

Selecting switches per NEC

Selecting switches per NEC

Article 430 of the US National Electric Code includes two methods for properly sizing disconnect switches:

1. Single motor application

A properly sized disconnect switch for a single motor will:

- a) have an ampere rating greater than or equal to 115 percent of the rated motor full load current; or,
- b) have a HP rating greater than or equal to the rated motor HP (at applied voltage) if the disconnect switch under consideration is HP rated.

2. Combination load application

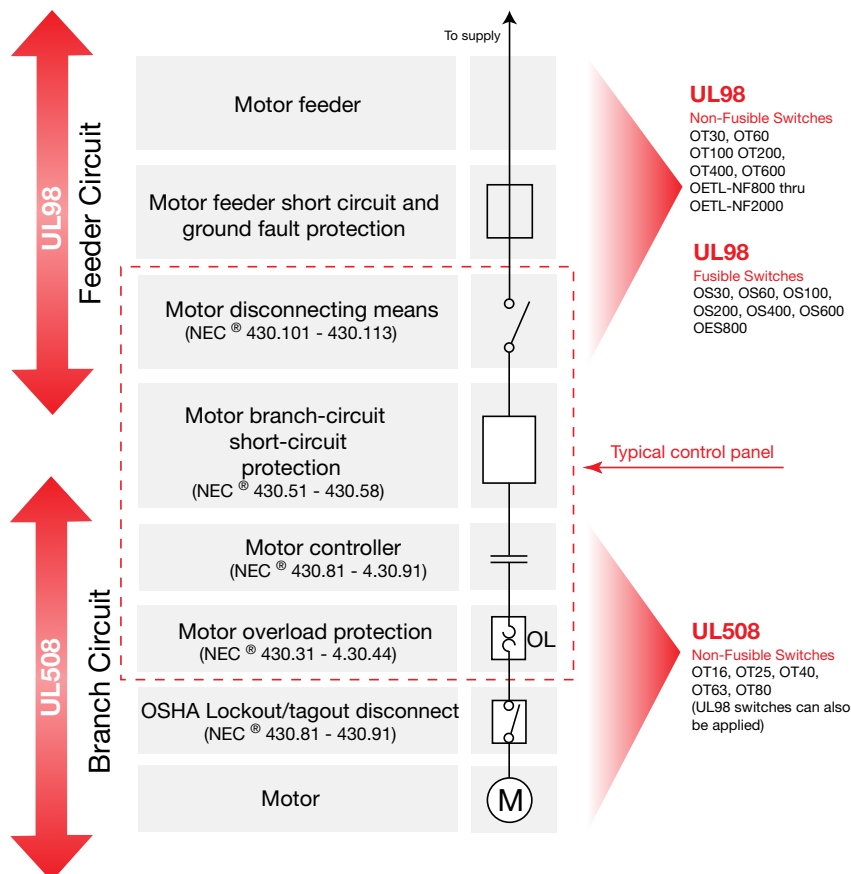
A properly sized disconnect switch for a combination load will be selected by adding all the simultaneous individual loads in the circuit under consideration.

Using motor nameplate information, load information, and tables from section 430 of the NEC, determine one equivalent full load current and one equivalent locked rotor current. The equivalent locked rotor current can be used with table 430-151 to determine an equivalent HP rating. Select a disconnect switch:

- a) greater than or equal to 115 percent of the equivalent full load current; and,
- b) greater than or equal to the equivalent HP rating.

Use of UL98 & UL508 Disconnects

According to *NEC*® Article 430



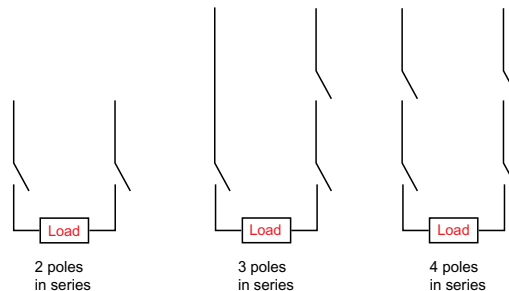
Technical data

OT16F3 – OT100F3

IEC

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Catalog number	3 pole	OT16F3	OT25F3	OT40F3	OT63F3	OT80F3	OT30F3	OT60F3	OT100F3	
Rated insulation and operation voltage, AC20 and DC20	40°C V	750	750	750	750	750	750	750	750	
Rated impulse withstand voltage	kV	8	8	8	8	8	8	8	8	
Rated thermal current, I_{th}										
AC 20/DC 20	open ①	A	25	32	40	63	80	40	63	115
	40°C enclosed	A	25	32	40	63	80	40	63	115
	60°C enclosed	A	25	32	40	63	80	40	63	115
Rated operational currents										
AC 21A	≤500V	A	16	25	40	63	80	30	60	100
	≤690V	A	16	25	40	63	80	40	63	100
	≤1000V	A	—	—	—	—	—	—	—	—
AC 22A	≤500V	A	16	25	40	63	80	40	63	100
	≤690V	A	16	25	40	63	80	40	63	100
	≤1000V	A	—	—	—	—	—	—	—	—
AC 23A	≤415V	A	16	20	23	45	75	40	63	80
	≤500V	A	16	20	23	45	58	40	60	60
	≤690V	A	10	11	12	20	20	40	40	40
	≤1000V	A	—	—	—	—	—	—	—	—
Rated operational currents/poles in series										
DC21A	48V	A	16/1	25/1	32/1	45/1	63/1	40/1	63/1	100/1
	110V	A	16/2	25/2	32/2	45/2	63/2	40/2	63/2	100/2
	220V	A	16/3	25/3	32/3	45/4	63/4	40/4	63/4	100/4
	440V	A	16/4	25/6	32/6	③	③	③	③	③
	750V	A	16/8	25/8	32/8	③	③	③	③	③
DC22A	48V	A	16/1	25/1	32/1	45/1	63/1	40/1	63/1	100/1
	110V	A	16/2	25/2	32/2	45/2	63/2	40/2	63/2	100/2
	220V	A	16/3	25/3	32/4	45/4	63/4	40/4	63/4	63/4
	440V	A	16/6	25/8	③	③	③	③	③	③
	750V	A	16/8	25/8	③	③	③	③	③	③
DC23A	48V	A	16/1	25/1	32/1	45/1	63/1	40/1	63/1	100/1
	110V	A	16/2	25/2	32/2	45/2	63/2	40/2	63/2	100/2
	220V	A	16/4	25/4	32/4	45/4	63/4	40/4	63/4	63/4
	440V	A	10/4	③	③	③	③	③	③	③
	750V	A	16/8	③	③	③	③	③	③	③
Rated operational power										
AC23A	230V	kW	3	4	5.5	11	22	7.5	11	22
	400/415V	kW	7.5	9	11	22	37	15	18.5	37
	500V	kW	7.5	9	11	22	37	15	18.5	37
	690V	kW	7.5	9	11	15	18.5	15	15	37
Short-circuit current	kA	50	50	50	50	50	50	50	50	
with back-up fuses of size	A	25	32	40	63	80	100	100	100	



① The ambient air temperature does not exceed +40°C and its average over a period of 24 hours does not exceed +35°C according to IEC 947.
 ② IEC 947-3, utilization category B, infrequent operation.
 ③ Not available at time of printing, please consult factory.

