

Contactors and Contactor Assemblies

Contactors for Switching Motors

Control Parts
Call to Order 717-209-7100



3RT10 contactors, 3-pole

Selection and ordering data

* AC or DC Coil

* Screw Terminals or Spring Loaded Terminal



3RT10 1.-1A...



3RT10 1.-2A...



3RT10 2.-1A.00



3RT10 2.-3A.00



3RT10 3.-1A.00



3RT10 4.-1A.00

Frame size	Amp ratings		Single phase HP ratings		Three phase HP ratings				Auxiliary contacts		Screw terminals	Spring loaded terminals ¹⁾	Weight approx. AC/DC kg
	AC3	AC1	115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.	Order No.	
S00	7	18	0.25	0.75	1.5	2	3	5	1	0	3RT10 15-1□□□1 3RT10 15-1□□□2	3RT10 15-2□□□1 3RT10 15-2□□□2	0.20/0.26
	9	22	0.33	1	2	3	5	7.5	1	0	3RT10 16-1□□□1 3RT10 16-1□□□2	3RT10 16-2□□□1 3RT10 16-2□□□2	
	12	22	0.5	2	3	3	7.5	10	1	0	3RT10 17-1□□□1 3RT10 17-1□□□2	3RT10 17-2□□□1 3RT10 17-2□□□2	
	9	40	0.33	1	2	3	5	7.5	0	0	3RT10 23-1□□□0	3RT10 23-3□□□0	
S0	12	40	0.5	2	3	3	7.5	10	0	0	3RT10 24-1□□□0	3RT10 24-3□□□0	0.35/0.58
	17	40	1	3	5	5	10	15	0	0	3RT10 25-1□□□0	3RT10 25-3□□□0	
	25	40	2	3	7.5	7.5	15	20	0	0	3RT10 26-1□□□0	3RT10 26-3□□□0	
S2	28	50	2	5	7.5	10	20	25	0	0	3RT10 33-1□□□0	3RT10 33-3□□□0	0.85/1.45
	32	50	2	5	10	10	25	30	0	0	3RT10 34-1□□□0	3RT10 34-3□□□0	
	40	60	3	7.5	10	15	30	40	0	0	3RT10 35-1□□□0	3RT10 35-3□□□0	
S3	50	60	3	10	15	15	40	50	0	0	3RT10 36-1□□□0	3RT10 36-3□□□0	1.8/2.8
	65	100	5	15	20	25	50	60	0	0	3RT10 44-1□□□0	3RT10 44-3□□□0	
	80	120	7.5	15	25	30	60	75	0	0	3RT10 45-1□□□0	3RT10 45-3□□□0	
	95	120	10	–	30	30	75	100	0	0	3RT10 46-1□□□0	3RT10 46-3□□□0	

AC Coil = A

DC Coil = B

A

B

NEMA Labeled Contactors

NEMA size	Amp ratings	Single phase HP ratings		Three phase HP ratings				Auxiliary contacts		Screw terminals with AC coil	Screw terminals with 24 V DC coil	Weight approx. AC/DC kg
		115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.	Order No.	
0	18	1	2	3	3	5	5	1	0	3RT10 17-1A□□1-0UA0	3RT10 17-1BB41-0UA0	0.20/0.26
1	27	2	3	7.5	7.5	10	10	0	0	3RT10 26-1A□□0-0UA0	3RT10 26-1BB40-0UA0	0.35/0.58
2	45	3	7.5	10	15	25	25	0	0	3RT10 36-1A□□0-0UA0	3RT10 36-1BB40-0UA0	0.85/1.45
3	90	10	20	25	30	50	50	0	0	3RT10 46-1A□□0-0UA0	3RT10 46-1BB40-0UA0	1.8/2.8

¹⁾ All terminals are spring loaded on frame size S00. Only the coil terminals are spring loaded on frame sizes S0, S2 & S3.

For further coil voltages, see page 2/23.
For auxiliaries and accessories, see page 2/35-51.
For spare parts, see page 2/54-58.
For technical data, see page 2/86-107.
For description, see page 2/65-66.
For int. circuit diagrams, see page 2/156.
For dimension drawings, see page 2/172-175.

AC Coil Selection for 3RT101 through 3RT104, □ = A							
Coil Code	C2 ²⁾	H2 ³⁾	K6	P6	U6	V6	T6
60 Hz	24 V	48 V	120 V	240 V	277 V	480 V	600 V
50 Hz	24 V	48 V	110 V	220 V	–	–	–

²⁾ Use code **B0** for 3RT101, S00

³⁾ Use code **H0** for 3RT101, S00

DC Coil Selection for 3RT101 through 3RT104, □ = B							
Coil Code	A4 ⁴⁾	B4	W4	E4	F4	G4	M4
DC	12 V	24 V	48 V	60 V	110 V	125 V	220 V

⁴⁾ 3RT101 only



Selection and ordering data

- * AC/DC Coils with built in surge suppressor
- * Coil Types (40Hz to 60Hz, DC)
- * Conventional Coil
- * Solid-state operated coil with wider range and 24 V DC PLC input
- * Solid-state operated coil with Remaining Lifetime Indication (RLT)
- * Solid-state operated coil with RLT and AS-Interface communication
- * Box terminals ordered separately



