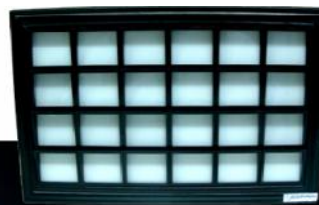




ESPAN
Alarm, Control & Monitoring Devices



PRODUCT CATALOG

2018



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Index:

Annunciator	Page No.
Annunciator System (01 Series)	01-08
Annunciator System (02 Series)	09-14
Annunciator System (03 Series)	15-18
Annunciator System (04 Series)	19-23

Audible Alarm Sound	Page No.
Power Buzzer (NBZ)	24-25
Universal Vibrating Horn (VH-U)	26-27

Monitoring Relay	Page No.
Fast Trip Relay	28-30
Modular Latching Relay	31-34
Digital AC Voltage Monitoring Relay	35-39
Digital DC Voltage Monitoring Relay	40-44

Diode Box	Page No.
Diode Box (DTB01)	45-46
Diode Box (DTB02)	47-48



ANNUNCIATOR SYSTEM



MASTER MODULE



EXTENSION MODULE



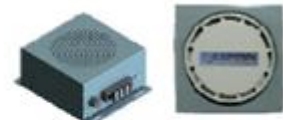
RELAY OUTPUT MODULE



DISPLAY WINDOW UNIT



POWER SUPPLY UNIT



AUDIBLE DEVICE

Features

- ✓ Robust and compact design
- ✓ Space problem solving by separate into three modules; Master Module/Extension Module/Relay Module
- ✓ The three modules are connected by detachable wire connector
- ✓ Sequence control pushbutton switches are separated as given design on control panel
- ✓ All input channels are opto-isolator designed concept
- ✓ Alarm input contact can be selected by software to accept either NO or NC contact
- ✓ Alarm sound can be selected to be bell or horn (heavy fault) and buzzer (light fault) by software
- ✓ Number of alarms: 16 to 64 alarms per one set of alarm sequence unit (Maximum is 640 alarms)
- ✓ Number of I/O of Master Module is 16 I/O per module, Extension Module is 8 I/O per module and Relay Output Module is 8 NO contacts per module
- ✓ Easily could be programmed with the belonging software (ESPAN01 V1.0) connected with USB port to computer
- ✓ Communication port: USB and RS485 Modbus RTU Protocols (Option: Optical Port)
- ✓ Lay out of display window is flexible according to the requirement
- ✓ Power supply: 24Vdc (~50 watt for 16 alarms, ~100 watt for 32 alarms, ~150 watt for 64 alarms)
- ✓ Head protection class: IP55 for Display Window and IP50 for Alarm Sequence Unit
- ✓ Ambient Temperature: -10 to + 55°C
- ✓ Storage Temperature: + 70°C
- ✓ Humidity: up to 95%

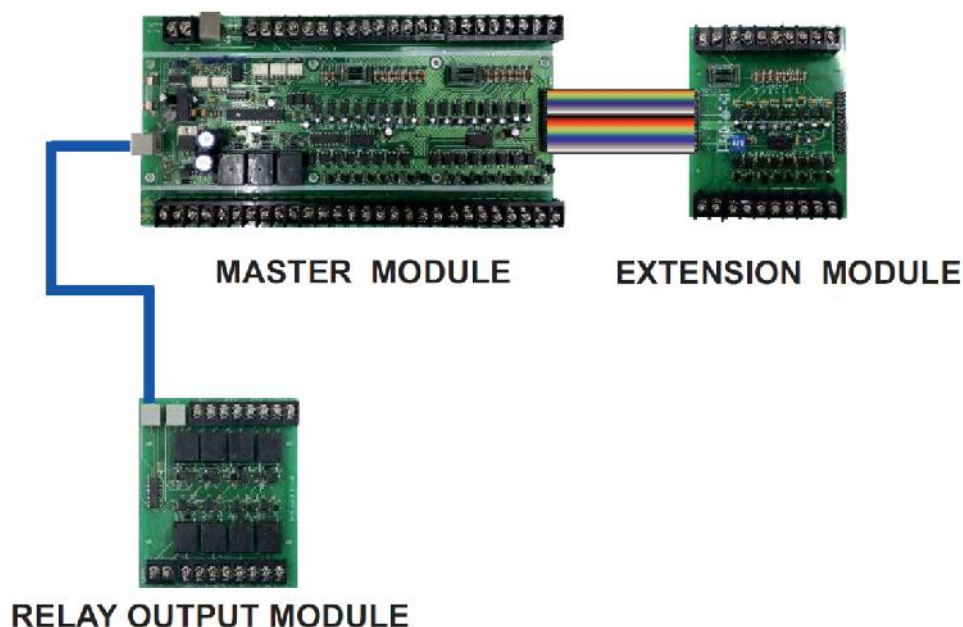
Technical Data

Alarm Sequence Unit

This unit is a combination module that starting from 16 to 64 alarm points using microprocessor base concept. When the fault signal occurs through an opto-isolator input channel, it will send flicker output (Open Collector Type) toward the visual device (display window) and audible device such as bell or buzzer. The main features of this module are as below;

