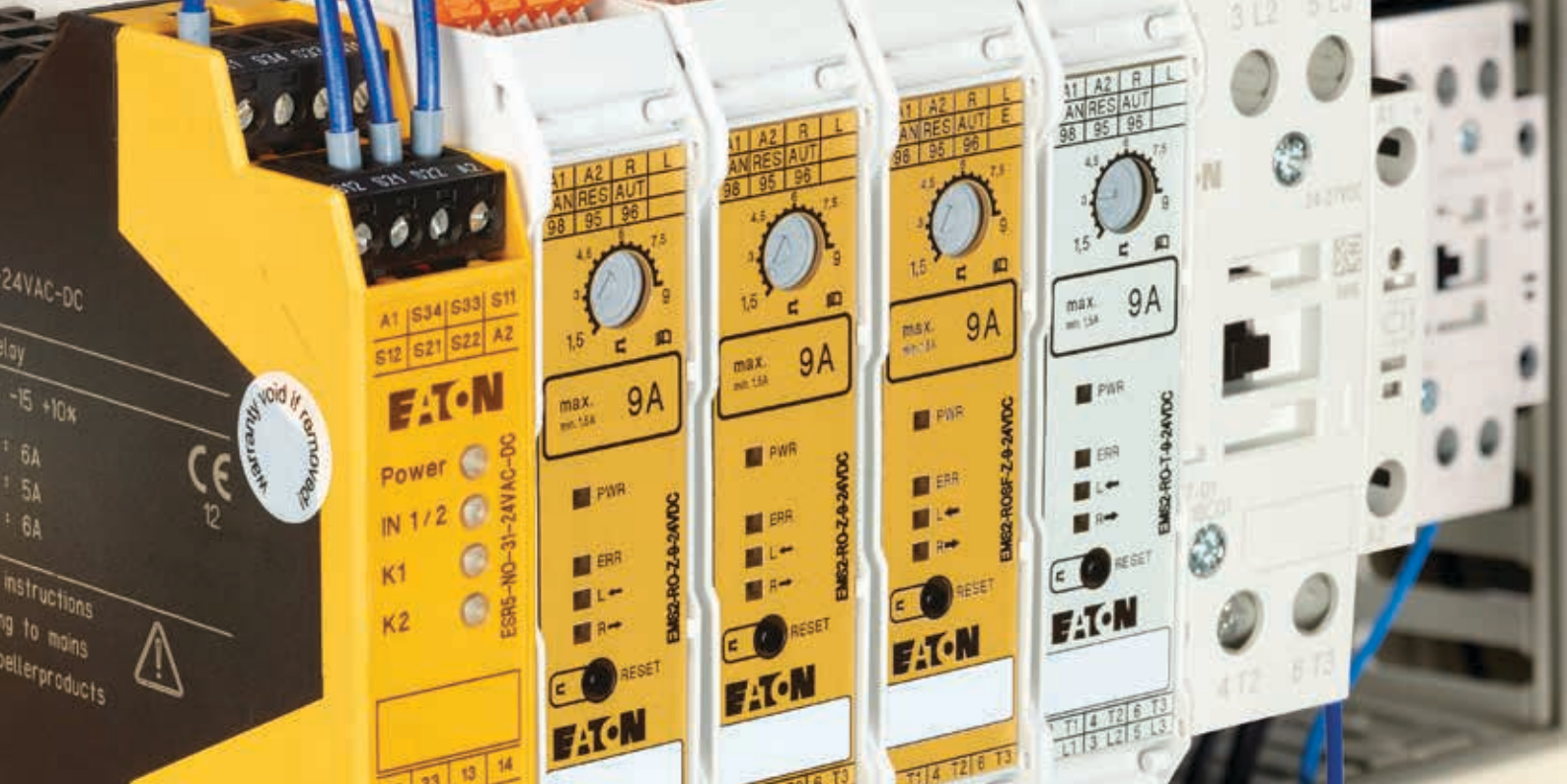


Easy Multifunctional Safe



Powering Business Worldwide



EMS2 – The perfect all rounder only 22.5 mm wide

EMS2 electronic motor starters combine an extremely compact design with the traditional functions of conventional motorstarters. Their narrow overall width of 22.5 mm means that these units can be used wherever motors, with a rated power of up to 3 kW, need to be driven.

