

Motor Starting and Protection solutions for Ventilation systems in Greenhouse horticulture

IEC



Grow healthy and tasty crops with our broad range of scalable Motor Starting and Protection solutions for full-speed motor control of your Ventilation systems.

What is a Ventilation system?

Greenhouse horticulture needs dedicated ventilation control to maintain an optimal growing environment while improving the overall efficiency of the plants. The ventilation system is responsible for air circulation and carbon dioxide replenishment. Poor air circulation would otherwise reduce plant activity and could lead to problems with humidity and disease management.

Why you need Motor Starting & Protection solutions for Ventilation systems

Poor air quality and temperature inside greenhouses can cause significant damage to crops and even lead to their complete loss. To ensure the right environmental conditions continue to be provided, the ventilation system must always be up and running. ABB scalable motor starting and protection solutions ensure complete flexibility in choosing the right starter for full-speed motor control of the Ventilation System.

Main benefits

Continuous Operation

Ensure continuous operation and keep your ventilation systems up and running in any condition thanks to reliable ABB products and coordinated solutions.



Compact and Easy to install

Save up to 50% space in the control panel thanks to narrower electronic compact starters and AF contactors while saving time during the installation phase by using our ready-made starter connection kits.



Integrated advanced control & protection

ABB advanced solutions ensure precise, flexible control and measurement of all parameters while providing maximum reliability and protection and driving an intelligent data hub for predictive maintenance and asset management.



Energy efficient system

Make your ventilation starter panel energy-efficient thanks to AF technology, which ensures an 80% reduction in contactor coil consumption, less heat dissipation and reduced temperature rise, thereby allowing installation density in the panel to be increased.



Controlled Environment Agriculture

Controlled Environment Agriculture (CEA) combines engineering, plant science and computer-managed greenhouse control technologies to optimize plant growing systems, plant quality and production efficiency.

CEA provides protection and maintains optimal growing conditions throughout crop development. Production takes place within an enclosed growing structure such as a greenhouse or building. Plants are often grown using hydroponic methods to supply the root zone with the proper amounts of water and nutrients. CEA optimizes the use of resources such as water, energy, space, capital and labor. The most relevant variables controllable through CEA are:



Nutrients and Irrigation



Temperature and humidity



CO₂ supply



Light
(intensity, spectrum, duration and intervals)

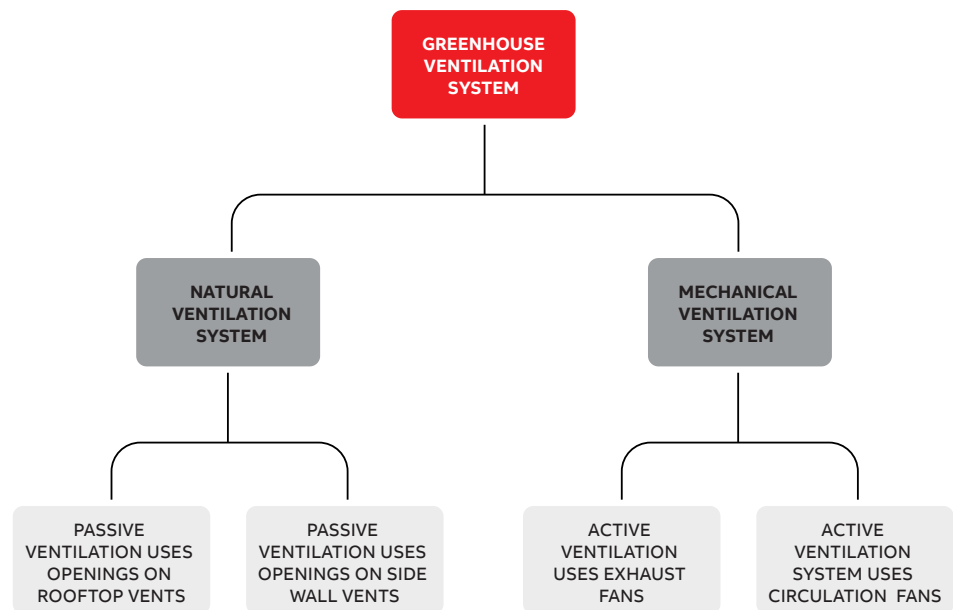


Ventilation systems in Greenhouse Horticulture

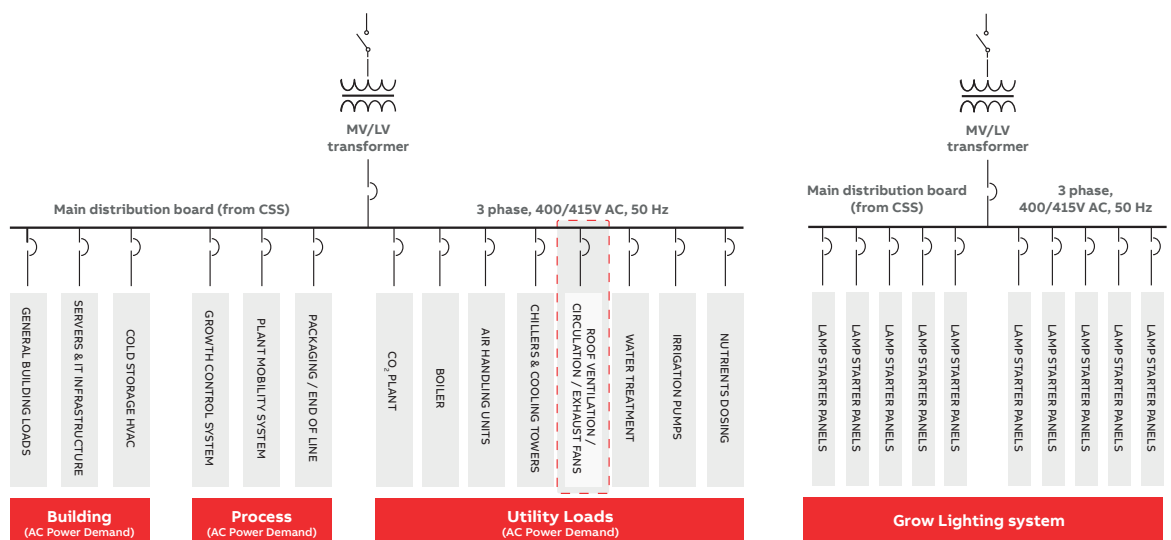
Good ventilation is critical in maintaining an optimal growing environment and improving the overall efficiency of a greenhouse. It is important for air circulation and carbon dioxide replenishment, while poor air circulation reduces plant activity and can lead to problems with humidity and disease management.

There are 2 main types of ventilation systems in greenhouse horticulture:

- **Passive ventilation**, which uses vents on the rooftop or sides to naturally draw air through the greenhouse.
- **Active ventilation**, which uses equipment to force air into or out of the structure. Fans are the key method for actively venting a greenhouse.



A typical electrical distribution system in a greenhouse

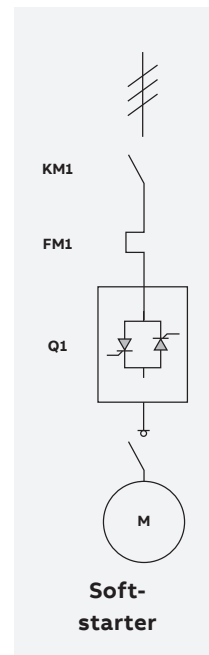
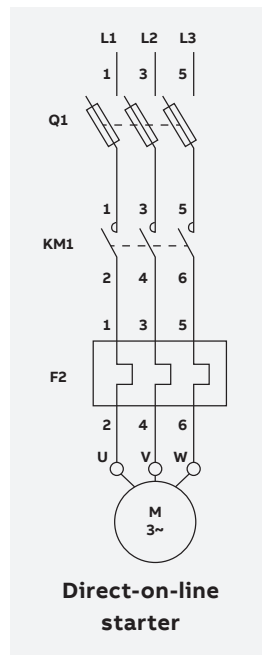


Current rating and starter type

The typical fan rating of a ventilation system is below 16A. In this case, ABB recommends a Direct-on-line starter & Softstarter if the fans are designed for full-speed running, considering the constant airflow inside the greenhouse.

