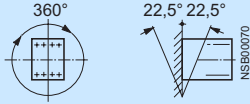



3RH, 3TH Contactor Relays

3RH1 contactor relays, 4- and 8-pole

Technical specifications

| | | |
|---|--------------|--|
| Contactors | Type Size | 3RH1 S00 |
| Permissible mounting position | | |
| The contactors are designed for operation on a vertical mounting surface. | |  |
| Upright mounting position (only for 3RH11/3RH12/3RH14) | AC operation |  |
| | DC operation | Special version required Standard version (for coupling relays and contactor relays with extended tolerance 3RH11 22-2K.40, please ask) |

Positively-driven operation of contacts in contactor relays

3RH1:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (removable) acc. to:

- ZH 1/457
- EN 60947-5-1, Appendix L

3RH12:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (fixed) acc. to:

- ZH 1/457
- EN 60947-5-1, Appendix L
- SUVA

Note
3RH19 11-NF solid-state compatible auxiliary switch blocks have no positively-driven contacts.

Contact reliability

Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4

Explanations:
There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

ZH1/457
Safety rules for control units on power-operated presses in the metal-working industry.

EN 60947-5-1, Appendix L
Low-voltage controlgear, control equipment, and switching elements. Special requirements for positively-driven contacts

SUVA
Accident prevention regulations of the Schweizer Unfallverhütungsanstalt (Swiss Institute for Accident Insurance)

Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i.e. not synchronized with the phase angle of the supply system. If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary. RC elements and freewheel diodes would be suitable as protective features. The characteristic curves apply to:

- 3RH11, 3RH12 contactor relays
- 3RH14 latched contactor relays
- 3RH19 11 auxiliary switch blocks.

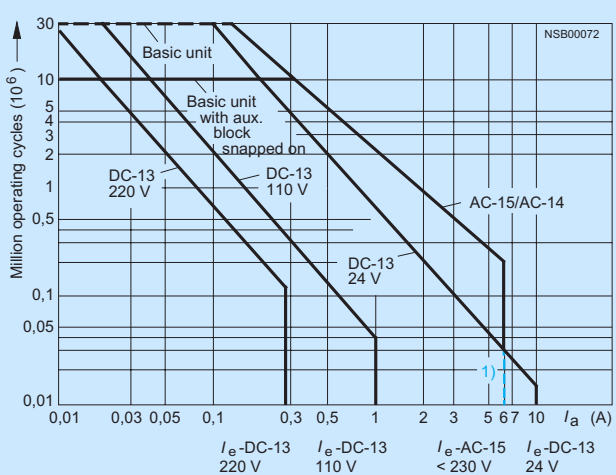


Diagram legend:
 I_a = Breaking current
 I_e = Rated operational current

1) Snap-on auxiliary switch blocks: I_e /DC-13 max. 6 A.

