

# Safety Modules

## Emergency Stop and Safety Gate

### Types NES02D, NES13D

CARLO GAVAZZI



Screw, fixed



Screw, detachable

- Safety Category 4, Performance Level e according to EN 13849-1
- Safety Category 4 according to EN 954-1
- Category 0 Emergency Stop (EN 60204-1)
- 2 x 6 A NO safety outputs (NES02D)
- 3 x 6 A NO safety outputs and 1 x 6 A NC auxiliary output (NES13D)
- Automatic / manual or monitored manual reset
- Single / double channel operations
- LED indication for outputs status and power supply ON
- Connection by fixed or detachable terminals
- For mounting on DIN-rail in accordance with DIN/EN 50 022
- 22.5 mm Euronorm housing

## Product Description

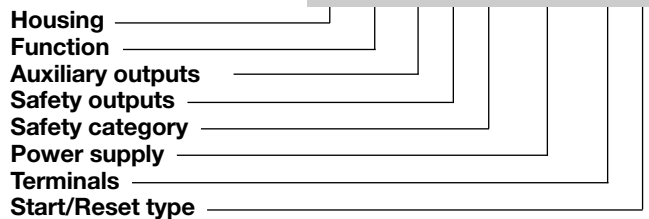
Emergency Stop and Safety Gate modules according to EN 60204-1, EN 292-1/-2, EN 418 and EN1088.

This family of safety module in Safety Category 4, Performance Level e, includes

fixed screw and detachable screw as well as automatic/manual or monitored manual restart versions.

## Ordering Key

**N ES 0 2 D B24 S A**



## Type Selection

Auxiliary outputs	Safety outputs	Terminals	Start/Reset type	Supply: 24 VAC/DC
	2 NO	Screw, fixed	Automatic / Manual	<b>N ES 0 2 D B24 S A</b>
	2 NO	Screw, fixed	Monitored manual	<b>N ES 0 2 D B24 S C</b>
	2 NO	Screw, detachable	Automatic / Manual	<b>N ES 0 2 D B24 D A</b>
	2 NO	Screw, detachable	Monitored manual	<b>N ES 0 2 D B24 D C</b>
1 NC	3 NO	Screw, fixed	Automatic / Manual	<b>N ES 1 3 D B24 S A</b>
1 NC	3 NO	Screw, fixed	Monitored manual	<b>N ES 1 3 D B24 S C</b>
1 NC	3 NO	Screw, detachable	Automatic / Manual	<b>N ES 1 3 D B24 D A</b>
1 NC	3 NO	Screw, detachable	Monitored manual	<b>N ES 1 3 D B24 D C</b>

## Time Specifications

Delay ON energisation	< 150 ms
Delay ON de-energisation	≤ 30 ms
Recovery time	≥ 30 ms
Channel simultaneity during outputs closing	Infinite
Input operating to START operating delay NES...C	> 500 ms

## Input specifications

Function	2 NO, voltage free
Input current NES02D	
Terminals S11-S21	max 50 mA
Terminals S12-S22	max 60 mA
Switching	max 470 mA
NES13D	
Terminals S11-S12	max 60 mA
Terminals S21-S22	max 50 mA
Switching	max 470 mA

## Output Specifications

Safety outputs	Category 4, Performance Level e (EN 13849-1)
NES02D	2 NO (13-14, 23-24)
NES13D	3 NO (13-14, 23-24, 33-34)
Auxiliary output NES13D	1 NC (41-42)
Rated insulation voltage	250 VAC (rms)
Contact ratings (AgSnO <sub>2</sub> )	2 μm Au
Resistive loads	AC1 6 A @ 230 VAC
	DC12 6 A @ 24 VDC
Small inductive loads	AC15 3 A @ 230 VAC
	DC13 2.5 A @ 24 VDC
External contact fuse protection	5 A fast, 4 A slow
Mechanical life	> 10 <sup>7</sup> operations
Electrical life	> 10 <sup>5</sup> operations
Dielectric strength	
Dielectric voltage	4 kVAC (rms)

## Supply Specifications

<b>Power supply</b> Rated operational voltage through terminals: A1, A2	Overvoltage cat. III (IEC 60664)  24 VAC -15% / +10%, 50 to 60 Hz 24 VDC -15% / +10%	
<b>Short circuit protection</b>	Internal PTC	
<b>Dielectric voltage</b> Supply to input Supply to output Input to output	<b>DC supply</b> none 4 kV 4 kV	<b>AC supply</b> none 4 kV 4 kV
<b>Rated operational power</b>	max 5 VA	

