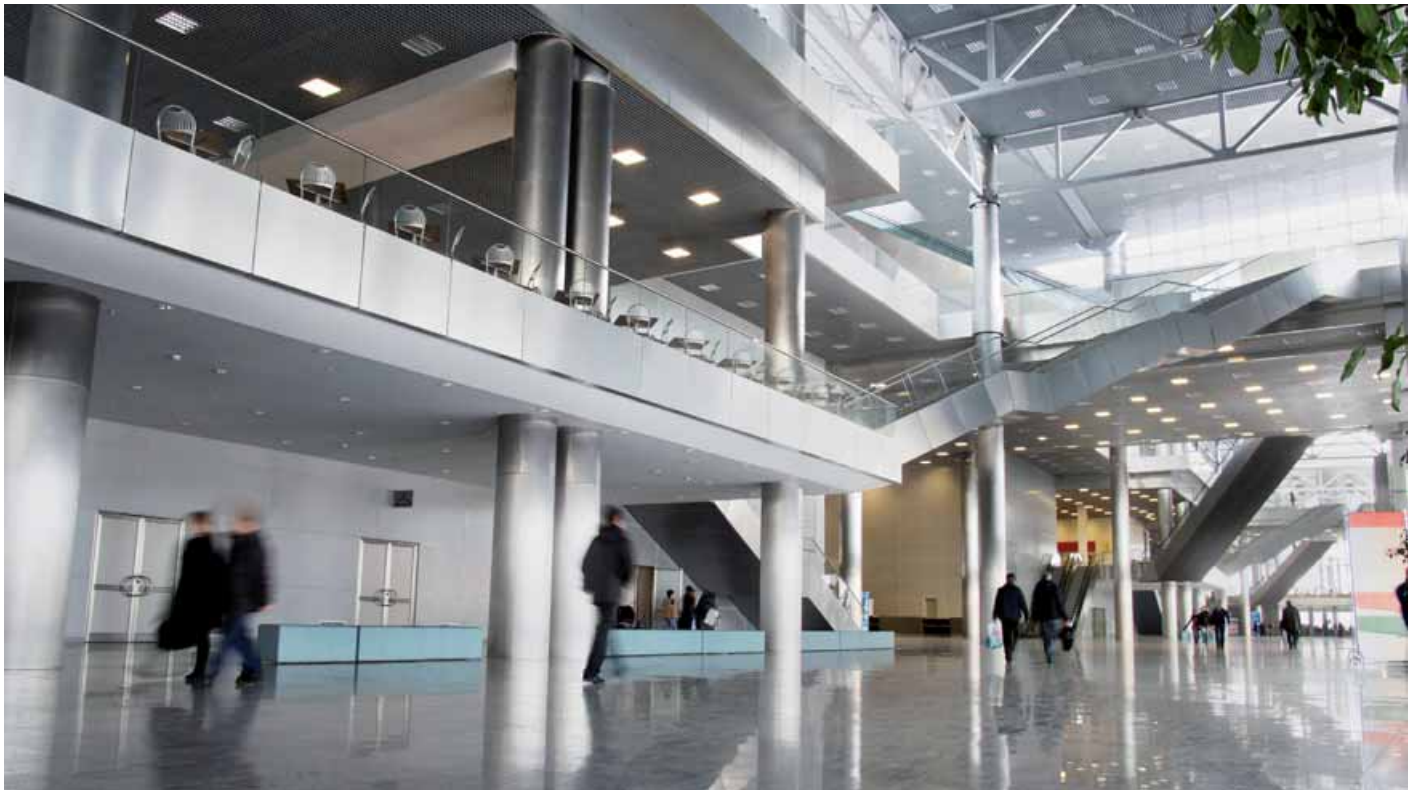
The emergency stop according to ABB

The emergency stop device is used to interrupt a system's power supply safely and immediately. Its functioning, which must be guaranteed for the system entire life, must never allow the unexpected. There are several technical solutions for triggering an emergency shut off: here we will discover their advantages and disadvantages and illustrate the solution patented by ABB for this specific application.

Monica Meda: *Product Manager - DIN-Rail products*

The DDA 203 A AE residual current block



A reliable emergency circuit? With positive safety!

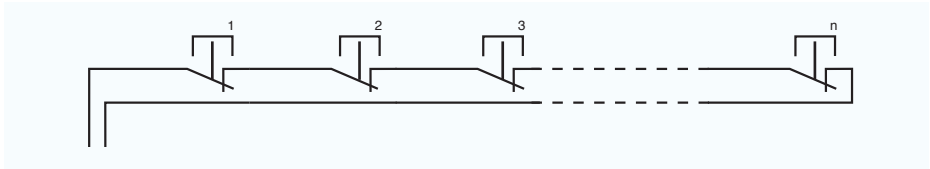
An emergency circuit typically has one or more buttons of the “normally closed” type connected in series in a full circlip. Each button is accompanied by a light indicator that signals correct operation when voltage is present.

This safety circuit is known as a “positive safety circuit” because an accidental breakage in the circuit is equivalent to operating an emergency control button. Power can be restored only when the emergency circuit has been repaired: this way the detection of the emergency signal is fully reliable.

