

# 3RT, 3RH Contactors for Special Applications

## Contactors with Extended Operating Range $0.7 \dots 1.25 \times U_s$ , for Railway Applications

3RH21 contactor relays

### Overview

#### DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactor relays are finger-safe according to EN 50274. The size S00 contactor relays have spring-type connections for all terminals.

#### Ambient temperature

The permissible ambient temperature for operation of the contactor relays (across the full coil operating range) is  $-40$  to  $+70$  °C.

Uninterrupted duty at temperatures  $> +60$  °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

#### Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from  $0.7$  to  $1.25 \times U_s$  and are fitted as standard with suppressor diodes to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

### Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

#### Contactor relays without series resistor

##### Control and auxiliary circuits

These contactor relays have an extended operating range from  $0.7$  to  $1.25 \times U_s$ ; the solenoid coils are fitted with a suppressor diode. An additional series resistor is not required.

##### Note:

*An additional auxiliary switch block cannot be mounted.*

##### Side-by-side mounting

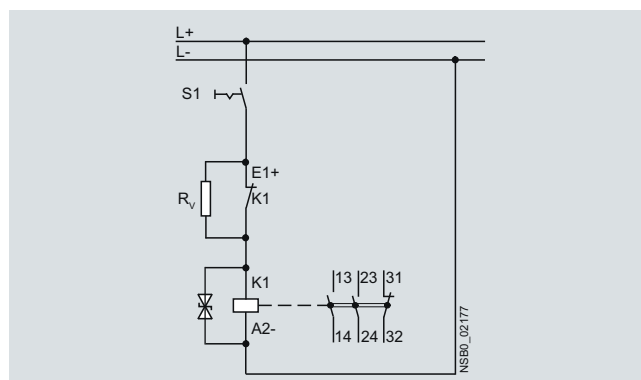
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures  $> 60$  °C  $\leq 70$  °C.

#### Contactor relays with series resistor

##### Control and auxiliary circuits

The DC solenoid systems of the contactor relays are modified (to hold-in coil) by means of a series resistor.

The size S00 contactor relays are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated.



A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

##### Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to  $70$  °C.

# 3RT, 3RH Contactors for Special Applications

## Contactors with Extended Operating Range 0.7 ... 1.25 x U<sub>s</sub>, for Railway Applications

### 3RH21 contactor relays

#### Selection and ordering data

DC operation · DC solenoid system  
 Spring-type terminals  
 For screw and snap-on mounting onto standard mounting rail  
 Solenoid coil fitted with suppressor diode



3RH21 22-2K.40



3RH21 22-2K.40-0LA0

Rated operational current I <sub>e</sub> /AC-15/AC-14 T <sub>U</sub> : 70 °C at				Contacts		Rated control supply voltage U <sub>s</sub>	Spring-type terminals	Weight approx.
230 V	400 V	500 V	690 V	Version				
A	A	A	A	NO	NC	V DC		
Order No.								kg

#### 3RH21 contactor relays

Size S00

##### Without series resistor

Terminal designations according to EN 50011

2 NO + 2 NC, identification number **22E**

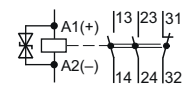


10	3	2	1	2	2 <sup>1)</sup>	24	<b>3RH21 22-2KB40</b>	0.300
						110	<b>3RH21 22-2KF40</b>	0.300

##### With series resistor

Terminal designations according to EN 50005

2 NO + 1 NC, identification number **21E**



10	3	2	1	2	1 <sup>2)</sup>	24	<b>3RH21 22-2KB40-0LA0</b>	0.300
						110	<b>3RH21 22-2KF40-0LA0</b>	0.300

1) It is not possible to mount an auxiliary switch block.  
 2) 4-pole auxiliary switch block according to EN 50005 can be mounted.

#### More information

Contactors	Type	3RH21 ..
<b>Upright mounting position</b>		
• Contactors with series resistor		Special version (on request)
• Contactors without series resistor		Special version (on request)
<b>Ambient temperature</b>		
• During operation	°C	-40 ... +70
• During storage	°C	-55 ... +80
<b>Solenoid coil operating range</b> DC		
		0.7 ... 1.25 x U <sub>s</sub>
<b>Power consumption of the solenoid coils</b>		
		For cold coil and 1.0 x U <sub>s</sub>
• Contactors with series resistor	- Closing	W 13
	- Closed	W 4
• Contactors without series resistor	- Closing	W 2.8
	- Closed	W 2.8

All specifications and technical specifications not mentioned here are identical to those of the standard contactor relays.

