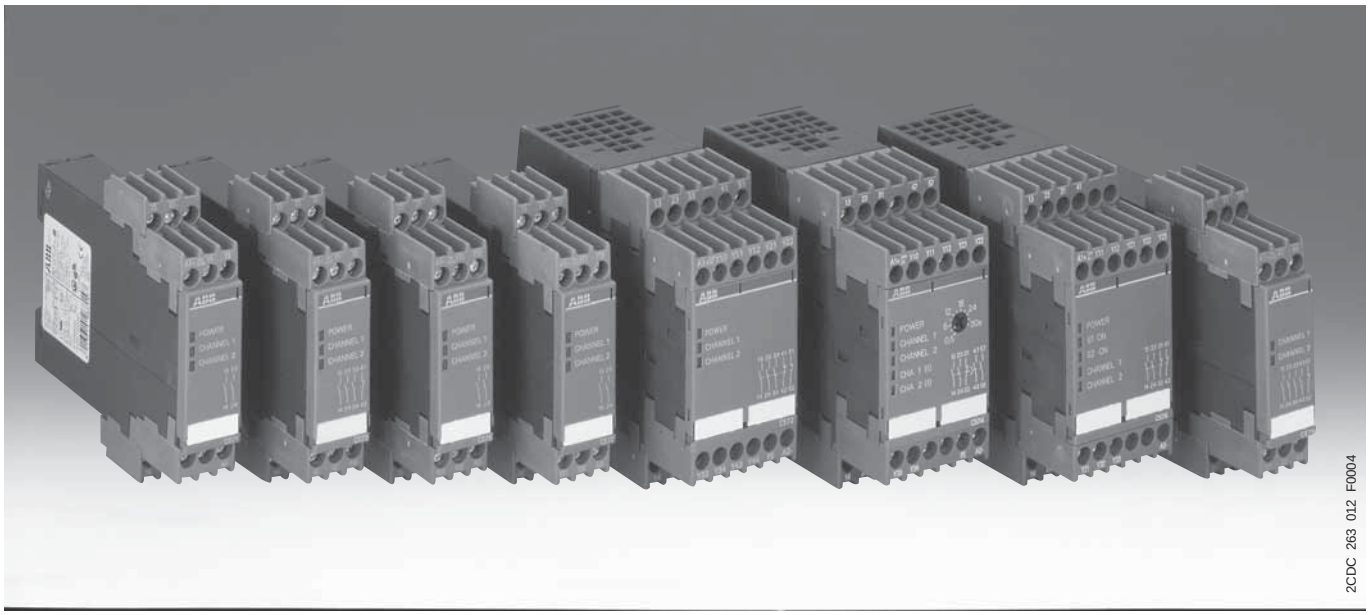
Safety relays
C57x and C67xx range

Content

Safety relays
C57x range
Selection table



Type		C571	C573	C576	C577	C572	C574	C575	C579
Function	EMERGENCY STOP	■ 5)	■ 5)	■ 5)	■	■	■ 5)	-	-
	Safety gate monitoring	■	■	■	■ 6)	■	■ 6)	-	-
	Press control	-	-	-	-	-	-	■	-
	Cross circuit detection	-	-	■	■	■	■	■	-
Safety categorie	B	■	■	■	■	■	■	■	■ 4)
acc. to EN 954-1 1)	1	■	■	■	■	■	■	■	■ 4)
	2	■	■	■	■	■	■	■	■ 4)
	3	■	■	■	■	■	■	■	■ 4)
	4	■ 1)	■ 1)	■	■	■	■ 3)	■ 7)	■ 4)
Connection	single channel	■	■	-	-	■	■	-	-
	two channel	-	-	■	■	■	■	■	-
Enabling circuits undelayed		2 n/o	3 n/o	2 n/o	2 n/o	3 n/o	2 n/o	2 n/o	4 n/o
Enabling circuits delayed		-	-	-	-	-	2 n/o	-	-
Signaling circuits		-	1 n/c	-	-	2 n/c	1 n/c	2 n/c	-
Start	automatic	■	■	■	-	■	■, -	-	-
	monitored	-	-	-	■	■	■, -	-	-

Approvals (not for C579), , , SUVA, C-Tick (under preperation)

1) Possible with additional external measures. The figures apply only if the cables and sensors are laid safely and protected mechanically. See also user manual and application manual.
2) The maximum safety category acc. EN 954-1, which can be reached, depends essentially on the external wiring, the choice of the sensors and the position of the machine. The nominal regulations for the safety at machines have to be observed.
3) Possible with undelayed enable contact.
4) The safety category acc. to EN 954-1 corresponds to those of the basic unit.
5) The ON-button is not monitored. Valid only for C574 devices with auto-start.
6) With monitored ON-button possible. Valid only for C574 devices with monitored start.
7) Acc. to EN 574, type III C.

Safety relays with solid-state outputs
C67xx range
Selection table

Type		C6700	C6701	C6702
Function	EMERGENCY-STOP	■	■	■
	Safety gate monitoring	■	■	■
	Press control	-	-	-
	Tread mats	-	■	■
	Electronic sensors	-	■	■
	Cascade input 24 V DC	-	1	1
	Cross short-circuit detection	■	■	■
Safety categorie	B	■	■	■
acc. to EN 954-1 [1]	1	■	■	■
	2	■	■	■
	3	■	■	■
	4	-	■	■
Connection	single channel	■	■	■
	two channel	■	■	■
	Enabling circuits Stop-Cat. 0	2 n/o [2]	2 n/o	1 n/o
	Enabling circuits Stop-Cat. 1	-	-	1 n/o
	Signaling circuits [1]	-	-	-
Start	automatic	■	■	■
	monitored	■	■	■

Approvals TÜV, , , SUVA

[1] One safety circuit can be used as signaling circuit.
[2] The outputs are only safe in connection with an external contactor.

Safety for man and machine

Machinery Directive 98/37/EEC

The Machinery Directive 98/37/EEC is valid throughout Europe. This Directive obliges the machine manufacturer to guarantee, by attaching the CE mark, that all European Standards relevant to this machine type have been observed.
The CE mark is attached by the manufacturer at his responsibility. No machine may be put into circulation or marketed without this CE mark.

Safety circuits must meet the following requirements depending on the safety categorie acc, to EN 954-1:

- Coping with an individual fault including all sequential faults in the control circuit (single-fault tolerance).
- Prevention of automatic restart of the machine when the EMERGENCY STOP facility is reset.
- Setting up a redundant circuit by at least two contactor relays.
- Creating diversity, e. g. by combining n/c and n/o contacts of the auxiliary contactors.
- Cyclic monitoring of the safety circuit with each ON-OFF cycle.

The ABB safety switching devices comply with all requirements of EN 60204, part 1, and are approved by the German Employers' Liability Insurance Associations (BG) and/or TÜV (German Technical Inspection Authority).

Fields of application:

- EMERGENCY STOP circuits
- Safety gate monitoring
- Two-hand controls
- Safety tread mats

Practical experience has shown that, in a few applications, it is necessary to also monitor the sensing elements (EMERGENCY STOP buttons, limit switches of the safety gates etc.).
A **two-channel** and/or **cross circuit safe** configuration is advisable in systems with a high level of contamination. In case of the two-channel control configuration, the contact part of the command unit has a **redundant** design. The supply leads can also be monitored for cross circuits.
In case of a fault, the system reverts to safe state after the safety contacts (**enabling circuits**) are opened. Enabling circuits are safety contacts which reliably switch off the hazardous drives or machines. (n/o contacts which reliably open in case of faults).
Depending on the device type, there are additional **signalling contacts** (n/c contacts which close in the event of a fault or semiconductor outputs). Of course, it is possible to also use enabling contacts as signaling contacts.
Unique and clear terminal identification permits simple, reliable and rapid wiring. The risk of a wiring fault is appreciably reduced.

Standards for the safety of machinery

EN 60204-1	"Functional safety of electrical/electronic/ programmable electronic safety-related systems"
EN 418	"Safety of machinery; emergency stop equipment"
EN 574	"Two-hand control devices"
EN 954-1	"Safety-related parts of control systems"
EN 1050	"Principles for risk assessment"
EN 1088	"Interlocking devices associated with guards"
IEC 61508	"Functional safety of electrical/programmable electronic safety related system"

Important notice:

The products described here in are designed to be components of a customized machinery safety-oriented control system. A complete safety-oriented system may include safety sensors, evaluators, actuators and signaling components. It is the responsibility of each company to conduct its own evaluation of the effectiveness of the safety system by trained individuals.
ABB AG, its subsidiaries and affiliates (collectively "ABB") are not in a position to evaluate all of the characteristics of a given system or product or machine not designed by ABB.
ABB accepts no liability for any recommendation that may be implied or stated here in. The warranty contained in the contract of sale by ABB is the sole warranty of ABB. Any statements contained here in do not create new warranties or modify existing ones.

Further Information:

User manual

A user manual with a device description, connection diagrams and application information in several languages is enclosed with every safety switching device of C570 and C67xx range.

Application manual "Safety Engineering"

You can find further information in the "Safety Engineering" application manual. It provides you with the required information on the relevant safety standards and project planning information.
The entire range of components used for safety applications is explained in this Manual, from the sensor (emergency stop command devices and position switches), through evaluation units (safety switching devices C57x and fail-safe control AC 31 S) to the actuator (e. g. contactor for switching motors). All these components must be selected correctly in order to meet the requirements applicable to modern safety facilities.
Please order the "Safety Engineering" application manual:

English:	1SAC 103 201 H 0201
German:	1SAC 103 201 H 0101

Classification of a machine into categories according to EN 954-1

Pursuant to the **Machinery Directive 98/37/EEC**, every machine must comply with the relevant directives and standards. Measures must be taken to keep the risk to persons below a tolerable extent.

