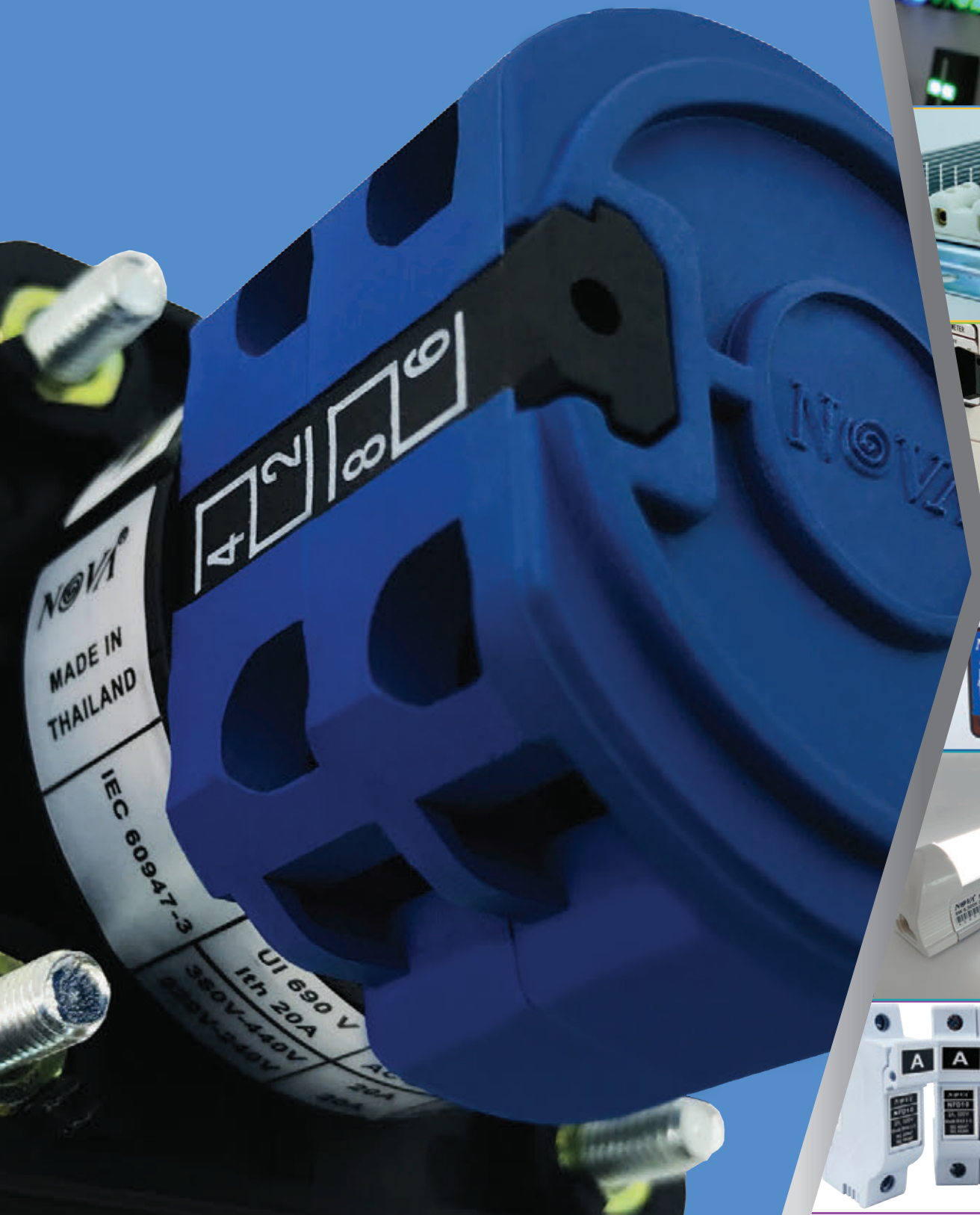
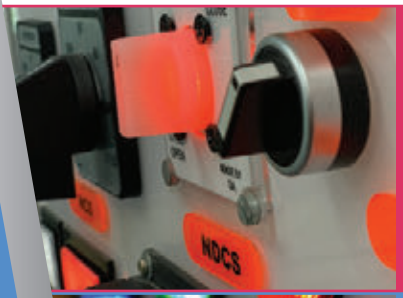
2022 PRODUCT CATALOG

CONTROL AND SIGNALLING DEVICES



NOVA®



SWITCHES

INDICATOR

HEATER

METER

RELAY

LIGHTING LUMINAIRE

OTHER

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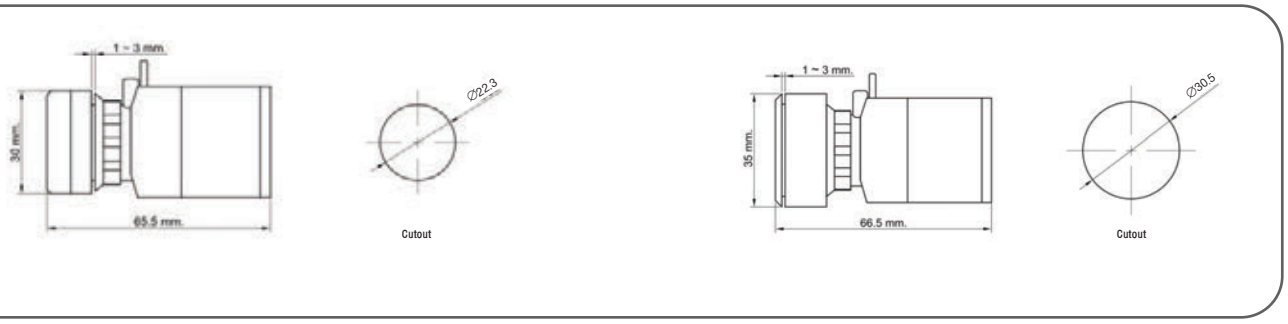
Push Button Switch (NPB)

Specification

Model	NPB
Insulation withstand voltage	10MΩ at DC 500V, AC 1,500V/min.
Contact rating	10A at 250VAC, 5A at 125VDC
Rated voltage of lamp	24, 48, 70, 125, 220 VAC/DC
Mechanical lifetime	3 x 10^6
Electrical lifetime	12 x 10^5
Ambient temperature	-5°C ~ +55°C
Storage temperature	-20°C ~ 70°C
Ambient humidity	45 ~ 85%
Degree of protection	IP54
Cutout	22.3 mm. / 30.5 mm.

Cutout Dimension



Product Coding

NPB 22 - R 13 - A 11

Basic type

Cutout

22	22.3 mm.
30	30.5 mm.

Button color

R	Red
B	Black
G	Green
Y	Yellow
W	White
S	Sky blue

Rated voltage (with lamp)(±20%)

FL	Without lamp (Flat)
EM	Emergency*
24	AC/DC 24V
48	AC/DC 48V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V

*Other rating can be supplied upon request

Function operate

A	Alternate
M	Momentary
T	Turn to release

Number of contacts

11	1NO/1NC
20	2NO
02	2NC
22	2NO/2NC

NOTE : Emergency push button has red color only. The emergency stop push button comply with IEC 60204, IEC 60947 and IEC 60073. They are designed with a positive mechanical movement sequence. The push button latches when pressed and is reset by turning it in a clockwise direction.

Push Button Switch (NPBH)

Applications

- Hazardous areas : Zone 1 & 2 or zone 20, 21, 22
  Explosive gas atmosphere : class II A, II B, II C
  or Flammable dust atmospheres

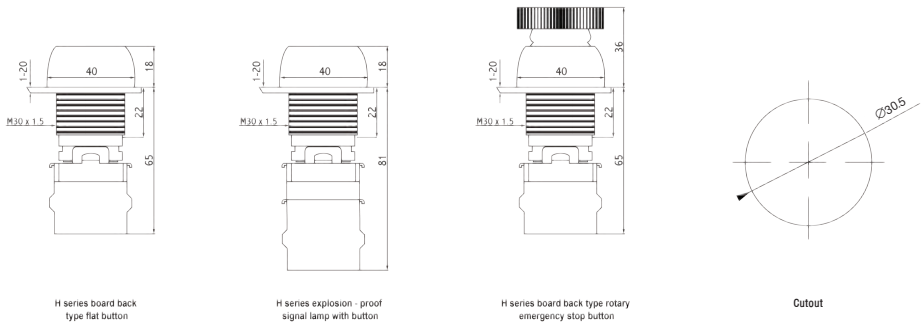
Features

- This products are made by aluminum alloy, stainless steel or medium carbon steel
- The explosion-proof signal lamp should be used together with flame proof enclosure, cannot be used alone at explosive atmosphere

Specification

Model	NPBH
Insulation withstand voltage	10MΩ at DC 500V, AC 1,500V/min.
Contact rating	**AC-15 :** 200V/6A, 380V/4A, 600V/2A **DC-13 :** 24V/6A, 48V/3A, 110V/1A, 220V/0.5A
Mechanical lifetime	3 x 10^6
Electrical lifetime	12 x 10^5
Ambient temperature	-5°C ~ +55°C
Storage temperature	-20°C ~ 70°C
Ambient humidity	45 ~ 85%
Degree of protection	IP65
Cutout	30.5 mm.

Cutout Dimension



Product Coding

NPBH - R 13 - A 11

Basic type

Button color

R	Red
B	Black
G	Green
Y	Yellow
W	White
S	Sky blue
A	Amber

Rated voltage (with lamp)

FL	Without lamp (Flat)
EM	Emergency
24	AC/DC 24V
48	AC/DC 48V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V

*Other rating can be supplied upon request

Function operate

A	Alternate
M	Momentary

Number of contacts

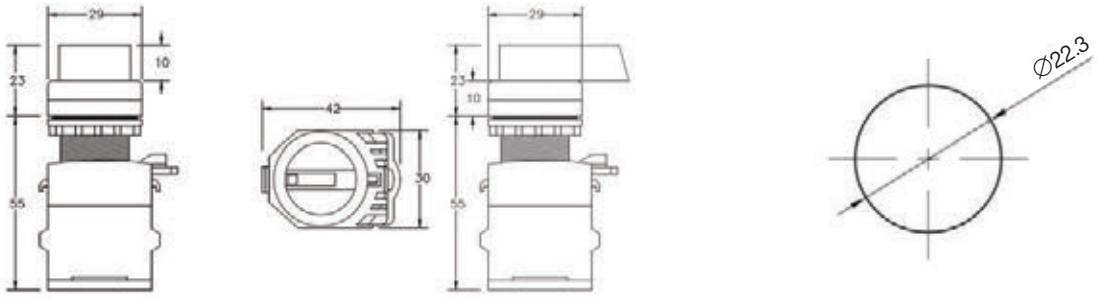
11	1NO/1NC
20	2NO
02	2NC
22	2NO/2NC

Selector Switch (NSS)

Specification

Model	NSS
Insulation withstand voltage	10MΩ at DC 500V, AC 1,500V/min.
Contact rating	10A at 250VAC, 5A at 125VDC
Mechanical lifetime	3 x 10^6
Electrical lifetime	12 x 10^5
Ambient temperature	-5°C ~ +55°C
Storage temperature	-20°C ~ 70°C
Ambient humidity	45 ~ 85%
Degree of protection	IP54
Cutout	22.3 mm.

Cutout Dimension



Short handle | Long handle | Cutout

Product Coding

NSS22 - 2 L - 11 S

Basic type

Working step

2	2 Steps
3	3 Steps

Handle type

L	Long
S	Short

Number of contacts

11	1NO/1NC
20	2NO
02	2NC
22	2NO/2NC

Operation state

S	Spring return
None	Limit movement

Selector Switch (NSSH)

Applications

- Hazardous areas: Zone 1&2 or zone 20, 21, 22
- Explosive gas atmosphere : class II A, II B, II C or Flammable dust atmospheres

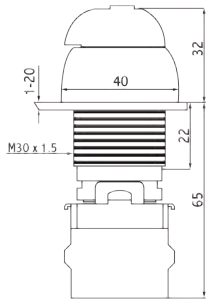
Features

- This products are made by aluminum alloy, stainless steel or medium carbon steel
- The explosion-proof signal lamp should be used together with flame proof enclosure, cannot be used alone at explosive atmosphere

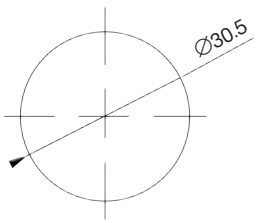
Specification

Model	NPBH
Insulation withstand voltage	10MΩ at DC 500V, AC 1,500V/min.
Contact rating	**AC-15 :** 200V/6A, 380V/4A, 600V/2A **DC-13 :** 24V/6A, 480V/3A, 110V/1A, 220V/0.5A
Mechanical lifetime	3 x 10^6
Electrical lifetime	12 x 10^5
Ambient temperature	-5°C ~ +55°C
Storage temperature	-20°C ~ 70°C
Ambient humidity	45 ~ 85%
Degree of protection	IP65
Cutout	30.5 mm.

Cutout Dimension



H series explosion - proof Selector Switch



Cutout

Product Coding

NSSH - 2 - 11

Basic type

Working step

2	2 Steps

Number of contacts

11	1NO/1NC
20	2NO
02	2NC
22	2NO/2NC

Limit Switch (NLS)

NLS-DS

NLZ-15GQ-B

NLZ-15GW-B

NLZ-15GW22-B

NLZ-15GW2-B

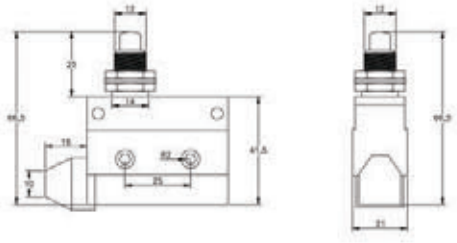
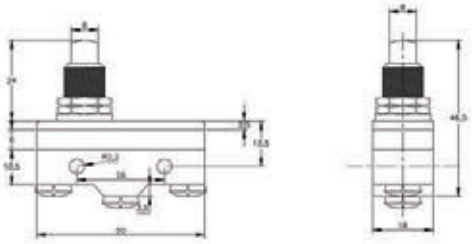
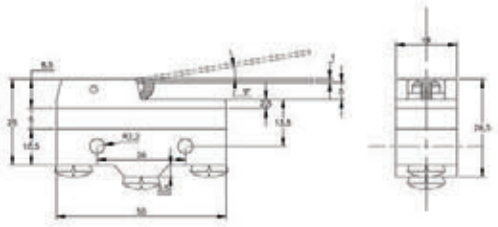
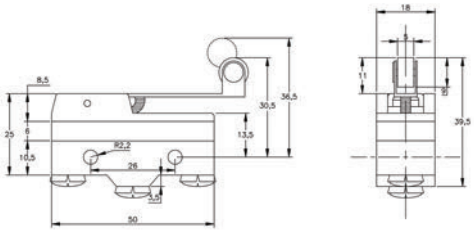
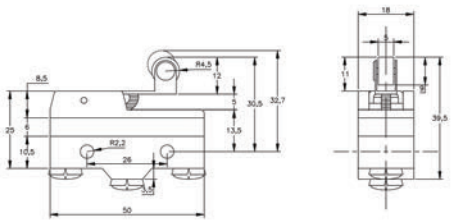
Features

- Enclosed Switches with Built-in Basic Switches for high repeatability and durability of 10 million operations minimum.
- High precision basic switch in a variety of styles
- Suitable for applications demanding higher mechanical strength, dustproof and drip-proof properties than those on basic switches.

Specification

Model		NLS-DS	NLZ-15GQ-B	NLZ-15GW-B	NLZ-15GW2-B	NLZ-15GW22-B
Operating force (Max.)		600 g.	350 g.	100 g.	200 g.	130 g.
Releasing force (Min.)		100 g.	114 g.	14 g.	42 g.	21 g.
Pre travel (Max.)		2.0 mm.	0.4 mm.	10.0 mm.	2.7 mm.	7.1 mm.
Over travel (Min.)		6.0 mm.	5.5 mm.	5.6 mm.	2.4 mm.	4.0 mm.
Movement differential (Max.)		0.8 mm.	0.05 mm.	2.0 mm.	0.8 mm.	1.6 mm.
Free position (Max.)		-	-	28.2 mm.	32.9 mm.	36.5 mm.
Operating position		21.8 ±1.2 mm.	19.0 ±0.8 mm.	19.0 ±0.8 mm.	30.2 ±0.4 mm.	30.2 ±0.8 mm.
Operating frequency	Mechanical	240 ops/min				
	Electrical	20 ops/min				
Service life	Mechanical	1×10^6 (Operations)				
	Electrical	5×10^6 (Operations)				
Rated current / Voltage		10A at 250VAC				
Rated insulation voltage		600VAC				
Operating temperature		-20° to +80°C (-4° to 176°F)				
Dielectric strength		1500VAC 50/60Hz (For 1 min.)				
Degree of protection		IP63				

Dimension

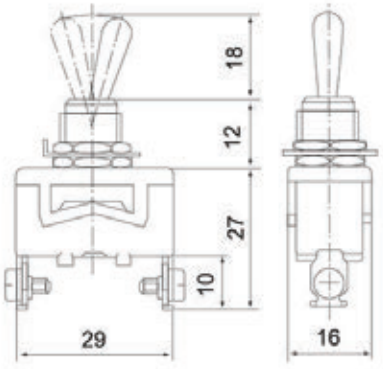
Product	Model	Dimension (mm.)
	NLS-DS	
	NLZ-15GQ-B	
	NLZ-15GW-B	
	NLZ-15GW2-B	
	NLZ-15GW22-B	

Toggle Switch (NTG)

Specification

Model		NTG-C511B
Rated current / Voltage		15A / 250VAC
Function		OFF-ON
Terminal type		Screw type
Contact resistant		15mΩ max.
Insulation resistance		100mΩ
Dielectric strength		2000VAC, 50/60Hz for 1 minute
Vibration		55Hz, 1.5mm Double amplitude
Ambient temperature		10°C ~ +80°C
Humidity		85% RH max.
Service life	Mechanical	$5x10^5$ min. (Operations)
	Electrical	$1x10^5$ min. (Operations)

Dimension



Micro Switch (NMS)

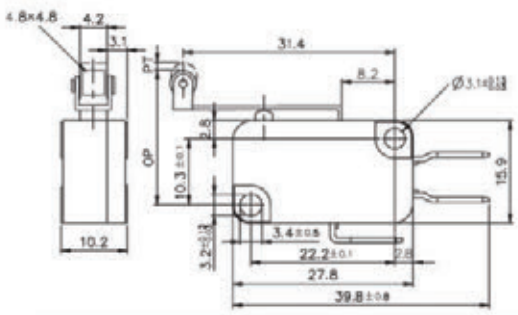
Features

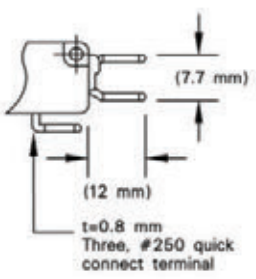
- High switch on and off capacity (16A)
- Economy model

