Operating instructions for safety control unit mod. NC96 Lift - Original instructions -

Description
The NC96 Lift safety relay is created for use in safety circuit intended by EN 81-20:2014, EN 81-50:2014.
This module is based upon the use of guided-contact safety relays.

⚠ **Safety Precautions** ⚠
The NO contacts connected to the NC96 Lift fullfills a personal protection function; they must not be bypassed (bridging the contacts), moved, removed or otherwise made ineffective. Incorrect installation or manipulation can lead to severe injuries to personnel. The manufacturer or the technician that intall the machinery is responsible for correct and safe overall function.
NC 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 **NC96 Lift** is not proper for the operation in presence of ionizing and not ionizing radiations (rays X, microwaves, laser, ultraviolet rays) (CEI EN 60204-1:2006, §4.4.7).
The NCUM96 Lift control unit must be assembled in a suitable operating area (switch cabinet, protective housing).
In the following case you must use a IP54 cabinet:
- If the safety outputs (13-14,23-24) have a voltage difference between them or between the other connections greater than 160V

Functioning
The **NC96 Lift** Module can control the state of two NO contacts: the output is activated by pressing the START button only if the contacts of two sensors are closed. 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.
For automatic START see the connection diagram.
The inputs channels work on opposite potentials (S12→+ S22→-).
The safety is ensured by using guided contacts, by the redundance 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.

Operation according to EN 81-20:2014.
The safety module ensures the opening of contacts within 20 ms from the opening of the sensors S11-S12 or S21-S22.
It can be used as a detector, according to 5.6.7.7 EN 81-20:2014, to be integrated in a A3 system.

Assembly
Installation must be performed by authorized personnel only.
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.
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 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 standard 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 NC96 Lift safety unit must be controlled by the operator and/or by the control circuit of the machine in which it is used periodically, 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.

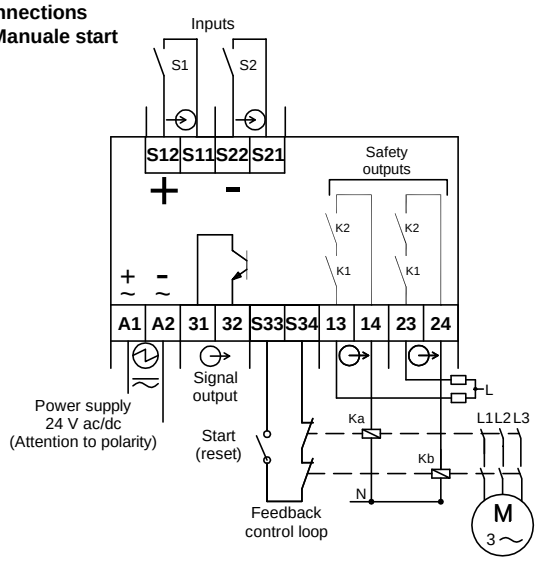
Liability coverage is void under the following circumstances:
- if instructions are not followed
- non-compliance with safety regulations
- installation and electrical connection not performed by authorized personnel
- non-implementation of functional checks.

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.

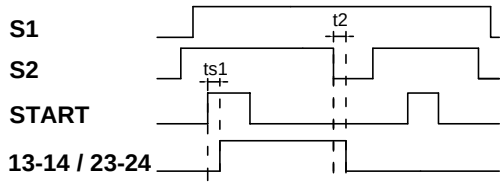
LED Display

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

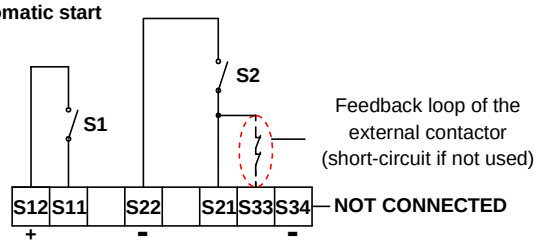
Connections
1) Manuale start



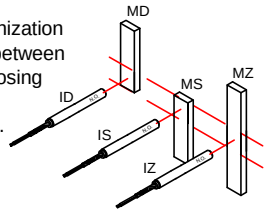
Timing diagram for manual start

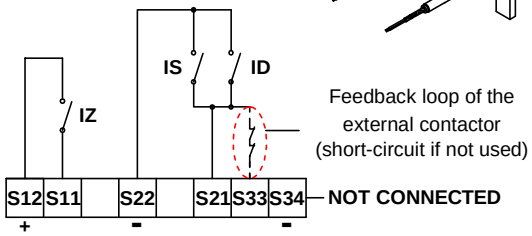


2) Automatic start

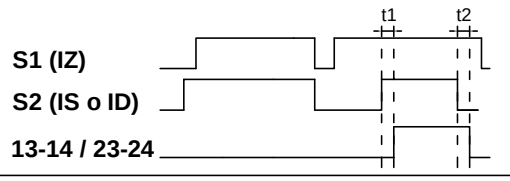


Example
Reed switch sensors ID, IS and IZ.
In this configuration the inputs synchronization time among the closing of IZ and one between IS and ID, it is endless, but a correct closing sequence has to be respected: the first contact to be closed is IZ, then IS or ID.





Timing diagram for automatic start



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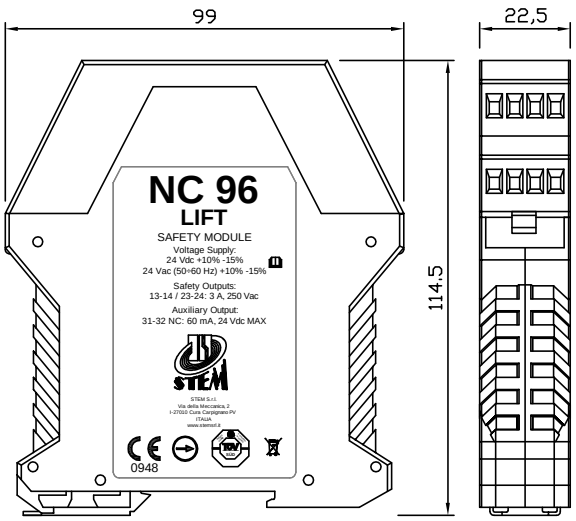
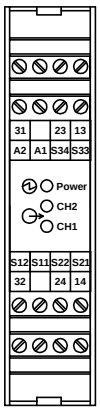
Dimensions



Frontal view



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 **(see note 1)**	3	
Overvoltage Category	3	
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 consuption	@24Vdc: 25 min, 100 max; @24Vac: 110 min, 220 max	mA
Safety Outputs switching voltage	240 (max)	V AC
Safety Outputs switching current (AC-1)	3 A	
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) / 10^5c. DC-13: 1A / 24 V / 10^5cycles	
Auxiliary NC output parameters	max: 60 mA @ 24 Vdc	
Output response time (t1)	20	ms
OFF state response time (t2)	20	ms
Massima resistenza del sensore in ingresso	200	ohm
Safety category and PL (EN ISO 13849-1:2008)	Cat.4 - PL e	
Vibration resistance	IEC 60068-2-6:2007, IEC 60068-2-27:2008 EN 81-50:2014	
Mechanical life	10^7	N° cicli
EMC compliance	EN 61000-6-2:2005, EN 61000-6-3:2007, EN 12015:2014, EN 12016:2013	
In accordance with	EN 81-20:2014, EN 81-50:2014, EN ISO 13849-1:2015	
Approvals	TüV EDES 008	

NOTE 1
Condition met if:
-The safety outputs (13-14,23-24) in the final application have a voltage difference between them or between the other connections lower than 160V