Technical data
OS30A_12 – OES800L3
UL & CSA

UL & CSA

Catalog number	3 pole	OS30A_12	OS60J12	OS100J03	OES200J3	OES400J3	OES600J3	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								
200 – 208V	HP/A	5/16.8 – 7.5/24.2	15/46.2	25/75.0	50/143.0	100/273 – 125/344	150/396	200/528
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	200
UL Fuse size	A	30	60	100	200	400	600	800
UL Fuse type		J/CC	J	J/T	J/T	J/T	J/T	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	16,000	12,000	10,000	7000
Physical characteristics								
Weight	3 pole lb	1.54	2.86	3.30	15.20	17.18	37.44	37.44
	4 pole lb	1.98	3.52	3.96	17.4	19.38	46.26	46.26
Dimension	3 pole H in	3.66	3.94	5.67	7.87	8.90	10.10	10.10
	W in	4.15	5.63	7.07	10.32	11.26	14.80	14.80
	D in	4.10	5.04	5.10	7.80	8.07	9.17	9.17
Shaft size square □	in	.20 x 2.0	.24 x .24	.24 x .24	.47 x .47	.47 x .47	.47 x .47	.47 x .47
	mm	5 x 5	6 x 6	6 x 6	12 x 12	12 x 12	12 x 12	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-25	OZXA-26	OZXA-27	OZXA-27
Wire range	AWG	#18 – 8	#14 – 4	#14 – 2/0	#6 – 300kcmil	#2 – 600kcmil	(2) #2 – 600 kcmil	(2) #2 – 600 kcmil
Torque:								
Wire tightening	lb. in.	17	30	120	375	500	500	500
Lug mounting	lb. in.	N/A	N/A	50	230	480	480	480

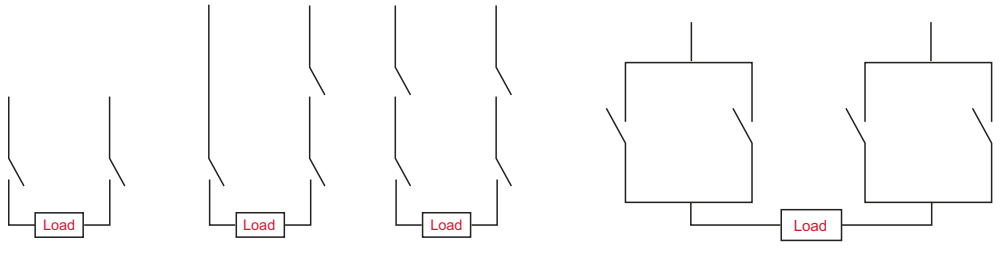
Auxiliary contacts		OA4G_	OA1/3G_	OA_G_	OA_G_	OZXK-__	OZXK-__	OZXK-__	OZXK-__
NEMA ratings, AC		—	A600	A600	A600	A600	A600	A600	A600
AC rated voltage	VAC	250	600	600	600	600	600	600	600
AC thermal rated current	A	6	10	10	10	10	10	10	10
AC maximum volt ampere making	VA	—	7200	7200	7200	7200	7200	7200	7200
AC maximum volt ampere breaking	VA	—	720	720	720	720	720	720	720
NEMA ratings, DC		—	P300	R300	R300	P600	P600	P600	P600
DC rated voltage	VDC	—	300	300	300	600	600	600	600
DC thermal rated current	A	—	1	1	1	5	5	5	5
DC maximum make break current	A	—	28	28	28	138	138	138	138
Torque:									
Wire tightening	lb. in.	7		7	7	7	7	7	7
Wire range	AWG	#22 – 14/#18 – 14		#18 – 14	#18 – 14	#20 – 12	#20 – 12	#20 – 12	#20 – 12

① The following UL Listed switches are also CSA approved.

