

Handles with built-in safety switch

Technopolymer

MATERIAL

- **Handle body:** glass-fibre reinforced polyamide based (PA) technopolymer, certified self-extinguishing UL-94 V0, black colour.
- **Clamp element:** acetal-based technopolymer (POM), black colour.
- **Screw cover:** glass-fibre reinforced polyamide based (PA) technopolymer, certified self-extinguishing UL-94 V0, black colour.
- **LED light diffusor:** UL-94 V0 self-extinguishing polycarbonate, opal colour.
- **Fixing plates:** stainless steel.

STANDARD EXECUTIONS

- **ESC-SFT-C-A:** 8 pole male connector M12, top axial output.
- **ESC-SFT-C-C:** 8 pole male connector M12, bottom axial output.
- **ESC-SFT-C-B:** 8 pole male connector M12, back output.
- **ESC-SFT-F-A:** cable length 2 or 5 metres, top axial output.
- **ESC-SFT-F-C:** cable length 2 or 5 metres, bottom axial output.
- **ESC-SFT-F-B:** cable length 2 or 5 m, back output.

The ESC-SFT handle must be mounted with the matching part side equipped with a cable/connector exit on the fixed part (structure chassis) and with the handle side on the mobile part (door).

Contact blocks in the standard execution:

- **NC-NO-NC+LED:** 1 NC safety contact, 1 NO safety contact, 1 NC signalling contact with LED.
- **NC-NC-NC+LED:** 2 NC safety contacts, 1 NC signalling contact with LED.

NO contact is considered to be the normally open contact when the two elements of the handle are in contact, while NC contact is the normally closed contact when the two elements of the handle are in contact.

The green LED is on when the protection is closed (two elements of the handle contact) and indicates the correct functioning of the machinery in accordance with IEC 60204-1.

IP PROTECTION

IP67 protection class, see Table EN 60529.

ACCESSORIES ON REQUEST

- CN-SFT: safety control unit for category 3 and 4.
- FC-ESC: extension length 2.5 or 5 m.



ELESA Original design

FEATURES AND APPLICATIONS

Staff protection: the ESC-SFT handle is a coded sensor with redundant channels that can be used in safety circuits designed to monitor the status of dangerous guards on board the machine. In combination with an appropriate certified control logic, in the case of accidental opening of doors, casings, protective covers of machinery or production lines, it activates the interruption of the machinery's power circuit. The interlocking device consists of a magnetic sensor and the corresponding actuator (coded magnet), incorporated into the two elements of the handle. The approach of the coded magnet to the sensor involves the switching of the contacts inside the sensor and the relative closure of the safety outputs of the control unit connected to it. A green LED is on when the two elements of the handle are in contact and the guard is closed. The ESC-SFT handle is classified as a low coding level type 4 magnetic interlock device in accordance with EN14119. If used as an input to a certified safety control unit (see accessories on request), it permits a system architecture up to SIL3 in accordance with the IEC 62061 standard or category 4 - PLe in accordance with the EN ISO 13849-1 standard. It can be associated with the CFSQ or CFSW hinge to increase the system safety level (systems with different operating principles). The switching distance of the sensors is independent of the geometry of the door on which the product is installed.

Snap lock: the two parts that make up the product (handle side and matching part side) are equipped with a mechanical coupling system that allows the door to remain closed. The opening force required to open the door is approximately 2 kg.

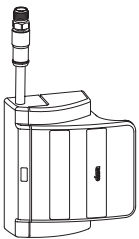
Self-centring: the handle is fitted with a mechanical self-centring system with respect to its matching part which compensates for any misalignment of the door or bending of it due to the weight. It can be used for sliding or swing doors.

FUNCTIONING

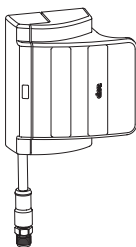
The safety system is composed of a control unit and a handle, which works only in particular configurations (see the combination and wiring options with the respective combined safety control units). The safety handle contains reed contacts that are activated by coded magnets. The safety control unit converts the information and transfers the state of the protections to the control system via a safety output.

The safe state is defined as the state in which the handle is away from its activation magnet.

