System pro *M* compact®

Motor operating devices and auto-reclosing units for circuit breakers

2CSC400013B0201

S2C-CM and F2C-CM motor operating devices and F2C-ARI auto-reclosing unit: first class performance and functionality

With ABB's new range of motor operating devices it is now possible to open and close by remote control System pro M compact miniature circuit breakers of S200 series up to 63 A and all residual current circuit breakers of F200 series up to 100 A.
ABB's new S2C-CM and F2C-CM motor operating devices are especially suitable for use in centralized, large-scale plants or plants with difficult access, and where many operations per day are required for powering and switching off lines, for example: power lines of unmanned stations, security systems (detectors and alarms), central lighting commands, etc.
For System pro M compact residual current circuit breakers, the F2C-ARI auto-reclosing unit is also available. The F2C-ARI enables automatic reclosing of the circuit breaker in case of nuisance tripping (for example due to overvoltages generated by lightings). The F2C-ARI auto-reclosing unit is particularly suitable for use in electricity stations located in areas that are difficult to access and unmanned stations, where a high level of service availability is required (mobile phone and television repeater stations, traffic and signalling control, pumping and irrigation stations, refrigeration and cool rooms, public lighting, etc.).

- Simple and safe assembly by the installers.
  The devices are assembled by means of two plastic hooks, tightened by two screws.

- They can be supplied with alternating current (12-30 V AC with direct connection and 230 V AC with safety transformer) and direct current (12-48 V DC with direct connection).
  When powered by direct current, there are no polarity restrictions.

- Overall dimensions reduced to two modules if powered directly at 12-30 V AC and 12-48 V DC. Dimensions are also limited if powered at 230 V AC with safety transformer, even if not modular.

- Reduced power consumption with the possibility to power several devices by mean of single safety transformers.
- Simplified wiring due to two push-fit withdrawable terminal blocks.

- Command circuit powered by the device itself (+5 V DC): the command contacts are clean and guarantee the operation in complete safety, even at extended distances.
- Integrated safety logic with an internal reserve charge that, if there is a failure in the power circuit supplying the motorised command or auto-reclosing device during the operation, causes the associated circuit breaker to open.
- Increased insensitivity to disturbances in the command circuit, due to the preset 100 ms activation delay in the device logic.
- The residual current protection with a remote resetting function can be implemented by assembling a residual current circuit breaker with an F2C-CM motor operating device or with an F2C-ARI auto-reclosing unit. To combine residual current, short circuit and overload protection with the remote resetting function, it is necessary to install a residual current monitor with a separate toroidal transformer that commands a shunt trip mounted on the left side of the miniature circuit breaker.

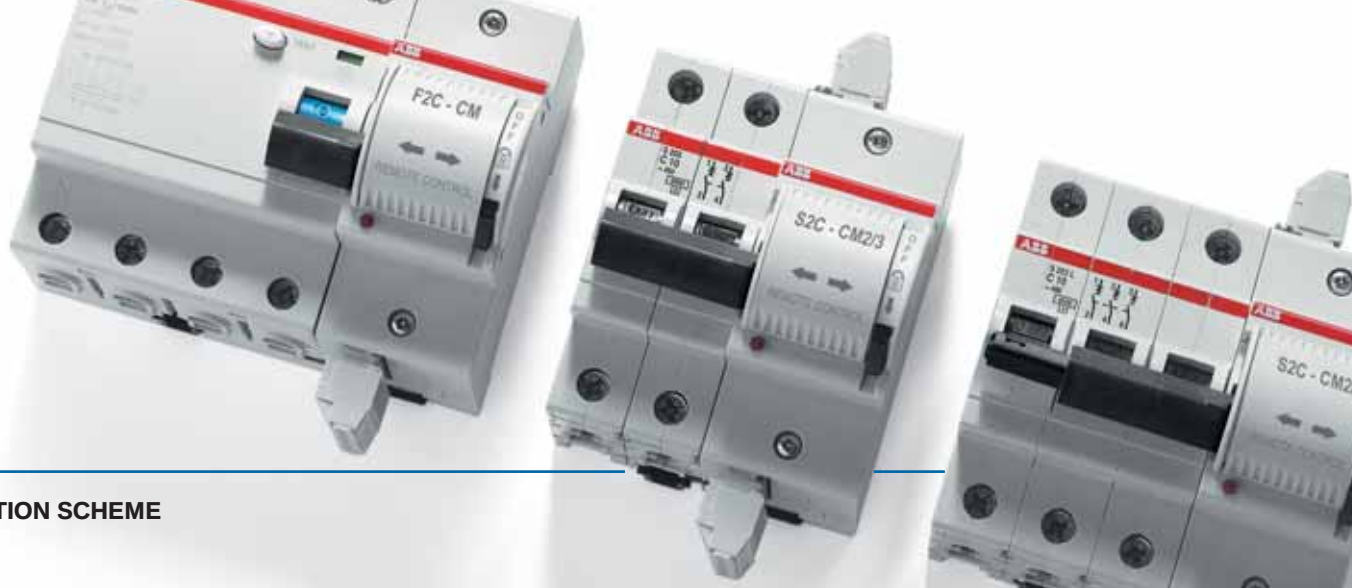
S2C-CM and F2C-CM motor operating devices
Specific features

