

DSW, DSUB, DSKR Compact Contactors

Description, Technical Data

Description

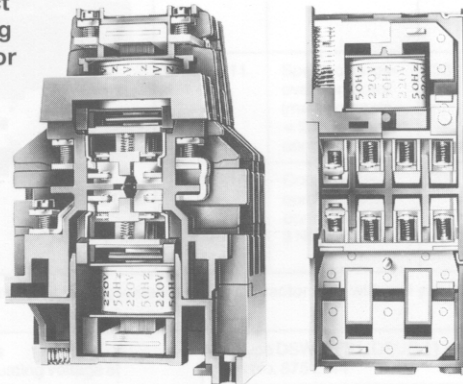
- The DSW compact reversing contactor changes the direction of rotation of three-phase current motors. Its contacts are interlocked mechanically. The contactor incorporates the main circuit wiring.
- The novel design of this contactor type fulfils all the requirements to be met by contactors used in lifting appliances.
- Long contact life when switching on and off motors rated for outputs from 3 kW to 15 kW (at 380 V).
- The reversing contactor contacts are interlocked mechanically. This means that short circuits in phases caused by mechanical shocks, e.g. buffer shocks, are avoided. If the direction of rotation is changed and the intervals between switching exceed 20 ms, electrical interlocking of the magnet systems is not required. When the contactors are operated manually, control switches with electrical or mechanical interlocking must be used.

The two directions of rotation must not be activated at the same time.

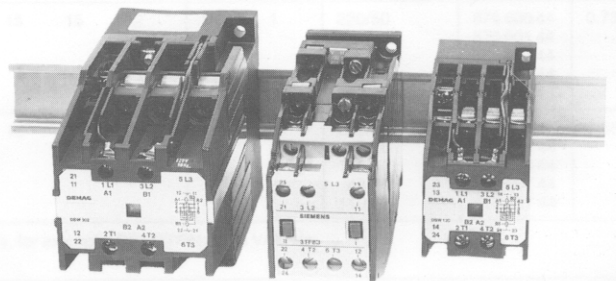
- The compact reversing contactor, which is equipped with two electromagnetic systems and a complete set of contacts, needs only half the space required for fitting the two single contactors previously used, although it has the same output.
- Reduced amount of wiring due to direct connections between contacts.
- The normally closed contact opens the auxiliary circuit earlier than the normally open contacts close the main circuit; all relevant safety regulations are thus observed.
- Optionally, the contactor can be mounted by snapping it on a 35 mm wide top hat rail or be fixed by screws.
- The contactor is supplied with slackened captive terminal screws so that all connections can be made very quickly.

- Holes and cross-shaped screw slots are provided for guiding an electric screw driver.
- The contactor is designed to provide protection against accidental contact of live parts with the fingers and hands of maintenance staff.
- The combination of only two contactors, i.e. a DSW reversing contactor and a DSUB speed change-over contactor results in a complete circuit for a drive unit with two speeds and two directions of rotation.
- The contactor complies with the rules of VDE 0660 (Association of German Electrical Engineers) for low-voltage switchgear, IEC publication 158-1, and the rules according to CSA (Canada), UL (USA) and SEV (Switzerland).
- We declare that the DSW reversing contactor conforms to the EEC safety regulations for low-voltage switchgear dated 19/2/1973.

