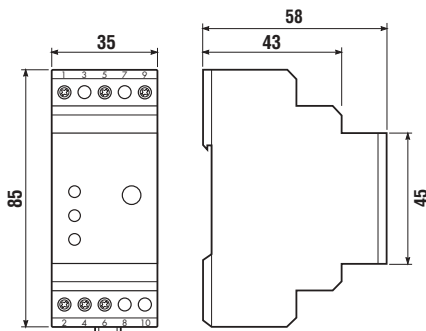
## 71.31.8.400.2000

- Designed for industrial applications
- Positive safety logic - make contact opens if the measured value is outside of the acceptable range
- High precision - measured value based on the average of 500 measurements over a 100 ms period
- Industry standard module
- 35 mm rail (EN 50022) mounting
- Adjustable setting of the detecting levels
- LED status indication

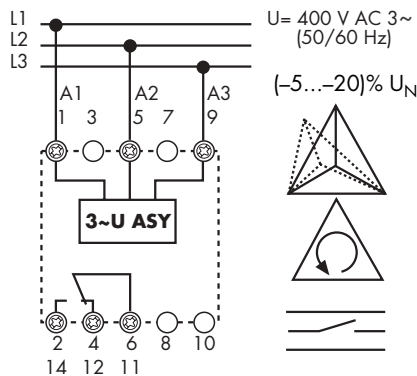


- 3 phase asymmetry monitoring
- Phase rotation monitoring
- Phase loss monitoring

- Line voltage detection 400 V AC (50/60 Hz)
- Asymmetry of one or two phases  $(-5... -20)\% U_N$  adjustable
- Detection of the supply voltage  
 $U$  to A1 (1) and/or A2 (5)  $> 1.11 U_N$

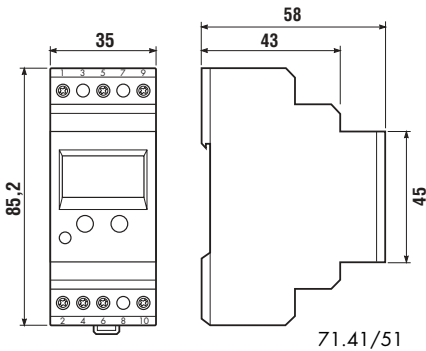


71.31.8.400.2000



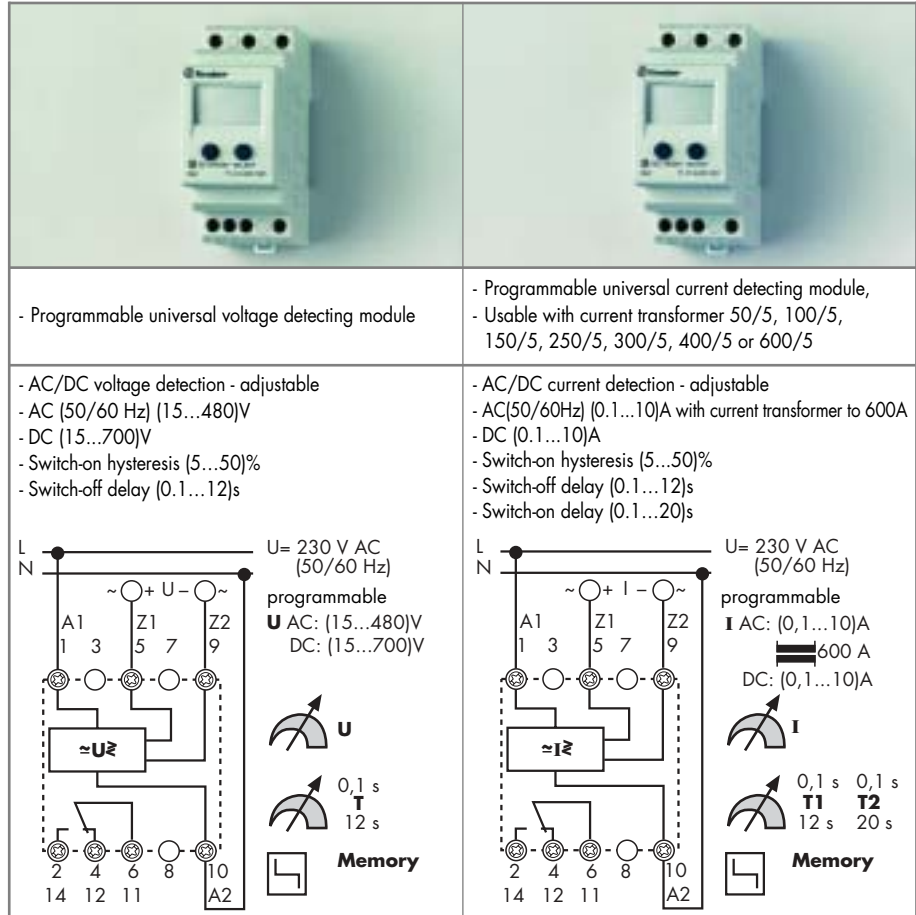
Contact specification		
Contact configuration		1 CO (SPDT)
Rated current/Maximum peak current	A	10/15
Rated voltage/Maximum switching voltage	V AC	250/400
Rated load in AC1	VA	2,500
Rated load in AC15 (230 V AC)	VA	500
Single phase motor rating (230 V AC)	kW	0.5
Breaking capacity in DC1: 30/110/220V	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	$(0.8...1.15)U_N$
	DC	—
Technical data		
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$
Detection level: Phase asymmetry: Adjustable		$(-5...-20)\% U_N$
Switch-off delay/activation time		— / $< 0.5$ s
Fault memory		—
Electrical isolation: Supply to Measuring circuits		None – circuits are electrically common
Insulation according to EN 61810-1 ed. 2		6 kV
Ambient temperature range	°C	$-20...+55$
Protection category		IP20
Approvals (according to type):		

