Timing Relays

Overview

3RP15 and 3RP20 function table

Function chart legend:
- ▨ Timing relay energized
- ▩ Contact closed
- ☐ Contact open

Function	Function chart	3RP20 05-..A	3RP20 25	3RP15 05-..A 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 7.
1 CO												
With ON-delay	A1/A2, 15/18, 15/16, t (NSB00858)	■	■	■	A	■	■					
OFF-delay with auxiliary voltage	A1/A2 ≥ 35 ms, B1/A2, 15/18, 15/16, t (NSB00859)	■		■	B[1]				■			
OFF-delay without auxiliary voltage *Observe minimum ON period for correct operation. For 3RP15 40-..W31: U_s 24 to 40 V AC/DC: 400 ms and U_s > 40 to 240 V AC/DC: 200 ms.*	≥ 200 ms, A1/A2, 15/18, 15/16, t (NSB0_00860a)									■		
ON-delay and OFF-delay with auxiliary voltage ($t = t_{on} = t_{off}$)	A1/A2, B1/A2, 15/18, 15/16, t, t (NSB00861)	■		■	C[1]							
Flashing, starting with interval (pulse/interval 1:1)	A1/A2, 15/18, 15/16, t, t (NSB00862)	■		■	D							
Clock-pulse, starting with interval (dead time, pulse time, and time setting ranges each separately adjustable)	A1/A2, 15/18, 15/16, Interval, Pulse period (NSB00863)										■	
Passing make contact	A1/A2, 15/18, 15/16, t (NSB00864)	■		■	E							
Passing break contact with auxiliary voltage	A1/A2 ≥ 35 ms, B1/A2, 15/18, 15/16, t (NSB00865)	■		■	F[1]							
Pulse-forming with auxiliary voltage (pulse generation at the output does not depend on duration of energizing)	A1/A2 ≥35 ms, B1/A2, 15/18, 15/16, t (NSB00867)	■		■	G[1]							
Additive ON-delay with auxiliary voltage	A1/A2 t₁ t₂ t₃, B1/A2, 15/18, 15/16, Σ t (NSB00868)	■		■	H[1]							
1 NO contact (semiconductor)												
ON-delay The two-wire timing relay is connected in series with the load. Timing begins after application of the exciting voltage. The semiconductor output then becomes conducting, and the load is under power.	A1/A2, t (NSB00869a)							■				

[1] Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero. This does not apply to G, G● and H, H●, which are not retriggerable.
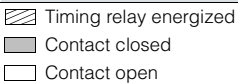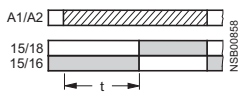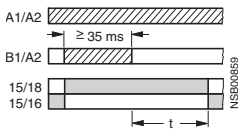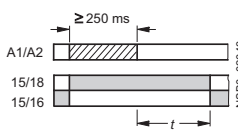
■ Function is possible

Timing Relays

General data

Legend for function chart:
- ▨ Timing relay energized
- ▦ Contact closed
- ☐ Contact open

■ = Function is possible

Function	Function chart	3RP20 05-.B	3RP20 25	3RP15 05-.B / 3RP19 01-0B	3RP15 05-.R / 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.
2 CO														
With ON-delay	A1/A2, 15/18, 15/16, 25/28, 25/26 (NSB00871)	■		■	■	A	■							
ON-delay and instantaneous contact	A1/A2, 15/18, 15/16, 21/24, 21/22 (NSB00872)	■		■		A●								
OFF-delay with auxiliary voltage	A1/A2, ≥ 35 ms, B1/A2, 15/18, 15/16, 25/28, 25/26 (NSB00873)	■		■	■	B[1]								
OFF-delay with auxiliary voltage and instantaneous contact	A1/A2, ≥35ms, B1/A2, 15/18, 15/16, 21/24, 21/22 (NSB00874)	■		■		B[1]								
OFF-delay without auxiliary voltage	≥200 ms, A1/A2, 15/18, 15/16, 25/28, 25/26 (NSB0_00875a)										■			
ON-delay and OFF-delay with auxiliary voltage ($t = t_{on} = t_{off}$)	A1/A2, B1/A2, 15/18, 15/16, 25/28, 25/26 (NSB00876)	■		■	■	C[1]								
ON-delay and OFF-delay with auxiliary voltage and instantaneous contact ($t = t_{on} = t_{off}$)	A1/A2, B1/A2, 15/18, 15/16, 21/24, 21/22 (NSB00877)	■		■		C●[1]								
Flashing, starting with interval (pulse/interval 1:1)	A1/A2, 15/18, 15/16, 25/28, 25/26 (NSB00878)	■		■	■	D								
Flashing, starting with interval (pulse/interval 1:1) and instantaneous contacts	A1/A2, 15/18, 15/16, 21/24, 21/22 (NSB00879)	■		■		D●								
Passing make contact	A1/A2, 15/18, 15/16, 25/28, 25/26 (NSB00880)	■		■	■	E								
Passing make contact and instantaneous contact	A1/A2, 15/18, 15/16, 21/24, 21/22 (NSB00881)	■		■		E●								

