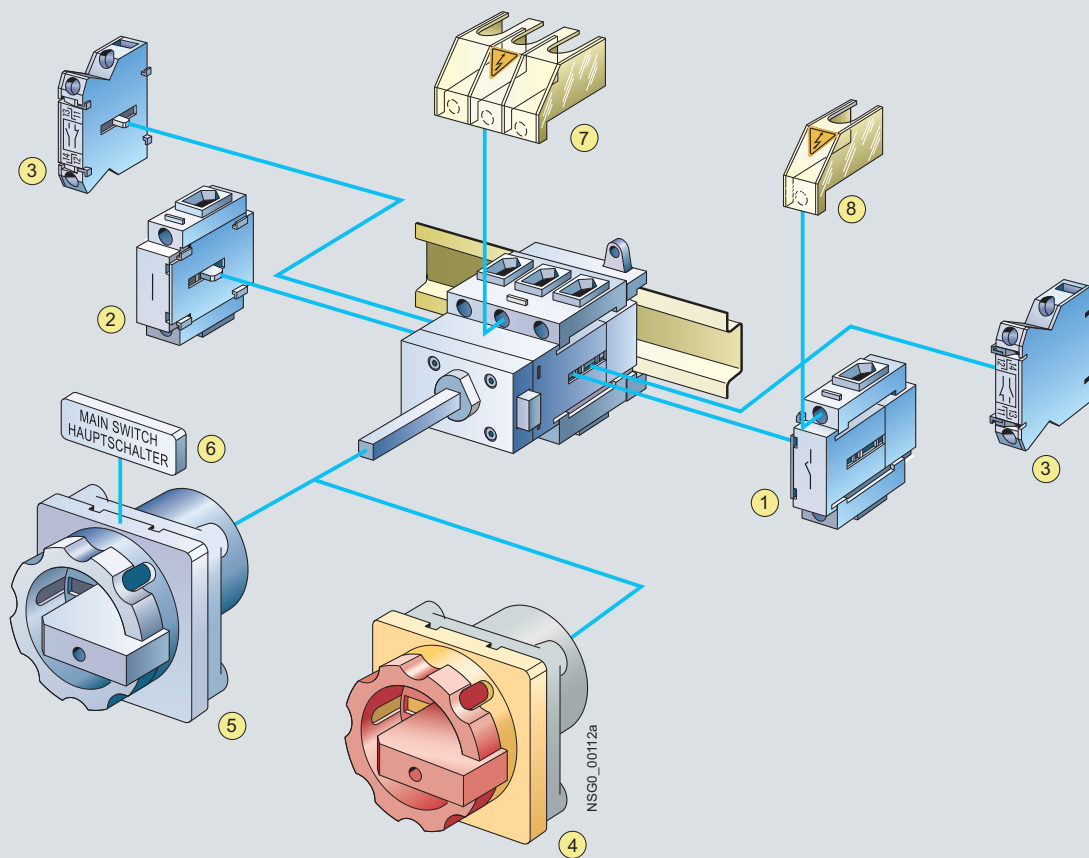


Switch Disconnectors

SENTRON 3LD Main and EMERGENCY-STOP Switches up to 250 A

Introduction

Overview



- ① 4th contact (N conductor)
- ② N or PE/ground terminal, continuous
- ③ Auxiliary switch 1 NO + 1 NC
- ④ Rotary operating mechanism, red/yellow
- ⑤ Rotary operating mechanism, black
- ⑥ Front plate, English/German
- ⑦ Terminal cover, three-pole
- ⑧ Terminal cover, single-pole

The 3LD main and EMERGENCY-STOP switches are manually operated switch disconnectors according to IEC 60947-3/EN 60947-3 and comply with the conditions for switch disconnectors.

In EN 60204-1, main control switches are called "disconnector units", while EMERGENCY-STOP switches are termed "devices for emergency shutdown".

The 3LD switches for 16 to 250 A are approved according to UL 508 and can be used as "manual motor controllers" and "motor disconnects".

Maintenance personnel can protect themselves against unauthorized startup with padlocks (up to three can be fitted).

The 3LD switches can be used in any mounting position.

Application

The 3LD switches are used for switching main and auxiliary circuits, but also for switching induction motors and other loads during maintenance and repair work.

They can be used as:

- ON-OFF switches
- EMERGENCY-STOP switches
- Main control switches according to EN 60204-1.

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Introduction

Design

Construction of the contacts

Each switch has three adjacent contact elements¹⁾. A fourth leading contact for switching the N conductor, a continuous PE terminal, an auxiliary switch (1 NO + 1 NC) can be fitted to each side of the switch. The auxiliary switches operate as leading contacts on opening. On opening, the NO contact opens before the main contacts, so that a contactor carries the switching capacity in the circuit and the maintenance or safety switch switches at zero current. On closing, the auxiliary switch switches later than or at the same time as the main contacts.

