

Signalling devices

General

Series 105 signalling units are used to indicate the electric equipment power supply conditions.

For this purpose the devices shall be wired after the main disconnecting switch and clearly in view when the cabinet's doors are opened.

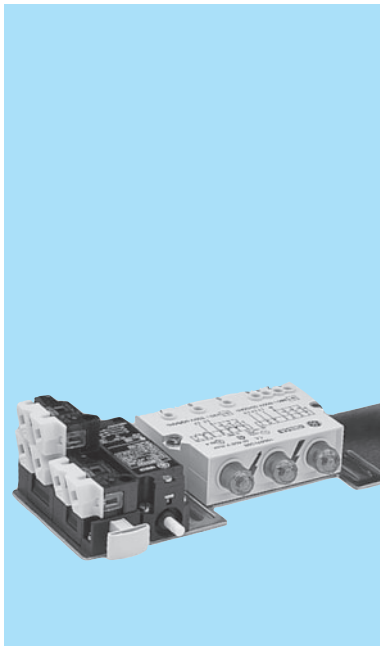
Series 105 DTL devices can be used on three-phase lines with or without the neutral wire or single-phase power lines, indicating the hazardous condition due to the applied voltage.

Three luminous red lamps are used. The flashing devices are normally used in combination with limit switches contacts NC type 114FCT03 that provides insertion when the cabinet door are open only.

Climatic protection

The standard versions are suitable for use in the following climates:

- Temperate climate cat. 23/50 (DIN 50014)
- Wet climate cat. 23/83 (DIN 50015)
- Hot wet climate cat. 40/92 (DIN 50015)
- Variable wet climate cat. FW 24 (DIN 50016)



Standards

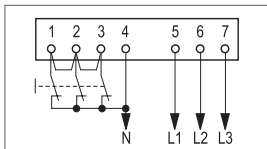
CEI, IEC, VDE, BSI and UTE

Approvals

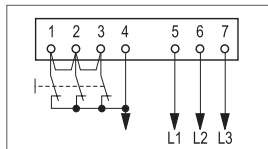
CE, UL, CSA

Suggested connections

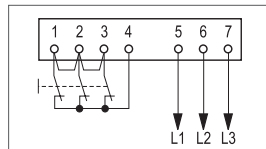
Indicates the presence of 3, 2 or 1 phase only by means of the relative lamp.



3-phase line with insulated neutral 3-phase line with grounded neutral

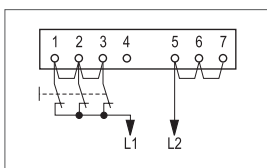


Indicates the presence of 3 or 2 phases by means of the relative lamp. One phase only is not indicated (all lamps OFF)

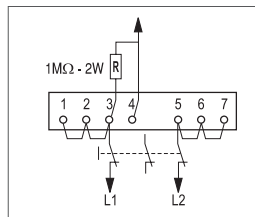


3-phase line without neutral

Indicates both phases with 3 lamps ON at same time. One phase only is not indicated (all lamps OFF)



Single-phase line (general diagram)



Single phase-line (alternative diagram)

1. Phase to phase connection on a 3 phase line with grounded neutral. Indicates the presence of 2-phases or 1 only with the 3 lamps ON at the same time.
2. Phase to neutral connection on a 3 phase line with grounded neutral or phase to phase by a matching transformer with one phase grounded. Indicates the presence of the ungrounded phase with the 3 lamps ON at the same time. No indication occur if the ungrounded phase is missing (all lamps OFF).

Specifications

Temperature ranges	Operation	from -25°C up to +70°C
	Storage	from -40°C up to +70°C
Degree of protection (according to IEC 529)		IP 20
Electrical		
Rated insulation voltage according to EN 60947.1		690V
Impulse withstand voltage according to EN 60947.1		4kV
Electrical input		2mA max.
Connections		Terminal strip with numbered terminals, accessible from outside
		protected against accidental contacts according to DIN 57106 and IP 20 according to IEC 529
Clamping capacity		Maximum one flexible conductor 12 AWG (3.3mm ²)

Order codes ● pg. F.58
Dimensional drawings ● pg. F.60



Flashing devices



Supply voltage		Cat. no	Ref. no.	Pack
Three-phase (50-60Hz)	Single-phase (50/60Hz)			
220V	110-127V	105DTL220	132230	1
380-600V	220-350V	105DTL500	132231	1
690V		105DTL690	132232	1

3 pole limit switch for device control



Protection degree	Cables entry	Operation force	Contacts	Cat. no	Ref. no.	Pack
IP40	PG11	8.5 N min.	3NC	114FCT03	130320	25
IP65	PG11	8.5 N min.	3NC	114FCT03T	130321	25

Paralell bridge for 3 poles limit switches



Cat. no	Ref. no.	Pack
105 PT	132234	50x5

Single door protection unit



The unit includes the following components:

- one flashing device 105DTL220 or 105DTL500.
- one 3-pole limit switch 114FCT03 for connection of the flashing device
- one electrical interlock device and panel light 105GIL or 105GIL10.
- one mounting plate 105PM on which are fitted on the above devices.