Eaton's electronic motor starters range overview



MSC-D motor starters

Motor-starter combination (motor-protective circuit-breaker and contactor)

- Overload and short-circuit protection
- A large variety of accessories
- Proven components
- Can be expanded with SmartWire-DT



MSC-DE motor starters

Motor-starter combination (motor-protective circuit-breaker and contactor)

- High short-circuit breaking capacity
- Wide-range overload protection (4:1)
- Variable motor protection characteristic (class 5- 20)
- Replaceable trip blocks
- Additional monitoring functions via SmartWire-DT



Electronic motor starter EMS2

Multi-functional motor starter

- DOL and reversing starter
- Wide-range overload protection
- Emergency-stop function (SIL3)
- 22.5 mm wide
- Additional monitoring functions via SmartWire-DT
- Hybrid switching technology
- ATEX approval
- Short-circuit protection



DS7 soft starters

- 45 mm width for up to 32 A
- Version able to handle temperatures as low as -40°C
- Improved control of motor torque, ensuring longer gearbox and bearing service lives
- Comprehensive monitoring functions via SmartWire-DT

Motor output (AC-3 / 400 V)

From 0.06 to 15 kW

From 0.06 to 15 kW

From 0.06 to 3 kW

from 2.2 to 110 kW

Application

Can be used universally for:

- Motor protection
- Transformer protection
- System protection

Can be used universally for:

- Motor protection
- Transformer protection
- System protection

- Slide controls
- Horizontal / vertical conveyors
- Small drives
- Fans

Star-delta applications

- Pumps and fans in HVAC applications
- Water/sewage treatment industries
- Conveyor belts

EMS2 – Five functions in a single device

The EMS2 electronic motor starter combines a DOL starter, a reversing starter, wide-range overload protection and an emergency-stop function (SIL3) in one device. Additional functions can be implemented via SmartWire-DT.



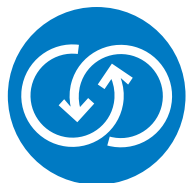
Electronic motor protection

Despite having only two current ranges, the electronic motor starter can be used to protect motors from from 0.06 up to 3 kW (400 V 50 Hz).



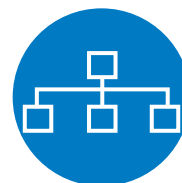
A motor starter with a long life span

The integrated hybrid switching technology not only ensures minimal wear during start-up, but also increases the contact life by a factor of 10, to approximately 30 million operations.



Integrated reversing starter

The electronic motor starter enables both clockwise and counterclockwise rotation.



Intelligent networking

The SmartWire-DT interface replaces the conventional control wiring and also supplies additional information.

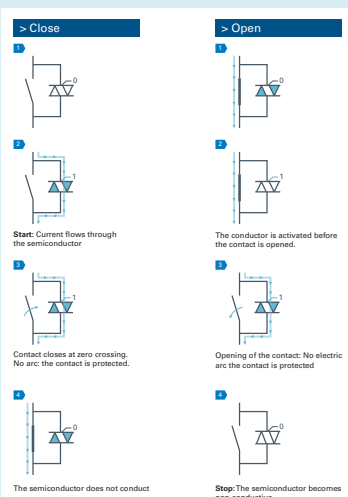


Safe stop

Thanks to its dual-channel design, the electronic motor starter ensures safe stops up to SIL3 / PLe.

What does "hybrid technology" mean?

- The technology is based on a microprocessor-controlled design that combines resilient semiconductors with relays that are built to last.
- In order to reduce wear during switching, each contact is coupled with a semiconductor.
- This gentle switching process increases the service life of the motor starter by a factor of 10, to approximately 30 million operations.