This mandatory classification runs like a red thread from selection of the smallest limit switch through to the overall concept of the entire machine, always raising a permanent conflict between what is technically feasible and what is permitted on the basis of "pure theory".

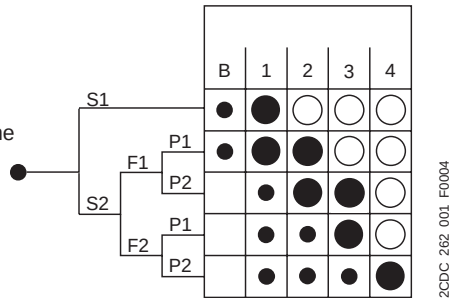
In the first step, the project planner performs a risk evaluation acc. to **EN 1050 "Risk Assessment"**. This must take into account the machine's ambient conditions for instance. Then, any overall risk must be assessed. This risk assessment has to be conducted in a form that allows documentation of the procedure and the results achieved. The risks, dangers and possible technical measures to reduce risks and dangers must be stipulated in this risk assessment.

After stipulating the extent of the risk, the category on the basis of which the safety circuits are to be designed is determined with the aid of **EN 954-1 "Safety-Related Components of Controls"**. The category determined this way defines the technical requirements applicable to the design of the safety equipment. There are five categories (B, 1, 2, 3 and 4), where B (standing for basic category) defines the lowest risk and thus also the minimum requirements applicable to the controller.

Thus: Depending on the application, not every technically feasible safety category is also permitted. For instance, in case of contactless protection devices (light barriers etc.) only categories 2 or 4 are permitted. In contrast, in case of tread mats, categories B to 4 can be used depending on risk assessment, provided that these categories can be reached at all owing to the design.

Possible selection of categories according to EN 954-1

Starting point for the risk assessment of the safety-related component of the controller.



S- Serious injuries
- **S1** Slight (and normally reversible) injuries.
- **S2** Serious (normally irreversible) injuries, including death.

F- Frequency and/or duration of the risk exposure
- **F1** Rare to frequent and/or short duration of exposure.
- **F2** Frequent to sustained and/or longduration of exposure.

P- Options for risk avoidance

(generally referred to the speed and frequency at which the dangerous component moves and to the clearance from the dangerous component)
- **P1** Possible under certain conditions.
- **P2** Hardly possible.

B, 1, 2, 3 and 4: Categories for safety-related components of controls
- ● Preferred category.
- ● Possible category requiring additional measures.
- ○ Disproportionately extensive measures by comparison with the risk.

Summary of the requirements for categories according to EN 954-1

Safety category[1]	Summary of requirements	System behavior[2]	Principles for achieving safety
B	The safety-related components of controls and/or their protection devices and their components must be designed, constructed, selected, assembled and combined in compliance with the applicable standards, such that they can withstand the anticipated influences.	The occurrence of a fault may lead to loss of the safety function.	Predominantly characterized by selection of componentsl
1	The requirements of B must be complied with. Time-proven components and time-proven safety principles have to be applied.	The occurrence of a fault may lead to loss of the safety function but the probability of occurrence is less than in category B.	
2	The requirements of B and the use of the time-proven safety principles must be complied with. The safety function has to be checked at appropriate intervals by the machine control.	■ The occurrence of a fault may lead to loss of the safety function between the inspection intervals.	Predominantly characterized by the structure
3	The requirements of B and the use of the time-proven safety principles must be complied with. Safety related components must be designed in a way that: ■ a single fault in any of these components does not lead to loss of the safety function and ■ the individual fault is detected, whenever feasible in an appropriate manner.	■ The loss of the safety function is detected by the check/inspection. ■ If the single fault occurs, the safety function is always maintained. ■ Certain faults but not all faults are detected. ■ An accumulation of undetected faults may lead to loss of the safety function.	
4	The requirements of B and the use of the time-proven safety principles must be complied with. Safety related components must be designed in a way that: ■ a single fault in any of these components does not lead to loss of the safety function and ■ the individual fault is detected at or before the next requirement applicable to the safety function or, if this is not possible, that an accumulation of faults may not lead to loss of the safety function.	■ If the faults occur, the safety function is always maintained. ■ The faults are detected in good time to prevent loss of the safety function.	

1) The categories are not intended to be applied in any specific order or hierarchical arrangements with respect to the technical-safety requirements.
2) The risk assessment will indicate whether full or partial loss of the safety function(s) as the result of fault is acceptable.

Stop categories acc. to EN 60204

Standard EN 60204 demands that every machine must feature the stop function of category 0. Stop functions of categories 1 and/or 2 must be provided if necessary for technical safety and/or functional requirements of the machine. Category 0 and category 1 stops must be operable independent of the operating mode, and a category 0 stop must have priority.

There are three categories of stop functions:

Category 0:
Shut-down by immediate switch-off of the energy supply to the machine drives.

Category 1:
Controlled shut-down, where the energy supply to the machine drives is retained in order to achieve shut-down and where the energy supply is only interrupted after standstill has been reached.

Category 2:
A controlled shut-down where the energy supply to the machine drives is retained.

Scope of application

Potential risks and hazards posed by a machine must be eliminated as fast as possible in the event of danger. For dangerous movements, the safe state is generally a standstill. All safety switching devices of C 570 range switch to de-energized state, i.e. standstill for drives, in the event of danger or fault.

EMERGENCY STOP

EMERGENCY STOP devices must have priority over all other functions.

The energy supplied to the machine drives which may cause dangerous states must be switched off as fast as possible without further risks or dangers. Resetting the drives may not trigger a restart. The EMERGENCY STOP must act either as a stop of category 0 or as a stop of category 1.

According EN 418 "EMERGENCY STOP equipment, functional aspects, principles for design" the resetting of the control device may only be possible as a result of an action by hand at the control device. Resetting the control device may not release a restart instruction. A restart of the machine may only be possible when all concerned operating elements have been reset individually and consciously by hand.

The basic devices of the C57x range of safety switching devices can be used for EMERGENCY STOP applications up to category 4 acc. to EN 954-1. Depending on external wiring and cable routing of the sensors, category 3 or 4 acc. to EN 954-1 can be reached.

Safety gate monitoring

According to EN 1088, a distinction is made between interlocking guards and interlocking guards with guard locking.
Here as well, the safety switching devices are used for EMERGENCY STOP applications. Controls up to category 4 to EN 954-1 are possible.

Presses and punches
Two-hand control is intended for devices on which the operator must use both hands simultaneously, thus protecting him against risks and dangers.

Safety functions

Auto-start
When the sensor circuit is closed the device is active.

If an ON-button is installed in the feedback circuit, a cross circuit of the feedback circuit is not monitored. Safety categories B, 1, 2, and 3 do not dictate a cross-circuit detection.

If a device with the function "auto-start" shall be used for safety categories 4 and EMERGENCY STOP, the user has to guarantee a fault exclusion in the ON-button circuit, e. g. by a safe laying of the ON-button line.

Monitored start
After a supply voltage failure or a saftey-related switch-off, the device will be started only by actuation of the ON-button.

Especially for presses type III C to DIN 574 is possible.
Safety category 4 to EN 954-1 is possible if the feed and the feedback circuit are monitored for cross circuits.

After closing the sensor line the ON-button has to be actuated.

Cross circuit safety
Cross circuit safety denotes the ability of monitoring modules to detect faults (caused by pinched cable, earth-leakage, ect.) that can occur in the application being monitored and to prevent the release of the safety circuits until external faults have been removed.

Device outputs

Safety outputs

The safety-related function must be controlled via safe output contacts, the so-called safety outputs. Safety outputs are always normally open contacts and switch off without delay.

Signalling outputs

For the signalling outputs, normally open contacts and normally closed contacts which may not perform safety-related functions are used. Safety outputs also be used as signalling outputs.

Delayed safety outputs

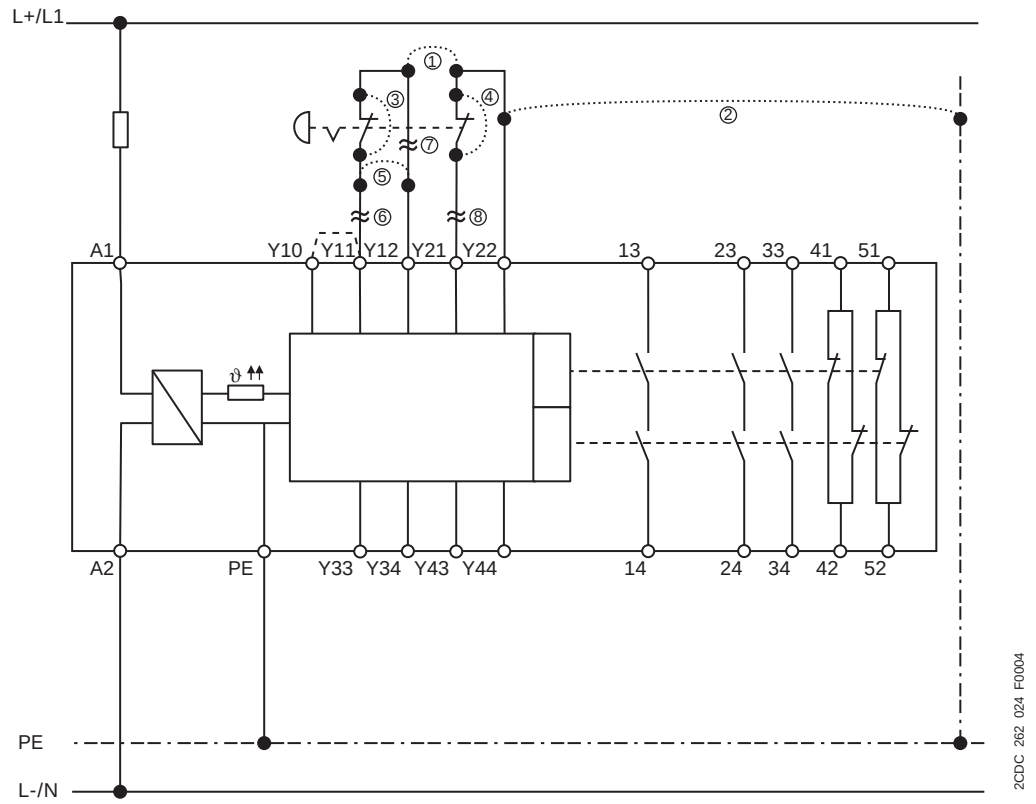
Drives which have a long overtravel must be decelerated in the event of danger. For this purpose, the energy supply must be maintained for electrical braking (stop category 1 acc. to EN 60 204-1).

