



Product highlights

ABB EP products for control panels and more



ABB EP products for control panels and more

This booklet contains highlights of key ABB EP products categorized as follows:

- Power circuit (Index page 004)
- Control circuit (Index page 020)
- Wire management (Index page 048)
- Enclosed solutions (Index page 062)
- Other products (Index page 078)


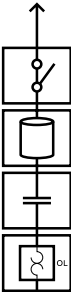

Note: Ratings listed in this booklet are UL ratings. IEC ratings are available on line at www.abb.com or in each product's specific technical catalog.

Power circuit

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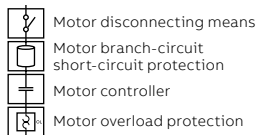
Power circuit

	UL 98 or UL 489	Feeder circuit	Motor disconnecting means (NEC® 430.101 – 430.113)	
			Motor branch-circuit short-circuit protection (NEC® 430.51 – 430.58)	
			Motor controller (NEC® 430.61 – 430.91)	
	UL 508	Branch circuit	Motor overload protection (NEC® 430.31 – 430.44)	

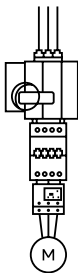
Motor protection and control

UL listed motor combinations

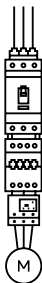
Typical one-line diagram within a control panel power circuit



Type A Feeder Circuit Conductors



Type C & D Feeder Circuit Conductors



Type E Feeder Circuit Conductors







Type F Feeder Circuit Conductors



Motor protection and control

UL listed motor combinations

Save time and money with UL approved combination motor control SCCR ratings

Type A	Type C & D
 <ul style="list-style-type: none">• Fusible disconnect switches (OS)• Fuses• AF contactors• Thermal and electronic overload relays	 <ul style="list-style-type: none">• Tmax/Tmax XT thermal magnetic (C) or magnetic (D) circuit breaker• AF contactors• Thermal and electronic overload relays
Type E	Type F
 <ul style="list-style-type: none">• Manual motor starters (MMS)	 <ul style="list-style-type: none">• Manual motor starters (MMS)• AF contactors

Open disconnect switches

High performance, compact solutions



Non-fusible – OT

Up to 600 V AC
20...2000 A



DC – OTDC

Up to 1500 V DC
16...1000 A



Fusible – OS

Up to 600 V AC
30...1200 A

Cam switch – OC/OL

Up to 600 V AC
10...200 A

Motor disconnecting means



Open disconnect switches

High performance, compact solutions



Key benefits

- Small footprint, allowing installation in confined spaces
- Base, door, or DIN-rail mountable
- Fusible and non-fusible
- Accessories snap-on, no tools or hardware needed; available in a wide variety including handle shafts, auxiliary contacts, cabling accessories and additional power poles
- cUL approved, UL508 and 98 Listed
- A powerful construction and quick-make/quick-break operation, no need for derating

Molded Case Circuit Breakers (MCCB)

Formula, Tmax XT, and Tmax T



T8	Up to 3000 A, 600 V AC – up to 125 kA at 480 V – 3, 4 pole
T7	Up to 1200 A, 600 V AC – up to 100 kA at 480 V – 3, 4 pole
T6	Up to 800 A, 600 V AC/DC – up to 100 kA at 480 V – 3, 4 pole
T5	Up to 600 A, 600 V AC/DC – up to 150kA at 480 V – 3, 4 pole
XT4	Up to 250 A, 600 V AC/DC – up to 200 kA at 480 V – 3, 4 pole
XT3	Up to 225 A, 480 V AC/500 V DC – up to 65 kA at 480 V – 3, 4 pole
XT2	Up to 125 A, 600 V AC/500 V DC – up to 200 kA at 480 V – 3, 4 pole
XT1	Up to 125 A, 480 V AC/500 V DC – up to 100 kA at 480 V – 3, 4 pole
A2	Up to 250 A, 240 V AC/250 V DC – up to 25 kA at 240 V – 2, 3 pole
A1	Up to 100 A, 240 V AC/250 V DC – up to 25 kA at 240 V – 1,2,3 pole

Motor disconnecting means

Motor branch-circuit
short-circuit protection



Note: Check technical catalogs for additional details

Molded Case Circuit Breakers (MCCB)

Formula, Tmax XT, and Tmax T



Key benefits

- 240 V, 480 V, and 600 V frame breakers allow you to buy only the voltage you need
- Breaker sizes are very competitive and ideal for tight spaces
- Plug in accessories below 250 A allow for quick additions
- Configure breakers using our online configurator
- Commission complex trip units quickly using EKIP Connect – our free commissioning software
- Formula breakers offer cost competitive 240 V solutions with MCCB features
- Adjustable thermal magnetic trip units up to 800 A
- T7 and T8 offer integrated stored energy mechanisms for easy operation
- T8 offers a compelling UL489 option for main breaker applications

Miniature Circuit Breakers (MCB) – UL489

The next generation of circuit protection



UL489

SU200M	Up to 35/40 A @277/Y480 V AC Up to 63 A @240 V AC/48/96 V DC
S800U	Up to 100 A @240 V AC
S 200 UDC	Up to 63 A @60/125 V DC
SU 200 MR	Up to 35 A @277/480 V AC Up to 63 A @240 V AC
S 800 U-PVS/S 800 U-UC	5 A @1000 V DC/10 – 80 A @600 V DC

Motor disconnecting means

Motor branch-circuit
short-circuit protection



Miniature Circuit Breakers (MCB) – UL489

SU200 M – The next generation of circuit protection



Key benefits

- UL current limiting
- Fast breaking time (2.3 – 2.5 ms)
- Bus connection system
- Wide range of accessories
- Available with variable depth handle mechanism
- DIN rail mounting
- Finger safe terminals – Multi-function terminals
- Suitable for reverse feed (except for S200UDC)
- Accessories: bus bars, auxiliary and signal contacts, shunt trip, rotary handle and lockout/tagout
- UL, CSA, IEC, CE and CCC
- SU200M, SU200MR, and S200UDC MCBs come in up to 3 trip curves to provide maximum circuit protection