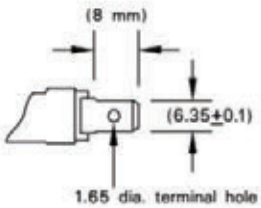
Specification

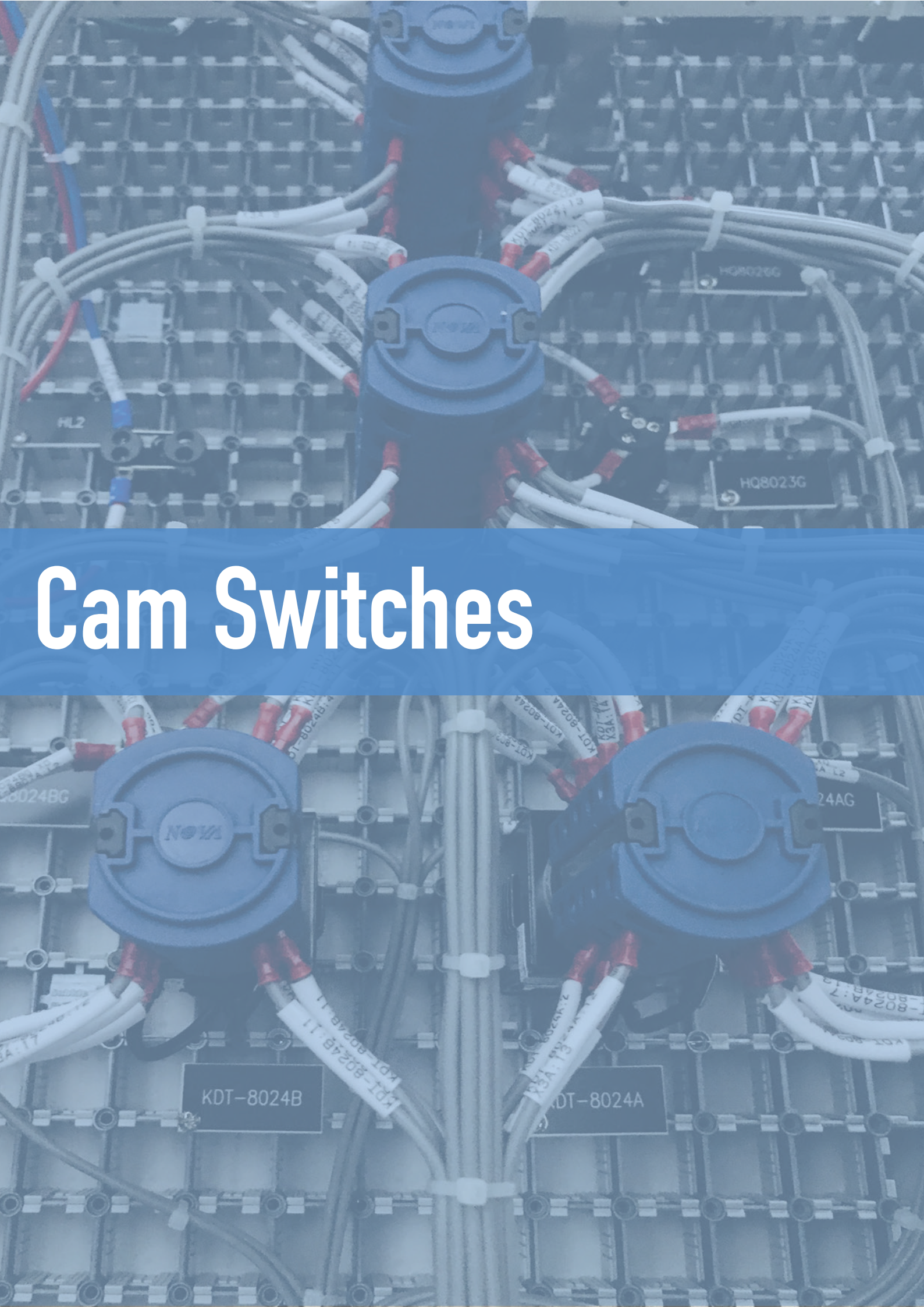
Model		NMS
Head and driving rod		Hinge Roller Lever
Rated current / Voltage		16A / 250VAC
Contact type		SPDT 1NO 1NC
Terminal type		NEMA Type #250, 6.3 mm.
Operation speed		0.1 mm. ~ 1m/s (Button type)
Insulation resistance		100 MΩ above (at 500VDC)
Contact resistance		15 mmΩ max. (Initial value) 1,000VAC
Withstand voltage	Non-continuous teminals	50/60Hz for 1 min.
	Current-carrying and non-current carrying metal parts Between terminal and earthing	2,000Vac, 50/60Hz for 1 min.
Vibration	Misoperation	10 to 55Hz, 1.5 mm. pairs swing
Shock	Durable	1,000m/s^2 (100G)
	Misoperation	300m/s^2 (100G)
Service life	Mechanical	1x10^7 min. (Operations)
	Electrical	1x10^5 min. (Operations)
Operation frequency	Mechanical	240 min. (Operations)
	Electrical	20 min. (Operations)
Temperature		-10°C ~ +65°C
Humidity		85%RH (-5°C ~ +35°C)

Dimension









Cam Switches

Description

Cam switches series NCS have been developed to the latest achievements in the field of switching devices through the application of high quality insulation material and contacts made from silver alloys. Their advantages are high making and breaking capacities, electrical and mechanical endurance and small dimensions. The rotary cam switches are intended for multiple switching operations in main circuit as well as in auxiliary circuits.

NCS series rotary cam switches have five current ratings : 20A, 25A, 32A, 40A and 63A. All ratings have the finger proof terminal (except for 40A and 63A). The series comply with IEC 60947-1, IEC 60947-3, IEC 60947-5-1.

NCS series mainly applies to 600Vac and below voltage (240Vac/50 Hz) as well as DC circuit. Typical applications are breaking and closing, change-over of circuit, selector switches (for example: Auto-Manual), control switch of switchgear / control gear and control switch of instruments.

Applications

The NCS series cam switches can be used for virtually all purposes which classified by utilization as the following :

- Motor switches - these switches are designed for direct-online starting and stopping of single phase and three phase motors, which also come out as star-delta switches, reversing switches, pole-change over motor switches.
- Selector switches and multi-step switches - e.g. Voltmeter selector switches, Ammeter selector switches and etc. for transformers and welding apparatuses.
- Cut-Off switches or ON-OFF switches in auxiliary circuits - these switches are assembled in compliance with the switching programmer according to preference : switches for control, signaling and measuring circuits.
- Control switches with spring return - pull to operate and etc.

Cam switches can have up to 15 layers (30 contacts) in maximum. In principle all sizes and designs of cam switches can be arranged with four different angles of rotation. Suitable to the application of stop mechanism with 90°, 60°, 45°, 30° at uniform distribution of a full circle, maximum 4, 6, 8 or 12 switch positions are possible.

The switches can be used at the ambient temperature from $-5^{\circ}C$ to $+55^{\circ}C$ and storage temperature from $-20^{\circ}C$ to $+70^{\circ}C$

Specification

Conforming to the standards IEC 60947-1, IEC 60947-3 and IEC 60947-5-1

Front protection class : IP40

Live part : IP20

Contact material : Ag Ni10 (90% silver + 10% Nickel)

Model			NCS-20	NCS-25	NCS-32	NCS-40	NCS-63
Rated insulation voltage U_i		A	690	690	690	690	690
Rated impulse withstand voltage U_{imp}		kV	6	6	6	6	6
Rated thermal current I_{th}		A	20	25	32	40	63
Rated operational current I_e							
AC-21A, AC-22A (240/440V)		A	20/16	25/20	32/25	40/32	63/63
AC-23A (240/440V)		A	15/15	22/22	30/30	32/32	57/57
AC-2 (240/440V)		A	15/15	22/22	30/30	32/32	57/57
AC-15 (240/440V)		A	5/4	8/5	14/6	14/6	28/12
Power rating							
AC-23A (380V-440V) / (220V-240V)		kW	7.5/3.7	11/5.5	15/7.5	18.5/7.5	30/15
AC-2 (380V-440V) / (220V-240V)		kW	7.5/3.7	11/5.5	15/7.5	18.5/10	30/18.5
AC-3 (380V-440V) / (220V-240V)		kW	5.5/3	7.5/3.7	11/5.5	15/7.5	18.5/6
AC-4 (380V-440V) / (220V-240V)		kW	1.5/1.5	3/2.2	5.5/3	6/3.7	7.5/2.4
DC Switching capacity							
Resistive loads							
T = 1 ms	Voltage						
	24	A	20	25	32	40	63
	48	A	12	20	25	32	40
	60	A	4.5	7.5	8	10	16
	110	A	2	3	4	4.5	6
Inductive loads							
T = 50 ms	Voltage						
	24	A	16	20	25	32	40
	48	A	9.5	16	20	19.5	32
	60	A	3.5	6	6	8	13
	110	A	1.0	1.5	2	2.3	3

NOTE : The power under AC-23A, AC-2, AC-3, AC-4 are in three phase/three pole and the divider represents the power under single phase/two pole.

Mechanical life without load : 10 x 10^4 times, operation frequency is 120 times/h.

Mechanical life with load : 3 x 10^4 times, operation frequency is 120 times/h.

Applications

Ammeter selector switches

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Voltmeter selector switches

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Breaker control switches (Pull to lockout)

Model		NCS
Size	M2	64x64mm. / 64x80mm.(with rectangle plate)
	M3	88x88mm.
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Circuit breaker control switch (Pull and turn / Push and turn)

Model		NCS
Size	M1	64x64mm. / 64x80mm.(with rectangle plate)
	M3	88x88mm.
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Cam Switches (NCS)

Open-close switch (Spring return / Limited movement)

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
	M2	64x64mm. / 64x80mm.(with rectangle plate)
	M3	88x88mm.
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Changeover switch (Limited movement)

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Changeover switch M2 (Type (O) handle for M2 only)

Model		NCS
Size	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Changeover switch M2 (Type (S) handle for M2 only)

Model		NCS
Size	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Cam Switches (NCS)

Open-close switch (Push and spring return)

Model		NCS
Size		∅22
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Padlock changeover switch (Push and turn / Push for padlock)

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Padlock control switch

Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2x0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Double layer (multi-contact) **switch**

Model		NCS
Size	M2	64x64mm.
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2 x 0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal
Contacts		Maximum 60 contacts

Key changeover switch RK (Lock and removable)

Model		NCS
Size	M1K	48x85mm.
	M2K	64x129mm.
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2 x 0.5 - 2.5mm. / 14AWG
Terminal Lug		Fork terminal

Key changeover switch M1, M2 (Lock and removable)

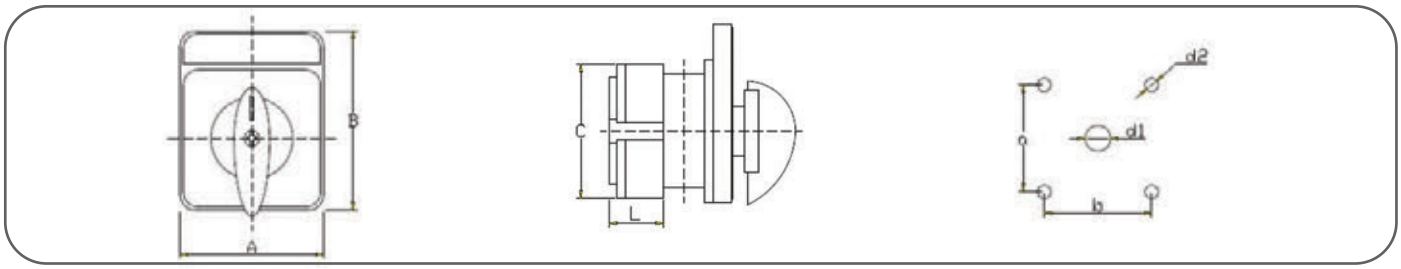
Model		NCS
Size	M1	48x48mm. / 48x64mm.(with rectangle plate)
	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2 x 0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal

Key operate type (Lock and removable)

Model		NCS
Size	M1	48x48mm.
	M2	64x64mm. / 64x80mm.(with rectangle plate)
Rated current		20A / 25A / 32A / 40A / 63A
Voltage	Rated impulse withstand voltage	6kV
	Rated insulation voltage	690VAC
Wire size		2 x 0.5 - 2.5mm.^{2} / 14AWG
Terminal lug		Fork terminal
Color		No.64 /No Color, No.65/Yellow, No.66/Red, No.67/Blue, No.68/Green, No.69/Purple, No.S01/Pink

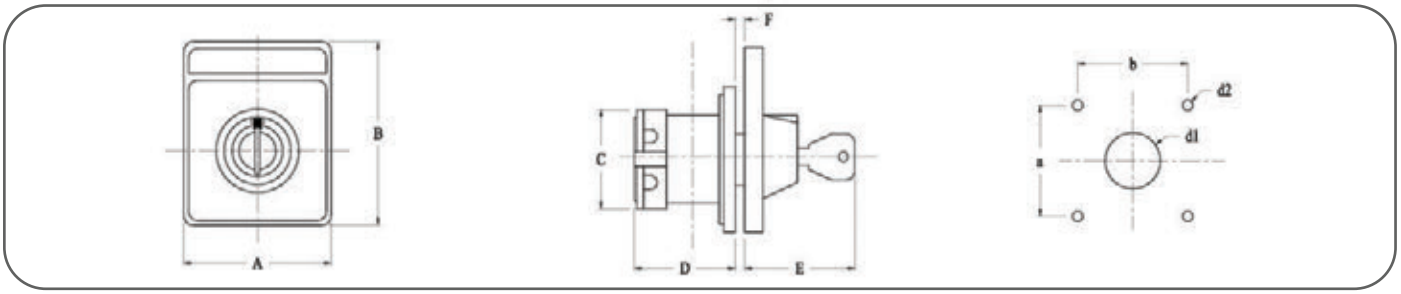
Dimension

Cam switch (Normal type)



Model	Escutcheon plate	Dimension (mm.)				Installation (mm.)			
		A	B	C	L	a	b	d1	d2
NCS-20	M1	48	48	43	9.6n	36	36	∅8.5	∅4.5
	M1 (with rectangle plate)		60						
	M2	64	64			48	48	∅10	
	M2 (with rectangle plate)		80						
NCS-25	M1	48	48	45.2	12.8n	36	36	∅8.5	
	M1 (with rectangle plate)		60						
	M2	64	64			48	48	∅10	
	M2 (with rectangle plate)		80						
NCS-32	M2		64	58	14n				
	M2 (with rectangle plate)		80						
NCS-40	M2		64						
	M2 (with rectangle plate)		80						
NCS-63	M2		64	66	22n				
	M2 (with rectangle plate)		80						
	M3	88	88			68	68	∅13	∅6.0

Cam switch (Key type)

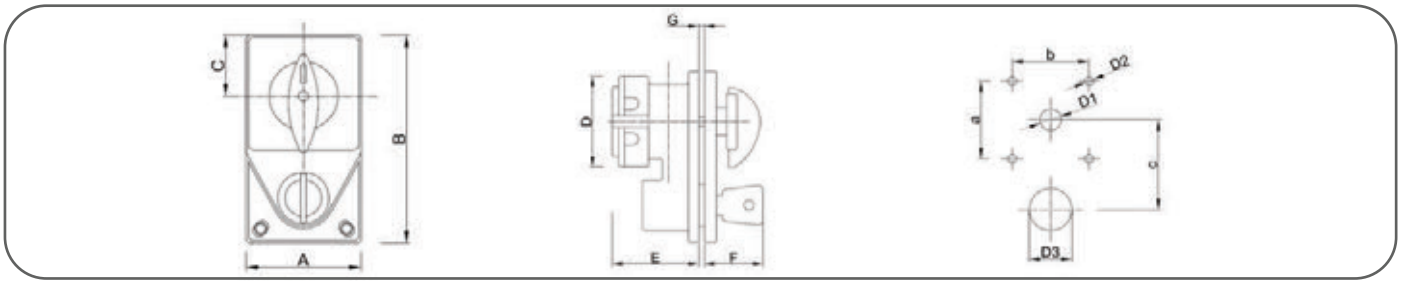


Model	Escutcheon plate	Dimension (mm.)						Installation (mm.)			
		A	B	C	D	E	F	a	b	d1	d2
NCS-20	M1	48	48	43	40+9.6n	40	1-4	36	36	∅24	∅4.5
	M2	64	64		35+9.6n	48		48	48		
	M2 (with rectangle plate)	64	80		35+9.6n	48		48	48		
NCS-20	M1	48	48	45.2	23+12.8n	40		36	36		
	M2	64	64		34.4+12.8n	48		48	48		
	M2 (with rectangle plate)	64	80		34.4+12.8n	48		48	48		

NOTE : n for number of layers

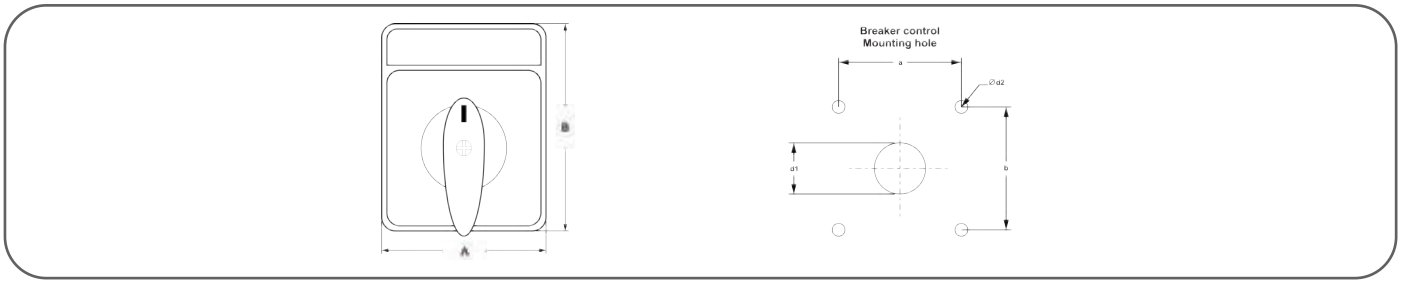
: Square escutcheon plate plus rectangle plate is added for M1 and M2, shall be used for Model NCS20 and NCS25. NCS32, NCS40 and NCS63 should be M2, and M3 only.

Cam switch (Key changeover switch RK)



Model	Escutcheon plate	Dimension (mm.)							Installation (mm.)					
		A	B	C	D	E	F	G	a	b	c	D1	D2	D3
NCS-20	M1	48	85	25	45	34+9.6n	29	1-4	36	36	41.5	∅10	∅4	∅20
	M2	64	129	32										
NCS-25	M1	48	85	25	47.2	34+12.8n								
	M2	64	129	32										

Breaker control switches (Pull to Lockout)



Model	Escutcheon plate	Dimension (mm.)		Installation (mm.)			
		A	B	a	b	d1	d2
NCS-25	M2	64	80	48	48	∅10	∅4
	M3	88	88	68	68	∅13	∅6

NOTE : n for number of layers

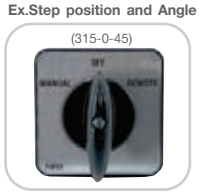
Product Coding

NCS - 20 M1 - 10 (X A K) -D (270 - 0 - 90) (K66)

Current rating

20	20 A
25	25 A
32	32 A
40	40 A
63	63 A

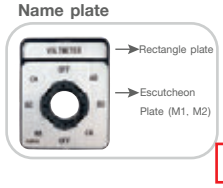
Ex.Step position and Angle



Escutcheon plate size

M1	48 x 48 mm.
M2	64 x 64 mm.