Contact expansion

If the safety outputs of the basic device do not suffice, positively driven contactors (e. g. B6, B7) may be used for contact expansion.

Cross circuit safety

On ABB Safety relays C57x and C67xx, wich are designed to monitor EMERGENCY STOP, two-hand control units and safety gates, cross circuit safety is achieved by two channel (redundant) wiring of EMERGENCY STOP control devices (see diagram below). The two EMERGENCY STOP channels are operated at different voltages; thus the units will detect excessive current flow between the two points and disconnect the enabling circuits.



Type of fault

① + ⑤ Connection (cross circuit) between Y12 and Y21
▶ The fault will be detected as a short-circuit (excessive current flow). The unit will disconnect the enabling circuits.

② Earthing of Y21
▶ The fault will be detected as a short-circuit (excessive current flow). The unit will disconnect the enabling circuits.

③ + ④ Next operation of EMERGENCY STOP button will detect the fault as no voltage change will occur on Y12.
▶ The unit will prevent restarting unitl the fault has been removed and the EMERGENCY STOP module reset.

⑥ - ⑧ Immediate detection of the line interruption (voltage change on Y12) and opening of the enabling circuits
▶ The unit will prevent restarting unitl the fault has been removed and the EMERGENCY STOP module reset.

▶ The units incorporate internal electrical short-circuit protection which will trip when a fault occurs (short-circuit, cross circuit, ...) and disconnect the enabling circuits. After a fault has been removed, the safety relay will recognize this and again be ready for operation. Neither the unit nor any internal fusibles will need to be exchanged.

Safety relays
C571 and C571-AC
Ordering details

C571

- Auto-start / monitored start
- Operating voltage V_c at EMERGENCY STOP button or limit switch
- Feedback loop for monitoring of external contactors
- Safety outputs: 2 n/o contacts, positively guided
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4[1)]

EMERGENCY STOP monitor and safety gate monitor C571

Application

The safety relays C571 and C571-AC can be used in EMERGENCY STOP circuits according to EN 418 and in safety circuits according to VDE 0113 Part 1 (11.98) and/or EN 60 204-1 (11.98), e. g. with movable covers and guard doors. Depending on the external connections, safety categories B, 1, 2, 3 or 4[1)] according to DIN EN 954-1 are achievable.

When the safety combination is used in "automatic start" mode, automatic restarting (according to EN 60 204-1, sections 9.2.5.4.2 and 10.8.3) must be prevented by the higher-level control system in the event of EMERGENCY STOP.

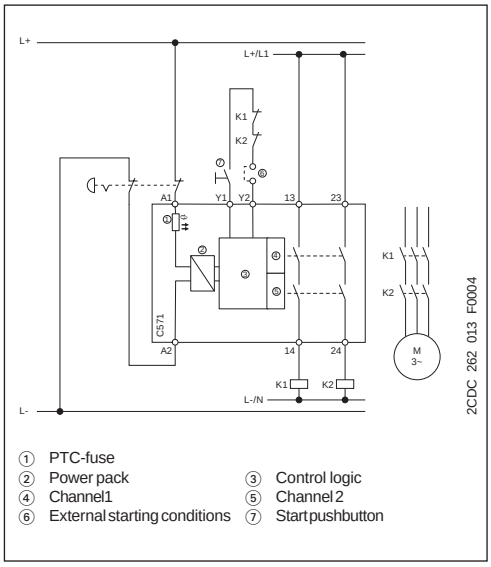
Functions

The safety relays C571 and C571-AC have two enabling (safe) circuits which are configured as n/o contacts. The number of enabling circuits can be increased by adding one or more C579 extension units.

Three LEDs (Power, Channel 1, Channel 2) indicate the operating state and function.

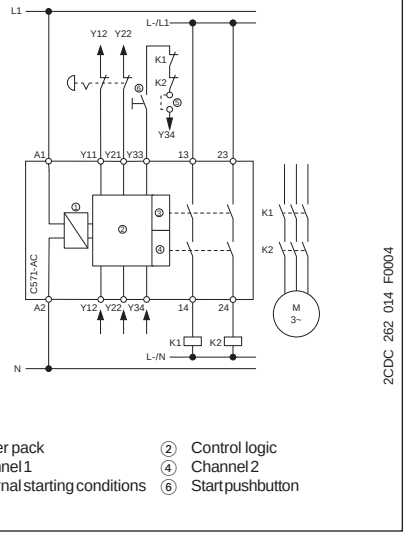
When the EMERGENCY STOP button or the limit switch is unlocked and when the ON-button is pressed, the internal circuits of the safety relays and the external contactors are checked for proper functioning.

Block diagram C571



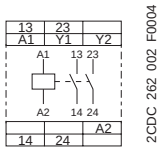
① PTC-fuse
② Power pack
③ Control logic
④ Channel1
⑤ Channel 2
⑥ External starting conditions
⑦ Start pushbutton

Block diagram C571-AC



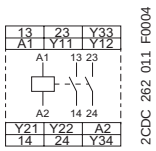
① Power pack
② Control logic
③ Channel 1
④ Channel 2
⑤ External starting conditions
⑥ Start pushbutton

Connection diagram C571



A1/A2	Supply voltage
13-14, 23-24	Safety outputs (n/o)
Y1-Y2	Feedback loop, ON-button

Connection diagram C571-AC



A1/A2	Supply voltage
13-14, 23-24	Safety outputs (n/o)
Y11-Y12	Channel 1
Y21-Y22	Channel 2
Y33-Y34	Feedback loop, ON-button

Type	Supply voltage U_c	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C571	24 V DC	1SAR 501 020 R 0003	1		0,240/0.53
C571	24 V AC/DC	1SAR 501 020 R 0001	1		0,240/0.53
C571-AC	115 V AC	1SAR 501 020 R 0004	1		0,260/0.57
C571-AC	230 V AC	1SAR 501 020 R 0005	1		0,260/0.57

[1)] Possible in combination with additional external measures. Information given in brackets only apply if cables and sensors are installed safely and mechanically protected.

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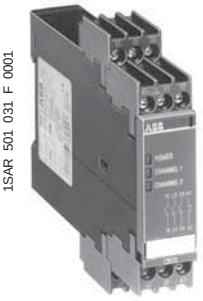


C573

- Operating voltage V_c at EMERGENCY STOP button or limit switch
- Single- or two-channel connection
- Feedback loop for monitoring of external contactors
- Safety outputs: 3 n/o contacts, positively guided
- Signalling contacts: 1 n/c contact, positively guided
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4[1)]

EMERGENCY STOP monitor and safety gate monitor C573

Application

The safety relay C573 can be used in EMERGENCY STOP circuits according to EN 418 and in safety circuits according to VDE 0113 Part 1 (11.98) and/or EN 60 204-1 (11.98), e.g. with movable covers and guard doors. Depending on the external connections, safety categories B, 1, 2, 3 or 4[1)] according to DIN EN 954-1 are achievable.

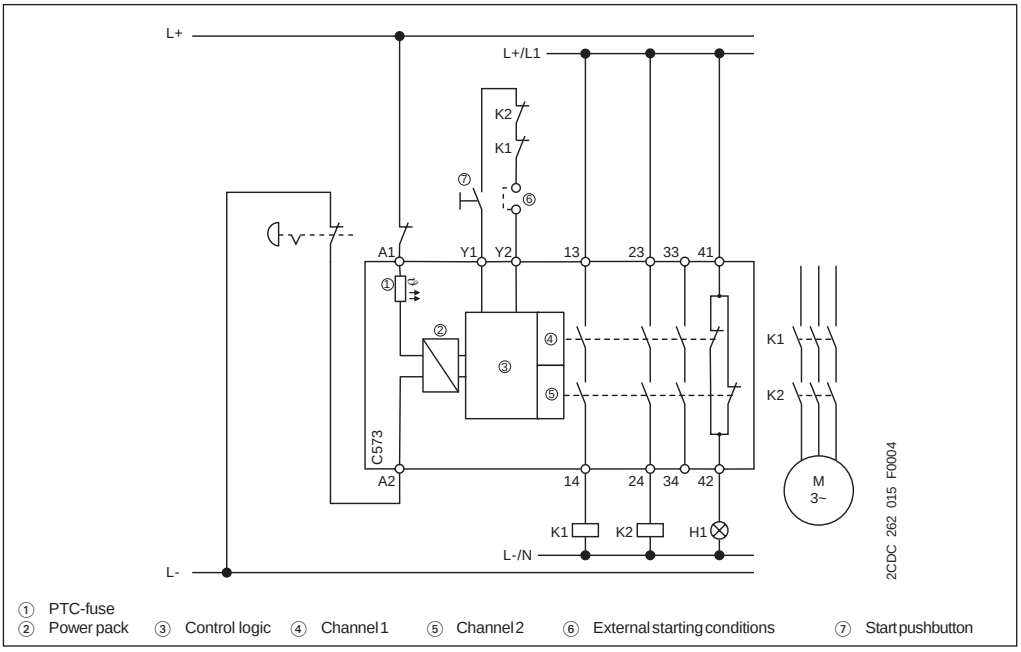
Functions

The safety relay C573 has three enabling circuits (safety outputs) which are configured as n/o contacts and a signal circuit configured as a n/c contact. The number of enabling circuits can be increased by adding one or more C579 extension units.