Miniature contactor

Motor control when space is limited



Screw terminal

Up to 5.5 kW - 400 V AC-3, 5 HP - 480 V
20 A - 400 V AC-1 and 16 A - general use



Soldering pin

Up to 5.5 kW - 400 V AC-3, 5 HP - 480 V
20 A - 400 V AC-1 and 16 A - general use



Flat pin

Up to 5.5 kW - 400 V AC-3, 5 HP - 480 V
20 A - 400 V AC-1 and 16 A - general use

Miniature contactor

Motor control when space is limited



Key benefits

- Flattest mini contactor on the market
- No noise in operation thanks to the hum free coil
- Energy and cost saving
- Flexible use in any position
- Special version with 1.4 W coil consumption for direct connection to PLC
- Mini-reversing contactor with built-in mechanical interlock available
- Integrated protective circuit with diodes and an additional surge suppressor

AF Contactors

A new standard in motor control and power switching



3-pole	Contactor	AF09	AF40	AF80	AF116	AF190	AF265	AF400	AF580	AF1350
		-AF38	-AF65	-AF96	-AF146	-AF205	-AF370	-AF460	-AF1250	-AF2650
	General use	25	60	105	160	250	350	550	750	1350
	600 V	-50 A	-90 A	-115 A	-200 A	-300 A	-520 A	-650 A	-1210 A	-2700 A
	3-phase motor	5	30	60 HP	75	125	200	350	500	800
	rating 480 V	-25 HP	-50 HP		-100 HP	-150 HP	-300 HP	-400 HP	-600 HP	-900 HP



4-pole	Contactor	AF09	AF40	AF80	AF116	AF190	AF265
		-AF38	-AF52		-AF140	-AF205	-AF370
	General use	25-55 A	60-80 A	105 A	160-175 A	230-250 A	300-420 A
	600 V						

Motor controller



AF Contactors

A new standard in motor control and power switching



Key benefits

Easy to install

– reduced installation costs

- Built-in surge suppression
- Snap-on functionality
- Reduced space requirements
- Screw or push-in termination

Streamlined range

– ease of design with high flexibility

- 4 coils cover the entire voltage range AC/DC
- 90% fewer product variations

Continuous operations

– maximize uptime

- Power quality ride-through with an electronic coil
- No welding during contact closing

Note: See page 47 for ABB's new AFS contactors for safety applications.

Overloads

Thermal and electronic



Thermal miniature

Up to 16 A, 10 HP
Class 10
Fit to mini contactors

Thermal

Up to 200 A, 150 HP
Class 10
Fit to AF contactors



Electronic

Up to 1250 A, 500 HP
Selectable Class 10, 20, 30
Fit to AF contactors

Motor overload protection



Overloads

Thermal and electronic



Key benefits

Productivity

- Easy to create starters
- Optimized match to AF contactors

Efficiency

- Trip unit class 10 for thermal and 10, 20, and 30 for electronic
- Adjustable current range

Reliability

- Automatic or manual reset
- Stop and test function

Manual and electronic compact motor starters

Motor starting solutions



Manual
motor
starters

Up to 100 A, 100 HP, and 65 kA short circuit protection
Thermal and magnetic options
Screw or push-in wire termination

Electronic
compact
starters

Up to 6.5 A for motors up to 3 kW-400 V AC
Up to 9 A resistive loads

Motor disconnecting means



Motor branch-circuit
short-circuit protection



Motor controller



Motor overload protection



Manual and electronic compact motor starters

Non-combination and combination motor controllers



Key benefits

Manual motor starters

- Easy connection, shared accessories, and decreased space requirements
- A simple, handy ON/OFF switch
- Fuse-less motor protection and increased trouble shooting capabilities
- Accessories include: connection sets, auxiliary contact blocks and shunt trips, power-feed blocks, under-voltage release and short circuit signaling contacts

Electronic compact starters

- Space savings up to 90%
- Integrated safety functions
- Up to 75% reduced time in wiring; one component includes protection, reversing, and emergency stop

Control circuit

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Control circuit

Pilot devices

Heavy duty modular and IP69K rated compact

	Modular range	NEMA type: 1, 3R, 4, 4X, 12, 13 ¹ IP66 600 V AC/10 A 600 V DC/2.5 A	10,000,000 operations 2,000,000 operations ¹ 1,000,000 operations ¹ 500,000 operations ¹	Contact blocks Pushbuttons Toggle switches Selector switches Joystick
			100,000 operations	Emergency stops
			n/a	Pilot lights
				Potentiometer
	Compact range	NEMA type: 1, 3R, 4, 4X, 12, 13 IP66, IP67, IP69K 250 V AC/2.5 A 250 V DC/1 A	500,000 operations	Pushbuttons
				Selector switches
				Buzzers
			50,000 operations	Emergency stops
			n/a	Pilot lights
	Accessories			Enclosures, 33mm adapters, installation tools, shrouds, etc.

¹ See technical data in the core catalog for limitations and exceptions.

Pilot devices

Heavy duty modular and IP69K rated compact



Key benefits

Compact

- All-in-one design for fast easy installation
- Compact size with only 42mm (1.65 in) depth
- Up to 2 electrical contacts
- IP67 rated – protects against dust and immersion in water to depth between 15cm and 1m
- IP69K for high pressure and high temperature wash-down; ideal for the food and beverage industry

Modular

- High electrical rating
- Tool-free installation with snap-on contact blocks
- Easy to do last-minute changes of both operator and contacts
- Holds up to 6 contacts

Power supplies

Economic to high performance



CP-E – Economic

Input: 100-240 V AC/ 90-375 V DC
Output: Up to 48 V DC/ 20 A/480 W

CP-C.1 – High performance

Input: 100-240 V AC/ 90-300 V DC
Output: Up to 24 V DC/ 20 A/480 W

Power supplies

Economic to high performance



Key benefits

CP-E – Economic

- Efficiency up to 90%
- Adjustable output voltages:
5 V, 12 V, 24 V, 48 V DC
- Output currents: 0.625 A, 0.75 A,
1.25 A, 2.5 A, 3 A, 5 A, 10 A, 20 A
- Power range: 15 W, 18 W, 30 W, 60 W,
120 W, 240 W, 480 W
- Ambient temperature range:
-40 °F to 158 °F
- Redundancy modules available