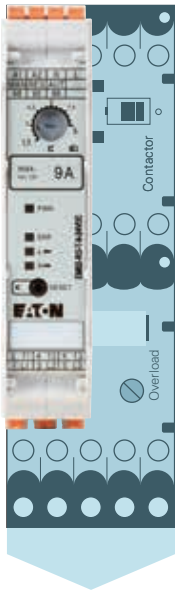


EMS2 – Complex Functions Made Simple

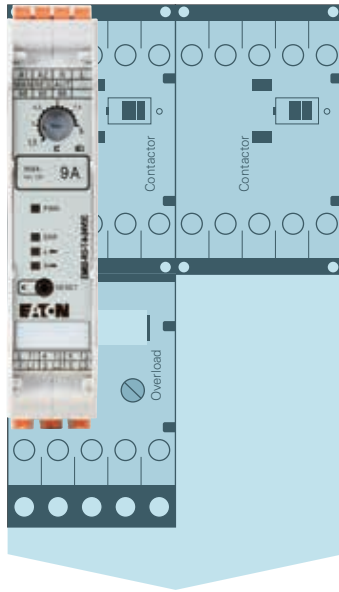
Faster for increased safety

Compared to conventional motor starters, the EMS2 makes it much easier and faster to start applications with safe stop according to SIL 3 and PLe. The multi-functionality simplifies the implementation of the main and control circuit, as a result, the number of hardware components can be reduced, resulting in one thing in a savings of up to 80% in overall width and at the same time reduces assembly work by up to 60%.

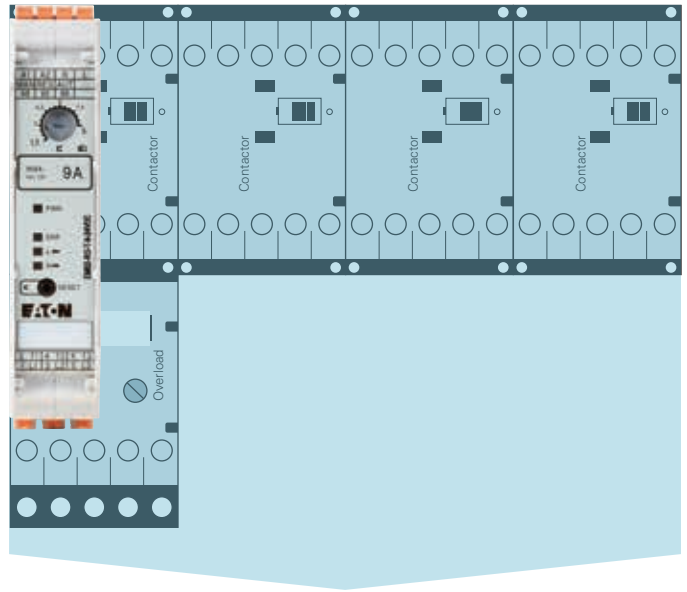
Direct starter



Reversing starter



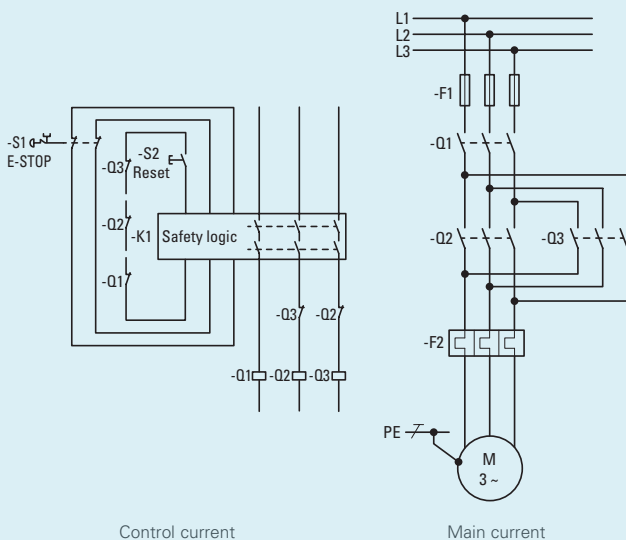
Reversing starter with emergency stop



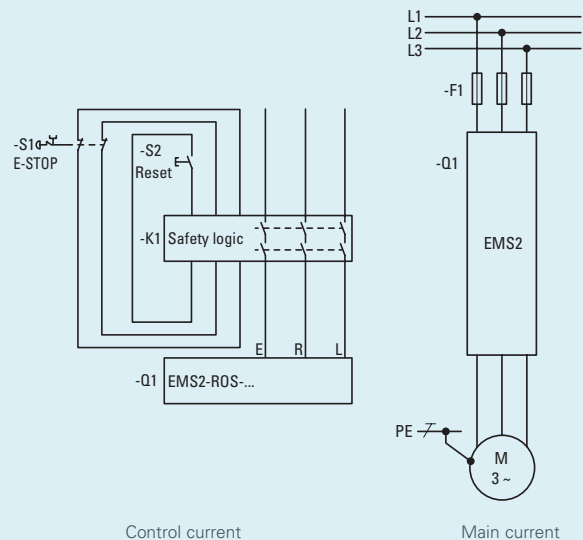
Compared to conventional motor starters, the overall width is reduced by up to 80 %.