Three LEDs (Power, Channel 1, Channel 2) indicate the operating state and function.

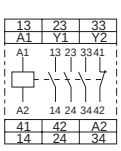
When the EMERGENCY STOP button or the limit switch is unlocked and when the ON-button is pressed, the internal circuits of the safety relays and the external contactors are checked for proper functioning.

Block diagram C573



① PTC-fuse
② Power pack
③ Control logic
④ Channel 1
⑤ Channel 2
⑥ External starting conditions
⑦ Start pushbutton

Connection diagram C573



A1/A2	Supply voltage
13-14, 23-24	Safety outputs (n/o)
41-42	Signalling output (n/c)
Y1-Y2	Feedback loop, ON-button

Type	Supply voltage U_c	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C573	24 V DC/AC	1SAR 501 031 R 0001	1		0,240/0.53

[1)] Possible in combination with additional external measures. Information given in brackets only apply if cables and sensors are installed safely and mechanically protected.

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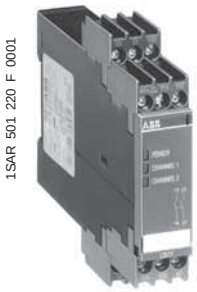
Safety relays C576 and C577
Ordering details

C576



C577

C576:
- Auto-Start

C577:
- Monitored Start

C567 and C577:
- Cross circuit detection at EMERGENCY STOP button or limit switch
- 24 V DC at the EMERGENCY STOP button
- Two-channel connection
- Feedback loop for monitoring of external contactors
- Safety outputs: 2 n/o contacts, positively guided
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4

EMERGENCY STOP monitor and safety gate monitor C576 and C577

Application

The safety relays C576 and C577 can be used in safety circuits according to VDE 0113 Part 1 (11.98) or EN 60 204-1 (11.98), e. g. with movable covers and safety gates in EMERGENCY STOP circuits according to EN 418. Depending on external connections, safety categories B, 1, 2, 3 or 4 according to DIN EN 954-1 are achievable.

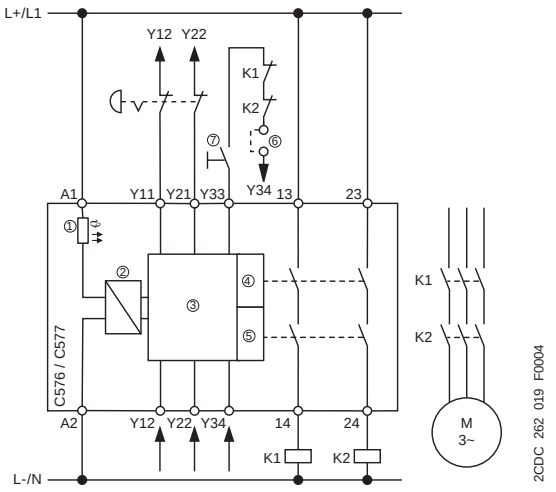
Functions

The safety relays C576 and C577 have two enabling circuits (safety outputs) configured as n/o contacts. The number of enabling circuits can be increased by adding one or more C579 extension units.

Three LEDs (Power, Channel 1, Channel 2) indicate operating state and function.

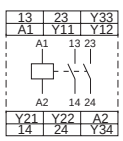
When the EMERGENCY STOP button or the limit switch is unlocked and when the ON-button is pressed, the internal circuit of the safety relay and the external contactors are checked for proper functioning. On the C577, the ON circuit Y33-Y34 is checked for short circuit. This means that a fault is detected when Y33-Y34 is closed before the EMERGENCY STOP button is closed.

Block diagram C576 and C577



① PTC-fuse
② Power pack
③ Control logic
④ Channel 1
⑤ Channel 2
⑥ External starting conditions
⑦ Start pushbutton

Connection diagram C576 and C577



A1/A2	Supply voltage	Y11-Y12	Channel 1: EMERGENCY STOP or limit switch
13-14, 23-24	Safety outputs (n/o)	Y21-Y22	Channel 2: EMERGENCY STOP or limit switch
		Y33-Y34	Feedback loop, ON-button

Type	Supply voltage U_c	Start	Order code	Pack unit piece	Price 1 piece	Weight 1 piece kg/lb
C576	24 V AC/DC	auto	1SAR 501 120 R 0001	1		0,240/0.53
C577	24 V AC/DC	monitored	1SAR 501 220 R 0001	1		0,240/0.53

• Technical data 130
• Dimensional drawings 131

C572

- Auto-start / monitored start
- 24 V DC at EMERGENCY STOP button or limit switch
- Cross circuit detection at EMERGENCY STOP button or limit switch
- Feedback loop for monitoring of external contactors
- Safety outputs: 3 n/o contacts, positively guided
- Signalling contacts: 2 n/c contacts, positively guided
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4

EMERGENCY STOP monitor and safety gate monitor C572

Application

The safety relay C572 can be used in EMERGENCY STOP circuits according to EN 418, in safety circuits according to VDE 0113 Part 1 (06.93) and/or EN 60 204-1 (12.97), e.g. with movable covers and safety gates. Depending on the external connection, safety categories B, 1, 2, 3 or 4 according to DIN EN 945-1 are achievable with this device.

Functions

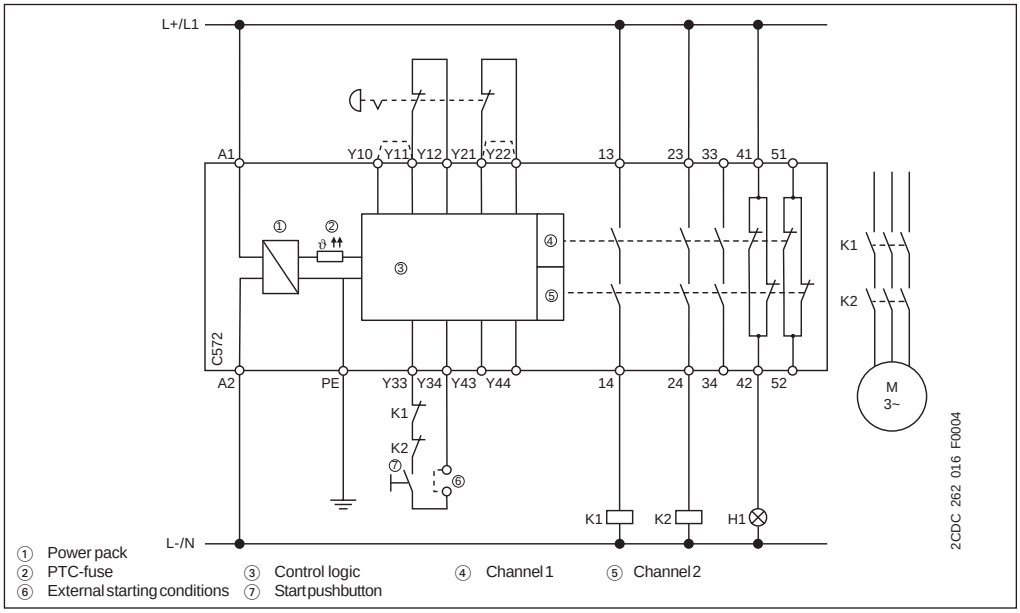
The safety relay C572 has three enabling circuits (safety outputs) which are configured as n/o contacts and two signal circuits configured as a n/c contact.

Three LEDs (Power, Channel 1, Channel 2) indicate operating state and function.

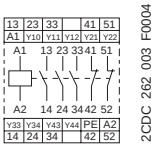
When the EMERGENCY STOP pushbutton or limit pushbutton is unlocked and the ON-button is pressed, the redundant safety relays, electronic circuitry and external contactors are tested for proper functioning.

On the C572, the ON circuit Y33-Y34 is checked for short circuit. This means that a fault ist detected when Y33-Y34 is closed before the EMERGENCY STOP button is closed.

Block diagram C572



Connection diagram C572



A1/A2	Supply voltage
13-14, 23-24	Safety outputs
33-34	(n/o)
41-42, 51-52	Signalling outputs (n/c)

Y43-Y44	jumper = Auto-start without jumper = monitored start
Y10-Y11	jumper = two channel operation, EMERGENCY STOP at Y11-Y12 and Y21-Y22
Y11-Y12,	jumper = single channel operation, EMERGENCY STOP at Y10-Y12, Y21-Y22 jumpered
Y33-Y34	Feedback loop, ON-button

Type	Supply voltage U_c	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C572	24 V DC	1SAR 501 032 R 0003	1		0,360/0.79
	24 V AC	1SAR 501 032 R 0002	1		0,360/0.79
	115 V AC	1SAR 501 032 R 0004	1		0,450/0.99
	230 V AC	1SAR 501 032 R 0005	1		0,450/0.99

• Technical data ..... 130 • Dimensional drawings 131

C574

- Auto-start/ monitored start
- Single- or two-channel connection
- Feedback loop for monitoring of external contactors
- Delay time t_v continuously adjustable
- Safety outputs:
  2 n/o contacts
  (stop cat. 0),
  2 n/o contacts
  (stop cat. 1),
  time delayed, pos. guided
- Signalling output:
  1 n/c contact,
  positively guided
- 5 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4[1)]

EMERGENCY STOP monitor and safety gate monitor with time delay C574

Application

The safety relay C574 can be used in EMERGENCY STOP devices according to EN 418, in safety circuits according to VDE 0113 Part 1 (06.93) and/or EN 60 204-1 (12.97), such as for monitoring safety gates, or in circuits with controlled stand-still requirement (STOP Category 1). Depending on the external circuitry, this device can be used to realize safety categories B, 1, 2, 3 or 4[1)] for undelayed enabling circuits according to DIN EN 954-1.