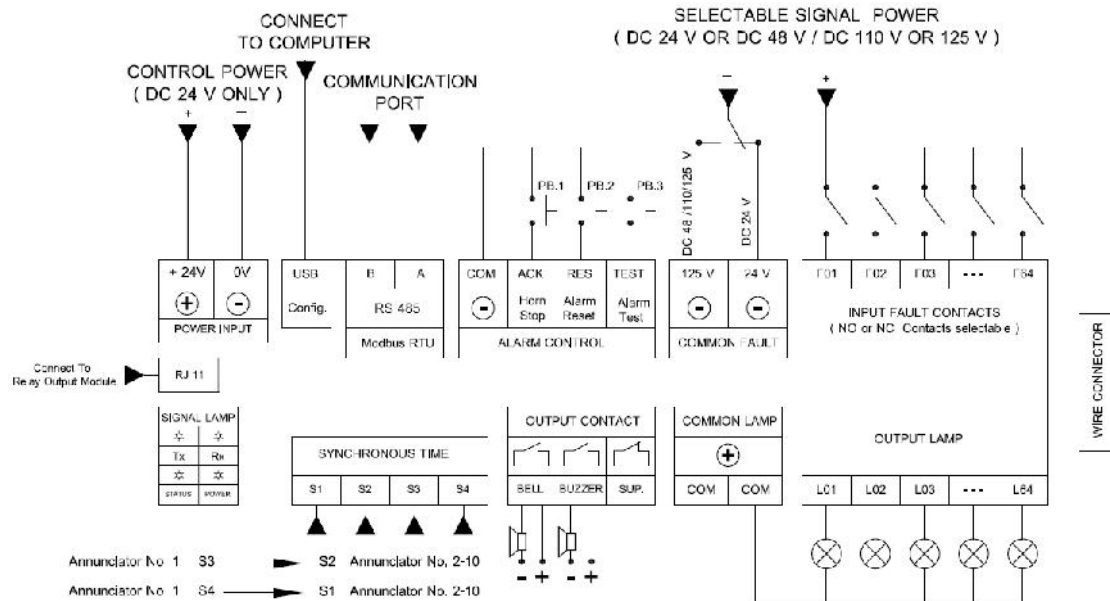
- This alarm sequence unit can accept fault signal DC 24/48V or DC 110/125V which powered through field contact.
- Flicker output can be adjustable and fault input signal can be set or adjust for delay by software as well.
- The alarm sequence units are 16, 24, 32, 40, 48, 56 and 64 alarm type.
- This unit can select bell or horn as a heavy fault and buzzer as a light fault by program software for each alarm point.
- Input alarm contact shall be either normally open (NO) or normally closed (NC) contact which can be selected by program software.
- Connection between modules equipped with detachable wire connector (RJ11 and pair connector)

ESPAN01	Width (mm.)	Length (mm.)	Height (mm.)	Weight (kg.)
16 Alarm (Master)	135	293	50	1.3
6 Alarm (Extension)	125	142	50	0.4
8 N.O. (Relay output)	125	142	50	0.5

