

3RP20, 3RP15 solid-state time relays

Section	Subject	Page
7.1	Specifications/regulations/approvals	7-2
7.2	Device description	7-3
7.2.1	Device types	7-3
7.2.2	Installation	7-5
7.2.3	Special features	7-5
7.2.4	Notes on configuration	7-6
7.2.5	Explanation of terms	7-7
7.3	Application and areas of use	7-8
7.3.1	Multifunction(3RP20 05 solid-state time relay)	7-8
7.3.2	Multifunctional (3RP15 05 solid-state time relay)	7-12
7.3.3	On-delay	7-18
7.3.4	Off-delay	7-19
7.3.5	Clock pulse generator (3RP15 55 solid-state time relay)	7-20
7.3.6	Wye-delta function (3RP15 74/76 solid-state time relay)	7-21
7.3.7	Wye-delta function with overtravel (3RP15 60 solid-state time relay)	7-21
7.4	Accessories	7-22
7.4.1	Accessories for 3RP15 05, 3RP20 05	7-22
7.5	Mounting and connection	7-24
7.5.1	Mounting	7-24
7.5.2	Connection	7-25
7.5.3	Circuit diagrams	7-26
7.6	Dimensional drawings (dimensions in mm)	7-27
7.7	Technical Data	7-28

7.1 Specifications/regulations/approvals

Standards	<p>The time relays comply with the following standards:</p> <ul style="list-style-type: none">• IEC 61812-1/DIN VDE 0435 Part 2021 on electrical relays and time relays• IEC 61000 on electromagnetic compatibility• IEC 60947-5-1; DIN VDE 0660 Part 200 on low-voltage switchgear• IEC 60721-3-1/-3 on environmental conditions• IEC 60529 on degree of protection
Electromagnetic compatibility	<p>The time relays are tested in acc. with EN 50 081-1 (emission) and EN 50 082-2 (immunity) and are thus noise-free and surge-proof.</p>
Switching capacity	<p>The switching capacity complies with IEC 60947-5-1</p> <ul style="list-style-type: none">• In the case of utilization category AC-15 and 230 VAC: 3 A• In the case of utilization category DC-13 and 24 VDC: 1 A• In the case of utilization category DC-13 and 48 VDC: 0.45 A• In the case of utilization category DC-13 and 60 VDC: 0.35 A• In the case of utilization category DC-13 and 110 VDC: 0.2 A• In the case of utilization category DC-13 and 230 VDC: 0.1 A
UL/CSA/marine approval	<p>The SIMIREL time relays are approved by UL and CSA for use worldwide and tested by the GL, LRS, DM marine authorities.</p>
Approvals/test reports	<p>Confirmation of approvals, test certificates, and the declaration of conformity can be obtained on the Internet/intranet.</p>

7.2 Device description

Time relays are used for different control tasks in automatic production lines and for processing machines.

They are suitable for all time-delayed switching operations in control, starting, protective, and regulating circuits and ensure high repeatability of the set run times.

7.2.1 Device types

Device types

The SIMIREL 3RP1 time relays are available in the following forms:

- Single-function devices, such as the on-delay function
- Multifunctional devices

Frame sizes

The SIMIREL 3RP1 time relays are available in two widths:

- 3RP10: 45 mm
The width, height, and depth of time relays and contactors of frame size S00 (3RT/3RH10) are identical. The terminals are therefore on the same level, and the tier spacing in the cubicle can be kept correspondingly low.
- 3RP15: 22.5 mm
Time relays with 1 changeover contact are 82 mm in height and have six possible terminals
Time relays with 2 changeover contacts are 102 mm in height and have a possible twelve terminals

View of the 3RP10

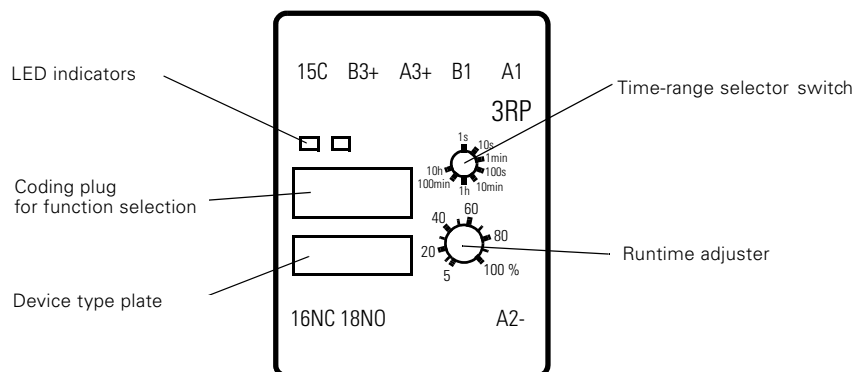


Fig. 7-1: 3RP1000 solid-state time relay, multifunctional

3RP10 features

The features of the 3RP10 solid-state time relay:

- 1 changeover contact
- Eight selectable time ranges
- Adjustable runtime from 0.05 s to 10 hr.
- Contact position and voltage indication by means of LED
- Safe isolation between the control and load sides in acc. with DIN VDE 0106 Part 101
- Combination voltage 24 VAC/VDC / 200-240 VAC and 24 VAC/VDC / 100-127 VAC
- Single-function device for the on-delay function
- Multifunctional device with 7 functions

View of the 3RP15

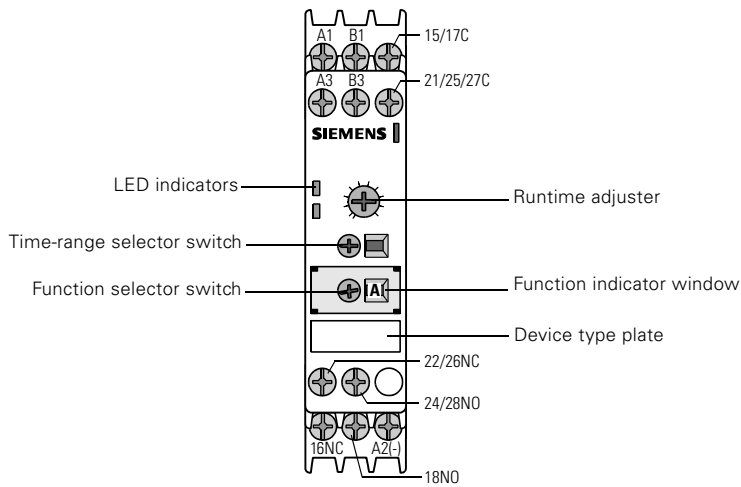


Fig. 7-2: 3RP15 solid-state time relay, multifunctional with 2 changeover contacts