- On the front of the device there is a moveable element for allowing or locking out remote commands. This element may be used when performing maintenance with the circuit breaker in the OFF position, in order to avoid remote-activated closing operations.

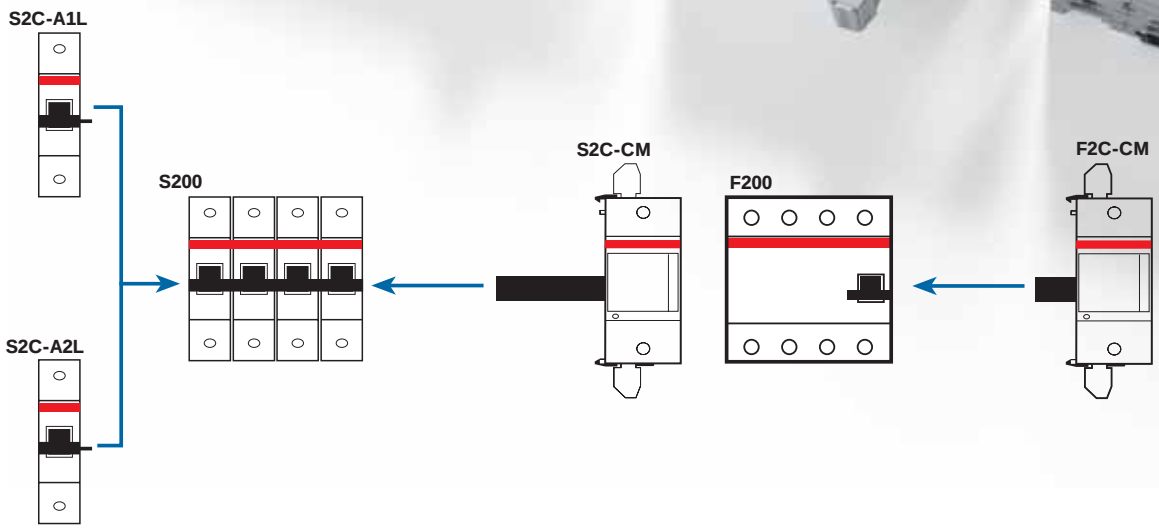
- With remote commands locked out and the circuit breaker open, the device may be physically locked by threading a padlock through the withdrawable element on the front. In this way operation of the motorised command, both remotely and manually, is prevented.

- The operation can be performed via an impulse command or a maintained command. Manual operation is performed by moving the motorised command lever which, in the absence of an operation, allows the circuit breaker lever to be freely moved.

- The lower section of the device contains an integrated 1NO+1NC auxiliary change-over contact, which indicates the position of the contacts of the associated circuit breaker.
- The upper section of the device contains an integrated 1NO+1NC signal change-over contact, which signals the intervention of the associated circuit breaker.
- The red LED on the front of the device gives a local visual indication of the intervention of the associated device.