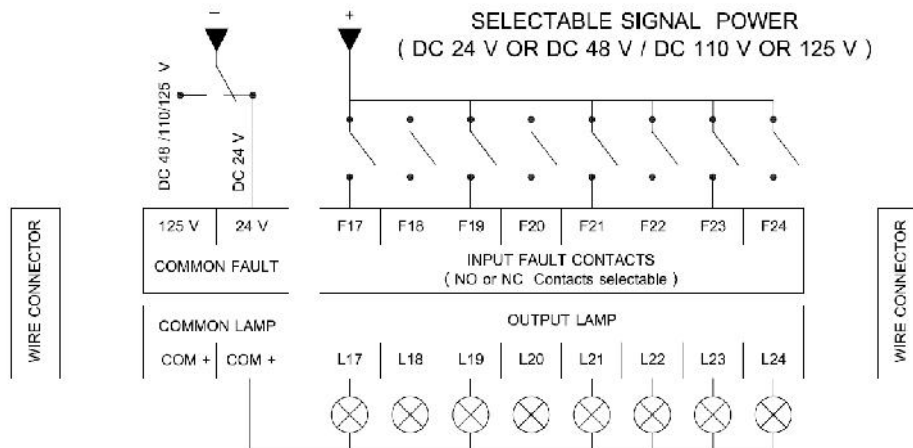


Circuit Wiring Diagram

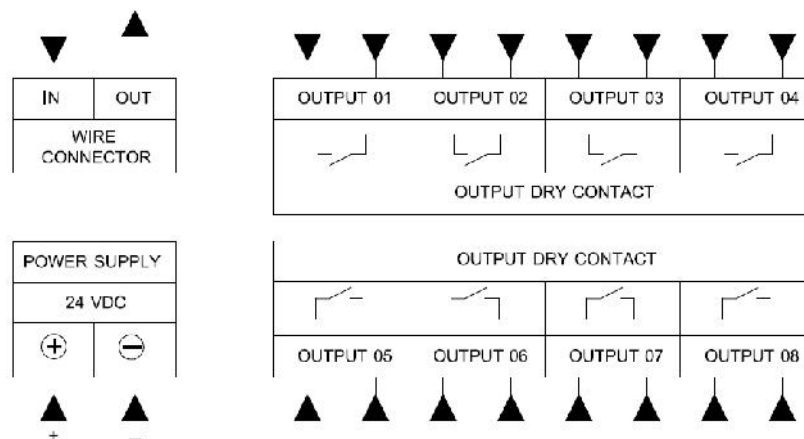
Wiring Diagram ESPAN01 Master Module



Wiring Diagram ESPAN01 Extension Module



Wiring Diagram ESPAN01 Relay Output Module



Power Supply Unit

The Power Supply Unit is a DC/DC converter regulated type, designed with surge protection and to provide transient surge isolation between the station battery and the sensitive electronic components of the Annunciator system. Fuse protection is also provided to protect from overload or short circuit on the power supply output. There are three rating: 60 watts, 120 watts and 240 watts to suit for the Annunciator system (16, 32 and 64 alarm system).

Input voltage is 48, 110, 125 or 220 VDC (Specified when order) but output voltage shall be 24 VDC only.



Operating Principle

The ESPAN-01 series Annunciator system is simple for installation by using detachable connector concept which managed most of the wiring. Besides, it is convenience for maintenance. Only the malfunction module of the three separate-modular module can be repaired or changed.

The operation sequence of the Annunciator is as following; when the fault signal is occurred in each input, an alarm output signal is sent toward bell/horn or buzzer which can be pre-selected as heavy fault (bell/horn) or light fault (buzzer). At the same time, it will send flicker output to the set style indication lamp that corresponds to each I/O channel. After pressing an acknowledged push button switch, if an alarm-contact is returned, then the alarm is canceled. However, the indication window is steady on unless the reset pushbutton switch is activated. Then the lamp will be turn off and ready for the next operation.

The lamp test push button switch is also provided for the purpose of checking lamp at normal condition and while checking the lamp, if a fault occurs, the operating alarm sequence will be operated as usual with no effect from the lamp test sequence anymore.

Function Test of ESPAN-01 Annunciator : if the lamp test push button switch is pressed more than 3 seconds, all the display window lamps would flash with audible sound alarm. (bell/horn or buzzer)

Display Window Unit

- Display window frames are made of alu-zinc steel 1.0 - 1.5 mm. thickness, total depth is not more than 80 mm. (including protection cover-if any)
- Display window unit is made of self-extinguishing plastic material and acrylic resin for window plate.
- Display window compose of color legend plate, diffused lens and cover lens.
- Number of alarm windows start from 1 to 120 (max.640 windows)
- Window plate color shall be specified when order.
W: White, R : Red, G : Green, Y : Yellow, A : Amber, S : Sky Blue.
- Window sizes are available in 2 size ; 30 x 30 mm. and 30 x 60 mm.
- Display lamp is 24 VDC LED ; one lamp for window size 30x30 mm. and two lamp for window size 30x60 mm.
- Lamp replacement could be done easily by taking off the front plate.
- Wiring connection between Display Window to alarm sequence unit is 1.5-2.5 sq.mm. or up on the requirement.
- Connection to the display windows has to be done through the terminal of the rear side only.
- Window arrangement is flexible according to the requirement (specified when order)

H30 x W30 mm.(Window size)

Columns				1	2	3	4	5	6	7	8	9	10	11	12
Rows	Dimension (mm.)	Panel Cut-out	W	46	76	106	136	166	196	226	256	286	316	346	376
	H		W	35	65	95	125	155	185	215	245	275	305	335	365
	H	H													
1	46	35		1	2	3	4	5	6	7	8	9	10	11	12
2	76	65		2	4	6	8	10	12	14	16	18	20	22	24
3	106	95		3	6	9	12	15	18	21	24	27	30	33	36
4	136	125		4	8	12	16	20	24	28	32	36	40	44	48
5	166	155		5	10	15	20	25	30	35	40	45	50	55	60
6	196	185		6	12	18	24	30	36	42	48	54	60	66	72
7	226	215		7	14	21	28	35	42	49	56	63	70	77	84
8	256	245		8	16	24	32	40	48	56	64	72	80	88	96
9	286	275		9	18	27	36	45	54	63	72	81	90	99	108
10	316	305		10	20	30	40	50	60	70	80	90	100	110	120
11	346	335		11	22	33	44	55	66	77	88	99	110	121	132
12	376	365		12	24	36	48	60	72	84	96	108	120	132	144

Note: other window arrangements can be done upon requested.