- Universal voltage or current detecting and monitoring relay
- 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



## 71.41.8.230.1021

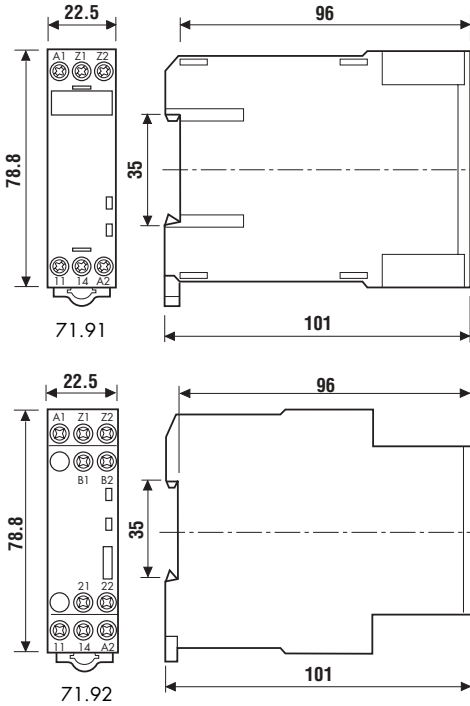
## 71.51.8.230.1021



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 in AC1	VA	2,500	2,500
Rated load in AC15 (230 V AC)	VA	500	500
Single phase motor rating (230 V AC)	kW	0.5	0.5
Breaking capacity in DC1: 30/110/220V	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 600A / $(0.1...10)A$
Switch-off/reaction/Switch-on reaction time		$(0.1...12)s / < 0.35 s / < 0.5 s$	$(0.1...12)s / < 0.35 s / (0.1...20)s$
Switch-on level of the detecting level	%	5...50	5...50
Fault memory - programmable		Yes	Yes
Electrical isolation: Supply to Measuring circuits		Yes	Yes
Insulation according to EN 61810-1 ed. 2		6 kV	6 kV
Ambient temperature range	°C	-20...+55	-20...+55
Protection category		IP20	IP20
Approvals (according to type):			

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- Designed for industrial applications
- 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
- 35 mm rail (EN 50022) mounting
- LED status indication

