Technical data
OT200U03 – OETL-NF3150
UL & CSA

UL & CSA

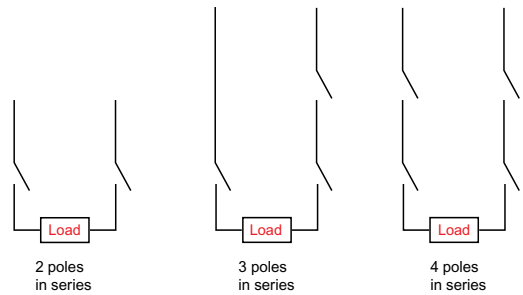
Catalog number	3 pole	OT200U03	OT400U03	OETL-NF600A	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150 ⑤
Approvals①	2 pole 3 pole 4 pole	UL98 & IEC UL98 & IEC IEC	UL98 & IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC UL98 & IEC	UL98 & IEC UL98 & IEC IEC	UL98 & IEC UL98 & IEC IEC	UL98 & IEC UL98 & IEC IEC	UL98 & IEC UL98 & IEC IEC	IEC IEC IEC
General purpose amp rating -40° to 40°C pf = 0.7 – 0.8	**A**	**200**	**400**	**600**	**800**	**1200**	**1600**	**2000**	**3150**
Max. operating voltage	V	600	600	600	600	600	600	480	—
Max. horsepower rating/Max. motor FLA current,									
pf = 0.4 – 0.5									
Three phase 200 – 208V	HP/A	60/160.0	100/273.0	150/396.0	200/528.0	—	—	—	—
240V	HP/A	75/192.0	125/312.0	200/480.0	250/602.0	—	—	—	—
480V	HP/A	150/180.0	250/302.0	400/477.0	500/590.0	—	—	—	—
600V	HP/A	200/192.0	350/336.0	500/472.0	600/576	—	—	—	—
Single phase 120V	HP/A	—	—	—	—	—	—	—	—
240V	HP/A	—	—	—	—	—	—	—	—
Short circuit rating with fuse									
Fuse type CC	kA	—	—	—	—	—	—	—	—
Fuse type J	kA	100	100	100	—	—	—	—	—
Fuse type T	kA	—	—	100	—	—	—	—	—
Fuse type RK1	kA	—	—	—	—	—	—	—	—
Fuse type RK5	kA	—	—	100	—	—	—	—	—
Fuse type L	kA	—	—	—	100	100	100	100	—
Fuse type H	kA	—	—	—	—	—	—	—	—
Maximum fuse size	A	350	600	600	1200	1200	2000	2000	—
3 cycle short circuit current withstand rating ⑥	kA	15	30	50	50	50	65	65	—
Endurances									
Min. Electrical endurance, pf = 0.75 – 0.80	operation cycles	6000	1000	1000	500	500	500	500	400
Min. Electrical endurance, pf = 0.40 – 0.50	operation cycles	②	②	②	②	②	②	②	②
Mechanical endurance	operations	20,000	20,000	10,000	10,000	10,000	6000	6000	6000
Physical characteristics									
Weight, switches 3 pole	lb	2.9	5.7	13.66	35.9	38.55	127.7	127.7	127.7
4 pole	lb	3.5	6.8	16.74	45.15	49.56	149.7	149.7	149.7
Dimension, switches 3 pole H	in	5.9	6.9	8.54	14.65	14.65	21.5	21.5	21.5
W	in	6.7	8.7	11.69	14.25	14.25	18.11	18.11	18.11
D	in	2.8	3.4	5.12	4.92	4.92	10.67	10.67	10.67
Shaft set screw tightening torque	lb. in.	14-17.7	—	—	—	—	—	—	—
Shaft size — square □	in	.24 x .24	.47 x .47	.47 x .47	.47 x .47	.47 x .47	.47 x .47	.47 x .47	.47 x .47
	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	lb. in.	62	142	184	184	184	438	438	438
Terminal lug kits		OZXA-200	OZXA-400	OZXA-27	OZXA-30	OZXA-28	OZXA-28	OZXA-28/2	OZXA-28/2
Wire range	AWG	#4-300kcmil③	#2-600kcmil③	(2)#2-600kcmil③	(2)#2-600kcmil③	(4)#2-600kcmil	(4)#2-600kcmil	(8)#2-600kcmil	(8)#2-600kcmil
Torque:									
Wire tightening	lb. in.	200	375	500	375	375	375	375	375
Lug mounting	lb. in.	72	240	480	230	230	230	230	230
Auxiliary contacts		OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _	OZXK-_ _
NEMA ratings, AC		A600	A600	A600	A600	A600	A600	A600	A600
AC rated voltage	VAC	600	600	600	600	600	600	600	600
AC thermal rated current	A	10	10	10	10	10	10	10	10
AC maximum volt-ampere making	VA	7200	7200	7200	7200	7200	7200	7200	7200
AC maximum volt-ampere breaking	VA	720	720	720	720	720	720	720	720
NEMA ratings, DC		P600	P600	P600	P600	P600	P600	P600	P600
DC rated voltage	VDC	600	600	600	600	600	600	600	600
DC thermal rated current	A	5	5	5	5	5	5	5	5
DC maximum make-break	VA	138	138	138	138	138	138	138	138
Torque: Wire tightening	lb. in	7	7	7	7	7	7	7	7
Wire range	AWG	#22 – #14	#22 – #14	#22 – #14	#22 – #14	#22 – #14	#22 – #14	#22 – #14	#22 – #14