3RT10 64-6A-6 3RT10 56-6P-5 3RT10 56-6Q-5

Frame size	Amp ratings		Single phase HP ratings		Three phase HP ratings				Auxiliary contacts		Screw terminals on coil and aux contacts	Spring loaded terminals on coil and aux contacts	Weight approx. kg
	AC3	AC1	115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.	Order No.	
S6	115	160	-	-	40	50	100	125	2	2	3RT10 54-6□●●6	3RT10 54-2□●●6	3.5
	150	185	-	-	50	60	125	150	2	2	3RT10 55-6□●●6	3RT10 55-2□●●6	
	185	215	-	-	60	75	150	200	2	2	3RT10 56-6□●●6	3RT10 56-2□●●6	
S10	225	275	-	-	60	75	150	200	2	2	3RT10 64-6□●●6	3RT10 64-2□●●6	6.7
	265	330	-	-	75	100	200	250	2	2	3RT10 65-6□●●6	3RT10 65-2□●●6	
	300	330	-	-	100	125	250	300	2	2	3RT10 66-6□●●6	3RT10 66-2□●●6	
S12	400	430	-	-	125	150	300	400	2	2	3RT10 75-6□●●6	3RT10 75-2□●●6	10.5
	500	610	-	-	150	200	400	500	2	2	3RT10 76-6□●●6	3RT10 76-2□●●6	

Conventional Coil = **A** **A**
 Solid State Operated Coil = **N** **N**

Frame size	Amp ratings		Single phase HP ratings		Three phase HP ratings				Auxiliary contacts		Screw terminals on coil and aux contacts	Spring loaded terminals on coil and aux contacts	Weight approx. kg
	AC3	AC1	115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.	Order No.	
S6	115	160	-	-	40	50	100	125	2	2	3RT10 54-6□●●5	3RT10 54-2□●●5	4
	150	185	-	-	50	60	125	150	2	2	3RT10 55-6□●●5	3RT10 55-2□●●5	
	185	215	-	-	60	75	150	200	2	2	3RT10 56-6□●●5	3RT10 56-2□●●5	
S10	225	275	-	-	60	75	150	200	2	2	3RT10 64-6□●●5	3RT10 64-6□●●5	7
	265	330	-	-	75	100	200	250	2	2	3RT10 65-6□●●5	3RT10 65-6□●●5	
	300	330	-	-	100	125	250	300	2	2	3RT10 66-6□●●5	3RT10 66-6□●●5	
S12	400	430	-	-	125	150	300	400	2	2	3RT10 75-6□●●5	3RT10 75-6□●●5	10.5
	500	610	-	-	150	200	400	500	2	2	3RT10 76-6□●●5	3RT10 76-6□●●5	

Solid State Operated Coil with Remaining Lifetime Indication = **P** **P**
 Solid State Operated Coil with AS-Interface and Remaining Lifetime Indication = **Q** **Q**

NEMA Labeled Contactors with Conventional Coil

NEMA size	Amp ratings	Single phase		Three phase HP ratings				Auxiliary		Screw terminals	Weight approx. AC/DC
		115 V	230 V	200 V	230 V	460 V	575 V	NO	NC	Order No.	
4	135	-	-	40	50	100	100	2	2	3RT10 56-6A●●6-0UA0	3.1/3.1

For further coil voltages, see page 2/23.
 For auxiliaries and accessories, see page 2/35-50.
 For spare parts, see page 2/56-58.
 For technical data, see page 2/86-116.
 For description, see page 2/67-69.
 For int. circuit diagrams, see page 2/156.
 For dimension drawings, see page 2/176-177.

Conventional Coil Selection for 3RT105 through 3RT107, □ = A							
Coil Code	B3	D3	F3	P3	U3	R3	T3
AC 40-60 Hz, DC	23-26 V	42-48 V	110-127 V	220-240 V	240-277 V	440-480 V	575-600 V

Solid State Operated Coil Selection for 3RT105 through 3RT107, □ = N, P, Q			
Coil Code	B3	F3	P3
AC 40-60 Hz, DC	21-27.3 V	96-127 V	200-277 V



Selection and ordering data

Contactor type	3RT10 1	3RT10 2, 3RT10 3, 3RT10 4, 3RA132, 3, 4	3RT14	3RT13 1, 3RT15 1	3RT13 2 ... 3RT13 4, 3RT15 2 and 3RT15 3	3RT16
Rated control supply voltage U_s	3RA131					
Control supply voltage at 60 Hz						

▶ Preferred type (applies only to 12-digit Order Nos.)

Rated control supply voltages (changes to 10th and 11th positions of the Order No.)