Technical data

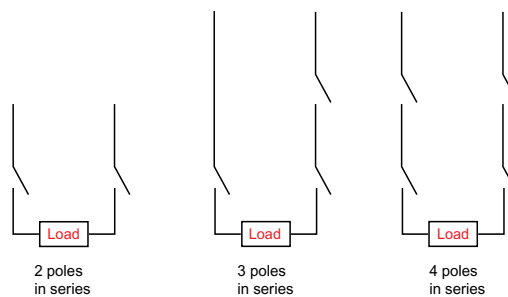
OT200U03 – OETL-NF3150

IEC

Disconnect
switches
Technical
data

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Catalog number	3 pole	OT200U03	OT400U03	OT600U03	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150
Rated insulation and operational voltage, AC20 and DC20	40°C V	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage	kV	12	12	12	8	8	8	8	8
Rated thermal current, I_n									
AC 20/DC 20	open ^① A	250	400	800	1250	1600	2500	3150	
	40°C enclosed A	250	400	800	1250	1600	2300	2300	2600
	60°C enclosed A	—	—	—	1000	1250	1950	1950	2300
Rated operational currents									
AC 21A	≤500V A	250	400	800	1250	1600	2500^②	2500^②	3150^③
	≤690V A	250	400	800	1250	1600	2500 ^②	2500 ^②	3150 ^③
	≤1000V A	—	—	800	—	—	—	—	—
AC 22A	≤500V A	250	400	800	1250	1600	1600 ^②	1600 ^②	1600 ^②
	≤690V A	250	400	800	—	—	—	—	—
	≤1000V A	—	—	800	—	—	—	—	—
AC 23A	≤415V A	250	400	800	800	800	800 ^②	800 ^②	800 ^②
	≤500V A	250	400	800	800	800	800 ^②	800 ^②	800 ^②
	≤690V A	250	400	800	—	—	—	—	—
	≤1000V A	—	—	800	—	—	—	—	—
Rated operational currents/poles in series									
DC21A	48V A	250/1	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	110V A	250/2	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	220V A	250/2	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	440V A	250/3	630/3	800/3	1250/3	1600/3	2500/3	2500/3	3150/2
	750V A	250/4	—	—	—	—	—	—	—
DC22A	48V A	250/1	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	110V A	250/2	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	220V A	250/2	630/2	800/2	1250/2	1600/2	2500/2	2500/2	3150/2
	440V A	250/3	630/3	800/3	—	—	—	—	—
	750V A	250/4	—	—	—	—	—	—	—
DC23A	48V A	250/1	630/2	—	—	—	—	—	—
	110V A	250/2	630/2	—	—	—	—	—	—
	220V A	250/2	630/2	—	—	—	—	—	—
	440V A	250/3	—	—	—	—	—	—	—
	750V A	250/4	—	—	—	—	—	—	—
Rated operational power									
AC23A	230V kW	75	110	—	250	250	250	250	250
	400/415V kW	132/140	220/230	450	400	400	400	400	400
	500V kW	170	280	560	450	450	450	450	450
	690V kW	240	355	800	—	—	—	—	—
Short-circuit current	kA	100	100	100	50/50 ^④	50/50 ^④	50/63 ^④	50/63 ^④	50/63 ^④
with back-up fuses of size	A	400	800	800	—	—	—	—	—



① The ambient air temperature does not exceed +40°C and its average over a period of 24 hours does not exceed +35°C according to IEC 947.

② IEC 947-3, utilization category B, infrequent operation.

③ Not available at time of printing, please consult factory.

④ 690V / 500V

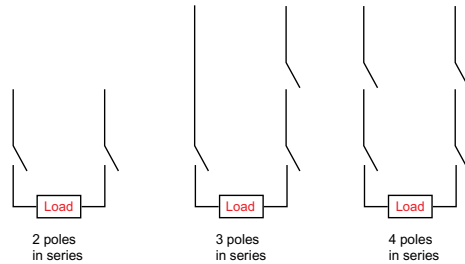
Technical data

OT16F3 – OT100F3

IEC

IEC

Catalog number	3 pole	OT16F3	OT25F3	OT40F3	OT63F3	OT80F3	OT30F3	OT60F3	OT100F3
Rated short-circuit making capacity, prospective peak value, I _{cm}	kA	0.7	0.7	0.7	1.4	1.4	3.6	3.6	3.6
Rated short time withstand current,									
RMS I ^{cw} 0.2s	kA	—	—	—	—	—	—	—	—
RMS I ^{cw} 1.0s	kA	0.5	0.5	0.5	1	1	2.5	2.5	2.5
AC breaking capacity									
pf = 0.35									
≤415V	A	128	160	184	240	304	320	504	640
≤500V	A	128	160	184	240	256	320	480	480
≤690V	A	80	88	96	160	160	320	320	320
DC breaking capacity/poles in series									
L/R = 15ms									
≤48V	A	64/1	100/1	128/1	180/1	252/1	160/1	252/1	400/1
≤110V	A	64/2	100/2	128/2	180/2	252/2	160/2	252/2	400/2
≤220V	A	64/3	100/4	128/4	180/4	180/4	160/4	252/4	252/4
≤440V	A	①	①	①	①	①	①	①	①
≤750V	A	①	①	①	①	①	①	①	①
Physical characteristics									
Electrical endurance at rated operational current, pf = 0.65	operation cycles	3000	3000	3000	3000	3000	3000	3000	3000
Mechanical endurance	operations	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Weight	3 pole	kg	0.11	0.11	0.11	0.27	0.36	0.36	0.36
	4 pole	kg	0.15	0.15	0.15	0.35	0.5	0.5	0.5
Dimension	3 pole	H mm	68	68	68	91.5	91.5	100	100
		W mm	35	35	35	52.5	52.5	70	70
		D mm	56	56	56	72.5	72.5	75	75
Power loss per pole	W	0.3	0.6	1	1.4	2.8	1	1.6	4
Shaft size — square	mm	6 x 6	6 x 6	6 x 6	6 x 6	6 x 6	6 x 6	6 x 6	6 x 6
Switch operating torque for rotary 3 pole switches	Nm	1	1	1	1.2	1.2	2	2	2
Suitable conductor cross section Cu	mm ²	0.75 – 10	0.75 – 10	0.75 – 10	1.5 – 25	1.5 – 25	1.5 – 25	1.5 – 25	10 – 70
Bolt size		—	—	—	—	—	—	—	—
Auxiliary contacts		OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _
Ratings according to IEC 947-5-1									
Rated voltage, U _i	VAC	690	690	690	690	690	690	690	690
Thermal current, I th	A	16	16	16	16	16	16	16	16
AC12/DC12 I ^e , A	U ^e = 120V	A	—	—	—	—	—	—	—
	125V	A	—	—	—	—	—	—	—
	240V	A	6 ②	6 ②	6 ②	6 ②	6 ②	6 ②	6 ②
	250V	A	—	—	—	—	—	—	—
	400V	A	4 ②	4 ②	4 ②	4 ②	4 ②	4 ②	4 ②
	415V	A	—	—	—	—	—	—	—
	440V	A	—	—	—	—	—	—	—
	480V	A	—	—	—	—	—	—	—
	500V	A	—	—	—	—	—	—	—
	600V	A	—	—	—	—	—	—	—
	690V	A	2 ②	2 ②	2 ②	2 ②	2 ②	2 ②	2 ②



① Not available at time of printing, please consult factory.
② AC15, according to IEC947-5-1.