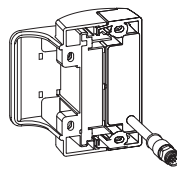
ESC-SFT-C-A



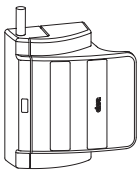
ESC-SFT-C-C



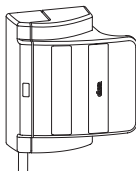
ESC-SFT-C-B



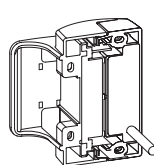
ESC-SFT-F-A



ESC-SFT-F-C



ESC-SFT-F-B



ASSEMBLY INSTRUCTIONS

- Mount the handle matching part on the frame and the handle on the door, using the fixing plates (included in the supply) placing them between the TCEI M5 screws and the handle. The presence of slotted holes allows for easier installation of the product.
- Carry out the wiring according to the electrical diagram indicated.
- The use of an external fast fuse on the safety line is recommended.
- The product should not be used in an environment with strong magnetic fields.
- Assembly permitted only in the absence of voltage.
- Mounting position of choice, provided that the active surface of the safety sensor and that of the actuator are opposite each other.
- Only mount the sensor on flat surfaces.
- If possible, do not mount the sensor and actuator on surfaces made of ferromagnetic material. It is recommended to install a non-magnetic spacer with a thickness of at least 5 mm. It is also recommended to use non-magnetic fixing screws.
- Do not expose the sensor and actuator to strong vibrations and shocks.
- Keep away from iron residues.
- Leave a minimum mounting distance between two handles of 50 mm.
- For minimum distance between holes on the door side and frame, see drilling template.

PRECAUTIONS

Before using the product, a risk assessment must be carried out on the machine in accordance with:

- EN ISO 13849-1, Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design;
- EN ISO 14119, Safety of machinery — Interlocking devices associated with guards;
- EN 60204-1, Safety of machinery - Electrical equipment of machines;
- EN 60947-5-3, Low-voltage switchgear and controlgear - Part 5-3: control circuit devices and switching elements - Requirements for proximity devices with defined behaviour under fault conditions (PDBB).
- The ESC-SFT handle performs a personal protection function. Incorrect installation or handling can cause serious damage to people. In particular, the handle must not be bypassed (short-circuiting the contacts), moved, removed or otherwise rendered ineffective.
- Safe operation is ensured only when the complete system, safety handle + control unit CN-SFT.115-2NC, CN-SFT.46-2NC/CN-SFT.115-1NC+1NO, CN-SFT.46-1NC+1NO or comparable is used. If the handle is used without a suitable control unit, the responsibility lies with the assembler of the system/machine.
- A complete safety system is generally composed of many signalling devices, sensors, control units. The manufacturer of the machine, or the installer, is responsible for correct and safe overall operation.

MAINTENANCE AND CHECKS

Remove any iron filings from the handle at regular intervals. Use only solvent-free detergents to clean the handle.

ADDITIONAL SAFETY MEASURES (EN ISO 14119:2013, TABLE 3)

It is mandatory to periodically check (at the beginning of each shift at the latest within 8 hours) the correct functioning of the handles by inspecting the following:

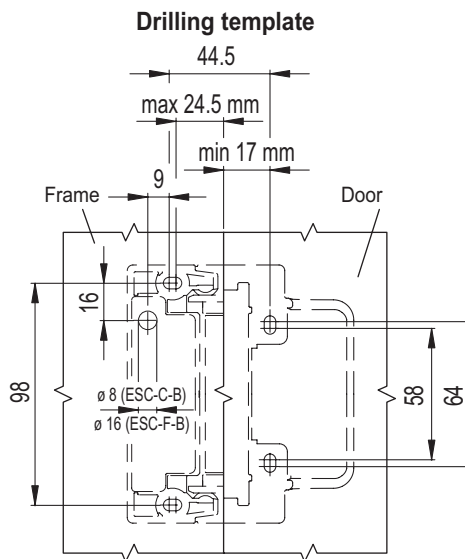
- correct switching of each handle by checking:
 - that when the guard to which the handle is mounted opens, the safety outputs of the connected control unit are opened.
 - that when the same guard closes, the safety outputs of the control unit are closed following any start command.
- secure fixing of the handle.
- correct fixing of the connections.

The monitoring function of the device must be carried out by the safety control unit connected for each intervention of the device itself.

If, with all protections closed and following a possible start command, the control unit does not activate its safety outputs, avoid turning the control unit off and on and proceed to check for any open guards and carry out the checks indicated above in points a) and b).

