

Overview

Standards

IEC 60947-1, EN 60947-1,
IEC 60947-5-1, EN 60947-5-1

The 3TH42 and 3TH43 contactor relays are suitable for use in any climate. They are finger-safe according to IEC 60529.

Note:

The 3TH42 and 3TH43 contactor relays feature positively-driven operation in accordance with IEC 60947-5-1, Ed. 3.1.

Terminal designations according to EN 50011

In terms of their terminal designations, identification numbers and identification letters, the 3TH42 and 3TH43 contactor relays conform to the standard EN 50011 for Specific Contactor Relays.

Contact reliability

High contact stability at low voltages and currents as a result of double-break contacts, suitable for solid-state circuits with currents ≥ 1 mA at a voltage of ≥ 17 V.

Surge suppression

The 3TH42 and 3TH43 contactor relays can be equipped with RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) for damping opening surges. The surge suppressors can be mounted directly on the coil (see page 5/24).

Note:

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

Mounting

Note:

With 3TH4 contactor relays with AC operation, an overvoltage of $1.1 \times U_s$, an ambient temperature ≥ 45 °C and 100% ON-period of all contactors, a minimum clearance of 5 mm between the contactors shall be observed in the case of side-by-side mounting.

Technical specifications

Contactor relays

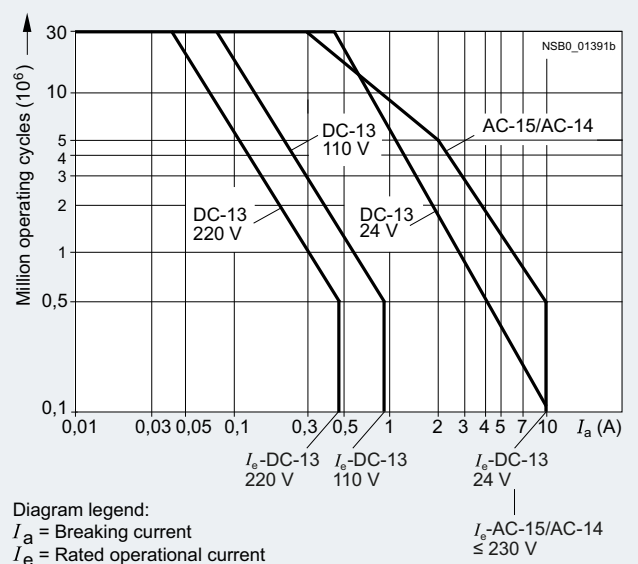
Type **3TH42, 3TH43**

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.

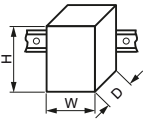
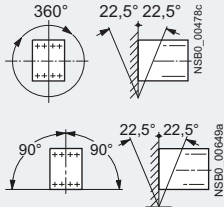


If magnetic circuits other than the contactor coil systems or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary.

RC elements or freewheel diodes are suitable as protective measures for the circuits.



Contactors Relays

3TH4 contactor relays, 8- and 10-pole

Contactors relays	Type	3TH42	3TH43
General data			
Dimensions (W x H x D)			
<ul style="list-style-type: none"> AC operation DC operation 		mm 45 x 78 x 97 mm 45 x 78 x 130	55 x 78 x 97 55 x 78 x 130
Permissible mounting position			
The contactor relays are designed for operation on a vertical mounting surface.			
<ul style="list-style-type: none"> AC operation DC operation 			
Upright mounting position AC and DC operation			Special version required
Mechanical endurance	Basic units	Operating cycles	30 million
Rated insulation voltage U_i (pollution degree 3)		V	690
Rated impulse withstand voltage U_{imp}		kV	8
Protective separation between coil and main contacts acc. to IEC 60947-1, Appendix N		V	Up to 500
Permissible ambient temperature			
<ul style="list-style-type: none"> During operation During storage 	°C	-25 ... +55 -55 ... +80	
Degree of protection acc. to IEC 60529			
<ul style="list-style-type: none"> On front Connecting terminal 		IP20 (with screw terminals) IP20 (with screw terminals)	
Touch protection acc. to IEC 60529			Finger-safe (for screw terminals)
Shock resistance			
<ul style="list-style-type: none"> Rectangular pulse - AC operation - DC operation Sine pulse - AC operation - DC operation 		g/ms g/ms g/ms g/ms	7.7/5 and 4.4/10 9.3/5 and 5.4/10 12/5 and 6.8/10 14.7/5 and 8.5/10
Short-circuit protection			
Short-circuit test			
<ul style="list-style-type: none"> With fuse links of operational class gG: With short-circuit current $I_k = 1$ kA acc. to IEC 60947-5-1 - LV HRC, type 3NA - DIAZED, type 5SB - NEOZED Type 5SE, quick With miniature circuit breaker with short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1 - C Characteristic - B Characteristic 	A A A A A	16 16 20 16 16	
Ⓢ and Ⓜ rated data			
Basic units			
Rated control supply voltage U_s			Max. 600 V AC, 230 V DC (acc. to UL 240 V DC)
Rated voltage			600 V AC, 600 V DC
Switching capacity			A 600, P 600
Conductor cross-sections			
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			 Screw terminals
<ul style="list-style-type: none"> Solid or stranded Finely stranded with end sleeve Terminal screw 	mm ² mm ²		2 x (0.5 ... 1) ¹⁾ ; 2 x (1 ... 2.5) ¹⁾ ; 1 x 4 2 x (0.75 ... 2.5) M3.5