CP-C.1 – High performance

- Small size to reduce space needed
- Redundancy unit available
- Coated (PCBA) version available for
hazardous locations
- Free convection cooling
- High efficiency up to 94%
- Output voltage: 24 V DC
- Output currents: 5 A, 10 A, 20 A
- Power range: 120 W, 240 W, 480 W
- -13 °F (coated -40 °F) to 158 °F
- UL 508 listed and UL60950-1
recognized

Electronic relays and timers

Core offering to complete your DIN rail



CR-U	Up to 230 V AC or 220 V DC
Ice cube relay	10 A, 2 and 3 c/o

CR-S	Up to 24 V DC or 230 V AC/DC
Slim relay	Electromechanical relay output: 1 c/o (SPDT) contact (6A)
	Solid state output: Transistor 100 mA - 48 V DC,
	MOS-FET 2 A - 24 V DC, Triac 2 A - 240 V AC
	Less than 1/4" wide



CT-D	5/8" wide
Electronic timers	7 time ranges from 0.05s to 100h
	10 single-function as well as 2 multi-function devices

Electronic relays and timers

Core offering to complete your DIN rail



Key benefits

Ice cube relays (CR-U)

- Integrated test button
- Socket widths: 1.5"
- Options: Reverse polarity protection, LED indicators, RC element, overvoltage protection, multi-function time module



Slim relays (CR-S)

- Super slim; less than 1/4" wide
- Optional gold-plated contacts
- Accessories: Jumper bar (red, black, blue), marker and separator

Electronic timers (CT-D)

- Space saving
- Easy to adjust for time savings
- World wide approvals
- Single and multi-function versions are available
- Wide supply voltage range
- 7 time ranges from 0.05s to 100h
- Only 5/8" (17.5mm) wide
- MDRC housing for distribution panels

Residual Current Devices (RCD)

Ultimate protection of equipment



Residual current devices – RCCB without overcurrent protection

F200 type	2 and 4 pole, up to 100 A
F200 type ratings	Selectivity available for applications requiring trip delays UL 1053; 2 pole 277 V AC, 4 pole 480 V AC 10, 30, 100, 300 and 1000 mA rated residual current A and AC Earth Fault types

Residual current devices – RCBO with overcurrent protection

DS951 type	2 pole, up to 20 A
DS951 type ratings	B, C, and K trip curves UL 1053 and UL 1077 10, 30, and 300 mA rated residual current A and AC Earth Fault types

Residual Current Devices (RCD)

Ultimate protection of equipment



Key benefits

Designed to detect and protect against electrical leakage currents (ground faults), thus ensuring protection against unwanted electrical grounding that can cause machine damage

Main features

- Various residual current sensitivity versions allows the users to select the correct RCD based on grounding risks

Main benefits

- Contact position indicator allows workers to immediately see the contact status independently of the toggle position saving trouble shooting time
- Various accessories provide additional functionality such as over/under voltage release and auto-reclose

Miniature Circuit Breakers (MCB) – UL1077

The next generation of circuit protection



UL1077

S 200/S 200 P/S 200 MUC	Up to 63 A @ 277/Y480 V AC/60/110 V DC/63 A @ 277/Y480 V AC
S 200 MR	63 A @ 277/Y480 V AC/250/500 V DC Up to 63 A @ 277/Y480
S 500/S 500 UC	Up to 45 A @ 347/Y600 V AC/45 A @ up to 600 V DC

Miniature Circuit Breakers (MCB) – UL1077

The next generation of circuit protection



Key benefits

- A broad range of solutions – more tripping characteristics, more poles, more rated current ranges
- AC and DC at your command simplifies the planning, installation and maintenance of your equipment; all you need is one model for your entire project and warehouse
- The S 200 M UC offers outstanding electrical and mechanical performance: Rated breaking capacity 10kA (DC)
- Tripping characteristics B, C, D, K, Z
- Up to 20,000 switching cycles, resulting in a long service life
- Approvals include IEC 60898-1, IEC 60947-2, UL 1077, CSA 22.2 no. 235, CCC – Ship classifications include ABS, GL, BV, DNV

E90 Fuse holder family

Uncompromising performance



E90/32 10.3 x 38mm

1, 1N, 2, 3, 3N and 4 poles, 32 A

E90/32 PV

1 and 2 pole, 1000 V DC, 30 A

1 pole, 1500 V DC, 30A

E90/50 14 x 51mm

1, 1N, 2, 3 and 3N poles, 50 A



E90/125 22 x 58mm

1, 1N, 2, 3 and 3N poles, 125 A

E90/30 CC

1, 1N, 2, 3, 3N and 4 poles, 30 A

CC fuse – 10.4 x 38mm

E90/30 J

1, 2 and 3 poles, 30 A

J fuse – 21 x 57mm

E90/60 J

1, 2 and 3 poles, 60 A

J fuse – 27 x 60mm



E90 Fuse holder family

Uncompromising performance



Key benefits

Easy of use

- 90° flip hinge with ergonomic knob makes the replacement of fuses easier even in small spaces or when wearing protective gloves

Efficient

- Optional blown fuse indicator allows the faulty phase to be immediately detected

Safety

- Fuse holder can be sealed in closed position and padlocked in open position
- IP20 finger-safe
- Compact design enables the enclosure door to close even when the fuse holder is open

Reliability

- Venting grooves and cooling chambers improve heat dissipation for longer life

Surge Protective Devices (SPD)

Protect your investments



OVR

Panelboard/ Point of use (DIN rail) Type 4	OVR T2 – AC Applications	15 and 40 kA @ 120/277/347/480/600 V AC
	OVR PV – Solar (DC)	15 and 40 kA @ 600/800/1000/1500 V DC
	OVR TC – Data (DC)	10 kA @ 6/12/24/48/200 V DC

JOSLYN®

Mid-Level Distribution/ Point of use Type 1 and Type 2	20 kA – 400 kA, 120 V – 600 V 3 – 10 years of warranty Advanced monitoring, surge counter, transient filter, light indication, etc.
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Current Technology

Service Entrance Type 1	50 kA - 300 kA Up to 20 years of warranty Advanced remote monitoring, surge counter, transient filter, sag and swell indication, MOV life read, selenium conducts, etc.
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Surge Protective Devices (SPD)