Technical data

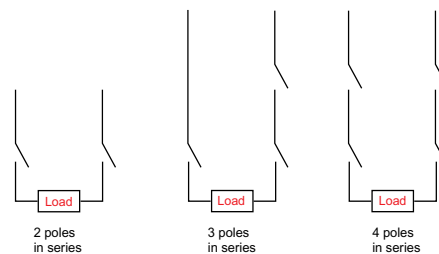
OT200U03 – OETL-NF3150

IEC

Disconnect
switches
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IEC

Catalog number	3 pole	OT200U03	OT400U03	OT600U03	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150	
Rated short-circuit making capacity, prospective peak value, $I_{cm}500/690V$	kA	30	65	80	105	105	140/105	140/105	140/105	
Rated short time withstand current,										
RMS I_{sc}	0.2s	kA	15	28	36	—	—	—	—	
RMS I_{sc}	1.0s	kA	8	15	20	50 ②	50 ②	80 ②	80 ②	
AC breaking capacity										
pf = 0.35	≤415V	A	2000	3200	5760	6400	6400	6400	6400	
	≤500V	A	2000	3200	5600	6400	6400	6400	6400	
	≤690V	A	2000	3200	5600	2500 ③	2500 ③	4800 ④	4800 ④	
DC breaking capacity/poles in series										
L/R = 15ms, 3 pole in series										
	48V	A	1000/2	①	①	①	①	①	①	
	110V	A	1000/2	①	①	①	①	①	①	
	220V	A	1000/2	1600/2	2000/2	1900/2	2600/2	2600/2	2600/2	
	440V	A	1000/3	1600	2000/3	①	①	①	①	
	750V	A	1000/4	①	①	①	①	①	①	
Physical characteristics										
Electrical endurance at rated operational current, pf = 0.65 operation cycles										
			1000	1000	1000	500	500	100 ⑤	100 ⑤	100 ⑤
Mechanical endurance operations										
			20,000	16,000	10,000	10,000	10,000	6000	6000	6000
Weight										
	3 pole	kg	1.2	2.2	5.2	16.3	17.5	37	37	37
	4 pole	kg	1.6	2.6	6.5	20.5	22.5	47	47	47
Dimension										
	3 pole	H mm	162	216	250	372	372	546	546	546
		W mm	219	260	266	363	363	468	468	468
		D mm	92.5	130	139	125	125	271	271	271
Power loss per one pole										
		W	6.5	10	40	40	67	90	90	140
Shaft size — square □										
		mm	6 x 6	12 x 12	12 x 12	12 x 12	12 x 12	12 x 12	12 x 12	12 x 12
Switch operating torque for rotary 3 pole switches										
		Nm	7	16	21	21	21	50	50	50
Suitable conductor cross section Cu										
		mm ²	—	—	—	—	—	—	—	—
Bolt size										
			8 x 25	10 x 30	12 x 40	12 x 60	12 x 60	12 x 60	12 x 60	12 x 60
Auxiliary contacts										
			OA_G_	OA_G_	OA_G_	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _
Ratings according to IEC 947-5-1										
Rated voltage, U_i										
	VAC		690	690	690	690	690	690	690	690
Thermal rated current, I_{th}										
	A		16	16	10	10	10	10	10	10
AC12/DC12 I_{th} , A $U_e =$										
	120V	A	—	—	8/—	8/—	8/—	8/—	8/—	8/—
	125V	A	—	—	—/1.1	—/1.1	—/1.1	—/1.1	—/1.1	—/1.1
	240V	A	6/—	6/—	6/—	6/—	6/—	6/—	6/—	6/—
	250V	A	—	—	—/0.55	—/0.55	—/0.55	—/0.55	—/0.55	—/0.55
	400V	A	4/—	4/—	4/—	4/—	4/—	4/—	4/—	4/—
	415V	A	—	—	4/—	4/—	4/—	4/—	4/—	4/—
	440V	A	—	—	—/0.31	—/0.31	—/0.31	—/0.31	—/0.31	—/0.31
	480V	A	—	—	3/—	3/—	3/—	3/—	3/—	3/—
	500V	A	—	—	3/0.27	3/0.27	3/0.27	3/0.27	3/0.27	3/0.27
	600V	A	—	—	—/0.2	—/0.2	—/0.2	—/0.2	—/0.2	2—/0.2
	690V	A	2/—	2/—	2/—	2/—	2/—	2/—	2/—	2/—



① Not available at time of printing, please consult factory.
 ② Maximum distance between busbar support and switch terminal 70mm.
 ③ pf 0.95.
 ④ pf 0.65.
 ⑤ IEC 947-3, utilization category B, infrequent operation.