¹⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

3TH4 contactor relays, 8- and 10-pole

Contactor relays	Type	3TH42, 3TH43
Control		
Solenoid coil operating range		
• AC operation		0.8 ... 1.1 x U_s ¹⁾
• DC operation (except 24 V)		0.8 ... 1.1 x U_s
- At 24 V DC		0.8 ... 1.2 x U_s
Solenoid coil power consumption (for cold coil and 1.0 x U_s)		
• AC operation, 50 Hz, standard version		
- Closing	VA/p.f.	68/0.82
- Closed	VA/p.f.	10/0.29
• AC operation, 50/60 Hz, standard version		
- Closing, 50 Hz	VA/p.f.	77/0.81
- Closed, 50 Hz	VA/p.f.	11/0.28
- Closing, 60 Hz	VA/p.f.	71/0.75
- Closed, 60 Hz	VA/p.f.	9/0.27
• AC operation, 50 Hz, USA/Canada		
- Closing	VA/p.f.	68/0.82
- Closed	VA/p.f.	10/0.29
• AC operation, 60 Hz, USA/Canada		
- Closing	VA/p.f.	75/0.76
- Closed	VA/p.f.	9.4/0.29 ... 0.3
• AC operation, 50 Hz, standard version		
- Closing	VA/p.f.	80/0.8
- Closed	VA/p.f.	10.7/0.29
• AC operation, 60 Hz, standard version		
- Closing	VA/p.f.	75 ... 90/0.73
- Closed	VA/p.f.	8.5 ... 10.7/0.29 ... 0.3
• DC operation up to 250 V	W	6.2
Closing = Closed		
Permissible residual current of the electronics (with 0 signal)		
• For AC operation		$\leq 8 \text{ mA} \times (220 \text{ V}/U_s)$
• For DC operation		$\leq 1.25 \text{ mA} \times (220 \text{ V}/U_s)$
Operating times at 1.0 x U_s²⁾		
<u>AC operation</u>		
• Closing		
- ON-delay NO	ms	10 ... 25
- OFF-delay NC	ms	7 ... 20
• Opening		
- OFF-delay NO	ms	5 ... 18
- ON-delay NC	ms	7 ... 20
<u>DC operation</u>		
• Closing		
- ON-delay NO	ms	30 ... 70
- OFF-delay NC	ms	28 ... 65
• Opening		
- OFF-delay NO	ms	10 ... 20
- ON-delay NC	ms	15 ... 25
Arcing time	ms	10

1) Coils for USA, Canada and Japan: 0.85 to 1.1 x U_s at 60 Hz.

2) 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 (suppression diode 6x to 9x); diode assembly 2x to 6x; varistor +2 to 5 ms).