Timing Relays

General data

Function	Function chart	3RP20 timing relay and 3RP19 01 label set		3RP15 timing relay and 3RP19 01 label set										
		3RP20 05-.B	3RP20 25	3RP15 05-.B / 3RP19 01-0B	3RP15 05-.R / 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.

Legend: ▨ Timing relay energized   ▨ Contact closed   ▭ Contact open

2 CO

Function	Function chart	3RP20 05-.B	3RP20 25	3RP15 05-.B / 3RP19 01-0B	3RP15 05-.R / 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.
Passing break contact with auxiliary voltage		■		■	■	F[1]								
Passing break contact with auxiliary voltage and instantaneous contact		■		■		F●[1]								
Pulse-forming with auxiliary voltage (pulse generation at the output does not depend on duration of energizing)		■		■	■	G[1]								
Pulse-forming with auxiliary voltage and instantaneous contact) (pulse generation at the output does not depend on duration of energizing)		■		■		G●[1]								
Additive ON-delay with auxiliary voltage					■	H[1]								
Additive ON-delay with auxiliary voltage and instantaneous contact		■		■		H●[1]								
Wye-delta function		■		■		Y∆								

2 NO

Function	Function chart	3RP20 05-.B	3RP20 25	3RP15 05-.B / 3RP19 01-0B	3RP15 05-.R / 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.
Wye-delta function Y∆														■

3 NO

Function	Function chart	3RP20 05-.B	3RP20 25	3RP15 05-.B / 3RP19 01-0B	3RP15 05-.R / 3RP19 01-0A	Identification letter	3RP15 1.	3RP15 25	3RP15 27	3RP15 3.	3RP15 40	3RP15 55	3RP15 60	3RP15 7.
Wye-delta function with overtravel function[2] (idling)													■	

[1] Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero. This does not apply to G, G● and H, H●, which are not retriggerable.
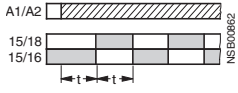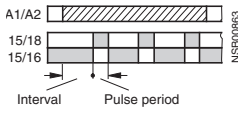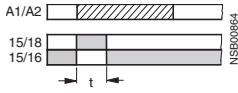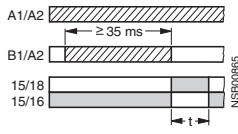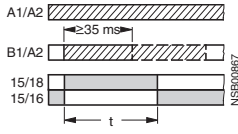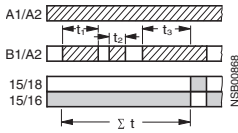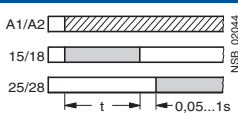
■ Function is possible

Timing Relays

General data
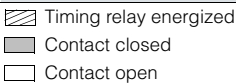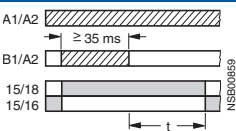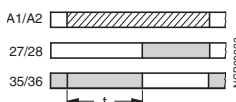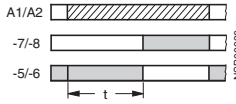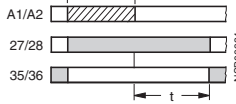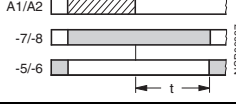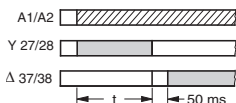
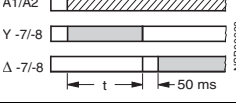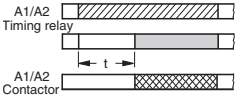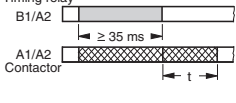### 7PV15 function table