ANNUNCIATOR SYSTEM (01 SERIES)



H30 x W60 mm. (Window size)

Rows	Columns			1	2	3	4	5	6	7	8	9	10
	Dimension (mm.)	Panel Cut-out	W	76	136	196	256	316	376	436	496	556	616
				65	125	185	245	305	365	425	485	545	605
	H	H											
1	46	35		1	2	3	4	5	6	7	8	9	10
2	76	65		2	4	6	8	10	12	14	16	18	20
3	106	95		3	6	9	12	15	18	21	24	27	30
4	136	125		4	8	12	16	20	24	28	32	36	40
5	166	155		5	10	15	20	25	30	35	40	45	50
6	196	185		6	12	18	24	30	36	42	48	54	60
7	226	215		7	14	21	28	35	42	49	56	63	70
8	256	245		8	16	24	32	40	48	56	64	72	80
9	286	275		9	18	27	36	45	54	63	72	81	90
10	316	305		10	20	30	40	50	60	70	80	90	100
11	346	335		11	22	33	44	55	66	77	88	99	110
12	376	365		12	24	36	48	60	72	84	96	108	120

Note: other window arrangements can be done upon requested.



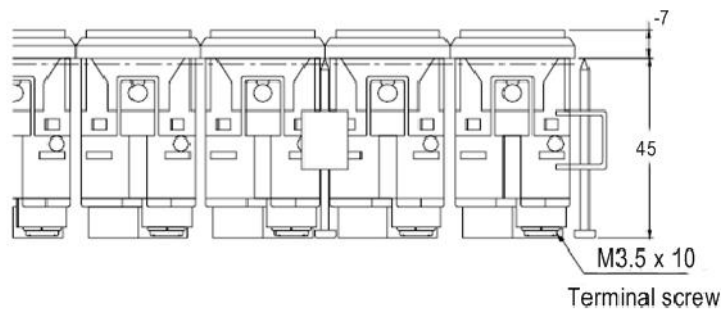
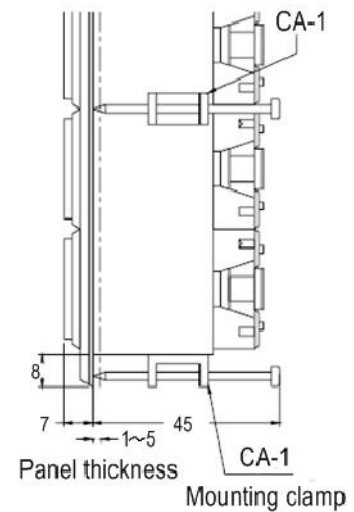
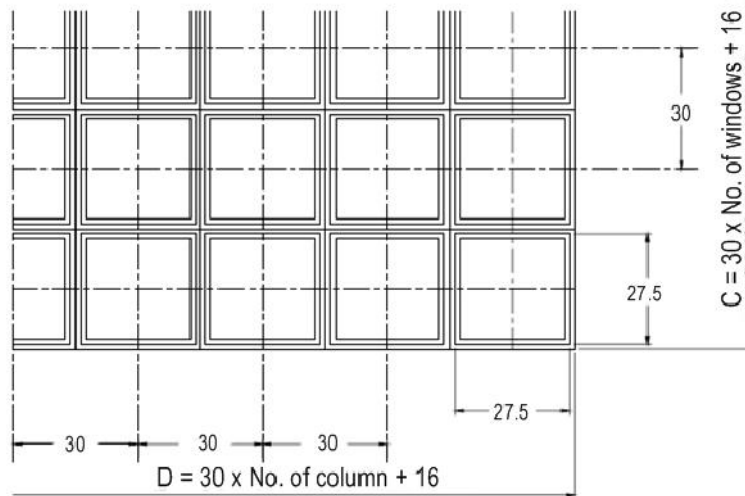
Size : 30x30 mm. per window



Size : 30x60 mm. per window

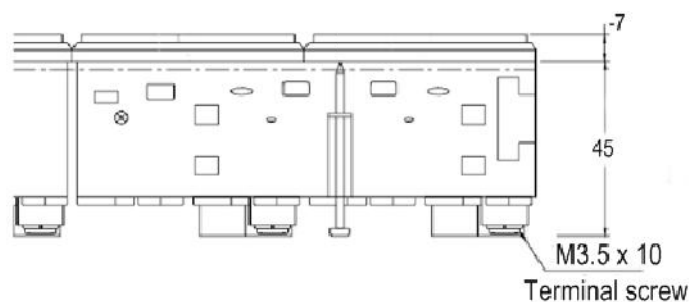
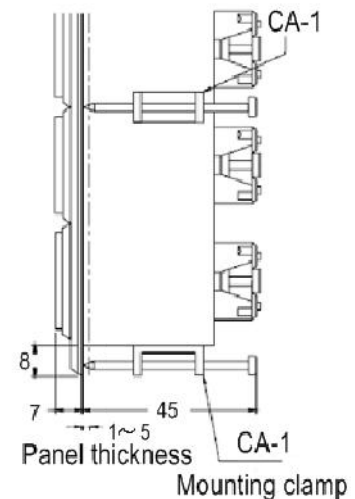
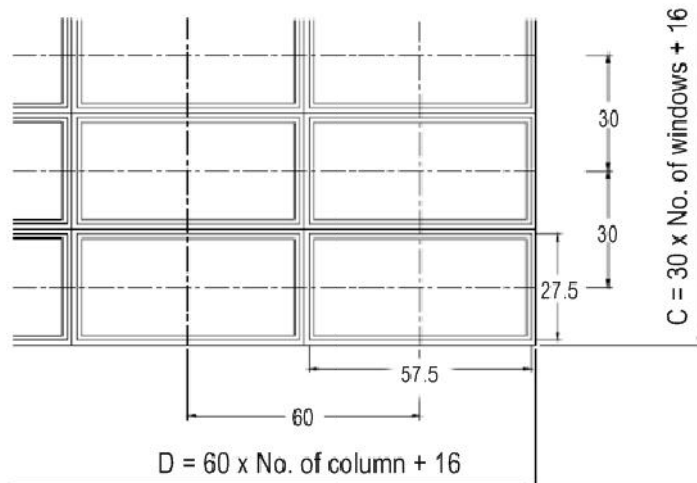
ANNUNCIATOR SYSTEM (01 SERIES)

