SIRIUS 3RT10 contactors,
3-pole, 15 ... 250 kW

## Overview

## Standards

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1,
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)
The 3RT1 contactors are climate-proof. They are finger-safe according to EN 50274.

## Contact reliability

If voltages $\leq 110 \mathrm{~V}$ and currents $\leq 100 \mathrm{~mA}$ are to be switched, the auxiliary contacts of the 3RT1 contactor or 3RH11 contactor relay should be used as they guarantee a high level of contact reliability.
These auxiliary contacts are particularly suitable for solid-state circuits with currents $\geq 1 \mathrm{~mA}$ at a voltage $\geq 17 \mathrm{~V}$.

Short-circuit protection of the contactors
For more information about short-circuit protection of contactors without overload relay, see "Technical specifications". For short-circuit protection of the contactors with overload relay see "Overload Relays".

To assemble fuseless motor feeders you must select combinations of motor starter protector and contactor as explained in "Fuseless Load Feeders".

## Motor protection

3RU11 thermal overload relays or 3RB20/3RB21 solid-state overload relays can be fitted to the 3RT1 contactors for protection against overload. The overload relays must be ordered separately.

## Ratings of induction motors

The quoted rating (in kW ) refers to the output power on the motor shaft (according to the nameplate).

## Surge suppression

3RT1 contactors can be retrofitted with RC elements, varistors, diodes or diode assemblies (assembly of diode and Zener diode for short break times) for damping opening surges in the coil.

## Note

The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms ).

## Sizes S00 and S0, up to 11 kW

The 3RT1 devices in these sizes can be found in SIRIUS datasheet 2009.

## Sizes S2 and S3, up to 45 kW

Auxiliary contact complement
The basic units of sizes S2 and S3 are delivered only with the main contacts and can be extended with auxiliary switch blocks.

## Surge suppression

For size S2 and S3 contactors, varistors and RC elements can be snapped on either on the top or directly below the coil terminals. Diode assemblies are available in 2 different versions on account of their polarity. Depending on the application they can be connected either only at the bottom (assembly with motor starter protector) or only at the top (assembly with overload relay).

The plug-in direction of the diodes and diode assemblies is specified by coding.

## Exceptions

3RT19 26-1T. 00 and 3RT19 36-1T . 00,
in this case the plug-in direction is marked with " + " and " "-".

## Sizes S6 to S12, > 45 to 250 kW

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


## Operating mechanism types

Two types of solenoid operation are available:

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


## Control supply voltage

The contactors have a UC operating mechanism which can be operated with AC ( 40 to 60 Hz ) as well as with DC.

## Withdrawable coils

For simple coil replacement, e. g. if the application is replaced, the solenoid coil can be pulled out upwards after the release mechanism has been actuated and can be replaced by any other coil of the same size.

## Auxiliary contact complement

Contactor sizes S6 to S12 are supplied with mounted auxiliary switch blocks.

- 3RT10 and 3RT14 contactors:

Auxiliary contacts mounted laterally and on front

- 3RT12 vacuum contactors:

Auxiliary contacts mounted laterally

## Contactors with conventional operating mechanism

## Version 3RT1 . . . - . A:

The solenoid coil is switched directly on and off with the control supply voltage $U_{s}$ by way of terminals A1/A2.

Multi-voltage range for the control supply voltage $U_{s}$ :
Only one coil covers several close-lying control supply voltages which are used worldwide, e. g. 110-115-120-127 V AC/DC or 220-230-240 V AC/DC. Allowance is made in addition for am operating range of 0.8 times the lower $\left(U_{s \text { min }}\right)$ and 1.1 times the upper $\left(U_{s_{\max }}\right)$ rated control supply voltage within which the contactor switches reliably and no thermal overload occurs.

## Contactors with solid-state operating mechanism

The solenoid coil is supplied selectively with the power required for reliable switching and holding by upstream control electronics.

- Wide 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 control supply voltages used worldwide within one coil variant. For example, the coil for 200 to 277 V AC/DC $\left(U_{s \text { min }}\right.$ to $\left.U_{s \text { max }}\right)$ covers the voltages 200-208-220-230-240-254-277 V used worldwide.
- Extended operating range 0.7 to $1.25 \times U_{s}$ :

The wide range for the rated control supply voltage and the additionally allowed coil operating range of $0.8 \times U_{s \min }$ to $1.1 \times U_{s \text { max }}$ results in an extended coil operating range of at least 0.7 to $1.25 \times U_{s}$, within which the contactors will operate reliably, for the most common control supply voltages of 24, 110 and 230 V .

# Power Contactors for Switching Motors 

SIRIUS 3RT10 contactors,
3-pole, 15 ... 250 kW

- Bridging temporary voltage dips:

Control voltage failures dipping to 0 V (at A1/A2) are bridged for up to approx. 25 ms to avoid unintentional tripping.

- Defined ON and OFF thresholds:

For voltages above $0.8 \times U_{s \min }$ the electronics will reliably switch the contactor ON, and for voltages below the value $0.5 \times U_{\text {s min }}$ it is reliably switched OFF. The hysteresis in the switching thresholds prevents the main contacts from chattering as well as increased wear or welding when operated in weak, unstable networks. This also prevents thermal overloading of the contactor coil if the voltage applied is too low (contactor does not close properly and is continuously operated with overexcitation).