Function	Function chart	7PV15 08	Identification letter	7PV15 12 / 7PV15 13 / 7PV15 18	7PV15 38	7PV15 40	7PV15 58	7PV15 78
	▨ Timing relay energized / ▨ Contact closed / ☐ Contact open							
1 CO								
With ON-delay		■	A	■				
OFF-delay with auxiliary voltage		■	B		■			
OFF-delay without auxiliary voltage						■		
Flashing, starting with interval (pulse/interval 1:1)		■	C					
Clock-pulse, starting with interval (dead time, pulse time, and time setting ranges each separately adjustable)							■	
Passing make contact		■	D					
Passing break contact with auxiliary voltage		■	E					
Pulse-forming with auxiliary voltage (pulse generation at the output does not depend on duration of energizing)		■	F					
Additive ON-delay with auxiliary voltage		■	G					
2 CO								
Wye-delta function								■

Note:
With the 7PV15 08 multifunction relay the identification letters A to G are printed on the front alongside the rotary selector switch. The related function can be found in the form of a bar graph on the side of the device.

Timing Relays

Function table 3RT19 16, 3RT19 26

Function	Function chart	3RT19 16-2C	3RT19 16-2D	3RP19 16-2E	3RT19 16-2F	3RT19 16-2G	3RT19 16-2L	3RT19 26-2C	3RT19 26-2D	3RT19 26-2E	3RT19 26-2F	3RT19 26-2G
	▨ Timing relay energized — Contact closed — Contact open											
1 CO												
OFF-delay with auxiliary voltage (varistor integrated)	A1/A2 ≥ 35 ms; B1/A2; 15/18; 15/16; t (NSB00859)						■					
1 NO + 1 NC												
ON-delay (varistor integrated)	A1/A2; 27/28; 35/36; t (NSB00933)			■								
With ON-delay	A1/A2; -7/8; -5/6; t (NSB00936)									■		
OFF-delay without auxiliary voltage (varistor integrated)	≥ 200 ms; A1/A2; 27/28; 35/36; t (NSB00934)					■						
OFF-delay without auxiliary voltage	≥ 200 ms; A1/A2; -7/8; -5/6; t (NSB00937)										■	
2 NO												
Wye-delta function (varistor integrated) 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)	A1/A2; Y 27/28; Δ 37/38; t; 50 ms (NSB00935)						■					
Wye-delta function 1 NO delayed, 1 NO instantaneous, dead time 50 ms (varistor integrated)	A1/A2; Y -7/-8; Δ -7/-8; t; 50 ms (NSB00938)											■
1 NO contact (semiconductor)												
ON-delay Two-wire design (varistor integrated)	A1/A2 Timing relay; t; A1/A2 Contactor (NSB00939a)	■						■				
OFF-delay with auxiliary voltage (varistor integrated)	A1/A2 Timing relay; B1/A2; ≥ 35 ms; A1/A2 Contactor; t (NSB00940a)		■						■			

■ Function is possible

Timing Relays

General data

3RP15 function table

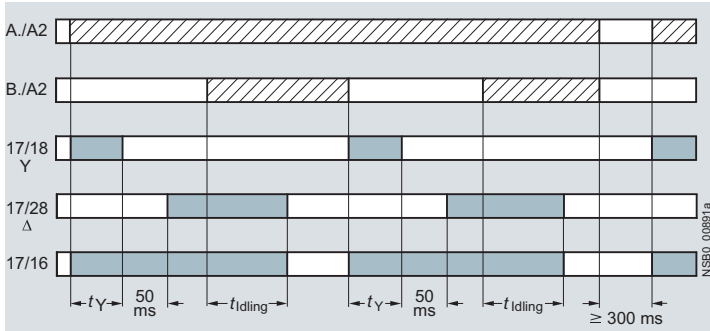| Possibilities of operation of the 3RP15 60-1S.30 timing relay |
|---|

▨ Timing relay energized

▇ Contact closed

▭ Contact open

t_Y = Star time 1 ... 20 s

t_{Idling} = Idling time (coasting time) 30 ... 600 s

Operation 1

Operation 2

Operation 3

Operation 4

Operation 1:
Start contact B./A2 is open when control supply voltage A./A2 is applied.

The control supply voltage is applied to A./A2 and there is no control signal on B./A2. This starts the Y∆ timing. The idling time (coasting time) is started by applying a control signal to B./A2. When the set time t_{Idling} (30 ... 600 s) has elapsed, the output relays (17/16 and 17/28) are reset. If the control signal on B./A2 is switched off (minimum OFF period 270 ms), a new timing is started.