If two doors have to be protected (as double enclosure closing on the middle) the mounting plate shall be fitted also one limit switch 114FCT03 and one device 105GIL or 105GIL10.

Approvals:

UL (USA) - CSA (Canada)

Supply voltage			Cat. no	Ref. no.	Pack
Three-phase (50-60Hz)	Single-phase (50/60Hz)	Tripping coil			
220V	110-127V	Shunt trip	105GP1P220	132250	1
220V	110-127V	Undervoltage trip	105GP1P220M	132251	1
380-600V	220-350V	Shunt trip	105GP1P500	132252	1
380-600V	220-350V	Undervoltage trip	105GP1P500M	132253	1

Electrical interlock device and cubicle lighting ⁽¹⁾



The switch can be directly driven by the enclosure door.
If several doors are employed, one switch per door shall be used.
When properly connected, the following functions are provided:

- Position 1 (pushed) door closed: light OFF, tripping coil of main switch unpowered (normal equipment operation)
- Position 2. (free) door opening: light ON, tripping coil of main switch powered (equipment shall cut-out automatically).
- Position 3 (pulled) door open: light ON, tripping coil of main switch unpowered (adjustment on the equipment of dry checks). When door is closed again, the switch revert automatically from position 2 or 3 to position 1.

Terminals have IP2X protection degree according to IEC/EN 60529

Approvals: UL (U.S.A.) - CSA (Canada)

Tripping coil		Cat. no	Ref. no.	Pack																
Shunt trip		105 GIL	132240	1																
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	1	2	3																	
E	○	○	○																	
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G	○	○	○																	
Undervoltage trip		105 GIL 10	132241	1																
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F	○	○	○																	
G	○	○	○																	

Electrical interlock device ⁽¹⁾



The switch is directly driven by the enclosure door.
If several doors are employed, one switch per door is needed.
When properly connected, the same functions of devices above shall be provided but without enclosure control light.

Terminals have IP2X protection degree according to IEC 529

Tripping coil		Cat. no	Ref. no.	Pack								
Shunt trip		105 CI	132242	1								
	<table border="1"> <thead> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>G</td> <td>○</td> <td>○</td> <td>○</td> </tr> </tbody> </table>		1	2	3	G	○	○	○			
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Undervoltage trip		105 CI 10	132243	1								
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	1	2	3									
G	○	○	○									

Mounting plate



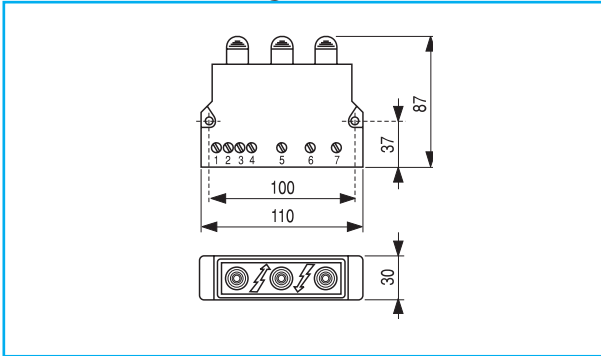
	Cat. no	Ref. no.	Pack
	105 PM	132244	1

(1) For electrical performance and features of contact blocks please see F.42

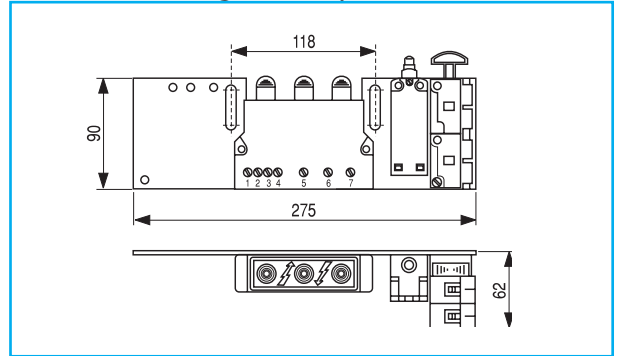


Dimensional drawings

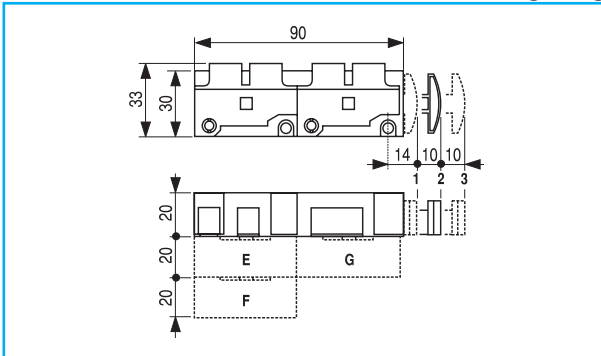
Series 105 - Flashing devices



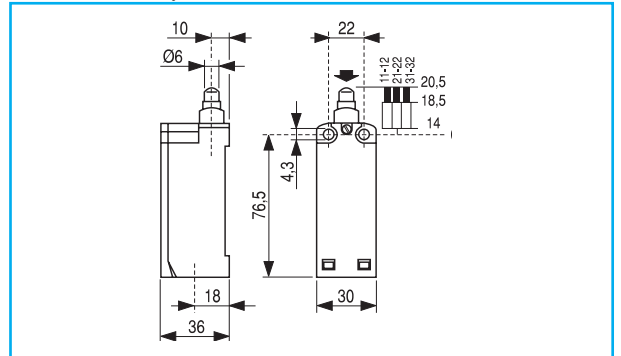
Series 105 - Single door protection unit