If adjustable airflow pressure is required inside the greenhouse, then a variable frequency drive is recommended for accurate control of the speed of the inlet and outlet fans.

Recommended starter for ventilation system control



Starter panel design parameters:

- Motor rated voltage
- Motor rated current
- Utilization category (AC-3/3e)
- Maximum operating current
- Starting torque depending on fan type
- Acceleration time (starting time)
- Control voltage
- Ambient temperature
- Altitude
- Enclosure type
- Starter type
- Operations - Auto / Manual & Local / Remote
- Digital connectivity (control/monitor).

Main protection functions:

- Short-circuit protection
- Overload protection (with adjustable current setting)
- Voltage level monitoring
- Phase loss & phase sequence – for correct fan running management
- Earth fault protection.

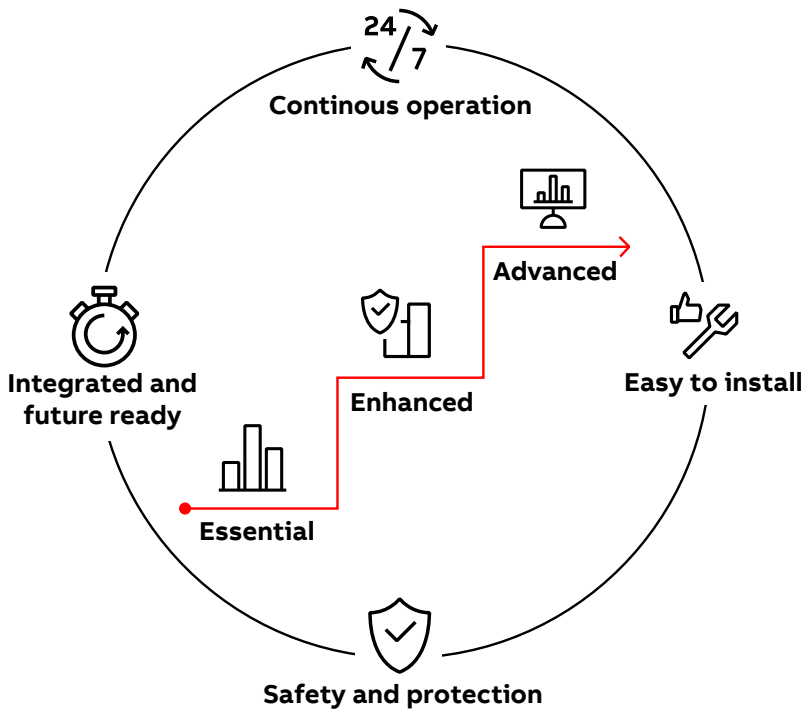
Secondary protection functions:

- Jammed fan – by locked rotor protection
- Broken belt detection – by an undercurrent
- Thermistor motor protection - for monitoring the winding temperature.
- Digital connectivity (control, energy measurements, etc...)
- Safety relays (if required, based on the design).



Motor Starting and Protection solutions for Ventilation systems in Greenhouse horticulture

Discover our Motor Starting and Protection solutions for Ventilation Systems in greenhouses. They always ensure the right environment for flourishing plants.



Essential Solution | Get the essentials right with fast and reliable installations

The Essential Solution ensures that combinations of core power devices function in a coordinated way, thereby guaranteeing continuous operation and ease of installation. In addition, the Essential Solution typically covers the requirements of stand-alone machinery like pumps, compressors, fans, etc.

Enhanced Solution | Get going with our robust protection offering featuring enhanced safety, control and monitoring functions

The Enhanced Solution provides enhanced control, safety and monitoring functions for applications in the discrete automation field. The Enhanced Solution for Ventilation Systems in Greenhouse horticulture includes additional protection functions such as temperature monitoring, a thermistor motor protection relay, under or over voltage monitoring relay, safety relays and more besides. We can address any other requirements to suit end-user requests.

Advanced Solution | Get ahead with smart data and predictive applications to keep your plant running

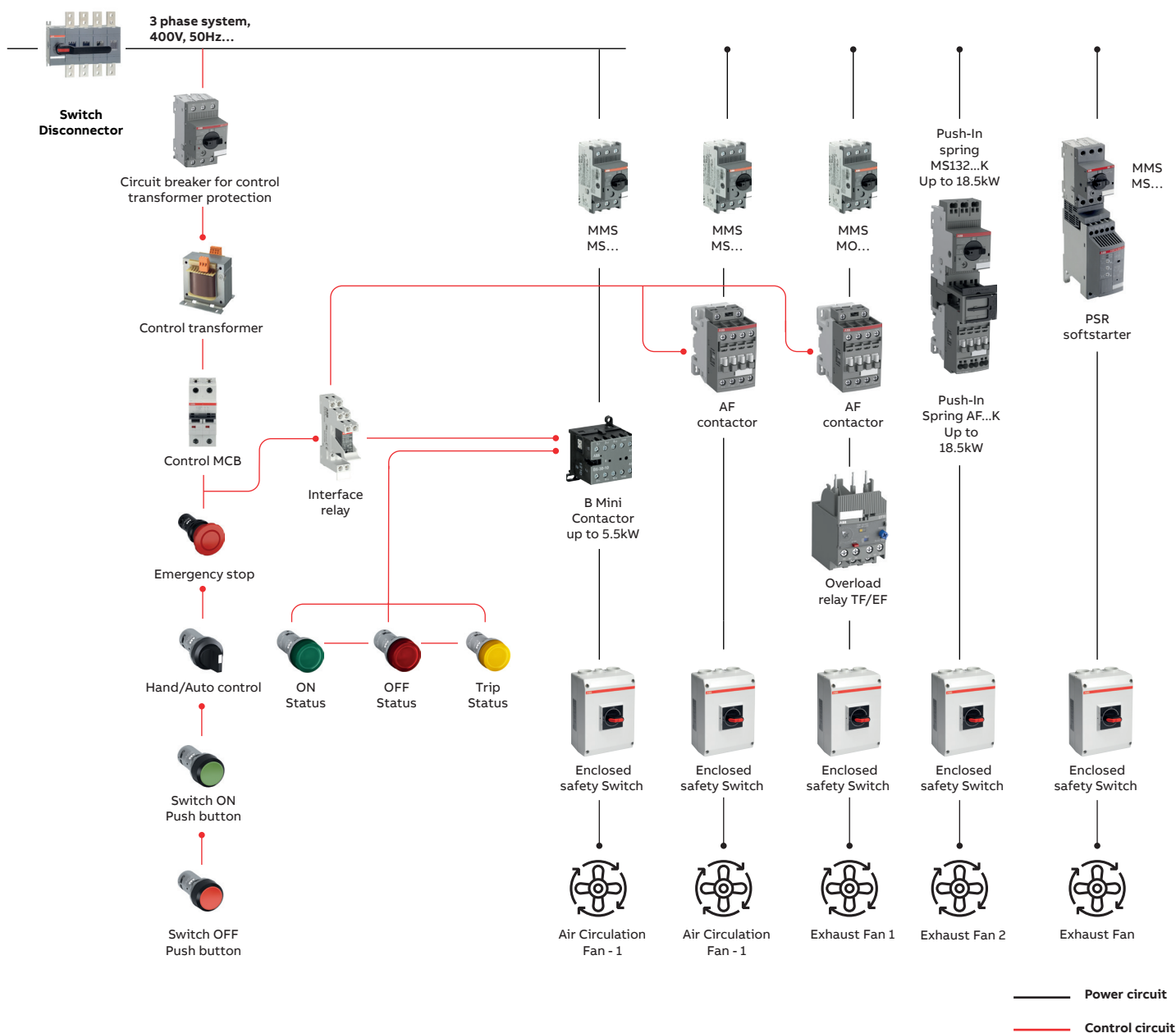
The Advanced Solution for Ventilation Systems includes integrated and future-ready motor protection, flexible motor control, fault diagnostics, maintenance schedules and supports all major communication protocols.

The table below provides an overview of the possible functions in the different solution offerings for ventilation systems in Greenhouse horticulture.