COMBINATION SCHEME



S2C-CM / F2C-CM TECHNICAL SPECIFICATIONS

Supply voltage		12 … 30 V AC +10% - 15% (50-60 Hz); 12 … 48 V DC +10% - 15%
Insulation voltage		2500 V for 1 minute
Power consumption	12 V AC	< 15 VA
	24 V AC	< 22 VA
	30 V AC	< 25 VA
	12 … 48 V DC	< 20 VA
Power consumption at rest		≤ 1,5 VA
Remote command (*)		via free voltage contacts
Closing time at ambient temperature		≤ 1 second
Opening time at ambient temperature		≤ 0,5 seconds
Delay time for remote resetting after opening due to fault		8 seconds
Number of operations		≤ 20,000
Operating temperature		- 25 … + 55 °C
Storage temperature		- 40 ... + 70 °C
Fixing		on EN 60715 rails (35 mm) with rapid fixing system
Protection degree (EN 60529)		terminals: IP2X housing: IP4X
Cables length of control circuit		≤ 1500 m
Cable cross-section		≤ 2.5 mm^2
Signal contact (terminals 3, 4, 5) Rated current		1NO+1NC change-over 5 A (250 V AC), resistive load
Auxiliary contact (terminals 6, 7, 8) Rated current		1NO+1NC change-over 3 A (250V AC), resistive load
Command terminals		terminal 9 = closing contact
		terminal 10 = opening contact
		terminal 11 = common reference for control contacts, +5 V DC (supplied by motor operating device)

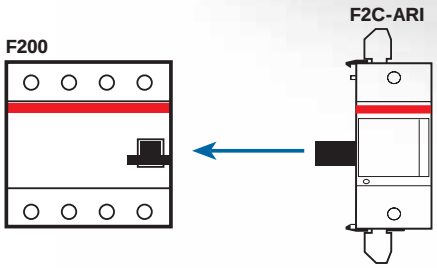
(*) 1) After powering up the device, wait 5 seconds before activating the command functions.
2) After opening due to a fault, wait 8 seconds before performing the remote resetting.

F2C-ARI auto-reclosing unit
Specific features

- The F2C-ARI auto-reclosing device, installed to the right side of the residual current circuit breakers, automatically performs three reclosing attempts in the event of a fault. If the result of the three reclosing attempts is negative, the device enters a locked state, signalling the failure of the resetting attempt via the 1NO+1NC signal change-over contact and via the LED on the front of the device.
- The luminous two-colour red/green LED shows the operating state of the auto-reclosing device.
  - Blinking green LED: this is displayed for five seconds after the device is powered up. When the LED stops blinking, the device is ready to operate.
  - Steady green LED: the remote control is activated and the device is powered.
  - LED is off: no power supply.
  - Blinking red LED: reclosing cycle in progress.
  - Steady red LED: the remote control is excluded on the device or is in a locked state following three unsuccessful reclosing attempts, or as a result of a remote opening command.
- The lower section of the device contains an integrated 1NO+1NC auxiliary change-over contact, which indicates the position of the contacts of the associated circuit breaker.
- The locked state can be reset:
  - locally, by manually moving the mobile element on the front of the device to the OFF position and subsequently to the ON position. The device will reset and automatically reclose the circuit breaker;
  - remotely, by means of a close command (NO contact) which resets the device and close the circuit breaker.

  Using both of the resetting methods, the cycle of three reclosing attempts can be repeated.
- The associated residual current circuit breaker can be remotely opened via a command with the NO contact. The remote open command locks out the resetting logic and brings the auto-reclosing device into a locked state.
- Operation of the close/reset and open commands can be performed via an impulse command or a maintained command.
- Remote commands and reclosing logic may be deactivated locally by means of the mobile element on the front of the device. This is desirable during maintenance interventions with the circuit breaker in the OFF position, in order to avoid remote-activated closing operations or automatic reclosing. In this case, with the selector and the circuit breaker in the OFF position, the device may be physically locked by threading a padlock through the withdrawable element on the front.