Technical data
OS30FA_12 – OES800L3
UL & CSA

UL & CSA

Catalog number	3 pole	OS30FA_12	OS60J12	OS100J03	OS200J03	OS400J03	OS600J03	OES800L3
Approvals ①	2 pole 3 pole 4 pole	N/A UL98 & IEC UL98 & IEC	N/A UL98 & IEC UL98 & IEC	IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC UL98 & IEC
Technical ratings	-40° to 40°C							
General purpose amp rating pf = 0.7 – 0.8	A	30	60	100	200	400	600	800
Max operating voltage	V	600	600	600	600	600	600	600
Max horsepower rating/ Max motor FLA current pf = 0.4 – 0.5 Three phase								
240V	HP/A	7.5/22.0	15/42.0	30/80.0	60/145.0	125/312.0	200/480.0	250/602.0
480V	HP/A	15/21.0	30/40.0	60/77.0	125/156.0	250/302.0	400/477.0	500/590.0
600V	HP/A	20/22.0	50/52.0	75/77.0	150/144.0	350/336.0	500/472.0	600/ —
Single phase								
120V	HP/A	2/24.0	—	—	—	—	—	—
240V	HP/A	3/17.0	—	—	—	—	—	—
Short circuit rating with fuse	kA	200	200	200	200	200	200	100
UL Fuse size	A	30	60	100	200	400	600	800
UL Fuse type	J/CC	J/CC	J	J/T	J/T	J	J	L
Endurances								
Min. Electrical endurance, pf = 0.75 – 0.80	operation cycles	6000	6000	6000	6000	1000	1000	500
Mechanical endurance	operation	20,000	20,000	20,000	20,000	12,000	10,000	7000
Physical characteristics								
Weight	3 pole lb 4 pole lb	1.54 1.98	2.86 3.52	3.30 3.96	5.9 7.5	12.56 15.21	28.66 37.48	37.44 46.26
Dimension	3 pole H in W in D in	3.66 4.15 4.10	3.94 5.63 5.04	5.67 7.07 5.10	6.5 7.1 5.2	9.29 10.04 6.93	12.04 13.50 9.17	10.10 14.80 9.17
Shaft size square □	in mm	.24 x .24 6 x 6	.24 x .24 6 x 6	.24 x .24 6 x 6	.24 x .24 6 x 6	.47 x .47 12 x 12	.47 x .47 12 x 12	.47 x .47 12 x 12
Switch operating torque for rotary 3 pole switches	lb. in.	26.6	35.5	70.9	195	195	248	248
Terminal lug kits		Integral	Integral	OZXA-24	OZXA-200	OZXA-400	OZXA-800	OZXA-27
Wire range	AWG	#18 – 8	#14 – 4	#14 – 2/0	#4 – 300kcmil	#2 – 600kcmil	(2) #2 – 600 kcmil	(2) #2 – 600 kcmil
Torque:								
Wire tightening	lb. in.	17	30	120	200	500	500	500
Lug mounting	lb. in.	N/A	N/A	50	72	480	480	480
Auxiliary contacts		OA4G_	OA1/3G_	OA_G_	OA_G_	OA_G_	OA_G_	OZKX_
NEMA ratings, AC		—	A600	A600	A600	A600	A600	A600
AC rated voltage	VAC	250	600	600	600	600	600	600
AC thermal rated current	A	6	10	10	10	10	10	10
AC maximum volt ampere making	VA	—	7200	7200	7200	7200	7200	7200
AC maximum volt ampere breaking	VA	—	720	720	720	720	720	720
NEMA ratings, DC		—	P300	R300	R300	P600	P600	P600
DC rated voltage	VDC	—	300	300	300	600	600	600
DC thermal rated current	A	—	1	1	1	1	7	5
DC maximum make break current	A	—	28	28	28	28	28	138
Torque:								
Wire tightening	lb. in.	7	7	7	7	7	7	7
Wire range	AWG	#22 – 14/#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#20 – 12

① The following UL Listed switches are also CSA approved.

Technical data

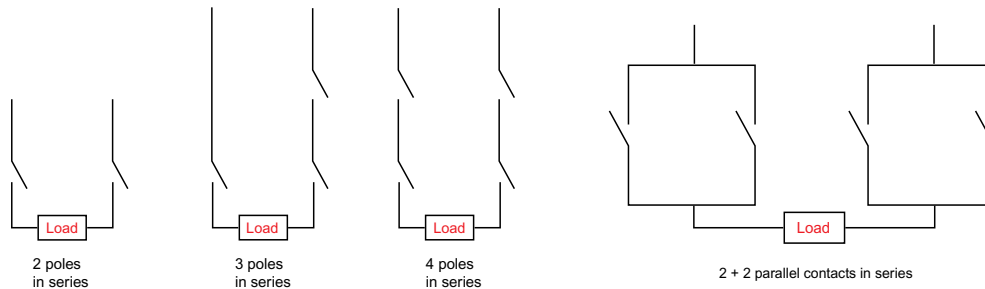
OS30FA_12 – OES800L3

IEC

Disconnect
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Catalog number	3 pole	OS30FA_12	OS60J12	OS100J03	OS200J03	OS400J03	OS600J03	OES800L3
Technical ratings	-40° to 40°C							
Rated insulation voltage								
Pollution degree 3 ⑥	V	1000	1000	1000	1000	1000	1000	1000
Dielectric strength 50Hz/60Hz, 1 min	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage	kV	12	12	12	12	12	12	12
Rated thermal current, I _n /max. fuse power dissipation ①								
AC 20/DC 20 open ②	A/W	32/3.5	63/7.5	160/12	200/17	400/45	630/60	800/65
40°C enclosed	A/W	32/3.5	63/7.5	160/10, 135/12	200/17	400/34, 360/37	600/45, 570/50	720/55
Enclosed with solid links	A/W	32	85	175	280	450	700	900
with minimum cable cross section Cu	mm ²	6	16	70	95	240	2 x 185	2 x 240
Rated operational voltage AC 20 and DC 20V		1000	1000	1000	1000	1000	1000	1000
AC Rated operational currents								
AC 21A	≤500V A	32	63	160	200	400	630	800
	≤690V A	32	63	160	200	400	630	800
AC 22A	≤500V A	32	63	160	200	400	630	800
	≤690V A	32	63	160	200	400	630	800
AC 23A	≤500V A	32	63 ⑤	160 ⑤	200	400	630	720
	≤690V A	32	63 ⑤	160 ⑤	200	400	630	720
DC Rated operational currents/poles in series								
DC21A	48V A	32/2 ③	④	④	200/1	400/2	—	800/2
	110V A	32/2	④	④	200/1	400/2	—	800/2
	220V A	32/2	④	④	200/1	400/2	—	800/2
	440V A	32/4	63/4	160/3	200/2	400/2	—	800/2
	750V A	—	④	④	180/4	400/3	—	800/3
	1000V A	—	④	④	—	400/4	—	800/4
DC22A	48V A	32/2 ③	④	④	200/1	400/2	—	800/2
	110V A	32/2	④	④	200/1	400/2	—	800/2
	220V A	32/2	④	④	200/1	400/2	—	800/2
	440V A	32/4	63/4	160/3	200/2	400/2	—	800/2
	750V A	—	④	④	180/4	400/3	—	800/3
	1000V A	—	④	④	—	400/4	—	800/4
DC23A	48V A	32/2 ③	④	④	200/1	400/2	—	800/2
	110V A	32/2	④	④	200/1	400/2	—	800/2
	220V A	32/2	④	④	200/1	400/2	—	800/2
	440V A	32/4	63/4	160/3	200/2	400/2	—	800/2
	750V A	—	④	④	180/4	400/3	—	800/3
	1000V A	—	④	④	—	—	—	800/4
Rated operational power	AC23A							
230V	kW	8	18.5	45	60	132	200	200
400V	kW	14	30	80	110	220	355	350
415V	kW	15	30	90	110	230	355	380
500V	kW	18	37	110	140	280	450	470
690V	kW	25	60	132	190	400	630	600



① Ambient temperature 60°C: derating 20 percent. Mounting on ceiling: derating 10 percent. Mounting on wall, horizontal fuses: derating 8 percent.
 ② The ambient air temperature does not exceed +40°C and its average over a period of 24h does not exceed +35°C according to IEC 947.
 ③ For 30A switches, use 2 + 2 parallel contacts in series.
 ④ Available on request.
 ⑤ IEC 947-3, utilization category B, infrequent operation.
 ⑥ Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs, which becomes conductive due to condensation.