Solution level	Basic protection functions	Monitoring of additional protection functions	Digital connectivity and cloud monitoring
Essential	●		
Enhanced	●	●	
Advanced	●	●	●

Fuseless protection with MMS
for motor rating 0.06 kW up to 45 kW

Softstarter with MMS
for motor rating 1.5 kW up to 45 kW



The table provides an overview of the difference between the combination products offered in

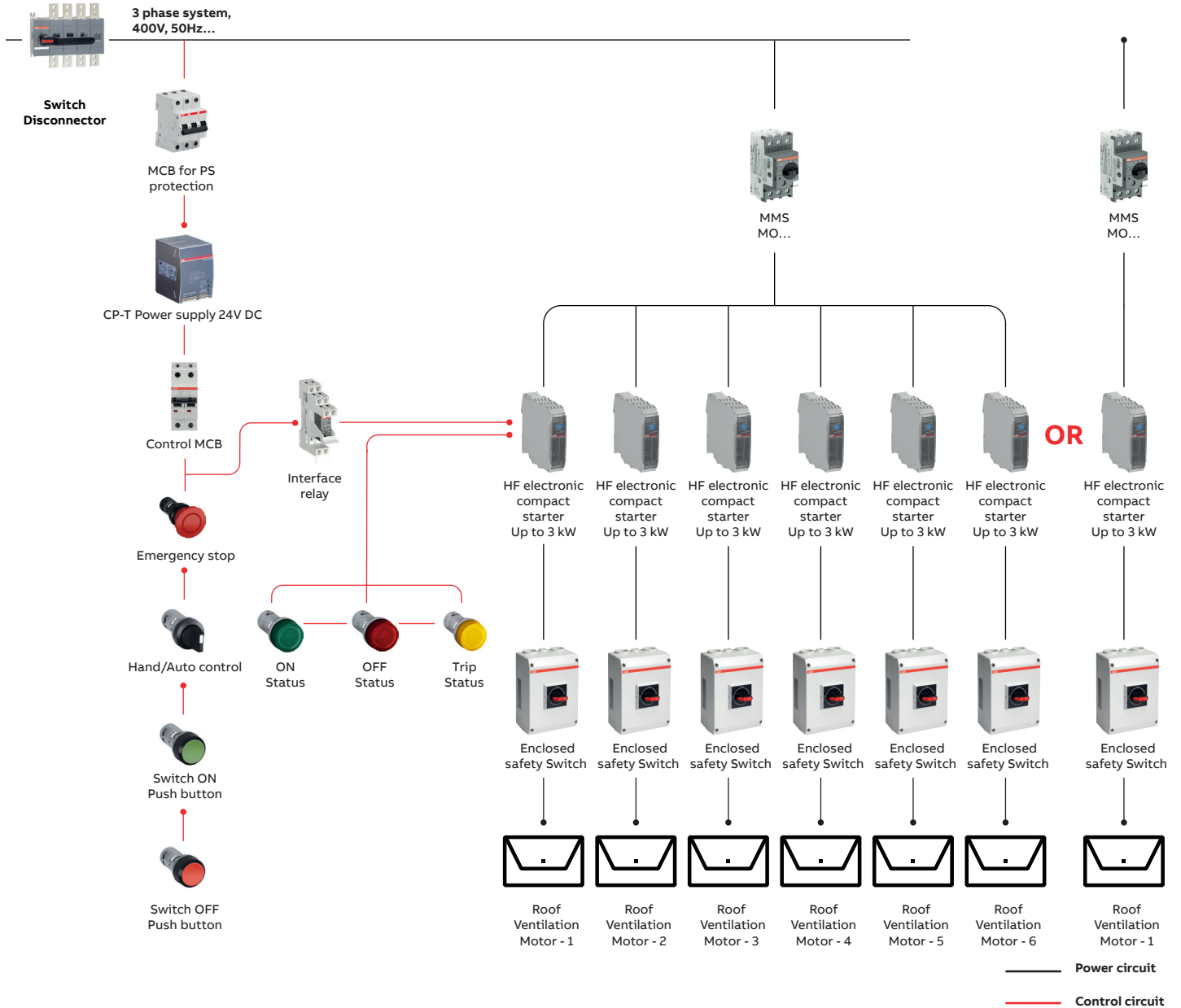
Essential solutions for ventilation systems in greenhouses.

Product combination	Motor rating supports	Key Differentiator
B Mini contactor	up to 5.5 kW	For efficiency and spacing saving
Contractor + MMS (Push-In Spring)	up to 18.5 kW	For reliable connection, faster, easier wiring. Vibration proof
Contactor + MMS (screw version)	up to 45 kW	For standard offerings
PSR + MMS (Softstarter)	up to 45 kW	For Smooth starting and stopping

Note:

The enclosed safety switch will be located close to the motor, to isolate the power supply and to ensure safety during fan maintenance for a person working close to that fan.

Fuseless protection with MMS

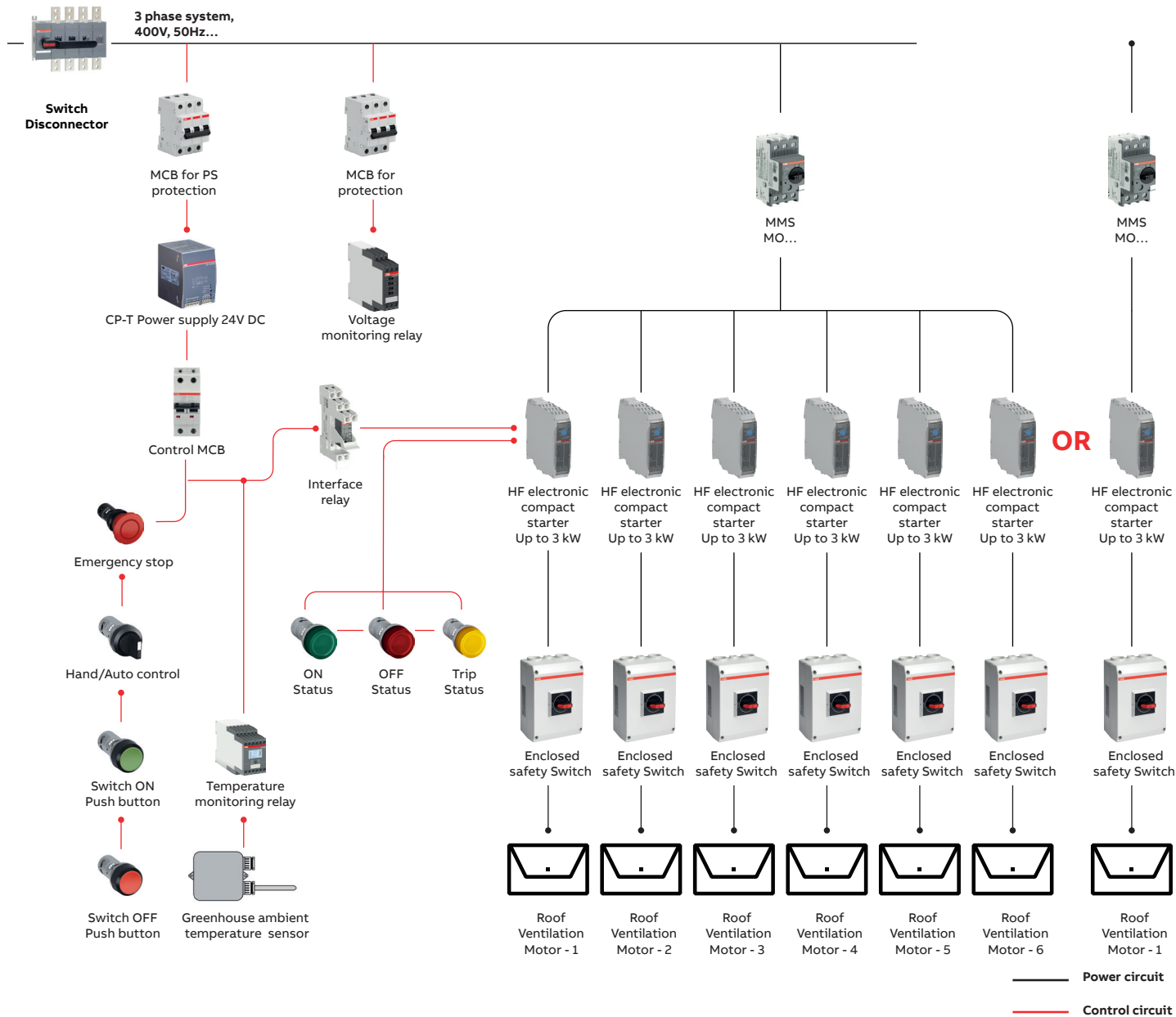


APPLICATION FINDER

We've made it simpler for you to set up your project!
Click here to find the reference architecture that best fits your needs and download the Bill of Materials.