Name plate

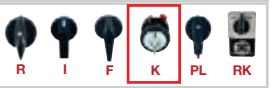


Number of contact

02	2 Contacts, 1 Layer
04	4 Contacts, 2 Layers
06	6 Contacts, 3 Layers
08	8 Contacts, 4 Layers
10	10 Contacts, 5 Layers
30	30 Contacts, 15 Layers

Handle type

Handle type (M1)



Handle type (M2)

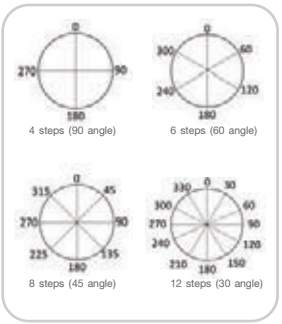
Additional rectangle plate

X	No
A	Add

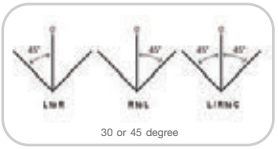
Operation

X	Normal
S	Spring return
P	Pull and turn
H	Push and turn

Step position and angle



Spring return



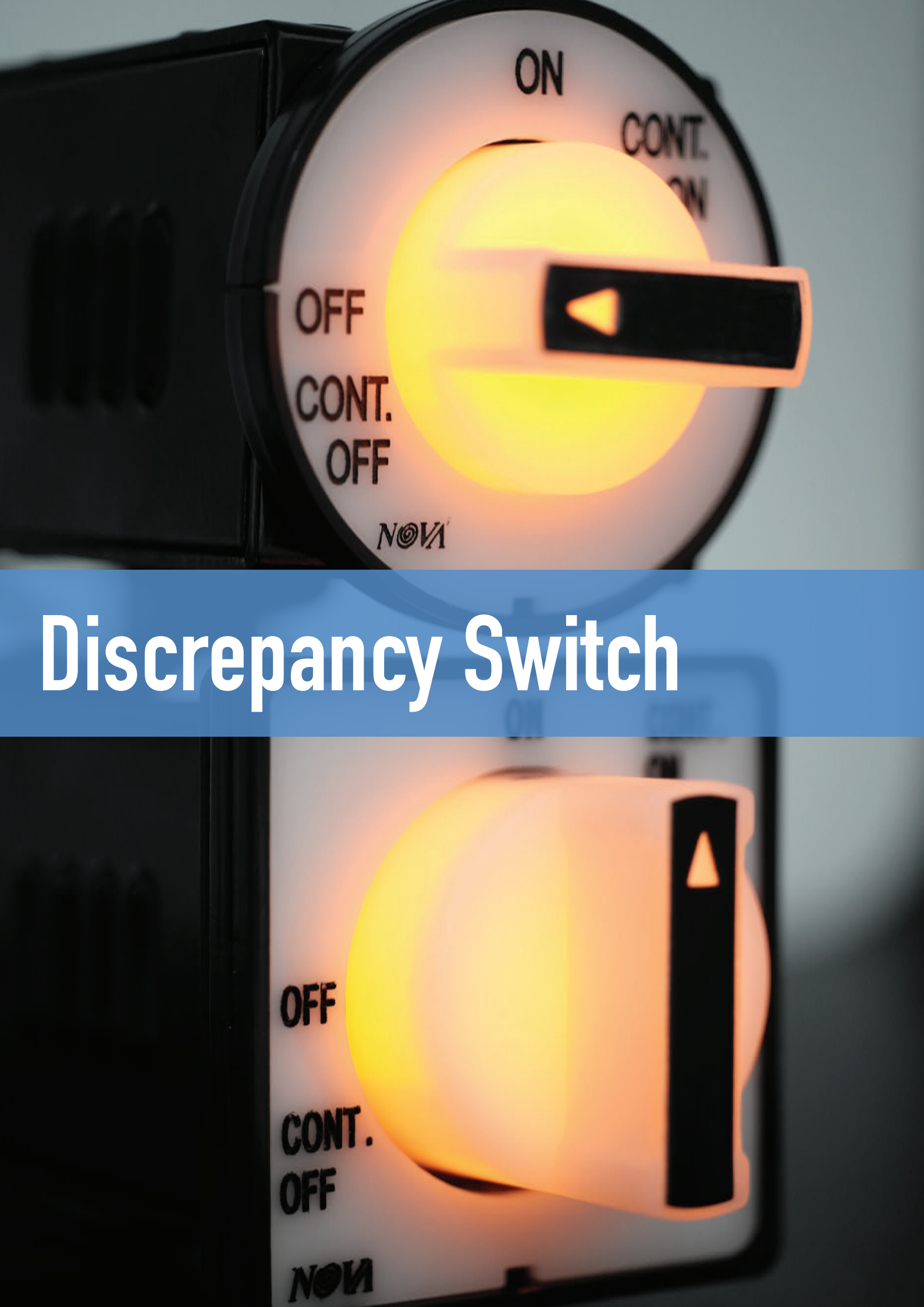
DIN Rail mounted option

	No
-D	Add DIN Rail

Key No. *

K64	No color
K65	Yellow
K66	Red
K67	Blue
K68	Green
K69	Purple
KS01	Pink

*for handle type Key



Discrepancy Switch

Discrepancy Switches (NDCS)

Description

NOVA Discrepancy switches (NDCS) are used to control & monitor the circuit breaker and disconnecting switches. Also display their circuit state in mimic panels and illuminated mimic diagrams.

When it lights up that means the position of the discrepancy switches does not match with the pre-assigned circuit breaker.

The luminous source is from high brightness LED lamp with yellow color.

Features

- Robust, durable, compact and luxurious design.
- Provide both round and square installation flanges.
- 2 points switching type
  (by pushing and turning to right or left side)
  High brightness LED chip technology with built in current limiting resistor and zener diode.
- Various input voltages (both AC & DC) for LED indicator.
- Flashlight could be supplied as an option.
- Finger proof terminal, screw type for contactor size 0.5-4 mm^2

Applications

Electrical utility substations

MV/LV energy distribution

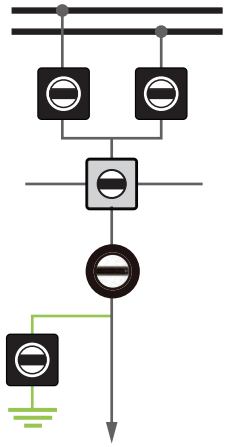
Railway transport industry

According to standards

- **IEC 60947-1**
- **IEC 60947-3**
- **IEC 60947-5-1**
- **IEC 60529**

Mimic diagram

The association between discrepancy switches and disconnector/circuit breaker is directly identified on the mimic diagram by the front plate shape.



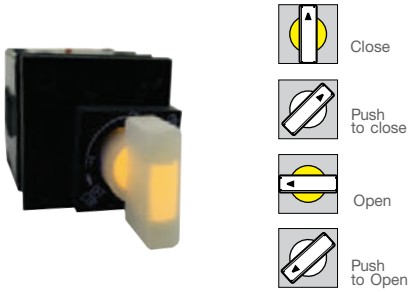
Control discrepancy switches mimic diagram

Specification

Model			NDCS-20	NDCS-25	NDCS-32
Rated insulation voltage U_i		V	690	690	690
Rated impulse withstand voltage U_{imp}		kV	6	6	6
Rated thermal current I_{th}		A	20	25	32
AC rated frequency			50/60 Hz		
Input voltages for LED lamp			24, 48, 110, 125, 220 and 250V AC/DC (±10%)		
Rated short-time withstand current (Icw)		for AC-22A	1.3kA	2.5kA	5kA
		for DC-22A	9A	14A	18A
Rated short-circuit making capacity (Icm)		for AC-22A	2kA	3.5kA	7.5kA
		for DC-22A	9A	14A	18A
Rated operational current (Ie)					
AC-21A, AC-22A		A	20	25	32
AC-23A		A	15	22	30
AC-2		A	15	22	30
AC-3		A	11	15	22
AC-4		A	3.5	6.5	11
AC-15 (220V-240V)		A	5	8	14
Power rating	Three phase	Single phase			
AC-22A	380V-440V	220V-240V	7.5/3.7 kW	11/5.5 kW	15/7.5 kW
AC-2	380V-440V	220V-240V	7.5/3.7 kW	11/5.5 kW	15/7 kW
AC-3	380V-440V	220V-240V	5.5/3 kW	7.5/3.7 kW	11/5.5 kW
AC-4	380V-440V	220V-240V	1.5/1.5 kW	3/2.2 kW	5.5/3 kW
DC operational performance capability (DC-22A)					
Resistive and inductive loads					
T = 2 ms	24VDC	A	20	25	32
	48VDC	A	12	20	25
	60VDC	A	4.5	7.5	10
	110VDC	A	1.0	1.5	2.0
	125VDC	A	0.9	1.4	1.8
	220VDC (2 Contacts in series)	A	1.0	1.5	2.0
	250VDC (2 Contacts in series)	A	0.9	1.4	1.8
Mechanical durability			$5x10^5$ operations up		
Electr ical durability			$2x10^5$ operations up		
Ambient temperature			-5°C to + 40°C		
Storage temperature (not exceeding 24 h)			-25°C to + 70°C		
Average maximum temperature			+ 45°C		
Contact material			AgNi (90% Silver + 10% Nickel)		

Discrepancy Switches (NDCS)

Micro knob

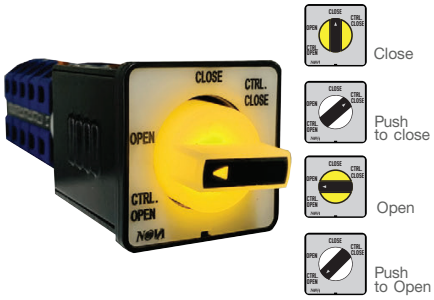


SM Square (Micro knob)
For Mosaic Tie (24x24mm.)

Normal knob

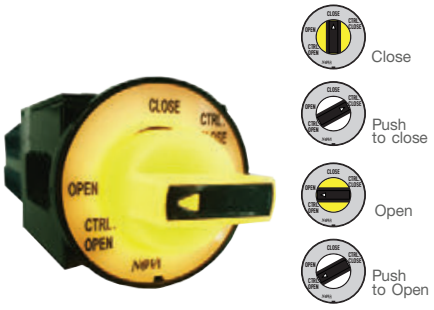
SN Square (Normal knob)
For Circuit breaker (48x48mm.)

Big knob

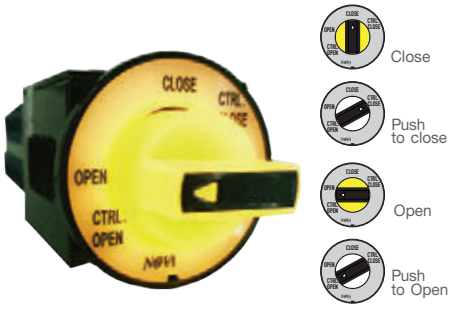


SB Square (Big knob)
For Circuit breaker (58x58mm.)

LED lamp (NLB)
24, 48, 110, 125, 220 and 250V AC/DC



RN Round (Normal knob)
For Disconnector (52x52mm.)



RB Round (Big knob)
For Disconnector (62x62mm.)

Special diagrams

Control discrepancy switches are mainly used to control and signal discrepancies on circuit breakers and disconnectors switches.

Often it is also requested on applications where the switch will control auxiliary circuits giving signal to external relays, acoustic circuits.

This product constructional flexibility offers optimal adaptation to specific needs of circuit breaker/disconnector circuits and other applications such as on load controller, contactor control.

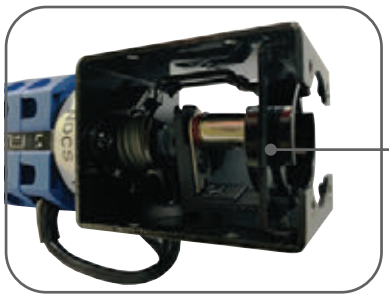
General characteristics

Combining electronics and electro mechanics technology on this product has achieved a solution that is distinguished by its well accomplished integration and simplicity on installation and operation.

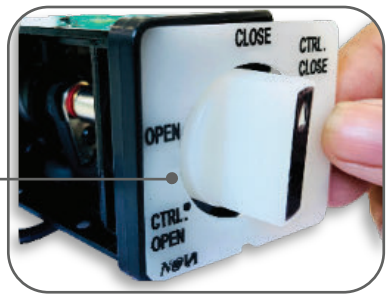
- High brightness LED chip technology with built in current limiting resistor and zener diode.
- Encapsulated electronics, Maximum protection and safety.
- Simple mounting insert bolts on frontal breaking mechanism.
- Easy "push to turn" front plate mounting.

Protection degree IP20
Terminals protected against solid objects up to 12.5 mm. finger touch proof.

Brightness
The luminous source is from high brightness LED lamp with yellow color.



Precision mechanism
2 points switching type
(by pushing and turning to right or left side)



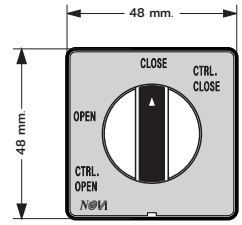
Simple "Click" front plate fixing
Front plate designed for easy fixing by simple push-in on the mounting plate.

Control panels retrofitting
When maintaining and updating control panels we often face product supply problems to localize and purchase original goods that frequently are yet out of production manufacturing.
In ESP Technologies Limited we can provide the product cross-reference that you need and benefit from an expert technical service manufacturing product countertypes from your original unit.

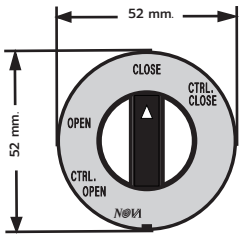
Dimensions

Normal knob

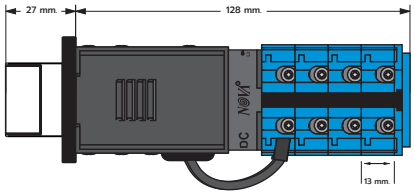
SN (Square normal knob)



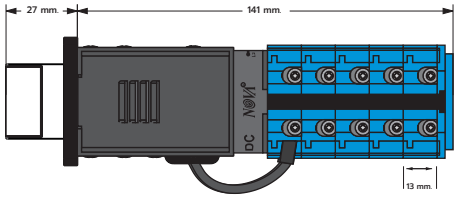
RN (Round normal knob)



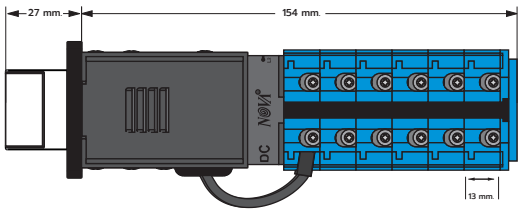
3 Layers (NDCS)



4 Layers (NDCS)

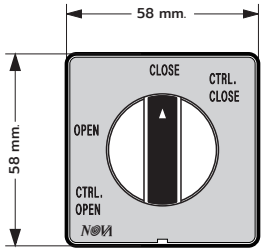


5 Layers (NDCS)

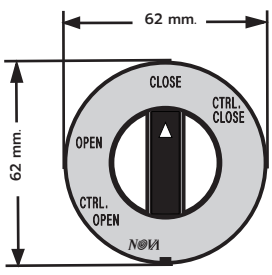


Big knob

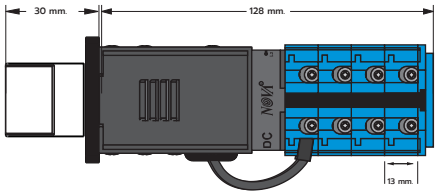
SB (Square normal knob)



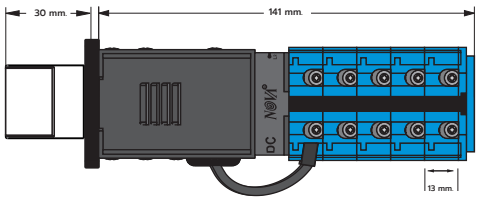
RB (Round normal knob)



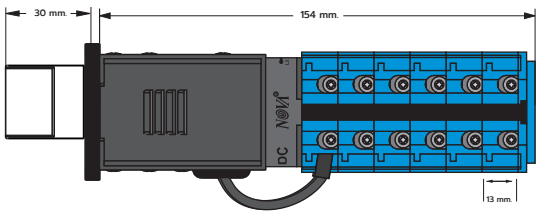
3 Layers (NDCS)



4 Layers (NDCS)

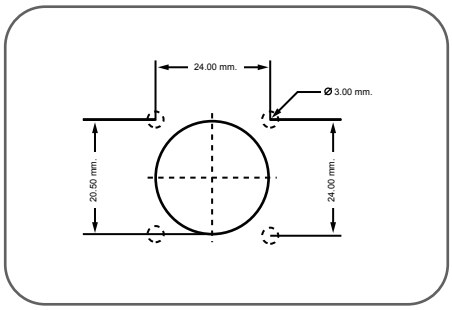


5 Layers (NDCS)

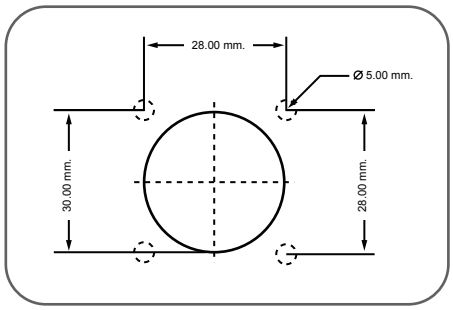


Fixing Dimensions

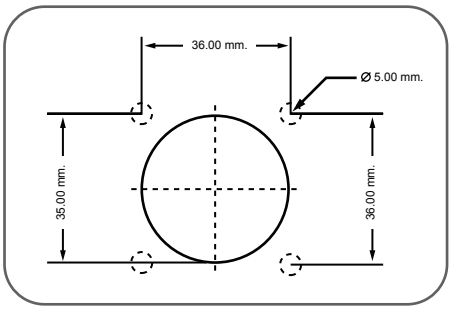
Micro knob mounting hole
Mosaic tie 24x24 mm.



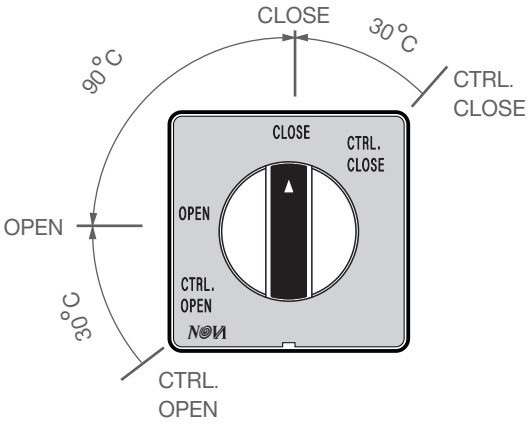
Normal knob mounting hole
flange code SN, RN

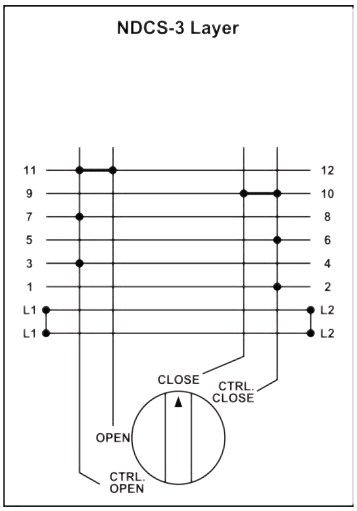


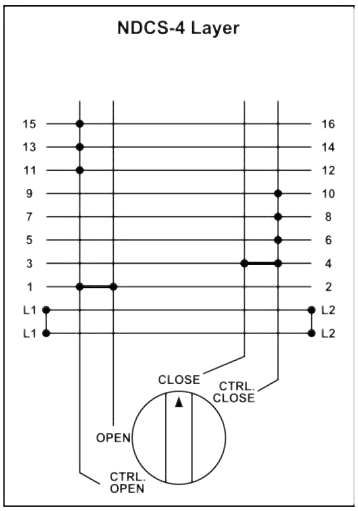
Big knob mounting hole
flange code SB, RB

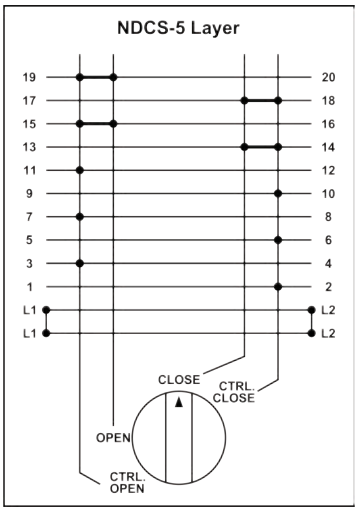


Operation









Product Coding

NDCS 20 - 4 - 24 - SN F

Basic type

Rating

20	20A
25	25A
32	32A

Number of layer

3	3 Layers*
4	4 Layers*
5	5 Layers*

*One more layer for LED lamp will be added.