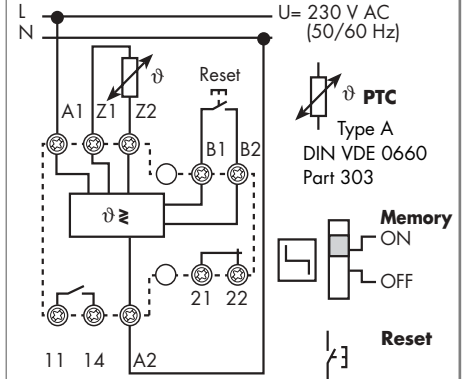
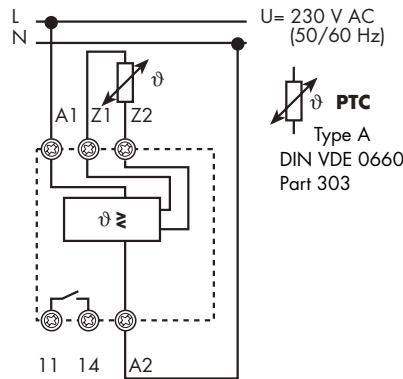

**71.91.8.230.0300**
**71.92.8.230.0401**


- Thermistor relay

- Thermistor relay with fault memory

- Temperature detection with PTC
- PTC short circuit detection
- PTC wire breakage detection
- Supply voltage 230 V AC (50/60 Hz)

- Temperature detection with PTC
- Fault memory – switch selectable
- Reset by Reset button or supply interruption
- PTC short circuit detection
- PTC wire breakage detection
- Supply voltage 230 V AC (50/60 Hz)



Contact specification			
Contact configuration		1 NO (SPST-NO)	1 NO + 1 NC (SPST-NO + SPST-NC)
Rated current/Maximum peak current	A	10/15	10/15
Rated voltage/Maximum switching voltage	V AC	250/400	250/400
Rated load in AC1	VA	2,500	2,500
Rated load in AC15 (230 V AC)	VA	500	500
Single phase motor rating (230 V AC)	kW	0.5	0.5
Breaking capacity in DC1: 30/110/220V	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	1/—	1/—
Operating range	AC	$(0.85 \dots 1.15) U_N$	$(0.85 \dots 1.15) U_N$
	DC	—	—
Technical data			
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
PTC detecting: Short circuit/Temperature OK		$<20 \Omega / >20 \Omega \dots <3 \text{ k}\Omega$	$<20 \Omega / >20 \Omega \dots <3 \text{ k}\Omega$
	Reset/PTC break	$<1.3 \text{ k}\Omega / >3 \text{ k}\Omega$	$<1.3 \text{ k}\Omega / >3 \text{ k}\Omega$
Delay time/activation time		— / $< 0.5 \text{ s}$	— / $< 0.5 \text{ s}$
Fault memory - switch selectable		—	Yes
Electrical isolation: Supply to Measuring circuits		Yes	Yes
Insulation according to EN 61810-1 ed. 2		6 kV	6 kV
Ambient temperature range	$^{\circ}\text{C}$	$-20 \dots +55$	$-20 \dots +55$
Protection category		IP20	IP20
Approvals (according to type):			

## ORDERING INFORMATION

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

**7 1 . 4 1 . 8 . 2 3 0 . 1 0 2 1**

**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) at 71.11, 31, 41 51 81
- 1 = 1 NO (SPST-NO) at 71.91
- 2 = 1 NO + 1 NC (SPST-NO + SPST-NC) at 71.92

**Supply version**

- 8 = AC (50/60 Hz)

**Supply voltage**

- 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 = 1 CO (SPDT)
- 3 = 1 NO (SPST-NO)
- 4 = 1 NO + 1 NC (SPST-NO + SPST-NC)

**Mounting width**

- 71.11.8.230.0010 / 35 mm
- 71.11.8.230.1010 / 35 mm
- 71.31.8.400.1010 / 35 mm
- 71.31.8.400.1021 / 35 mm
- 71.31.8.400.2000 / 35 mm
- 71.41.8.230.1021 / 35 mm
- 71.51.8.230.1021 / 35 mm
- 71.91.8.230.0300 / 22.5 mm
- 71.92.8.230.0401 / 22.5 mm

