

3TG10 Miniature Contactors

Description

AC and DC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

The 3TG10 contactors with 4 main contacts are available with screw-type terminals or with 6.3 mm to 0.8 mm tab connectors. The designs with screw-type terminals are suitable for use in any climate and safe from touch to DIN VDE 0106 Part 100.

The 3TG10 contactors have a compact design. Their overall width is 36 mm.

Application

They are suitable for use in household appliances as well as for distribution boards in offices and residential buildings, owing to their hum-free construction. They can further be used in all areas where there is only a limited amount of space available, e.g. in air conditioners, heating systems, pumps and fans - basically in all simple electrical controls.

Surge suppression

The 3TG10 contactors are fitted with an integrated protective circuit for damping opening surges.

Overload and short-circuit protection

For the short-circuit protection of contactors without an overload relay, see the technical data. The 3UA7 overload relay for contactor mounting or for mounting as a single unit can be used for overload protection (see NS E Catalog).

AC and DC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

The 3TF contactors are suitable for use in any climate. They are safe from touch according to DIN VDE 0106 Part 100. Terminal covers (see accessories) may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Main contacts

• 3TF50 to 3TF57 contactors

Important information about assessing contact erosion can be found in the brochure entitled "Contacts of the 3TF Contactors: Robust and Durable", Order No. E20001-P285-A495.

• Contact erosion indication with 3TF68/69 vacuum contactors

The contact erosion of the vacuum interrupters can be monitored in the closed position by means of three white double slides on the contactor base.

The vacuum interrupter must be replaced if the distance indicated by one of the double slides is less than 0.5 mm while the contactor is in the closed position. It is advisable to replace all three interrupters in order to ensure maximum reliability.

Main conductor connections

The 3TF50 contactors are available with box terminals for the main conductor connections.

Optionally, these contactors can be supplied without box terminals but with busbar connections and terminal screws. No additional charge is made.

When ordering these contactors, the Order No. must be supplemented with "-Z" and the order code "A01".

Example: 3TF50 22-0AP0-Z A01

Auxiliary contacts

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

Contact reliability

The auxiliary contacts are extremely reliable and as such are suitable for electronic circuits

- with currents ≥ 1 mA,
- at voltages greater than 17 V.

Surge suppression

Control circuit

Protection of the coil circuits against surges:

AC operation

- 3TF50 to 3TF56: can be retrofitted with varistors or RC elements.
- 3TF57, 3TF68 and 3TF69: fitted with varistors as standard.

DC operation

Retrofitting options:

- 3TF57, 3TF68 and 3TF69 with DC economy circuit: varistors.

Standard circuits:

- Pick-up and holding windings of 3TF50 to 3TF56 contactors with DC economy circuit: diodes or varistors.

An additional reversing contactor is necessary for 3TF52 to 3TF57 and 3TF68/3TF69 contactors; it is automatically included in the delivery in the same packaging as the contactor. No additional charge is made.

3TF50 to 3TF69 Contactors

Description

3TF50 to 3TF69 Contactors for Switching Motors

Description

Electromagnetic compatibility (EMC)

3TF57, 3TF68 and 3TF69 contactors with AC operation feature an electronically controlled mechanism. This mechanism has a surge strength in accordance with the table opposite:

Contactor Type	Rated control supply voltage U_c	Overtoltage type (IEC 60 801)	Severity to IEC 60 801	Surge strength
3TF57 . . -C.., 3TF68 44-C.., 3TF69 44-C..	110 V to 132 V	Burst Surge	3 4	2 kV 6 kV
	200 V to 276 V	Burst Surge	4 4	4 kV 5 kV
	380 V to 600 V	Burst Surge	4 4	4 kV 6 kV

3TF68 and 3TF69 vacuum contactors - circuit of the main conducting paths

An integrated RC varistor circuit in the main conducting paths of the contactors damps the rate of rise of switching overvoltages to uncritical values. Multiple re-striking of the switching arcs is thereby prevented. The user can rest assured that the potential danger to the motor winding

from switching overvoltages with a high rate of rise has been eliminated. The contactors can therefore be used without reservation for all AC switching applications, including three-phase motors with the demanding AC-4 utilization category.

Important note

The surge suppression circuit is not necessary when 3TF68/69 contactors are used in circuits with e. g. DC choppers, frequency converters and

variable-speed drives. A surge suppression circuit might be damaged by the voltage peaks and harmonics generated. This may also cause phase-to-phase short-circuits in the contactors.