3RP15 features

The features of the 3RP15 solid-state time relays are:

- 1 changeover contact (8 functions)
- 2 changeover contacts (16 functions)
- Single or up to 15 selectable time ranges
- Contact position and voltage indication by means of LEDs
- Combination voltage 24 VAC/VDC / 200-240 VAC, and 24 VAC/VDC / 100-127 VAC
- Wide-range voltage variant for 24-240 VAC/VDC
- Single-function devices for the following functions:
 - On-delay with 1 or 2 changeover contacts
 - Off-delay with auxiliary supply and 1 changeover contact
 - Off-delay without auxiliary supply and 1 or 2 changeover contacts
 - Clock pulse generator with 1 changeover contact
 - Star-delta with 2 NO contacts
 - 2-wire, on-delay with semiconductor output
- Multifunctional time relay with 8 (1 changeover contact) or 16 functions (2 changeover contacts)

Accessories

3RP10

Coding plug set for the multifunctional time relay with 7 functions

3RP15

- Label sets for the multifunctional time relay with 8 or 16 functions
- Sealable cap
- Push-in lugs for screw-type terminal

7.2.2 Installation

Attachment

Snap-on attachment

All the time relays can be snapped onto 35 mm rails and removed without tools in acc. with EN 50 022.

Screw-on attachment

3RP10: attachment openings are integrated in the device

3RP15: push-in lugs for screw-type attachment are available as accessories

Connection

The terminals of the 3RP1 time relays are designed for connections of the control cables with a maximum stripped length of 10 mm. Cross-sections of 2×0.5 to 2.5 mm^2 (single-coil) and 2×0.5 to 1.5 mm^2 (single-coil) can be clamped with a wire end ferrule.

Screw-type terminal (SIGUT[®] terminal)

The 3RP10 and 3RP15 time relays are available with plus-minus Pozidriv 2 screw-type connections.

Springloaded terminal

The 3RP10 and 3RP15 time relays are available with springloaded terminals.

7.2.3 Special features

Operating temperature

There are no restrictions on the control supply voltage, switching current, or duty cycle for operation between -25 °C to $+60 \text{ °C}$.

Time ranges

There are up to 15 time settings, ranging from 0.05 s to 100 hr. The 3RP15 has additional time settings between the decade scales (1/10/100 s/min/h) that make high setting accuracy possible.

Wide-range voltage

There are multifunctional relays with a wide voltage range of 24 VAC/VDC to 240 VAC/VDC.

Electrical service life

The electrical service life with contactor load (e.g. 3RT1016 contactor) is 10 million operating cycles.

The electrical service life at AC voltage of 230 V, utilization category AC-15/3 A, and at DC voltage, utilization category DC-13/1 A, is 100,000 operating cycles.

Start contact

In the case of functions that require a continuous auxiliary supply to terminals A1/A2 and A3/A2, the time function can be started by a control supply voltage to terminal B1 or B3.

7.2.4 Notes on configuration

The following specifications must be complied with to ensure error-free operation of the solid-state time relays:

Start input

Only apply the control supply voltage from start input B1 or B3 once the supply voltage has already been applied to A1/A2 or A3/A2.

Identical potential

Identical potential must be applied to terminals A1 and B1 or A3 and B3.

Combination voltage

In the case of combination voltage types, only one voltage range can be connected. Never apply the two control supply voltages simultaneously.

Parallel load at the start contact

The start contact is under voltage and rectified. There is a connection in the time relay to the A1 and A2 terminals. The control of loads parallel to the start input is therefore not permissible at AC 50/60 Hz control supply voltage.

The following information facilitates configuration of SIMIREL 3RP time relays:

Combination/wide-range voltages

80% of the time relay types are combination and wide-range voltage types because they are flexible in their uses:

- Combination voltage: two operating voltage ranges (e.g. 24 VAC/VDC and 200 to 240 VAC) at different terminals
- Wide-range voltage: one operating voltage range from 24 VAC/VDC to 240 VAC/VDC at the same terminals

Two-wire time relay

Two-wire time relays have the following advantages over conventional time relays in connection with contactors:

- Reduced wiring
- Bounce-free control
- The electronic output increases service life because no mechanical wear occurs.
- Greater switching frequency

Special functions

- Pulsing function: pulse and idle time can be set separately.
- Flashing: the pulse/break ratio is 1:1.
- The timing period starts with the "off-delay without auxiliary supply" function if the time relay is separated from the supply voltage.
- In the case of the 3RP15 time relay with 15 selectable time settings, there is a ∞ switch position. This means an endless timing period. If this setting is chosen for the on-delay function, the output relay never switches through after the supply voltage has been applied (off function). In the case of the "making pulse contact" function, the output relay always remains on (on function). This can be used for test purposes.
- In the case of the "additive on-delay with auxiliary supply" function, the time is added for as long as the start contact is activated. If the start contact is interrupted, the timing period stops and is then continued once the start contact is closed again.
This function is not non-volatile and requires a continuous auxiliary power supply.
- In the case of the "shaping pulse contact with auxiliary supply" function, an activated start contact triggers a timing period that can be set. The control signal for this can be shorter or longer than the desired runtime.

Cable ducts

If you use cable ducts for wiring, the position and dimensions of the terminal blocks must be taken into consideration (see pages 7-27).

7.2.5 Explanation of terms**Setting accuracy**

Setting accuracy is the accuracy in relation to the end value of the scale in line with the specified tolerance.