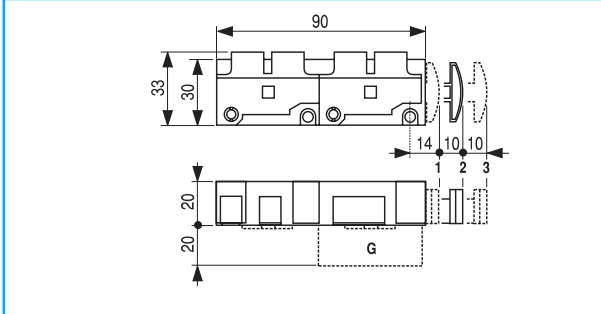
Series 105 - Electrical interlock and cubicle lighting



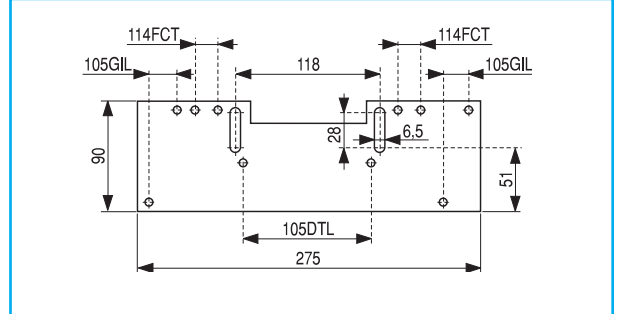
Series 105 - 3 pole limit switch for device control



Series 105 - Electrical interlock device



Series 105 - Mounting plate






Light towers

- Outstanding modular concept. One terminal unit can be combined with **up to seven modular signal units**.
- Steady light units, flashing light units, strobe light units, LED light units.
- The buzzer elements emit a clearly audible dual-tone signal for maximum safety.
- A bayonet mounting, through a simple manual operation, allows a quick and simultaneous method of joining the signal units together and the electrical connection of them.
- Compact dimension Ø70mm.
- IP65 for use in extreme conditions.
- Captive screw cable connectors, located with terminal unit are **easy** to reach and guarantee a quick and neat electrical connection.
- The special design makes maintenance quick, easy and carried out in complete safety and without tools.
- The high quality of materials used to manufacture the lenses ensures the light output is at the **highest luminous** intensity, combined with a sturdy construction and a good resistance to aging.

Marking



Meaning of optical signals

	Colour	Meaning	Operating state
	Red	Extreme danger Hazardous conditions	Immediate action necessary
	Yellow / Amber	Beware Warning conditions imminent	Abnormal state Monitor or action as necessary
	Green	Normal conditions	No actions required
	Blue	Conditions requiring defined action	Discontinuity Intervention mandatory
	White / Clear	No particular meaning	Other state Can be used as required

Meaning of audible signals (EN 981, IEC 73)

	Signal tone	Meaning	Operating state
	Intermittent modulated tone	Danger	Immediate action necessary
	Linear tone	Safety	No actions required



Light units

NLT1...

Steady light unit



- With socket BA15D for filament bulbs (7W max.) and LEDs
- Supply voltage: 240V AC/DC
- Current consumption (with 5W lamps):

24V	115V	240V
210mA	43mA	22mA

NLT2...

Flashing light unit

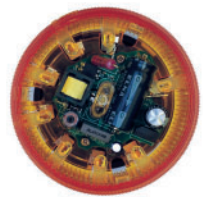


- With socket BA15D for filament bulbs (7W max.) and LEDs
- Supply voltage: 24V AC/DC, 115V AC, 240V AC
- Current consumption (with 5W lamps):

24V DC	24V AC	115V AC	240V AC
130mA	145mA	25mA	15mA

NLT3...

Strobe light unit



- Lamp type: 4 Joule xenon lamp
 - Supply voltage: 24V AC/DC, 115V AC, 240V AC
 - Current consumption:
- | | | | |
|--------|--------|---------|---------|
| 24V DC | 24V AC | 115V AC | 240V AC |
| 75mA | 135mA | 20mA | 15mA |
- Flash frequency: 1,4Hz (84 flashes per min.) according with EN 60073

Audio units

NLT73BD

Pulsating tone



- Protection degree IP54
- Tone: pulsating
- Audio frequency: 2900Hz
- Pulsating tone frequency: 0,5Hz according to EN 457
- Sound level at 1 m.: 90 dB (A)
- Supply voltage: 24V AC/DC
- Current consumption: 20mA

NLT75AJ - NLT75AN

Pulsating or constant tone



Pulsating or constant tone, adjustable by removing or inserting bridge JP1 in the printed circuit.

