

Monitoring Relays

3RN1 Thermistor Motor Protection

For PTC sensors

Overview



Thermistor motor protection devices are used for direct monitoring of the motor winding temperature. For this purpose, the motors are equipped with temperature-dependent resistors (PTC) that are directly installed in the motor winding and abruptly change their resistance at their limit temperature.

Benefits

- Thanks to direct motor protection, overdimensioning of the motors is not necessary
- No additional overload protection equipment is necessary
- No settings on the device are necessary
- Solid-state time-delay output thanks to variants with hard gold-plated contacts
- Rapid error diagnosis thanks to variants that indicate open- and short-circuit in the sensor circuit
- All versions with removable terminals
- All versions with screw terminals or alternatively with innovative spring-loaded terminals

Application

Direct motor protection through temperature monitoring of the motor winding offers 100 % motor protection even under the most difficult ambient conditions, without the need to make adjustments on the device. Versions with hard gold-plated contacts ensure, in addition, a high switching reliability that is even higher than an electronic control.

Motor protection:

- At increased ambient temperatures
- For high switching frequency
- For long start-up and braking procedures
- Used together with frequency converters (low speeds)

ATEX approval for operation in areas subject to explosion hazard

The SIRIUS 3RN1 thermistor motor protection relay for PTC sensors is certified according to ATEX Ex II (2) G and GD for gases and dust.

See "Appendix" --> "Standards and approvals" -->

"Type overview of approved devices for explosion-protected areas (ATEX Explosion Protection)".

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Selection and ordering data

Thermistor motor protection relays for PTC thermistors (Type A PTCs)

- Monostable version with closed-circuit principle, triggers in the event of control supply voltage failure
- PTB01 ATEX approval
See "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".
- 3RN10 13-.BW01: bistable version, does not trigger in the event of control supply voltage failure
- All devices except for 24 V AC/DC feature electrical isolation

RESET	Contacts	Rated control supply voltage U_s 50/60 Hz	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		V		Order No.	Price per PU			kg
Compact signal evaluation units, width 22.5 mm, 1 LED								
	Terminal A1 is jumpered with the root of the changeover contact							
Auto	1 CO	24 AC/DC 110 AC 230 AC	▶ A ▶	3RN10 00-1AB00 3RN10 00-1AG00 3RN10 00-1AM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.114 0.157 0.156
Standard evaluation units, width 22.5 mm, 2 LEDs								
	Auto	1 NO + 1 NC	▶ ▶ ▶ ▶	3RN10 10-1CB00 3RN10 10-1CG00 3RN10 10-1CM00 3RN10 10-1CW00	1 1 1 1	1 unit 1 unit 1 unit 1 unit	101 101 101 101	0.134 0.174 0.175 0.146
		2 CO	A A A	3RN10 10-1BB00 3RN10 10-1BG00 3RN10 10-1BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.162 0.213 0.213
		2 CO, gold-plated	B	3RN10 10-1GB00	1	1 unit	101	0.154
	Manual/ Remote ¹⁾	1 NO + 1 NC	▶ ▶	3RN10 11-1CB00 3RN10 11-1CK00	1 1	1 unit 1 unit	101 101	0.147 0.188
		2 CO	A B A	3RN10 11-1BB00 3RN10 11-1BG00 3RN10 11-1BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.163 0.214 0.212
		2 CO, gold-plated	B	3RN10 11-1GB00	1	1 unit	101	0.165
	Non-volatile ²⁾	1 NO + 1 NC	▶ ▶	3RN10 12-1CB00 3RN10 12-1CK00	1 1	1 unit 1 unit	101 101	0.148 0.188
	Manual/ Auto/ Remote	2 CO	B B A	3RN10 12-1BB00 3RN10 12-1BG00 3RN10 12-1BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.164 0.214 0.216
		2 CO, gold-plated	B	3RN10 12-1GB00	1	1 unit	101	0.155
		2 CO	▶ ▶	3RN10 13-1BB00 3RN10 13-1BW10	1 1	1 unit 1 unit	101 101	0.160 0.172
	2 CO, gold-plated	B	3RN10 13-1GW10	1	1 unit	101	0.168	
Evaluation units for 2 sensor circuits, warning and disconnection, width 22.5 mm, 3 LEDs								
Test / RESET button, non-volatile ²⁾	1 NO + 1 CO	24 ... 240 AC/DC	▶	3RN10 22-1DW00	1	1 unit	101	0.173
Evaluation units for 6 sensor circuits, multiple motor protection, width 45 mm, 8 LEDs								
Test / RESET button, non-volatile ²⁾	1 NO + 1 NC	24 ... 240 AC/DC	▶	3RN10 62-1CW00	1	1 unit	101	0.296
Bistable evaluation units, width 22.5 mm								
Test / RESET button, non-volatile ²⁾ , short-circuit and open-circuit detection and indication in sensor circuit	2 CO	24 ... 240 AC/DC	▶	3RN10 13-1BW01	1	1 unit	101	0.169

¹⁾ The unit can be reset with the RESET button or by disconnecting the control supply voltage.