Sizes S00 to S3

• AC operation ¹⁾

Coils for 50 Hz (exception: size S00: 50 and 60 Hz²⁾)

AC 24 V	B0	B0	B0	B0	B0	B0
AC 42 V	D0	D0	D0	D0	-	-
AC 48 V	H0	H0	H0	H0	-	-
AC 110 V	F0	F0	F0	F0	F0	F0
AC 230 V	P0	P0	P0	P0	P0	P0
AC 400 V	V0	V0	V0	V0	V0	V0

Coils for 50 and 60 Hz²⁾

AC 24 V	▶ B0	▶ C2	▶ C2	▶ B0	▶ C2	▶ C2
AC 42 V	D0	D2	D2	D0	D2	-
AC 48 V	H0	H2	H2	H0	H2	-
AC 110 V	F0	G2	G2	F0	G2	G2
AC 208 V	M2	M2	M2	M2	M2	M2
AC 220 V	N2	N2	N2	N2	N2	N2
AC 230 V	P0	L2	L2	P0	L2	L2

For USA and Canada³⁾

50 Hz	60 Hz						
AC 110 V	AC 120 V	▶ K6	▶ K6	▶ K6	▶ K6	▶ K6	▶ K6
AC 220 V	AC 240 V	▶ P6	▶ P6	▶ P6	▶ P6	▶ P6	▶ P6
	AC 277 V	▶ U6	▶ U6	▶ U6	▶ U6	▶ U6	▶ U6
	AC 480 V	▶ V6	▶ V6	▶ V6	▶ V6	▶ V6	▶ V6
	AC 600 V	▶ T6	▶ T6	▶ T6	▶ T6	▶ T6	▶ T6

For Japan

50/60 Hz ⁴⁾	60 Hz ⁵⁾						
AC 100 V	AC 110 V	G6	G6	G6	G6	G6	G6
AC 200 V	AC 220 V	N6	N6	N6	N6	N6	N6
AC 400 V	AC 440 V	R6	R6	R6	R6	R6	R6

• DC operation ¹⁾

DC 12 V	A4	-	-	A4	-	-
DC 24 V	▶ B4	▶ B4	▶ B4	▶ B4	▶ B4	-
DC 42 V	D4	D4	D4	D4	D4	-
DC 48 V	▶ W4	▶ W4	▶ W4	▶ W4	-	-
DC 60 V	E4	E4	E4	-	-	-
DC 80 V	E8	E8	-	-	-	-
DC 110 V	▶ F4	▶ F4	▶ F4	▶ F4	▶ F4	-
DC 125 V	G4	G4	G4	G4	G4	-
DC 220 V	M4	M4	M4	M4	M4	-
DC 230 V	P4	P4	P4	P4	-	-

Sizes S6 to S12

• AC/DC operation (40 ... 60 Hz, DC)

Conventional operating mechanism

$U_{s \text{ min}}$ to $U_{s \text{ max}}$ ⁶⁾	Size	S6	S10, S12	$U_{s \text{ min}}$ to $U_{s \text{ max}}$ ⁶⁾	Size	S6	S10, S12
	Contactor type	3RT1.5.-.A	3RT1.6/7.-.A		Contactor type	3RT1.5.-.A	3RT1.6/7.-.A
AC/DC 23 ... 26 V	▶ B3	▶ B3	▶ B3	AC/DC 240 ... 277 V	U3	U3	U3
AC/DC 42 ... 48 V	D3	D3	D3	AC/DC 380 ... 420 V	V3	V3	V3
AC/DC 110 ... 127 V	▶ F3	▶ F3	▶ F3	AC/DC 440 ... 480 V	R3	R3	R3
AC/DC 200 ... 220 V	M3	M3	M3	AC/DC 500 ... 550 V	S3	S3	S3
AC/DC 220 ... 240 V	▶ P3	▶ P3	▶ P3	AC/DC 575 ... 600 V	T3	T3	T3

Solid-state operating mechanism

$U_{s \text{ min}}$ to $U_{s \text{ max}}$ ⁶⁾	Size	S6	S10, S12	$U_{s \text{ min}}$ to $U_{s \text{ max}}$ ⁶⁾	Size	S6	S10, S12
	Contactor type	3RT1.5.-.N	3RT1.5.-.P/Q		Contactor type	3RT1.6/7.-.N	3RT1.6/7.-.P/Q
AC/DC 21 ... 27.3 V	▶ B3	-	B3		-	-	-
AC/DC 96 ... 127 V	▶ F3	▶ F3	▶ F3		▶ F3 ⁷⁾	▶ F3 ⁷⁾	▶ F3 ⁷⁾
AC/DC 200 ... 277 V	▶ P3	▶ P3	▶ P3		▶ P3 ⁷⁾	▶ P3 ⁷⁾	▶ P3 ⁷⁾

No additional charge is made for all voltages indicated above.

Further voltages on request.

1) The SITOP power DC 24 V power supply unit with extended-range input (AC 93 ... 264 V; DC 30 ... 264 V) can be used for energizing the coil for other coil voltages and coil voltage tolerances for sizes S00 and S0 (see Part 14).