COMBINATION SCHEME



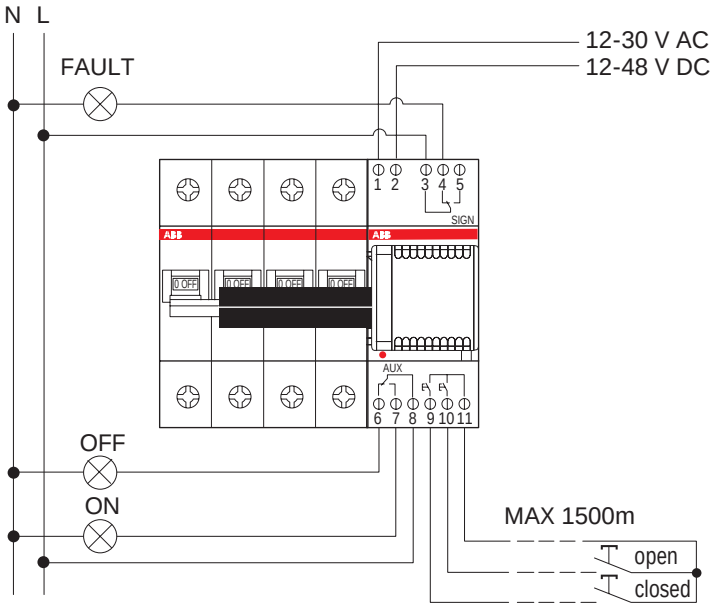
F2C-ARI TECHNICAL SPECIFICATIONS

Supply voltage		12 ... 30 V AC +10% - 15% (50-60 Hz); 12 ... 48 V DC +10% - 15%
Number of automatic reclosing attempts		3
Counter reset time		16 seconds
Insulation voltage		2500 V for 1 minute
Power consumption	12 V AC	< 15 VA
	24 V AC	< 22 VA
	30 V AC	< 25 VA
	12 ... 48 V DC	< 20 VA
Power consumption at rest		≤ 1,5 VA
Delay time for activation of automatic reclosing		3 seconds
Reclosing time at ambient temperature		≤ 1 second
Opening time at ambient temperature		≤ 0,5 seconds
Number of operations		≤ 20,000
Operating temperature		- 25 ... + 55 °C
Storage temperature		- 40 ... + 70 °C
Fixing		on EN 60715 rails (35 mm) with rapid fixing system
Protection degree (EN 60529)		terminals: IP2X housing: IP4X
Cables length of control circuit		≤ 1500 m
Cable cross-section		≤ 2.5 mm^2
Contact for signalling the locked state after the three set reclosing attempts (terminals 3, 4, 5) Rated current		1NO+1NC change-over 5 A (250 V AC), resistive load
Auxiliary contact (terminals 6, 7, 8) Rated current		1NO+1NC change-over 3 A (250V AC), resistive load
Remote command (*)		via dry contacts
Command terminals		terminal 9 = contact for closing and for remote reset of locked state
		terminal 10 = opening contact
		terminal 11 = common reference for control contacts, +5 V DC (supplied by motor operating device)

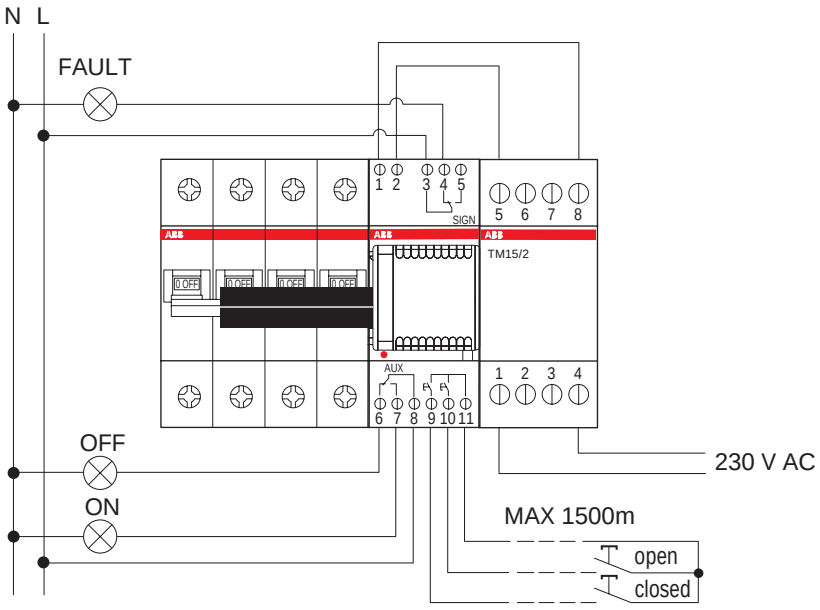
(*) After powering up the device, wait 5 seconds before activating the command functions.