Dimension of display unit 30 x 30



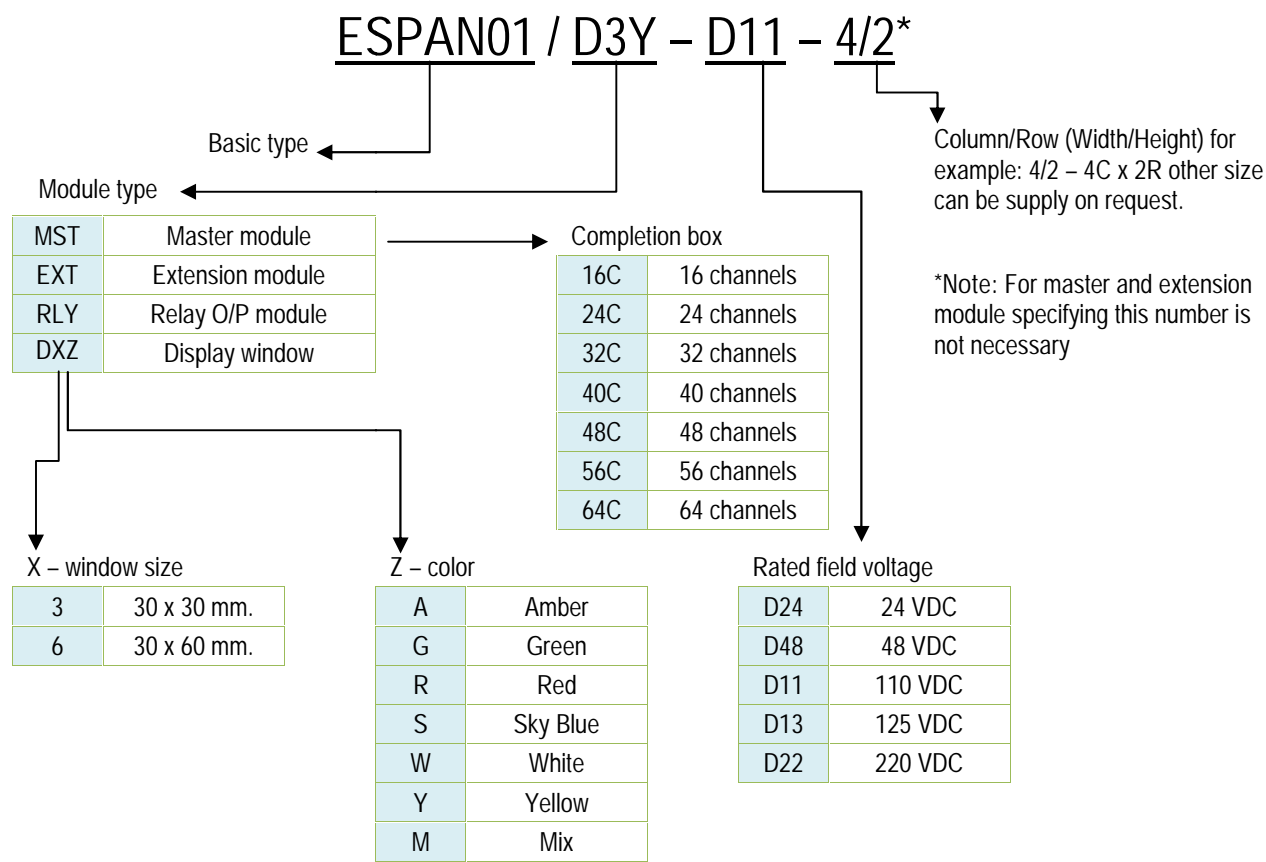
Legend plate size : 24 x 24mm.
Legend plate thickness : 1mm.
Lighting area : 24 x 24mm.
Engraving space : 24 x 24mm.