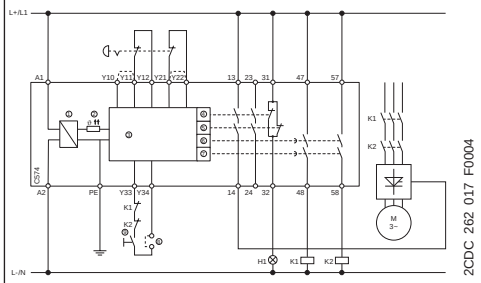
Functions

The C574 safety relay possesses two delayed and two undelaled enabling circuits (safety outputs) as n/o contacts and one undelayed signal output as n/c contact.

Five LEDs (Power, Channel 1, Channel 2, delayed channel 1, delayed channel 2) indicate the operating status and the functions.

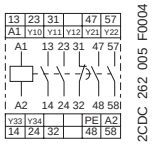
The redundant safety relays, the electronics and the operated motor contactors are tested for proper functioning when the EMERGENCY STOP button or the limit switch button is unlatched, and when ON circuit Y33-Y34 is closed. On the C574 (monitored start), the ON circuit Y33-Y34 is checked for short circuit. This means that a fault ist detected when Y33-Y34 is closed before the EMERGENCY STOP button is closed.

Block diagram C574



① Power pack
② PTC-fuse
③ Control logic
④ Channel 1
⑤ Channel 2
⑥ Channel 1 (+)
⑦ Channel 2 (+)
⑧ External starting conditions
⑨ Start pushbutton

Connection diagram C574



A1/A2	Supply voltage
13-14, 23-24	Safety outputs undelayed (n/o)
31-32	Signalling outputs undelayed (n/c)
47-48, 57-58	Safety outputs delayed (n/o)
for monitored start:	
Y11-Y12, Y21-Y22	jumper = singel channel operation, EMERGENCY STOP at Y10-Y11
Y10-Y11	jumper = two channel operation, EMERGENCY STOP at Y11-Y12 and Y21-Y22
Y33-Y34	Feedback loop, ON-button

Type	Supply voltage U_c	Delay-time t_v	Start	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C574	24 V DC	0,5-30 s	monitored	1SAR 503 041 R 0003	1		0,450/0.99
	24 V AC			1SAR 503 041 R 0002	1		0,450/0.99
	115 V AC			1SAR 503 041 R 0004	1		0,450/0.99
	230 V AC			1SAR 503 041 R 0005	1		0,450/0.99
C574	24 V DC	0,5-30 s	auto	1SAR 503 141 R 0003	1		0,430/0.95
	24 V AC			1SAR 503 141 R 0002	1		0,430/0.95
	115 V AC			1SAR 503 141 R 0004	1		0,600/1.32
	230 V AC			1SAR 503 141 R 0005	1		0,600/1.32
C574	24 V DC	0,05-3 s	monitored	1SAR 533 241 R 0003	1		0,430/0.95
	24 V AC			1SAR 533 241 R 0002	1		0,430/0.95
	115 V AC			1SAR 533 241 R 0004	1		0,600/1.32
	230 V AC			1SAR 533 241 R 0005	1		0,600/1.32
C574	24 V DC	0,05-3 s	auto	1SAR 533 141 R 0003	1		0,430/0.95
	24 V AC			1SAR 533 141 R 0002	1		0,430/0.95
	115 V AC			1SAR 533 141 R 0004	1		0,600/1.32
	230 V AC			1SAR 533 141 R 0005	1		0,600/1.32

[1)] For undelayed enabling circuits only.

• Technical data ..... 130 • Dimensional drawings 131

C575

- Two-Hand control acc. to EN 574 Type III C
- 24 V DC at the two-hand control switches
- Simultaneity monitoring: 0.5 s
- Cross circuit detection
- Feedback loop for monitoring of external contactors
- Safety outputs: 2 n/o contacts, positively guided
- Signaling contacts: 2 n/c contacts, positively guided
- 5 LEDs for status indication
- Safety category acc. to EN type III C: B4

TWO-HAND control C575

Application

C575 is suitable for installation in controls for presses: Hydraulic presses DIN EN 693, eccentric and related presses EN 692, screw presses EN 692.

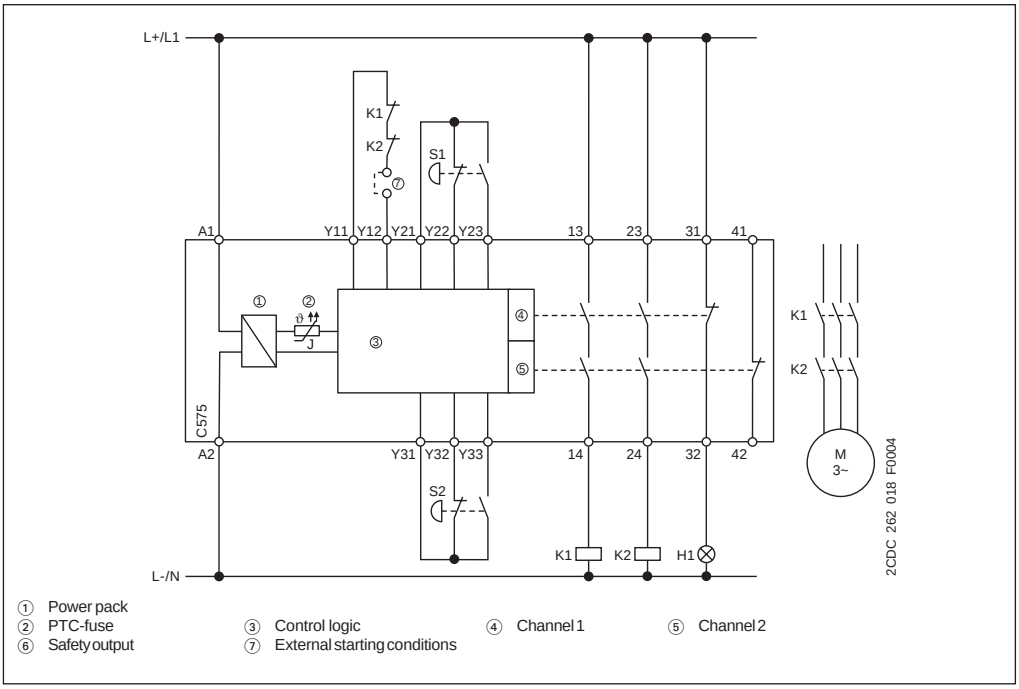
Functions

The two-hand control unit C575 possesses two enabling circuits (safety outputs) configure as n/o contacts and two signal outputs configured as n/c contacts.

Five LEDs (Power, S1 ON, S1 OFF, S2 ON, S2 OFF) indicate the operating status and the functions.

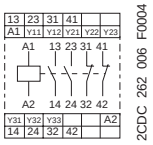
The safety outputs are closed by simultaneous operation (< 0.5 s) of the pushbuttons S1 and S2. If one pushbutton is no longer pressed, the outputs open. They do not close again until both pushbuttons are no longer pressed and then simultaneously pressed again.

Block diagram C575



① Power pack
② PTC-fuse
③ Control logic
④ Channel 1
⑤ Channel 2
⑥ Safety output
⑦ External starting conditions

Connection diagram C575



A1/A2	Supply voltage	Y11-Y12	Feedback loop
13-14, 23-24	Safety outputs (n/o)	Y21, 22, 23	Pushbutton S1
31-32, 41-42	Signalling outputs (n/c)	Y31, Y32, Y33	Pushbotton S2

Type	Supply voltage U_c	Order code	Pack unit piece	Price 1 piece	Weight 1 piece kg/lb
C575	24 V DC	1SAR 504 022 R 0003	1		0,350/0.77
	24 V AC	1SAR 504 022 R 0002	1		0,350/0.77
	115 V AC	1SAR 504 022 R 0004	1		0,350/0.77
	230 V AC	1SAR 504 022 R 0005	1		0,350/0.77

[1] According to EN 574, Type III C

• Technical data ..... 130 • Dimensional drawings 131

Safety relays - Contact expansion
C579
Ordering details

C579

- 1 safety output contact of the basic device is required for connection to the extension unit.
- Safety outputs: 4 n/o contacts, positively guided
- 2 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4 depending on the external connection

Extension unit C579 for contact expansion

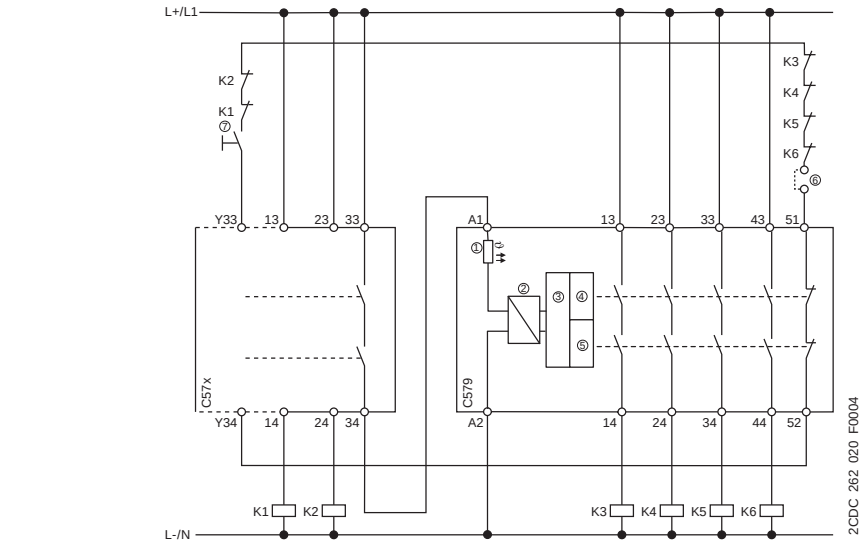
Applications

The C579 expansion unit can be used in combination with all C57x basic units. It extends the number of enabling circuits. Depending on the external connection, safety categories B, 1, 2, 3 or 4 according to DIN EN 954-1 are achievable with this device.