Remedy: Order the special contactor design without surge suppression. In this case the Order No. must be supplemented with "-Z" and the order code "A02". No additional charge is made.

Short-circuit protection of the 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 Part 4.

For assembling fuseless load feeders, please select a circuit-breaker/contactor combination according to the brochure entitled "Fuseless Load Feeders", Order No. E20001-P285-A726.

3TB50 to 3TB56 Contactors for Switching Motors

Description

DC operation

IEC 60 158-1 and
DIN VDE 0660.

Design

The contactors are suitable for use in any climate and safe from touch to DIN VDE 0106 Part 100. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Short-circuit protection of the 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 Part 4.

3TD Reversing Contactor Assemblies

1

2

3

Description

AC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

The contactor assemblies are suitable for use in any climate. The contactors are mechanically interlocked. They are safe from touch to DIN VDE 0106 Part 100.

Complete equipment assemblies and components for customer assembly are available. For motor protection, either overload relays for individual mounting or thermistor motor protection tripping units must be ordered separately in accordance with Part 4.

Complete equipment assemblies

3TD50 to 3TD68 contactor assemblies each consist of two 3TF50 to 3TF68 contactors of the same size. All starters are mechanically interlocked. Electrical interlocking is wired. The main and control circuits are wired according to the circuit diagrams.

An internal circuit diagram, a type designation and an identification plate are provided on a common cover.

Mode of operation

The operating times of the individual contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked via their auxiliary switches and the operating mechanisms.

The coils for AC 50/60 Hz for the 3TD50 may only be used if it is ensured that there is a minimum dead interval of 50 ms on reversing between the signaling for the two directions of rotation.

The operating times of the individual contactors are not affected by the mechanical interlock.

Auxiliary contacts

The contactor assemblies each have 2 NO + 2 NC contacts per contactor. 1 NO + 1 NC contacts with momentary-contact operation and 2 NO + 1 NC contacts with maintained-contact operation are unassigned.

3TE Contactor Assemblies for Star-Delta Starting

Description

AC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

The contactor assemblies are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100.

Complete 3TE equipment assemblies and components for customer assembly are available.

The complete equipment assemblies are optionally supplied without a main conducting path connection between the line contactor and the delta contactor.

Application

Star-delta starting can only be used either if the motor normally operates in a delta connection or starts softly or if the load torque during star starting is low and does not increase sharply. On the star step the motors can carry approximately 50 % (class KL 16) or 30 % (class KL 10) of their rated torque; the starting torque is approximately $\frac{1}{3}$ of that during direct on-line starting. The starting current is approximately 2 to 2.7 times the rated motor current.

The changeover from star to delta must not be effected until the motor has run up to rated speed. Drives which require this changeover to be performed earlier are unsuitable for star-delta starting.

The ratings given in the selection and ordering data are only applicable to motors with a starting current ratio of $I_A \leq 8.4 \times I_N$ and using a 7PU62 20 star-delta time-delay relay with a dead interval of approximately 50 ms on reversing.

Motor protection

3TE50 to 3TE68 contactor assemblies are supplied without overload protection. Overload relays or thermistor motor protection tripping units must be ordered separately.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

3TK5 Contactors with 3 Main NO Contacts

Description

AC and DC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

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

Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

Application

3TK5 contactors are used for switching resistive loads or as contactors, e.g. in variable-speed drives which normally only have to carry the current. Switching higher currents, e.g. in case of an EMERGENCY STOP, is possible up to 8 times $I_e/AC-3$.

Contact reliability

The auxiliary contacts are extremely reliable and as such are suitable for electronic circuits

- with currents ≥ 1 mA
- at voltages greater than 17 V.

Surge suppression Control circuit

AC operation

3TK50 to 3TK56: coils can be retrofitted with varistors or RC elements.

DC operation
(DC economy circuit)

With pick-up and holding windings. Fitted with diodes or varistors as standard.

An additional reversing contactor is necessary for 3TF52 to 3TF56 contactors; it is included in the delivery.

No additional charge is made.

3TK1 Contactors with 4 Main NO Contacts

Description

AC operation

EN 60 947-4-1
(VDE 0660 Part 102).

The contactors also fulfil the requirements of NFC 63-100 and NFC 20-040.