2) Coil voltage tolerance at 50 Hz: 0.8 ... 1.1 x U_s at 60 Hz: 0.85 ... 1.1 x U_s

3) Coil voltage tolerance Size S00: at 50 Hz: 0.85 ... 1.1 x U_s at 60 Hz: 0.8 ... 1.1 x U_s Sizes S0 ... S3: at 50 Hz and 60 Hz: 0.8 ... 1.1 x U_s

4) Coil voltage tolerance Size S00: at 50/60 Hz: 0.85 ... 1.1 x U_s

Sizes S0 ... S3: at 50 Hz: 0.8 ... 1.1 x U_s at 60 Hz: 0.85 ... 1.1 x U_s

5) Coil voltage tolerance at 60 Hz: 0.8 ... 1.1 x U_s

6) Coil voltage tolerance: 0.8 x $U_{s \text{ min}}$... 1.1 x $U_{s \text{ max}}$

7) 3RT12 vacuum contactors available from March 2002.



AC and DC operation

IEC 60 947, EN 60 947 (VDE 0660), UL 508

Design

The 3RT1 contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

The 3RT1 contactors are available with screw connections or with Cage Clamp connections.

An auxiliary contact is integrated in the basic unit of size S00 contactors. The basic units of sizes S0 to S3 only contain the main conducting paths.

All the basic units can be extended with auxiliary switch blocks. Cabinet units with 2 NO + 2 NC (terminal designations acc. to EN 50 012) are available as of size S0; the auxiliary switch block is removable.

The size S3 contactors have removable box terminals for the main conductor connections. Ring cable lugs or bars can thus also be connected.

Contact reliability

If voltages ≤ 110 V and currents ≤ 100 mA are to be switched, the auxiliary contacts of 3RT1 contactors and 3RH11 contactor relays should be used to ensure good contact stability.

These auxiliary contacts are suitable for electronic circuits with currents ≥ 1 mA at a voltage of 17 V.

Short-circuit protection of contactors

For the short-circuit protection of contactors without an overload relay, see the technical data.

For the short-circuit protection of contactors with an overload relay, see section 3.

Motor protection

3RU11 overload relays can be mounted onto the 3RT1 contactors for protection against overloads. The overload relays must be ordered separately (see section 3).

Surge suppression

The 3RT1 contactors can be retrofitted with RC elements, varistors, diodes or diode assemblies (combination of an interference suppression diode and a Zener diode for short tripping times) for suppressing opening surges in the coil.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

With all size S0 to S3 contactors, varistors and RC elements can be plugged on directly at the coil terminals, either on the top or underneath. Diode assemblies are available in two different designs with different polarities. Depending on the application, they can be attached either only on the bottom (assembly with circuit-breaker) or only on the top (assembly with overload relay).

The plug-in direction of the diodes and diode assemblies is determined by a coding device. Exceptions: 3RT19 26-1T.00 and 3RT19 36-1T.00; in these cases the plug-in direction is identified by "+" and "-".

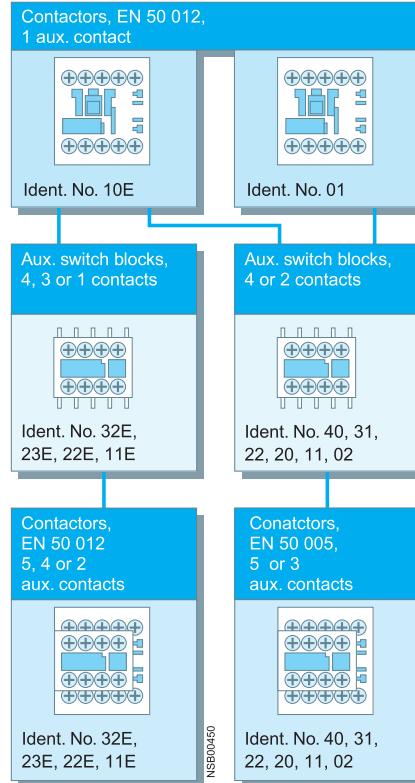
Coupling relays are supplied either without surge suppression or with a varistor or diode connected as standard, according to the design.

Note

The opening times of the NO contacts and the closing times of the NC contacts increase if the contactor coils are protected against voltage peaks (interference suppression diode 6 to 10 times; diode assemblies 2 to 6 times; varistor +2 ms to 5 ms).

3RT1 contactors, 3-pole, sizes S00 to S3

3RT10 1. contactors (size S00),
Terminal designations acc. to EN 50 012 or DIN 50 005.



Auxiliary switch blocks

The 3RT1 basic units can be extended with various auxiliary switch blocks, depending on the application:

Size S00 (3RT101)

Contactors with one NO contact as the auxiliary contact and with either screw or Cage Clamp connections, identification number 10E, can be extended to obtain contactors with 2, 4 or 5 auxiliary contacts in accordance with EN 50 012 using auxiliary switch blocks. The identification numbers 11E, 22E, 23E and 32E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks cannot be combined with contactors that have an NC contact in their basic unit, identification number 01, as these are coded.

All size S00 contactors with one auxiliary contact, identification number 10E or 01, and the contactors with 4 main contacts can be extended to obtain contactors with 3 or 5 auxiliary contacts (contactors with 4 main contacts: 2 or 4 auxiliary contacts) according to EN 50 005 using auxiliary switch blocks

with identification numbers 40 to 02. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary contacts.

Single or 2-pole auxiliary switch blocks that can be connected on either the top or the bottom facilitate quick, straightforward wiring, especially when assembling feeders. These auxiliary switch blocks are only available with screw-type terminals.