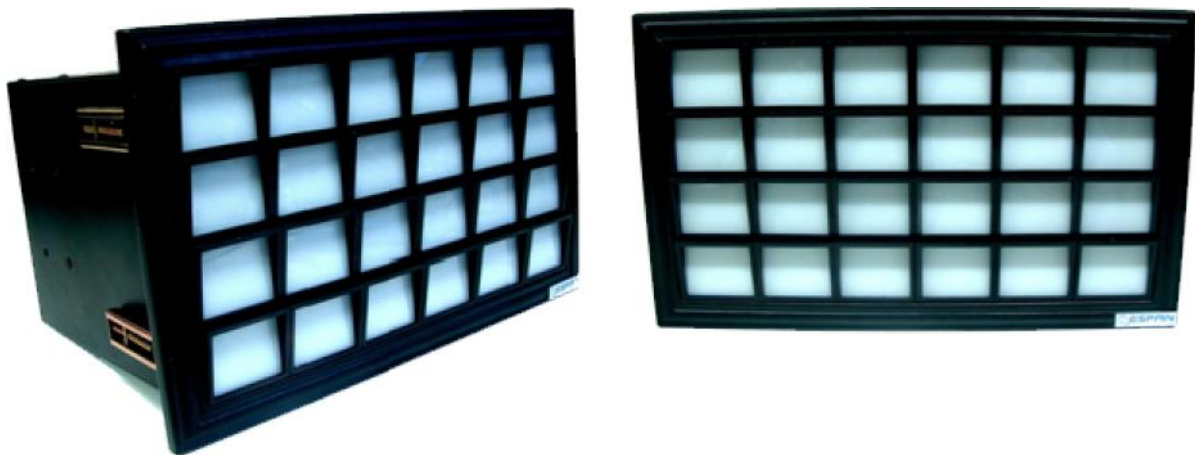
Dimension of display unit 30 x 60



Legend plate size : 24 x 54mm.
Legend plate thickness : 1mm.
Lighting area : 24 x 54mm.
Engraving space : 24 x 54mm.

Product Coding





Description

ESPAN-02 series is designed to use as an alarm system for general protection switchboard, local control panel of GIS, local control cabinet of power transformer and all of control panels, which needs alarm function. It indicates fault status by using high brightness LED with assembly in PCB one card each alarm input. Window displaying plates are made of white acrylic resin, which could be easily removed for text engraving.

Features

- ✓ Robust and compact design, comprise of display unit (single element) to combine as number as required and one of common unit
- ✓ Alarm input can be selected by dip - switch to accept either NO or NC contact
- ✓ One relay output contact (1 NO) of each alarm for remote function
- ✓ LED chip of high brightness display
- ✓ Direct power supply 24, 48, 110, 125, 220 Vac or Vdc. (specify when order and same as Fault input voltage)
- ✓ Display window size is 40 x 50 mm
- ✓ Conform to ANSI/ISA-S18.1
- ✓ Integral and/or remote push buttons
- ✓ Alarm sequence can be selected by dip - switch on PCB

Technical Data

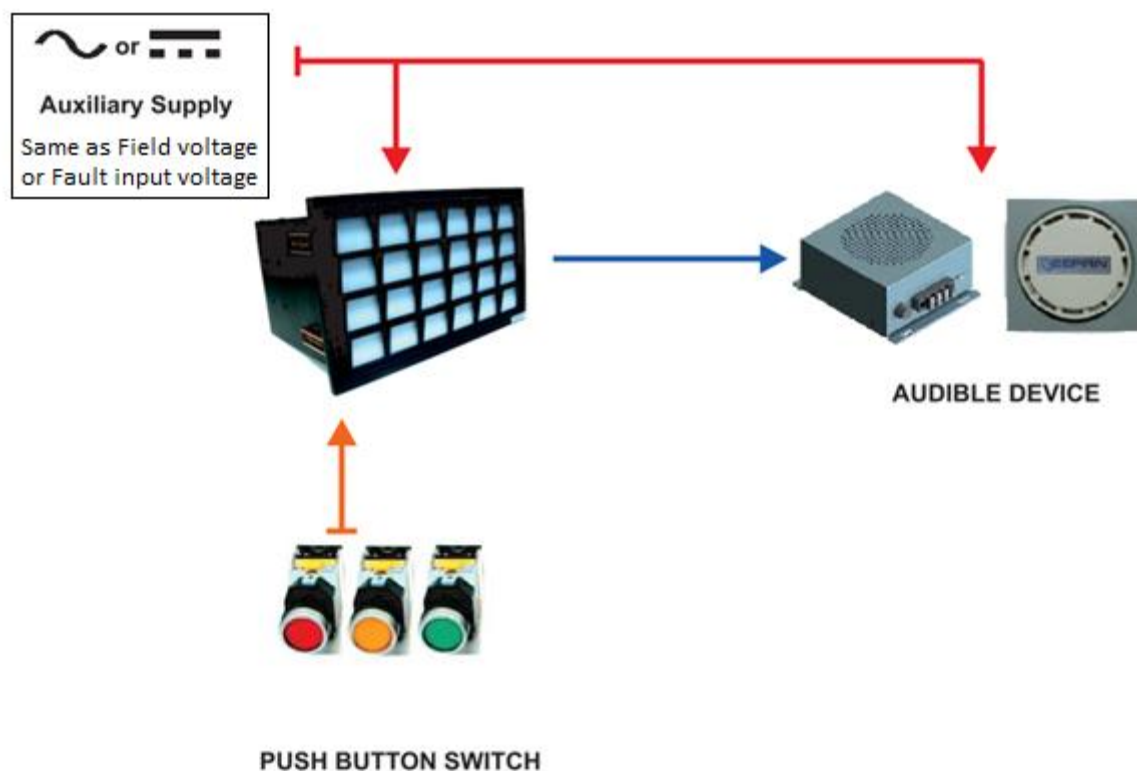
- | | |
|--------------------------------|--|
| ✓ Rating voltage | : 24, 48, 110, 125 and 220 Vac or Vdc |
| ✓ Power consumption per window | : 1W |
| ✓ Relay output 1 NO per window | : 10A/28Vdc or 10A/120 Vac |
| ✓ Display window | : comprise of high brightness surface mount LED chip (two color) |
| ✓ Signal duration time | : <20 ms |
| ✓ Ambient temperature | : 0 - 55°C |
| ✓ Storage temperature | : up to 70 °C |
| ✓ Humidity | : up to 95% |