Contactors Relays

3TH4 contactor relays, 8- and 10-pole

Contactors relays	Type	3TH42, 3TH43	
Rated data of the auxiliary contacts			
Load rating with AC			
Rated operational currents I_e			
• AC-12	A	16	
• AC-15/AC-14, for rated operational voltage U_e			
	230 V A	10	
	400 V A	6	
	500 V A	4	
	690 V A	2	
Rated power of three-phase motors			
According to utilization categories AC-2 and AC-3, 50 Hz			
	230/220 V kW	2.4	
	400/380 V kW	4	
	500 V kW	4	
	690/660 V kW	4	
Load rating with DC			
Rated operational currents I_e			
DC-12, for rated operational voltage U_e			
• 1 conducting path			
	Up to 48 V A	10	
	110 V A	2.1	
	220 V A	0.8	
	440 V A	0.6	
• 2 conducting paths in series			
	Up to 48 V A	10	
	110 V A	10	
	220 V A	1.6	
	440 V A	0.8	
• 3 conducting paths in series			
	Up to 48 V A	10	
	110 V A	10	
	220 V A	10	
	440 V A	1.3	
DC-13, for rated operational voltage U_e			
• 1 conducting path			
	Up to 24 V A	10	
	48 V A	5	
	110 V A	1	
	220 V A	0.45	
	440 V A	0.25	
	600 V A	0.2	
• 2 conducting paths in series			
	Up to 24 V A	10	
	48 V A	10	
	110 V A	2.5	
	220 V A	0.75	
	440 V A	0.5	
	600 V A	0.4	
• 3 conducting paths in series			
	Up to 24 V A	10	
	48 V A	10	
	110 V A	10	
	220 V A	2	
	440 V A	0.9	
	600 V A	0.8	
Switching frequency			
Switching frequency z in operating cycles/hour			
• Rated operation for utilization category	AC-12/DC-12	h^{-1}	1 000
Dependence of the switching frequency z' on the operational current I' and operational voltage U' :	AC-2	h^{-1}	500
	AC-3	h^{-1}	1 000
	AC-15/AC-14	h^{-1}	3 600
	DC-13	h^{-1}	3 600
$z' = z \cdot (I_e/I') \cdot (U_e/U')^{1.5} \cdot 1/h$			
• No-load switching frequency		h^{-1}	10 000

Contactors Relays

3TH4 Contactor Relays, 8- and 10-Pole

Accessories for 3TH4 contactor relays

Selection and ordering data

Version	Rated control supply voltage U_s		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	AC	DC						
	V	V	d					

Surge suppressors¹⁾ for 3TH4 contactor relays



3TX7402-3.

Noise suppression diodes With line spacer, for mounting onto the coil terminal	--	24 ... 250	2	3TX7402-3A		1	1 unit	41B
Diode assemblies (diode and Zener diode) with line spacer, DC operation, for mounting onto the coil terminal	--	24 ... 250	2	3TX7402-3D		1	1 unit	41B
Varistors²⁾ With line spacer, for mounting onto the coil terminal	24 ... 48	24 ... 70	2	3TX7402-3G		1	1 unit	41B
	48 ... 127	70 ... 150	2	3TX7402-3H		1	1 unit	41B
	127 ... 240	150 ... 250	2	3TX7402-3J		1	1 unit	41B
	240 ... 400	--	15	3TX7402-3K		1	1 unit	41B
	400 ... 600	--	15	3TX7402-3L		1	1 unit	41B
RC elements With line spacer, for mounting onto the coil terminal	24 ... 48	24 ... 70	2	3TX7402-3R		1	1 unit	41B
	48 ... 127	70 ... 150	2	3TX7402-3S		1	1 unit	41B
	127 ... 240	150 ... 250	2	3TX7402-3T		1	1 unit	41B
	240 ... 400	--	5	3TX7402-3U		1	1 unit	41B
	400 ... 600	--	15	3TX7402-3V		1	1 unit	41B
Covers for switch position indicator	--	--	X	3TX4210-0P		1	1 unit	41B

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 (suppression diode 6x to 10x; diode assembly 2x to 6x; varistor +2 to 5 ms).

²⁾ Includes the peak value of the alternating voltage on the DC side.

For contactors	Version	Rated control supply voltage U_s 50/60 Hz AC	Time setting range (minimum times)	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG

ON-delay devices



3TX4180-0A

3TH42, 3TH43	NTC thermistors Time tolerance +100 %, -50 %	220 ... 230	0.1	5	3TX4180-0A	1	1 unit	41B
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Coupling links for control by PLC for 3TH4 contactor relays

3TX4090
Mounted on contactor

3TH42, 3TH43	Operating range: 17 ... 30 V DC Power consumption: 0.5 W at 24 V DC • for direct mounting on the contactor coil - Without surge suppressor - With surge suppressor							
				15	3TX4090-0C	1	1 unit	41B
				2	3TX4090-0D	1	1 unit	41B

For contactors	Rated control supply voltage U_s		OFF-delay (minimum times)	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
	50/60 Hz AC	DC						
Type	V	V	s	d	Article No.	Price per PU		

OFF-delay devices for contactors with DC operation



3TX4701-0AN1

Bridging of voltage interruptions up to 1.2 sec								
3TH42...-0BF4 3TH43...-0BF4	110	--	0.15 or 0.3	2	3TX4701-0AN1	1	1 unit	41B
3TH42...-0BM4 3TH43...-0BM4	220	--	0.6 or 1.2	2	3TX4701-0AN1	1	1 unit	41B
3TH42...-0BP4 3TH43...-0BP4	230	--	0.6 or 1.2	2	3TX4701-0AN1	1	1 unit	41B
3TH42...-0BB4 3TH43...-0BB4	--	24	0.4 or 0.8	15	3TX4701-0BB4	1	1 unit	41B