Design

The contactors are suitable for use in any climate. They are safe from touch to DIN VDE 0106 Part 100. Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Application

- Isolating systems with un-earthed or poorly earthed neutral conductors
- Switching resistive loads
- System transfers when alternative AC power supplies are used
- As contactors, e.g. for variable-speed drives which only have to carry current and not switch

Surge suppression Control circuit

Coils of 3TK1 contactors: can be retrofitted with RC elements.

Coils of 3TK10 to 3TK13 contactors: designed as withdrawable coils.

3TC44 to 3TC56 Contactors

Description

AC and DC operation

EN 60 947-4-1
(VDE 0660 Part 102).

Design

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

Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

The DC motor ratings given in the tables are applicable to the DC-3 and DC-5 utilization categories with two-pole switching of the load or with the two conducting paths of the contactor connected in series.

One contactor conducting path can switch full power up to 220 V. The ratings for higher voltages are available on request.

Auxiliary contacts

The terminal designations comply with EN 50 012. When the contactors are energized, the NC contacts in an auxiliary switch block open before the NO contacts close.

Application

The contactors are suitable for switching and controlling DC motors as well as all other DC circuits.

A design with an especially large coil voltage tolerance is available for use in electrically driven vehicles and in switch-gear with significant fluctuations in the operating voltage (see page 3/159).

3TC74 Single-Pole Contactors, 3TC78 Two-Pole Contactors

1

2

3

AC and DC operation

EN 60 947-4-1 (VDE 0660 Part 102).

The 3TC74 additionally complies with UIC 616 (specifications of European Railway Companies).

Design

The contactors are suitable for use in any climate. They can be used for switching and controlling DC motors as well as all other DC loads. The operating coil system is designed for an especially large voltage tolerance.

It is between 0.7 or 0.8 and $1.2 \times$ the rated control supply voltage.

Description

The contactors are largely insensitive to vibrations and are therefore also ideal for use in vehicles and hoisting gear in which such vibrations occur.

3TC74 contactors can be used at up to 750 V/400 A and 50 Hz in AC-1 operation.

Auxiliary switches

The terminal designations comply with EN 50 012.

When the contactors are energized, the NC contacts open before the NO contacts close.

They provide good contact reliability at low voltages and currents by means of moving double-break contacts.

Contactors with Extended Tolerance

0.7 to $1.25 \times U_s$

DC operation

IEC 60 158, EN 60 947-4-1 (VDE 0660 Part 102). For specifications according to IEC 60 077.

Design

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

Terminal covers may have to be fitted onto the connecting bars, depending on the configuration with other devices.

Control and auxiliary circuits

The coils of the contactors have an extended voltage tolerance from 0.7 to $1.25 \times U_s$ and are fitted as standard with varistors to provide protection against voltage surges. The opening delay is consequently 2 ms to 5 ms longer than for standard contactors.

The DC solenoid systems of the 3TB, 3TC and 3TF46/47 contactors must be modified (to hold-in coil) by means of a series resistor.

This series resistor is supplied separately packed with the contactors. With types 3TB48/50, 3TC48 and 3TF46/47, the series resistor must be attached onto the right-hand side of the auxiliary switch block by means of the enclosed mounting parts and sets of links provided, while in the case of the 3TC44 it must be mounted and wired between the contactor poles. With types 3TB52/54/56 and 3TC52/56, the series resistor must be attached separately next to the contactors. 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. It is not possible to extend the number of auxiliary contacts.

Description

With the 3TB52, 3TC52 and larger contactors, the series resistor must be connected via an additional K2 reversing contactor (3TH40 40-3B..)*). This contactor is automatically included in the delivery in the same packaging as the contactor.

All specifications and technical data not mentioned here are identical to those of the standard 3TB, 3TC, 3TF and 3TH contactors.

Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full voltage tolerance range of the coils) is -50 °C to $+70$ °C.

Uninterrupted duty at temperatures < -25 °C and $> +55$ °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the operating frequency.

Mounting

At ambient temperatures > 55 °C, a clearance of 10 mm must be observed if contactor relays and size S00 to S2 contactors are mounted side by side. There is no need to reduce the technical data.

Dimensions

Attaching resistors and varistors increases the width of the contactors²⁾.

Application

For operation in rolls which are subject both to considerable variations in the control voltage and to high ambient temperatures, e.g. railway applications.

1) See circuit diagrams on page 3/166.