Construction of rotary operating mechanisms

The rotary operating mechanisms of the switches for front or floor mounting are mounted on control cabinet doors, front or side panels with four-hole or center-hole mounting with a standard diameter of 22.5 mm and operated from the outside. In their Off position, they can be locked with up to three padlocks with a hasp thickness of 8 mm. Controls with defeatable door-coupling rotary operating mechanism are available in addition.

- **Switch position indicator:**
The switch position is clearly marked with direction arrows and an "O" for OFF and a "I" for ON at the front.
- **Switches for front mounting:**
The switches for front mounting are connected directly to the rotary operating mechanism through the fixing screws or - in the case of center-hole mounting - a special-purpose coupling.
- **Switches for floor mounting:**
The switches for floor mounting are snapped onto 35 mm standard mounting rails according to EN 60715 or screw-mounted on mounting plates. The actuators are connected to the lower section of the switch through a door coupling, which can be released in its zero position, and a 300 mm long switch shaft. When the control cabinet door is open, the switch can be protected against inadvertent operation by removing the switch shaft from the lower section of the switch. The mounting depth can be adapted to individual requirements by adjusting the switch shaft length.
- **Switches for distribution board mounting:**
The switches for distribution board mounting are suited for operation in switchboards and for switching inside control cabinets or distributors. They have cap and mounting dimensions to DIN 43880 and can be fitted under the same cover together with miniature circuit breakers. The selector switches can be locked in their Off position with up to 2 padlocks with a hasp thickness of 6 mm.
- **Switches in molded-plastic enclosure:**
For surface mounting of individual main and EMERGENCY-STOP switches, molded plastic-enclosed switches to degree of protection IP65 are used. The actuators can be locked in their Off position with three padlocks with a hasp thickness of 8 mm.
The molded-plastic enclosures each contain an N and/or a PE terminal.

¹⁾ 16 A versions have four contact elements; 3-pole changeover switches and 6-pole main control switches have six contact elements.



3LD2 704-0TK53 switch for front mounting with rotary operating mechanism



3LD2 222-0TK1 switch for front mounting with knob



3LD2 122-7UK01 3-pole changeover switch for front mounting with knob



3LD2 103-3VK53 6-pole switch for front mounting with rotary operating mechanism



3LD2 144-0TK53 switch for floor mounting with rotary operating mechanism and door coupling



3LD2 530-0TK11 switch for distribution board mounting with knob



3LD2 264-0TB5 switch in molded-plastic enclosure



3LD2 217-1TL13 switch for floor mounting with rotary operating mechanism and defeatable door coupling



3LD2 265-8VQ51-0AF6 solar plant isolator



3LD2 418-0TK13 switch for floor mounting, 250 A, with rotary operating mechanism and door coupling