In the event of failure or wear, the damaged system must be replaced. The warranty coverage as well as the manufacturer's liability ceases in the following circumstances:

- if the instructions have not been followed.
- failure to comply with the safety regulations.
- electrical installation and connection not carried out by authorised personnel.
- failure to carry out operational checks.
- tampering with the product.



HANDLE TECHNICAL DATA				
GENERAL FEATURES				
Housing material	Black glass-fibre reinforced self-extinguishing technopolymer			
Operating room temperature	-25 +70 °C			
Protection class	IP 67 (IEC 60529)			
Connections	Cable with ferrules - M12 male connector			
Operational voltage (Ue)	24 V dc			
Minimum operating current per channel (Im)	6 mA			
Maximum operating current with LED in the absence of load	16 mA			
Current in the Off state	0 mA			
Insulation voltage (Ui)	26.4 V			
Rated withstand voltage (Ui)	1500 V			
Pollution degree	2			
Fast external fuse	0.5 A			
Category of usage	DC12: 0.4A at 24Vdc - DC13: 0.4A at 24Vdc			
Max. switching frequency	500 Hz			
Voltage drop (Ud)	0.3 V			
Switching indication	Green LED + NC signalling output (24V, 10mA)			
ACTIVATION PARAMETERS				
Handle Options (sliding door S, swing door B)	NC+NO S	NC+NC S	NC+NO B	NC+NC B
Guaranteed intervention distance (Sao)	3 mm	5 mm	6 mm	9 mm
Guaranteed release distance (Sar)	13 mm	17 mm	17 mm	20 mm
Repetition accuracy	<10%	<10%	<10%	<10%
RELIABILITY/SAFETY FUNCTIONAL PARAMETERS				
B10d (EN 13849-1)	20x10 ⁶ cycles			
TM	20 years			
Diagnostic coverage (DC)	Sent to the control unit			
Disabling time	<10 ms			
Risk time	Sent to the control unit			
PL/category in accordance with EN13849-1	up to PL e/Cat.4 (in combination with the safety modules CN-SFT.115-2NC, CN-SFT.46-2NC/CN-SFT.115-1NC+1NO, CN-SFT.46-1NC+1NO or other comparable safety control units)			
Coding EN ISO 14119:2013	Type 4 (low coding level)			
CONFORMITY				
Resistance to vibrations and shocks	EN60947-5-3			
Product conformity	EN60947-5-3 EN14119			
Approved by TUV	TUV IT 0948 24 MAC 429 B TUV IT 0948 24 MAC 428 B			
Approved by UL	E542642			



4
U-Handles

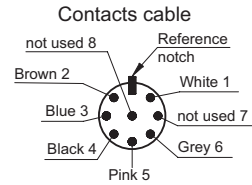
ELECTRICAL CONNECTIONS

Electrical connections must only be carried out by authorised personnel.

The sensor connection cable must not be stretched out. The sensors must be connected to the control unit according to the suggested diagrams (see also the operating instructions for the control units).

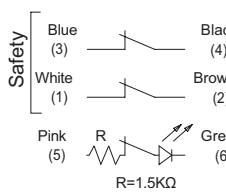
Cabling in accordance with Standard 60947-5-2

Colour	Type	Function
Brown (BN) - White (WH)	NC contact	safety outputs Channel 1
Blue (BU) - Black (BK)	NC contact (vers. NC+NC) NO contact (vers. NC+NO)	safety outputs Channel 2
Pink (PK)	Auxiliary contact positive (+24Vdc)	Positive for LED signalling
Grey (GY)	Auxiliary contact negative (GND)	Negative for LED signalling

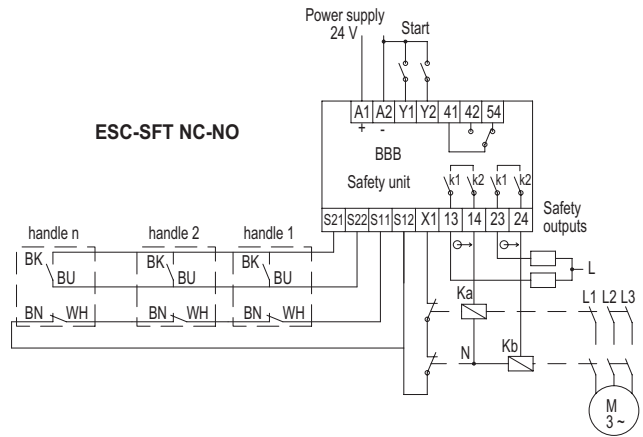
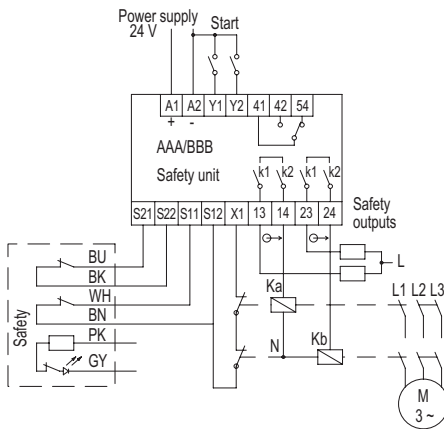
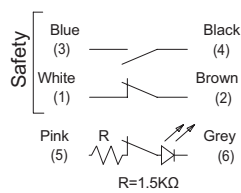