- Protection degree IP54
- Tone: pulsating or constant
- Audio frequency: 2600Hz according to EN 457
- Pulsating tone frequency: 1Hz according to EN 457
- Sound level at 1 m.: pulsating tone: 95 dB (A) constant tone: 93 dB (A)
- Supply voltage: 115VAC (NLT75AJ) / 240VAC (NLT75AN)
- Current consumption:

115VAC	240VAC
40mA	30mA

NLT75BD

Modulated tone



- Protection degree IP54
- Audio frequency: 2500 - 2800Hz according to EN 457
- Sound level at 1 m.: max. 90 dB (A)
- Supply voltage: 24V AC/DC
- Current consumption: 40mA

16 sounds can be selected by means of the dip switch

NLT77BD

Pulsating tone



- Protection degree IP65
- Audio frequency: 1200 - 2600Hz according to EN 457
- Sound level at 1 m.: max. 84 dB (A)
- Supply voltage: 24V AC/DC
- Current consumption: 40mA

NLT77AJ - NLT77AN

Pulsating or constant tone



Pulsating or constant tone, adjustable by removing or inserting bridge JP1 in the printed circuit.

- Protection degree IP65
- Tone: pulsating or constant
- Audio frequency: 2600Hz according to EN 457
- Pulsating tone frequency: 1Hz according to EN 457
- Sound level at 1 m.: pulsating tone: 78 dB (A) constant tone: 75 dB (A)
- Supply voltage: 115VAC (NLT77AJ) / 240VAC (NLT77AN)
- Current consumption:

115VAC	240VAC
40mA	30mA

Light units

	Supply voltage	Red		Amber		Yellow		Green		Blue		Clear		
		Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	
Steady light units (bulb not included)	12...240V	NLT1R	222230	NLT1A	222231	NLT1G	222232	NLT1V	222233	NLT1L	222234	NLT1I	222235	1
Flashing light units (bulb BA15D filament) (bulb included)	24V AC/DC	NLT2BDR	222236	NLT2BDA	222237	NLT2BDG	222238	NLT2BDV	222239	NLT2BDL	222240	NLT2BDI	222241	1
	115V AC	NLT2AJR	222242	NLT2AJA	222243	NLT2AJG	222244	NLT2AJV	222245	NLT2AJL	222246	NLT2AJI	222247	1
	240V AC	NLT2ANR	222248	NLT2ANA	222249	NLT2ANG	222250	NLT2ANV	222251	NLT2ANL	222252	NLT2ANI	222253	1
Flashing light units (bulb LED) (bulb included)	24V AC/DC	NLT2BDLR	222289	NLT2BDLA	222290	NLT2BDLG	222291	NLT2BDLV	222292	NLT2BDLL	222293	NLT2BDLI	222294	1
	115V AC	NLT2AJLR	222295	NLT2AJLA	222296	NLT2AJLG	222297	NLT2AJLV	222298	NLT2AJLL	222299	NLT2AJLI	242464	1
	240V AC	NLT2ANLR	222301	NLT2ANLA	222302	NLT2ANLG	222303	NLT2ANLV	222304	NLT2ANLL	222305	NLT2ANLI	222306	1
Strobe light units (bulb included)	24V AC/DC	NLT3BDR	222254	NLT3BDA	222255	NLT3BDG	222256	NLT3BDV	222257	NLT3BDL	222258	NLT3BDI	222259	1
	115V AC	NLT3AJR	222260	NLT3AJA	222261	NLT3AJG	222262	NLT3AJV	222263	NLT3AJL	222264	NLT3AJI	222265	1
	240V AC	NLT3ANR	222266	NLT3ANA	222267	NLT3ANG	222268	NLT3ANV	222269	NLT3ANL	222270	NLT3ANI	222271	1

Signalling devices

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Audio units

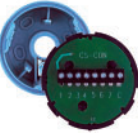
	Protection degree	Supply voltage	Cat. no.	Ref. no.	Pack
 <p>Pulsating tone</p>	IP54	24V AC/DC	NLT73BD	222278	1
	IP65	24V AC/DC	NLT77BD	222279	1
 <p>Pulsating or constant tone Adjustable by removing or inserting bridge JP1 in the printed circuit</p>	IP54	115V AC	NLT75AJ	222287	1
		240V AC	NLT75AN	222288	1
	IP65	115V AC	NLT77AJ	222280	1
		240V AC	NLT77AN	222281	1
 <p>Modulated tone 16 sounds can be selected by means of dip switch</p>	IP54	24V AC/DC	NLT75BD	222286	1

The audio units can only be mounted as final top unit (top cover included)


Bulbs

	Supply voltage	Red		Amber		Yellow		Green		Blue		White		Pack
		Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	Cat. no.	Ref. no.	
 <p>LED - BA15D</p>	24V AC/DC	BA15D24LR	222330	BA15D24LA	222331	BA15D24LG	222332	BA15D24LV	222333	BA15D24LL	222334	BA15D24LB	222335	1
	115V AC	BA15D115LR	222336	BA15D115LA	222337	BA15D115LG	222338	BA15D115LV	222339	BA15D115LL	222340	BA15D115LB	222341	1
	240V AC	BA15D230LR	222342	BA15D230LA	222343	BA15D230LG	222344	BA15D230LV	222345	BA15D230LL	222346	BA15D230LB	222347	1
<p>Incandescent BA15D</p>	Supply voltage													
														Clear
														Cat. no. Ref. no. Pack
	12V													BA15D125 222348 5
	24V													BA15D245 222349 5
	30V													BA15D305 222350 5
115V													BA15D1155 222351 5	
240V													BA15D2305 222352 5	