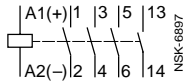
2) For dimensions, see page 3/200.

3TG10 Contactors

Internal circuit diagrams

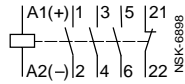
3TG10 10

1 NO
Ident no.: 10E



3TG10 01

1 NC
01E



3TF2 Contactors

SIMICONT

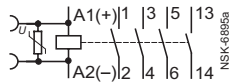
Internal circuit diagrams

DC operation

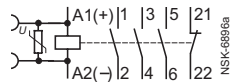
Size 00
3TF20

Connect L+ to A1
Varistor integrated

1 NO
Ident no.: 10E



1 NC
Ident no.: 01E



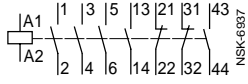
3TF40 to 3TF45 Contactors

Internal circuit diagrams

DC operation, coil fitted with varistor

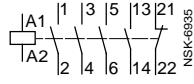
Size 0
3TF40 und 3TF41

2 NO + 2 NC
Ident no.: 22



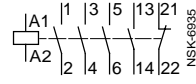
Size 1
3TF42 and 3TF43

1 NO + 1 NC
Ident no.: 11



Size 2
3TF44 and 3TF45

1 NO + 1 NC
Ident no.: 11

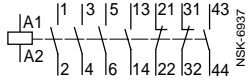


3TF46, 3TF47 Contactors

Internal circuit diagrams

Size 3
3TF46 and 3TF47

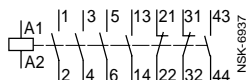
2 NO + 2 NC
Ident no.: 22



Contactors

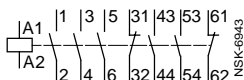
Sizes 6 to 12 3TF50 to 3TF56

2 NO + 2 NC
AC and DC operation
3TF57
AC operation



Size 12 3TF57

2 NO + 2 NC
DC operation



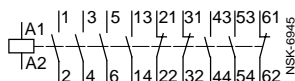
Size 14 3TF68 44 and 3TF69 44

4 NO + 4 NC
AC operation
max. complement of auxiliary switches



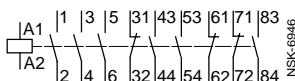
Sizes 6 to 12, 3TF50 to 3TF56

3 NO + 3 NC
DC operation
max. complement of auxiliary switches



Sizes 12 and 14, 3TF57 to 3TF69

3 NO + 3 NC
DC operation
max. complement of auxiliary switches



Auxiliary switch blocks

3TY7 4.1-1F

for coil reconnection,
3TF52 to 3TF56,
DC economy circuit



3TY7 681-1G

for coil reconnection,
3TF57 to 3TF69,
DC economy circuit



3TY7 561-1AA00

first auxiliary switch block
left or right
mounted on left mounted on right



3TY7 561-1KA00

second auxiliary switch block
left or right
mounted on left mounted on right



3TY7 561-1EA00

make-before-break
mounted on left mounted on right



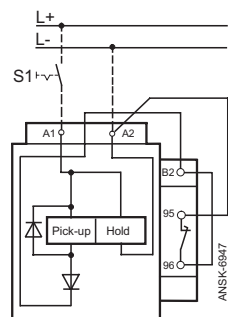
3TY7 561-1.