Input voltage for LED lamp (±10%)

24	AC/DC 24V
48	AC/DC 48V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
25	AC/DC 250V

*Other rating can be supplied upon request

LED Operation

N/A	Normal LED
F	Flash light LED

Flange type and size

SM	Square (Micro knob)
SN	Square (Normal knob)
RN	Round (Normal knob)
SB	Square (Big knob)
RB	Round (Big knob)

Indicator

High Brightness LED Bulb (NLB)

Description

The BA9S and E10 are standard socket of LED bulb, with diameter approx. 9-10mm. multi-chip and latest technology assures bright intensity, shock resistance and long life operation. Meanwhile E12 and E14 (diameter 12mm. and 14mm.) could be done upon customer requested.

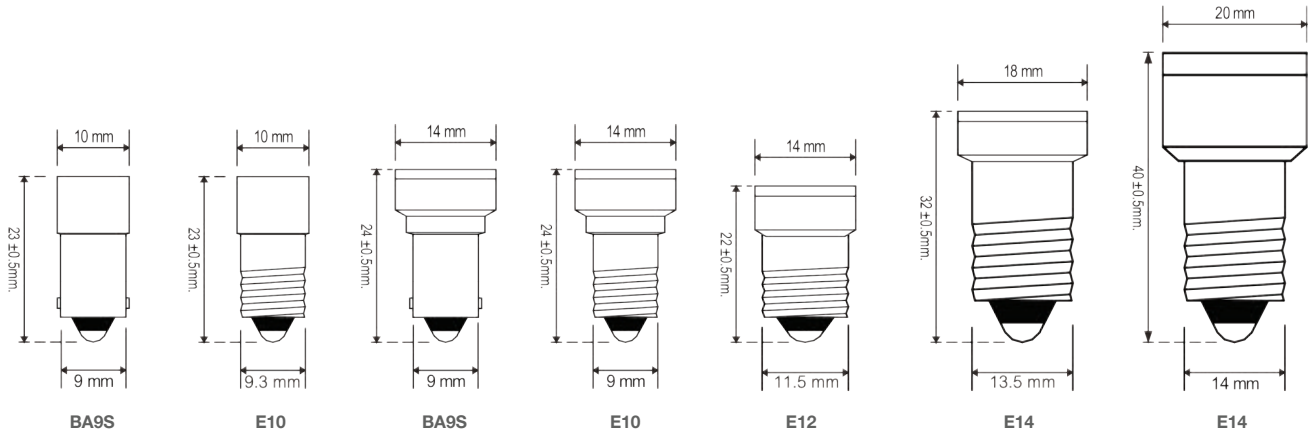
Features

- Low power consumption
- Lifetime : more than 30,000 hours
- Ambient Temperature : -5°C ~ +50°C
- Insulation : 100 MΩ at DC 500V
- Selectable input voltage
  from 24, 48, 70, 110,125, 220, 230 VAC/DC
- Operating current less than 10mA

Specification

Rated voltage	Model	White	Sky blue	Green	Yellow	Amber	Red
AC/DC-24V	Operating current (mA)	6.0	6.0	6.0	6.0	6.0	6.0
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	80	70	80	80	80	90
AC/DC-48V	Operating current (mA)	6.0	6.0	6.0	6.0	6.0	6.0
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	80	70	80	80	80	90
AC/DC-70V	Operating current (mA)	6.0	6.0	6.0	6.0	6.0	6.0
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	80	70	80	80	80	90
AC/DC-110V	Operating current (mA)	3.5	3.5	3.5	3.5	3.5	3.5
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	50	45	50	50	50	65
AC/DC-125V	Operating current (mA)	3.5	3.5	3.5	3.5	3.5	3.5
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	50	45	50	50	50	65
AC/DC-220V	Operating current (mA)	3.0	3.0	3.0	3.0	3.0	3.0
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	50	45	50	50	50	65
AC/DC-230V	Operating current (mA)	3.0	3.0	3.0	3.0	3.0	3.0
	Wave length (nm)	459	466	523	596	613	633
	Luminous intensity (mcd)	50	45	50	50	50	65

Dimensions



Product Coding

NLB - BA9S - R 13 - 10

Basic type

Socket type

BA9S	Bayonet base 9 mm.
E10	Screw-in base 9.3 mm.
E12	Screw-in base 11.5 mm.
E14	Screw-in base 13.5 mm.

Emitting color

R	Red
G	Green
A	Amber
W	White
S	Sky blue
Y	Yellow

Rated voltage of lamp (±20%)

24	AC/DC 24V
48	AC/DC 48V
70	AC/DC 70V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V

*Other rating can be supplied upon request

LED Diameter

10	10 mm.
14	14 mm.
20	20 mm.

Semaphore Indicator (NSI)

Description

NOVA LED semaphore indicator is used as a state indicator of the circuit breaker, disconnector or earthing switch. The indicator is mounted on the panel with mounting hole diameter 22.3 mm. and operated by two color LED. The two colors are red and green, detail description is as below:

Model	Symbol	Connection		Equipment status	
		X0-X1	X0-X2		
Draw out		Red		Service	
			Green		Test
Grounding or earth		Red		Close	
			Green		Open
Operation		Red		Close	
			Green		Open

Specification

Conform to standards IEC 60073 (Lamp colors) and IEC 60947-5

Model	NSI22
Insulation withstand voltage	10MΩ at DC 500V, AC 1,500V/min.
Electrical lifetime	Above 50,000 hrs.
Operating current	4-6 mA
Power consumptions	0.12W(24VDC), 0.24W(48VDC), 0.55W(110VDC), 0.625W(125VDC), 1.10W(220VDC)
Ambient temperature	-5°C ~ +55°C
Storage temperature	-20°C ~ 70°C
Ambient humidity	45 ~ 85%
Degree of protection	IP40 (front plate)
Cutout	22.3 mm.
Weight	30g.

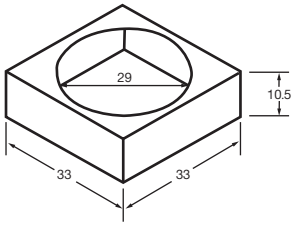
Dimensions

NSI22W (White plate)

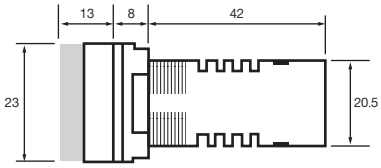
NSI22B-S

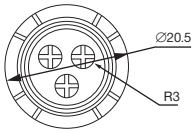
NSI22B-E

NSI22B-D



Removable square plate



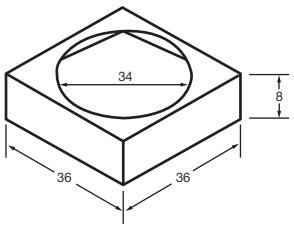


NSI22B (Black plate)

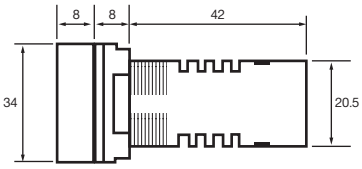
NSI22B-S

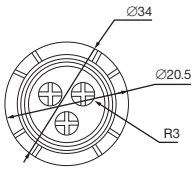
NSI22B-E

NSI22B-D



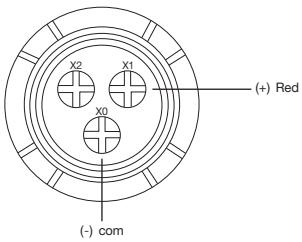
Removable square plate



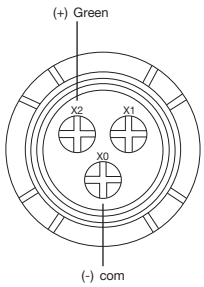


Wiring Diagram

Red



Green



Product Coding

NSI22 B - E - 13

Basic type

Surface color

W	White plate
B	Black plate

Working status

D	Draw out status of breaker or DS
E	Grounding or earth of breaker or DS
S	Operation status (Close or open) of breaker or DS

Rated voltage (±20%)

24	AC/DC 24V
48	AC/DC 48V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V

*Other rating can be supplied upon request

Removable LED (BA9S) type

Flat lens (NPL22-L)

Dome lens (NPL22-LD)

Fixed LED type

Flat lens (NPL16-F)

Flat lens (NPL22-F)

Flat lens (NPL30-F)

Description

Pilot lights are panel mounted lamp assemblies consisting of the indicator housing, an internal LED lamp, terminal, and a lens. Applications include industrial control panels of all types, equipment indicator panels, status indicators and display lighting. The light source is high brightness pure color LED.

Features

- Unique Lens & bulb uniform body assures bright intensity, shock resistance, and oil tight construction.
- Full voltage up to 480VAC 50/60 Hz without bulky transformer
- High brightness LED chip technology with built in current-limiting resistor and zener diode
- Other voltage rating can be done upon request.

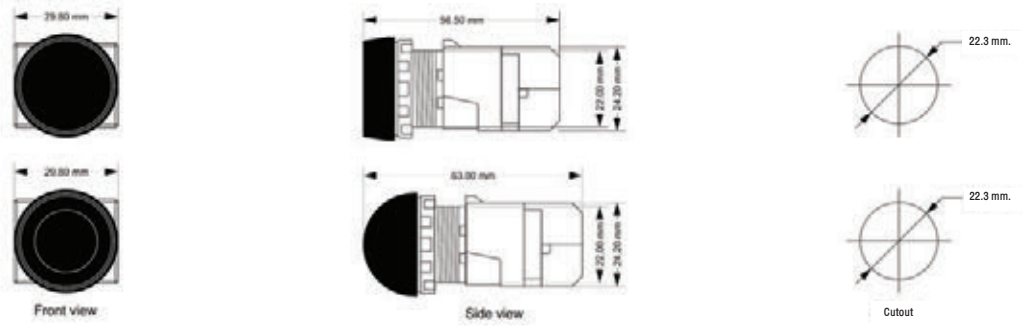
Specification

Conform to standards IEC 60947-5 and IEC 60073 (Lamp colors)

Model			NPL
Rate voltage of lamp (±20%)			380/400VAC, AC/DC 220V, 230V, 125V, 110V, 70V, 48V, 24V, 12V
Current			less than 6mA
Insulation			100 MΩ at DC 500V
Ambient temperature			-5°C ~ +55°C
Storage temperature			-20°C ~ 70°C
Electrical lifetime			Above 30,000 hrs.
Degree of protection			IP40
Cutout	Removable LED (BA9S) type	Flat lens	22.3mm.
		Dome lens	22.3mm.
	fixed LED type	Flat lens	16.2 mm.
			22.3 mm.
			30.5 mm.

Dimensions

Removable LED (BA9S) type



Fixed LED type

Product Coding

NPL 22 - R 13 - L D

Basic Type

Cutout

16	16.3mm. (Fix LED type)
22	22.3mm.
30	30.3mm. (Fix LED type)

Color

R	Red
G	Green
Y	Yellow
W	White
S	Sky blue
A	Amber

Rated voltage of lamp (±20%)

12	AC/DC 12V
24	AC/DC 24V
48	AC/DC 48V
70	AC/DC 70V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V
38**	AC 380V
40**	AC 400V

**For Fix LED type only

Lens type

D*	Dome
None	Flat

*For removable LED type only

Bulb type

L	LED(BA9S), Removable
F	Fix LED

Pilot Light (NPLH)

Applications

- Hazardous areas: Zone 1&2 or zone 20, 21, 22:
- Explosive gas atmosphere: class II A, II B, II C
- Flammable dust atmospheres
- Strong corrosive gas environment

Features

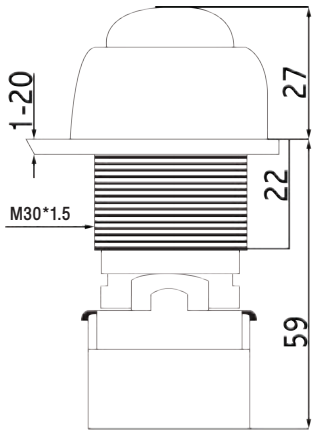
- This products are made by aluminum alloy
- The explosion-proof signal lamp should be used together with flame proof enclosure, cannot be used alone at explosive atmosphere.

Specification

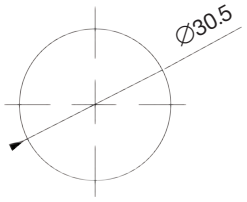
Conform to standards : IEC 60073, IEC 60079, IEC 60073, IEC 61241, EN 60079, EN 61241

Model	NPLH
Rate voltage of lamp (±20%)	AC/DC 230V, 220V, 125V, 110V, 48V, 24V, 12V
Power consumption	Pmax ≤ 1W
Electric life	300,000 hours
Ambient temperature	-60°C ≤ Ta ≤ +55°C
Ex mark	Ex de II C T6 DIP A21 TA, T6
Electrical lifetime	Above 30,000 hrs.
Degree of protection	IP65
Cutout	30.5 mm.

Dimensions



H series cover face explosion - proof signal lamp



Cutout

Product Coding

NPLH - R 22

Basic Type

Color

R	Red
G	Green
Y	Yellow
W	White
S	Sky blue
A	Amber

Rated voltage of lamp (±20%)

12	AC/DC 12V
24	AC/DC 24V
48	AC/DC 48V
70	AC/DC 70V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V
38**	AC 380V
40**	AC 400V

**For Fix LED type only

Line Lamp (NLL)

Description

NLL series line lamps or status lamps are panel mounted assemblies which are consisting of the indicator housing, an internal LED lamp, terminals (at the rear side), and lens. Applications include industrial control panels of all types, equipment indicating panels, status indicators and display lighting. The light source is from high brightness pure color LED.

Features

- Robust, compact and luxurious design
- Selectable lens shape either square (30 x 30 mm.) or rectangular shape (30 x 60 mm.)
- High brightness LED chip technology with built in current limiting resistor and zener diode
- Various choices of LED illuminating colors such as white, red, green, yellow, amber and sky blue
- Various input voltages (both AC & DC) for LED indicator

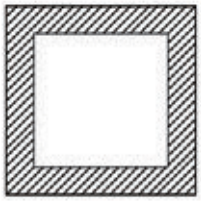
Specification

Model	NLL
Input voltage for LED lamp	AC/DC 230V, 220V, 125V, 110V, 48V, 24V
Allowable voltage fluctuation	±20%
AC rated frequency	50/60 Hz
LED illuminating color	White, Red, Green, Yellow, Amber and Sky blue
LED base type	E10
LED power consumption	Below 20 mA.
Insulation resistance	>100 MΩ (DC 500 V. Meg)
Withstand voltage	AC 2,500 V/1 min.
Ambient temperature	-5°C to +55°C
Relative humidity	45 – 85 %
Degree of protection	IP40 (Front panel)
Recommended wire size	1.0 – 2.5 mm^2

Dimensions

Square lens

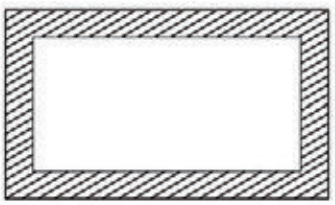
Square lens
Frame : 42.3x42.3 mm.
Lens : 30x30 mm.



Panel cutout
Cutout Square hole 35x35 mm.

Rectangular lens

Square lens
Frame : 42.3x72.3 mm.
Lens : 30x30 mm.



Panel cutout
Cutout Rectangular lens 35x65 mm.

NLL - 3 R - L 24

Basic type

Dimension

3	Rectangular lens(30x30 mm.)
6	Rectangular lens(30x60 mm.)

Colors of LED lamp

W	White
R	Red
G	Green
Y	Yellow
A	Amber
S	Sky blue

LED lamp with E10 base type

Input voltage for LED lamp (±20%)

24	AC/DC 24V
48	AC/DC 48V
11	AC/DC 110V
13	AC/DC 125V
22	AC/DC 220V
23	AC/DC 230V

*Other rating can be supplied upon request

Miniature Buzzer (NBZ)

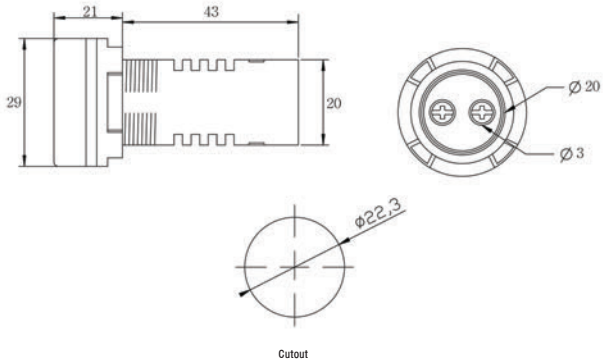
Description

The miniature buzzer is used for general purpose alarm and warning applications. Usually it is used in cubicle or control boxes for wide application such as power distribution boards, LV. switchgear, MV. switchgear, Panel boards/ Switchboards as well as in controller box of production machine and so on.

Features

- Small size/light weight and 5 cm. depth in panel.
- Daimeter 22 mm. buzzer is intermittent sound and flashing lamp. (C : Continuous sound and display lamp)
- Sound volume is 80 dB. at 10 cm.
- Both AC and DC type can be supplied with wide range of voltage.
- Ambient temperature -5°C to +55°C
- Degree of protection : IP20
- Weight 22g
- Low Power consumption < 3W
- Optional : Continuous sound & display lamp

Dimensions



Product Coding

NBZ - 130 C

Basic type

Rated voltage (±20%)

024	AC/DC 24V
048	AC/DC 48V
110	AC/DC 110V
130	AC/DC 125V
220	AC/DC 220V
230	AC/DC 230V

Continuous sound & Display lamp

Miniature Buzzer (NBZH)

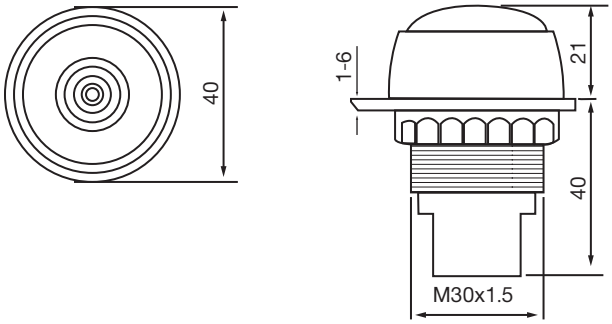
Applications

- Hazardous areas : Zone 1&2 or Zone20, 21 22
- Explosive gas atmosphere : class II A, II B, II C
- Flammable dust atmospheres
- Strong corrosive gas environment

Features

- Transparent part is made by polycarbonate
- This product should be used together with increased safety enclosure or explosion-proof box, cannot be used separately.