Technical data
OS30A_12 – OES800L3
IEC

IEC

Catalog number	3 pole		OS30A_12	OS60J12	OS100J03	OES200J3	OES400J3	OES600J3	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_{th}/ max. fuse power dissipation ①									
AC 20/DC 20 open ②		A/W	32/3.5	63/7.5	160/12	200/22	400/45	630/60	800/65
40°C enclosed		A/W	32/3.5	63/7.5	160/10, 135/12	200/22	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		mm²	6	16	70	95	240	2 x 185	2 x 240
Rated operational voltage	AC 20 and DC 20	V	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	200/2	400/2	630/2	800/2
	110V	A	32/2	④	④	200/2	400/2	630/2	800/2
	220V	A	32/2	④	④	200/2	400/2	630/2	800/2
	440V	A	32/4	63/4	160/3	200/2	400/2	630/2	800/2
	750V	A	—	④	④	200/3	400/3	630/3	800/3
	1000V	A	—	④	④	200/4	400/4	630/4	800/4
DC22A	48V	A	32/2 ③	④	④	200/2	400/2	630/2	800/2
	110V	A	32/2	④	④	200/2	400/2	630/2	800/2
	220V	A	32/2	④	④	200/2	400/2	630/2	800/2
	440V	A	32/4	63/4	160/3	200/2	400/2	630/2	800/2
	750V	A	—	④	④	200/3	400/3	630/3	800/3
	1000V	A	—	④	④	200/4	400/4	630/4	800/4
DC23A	48V	A	32/2 ③	④	④	200/2	400/2	630/2	800/2
	110V	A	32/2	④	④	200/2	400/2	630/2	800/2
	220V	A	32/2	④	④	200/2	400/2	630/2	800/2
	440V	A	32/4	63/4	160/3	200/2	400/2	630/2	800/2
	750V	A	—	④	④	200/3	400/3	630/3	800/3
	1000V	A	—	④	④	—	—	630/4	800/4
Rated operational power	AC23A								
	230V	kW	8	18.5	45	57	110	180	200
	400V	kW	14	30	80	100	210	315	350
	415V	kW	15	30	90	110	230	340	380
	500V	kW	18	37	110	140	280	400	470
	690V	kW	25	60	132	180	330	540	600



2 poles in series | 3 poles in series | 4 poles in series | 2 + 2 parallel contacts in series

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.

IEC

Catalog number	3 pole		OS30A_12		OS60J12	OS100J03	OES200J3	OES400J3	OES600J3	OES800L3
Rated breaking capacity										
in category AC-23A	500V	A	256		504	1280	2000	3200	5760	5760
	690V	A	256		504	1280	2000	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	40	40	75	75
	100 kA, 500 V	kA	7.5		17	22	40	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	—	90	180	250	310
	415V	kVar	15		32	—	100	200	270	340
	690V	kVar	25		50	—	160	325	450	550
Power loss/pole										
with rated current, without fuse		W	2		4	9	5	30	55	77
Mechanical endurance		operations	20,000		20,000	20,000	16,000	16,000	10,000	10,000
Fuse types, IEC 269-2		DIN 43620	—		000, 00	000, 00	0 – 1	0 – 2	3	3
		NFC	10 x 38, 14 x 51		14 x 51, 22 x 58	22 x 58	0 – 1	0 – 2	3	—
		BS 88	A1, A2, F1		A2 – A3	A2 – A4	B1 – B3	B1 – B4	C1 – C2	C1 – C3
size/distance of link bolts			M4/44.5(A1) M5/73(A2)		M5/73	M5/73 M8/94	M8/111	M8/111	M10/133, 184	M10/133, 184
Physical characteristics										
Weight	3 pole	kg	0.7		1.3	1.5	6.9	7.8	17.0	17.0
	4 pole	kg	0.9		1.6	1.8	7.9	8.8	21.0	21.0
Dimension	3 pole	H mm	93		100	144	200	226	282	282
		W mm	106		143	179	262	286	376	376
		D mm	104		120	129	198	205	233	233
Shaft size	square □	mm	5 x 5		6 x 6	6 x 6	12 x 12	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	M10 x 40	M10 x 40	M12 x 40	M12 x 40
Terminal bolt tightening torque		Nm	2		3.5	6 – 9	30 – 44	30 – 44	50 – 75	50 – 75
Fuse-links bolts tightening torque		Nm	2		3.5	3.5 – 5	15	15	40	40
Operating torque		Nm	3		4	8	22	22	28	28
Auxiliary contacts			OA4G_ ①	OA1/3G ②	OA_G_ ②	OA_G_ ②	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 current, I_{th}		A	10	16	16	16	10	10	10	10
AC12 / DC12, I_e	U_e=24V	A	— / 6	—	—	—	—	—	—	—
	120V	A	— / 6	—	—	—	8 / —	8 / —	8 / —	8 /—
	125V	A	—	—	—	—	— / 1.1	—/ 1.1	—/ 1.1	— / 1.1
	230V	A	—	6 / —	6 / —	6 / —	6 / —	6 / —	6 / —	6 / —
	250V	A	3 / 0.1	—	—	—	— / 0.55	— / 0.55	— / 0.55	— / 0.55
	400V	A	—	4 / —	4 / —	4 / —	4 / —	4 / —	4 / —	4 / —
	415V	A	—	—	—	—	4 / —	4 / —	4 / —	4 / —
	440V	A	2 / —	—	—	—	— / 0.31	— / 0.31	— / 0.31	— / 0.31
	480V	A	—	—	—	—	3 / —	3 / —	3 / —	3 / —
	500V	A	—	—	—	—	3 / 0.27	3 / 0.27	3 / 0.27	3 / 0.27
	600V	A	—	—	—	—	— / 0.2	— / 0.2	— / 0.2	— / 0.2
	690V	A	—	2 / —	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.