Reversing starter with emergency stop

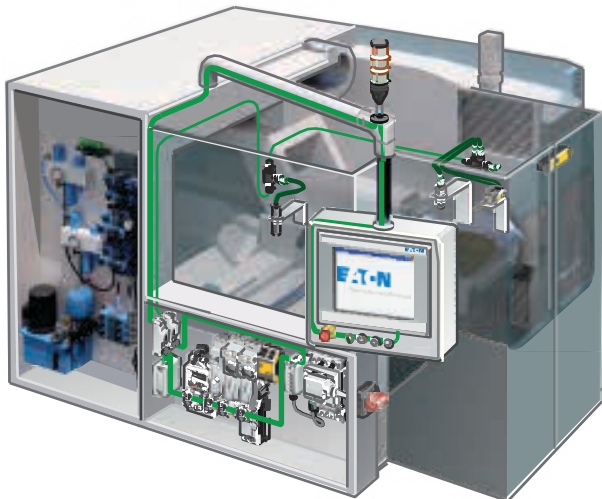
Conventional



Electronic motor starter



EMS2 with SmartWire-DT – Faster commissioning, powerful extra features



SmartWire-DT adds value to your entire machine

The SmartWire-DT removes the need for control wiring as it is replaced with a plug-in communication connection. It minimises the time needed for planning, wiring and commissioning. The additional communication connection allows to obtain further information on machine and process states, so faults and machine maintenance can be detected much faster.

From conventional control wiring...

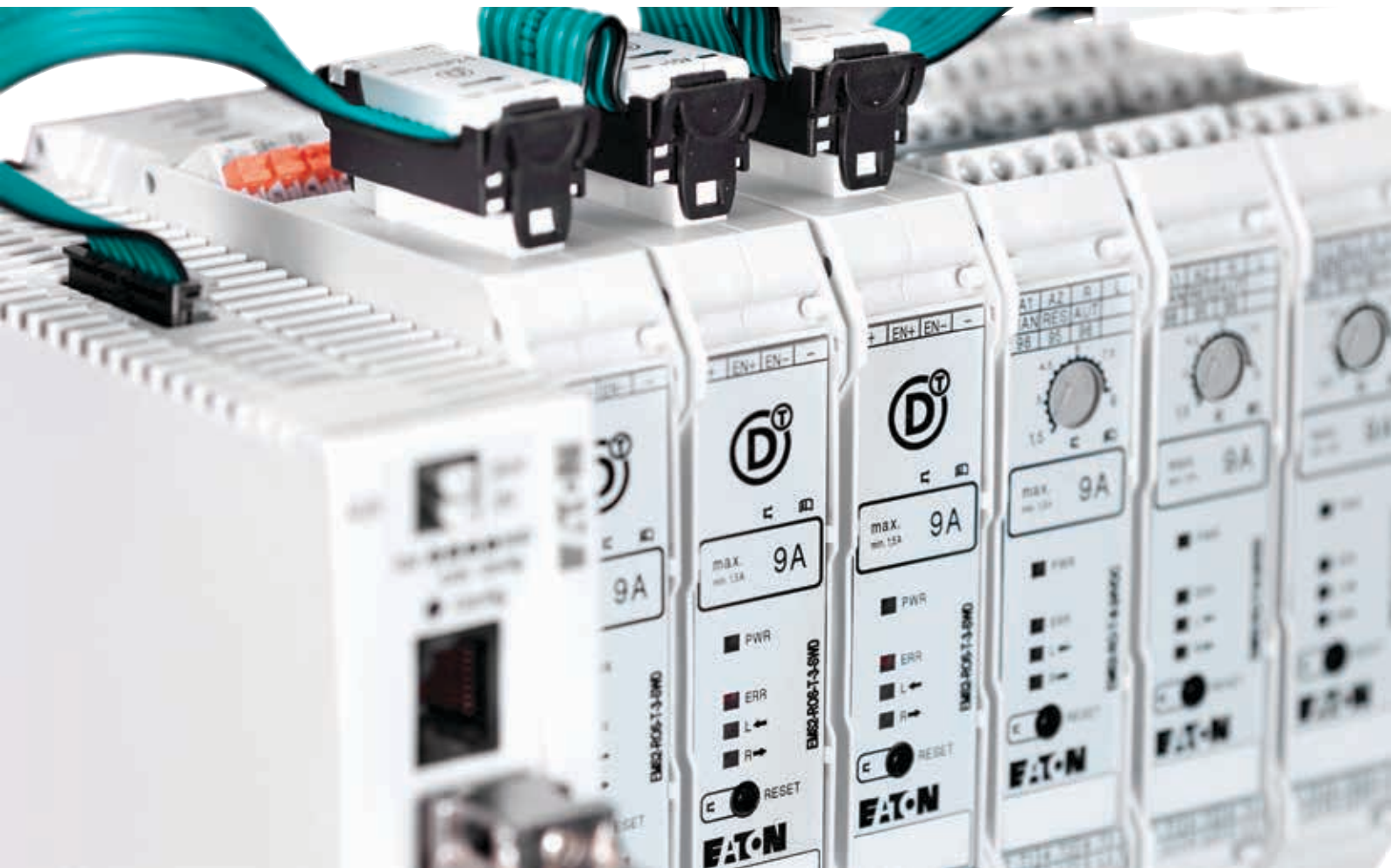
Traditionally motor starters have usually been driven through a PLC system's inputs and outputs. The wiring required for this is time consuming prone to errors, and, once installed, can only provide limited information on the corresponding application's state..

