

Description

The NC95 safety relay has been designed to control pressure sensitive safety mats and edges in according to EN ISO 13856-1:2013, EN ISO 13856-2:2013, EN 60204-1:2006+A1:2009, EN ISO 13849-1:2015. This module is based upon the use of guided-contact safety relays.

⚠ Safety Precautions ⚠

The pressure sensitive safety mats and edges fulfill a personal protection function. Incorrect installation or manipulation can lead to severe injuries to personnel. The pressure sensitive safety mats and edges must not be bypassed (bridging the contacts), moved, removed or otherwise made ineffective. The manufacturer or the technician that install the machinery is responsible for correct and safe overall function. Auxiliary output 31/32 is optically isolated and gives informations about the state of the device; it must not be used as a safety output. The NC95 is not proper for the operation in presence of ionizing and not ionizing radiations (rays X, microwaves, laser, ultraviolet rays) (EN 60204-1:2006, §4.4.7).

Functioning

The NC95 Module is used to control pressure sensitive safety mats and edges: the safety outputs are closed by pushing and releasing the START (reset) button only if the 2 inputs are closed and nobody is on the safety mat (edge) area. At the pressure of the safety device, the unit opens the safety outputs 13-14 and 23-24. The reset (manual and monitored) is possible if the mat (edge) is not pressed according to EN ISO 13856-1:2013 (Annex A) and EN ISO 13856-2:2013 (Annex A). The NC95 can be used only with manual and monitored start (reset); to configure the system with automatic start the NC96, NC96 MAT modules have to be used.

The opening of even only one input contact, leads to a safety situation, by putting the safety outputs in open state and by preventing the closing even after the re-closing of the contact and the pressure of the START button.

The system NC95 + pressure sensitive safety mat or edge reaches the safety category 3 according to EN ISO 13849-1:2015 only if two relays (Ka, Kb; see connection diagram) are used to interrupt the load, each connected to an input of the safety unit.

In order to check the functionality of the Ka, Kb relays, it is possible to connect the NC auxiliary contacts of these contactors in series to the reset circuit.

The safety is ensured by using guided contacts, by the redundancy and by the interconnection schematic of the contacts.

The responsibility to choose the adequate components for safety applications, for example guided contacts safety relays, falls to the user.

Assembly

Installation must be performed by authorized personnel only. The NC95 control unit must be assembled in a suitable operating area (switch cabinet, protective housing, at least IP 54). The unit is installed by clipping it to a standard 35 mm top-hat rail.

Electrical Connection

Electrical connection must be performed by authorized personnel only according to EN 60664-1:2006.

All the electrical inputs must either be isolated from the mains supply by a separate coils safety transformer in accordance with EN IEC 61558-2-6 with limited output voltage in the event of a defect or by another equivalent movable mechanism. The power supply have to be connected in a permanently way and using a cable with a maximum lenght of 10 m; the safety mat has to be connected to the unit using a cable with a maximumum lenght of 30 m.

The outputs of the relays have a maximum current of 3 A; the power supply connected to the outputs must be protected from overcurrents by devices adequate to the loads that have to be protected. All the output contacts must have an adequate protective circuit for capacitive and inductive loads. If a common power supply is used, all the inductive and capacitive loads (e.g. relay contactors) connected to the power supply must be connected to appropriate interference suppressors.

Service and Inspection

The correct functioning of the NC95 safety unit must be controlled by the operator and/or by the control circuit of the machine in which it is used periodically (at the beginning of every shift), by checking:

- correct switching function
- secure mounting of components
- correct connection fixing.

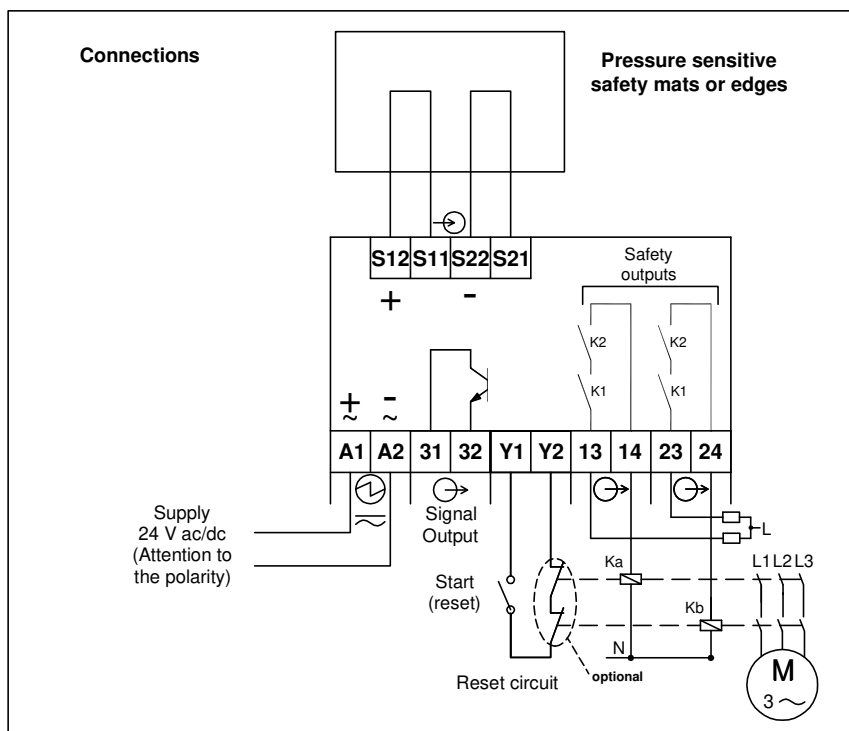
The monitoring function of the unit is done at every switching. In the event of damage or wear and tear, the damaged system component must be replaced.