## TECHNICAL DATA

### 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...1,000)MHz		EN 610004-3	3 V/m
Fast transients (burst) (5-50 ns, 5 kHz) on (A1, A2, A3, R1, R2) 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

### INSULATION

Insulation according to EN 61810-1 ed. 2	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		2,500
	kV (1,2/50 μs)		6
Dielectric strength at open contact	V AC		1,000

### 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	VA	4	
	with rated current	VA	5	
Permitted storage temperature range		°C	-40...+85	
Protection category		IP 20		
Max. wire size		solid cable	standed cable	
		mm <sup>2</sup>	0.5...(2 x 2,5)	(2 x 1,5)
		AWG	20...(2 x 14)	(2 x 16)
Screw torque		Nm	0.8	

## FUNCTIONS

Monitoring Relay - Type	Types										Times		Supply voltage		Module width		Contact conf.			
	1-phase 230 V, Under/Over voltage	3-phase 400 V, Under/Over voltage	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(or 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	230 V AC		400 V AC	35 mm wide	22.5 mm wide
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
71.91.8.230.0300									•	•					•				•	1 NO SPST-NO
71.92.8.230.0401									•	•	•				•				•	1 NO SPST-NO 1 NC SPST-NO
Current transformer	Source as required																			

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## 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 asymmetry 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 occurrence 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), or 71.91.8.230.0401 by operating of the "RESET" button (71.91.8.230.0401).		
MEMORY OFF	Fault memory turned off: The state of the output contacts will only remain in the "fault" condition (contact 11-14 (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 instructions 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 secs. The word "prog" is shown for 1 sec. "SELECT" allows the choice of "AC" or "DC", and is confirmed with "SET/RESET". Successively pressing the button "SELECT" brings up the choices of Up, Lo, or UpLo. The appropriate choice is made by pressing the "SET/RESET" button. The next steps 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 programming 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 broken 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 sec, 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 3 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) UpLo = upper and lower limit - range detecting	Level = value Hys = hysteresis M = Memory (fault) Yes = yes - with memory no = no - without memory	t1 = T1 - time during which short-time fluctuations are not taken into account t2 = T2 - (monitoring relay 71.51) the time during which inrush currents are not taken into account.