²⁾ For more information on protection against voltage failure see Technical Information LV 1 T.


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Thermistor motor protection relays for PTC thermistors (Type A PTCs)

- Monostable version with closed-circuit principle, triggers in the event of control supply voltage failure
- PTB01 ATEX approval
See "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".
- 3RN10 13-.BW01: bistable version, does not trigger in the event of control supply voltage failure
- All devices except for 24 V AC/DC feature electrical isolation

RESET	Contacts	Rated control supply voltage U_s 50/60 Hz	DT	Spring-loaded terminals	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.		
		V		Order No.	Price per PU			kg		
Compact signal evaluation units, width 22.5 mm, 1 LED										
	Terminal A1 is jumpered with the root of the changeover contact									
Auto	1 CO	24 AC/DC 110 AC 230 AC	A B B	3RN10 00-2AB00 3RN10 00-2AG00 3RN10 00-2AM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.104 0.153 0.153		
Standard evaluation units, width 22.5 mm, 2 LEDs										
	Auto	1 NO + 1 NC	24 AC/DC 110 AC 230 AC	▶ B A	3RN10 10-2CB00 3RN10 10-2CG00 3RN10 10-2CM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.116 0.153 0.159	
			24 ... 240 AC/DC	A	3RN10 10-2CW00	1	1 unit	101	0.127	
		2 CO	24 AC/DC 110 AC 230 AC	C C C	3RN10 10-2BB00 3RN10 10-2BG00 3RN10 10-2BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.137 0.139 0.190	
		2 CO, gold-plated	24 AC/DC	C	3RN10 10-2GB00	1	1 unit	101	0.139	
		Manual/ Remote ¹⁾	1 NO + 1 NC	24 AC/DC 110/230 AC	A A	3RN10 11-2CB00 3RN10 11-2CK00	1 1	1 unit 1 unit	101 101	0.125 0.164
		Short-circuit detection for sensor circuit								
		Manual/ Remote ¹⁾	2 CO	24 AC/DC 110 AC 230 AC	C C B	3RN10 11-2BB00 3RN10 11-2BG00 3RN10 11-2BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.138 0.190 0.192
			2 CO, gold-plated	24 AC/DC	C	3RN10 11-2GB00	1	1 unit	101	0.154
		Non-volatile ²⁾								
		Manual/ Auto/Remote	1 NO + 1 NC	24 AC/DC 110/230 AC	A B	3RN10 12-2CB00 3RN10 12-2CK00	1 1	1 unit 1 unit	101 101	0.125 0.161
		Non-volatile ²⁾ , short-circuit detection in sensor circuit								
		Manual/ Auto/ Remote	2 CO	24 AC/DC 110 AC 230 AC	C C C	3RN10 12-2BB00 3RN10 12-2BG00 3RN10 12-2BM00	1 1 1	1 unit 1 unit 1 unit	101 101 101	0.130 0.130 0.181
		2 CO, gold-plated	24 AC/DC	C	3RN10 12-2GB00	1	1 unit	101	0.140	
	Non-volatile ²⁾ , short-circuit and open-circuit detection and indication in sensor circuit									
	Manual/ Auto/ Remote	2 CO	24 AC/DC 24 ... 240 AC/DC	A A	3RN10 13-2BB00 3RN10 13-2BW00	1 1	1 unit 1 unit	101 101	0.140 0.151	
		2 CO, gold-plated	24 ... 240 AC/DC	C	3RN10 13-2GW00	1	1 unit	101	0.143	
Evaluation units for 2 sensor circuits, warning and disconnection, width 22.5 mm, 3 LEDs										
	Test/RESET button, non-volatile ²⁾									
Manual/ Auto/ Remote	1 NO + 1 CO	24 ... 240 AC/DC	B	3RN10 22-2DW00	1	1 unit	101	0.147		
Evaluation units for 6 sensor circuits, multiple motor protection, width 45 mm, 8 LEDs										
	Test/RESET button, non-volatile ²⁾									
Manual/ Auto/ Remote	1 NO + 1 NC	24 ... 240 AC/DC	B	3RN10 62-2CW00	1	1 unit	101	0.251		
Bistable evaluation units, width 22.5 mm										
	Test/RESET button, non-volatile ²⁾ , short-circuit and open-circuit detection and indication in sensor circuit									
Manual/ Auto/ Remote	2 CO	24 ... 240 AC/DC	B	3RN10 13-2BW01	1	1 unit	101	0.139		

¹⁾ The unit can be reset with the RESET button or by disconnecting the control supply voltage.


²⁾ For more information on protection against voltage failure see Technical Information LV 1 T.

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Accessories

Use	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Blank labels								
	Blank labels, 20 mm x 7 mm, pastel turquoise ¹⁾	C	3RT19 00-1SB20		100	340 units	101	22.000
Push-in lugs								
 3RP19 03	For devices with 1 or 2 CO contacts	Push-in lugs For screw mounting, 2 units are required for each device	3RP19 03		1	10 units	101	0.002

¹⁾ Computer labeling system for individual inscription of unit labeling plates available from:
murrplastik Systemtechnik GmbH.