Terminal

	Cat. no.	Ref. no.	Pack
 <p>Terminal unit with top cover</p>	NLT9TC	222282	1

Base with tube

	Cat. no.	Ref. no.	Pack
 <p>Base + tube height 100mm</p>	NLT5BT	222284	1
Base + tube height 100mm, 90° fixing	NLT90BT	222307	1
Tube height extension 100mm	NLT5ET	222285	1

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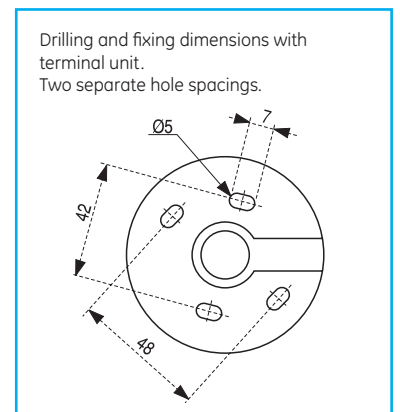
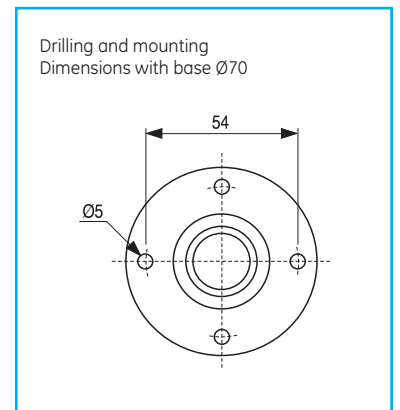
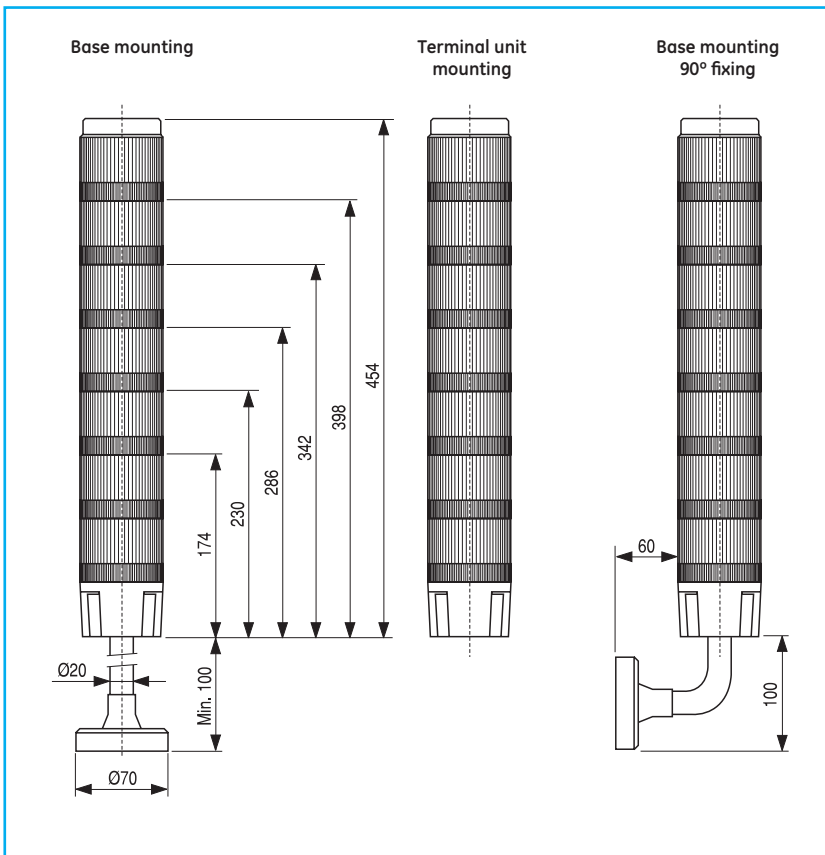
Technical data

Conformity to standards	EEC regulation 89/336 electromagnetic compatibility EEC regulation 73/23 low voltage, including amendment EEC 93/68 All NLT range are made and tested in full compliance with: EN 60947-5-14 (VDE 0470, IEC 60947) CE, cUL US
Materials	Polycarbonate Visual and audio signal units, terminal unit, top cover, base and extension tubes
Rated insulated voltage	250V max.
Operating temperature	-20°C ... +60°C (except version with bulb 12V = 40°C)
Protection degree (according to EN 60529)	IP65 (IP54 for audio units types NLT73xx and NLT75xx) (indicators must be correctly assembled with top cover, gasket or PG conduit fitting)
Colours (according to EN 60073)	Amber, Blue, Yellow, Clear, Red and Green
Lamp type	Steady/flashing units: Bayonet type BA15D socket: filament (7W max.) or LED Strobe units: Xenon lamps
Nr. of combined units	Up to 7 modular units
Connection	Captive screw cable connectors (max. cable size 1.5mm ²) inside terminal sleeve «C» is common to all signal units.
Connection identification code	They are numbered 1/7 from base to top