Wiring diagrams for S2C-CM and F2C-CM motor operating devices

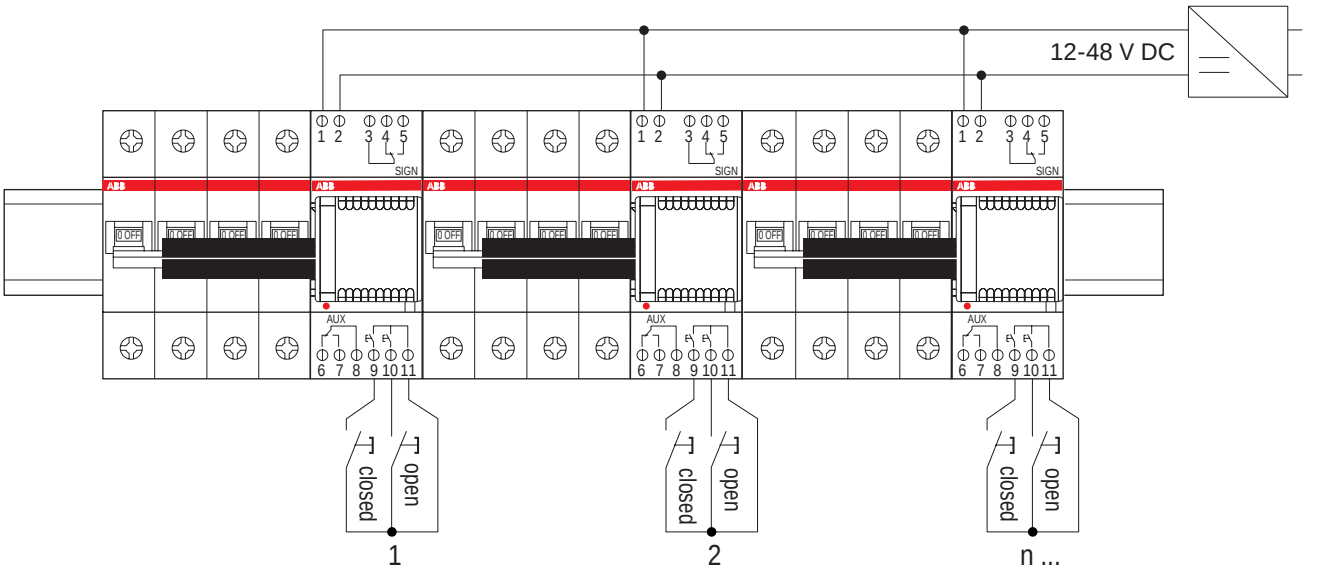
Low voltage use: 12...30 V AC, 12...48 V DC



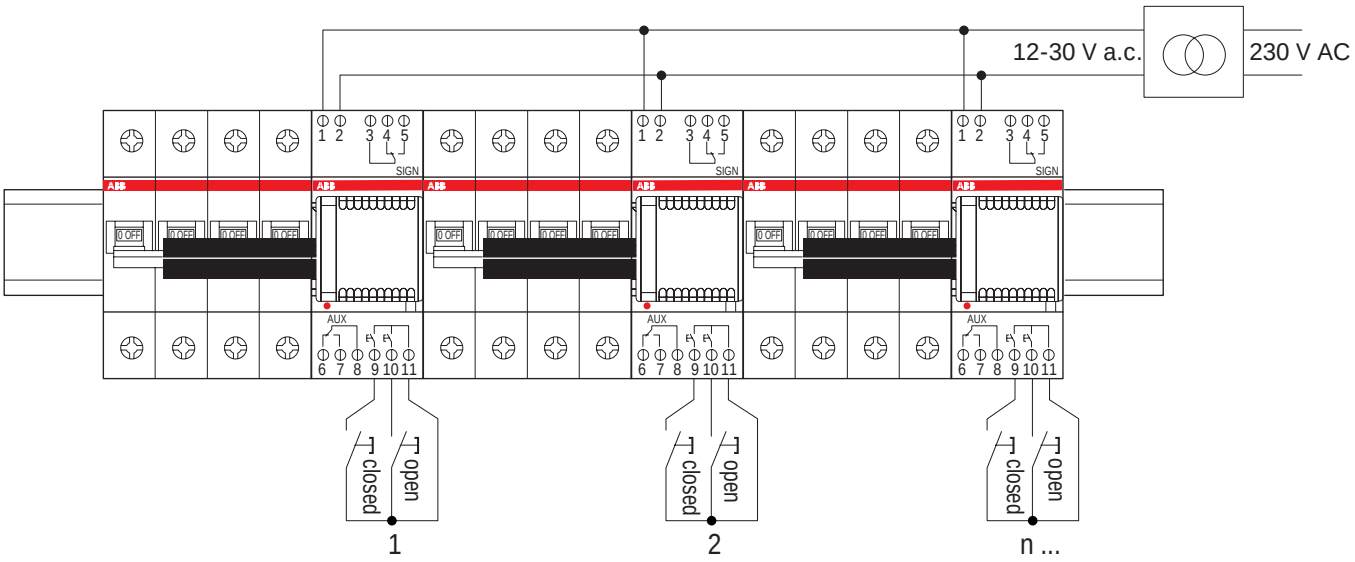
Use at 230 V AC via a TM15/12 bell transformer