Repeatability

Repeatability describes the accuracy with which the set value can be reproduced with the specified tolerance.

7.3 Application and areas of use

7.3.1 Multifunction(3RP20 05 solid-state time relay)

The time relay contains one or two SPDT contacts.

Operating time adjustment

15 time ranges can be set by means of a rotary switch. The desired runtime can be set accurately by means of a potentiometer (rotary switch for fine adjustment).

Important

Changes to the time range are only effective if they are made in a deenergized state.

Example

You want to set a duration of 5 seconds:

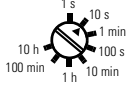
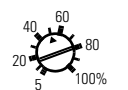
Step	Procedure
1	 <p>Rotate the time range selector switch to 10 s. This means runtimes of up to 10 seconds can be set.</p>
2	 <p>Rotate the potentiometer to 50 % for fine adjustment. In other words, 50 % (= 5 seconds) of the maximum value (10 seconds) is set.</p>

Table 7-1: 3RP20 05 (multifunctional) operating time adjustment)

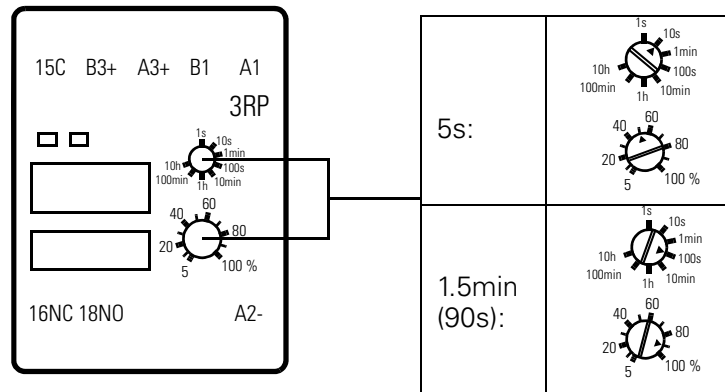


Fig. 7-3: 3RP20 05 (multifunctional) operating time adjustment

Functions

You can select 8 different functions with the integrated function setting dial.

Important

Changes to the function are only effective if they are made in a deenergized state.

Function diagrams

The label set, for labeling the set function on the solid state time relay 3RP2005- .A, contains the functions shown in the following table:

Function	Circuit diagram	Function diagram
1 SPDT		
On-delay		
Off-delay with auxiliary supply		
On-delay and off-delay with auxiliary supply (t = tan = tab)		
Flashing, start with break (pulse/break 1:1)		
passing make contact		
Breaking pulse contact with auxiliary supply		
Pulse shaping contact with auxiliary supply		
additive ON-delay with auxiliary voltage		

Table 7-2: 3RP20 05-. A (multifunctional) circuit diagrams and function diagrams

The label set, for labeling the set function on the solid state time relay 3RP2005- .B, contains the functions shown in the following table:

Function	Circuit diagram	Function diagram
2 SPDT		
ON-delay		
ON-delay and instantaneous contact		
OFF-delay with auxiliary voltage		
OFF-delay with auxiliary voltage and instantaneous contact		
ON-delay and OFF-delay with auxiliary voltage ($t = t_{an} = t_{ab}$)		
ON-delay and OFF-delay with auxiliary voltage and instantaneous contact ($t = t_{an} = t_{ab}$)		
flashing, start with break (pulse/break 1:1)		
flashing, start with break (pulse/break 1:1) and instantaneous contact		

Function	Circuit diagram	Function diagram
passing make contact		
passing make contact and instantaneous contact		
passing break contact with auxiliary voltage		
passing break contact with auxiliary voltage and instantaneous contact		
Pulse shaping with auxiliary voltage (creates a pulse at the output irrespective of the length of excitation)		
Pulse shaping with auxiliary voltage and instantaneous contact (creates a pulse at the output irrespective of the length of excitation)		
additive ON-delay with auxiliary voltage and instantaneous contact		
Wye-delta function		

Table 7-3: 3RP20 05-B (multifunctional) circuit diagrams and function diagrams

Important

The same potential must be applied to terminals A and B.

A./A2 ≙ A1/A2 or A3/A2, depending on the voltage level connected
 B./A2 ≙ B1/A2 or B3/A2, depending on the voltage level connected

7.3.2 Multifunctional (3RP15 05 solid-state time relay)

Operating time adjustment

Fifteen time ranges can be set using a rotary switch, ensuring very precise adjustment. The set time range is displayed in a window next to the rotary switch.

The desired runtime can be set accurately by means of a potentiometer (rotary switch for fine adjustment).

In the time range position ∞ the function is executed with an endless time period. This means, for example, that the output relay never switches through when "on-delay" is set and the supply voltage is applied or that the output relay remains continuously on when "making pulse contact" is set.

Important

Changes to the time range are only effective if they are made in a deenergized state.

Example

You want to set a 90 second period:


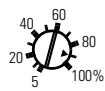
Step	Procedure
1	 Rotate the time range selector switch until 100 s appears in the adjacent window. This means runtimes of up to 100 seconds can be set.
2	 Rotate the potentiometer to 90 %. In other words 90 % (= 90 seconds) of the maximum value (= 100 seconds) is set.

Table 7-4: 3RP15 05 (multifunctional) operating time adjustment

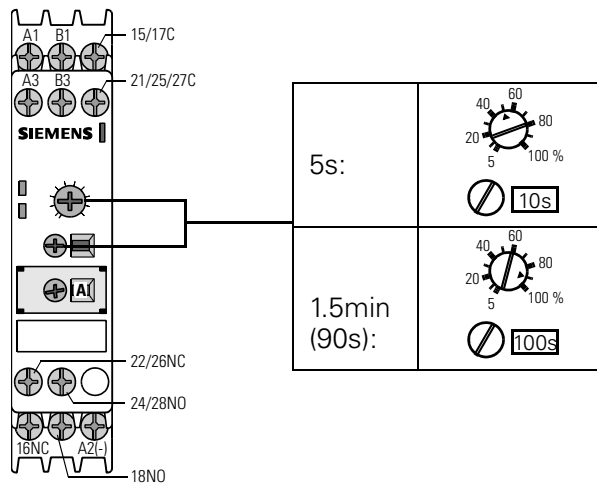


Fig. 7-4: 3RP15 05 (multifunctional) operating time adjustment

Functions

The following can be set by means of a rotary switch.