Compact reversing contactor



24524



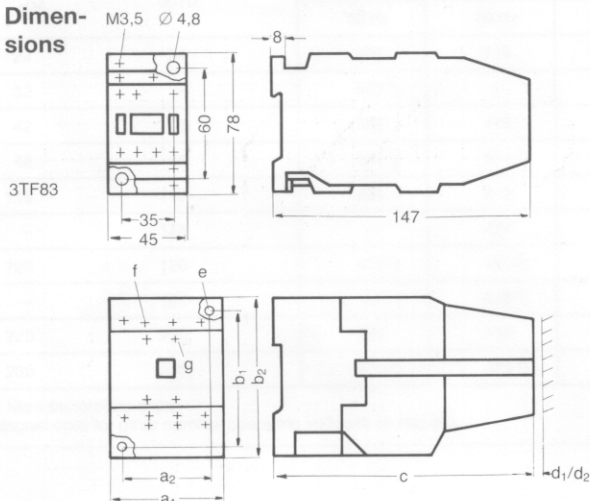
3TF8633

3TF8332

3TF8131

24508

Dimensions



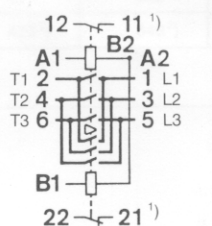
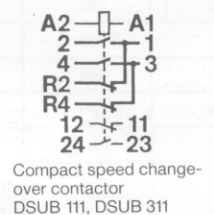
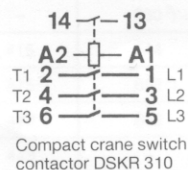
Type	a ₁	a ₂	b ₁	b ₂	c	d ₁	d ₂	∅e	f	g
1)	45	35	60	71	110	13	2	4.8	M3.5	M3.5
2)	65	50	75	89	148	10	2	5.5	M5	M3.5

1) 3TF 81, DSUB 111

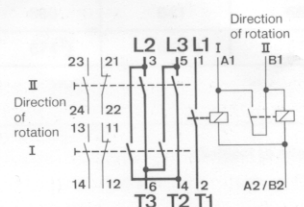
2) 3TF 86, DSUB 311, DSKR 310

d₁: Distance from earthed elements
d₂: Distance from insulated elements

Switchgear wiring diagrams



1) Optionally, NC contact or NO contact



Compact reversing contactor 3TF83

Contactor	Type	DSW DSUB DSKR	3TF81 111 -	3TF83 -	3TF86 311, 310
Mechanical service life	switching cycles	mill.	5	5	5
Electrical service life (under nominal load)	switching cycles	mill.	1.3	1.3	1.3
Nominal insulation voltage		V	660	660	660
Admissible ambient temperature	during operation when stored	°C °C	-25 to +55 -50 to +80		
Nominal magnet coil input (for cold coil 1.0 x U ₀)					
Alternating current operation	when switching on direction of rotation I direction of rotation II	VA	37 cos φ 0.9	68 cos φ 0.79	79 cos φ 0.8
		VA	37 cos φ 0.9	80 cos φ 0.75	79 cos φ 0.8
	in ON position direction of rotation I direction of rotation II	VA	7 cos φ 0.45	10 cos φ 0.29	10 cos φ 0.3
		VA	7 cos φ 0.45	15 cos φ 0.36	10 cos φ 0.3
Magnet coil operating range			0.8 to 1.1 times the nominal operating voltage		
Impact strength (rectangular diagram)		g/ms	10.2/ 5 5.2/10	9.3/ 5 5 /10	9.5/ 5 4.8/10
Short-circuit protection of contactors without motor protection					
Low-voltage HRC fuse links, type 3NA1 (for a nominal fuse current up to 50 A NEOZED and DIAZED fuse links, duty class gL, can also be used)	I ¹⁾	A	10	10	35
	II ²⁾	A	20	25	63
Conductor connecting cross-section , solid single wire (screw connection)		mm ²	2 x (1-2.5); 1 x 4	2 x (1-2.5); 1 x 4	1 x (2.5-10) and 1 x (1.5-6)
	flexible multiple wires with connector sleeve	mm ²	2 x (0.75-2.5) M 3.5	2 x (0.75-2.5) M 3.5	1 x (2.5-10) and 1 x (1.5-4) M 5
Switching frequency in switching cycles/hour (1/h)					
	Operation according to AC-2 and AC-3 Operation according to AC-4	1/h 1/h	500 (250 for DSUB) 250	500 250	750 (250 for DSUB) 180
Admissible contactor load					
Permanent current I _{th2} (at 35°C) Nominal operating current I ₀ /AC-1		A	20	22	50
		A	20	20	45
Duty categories AC-2 and AC-3			see selection table		
Duty category AC-4 (contact life approx. 200 000 switching cycles)					
Nominal operating current I ₀		A	2.6	4.3	15.6
Nominal output of squirrel-cage motors at 50 Hz and I _A ≤ 6 · I ₀	380 V	kW	1.1	1.9	7.5
Auxiliary contacts					
Short-circuit protection (short-circuit current I _K ≤ 1 kA) NEOZED and DIAZED fuse links (duty class gL)	max.	A	16	16	16
Conductor connecting cross-section , solid single wire (screw connection)		mm ²	2 x (1-2.5); 1 x 4	M 3.5	
	flexible multiple wires with connector sleeve	mm ²	2 x (0.75-2.5)		
Admissible load on auxiliary contacts					
Permanent current I _{th2} (at 35°C)		A	10	10	10
	Nominal operating current AC-11 ≤ 220 V 380 V	A A	6 4	10 6	10 6