Low voltage use of several motor operating devices: 12...30 V AC, 12...48 V DC

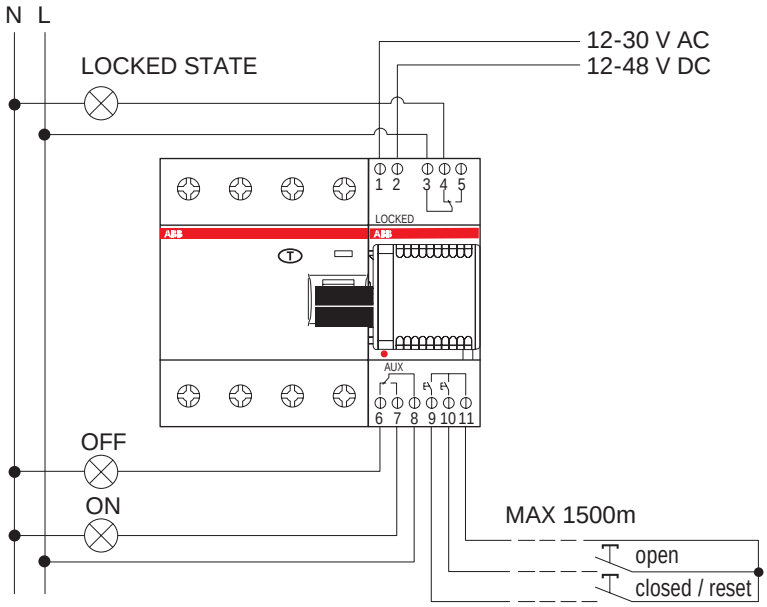


Use of several motor operating devices at 230 V AC via a single safety transformer