Protect your investments

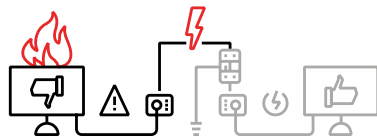


Key benefits

Surge protective devices are designed to protect against transient surge conditions. Large single-surge events, such as lightning, can reach hundreds of thousands of volts and can cause immediate or intermittent equipment failure. However, most surges occur from internally generated surges such as load switching. SPDs are designed to protect critical power facilities (hospitals, data centers, etc.) as well as renewable energy, water/wastewater

and other manufacturing and commercial operations from these surge events

- UL 1449 4th Ed.
- Visual End-of-Life indicator



Without SPD

With SPD

Circuit Monitoring System (CMS)

You can't improve what you can't measure



Control unit	
CMS – 600	Supply voltage 24 V DC, Modbus RTU, max 64 sensors
CMS – 700	Supply voltage 80-277 V AC, Modbus RTU/TCP/SNMP/FTP, max 96 sensors
Sensors	
System Pro M, SMISSLINE S400	Open-core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 25 mm, 40 A, 80 A, 160 A
S 800	Open-core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 25 mm, 40 A, 80 A, 160 A
DIN rail	Open-core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 25 mm, 40 A, 80 A, 160 A
Cable tie	Open-core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 18 mm, 20 A, 40 A, 80 A
	Solid core – 25 mm, 40 A, 80 A, 160 A

Circuit Monitoring System (CMS)

You can't improve what you can't measure



Key benefits

A compact solution for measuring individual branch load circuits, and presenting Energy and power quality dashboards

Improve efficiency

- Most compact sensors on the market – 17.5 mm
- Reduce downtime by detecting potential issues early
- Cable, direct or DIN rail mount sensors

User-friendly Integration

- Plug, push and play sensor connection
- Easy configuration without external software
- Communication – Web server, Ethernet TCP, Modbus, SNMP, FTP

Increase flexibility

- Sensors can measure AC and DC loads up to 160A TRMS
- Connection of up to 96 sensors, easy retrofit
- Energy and power quality dashboards

Pluto safety PLCs – Jokab

Simplifying design

		I/O	Failsafe Inputs	Failsafe inputs or non- failsafe outputs	Analog inputs	Failsafe relay outputs	Failsafe transistor outputs	Other
Single Pluto - stand-alone units for smaller systems	Pluto S20	20	8	8	1	2	2	
	Pluto S46	46	24	16	3	4	2	
Pluto with safe Pluto-bus	Pluto A20 v2	20	8	8	1	2	2	(2) Current monitoring
	Pluto B20 v2	20	8	8	1	2	2	
	Pluto B22	22	14	8	1	–	–	
	Pluto B46 v2	46	24	16	3	4	2	
Pluto models with bus and analog inputs	Pluto D20	20	8	8	5	2	2	
Pluto with counter inputs for speed monitoring	Pluto D45	45	24	15	11	4	2	(4) Counter inputs
Pluto with AS-i where all the safety components connect to a single cable	Pluto AS-i	20	4	4	4	2	2	Asi bus
	Pluto B42 AS-i	42	20	16	3	4	2	Asi bus

Pluto safety PLCs – Jokab

Simplifying design



Key benefits

Pluto is a SIL 3, Category 4 Safety PLC that is used whenever the safety system requires multiple safety relays or to address dynamic applications

Inputs – work with both dual channel safety devices and DynLink square wave (Dynamic Pulse) based safety devices that reduce wiring and has advanced diagnostic features

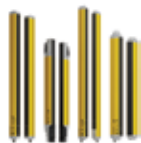
Programmed with Pluto Manager software which comes with the Pluto PLC, using basic ladder logic and safe function blocks

Pluto PLCs are available in stand-alone; networkable, up to 32 Plutos; analog safety versions; or ASI models

Advanced hot swappable design allows replacing the Pluto and reprogramming it in seconds

Orion safety light guards – Jokab

Reduce complexity and save time



Orion 1 Finger and hand detection	Basic light curtain for 85% of the applications finger or hand detection 14 and 30 mm resolutions, 150 to 1800 mm lengths
Orion 2 Body detection	For perimeter guarding applications Up to 50m operating distance 500 to 1200 mm lengths
Orion 3 Body detection	For perimeter guarding applications Transmitter and receiver are both in the same active unit Reduces the need for cabling, connect only the active unit Up to 8m operating distance 500 to 1200 mm lengths
Base or Extended	All Orion models are available as Base or Extended Base: features manual/automatic reset, EDM Extended: features manual/automatic reset, EDM, muting, blanking, cascading, coding push button programmable

Orion safety light guards – Jokab

Reduce complexity and save time



Key benefits

Engineered features reduce complexity, speed up installation, and reduce downtime

- Blanking allows an object to be in the detection zone during normal operation
- Coding allows multiple light guards to be placed close to each other without interfering with each other
- External device monitoring (EDM) allows the Orion Light Guards to act as its own safety relay. This removes the expense of a safety relay in small systems
- Selectable manual or automatic modes of operation
- Muting temporarily allows material/pallets to travel through the light curtain without stoppages while preventing personnel from entering the hazardous area
- No dead zone. The detection zone is the length of the device

Eden non-contact safety sensor – Jokab

Highest safety level for harsh environments



Eden OSSD
safety sensors

Eden Dynamic
safety sensors

Uses RFID technology

Up to 30 Eden OSSD's on any standard safety relay

Works with Dynlink Safety Architecture

Dynlink uses almost ½ the wiring connections versus dual channel
30 Eden Dynamics can be put on our Vital Safety Controller

Eden non-contact safety sensor – Jokab

Highest safety level for harsh environments



Key benefits

RFID technology, Eden Safety Sensors have a high tolerance to misalignment (0-15 mm) due to door sags, etc., they also have no mechanical parts to wear

- Adam and Eva pairs. All Edens can be configured general or uniquely coded safety sensors per EN/ISO 14119

- 360° mounting possibility
- Local reset versions are available
- IP69K protection class. Perfect for the high temperature, high pressure requirements of food and beverage washdown areas
- Temperature range: -40 to 158 °F