## General Specifications

<b>Indication for</b> Power supply ON Output relays ON	LED, green LED, green (CH 1, 2)
<b>Environment</b> Degree of protection Pollution degree Operating temperature Storage temperature	(EN 60529) IP 30 2 -25 to 65°C, R.H. < 95% -30 to 65°C, R.H. < 95%
<b>Minimum protection degree of the installation location</b>	IP 54
<b>Housing dimensions</b>	22.5 x 99 x 114 mm
<b>Weight</b>	Approx. 200 g
<b>Screw terminals</b> Tightening torque Upper terminals Lower terminals	Max. 0.5 Nm Max 0.8 Nm
<b>Approvals</b>	cULus, TUV (NES13 only)
<b>CE Marking</b>	Yes
<b>EMC</b> Immunity Emission	Electromagnetic Compatibility According to EN 61000-6-2 According to EN 61000-6-3

## Mode of Operation

The safety modules NES02D and NES13D monitor E-Stop pushbutton and limit switch devices, according to 98/37/CE Machinery Directive.

If the unit is correctly supplied and the input terminals are closed (i.e. E-Stop not pushed), the module is enabled to close the safety outputs and the external contactors can be energized.

When the input terminals are open (i.e. E-Stop pushed) the module is not enabled to close the safety outputs and the external contactors can not be energized.

### Automatic START

Provided that the terminals X1 and X2 (NES02...A) or S33 and S34 (NES13...A) are connected, the safety outputs close and the auxiliary output opens (NES13...A) as soon as both S1 and S2 switches are closed.

The relevant CH1 and CH2 LED turn on.

Releasing even one input contact (S1 and/or S2) forces immediately the safety outputs to open and the auxiliary output (NES13...A) to close.

A new operating cycle is possible only after releasing both input contacts and then operating them again.

### Manual START

Provided that both S1 and S2 switches are closed, the safety outputs close and the auxiliary output opens (NES13...A) as soon as the NO START pushbutton is pushed [connecting X1 and X2 (NES02...A) or S33 and S34 (NES13...A)]

A new operating cycle is possible only after releasing both input contacts, closing them again and pushing the START button.

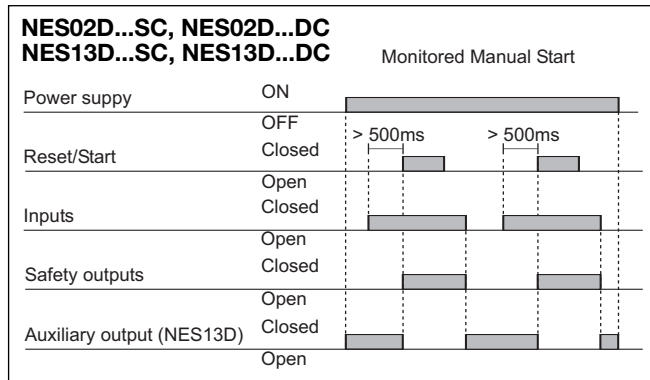
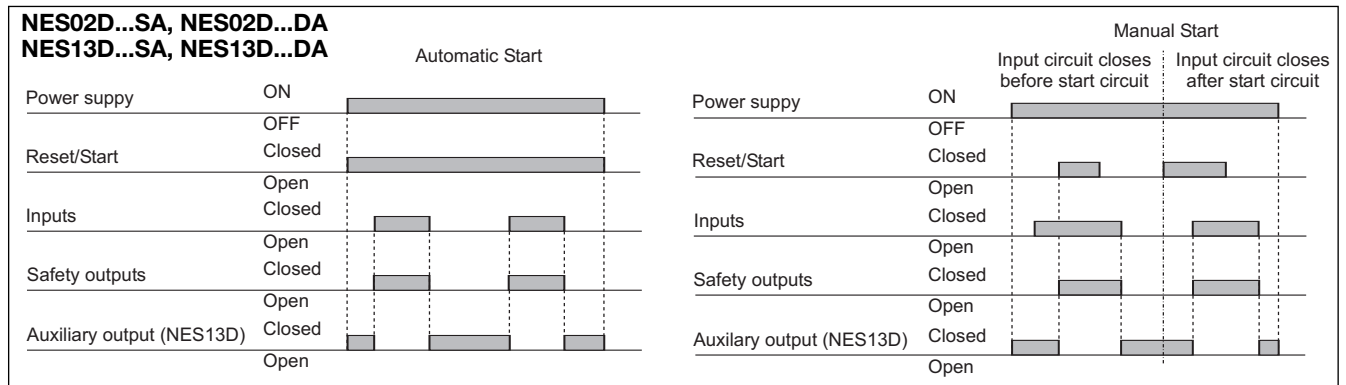
### Monitored manual START

The monitored manual START versions (NES...C) work as described in the previous paragraph (Manual START) except for a minimum delay of 500 ms from the closed status of the input contacts to the pushing of the START button.