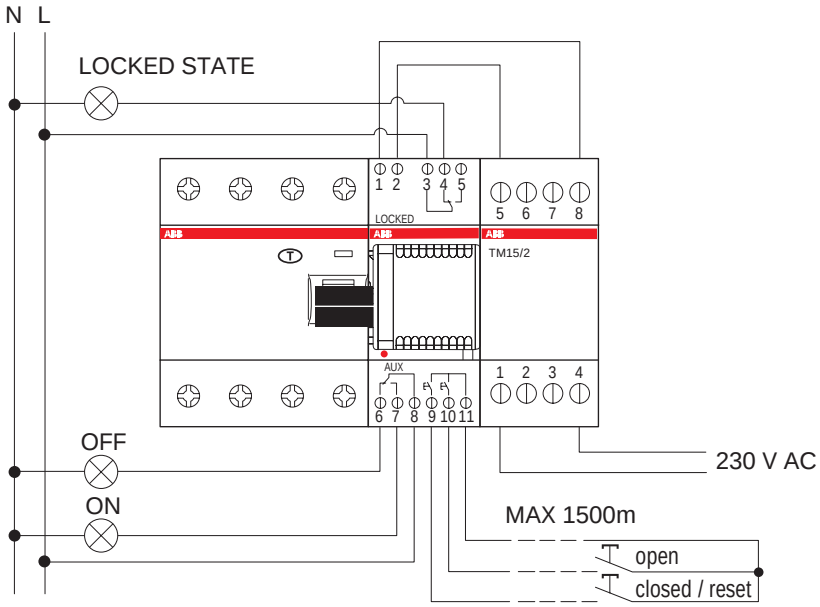


Wiring diagrams for F2C-ARI auto-reclosing unit

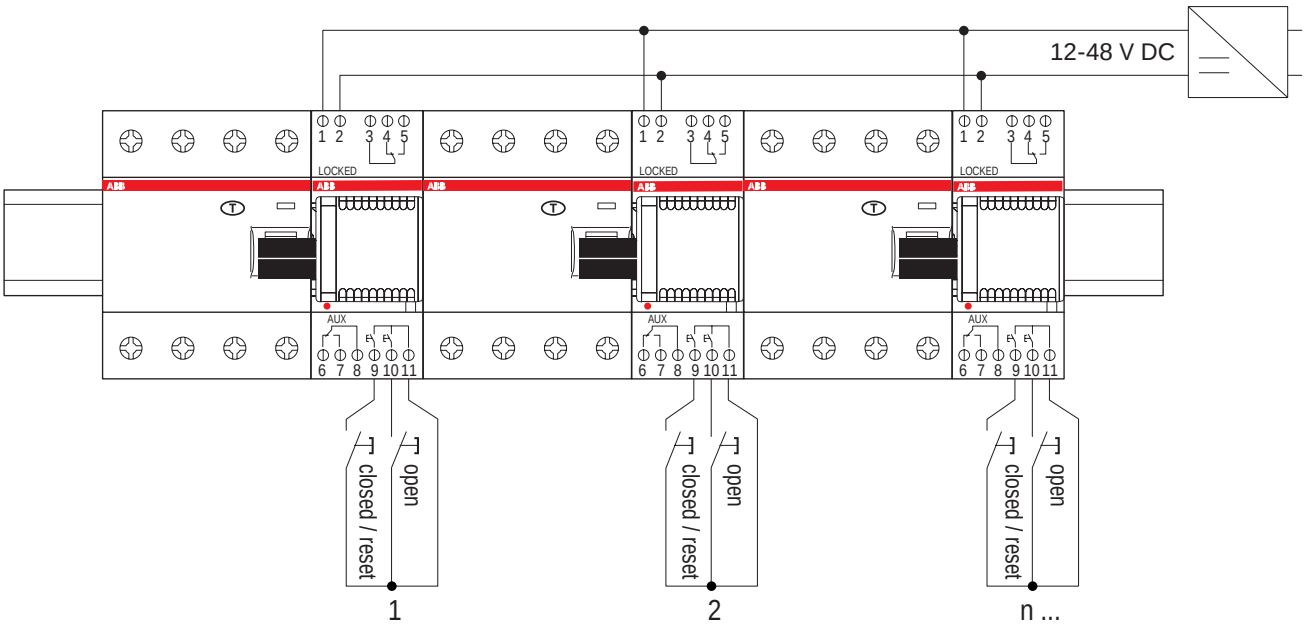
Low voltage use: 12...30 V AC, 12...48 V DC



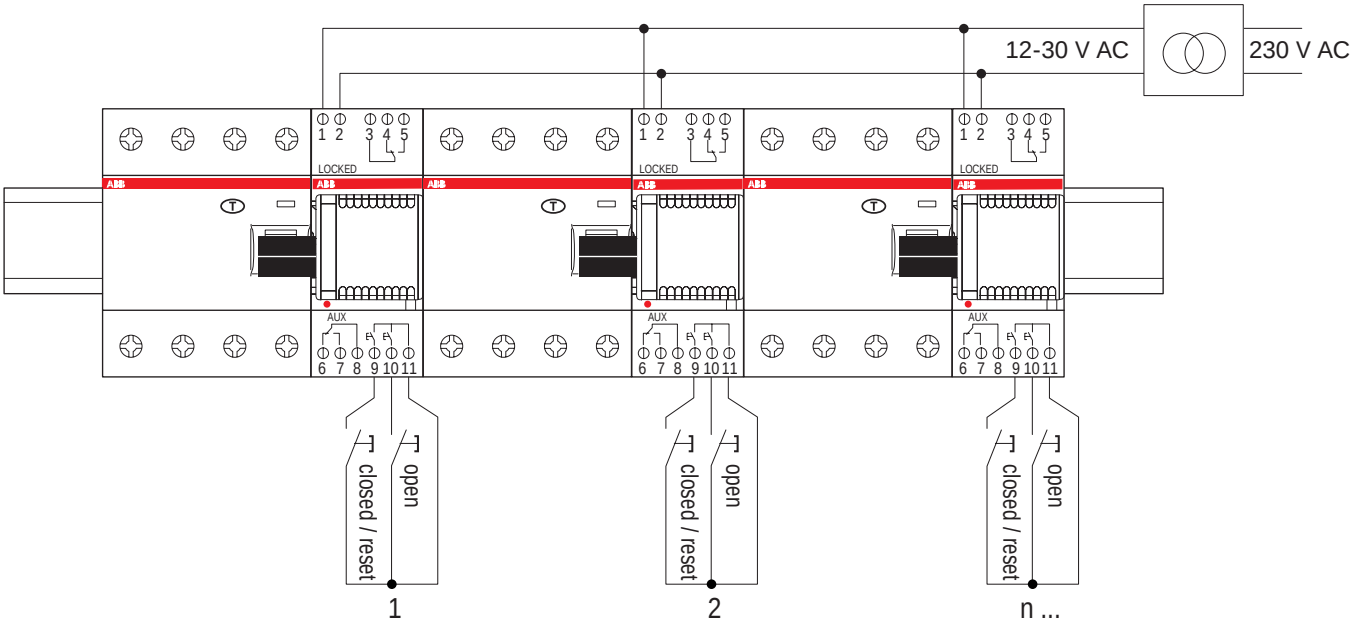
Use at 230 V AC via a TM15/12 bell transformer