- Low control power consumption when closing and in the closed state.


## Electromagnetic compatibility (EMC)

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

- Interference immunity
- Burst (IEC 61000-4-4): 4 kV
- Surge (IEC 61000-4-5): 4 kV
- Electrostatic discharge, ESD (IEC 61000-4-2): 8/15 kV
- Electromagnetic field (IEC 61000-4-3): $10 \mathrm{~V} / \mathrm{m}$
- Emitted interference
- Limit value class A according to EN 55011

Note:
In connection with converters, the control cables must be routed separately from the load cables to the converter

## Indication of remaining lifetime (RLT)

Main contactor contacts are working parts which therefore must be replaced in good time when the end of their service life has been reached. The degree of contact erosion and thus the electrical endurance (= number of operating cycles) depends on the loading, utilization category, operating mode, etc. Up to now, routine checks/visual inspections by the maintenance personnel were needed in order to gain an insight into the state of the main contacts. The remaining lifetime indication function now takes over this task. It does not count the number of operating cycles which does not provide information about contact erosion - but instead electronically identifies, evaluates and stores the actual progress of erosion of each one of the three main contacts, and outputs a warning when specified limits are reached. The stored data are not lost even if the control supply voltage for A1/A2 fails. After replacement of the main contacts, measurement the remaining lifetime must be reset using the "RESET" button (hold down RESET button for about 2 seconds using a pen or similar tool).

## Advantages:

- Signaling through relay contact or AS-i when remaining lifetime is $20 \%$, i. e. contact material wear is $80 \%$.


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

■ Conventional control by applying the control supply voltage at A1/A2 through a switching contact


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

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

3-pole, 15 ... 250 kW
Version 3RT1 . . . - . P: for 24 V DC PLC output or PLC relay output, with remaining lifetime indicator (RLT).


To supply the solenoid and the remaining lifetime indicator with power, the control supply voltage $U_{s}$ must be connected to terminals A1/A2 of the laterally mounted solid-state module. The control inputs of the contactor are connected to a 7-pole plug-in connection; the screwless spring-type connection is part of the scope of supply.

- The "Remaining Lifetime RLT" status signal is available at terminals R1/R2 through a floating relay contact (hard goldplated, enclosed) and can be input to SIMOCODE, PLC or other devices for processing, for example.
Permissible current-carrying capacity of the R1/R2 relay output:

```
- IIAC-15/24 to 230 V: 3 A
- \(\quad I_{\mathrm{e}} \mathrm{IDC}-13 / 24 \mathrm{~V}: 1 \mathrm{~A}\)
```

- LED indications

The following states are indicated by means of LEDs on the laterally mounted solid-state module:

- Contactor ON (energized state): green LED ("ON")
- Indication of remaining lifetime

2 control options:

- Contactor control without a coupling link directly through a $24 \mathrm{VDCl} \geq 30 \mathrm{~mA}$ PLC output (EN 61131-2) by way of terminals $\mathrm{IN}+/ \mathrm{IN}$-.


Possibility of switching from automatic control to local control by way of terminals $\mathrm{H} 1 / \mathrm{H} 2$, i. e. automatic control through PLC or SIMOCODE/PROFIBUS DP can be deactivated e. g. at start-up or in the event of a fault and the contactor can be controlled manually.

- Contactor control through relay outputs at connections H1/

H2, e. g. by

- PLC or
- SIMOCODE.


Contact loading: Ulapprox. 5 mA .
When operated through SIMOCODE, a communication link to PROFIBUS DP is also provided.

Order No. scheme

| Digit of the Order No. | 1st - 3rd <br> $\square \square \square$ | 4th $\square$ | 5th | 6th | 7th $\square$ | - | 8th $\square$ | 9th $\square$ | 10th $\square$ | 11th $\square$ | 12th $\square$ | - | 13th | 14th | 15th | 16th |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SIRIUS power contactors | 3 RT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1st generation |  | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Device type (e. g. $0=3$-pole motor contactor, 3 = 4-pole AC-1 contactor) |  |  | $\square$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Size of the contactor ( $3=\mathrm{S} 2,4=\mathrm{S} 3,5=\mathrm{S} 6$, etc.) |  |  |  | $\square$ |  |  |  |  |  |  |  |  |  |  |  |  |
| Power dependent on size (e. g. $45=37 \mathrm{~kW}$ ) |  |  |  |  | $\square$ |  |  |  |  |  |  |  |  |  |  |  |
| Connection type ( 1 = screw, 2 = spring-type) |  |  |  |  |  |  | $\square$ |  |  |  |  |  |  |  |  |  |
| Operating range / solenoid coil circuit (e. g. A = AC standard / without) |  |  |  |  |  |  |  | $\square$ |  |  |  |  |  |  |  |  |
| Rated control supply voltage (e. g. P0 = 230 V, 50 Hz) |  |  |  |  |  |  |  |  | $\square$ | $\square$ |  |  |  |  |  |  |
| Auxiliary switches (e. g. S3: $0=$ without auxiliary switches) |  |  |  |  |  |  |  |  |  |  | $\square$ |  |  |  |  |  |
| Special version |  |  |  |  |  |  |  |  |  |  |  |  | $\square$ | $\square$ | $\square$ | $\square$ |
| Example | 3 RT | 1 | 0 | 4 | 5 | - | 1 | A | P | 0 | 0 |  |  |  |  |  |

Note: The Order No. scheme is presented here merely for information purposes and for better understanding of the logic
behind the order numbers. For your orders, please use the order numbers quote in the catalog and in the Industry Mall.