AFS contactors

Dedicated for safety applications



Type	AFS09...AFS38		AFS40...AFS96	
Power pole	3-pole		3-pole	
Coil	20...60 V AC/DC		20...60 V AC/DC	
	24 V DC		Coil – 11	
	100...250 V AC/DC		100...250 V AC/DC	
	Coil – 13		Coil – 13	
Terminal	Screw or push-in terminals		Screw or push-in terminals	

AFS contactors

Dedicated for safety applications



Key benefits

Safety in all things – Comply with EN ISO 13849 and EN 62061

- Contactors are mechanically linked with mirror contacts
- Prevent unexpected operations with safety cap
- Fast response for optimized distances and opening times
- Non-removable, safety yellow front auxiliary contact block

Secure uptime – Low energy auxiliary contacts provide system feedback, making the system safe and reliable

- ABB's AFS contactors can be controlled directly by relay output of safety relay or safety PLC

Simplify design – Perfect design makes integration easier

- Safety data available in the software library (Sistema, FSDT)
- Built-in surge protection

Wire management

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060-061	E-Z-Code identification products
062-063	Enclosures
064-065	T&B® Fittings and Systems™
066-067	Industrial plugs, sockets, and interlocks

Ty-Duct® wiring duct

Wire management made easy



Solid	Gray, white, black, intrinsic blue PVC 0.75" to 6" wide, 1" to 5" deep 6 feet long with writable cover film UL94V-0, continuous use temperature up to 140 °F
Wide slot	Gray, white, black, intrinsic blue PVC 0.75" to 6" wide, 1" to 5" deep 6 feet long with writable cover film UL94V-0, continuous use temperature up to 140 °F
Narrow slot	Gray, white, black, intrinsic blue PVC 0.75" to 4" wide, 1" to 5" deep 6 feet long with writable cover film UL94V-0, continuous use temperature up to 140 °F
Round hole	Gray, white, black, intrinsic blue PVC 1" to 4" wide, 1.5" to 4" deep 6 feet long with writable cover film UL94V-0, continuous use temperature up to 140 °F

Ty-Duct® wiring duct

Wire management made easy



Metric duct	Gray, narrow and wide slot, thermoplastic 15 to 150 mm wide, 17 to 100 mm deep 2 meters long UL94V-0, -15 °C to 60 °C
Flexible duct	Gray, 500 mm length 12.5, 20, 25, 30, and 40 mm square UL94V-2, continuous use 80 °C with peaks up to 110 °C
Halogen-free	Gray, narrow and wide slot, thermoplastic 15 to 120 mm wide, 17 to 100 mm deep 2 meters long UL94V-0, -40 °C to 100 °C
Accessories	Dividers, corner and joining strips, rivets, cutters, installation tools, and more

ABB connection products

SNK - Designed by our customers, developed, engineered, and manufactured by ABB



PI-Spring technology	12 to 4 AWG
Screw clamp technology	12 to 500 kcmil
Pluggable technology	12 to 10 AWG

ABB connection products

SNK - Designed by our customers, developed, engineered, and manufactured by ABB



Key benefits

- Full range of connection technologies including screw, PI spring, and pluggable
- The SNK line provides a diverse offering for a wide variety of applications. Double and triple deck blocks, a variety of disconnect and fuse protection options, component holders, and test and measurement solutions
- Innovative new design features including engineered wire entryway, improved rigidity, and asymmetrical design
- Common accessories like cross-spacing jumpers, end stops, label holders, and screw-less jumper bars reduce inventory and help to streamline assembly

SpecKon® crimp – on wire terminals

High quality connection at a low installation cost

Example: KV18-6R-M					
K	V	18	6	R	M
Product	Terminal and insulation	Wiring size range	Feature size	Terminal type	Quantity
Spec-Kon® terminals	(Blank)	(18) 22-16 AWG	Bolt hole:	(R) ring	(C) 100
	Non-insulated	(14) 16-14 AWG	ring and fork	(MS) multiple stud ring	(CC) 200
	(V) Vinyl funnel entry	(10) 12-10 AWG		(F) fork	(W) 250
	(N) Nylon funnel entry	(8) 8 AWG	Tab width:	(LF) locking fork	(D) 500
	(VF) Vinyl fully insulated	(6) 6 AWG	disconnects	(FF) flanged fork	(M) 1,000
	(NF) Nylon fully insulated	(4) 4 AWG		(PT) pin terminal	(T) Mylar tape
		(2) 2 AWG	Pin length:	(BL) blade length	
			pin	(MD) male disconnect	
				(FD) female disconnect	
			Blade length:	(FFD) female flag disconnect	
			blade terminals	(PD) piggy back disconnect	
				(FB) female bullet	
			Diameter:	(MB) male bullet	
			bullets	(BS) butt splice	
				(QS) quick splice	
				(WJ) wire joint	
				(BFD) barrel flag disconnect	

SpecKon® crimp – on wire terminals

High quality connection at a low installation cost



Key benefits

Crimp terminals, disconnects, and splices ideal for OEM applications, can be used anywhere a high number of terminations are required every day, such as the wiring harness, panelboard, telecommunications, and automotive industries

The offering includes:

- A broad selection of bulk-packaged loose piece terminals in non-insulated and insulated varieties, including male and female disconnects, rings, forks, pins, blades, butt splices, wire joints and bullet connectors
- Offered on mylar tape for automated applications
- The ERG-2500 ergonomic hand tool, is perfect for lower volume crimping

Color-Keyed® compression and Blackburn® mechanical

High quality connection at a low installation cost



Compression

- Angled
- Bell ended
- Narrow tongue
- Stacked
- Tapered
- Motor lead disconnect

Mechanical

- Anti-rotational
- Clamp
- Copper and dual-rated
- Insulated multi-tap
- Service post
- Split bolt and two bolt

Lugs range from #10
AWG to 1000 kcmil in both copper
and aluminum connectors

Color-Keyed® compression and Blackburn® mechanical

High quality connection at a low installation cost



Key benefits

Color-Keyed Compression System

The original compression color coded system



High conductivity – made of high grade materials offering high conductivity/low resistance, meet or exceed all industry standards and can be installed with other commonly used tools with no loss of agency certification (contact T&B Technical Service for tool compliance)