① UL Listed switches are also CSA Approved.
② UL98 overload test, 50 operations, pf 0.40 – 0.50 at 2x FLA.
③ Multi-tap lug available, please see pg. 18.24 and 18.27.
④ Fuse size 70A for RK5
⑤ IEC rated only.
⑥ When protected by any Listed fuse or Listed circuit breaker whose current rating does not exceed the maximum thermal current rating of the switch.

Technical data
OT200U03 – OETL-NF3150
IEC

IEC

Catalog number	3 pole		OT200U03	OT400UO3	OETL-NF600A	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150
Rated insulation and operational	40°C									
voltage, AC20 and DC20		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_{th}										
AC 20/DC 20	open①	A	250	400	800	1250	1600	2500	3150	
	40°C enclosed	A	250	400	720	1250	1600	2300	2300	2600
	60°C enclosed	A	—	—	600	1000	1250	1950	1950	2300
Rated operational currents										
AC 21A	≤500V	A	**250**	**400**	**800**	**1250**	**1600**	**2500**②	**2500**②	**3150**②
	≤690V	A	250	400	800	1250	1600	2500②	2500②	3150②
	≤1000V	A	—	—	630	—	—	—	—	—
AC 22A	≤500V	A	250	400	800	1250	1600	1600②	1600②	1600②
	≤690V	A	250	400	800	—	—	—	—	—
	≤1000V	A	—	—	400	—	—	—	—	—
AC 23A	≤415V	A	250	400	720	800	800	800②	800②	800②
	≤500V	A	250	400	600	800	800	800②	800②	800②
	≤690V	A	250	400	350	—	—	—	—	—
	≤1000V	A	—	—	200	—	—	—	—	—
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	200	250	250	250	250	250
	400/415V	kW	132/140	220/230	355	400	400	400	400	400
	500V	kW	170	280	400	450	450	450	450	450
	690V	kW	240	355	355	—	—	—	—	—
Short-circuit current		kA	100	100	100	50/50④	50/50④	50/63④	50/63④	50/63④
with back-up fuses of size		A	400	800	800	—	—	—	—	—



2 poles in series | 3 poles in series | 4 poles in series

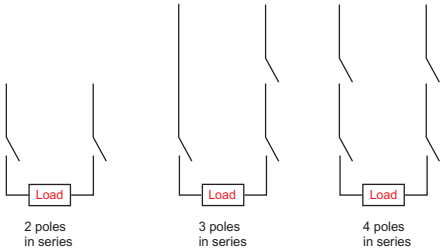
① The ambient air temperature does not exceed +40°C and its average over a period of 24 hours does not exceed +35°C according to IEC 947.
② IEC 947-3, utilization category B, infrequent operation.
③ Not available at time of printing, please consult factory.
④ 690V / 500V