solid-state compatible aux. switch block
mounted on left mounted on right

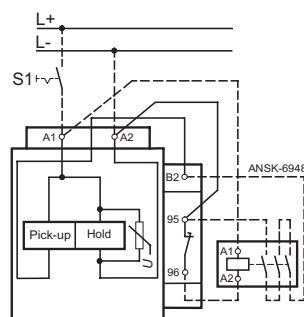


Circuit diagrams for DC economy circuit - maintained-contact operation

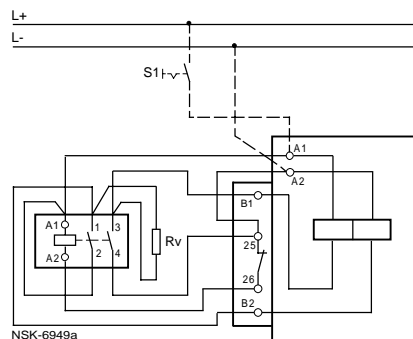
Size 6, 3TF50 and 3TF51



Sizes 8 to 12, 3TF52 to 3TF56



Sizes 12 and 14, 3TF57 to 3TF69



3TB50 to 3TB56 Contactors

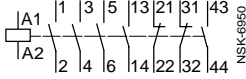
Internal circuit diagrams

DC operation

Sizes 6 to 12
3TB50 to 3TB56

Auxiliary contacts: 2 NO + 2 NC

3TY6 501-1E, 3TY6 561-1E auxiliary switch blocks
with make-before-break contacts

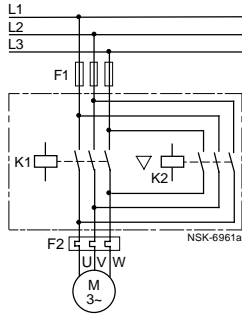


3TD50 to 3TD68 Contactor Assemblies

Circuit diagrams

Main circuit

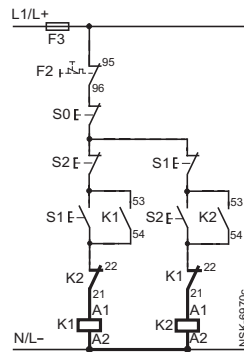
In the main circuit the connections are made between contactors K1 and K2.



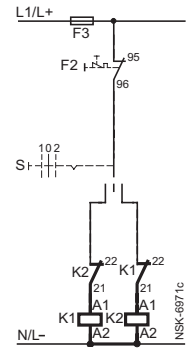
Control circuits

The control circuit leads indicated by broken lines are not wired in the factory.

Momentary-contact operation



Maintained-contact operation



Terminal designations of the unassigned auxiliary contacts

Contactor assembly	With electrical interlock				Without electrical interlock			
	K1 contactor		K2 contactor		K1 contactor		K2 contactor	
	NO	NC	NO	NC	NO	NC	NO	NC
3TD50 to 3TD56	13 - 14	21 - 22	13 - 14	31 - 32	13 - 14	21 - 22	13 - 14	21 - 22
	43 - 44		43 - 44		43 - 44	31 - 32	43 - 44	31 - 32
3TD68	13 - 14	21 - 22	13 - 14	31 - 32	13 - 14	21 - 22	13 - 14	21 - 22
	43 - 44	61 - 62	43 - 44	61 - 62	43 - 44	31 - 32	43 - 44	31 - 32
	53 - 54	71 - 72	53 - 54	71 - 72	53 - 54	61 - 62	53 - 54	61 - 62
	83 - 84		83 - 84		83 - 84	71 - 72	83 - 84	71 - 72

- S0 "OFF" button
- S1 "Clockwise ON" button
- S2 "Counterclockwise ON" button"
- S "CW-OFF-CCW" button
- K1 Clockwise contactor
- K2 Counterclockwise contactor
- F1 Fuses for main circuit
- F3 Fuses for control circuit
- F2 Overload relay

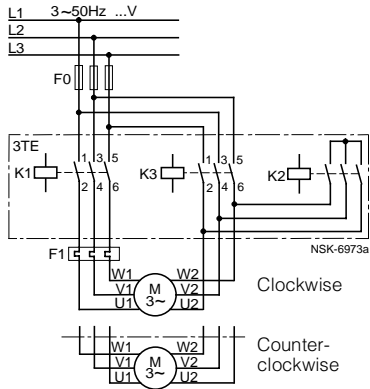
Terminal designations according to EN 50 012.

Circuit diagrams

Main circuit

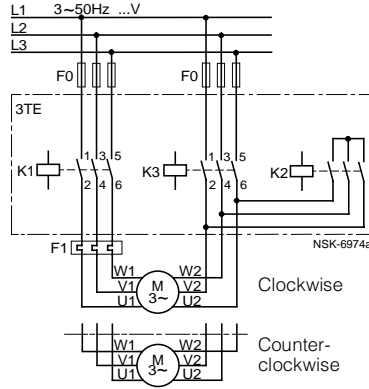
Single infeed

Without main conducting path connection between line and delta contactors



Double infeed

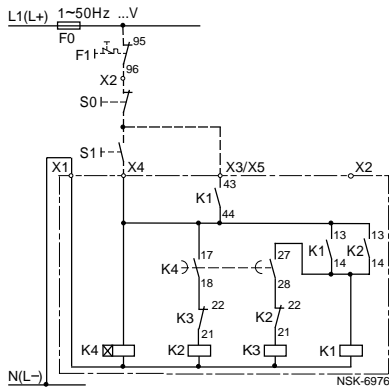
Without main conducting path connection between line and delta contactors