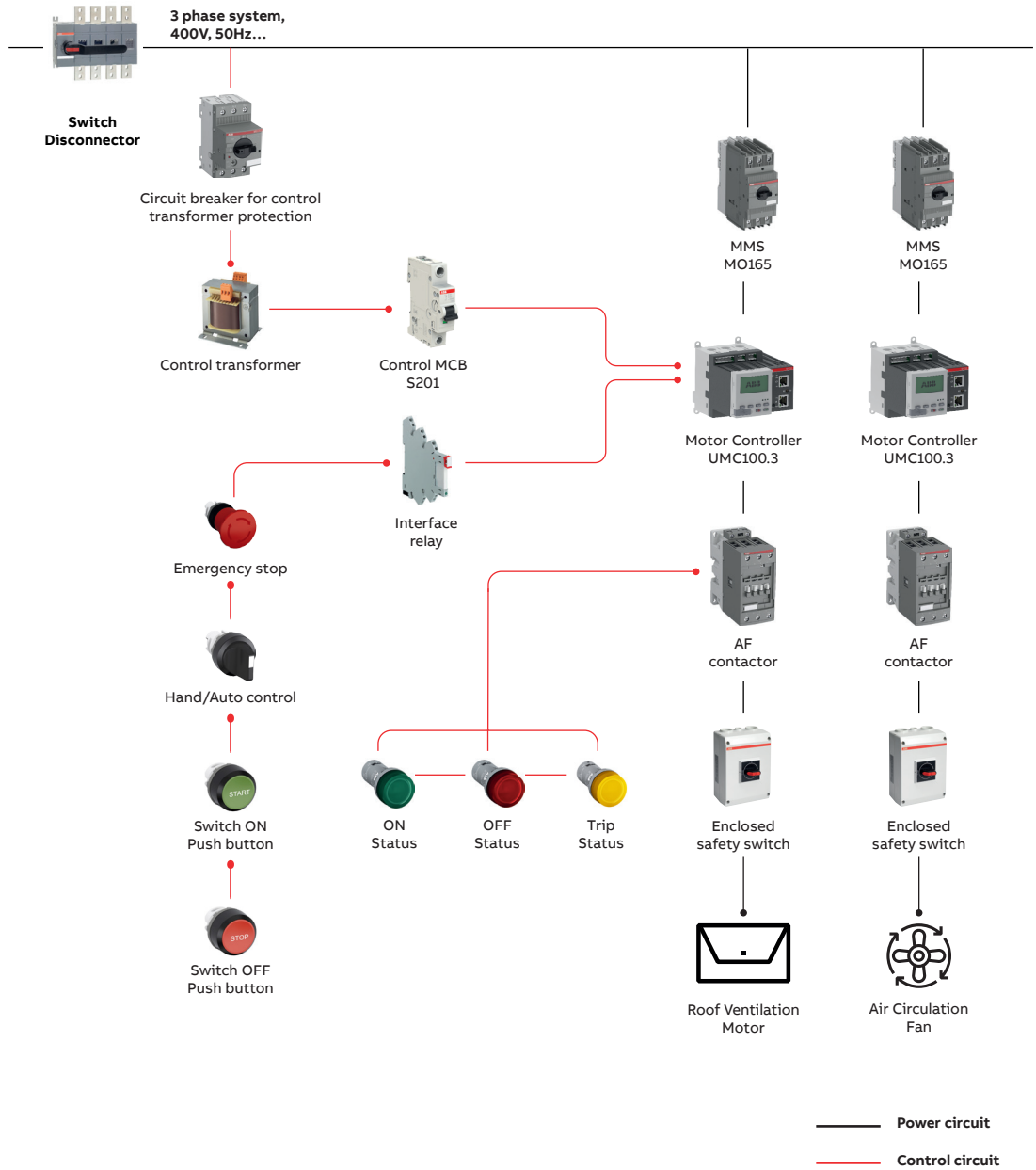
Fuseless protection with MMS



Main benefits of an electronic compact starter for opening and closing a roof ventilation system

- Forward and reverse running, motor protection and emergency stop functions are all included
- Up to 90% space savings – just 22.5 mm wide
- Up to 75% less time spent on wiring and installation
- Wiring error risks are minimized since more functions are built-in
- Solid state bypass supports load-free switching of mechanical contacts, thereby reducing power losses by up to 34%.

The ABB Advanced Solution for starting ventilation systems



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Digital offering

A smart ventilation system in a greenhouse guarantees fresh air quality and maintains the necessary humidity level without requiring on-site supervision.



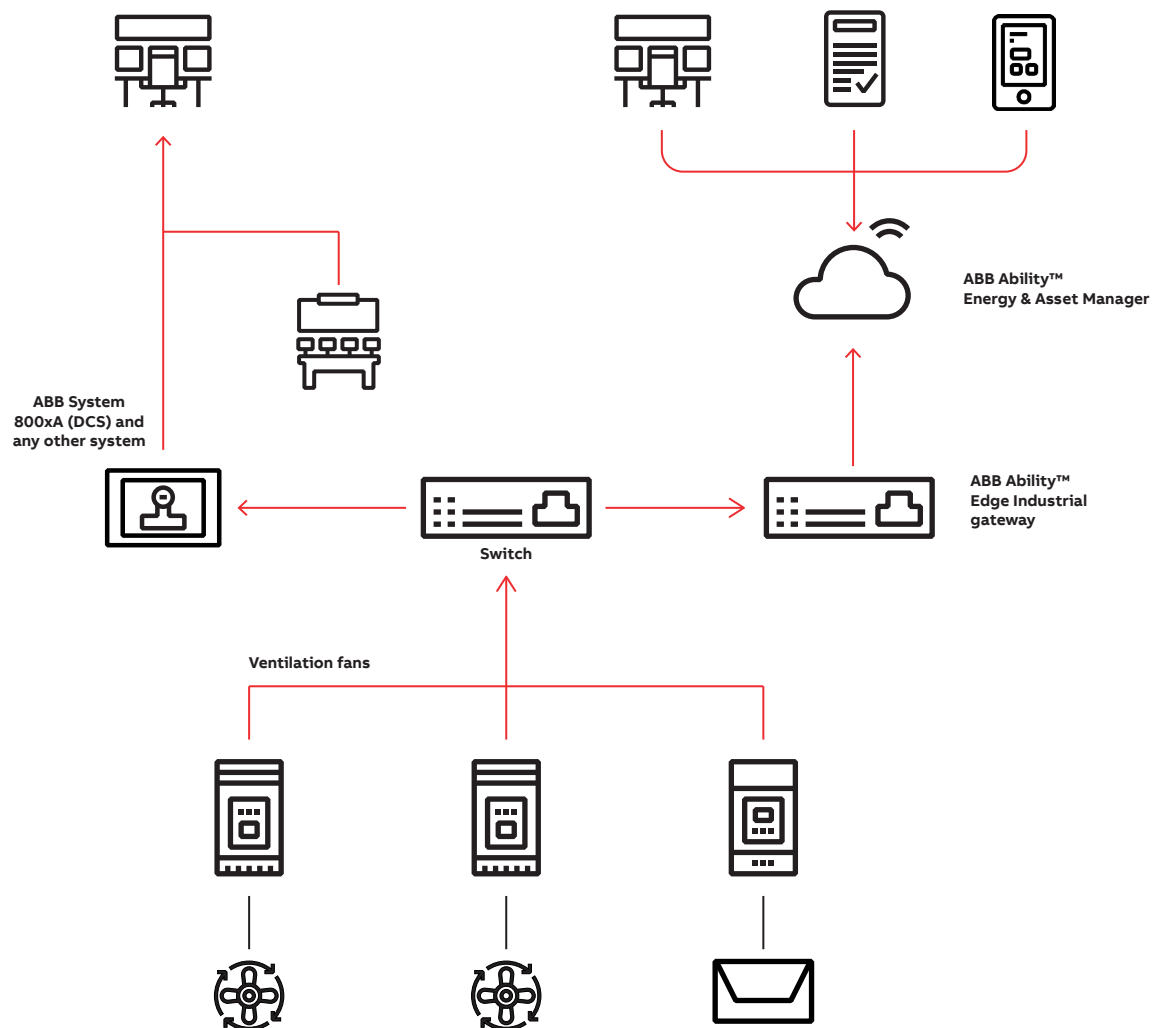
Flexible remote control and monitoring of ventilation system