The solid-state compatible 3RH19 11-1NF.. auxiliary switch blocks for size S00 contactors contain two enclosed contact elements. They are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in dusty atmosphere. The contacts do not have positively-driven operation.

All the above-mentioned auxiliary switch variants can be snapped into the location holes on the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

Contactors and Contactor Assemblies

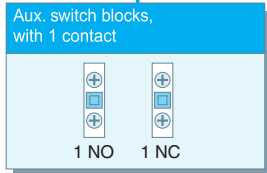
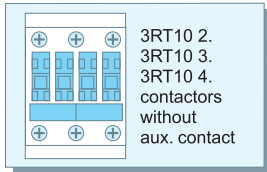
Contactors for Switching Motors

SIRIUS



3RT1 contactors, 3-pole, sizes S00 to S3

3RT10 2. to 3RT10 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.

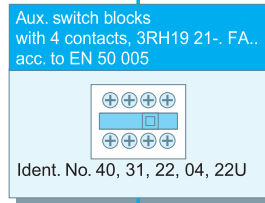
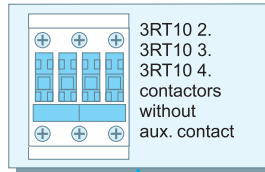


Possible complements of contactors with 1-pole aux. switch blocks, terminal signations acc. to EN 50 005 or EN 50 012

Ident. No.
01, 10
11
21, 12
31, 22, 13
02, 20
03, 30
04, 40

NSB00451a

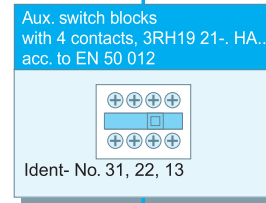
3RT10 2. to 3RT10 4. contactors (sizes S0 to S3), single-pole auxiliary switch blocks,
terminal designations acc. to EN 50 005 or EN 50 012.



Possible complements of contactors with 4-pole aux. switch blocks, terminal designations acc. to EN 50 005

Ident. No. 40, 31, 22, 02

NSB00452a



Possible complements of contactors with 4-pole aux. switch blocks, terminal designations acc. to EN 50 012

Ident. No. 31, 22, 13

Sizes S0 to S3 (3RT102 to 3RT104)

An extensive range of auxiliary switch blocks is available for various applications. The contactors themselves do not have an integrated auxiliary conducting path.

The auxiliary switch variants are identical for all size S0 to S3 contactors.

One 4-pole or up to four single-pole auxiliary switch blocks (with screw or Cage Clamp connections) can be snapped onto the front of the contactors. When the contactors are energized, the NC contacts open before the NO contacts close.

The terminal designations of the single-pole auxiliary switch blocks consist of location digits on the basic unit and function digits on the auxiliary switch blocks.

In addition, 2-pole auxiliary switch blocks (screw-type terminals) are provided for cable entries from above or below in the style of a four-connector block (feeder auxiliary switch).

If the available installation depth is restricted, 2-pole auxiliary switch blocks (screw or Cage Clamp connections) can be mounted laterally on the left or right.

The auxiliary switch blocks designed for mounting onto the front can be disassembled with the aid of a centrally positioned release lever; the laterally mountable auxiliary switch blocks can be removed easily by pressing on the fluted grips.

The terminal designations of the individual auxiliary switch blocks comply with EN 50 005 or EN 50 012, while those of the complete contactors with an auxiliary switch block with 2 NO + 2 NC comply with EN 50 012.

The laterally mountable auxiliary switch blocks to EN 50 012 can only be used if no 4-pole auxiliary switch blocks are snapped onto the front. If single-pole auxiliary switch blocks are used in addition, the location digits on the contactor must be noted.

Two enclosed contact elements and two standard contact elements are available for the 3RH19 21-.FE22 solid-state compatible auxiliary switch block mountable on the front. The laterally mountable 3RH19 21-2DE11 solid-state compatible auxiliary switch block contains 2 enclosed contact elements (1 NO + 1 NC). The enclosed contact elements are ideal for switching low voltages and currents (hard gold-plated contacts) or for use in a dusty atmosphere. The contacts are positively driven.

Sizes S0 and S2 (3RT102 and 3RT103)

Up to four auxiliary contacts can be mounted, whereby any design of the auxiliary switch blocks is permitted. If two 2-pole, laterally mounted, auxiliary switch blocks are used, one must be mounted on the left and one on the right for the sake of symmetry.

Under certain circumstances, more auxiliary contacts are allowed for size S2 (please ask for details).

With regard to 3RT13 and 3RT15 4-pole contactors, please refer to pages 2/12 to 2/14.

Sizes S3 to S12 (3RT104 to 3RT107)

Up to eight auxiliary contacts can be mounted, whereby the following points must be noted:

- Of these eight auxiliary contacts, no more than four must be NC contacts.
- If laterally mounted auxiliary switch blocks are used, they must be symmetrical.

With regard to 3RT13 and 3RT15 4-pole contactors, please refer to pages 2/12 to 2/14.