Functions

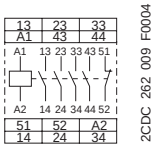
The C579 expansion unit has four enabling circuits (safety circuits) configured as n/o circuits.
Two LEDs (channel 1, channel 2) indicate operating state and function.
The device is controlled via one enabling circuit of the safety relays C57x.
When the EMERGENCY STOP pushbutton or the limit switch is unlocked and the ON-button is pressed, the internal circuit of the safety relay and the external contactors are checked for correct functioning.

Block diagram C579



① PTC-fuse
② Power pack
③ Control logic
④ Channel 1
⑤ Channel 2
⑥ External starting conditions
⑦ Start pushbutton

Connection diagram C579



A1/A2	Supply voltage
13-14, 23-24, 33-34, 43-44	Safety outputs (n/o)
51-52	Signalling output (n/c)

Type	Supply voltage U_c	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C579	24 V AC/DC	1SAR 502 040 R 0001	1		0,240/0.53
C579-AC	115 V AC	1SAR 502 040 R 0004	1		0,240/0.53
C579-AC	230 V AC	1SAR 502 040 R 0005	1		0,240/0.53

• Technical data 130
• Dimensional drawings 131

Safety relay with solid-state output C6700
Ordering details

C6700

- Auto-start / monitored start
- Feedback loop for monitoring of external contactors
- Safety outputs: 2 solid-state components á 0,5 A
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3
- Safety integrity level acc. to IEC 61508: SIL 1, SIL 2

Electronic safety relay with solid-state output C6700

Applications

The C6700 safety combination can be used in EMERGENCY STOP circuits according to EN 418 and in safety circuits according to EN 60 204-1 (11.98), e. g. for moving covers and safety gates. Safety catetories B, 1, 2 or 3 according to DIN EN 954-1 or SIL 1 or SIL 2 according to IEC 61508 can be achieved, depending on the external circuits.

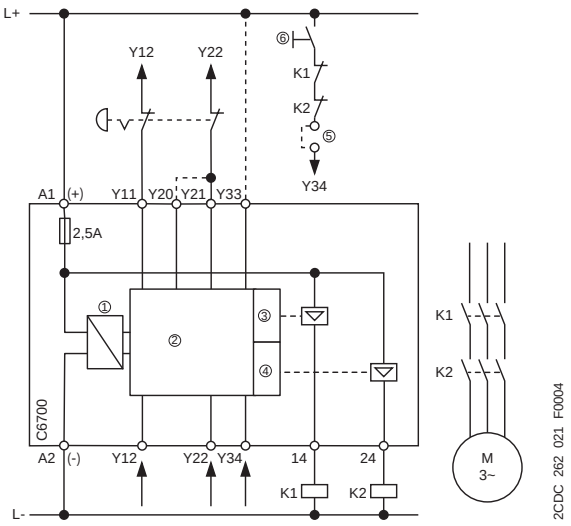
Functions

The C6700 safety relay has two solid-state outputs.

Three LEDs (Power, Run, Fail) indicate the operating state and the function.

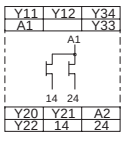
During operation, all internal circuit elements are cyclically monitored for faults. Safety category 3 according to EN 954-1 is achieved only in combination with 2 external actuators with positively driven feedback contacts.

Block diagram C6700



① Power pack
② Control logic
③ Channel 1
④ Channel 2
⑤ External starting conditions
⑥ Start pushbutton

Connection diagram C6700



A1/A2 Supply voltage
14, 24 Safety outputs (electronic outputs)

Y20-Y21	with jumper = single channel without jumper = two channel
Y11-Y12	Channel 1: EMERGENCY STOP or limit switch
Y21-Y22	Channel 2: EMERGENCY STOP or limit switch
Y33-Y34	Feedback loop (Auto-start)
A1-Y34	Feedback loop, ON-button (monitored start)

Type	Supply voltage U_c	Release time after EMERG. STOP	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C6700	24 V DC	< 30 ms	1SAR 510 120 R 0003	1		0.150/0.33

• Technical data 132
• Dimensional drawings 133

Safety relay with solid-state outputs
C6701
Ordering details

C6701

- Auto-start / monitored start
- Cross circuit detection configurable
- Feedback loop for monitoring of external contactors
- 2 solid-state components à 1,5 A
- Cascading input
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4
- Safety integrity level acc. to IEC 61508: SIL 1, SIL 2, SIL 3

Electronic safety relay with solid-state output C6701

Application

The C6701 safety relay can be used in EMERGENCY STOP circuits according to EN 418 and in safety circuits according to EN 60 204-1 (11.98), e.g. in movable guards and safety gates. Depending on the external circuit elements, safety categories B, 1, 2, 3 or 4 according to DIN EN 954-1 or SIL 1, SIL 2 or SIL 3 according to IEC 61508 can be achieved.

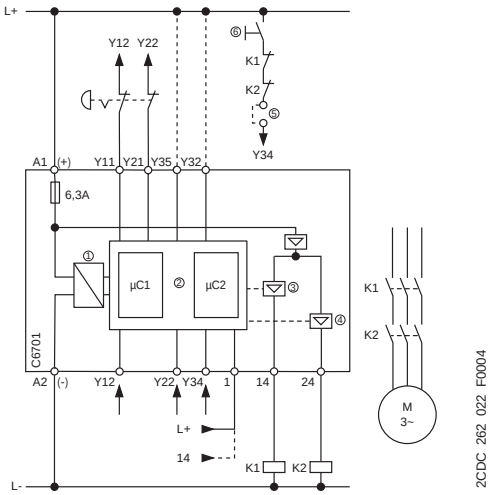
Functions

The C6701 safety relay has two reliable solid-state outputs.

Three LEDs (Power, Run, Fail) indicate the operating state and the function.

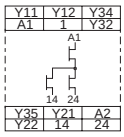
When the device is put into operation it runs through a self-test to test the correct functioning of the internal electronics. All internal circuit components are monitored for faults cyclically during operation. External actuators or loads can be switched via safe outputs 14 and 24.

Block diagram C6701



① Power pack
② Control logic
③ Channel 1
④ Channel 2
⑤ External starting conditions
⑥ Start pushbutton

Connection diagram C6701



A1/A2	Supply voltage
14, 24	Electronic outputs
1	Cascading input

Y32	to supply	= Auto-start
	open	= monitored start
Y35	to supply	= without cross circuit detection
	open	= with cross circuit detection
Y11-Y12	Channel 1: EMERGENCY STOP or limit switch	
Y21-Y22	Channel 2: EMERGENCY STOP or limit switch	
A1-Y34	Feedback loop, ON-button	

Type	Supply voltage U_c	Release time after EMERG. STOP	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C6701	24 V DC	30 ms min.	1SAR 511 320 R 0003	1		0.150/0.33

• Technical data ..... 132 • Dimensional drawings 133

Safety relays with solid-state outputs
C6702
Ordering details

C6702

- Auto-start / monitored start
- Cross circuit detection configurable
- Feedback loop for monitoring of external contactors
- 2 Safety outputs à 1,5 A:
  1 solid-state component undelayed:
  stop category 0
  1 solid-state component delayed (delay time adjustable from 0,05-3 s or 0,5-30 s): stop category 1
- Cascading input
- 3 LEDs for status indication
- Safety category acc. to EN 954-1: B, 1, 2, 3, 4
- Safety integrity level acc. to IEC 61508: SIL 1, SIL 2, SIL 3

Electronic safety relays with solid-state output C6702

Application

The C6702 safety relays can be used in EMERGENCY STOP circuits according to EN 418 and in safety circuits according to EN 60 204-1 (11.98), e.g. in movable guards and safety gates. Depending on the external circuit elements, safety categories B, 1, 2, 3 or 4 according to DIN EN 954-1 or SIL 1, SIL 2 or SIL 3 according to IEC 61508 can be achieved.

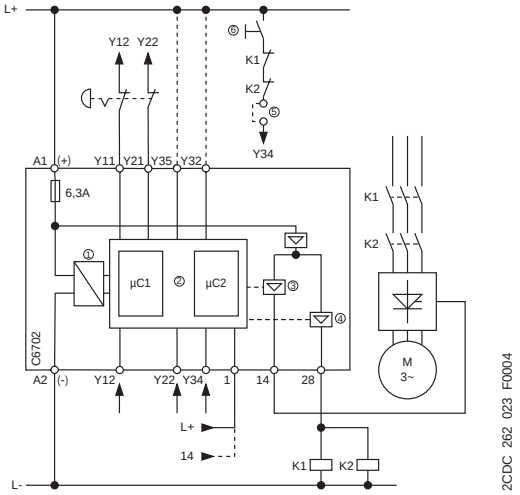
Functions

The C6702 solid-state safety relays have one safe solid-state output and one time-delayed safe solid-state output.

Three LEDs (Power, Run, Fail) indicate the operating state and the function.

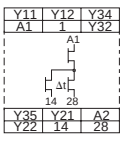
When the device is put into operation it runs through a self-test to test the correct functioning of the internal electronics. All internal circuit components are monitored for faults cyclically during operation. External actuators or loads can be switched via safe outputs 14 and 28.