# Power Contactors for Switching Motors 

SIRIUS 3RT10 contactors,
3-pole, 15 ... 250 kW

## Technical specifications

## Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.
The rated operational current $I_{\mathrm{e}}$ complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200000 operating cycles.
If a shorter endurance is sufficient, the rated operational current $I_{\mathrm{e}} / \mathrm{AC}-4$ can be increased. $I_{\mathrm{e}}$
If the contacts are used for mixed operation, i. e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$
x=\frac{A}{1+\frac{C}{100}\left(\frac{A}{B}-1\right)}
$$

Characters in the equation:
$X$ Contact endurance for mixed operation in operating cycles
A Contact endurance for normal operation $\left(I_{\mathrm{a}}=I_{\mathrm{e}}\right)$ in operating cycles

B Contact endurance for inching ( $I_{\mathrm{a}}=$ multiple of $I_{\mathrm{e}}$ ) in operating cycles

C Inching operations as a percentage of total switching operations

Size S2



Diagram legend:
$P_{\mathrm{N}}=$ Rated power for squirrel-cage motors at 415 V
$I_{\mathrm{a}}=$ Breaking current
= Rated operational current

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

3-pole, 15 ... 250 kW
Endurance of the main contacts
Sizes S6 to S12


3RT12 vacuum contactors • Sizes S10 and S12


Diagram legend:
$P_{\mathrm{N}}=$ Rated power for squirrel-cage motors at 415 V
$I_{a}=$ Breaking current
$I_{\mathrm{e}}=$ Rated operational current

| Type <br> Size |  | $\begin{aligned} & \text { 3RT10 } 34 \\ & \text { S2 } \end{aligned}$ | 3RT10 35 | 3RT10 36 | $\begin{aligned} & \text { 3RT10 } 44 \\ & \text { S3 } \end{aligned}$ | 3RT10 45 | 3RT10 46 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Dimensions ( $\mathrm{W} \times \mathrm{H} \times \mathrm{D}$ ) <br> - With mounted auxiliary switch block | mm <br> mm | $\begin{aligned} & 55 \times 112 \times \\ & 55 \times 112 \times \end{aligned}$ |  |  | $\begin{aligned} & 70 \times 146 x \\ & 70 \times 146 x \end{aligned}$ |  |  |
| General data |  |  |  |  |  |  |  |
| Permissible mounting positions <br> The contactors are designed for operation on a vertical mounting surface. |  |  |  |  |  |  |  |
| Mechanical endurance |  |  |  |  |  |  |  |
| - Basic units | Operating cycles | 10 million |  |  |  |  |  |
| - Basic units with snap-on auxiliary switch block | Operating cycles | 10 million |  |  |  |  |  |
| - Solid-state compatible auxiliary switch blocks | Operating cycles | 5 million |  |  |  |  |  |
| Electrical endurance |  | 1) |  |  |  |  |  |
| Rated insulation voltage $U_{i}$ (pollution degree 3) | V | 690 |  |  | 1000 |  |  |
| Rated impulse withstand voltage $U_{\text {imp }}$ | kV | 6 |  |  | 6 |  |  |
| Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N | V | 415 |  |  | 690 |  |  |
| Mirror contacts |  |  |  |  |  |  |  |
| A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact. |  |  |  |  |  |  |  |
| - With removable auxiliary switch block |  | Yes, acc. to | EN 60947-4-1 | , Appendix |  |  |  |
| Permissible ambient temperature |  |  |  |  |  |  |  |
| - During operation | ${ }^{\circ} \mathrm{C}$ | $-25 \ldots+60$ |  |  |  |  |  |
| - During storage | ${ }^{\circ} \mathrm{C}$ | $-55 \ldots+80$ |  |  |  |  |  |
| Degree of protection acc. to EN 60947-1, Appendix C |  | IP20 (termi AC coil ass DC coil ass | al compartm mbly IP40, mbly IP30 | ent IPOO), |  |  |  |
| Touch protection acc.to EN 50274 |  | Finger-safe |  |  |  |  |  |
| Shock resistance (AC and DC operation) |  |  |  |  |  |  |  |
| - Rectangular pulse | $\mathrm{g} / \mathrm{ms}$ | $10 / 5$ and 5 |  |  | $6.8 / 5$ and 4 |  |  |
| - Sine pulse | $\mathrm{g} / \mathrm{ms}$ | 15/5 and 8 |  |  | $10.6 / 5$ and | 6.2110 |  |
| Conductor cross-sections |  | 2) |  |  |  |  |  |
| Short-circuit protection for contactors without overload relays |  |  |  |  |  |  |  |
| For short-circuit protection for contactors with overload relays see "Protection Equipment" $\longrightarrow$ "Overload Relays". |  |  |  |  |  |  |  |
| Main circuit |  |  |  |  |  |  |  |
| Fuse links gG, type NH 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1 |  |  |  |  |  |  |  |
| - Type of coordination "1" | A | 125 | 125 | 160 | 250 | 250 |  |
| - Type of coordination "2" | A | 63 | 63 | 80 | 125 | 160 |  |
| - Weld-free ${ }^{3)}$ | A | 16 | 16 | 50 | 63 | 100 |  |
| Auxiliary circuit |  |  |  |  |  |  |  |
| - Fuse links gG, type DIAZED 5SB, NEOZED 5SE (weld-free protection at $I_{k} \geq 1 \mathrm{kA}$ ) | A | 10 |  |  |  |  |  |
| - Miniature circuit breakers with C characteristic (short-circuit current $I_{k} \leq 400 \mathrm{~A}$ ) | A | 10 |  |  |  |  |  | (short-circuit current $I_{k} \leq 400 \mathrm{~A}$ )