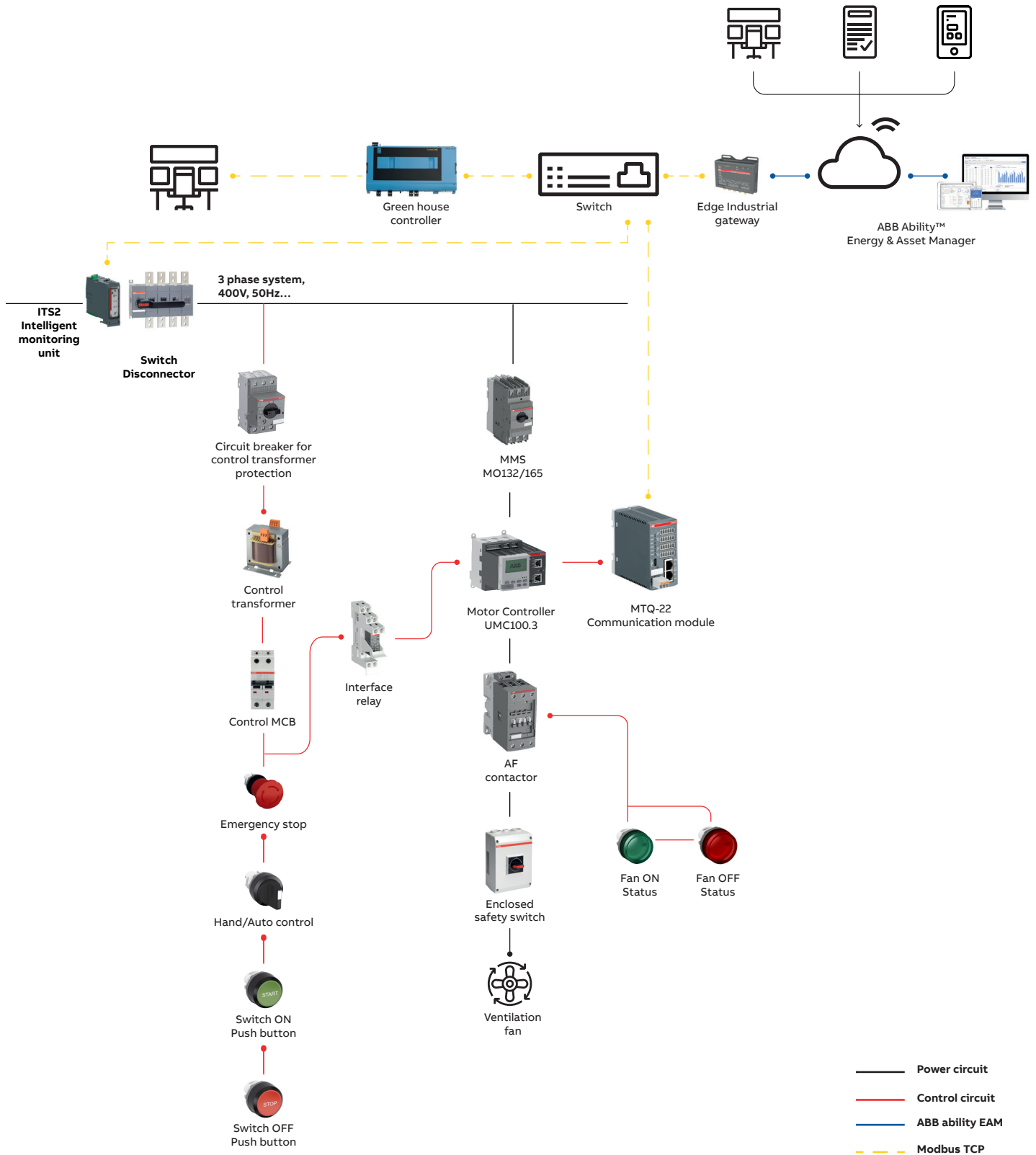
100% availability of fan measurement data as an aid to predictive maintenance



The ABB Ability™ Energy and Asset Manager web application provides easy and quick access to the data and enables a greenhouse climate controller to be connected



Digital offering with UMC100.3 for controlling and monitoring ventilation systems with cloud connectivity
For 0.06 kW to 500 kW motor ratings at 400V AC



Supporting communication protocols

Industrial Ethernet

- Ethernet/IP™
- Profinet IO
- Profinet (S2)
- Modbus TCP

Fieldbus

- Modbus RTU
- DeviceNet™
- Profibus DP

Note:

UMC100.3 supports ABB Ability through MTQ22 (Modbus TCP)

Features

- Flexible ventilation system control (remote or local)
- Advanced protection functions
- Status and fault diagnosis
- Monitoring of all electrical parameters
 - Voltage (V)
 - Current (A)
 - Power factor (Cos phi)
 - Active power (kW)
 - Reactive power (KVAR)
 - Total Harmonic distortion (THD)
 - Active energy (kWh)
 - Temperature
- Cloud connectivity - ABB Ability Energy & Asset Manager

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Bill of materials

Essential level Motor starting and protection solution for a Roof ventilation vent motor mounting system in a greenhouse

List of parameters considered when developing the bill of materials	
Standard	IEC
System Design	Main Voltage 400V AC, 3 phase, 50 Hz, control voltage -24V DC
Starter type	Roof ventilation vent motor : Mounting system with Direct-online starter and Electronic compact starter
Coordination type	Type-1
System Power	6 x Roof vent -0.55 kW (1.6 A)

Product	Part number	Description	Q.ty
Power circuit products			
MMS	1SAM360000R1010	MO132-10	1
MS116/132 SIGNAL/TRIP ALARM, 1NO/1NC	1SAM201903R1001	SK1-11	1
Electronic compact starter	1SAT122000R1011	HF2.4-DOL-24VDC	6
3P, 16A enclosed Disconnect Switch	1SCA022400R9910	OTP16T3M Safety switch	6
Control circuit products			
MCB for power supply protection	2CDS253001R0064	S203-C6	1
24V DC power supply	1SVR427054R0000	CP-T 24/5.0	1
MCB for DC power supply secondary side	2CDS252001R0064	S202-C6 Miniature Circuit Breaker - 2P - C - 6 A	1
Switch disconnecter - 16A (Main incomer)	1SCA104811R1001	OT16F3	1
Pistol handle for OT switch	1SCA022380R8770	OHB45J6	1
Pistol handle mounting kit for OT	1SCA022559R5670	OHZX6	1
Command and signalling products			
PILOT LIGHT CL2 RED 24V AC / DC	1SFA619403R5021	CL2-502R	6
PILOT LIGHT CL2 GREEN 24V AC / DC	1SFA619403R5022	CL2-502G	6
PILOT LIGHT CL2 YELLOW 24V AC / DC	1SFA619403R5023	CL2-502Y	6
40MM TW-REL RED, 1 NC	1SFA619550R1041	CE4T-10R-01	6
SELECTR 2 POS. MAINT. BLACK 1NO	1SFA619200R1016	C2SS1-10B-10	6
COMPACT FLUSH PB MOM. RED, 1NC	1SFA619100R1041	CP1-10R-01	6
COMPACT FLUSH PB MOM. GREEN 1NO	1SFA619100R1012	CP1-10G-10	6
Interface relay 2 c/o	1SVR405601R1000	CR-P024DC2	6
Interface relay - socket	1SVR405650R1000	CR-PSS	6

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APPLICATION FINDER

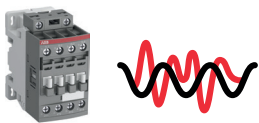
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Key benefits of offered products

Reliable in all networks

The electronic system within the AF contactor continuously monitors the current and voltage applied to the coil. The contactor is safely operated in an always-optimized, hum-free condition.