Overview

Design

- 3RT10 contactors for switching motors
- 3RT12 vacuum contactors for switching motors
- 3RT14 contactors for AC-1 applications

Operating mechanism

Two types of solenoid-operated mechanism are available:

- Conventional operating mechanism
- Solid-state operating mechanism (with 3 performance levels)

UC operation

The contactors can be AC (40 to 60 Hz) and DC driven.

Withdrawable coils

To allow easy coil changing, for example if the application is changed, the magnetic coil can be pulled out upwards without tools after the release mechanism has been actuated, and can be replaced by any other required coil of the same size.

Auxiliary contact complement

The contactors can be equipped with a maximum of 8 auxiliary contacts, with identical auxiliary switch blocks from S0 to S12. Of these, no more than 4 are permitted to be NC contacts.

- 3RT10 and 3RT14 contactors: auxiliary contacts mounted laterally and on front
- 3RT12 vacuum contactors: auxiliary contact mounted laterally

Contactor with conventional operating mechanism

3RT1...-A:

The magnetic coil is switched on and off directly with the control supply voltage U_s via terminals A1/A2.

Multi-voltage range for the control supply voltage U_s :
Several closely adjacent control supply voltages, available around the world, are covered by just one coil, for example UC 110-115-120-127 V or UC 220-230-240 V.

In addition, allowance is also made for a coil voltage tolerance of 0.8 times the lower rated control supply voltage ($U_{s\ min}$) and 1.1 times the upper rated control supply voltage ($U_{s\ max}$), within which the

contactor switches reliably and no thermal overloading occurs.

Contactor with solid-state operating mechanism

The power required for reliable switching and holding is supplied selectively to the magnetic coil by series-connected control electronics.

Features:

- **Extended voltage range for the control supply voltage U_s :**
Compared with the conventional operating mechanism, the solid-state operating mechanism covers an even broader range of globally available control supply voltages within one coil variant. For example, the globally available voltages 200-208-220-230-240-254-277 V are covered with the coil for UC 200 to 277 V ($U_{s\ min}$ to $U_{s\ max}$).

- **Extended coil voltage tolerance 0.7 to $1.25 \times U_s$:**
On account of the broad range for the rated control supply voltage and the additionally allowed coil voltage tolerance of $0.8 \times U_{s\ min}$ to $1.1 \times U_{s\ max}$, an extended coil voltage tolerance of at least 0.7 to $1.25 \times U_s$, within which the contactors will operate reliably, is available for the most common control supply voltages of 24, 110 and 230 V.
- **Bridging short-time voltage dips:**
Control voltage failures dipping to 0 V (at A1/A2) are bridged for up to approx. 25 ms, therefore preventing unintentional disconnection.

- **Defined ON and OFF thresholds:**
As of voltages $\geq 0.8 \times U_{s\ min}$, the electronics reliably switch the contactor on and as of $\leq 0.5 \times U_{s\ min}$ it is reliably switched off. The differential travel in the switching thresholds prevents chattering of the main contacts and hence increased wear or welding when operated in weak, unstable networks. Similarly, thermal overloading of the contactor coil is prevented if the voltage applied is too low – the contactor is not switched on and is operated with overexcitation.
- **Low control power consumption when closing and in closed state.**

Electromagnetic compatibility (EMC)

The contactors with solid-state operating mechanism conform to the requirements for operation in industrial plants.

- **Noise immunity**
 - Burst (IEC 61 000-4-4): 4 kV
 - Surge (IEC 61 000-4-5): 4 kV
 - Electrostatic discharge, ESD (IEC 61 000-4-2): 8/15 kV
 - Electromagnetic field (IEC 61 000-4-3): 10 V/m
- **Emitted interference**
Limiting value class A to EN 55 011

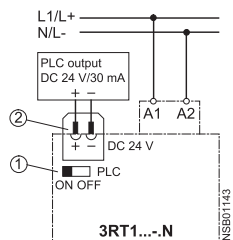
Note:
In connection with converters, the control cables should be installed separately from the load cables to the converter.

3RT1...-N: for DC 24 V PLC output

2 control options:

- Control without an interface directly via a DC 24 V ≥ 30 mA PLC output (EN 61 131-2). Connection via a 2-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply. The control supply voltage for supplying power to the solenoid operating mechanism must be connected to A1/A2.

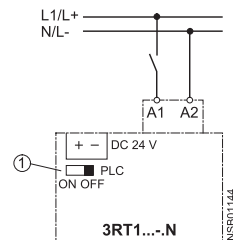
Note:
Before start-up, the sliding-dolly switch for PLC operation must be moved to the "PLC ON" position (setting ex works: "PLC OFF").



- ① Sliding-dolly switch, must be in PLC "ON" position
- ② Plug-in connection, 2-pole

- Conventional control by applying the control supply voltage at A1/A2 via a switching contact.

Note:
The sliding-dolly switch must be in the "PLC OFF" position (= setting ex works).