Comments:

Observe response time (dead time) of 400 ms on energizing control supply voltage until contacts 17/18 and 17/16 close.

Operation 2:
Start contact B./A2 is closed when control supply voltage A./A2 is applied.

If the control signal B./A2 is already present when the supply voltage A./A2 is applied, **no** timing is started. The timing is only started when the control signal B./A2 is switched off.

Operation 3:
Start contact B./A2 closes while star time is running.

If the control signal B./A2 is applied again during the star time, the idling time starts and the timing is terminated normally.
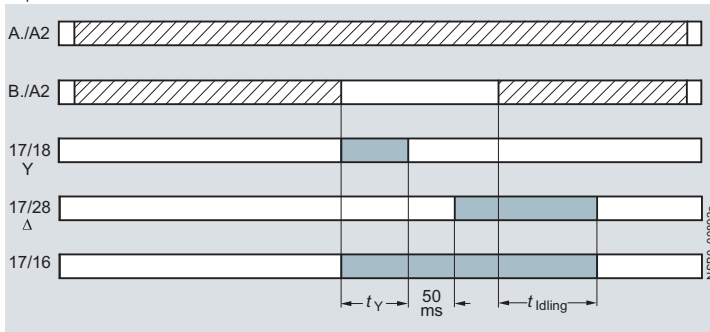
Operation 4:
Start contact B./A2 opens while delta time is running and is applied again.

If the control signal on B./A2 is applied and switched off again during the delta time, although the idling time has not yet elapsed, the idling time (coasting time) is reset to zero. If the control signal is re-applied to B./A2, the idling time is restarted.

Application example based on standard operation (operation 1): For example, use of 3RP15 60 for compressor control

Frequent starting of compressors strains the network, the machine, and the increased costs for the operator. The new timing relay prevents frequent starting at times when there is high demand for compressed air. A special control circuit prevents the compressor from being switched off immediately when the required air pressure in the tank has been reached. Instead, the valve in the intake tube is closed and the compressor runs in "Idling" mode for a specific time which can be set from 30 ... 600 s.

If the pressure falls within this time, the motor does not have to be restarted again, but can return to nominal load operation from no-load operation.

If the pressure does not fall within this idling time, the motor is switched off.

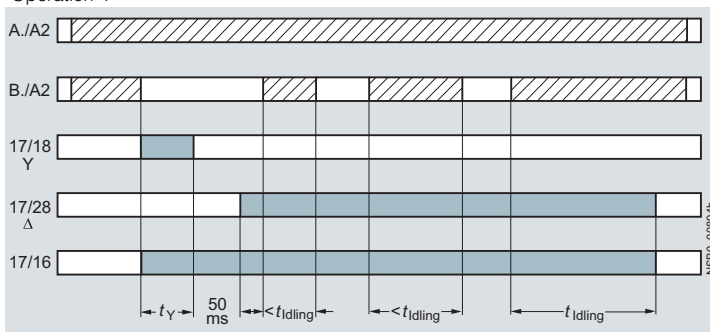The pressure switch controls the timing via B./A2.

The control supply voltage is applied to A./A2 and the start contact B./A2 is open, i. e. there is no control signal on B./A2 when the control supply voltage is applied. The pressure switch signals "too little pressure in system" and starts the timing by way of terminal B./A2. The compressor is started, enters Y∆ operation, and fills the pressure tank.

When the pressure switch signals "sufficient pressure", the control signal B./A2 is applied, the idling time (coasting time) is started, and the compressor enters no-load operation for the set period of time from 30 ... 600 s. The compressor is then switched off. The compressor is only restarted if the pressure switch responds again (low pressure).
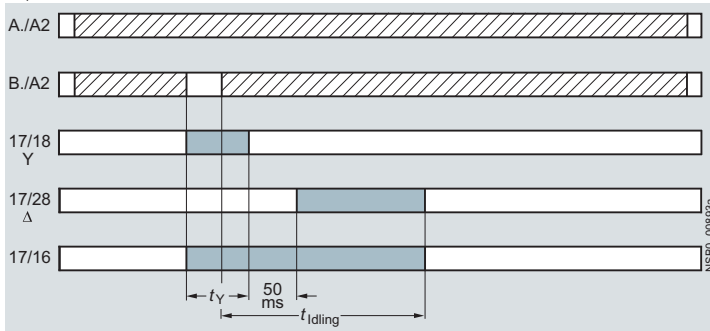
Note:
The following applies to all operations: The pressure switch controls the timing via B./A2.