Technical data

OS30FA_12 – OES800L3

IEC

IEC

Catalog number	3 pole	OS30FA_12	OS60J12	OS100J03	OS200J03	OS400J03	OS600J03	OES800L3
Rated breaking capacity								
in category AC-23A	500V A	256	504	1280	1600	3200	5760	5760
	690V A	256	504	1280	1600	3200	5760	5760
Rated breaking capacity/poles in series								
in category DC-23	<220V A	128/2	—	—	1000/2	1600/2	3200/2	3200/2
	440V A	128/4	—	—	1000/2	1600/2	3200/2	3200/2
	500 – 750V A	—	—	—	1000/3	1600/3	3200/3	3200/3
	1000V A	—	—	—	—	—	3200/4	3200/4
Rated conditional short-circuit current r.m.s. ③								
	80 kA, 415V kA	9	17	22	35	40	75	75
	100 kA, 500 V kA	7.5	17	22	37.5	40	75	75
	50 kA, 690 V kA	6	13	15	35	35	60	60
Rated short time withstand current, 1s. kA		1	2.5	5	8	10	16	16
Rated capacitor power								
The capacitor rating of the fusible disconnect switch is limited by the fuse link								
	400 V kVar	15	30	—	—	180	250	310
	415V kVar	15	32	—	—	200	270	340
	690V kVar	25	50	—	—	325	450	550
Power loss/pole								
with rated current, without fuse	W	2	4	9	8	30	46	77
Mechanical endurance	operations	20,000	20,000	20,000	20,000	16,000	10,000	10,000
Fuse types, IEC 269-2	DIN 43620	—	000, 00	000, 00	—	0 – 2	3	3
	NFC	10 x 38, 14 x 51	14 x 51, 22 x 58	22 x 58	—	0 – 2	3	—
	BS 88	A1, A2, F1	A2 – A3	A2 – A4	B1 – B2	B1 – B4	C1 – C2	C1 – C3
size/distance of link bolts		M4/44.5(A1) M5/73(A2)	M5/73	M5/73 M8/94	M6/111	M8/111	M10/133, 184	M10/133, 184
Physical characteristics								
Weight	3 pole kg	0.7	1.3	1.5	2.6	5.7	13.0	17.0
	4 pole kg	0.9	1.6	1.8	7.9	6.9	17.0	21.0
Dimension	3 pole H mm	93	100	144	198.5	236	306	282
	W mm	106	143	179	181.5	255	343	376
	D mm	104	120	129	132	176	233	233
Shaft size	square □ mm	6 x 6	6 x 6	6 x 6	6 x 6	12 x 12	12 x 12	12 x 12
Terminals								
Built-in terminal size mm ²		0.5 – 10	2.5 – 25	—	—	—	—	—
Terminal bolt size, metric thread diameter x length mm		—	—	M6 x 20	M8 x 25	M10 x 40	M12 x 40	M12 x 40
Terminal bolt tightening torque	Nm	2	3.5	6 – 9	15 – 22	30 – 44	50 – 75	50 – 75
Fuse-links bolts tightening torque	Nm	2	3.5	3.5 – 5	4	15	40	40
Operating torque	Nm	3	4	8	7	22	28	28
Auxiliary contacts		OA4G_	OA1/3G	OA_G_	OA_G_	OA_G_	OA_G_	OZXK_
		①	②	②	②	②	②	②
Ratings according to IEC 947-5-1								
Rated voltage, U _e	VAC	690	690	690	690	690	690	690
Thermal current, I _m	A	10	16	16	16	16	16	10
AC12 / DC12, I _e	U _e =24V A	— / 6	—	—	—	—	—	—
	120V A	— / 6	—	—	—	—	—	8 / —
	125V A	—	—	—	—	—	—	— / 1.1
	230V A	—	6 / —	6 / —	6 / —	—	—	6 / —
	250V A	3 / 0.1	—	—	—	—	—	— / 0.55
	400V A	—	4 / —	4 / —	4 / —	—	—	4 / —
	415V A	—	—	—	—	—	—	4 / —
	440V A	2 / —	—	—	—	—	—	— / 0.31
	480V A	—	—	—	—	—	—	3 / —
	500V A	—	—	—	—	—	—	3 / 0.27
	600V A	—	—	—	—	—	—	— / 0.2
	690V A	—	2 / —	2 / —	2 / —	2 / —	2 / —	2 / —

① AC15 / DC12, according to IEC 947-5-1

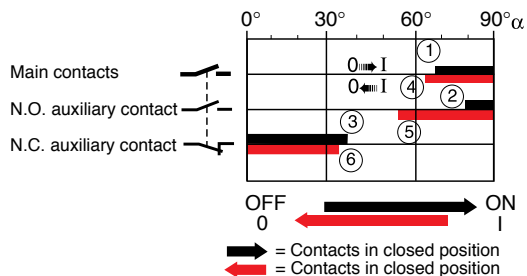
② AC15, according to IEC 947-5-1

③ Values shown are corresponding max. allowed cut-off current, peak-values per single phase fuse tests.

Auxiliary contact timing diagrams OT16 – OT100

Disconnect
switches
Technical
data

Legend



Contacts closing

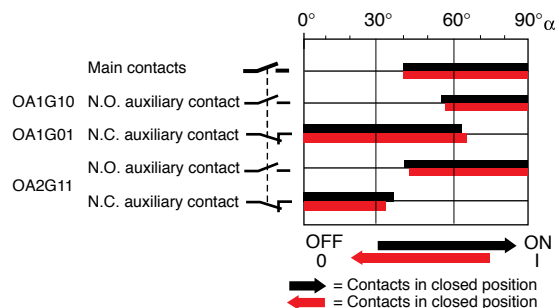
- ① Main contacts close
- ② N.O. auxiliary contacts close
- ③ N.C. auxiliary contacts open

Contacts opening

- ④ Main contacts open
- ⑤ N.O. auxiliary contacts open
- ⑥ N.C. auxiliary contacts close

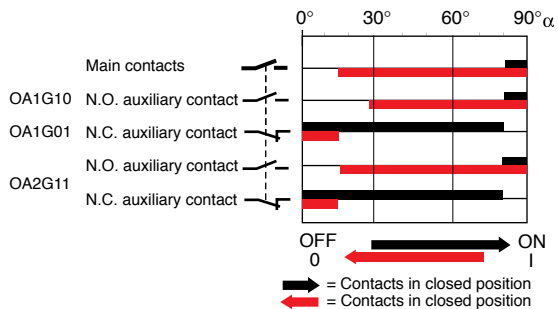
OT16, OT25, OT40

Catalog number	Auxiliary contact	Contact configuration
OT16, OT25, OT40	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



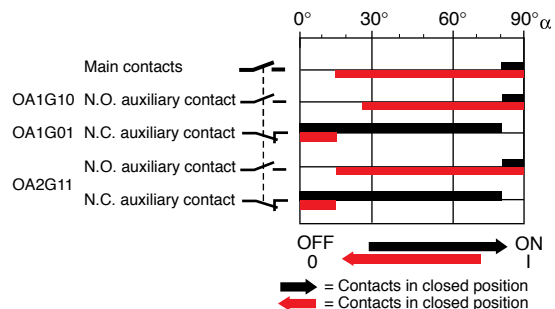
OT63, OT80

Catalog number	Auxiliary contact	Contact configuration
OT63, OT80	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