...for controlling the EMS2 with SmartWire-DT

SmartWire-DT replaces the PL system's digital inputs and outputs. It provides switchgear with communication capabilities and makes it possible to obtain much more detailed information about the application. Additionally the SmartWire-DT detects critical errors in advance and ensures that your machine will keep running without any interruptions.

The benefits:

- Faster commissioning thanks to plug-in control wiring
- Save space by eliminating the need for PLC I/O
- Improved machine reliability thanks to more comprehensive information being available



The EMS2 terminals are flexible and versatile

Push-in technology: Smart Terminals

- The electronic motor starter relies on push-in terminals for connection to the main current and the control current.
- The terminals make it possible to install and disassemble the connection cables without the use of any tools, thereby reducing the wiring time by up to 60 % compared to conventional screw terminals. The technology is not only safe, but also user-friendly, quick and easy to handle.
- Save up to 60% time. Thanks to tool-free push-in technology the assembly is done in the twinkling of an eye and you can use the time saved for more important things.



Screw terminals: Proven and simple

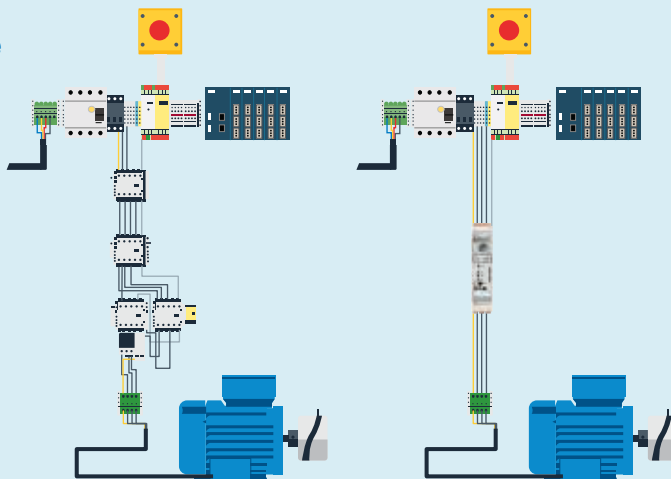
- The EMS2 can also be connected using standard screw terminals.



Terminals are simple, flexible and cost-effective

The EMS2 combines a number of functions in a single device, including a reversing circuit, motor protection, connectivity and various safety features.

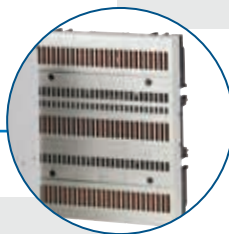
- Fewer wires and components make the EMS2 solution particularly cost-effective
- The devices are easy to install, reducing the risk of errors during the installation
- The wiring time is significantly reduced





EMS2 with Motor Started Feeder System: A plug-in technology that's simple, flexible and safe

The MSFS feeder system forms the basis for safe and innovative power distribution systems up to 125 A. Thanks to the modular design, this plug-in solution can be easily and intuitively integrated into any machine or system. The easy and flexible handling of the MSFS System reduces the installation time and costs. The components can be placed anywhere on the board. The IP20XB rating makes the devices especially touch safe. Components such as our proven motorprotective circuit breakers and motor-starter combinations can be easily mounted on the feeder system adapters. The EMS2 does not require any adapter on the board itself.