Technical data
OT200U03 – OETL-NF3150
IEC

IEC

Catalog number	3 pole		OT200U03	OT400U03	OETL-NF600A	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150
Rated voltage, U_e		V/V	500/690	500/690	500/690	500/690	500/690	500/690	500/690	500/690
Rated conditional short-circuit current		kA	100/80	100/80	100/50	50	50	63/50	63/50	63/50
Max. allowed fuse size, type OFAA		A	315/355	500/500	800	—	—	—	—	—
Max. allowed cut-off current, peak value		kA	40.5/40.5	615/59	70/63	—	—	—	—	—
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_{cw}	0.2s	kA	15	28	38	—	—	—	—	—
RMS I_{cw}	1.0s	kA	8	15	17	50 ②	50 ②	80 ②	80 ②	80 ②
AC breaking capacity										
pf = 0.35	≤415V	A	2000	3200	5760	6400	6400	6400	6400	6400
	≤500V	A	2000	3200	4800	6400	6400	6400	6400	6400
	≤690V	A	2000	3200	2800	2500 ③	2500 ③	4800 ④	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	①
	110V	A	1000/2	①	①	①	①	①	①	①
	220V	A	1000/2	1600/2	2000/2	1900/2	2600/2	2600/2	2600/2	2600/2
	440V	A	1000/3	1600	2000	①	①	①	①	①
	750V	A	1000/4	①	①	①	①	①	①	①
Capacitor ratings	400/415V	kVar	—	—	330	①	①	①	①	①
Rated capacitor duty		kA	—	—	500	①	①	①	①	①
Physical characteristics										
Electrical endurance at rated operational current, pf = 0.65		operation cycles	1000	1000	500	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	6.2	16.3	17.5	37	37	37
	4 pole	kg	1.6	2.6	7.6	20.5	22.5	47	47	47
Dimension	3 pole	H mm	162	216	216	372	372	546	546	546
		W mm	219	260	304	363	363	468	468	468
		D mm	92.5	130	130	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_	OZXK-_ _	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_e, 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—/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.



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.