## LED/LCD status announcement/advice

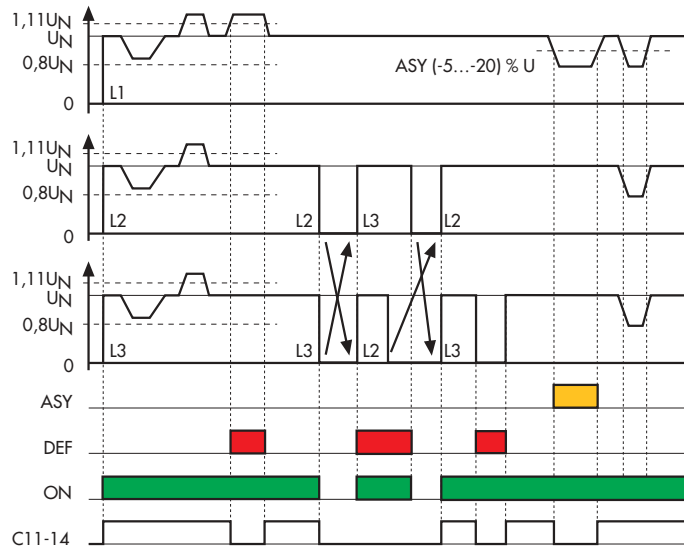
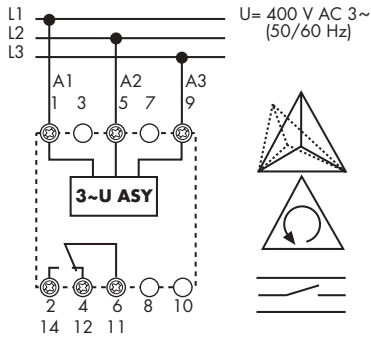
Type	Starting mode	Normal operation	Abnormal mode		Reset
71.11.8.230.0010 71.11.8.230.1010 71.31.8.400.1010	After connecting T = 5 or 10 min 11-14 open	Normal operation Set point is OK 11-14 is closed	Time T runs Set point is immaterial 11-14 is open <b>Will close after T, if set point is OK</b>	After expiry of T Set point is not OK 11-14 is open <b>Will close, if set point is OK</b>	
71.31.8.400.1021 Memory 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 <b>Will close, if set point is OK</b>	
71.31.8.400.1021 Memory ON 		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 <b>Will not close at RESET</b>	After expiry of T Set point is OK 11-14 is open <b>Will close at RESET</b>
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 <b>Will close if supply voltage re- stored and set point OK</b>  Incorrect phase rotation or phase failure or voltage A1 (1) and/or A2 (5) is > 1.11 UN 11-14 is open <b>Will close, if set point is OK</b>	Phase asymmetry 11-14 is open 11-14 is open 	
71.41.8.230.1021 Memory OFF		<b>Measured value displayed</b> Normal operation Set point is OK 11-14 is closed	<b>Measured value displayed</b> Time T runs Set point is not OK 11-14 is closed	<b>Measured value displayed</b> After expiry of T Set point is not OK 11-14 is open <b>Will close, if set point is OK</b>	
71.41.8.230.1021 Memory ON		<b>Measured value displayed</b> Normal operation Set point is OK 11-14 is closed	<b>Measured value displayed</b> Time T runs Set point is not OK 11-14 is closed	<b>M in the display flashes</b> <b>Measured value displayed</b> After expiry of T Set point is not OK 11-14 is open <b>Will not close at RESET</b>	<b>M in the display - static</b> <b>Measured value displayed</b> After expiry of T Set point is OK 11-14 is open <b>Will close at RESET</b>
71.51.8.230.1021 Memory OFF	<b>Measured value displayed</b> Time T2 runs Set point immaterial 11-14 is closed	<b>Measured value displayed</b> Normal operation Set point is OK 11-14 is closed	<b>Measured value displayed</b> Time T1 runs Set point is not OK 11-14 is closed	<b>Measured value displayed</b> After expiry of T1 Set point is not OK 11-14 is open <b>Will close if set point OK</b>	
71.51.8.230.1021 Memory ON	<b>Measured value displayed</b> Time T2 runs Set point immaterial 11-14 is closed	<b>Measured value displayed</b> Normal operation Set point is OK 11-14 is closed	<b>Measured value displayed</b> Time T1 runs Set point is not OK 11-14 is closed	<b>M in the display flashes</b> <b>Measured value displayed</b> After expiry of T1 Set point is not OK 11-14 is open <b>Will not close at RESET</b>	<b>M in the display - static</b> <b>Measured value displayed</b> After expiry of T1 Set point is OK 11-14 is open <b>Will close at RESET</b>
71.91.8.230.0300		Normal operation Set point is OK 11-14 is closed	Temperature too high or PTC line break or PTC short circuit 11-14 is open <b>Will close if set point OK</b>		
71.92.8.230.0401 Memory OFF 		Normal operation Set point is OK 11-14 is closed	Temperature too high or PTC line break or PTC short circuit 11-14 is open <b>Will close if set point OK</b>		
71.92.8.230.0401 Memory ON 		Normal operation Set point is OK 11-14 is closed	Temperature too high or PTC line break or PTC short circuit 11-14 is open		Temperature is OK 11-14 is open  <b>Will close at RESET</b>