*The colours refer to the use of the FC-ESC accessory

Button NC-NC-NC+LED



Button NC-NO-NC+LED



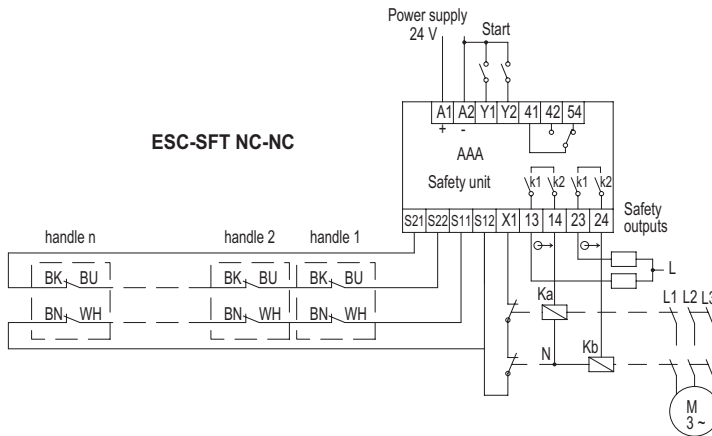
Connection diagram of a single handle to the CN-SFT.115-2NC, CN-SFT.46-2NC / CN-SFT.115-1NC+1NO, CN-SFT.46-1NC+1NO control units or equivalent models. The handle with NC-NC contacts must be connected to the CN-SFT.115-2NC / CN-SFT.46-2NC control unit, the handle with NC-NO contacts must be connected to the CN-SFT.115-1NC+1NO / CN-SFT.46-1NC+1NO control unit. In any case, it is advisable to read the safety control unit instruction manual to verify the correct wiring of the product.

Connection diagram of a single handle to the CN-SFT.115-2NC / CN-SFT.46-2NC control units or equivalent models in the case of multiple handles with NC-NC contacts.

- Channels 1 (BU-BK, NC) in series
- Channels 2 (WH-BN, NC) in series

In any case, it is advisable to read the safety control unit instruction manual to verify the correct wiring of the product.