- ① Sliding-dolly switch, must be in PLC "OFF" position

Contactors and Contactor Assemblies

Contactors for Switching Motors

SIRIUS



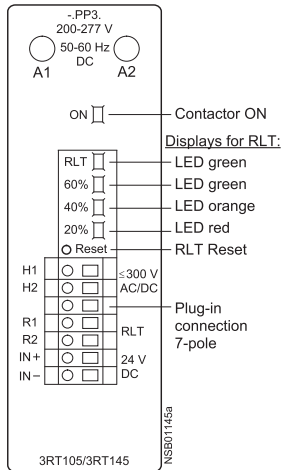
3RT1 contactors, 3-pole, sizes S6 to S12

Overview

Contactors with solid-state operating mechanism

3RT1...-P: for DC 24 V PLC output or PLC relay output, with indication of remaining lifetime

(Indication of remaining lifetime RLT: see 2/69.)



- The remaining lifetime RLT status signal is available at terminals R1/R2 via a floating relay contact (hard gold-plated, enclosed) and can be processed for example via SIMOCODE-DP or PLC inputs or elsewhere.

Permissible current carrying capacity of relay output R1/R2:

- I_{th}/AC -15/24 to 230 V: 3 A
- I_{th}/DC -13/24 V: 1 A

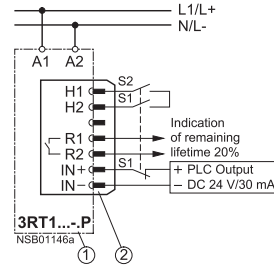
LED indicators

The following statuses are indicated by LEDs on the laterally mounted electronics module:

- Contactor ON (energized state): Green LED ("ON")
- Indication of remaining lifetime (see 2/69)

2 control options:

- Contactor control without an interface directly via a DC 24 V / ≥ 30 mA PLC output (EN 61 131-2) via terminals IN+/IN-.



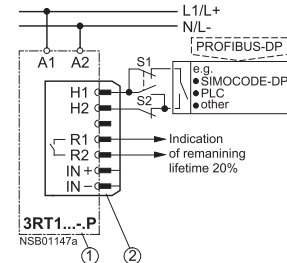
Electronics module of 3RT1...-P contactor
Plug-in connection, 7-pole

- S1 Changeover switch from automatic control via PLC semiconductor output to local control
- S2 Local control option

Possibility of switching from automatic control to local control via terminals H1/H2, i.e. automatic control via a PLC or SIMOCODE-DP/PROFIBUS-DP can be deactivated, for example during start-up or in the event of a fault, and the contactor can be controlled manually.

- Contactor control via relay outputs, e.g. by
 - PLC
 - SIMOCODE-DP 3UF5 via terminals H1/H2.
- Contact loading:
 U_s /approx. 5 mA.

When operated via SIMOCODE-DP, a communication link to PROFIBUS-DP is also provided.

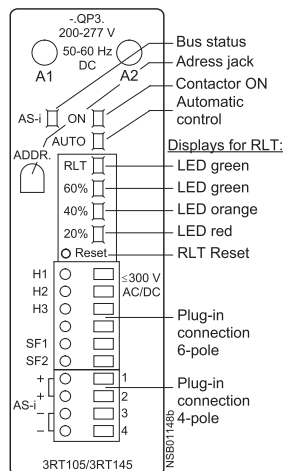


Electronics module of 3RT1...-P contactor
Plug-in connection, 7-pole

- S1 Changeover switch from automatic control, e.g. via SIMOCODE-DP or PLC relay output to local control
- S2 Local control option

To supply power to the solenoid operating mechanism and the remaining lifetime indication, the control supply voltage U_s must be run to terminals A1/A2 of the laterally mounted electronics module. The control inputs of the contactor are brought out to a 7-pole plug-in connection; the connector, using screwless spring-force technology, is included in the scope of supply.

3RT1...-Q: communication-capable with integrated AS-Interface and indication of remaining lifetime



Inputs and outputs are brought out to a 10-pole plug-in connection; the connectors (6-pole for external connection and 4-pole for an AS-Interface) using screwless spring-force technology, are included in the scope of supply.

LED indicators:

The following statuses are indicated by LEDs on the laterally mounted electronics module:

- Contactor ON (energized state): Green LED ("ON")
- Automatic/local control: Green LED ("AUTO")
- Bus status: Green/red dual LED ("AS-i")
- Remaining lifetime RLT (see separate description 2/16)

AS-Interface address jack "ADDR":

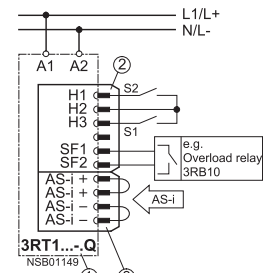
The contactor address can be assigned in the built-in state.

Control circuit:

- Contactor control through AS-Interface via terminals AS-i+/AS-i-. Terminals AS-i+ and AS-i- are each brought out twice to a 4-pole connector separate from the other control inputs and are jumpered.

Advantages:

- The AS-Interface cable is not interrupted when the connector is removed
- The contactor remains capable of operation via the local control inputs via its own 6-pole connector.
- Control signals via AS-i:
 - Contactor ON/OFF
- Status signals via AS-i:
 - Contactor ON/OFF
 - Automatic/local control
 - Remaining lifetime RLT
 - Signal via free input, e.g. overload relay tripped.