OT30, OT60, OT100

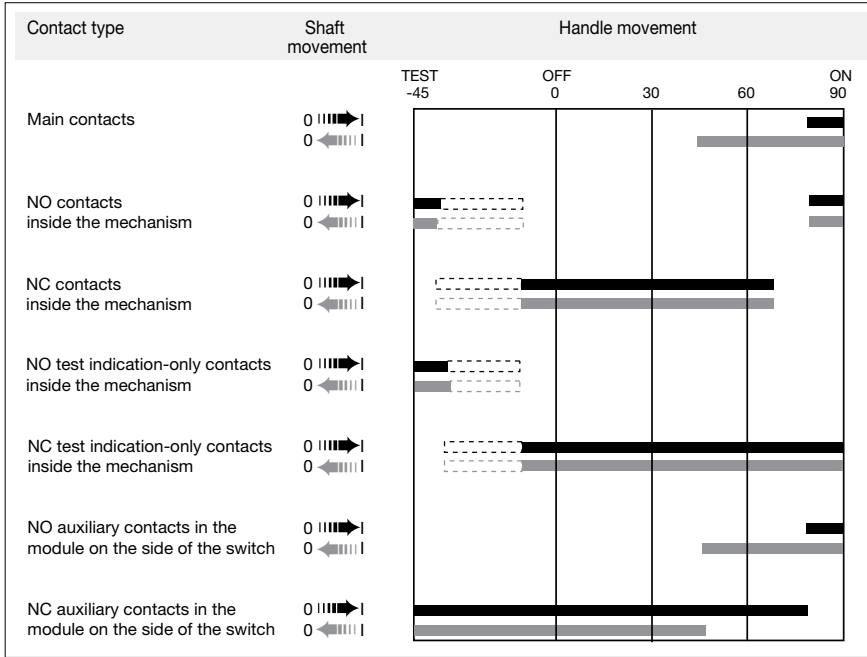
Catalog number	Auxiliary contact	Contact configuration
OT30, OT60, OT100	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



Auxiliary contact timing diagrams OT200U – OETL-NF3150

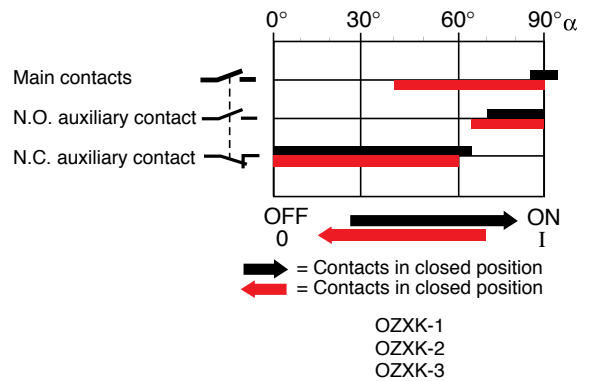
OT200U03 – OT600U03

Catalog number	Auxiliary contact	Contact configuration
OT200U03 – OT600U03	OA1G10 OA3G01	1 N.O. 1 N.C.



OETL-NF800A – OETL-NF3150

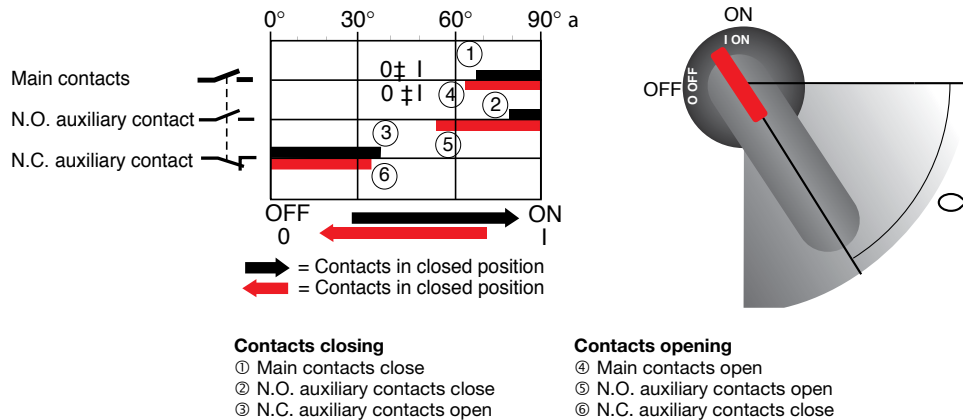
Catalog number	Auxiliary contact	Contact configuration
OETL-NF800A – OETL-NF3150	OZXK-1 OZXK-2 OZXK-3	1 N.O. & 1 N.C. 2 N.O. & 2 N.C. 4 N.O. & 4 N.C.



Auxiliary contact timing diagrams OS30_ – OS100

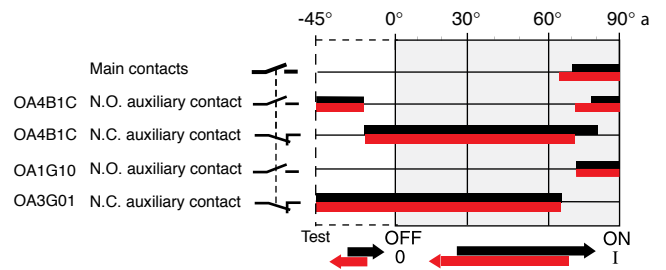
Disconnect
switches
Technical
data

Legend



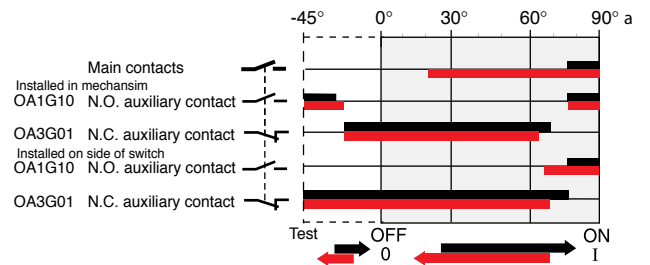
OS30_

Catalog number	Auxiliary contact	Contact configuration
OS30_	OA4B1C OA1G10 OA3G01	1 N.O. & 1 N.C. 1 N.O. 1 N.C.



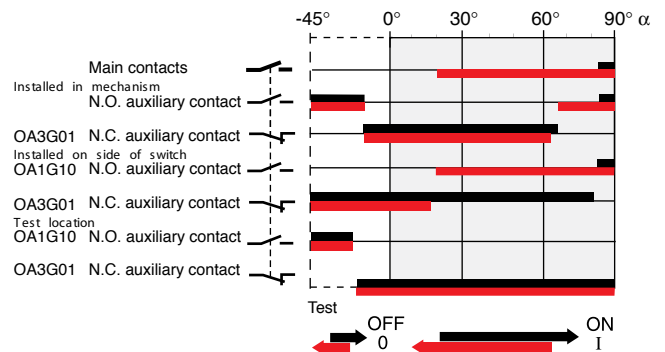
OS60

Catalog number	Auxiliary contact	Contact configuration
OS60	OA1G10 OA3G01	1 N.O. 1 N.C.