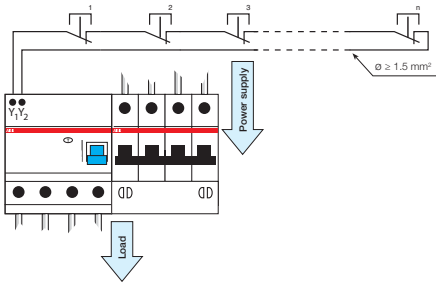
The circuit opens - with a simple touch!

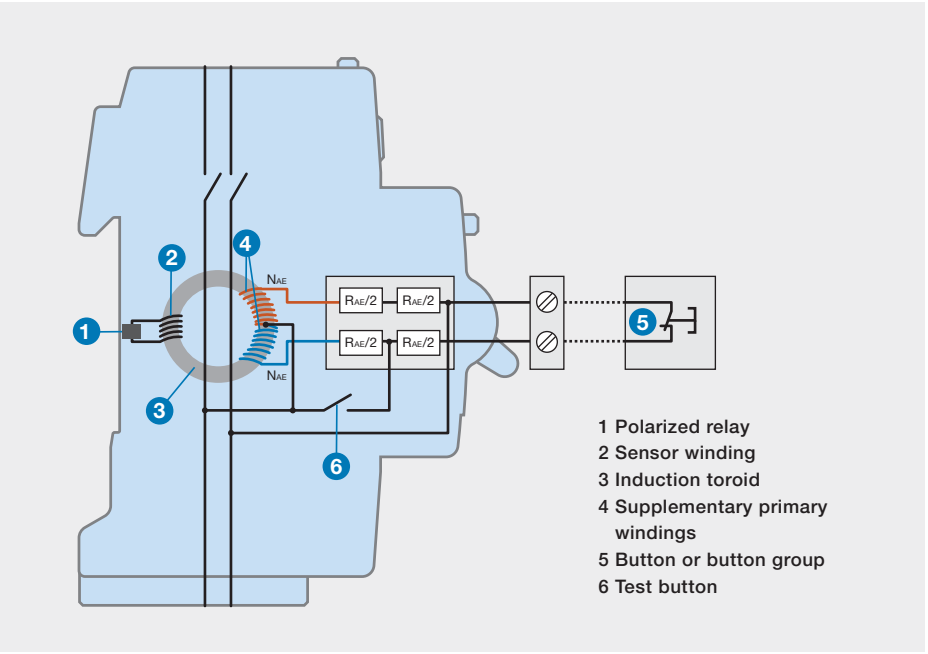
There are different methods for opening an electrical circuit remotely:

– with a shunt-trip coil. The shunt-trip coil is used to command the circuit opening at the push of a button. Its operating mode, however (releases when powered), prevents its use for the construction of positive safety emergency circuits.
– with an undervoltage release. This type of device allows construction of a positive safety emergency circuit thanks to the opening of the circuit in case of supply voltage failure, whether due to pressure on a button or to the emergency circuit damages. However, the release permanent consumption (approximately 3 Watts) and the automatic circuit opening in case of supply voltage failure (including micro-interruptions) inspired ABB to develop an innovative solution to ensure the highest level of service and energy savings.

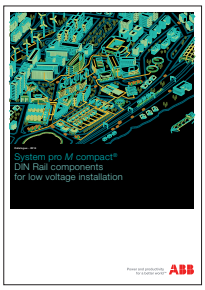


Positive safety emergency circuit

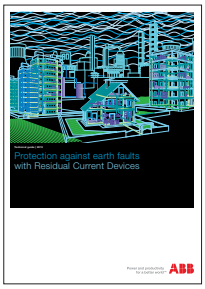




1 Polarized relay
2 Sensor winding
3 Induction toroid
4 Supplementary primary windings
5 Button or button group
6 Test button



For more information, please consult or download the System Pro *M* compact® catalog
Code: 2CSC400002D0211



Please consult the Guide Protection against ground fault current with residual current circuit breakers
Code: 2CSC420004B0201

Monica Meda
Product Manager - DIN-Rail products

DDA 200 AE, the emergency stop according to ABB

The residual current block DDA 200 AE Series combines the features of the residual current block and a positive safety emergency shut off with no additional accessories and a compact size.

The safety circuit wiring is very easy. Just connect it to Y1 and Y2 terminals in the upper-left corner of the product. Easier, safer!

An ABB patented operating principle

The residual current transformer is integrated with two primary circuits powered with the same voltage and having the same resistance; therefore, under normal conditions the same current would flow through, but since they are wound by the same number of coils in opposite directions they cancel each other out and do not produce any flow.

One of these two windings is also the remote control circuit: the emergency stop is obtained by interrupting the passage of current in this circuit. This clearly demonstrates the positive safety aspect: an accidental circuit breakage is equivalent to pressing an emergency actuator button.

Suitable for a variety of applications

The use of DDA AE blocks complies with the requirements of the IEC 60364-8 Standard; they are therefore suitable, among others, for escalators, lifts, hoists, electric entry barriers, machine tools, car wash equipment and conveyor belts.

The DDA 200 AE Series residual current blocks can be used in conjunction with the full range of the S 200 Series: the rated current up to 63A, the 2-3-4 pole versions and the sensitivity from 30 mA to 1A cover all applications.

Advantages

Compared to the devices commonly used in emergency circuits, the DDA AE blocks offer the following advantages:

– positive safety emergency shut off.
– continuity of service thanks to the absence of unwanted tripping if there is a reduction or temporary interruption of the mains voltage or of manual power supply shut off.
– no additional energy consumption.
– immediate and full operation even after long periods of system service shut down.