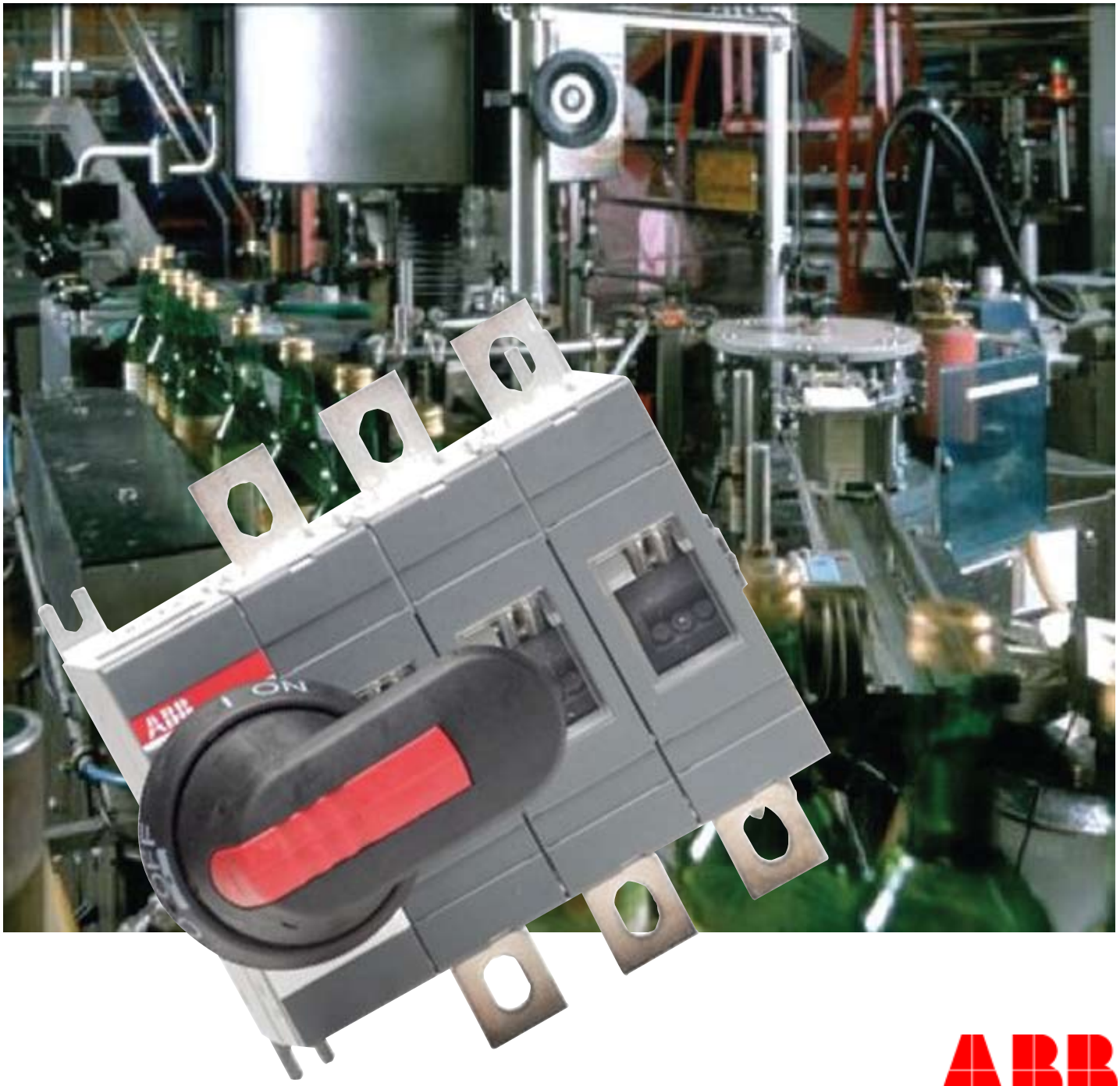
Material Handling Applications

Low Voltage Circuit Protection
Devices & Control Products



Material Handling Applications

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The ABB Solution

The ABB Solution

Material handling and logistics have assumed very strategic roles in the improvement of order-to-delivery schedules, inventory reduction, and satisfying changing customer demands.

ABB understands the material handling industry's needs. Our focus on circuit protective devices and control products means we are qualified to provide solutions to address these challenges. ABB offers solutions that can improve material handling operations by supplying the optimum low voltage circuit protection and control equipment for an effective material handling system.

Comprehensive ABB

The comprehensive ABB product offering provides a wide range of high-quality low voltage products and systems for the material handling industry. We can help meet the critical needs of integrating machinery controls and circuit protective devices from beginning to end. Our products are designed to work together to improve quality, accuracy, and efficiency—helping the material handling industry manage costs and ultimately, boost bottom line earnings.

Compatible systems

Industry knowledge and experience means ABB can provide the material handling market with the right solutions at the right time. ABB can extend customer's performance by assuring that different control technologies work together. When you choose ABB, you can be assured of obtaining trusted, proven circuit protection and control technology. We design our new products to be compatible with current systems. As a result, reliability is greater, while total costs are minimized.

Technology

ABB is the global technology leader for low voltage products and conveys their technological expertise through state-of-the-art product designs. This statement is illustrated by ABB's unparalleled quality and performance. Continuing its tradition of excellence, ABB is committed to offering high quality and innovative low voltage products.

Responsive support

Exceptional quality is only the first part of ABB's comprehensive low voltage products program. We follow up with outstanding service and support. ABB's experienced technical support staff provides immediate information services— over the phone or on the web.