Mechanical characteristics

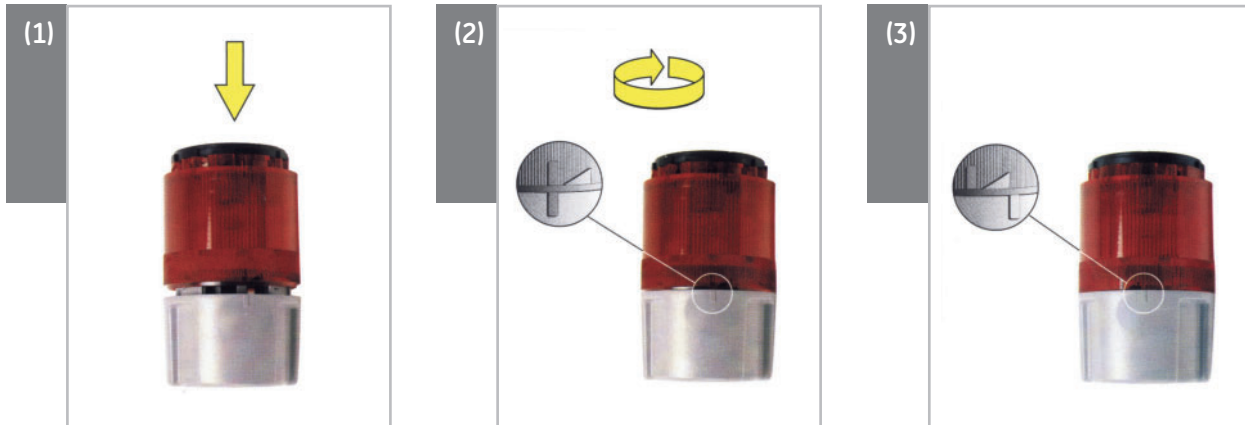
Mounting of the units	
Average torque	2.4Nm
Unfastening of the units	
Average torque	2.3Nm
Vibration resistance	2g min. (10-150Hz) according to IEC 68-2-6
Mounting	Direct through terminal unit or with base and tube

Dimensions



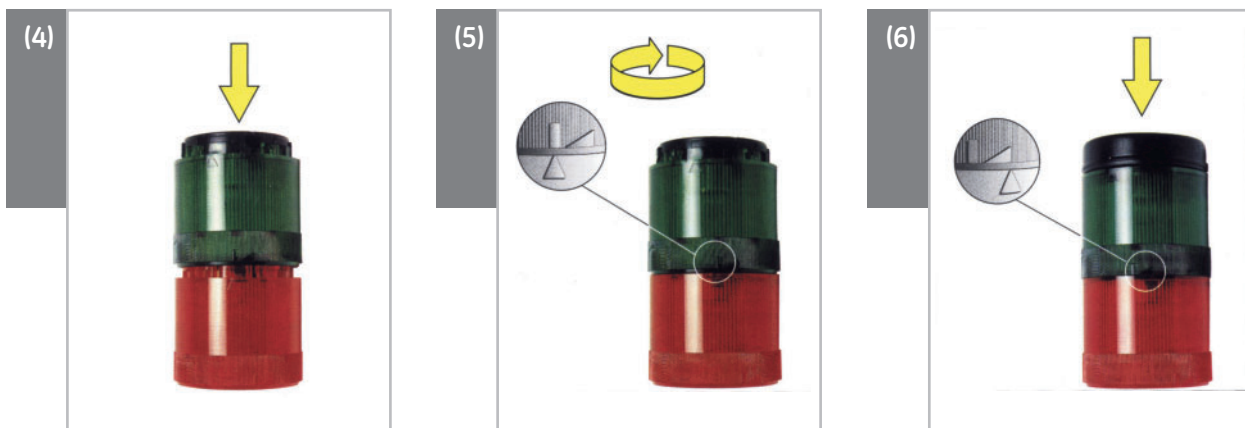
Modular system

Place signal beacon unit onto terminal unit **(1)** align guide marks and twist clockwise till they are locked **(2) + (3)**