Electronics module of 3RT1...-Q contactor

- Plug-in connection, 6-pole
- Plug-in connection, 4-pole
- S1 Changeover switch from automatic control, e.g. via AS-Interface, to local control
 - S1 open: automatic mode
- S2 Local control option

Possibility of switching from automatic control to local control via terminals H1/H2/H3, i.e. automatic control via AS-Interface can be deactivated, for example during start-up or in the event of a fault, and the contactor can be controlled manually.

To supply power to the solenoid operating mechanism and the remaining lifetime indication, the control supply voltage U_s must be run to terminals A1/A2 of the laterally mounted electronics module. The contactor itself is controlled via the integrated AS-Interface.



Overview

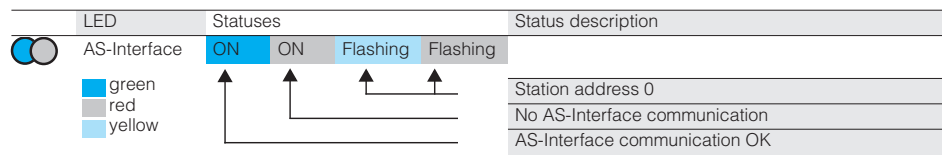
Actuator-Sensor-Interface

Technical data

I/O configuration (hex)		7
ID code (hex)		F
Power supply	V	26.5 to 31.6 (in accordance with AS-Interface specification)
AS-Interface current input	mA	max. 20
Contact loading at SF1/2	mA	3 to 6
Watchdog function (disconnection of outputs in event of AS-Interface fault)		Built-in

Indication

During operation, the LEDs on the contactor indicate the states shown opposite.



Diagnosing the contactors using the application program

• Inputs

Input signals	Device status
DI0 "ready"	0 Device not ready/manual operation 1 Device ready/automatic operation
DI1 "running"	0 Contactor off 1 Contactor on
DI2 "remaining lifetime"	0 Remaining lifetime RLT > 20 % 1 Remaining lifetime RLT ≤ 20 %
DI3 "free input"	0 No input signal at SF1/2 1 Input signal at SF1/2

• Outputs

Output signals	Device status
DO0 "running"	0 Contactor off 1 Contactor on
DO1	0 – 1 –
DO2	0 – 1 –
DO3	0 – 1 –

Indication of remaining lifetime (RLT)

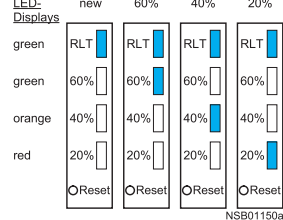
Main contactor contacts are wearing parts and must be replaced in good time when they reach the end of their service life. The degree of erosion of the contact material and hence the electrical endurance (= number of make-break operations) varies, depending on the loading, utilization category, duty type etc. Routine inspections/visual checks by maintenance staff are needed in order to determine the state of the main contacts. The "remaining lifetime indication" facility takes over this task. This does not comprise counting the make-break

operations – these offer no information about contact wear – but instead entails determining and evaluating the actual progress of erosion of each of the three main contacts by electronic means; the results are stored, and a warning is issued when specified limits are reached. Even if the control supply voltage at A1/A2 fails, the stored data is not lost. After the main contacts are replaced, measurement of the remaining lifetime must be reset with the "RESET" button (hold down the RESET button for approx. 2 sec. with a ball-point pen or similar tool).

Advantages:

- Signalling via a relay contact or AS-i when a remaining lifetime of 20 % is reached, i. e. when the contact material is 80 % worn.
- Additional visual indication of various levels of erosion via LEDs on the laterally mounted electronics modules when a remaining lifetime of 60 % (green), 40 % (orange) and 20 % (red) is reached.

- Advice to change contacts at the appropriate time.
- Optimum utilization of the contact material.
- Visual inspection of the condition of contacts no longer necessary.
- Reduction of ongoing operating costs.
- Optimum planning of maintenance measures.
- Avoidance of unforeseen plant stoppages.



3RT12 vacuum contactors

In contrast with the 3RT10 contactors – the main contacts operate in air under atmospheric conditions – the contact gaps of the 3RT12 vacuum contactors are contained in hermetically enclosed vacuum contact tubes. Neither arcs nor arcing gases are produced. The particular benefit of 3RT12 vacuum contactors, however, is that their electrical endurance is at least twice as long as that of 3RT10 contactors.

They are therefore particularly well suited to frequent switching in jogging/mixed operation, for example in crane control systems.

- Advantages:
- Very long electrical endurance
 - High short-time current-carrying capacity for heavy switching
 - No open arcs, no arcing gases, i.e. no minimum clearances from earthed parts required either
 - Longer maintenance intervals
 - Increased plant availability

Notes on operation:

– Switching motors with rated operational voltages $U_e > 500 V$;
In order to damp overvoltages and protect the motor winding insulation against multiple reignition when switching off three-phase motors, it is recommended to fit the contactors on the outgoing side (T1/T2/T3) with the 3RT19 66-1PV surge suppression module – RC varistor – (accessory).

This additional equipment is not required for operation in circuits with converters. It might be damaged by the voltage peaks and harmonics generated.

- Switching DC voltage: Vacuum contactors are basically unsuitable for switching DC voltage.