1) For endurance of the main contacts see page $2 / 33$.
2) For conductor cross-sections see page $2 / 38$.
3) Test conditions acc. to IEC 60947-4-1.

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

## 3-pole, 15 ... 250 kW



1) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms , diode assembly: 2 to 6 times).

| Contactor | Type Size | $\begin{aligned} & \text { 3RT10 } 34 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 35 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 36 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 44 \\ & \text { S3 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 45 \\ & \text { S3 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 46 \\ & \text { S3 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Main circuit |  |  |  |  |  |  |  |
| AC capacity |  |  |  |  |  |  |  |
| Utilization category AC-1 Switching resistive loads |  |  |  |  |  |  |  |
| - Rated operational currents $I_{\text {e }}$ |  |  |  |  |  |  |  |
| - At $40^{\circ} \mathrm{C}$ up to 690 V | A | 50 | 60 | 60 | 100 | 120 | 120 |
| - At $60^{\circ} \mathrm{C}$ up to 690 V | A | 45 | 55 | 55 | 90 | 100 | 100 |
| - Rated power for AC loads ${ }^{1}$ ) with p.f. $=0.95$ (at $60^{\circ} \mathrm{C}$ ) |  |  |  |  |  |  |  |
| - At 415 V | kW | 31 | 38 | 38 | 59 | 66 | 66 |
| - Minimum conductor cross-section for loads with $I_{\text {e }}$ |  |  |  |  |  |  |  |
| - At $40{ }^{\circ} \mathrm{C}$ | $\mathrm{mm}^{2}$ | 16 | 16 | 16 | 35 | 50 | 50 |
| - At $60{ }^{\circ} \mathrm{C}$ | $\mathrm{mm}^{2}$ | 10 | 16 | 16 | 35 | 35 | 35 |
| Utilization categories AC-2 and AC-3 |  |  |  |  |  |  |  |
| - Rated operational currents $I_{\text {e }}$ |  |  |  |  |  |  |  |
| - Up to 500 V | A | 32 | 40 | 50 | 65 | 80 | 95 |
| - At 690 V | A | 20 | 24 | 24 | 47 | 58 | 58 |
| - Rated power of slipring or squirrel-cage motors at 50 and 60 Hz |  |  |  |  |  |  |  |
| - At 230 V | kW | 7.5 | 11 | 15 | 18.5 | 22 | 22 |
| - At 415 V | kW | 15 | 18.5 | 22 | 30 | 37 | 45 |
| - At 500 V | kW | 18.5 | 22 | 30 | 37 | 45 | 55 |
| - At 690 V | kW | 18.5 | 22 | 22 | 45 | 55 | 55 |
| Thermal current-carrying capacity, 10 s current²) | A | 320 | 400 | 400 | 600 | 760 | 760 |
| Power loss per conducting path at $l_{e} / \mathrm{AC}-3$ | W | 1.8 | 2.6 | 5 | 4.6 | 7.7 | 10.8 |
| Utilization category AC-4 (for $I_{\mathrm{a}}=6 \times \mathrm{I}_{\mathrm{e}}$ ) |  |  |  |  |  |  |  |
| - Rated operational current $I_{\mathrm{e}}$ |  |  |  |  |  |  |  |
| - Rated power for squirrel-cage motors with 50 Hz and 60 Hz $\text { - At } 415 \mathrm{~V}$ | kW | 15 | 18.5 | 22 | 30 | 37 | 45 |
| The following applies to a contact endurance of about 200000 operating cycles: |  |  |  |  |  |  |  |
| - Rated operational currents $\mathrm{I}_{\mathrm{e}}$ |  |  |  |  |  |  |  |
| - Up to 415 V | A | 15.6 | 18.5 | 24 | 28 | 34 | 42 |
| - Up to 690 V | A | 15.6 | 18.5 | 24 | 28 | 34 | 42 |
| - Rated power for squirrel-cage motors with 50 Hz and 60 Hz |  |  |  |  |  |  |  |
| - At 230 V | kW | 4.7 | 5.4 | 7.3 | 8.7 | 10.4 | 12 |
| - At 415 V | kW | 8.2 | 9.5 | 12.6 | 15.1 | 17.9 | 22 |
| - At 500 V | kW | 9.8 | 11.8 | 15.8 | 18.4 | 22.4 | 27 |
| - At 690 V | kW | 13 | 15.5 | 21.8 | 25.4 | 30.9 | 38 |