Blackburn mechanical connectors

- Make terminating, splicing, and tapping quick and easy
- Each size lug, connector accommodates a range of cables sizes which means reduced inventory
- The specially shaped screw tip penetrates the inner strands and abrades the oxide films for positive contact and low inter-stand resistance

Ty-Fast® cable ties

All plastic cable ties, perfect for high volume applications

Product	Length	Tensile strength/ width	Color ¹	Quantity
(TY)	(100) 4"	(18) 18 lbs., 0.09" wide	(blank) natural	(L) 50
Ty-Fast cable ties	(125) 5"	(40) 40 lbs., 0.14" wide	X – UV black	(C) 100
	(175) 7.5"	(50) 50 lbs., 0.19" wide	2 - red	(D) 500
	(200) 8"	(120) 120 lbs., 0.30" wide	39 – Heat stabilized	(M) 1,000
	(300) 11"	(175) 175 lbs., 0.35" wide		
	(400) 14"			
	(800) 28"			
	(900) 36"			
	(1200) 48"			

¹ Other colors are available upon request

Ty-Fast® cable ties

All **plastic cable** ties, perfect for high volume applications



Key benefits

- ABB offers a complete range of plastic cable ties to cover the most demanding applications
- Offer an integrally formed, nylon 6.6 pawl which combines low insertion force with high locking strength
- A rounded, low-profile head makes for less snags, tails have improved two-sided finger grip design that helps the operator grasp and pull ties snug
- The Sure Grip tab keeps the tail from popping out while being threaded, then holds it securely for final tightening by hand or tool
- Halogen-free nylon 6.6, UL 94V-2, operating temperature -40 °F to 185 °F
- A full line of accessories including mounting bases, cable clips, spiral wrap and more.

E-Z-Code® identification products

Wire markers and labels for EZ NEC compliance



Wire marker booklets

Most popular products:

"0" thru "45" (WM-0-45)

"46" thru "90" (WM-46-90)

"A" thru "Z", "+", "-", and "0" thru "15" (WM-A-Z)

"0" thru "9", "T1", "T2", "T3", "L1", "L2", "L3" (WM-0)

1" x 3" write-on, self laminating markers (WM-BW-5)

Labels and signs

Conduit and voltage markers in three sizes black ring on safety-orange background

Arc flash warning label (LB94913)

220 VOLTS



E-Z-Code® identification products

Wire markers and labels for EZ NEC compliance



220 VOLTS



Key benefits

Wire and cable markers




- Wide selection of sizes and legends
- standard size 3" x 5-1/2" with 10 pages per book
- High-quality vinyl cloth material resists abrasion, oil, water and dirt

Labels & signs

- Wide range of colors, sizes, and legends.
- OSHA, NEMA, NEC, and LOTO complaint
- Made of rugged, self sticking vinyl

Enclosures

Modular flexibility with power and safety

	Thermo-plastic	Gemini UL	<p>Available in six sizes</p> <p>For indoor and outdoor use – NEMA 1, 3R, 4, and 4X</p> <p>Doors can be mounted left or right open</p> <p>Wall, pole or pedestal mounting</p> <p>Modular assembly without the need for tools</p>
	Painted steel	SR2	<p>For indoor use – NEMA 1, 2</p> <p>Solid or tempered glass doors available</p> <p>Wall unit, multi-unit stackable, or floor mountable hinge pins provide easy removal of doors</p>
	Stainless steel	SRX	<p>For indoor and outdoor use – NEMA 1, 3R, 4, 4X, 12</p> <p>Made from AISI 304 stainless steel</p> <p>Solid and tempered glass doors available</p> <p>Wall unit, multi-unit stackable, or floor mountable hinge pins provide easy removal of doors</p>

Enclosures

Modular flexibility with power and safety



Key benefits

Flexibility

- Easily mounted to the wall or floor
- Vertically stackable with the use of a joining kit
- Door can be hinged on the right or left side

Durability

- Welded, durable construction (SR2, SRX)
- High mechanical strength ratings

Compatibility

- Designed for constructing small and medium-sized automation, switching and control panels

T&B® Liquidtight fittings and systems™

For demanding situations



Steel – for liquid and dust-tight connections between flexible, non-metallic conduit and a box or enclosure	1/4" to 6"; straight, 45° and 90° Insulated and non-insulated
Steel Quick-Connect™ – Installation 3x faster, no disassembly required	3/8" to 1"; straight, 45° and 90° Insulated and non-insulated
T&B Liquidtight high-temperature – up to 302 °F	3/8" to 4" straight; 3/8" to 2" 45° and 90° Insulated only
T&B Liquidtight 316 stainless steel	3/8" to 2"; straight, 45° and 90° Insulated only
T&B Liquidtight aluminum	3/8" to 4" straight; 3/8" to 2" 90° Non-insulated only
T&B Liquidtight Systems™	3/8" to 6" Available in general purpose, oil resistant, aluminum, extreme and wide temperature, EMC, halogen-free, computer blue, stainless steel, and food grade

T&B® Liquidtight fittings and systems™

For demanding situations



Key benefits

Fittings


- UL514B and IEC 61386
- Double beveled sealing ring, soft pliable material to ensure ease of slipping on conduit during installation
- Connector body has rolled threads which are stronger than cut threads and void of burrs making installation faster and easier
- Safe Edge™ ground cone offers a crisp edge to guide cone into conduit convolutions

System

- A full system, fittings and conduit, tested to UL50E ingress protection standards

Industrial plugs, connectors, receptacle, and interlocks

Safe, reliable, repeatable electrical connections

	IEC 60309 16 A to 125 A Up to 600 V AC	Pin and sleeve	IP44, IP67 and IP69K
		Mechanical interlocks	NEMA 4X and 12K, IP67 and IP69K

Industrial plugs, connectors, receptacle, and interlocks

Safe, reliable, repeatable electrical connections



Key benefits

Safety and protection

- Flame safe housing (UL94 V0)
- Load breaking design
- Interlocks

Ease of maintenance

- Self-cleaning sleeves
- 2 cable clamp design
- Replacement lids and inserts offered