EMS2 with Motor Starter Feeder System

Thanks to the tool-free plug-in technology, the EMS2-ROSF version of the electronic motor starter (which is available in two separate sizes) can be quickly installed anywhere on the base module of the feeder system. The positioning of the adapters – and thus that of the motor starter itself – can be changed at any time, in line with the exact requirements placed on the machine or system. As the user-friendly plug-in technology automatically establishes an electrical and mechanical connection to the feeder module, the motor starter is immediately ready for use. While the integrated covers ensure that there are no exposed live parts, the so-called “push lock system” guarantees that everything stays firmly in place during transport or when the machine is in use – this provides additional safety and prevents accidents and malfunctions.



Electronic motor starter EMS2

Actuating voltage 24 V DC

Function	Rated operational output AC-53a	Adjustment range overload release	Connection technique	Type Article-No
	380 V 400 V 415 V			
	P kW	I _r A		

Direct starter

Motor protection
Switching principle: safety output stage with bypass, three-phase switch-off.
For connection to SmartWire-DT for extended diagnostics. Motor current additionally adjustable via SmartWire-DT.

	0.06 - 1.1	0.18 - 3	Push-in-terminal	EMS2-DO-T-3-SWD¹⁾ 192383	
EMERGENCY STOP via additional enabling terminal to SIL3/Ple.				  EMS2-DOS-T-3-SWD^{2) 3) 4)} 192385	
	0.55 - 3	1.5 - 7 (AC-53a) 9 (AC-51)		EMS2-DO-T-9-SWD¹⁾ 192387	
EMERGENCY STOP via additional enabling terminal to SIL3/Ple.				  EMS2-DOS-T-9-SWD^{2) 3) 4)} 192389	

Reversing starter

Motor protection
Switching principle: safety output stage with bypass, three-phase switch-off.
For connection to SmartWire-DT for extended diagnostics. Motor current additionally adjustable via SmartWire-DT.

	0.06 - 1.1	0.18 - 3	Push-in-terminal	EMS2-RO-T-3-SWD¹⁾ 192384	
EMERGENCY STOP via additional enabling terminal to SIL3/Ple.				  EMS2-ROS-T-3-SWD^{2) 3) 4)} 192386	
EMERGENCY STOP via additional enabling terminal to SIL3/Ple.	0.55 - 3	1.5 - 7 (AC-53a) 9 (AC-51)		EMS2-RO-T-9-SWD¹⁾ 192388	
				  EMS2-ROS-T-9-SWD^{2) 3) 4)} 192390	

Reversing starter with integrated short-circuit fuse

Motor protection
Switching principle: safety output stage with bypass, three-phase switch-off. For mounting on the feeder system

	0.06 - 1.1	0.18 - 3	Screw - terminals	  EMS2-ROSF-Z-3-24VDC^{1) 2) 3)} 192399
EMERGENCY STOP via additional enabling terminal to SIL3/Ple.	0.55 - 3	1.5 - 7 (AC-53a) 9 (AC-51)		  EMS2-ROSF-Z-9-24VDC^{1) 2) 3)} 192400

Notes

- ¹⁾ Explosion protection (according to ATEX 94/9/EG)
II (2) G [Ex db] [Ex eb] [Ex pxb]
II (2) D [Ex tb] [Ex pb]
²⁾ EG-Type-examination certificate
PTB 13 ATEX 3000

Information relevant for export to North America

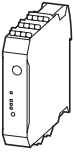
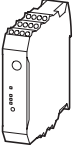
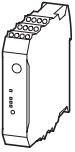


→ Go to online catalog

Function	Rated operational output AC-53a 380 V 400 V 415 V P kW	Adjustment range overload release I_r A	Technical connection	Actuating voltage 24 V DC	Actuating voltage 230 V AC
				Type Article-No.	Type Article-No.