Technical specifications

Standards		IEC 60947-3								
Switches		Type	3LD2 0	3LD2 1	3LD2 2	3LD2 5	3LD2 7	3LD2 8	3LD2 3	3LD2 4
Rated insulation voltage U_i		V	690							
Rated operational voltage U_e		V AC	690							
Rated frequency		Hz	50 ... 60							
Rated impulse withstand voltage U_{imp}		V	690	690	690	690	690	690	690	690
Rated short-time withstand current (1 s current, rms value)		A	340	640	640	1260	2000	2000	4000	4000
Short-circuit protection, max. back-up fuse (gG)		A	20	25	40	63	100	125	160	250
Rated conditional short-circuit current with upstream fuses at AC 50/60Hz, 690V		kArms	50	50	50	50	50	20	50	50
Permissible let-through current of the fuse		kA	3	3.5	4.5	6	10	10	15	15
Rated uninterrupted current I_U		A	16	25	32	63	100	125	160	250
AC-21A load-break switch	Rated operational current I_e	A	16	25	32	63	100	125	160	250
AC-3 motor load switches	Rating									
In-service switching	At 220 ... 240 V	kW	3.0	4.0	5.5	11.0	18.5	22.0	35.0	55.0
of individual motors	At 380 ... 440 V	kW	5.5	7.5	9.5	18.5	30.0	37.0	50.0	110.0
	At 660/690 V	kW	5.5	7.5	9.5	15.0	22.0	30.0	37.0	45.0
AC-23A main control switch	Rating									
Repair switch	At 220 ... 240 V	kW	4.0	5.0	6.0	11.0	18.5	22.0	45.0	75.0
frequent, but not in-service switching	At 380 ... 440 V	kW	7.5	9.5	11.5	22.0	37.0	45.0	75.0	132.0
	At 660/690 V	kW	7.5	9.5	11.5	18.5	30.0	37.0	45.0	55.0
of individual motors										
Power loss per conducting path at I_e		W	0.5	1.1	1.8	4.5	7.5	12.0	36.0	36.0
Endurance mechanical	Switching cycles		100 000							
Switching frequency		1/h	50							
Permissible ambient temperature		°C	-25 ... +55							
Isolating features		Up to max.	V 690							
Conductor cross-sections for main conductors ¹⁾										
Solid or stranded		mm ²	1 ... 6	1.5 ... 16	1.5 ... 16	2.5 ... 35	4 ... 50	4 ... 50	16 ... 185	16 ... 185
Finely stranded with end sleeve (max.)		mm ²	4	10	10	16	35	35	150	150
Conductor cross-sections	Copper cable	AWG	18 ... 10	14 ... 8	14 ... 8	14 ... 6	12 ... 1	12 ... 1		
Torque for terminal		Nm	1.5 ... 2	2 ... 2.5	2 ... 2.5	2.5 ... 3	2.5 ... 3	2.5 ... 3	9.5 ... 10	9.5 ... 10
Touch protection acc. to EN 50274			Yes							
Auxiliary switches										
Rated insulation voltage U_i		V	500							
Rated operational voltage U_e		V AC	500							
Rated uninterrupted current I_U		A	10							
Rated operational current I_e , AC-15	At 120 V	A	6							
	At 220 ... 240 V	A	3							
	At 380 ... 415 V	A	1.8							
	At 500 V	A	1.4							
Short-circuit protection, auxiliary switch, max. back-up fuse (gG)		A	10							
Conductor cross-sections for auxiliary conductors										
Connection type			Terminals							
Solid or stranded		mm ²	2 × (0.75 ... 2.5), 1 × 4							
Finely stranded with end sleeve		mm ²	2 × (0.75 ... 1.5), 1 × 2.5							
Torque for terminal		Nm	0.8							

SENTRON 3LD main and EMERGENCY-STOP switches for UL/CSA

Standards		UL/CSA								
Switches		Type	3LD2 0	3LD2 1	3LD2 2	3LD2 5	3LD2 7	3LD2 8	3LD2 3	3LD2 4
Rated operational voltage U_e		V AC	600	600	600	600	600	600	600	600
Rated uninterrupted current I_U		A	10	20	30	60	100	125	160	250
Conventional thermal current I_{th}	Current rating	A	A 600	A 600	A 600	--	--	--	--	--
	Pilot duty	A	P 600	P 600	P 600	--	--	--	--	--
		A	16	25	32	63	100	125	160	250
Maximum rated power (AC-3)	3 ~ 120 V	HP	1	3	3	5	10	15	--	--
Alternating current operating mechanisms 40 ... 60 Hz	240 V	HP	3	7.5	10	15	30	40	40	50
	480 V	HP	7.5	10	20	40	60	75	75	100
	600 V	HP	10	15	30	50	75	100	75	75
	1 ~ 120 V	HP	0.5	2	2	3	--	--	--	--
	240 V	HP	1.5	3	3	10	--	--	--	--
Conductor cross-sections	Cu cable	AWG	18 ... 10	14 ... 8	14 ... 8	14 ... 6	12 ... 1	12 ... 1	1 ... MCM400	
Torque		Nm	1.5 ... 2	2 ... 2.5	2 ... 2.5	2.5 ... 3	2.5 ... 3	2.5 ... 3	10	10



¹⁾ Depending on the cable infeed, only small cross-sections are possible with devices in molded-plastic enclosures