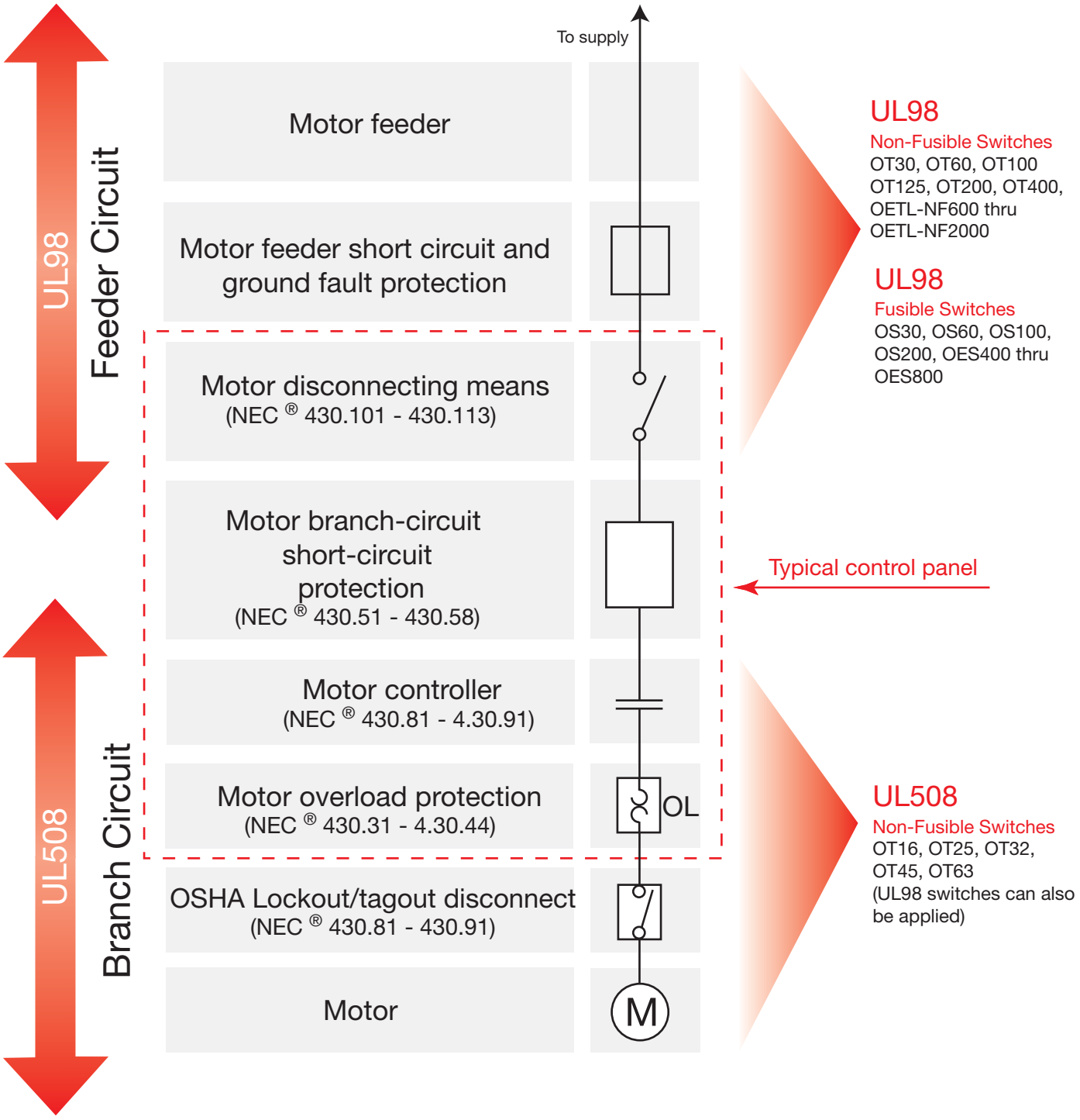
Selecting switches per IEC

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 > 0.35 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
According to *NEC* ® Article 430



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 18.52.

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 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 = 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.

NEMA environmental protection type — see page 18.51.

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

NEMA Environmental ratings

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)

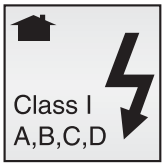
Type 12

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

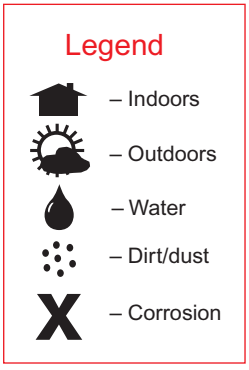


Type 7

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.)



IEC Environmental ratings

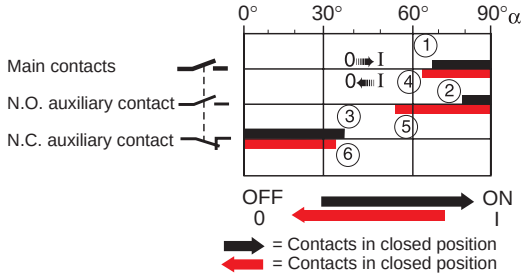
IP ratings

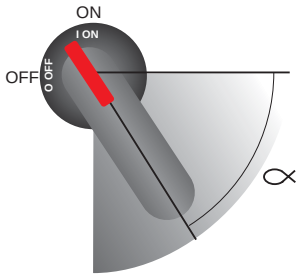
indicate the degree of protection against dust, liquids and impacts. The IP degrees of protection are defined by the French standard NFC 20-010. To rate a device's degrees of protection, the letters IP are followed by up to three numbers. These numbers are defined as follows:

first number protection against solid objects	second number protection against liquids	third number protection against mechanical impacts
IP 0 no protection	IP 0 no protection	IP 0 no protection
1 protected against solid objects over 50mm (e.g. accidental touch by hands.)	1 protected against vertically falling rain or condensation	1 impact 0,225 joule 150g falling from 15 cm
2 protected against solid objects over 12 mm (e.g. fingers)	2 protected against direct sprays of water up to 15° from vertical	2 impact 0,375 joule 250g falling from15 cm
3 protected against solid objects over 2.5 mm (tools & wires)	3 protected against sprays to 60° from vertical	3 impact 0,50 joule 250g falling from 20cm
4 protected against solid objects over 1mm (small tools & small wires)	4 protected against water sprayed from all directions	5 impact 2,00 joule 500g falling from 40 cm
5 protected against dust (no harmful deposit)	5 protected against low pressure jets of water from all directions	7 impact 6,00 joule 1.5kg falling from 40 cm
6 totally protected against dust	6 protected from strong jets of water (e.g. for use on ship decks)	9 impact 20,00 joule 5 kg falling from 40 cm
	7 protected against the effects of immersion between 15cm and 1m	

Auxiliary contact timing diagrams
OT16 – OT100

Legend





Contacts closing

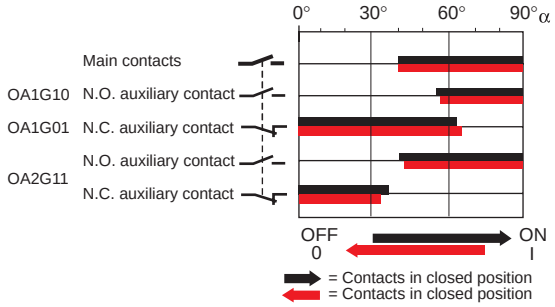
① Main contacts close
② N.O. auxiliary contacts close
③ N.C. auxiliary contacts open

Contacts opening

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

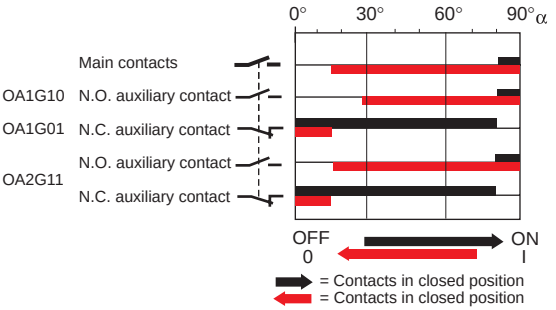
OT16, OT25, OT32

Catalog number	Auxiliary contact	Contact configuration
OT16, OT25, OT32	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



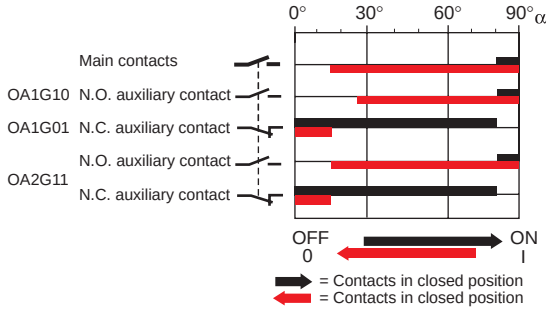
OT45, OT63

Catalog number	Auxiliary contact	Contact configuration
OT45, OT63	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



OT30, OT60, OT100

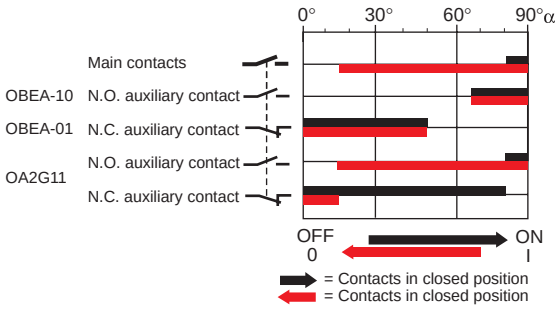
Catalog number	Auxiliary contact	Contact configuration
OT30, OT60, OT100	OA1G10 OA1G01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