Dimensions



Product Coding

NBZH - 130

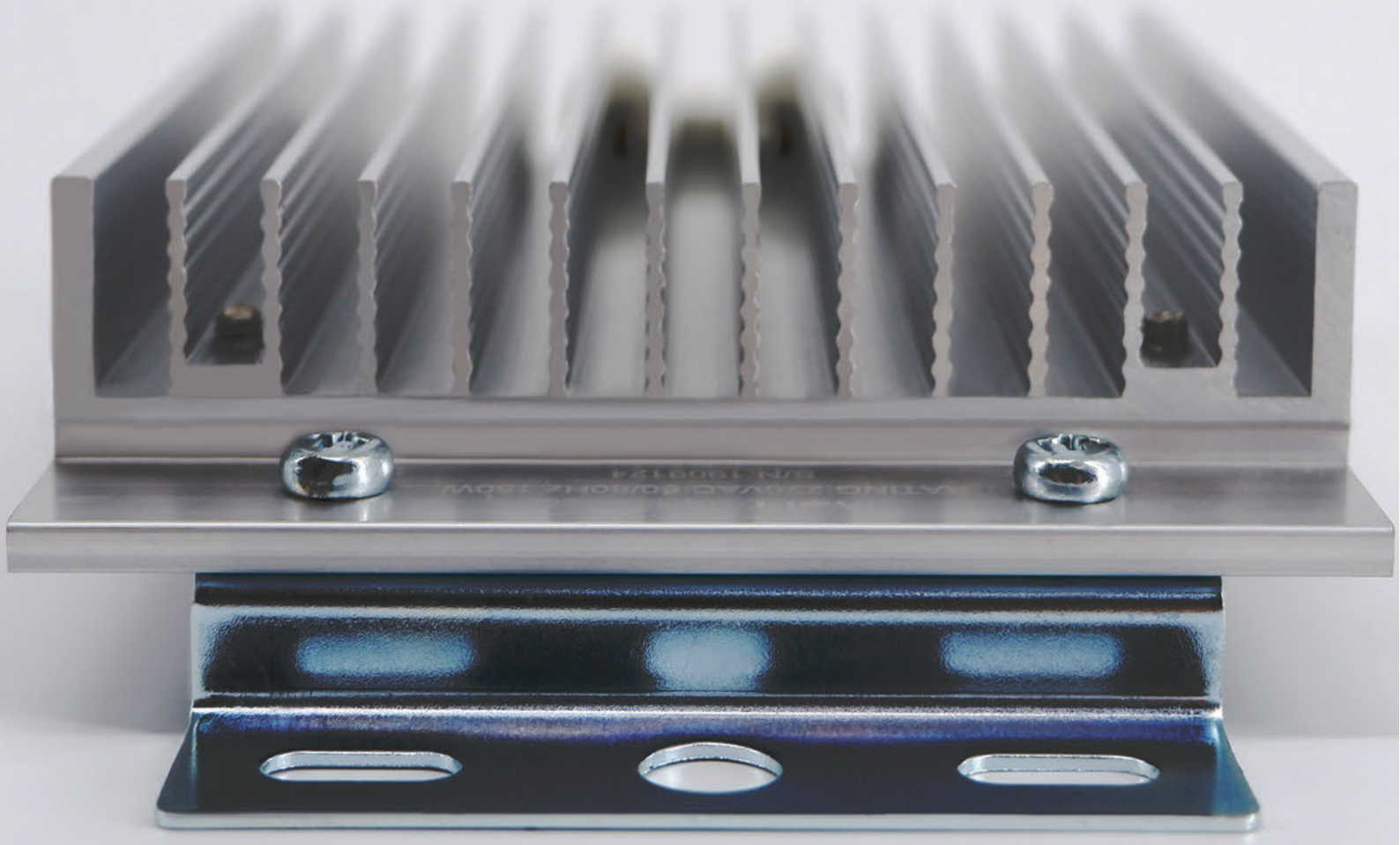
Basic type

Rated voltage

024	AC-DC 24V
048	AC-DC 48V
110	AC-DC 110V
130	AC-DC 125V
220	AC-DC 220V
230	AC-DC 230V

*Other rating can be supplied upon request

HEATER
AND
HEATER CONTROLLER



Space Heater (NSH01)

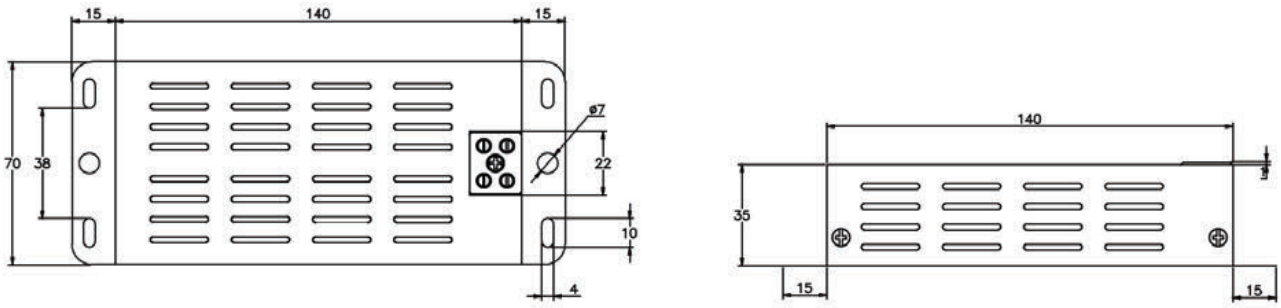
Description

Space heater is an economical and reliable source of heat, widely used in the control panel, switchgear cubicle, main distribution board, control boxes etc. When it is in use, normally it should be combined with other products such as electric fan, thermostat or hygrostat.

Heat element is a mica strip heater and the flat resistance ribbon generates heat over a broad area. Installation of the space heater should be at the bottom part of the cubicle or the lowest part of the control panel to get the best result of the heater.

The complete set of space heater is rugged and modern design to fulfill the function of heating. The body of the heater is made of zinc-coated steel and painted with epoxy black color.

Dimensions



Note: Tolerance = +/- 2 mm.

Product Coding

NSH01 - 050

Basic type

Power consumption

050	50W 220VAC ±10%
100	100W 220VAC ±10%

Space Heater (NSH02)

NSH02 NSH02 With cover

Description

Space heater is used in enclosures where damage from condensation must be prevented, or where the temperature may not fall below a minimum value, widely used in the control panel, switchgear cubicle, main distribution board, control boxes. When it is in use, it should be combined with other products such as electric fan, thermostat or hygrostat, Heat element is a mica strip heater and the flat resistance ribbon genrates heat over a broad area. To get the best result of the heater, the space heater shall be install at the bottom side of the cubicle or the lowest part of the control panel.

The NSH02 series space heater is rugged and aluminum profile heater body design to fulfill the function of heating The extruded aluminum profile has a chimney effect and distributor the heat evenly.

Features

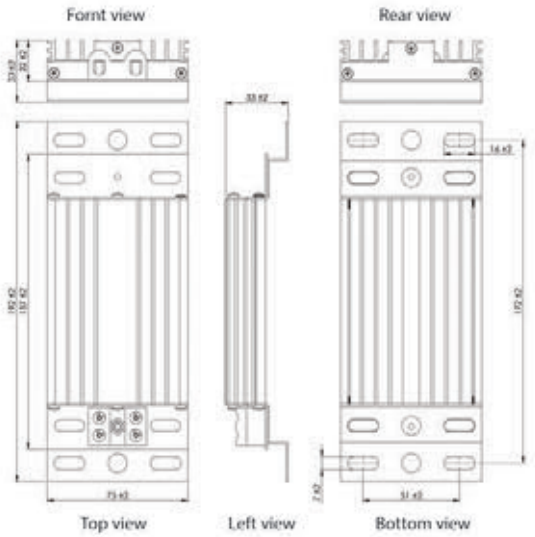
- Lightweight heater enable wide range of application and contributes to size and weight saving.
- Construction provides temperature capability between 100°C to 300°C
- Dynamic heating up, Excellent heat radiation
- Corrosion resistance
- Wide Supply voltage range 195 VAC – 245 VAC
- Insulation resistance >500MΩ
- Resistance tolerance ±10%
- Dielectric strength 2,000 VAC
- Lifespan >5,000 hrs
- Very low power consumption by a shorter heating time comparing to the same wattage of power.
- Heat transfer area ≈ 810 Sq.cm at 50W Model.
- Approvals : VDE, UL

Specification

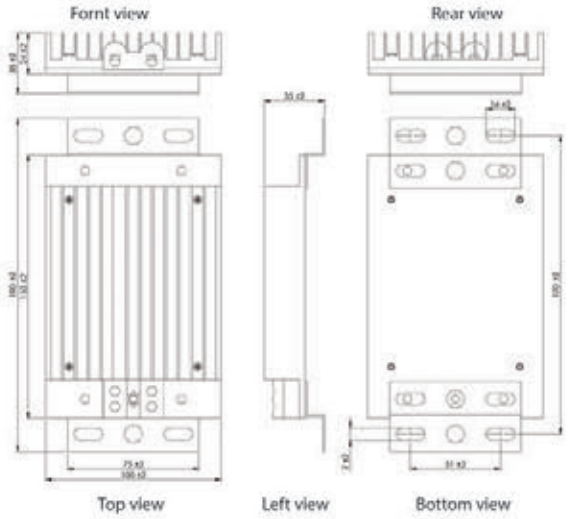
Model	NSH02-020	NSH02-050	NSH02-100	NSH02-150	NSH02-200	NSH02-350	NSH02-500
Power (W)	20	50	100	150	200	350	500
Inrush current (max)	0.09A	0.23A	0.45A	0.68A	0.91A	1.52A	2.27A
Resistance (Ω)	2,420	968	484	322	242	145	97
Working temp. (Max.15 min)	60°	90°	140°	180°	200°	260°	300°
Dimension (L x W x H) mm.	157x75x22	150x100x24	150x100x24	150x100x24	155x100x22.5	200x100x24	201x105x26
Weight (approx.)	198g	361g	381g	381g	320g	410g	448g

Dimensions

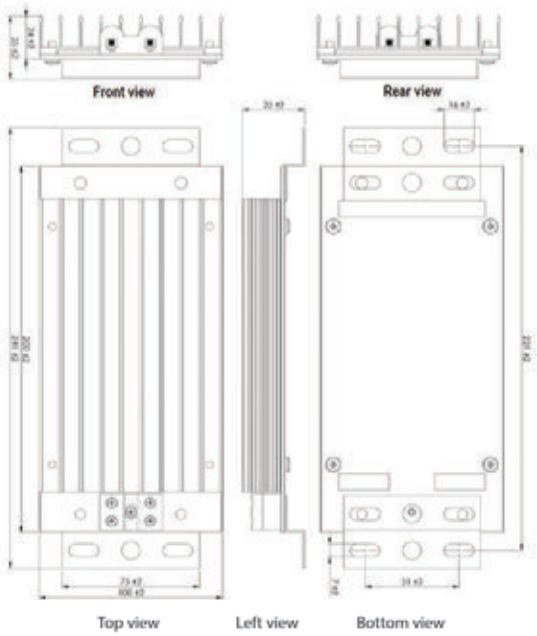
Power 20W



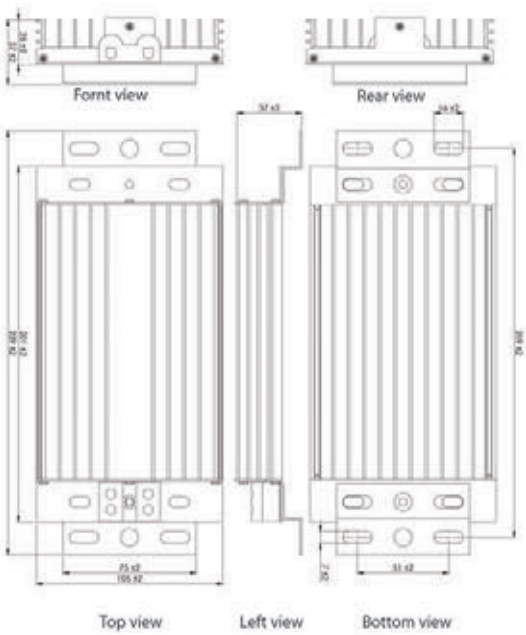
Power 50-150W



Power 350W



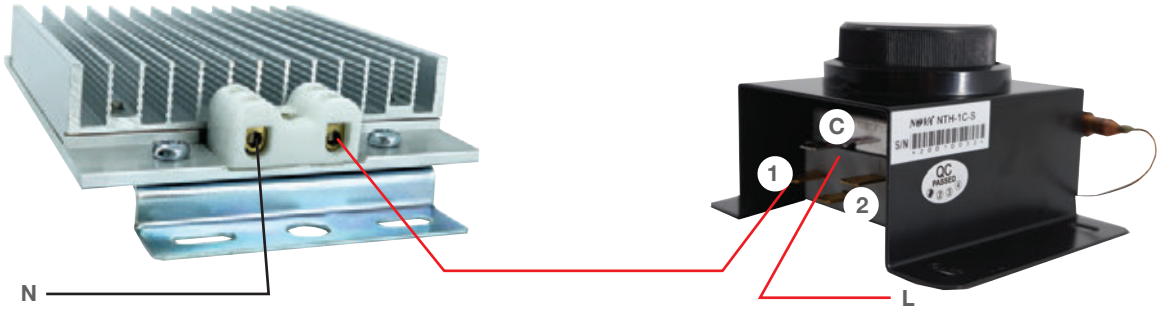
Power 500W



Space Heater (NSH02)

Application

Wiring sample



Product Coding

NSH02 - 050 C

Basic type

Power consumption

020	20W/220VAC ±10%
050	50W/220VAC ±10%
100	100W/220VAC ±10%
150	150W/220VAC ±10%
200	200W/220VAC ±10%
350	350W/220VAC ±10%
500	500W/220VAC ±10%

Cover protection

C	With cover
N/A	No cover

Thermostat (NTH)

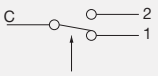
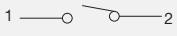
Description

Capillary thermostats are designed for accurate and reliable temperature control for domestic appliances and industrial equipments. Thermostat (NTH type) is an economic and reliable instrument, widely used in relay & control panel, switchgear cubicle, main distribution board, control boxes, laboratory instrument and others. When it is in use, usually it should be combined with other products such as an electric fan or space heater.

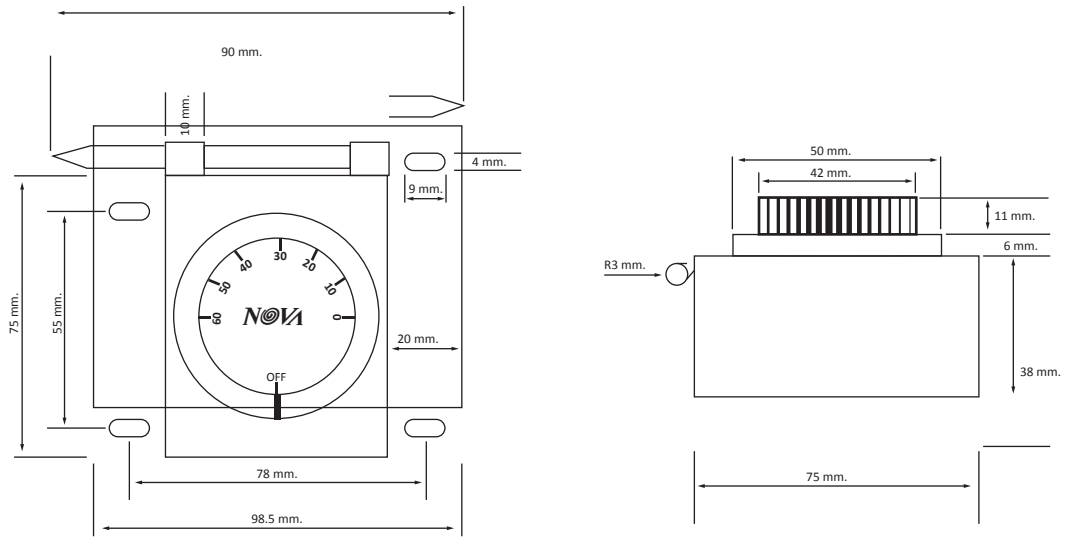
The assembly of the thermostats consisted by a capillary tube, sensing bulb and diaphragm (phial) filled with liquid (which sensitive to the ambient temperature) total length approx 1.5 metre and fixed in the polycarbonate housing and switch base. A black polycarbonate knob with white scale marking is provided to set the desired temperature. The complete set of thermostat (NTH type) is rugged and modern design. The box of the thermostat is made of zinc-coated steel, painted with epoxy resin black color.

This instrument keeps constant within the differential temperature. It is intended to use for preventing of moisture content which may be occurred in the switchboard or electrical cabinets, control panel, switchgear cubicle, small control boxes etc. The setting ranges are started from 0°C to 60°C (error : +2 ~ 5°C) with one change over contact (breaking capacity: 16A at 220Vac ±10%) for controlling or command purpose.

Specification

Model	NTH
Temperature range	0 - 60°C
Differential temperature	2 - 7°C
Contact resistance	50MΩ
Dielectric strength	AC 2,000V/1min
Insulation resistance	100MΩ
Life cycle	100,000 cycles
Max. switching capacity	16A/220VAC ±10%3A (24-125VDC), 380W
Degree of protecection	IP40
S.P.D.T (change over contact)	
S.P.S.T (normally open contact)	

Dimensions



Product Coding

NTH - 1C - S

Basic type

Contact type

1C	1CO
1N	1NO

Mounting type

S	Surface mounted
D	DIN Rail mounted

Electronic Thermostat

Description

Electronic thermostats are designed for accurate and reliable temperature control for domestic appliances and industrial equipments. Electronic thermostat (NTH02) is an economic and reliable instrument, widely used in relay & control panel, switchgear cubicle, main distribution board, control boxes, laboratory instruments and others. When it is in use, usually it should be combined with other products such as an electric fan or space heater.

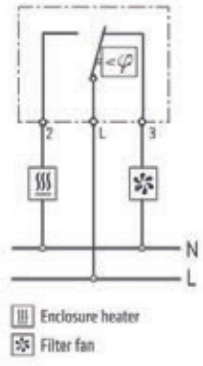
The complete set of electronic thermostat (NTH02) is rugged and modern design. The thermostat is made of polycarbonate housing with a black polycarbonate knob, also marking scale is provided to set the desired temperature.

This instrument keeps constant within the differential temperature. It is intended to use for preventing of moisture content which may be occurred in the switchboard, control panel, switchgear cubicle, small control boxes etc. The setting ranges are started from -20°C to 60°C (error: +2 ~ 5°C) with one change over contact (breaking capacity : 10A at 250VAC) for controlling or command purpose.

Wiring Diagram

Electronic Thermostat
Model : NTH02
AC 250V 10A CE

Connection diagram



Specification

Model	NTH02
Temperature range adj.	-20 to + 60°C
Differential Temperature	2 - 5°C
Sensor type	Bimetal
Dielectric strength	AC 2,000V/1min
Insulation resistance	10mΩ
Life cycle	100,000 cycles
Max. switching capacity	10A / 250VAC
Mounting	Clip for 35mm. DIN rail, EN 50022
EMC	EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Casing	Plastic according to UL94 V-0, light grey
Degree of protection	IP20
Dimension	67 x 50 x 38 mm.
Weight	Approx. 60 g.

Hygrostat (NMH)

Features

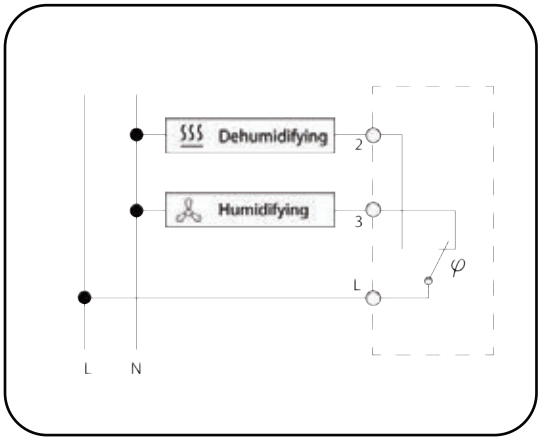
- Adjustable relative humidity
- Setting in 5% RH intervals
- Can work in either NC (Humidifying) or NO mode (Dehumidifying)
- Change-over contact high switching capacity
- Easily accessible terminals
- Clip fixing for 35mm. Din rail
- Protection class IP20

Description

The electromechanical hygrostat NMH is designed to control the relative humidity inside enclosures and electrical cabinets. It can be used to switch on a heater or dehumidifier at the humidity setpoint or when the critical relative humidity of 65% is exceeded to increase the dew point within the cabinet. In this way condensation and corrosion is effectively prevented. This prevents damage and malfunction of electronic components and metal parts caused by condensation and corrosion.