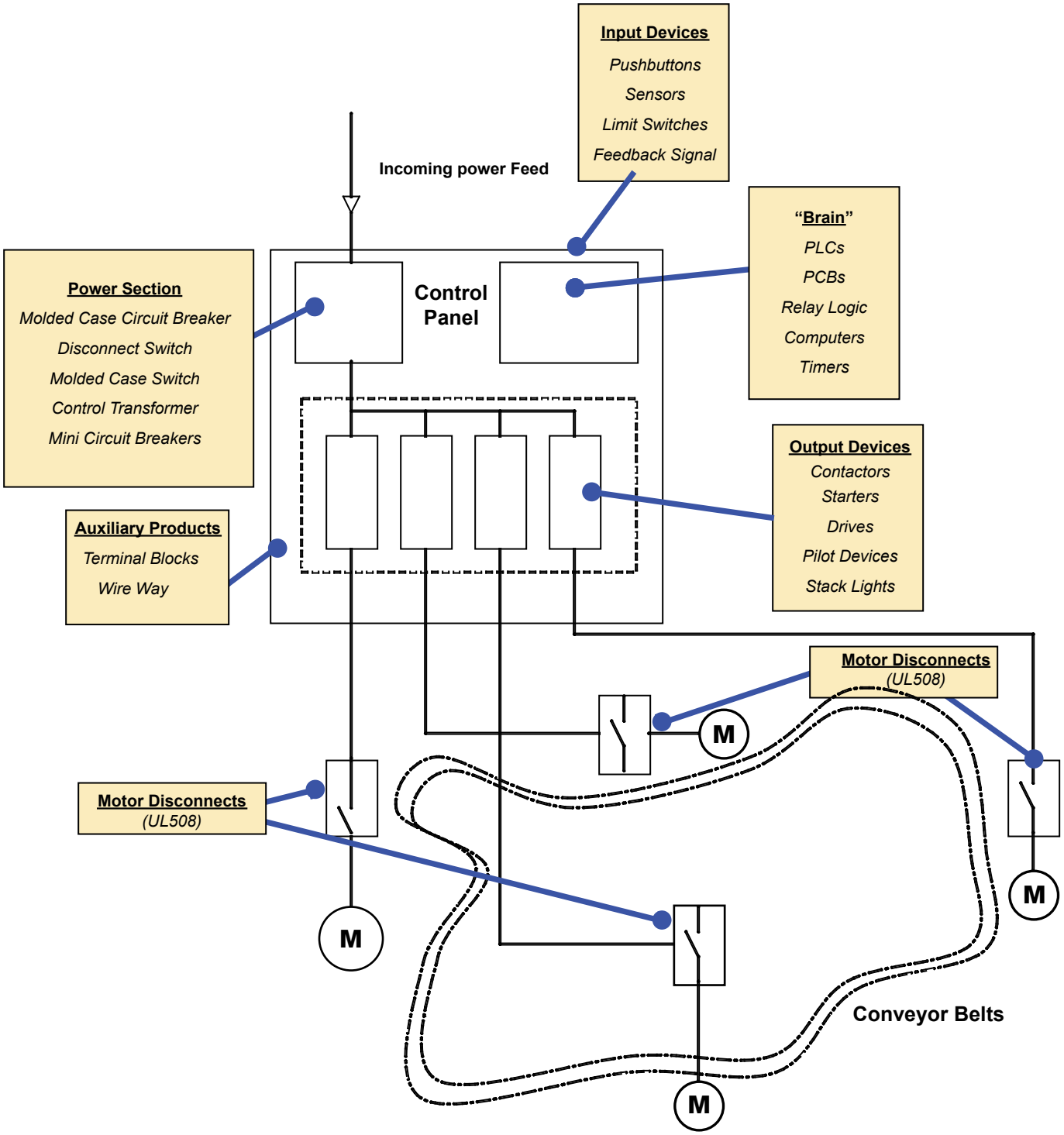
Superior safety

ABB allows numbers of the material handling industry to increase employee safety while increasing productivity. Our expertise in industrial control means we understand on-site issues and how to implement safety solutions to meet the goals of the material handling industry. Products are designed and built to global standards for high safety, reliability, and quality, and can withstand extreme environments.

Global Support & Availability

ABB products have always been recognized worldwide for quality, reliability, and versatility. This is exemplified by a multitude of internal certifications.

ABB's Low Voltage products can most commonly be used in a typical material handling control panel. The single line diagram below illustrates where many of these products can be applied in the control panel as well as at the motor in material handling applications.



Disconnect Switches in Material Handling Applications

Disconnect switches can be used in Material Handling applications as Lock Out/Tag Out devices to isolate a load for maintenance, service or repair or as the NEC required motor disconnect upstream from the motor. Heavy duty disconnect switches can also be used in Industrial Control panels for material handling technologies. ABB offers a state-of-the-art and unmatched disconnect switch portfolio to meet the needs of the Material Handling market. A wide range of configurations from 4-pole to enclosed versions and a variety of accessories makes ABB's line even more flexible to meet your specific material handling needs.

OSHA Lock Out/Tag Out Disconnects

OSHA requires the use of Lock Out/Tag Out devices whenever service or maintenance is being performed in proximity to a machine in order to prevent injury potentially caused by unexpected start up of machinery.

ABB's UL508 and UL 98 listed disconnect switches (non-fusible and fusible) are suitable for use as OSHA Lock Out/Tag Out devices. ABB selector, pistol grip, and optional mount handles are padlockable and provide clear position indication – both important features and requirements for Lock Out/Tag Out applications.

Motor Disconnects

ABB's UL 98 listed disconnect switches are designed to meet National Electric Code, Article 430-102, requiring a disconnecting means, located within sight, from the motor location.

Motor rated switches are available as open-style components or as enclosed assemblies in metal or polycarbonate enclosures. ABB's enclosed disconnect switches are available in a variety of Nema environmental categories, in particular, for material handling market, Nema 1 or Nema 12 enclosures to protect against limited amounts of falling dirt, circulating dust or dripping non-corrosive liquids. With Nema 1/3R/12 and 4/4X options, ABB's new eOT polycarbonate enclosed disconnect switch line is a perfect choice for those material handling applications requiring a less expensive or alternate solution to metallic boxes.

Some material handling applications such as food and beverage processing may require Nema 4/4X stainless steel enclosures as well as stainless steel handles for extra strength and corrosion prevention. ABB is able to meet these special requirements and boasts the only Stainless Steel handle range on the market today.

Industrial Control Panel Heavy Duty Disconnect

A broad range of disconnects are available to meet your industrial control panel needs. All ABB disconnect switches, open-style and enclosed, are heavy duty – 600V and horsepower rated and are supplemented by an extensive collection of operating handle options from rotary style selector and pistol grip handles to flange operators and direct mount options. Side operated configurations are available in select amperages and complement ABB's standard line of disconnect switches.

Accessories

Auxiliary Contacts

ABB also provides snap-on auxiliary contacts which can provide early make/late break to alert the control system that the motor has been turned off. This allows for systems behind the motor to react so that product or processes do not become backed-up behind the area being serviced or encountering a problem.

Handles

NFPA79/UL508A requirement for Industrial Machinery

Material Handling equipment is classified by NFPA79 and UL508A as Industrial machinery. Because of this, they must comply with the operating handle requirements as set by these organizations.

The requirement states that the main disconnect means is to be operable without the use of accessory tools or devices, independent of door position. This code also includes an interlock provision to prevent the closing of disconnects while the enclosure door is open, unless an interlock is operated by a deliberate action.

ABB's disconnect switch product line offers 2 solutions to the requirement – shaft or cable flange operators and optional direct mount handles suitable for non-fusible and fusible disconnect switches. These optional handles may be ordered separately as accessories.

Stainless Steel Hasps and Handles

For Material Handling applications where frequent washdown is required, ABB has an industry exclusive 316L stainless steel handle range – from plastic pistol handles with SS hasps to a complete 4X SS molded pistol handle. Handles range in length from 45mm to 175mm.

Compact Size

Extremely compact dimensions and ease of installation indisputably places ABB disconnect switches at the top of their class by enabling reduction of panel space, minimization of real estate, and significant time savings – all important factors for material handling applications.

Non-Fusible Disconnect Switches

ABB's UL508 and UL98 listed non-fusible disconnect switches are designed to offer maximum versatility to meet specific customer requirements and specifications. All frame sizes are compact, heavy duty 600V, and are available in a variety of configurations. The basic construction provides flexibility, safety, and exceptional performance in the smallest package.

Fusible Disconnect Switches

ABB's UL98 listed fusible disconnect switches are designed to meet customer requirements in terms of high interrupting capacity and long electrical life while occupying little more panel space than the appropriate fuses. Fuses efficiently limit the peak let-through current during a fault better than any other product, contributing to safety and reliability.

Designed for Safety

ABB prides itself in being the safety pioneer for the low voltage electrical products industry as our products offer maximum protection of the electrical installation and the user. Designed to meet customer requirements for safety, ABB's disconnect switch lines offer:

Fingerproof construction

Dead-front construction plus terminal shrouds reduce the risk of touching live parts

Padlockable

Handles can be padlocked in the "OFF" position with up to three padlocks. Additionally, the switch mechanism can be directly padlocked in the "OFF" position when the door is open.

Welded Contact Protection

Positive opening operation safeguards users in case of welded contacts due to an overload or short circuit.

Track Resistant Material

Excellent track resistant material reduces the risk of flashover between phases even in the most severe circumstances.

Door interlock

The handle and shaft provide door interlock so that the door cannot be opened when the switch is in the "ON" position.