3RH, 3TH Contactor Relays

3RH1 contactor relays, 4- and 8-pole

| Contactor | Type | | 3RH11, 3RH12 | 3RH14 |
|---|--|------------------|---|-----------|
| | Size | | S00 | S00 |
| CSA and UL rated data | | | | |
| Basic units and auxiliary switch blocks | | | | |
| • Rated control supply voltage | V AC | | Max. 600 | |
| • Rated voltage | V AC | | 600 | |
| • Switching capacity | | | A 600, Q 600 | |
| • Uninterrupted current at AC 240 V | A | | 10 | |
| General data | | | | |
| Mechanical endurance | Basic units | Operating cycles | 30 million | 5 million |
| | Basic unit with snap-on auxiliary switch block | Operating cycles | 10 million | |
| | Solid-state compatible auxiliary switch block | Operating cycles | 5 million | |
| Rated insulation voltage U_i (pollution degree 3) | | V | 690 | |
| Rated impulse withstand voltage U_{imp} | | kV | 6 | |
| Safe isolation | | V | 400 | |
| Between the coil and the contacts in the basic unit acc. to EN 60947-1, Appendix N | | | | |
| Permissible ambient temperature | During operation | °C | -25 ... +60 | |
| | During storage | °C | -55 ... +80 | |
| Degree of protection acc. to EN 60947-1, Appendix C | | | IP20, coil assembly IP40 | |
| Touch protection acc. to EN 50274 | | | Finger-safe | |
| Shock resistance | | | | |
| Rectangular pulse | AC/DC operation | g/ms | 10/5 and 5/10 | |
| Sine pulse | AC/DC operation | g/ms | 15/5 and 8/10 | |
| Conductor cross-sections | | | | |
| Screw terminals | Auxiliary conductor and coil terminals | | | |
| (1 or 2 conductors connectable) | • Solid | mm ² | 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) acc. to IEC 60947; max. 2 x (1 ... 4) | |
| | • Finely stranded with end sleeve | mm ² | 2 x (0.5 ... 1.5); 2 x (0.75 ... 2.5) | |
| | • AWG conductors, solid or stranded | AWG | 2 x (20 ... 16); 2 x (18 ... 14); 1 x 12 | |
| | • Terminal screws | | M3 | |
| | - Tightening torque | Nm | 0.8 ... 1.2 (7 ... 10.3 lb.in) | |
| Cage Clamp terminals | Auxiliary conductor and coil terminals | | | |
| (1 or 2 conductors connectable) | • Solid | mm ² | 2 x (0.25 ... 2.5) | |
| | • Finely stranded with end sleeve | mm ² | 2 x (0.25 ... 1.5) | |
| | • Finely stranded without end sleeve | mm ² | 2 x (0.25 ... 2.5) | |
| | • AWG conductors, solid or stranded | AWG | 2 x (24 ... 14) | |
| Short-circuit protection | | | | |
| (weld-free protection at $I_k \geq 1$ kA) | | | | |
| • Fuse links, gL/gG operational class | | | | |
| | - DIAZED, Type 5SB | A | 10 | |
| | - NEOZED Type 5SE | A | 10 | |
| • or miniature circuit-breakers with C-characteristic (short-circuit current $I_k < 400$ A) | | A | 6 | |

For corresponding 8WA2 803/8WA2 804 opening tool, see Catalog LV 1.

An "insulation stop" must be used for conductor cross-sections ≤ 1 mm², see Catalog LV 1.

Maximum outer diameter of the conductor insulation: 3.6 mm.

3RH, 3TH Contactor Relays

3RH1 contactor relays, 4- and 8-pole

| Contactor | | Type Size | 3RH1. S00 | |
|--|------------------------------|---|--------------------------|-----------|
| Control | | | | |
| Coil operating range | | | | |
| AC operation | | at 50 Hz | 0.8 ... 1.1 x U_s | |
| | | at 60 Hz | 0.85 ... 1.1 x U_s | |
| DC operation | | at +50 °C | 0.8 ... 1.1 x U_s | |
| | | at +60 °C | 0.85 ... 1.1 x U_s | |
| Power consumption of the magnetic coils (when coil is cold and 1.0 x U_s) | | | | |
| AC operation, 50 Hz | | • Closing | VA/p.f. | 27 /0.8 |
| | | • Closed | VA/p.f. | 4.6 /0.27 |
| AC operation, 60 Hz | | • Closing | VA/p.f. | 24 /0.75 |
| | | • Closed | VA/p.f. | 3.5 /0.27 |
| DC operation | | Closing = Closed | W | 3.2 |
| Permissible residual current of the electronics (with 0 signal) | | | | |
| | | For AC operation ¹⁾ | < 3 mA x (230 V/ U_s) | |
| | | For DC operation | < 10 mA x (24 V/ U_s) | |
| Operating times ²⁾ (Total break time = OFF-delay + Arcing time) | | | | |
| AC operation | | Values apply with coil in cold state and at operating temperature for operating range | | |
| Closing | | | | |
| • ON-delay of NO contact | 0.8 ... 1.1 x U_s | ms | 8 ... 35 | |
| | 1.0 x U_s | ms | 10 ... 25 | |
| | 3RH14 minimum operating time | ms | ≥ 35 | |
| • OFF-delay of NC contact | 0.8 ... 1.1 x U_s | ms | 6 ... 20 | |
| | 1.0 x U_s | ms | 7 ... 20 | |
| Opening | | | | |
| • OFF-delay of NO contact | 0.8 ... 1.1 x U_s | ms | 4 ... 30 | |
| | 1.0 x U_s | ms | 5 ... 30 | |
| | 3RH14 minimum operating time | ms | ≥ 30 | |
| • ON-delay of NC contact | 0.8 ... 1.1 x U_s | ms | 5 ... 30 | |
| | 1.0 x U_s | ms | 7 ... 20 | |
| DC operation | | | | |
| Closing | | | | |
| • ON-delay of NO contact | 0.8 ... 1.1 x U_s | ms | 25 ... 100 | |
| | 1.0 x U_s | ms | 30 ... 50 | |
| | 3RH14 minimum operating time | ms | ≥ 100 | |
| • OFF-delay of NC contact | 0.8 ... 1.1 x U_s | ms | 20 ... 90 | |
| | 1.0 x U_s | ms | 25 ... 45 | |
| Opening | | | | |
| • OFF-delay of NO contact | 0.8 ... 1.1 x U_s | ms | 7 ... 10 | |
| | 1.0 x U_s | ms | 7 ... 9 | |
| | 3RH14 minimum operating time | ms | ≥ 30 | |
| • ON-delay of NC contact | 0.8 ... 1.1 x U_s | ms | 13 ... 16 | |
| | 1.0 x U_s | ms | 13 ... 15 | |
| Arcing time | | ms | 10 ... 15 | |
| Dependence of the operating frequency z' on the operational current I' and operational voltage U' $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$ | | | | |