Block diagram C579



① Power pack
② Control logic
③ Channel 1
④ Channel 2
⑤ External starting conditions
⑥ Start pushbutton

Connection diagram C579



A1/A2	Supply voltage
14	Electronic output
24	Delayed electronic output
1	Cascading input

Y32	to supply = Auto-start open = monitored start
Y35	to supply = without cross circuit detection open = with cross circuit detection
Y11-Y12	Channel 1: EMERGENCY STOP or limit switch
Y21-Y22	Channel 2: EMERGENCY STOP or limit switch
A1-Y34	Feedback loop, ON-button

Type	Supply voltage U_c	Release time after EMERG. STOP	Order code	Pack. unit piece	Price 1 piece	Weight 1 piece kg/lb
C6702	24 V DC	0.05-3 s	1SAR 543 320 R 0003	1		0.150/0.33
C6702	24 V DC	0.5-30 s	1SAR 513 320 R 0003	1		0.150/0.33

• Technical data 132
• Dimensional drawings 133

C565.20

Accessories

	Order code	Pack. unit sets	Price 1 piece	Weight 1 piece kg/lb
C560.10, sealable cover				
For protection against unauthorized re-adjustment of the delay time for C574 and C6702	1SAR 390 000 R 1000	5		0.240/0.53
C560.20, plug-in tab for screw mounting				
For mounting the C560 time relay on a mounting panel (without a DIN rail)	1SAR 390 000 R 2000	5 with 2 pcs. each		0.240/0.53

Safety relays
Conversion table
ESTOP, SGATE, 2HAND, EBLOC → C57x range

	ESTOP, SGATE, 2HAND, EBLOC				C57x		
Supply voltage	Type	order code old	release circuits / cross short-circuit detection		Type	order code new	release circuits / cross short-circuit detection
	EMERGENCY STOP / safety gate				**EMERGENCY STOP / safety gate**		
24 V DC					C571	1SAR501020R0003	2 / - / auto-start / monitored start
24 V AC/DC	ESTOP-2	2450800 00	2 / - / auto-start	→	C571	1SAR501020R0001	2 / - / auto-start / monitored start
115 V AC	ESTOP-2	2450800 10	2 / - / auto-start	→	C571-AC	1SAR501020R0004	2 / - / auto-start / monitored start
230 V AC	ESTOP-2	2450800 20	2 / - / auto-start	→	C571-AC	1SAR501020R0005	2 / - / auto-start / monitored start
24 V AC/DC	ESTOP-3	2450801 00	3 / - / auto-start	→	C573	1SAR501031R0001	3 / - / auto-start / monitored start
24 V AC/DC	ESTOP-2a	2450803 00	2 / yes / auto-start / monitored start	→	C567	1SAR501120R0001	2 / yes / auto-start
115 V AC / 24 V AC/DC	ESTOP-2a	2450803 10	2 / yes / auto-start / monitored start	→	C577	1SAR501220R0001	2 / yes / monitored start
230 V AC	ESTOP-2a	2450803 20	2 / yes / auto-start / monitored start	→			
24 V AC/DC	ESTOP-2b	2450804 00	2 / yes / auto-start / monitored start	→			
115 V AC	ESTOP-2b	2450804 10	2 / yes / auto-start / monitored start	→	on request		
230 V AC	ESTOP-2b	2450804 20	2 / yes / auto-start / monitored start	→			
24 V DC					C572	1SAR501032R0003	3 / yes / auto-start / monitored start
24 V AC/DC	ESTOP-3a	2450805 00	3 / yes / auto-start / monitored start	→	C572	1SAR501032R0002	3 / yes / auto-start / monitored start
115 V AC / 110 V AC	ESTOP-3a	2450805 10	3 / yes / auto-start / monitored start	→	C572	1SAR501032R0004	3 / yes / auto-start / monitored start
230 V AC	ESTOP-3a	2450805 20	3 / yes / auto-start / monitored start	→	C572	1SAR501032R0005	3 / yes / auto-start / monitored start
24 V AC/DC	ESTOP-3b	2450806 00	3 / yes / auto-start / monitored start	→			
115 V AC	ESTOP-3b	2450806 10	3 / yes / auto-start / monitored start	→	on request		
230 V AC	ESTOP-3b	2450806 20	3 / yes / auto-start / monitored start	→			
24 V AC/DC	ESTOP-6a	2450807 00	6 / yes / auto-start / monitored start	→			
115 V AC	ESTOP-6a	2450807 10	6 / yes / auto-start / monitored start	→	on request		
230 V AC	ESTOP-6a	2450807 20	6 / yes / auto-start / monitored start	→			
24 V AC/DC	ESTOP-6b	2450808 00	6 / yes / auto-start / monitored start	→			
115 V AC	ESTOP-6b	2450808 10	6 / yes / auto-start / monitored start	→	on request		
230 V AC	ESTOP-6b	2450808 20	6 / yes / auto-start / monitored start	→			
24 V DC					C574	1SAR503141R0003	2, 2 (delayed) / - / auto-start
24 V AC/DC / 24 V AC	ESTOP-3+2	2450802 00	3, 2 (del.) / yes / auto-start / monitored start	→	C574	1SAR503141R0002	2, 2 (delayed) / - / auto-start
115 V AC / 110 V AC	ESTOP-3+2	2450802 10	3, 2 (del.) / yes / auto-start / monitored start	→	C574	1SAR503141R0004	2, 2 (delayed) / - / auto-start
230 V AC	ESTOP-3+2	2450802 20	3, 2 (del.) / yes / auto-start / monitored start	→	C574	1SAR503141R0005	2, 2 (delayed) / - / auto-start
24 V DC					C574	1SAR503041R0003	2, 2 (delayed) / - / monitored start
24 V AC					C574	1SAR503041R0002	2, 2 (delayed) / - / monitored start
110 V AC					C574	1SAR503041R0004	2, 2 (delayed) / - / monitored start
230 V AC					C574	1SAR503041R0005	2, 2 (delayed) / - / monitored start
24 V DC					C574	1SAR533141R0003	2, 2 (delayed) / - / auto-start
24 V AC					C574	1SAR533141R0002	2, 2 (delayed) / - / auto-start
110 V AC					C574	1SAR533141R0004	2, 2 (delayed) / - / auto-start
230 V AC					C574	1SAR533141R0005	2, 2 (delayed) / - / auto-start
24 V DC					C574	1SAR533241R0003	2, 2 (delayed) / - / monitored start
24 V AC					C574	1SAR533241R0002	2, 2 (delayed) / - / monitored start
110 V AC					C574	1SAR533241R0004	2, 2 (delayed) / - / monitored start
230 V AC					C574	1SAR533241R0005	2, 2 (delayed) / - / monitored start
	Safety gate				**Safety gate**		
24V AC/DC	SGATE-3	2450820 00	3 / yes / monitored start	→			
115 V AC	SGATE-3	2450820 10	3 / yes / monitored start	→	on request		
230 V AC	SGATE-3	2450820 20	3 / yes / monitored start	→			
	Two-hand control				**Two-hand control**		
24 V DC	2HAND-2	2450811 00	2 / yes	→	C575	1SAR504022R0003	2 / yes
24 V AC					C575	1SAR504022R0002	2 / yes
115 V AC / 110 V AC	2HAND-2	2450811 10	2 / yes	→	C575	1SAR504022R0004	2 / yes
230 V AC	2HAND-2	2450811 20	2 / yes	→	C575	1SAR504022R0005	2 / yes
	Extension unit				**Extension unit**		
24 V AC/DC	EBLOC-4	2450830 00	4 / yes	→	C579	1SAR502040R0001	4 / -
115 V AC	EBLOC-4	2450830 10	4 / yes	→	C579-AC	1SAR502040R0004	4 / -
230 V AC	EBLOC-4	2450830 20	4 / yes	→	C579-AC	1SAR502040R0005	4 / -
24 V AC/DC	EBLOC-8	2450831 00	8 / yes	→			
115 V AC	EBLOC-8	2450831 10	8 / yes	→	on request		
230 V AC	EBLOC-8	2450831 20	8 / yes	→			

Safety relays
C57x range
Technical data

Type	C571	C573	C576	C577	C579	C572	C574	C575
Input circuit								
Supply voltage	see ordering details							
Supply voltage tolerance								
AC versions	-15 % ... +10 %							
DC versions	-15 % ... +20 %					-15 % ... +10 %		
Power consumption	1.5 W / VA					3 W / VA	4 W / VA	3 W / VA
Duty time	100 %							
Time response								
Response time					≤ 30 ms [1]			≤ 100 ms
monitored start	-	-	-	≤ 30 ms	-	≤ 25 ms	≤ 80 ms	-
auto-start	≤ 200 ms [2], [3]	≤ 200 ms [2]	≤ 100 ms	-	-	≤ 150 ms	≤ 80 ms	-
Release time								≤ 20 ms
at EMERGENCY STOP	≤ 200 ms	≤ 200 ms	≤ 80 ms	≤ 20 ms	-	≤ 25 ms	≤ 25 ms	-
at power failure	≤ 200 ms	≤ 200 ms	≤ 100 ms	≤ 150 ms	≤ 25 ms [4]	≤ 350 ms	≤ 100 ms	-
Recovery time								≥ 250 ms
at EMERGENCY STOP	≥ 200 ms	≥ 200 ms	≥ 200 ms	≥ 400 ms	-	≥ 200 ms	after time lapse	-
at power failure	≥ 200 ms	≥ 200 ms	≥ 200 ms	≥ 600 ms	≥ 100 ms	≥ 500 ms	≥ 1 s	-
Mains buffering	60 ms	60 ms	30 ms	80 ms	35 ms	100 ms	30 ms	40 ms
Minimum EMERGENCY STOP	≥ 200 ms [8]	≥ 200 ms	≥ 25 ms	≥ 25 ms	-	≥ 25 ms	≥ 25 ms	-
command time ON-button	≥ 150 ms [8]	≥ 150 ms	≥ 40 ms	≥ 25 ms	-	≥ 25 ms	≥ 25 ms	-
Simultaneity	unlimited							500 ms
Output circuits								
Number of contacts	2 n/o	3 n/o + 1 n/c	2 n/o	2 n/o	4 n/o	3 n/o + 2 n/c	4 n/o + 1 n/c	2 n/o + 2 n/c
Contact material								
Rated switching current acc. to IEC 60947-5-1 AC-15 115 V	5 A					6 A	5 A / 2 A [5]	6 A
AC-15 230 V	5 A					6 A	5 A / 2 A [5]	6 A
DC-13 24 V	5 A					6 A	5 A / 2 A [5]	6 A
Rated thermal current	5 A				6 A	5 A	6 A	
for 2-4 release circuits								
at U_T = 70 °C	2 RC: 4 A		3 RC: 3.5 A		4 RC: 3 A	5 A	4 A	5 A
at U_T = 60 °C	2 RC: 4.5 A		3 RC: 4 A		4 RC: 3.5 A	6 A	5 A	6 A
at U_T = 50 °C	2 RC: 5 A		3 RC: 4.5 A		4 RC: 4 A	6 A	5 A	6 A
Maximum lifetime mechanical	$1x10^7$ switching cycles							
electrical	$1x10^5$ switching cycles							
Operating frequency	1000/h at load with rated switching current							
Short-circuit proof I_K = 1 kA [6], max. fuse rating	6 A slow, 10 A fast [7], operating class gL/gG							