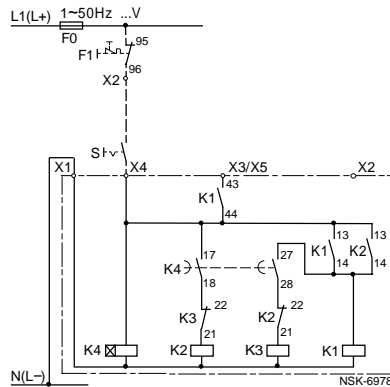
Control circuit

The control circuit leads indicated by broken lines are not wired in the factory. Contact element 17/18 of the time-delay relay is only closed on the star step; the contact element is open on the delta step and when de-energized.

Momentary-contact operation



Maintained-contact operation



Terminal designations of the unassigned auxiliary contacts

Contactor assembly	Line contactor		Delta contactor		Star contactor	
	NO	NC	NO	NC	NO	NC
3TE50 to 3TE56	-	21 - 22 31 - 32	13 - 14 43 - 44	31 - 32	43 - 44	31 - 32
3TE68	53 - 54 83 - 84	21 - 22 31 - 32 61 - 62 71 - 72	13 - 14 43 - 44 53 - 54 83 - 84	31 - 32 61 - 62 71 - 72	43 - 44	31 - 32

Legend:

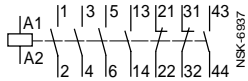
- S0 "OFF" button
- S1 "ON" button
- S Maintained-contact switch
- K1 Line contactor
- K2 Star contactor
- K3 Delta contactor
- K4 Timing element or time-delay relay
- F0 Fuses
- F1 Overload relay

Terminal designations according to EN 50 012.

3TK5 Contactors with 3 Main Contacts

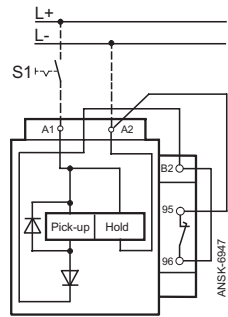
Internal circuit diagrams

Sizes 6 to 12
3TK50 22 to 3TK56 22
 AC and DC operation (DC economy circuit)

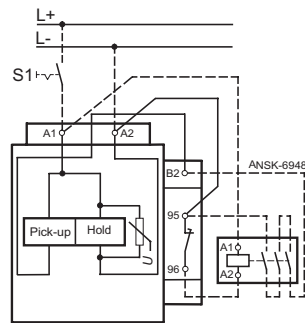


DC economy circuit - maintained-contact operation

**Size 6
 3TK50**



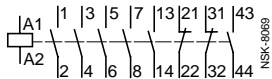
**Sizes 8 to 12
 3TK52 to 3TK56**



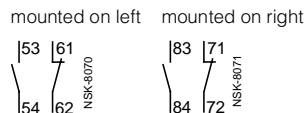
3TK1 Contactors with 4 Main Contacts

Internal circuit diagrams

3TK1



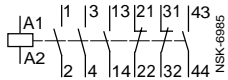
3TK1 910-3B auxiliary switch block



3TC44 to 3TC56 Contactors

Internal circuit diagrams

3TC44 to 3TC56

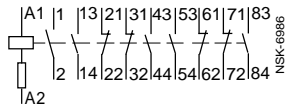


Terminal designations according to EN 50 012.

DC operation

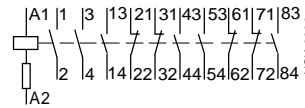
3TC74

Auxiliary contacts 4 NO + 4 NC



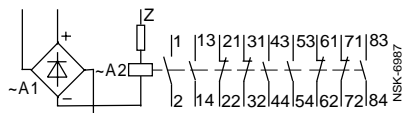
3TC78

Auxiliary contacts 4 NO + 4 NC

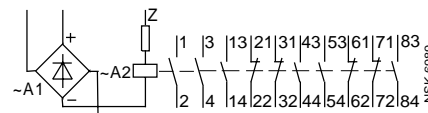


AC operation

Auxiliary contacts 4 NO + 4 NC
Must be operated in the DC circuit



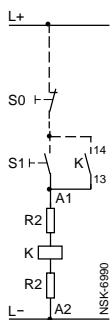
Auxiliary contacts 4 NO + 4 NC
Must be operated in the DC circuit