Clear Position Indication

Both the switches themselves and corresponding handles are clearly marked with "ON" and "OFF" designations.

eOT Enclosed Disconnect Switches

Features

- 3-pole configurations
- cULus approved & UL508 Listed
- Suitable as Motor Disconnect
- Horsepower rated
- Extremely Compact
- Touch safe construction
- Positive Operation Clear Position Indication
- Self-lifting tunnel terminals
- Nema 3R/12 & Nema 4/4X versions
  - 3R/12 – equipped with selector handle ①
  - 4/4X – equipped with pistol handle
- 2 Handle Color Options
  - Standard black/red handle
  - Emergency red/yellow handle
- Available with and without 1 N.O. auxiliary contact

Nema 3R/12

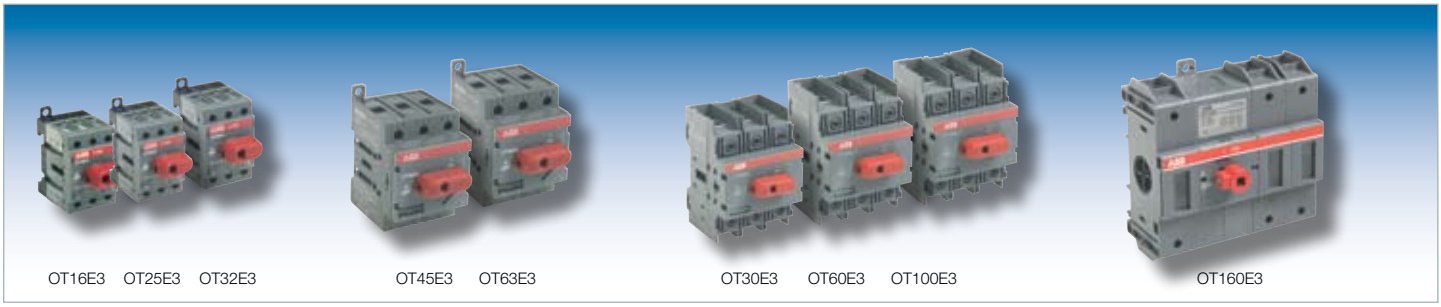
Handle type	Handle color	Amp rating	Auxiliary contact	Catalog number
Selector	Black	16		EOT16U3P3-S
Selector	Black	40		EOT32U3P3-S
Selector	Black	60		EOT45U3P3-S
Pistol	Black	80		EOT63U3P3-P
Selector	Black	16	1 NO	EOT16U3P3-1S
Selector	Black	40	1 NO	EOT32U3P3-1S
Selector	Black	60	1 NO	EOT45U3P3-1S
Pistol	Black	80	1 NO	EOT63U3P3-1P
Selector	Red/Yellow	16		EOT16U3P3-S1
Selector	Red/Yellow	40		EOT32U3P3-S1
Selector	Red/Yellow	60		EOT45U3P3-S1
Pistol	Red/Yellow	80		EOT63U3P3-P1
Selector	Red/Yellow	16	1 NO	EOT16U3P3-1S1
Selector	Red/Yellow	40	1 NO	EOT32U3P3-1S1
Selector	Red/Yellow	60	1 NO	EOT45U3P3-1S1
Pistol	Red/Yellow	80	1 NO	EOT63U3P3-1P1

Nema 4/4X

Pistol	Black	16		EOT16U3P4-P
Pistol	Black	40		EOT32U3P4-P
Pistol	Black	60		EOT45U3P4-P
Pistol	Black	80		EOT63U3P4-P
Pistol	Black	16	1 NO	EOT16U3P4-1P
Pistol	Black	40	1 NO	EOT32U3P4-1P
Pistol	Black	60	1 NO	EOT45U3P4-1P
Pistol	Black	80	1 NO	EOT63U3P4-1P
Pistol	Red/Yellow	16		EOT16U3P4-P1
Pistol	Red/Yellow	40		EOT32U3P4-P1
Pistol	Red/Yellow	60		EOT45U3P4-P1
Pistol	Red/Yellow	80		EOT63U3P4-P1
Pistol	Red/Yellow	16	1 NO	EOT16U3P4-1P1
Pistol	Red/Yellow	40	1 NO	EOT32U3P4-1P1
Pistol	Red/Yellow	60	1 NO	EOT45U3P4-1P1
Pistol	Red/Yellow	80	1 NO	EOT63U3P4-1P1

① Due to torque requirements, the eOT63 requires use of a pistol handle for both 3R/12 & 4/4X versions.

Non-Fusible Disconnect Switches – OT16E3 thru OT160E3



OT16E3 OT25E3 OT32E3 OT45E3 OT63E3 OT30E3 OT60E3 OT100E3 OT160E3

Catalog number	3 pole	OT16E3	OT25E3	OT32E3	OT45E3	OT63E3	OT30E3	OT60E3	OT100E3	OT160E3
Approvals①	2 pole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	UL98 & IEC
	3 pole	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC
	4 pole	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL508 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC
General purpose amp rating -40° to 40°C										
pf = 0.7 – 0.8	A	16	25	40	60	80	30	60	100	125
Max. operating voltage	V	600	600	600	600	600	600	600	600	600
Max. horsepower rating/motor FLA current,										
pf = 0.4 – 0.5										
Three phase 200V – 208V	HP/A	3/10.6	7.5/24.2	10/30.8	15/46.2	20/60.0	10/30.8	20/60.0	25/75.0	30/88.0
240V	HP/A	5/15.2	7.5/22.0	10/28.0	15/42.0	20/54.0	10/28.0	20/54.0	30/80.0	40/104.0
480V	HP/A	10/14.0	15/21.0	20/27.0	30/40.0	40/52.0	20/27.0	40/52.0	50/65.0	75/96.0
600V	HP/A	10/11.0	20/22.0	25/27.0	30/32.0	40/41.0	30/32.0	40/41.0	50/52.0	100/99.0
Single phase 120V	HP/A	1/16	1.5/20	2/24	2/24.0	2/24.0	2/24.0	3/34.0	5/56.0	7.5/80
240V	HP/A	2/13.2	3/18.7	5/30.8	7.5/40.0	10/57.5	5/28.0	7.5/40.0	15/68.0	20/88.0
Short circuit rating with fuse										
Fuse type CC	kA	10 —	10 —-	10 —-	— —	— —	— —	— —	— —	—
Fuse type J	kA	10 10	10 10	10 10	100 —	100 —	50 —	50 —	50 —	100
Fuse type T	kA	10 10	10 10	10 10	100 —	100 —	50 —	50 —	50 —	—
Fuse type RK1	kA	10 —	10 —	10 —	— —	— —	— —	— —	— —	—
Fuse type RK5	kA	5 5	5 5	5 5	10 5	10 5	— —	— —	— —	—
Fuse type L	kA	— —	— —	— —	— —	— —	— —	— —	— —	—
Fuse type H	kA	— —	— —	— —	— 5	— 5	— —	— —	— —	—
Maximum fuse size	A	30 60 ④	30 60 ④	30 60 ④	100 150	100 150	60 —	150 —	150 —	200
3 cycle short circuit current withstand rating ⑤	kA	—	—	—	—	—	—	—	—	25
Endurances										
Min. Electrical endurance, pf = 0.75 – 0.80	operation cycles	6000	6000	6000	6000	6000	6000	6000	6000	6000
Min. Electrical endurance, pf = 0.40 – 0.50	operation cycles	1000	1000	1000	1000	1000	②	②	②	②
Mechanical endurance	operations	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	16,000
Physical characteristics										
Weight, switches 3 pole	lb	0.24	0.24	0.24	0.59	0.59	0.79	0.79	0.79	2.42
4 pole	lb	0.33	0.33	0.33	0.77	0.77	1.10	1.10	1.10	2.86
Dimension, switches 3 pole H	in	2.68	2.68	2.68	3.60	3.60	3.94	3.94	3.94	5.00
W	in	1.38	1.38	1.38	2.07	2.07	2.76	2.76	2.76	4.96
D	in	2.20	2.20	2.20	2.85	2.85	2.95	2.95	2.95	2.93
Shaft set screw tightening torque	lb. in.	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
Shaft size — square □	in	.20 x .20	.20 x .20	.20 x .20	.20 x .20	.20 x .20	.20 x .20	.20 x .20	.20 x .20	.24 x .24
	mm	5 x 5	5 x 5	5 x 5	5 x 5	5 x 5	5 x 5	5 x 5	5 x 5	6 x 6
Switch operating torque for rotary 3 pole switches	lb. in.	8.8	8.8	8.8	10.5	10.5	17.5	17.5	17.5	52.5
Terminal lug kits		Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required	Not required
Wire range	AWG	#18 – 8	#18 – 8	#18 – 8	#14 – 1	#14 – 1	#14 – 4	#14 – 4	#8 – 1/0	#8 – 1/0
Torque:										
Wire tightening	lb. in.	7	7	7	18	18	55	55	55	70
Lug mounting	lb. in.	Integral	Integral	Integral	Integral	Integral	Integral	Integral	Integral	Integral
Auxiliary contacts		OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OA1G_ _	OBEA_ _
NEMA ratings, AC		A600	A600	A600	A600	A600	A600	A600	A600	A600
AC rated voltage	VAC	600	600	600	600	600	600	600	600	600
AC thermal rated current	A	10	10	10	10	10	10	10	10	10
AC maximum volt-ampere making	VA	7200	7200	7200	7200	7200	7200	7200	7200	7200
AC maximum volt-ampere breaking	VA	720	720	720	720	720	720	720	720	720
NEMA ratings, DC		R300	R300	R300	R300	R300	R300	R300	R300	P600
DC rated voltage	VDC	300	300	300	300	300	300	300	300	600
DC thermal rated current	A	1	1	1	1	1	1	1	1	5
DC maximum make-break	VA	28	28	28	28	28	28	28	28	138
Torque: Wire tightening	lb. in	7	7	7	7	7	7	7	7	7
Wire range	AWG	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#18 – 14	#22 – 14