- Time relay with 1 changeover contact: 8 functions
- Time relay with 2 changeover contacts: 16 functions

Important

Changes to the function are only effective if they are made in a deenergized state.

Function setting

The function is set using a rotary switch and is indicated by an identifying letter in the adjacent window.

The set function can be labeled distinctly with an identification plate with the corresponding function diagram. At the same time, a mechanical code ensures that the correct function is set by ensuring that a label can only be clipped on if the corresponding function is set using the rotary switch.

A label set with function diagrams of all the functions that can be set for the time relay is available as an accessory.

Break the label of the set function out of the label set, and snap it firmly onto the time relay as shown in the following diagram:

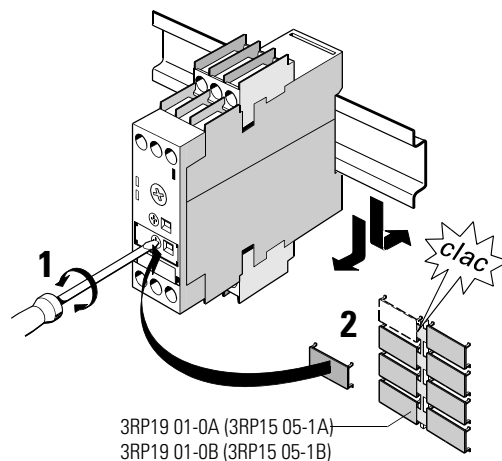


Fig. 7-5: 3RP15 05 (multifunctional) function identification

Identifying letters

The following table lists the identifying letters for the 8 or 16 functions of the solid-state multifunctional 3RP15 05 time relay:

Function	Identifying letter with time relay with 1 changeover contact	Identifying letter with time relay with 2 changeover contacts
On-delay	A	A
Off-delay with auxiliary supply	B	B
On-delay and off-delay with auxiliary supply	C	C
Flashing, start with break	D	D
Making pulse contact	E	E
Breaking pulse contact with auxiliary supply	F	F
Shaping pulse contact with auxiliary supply	G	G
Additive on-delay with auxiliary supply (and immediate switching only H•)	H	H•
On-delay and immediate switching		A•
Off-delay with auxiliary supply		B•
On-delay and off-delay with auxiliary supply and immediate switching		C•
Flashing, start with break, and immediate switching		D•
Making pulse contact and immediate switching		E•
Breaking pulse contact with auxiliary supply and immediate switching		F•
Shaping pulse contact with auxiliary supply and immediate switching		G•
Wye-delta function		YΔ

Table 7-5: 3RP15 05 (multifunctional) assignment of the identifying letters

The • after the identifying letter indicates that the second changeover contact present reacts as an immediate switching contact (controlled by the supply voltage or the start contact depending on the function). If this • is not present, the second changeover contact reacts with a time delay like the first changeover contact.

Function diagrams
Circuit diagrams

The following table explains the 8 or 16 functions of the solid-state multi-functional 3RP15 05 time relay using circuit diagrams and function diagrams:

Identifying letter	Device circuit diagrams	Function diagram
A ON-delay		
B OFF-delay with auxiliary voltage		
C ON-delay and OFF-delay with auxiliary voltage (<math>t=t_{an}=t_{ab}</math>)		
D flashing, start with break (pulse/break 1:1)		
E passing make contact		
F passing break contact with auxiliary voltage		
G Pulse shaping with auxiliary voltage (creates a pulse at the output irrespective of the length of excitation)		
H additive ON-delay with auxiliary voltage and instantaneous contact		

Table 7-6: Function diagrams (3RP15)

Identifying letter	Device circuit diagrams	Function diagram
A• ON-delay and instantaneous contact		
B• OFF-delay with auxiliary voltage and instantaneous contact		
C• ON-delay and OFF-delay with auxiliary voltage and instantaneous contact (t=t_{an}=t_{ab})		
D• flashing, start with break (pulse/break 1:1) and instantaneous contact		
E• passing make contact and instantaneous contact		
F• passing break contact with auxiliary voltage and instantaneous contact		
G• Pulse shaping with auxiliary voltage and instantaneous contact (creates a pulse at the output irrespective of the length of excitation)		
$\Upsilon\Delta$ Wye-delta function		

Table 7-6: Function diagrams (3RP15)

* Only with devices with 2 changeover contacts

7.3.3 On-delay

3RP20 25 solid-state time relay

The time relay contains 1 changeover contact.

Time ranges

15 time ranges can be set by means of a rotary switch.

Important

Changes to the time range are only effective if they are made in a deenergized state.

Function diagram

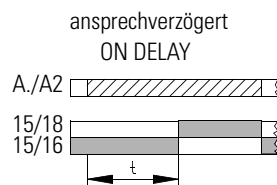


Fig. 7-6: 3RP20 25 function diagram

The 3RP15 11/12/13 solid-state time relay

The time relay contains 1 changeover contact.

Time ranges

Fixed time ranges are offered: 10 s, 30 s, 100 s

Function diagram

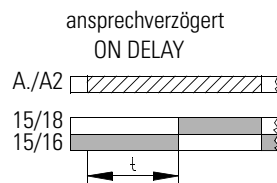


Fig. 7-7: 3RP15 1. function diagram

The 3RP15 25 solid-state time relay

The time relay is available with either 1 or 2 changeover contacts.

Time ranges

Fifteen time ranges can be set by means of a rotary switch.

Important

Changes to the time range are only effective if they are made in a deenergized state.