**FUNCTIONS**

<p><b>Type 71.11.8.230.0010</b></p> <p>U = 230 V AC (50/60 Hz)  <math>U : (0,75 \dots 1,2)U_N</math>          Fixed limits</p> <p>10 min T          5 min</p>	<p><b>Switch off</b>          Immediately if monitored value is outside of the set points.</p> <p><b>Switch on</b>          After expiry of the time T and if monitored value is within the set points.</p> <p><b>C = output contact</b>          NO 11-14 (6-2) closed.</p>
<p><b>Type 71.11.8.230.1010</b></p> <p>U = 230 V AC (50/60 Hz)</p> <p><math>\Delta U\%</math></p> <p>10 min T          5 min</p>	<p><b>Switch off</b>          Immediately if monitored value is outside of the set points.</p> <p><b>Switch on</b>          After expiry of the time T and if monitored value is within the set points.</p> <p><b>C = output contact</b>          NO 11-14 (6-2) closed, all values within the set points.</p>
<p><b>Type 71.31.8.400.1010</b></p> <p>U = 400 V AC 3~ (50/60 Hz)</p> <p><math>\Delta U\%</math></p> <p>10 min T          5 min</p>	<p><b>Switch off</b>          Immediately if monitored value is outside of the set points.</p> <p><b>Switch on</b>          After expiry of the time T and if monitored value is within the set points.</p> <p><b>C = output contact</b>          NO 11-14 (6-2) closed.</p>
<p><b>Type 71.31.8.400.1021</b></p> <p>U = 400 V AC 3~ (50/60 Hz)</p> <p><math>\Delta U\%</math></p> <p>0,1 s T          12 s</p> <p>Memory ON          OFF</p>	<p><b>Switch off</b>          If monitored value is outside of the set points and time T has elapsed.</p> <p><b>Switch on - MEMORY OFF</b>          Immediately monitored value returns within limits (off-set by 1% hysteresis).</p> <p><b>Switch on - MEMORY ON</b>          As above, but subject to the RESET operation having been actioned.</p> <p><b>RESET</b>          By Memory switch manipulation from ON to OFF and back to ON, or power down.</p> <p><b>C = output contact</b>          NO 11-14 (6-2) closed.</p> <p>* RESET MEMORY = By power-down or switch manipulation from ON to OFF to ON</p>

FUNCTIONS

Type 71.31.8.400.2000



**Switch off:**  
Phase asymmetry  
Incorrect phase rotation  
Phase loss

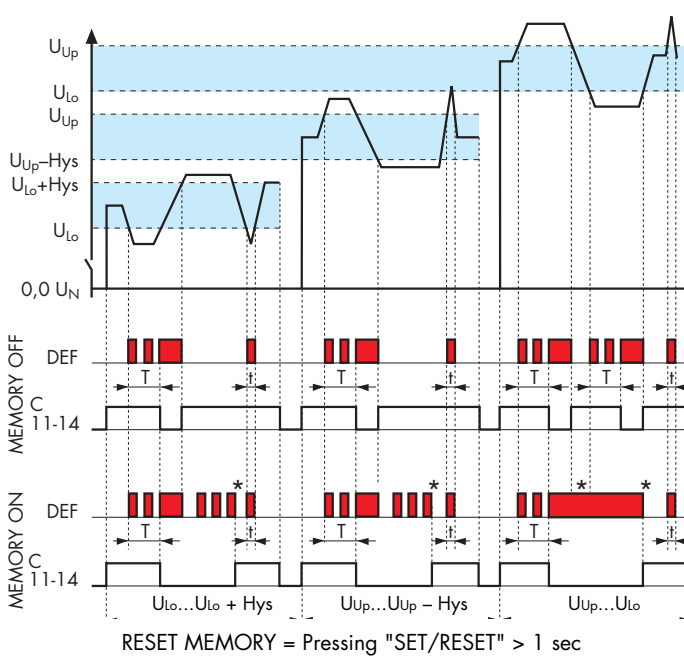
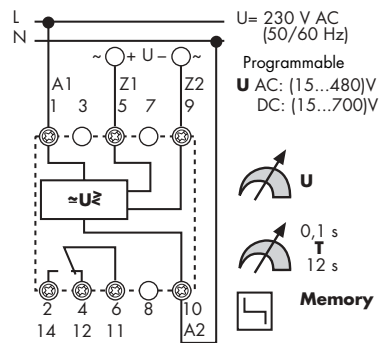
**LED • ASY yellow**  
Phase asymmetry

**LED • DEF red**  
Voltage to A1 (1) and/or A2 (5) > 1.11 U<sub>N</sub>  
Incorrect phase rotation  
Phase loss to A3 (9)

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

**C = output contact**  
NO 11-14 (6-2) closed

Type 71.41.8.230.1021



**Switch off:**  
U<sub>lo</sub> - mode  
If the monitored value is less than the lower-limit and, time T has expired

U<sub>Up</sub> - mode  
If the monitored value is higher than the upper limit, and time T has expired