# 3RT, 3RH Contactors for Special Applications

## Contactors with Extended Operating Range 0.7 ... 1.25 x $U_s$ , for Railway Applications

### 3RT20 motor contactors, 7.5 ... 25 HP

#### Overview

##### DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactors are finger-safe according to EN 50274. The contactors have spring-type connections as well as screw connections. The size S00 and S0 contactors have spring-type connections for all terminals.

##### Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

##### Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 or 1.3 x  $U_s$  and are fitted as standard with suppressor diodes. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

#### Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

##### Contactors without series resistor

##### Control and auxiliary circuits

These contactors have an extended operating range from 0.7 to 1.25 x  $U_s$ ; on size S00 the coils are fitted with suppressor diodes, on size S0 with varistors. An additional series resistor is not required.

##### Note:

*An additional auxiliary switch block cannot be mounted.*

##### Side-by-side mounting

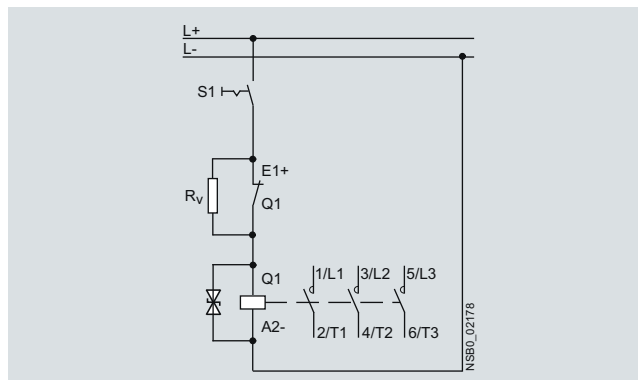
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

#### 3RT20 1. contactors with series resistor

##### Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.25 x  $U_s$  and are fitted as standard with suppressor diodes to provide protection against overvoltage.

The DC solenoid systems of the contactors are modified (to holding excitation) by means of a series resistor.



The size S00 contactors are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated. A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

A circuit diagram showing the terminals is labeled on each contactor. One NC of the auxiliary contacts is required for the series resistor function. The selection and ordering data shows the number of additional, unassigned auxiliary contacts. With size S00 it is possible to extend the number of auxiliary contacts.

##### Side-by-side mounting

At ambient temperatures up to 70 °C, the size S00 contactors and contactor relays are allowed to be mounted side by side.

#### 3RT20 2. contactors with solid-state operating mechanism, extended operating range

##### Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.3 x  $U_s$  and are fitted as standard with varistors to provide protection against overvoltage.

The contactors are energized via upstream control electronics which ensure the coil operating range of 0.7 to 1.3 x  $U_s$  at an ambient temperature of 70 °C. They are supplied as complete units with integrated coil electronics. A varistor is integrated for damping opening surges in the coil.

The mounting possibilities for auxiliary switches correspond to those of the standard contactors for switching motors in the matching size (see page 3/6).

##### Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C for these contactor versions in size S0.

# 3RT, 3RH Contactors for Special Applications

## Contactors with Extended Operating Range 0.7 ... 1.25 x $U_s$ , for Railway Applications

### 3RT20 motor contactors, 7.5 ... 25 HP

#### Selection and ordering data

DC operation · DC solenoid system  
 Spring-type terminals  
 For screw and snap-on mounting onto standard mounting rail  
 Solenoid coil fitted with suppressor diode (S00)



3RT20 1.-2K.4.



3RT20 1.-2K.42-0LA0

Rated data		Auxiliary contacts		Rated control supply voltage $U_s$	Spring-type terminals	Weight approx.
AC-3	Operational current $I_e$ at	Ident. No.	Version			
400 V	200 V 230 V <b>460 V</b> 575 V			V DC		
A	HP HP <b>HP</b> HP		NO NC			kg

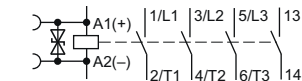
#### 3RT20 contactors for switching motors

Size S00

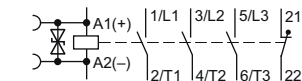
Without series resistor<sup>4)</sup>

Terminal designations according to EN 50012 or EN 50005

- 1 NO, identification number **10E**

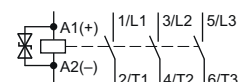


- 1 NC, identification number **01**



12	--	3	<b>7.5</b>	10	<b>10E</b> <sup>1)</sup>	1	--	24	<b>3RT20 17-2KB41</b>	0.300
								125	<b>3RT20 17-2KG41</b>	0.300
12	--	3	<b>7.5</b>	10	<b>01</b> <sup>1)</sup>	--	1	24	<b>3RT20 17-2KB42</b>	0.300
								125	<b>3RT20 17-2KG42</b>	0.300