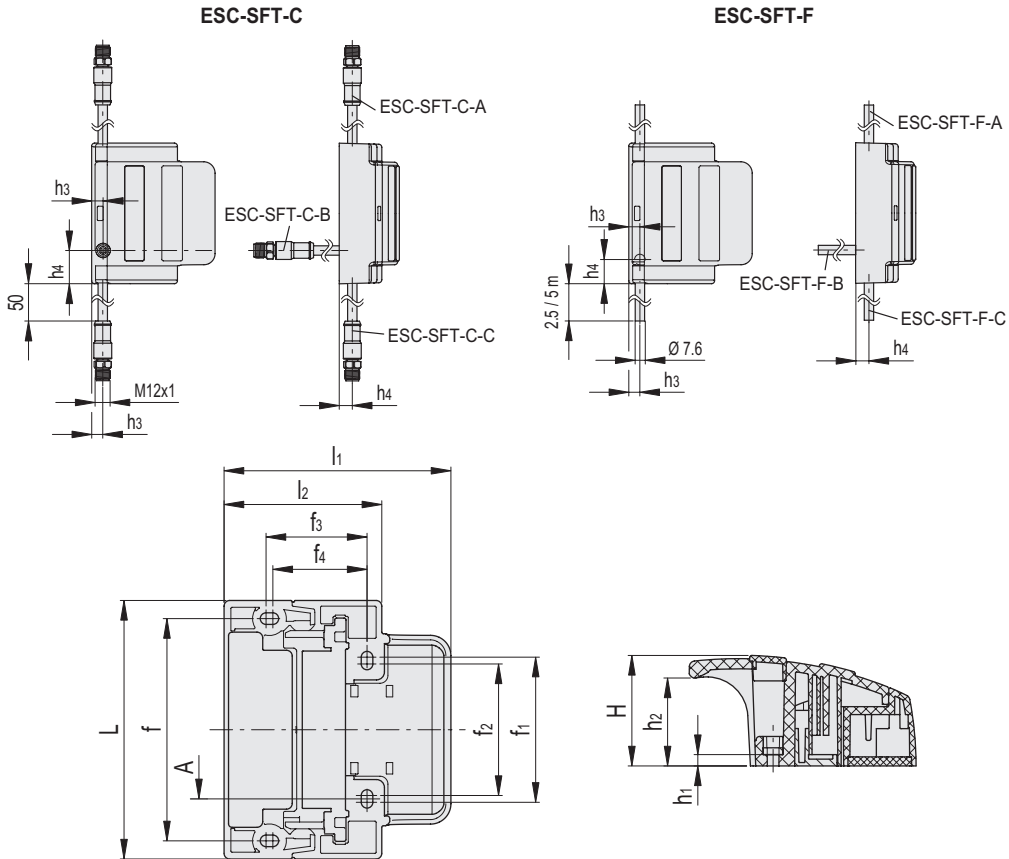
ESC-SFT NC-NC



Connection diagram of a single handle to the CN-SFT.115-1NC+1NO / CN-SFT.46-1NC+1NO control units or equivalent models in the case of multiple handles with NC-NO contacts.

- Channels 1 (BU-BK, NO) in parallel
- Channels 2 (WH-BN, NC) in series

In any case, it is advisable to read the safety control unit instruction manual to verify the correct wiring of the product.



ESC-SFT-C-A

Code	Description	L	f _{±0.25}	f _{1±0.25}	f _{2±0.25}	f _{3±0.25}	f _{4±0.25}	H	h ₁	h ₂	h ₃	h ₄	l ₁	l ₂	C# [Nm]	⚖
225041	ESC-SFT.110-5-NC+NC-C-A	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	318
225071	ESC-SFT.110-5-NC+NO-C-A	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	318

ESC-SFT-C-C

225047	ESC-SFT.110-5-NC+NC-C-C	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	318
225077	ESC-SFT.110-5-NC+NO-C-C	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	318

ESC-SFT-C-B

225044	ESC-SFT.110-5-NC+NC-C-B	114	98	64	58	44.5	41.5	49	5	39	9.3	24	100	69.5	5	318
225074	ESC-SFT.110-5-NC+NO-C-B	114	98	64	58	44.5	41.5	49	5	39	9.3	24	100	69.5	5	318

ESC-SFT-F-A

Code	Description	L	f _{±0.25}	f _{1±0.25}	f _{2±0.25}	f _{3±0.25}	f _{4±0.25}	H	h ₁	h ₂	h ₃	h ₄	l ₁	l ₂	C# [Nm]	⚖
225051	ESC-SFT.110-5-NC+NC-F-A-2	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	400
225081	ESC-SFT.110-5-NC+NO-F-A-2	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	400
225061	ESC-SFT.110-5-NC+NC-F-A-5	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	635
225091	ESC-SFT.110-5-NC+NO-F-A-5	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	635

ESC-SFT-F-C

225057	ESC-SFT.110-5-NC+NC-F-C-2	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	400
225087	ESC-SFT.110-5-NC+NO-F-C-2	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	400
225067	ESC-SFT.110-5-NC+NC-F-C-5	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	635
225097	ESC-SFT.110-5-NC+NO-F-C-5	114	98	64	58	44.5	41.5	49	5	39	7	15	100	69.5	5	635

ESC-SFT-F-B

225054	ESC-SFT.110-5-NC+NC-F-B-2	114	98	64	58	44.5	41.5	49	5	39	9.5	24	100	69.5	5	400
225084	ESC-SFT.110-5-NC+NO-F-B-2	114	98	64	58	44.5	41.5	49	5	39	9.5	24	100	69.5	5	400
225064	ESC-SFT.110-5-NC+NC-F-B-5	114	98	64	58	44.5	41.5	49	5	39	9.5	24	100	69.5	5	635
225094	ESC-SFT.110-5-NC+NO-F-B-5	114	98	64	58	44.5	41.5	49	5	39	9.5	24	100	69.5	5	635



Safety control unit for category 3 and 4

Technopolymer

MATERIAL

Polyamide-based (PA) technopolymer, grey colour.