Function diagrams

The function diagram for the time relay with 1 changeover contact and with 2 changeover contacts:

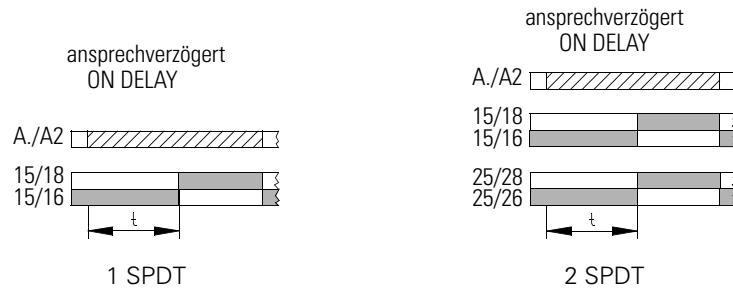


Fig. 7-8: 3RP15 25 function diagram

The 3RP15 27 solid-state time relay (two-wire time relay)

The two-wire time relay is connected in series with the load. The timing period begins after the control supply voltage has been applied. The semiconductor output then becomes live, and voltage is applied to the load. Four time ranges can be set by means of a rotary switch.

Time ranges

Important

Attention must be paid to the rated operational current, residual current with unswitched output, and voltage drop in the case of a switched output.

Function diagram

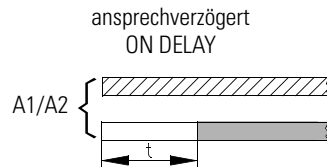


Fig. 7-9: 3RP15 27 Funktionsdiagramm

7.3.4 Off-delay

The 3RP15 31/32/33 solid-state time relay with auxiliary supply

The time relay contains 1 changeover contact.

Time ranges

Fixed time ranges are offered: 10 s, 30 s, 100 s

Function diagram

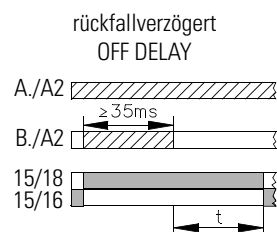


Fig. 7-10: 3RP15 31. function diagram

There is continuous auxiliary voltage (A./A2) at the time relay. If a control supply voltage is applied to the start contact, the output relay switches over. After the start contact is disconnected, the set runtime starts. The minimum on-time of ≥ 35 ms must be adhered to.

The 3RP15 40 solid-state time relay without auxiliary supply

The time relay is available with either 1 or 2 changeover contacts.

Time ranges

Seven time ranges can be set by means of a rotary switch. Times ranging from 0.05 to 100 s are possible.

Important

Changes to the time range are only effective if they are made in a deenergized state.

Function diagrams

The function diagram for the time relay with 1 changeover contact and with 2 changeover contacts::

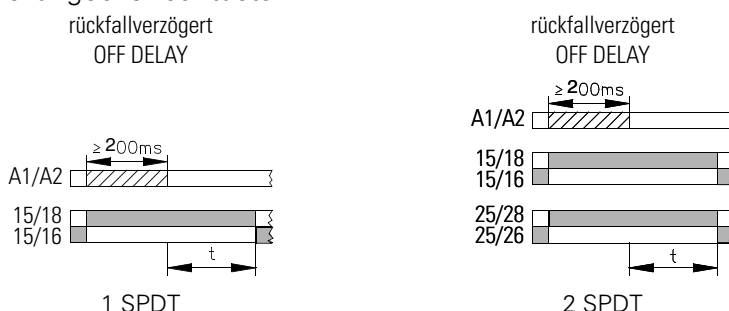


Fig. 7-11: 3RP15 40 Funktionsdiagramm

Mode of operation

When the rated control supply voltage is applied, the time relay switches over. After the rated control supply voltage has been disconnected, the run-time t starts. After t has finished, the relay switches back to the quiet state. If the minimum on-time is not adhered to, it is ensured that either the timing period will not start or that a started timing period will always be properly completed.

Intermediate states in the function process, such as the relay getting stuck, are successfully prevented.

7.3.5 Clock pulse generator (3RP15 55 solid-state time relay)

Description

The idle time and the pulse time of the clock pulse generator and the time ranges must be set separately.

The pulsing function begins with the break.

The time relay contains a changeover contact.

Time ranges

Fifteen time ranges can be set by means of a rotary switch.

Important

Changes to the time range are only effective if they are made in a deenergized state. A pulse, for example, can be output cyclically for 1 second after a break of 1 hour.

Function diagram

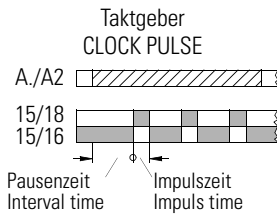


Fig. 7-12: 3RP15 55 function diagram

7.3.6 Wye-delta function (3RP15 74/76 solid-state time relay)

Description

The instantaneous star contact and the time-delayed delta contact have a shared contact root. To avoid phase short circuits, the switch-over break from star to delta is 50 ms.

Time ranges

The time relay offers a fixed time range: 20 s, 60 s

Function diagram

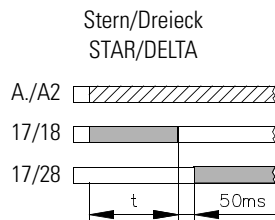


Fig. 7-13: 3RP15 7. function diagram

7.3.7 Wye-delta function with overtravel (3RP15 60 solid-state time relay)

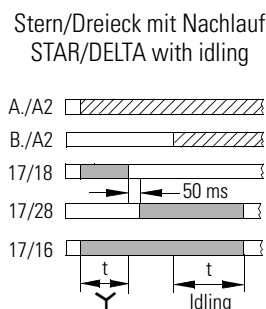
Description

Supply voltage is applied to A./A2 and there is no control signal at B./A2. This starts the $\Upsilon\Delta$ timing period. By applying the control signal to B./A2, the idling time (overtravel time) is started. When the set time t_{idling} (30 s to 600 s) is completed, the output relays (17/16 and 17/28) are reset. If the control signal is switched off at B./A2 (minimum off-time 270 ms), a new timing period is started.