Selecting switches per NEC & IEC

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.

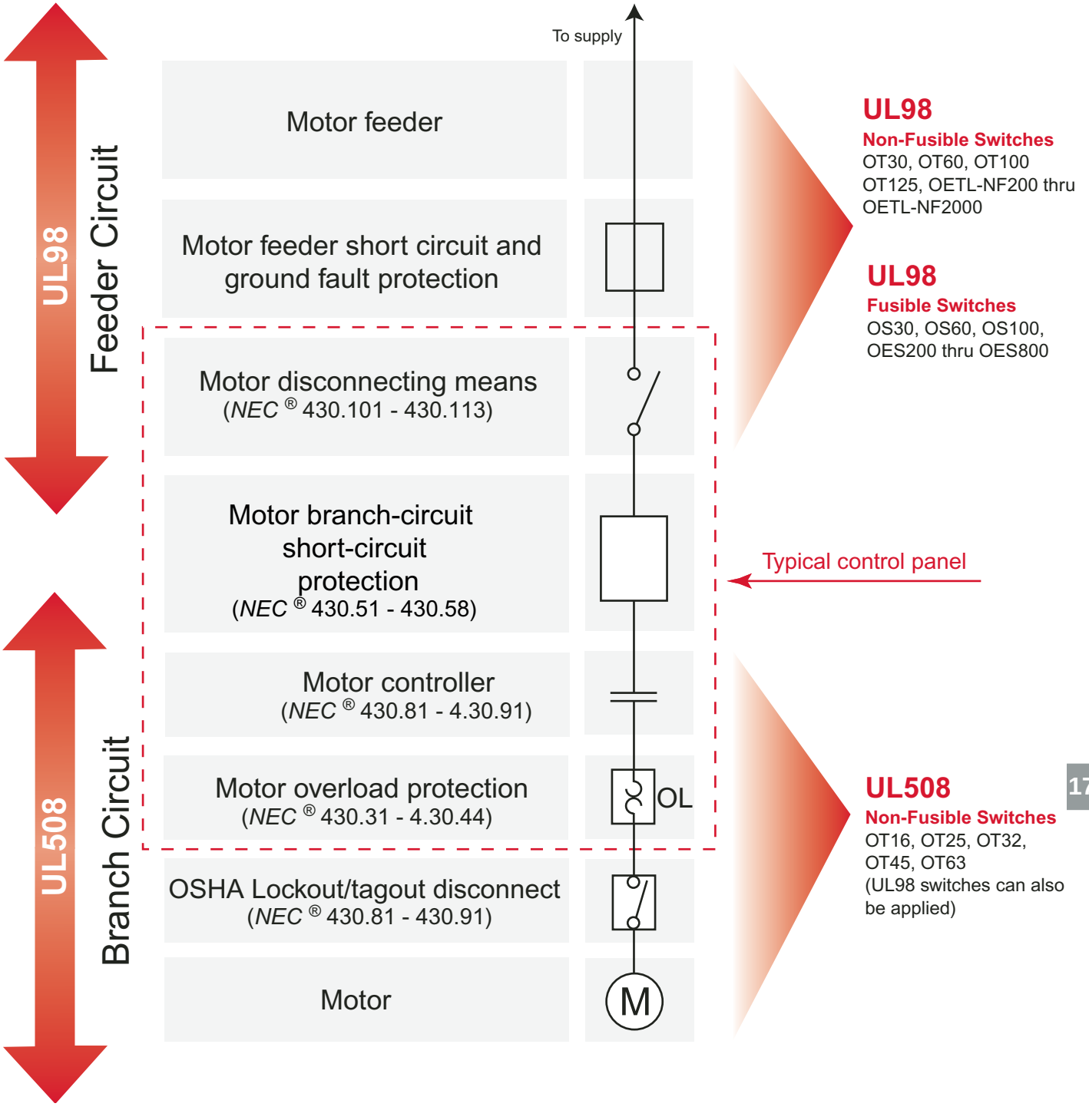
Selecting switches per IEC

Utilization categories

Nature of current	Utilization category		Typical applications
	Frequent operation	Infrequent operation	
Alternating current	AC-20A	AC-20B	• Connecting and disconnecting under no-load conditions
	AC-21A	AC-21B	• Switching of resistive loads including moderate overloads (PF > 0.95)
	AC-22A	AC-22B	• Switching of mixed resistive and inductive loads, including moderate overloads (PF > 0.65)
	AC-23A	AC-23B	• Switching of motor loads or other highly inductive loads (PF > 0.45 below 100A; PF > .35 above 100A
Direct current	DC-20A	DC-20B	• Connecting and disconnecting under no-load conditions
	DC-21A	DC-21B	• Switching of resistive loads including moderate overloads (L/R < 1ms)
	DC-22A	DC-22B	• Switching of mixed resistive and inductive loads, including moderate overloads, e.g., shunt motors (L/R < 2.5ms)
	DC-23A	DC-23B	• Switching of highly inductive loads, e.g., series motors (L/R < 15ms)
Mechanical endurance	Number of operations	Number of operations	