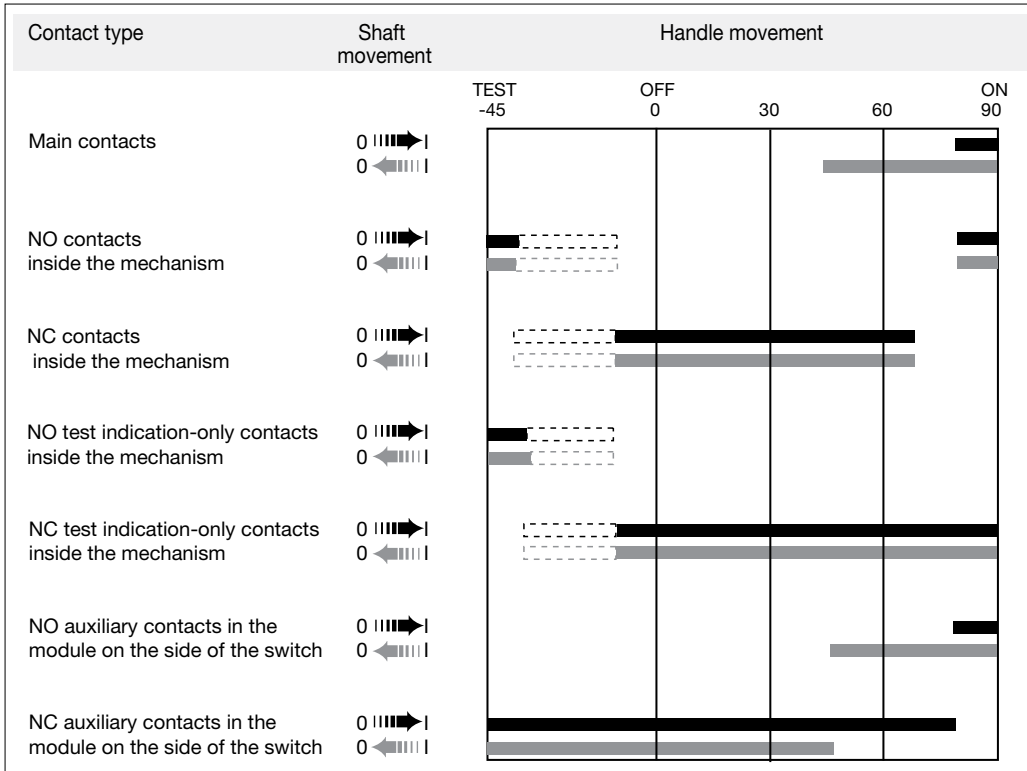
OS100

Catalog number	Auxiliary contact	Contact configuration
OS100	OA1G10 OA3G01	1 N.O. 1 N.C.



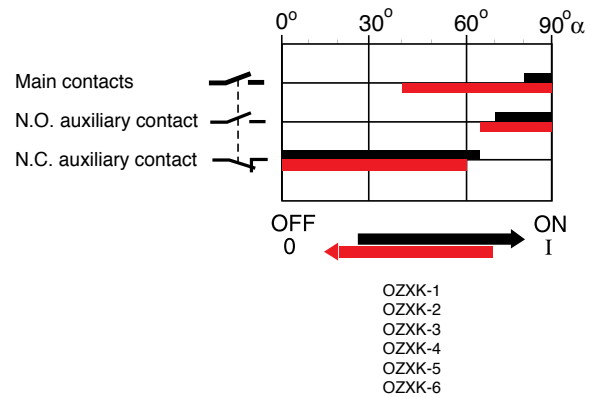
Auxiliary contact timing diagrams OS200 – OES800

OS200 - OS600



OES800

Catalog number	Auxiliary contact	Contact configuration
OES800	OZXK-1	1 N.O. & 1 N.C.
	OZXK-2	2 N.O. & 2 N.C.
	OZXK-3	4 N.O. & 4 N.C.
	OZXK-4	2 N.O.
	OZXK-5	4 N.O.
	OZXK-6	8 N.O.



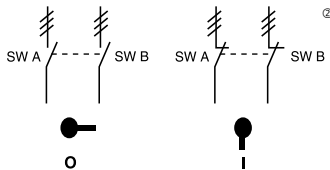
Technical data

Other configuration descriptions

Conversion mechanisms

6 or 8 pole

6 (8) pole mechanism allows two switches controlled by one handle to open or close simultaneously.

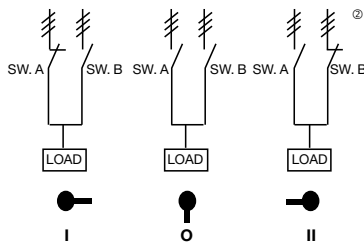


	POS. 0	POS. I
SW. A	O	X
SW. B	O	X

X = Closed
O = Open

Double throw^①

Transfer mechanism manually transfers between two power sources using two switches and a center "OFF" position.

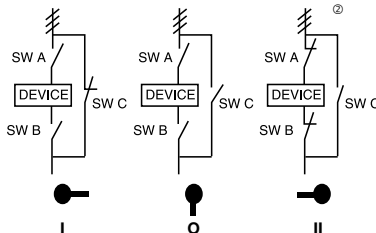


	POS. I	POS. O	POS. II
SW. A	X	O	O
SW. B	O	O	X

X = Closed
O = Open

Bypass^①

Bypass mechanism operates three switches: Two switches in series and one changeover switch to allow power bypass.

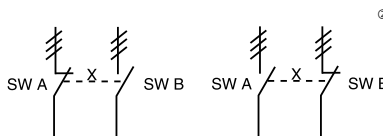


	POS. I	POS. O	POS. II
SW. A	O	O	X
SW. B	O	O	X
SW. C	X	O	O

X = Closed
O = Open

Mechanical interlock

Mechanical interlock mechanism prevents both switches from being in the ON position at the same time.



	SW. A POS. I	SW. B POS. O
SW. A	X	O
SW. B	O	X

X = Closed
O = Open

^① Transfer and bypass enclosed switches include the load side bussed or cabled together and all switches come standard with ground lugs.

^② = Three poles

Introduction

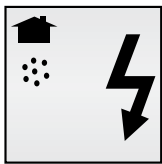
An enclosure is a surrounding case constructed to provide a degree of protection to personnel against accidental contact with the enclosed equipment and to provide a degree of protection to the enclosed equipment against specified environmental conditions.

A brief description of the more common types of enclosures used by the electrical industry relating to their environmental

capabilities follows. Refer to NEMA Standards Publication for more information regarding applications, features and design tests.

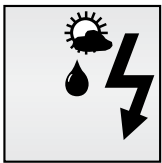
Individual NEMA product Standards Publications or third party certification standards may contain additional requirements for product testing and performance.