Continuous operations – maximize uptime

- IP69K and IP67 rated liquid and dust ingress protection
- Valox™ housing provides high chemical and impact resistance
- Marine grade solid brass pins and sleeves
- UV resistant housing

Note: Coming soon - Dual listed IP44 devices (Easy to install; advanced strain relief)

Enclosed Solutions

068-069	Enclosed starters
070-071	Enclosed disconnect/heavy-duty safety switches (EOH/eOT)
072-073	SafeT™ Interiors
074-075	Emax Link 2 abbreviated switchgear
076-077	ProLine
078-079	SMISLINE TP

Enclosed Solutions

Enclosed starters

Non-combination and combination motor controllers



208 V AC, 240 V AC, 480 V AC, and 600 V AC
Up to 1200 A, 700 HP
NEMA/UL Type 1, 12, 3R, 4, and 4X stainless steel

Motor disconnecting means



Motor branch-circuit
short-circuit protection



Motor controller



Motor overload protection



Enclosed starters

Non-combination and combination motor controllers







Key benefits

NEMA Combination and non-combination enclosed motor starters

- Available with non-reversing, reversing, two speed one winding and two speed two winding
- Available in non-combination and combination
- Available in UL type 1, 3R, 12, 4, and 4X stainless steel enclosures
- Available with non-fusible or fusible disconnect switches and thermal magnetic circuit breaker
- Compact space saving design
- Standard auxiliary contact configurations: 1 N.O. and 1 N.C.
- Overload relay protection: adjustable thermal and electronic overloads available, Class 10, 20, 30
- Field kits are available. Pre-wired and ready to operate, making installation easy and reliable

Enclosed disconnect switches

Reliable switching time after time

	Heavy duty safety – fusible and non-fusible (EOH)	NEMA 1, steel sheet enclosed	Up to 1200 A
		NEMA 12 and 3R, steel sheet enclosed	500 HP 200 kA
		NEMA 4X, stainless steel Grade 304 or 316	
	Rotary style – fusible and non-fusible (eOT)	NEMA 1, 3R, 4, 4X, 12	Up to 2000 A
		Thermoplastic, steel, and stainless steel	600 HP
OSHA lockout/tagout disconnect 			

Enclosed disconnect switches

Reliable switching time after time



Key benefits

Heavy duty safety

Ready and safe to operate wherever you need it

- Sealed, visible double break contact for touch-safe, maintenance free performance
- Modular construction for quick easy
- UL98, UL50, UL50E, NEMA KS-1 and CSA

Rotary style

Cutting edge design and technology

- cUL approved, UL508 and UL98 Listed
- Suitable as motor disconnect
- Horsepower rated
- Touch-safe construction

SafeT™ Interiors

OEM Solutions



UL67 Power Panelboard

Main bus available up to 1200 A
Mains and feeders up to 1200 A
600 V AC Max 3P3 W/4 W

Three interior types

- Main Circuit Breaker (MCB)
- Main Lug Only (MLO)
- Universal (Back feed)



UL891 Switchboard

Main bus available up to 4000 A
Feeders up to 1200 A
600 V AC Max 3P3 W/4 W
Single and double side circuit breaker mounting

Two interior types

- Center feed
- End feed

SafeT™ Interiors

OEM Solutions



UL67 Power Panelboard

Key benefits

- IP20 “finger-safe” SafeT Bus Stack with plug-on adaptor for Tmax MCCBs
- UL Listed Component
- ABB Tmax MCCBs –7 frames fulfill ratings from 15-1200 A
- Only 3 widths and 3 heights



UL891 Switchboard

Key benefits

- IP20 “finger-safe” SafeT Bus Stack with plug-on adaptor for Tmax MCCBs
- UL Recognized Component
- ABB Tmax MCCBs –7 frames fulfill ratings from 15-1200 A
- Half and full height

Emax Link 2

UL 1558 Recognized abbreviated switchgear



- Maximum rated voltage 635 V AC
- Rated operating voltage 240 V AC, 480 V AC, 600 V AC—3-phase 3-wire, 3-phase, 4-wire
- Rated frequency 50/60 Hz
- Rated current 5000 A maximum horizontal/vertical bus
- Short circuit withstand (4 cycles) 100 kA
- Short-time withstand (60 cycles) 85 kA, 100 kA
- Neutral 5000 A maximum

Emax Link 2

UL 1558 Recognized abbreviated switchgear



Key benefits

- Switchgear standards
- ANSI C37.20.1 Metal-enclosed low-voltage power circuit breaker switchgear ANSI
- C37.51 Metal-enclosed low-voltage AC power circuit breaker switchgear assemblies—Conformance test procedures

Circuit breaker standards

- ANSI C37.13 Low-voltage AC power circuit breakers used in enclosures

- ANSI C37.17 Trip systems for low-voltage power circuit breaker switchgear

Certifications and markings

- UL Recognized 1558 Standard for metal-enclosed low-voltage power circuit breaker switchgear
- UL 1066 Standard for low-voltage AC and DC power circuit breakers used in enclosures
- CSA 22.2, No. 31 Switchgear assemblies

ProLine – panelboard and breakers

IP20 touch safe with high reliability



- Up to 400 A bus
- 12, 24, and 42 circuits with options of up to 84 circuits
- 1 A to 100 A branch breakers
- Single or double ended feed
- Up to 35 kAIC @240 V AC
- Up 14 kAIC @480Y/277 V AC
- 10 kAIC for MLO

ProLine – panelboard and breakers

IP20 touch safe with high reliability



Key benefits

Enhance safety

- UL67 panelboard with IP20 rating
- Current limiting main and branch breakers
- Encapsulated bus bars and non-energized bolt on branch breakers

Improve uptime

- Fully coordinated branch with main breakers contain the fault to the branch level leaving the other branch circuits and main breaker on

Powerful ratings

- Up to 400 A with full feed through capability
- Branch circuits up to 100 A

SMISLINE TP – touch proof system

Modular flexibility with power and safety



Bus modules, bus bar
and end pieces

6 or 8 slot base modules (starter kits)

Power Connection
Bus Modules

225 A 3 Phase (+N)

200 A L1, L2, L3 and N



UL489 Power Distribution
Components

Flexible bus adapter for MCBs

UL508 Control Panel
Application Components

Flexible bus adapters for MCBs
(UL489 and/or UL1077)