100A 315A >315A	10,000 8000 2000	2000 1600 400	

• Category AC-23 includes occasional switching of individual motors. The switching of capacitors of tungsten filament lamps shall be subject to agreement between manufacturer and user.

Use of UL98 & UL508 Disconnects



Definitions

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 17.50.

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_e — 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 disconnector 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 disconnector 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 co-ordination — Co-ordination types "1" and "2" are defined in IEC 947-4-1.

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

Type 2 co-ordination — No damage to the overload relay or other parts has occured, 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 = mH/Ohm = ms.

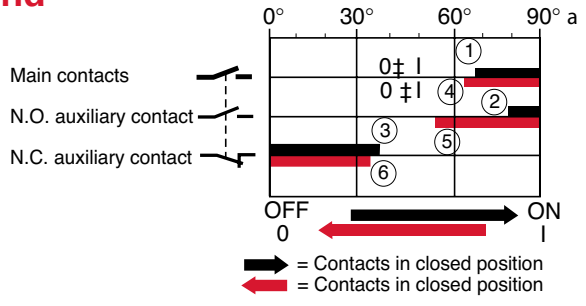
Torque — The force that produces rotation. It is commonly measured in pound-feet (lb-ft). Torque applies to such things as motor operations, handle rotations, wire tightening.

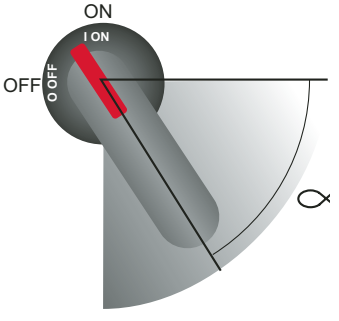
UL environmental protection type — see page 17.49.