Operating Principle

When an alarm signal is occurred, it will initiate horn/buzzer to operate. In the meantime, it will send an output directly to the display lamp, which makes the lamp flicks. After pressing an acknowledged push button switch, horn or buzzer remains silence but the lamp is still steady on. If an alarm signal is returned to normal status then the alarm is cancelled. However, the light of the correspondent indicating display lamp will be sustained. Unless the reset push button switch is activated then the lamp will be turned off and return to its initial condition.

The lamp test switch is also provided for checking all lamps at normal condition. While checking all lamps and suddenly some of the alarm signals are occurred, the alarm sequence will be operated as usual without any effect from the lamp test sequence. Alarm sequence can be selected by selector or dip switch for manual reset sequence or auto reset sequence, which described as below:

SYSTEM OF ANNUNCIATOR ESPAN 02



Sequence M: Manual Reset

In this mode, the momentary fault inputs will be latched until acknowledgement is manually reset to clear. Alarm device will be silenced, also lamp would stop flashing and steady on when acknowledged command. Manual reset of the alarm can be done only when process conditions return to normal.

STANDARD	SIGNAL	NORMAL	ALERT	ACK BEFORE/AFTER RETURN TO NORMAL	RETURN TO NORMAL	RETURN TO NORMAL BEFORE ACK	RESET
M-1-2-14	VISUAL LAMP	OFF	FLASH	STEADY ON	STEADY ON	FLASH	OFF
	AUDIBLE SOUND	OFF	ON	OFF	OFF	ON	OFF

Sequence A: Auto Reset

In this mode, If alarm contact returns to normal before acknowledgement the alarm function will immediately reset on acknowledge stage.

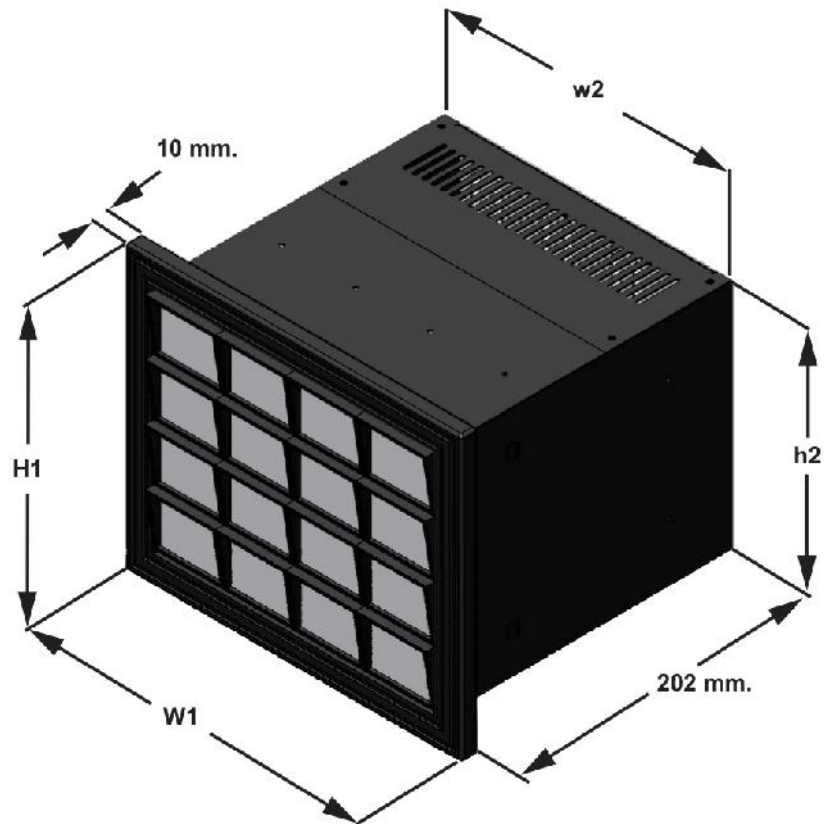
STANDARD	SIGNAL	NORMAL	ALERT	RETURN TO NORMAL BEFORE ACK	ACK BEFORE RETURN TO NORMAL	RETURN TO NORMAL
A-1-2-14	VISUAL LAMP	OFF	FLASH	OFF	STEADY ON	OFF
	AUDIBLE SOUND	OFF	ON	OFF	OFF	OFF

Sequence R: Ring back

When an alarm occurs, the lamp would flash and horn/buzzer will activate continuously. To stop the sound of horn or buzzer, ack. push button switch should be pressed. Then horn/buzzer will be silenced but the lamp would be still steady on. When alarm input returns to the normal status the lamp will gently flash while reset is only a choice to turn off the lamp.