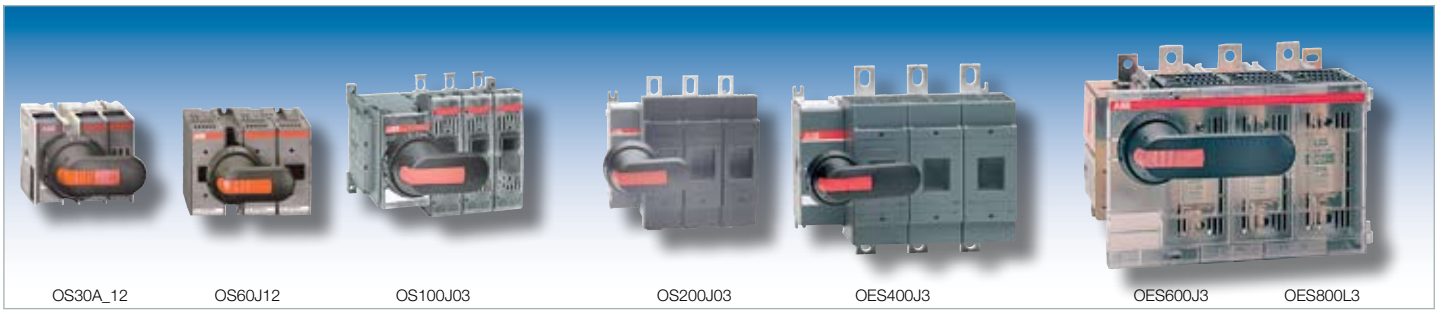
① UL Listed switches are also CSA Approved.
② UL98 overload test, 50 operations, pf 0.40 – 0.50 at 2x FLA.
③ Multi-tap lug available, please see pg. 18.24 and 18.27.
④ Fuse size 70A for RK5
⑤ When protected by any Listed fuse or Listed circuit breaker whose current rating does not exceed the maximum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

Non-Fusible Disconnect Switches – OT200U03 thru OETL-NF3150

Catalog number	3 pole	OT200U03	OT400U03	OETL-NF600A	OETL-NF800A	OETL-NF1200	OETL-NF1600	OETL-NF2000	OETL-NF3150 ⑤
Approvals①	2 pole	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	IEC
	3 pole	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	IEC
	4 pole	IEC	UL98 & IEC	UL98 & IEC	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.

Fusible Disconnect Switches



OS30A_12 OS60J12 OS100J03 OS200J03 OES400J3 OES600J3 OES800L3

Catalog number	3 pole	OS30A_12	OS60J12	OS100J03	OS200J03	OES400J3	OES600J3	OES800L3
Approvals ①	2 pole	N/A	N/A	IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC
	3 pole	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC	UL98 & IEC
	4 pole	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	100	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	20,000	12,000	10,000	7000
Physical characteristics								
Weight 3 pole	lb	1.54	2.86	3.30	5.9	17.18	37.44	37.44
4 pole	lb	1.98	3.52	3.96	7.5	19.38	46.26	46.26
Dimension 3 pole H	in	3.66	3.94	5.67	6.5	8.90	10.10	10.10
W	in	4.15	5.63	7.07	7.1	11.26	14.80	14.80
D	in	4.10	5.04	5.10	5.2	8.07	9.17	9.17
Shaft size square ☐	in	.20	.24 x .24	.24 x .24	.24 x .24	.47 x .47	.47 x .47	.47 x .47
	mm	5 x 5	6 x 6	6 x 6	6 x 6	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-200	OZXA-26	OZXA-27	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	275	500	500	500
Lug mounting	lb. in.	N/A	N/A	50	150	480	480	480

Auxiliary contacts		OA4G_	OA1/3G_	OA_G_	OA_G_	OA_G_	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	R300	P600	P600	P600
DC rated voltage	VDC	—	300	300	300	300	600	600	600
DC thermal rated current	A	—	1	1	1	1	5	5	5
DC maximum make break current	A	—	28	28	28	28	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	#18 – 14	#20 – 12	#20 – 12	#20 – 12

Circuit Breakers in Material Handling Applications

Circuit breakers are typically used as overload and short circuit protection or as an alternative disconnecting means in a material handling control panel. Providing versatility, flexibility, and adaptability through innovative product and accessory design and availability, ABB's Molded Case Circuit Breakers are top-of-the-line and offer many outstanding features attractive to the material handling industry.

Tmax

The Tmax line of Molded Case Circuit Breakers (MCCBs) provides ultimate circuit protection all the while allowing members of the material handling segment to reduce cost through an exceptionally compact product. With smaller dimensions than others on the market, ABB's MCCBs allow for additional cabling space, easy installation, reduced footprint, and a notable savings in real estate, time, and money. ABB's Tmax circuit breakers feature the lowest I^2t and the highest interrupting capacity in the smallest packaging – this product offering sets the bar for size to performance ratios and ensures extreme safety at any speed.

Worldwide Market Availability – Global Product

The Tmax offering is UL489 listed and thus, is able to be used in feeder or branch circuits. The Tmax range is also globally accepted and boasts a multitude of international certifications – UL, CSA, IEC, CE, etc.

Trip Units

The Tmax range of MCCBs have both thermomagnetic and electronic trip units.

Electronic trip units are designed to the latest standards and provides exceptional functions for material handling systems. These trip units are equipped with the ability to accept multiple neutral protection settings as well as with pre-alarm and alarm signaling with LED for overload protection.

Complimentary to ABB's electronic trip unit offering, thermomagnetic trip units are also available. These trip units provide another level of flexibility for the customer as they are suitable for AC as well as DC applications.

Modbus Communications

The Tmax range can be integrated in a communication network based on the Modbus RTU protocol. All the information provided by the trip unit (measurement functions, alarms, maintenance data, state of the circuit breaker) can be consulted both locally, directly on the front of the circuit breaker, and remotely by means of supervision and control systems.

For the material handling industry, this translates into improved factory flow automation and efficiency.

Terminals

The complete range of connection terminals makes it possible to select those most suited to customer specific installations and requirements. Standard front, front extended, front extended spread, saddle lugs for copper cables, for copper-aluminum cables and distribution terminals as well as rear terminals make all configurations possible. Ease of installation undoubtedly is a key consideration in material handling applications as process improvement and simplicity is a must.

Tmax accessories

The Tmax line is complimented by a variety of accessories -- from auxiliary contacts to motor operators – accessories that provide exceptional benefits for material handling users.

Auxiliary Contacts and Bell Alarm

These accessories carry out the electrical signaling of the operating state of the circuit breaker. Auxiliary contacts with bell alarms provide indication of the breaker position (ON or OFF) as well as an audible notification in the event the circuit breaker is tripped due to overload, short circuit, shunt trip, UVR, residual current release, emergency opening pushbutton of the motor operator, or operation of the circuit breakers test pushbutton. This contributes to the overall safety and reliability of the circuit breaker and its functions and therefore minimizes the lost time associated with the above mentioned occurrences.