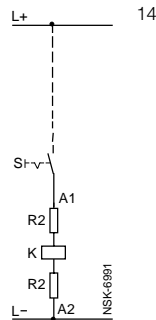
Circuit diagrams

3TC74

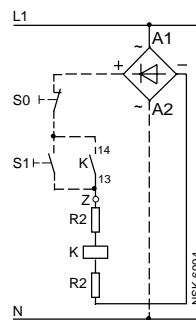
Momentary-contact operation
DC operation



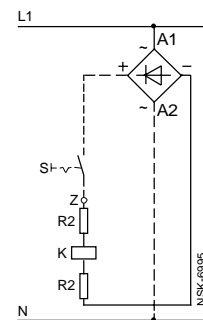
Maintained-contact operation



Momentary-contact operation
AC operation (must be operated in the DC circuit)

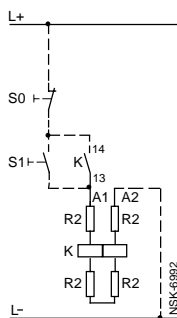


Maintained-contact operation

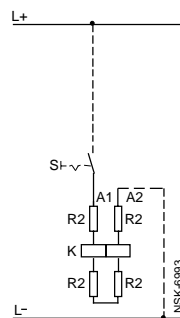


3TC78

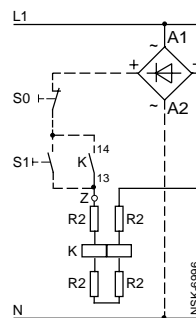
Momentary-contact operation
DC operation



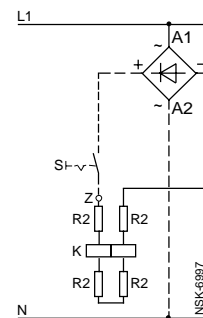
Maintained-contact operation



Momentary-contact operation
AC operation (must be operated in the DC circuit)



Maintained-contact operation



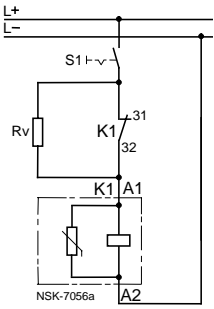
Terminal designations according to EN 50 012.

Contactors with Extended Tolerance

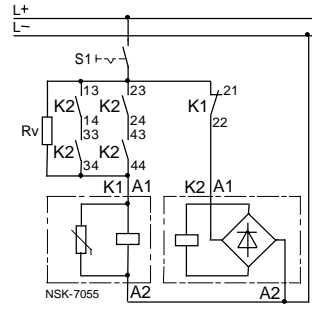
0.7 to 1.25 × U_s

Circuit diagrams

Circuit with series resistor Rv (size 2 or larger), without reversing contactor



Circuit with series resistor Rv and K2 reversing contactor (for size 8 K1 contactors or larger)

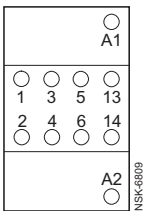


Rv: Two resistors are connected in series for 3TB54, 3TB56 and 3TC56 contactors.

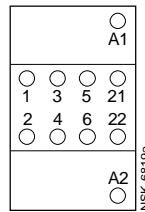
3TG10 Contactors

Position of terminals

3TG10 10
1 NO



3TG10 01
1 NC



Terminal designations according to EN 50 012.

3TF50 to 3TF69 Contactors

1

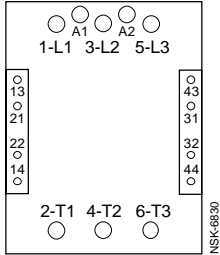
Position of terminals

2

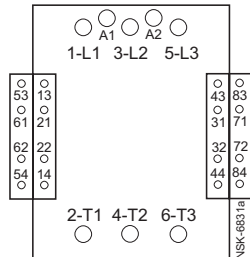
3

AC operation

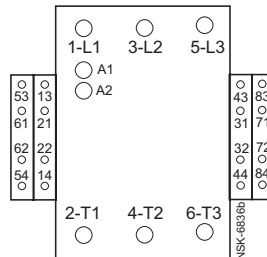
Sizes 6 to 12
3TF50 to 3TF57
2 NO + 2 NC