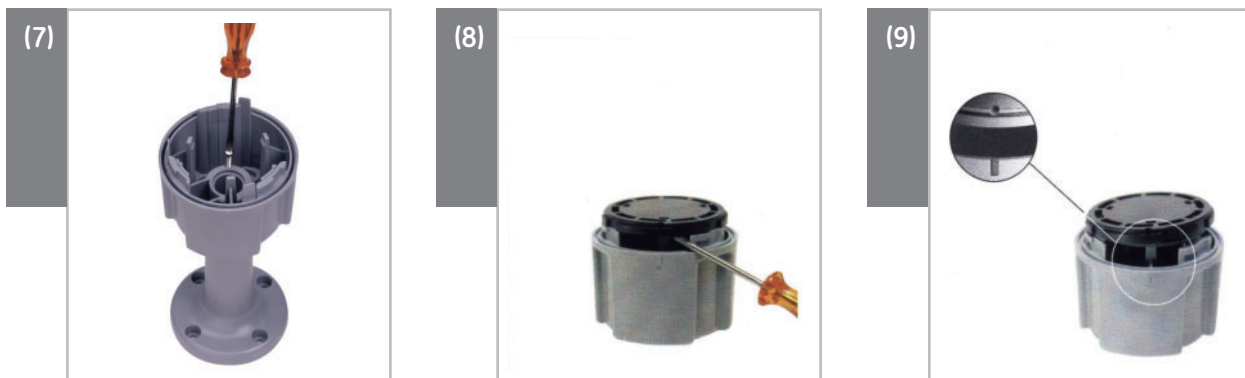


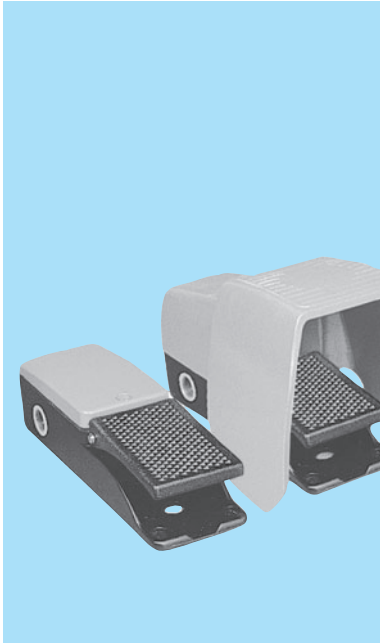
Follow the same steps to add more signal units **(4) + (5) + (6)**

The audible element can be mounted as final top unit, as it is complete with a top cover.



To fix extension tube (base always included), insert it into opening on the underside of the terminal unit and tighten screw on the side **(7)**. To reach the screw cable clamp terminals, remove black disc first, prising with a small screwdriver **(8)**. Connect to terminals (coloured units are numbered from base to top). To place terminal back into position, align the guiding marks **(9)** and press inwards.





Foot switches

General

Foot switches, for intensive services suitable for controlling and monitoring of low voltage AC and DC electrical circuits.

Climatic protections

The standard versions are suitable for use in the following climates:

- Temperate climate cat. 23/50 (DIN 50014)
- Wet climate cat. 23/83 (DIN 50015)
- Hot wet climate cat. 40/92 (DIN 50015)
- Variable wet climate cat. FW 24 (DIN 50016)

Standards

IEC 947-5-1, CEI EN 60947.5.1
VDE 0660

Approvals

CSA, UL


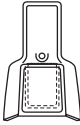
Specifications

Temperature ranges	Operation	from -30°C up to +80°C						
	Storage	from -30°C up to +80°C						
Degree of protection (according to IEC 529)	IP 65							
Vibration resistance	20g (10 up to 55Hz)							
Mechanical endurance	2 × 10 ⁷ for all the types							
Electrical								
Rated insulation voltage according to EN 60947.1	500V							
Insulation class according to VDE 0110	Group C							
Electric shock protection according to IEC 536	Class I							
Short-circuit prot. according to IEC 269.1 and 269.3	10A gL fuses							
Electrical performances of the contact blocks								
Rated thermal current (I _{th})	10A							
Performances according to EN 60947.5.1								
Slow motion contacts	Voltage	Ue (V)	24	48	110	220	380	
	Category AC 15	Current	Ie (A)	6	6	6	6	4
Snap action contacts	Voltage	Ue (V)	24	48	110	220	380	
	Category AC 15	Current	Ie (A)	6	6	6	5	4
Category DC 13	Voltage	Ue (V)	24	48	110	220		
	Current	Ie (A)	1	0,8	0,7	0,3		
Connection	Same polarity for both slow motion and snap action contacts							
Cables entries	IPA1, IPA2, IPB1, IPB2	1 × M20						
	IPA1-P	2 × M20						

Order codes ● pg. F.69
Dimensional drawings ● pg. F.69



Foot switches - order codes

	Function (1)	Slow break				Snap action				Pack
		Cat. no	Ref. no.	Cat. no	Ref. no.	Cat. no	Ref. no.	Cat. no	Ref. no.	
	N	IPA1-N211B	132170	-	-	IPA1-N411B	132198	IPA1-N422B	132213	1
	N	IPB1-N211B	132172	IPB1-N222B	132186	IPB1-N411B	132201	IPB1-N422B	132215	1
	D	-	-	-	-	-	-	IPB1-D422B	132216	1
	R	-	-	-	-	IPB1-R411B	132203	-	-	1
Spare microswitches		N211B	116113	N222B	116664	N411B	116663	N422B	116665	1

(1) **Function N**
Normal operation. When the pedal is pressed the contacts change position. When released they return to their position.