Motor Operators & Shunt Trips

Motor Operators allow remote control of circuit breaker opening and closing and are particularly suitable for use in electrical network supervision and control systems. Shunt trips allow for remote opening of the circuit breaker. Such devices further increase the safety of your equipment and your personnel by allowing for remote stop of machinery in the event of electrical fires or other emergency situations.

Undervoltage Release

The Tmax range is also complimented by undervoltage release accessories which help to protects against sags and brown-out conditions. These accessories open the circuit breaker per a predetermined level in the even of a power supply failure.

Handle Operating Mechanisms with Locks

In addition to the above mentioned accessories, ABB's circuit breaker lines have both through-the-door and flange operating mechanisms. Padlocking provisions improve the safety of these handle options as the circuit breaker is padlockable with up to 3 padlocks in the open position.

The rotary handle operating mechanism for Tmax is always fitted with a compartment door lock and, on request, can be supplied with a key lock in the open position.

Isomax and Tmax Molded Case Breakers – Tmax T1 thru Tmax T3

UL 489 CSA C22.2			Tmax T1 1P	Tmax T1	Tmax T2	Isomax S3	Tmax T3
Frame size		[A]	100	100	100	150 / 225	225
Number of poles		[Nr]	1	3,4	3,4	2,3,4 / 2,3,4	3,4
Rated voltage	AC (50-60Hz)	[V]	277	480	480	600 / 480	480
	DC	[V]		500			500
Interrupting ratings			B	N	S H	N H L B N H L	N S
	AC 240V	[kA]		50[2]	65 100	65 100 150 150 65 100 150	50 65
	277V	[kA]	18[1]				
	480V	[kA]		22[2]	35 65	25 50 83[3] 25 50 65	25 35
	600V	[kA]				14 14 25	
	DC 250V - 2 poles in series	[kA]		25			25 35
	500V - 3 poles in series	[kA]		25			25 35
	500V - 2 poles in series	[kA]				35 50 65 50 20 35 50	
	600V - 3 poles in series	[kA]				20 35 50 20 35 50	
Trip units	Thermal Magnetic Fixed		■	■	■		■
	Adjustable Thermal Magnetic						
	Electronic				■		
	Magnetic Only				■		■
Versions	Molded Case Circuit Breaker		■	■	■		■
	Molded Case Switch			■	■		■
	Motor Circuit Protector				■		■
	100% Rated			■	■	■	■

IEC 60947-2			Tmax T1 1P	Tmax T1	Tmax T2	Isomax S3	Tmax T3
Rated uninterrupted current, Iu		[A]	160	160	160		250
Number of poles		[Nr]	1	3,4	3,4		3,4
Rated service voltage, Ue	AC (50-60Hz)	[V]	240	690	690		690
	DC	[V]	125	500	500		500
Rated ultimate short circuit breaking capacity, Icu							
	AC (50-60 Hz)		B	B C N	N S H L		N S
	220/230V	[kA]	25	25 40 50	65 85 100 120		50 85
	380/415V	[kA]		16 25 36	36 50 70 85		36 50
	440V	[kA]		10 15 22	30 45 55 75		25 40
	500V	[kA]		8 10 15	25 30 36 50		20 30
	690V	[kA]		3 4 6	6 7 8 10	For IEC	5 8
	DC 250V - 2 poles in series	[kA]		16 25 36	36 50 70 85	Use	36 50
	250V - 3 poles in series	[kA]		20 30 40	40 55 85 100		40 55
	500V - 2 poles in series	[kA]				Tmax Range	
	500V - 3 poles in series	[kA]		16 25 36	36 50 70 85		36 50
	750V - 3 poles in series	[kA]					
Trip units	Thermal Magnetic Fixed		■				
	Adjustable Thermal Magnetic			■	■		■
	Electronic				■		
	Magnetic Fixed				■		
	Magnetic Only				■		■

UL 489 CSA C22.2 and IEC 60947-2			Tmax T1 1P	Tmax T1	Tmax T2	Isomax S3	Tmax T3
Dimensions	H	[in/mm]	5.12/130	5.12/130	5.12/130	6.70/170	5.9/150
	W 1p or 3p	[in/mm]	1/25.4	3/76	3.54/90	4.13/105	4.13/105
	W 4p	[in/mm]		4/102	4.72/120	5.51/140	5.51/140
	D	[in/mm]	2.76/70	2.76/70	2.76/70	4.07/103.5	2.76/70
Mechanical life		[No. operations]	25,000	25,000	25,000	25,000	25,000
		[No. Hourly operations]	240	240	240	120	240
Electrical life @ 415VAC		[No. operations]	8000	8000	8000	10,000 (150) 8,000 (225)	8000
		[No. Hourly operations]	120	120	120	120	120

[1] In15A = 10kA @ 277VAC
[2] In15A = 35kA @ 240VAC, 14kA @ 480VAC
[3] 15 - 30A = 65kA @ 480VAC
[4] 400A only
[5] 1600 - 2000A only

Isomax and Tmax Molded Case Breakers – Tmax T4 thru Isomax S8

UL 489 CSA C22.2			Tmax T4	Tmax T5	Isomax S6	Isomax S7	Isomax S8
Frame size		[A]	250	400 - 600[3]	800	1200	1600, 2000, 2500
Number of poles		[Nr]	3,4	3,4	2,3,4	2,3,4	3
Rated voltage	AC (50-60Hz)	[V]	600	600	600	600	600
	DC	[V]	600	600	600		
Interrupting ratings			N S H L V	N S H L V	N H L	H	V
	AC 240V	[kA]	65 100 150 200 200	65 100 150 200 200	65 150 200	100	125
	277V	[kA]					
	480V	[kA]	25 35 65 100 150	25 35 65 100 150	50 65 100	65	100
	600V	[kA]	18 25 35 65 85	18 25 35 65 85	25 35 42	50	85
	DC 250V - 2 poles in series	[kA]					
	500V - 3 poles in series	[kA]					
	500V - 2 poles in series	[kA]	25 35 50 65 100	25 35 50 65 100	35 50 65		
	600V - 3 poles in series	[kA]	16 25 35 50 65	16 25 35 50 65	20 35 50		
Trip units	Thermal Magnetic Fixed		■				
	Adjustable Thermal Magnetic		■	■	■		
	Electronic		■	■	■	■	■
	Magnetic Only						
Versions	Molded Case Circuit Breaker		■	■	■	■	■
	Molded Case Switch		■	■	■	■	■
	Motor Circuit Protector		■	■	■	■	■
	100% Rated			■[4]	■	■	■[5]

IEC 60947-2			Tmax T4	Tmax T5	Isomax S6	Isomax S7	Isomax S8
Rated uninterrupted current, Iu		[A]	250 - 320	400 - 630	630 - 800	1250 - 1600	2000, 2500, 3200
Number of poles		[Nr]	3,4	3,4	3,4	3,4	3,4
Rated service voltage, Ue	AC (50-60Hz)	[V]	690	690	690	690	690
	DC	[V]	750	750	750		
Rated ultimate short circuit breaking capacity, Icu							
	AC (50-60 Hz)		N S H L V	N S H L V	N S H L	S H L	H V
	220/230V	[kA]	70 85 100 200 300	70 85 100 200 300	65 85 100 200	85 100 200	85 120
	380/415V	[kA]	36 50 70 120 200	36 50 70 120 200	35 50 65 100	50 65 100	85 120
	440V	[kA]	30 40 65 100 180	30 40 65 100 180	30 45 50 80	40 55 80	70 100
	500V	[kA]	25 30 50 85 150	25 30 50 85 150	25 35 40 65	35 45 70	50 70
	690V	[kA]	20 25 40 70 80	20 25 40 70 80	20 22 25 30	20 25 35	40 50
	DC 250V - 2 poles in series	[kA]	36 50 70 120 200	36 50 70 120 200	35 50 65 100		
	250V - 3 poles in series	[kA]					
	500V - 2 poles in series	[kA]	25 36 50 70 100	25 36 50 70 100	20 35 50 65		
	500V - 3 poles in series	[kA]					
	750V - 3 poles in series	[kA]	16 25 36 50 70	16 25 36 50 70	16 20 35 50		
Trip units	Thermal Magnetic Fixed						
	Adjustable Thermal Magnetic		■	■	■		
	Electronic		■	■	■	■	■
	Magnetic Fixed						
	Magnetic Only		■				