Switch Disconnectors

SENTRON 3LD Main and EMERGENCY-STOP Switches up to 250 A

Front mounting

Selection and ordering data

Number and version of the contacts		Rated data at 50 ... 60 Hz, 380 ... 440 V			DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*/P. unit	PG	Weight per PU approx.
Main contact elements	Auxiliary contact elements	P/AC-3 kW	P/AC-23A kW	I_{tj} /AC-21A A							kg
Main and EMERGENCY-STOP switches with rotary operating mechanism/knob-operated mechanism <ul style="list-style-type: none"> • Lockable in 0 position with up to 3 padlocks • Degree of protection at front side IP65 • All versions with rotary operating mechanism Exception: 3LD2 3 and 3LD2 4 with knob-operated mechanism • Including terminal cover for the infeed side • Front plate: <ul style="list-style-type: none"> - 3LD2 0, 3LD2 1, 3LD2 2: 67 mm × 67 mm - 3LD2 0, 3LD2 1, 3LD2 2: 67 mm × 67 mm - 3LD2 3 to 3LD2 4: 96 mm × 96 mm 											
Four-hole mounting											
 3LD2 203-0TK51	3	--	5.5	7.5	16	▶	3LD2 003-0TK5□	1	1 unit	103	0.207
			7.5	9.5	25	▶	3LD2 103-0TK5□	1	1 unit	103	0.206
			9.5	11.5	32	▶	3LD2 203-0TK5□	1	1 unit	103	0.206
			18.5	22.0	63	▶	3LD2 504-0TK5□	1	1 unit	103	0.424
			30	37.0	100	▶	3LD2 704-0TK5□	1	1 unit	103	0.501
			37	45.0	125	A	3LD2 804-0TK5□	1	1 unit	103	0.503
			50	75.0	160	A	3LD2 305-0TK1□	1	1 unit	103	2.100
		110	132.0	250	A	3LD2 405-0TK1□	1	1 unit	103	2.100	
 3LD2 704-0TK53	3 + N	--	5.5	7.5	16	▶	3LD2 003-1TL5□	1	1 unit	103	0.217
			7.5	9.5	25	A	3LD2 103-1TL5□	1	1 unit	103	0.243
			9.5	11.5	32	A	3LD2 203-1TL5□	1	1 unit	103	0.243
			18.5	22.0	63	A	3LD2 504-1TL5□	1	1 unit	103	0.424
			30.0	37.0	100	▶	3LD2 704-0TK5□ + ¹⁾	1	1 unit	103	0.501
			37.0	45.0	125	A	3LD9 280-0B + ¹⁾	1	1 unit	103	0.101
			50	75.0	160	A	3LD2 305-1TL1□	1	1 unit	103	2.600
		110	132.0	250	A	3LD2 405-1TL1□	1	1 unit	103	2.600	
3	1 NO + 1 NC	5.5	7.5	16	A	3LD2 003-1TP5□	1	1 unit	103	0.250	
		7.5	9.5	25	A	3LD2 103-1TP5□	1	1 unit	103	0.249	
		9.5	11.5	32	A	3LD2 203-1TP5□	1	1 unit	103	0.206	
		18.5	22.0	63	A	3LD2 504-1TP5□	1	1 unit	103	0.424	
		30.0	37.0	100	A	3LD2 704-1TP5□	1	1 unit	103	0.503	
		37	45.0	125	A	3LD2 804-1TP5□	1	1 unit	103	0.503	
		50.0	75.0	160	A	3LD2 305-0TK1□ + ²⁾	1	1 unit	103	2.100	
						▶	3LD9 200-5B	1	1 unit	103	0.046
		110.0	132.0	250	A	3LD2 405-0TK1□ + ²⁾	1	1 unit	103	2.100	
						▶	3LD9 200-5B	1	1 unit	103	0.046
3 + N	1 NO + 1 NC	5.5	7.5	16	A	3LD2 003-2EP5□	1	1 unit	103	0.272	
		7.5	9.5	25	A	3LD2 103-2EP5□	1	1 unit	103	0.287	
		9.5	11.5	32	A	3LD2 203-1TL5□ + ²⁾	1	1 unit	103	0.243	
						▶	3LD9 200-5B	1	1 unit	103	0.046
		18.5	22.0	63	A	3LD2 504-1TP5□ + ¹⁾	1	1 unit	103	0.424	
						▶	3LD9 250-0BA	1	1 unit	103	0.079
		30.0	37.0	100	▶	3LD2 704-0TK5□ + ¹⁾	1	1 unit	103	0.501	
						▶	3LD9 280-0B + ²⁾	1	1 unit	103	0.101
						▶	3LD9 200-5B	1	1 unit	103	0.046
		37.0	45.0	125	A	3LD2 804-0TK5□ + ¹⁾	1	1 unit	103	0.503	
				▶	3LD9 280-0B + ²⁾	1	1 unit	103	0.101		
				▶	3LD9 200-5B	1	1 unit	103	0.046		
50.0	75.0	160	A	3LD2 305-1TL1□ + ²⁾	1	1 unit	103	2.600			
				▶	3LD9 200-5B	1	1 unit	103	0.046		
110.0	132.0	250	A	3LD2 405-1TL1□ + ²⁾	1	1 unit	103	2.600			
				▶	3LD9 200-5B	1	1 unit	103	0.046		

Actuator color

Black
Red/yellow (EMERGENCY-STOP)

1
3

¹⁾ 4. Contact element as N conductor to be ordered separately, see "Accessories".

²⁾ Auxiliary switches 1 NO + 1 NC to be ordered separately, see "Accessories".