[1] at 115 V AC, 230 V AC: max. 200 ms
[2] at 24 V AC: max. 300 ms
[3] at 115 V AC, 230 V AC: max. 300 ms
[4] at 115 V AC, 230 V AC: max. 80 ms
[5] undelayed / delayed release circuits
[6] other fuses on request
[7] signal circuit of C573 = 6 A

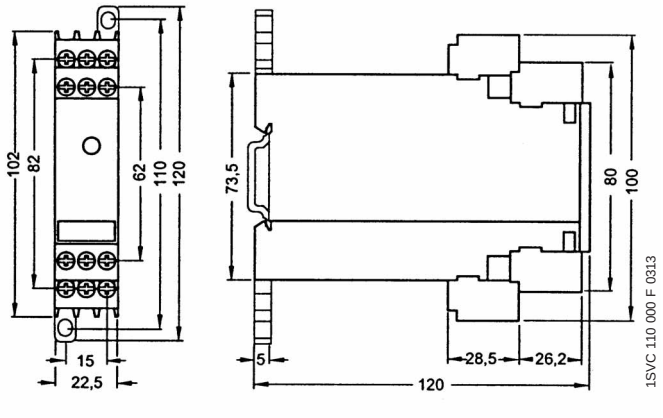
Safety relays
C57x range
Technical data (continued), dimensional drawings

Type	C571	C573	C576	C577	C579	C572	C574	C575
General data								
Width of enclosure	22.5 mm					45 mm		
Wire size rigid	2 x 2.5 mm² (2 x 14 AWG), 1 x 4 mm² (1 x 12 AWG)							
stranded	with wire end ferrules 2 x 1.5 mm² (2 x 16 AWG), 1 x 2.5 mm² (2 x 14 AWG)							
Weight approx.	260 g	270 g	360 g	350 g	180 g	450 g	320 g	190 g
Mounting position	any							
Degree of protection enclosure / terminals	IP40 / IP 20					IP20 / IP 20		
Temperature range operation	-25 °C ... +60 °C							
storage	-40 °C ... +80 °C							
Mounting	DIN rail (EN 50022)							
Standards								
Standards	EN 60204-1 (VDE 0113-1), EN 292, EN 954-1							
Safety catagory acc. to EN 954-1	4[1]	4[1]	4	4	as basic device [3]	4	4[2]	4[4]
acc. to EN 574	-	-	-	-	-	-	-	Type III C
Mechanical resistance acc. to EN 60068	8 g, 10 ms							
Approvals	**C-Tick (under preperation), BG (not for C579), SUVA, UL, CSA**							
Isolation data								
Rated insulation voltage acc. to VDE 0110, IEC 947-1	300 V							
Rated impulse withstand voltage acc. to VDE 0110, IEC 664	4 kV							
Pollution degree acc. to VDE 0110, IEC 664, IEC 255-5	3							
Overvoltage category acc. to VDE 0110	III							

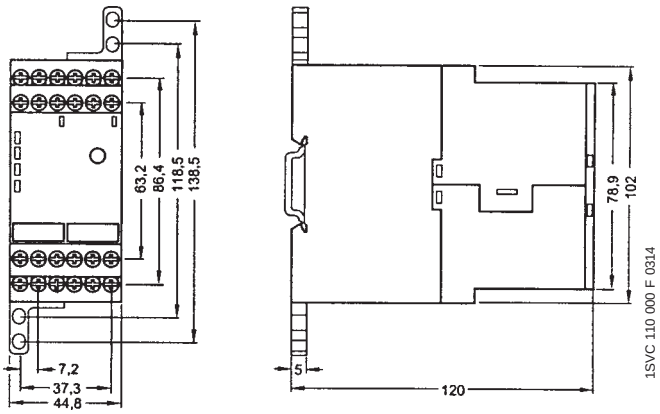
Dimensional drawings

Dimensions in mm

C571, C573, C576, C577, C579



C572, C574, C575



[1] Possible with additional external measures. The figures apply only if the cables and sensors are laid safely and protected mechanically. See also user manual and application manual.
[2] Possible with undelayed enable contact.
[3] The safety category acc. to EN 954-1 corresponds to those of the basic unit.
[4] Acc. to EN 574, type III C.

Safety relays with solid-state outputs
C67xx range
Technical data

Type		C6700	C6701	C6702
Input circuit				
Supply voltage		24 V DC		
Supply voltage tolerence		-10 % ... +15 %		
Power consumption		1.5 W	1.3 W	1.3 W
Duty time		100 %		
Time response				
Response time	monitored start	125 ms	60 ms	60 ms
	auto-start	250 ms	60 ms	60 ms
Release time	at EMERGENCY STOP	30 ms	45 ms	45 ms [1] adjustable 0,05-30 s
	at power failure	25 ms	100 ms [2]	100 ms [2]
Recovery time	at EMERGENCY STOP	20 ms	400 ms	400 ms
	at power failure	0,02 s	max. 7 s	max. 7 s
Mains buffering		25 ms [3]	25 ms [2] [3]	25 ms [2] [3]
Minimum	EMERGENCY STOP	20 ms	25 ms	30 ms
command time	ON-button	0,02 s	0,2-5 s	0,2-5 s
Simultaneity		unlimited		
Output circuits				
Number of contacts		2 S		
Contact material		solid-state		
Rated switching current acc. to IEC 60947-5-1	AC-15 115 V	-	-	-
	AC-15 230 V	-	-	-
	DC-13 24 V	0.5 A	1.5 A	1.5 A
Maximum lifetime	mechanical			
	electrical	unlimited as switching electronically		
Operating frequency		3000/h at load with rated switching current		
Short-circuit proof, max. fuse rating		short-circuit proof, no fusing necessary		
General data				
Width of enclosure		22,5 mm		
Wire size	rigid	2 x 2.5 mm^2 (2 x 14 AWG), 1 x 4 mm^2 (1 x 12 AWG)		
	stranded	with wire end ferrules 2 x 1.5 mm^2 (2 x 16 AWG), 1 x 2.5 mm^2 (1 x 14 AWG)		
Weight	approx.	180 g	150 g	150 g
Mounting		any		
Degree of protection enclosure / terminals		IP40 / IP 20		
Temperature range	operation	-25 °C ... +60 °C		
	storage	-40 °C ... +80 °C		
Mounting		DIN rail (EN 50022)		
Standards				
Standards		EN 60204-1 (VDE 0113-1), EN 292, EN 954-1, IEC 61508, DIN EN 0116 [4]		
Safety category acc. to EN 954-1		3	4	4
Mechanical resistance acc. to EN 60068		8 g / 10 ms, 15 g / 5 ms		
Safety integrity level acc. to IEC 61508		2	3	3

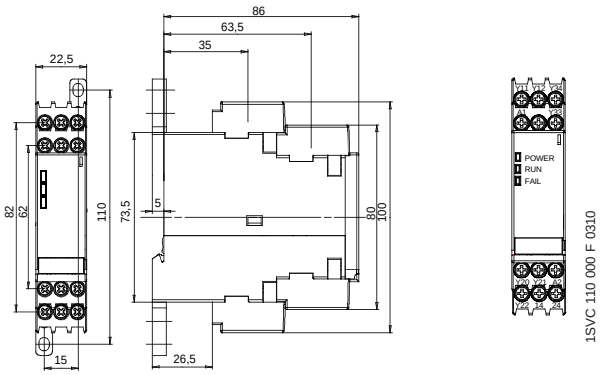
[1] only for undelayed output
[2] When the casade input is supplied from A1, the maximum reaction time after an EMERGENCY STOP aplies.
[3] No supply of the drivers, only internal supply bridging, SELV-/PELV power supply buffers.
[4] Electrical equipment of furnaces. VDE-Certificat for C6701 and C6702 available.

Type	C6700	C6701	C6702
Approvals	**TÜV, UL, CSA, SUVA**		
Insulation data			
Rated insulation voltage acc. to VDE 0110, IEC 947-1	50 V		
Rated impulse withstand voltage acc. to VDE 0110, IEC 664	500 V		
Pollution degree acc. to VDE 0110, IEC 664, IEC 255-5			
Overvoltage category acc. to VDE 0110			

Dimensional drawing

Dimensions in mm

C6700 / C6701 / C6702



Notes