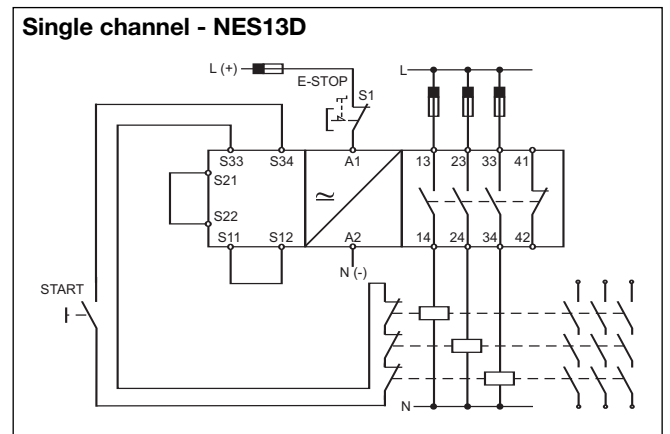
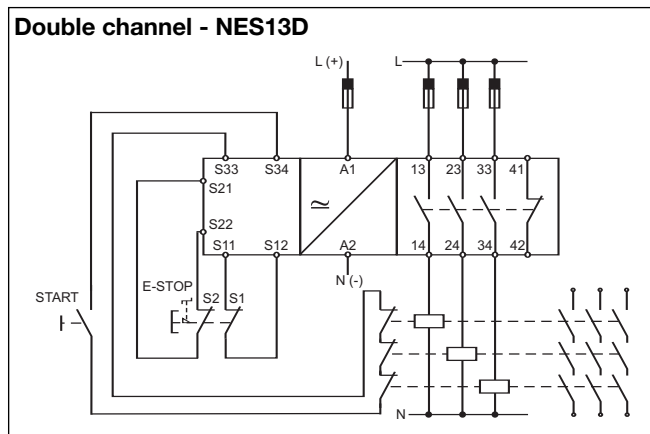
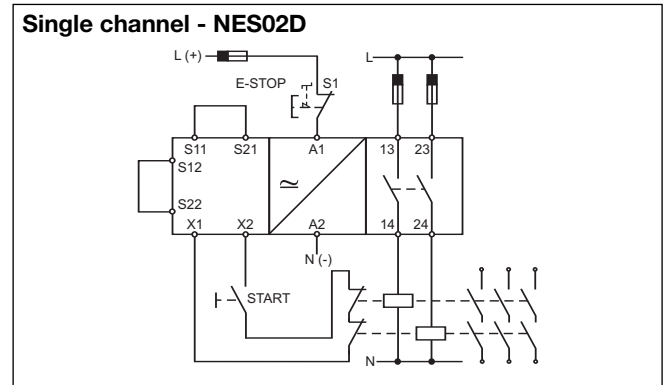
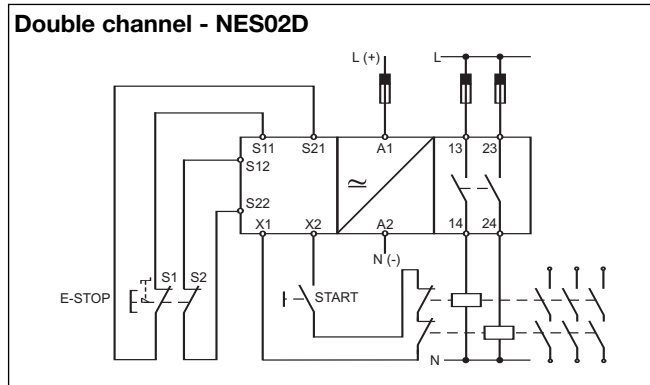
If the input terminals get closed with the START switch already closed, the safety outputs don't close and the auxiliary doesn't open (NES13...C): it is necessary to release the START button and the input contacts before starting a new cycle, then operate the input contacts and finally, after at least 500 ms, operate the START button.

So if the NO START button gets welded, the outputs don't close anymore.

## Operation Diagrams

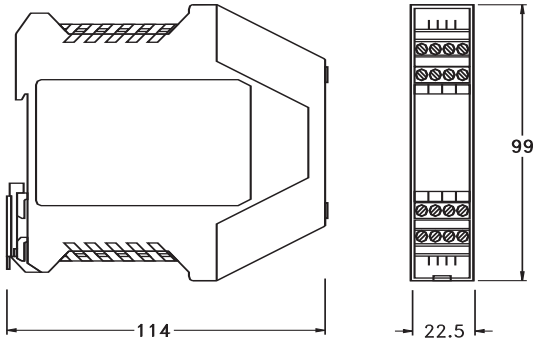


## Wiring Diagrams



## Dimensions

Versions with fixed terminals



Versions with detachable terminals