Time ranges

Star-delta time 1 s to 20 s
Overtravel time: 30 s to 600 s

Function diagram



7.4 Accessories

7.4.1 Accessories for 3RP15 05, 3RP20 05

Label Sets

Two label sets are available to the 3RP15 05 and 3RP20 05 solid-state time relay, multifunction device for labeling, depending on the version (8 functions with 1 changeover contact, 16 functions with 2 changeover contacts):

- 3RP19 01-0A for the 3RP15 05-1A, 3RP20 05-.A, electronic relays, 1 SPDT
- 3RP19 01-0B for the 3RP15 05-1B, 3RP20 05-.B, electronic relays, 2 SPDT

The following table shows you how to set the function on the time relay and put on the label:

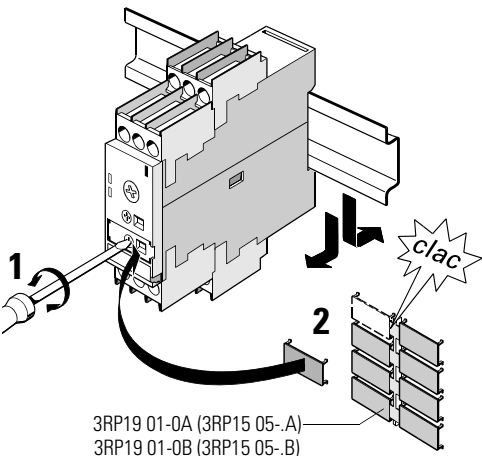
Illustration	Step	Procedure
 <p data-bbox="544 1249 778 1299">3RP19 01-0A (3RP15 05-.A) 3RP19 01-0B (3RP15 05-.B)</p>	1	The desired function is set on the potentiometer of the time relay using a screwdriver.
	2	The corresponding label identifying the set function is clipped on.

Table 7-7: Label set (3RP15, 3RP20 05)

Sealable cover

All 3RP15 solid-state time relays can be secured against unauthorized adjustment by means of a sealable cover (3RP19 02). The following table and illustration explain how to do this:

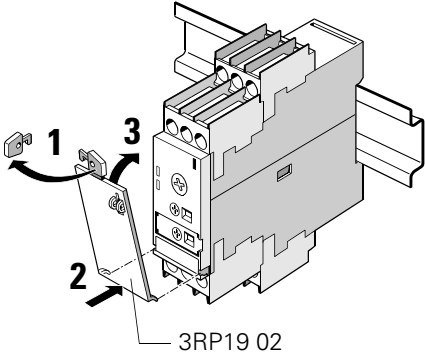
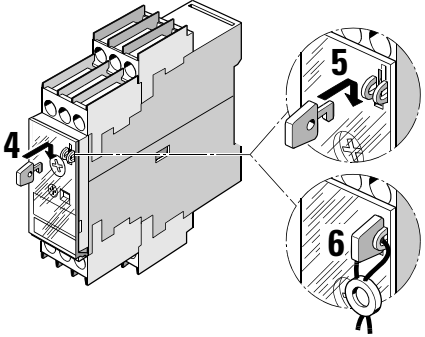
Illustration	Step	Procedure
	1	Break off the key for interlocking from the upper edge of the cover.
	2	Use the hook to put the cover in the openings to the side of the device identification label.
	3	Move the cover toward the time relay.
	4	Hook the key onto the time relay through the slit in the cover to attach the cover to the time relay.
	5/6	Pull the seal through the opening of the key.

Table 7-8: Sealable cover

Push-in lugs for screw-type attachment

Push-in lugs (3RP19 03) are available for panel mounting:

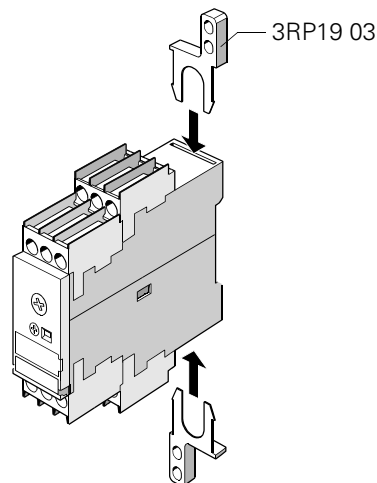


Fig. 7-14: Panel mounting

7.5 Mounting and connection

7.5.1 Mounting

DIN rail mounting

3RP20

The 3RP20 time relays can be snapped onto the 35 mm DIN rails and removed without tools in acc. with EN 50 022. Place the time relay on the upper edge of the rail, and press it downward until it snaps onto the lower edge of the rail. To remove the time relay, press it downward to release the tension of the spring, and the time relay can be removed..

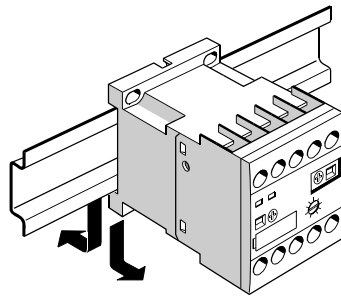


Fig. 7-15: 3RP20:mounting on and removal from a 35 mm rail

Panel mounting

The following is required for panel mounting of the 3RP20 time relay:

- 2 M4 screws, diagonal
- Maximum tightening torque of 10.5 Nm
- Washers and spring lock washers must always be used
- The distance to grounded parts at the side must be more than 6 mm

DIN rail mounting

3RP15

The 3RP15 time relays can be snapped onto the 35 mm DIN rails and removed without tools in acc. with EN 50 022. Place the time relay on the upper edge of the rail, and press it downward until it snaps onto the lower edge of the rail. To remove the time relay, press it downward to release the tension of the spring, and the time relay can be removed.

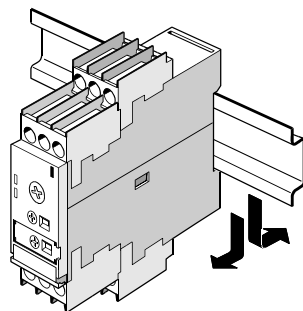


Fig. 7-16: DIN rail mounting

Panel mounting

Panel mounting is possible by means of push-in lugs for M4 screws (application, see under Section 7.4 Accessories)

7.5.2 Connection

The 3RP20 solid-state time relays are available with SIGUT® terminals with plus/minus Pozidriv 2 screws and also with Cage Clamp terminals.