STANDARD EXECUTIONS

Safety control unit for category 3 and 4.

- **CN-SFT.115:** standard dimensions.

- **CN-SFT.46:** reduced dimensions.

Contact blocks in the standard execution:

- **NO-NC:** 1 NO contact + 1 NC contact.

- **NC-NC:** 2 NC contacts.

FEATURES AND APPLICATIONS

CN-SFT can be used in conjunction with the following Elesea products:

ESC-SFT, CFSW, CFSQ, M.2000-SWM.

The CN-SFT safety control unit is able to control the status of two contacts (safety Reed magnetic sensors, emergency buttons, mechanical safety switches, safety interlocks for mobile guards): the output is activated by pressing and releasing the START button (reset) only if the NO contact is open and the NC contact is closed (NO-NC version) or only if the two NC contacts are closed (NC-NC version).

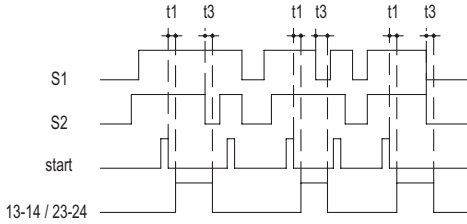
The switching of even just one input contact results in a safe situation, placing the safe outputs in an open state and preventing them from closing again, even after a new switching of the contact and pressing the START (reset) button.



Technical data	
Container material	PA
Dimensions	CN-SFT.115: 114.5x99x22.5 mm CN-SFT.46: 97x72x46 mm
Weight	160 g
Operational environmental conditions	Temperature: -5 ... +55°C
	Relative humidity: 4% ... 100%
	Pressure: 86 ... 106 kPa
Storage environmental conditions	Temperature: -25 ... +70°C
	Relative humidity: 5% ... 95%
	Pressure: 86 ... 106 kPa
Degree of protection (IEC 60529)	IP20
Pollution degree	2
Withstand voltage at pulse (Uimp)	4 kV
Insulation nominal voltage (Ui)	250 V
Overvoltage category	III
Mounting	standard 35mm DIN rail
Connection type	Screw terminals
Supply voltage	24 -15%/+10% (AC 50 ± 60 Hz) V AC/DC
Internal fuse on power supply	750 mA PTC
Absorption current	24 Vdc: min 25 mA, max 100 mA;
	24 Vac: min 110 mA, max 220 mA
Output switching voltage	240 Vac (max) (outputs SAFE)
Switching current AC-1/V electrical	3 A (safety outputs)
Minimum switching current at 10 V	10 mA
Switching power	720 VA (max)
External fuse on output	4 A gG (in accordance with IEC EN 60269-1)
Safety output terminals	13-14, 23-24
Auxiliary output terminals	41-42 NO, 41-54 NC

Category of use / Electrical screw (safety outputs)	AC-15: 1.4 A / 240 V (inductive load, $\cos\phi = 0.3$)/105 cycles				
	DC-13: 1A/ 24V / 105 cycles				
Auxiliary output parameters	max: 0.5A at 24Vdc				
Output response time - manual start (t1)	150 ms				
Output response time - automatic start (t2)	30 ms				
Response time in OFF state (t3)	20 ms				
Maximum input sensor resistance	200 ohm				
Safety cat. (EN ISO 13849-1)	Cat. 4 (1 sensor)		Cat. 3 (more than 1 sensor)		
	e	e	d	d	e
PL (EN ISO 13849-1)	65000	19200	65000	31500	19200
	No. cycles/year	No. cycles/year	No. cycles/year	No. cycles/year	No. cycles/year
nop (number of operations/year)	30	100	30	56	100
	years	years	years	years	years
MTT-Fd	9,54x10 ⁻⁸	2,47x10 ⁻⁸	2,65x10 ⁻⁷	1,03x10 ⁻⁷	4,29x10 ⁻⁸
PFHd					
TM	20 years (for MTTFd = 100 years)				
Stop category (EN ISO 13850)	0				
Resistance to vibrations	EN 60068-2-6, EN 60947-5-3				
Mechanical life-span	107 No. of cycles				
EMC conformity	EN 61000-6-2, EN 61000-6-3				
	IEC 61326-3-1, EN 60947-5-3				
Conformity to standards	EN 60204-1, IEC 60664-1				
	EN ISO 13849-1, EN 13849-2				
	EN ISO 14119, EN ISO 13850				
Approval	TUV IT 0948 24 MAC 429 B		CN-SFT.115-1NC+1NO CN-SFT.115-1NC+1NO		
	TUV IT 0948 24 MAC 428 B		CN-SFT.115-2NC CN-SFT.115-2NC		