With series resistor



12	--	3	<b>7.5</b>	10	-- <sup>2)</sup>	--	1 <sup>3)</sup>	24	<b>3RT20 17-2KB42-0LA0</b>	0.300
								125	<b>3RT20 17-2KG42-0LA0</b>	0.300
16	--	5	<b>10</b>	10	-- <sup>2)</sup>	--	1 <sup>3)</sup>	24	<b>3RT20 18-2KB42-0LA0</b>	0.300
								125	<b>3RT20 18-2KG42-0LA0</b>	0.300

For accessories and spare parts, see page 3/93.

- 1) It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.
- 2) One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.
- 3) NC contact cannot be used because it is required for switching the series resistor.
- 4) Versions available with screw terminals.

# 3RT, 3RH Contactors for Special Applications

## Contactors with Extended Operating Range 0.7 ... 1.25 x $U_s$ , for Railway Applications

3RT20 motor contactors, 7.5 ... 25 HP

**DC operation - DC solenoid system**  
**Spring-type terminals**  
 For screw and snap-on mounting onto standard mounting rail  
 Solenoid coil fitted with varistor (S0)



3RT20 2.-2K.40



3RT20 2.-2X.40-0LA2

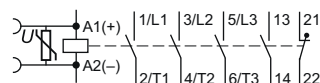
Rated data AC-3	Auxiliary contacts	Rated control supply voltage $U_s$	<b>Spring-type terminals</b> 	Weight approx.
Operational current $I_e$ at	Ident. No.    Version			
400 V			Order No.	kg
A	NO    NC	V DC		

### 3RT20 contactors for switching motors

#### Size S0

Terminal designations according to EN 50012

1 NO + 1 NC, identification number **11E**



#### Without series resistor<sup>1)</sup>

16	--	5	<b>10</b>	15	<b>11E</b>	1	1	24 125	<b>3RT20 25-2KB40</b> <b>3RT20 25-2KG40</b>	0.600 0.600
25	--	7.5	<b>15</b>	20	<b>11E</b>	1	1	24 125	<b>3RT20 26-2KB40</b> <b>3RT20 26-2KG40</b>	0.600 0.600
32	--	10	<b>20</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 27-2KB40</b> <b>3RT20 27-2KG40</b>	0.600 0.600

#### With solid-state operating mechanism

16	--	5	<b>10</b>	15	<b>11E</b>	1	1	24 125	<b>3RT20 25-2XB40-0LA2</b> <b>3RT20 25-2XG40-0LA2</b>	0.580 0.580
25	--	7.5	<b>15</b>	20	<b>11E</b>	1	1	24 125	<b>3RT20 26-2XB40-0LA2</b> <b>3RT20 26-2XG40-0LA2</b>	0.580 0.580
32	--	10	<b>20</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 27-2XB40-0LA2</b> <b>3RT20 27-2XG40-0LA2</b>	0.580 0.580
38	--	10	<b>25</b>	25	<b>11E</b>	1	1	24 125	<b>3RT20 28-2XB40-0LA2</b> <b>3RT20 28-2XG40-0LA2</b>	0.580 0.580

For accessories and spare parts, see page 3/93.

<sup>1)</sup> It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

### More information

Contactors	Type		3RT20 17	3RT20 2.	3RT20 2.-2XB40-0LA2	3RT20 2.-2XF40-0LA2
<b>Ambient temperature</b>						
• During operation		°C	-40 ... +70			
• During storage		°C	-55 ... +80			
<b>Solenoid coil operating range</b>	DC		0.7 ... 1.25 x $U_s$		0.7 ... 1.3 x $U_s$	
<b>Power consumption of the solenoid coils</b>			For cold coil and 1.0 x $U_s$			
• Contactors with series resistor	- Closing	W	13	--	--	--
	- Closed	W	4	--	--	--
• Contactors without series resistor	- Closing	W	2.8	4.5	--	--
	- Closed	W	2.8	4.5	--	--
• Contactors with solid-state operating mechanism	- Closing	W	--	--	6.7	13.2
	- Closed	W	--	--	0.8	1.56

All specs and technical specs not mentioned here are identical to those of the standard contactors for switching motors.