## Switching frequency

## Switching frequency z in operating cycles/hour

Contactors without overload relays

- No-load switching frequency AC
- No-load switching frequency DC
- Dependence of the switching frequency $z^{\prime}$ on the operational current I' and operational voltage $U^{\prime}$ :
$z^{\prime}=z \cdot\left(I_{\mathrm{e}} / I^{\prime}\right) \cdot\left(400 \mathrm{~V} / \mathrm{U}^{\prime}\right)^{1.5} \cdot 1 / \mathrm{h}$

| $-A C-1$ | $h^{-1}$ | 1200 | 1200 | 1000 | 1000 | 900 | 900 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $-A C-2$ | $h^{-1}$ | 750 | 600 | 400 | 400 | 400 | 350 |
| - AC-3 | $h^{-1}$ | 1000 | 1000 | 800 | 1000 | 1000 | 850 |
| - AC-4 | $h^{-1}$ | 250 | 300 | 300 | 300 | 300 | 250 |
| Contactors with overload relays |  |  |  |  |  |  |  |
| - Mean value | $h^{-1}$ | 15 |  |  |  |  |  |

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).
2) According to IEC 60947-4-1.

For rated values for various start-up conditions see "Protection Equipment" $\longrightarrow$ "Overload Relays".

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

## 3-pole, 15 ... 250 kW



1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

2) For endurance of the main contacts see page $2 / 34$.
3) For conductor cross-sections see page $2 / 42$.
4) For electromagnetic compatibility (EMC) see page $2 / 31$.
5) Test conditions according to IEC 60947-4-1.

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

## 3-pole, 15 ... 250 kW




Switching frequency
Switching frequency z in operating cycles/hour
Contactors without overload relays

- No-load switching frequency
- Dependence of the switching frequency $z$ ' on the operational current $I^{\prime}$ and operational voltage $U^{\prime}$ :

| - AC-1 | $\mathrm{h}^{-1}$ | 800 | 800 | 750 | 800 | 750 | 700 | 500 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - AC-2 | $\mathrm{h}^{-1}$ | 400 | 300 | 250 | 300 | 250 | 200 | 170 |
| - AC-3 | $\mathrm{h}^{-1}$ | 1000 | 750 | 500 | 700 | 500 | 500 | 420 |
| - AC-4 | $\mathrm{h}^{-1}$ | 130 | 130 | 130 | 130 | 130 | 130 | 130 |
| Contactors with overload relays |  |  |  |  |  |  |  |  |
| - Mean value | $h^{-1}$ | 60 |  |  |  |  |  |  |

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).
2) According to IEC 60947-4-1.

For rated values for various start-up conditions see "Protection Equipment" $\longrightarrow$ "Overload Relays".

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

## 3-pole, 15 ... 250 kW



1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

| Contactor | Type <br> Size |  | $\begin{aligned} & \text { 3RT10 } 34 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 35 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 36 \\ & \text { S2 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 44 \\ & \text { S3 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 45 \\ & \text { S3 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 46 \\ & \text { S3 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (4) and (1) rating |  |  |  |  |  |  |  |  |
| Rated insulation voltage |  | V AC | 600 |  |  | 600 |  |  |
| Uninterrupted current, at $40^{\circ} \mathrm{C}$, open and enclosed |  | A | 45 | 55 | 50 | 90 | 105 | 105 |
| Maximum horsepower ratings (\$1/C and (14) approved values) |  |  |  |  |  |  |  |  |
| - Rated power for induction motors at 60 Hz |  |  |  |  |  |  |  |  |
| - At 200 V |  | hp | 10 | 10 | 15 | 20 | 25 | 30 |
| - At 230 V |  | hp | 10 | 15 | 15 | 25 | 30 | 30 |
| - At 460 V |  | hp | 25 | 30 | 40 | 50 | 60 | 75 |
| - At 575 V |  | hp | 30 | 40 | 50 | 60 | 75 | 100 |
| Short-circuit protection |  |  |  |  |  |  |  |  |
| - At 600 V (contactor or overload relay) |  | kA | 5 | 5 | 5 | 10 | 10 | 10 |
| - CLASS RK5 fuse |  | A | 125 | 150 | 200 | 250 | 300 | 350 |
| - Circuit breakers with overload protection acc. to UL 489 |  | A | 125 | 150 | 200 | 250 | 300 | 400 |
| - Combination motor controllers type E acc. to UL 508 |  |  |  |  |  |  |  |  |
| - At 480 V |  | Type | 3RV10 3 |  |  | 3RV10 4 |  |  |
|  |  | A | 32 | 40 | 50 | 63 | 75 | 100 |
|  |  | kA | 65 | 65 | 65 | 65 | 65 | 65 |
| - At 600 V |  | Type | 3RV10 4 |  |  | 3RV10 4 |  |  |
|  |  | A | 32 | 40 | 50 | 63 | 75 | 75 |
|  |  | kA | 25 | 25 | 25 | 30 | 30 | 30 |
| NEMA/EEMAC ratings |  |  |  |  |  |  |  |  |
| NEMA/EEMAC size |  | hp | - |  | 2 | - |  | 3 |
| - Uninterrupted current |  |  |  |  |  |  |  |  |
| - Open |  | A | - |  | 45 | - |  | 90 |
| - Enclosed |  | A | - |  | 45 | - |  | 90 |
| - Rated power for induction motors at 60 Hz |  |  |  |  |  |  |  |  |
| - At 200 V |  | hp | - |  | 10 | - |  | 25 |
| - At 230 V |  | hp | - |  | 15 | - |  | 30 |
| - At 460 V |  | hp | - |  | 25 | - |  | 50 |
| - At 575 V |  | hp | - |  | 25 | - |  | 50 |
| Overload relays |  | Type | 3RU11 3 |  |  | 3RU11 4 |  |  |
| - Setting range |  | A | 5.5 ... 50 |  |  | $18 . .100$ |  |  |