Definitions pertaining to nonhazardous locations



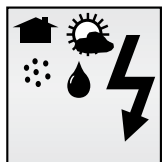
Type 1

Enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling dirt. (NEMA Standard 7-15-1991.)



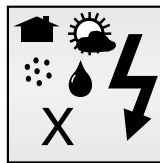
Type 3R

Enclosures are intended for outdoor use primarily to provide a degree of protection against rain, sleet and damage from external ice formation. (NEMA Standard 7-15-1991.)



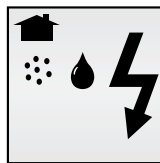
Type 4

Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, hose-directed water and damage from external ice formation. (NEMA Standard 1-10-1979.)



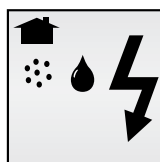
Type 4X

Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, hose-directed water and damage from external ice formation. (NEMA Standard 1-10-1979)



Type 12

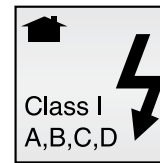
Enclosures are intended for indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping noncorrosive liquids. (NEMA Standard 7-15-1991.)



Type 13

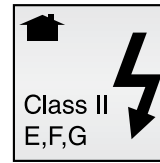
Enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and noncorrosive coolant. (NEMA Standard 1-10-1979.)

Definitions pertaining to hazardous locations



Type 7

Enclosures are intended for indoor use in locations classified as Class I, Groups, A, B, C, or D, as defined in the National Electrical Code. (NEMA Standard 7-15-1991.)



Type 9

Enclosures are intended for indoor use in locations classified as Class II, Groups E, F, or G, as defined in the National Electrical Code. (NEMA Standard 7-15-1991.)

Legend






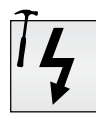

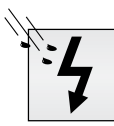

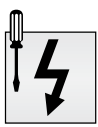
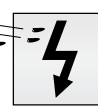








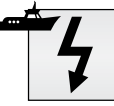

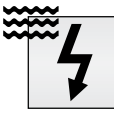
- Indoors
- Outdoors
- Water
- Dirt/dust
- Corrosion

IEC Environmental ratings

Disconnect
switches
Technical
data

IP ratings

indicate the degree of protection against dust, liquids and impacts. The IP degrees of protection are defined by the French standard NFC 20-010. To rate a device's degrees of protection, the letters IP are followed by up to three numbers. These numbers are defined as follows:

first number protection against solid objects	second number protection against liquids	third number protection against mechanical impacts
<p>IP 0  no protection</p>	<p>IP 0  no protection</p>	<p>IP 0  no protection</p>
<p>1  protected against solid objects over 50mm (e.g. accidental touch by hands.)</p>	<p>1  protected against vertically falling rain or condensation</p>	<p>1  impact 0,225 joule 150g falling from 15 cm</p>
<p>2  protected against solid objects over 12 mm (e.g. fingers)</p>	<p>2  protected against direct sprays of water up to 15° from vertical</p>	<p>2  impact 0,375 joule 250g falling from 15 cm</p>
<p>3  protected against solid objects over 2.5 mm (tools & wires)</p>	<p>3  protected against sprays to 60° from vertical</p>	<p>3  impact 0,50 joule 250g falling from 20cm</p>
<p>4  protected against solid objects over 1mm (small tools & small wires)</p>	<p>4  protected against water sprayed from all directions</p>	<p>5  impact 2,00 joule 500g falling from 40 cm</p>
<p>5  protected against dust (no harmful deposit)</p>	<p>5  protected against low pressure jets of water from all directions</p>	<p>7  impact 6,00 joule 1.5kg falling from 40 cm</p>
<p>6  totally protected against dust</p>	<p>6  protected from strong jets of water (e.g. for use on ship decks)</p>	<p>9  impact 20,00 joule 5 kg falling from 40 cm</p>
	<p>7  protected against the effects of immersion between 15cm and 1m</p>	

AC – Alternating current — Current that reverses its direction of flow twice per cycle.

Ambient temperature — Temperature of the air surrounding the unit.

Amp rating — The basic unit of measurement for electric current (columbs / seconds).

Conventional thermal current I_{th} — Value of the current the disconnect switch can withstand with poles in closed position, in free air for an eight hour duty, without the temperature rise of its various parts exceeding the limits specified by the standards.

Cycle duration — Total time of the on-load + off-load period.

DC – Direct current — Current that flows in only one direction.

Electrical endurance — Number of on-load operating cycles.

IEC environmental protection type — see page 18.48.

Full load amp current FLA — The current required by a motor to produce full-load torque at the motor's rated speed.

Inductive load — An electrical load characterized by having significant inrush (5 to 6 times FLA for typical design-B AC induction motors).

kW — Kilowatts (1000 watts)

Lockout/Tagout — Means of removing power from electrical equipment during inspection, service or repair.

Make / Break — ON / OFF

Mechanical endurance — Number of off-load operating cycles.

Poles in series — Means of connection poles using wires or bus bars to increase breaking capacity of load.

Power factor — The relationship between working power and total power consumed. Power factor measures how effectively electrical power is being used.

Rated insulation U_i — Voltage value which designates the unit and to which dielectric tests, clearance and creepage distances are referred.

Rated operating current I_o — Current value stated by the manufacturer and taking into account the rated operating voltage U_e , the rated frequency, the rated duty, the utilization category, the electrical contact life and the type of protective enclosure.

Rated operating voltage U_e — Voltage value to which utilization characteristics of the disconnect switch are referred, i.e. phase-to-phase voltage in 3 phase circuits.

Rated short circuit making capacity I_{cm} — The rated short-circuit making capacity of a disconnect switch, a disconnect or a switch-disconnector is the value assigned to equipment at the rated operational voltage, frequency (if any) and specified power-factor for AC or time constant for DC. It is expressed as the maximum prospective peak current under prescribed conditions.

Rated short time withstand current I_{cw} — The rated short-time withstand current of a disconnect switch, a disconnect or a switch-disconnector is the value that the equipment can carry without damage, under the test conditions specified in the relevant product standard. The value of the rated short-time withstand current shall be not less than twelve times the maximum rated operational current unless otherwise stated by manufacturer and the duration of the current shall be 1 s.

Resistive load — An electrical load characterized by not having any significant inrush current.

Short circuit protection coordination — Co-ordination types "1" and "2" are defined in IEC 947-4-1.

Type 1 coordination — There has to be no discharge of parts beyond the enclosure. Damage to the contactor and the overload is acceptable.

Type 2 coordination — No damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts is permitted, if they are easily separated.

Time constant — Ratio of inductance to the resistance:
 $L/R = \text{mH}/\text{Ohm} = \text{ms}$.

Torque — The force that produces rotation. It is commonly measured in pound-feet (lb-ft). Torque applies to such things as motor operations, handle rotations, wire tightening.

NEMA environmental protection type — see page 18.47.

Volt — The unit of electrical potential difference and electromotive force.