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

Auxiliary contact timing diagrams
OS30_ – OS100

Legend



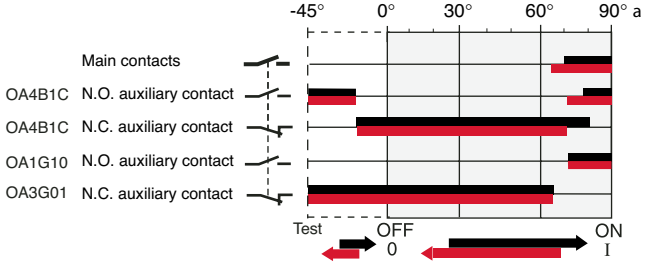


Contacts closing
① Main contacts close
② N.O. auxiliary contacts close
③ N.C. auxiliary contacts open

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

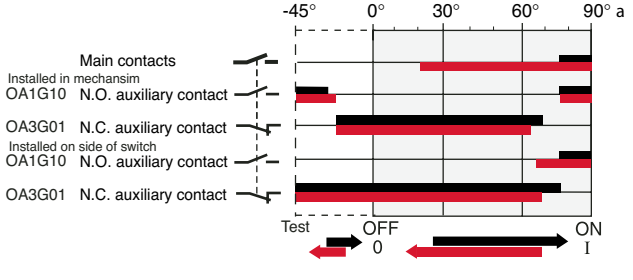
OS30_

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



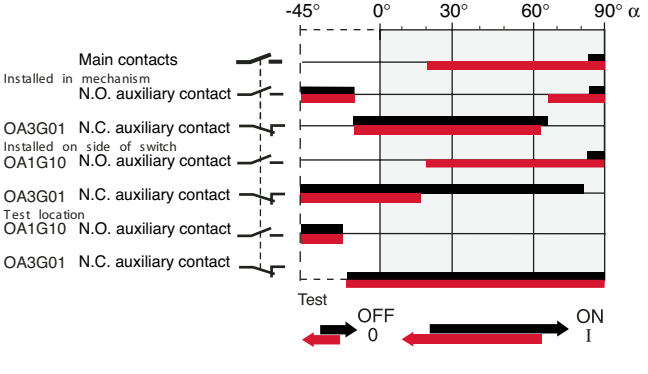
OS60

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



OS100

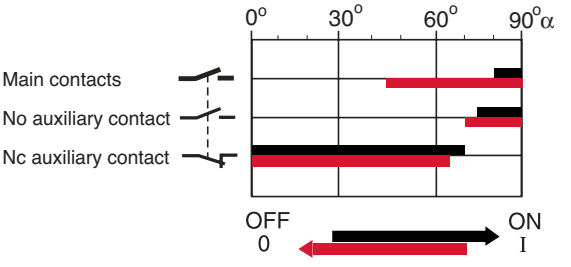
Catalog number	Auxiliary contact	Contact configuration
OS100	OA1G10 OA3G01	1 N.O. 1 N.C.



Auxiliary contact timing diagrams
OES200 – OES800

OES200 & OES400

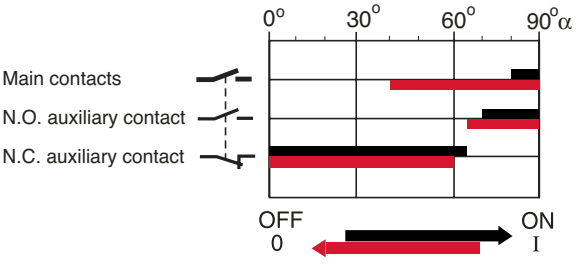
Catalog number	Auxiliary contact	Contact configuration
OES200 – 0ES400	OZXK-1	1 N.O. & 1 N.C.
	OZXK-2	2 N.O. & 2 N.C.
	OZXK-3	4 N.O. & 4 N.C.
	OZXK-4	2 N.O.
	OZXK-5	4 N.O.
	OZXK-6	8 N.O.



OZXK-1
OZXK-2
OZXK-3
OZXK-4
OZXK-5
OZXK-6

OES600 & OES800

Catalog number	Auxiliary contact	Contact configuration
OES600 – 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.



OZXK-1
OZXK-2
OZXK-3
OZXK-4
OZXK-5
OZXK-6