The 3RP15 solid-state time relays are available:

- With SIGUT® terminals with plus/minus Pozidriv 2 screws
- With Cage Clamp terminals

Conductor cross-sections

The following table lists the permissible conductor cross-sections for the 3RP1 solid-state time relays. The specifications apply to control and load current connections.

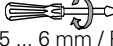



	3RP20.5-1	3RP20.5-2 (springloaded terminal)	3RP15	3RP15..-2 (springloaded terminal)
 Ø 5 ... 6 mm / PZ2	0.8 to 1.2 Nm 7 to 10.3 lb·in	—	0.8 to 1.2 Nm 7 to 10.3 lb·in	—
	2 x (0.5 to 1.5 mm ²) 2 x (0.75 to 4 mm ²)	2 x (0.25 to 2.5 mm ²)	1 x (0.5 to 4 mm ²) 2 x (0.5 to 2.5 mm ²)	2 x (0.25 to 1.5 mm ²)
	2 x (0.5 to 2.5 mm ²)	2 x (0.25 to 1 mm ²)	1 x (0.5 to 2.5 mm ²) 2 x (0.5 to 1.5 mm ²)	2 x (0.25 to 1 mm ²)
	—	2 x (0.25 to 1.5 mm ²)	—	2 x (0.25 to 1.5 mm ²)
AWG	2 x (18 to 14)	2 x (24 to 14)	2 x (20 to 14)	2 x (24 to 16)

Table 7-9: Permissible conductor cross-sections for control and load current connections:

The following illustration shows you the springloaded terminal:

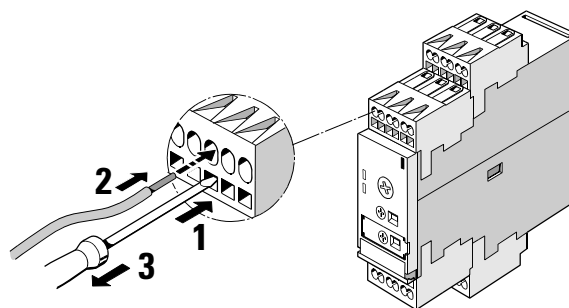
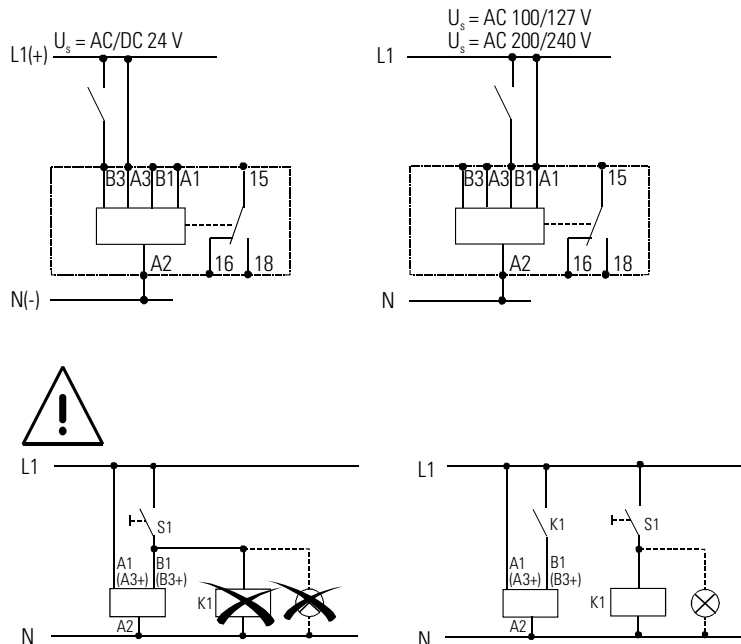