Sizes 6 to 12
3TF50 to 3TF57
4 NO + 4 NC

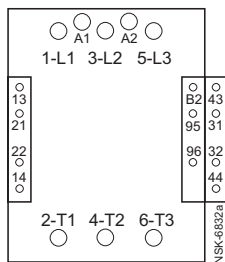


Size 14
3TF68 and 3TF69
4 NO + 4 NC

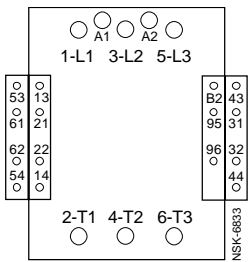


DC operation - DC economy circuit

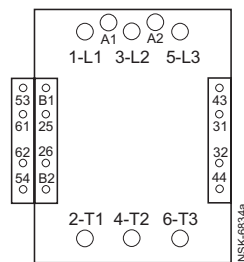
Sizes 6 to 12
3TF50 to 3TF56
2 NO + 2 NC



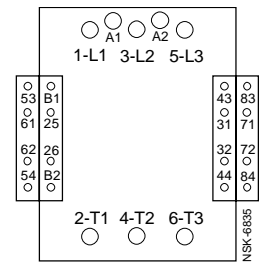
Sizes 6 to 12
3TF50 to 3TF56
3 NO + 3 NC
max. complement of auxiliary switches



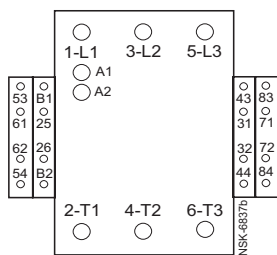
Size 12
3TF57
2 NO + 2 NC



Size 12
3TF57
3 NO + 3 NC
max. complement of auxiliary switches



Size 14
3TF68 and 3TF69
3 NO + 3 NC
max. complement of auxiliary switches



3TY7 561-1. solid-state compatible auxiliary switch blocks for lateral mounting onto size 6 to 14 contactors

mounted on left



mounted on right

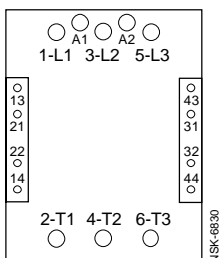


3TB50 to 3TB56 Contactors

Position of terminals

DC operation - DC economy circuit

Sizes 6 to 12
3TB50 to 3TB56
2 NO + 2 NC



3TK and 3TC Contactors

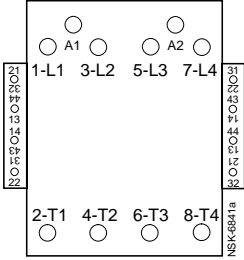
Position of terminals

3TK1 contactors with 4 main NO contacts

AC operation

3TK10 to 3TK17

2 NO + 2 NC

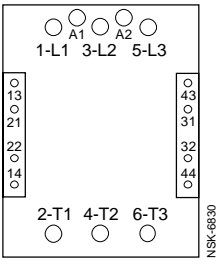


3TK5 contactors with 3 main contacts

AC operation

Sizes 6 to 12
3TK50 to 3TK56

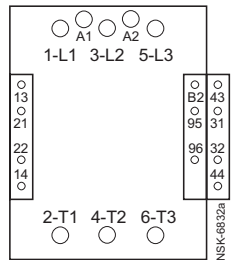
2 NO + 2 NC



DC operation

Sizes 6 to 12
3TK50 to 3TK56

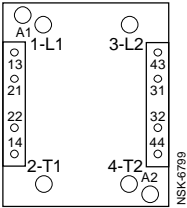
2 NO + 2 NC



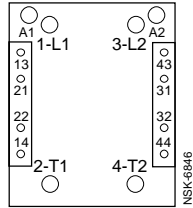
3TC44 to 3TC56 contactors

AC and DC operation

Size 2
3TC44



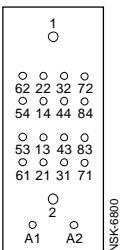
Sizes 4, 8 and 12
3TC48 to 3TC56



3TC74 and 3TC78 contactors

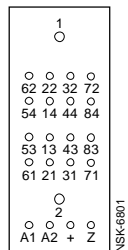
DC operation

3TC74



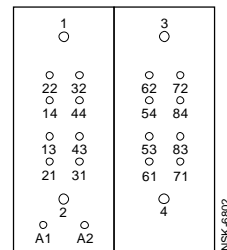
AC operation

3TC74



DC operation

3TC78



AC operation

3TC78