Application is for cabinets of electrical distribution, control panel, switchgear and control gear, ticket and vending machine.

Wiring Diagram

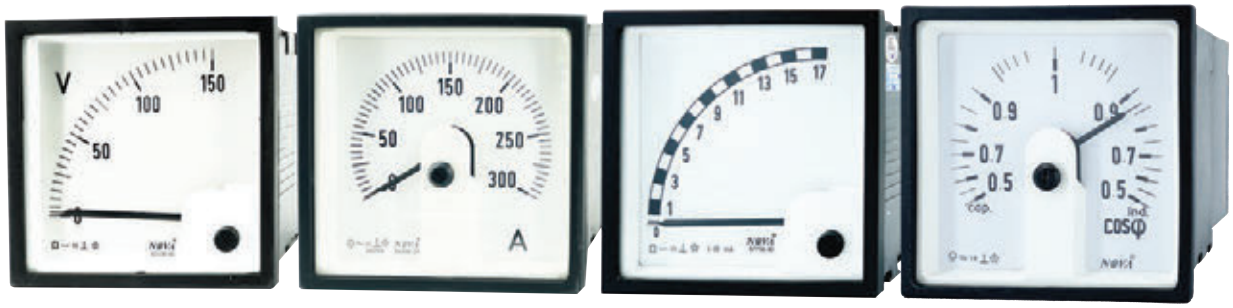


Specification

Model	NMH
Setting range (%RH)	35% - 95%
Switching differential (%RH)	4% RH (±3% tolerance)
Contact type	change - over contact
Contact resistance	<10mΩ
Service life	100,000 cycles
Max. switching capacity	250VAC, 5A / DC 20W (24-75VDC)
Connection	3-pole terminal for 2.5mm^2 Clamping torque 0.5Nm max. : rigid wire 2.5mm^2 Stranded wire (with wire end ferrule) 1.5mm^2
Mounting	Clip for 35mm DIN rail, EN 50022
EMC	EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Casing	Plastic according to UL94 V-0, light grey
Dimension	67 x 50 x 38 mm.
Weight	Approx. 60 g.
Operating/Storage temperature	0 to 60°C (+32 to 140°F)/-20 to +80°C (-4 to +176°F)
Degree of protection	IP20

Analogue Panel Meter

Analogue Panel Meter



Description

Specifications are in accordance with UL94V-0 (flame retardancy), DIN 43700 (dimensions), DIN 43802 and DIN 43701 (pointer and scale), VDE 410, IEC 51, UL 94 and EN 60051.

Accuracy	Most instruments are calibrated to a class index (CI) of 1.5 as standard although certain instruments can be calibrated to a CI of 1.0 on request. A CI of 1.5 signifies an error of up to ±1.5% of full scale.
Magnetic field	All the devices keep their accuracy under the influence of an external magnetic field with a value ≥0.5mT.
Voltage influence	Maximum additional error is not more than ±1.5% indication for ±1.5% voltage variation.
Frequency influence	For variations from nominal of ±10% the maximum addition error is ±0.5% of indication.
Power factor influence	For variations between unity and 1.5 lag and lead at any power factor up to half scale, the maximum additional error is ±0.5% of full scale deflection. Between unity and zero p.f. lag or lead the maximum additional error is ±1.0% of full scale deflection.
Temperature influence	Maximum additional error is ±0.05% per °C.
Operating temperature range	-25°C to +65°C (unless otherwise specified)
Relative humidity	Standard 90% RH for 4 days. The accuracy class is stable within an interval from 25 to 95% non-condensed relative humidity.
Dielectric level	2kV (RMS) for one minute between movement and case and between terminals which are electrically isolated.
Degree of protection	IP52 (case) in accordance with IEC 60529
Permanent overloads	Voltage circuit : 1.2Un Current circuit : 1.2In (1.5In for moving iron)
Short-time overloads	Voltage circuits : 2Un for 5s Current circuit : 5In for 30s, 10In for 5s
Insulation	Insulation reference voltage 0.6kV
Full scale deflection angle	Quadrant scale : 90° Long scale : 240° Synchroscope : 360°
Case material	96mm : Polycarbonate in black 144mm : Polycarbonate in black
Mounting position	Standard operating position is vertical (unless otherwise specified).

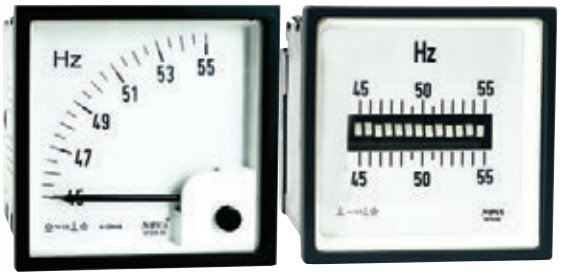
Symbols for marking instruments and accessories

Normal operating position of the panel meter is vertical. The position is marked on the scale and the meters are correspondingly calibrated.

Principal units and their main multiples	
kA	Kiloampere
A	Ampere
mA	Milliampere
µA	Microampere
kV	Kilovolt
V	Volt
mV	Millivolt
µV	Microvolt
MW	Megawatt
kW	Kilowatt
W	Watt
Mvar	Megavar
kvar	Kilovar
Var	Var
MHz	Megahertz
kHz	Kilohertz
Hz	Hertz
MΩ	Megaohm
kΩ	Kiloohm
Ω	Ohm
mΩ	Milliohm

Significance of symbols	
	Measuring system with a moving coil
	Measuring system with a moving coil and rectifier
	Measuring system with a moving iron
	Bimetal measuring system
	Electronic device in a measuring circuit
	Externally positioned electronic device
	Vibrating measuring system
	Warning : see application instructions
⎓	DC
~	AC
≂	DC and AC
	3 phase 3 wire system with balanced load
	3 phase 4 wire system with balanced load
	3 phase 3 wire system with unbalanced load
	3 phase 4 wire system with unbalanced load
1,5	Accuracy class 1.5
1,0	Accuracy class 1.0
Safety	
	Test voltage of 500V
	Test voltage above 500V (e.g. 2kV)
⊥	Vertically

Moving Coil Frequency Meters



Instruments for local indication are usually supplied as self-contained units in sizes 96mm. and 144mm. Each instrument incorporates a moving coil movement driven by an internally mounted static circuit.

For remote indication moving coil instruments can be supplied to operate with transducers (0..1mA or 4..20mAdc)

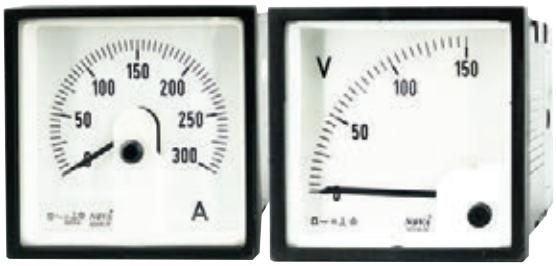
Model	Model	Type reference		Burden (VA)
NFR96	0.5	-	96x96	3VA(MAX)
NFQ96-90	1.5	90°	96x96	2VA(MAX)
NFQ96-24	1.5	240°	96x96	3VA(MAX)

Standard ranges : 44..55Hz., 45..65Hz., 55..65Hz., 47..53Hz., 57..63Hz., 44..56Hz., 54..66Hz.

Information required with order : Type reference and model. Details of required scale and any optional features of required electrical rating

Example : Pointer, NFQ96-90 Scale 45..55Hz. Rating 110V, 115V, ete.

Moving coil DC ammeters and DC voltmeters



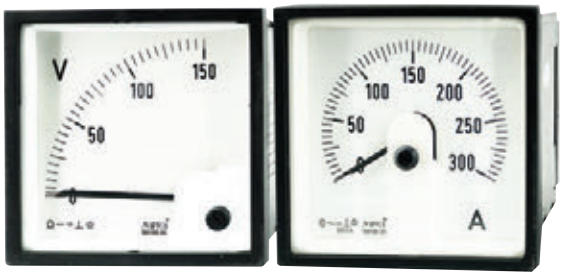
Moving coil instruments are suitable for a wide range of DC application, particularly for remote indication when use with a suitable transducer (0..1mA or 4..20mADC). Scales are linear and can be drawn to suit customer specification together with any chosen title.

Overload ratings	DC Ammeters : 1.2 x rated current continuously 10 x rated current for 5s DC Voltmeters : 1.2 x rated voltage continuously 2 x rated voltage for 5s
Accuracy	DC Ammeters : Class index 1.5 (Class index 1.0 available) DC Voltmeters : Class index 1.5 (Class index 1.0 available)

Model	Type reference			Burden (VA)
NDA96-90	90°	DC ammeter	96x96	**1.5**
NDA96-24	240°			
NDV96-90	90°	DC voltmeter		**2.0**
NDV96-24	240°			

Information required with order : Type reference and model Details of required scale and any optional features. Details of required electrical rating or input transformer ratio
Example : Moving coil, NDA96-24 Input 4..20mA, Scale 0..200A

Moving coil AC ammeters and AC voltmeters



Moving coil instruments are suitable for a wide range of AC Rectified instruments are available for AC applications and have a long burden. Scales are linear and can be drawn to suit customer specification together with any chosen title.

Frequency	AC rectifier instruments are calibrated on a sinusoidal wave form at 50Hz. but are suitable for use without significant error on any frequency from 20Hz. To 10kHz. (2.5kHz. when internal CT is used).
Overload ratings	AC Ammeters : 1.2 x rated current continuously 10 x rated current for 5s AC Voltmeters : 1.2 x rated voltage continuously 2 x rated voltage for 5s
Accuracy	AC Ammeters : Class index 1.5 (Class index 1.0 available) AC Voltmeters : Class index 1.5 (Class index 1.0 available)

Model	Type reference			Burden (VA)
NAA96-90	90°	AC ammeter	96x96	**1.5**
NAA96-24	240°			
NAV96-90	90°	AC voltmeter		**2.0**
NAV96-24	240°			

Information required with order : Type reference and model Details of required scale and any optional features. Details of required electrical rating or input transformer ratio
Example : Moving coil, NAA96-24 Input 4..20mA, Scale 0..200A

Power Factor Meters

A power factor indicator with quadrant and long scale is available in size 96mm. these instruments are designed for measuring power factor in three phase three wire network with balanced load or in single phase network.

The moving coil movement is driven by an internal transducer circuit. Scale are central at unity and are available up to ±180 electrical degrees. For remote indication, moving coil instruments can be supplied to operate with transducer (0..1mA or 4..20mAdc). All instruments are 96 x 96mm.

Input ranges	Voltage : 100V, 110V, 120V, 230V, 380V and 415V Current : 1A or 5Aac Frequency : 50/60Hz.
Scales	0.5..1..0.5 cosØ, 0..1..0.cosØ, 0.7..1..0.3 cosØ, 0.3..1..0.7 cosØ
Overload ratings	Voltage : 1.2 x rated voltage continuously, 2 x rated voltage for 5s Current : 1.2 x rated current continuously, 10 x rated current for 5s
Accuracy	Class index 1.5 or 1.0 available on request

Model		Type reference		Burden (VA)
NPF96-90	NPF96-90B1	90°	Single phase	1.8 for 1A
	NPF96-90B3	90°	3 phase 3 wire balanced load	2.5 for 5A
NPF96-24	NPF96-24B1	240°	Single phase	3.3 for 1A
	NPF96-24B3	240°	3 phase 3 wire balanced load	4 for 5A

Information required with order : Type reference and model. Details of CT and VT transformer secondary inputs and frequency

Tap Position Meter

Position indicators can be used for many remote monitoring applications. For example, the position of transformer taps, mechanical values or sluice gates can be determined accurately.

Scale marking are kept to a minimum to present a clear pleasing appearance ensuring that the instruments can be read with ease from distance of several feet. An internally mounted static circuit ensure that normal supply variations do not affect the stated accuracy. For remote indication, these instruments can be supplied to operate with transducer (0..1mA or 4..20mA). Instruments are available in 96x96mm. and 144x144mm. cases.

Voltage influence	A static circuit is included which ensures that the effect of ±10% supply voltage variation does not affect the stated accuracy of indication. When the sensing resistor is positioned in some distance away from the indicator, the line impedance can affect the accuracy of indication. For example, an impedance of 10Ω per line causes an indication error not greater than 0.25% at 2.4kΩ sensing potentiometer.

Model	Type reference		Burden (VA)
NTP96-90	90°	96x96	2VA(MAX)
NTP96-24	240°	96x96	3VA(MAX)
NTP144-90	90°	144x144	2VA(MAX)

Information required with order : Type reference and model. Details of required electrical rating and number of taps and resistance per tap scale required

Moving Coil Wattmeters and Varmeters

Instruments for local indication are usually supplied as self-contained units in sizes 96mm. and 144mm. Each instrument incorporates a moving coil movement driven by an internally mounted static circuit.

For remote indication moving coil instruments can be supplied to operate with transducers (0..1mA or 4..20mAdc)

Input ranges	Voltage : 63.5V, 100V, 110V, 120V, 230V, 380V and 440V Current : 1A or 5Aac Frequency : 50/60Hz.
Overload ratings	Voltage : 1.2 x rated voltage continuously, 2 x rated voltage for 5s Current : 1.2 x rated current continuously, 10 x rated current for 5s
Accuracy	Class index 1.5 or 1.0 available on long scale instruments on request

Model		Type reference			Burden (VA)
NMW96-90	NW96-90B1	Wattmeter	90°	Single phase	1.0
	NW96-90B3			3 phase 3 wire balanced load	
	NW96-90B4			3 phase 4 wire balanced load	
	NW96-90U3			3 phase 3 wire unbalanced load	
	NW96-90U4			3 phase 4 wire unbalanced load	
NMW96-24	NW96-24B1		240°	Single phase	
	NW96-24B3			3 phase 3 wire balanced load	
	NW96-24B4			3 phase 4 wire balanced load	
	NW96-24U3			3 phase 3 wire unbalanced load	
	NW96-24U4			3 phase 4 wire unbalanced load	
NMV96-90	NQ96-90B1	Varmeter	90°	Single phase	
	NQ96-90B3			3 phase 3 wire balanced load	
	NQ96-90B4			3 phase 4 wire balanced load	
	NQ96-90U3			3 phase 3 wire unbalanced load	
	NQ96-90U4			3 phase 4 wire unbalanced load	
NMV96-24	NQ96-24B1		240°	Single phase	
	NQ96-24B3			3 phase 3 wire balanced load	
	NQ96-24B4			3 phase 4 wire balanced load	
	NQ96-24U3			3 phase 3 wire unbalanced load	
	NQ96-24U4			3 phase 4 wire unbalanced load	

Information required with order : Type reference and model Details of required scale and any optional features Details of CT and VT transformer input

Example : 90° Wattmeter 3 phase 3 wire balanced load,

Model : NW96-90B3
Voltage : 11kV/110V, 50Hz.
Scale : 0..4MW

Moving Coil Wattmeters and Varmeters

Synchroscope

Model		NSY96	NSY144
Dimension	mm.	96x96	144x144
Housing cutout	mm.	92x92	138x138
Class		1.0	1.0
Internal consumption : (at 100 V, 50Hz)			
At main side	VA	4	4
At generator side	VA	0.7	0.7
Weight	kg	1.0	1.1
Rated voltage	V	100	100
	V	110	110
	V	230	230
	V	400	400
	V	440	440

Double voltmeter

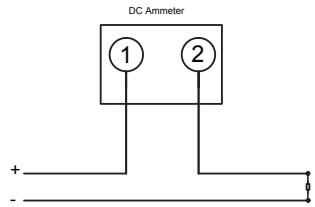
Model		NAV144-II
Dimension	mm.	144x144
Housing cutout	mm.	138x138
Scale length	mm.	105
Class		1.5
Internal consumption at 100V	VA	2.5
Test voltage	V~	2000
Weight	kg	1.5
Rated voltage	V	2xX/100
	V	2xX/100
	V	2x230
	V	2x400
	V	2x440

Double frequency meter

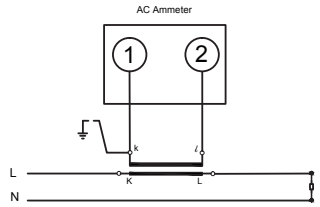
Model		NFQ144-II
Dimension	mm.	144x144
Housing cutout	mm.	138x138
Class		1.0
Internal consumption at 100V	VA	1.1
Test voltage	V~	2000
Weight	kg	1.0
Rated voltage	V	2x100
	V	2x110
	V	2x230
	V	2x400
	V	2x440
Measuring range	Hz	45-50-55
	Hz	55-60-65

Connection Diagram

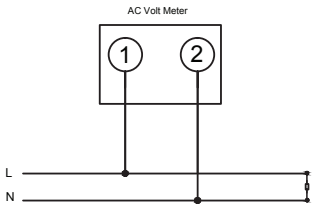
DC current
direct connection



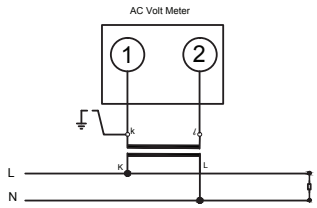
AC current
transformer connection



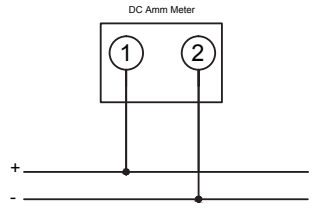
AC voltage
direct connection



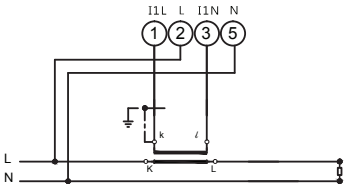
AC voltage
transformer connection



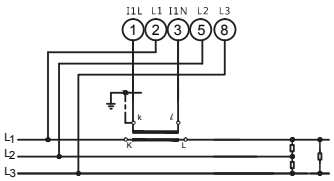
DC voltage



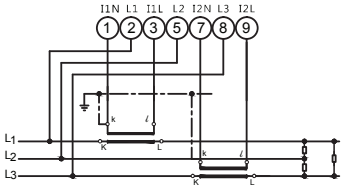
Active power
single-phase AC network



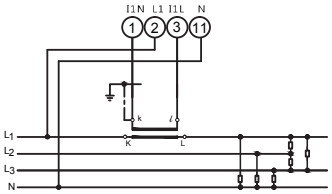
Active power
three-phase, three-wire network
balanced load



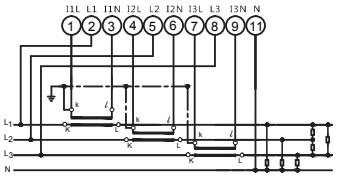
Active power
three-phase, three-wire network
unbalanced load



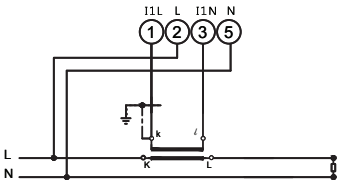
Active power
three-phase, four-wire network
balanced load



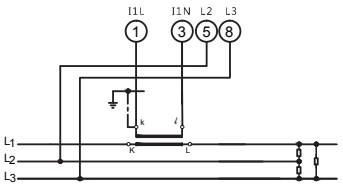
Active power
three-phase, four-wire network
unbalanced load