Fig. 7-17: Connection of the springloaded terminal

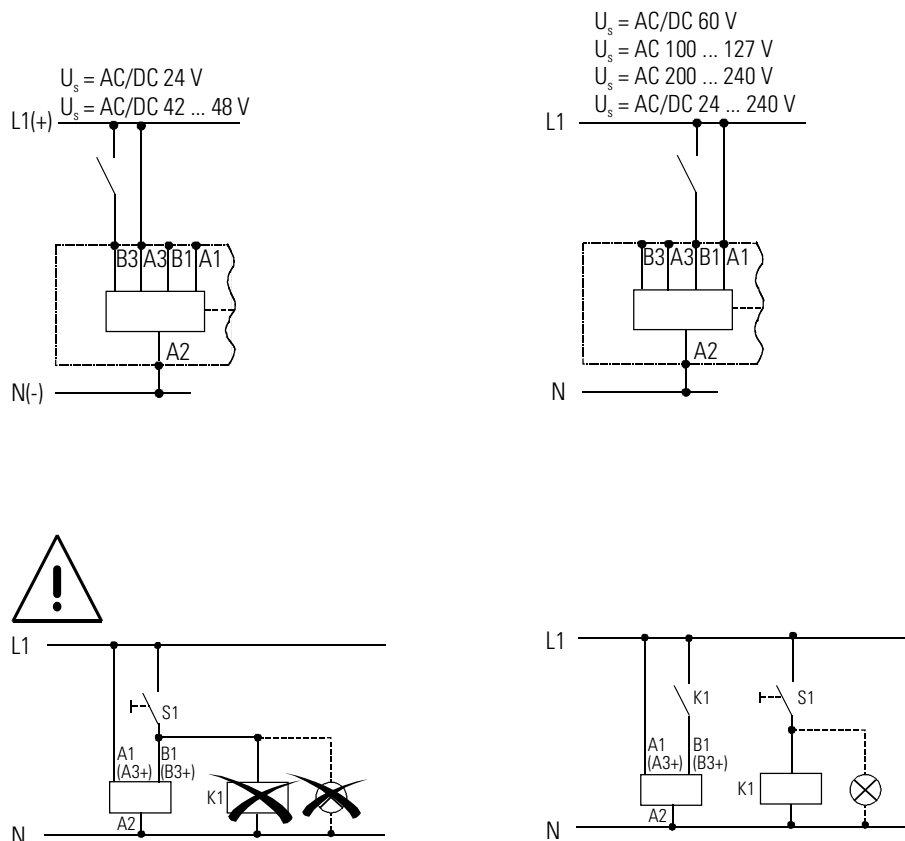
7.5.3 Circuit diagrams

3RP20



3RP20 circuit diagrams

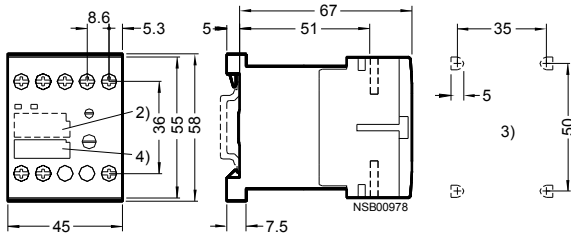
3RP15



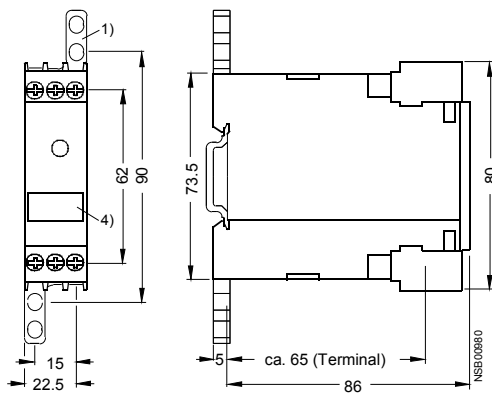
3RP15 circuit diagrams

7.6 Dimensional drawings (dimensions in mm)

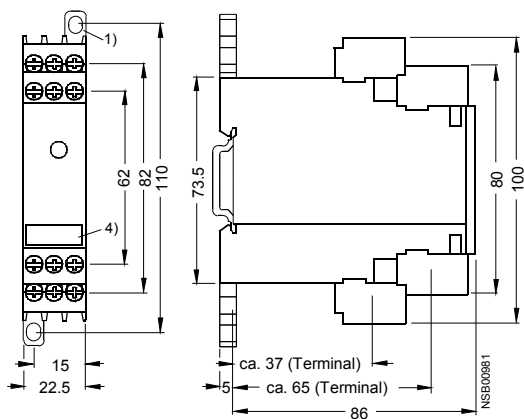
3RP1/2 time relay



3RP20



3RP15, 1 changeover contact without auxiliary supply⁵⁾, clock pulse generator, wye-delta function



3RP15 1 and 2 changeover contact devices with auxiliary supply

- 1) Push-in lug for screw-type attachment
- 3) Coding plug (with 3RP10) or identification label
- 4) Drilling pattern
- 5) Except 3RP15 05-1A.30 two-wire design
- 6) Identification label

7.7 Technical Data

Technical Data according to IEC 61812-1/DIN VDE 0435 part 2021

Type		3RP20 05	3RP15 05	3RP15 11	3RP15 40	3RP15 60	3RP15 74	3RP15 27
		3RP20 25	3RP15 31	3RP15 12			3RP15 76	
			3RP15 32	3RP15 13				
			3RP15 33	3RP15 25				
				3RP15 55				
Rated insulation voltage	AC V	300; 500 with 3RP1505-1BT20						
Pollution degree 3 Overvoltage category III in acc. with DIN VDE 0110								
Excitation operating range ¹⁾		0.85 to 1.1 × U_N with AC; 0.8 to 1.25 × U_N with DC 0.95 to 1.05 times the rated frequency						
Rated power	W	1	2	2	2	2	2	1
Power input at 230 VAC, 50 Hz	VA	4	6	6	2 ²⁾	6	6	1
Rated operational currents I_e								
AC-15 at 230 VAC, 50 Hz	A	3 ³⁾						—
AC-14; DC-13		—						0.01 to 0.6
DC-13 at 24 V		1						—
DC-13 at 48 V		0.45						—
DC-13 at 60 V		0.35						—
DC-13 at 110 V		0.2						—
DC-13 at 230 V		0.1						—
DIAZED fuse ⁴⁾								
Performance class	gL/Gg	A	4				—	
Switching frequency								
• Loaded with I_e 230 VAC	1/h	2500						5000
• Loaded with 3RT10 16 contactor, 230 VAC	1/h	5000						5000
Recovery time	ms	150 ⁵⁾				300	150	50
Minimum on-time	ms	35	35 ⁶⁾		—	200 ⁷⁾	—	—
Residual current	mA	—						≤ 5
With output not switched through								
Voltage drop	V	—						≤ 3.5
Switched through								
Short-term current-carrying capacity	A	—						10 (to 10 ms)
Setting accuracy		typisch ±5 %						
Related to the end of scale value								
Repeatability		≤ ±1 %						
Mechanical service life	Operating cycles	30 × 10 ⁶						100 × 10 ⁶
Permissible ambient temperature	In operation	°C -25 to +60						
	During storage	°C -40 to +85						
Degree of protection		IP40 Deckel						
In acc. with EN 60 529								
		IP20 Klemmen						
Shock resistance	g/ms	15/11						
Half-sine in acc. with IEC 60 068-2-27								
Vibration resistance in acc. with IEC 60 068-2-6	Hz/mm	10-55 / 0.35						
EMC tests		IEC 61 000-6-2 / EN 50 081-1						
In acc. with the basic specification								

1) If not specified otherwise

2) Maximum making current peak 1 A/100 ms

3) With 3RP15 05-R: NC contact → $I_e = 1$ A

4) Without any welding in acc. with IEC 60 947-5-1.

5) With 3RP15 05-.BW30/ .AVW30/ .RWV30 and 3RP15 25-.BW30 voltage-dependent 10 to 250 ms.

6) Minimum on-time with 3RP15 00-. BW30 150 ms until instantaneous contact is switched.

7) Adhere to minimum on-time for problem-free functioning.