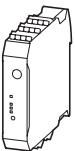
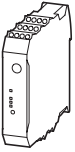
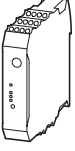
Direct starter

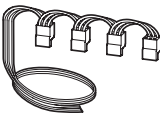
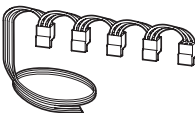
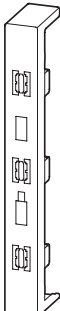
Motor protection
Switching principle: safety output stage with bypass, three-phase switch-off.

		0.06 - 0.75	0.18 - 2.4	Push-in terminals	EMS2-DO-T-2,4-24VDC⁽¹⁾ 192391	
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.	0.06 - 1.1	0.18 - 3		ATEX EMS2-DOS-T-3-24VDC^(1) 2) 3) 192393	
		0.55 - 3	1.5 - 6.5 (AC-53a) 9 (AC-51)		EMS2-DO-T-9-24VDC⁽¹⁾ 192395	
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.		1.5 - 7 (AC-53a) 9 (AC-51)		ATEX EMS2-DOS-T-9-24VDC^(1) 2) 3) 192397	
		0.06 - 0.75	0.18 - 2.4	Screw terminals	EMS2-DO-Z-2,4-24VDC⁽¹⁾ 197160	EMS2-DO-Z-2,4-230VAC⁽¹⁾ 197168
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.	0.06 - 1.1	0.18 - 3		ATEX EMS2-DOS-Z-3-24VDC^(1) 2) 3) 197162	
		0.55 - 3	1.5 - 6.5 (AC-53a) 9 (AC-51)		EMS2-DO-Z-9-24VDC⁽¹⁾ 197164	EMS2-DO-Z-9-230VAC⁽¹⁾ 197170
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.		1.5 - 7 (AC-53a) 9 (AC-51)		ATEX EMS2-DOS-Z-9-24VDC^(1) 2) 3) 197166	

Reversing starter

Motor protection
Switching principle: safety output stage with bypass, three-phase switch-off.

		0.06 - 0.75	0.18 - 2.4	Push-in terminals	EMS2-RO-T-2,4-24VDC⁽¹⁾ 192392	
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.	0.06 - 1.1	0.18 - 3		ATEX EMS2-ROS-T-3-24VDC^(1) 2) 3) 192394	
		0.55 - 3	1.5 - 6.5 (AC-53a) 9 (AC-51)		EMS2-RO-T-9-24VDC⁽¹⁾ 192396	
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.		1.5 - 7 (AC-53a) 9 (AC-51)		ATEX EMS2-ROS-T-9-24VDC^(1) 2) 3) 192398	
		0.06 - 0.75	0.18 - 2.4	Screw terminals	EMS2-RO-Z-2,4-24VDC⁽¹⁾ 197161	EMS2-RO-Z-2,4-230VAC⁽¹⁾ 197169
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.	0.06 - 1.1	0.18 - 3		ATEX EMS2-ROS-Z-3-24VDC^(1) 2) 3) 197163	
		0.55 - 3	1.5 - 6.5 (AC-53a) 9 (AC-51)		EMS2-RO-Z-9-24VDC⁽¹⁾ 197165	EMS2-RO-Z-9-230VAC⁽¹⁾ 197171
	EMERGENCY STOP via additional Release terminal up to SIL3/Plc.		1.5 - 7 (AC-53a) 9 (AC-51)		ATEX EMS2-ROS-Z-9-24VDC^(1) 2) 3) 197167	

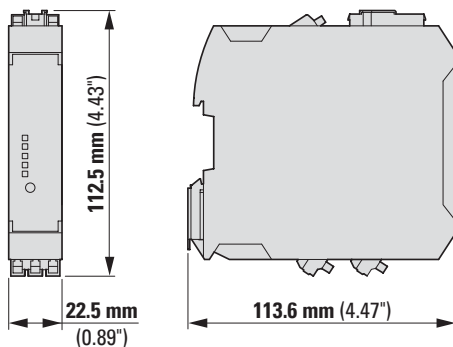
	Pole	Number of devices	Conductor cross-section mm ²	Suitable for	Type Article-No.			
Three-phase connector with plug								
	3	2	2.5	EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-2¹⁾ 197172			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-2 197176 ¹⁾			
				EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-3¹⁾ 197173			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-3¹⁾ 197177			
	3	3		EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-3¹⁾ 197173			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-3¹⁾ 197177			
				EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-4¹⁾ 197174			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-4¹⁾ 197178			
	3	4		EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-4¹⁾ 197174			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-4¹⁾ 197178			
				EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-5¹⁾ 197175			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-5¹⁾ 197179			
	3	5		EMS2-D-Z... EMS2-R-Z...	EMS2-XBR-Z-5¹⁾ 197175			
				EMS2-D-T... EMS2-D-T...-SWD... EMS2-R-T... EMS2-R-T...-SWD...	EMS2-XBR-T-5¹⁾ 197179			
				Adapter				
				Mounting rail adaptor				
	3	1	—	EMS2-ROSF-...	EMS2-XTH¹⁾ 192401			
	busbar adapter for mounting on CU flat rails with 60 mm rail centre distance							
	3	1	—		EMS2-XBB-60¹⁾ 192408			