| Contactor | Size |  | S2 to S12 <br> Screw terminals <br> Snap-on auxiliary switch block <br> (1- and 4-pole) | S2 to S12 <br> Screw terminals <br> Laterally mountable auxiliary switch block |
| :---: | :---: | :---: | :---: | :---: |
| (4) and (17) rating of the auxiliary contacts |  |  |  |  |
| Rated voltage |  | V AC | 600 | 600 |
| Switching capacity |  |  | A 600, Q 600 | A 300, Q 300 |
| - Uninterrupted current at 240 V AC |  | A | 10 | 10 |

## Power Contactors for Switching Motors

## SIRIUS 3RT10 contactors,

## 3-pole, 15 ... 250 kW

| Contactor | Type Size | $\begin{aligned} & \text { 3RT10 } 54 \\ & \text { S6 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 55 \\ & \text { S6 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 56 \\ & \text { S6 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 64 \\ & \text { S10 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 65 \\ & \text { S10 } \end{aligned}$ | $\begin{aligned} & \text { 3RT10 } 66 \\ & \text { S10 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

(e8 and (a) rating VAC

| Rated insulation voltage | V AC | 600 |  |  | 600 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uninterrupted current, at $40^{\circ} \mathrm{C}$, open and enclosed | A | 140 | 195 | 195 | 250 | 330 | 330 |
| Maximum horsepower ratings (\$5- and (1L) approved values) |  |  |  |  |  |  |  |
| - Rated power for induction motors at 60 Hz |  |  |  |  |  |  |  |
| - At 200 V | hp | 40 | 50 | 60 | 60 | 75 | 100 |
| - At 230 V | hp | 50 | 60 | 75 | 75 | 100 | 125 |
| - At 460 V | hp | 100 | 125 | 150 | 150 | 200 | 250 |
| - At 575 V | hp | 125 | 150 | 200 | 200 | 250 | 300 |


|  |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Short-circuit protection |  |  | 10 | 10 | 18 | 18 |
| - At 600 V | kA | 10 | 10 | 10 | 800 | 800 |
| - CLASS RK5/L fuse | A | 450 | 500 | 500 | 700 | 800 |
| - Circuit breakers with overload protection acc. to UL 489 | A | 350 | 450 | 500 | 500 | 700 |


| NEMA/EEMAC ratings |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NEMA/EEMAC size | hp | - | 4 | - | - | - | 5 |
| - Uninterrupted current |  |  |  |  |  |  |  |
| - Open | A | - | 150 | - | - | - | 300 |
| - Enclosed | A | - | 135 | - | - | - | 270 |
| - Rated power for induction motors at 60 Hz |  |  |  |  |  |  |  |
| - At 200 V | hp | - | 40 | - | - | - | 75 |
| - At 230 V | hp | - | 50 | - | - | - | 100 |
| - At 460 V | hp | - | 100 | - | - | - | 200 |
| - At 575 V | hp | - | 100 | - | - | - | 200 |
| Overload relays |  | 3RB |  |  |  |  |  |



Selection and ordering data
AC operation


3RT10 3.-1A. 00

| Rated data |  |  | Auxiliary contacts |  |  | Rated control <br> supply voltage $U_{s}$ at <br> $50 / 60 \mathrm{~Hz}$ | Screw terminals | (15) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Operational | Rating of induction | $\mathrm{AC}-1, T_{\mathrm{u}}: 40^{\circ} \mathrm{C}$ <br> Operational current $I_{\mathrm{e}}$ up to 690 V | Ident. No. | Versi |  |  | Order No. |  |
| $\begin{aligned} & \text { current } I_{\mathrm{e}} \text { up to } \\ & 500 \mathrm{~V} \end{aligned}$ | motors at 50 Hz and $415 \mathrm{~V}$ |  |  | ${ }^{1}$ | 4 |  |  |  |
| A | kW | A |  | NO | NC | V AC |  |  |