Liability coverage is void under the following circumstances:

- if instructions are not followed
- non-compliance with safety regulations
- installation and electrical connection not performed by authorized personnel
- non-implementation of functional checks.

Setup

If the control unit does not appear to function when operating voltage is applied (green "Power" LED does not light up), the unit must be returned unopened to the manufacturer. Check whether the safety outputs are being switched (see LED display) by activating the two inputs and START.



LED display

| Function | LED | Color | State |
|--------------------------------|-----|-------|-------|
| Power supply | PWR | Green | on |
| Outputs 13-14 e 23-24 : OPEN | CH1 | Green | off |
| Output 31-32 : CLOSED | CH2 | Green | off |
| Outputs 13-14 e 23-24 : CLOSED | CH1 | Green | on |
| Output 31-32 : OPEN | CH2 | Green | on |

| NC95 Dimensions | Technical data | | | | |
|--------------------------|---|---|-----------------------|-----------------------|--------|
| | Parameter | Value | Unit | | |
| | Housing material | PA | | | |
| | Dimensions | 114,5 x 99 x 22,5 | mm | | |
| | Weight | 160 | g | | |
| | Operating conditions | Temperature: -5 ... +55 | °C | | |
| | | Relative humidity: 4% ... 100% | | | |
| | | Pressure: 86 ... 106 | kPa | | |
| | Housing conditions | Temperature: -25 ... +70 | °C | | |
| | | Relative humidity: 5% ... 95% | | | |
| | | Pressure: 86 ... 106 | kPa | | |
| | Degree of protection (IEC 60529) | IP20 | | | |
| | Degree of contamination | 2 | | | |
| | Assembly | 35 mm DIN standard rail | | | |
| | Connection type | Screw terminals | | | |
| | Supply voltage | 24 -15% / +10% (AC 50 ÷ 60 Hz) | V ac/dc | | |
| | Internal fuse on the supply | 630 mA fast fuse | | | |
| | Current consumption | @24Vdc: 25 min, 70 max; @24Vac: 110 min, 220 max | mA | | |
| | Safety Outputs switching voltage | 240 (max) | V AC | | |
| | Switching current AC-1 / Electrical life | 3 A (safety outputs) / >10 ⁵ cycles | | | |
| | Minimum switching current @ 10 V | 10 | mA | | |
| | Safety output switching power | 720 (max) | VA | | |
| | External fuse at the output | 4 A gG (according to IEC EN 60269-1) | | | |
| | Safety outputs terminals | 13 -14, 23 - 24 | | | |
| | Auxiliary output terminals | 31 - 32 NC (optoisolated) | | | |
| | Usage category / Electrical Life (SAFETY outputs) | AC-15: 1,4 A / 240 V (inductive load, cosΦ=0,3) / 10 ⁵ c. DC-13: 1A / 24 V / 10 ⁵ cycles | | | |
| | Auxiliary NC output parameters | max: 60 mA @ 24 Vdc | | | |
| | Useful lifetime | 10 | years | | |
| | OFF state response time | 20 | ms | | |
| | Safety category and PL (EN ISO 13849-1:2015) | Cat.3 | | | |
| | | PL - d | PL - e | PL - e | |
| | | nop (n. operations / year) | 66000 | 31900 | 19000 |
| | MTTFd | 30 | 62 | 100 | years |
| | PFHd | 2,65x10 ⁻⁷ | 8,84x10 ⁻⁸ | 4,29x10 ⁻⁸ | |
| | TM | 20 | | | years |
| | Vibration resistance | EN ISO 13856-1:2013, EN ISO 13856-2:2013 | | | |
| | Mechanical life | 10 ⁷ | | | Cycles |
| | EMC compliance | EN 61326-3-1:2011 EN 55011:2011 | | | |
| | In accordance with | EN 60204-1:2006+A1:2009, EN ISO 13849-1:2015, EN ISO 13856-1:2013, EN ISO 13856-2:2013 | | | |
| | Approvals | TÜV IT 0948 10 MAC 0012 | | | |
| NC95 Frontal view | | | | | |

| UL CERTIFICATION REQUIREMENTS | | | |
|--|---------------|--|-------------------------|
| Power Source (input) | | | |
| Input Terminals | Voltage | Max. Current | |
| A1-A2 | 24Vac/dc | 220mA / 70mA | |
| Auxiliary Outputs (SAFETY) | | | |
| Output Terminals | Contacts Type | General Use Or Resistive | Pilot Duty |
| 13-14 23-24 | NO | 3A/240Vac Res | 1.4A/240Vac 1A/24Vdc |
| Signaling Outputs (SIGNAL) | | | |
| Output Terminals | Contacts Type | Nom. Ratings | |
| 31-32 | NC | 60mA/24Vdc | |
| Environmental Ratings Max. Surrounding Air Temperature: 55°C Pollution Degree: 2 Environmental designation Open type equipment | | Installation Notes Use with min. 60°C copper (CU) conductor only Terminal tightening torque: 5-7 Lbln (0,56-0,79 Nm) | |