Dimensions

Direct starter EMS2-D0, Reversing starter EMS2-R0

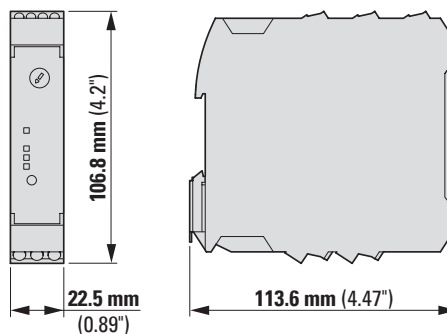
EMS2-D(R)0-...-SWD

EMS2-D(R)0S-...-SWD



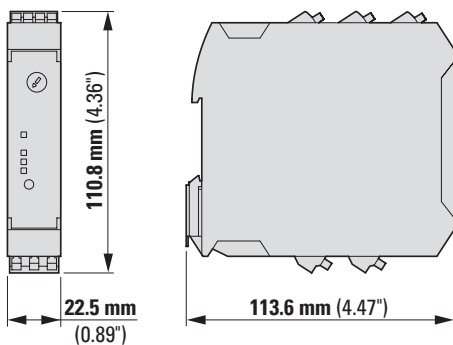
EMS2-D(R)0-Z...

EMS2-D(R)0S-Z...

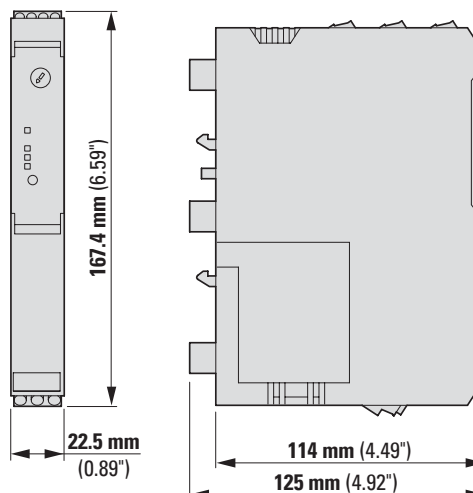


EMS2-D(R)0-T...

EMS2-D(R)0S-T...

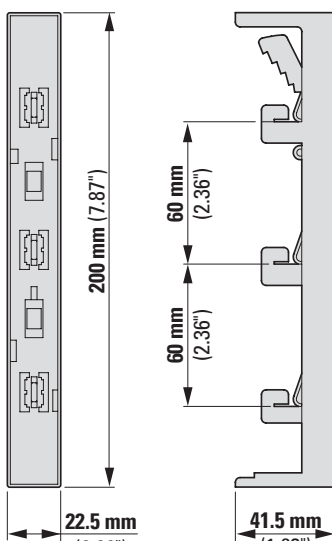


EMS2-R0SF...

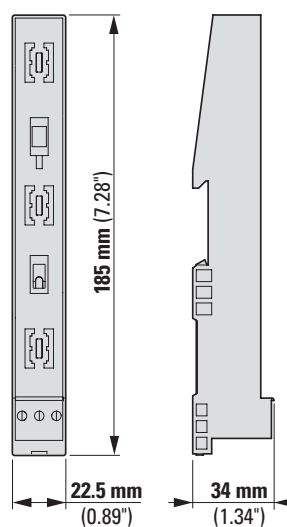


Additional equipment EMS2-X

EMS2-XBB-60



EMS2-XTH



Eaton is a power management company with 2018 sales of \$21.6 billion. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is dedicated to improving the quality of life and the environment through the use of power management technologies and services.

Eaton has approximately 99,000 employees and sells products to customers in more than 175 countries. For more information, visit Eaton.com.



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