Timing diagram for manual start



Timing diagram for automatic start (Y1-Y2-X1 bridged)

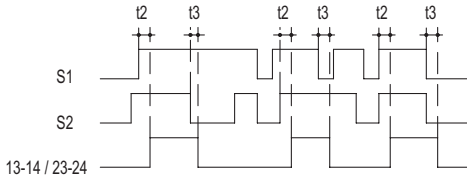


Table of LEDs			
Function	LED	Colour	Status
Power supply	PWR	Green	on
Outputs 13-14 and 23-24: OPEN	CH1 - CH2	Green - Green	off - off
Output 41-42: OPEN			
Output 41-54: CLOSED	CH1 - CH2	Green - Green	on - on
Outputs 13-14 and 23-24: CLOSED			
Output 41-42: CLOSED			
Output 41-54: OPEN			

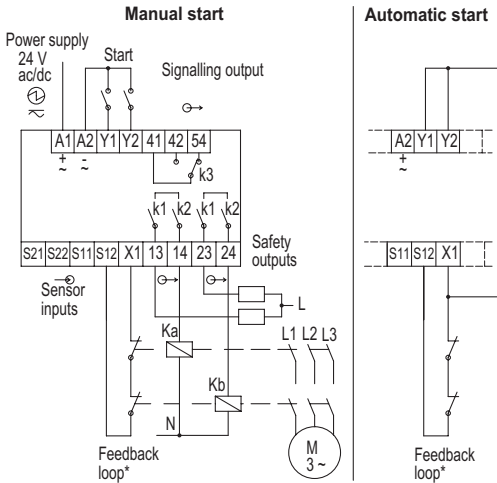
UL CERTIFICATION REQUIREMENTS				
Power supply (input)				
Input terminals	Voltage	Max. current		
A1-A2	24Vac/dc	220mA / 70mA		
Auxiliary outputs (safety)				
Output terminals	Type of contacts	General or resistive use	Pilot Duty	
13-14 / 23-24	NO	3A/240Vac Res	1.4A/240Vac	1A/24Vdc
Signalling outputs (signals)				
Output terminals	Type of contacts		Nominal values	
41-42	NO		0.5A/24Vdc	
41-54	NC			
Environmental values		Notes on installation		
Max. temperature surrounding air: 55°C		Use only with copper (CU) conductor at 60°C minimum		
Pollution degree: 2				
Environmental designation		Terminal tightening torque: 5-7 LbIn (0.56-0.79 Nm)		
Open type equipment				
Approved by UL		E542642		



U-Handles 4

MODEL CN-SFT.115-2NC AND MODEL CN-SFT.46-2NC

NOTE: the contact that is normally closed when the guard is closed is considered the NC input.

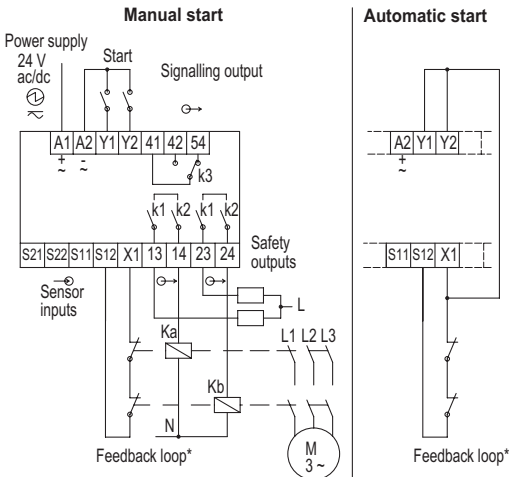


* If control via the feedback loop of the NC auxiliary contacts of the relays is not necessary, short-circuit clamps S12 and X1.