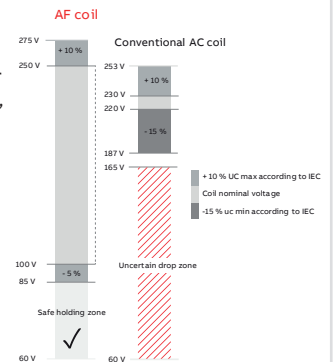
Troubleshooting made easy

Separate thermal and magnetic trip indication makes troubleshooting a lot easier and faster and reduces downtime. This allows you to easily take action based on thermal or magnetic tripping.



Wide control voltage range

The AF contactor ensures steady operation in unstable networks and signifies a major advancement in motor control and power switching, with no threat of voltages sags, dips, or surges. Prevents stoppages caused by voltage fluctuations.



AC & DC control voltage

Thanks to AF technology, the same contactor can be used for both AC and DC control. This makes it easier to choose the type of contactor and reduces the number of parts to keep in stock.



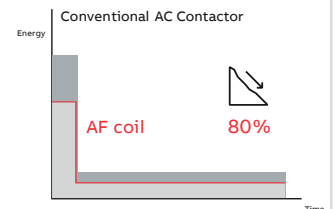
Built-in Surge suppressor

Conventional contactor technology normally requires an external surge suppressor. With AF contactor technology, surges are handled by a built-in contactor and never reach the control circuit. One less product required and no need to worry about complications causing electronics near contactors to fail.



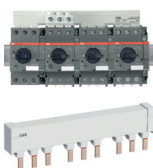
Reduced coil consumption

Thanks to AF technology contactor coil consumption is reduced by 80%, thus less heat dissipation and reduced temperature rise. This allows increased installation density in the panel, reduced control transformer rating, reduced control panel footprint and cost savings.



Busbar connectors for group assembly

Three-phase busbars ensure rapid, safe connection and are therefore a cost-effective solution. In addition, up to 5 manual motor starters can be fitted next to each other with optional spacing for auxiliary contacts.



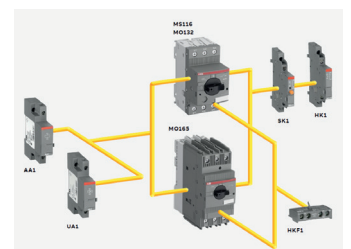
Easy to connect

Save wiring time and avoid mistakes by using a connecting link between ABB manual motor starters and soft starters or contactors. This creates harmonious and compact starter combinations that are easy to mount.



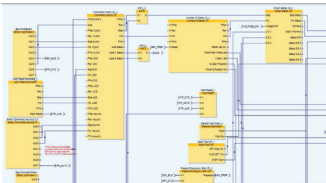
Harmonized range of accessories

MMS up to 80 A share the same main accessories like auxiliary contacts, signaling contacts, shunt trips and undervoltage releases. This significantly reduces the part list and makes selection of the right accessories easy.



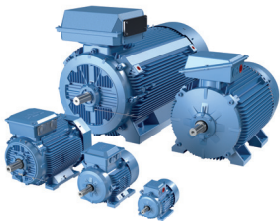
Flexible soft logic possible with UMC100.3

Flexible in creating the soft logic for switching ON the motor based on digital input conditions.



Ready for IE3 / IE4 motors

The ABB portfolio matches the latest requirements for IE3 and IE4 motor applications, including the most recent AC-3 upgrade and AC-3e utilization categories created for contactors and motor starters. ABB has validated coordination solutions for AC-3 and AC-3e applications. The results of these tests can be found in the ABB motor co-ordination tables.



Tested Co-ordination tables

ABB offers coordinated products to ensure the highest availability and protection for the installation. More than 1,800 tested and validated coordination tables are available in the SOC tool, so you can quickly and easily choose the right ABB solution.