1) No contact welding. 2) Welded contacts which can be separated easily without further damage.

Contact life

The characteristic curves in the facing diagram provide information regarding the service life of the contacts of the alternating current contactors mentioned in the table above when switching three-phase current consuming equipment, incorporating ohmic and inductive resistors, as a function of the breaking current. This requires, however, the use of order transmitting devices capable of sending pulses at any moment, i.e. not synchronously to the phase position of the mains. The nominal operating current I₀ according to duty category AC3 is rated for a contact life of approx. 1.3 million switching cycles. In the case of mixed loading, i.e. if normal switching operation (the nominal operating current is switched off according to duty category AC-3) is mixed with temporary in-ching (a multiple of the nominal operating current is switched off according to duty category AC-4), the contact life can be calculated approx. according to the following equation:

$$X = \frac{A}{1 + \frac{C}{100} \left[\frac{A}{B} - 1 \right]}$$

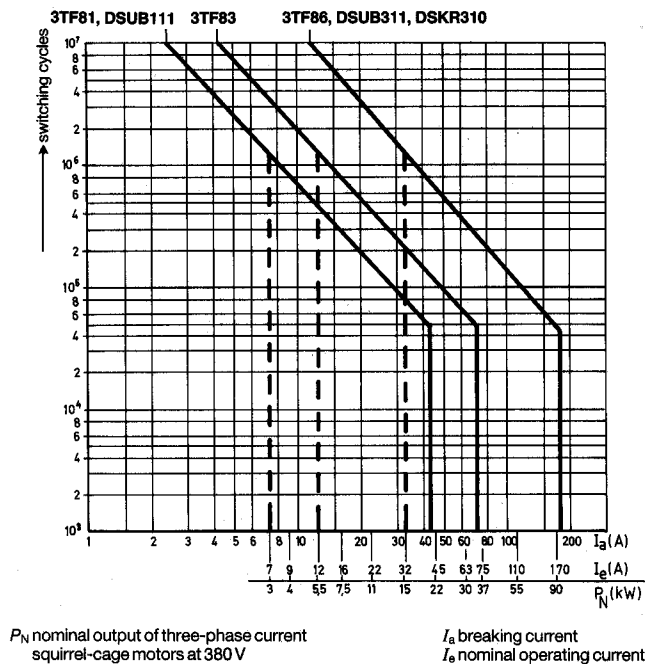
Meaning of the letters in the equation:

X contact life in switching cycles during mixed loading

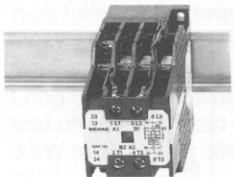
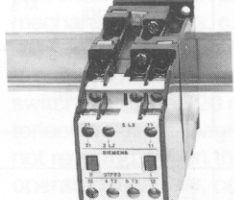
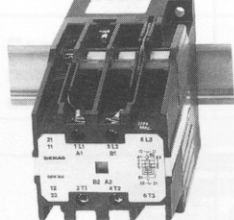
A contact life during normal operation (I_a = I₀ in switching cycles)

B contact life during in-ching (I_a = a multiple of I₀ in switching cycles)

C percentage of in-ching in the total number of switching cycles



Alternating current operation · without motor protection · open design
Selection and ordering data