Auxiliary contact timing diagrams
OT160 – OT400

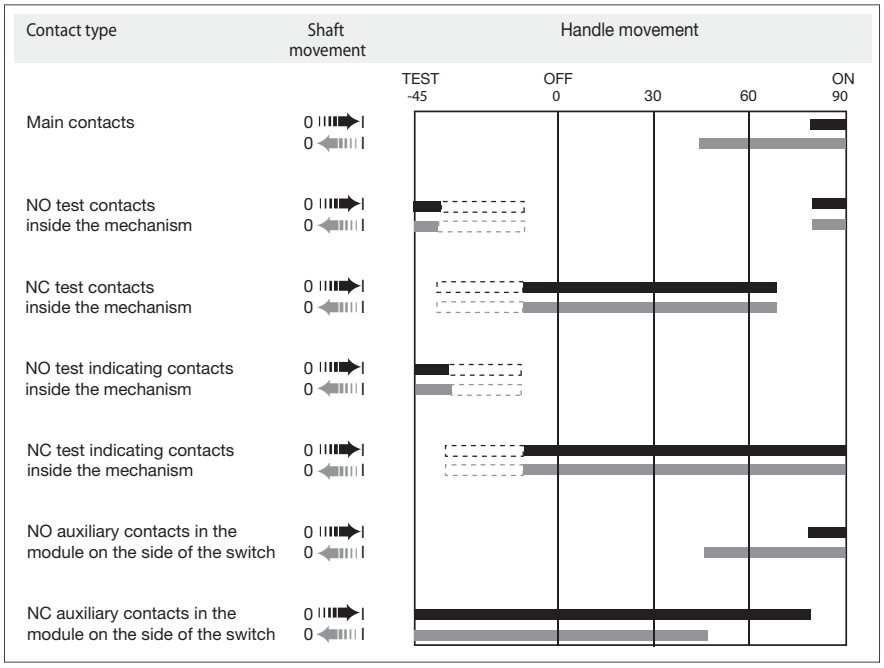
OT160E3

Catalog number	Auxiliary contact	Contact configuration
OT160E3	OBEA-10 OBEA-01 OA2G11	1 N.O. 1 N.C. 1 N.O. & 1 N.C.



OT200U03 – OT400U03

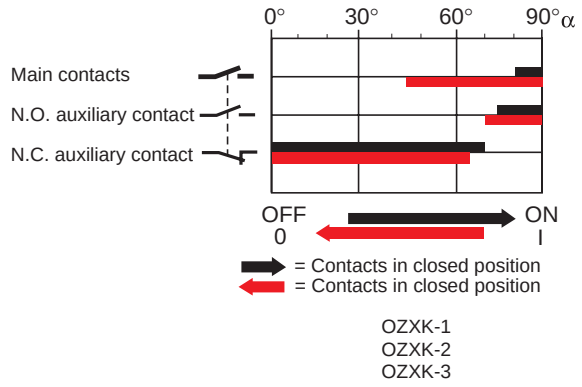
Catalog number	Auxiliary contact	Contact configuration
OT200U03 – OT400U03	OA1G10 OA3G01	1 N.O. 1 N.C.



Auxiliary contact timing diagrams
OETL-NF600 – OETL-NF3150

OETL-NF600A

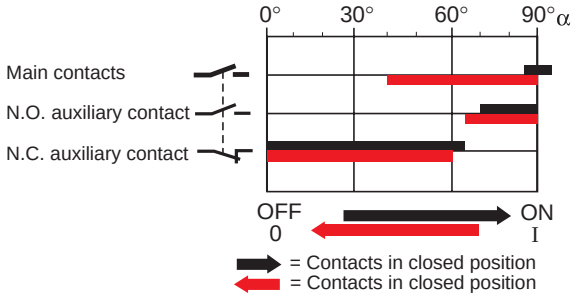
Catalog number	Auxiliary contact	Contact configuration form C
OETL-NF600A	OZXK-1 OZXK-2 OZXK-3	1 N.O. & 1 N.C. 2 N.O. & 2 N.C. 4 N.O. & 4 N.C.



OZXK-1
OZXK-2
OZXK-3

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.



OZXK-1
OZXK-2
OZXK-3