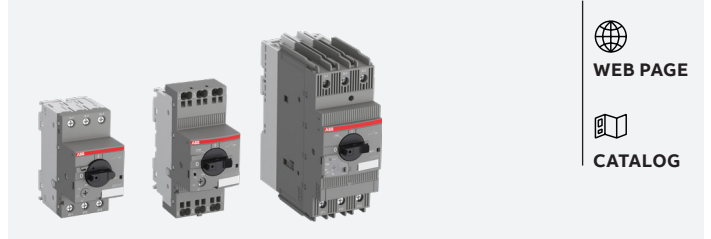
ABB Motor Co-ordination Tables									
Standard		Electric System		Motor Co-ordination Chart - Breaker					
Motor	Rated power	Rated voltage	Rated current	Rated torque	Rated speed	Rated current	Rated torque	Rated speed	Rated current
ABB Motor	100 kW	400 V	180 A	100 Nm	1450 rpm	180 A	100 Nm	1450 rpm	180 A
ABB Motor	150 kW	400 V	270 A	150 Nm	1450 rpm	270 A	150 Nm	1450 rpm	270 A
ABB Motor	200 kW	400 V	360 A	200 Nm	1450 rpm	360 A	200 Nm	1450 rpm	360 A
ABB Motor	250 kW	400 V	450 A	250 Nm	1450 rpm	450 A	250 Nm	1450 rpm	450 A
ABB Motor	300 kW	400 V	540 A	300 Nm	1450 rpm	540 A	300 Nm	1450 rpm	540 A
ABB Motor	350 kW	400 V	630 A	350 Nm	1450 rpm	630 A	350 Nm	1450 rpm	630 A
ABB Motor	400 kW	400 V	720 A	400 Nm	1450 rpm	720 A	400 Nm	1450 rpm	720 A
ABB Motor	450 kW	400 V	810 A	450 Nm	1450 rpm	810 A	450 Nm	1450 rpm	810 A
ABB Motor	500 kW	400 V	900 A	500 Nm	1450 rpm	900 A	500 Nm	1450 rpm	900 A
ABB Motor	550 kW	400 V	990 A	550 Nm	1450 rpm	990 A	550 Nm	1450 rpm	990 A
ABB Motor	600 kW	400 V	1080 A	600 Nm	1450 rpm	1080 A	600 Nm	1450 rpm	1080 A
ABB Motor	650 kW	400 V	1170 A	650 Nm	1450 rpm	1170 A	650 Nm	1450 rpm	1170 A
ABB Motor	700 kW	400 V	1260 A	700 Nm	1450 rpm	1260 A	700 Nm	1450 rpm	1260 A
ABB Motor	750 kW	400 V	1350 A	750 Nm	1450 rpm	1350 A	750 Nm	1450 rpm	1350 A
ABB Motor	800 kW	400 V	1440 A	800 Nm	1450 rpm	1440 A	800 Nm	1450 rpm	1440 A
ABB Motor	850 kW	400 V	1530 A	850 Nm	1450 rpm	1530 A	850 Nm	1450 rpm	1530 A
ABB Motor	900 kW	400 V	1620 A	900 Nm	1450 rpm	1620 A	900 Nm	1450 rpm	1620 A
ABB Motor	950 kW	400 V	1710 A	950 Nm	1450 rpm	1710 A	950 Nm	1450 rpm	1710 A
ABB Motor	1000 kW	400 V	1800 A	1000 Nm	1450 rpm	1800 A	1000 Nm	1450 rpm	1800 A
ABB Motor	1050 kW	400 V	1890 A	1050 Nm	1450 rpm	1890 A	1050 Nm	1450 rpm	1890 A
ABB Motor	1100 kW	400 V	1980 A	1100 Nm	1450 rpm	1980 A	1100 Nm	1450 rpm	1980 A
ABB Motor	1150 kW	400 V	2070 A	1150 Nm	1450 rpm	2070 A	1150 Nm	1450 rpm	2070 A
ABB Motor	1200 kW	400 V	2160 A	1200 Nm	1450 rpm	2160 A	1200 Nm	1450 rpm	2160 A
ABB Motor	1250 kW	400 V	2250 A	1250 Nm	1450 rpm	2250 A	1250 Nm	1450 rpm	2250 A
ABB Motor	1300 kW	400 V	2340 A	1300 Nm	1450 rpm	2340 A	1300 Nm	1450 rpm	2340 A
ABB Motor	1350 kW	400 V	2430 A	1350 Nm	1450 rpm	2430 A	1350 Nm	1450 rpm	2430 A
ABB Motor	1400 kW	400 V	2520 A	1400 Nm	1450 rpm	2520 A	1400 Nm	1450 rpm	2520 A
ABB Motor	1450 kW	400 V	2610 A	1450 Nm	1450 rpm	2610 A	1450 Nm	1450 rpm	2610 A
ABB Motor	1500 kW	400 V	2700 A	1500 Nm	1450 rpm	2700 A	1500 Nm	1450 rpm	2700 A
ABB Motor	1550 kW	400 V	2790 A	1550 Nm	1450 rpm	2790 A	1550 Nm	1450 rpm	2790 A
ABB Motor	1600 kW	400 V	2880 A	1600 Nm	1450 rpm	2880 A	1600 Nm	1450 rpm	2880 A
ABB Motor	1650 kW	400 V	2970 A	1650 Nm	1450 rpm	2970 A	1650 Nm	1450 rpm	2970 A
ABB Motor	1700 kW	400 V	3060 A	1700 Nm	1450 rpm	3060 A	1700 Nm	1450 rpm	3060 A
ABB Motor	1750 kW	400 V	3150 A	1750 Nm	1450 rpm	3150 A	1750 Nm	1450 rpm	3150 A
ABB Motor	1800 kW	400 V	3240 A	1800 Nm	1450 rpm	3240 A	1800 Nm	1450 rpm	3240 A
ABB Motor	1850 kW	400 V	3330 A	1850 Nm	1450 rpm	3330 A	1850 Nm	1450 rpm	3330 A
ABB Motor	1900 kW	400 V	3420 A	1900 Nm	1450 rpm	3420 A	1900 Nm	1450 rpm	3420 A
ABB Motor	1950 kW	400 V	3510 A	1950 Nm	1450 rpm	3510 A	1950 Nm	1450 rpm	3510 A
ABB Motor	2000 kW	400 V	3600 A	2000 Nm	1450 rpm	3600 A	2000 Nm	1450 rpm	3600 A
ABB Motor	2050 kW	400 V	3690 A	2050 Nm	1450 rpm	3690 A	2050 Nm	1450 rpm	3690 A
ABB Motor	2100 kW	400 V	3780 A	2100 Nm	1450 rpm	3780 A	2100 Nm	1450 rpm	3780 A
ABB Motor	2150 kW	400 V	3870 A	2150 Nm	1450 rpm	3870 A	2150 Nm	1450 rpm	3870 A
ABB Motor	2200 kW	400 V	3960 A	2200 Nm	1450 rpm	3960 A	2200 Nm	1450 rpm	3960 A
ABB Motor	2250 kW	400 V	4050 A	2250 Nm	1450 rpm	4050 A	2250 Nm	1450 rpm	4050 A
ABB Motor	2300 kW	400 V	4140 A	2300 Nm	1450 rpm	4140 A	2300 Nm	1450 rpm	4140 A
ABB Motor	2350 kW	400 V	4230 A	2350 Nm	1450 rpm	4230 A	2350 Nm	1450 rpm	4230 A
ABB Motor	2400 kW	400 V	4320 A	2400 Nm	1450 rpm	4320 A	2400 Nm	1450 rpm	4320 A
ABB Motor	2450 kW	400 V	4410 A	2450 Nm	1450 rpm	4410 A	2450 Nm	1450 rpm	4410 A
ABB Motor	2500 kW	400 V	4500 A	2500 Nm	1450 rpm	4500 A	2500 Nm	1450 rpm	4500 A
ABB Motor	2550 kW	400 V	4590 A	2550 Nm	1450 rpm	4590 A	2550 Nm	1450 rpm	4590 A
ABB Motor	2600 kW	400 V	4680 A	2600 Nm	1450 rpm	4680 A	2600 Nm	1450 rpm	4680 A
ABB Motor	2650 kW	400 V	4770 A	2650 Nm	1450 rpm	4770 A	2650 Nm	1450 rpm	4770 A
ABB Motor	2700 kW	400 V	4860 A	2700 Nm	1450 rpm	4860 A	2700 Nm	1450 rpm	4860 A
ABB Motor	2750 kW	400 V	4950 A	2750 Nm	1450 rpm	4950 A	2750 Nm	1450 rpm	4950 A
ABB Motor	2800 kW	400 V	5040 A	2800 Nm	1450 rpm	5040 A	2800 Nm	1450 rpm	5040 A
ABB Motor	2850 kW	400 V	5130 A	2850 Nm	1450 rpm	5130 A	2850 Nm	1450 rpm	5130 A
ABB Motor	2900 kW	400 V	5220 A	2900 Nm	1450 rpm	5220 A	2900 Nm	1450 rpm	5220 A
ABB Motor	2950 kW	400 V	5310 A	2950 Nm	1450 rpm	5310 A	2950 Nm	1450 rpm	5310 A
ABB Motor	3000 kW	400 V	5400 A	3000 Nm	1450 rpm	5400 A	3000 Nm	1450 rpm	5400 A
ABB Motor	3050 kW	400 V	5490 A	3050 Nm	1450 rpm	5490 A	3050 Nm	1450 rpm	5490 A
ABB Motor	3100 kW	400 V	5580 A	3100 Nm	1450 rpm	5580 A	3100 Nm	1450 rpm	5580 A
ABB Motor	3150 kW	400 V	5670 A	3150 Nm	1450 rpm	5670 A	3150 Nm	1450 rpm	5670 A
ABB Motor	3200 kW	400 V	5760 A	3200 Nm	1450 rpm	5760 A	3200 Nm	1450 rpm	5760 A
ABB Motor	3250 kW	400 V	5850 A	3250 Nm	1450 rpm	5850 A	3250 Nm	1450 rpm	5850 A
ABB Motor	3300 kW	400 V	5940 A	3300 Nm	1450 rpm	5940 A	3300 Nm	1450 rpm	5940 A
ABB Motor	3350 kW	400 V	6030 A	3350 Nm	1450 rpm	6030 A	3350 Nm	1450 rpm	6030 A
ABB Motor	3400 kW	400 V	6120 A	3400 Nm	1450 rpm	6120 A	3400 Nm	1450 rpm	6120 A
ABB Motor	3450 kW	400 V	6210 A	3450 Nm	1450 rpm	6210 A	3450 Nm	1450 rpm	6210 A
ABB Motor	3500 kW	400 V	6300 A	3500 Nm	1450 rpm	6300 A	3500 Nm	1450 rpm	6300 A
ABB Motor	3550 kW	400 V	6390 A	3550 Nm	1450 rpm	6390 A	3550 Nm	1450 rpm	6390 A
ABB Motor	3600 kW	400 V	6480 A	3600 Nm	1450 rpm	6480 A	3600 Nm	1450 rpm	6480 A
ABB Motor	3650 kW	400 V	6570 A	3650 Nm	1450 rpm	6570 A	3650 Nm	1450 rpm	6570 A
ABB Motor	3700 kW	400 V	6660 A	3700 Nm	1450 rpm	6660 A	3700 Nm	1450 rpm	6660 A
ABB Motor	3750 kW	400 V	6750 A	3750 Nm	1450 rpm	6750 A	3750 Nm	1450 rpm	6750 A
ABB Motor	3800 kW	400 V	6840 A	3800 Nm	1450 rpm	6840 A	3800 Nm	1450 rpm	6840 A
ABB Motor	3850 kW	400 V	6930 A	3850 Nm	1450 rpm	6930 A	3850 Nm	1450 rpm	6930 A
ABB Motor	3900 kW	400 V	7020 A	3900 Nm	1450 rpm	7020 A	3900 Nm	1450 rpm	7020 A
ABB Motor	3950 kW	400 V	7110 A	3950 Nm	1450 rpm	7110 A	3950 Nm	1450 rpm	7110 A
ABB Motor	4000 kW	400 V	7200 A	4000 Nm	1450 rpm	7200 A	4000 Nm	1450 rpm	7200 A
ABB Motor	4050 kW	400 V	7290 A	4050 Nm	1450 rpm	7290 A	4050 Nm	1450 rpm	7290 A
ABB Motor	4100 kW	400 V	7380 A	4100 Nm	1450 rpm	7380 A	4100 Nm	1450 rpm	7380 A
ABB Motor	4150 kW	400 V	7470 A	4150 Nm	1450 rpm	7470 A	4150 Nm	1450 rpm	7470 A
ABB Motor	4200 kW	400 V	7560 A	4200 Nm	1450 rpm	7560 A	4200 Nm	1450 rpm	7560 A
ABB Motor	4250 kW	400 V	7650 A	4250 Nm	1450 rpm	7650 A	4250 Nm	1450 rpm	7650 A
ABB Motor	4300 kW	400 V	7740 A	4300 Nm	1450 rpm	7740 A	4300 Nm	1450 rpm	7740 A
ABB Motor	4350 kW	400 V	7830 A	4350 Nm	1450 rpm	7830 A	4350 Nm	1450 rpm	7830 A
ABB Motor	4400 kW	400 V	7920 A	4400 Nm	1450 rpm	7920 A	4400 Nm	1450 rpm	7920 A
ABB Motor	4450 kW	400 V	8010 A	4450 Nm	1450 rpm	8010 A	4450 Nm	1450 rpm	8010 A
ABB Motor	4500 kW	400 V	8100 A	4500 Nm	1450 rpm	8100 A	4500 Nm	1450 rpm	8100 A
ABB Motor	4550 kW	400 V	8190 A	4550 Nm	1450 rpm	8190 A	4550 Nm	1450 rpm	8190 A
ABB Motor	4600 kW	400 V	8280 A	4600 Nm	1450 rpm	8280 A	4600 Nm	1450 rpm	8280 A
ABB Motor	4650 kW	400 V	8370 A	4650 Nm	1450 rpm	8370 A	4650 Nm	1450 rpm	8370 A
ABB Motor	4700 kW	400 V	8460 A	4700 Nm	1450 rpm	8460 A	4700 Nm	1450 rpm	8460 A
ABB Motor	4750 kW	400 V	8550 A	4750 Nm	1450 rpm	8550 A	4750 Nm	1450 rpm	8550 A
ABB Motor	4800 kW	400 V	8640 A	4800 Nm	1450 rpm	8640 A	4800 Nm	1450 rpm	8640 A
ABB Motor	4850 kW	400 V	8730 A	4850 Nm	1450 rpm	8730 A	4850 Nm	1450 rpm	8730 A
ABB Motor	4900 kW	400 V	8820 A	4900 Nm	1450 rpm	8820 A	4900 Nm	1450 rpm	8820 A
ABB Motor	4950 kW	400 V	8910 A	4950 Nm	1450 rpm	8910 A	4950 Nm	1450 rpm	8910 A
ABB Motor	5000 kW	400 V	9000 A	5000 Nm	1450 rpm	9000 A	5000 Nm	1450 rpm	9000 A
ABB Motor	5050 kW	400 V	9090 A	5050 Nm	1450 rpm	9090 A	5050 Nm	1450 rpm	9090 A
ABB Motor	5100 kW	400 V	9180 A	5100 Nm	1450 rpm	9180 A	5100 Nm	1450 rpm	9180 A
ABB Motor	5150 kW	400 V	9270 A	5150 Nm	1450 rpm	9270 A	5150 Nm	1450 rpm	9270 A
ABB Motor	5200 kW	400 V	9360 A	5200 Nm	1450 rpm	9360 A	5200 Nm	1450 rpm	9360 A
ABB Motor	5250 kW	400 V	9450 A	5250 Nm	1450 rpm	9450 A	5250 Nm	1450 rpm	9450 A
ABB Motor	5300 kW	400 V	9540 A	5300 Nm	1450 rpm	9540 A	5300 Nm	1450 rpm	9540 A
ABB Motor	5350 kW	400 V	9630 A	5350 Nm	1450 rpm	9630 A	5350 Nm	1450 rpm	9630 A
ABB Motor	5400 kW	400 V	9720 A	5400 Nm	1450 rpm	9720 A	5400 Nm	1450 rpm	9720 A
ABB Motor	5450 kW	400 V	9810 A	5450 Nm	1450 rpm	9810 A	5450 Nm	1450 rpm	9810 A
ABB Motor	5500 kW	400 V	9900 A	5500 Nm	1450 rpm	9900 A	5500 Nm	1450 rpm	9900 A
ABB Motor	5550 kW	400 V	9990 A	5550 Nm	1450 rpm	9990 A	5550 Nm	1450 rpm	9990 A
ABB Motor	5600 kW	400 V	10080 A	5600 Nm	1450 rpm	10080 A	5600 Nm	1450 rpm	10080 A
ABB Motor	5650 kW	400 V	10170 A	5650 Nm	1450 rpm	10170 A	5650 Nm	1450 rpm	10170 A
ABB Motor	5700 kW	400 V	10260 A	5700 Nm	1450 rpm	10260 A	5700 Nm	1450 rpm	10260 A
ABB Motor	5750 kW	400 V	10350 A	5750 Nm	1450 rpm	10350 A	5750 Nm	1450 rpm	10350 A
ABB Motor	5800 kW	400 V	10440 A	5800 Nm	1450 rpm	10440 A	5800 Nm	1450 rpm	10440 A
ABB Motor	5850 kW	400 V	10530 A	5850 Nm	1450 rpm	10530 A	5850 Nm	1450 rpm	10530 A
ABB Motor	5900 kW	400 V	10620 A	5900 Nm	1450 rpm	10620 A	5900 Nm	1450 rpm	10620 A
ABB Motor	5950 kW	400 V	10710 A	5950 Nm	1450 rpm	10710 A	5950 Nm	1450 rpm	10710 A
ABB Motor	6000 kW	400 V	10800 A	6000 Nm	1450 rpm	10800 A	6000 Nm	1450 rpm	10800 A
ABB Motor	6050 kW	400 V	10890 A	6050 Nm	1450 rpm	10890 A	6050 Nm	1450 rpm	10890 A
ABB Motor	6100 kW	400 V	10980 A	6100 Nm	1450 rpm	10980 A	6100 Nm	1450 rpm	10980 A
ABB Motor	6150 kW	400 V	11070 A	6150 Nm	1450 rpm	11070 A	6150 Nm	1450 rpm	11070 A
ABB Motor	6200 kW	400 V	11160 A	6200 Nm	1450 rpm	11160 A	6200 Nm	1450 rpm	