UL 489 CSA C22.2 and IEC 60947-2			Tmax T4	Tmax T5	Isomax S6	Isomax S7	Isomax S8
Dimensions	H	[in/mm]	8.07/205	8.07/205	10.55/268	15.98/406	15.75/400
	W 1p or 3p	[in/mm]	4.13/105	5.51/140	8.27/210	8.27/210	15.98/406
	W 4p	[in/mm]	5.51/140	7.24/184	11.02/280	11.02/280	21.89/556
	D	[in/mm]	4.07/103.5	4.07/103.5	4.07/103.5	5.45/138.5	9.53/242
Mechanical life		[No.operations]	20,000	20,000	20,000	10,000	10,000
		[No. Hourly operations]	240	120	120	120	20
Electrical life @ 415VAC		[No.operations]	8000(250A)-6000(320A)	7000(400A)-5000(630A)	7000(630A)-5000(800A)	7000(1250A)-5000(1600A)	2500(2500A)-1500(3200A)
		[No. Hourly operations]	120	60	60	20	20(2500A)-10(3200A)

1 In15A = 10kA @ 277VAC
2 In15A = 35kA @ 240VAC, 14kA @ 480VAC
3 15 - 30A = 65kA @ 480VAC
4 400A only
5 1600 - 2000A only

Pilot Devices in Material Handling Applications

Reliable operators

When it comes to industrial control in the material handling industry, one of the greatest concerns is avoiding costly downtime. A line that is idle for even a few minutes can cost thousands of dollars. ABB's pilot devices are designed for reliability:

- Up to 2 million operations for most operators; 10 million operations for contact blocks
- Contact blocks provide a wiping action, so that dust and oxidation are pushed to the side, ensuring a secure circuit
- All-in-one design of the Compact range eliminates assembly errors and ensures the contacts provide a solid closed circuit when actuated
- Corrosion-resistant chrome components available

Superior emergency-stops

ABB has a complete selection of emergency stop pushbuttons and stations, both in the Modular and Compact ranges.

- Compact emergency stops eliminate the possibility of the contact blocks being installed incorrectly, causing a potentially unsafe environment
- Durability tests ensure a minimum mechanical life of 50,000 operations
- The large push areas ensure easy activation, even with gloved hands
- 30mm, 40mm, and 60mm mushroom operator heads with twist, pull, or key release options
- Enclosures and shrouds designed specifically for our emergency stops, made of bright yellow polycarbonate
- Compact emergency stop enclosures give customers maximum performance in minimal space (48mm depth; 65mm x 65mm mounting area)

Operator and enclosure protection

ABB has the pilot devices and enclosure stations that the material handling industry needs for any environment. Our products are rated NEMA Types 1, 3, 4, 4X, 12, and 13, and can withstand corrosion, airborne dust and debris, hose-directed spray wash, and contact with oils and non-corrosive coolants.

ABB control devices will be protected, regardless of the external environment.

Softstarters in Material Handling Applications

Softstarters are an ideal solution to starting and controlling motors in the material handling industry. This is specifically due to the torque control during start and stop and the reduced in-rush current that a softstarter makes available.

The reduction in starting torque is proportional to the square of the starting voltage (50% V = 25% T). This provides a reduction in the mechanical effects of starting the motor and greatly prolongs the life of involved mechanical components.

Material Movers

Material movers like conveyors can benefit by experiencing much smoother starting and stopping.

An application example is a bottling plant. Abruptly starting and stopping a conveyor moving filled bottles could result in spills. The softstarter eases the starting and stopping so that the bottles will stay in place and in an upright position as the conveyor speed changes.

Heavy Lifting

Heavy lifting and moving equipment can benefit from using softstarters also. Softstarters are capable of controlling torque so that starting and running torque are very different. These types of applications (rock movers, etc.) may need a very strong initial torque and a controlled, steady running torque.

ABB offers three comprehensive lines of low Voltage softstarters: PSS, PSR, and PST.

The Softstarter... the solution to both mechanical and electrical problems

Constant-speed AC motors are the workhorses of industry; they are used to drive fans, pumps, conveyors and lots of other types of machinery. These motors are tough machines, but they have some drawbacks. During start and stop both mechanical and electrical stresses are high, causing undesirable load peaks each time the motors are started. An ABB Softstarter eliminates many of these problems. The voltage is smoothly applied to, and removed from, the motor. Both the torque and the current consequently behave in the same way. The result is that mechanical and electrical stresses are significantly lower than with conventional starting methods.

Fewer electrical problems

The starting current will be significantly lower than with across the line starting and compared with Y/D

starters the switching transients will be eliminated.

Fewer mechanical problems

Sliding drive belts and gearbox wear caused by heavy torque peaks are familiar problems that require lots

of maintenance. Our PSR Softstarters reduce the torque peaks as they apply the torque smoothly.

ABB softstarters - Advanced, Flexible and Compact Range

ABB offers three different ranges of softstarters to cover every customer need for solutions for small to medium-sized motor applications.

PST(B) - Advanced range

Covers motor currents from 30 to 1050 A and provides advanced functionality, including integrated protections, programmable signal relays, a flexible communication system and an LCD display. Sizes PSTB370 to 1050 A include a by-pass contactor as a standard function.

PSS - Flexible range

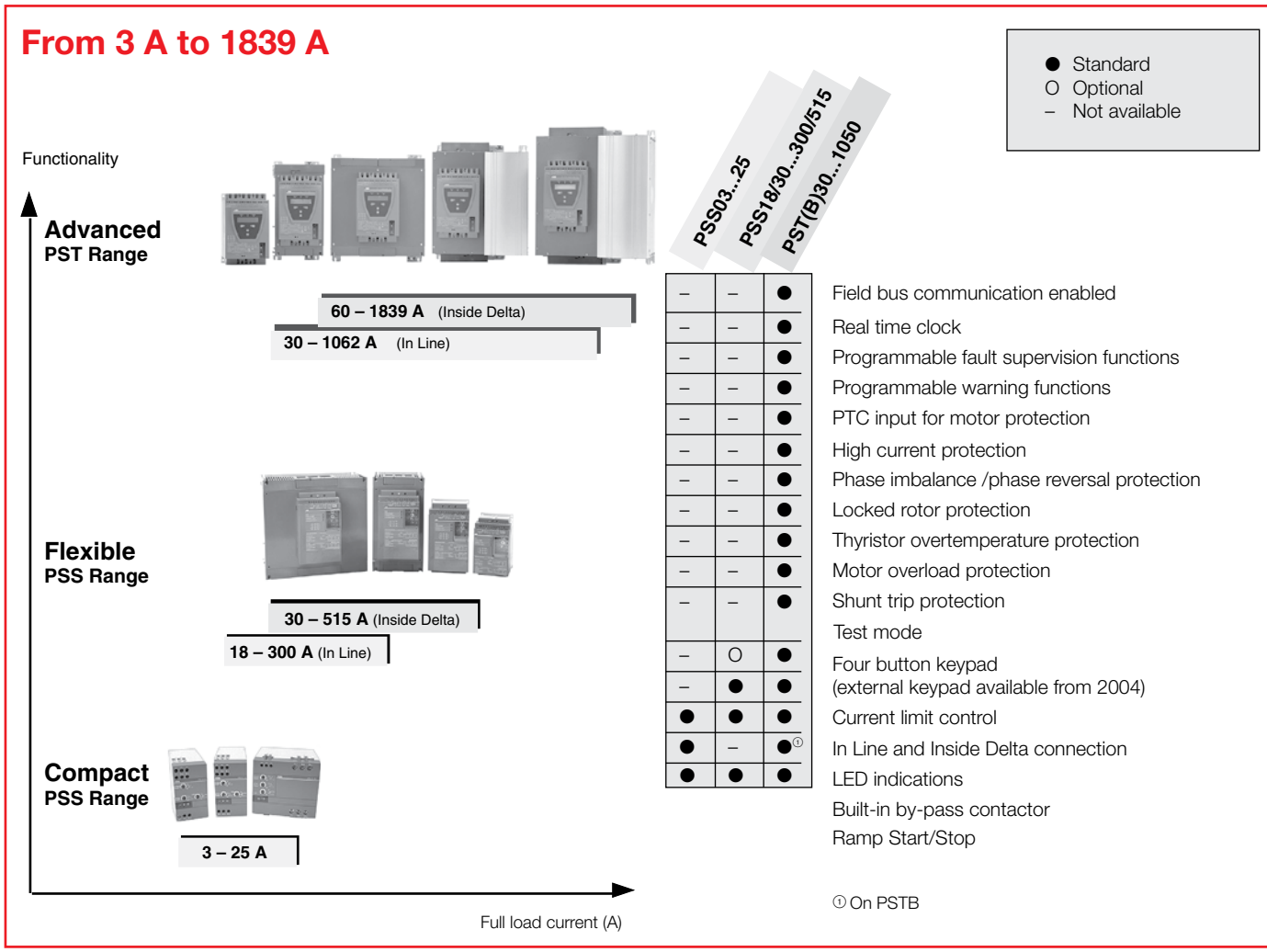
Covers motor currents from 18 to 300 A and offers a flexible solution with easy installation and setup. It can also be connected in-line or inside delta.