## For screw and snap-on mounting onto 35 mm standard mounting rail

## Size S2

| 32 | 15 | 50 | - | - | - | 24 | 3RT10 34-1AC20 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | 110 | 3RT10 34-1AG20 |
|  |  |  |  |  |  | 230 | 3RT10 34-1AL20 |
| 40 | 18.5 | 60 | - | - | - | 24 | 3RT10 35-1AC20 |
|  |  |  |  |  |  | 110 | 3RT10 35-1AG20 |
|  |  |  |  |  |  | 230 | 3RT10 35-1AL20 |
| 50 | 22 | 60 | - | - | - | 24 | 3RT10 36-1AC20 |
|  |  |  |  |  |  | 110 | 3RT10 36-1AG20 |
|  |  |  |  |  |  | 230 | 3RT10 36-1AL20 |

For screw and snap-on mounting onto 35 mm and 75 mm standard mounting rail
Size S3

| 65 | 30 | 100 | - | - | - | $\begin{aligned} & 24 \\ & 110 \\ & 230 \end{aligned}$ | 3RT10 44-1AC20-8K <br> 3RT10 44-1AG20-8K <br> 3RT10 44-1AL20-8K |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 80 | 37 | 120 | - | - | - | $\begin{aligned} & 24 \\ & 110 \\ & 230 \end{aligned}$ | 3RT10 45-1AC20-8K 3RT10 45-1AG20-8K 3RT10 45-1AL20-8K |
| 95 | 45 | 120 | - | - | - | $\begin{aligned} & 24 \\ & 110 \\ & 230 \end{aligned}$ | 3RT10 46-1AC20-8K 3RT10 46-1AG20-8K 3RT10 46-1AL20-8K |

Other voltages on request.
For accessories, see page $2 / 176$.
For spare parts, see page 2/183.

## Power Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 15 ... 250 kW

DC operation • DC solenoid system

3RT10 3.-1B. 40

| Rated data |  |  |
| :---: | :---: | :---: |
| AC-2 and AC-3, | Up to $60^{\circ} \mathrm{C}$ | $\mathrm{AC}-1, T_{u}: 40^{\circ} \mathrm{C}$ |
| Operational current $I_{\mathrm{e}}$ up to 500 V | Rating of induction motors at 50 Hz and 415 V | Operational current $I_{\mathrm{e}}$ up to 690 V |


| 3RT10 $4 .-1 \mathrm{~B} .40$ |  | Rated control supply <br> voltage $U_{s}$ |
| :--- | :--- | :--- |
| Auxiliary contacts |  | Screw terminals |
| Ident. No. Version |  |  |
| NO | NC | V DC |

For screw and snap-on mounting onto 35 mm standard mounting rail

Size S2

| 32 | 15 | 50 | - | - | - | $\begin{aligned} & 24 \\ & 220 \end{aligned}$ | $\begin{aligned} & \text { 3RT10 34-1BB40 } \\ & \text { 3RT10 34-1BM40 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 40 | 18.5 | 60 | - | - | - | $\begin{aligned} & 24 \\ & 220 \end{aligned}$ | $\begin{aligned} & \text { 3RT10 35-1BB40 } \\ & \text { 3RT10 35-1BM40 } \end{aligned}$ |
| 50 | 22 | 60 | - | - | - | $\begin{aligned} & 24 \\ & 220 \end{aligned}$ | $\begin{aligned} & \text { 3RT10 36-1BB40 } \\ & \text { 3RT10 36-1BM40 } \end{aligned}$ |

For screw and snap-on mounting onto 35 mm and 75 mm standard mounting rail
Size S3

| 65 | 30 | 100 | - | - | - | 24 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 220 | 3RT10 44-1BB40 <br> 3RT10 44-1BM40 |  |  |  |  |  |  |
| 80 | 37 | 120 | - | - | - | 24 | 3RT10 45-1BB40 <br> 3RT10 45-1BM40 |
| 95 | 45 | 120 | - | - | - | 24 | 3RT10 46-1BB40 |
|  |  |  |  |  |  |  |  |
| 3RT10 46-1BM40 |  |  |  |  |  |  |  |

Other voltages on request.
For accessories, see page 2/176.
For spare parts, see page 2/183.

## 3RT10 contactors, 3-pole, 15 ... 250 kW

Contactors without coils
AC/DC operation ( 40 Hz to $60 \mathrm{~Hz}, \mathrm{DC}$ )
Conventional operating mechanism / Solid-state operating mechanism for 24 V DC PLC output


3RT1. 5.


3RT1. 6.


3RT1. 7.