U<sub>lo</sub> U<sub>Up</sub> - mode  
If the monitored value of 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<sub>lo</sub> or U<sub>Up</sub> - modes  
When passing the hysteresis value

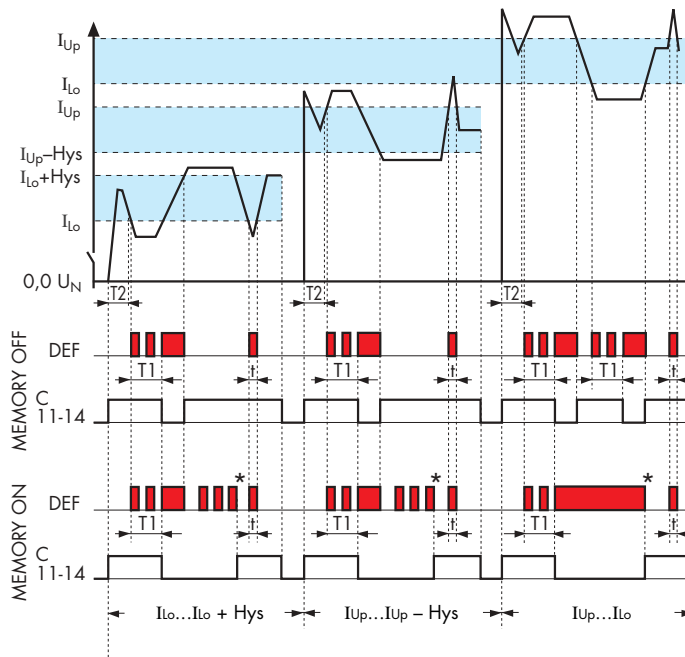
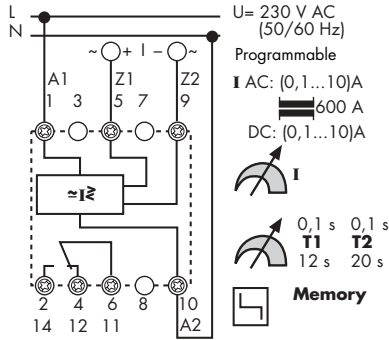
U<sub>lo</sub> U<sub>Up</sub> mode -  
When passing the U<sub>lo</sub> or U<sub>Up</sub> value

**RESET MEMORY:**  
Pressing "SET/RESET" > 1 sec

**C = output contact**  
NO 11-14 (6-2) closed

**FUNCTIONS**

**Type 71.51.8.230.1021**



\*RESET MEMORY = pressing "SET/RESET" > 1 sec

**Switch off:**  
 $I_{lo}$  - mode  
 If the monitored value is less than the lower-limit and, time T has expired

$I_{Up}$  - mode  
 If the monitored value is higher than the upper limit, and time T has expired

$I_{lo} I_{Up}$  - mode  
 If the monitored value of current is outside of the upper or lower limits, and time T has expired

Inrush current < T2 is ignored

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

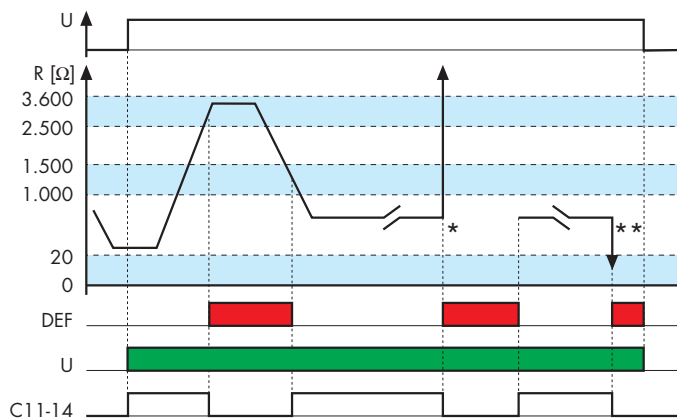
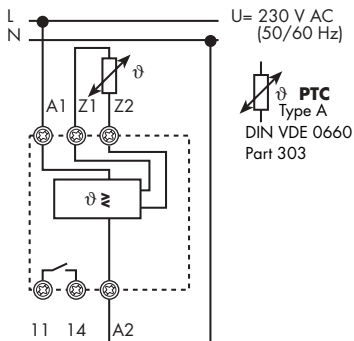
**Switch on:**  
 $I_{lo}$  or  $I_{Up}$  - mode  
 When passing the hysteresis value