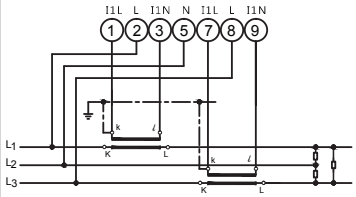
Reactive power
single-phase AC network



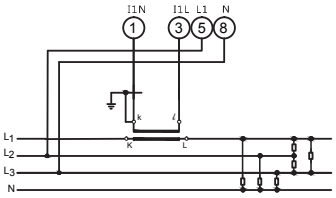
Reactive power
three-phase, three-wire network
balanced load



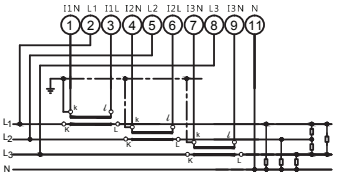
Reactive power
three-phase, three-wire network
unbalanced load



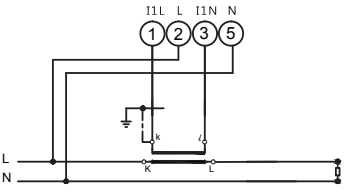
Reactive power
three-phase, four-wire network
balanced load



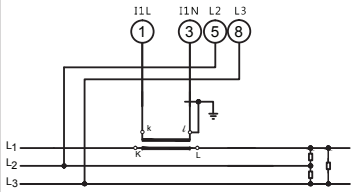
Reactive power
three-phase, four-wire network
unbalanced load



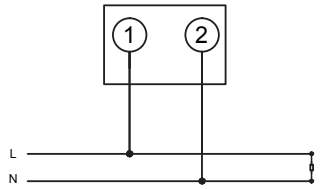
Power factor
single-phase AC



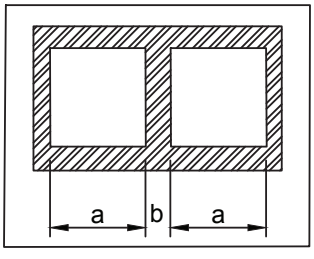
Power factor
three-phase AC



Frequency
single-phase AC / three-phase AC



PANEL CUT-OUT

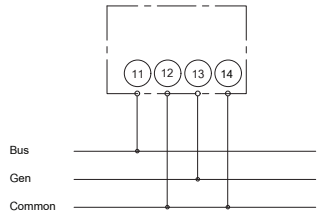


Bezel	(a) Panel cut-out	b (min.)
48 x 48	$45^{+0.6}$ X $45^{+0.6}$	3
72 x 72	$68^{+0.7}$ X $68^{+0.7}$	4
96 x 96	$92^{+0.8}$ X $92^{+0.8}$	4
144 x 144	$138^{+1.0}$ X $138^{+1.0}$	6

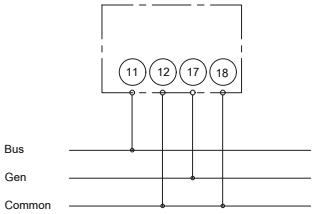
All dimensions in mm

Synchronizing system connection diagram

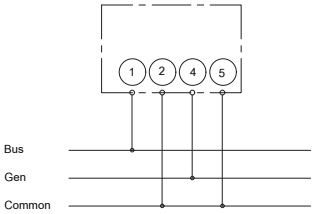
Double Frequency Meter
NOVA/NFQ144-II



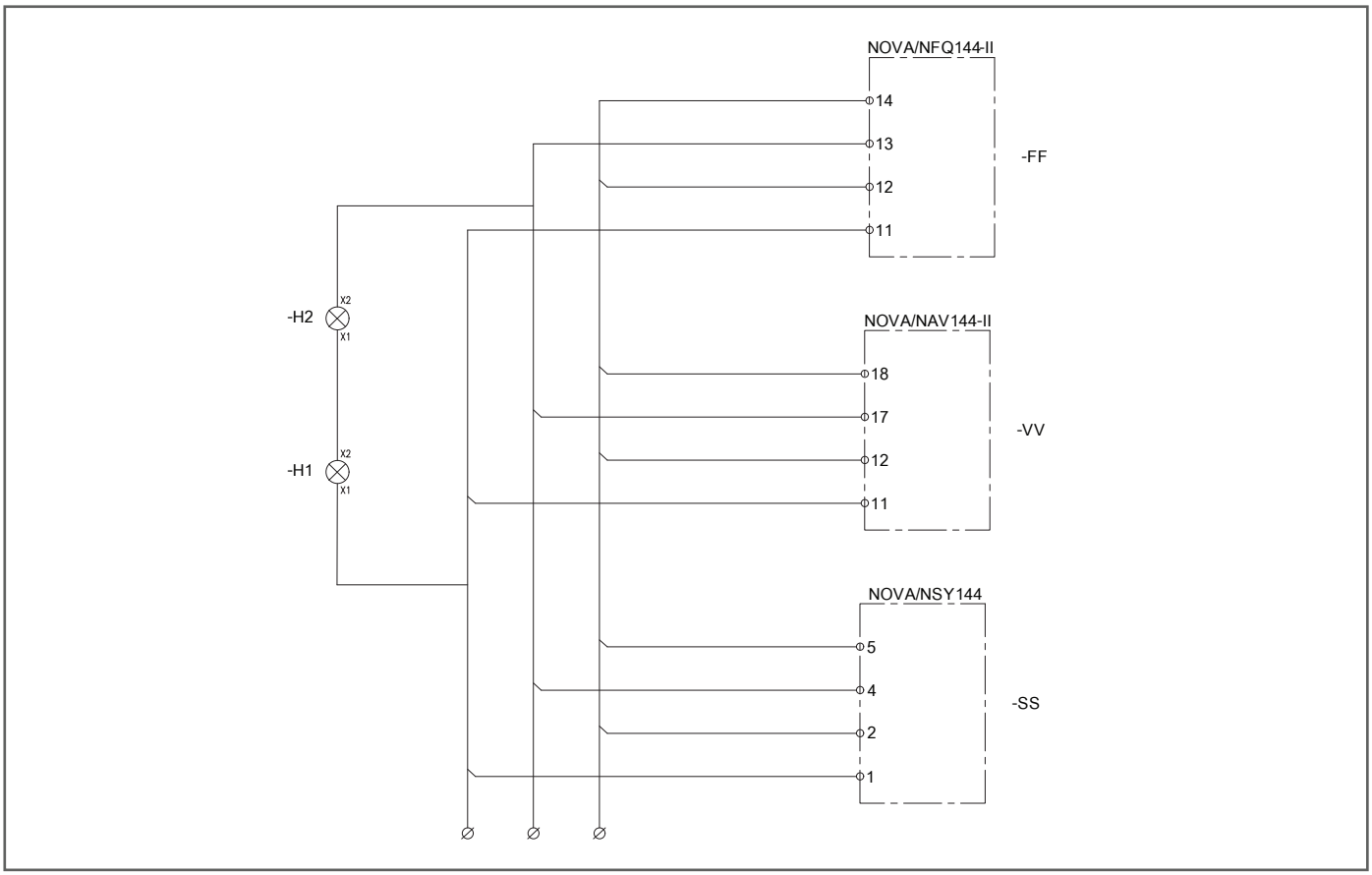
Double Voltmeter
NOVA/NAV144-II

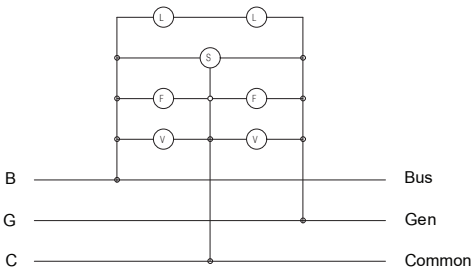


Synchroscope
NOVA/NSY144, NSY96



Overall connection diagram





Current Transformer (NCT)

Description

Current transformers are special transformers for the proportional transformation of high currents into direct measurable values. Their construction and physical operating principle enable an electrolytic separation of the primary circuit from the measured circuit, thereby providing a safety mechanism when switching on the measuring appliance in the event of a fault.

Specification

The products complied with VDE 0414, BS 7262 and IEC 185 standard.

Model	NCT
Primary current	30A-5000A
Secondary current	5A or 1A
Standard approval	VDE 0414, BS 7626, IEC 185
Maximum voltage	0.72kV
Frequency	50 - 60Hz
Rated load	5VA - 30VA
Dielectric strength	2kV (1 minute)
Class	0.5, 1.0
Short-time thermal current	50kA
Rated security coefficient	FS5
Ambient temperature	-5 ~ 55°C
Operating humidity	up to 95%

Measuring current transformer is an encapsulated type which intended to supply to indicative devices, integrated meter and similar apparatus.

They are characterized by their accuracy and for saturating at moderate over current. This effect protects the measuring instruments from possible over current.

Current Transformer (NCT)

Specification

Type	CT Ratio (A)	Rated Burden (VA)		Bar Dimension	Weight (kg)
		Class : 0.5	Class : 1.5		
NCT-30	20/5	-	1.5(2T)	30x10 mm.	0.38
	30/5	-	1.5(2T)		
	50/5	-	2.5(2T)		
	60/5	-	2.5(2T)		
	80/5	-	2.5		
	100/5	-	2.5		
	150/5	5	10		
	200/5	5	10		
	250/5	5	10		

Type	CT Ratio (A)	Class : 0.5	Class : 1.0	Bar Dimension	Weight (kg)
NCT-40	150/5	5	10	40x10 mm.	0.40
	200/5	10			
	250/5	10			
	300/5	10			
	400/5	10			
	500/5	10			
NCT-60	400/5	10	10	60x20 mm.	0.60
	500/5	10	10		
	600/5	10	10		
	750/5	15	15		
	800/5	15	15		
NCT-80	750/5	15	15	80x20 mm.	0.60
	800/5				
	1000/5				
	1200/5				
	1500/5				
NCT-100	1000/5	15	15	100x10 mm. or 80x30 mm.	0.80
	1200/5				0.94
	1500/5				1.10
	1600/5				1.20
	2000/5				1.40
	2500/5				1.60
	3000/5				1.60
NCT-125	1500/5	15	30	130x12 mm. or 125x57 mm.	1.00
	2000/5				1.15
	2500/5				1.45
	3000/5				1.60
	4000/5				1.90
	5000/5				2.20

Technical Data

Burden is the impedance of the secondary circuit in ohms and power factor. For the measurement or protection relay operating via a current transformer, in order to operate them, the primary current has to induce the power required in the secondary current of the instrument or relay.

This induced power must be equal or higher than the losses in the power line + consumption of the measurement instrument or protection relays.

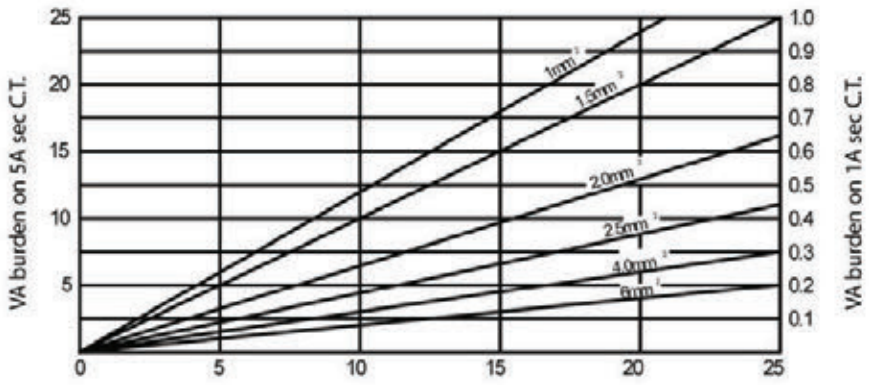
The burden imposed on a current transformer consist mainly of:

- The impedance of wiring cable between current transformer and instruments/relay
- The impedance of the instrument/relay
- The sum of the above constitute the external burden required

Table illustrating some typical instruments and its typical consumption

Instrument	Burden consumed
Moving iron instruments	0.3 - 15VA
Moving coil instruments	0.5VA
Analogue power meter	0.2 - 2.5VA
Maximum demand meter	2.5 - 5.0VA
Digital meter	0.5 - 1.0VA
Energy meter	1.0 - 1.5VA
Recording instruments	2.0 - 5.0VA

Table guide for wiring cable burden



Distance (double wire run) in meters from C.T. to the instrument or relay

Product Coding

NCT - 040 - 100/5 - A

Basic type

Dimensions

030	∅30x10mm.
040	∅40x10mm.
060	∅60x20mm.
080	∅80x20mm.
100	∅100x10mm. or ∅ 80x30
125	∅130x12mm. or ∅ 125x57

CT Ratio

Rated Supply voltage

A	Class: 0.5
B	Class: 1.0
C	Class: 1.5

Current Transformer (NCP)

Description

This NCP series split type current transformer is specially designed in order to make the installation of lectrical system and electric network transformation more convenient. It can be mounted under the circumstance of no need to disconnect the cable or busbar. It can save the mounting time and maintenance charge. The products complied with IEC 60044-1, GB 1208-2006, BS 7626

Features

- One button clamp-on design, safe, easy to install, portable
- Two uilt in fixing methods: Base; Busbar mounting
- Wide inner window, allowing clamping of big cables or bus-bars
- Wide range of sizes to accommodate all the existing installations.
- Primary current from 100A to 6000A

Applications

- Current measurement, monitoring and protection for electrical wiring and equipment
- Current and power measurement for electric motors, lighting, air compressor, heating and ventilation system, air-condition equipment and automation-control system.
- Current, power and energy monitoring device.
- Relay protection device

Specification

Electrical parameter	
Frequency	40-60 Hz
Rated input current	100A-6000A
Measuring range	10%In-120%In
Rated output current	5A, 1A
Accuracy class	0.5%, 1%
Dielectric strength	2.5KV/1min
Insulation resistance	DC500V/100MΩ min

Mechanical parameter	
Case	PC/UL 94-V0
Safety factor	FS 5
Core	Silicon steel
Internal structure	Epoxy
Operation temperature	-5°C ~ +55°C
Operating humidity	≤95%

Product Coding

NCP - 058 - 500/5 - A

Basic type

Dimensions

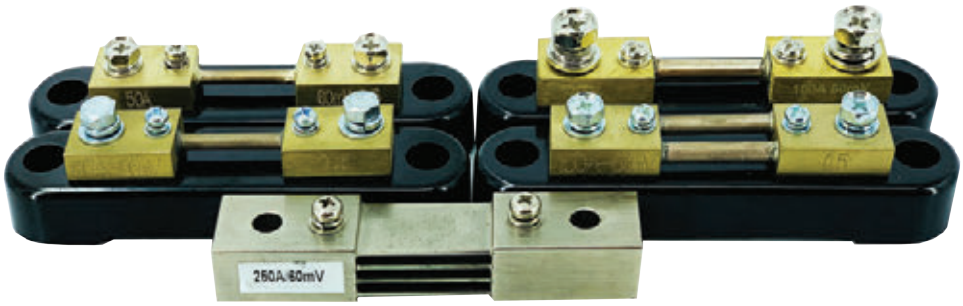
023	∅20x32mm.
058	∅50x80mm.
812	∅80x120mm.
816	∅80x160mm.

CT Ratio

Class

A	Class: 0.5
B	Class: 1.0

DC Shunt (NDS)



Description

Highly accurate manganin resistance dc shunts. When a current is passed through the shunt, a proportional millivolt output is produced. The current flowing through the shunts creates a voltage drop which can be measured with a measuring devices switched on in parallel. By switching on the shunts and the measuring devices in parallel, it is possible to use voltage measurement devices to measure the current or to gain an extension of the measuring facilities of the existing current measuring devices.

Applications

Shunts are used for the indirect monitoring of high electrical current. The series shunts accurately measure and convert high DC current into millivolt output. They are made from brass extrusions and high quality manganin resistance wire. The manganin resistance wire is noted for its excellent stability and extremely low temperature coefficient. Production of the shunts complied with the requirements of IEC 51/60051 part8 (1984) and DIN 43703. They are available for currents as high as 4000A and millivolt output as 60mV.

Specification

Model	NDS
Accuracy class	0.5
Output	60mV
Rated current	5-4000A
Dielectric strength	continuous 1.2 x rated current, 5 seconds 5x rated current
Operating temperature	-20°C to +70°C
Temperature co-efficient	0.002% per °C between 25°C to 80°C

Product Coding

NDS - 060

Basic type

Ratio

005	5A/60mV
060	60A/60mV
100	100A/60mV
150	150A/60mV
200	200A/60mV
250	250A/60mV
400	400A/60mV
4000	4000A/60mV

Industrial Power Relay (NP403)

Description

Industrial power relay of NP403 series enable the high switching capacity up to 40A, high contact force, minimum bouncing time, low power consumption with various choices of selectable coil voltage. Also their high degree of protection (IP50) ensures the reliable operation in tropical and/or salty ambient air condition.

These NP403 relays are an alternative choice which can be widely implemented to the power control circuit in industrial sector, electrical equipments, power stations, substations, railway and industrial plants etc.

Features

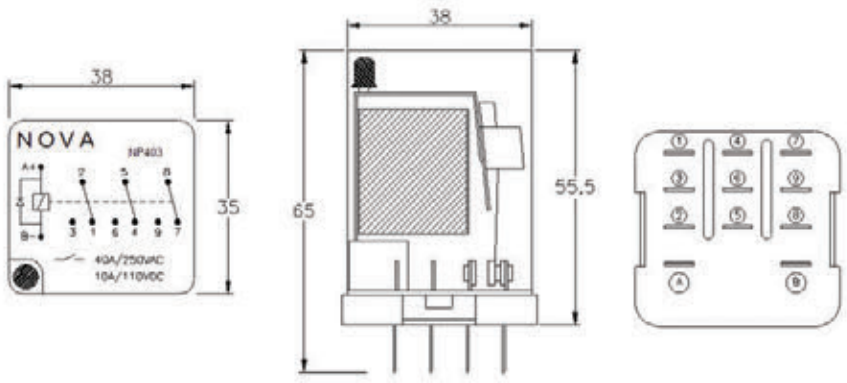
- Compact size and light weight
- Plug-in relay module
- 3 change-over contacts
- High contact load (40A at 250VAC or 10A at 110VDC)
- According to IEC 255, IEC 67-1, VDE 0435 part 201
- LED status indicator
- AC or DC coil
- DC type with back EMF diode protection
- Silver alloy contact material

Specification

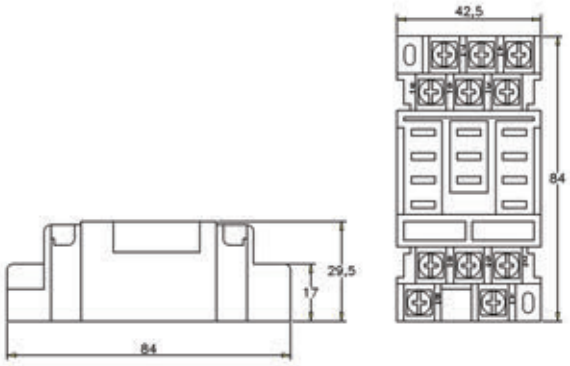
Model	NP403
Coil nominal voltage	AC/DC 12 to 230V
Coil nominal power	AC 4.0VA, DC 2.6W
Contact capacity	AC 40A at 250V, DC 10A at 110V
Contact resistance	Max 50mΩ
Max. switching power	10,000VA / 1,120W
Insulation resistance	>1000MΩ at 500VDC
Dielectric strength between open contacts	2,000VAC, 1 min.
Dielectric strength between coil & contacts	1,500VAC, 1 min.
Electrical service life	10^5 times
Mechanical service life	10^7 times
Pick-up time	20 ms max. for basic type, 9 ms max. for rapid type
Drop-out time	15 ms max. for basic type, 9 ms max. for rapid type
Operating temperature	-40 to +60°C
Ambient humidity	35 ~ 80% RH
Dimension	40W x 37L x 67H mm.
Weight	125 g.
Socket type	11 pins

Industrial Power Relay (NP403)

Dimension



Socket Dimension



Product Coding

NP - 40 3 - D 110

NP	Basic type
NPR	Rapid type

Contact rating 40A

3 Output Contact

Coil voltage type

D	DC
A	AC 50/60Hz

Rated voltage (±20%)

012	12V
024	24V
048	48V
110	110V
125	125V
220	220V
230	230V

Timer Relay (H3CR)

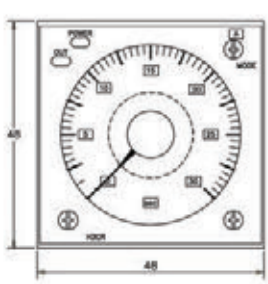
Features

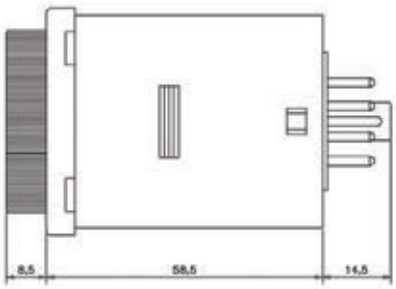
- Field-selectable time ranges from 0.2 second to 300 hrs.
- Use for delay timing, ON-delay and OFF-delay.
- Wide input voltage ranges model from 24 to 240VAC/DC, fit most applications and reduce spare part inventories.
- Timing functions : signal ON-delay (A), ON-OFF interval (B2), OFF-delay (E), Pulse Trigger (J)
- Timer LED indicators : POWER ON (green) flickers during operation OUT (red) on when normally open contact is closed.
- Short (80mm.) panel mounting depth with socket allows for more space-efficient control panel design.