PSR - Compact range

Covers motor currents from 3 to 45 A. It is the latest addition to the softstarter family and has an attractive, compact design. Further, the system concept includes the possibility to easily connect our Type MS manual motor protectors when used in Group motor applications and the softstarters are available for remote control connection using the FieldBusPlug as an accessory. All sizes include a Run signal relay. The 25A and above are also provided with an output signal for TOR (Top Of Ramp, i.e. full voltage). With standard performance the PSR Softstarters handle ten starts per hour. When an auxiliary cooling fan is added, the starting capacity is increased to 20 starts per hour.

- Current ratings 3.9 – 45 A
- Motor voltage 208 – 600 V
- Supply voltage 24 V DC or 100-240 V AC
- Easy to install and adjust
- DIN rail or screw mounting

With their compact design, the PSR Softstarters are ideal for installation in places where space is limited and where there is a demand for easy installation.



Manual Motor Protectors in Material Handling Applications

Manual Motor Protectors provide a reliable, cost-effective solution for motor protection for the material handling industry.

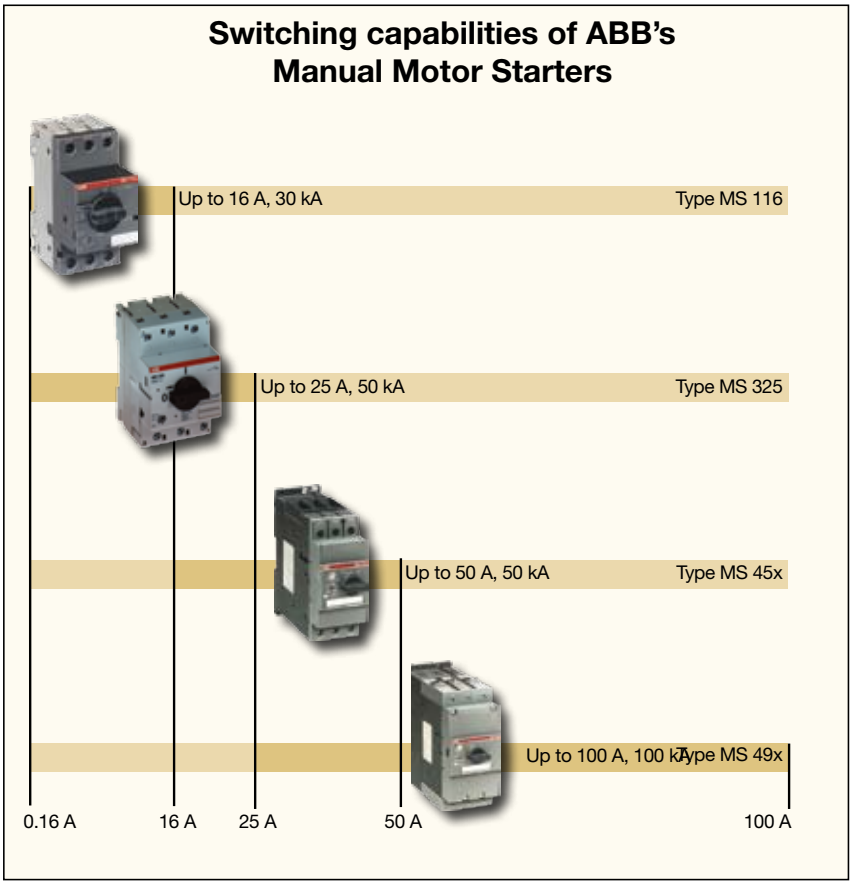
The ABB Type MS MMPs are a wide range of products providing highly efficient motor protection up to 100 Amps. The short circuit breaking capacity of these devices can reach up to 100 kA depending on the MMP type used, without the need for any special upstream protection. Our MMPs provide protection against:

- Overload
- Short circuits
- Phase failure
- Undervoltage

Additionally, the ABB Type MS MMP increases the reliability of applications due to the quick reaction time, switching off the motor within 3ms, under short-circuit conditions that could cause motor damage.

Combination Motor Controllers

The combination motor controller generally consists of (1) a circuit disconnecting means, (2) a motor branch circuit, short-circuit, and ground fault protection device, (3) a magnetic or solid state motor controller (i.e., contactor), and (4) and overload relay. The circuit disconnecting means, motor branch circuit, short circuit, and ground-fault protection device usually consists of a fusible disconnect or a circuit breaker.



The motor controller makes or breaks the motor current. The overload relay provides protection from overload conditions. Auxiliary pilot devices such as pushbuttons and selector switches are used to energize or de-energize the motor controller. Pilot lights are used to show equipment status.

The ABB manual motor protector is a device that replaces the magnetic contractor and overload relay in a motor controller. The MMP uses an adjustable bimetallic for overload protection. The bimetallic has four heaters, one in each phase for a quick acting overload protection and one for ambient compensation which negates the effects of ambient temperature. When used by itself, the MMP is a simple local manual control device for starting the motor, or with a contactor, remote control of the motor starting is available.

Manual Motor Protectors

MS116, BEA16/116, A12-30-10-84

MS116, BEA7/116, B7C-1

HK1-11

HKF1-11

UA1-120

AA1-110

BEA7/116

12644

MS116 Manual motor protectors

Thermal setting range (Amps)	3-phase horsepower ratings			Catalog Number
	240V	480V	600V	
0.10 - 0.16	-	–	-	MS116-0.16
0.16 - 0.25	-	–	-	MS116-0.25
0.25 - 0.40	-	–	-	MS116-0.40
0.40 - 0.63	-	–	-	MS116-0.63
0.63 - 1.0	-	1/2	1/2	MS116-1.0
1.0 - 1.6	-	3/4	3/4	MS116-1.6
1.6 - 2.5	-	1	1.5	MS116-2.5
2.5 - 4.0	1/8	2	3	MS116-4.0
4.0 - 6.3	1/4	3	5	MS116-6.3
6.3 - 10	1/2	5	7.5	MS116-10
8.0 - 12	1/2	7.5	10	MS116-12
10.0 - 16	1	10	10	MS116-16