| Size | Rated data AC-2 and AC-3, | : Up to |  |  |  |  | Auxiliary contacts, lateral |  | Screw terminals | (1) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Operational current $I$ up to | Rating of induction motors at 50 Hz and |  |  |  | $\mathrm{AC}-1, T_{\mathrm{u}}: 40^{\circ} \mathrm{C}$ <br> Operational current $I_{\mathrm{e}}$ up to 690 V | Version |  | Order No. |  |
|  | 500 V | 230 V | 415 V | 500 V | 690 V |  |  |  |  |  |
|  | A | kW | kW | kW | kW | A | NO | NC | V ACIDC |  |
| S6 | 115 | 37 | 55 | 75 | 110 | 160 | 2 | 2 | 3RT10 54-6LA06-8K |  |
|  | 150 | 45 | 75 | 90 | 132 | 185 | 2 | 2 | 3RT10 55-6LA06-8K |  |
|  | 185 | 55 | 90 | 110 | 160 | 215 | 2 | 2 | 3RT10 56-6LA06-8K |  |
| S10 | 225 | 55 | 110 | 160 | 200 | 275 | 2 | 2 | 3RT10 64-6LA06-8K |  |
|  | 265 | 75 | 132 | 160 | 250 | 330 | 2 | 2 | 3RT10 65-6LA06-8K |  |
|  | 300 | 90 | 160 | 200 | 250 | 330 | 2 | 2 | 3RT10 66-6LA06-8K |  |
| S12 | 400 | 132 | 200 | 250 | 400 | 430 | 2 | 2 | 3RT10 75-6LA06-8K |  |
|  | 500 | 160 | 250 | 355 | 400 | 610 | 2 | 2 | 3RT10 76-6LA06-8K |  |

For coils, see table below
For other accessories see page 2/176
For spare parts see page 2/183


For 24 V DC PLC output/PLC relay output, with remaining lifetime indicator (RLT)
(Withdrawable coil with lateral solid-state module)

| S6 | 3RT10 5 | 96...127V AC/DC | 3RT19 55-5PF31 |
| :---: | :---: | :---: | :---: |
|  | 3RT14 5 | 200...277V ACIDC | 3RT19 55-5PP31 |
| S10 | 3RT10 6 | 96...127V ACIDC | 3RT19 65-5PF31 |
|  | 3RT14 6 | 200...277V AC/DC | 3RT19 65-5PP31 |
| S12 | 3RT10 7 | 96...127V ACIDC | 3RT19 75-5PF31 |
|  | 3RT14 7 | 200...277V AC/DC | 3RT19 75-5PP31 |

## Power Contactors for Switching Motors

## 3RT10 contactors, 3-pole, 15 ... 250 kW

AC/DC operation ( 40 Hz to $60 \mathrm{~Hz}, D C$ )
Auxiliary and control conductors: screw terminals
Withdrawable coils
Integrated coil circuit (Varistor)
Main conductors: busbar connections
Remaining lifetime indicator (RLT)


For accessories see page $2 / 176$.
For spare parts see page 2/183.

## Options

Rated control supply voltages (the 10th and 11th position of the order number must be changed)

| Rated control supply voltage $U_{s}$ | Contactor type | $\begin{aligned} & \text { 3RT10 3, 3) } \\ & \text { 3RT10 } 4^{3)} \end{aligned}$ | 3RT14 4 | $\begin{aligned} & \text { 3RT13 3, 3) } \\ & \text { 3RT13 4, 3) } \\ & \text { 3RT15 3 } \end{aligned}$ | 3RT16 17, 3RT16 27, 3RT16 47 |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Size | S2, S3 | S3 | S2, S3 | S00, S0, S3 |

Sizes S2 and S3
AC operation
Solenoid coils for $50 \mathbf{H z}^{1)}$


| Rated control supply voltage $U_{s}$ | Contactor type |  | Rated control supply voltage $U_{s}$ | Contactor type | 3RT1.5.-. N 3RT1. $6 .-. N$ 3RT1. $7 .-$ N | $\begin{aligned} & \text { 3RT1. 5.-. P/Q } \\ & \text { 3RT1. 6.-. P/Q } \\ & \text { 3RT1. } 7 .-\mathrm{P} / \mathrm{Q} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $U_{s \text { min }} \ldots U_{s \text { max }}{ }^{5}{ }^{\text {s }}$ | Size | S6, S10, S12 | $U_{s \text { min }} \ldots U_{s \text { max }}{ }^{2}{ }^{2}$ | Size | S6, S10, S12 | S6, S10, S12 |

## Sizes S6 to S12

UC operation (AC 40 ... 60 Hz, DC)
Conventional operating mechanism
23 ... 26 V ACIDC
Solid-state operating mechanism
42 ... 48 V ACIDC
21 ... 27.3 V ACIDC
110 ... 127 V ACIDC
. 127 V AC/DC

|  | Solid-state operating mechanism |  |  |
| :---: | :---: | :---: | :---: |
| B3 | $21 . . .27 .3 \mathrm{~V}$ AC/DC | B3 | - |
| D3 | $96 . . .127 \mathrm{~V}$ AC/DC | F3 | F3 |
| F3 | $200 . .277$ V ACIDC | P3 | P3 |
| M3 |  |  |  |
| P3 |  |  |  |
| U3 |  |  |  |
| V3 |  |  |  |
| R3 |  |  |  |
| S3 |  |  |  |
| T3 |  |  |  |

200 ... 220 V ACIDC
200 ... 277 V ACIDC

1) Coil operating range:
at $50 \mathrm{~Hz}: 0.8$ to $1.1 \times \mathrm{U}_{\mathrm{s}}$ at $60 \mathrm{~Hz}: 0.85$ to $1.1 \times U_{s}$.
2) Operating range: $0.8 \times U_{s \min }$ to $1.1 \times U_{s \max }$.
3) Wideband coil voltages available.

For ordering and technical details, contact nearest sales office.