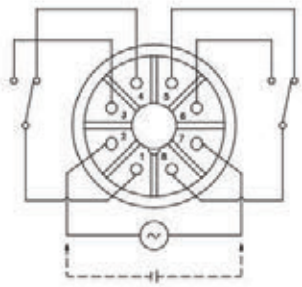
Specification

Model	H3CR
Supply voltage (Un)	AC/DC 24~240V
Operating voltage	AC/DC 24 to 240V
Time setting range	0.2 Sec. to 300 hrs.
Control output	DPDT relay type
Contact rating	5A at 250VAC
Repeat accuracy	Max ±0.5%
Dielectric strength	1,500VAC for 1 minute
Operating temperature	-25°C to +70°C
Degree of protection	IP40

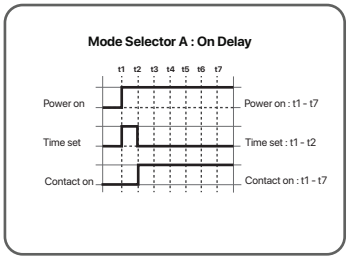
Dimension

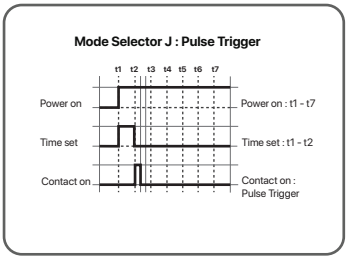


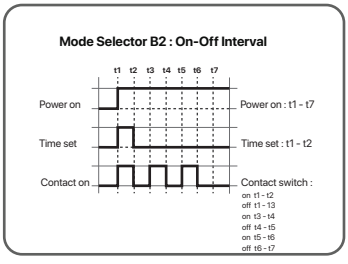


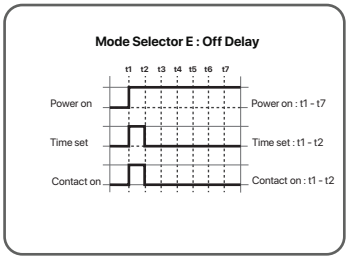


Time - chart









Timer Switch (NTS)

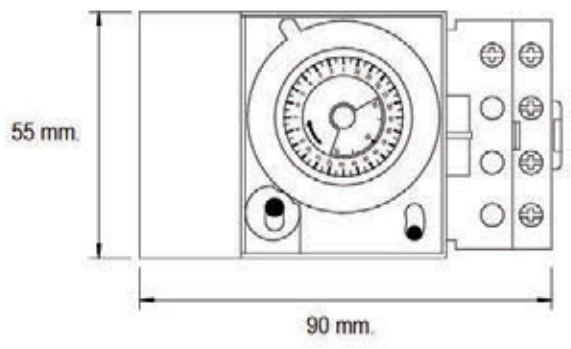
Features

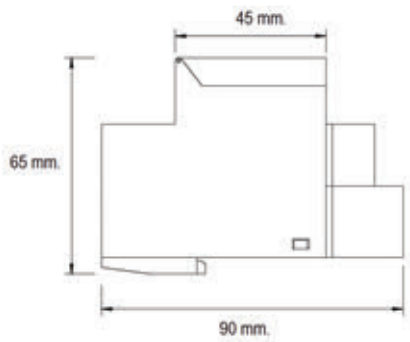
- Time switch with power reserve
- Nominal rated voltage at 230V ±10%
- 24 hour dial with 30 min. segment
- Manual over ride ON/OFF switching
- Permanent ON/OFF switching
- Snap on fixing for 35mm. din rail (EN 50022)

Specification

Model	NTS-24HR
Program dial	24 hrs.
Program interval	30 min.
Set up time	48 times
Supply failure reserve	150 hrs.
Operating voltage	220 ~ 250VAC (45 ~ 60Hz)
Contact capacity	16A/250VAC
Power consumption	1.5W
Output contact	1 Changeover
Motor load ($\cos\theta$ = 0.7)	220V, 1500W
Electric-filament lamp load	12A
Contact resistance	≤50mΩ
Insulation resistance	≥100mΩ
Electric lifetime	10^7 times
Mechanical lifetime	10^5 times
Operating temperature	-10 ~ +55°C
Dimension	110W x 66.5H x 52.5D (mm.)
Weight	190 g.

Dimension





LED Service Lamp (NSL)

Description

The LED service lamp (ultra - brightness LED) is use for lighting the control cubicle and all kinds of switchgear cubicles. Long span of input supply voltage for both AC and DC supply. Resistant to high temperatures, high efficiency of power saving and environmental friendly. Suitable for ceiling and wall installation.

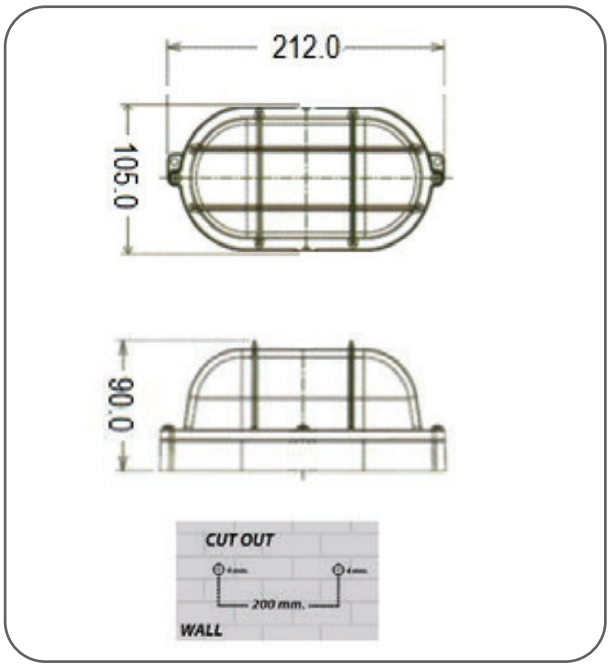
Features

- LED chip Epistar SMD2835
- Hi - Bright luminous efficacy 65 lm/Watt
- Correlated color temperature 6,000k (Day Light)
- Color rendering >75RA
- Power consumption 7watt, 11watt (CFL)
- Luminous flux : 450, 570 lumen
- Power factor >0.5
- Beam angle 120°
- Protection degree IP65
- No UV / IR and no mercury & lead
- Life span 25,000 hrs
- Supply voltage input 85 ~ 265VAC (50/60Hz) or 120 ~ 365VDC

Specification

Model	NSL	
Voltage (VAC)	85V ~ 265V (50/60Hz)	
Power (Watt)	11W (CFL)	7W, E27 (LED)
Luminous Flux (lm)	570lm	450lm
Replacement	Compact fluorescent 10 watt or incandescent 40 watt	
Cover	Protection glass cover	
Dimension (L x W x H)	212mm. x105 mm. x90 mm.	
Weight	510 g.	

Dimension



Product Coding

NSL OL - PGC

Basic type

Lamp type

OL	Oval Lamp
LO	LED Oval lamp

Material

PGC	Protection glass cover
*PCC	Polycarbonate cover

*for lamp type LO

Integrated LED Tube (NIT8)

Description

The integrated tube T8 (NIT8 series) (ultra - brightness LED) is use for lighting the control cubicle and all kinds of switchgear cubicles, long span of input supply voltage for both AC and DC supply. Resistant to high temperatures, high efficiency of power saving and environmental friendly. Suitable for ceiling, wall installation and general walkway.

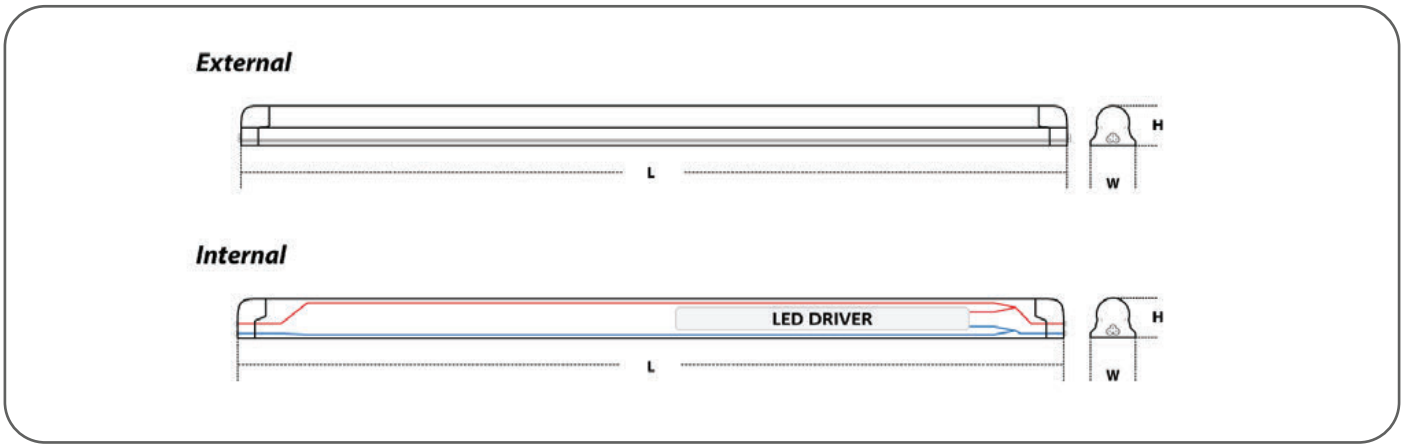
Features

- LED chip Epistar SMD2835
- Hi-Bright luminous efficacy 80 lm/Watt
- Correlated color temperature 6,500k (Day Light)
- Color rendering >75RA
- Power factor >0.5
- Beam angle 125°
- Protection degree IP33
- No UV / IR and no mercury & lead
- Life span 25,000 hrs
- Supply voltage input 130 ~ 265VAC (50/60Hz) or 185 ~ 365VDC
- Replace compact fluorescent 9 ~ 36 watt or incandescent 40 ~ 150 watt
- Approvals : CE, RoHS

Specification

Model	NIT8-30	NIT8-60
Voltage (VAC)	130V ~ 265V (50/60Hz)	
Power (Watt)	5W	9W
Luminous Flux (lm)	400lm	720lm
Replacement	Compact fluorescent 9 ~ 36 watt or incandescent 40 ~ 150 watt	
Housing	Aluminum + PC	
Cover	Polycarbonate Frosted	
Dimension (L x W x H)	317 x 31 x 38 mm.	592 x 31 x 38 mm.
Weight	66 g.	107 g.

Dimension



Universal Outlet (NUO-S)

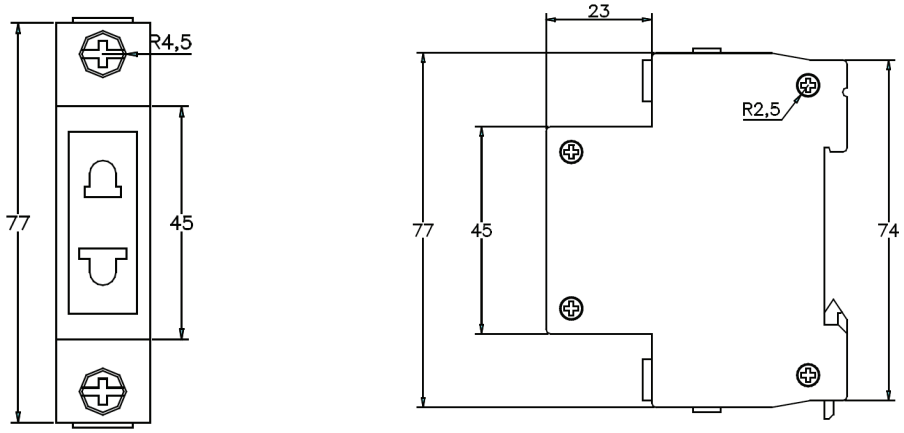
Description

Universal outlet is made of a high impact-resistant thermoplastic face for single outlet and rugged design with metal for double outlet. Ideal for mounting in equipment cabinets where AC power is required, i.e. laptop computers, test equipment, electrical tools, etc.

Features

- Current rating 16A, 250VAC
- One piece design, easy installation
- DIN Rail 35mm. EN 50022 & direct mountable
- Finger safe connections, allow for increased safety during maintenance

Dimension



Electro Magnetic Counter (NEC)

Resettable on Front side

Non-Resettable

Description

Electro-magnetic counter NEC series was designed to use as the accumulative recorder of the electrical pulse signal in the system. It can equip with the secondary instrument to form the digital display instrument, which is widely use for calculation in various industries such as the petroleum, chemical, textile, machinery, agriculture, food, printing and so on. After the electrical signal input to the counter, it will generate attractive power in the electromagnet, which will make the armature to drive the numerical gear to conduct decimal counting.

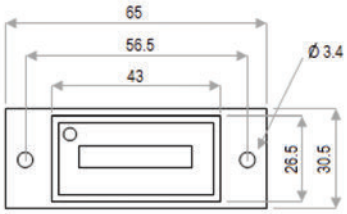
Specification

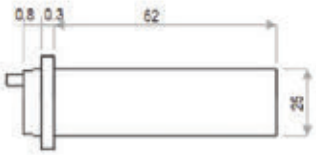
Model		NEC
Rated supply voltage		110, 220VAC, 50/60 Hz
		12, 24, 48VDC (specify when order)
Operating voltage range		85% to 110% of rated supply voltage
Power consumption	AC	approx. 3 VA
	DC	approx. 3.5 W
Counter (Count range)		0 to 99999 for 5 digits / 0 to 999999 for 6 digits
Counter (Input mode)		Increment
Display method		Thumbwheel (Half-digit drive system)
Digit		5/6 digits (Model : NEC-5/NEC-6)
Character height		4 mm. (White)
Temperature	Operating	-10°C to 60°C
	Storage	-25°C to 70°C
Ambient humidity		Operating : 45% to 85%
Insulation resistance		100 M-Ohm min. (at 500VDC)
Dielectric withstand voltage		1500VAC 50/60 Hz for 1 min
Mechanical life expectancy		$2x10^7$ operations min.
Weight		5/6 digits model : approx. 105 g

Electro Magnetic Counter (NEC)

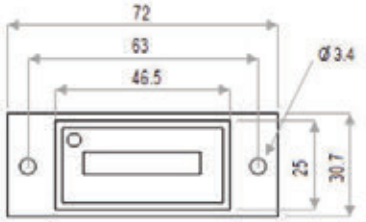
Dimension

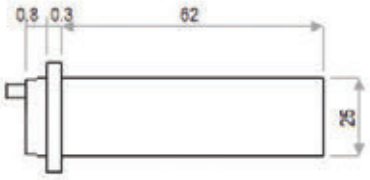
5 Digits



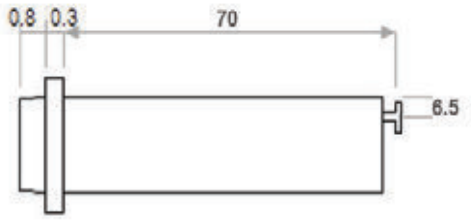


6 Digits





Resettable on Rear side (Pull to Reset)



Non-Resettable

Product Coding

NEC - 5 - RR - 24

Basic type

Digits

5	5 Digits
6	6 Digits

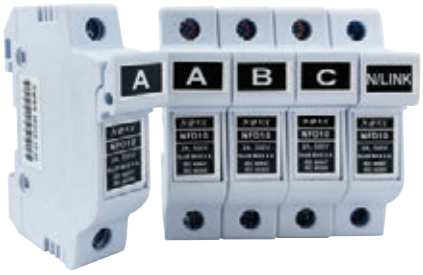
Reset type

RF	Resettable on Front side
RR	Resettable on Rear side
NR	Non-Resettable

Rated Supply voltage

12	12VDC
24	24VDC
48	48VDC
11	110VAC
22	220VAC

Fuse Disconnector (NFD)



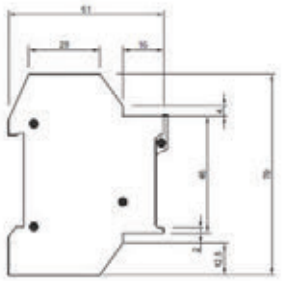
Features

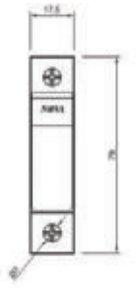
- Compliance with IEC 947-1, IEC 947-3 and IEC 269
- Plastic parts are made of material resistant to high temperatures.
- Mounting on standard DIN 35mm. (EN 50022)
- It is simply possible to assemble multi pole with some connecting pins.

Specification

Model	NFD10	NFD14
Number of poles	1P, 1P+N, 2P, 3P, 3P+N	
Type of current	AC	
Rated operational voltage (Ue)	500V	
Rated insulation voltage (Ui)	600V	
Rated frequency (Hz)	50	
Rated impulse withstand voltage (Uimp)	6kA	
Rated operational current (Ie)	32A	63A
Rated making capacity	75A	150A
Rated breaking capacity	75A	150A
Rated short time withstand current (Icw)	300A	600A
Rated conditional short circuit current	100kA	100kA
Connection	Max. 25mm^2	1Max. 35mm^2

Dimension





Pole	Dimension Width (mm.)
1P	17.5
2P	35
3P	52.5

Product Coding

NFD - 10 - 2P - 04

Basic type

Fuse link size

10	∅10 x 38
14	∅14 x 51

Number of poles

1P	One pole
1N	One Pole + Neutral
2P	Two poles
3P	Three poles
3N	Three poles + Neutral

Fuse rate

02	2A
04	4A
06	6A
10	10A
↓	
63	63A

Product Catalog 2022

Contact

ESP TECHNOLOGIES LIMITED

138/79 M.2, Ban Klang, Mueang Pathum Thani, Pathum Thani 12000

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