1) The 3RT19 16-1GA00 additional load module is recommended for higher residual currents, see Catalog LV 1.

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

3RH, 3TH Contactor Relays

3RH1 contactor relays, 4- and 8-pole

| Contactor | Type Size | 3RH1. S00 | |
|---|---------------|------------------|-------|
| Load side | | | |
| Rated operational currents I_e | | | |
| AC-12 | A | 10 | |
| AC-15/AC-14 | up to 230 V A | 6 | |
| For rated operational voltage U_s | 400 V A | 3 | |
| | 500 V A | 2 | |
| | 690 V A | 1 | |
| DC-12 | | | |
| For rated operational voltage U_s | | | |
| • 1 current path | 24 V A | 10 | |
| | 60 V A | 6 | |
| | 110 V A | 3 | |
| | 220 V A | 1 | |
| | 440 V A | 0.3 | |
| | 600 V A | 0.15 | |
| • 2 current paths in series | 24 V A | 10 | |
| | 60 V A | 10 | |
| | 110 V A | 4 | |
| | 220 V A | 2 | |
| | 440 V A | 1.3 | |
| | 600 V A | 0.65 | |
| • 3 current paths in series | 24 V A | 10 | |
| | 60 V A | 10 | |
| | 110 V A | 10 | |
| | 220 V A | 3.6 | |
| | 440 V A | 2.5 | |
| | 600 V A | 1.8 | |
| DC-13 | | | |
| For rated operational voltage U_s | | | |
| • 1 current path | 24 V A | 10 ¹⁾ | |
| | 60 V A | 2 | |
| | 110 V A | 1 | |
| | 220 V A | 0.3 | |
| | 440 V A | 0.14 | |
| | 600 V A | 0.1 | |
| • 2 current paths in series | 24 V A | 10 | |
| | 60 V A | 3.5 | |
| | 110 V A | 1.3 | |
| | 220 V A | 0.9 | |
| | 440 V A | 0.2 | |
| | 600 V A | 0.1 | |
| • 3 current paths in series | 24 V A | 10 | |
| | 60 V A | 4.7 | |
| | 110 V A | 3 | |
| | 220 V A | 1.2 | |
| | 440 V A | 0.5 | |
| | 600 V A | 0.26 | |
| Operating frequency z | | | |
| • In operating cycles/h during normal duty for utilization category | AC-12/DC-12 | h ⁻¹ | 1000 |
| | AC-15/AC-14 | h ⁻¹ | 1000 |
| | DC-13 | h ⁻¹ | 1000 |
| • No-load operating frequency | | h ⁻¹ | 10000 |

Dependence of the operating frequency z' on the operational current I' and operational voltage U'
 $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$

1) Snap-on auxiliary switch blocks: 6 A.