Product offering

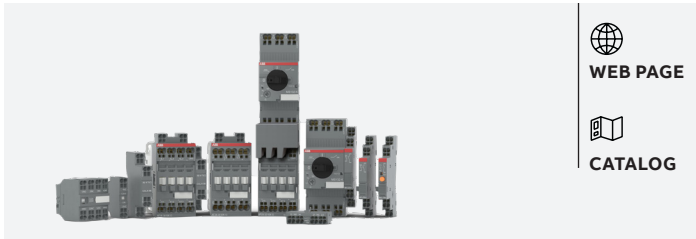
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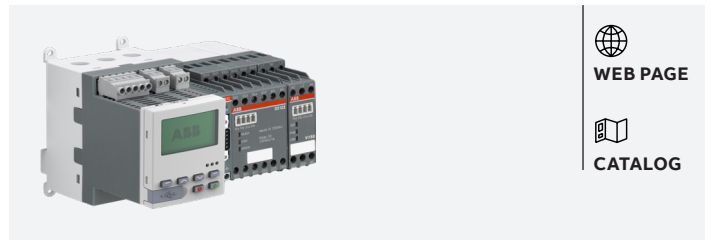
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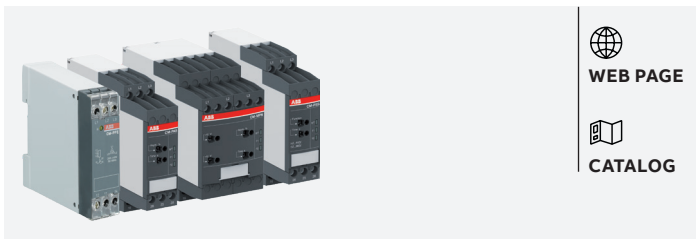
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