Adapters for MS116, AF contactor and
combination motor starters

SMISLINE TP – touch proof system

Modular flexibility with power and safety



Key benefits

Enhance safety

- IP20 bus system isolates personnel from unintentional exposure to energized systems
- Current limiting branch MCBs reduce the potential for arc flash in a short circuit event
- 200 A center fed bus
- UL489 and UL508 Listed

Truly economical

- Labor saving snap-on installation
No drilling, or need to strip and connect wires
- Smaller footprint resulting in overall space saving

Highly flexible

- Individual components can be removed and replaced on the bus without tools
- Loads can be easily balanced without wiring changes



Other products

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Arc Guard System™ – TVOC-2

Safety for your most valuable resources



Key benefits

- DIN-rail or screw mounting
- Detachable key-pad with full-text display (main unit can handle HMI mounted on cabin door at the same time as one is mounted on the TVOC-2 itself)
- SIL-2 certified according to IEC 61508 and IEC 62061 ensures extremely reliable function
- No risky calibration needed or possible ensures maximum reliability
- Increased safety to personnel and equipment
- Minimizes downtime after arc accident
- Easy-to-read interface makes reading status information quick and easy

Emax 2 power circuit breaker






From circuit breaker to power manager



Rating	Version	800 A or less	1200 A	1600 A	2000 A	2500 A	3200 A	4000 A	5000 A	6000 A
100	V					E4.2		E6.2		
85	H									
65	S			E2.2						
50	N									
42	B	E1.2								

Emax 2 power circuit breaker

Advanced trip unit capability

Trip unit		Application	Current protection and measurement	Measurement V,P,E	Measurement + protection V,P,E	Load management	ABB Ability™
	Ekip DIP	Distribution	✓ + Ekip multi-meter	–	–	–	–
	Ekip Touch	Distribution and power control	✓	✓ + Ekip measuring	✓ + Ekip measuring Pro	✓ + Ekip power controller	–
	Ekip Hi-Touch		✓	✓	✓	✓ + Ekip power controller	✓
	Ekip G Touch	Power control and generators	✓	✓	✓	✓ + Ekip power controller	–
	Ekip G Hi-Touch		✓	✓	✓	✓ + Ekip power controller	✓

Emax 2 power circuit breaker

From circuit breaker to power manager



Key benefits

Performance

- Optimal frame size for narrower switchgear design
- Precision allows the breaker to act as a measurement device

Connectivity

- Bus-friendly modifiable terminals allow for quick, easy connection
- Extensive communication capabilities eliminates the need for costly and difficult conversion components

Ease of use

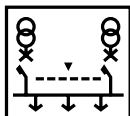
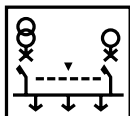
- Secure and easy wiring and upgrades for increased flexibility and fast, easy upgrades
- Fast, safe accessory installation protects personnel and the breaker

Control

- Reduces power management cost without the need for external systems
- A safe, ready-to-use control solution for generator protection

Emax 2 – Embedded ATS system

All-in-one innovation



Key benefits

Automatic Transfer Switch is the function for all electrical installations requiring switching from the main power circuit – main grid – to another source to ensure the supply of loads

Emax 2 with embedded automatic transfer switch extraordinarily simplifies the installation, programming and testing of this function

- Emax 2 **doesn't** require any kind of:
 - External control unit or external relays
 - Sensors and excessive wirings
 - Metal work, time and space
- Emax 2 **does** guarantee:
 - Ready to go programming
 - Simplified connections
 - Compact solution
 - System reliability

ABB Ability™ Electrical Distribution Control System

Understanding power



Key benefits Control

- Power management reduces costs without an external system
- Power quality analysis helps identify power issues to reduce equipment malfunctions and increase working life

ABB Ability™ Electrical Distribution Control System (ABB Ability™ EDCS)

- End-users save up to 30% on operational costs
- Consultants gain more projects and increase their value by 15%
- Facility managers can take action in 1 minute anywhere, anytime
- Panel builders can connect their panels to the cloud in as few as 10 minutes

Ekip UP

Turn analog to digital for power control



Key benefits




- Ekip UP is the new multi-functional unit to more easily monitor, protect, and control any plant
- Up-date your facility with advanced features such as communications, metering, and advanced protections without replacing your current power circuit breaker
- Up-grade and optimize your plant with energy management embedded energy features

Performance

- Operating voltages: 220 V...690 V
- Operating currents: 100 A...4000 A
- Operating temperature: Min -25 °C , Max +85 °C
- Measurement accuracy: Current class 1; voltage, class 0,5; power, class 2; harmonics up to 50th
- Power quality: IEC 61000-4-30

Products for 600 – 1500V DC and 800V AC

Solar and other applications

	Tmax T molded case circuit breakers (MCCB)	T4-T6	Up to 800 A, 600-1000 V DC
		T4V-HA & T5V-HA	Up to 300 A, 800 V AC
	Tmax T molded case switches (MCS)	T7 PV-E	Up to 1000 A, 1500 V DC
		T1-T7 PV	Up to 1000 A, 600-1000 V DC
	Open disconnect switches	OTDC 16	1000 A, 600 - 1500 V DC
	SlimLine XR fusegear	XRM1	160 A, 800 V AC, 50 kA, 3 Pole
	EasyLine XLP	XLP1	160 A, 800 V AC, 50k A, 3 Pole
	Fuse holder	E90/32PV	1, 2 pole, 1000 V DC, 30 A
		E91/32PV1500	1 pole, 1500 V DC, 30 A
	Surge protection devices	OVR PV-solar	15 and 40 kA @ 600/800/1000/1500 V DC

Products for 600 – 1500V DC and 800V AC

Solar and other applications

Key benefits

ABB – your one stop shop for high voltage AC and DC products for solar combiner boxes and inverters

With 800 V AC and 1500 V DC technology, ABB is the leader in the components needed for the demands of the solar market

ABB provides components which are engineered to offer:

- High efficiency to increase sellable energy
- Easy installation to reduce installation costs
- Streamlined range for ease of design with high flexibility
- High mechanical operations to maximize uptime





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