<p>1) Machine safety:</p> <p>One sensor (S1) with NC+NC contacts (cat.4 EN ISO 13849-1)</p> <p>More than one sensor (up to 30) (cat.3 EN ISO 13849-1)</p>
<p>2) Interlocking sensors of mobile guards with NC+NC contacts EN ISO 14119; cat. 4 EN ISO 13849-1; EN 60204-1 §9.3)</p>
<p>3) Controlling an emergency stop command (S1) with 1 NO+NO contact in accordance with EN ISO 13850 (stop cat. 0, EN ISO 13859; EN 60204-1 §9.2.3.4; cat.4 EN ISO 13849-1)</p>
<p>4) Controlling an emergency stop command (S1) with 1 NC contact in accordance with EN ISO 13850:2015 (stop cat. 0, EN ISO 13850:2015; EN 60204-1 §9.2.3.4; cat. 4 EN ISO 13849-1 if 1 or no sensor is connected to the control unit*; cat 3 EN ISO 13849-1 if more than one sensor is connected to the control unit)</p> <p>*Bridges on inputs if not used for a sensor with 2 NO contacts</p>

MODEL CN-SFT.115-1NC+1NO AND MODEL CN-SFT.46-1NC+1NO

NOTE: the contact that is normally closed when the guard is closed is considered the NC input. The contact that is normally open when the door is closed is considered the NO input.



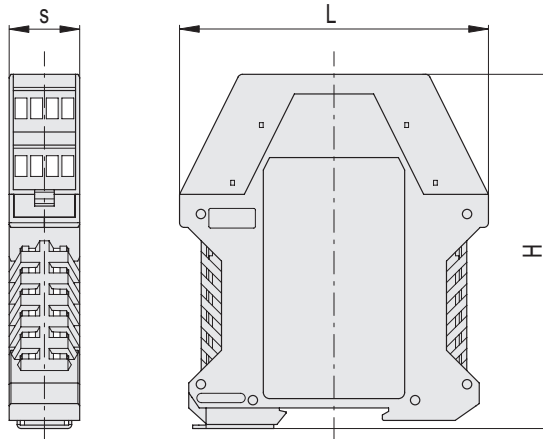
* If control via the feedback loop of the NC auxiliary contacts of the relays is not necessary, short-circuit clamps S12 and X1.

<p>1) Machine safety:</p> <p>One sensor (S1) with NC+NO contacts (cat.4 EN ISO 13849-1)</p> <p>More than one sensor (up to 30) (cat.3 EN ISO 13849-1)</p>
<p>2) Interlocking sensors of mobile guards with NO+NC contacts EN ISO 14119; cat. 4 EN ISO 13849-1; EN 60204-1 §9.3)</p>
<p>3) Controlling an emergency stop command (S1) with 1 NO+NO contact in accordance with EN ISO 13850 (stop cat. 0, EN ISO 13859; EN 60204-1 §9.2.3.4; cat.4 EN ISO 13849-1)</p>
<p>4) Controlling an emergency stop command (S1) with 1 NC contact in accordance with EN ISO 13850:2015 (stop cat. 0, EN ISO 13850:2015; EN 60204-1 §9.2.3.4; cat. 4 EN ISO 13849-1 if 1 or no sensor is connected to the control unit*; cat 3 EN ISO 13849-1 if more than one sensor is connected to the control unit)</p> <p>*if not used for a sensor with 2 NO contacts, terminals S12 and S11 are bridged and terminals S21 and S22 must remain open</p>

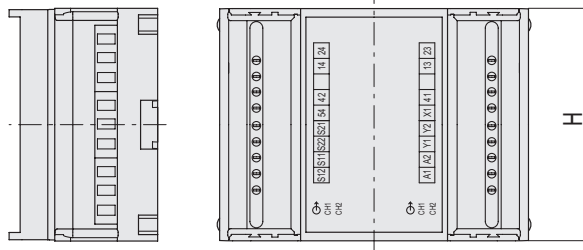
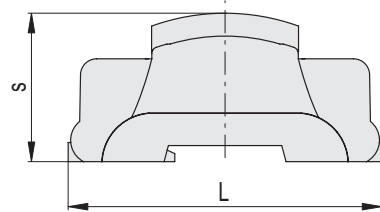


U-Handles 4

CN-SFT.115



CN-SFT.46



CN-SFT.115

Code	Description	L	s	H	△
225106	CN-SFT.115-1NC+1NO	99	22.5	114.5	156
225101	CN-SFT.115-2NC	99	22.5	114.5	156

CN-SFT.46

Code	Description	L	s	H	△
225107	CN-SFT.46-1NC+1NO	97	46	72	154
225102	CN-SFT.46-2NC	97	46	72	154