Compact contactors	Type	Designation	Motor switch Duty categories AC-2 and AC-3					Auxiliary contacts (for reversing contactors for each direction of rotation) Type of contact		Nominal operating voltages and frequencies	Order No.	Weight approx. kg
			Nominal operating current I_e 220 V 380 V	Nominal output of three-phase current motors 50 Hz and 380 V 500 V 660 V 230 V 400 V				NO	NC			
For snap-on mounting or fixing by screws Snap-on mounting on top hat rail 35 mm wide according to DIN EN 50 022												
 3TF81 24511	DSW 3TF8131	Reversing contactor (main contacts = 3 NO contacts for each direction of rotation)	7	1.5	3	4	4	1	–	220/50 115/60 110/50 42/50 110/60	875 355 44 875 356 44 875 358 44 875 357 44 875 541 44	0.38
	3TF8133							–	1	220/50 115/60 110/50 42/50 110/60	875 350 44 875 351 44 875 353 44 875 352 44 875 536 44	
 3TF83 24510	DSUB 111	Speed change-over contactor (main contacts 2 NO x 2 NC contacts)	7	1.5	3	4	4	1	1	220/50 115/60 110/50 42/50 110/60	875 360 44 875 361 44 875 363 44 875 362 44 875 546 44	0.3
	3TF8332	Reversing contactor (main contacts = 3 NO contacts for each direction of rotation)	12	3	5.5	7.5	7.5	1	1	220/50 42/50	894 937 44 895 105 44	0.56
 3TF86 24509	DSW 3TF8631	Reversing contactor (main contacts = 3 NO contacts for each direction of rotation)	32	8.5	15	15	12	1	–	220/50 115/60 110/50 42/50 110/60	875 595 44 875 596 44 875 598 44 875 597 44 875 811 44	0.98
	3TF8633							–	1	220/50 115/60 110/50 42/50 110/60	875 590 44 875 591 44 875 593 44 875 592 44 875 806 44	
	DSUB 311	Speed change-over contactor (main contacts = 2 NO + 2 NC contacts)	32	8.5	15	15	12	1	1	220/50 115/60 110/50 42/50 110/60	875 600 44 875 601 44 875 603 44 875 602 44 875 816 44	0.73
	DSKR 310	Crane switch contactor (main contacts = 3 NO contacts)	32	8.5	15	15	12	1	–	220/50 115/60 110/50 42/50 110/60	875 605 44 875 606 44 875 608 44 875 607 44 875 797 44	0.68

¹⁾ For other nominal actuating voltages, state contactor type with coil voltage and frequency, for example: DSW3TF8131/48 V/60 Hz.

Magnet coils Nominal actuating voltage at		for type DSW3TF81, DSUB 111 Part No. 875 ... 44				for type DSW3TF86, DSUB 311, DSKR 310 Part No. 875 ... 44			
50 Hz V	60 Hz V	Coil				Coil			
		above		below		above		below	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
24	24	398	416	399	417	646	666	647	667
32	–	520 ²⁾	–	521 ²⁾	–	930 ²⁾	–	931 ²⁾	–
42	42	396	414	397	415	644	664	645	665
48	48	404 ²⁾	574 ²⁾	405 ²⁾	575 ²⁾	652 ²⁾	676 ²⁾	653 ²⁾	677 ²⁾
110	110	394	412	395	413	642	662	643	663
–	115	–	424	–	443	–	672	–	673
120	120	402 ²⁾	420 ²⁾	403 ²⁾	421 ²⁾	650 ²⁾	670 ²⁾	651 ²⁾	671 ²⁾
–	127	–	418 ²⁾	–	419 ²⁾	–	668 ²⁾	–	669 ²⁾
220	220	392	410	393	411	640	660	641	661
230	230	400 ²⁾	422 ²⁾	401 ²⁾	423 ²⁾	648 ²⁾	674 ²⁾	649 ²⁾	675 ²⁾

²⁾ Manufactured to order
Magnet coils for other nominal operating voltages on request.

Subject to alterations