Low voltage use of several auto-reclosing units: 12-30 V AC, 12-48 V DC



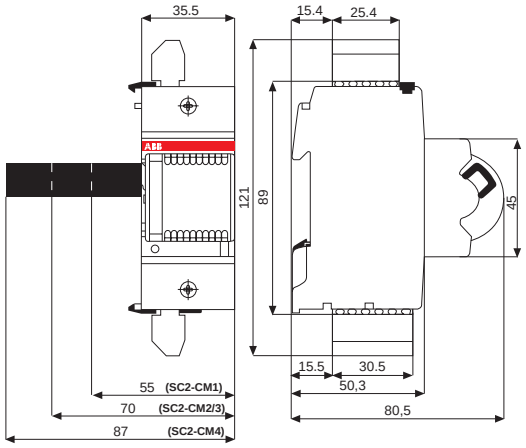
Use of several auto-reclosing units at 230 V AC via a single transformer



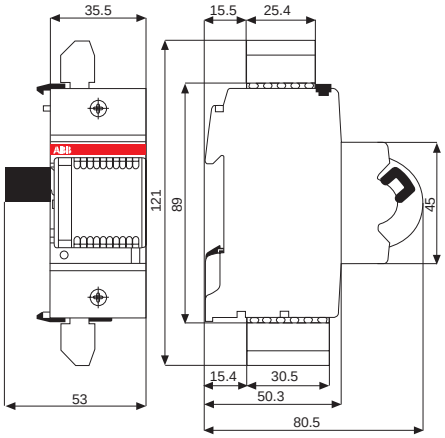
Order codes

Description	Type	ABB code
Motor operating devices and auto-reclosing unit		
Motor operating device for 1P S200 System pro *M* compact miniature circuit breakers	S2C-CM1	2CSS201997R0013
Motor operating device for 2P and 3P S200 System pro *M* compact miniature circuit breakers	S2C-CM2/3	2CSS203997R0013
Motor operating device for 4P S200 System pro *M* compact miniature circuit breakers	S2C-CM4	2CSS204997R0013
Motor operating device for 2P and 4P F200 System pro *M* compact residual current circuit breakers	F2C-CM	2CSF200997R0013
Auto-reclosing unit for 2P and 4P F200 System pro *M* compact residual current circuit breakers	F2C-ARI	2CSF200996R0013
Shunt trips to be mounted to left side of System pro *M* compact S200 miniature circuit breakers		
12-60 V AC/DC shunt trip mountable to left side of System pro *M* compact S200 miniature circuit breakers	S2C-A1L	2CDS200907R0001
110-415 V AC/110-250 V DC shunt trip mountable to left side of System pro *M* compact S200 miniature circuit breakers	S2C-A2L	2CDS200907R0002

S2C-CM overall dimensions



F2C-ARI, F2C-CM overall dimensions



Due to possible developments of standards as well as of materials, the characteristics and dimensions specified in the present document may only be considered binding after confirmation by ABB SACE.

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