MS116 Accessories

Description	Catalog Number
1 NO & 1 NC Auxiliary contact blocks, side mount	HK1-11
2 NO Auxiliary contact blocks, side mount	HK1-20
2 NC Auxiliary contact blocks, side mount	HK1-02
1 NO & 1 NC Auxiliary contact blocks, front mount	HKF1-11
1 NO & 1 NC Bell alarm contact blocks	SK1-11
2 NO Bell alarm contact blocks	SK1-20
2 NC Bell alarm contact blocks	SK1-02
24VAC Undervoltage trip	UA1-24
48VAC Undervoltage trip	UA1-48
60VAC Undervoltage trip	UA1-60
120VAC Undervoltage trip	UA1-120
230VAC Undervoltage trip	UA1-230
400VAC Undervoltage trip	UA1-400
415VAC Undervoltage trip	UA1-415
24VAC Shunt trip	AA1-24
110VAC Shunt trip	AA1-110
200 - 240VAC Shunt trip	AA1-230
350 - 415VAC Shunt trip	AA1-400
Busbar for direct mounting of contactors B6/B7	BEA7/116
Busbar for direct mounting of contactors A9/A12/A16	BEA16/116
Busbar for direct mounting of contactors A26	BEA26/116
Gray Enclosure with black handle, IP64	OTPA116L2P1
Gray Enclosure with red handle, IP64	OTPA116A2P1
Gray Enclosure with clear cover, 4 poles, IP55	12644
Gray Enclosure with clear cover, 6 poles, IP55	12646

UL 508 Type E Combination Motor Controllers

In recent years, UL added the Type E combination motor controller to its list of combination motor controllers in section 508, Industrial Control Equipment. The Type E controllers is a manual self-protected combination motor controller than provides both overload and short-circuit protection in a compact device.

This design DOES NOT require an upstream circuit breaker or fuses. The Type E controllers are designed to have a disconnect means, branch circuit protection, motor control and motor overload is a single device, the same features required on a combination motor controller.

Some of the other requirements are the disconnect will include a means to be locked in the OFF position, it will open all ungrounded supply conductors and no one pole can be opened independently. The enclosure door is to be interlocked with the disconnect so when the disconnect is closed, the door cannot be opened and if the door is open, the disconnect cannot be closed


MS325

UL 580 Type E


MS325, BEA26/325, A26-30-10-84, S3-M3, CK-11


MS325-HK11


MS325-SK10


MS325-UA110


MS325-AS


BEA16/325


OTPA116A2P1

MS325 Manual motor protectors

Thermal setting range (Amps)	3-phase horsepower ratings			Catalog Number
	240V	480V	600V	
0.10 - 0.16	-	–	–	MS325-0.16
0.16 - 0.25	-	–	–	MS325-0.25
0.25 - 0.40	-	–	–	MS325-0.40
0.40 - 0.63	-	–	–	MS325-0.63
0.63 - 1.0	-	1/2	1/2	MS325-1.0
1.0 - 1.6	-	3/4	3/4	MS325-1.6
1.6 - 2.5	1/2	1	1.5	MS325-2.5
2.5 - 4.0	1	2	3	MS325-4.0
4.0 - 6.3	1.5	3	5	MS325-6.3
6.3 - 9.0	2.5	5	7.5	MS325-9.0
9.0 - 12.5	3	7.5	10	MS325-12.5
12.5 - 16	5	10	10	MS325-16
16 - 20	5	10	15	MS325-20
20 - 25	7.5	15	20	MS325-25

MS325 Accessories

1 NO & 1 NC Auxiliary contact blocks, side mount	MS325-HK11
2 NO Auxiliary contact blocks, side mount	MS325-HK20
2 NC Auxiliary contact blocks, side mount	MS325-HK02
1 NO & 1 NC Auxiliary contact blocks, front mount	MS325-HKF11
2 NO Auxiliary contact blocks, front mount	MS325-HKF20
1 NO Bell alarm contact blocks	MS325-SK10
1 NC Bell alarm contact blocks	MS325-SK01
24VAC Undervoltage trip	MS325-UA24
48VAC Undervoltage trip	MS325-UA48
60VAC Undervoltage trip	MS325-UA60
120VAC Undervoltage trip	MS325-UA110
230VAC Undervoltage trip	MS325-UA230
400VAC Undervoltage trip	MS325-UA400
415VAC Undervoltage trip	MS325-UA415
480VAC Undervoltage trip	MS325-UA480
110 - 240VAC/DC Shunt trip	MS325-ST110
24 - 60VAC/DC Shunt trip	MS325-ST24
Busbar for direct mounting of contactors B6/B7	BEA7/325
Busbar for direct mounting of reversing contactors VB6/VB7	MS325-VB7
Busbar for direct mounting of contactors A9/A12/A16	BEA16/325
Busbar for direct mounting of contactor A26	BEA26/325
Gray Enclosure with black handle, IP64	OTPA325B2P1
Gray Enclosure with red handle, IP64	OTPA325A2P1
Gray Enclosure with clear cover, 4 poles, IP55	12644
Gray Enclosure with clear cover, 6 poles, IP55	12646
Line Side infeed block - required for UL508 type E	S3-M3
Short circuit trip signal - required for UL 508 type E	CK-11

ABB has several MMPs that have been tested for UL 508 Type E construction. These include the MS325, MS45X series, and the MS49X series. The MMPs have an optional short circuit indicating module that will provide a positive indication to differentiate between the short circuit trip and the overload trip.

The optional line side terminal shroud provides the minimum required spacing between the live parts over the surface and through the air, and is touch safe. The MMPs have auxiliary devices that can be added, such as auxiliary contacts, shunt trip and UV release. The MS325 and MS450 series also have line side busbar and through the door handles as options.


MS495, BEA110/495, A95-30-11-84


HKS4-11


HK4-11


UA4-120


AA4-110


BEA75/495


SK4-11

MS45X & MS49X Manual motor protectors

Thermal setting range (Amps)	3-phase horsepower ratings 230V	480V	575V	Catalog Number
11 - 16	5	10	15	MS450-16
14 - 20	7.5	15	20	MS450-20
18 - 25	10	20	25	MS450-25
22 - 32	10	25	30	MS450-32
28 - 40	15	30	40	MS450-40
36 - 45	15	30	40	MS450-45
40 - 50	20	40	50	MS450-50
11 - 16	5	10	15	MS497-16
14 - 20	7.5	15	20	MS497-20
18 - 25	10	20	25	MS497-25
22 - 32	10	25	30	MS497-32
28 - 40	15	30	40	MS497-40
36 - 50	20	40	50	MS497-50
45 - 63	25	50	60	MS497-63
57 - 75	25	60	75	MS497-75
70 - 90	30	75	100	MS497-90
80 - 100	40	75	100	MS497-100

MS45X & MS49X Manual motor protectors

Description		Catalog Number
1 NO & 1 NC Auxiliary contact blocks, side mount		HKS4-11
2 NO Auxiliary contact blocks, side mount		HKS4-20
2 NC Auxiliary contact blocks, side mount		HKS4-02
1 NO & 1 NC Auxiliary contact blocks, front mount		HK4-11
1 CHANGEOVER Auxiliary contact blocks, front mount		HK4-W
110 - 120VAC Undervoltage trip		UA4-120
208VAC Undervoltage trip		UA4-208
230 - 240VAC Undervoltage trip		UA4-240
400VAC Undervoltage trip		UA4-400
480VAC Undervoltage trip		UA4-480
Voltage continuous 50 - 60 Hz	Voltage 5 sec. Max.50 - 60 Hz, DC	
20 - 24 Shunt trip	20 - 70 Shunt trip	AA4-24
30 - 110	70 - 190	AA4-110
210 - 240	190 - 330	AA4-240
350 - 415	330 - 500	AA4-415
MS450 Busbar for direct mounting of contactors A30/A40		BEA40/450
MS450 Busbar for direct mounting of contactor A50		BEA50/450
MS497 Busbar for direct mounting of contactors A50/A63/A75		BEA75/495
MS497 Busbar for direct mounting of contactors A95/A110		BEA110/495
Short circuit trip 1NO & 1NC - required for UL508 Type E applications		SK4-11
MS49x Type E Terminal - required forUL508 Type E applications		DX495

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