$I_{lo} I_{Up}$  - mode  
 When passing the  $I_{lo}$  or  $I_{Up}$  values

**RESET MEMORY:**  
 Pushing "SET/RESET" > 1 sec

**C = output contact**  
 NO 11-14 (6-2) closed

**Type 71.91.8.230.0300**



\* PTC-Break \*\* PTC-Short circuit

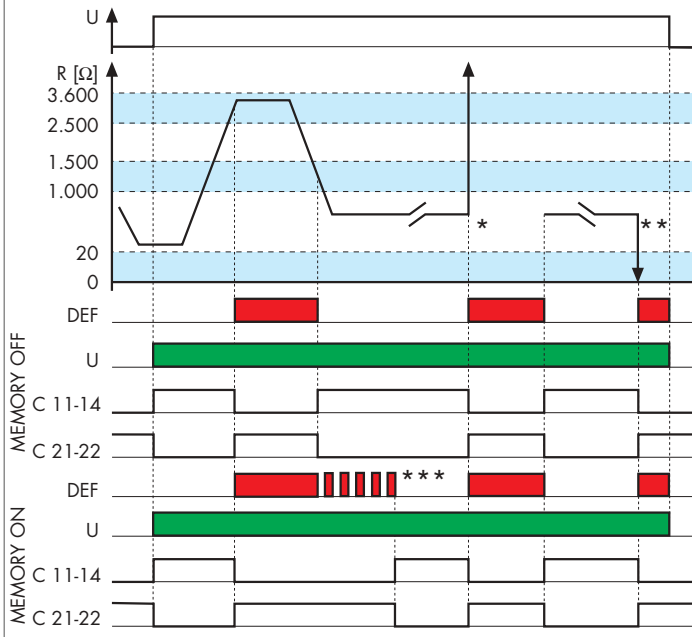
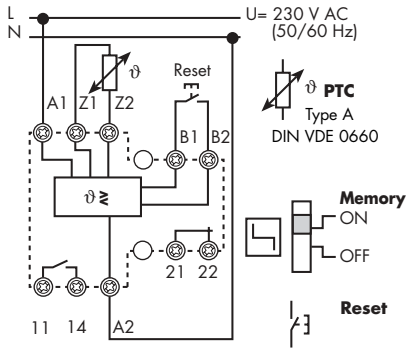
**Switch off:**  
 - Thermistor line break  
 - Over temperature  $R_{PTC} > (2,5...3,6)k\Omega$   
 - Thermistor line short circuit ( $R_{PTC} < 20\Omega$ )  
 - Loss of supply

**Switch on:**  
 Temperature within limits  $R_{PTC} > (1,0...1,5)k\Omega$  on power-up. ( $1k\Omega...1,5k\Omega$ ) on cooling

**C = output contact**  
 NO (11-14)  
 Closed when Temperature within limits

**FUNCTIONS**

**Type 71.92.8.230.0401**



**Switch off:**  
 - Thermistor line break  
 - Over temperature  
 $R_{PTC} > (2.5 \dots 3.6) k\Omega$   
 - Thermistor line short circuit  
 $R_{PTC} < 20\Omega$   
 - Loss of supply

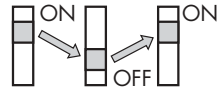
**Switch on:**  
 Temperature within limits  
 $(20\Omega \dots 2.5k\Omega)$  on power-up.  
 $R_{PTC} > (1.0 \dots 1.5)k\Omega$  on cooling.

**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.

\* PTC-Break    \*\* PTC-Short circuit  
 \*\*\* RESET MEMORY = Operate the RESET key, or interrupt the supply



**C = output contacts**  
 NO (11-14)  
 Closed when Temperature within limits  
 NC (21-22)  
 Closed when Temperature outside limits / Power off