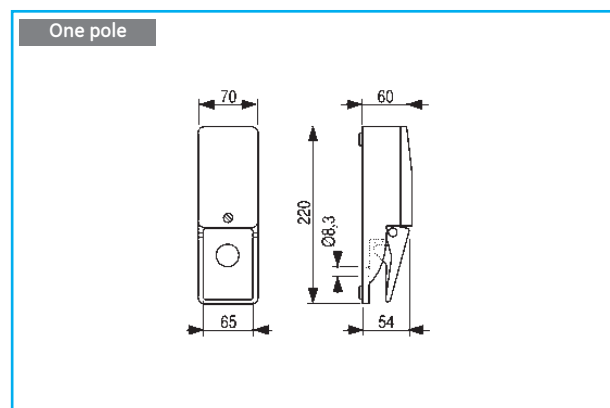
Function D
Two-stage operation. Used with two contacts blocks. When the pedal is pressed to the first point, the contacts of the first block switch; when pressed as far as the second point the contacts of the second block switch and the first block stays in the same position.

Function R
Normal operation with potentiometer. When the pedal is pressed, the contacts change position at the same time as the potentiometer is operated. When released, the contacts and potentiometer return to their initial position.

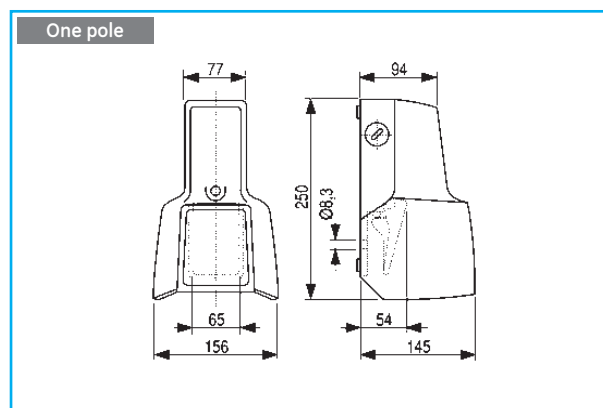
 Positive opening.

Dimensional drawings

Foot switches without protective guard



Foot switches with protective guard





Approvals



Standards

EN 60947-1 / IEC 60947-5-1

Features

Enclosed in metal with aluminium protection cover, safety latch function "OFF-ON-OFF" with manual reset.

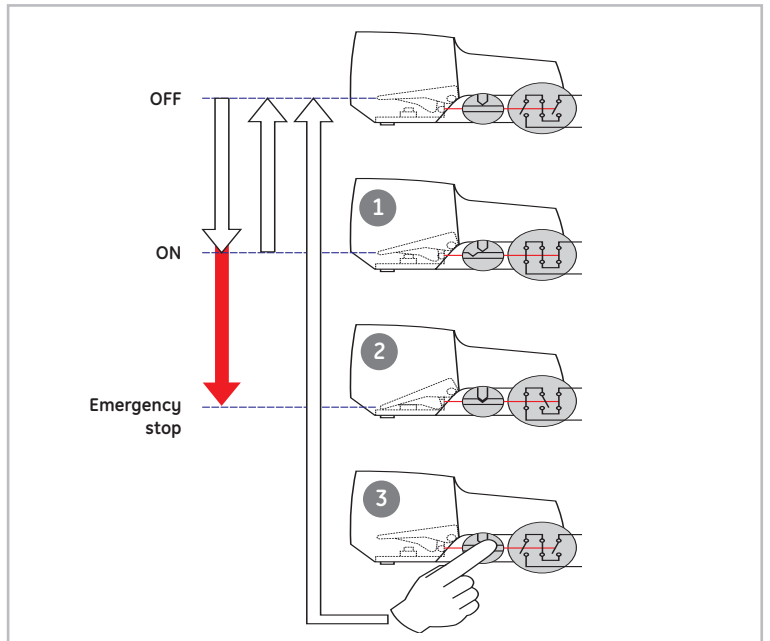
Technical data

Switching diagram	
1) Trigger point	1)
2) Latched position	2)
Rated insulation voltage U_i	max. 400VAC
Thermal continuous current I_{the}	max. 10A
Switching frequency	max. 50/min.
Mechanical operational life number of switching cycles	10×10^6
Ambient temperature	-30°C to +80°C
Cable conduits	(3x) M20x1.5
Protection degree	IP65
Actuating force (approx.)	10N
Trigger point	200N
Weight	1.5 kg

Safety foot switches

Operation

- 1 Pedal operation up to the trigger point**
The operating contact is closed, the operating process is started
- 2 Operation past the trigger point in emergency cases**
The operating contact is opened and latched and the process is stopped. Also if the device is unused, the latch remains in the off-position in this phase. Uncontrolled restart is prevented
- 3 Reset function**
Only after the danger has passed can the contacts be manually unlatched (push-button on the side). The operating process can now be restarted by pushing the pedal up to the triggering point.



Order codes

	Cat. no.	Ref. no.	Pack
- Slow-action contact - Snap-action contact - Trigger point - Latch function - Making current according to: EN/IEC 60947-5-1 AC15/240V/3A	IPSF1	223000	1

Dimensional drawings