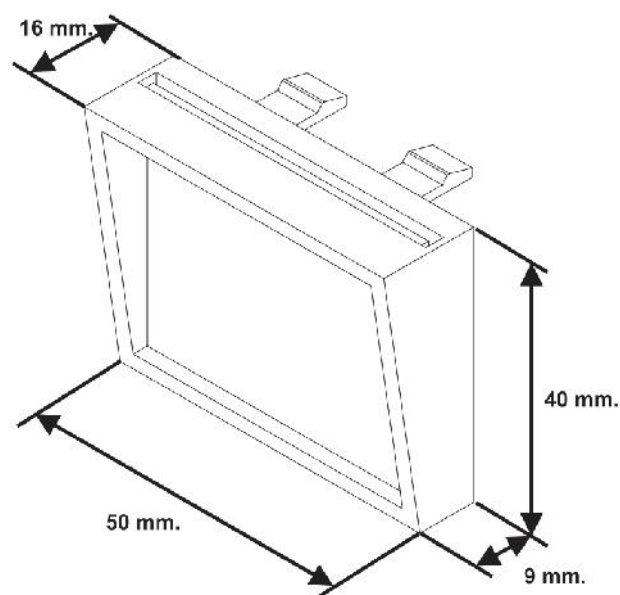
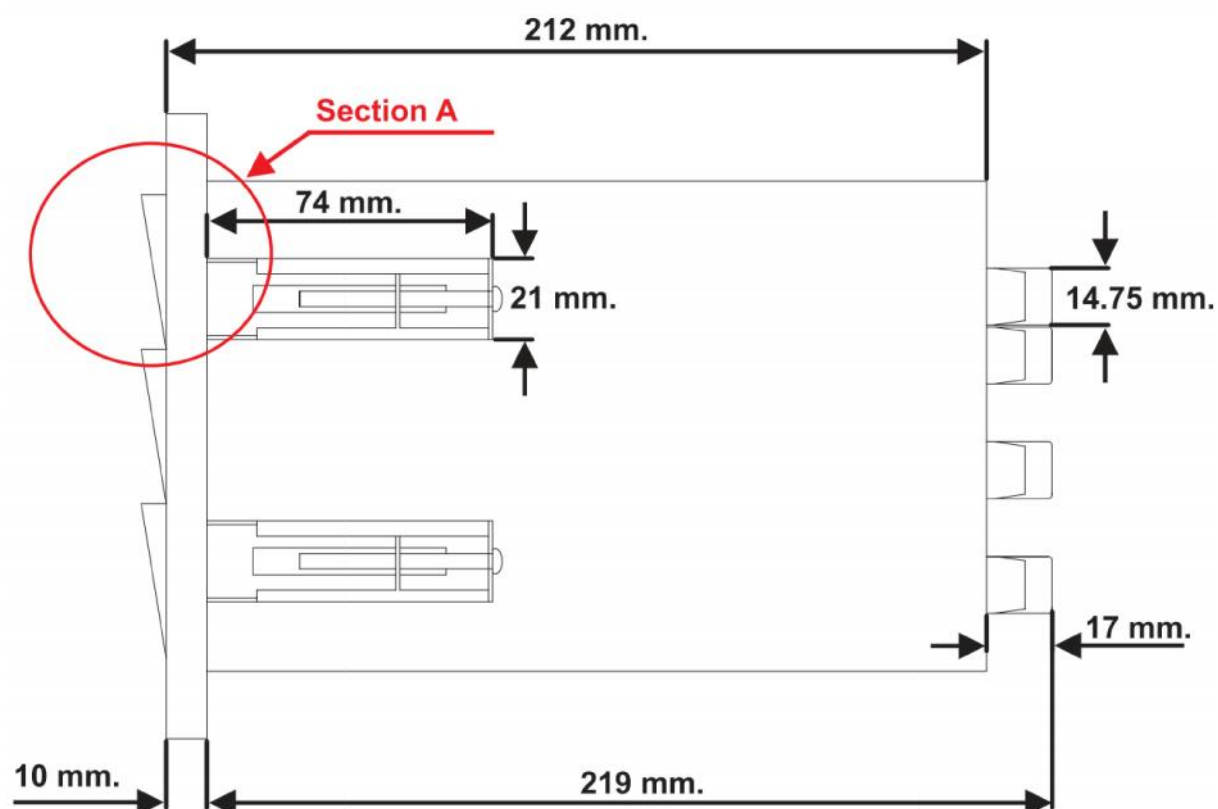
STANDARD	SIGNAL	NORMAL	ALERT	ACK	RETURN TO NORMAL	RESET
A-1-10	VISUAL LAMP	OFF	FLASH	ON	SLOW FLASH	OFF
	AUDIBLE SOUND	OFF	ON	OFF	OFF	OFF

Cut – out Dimension



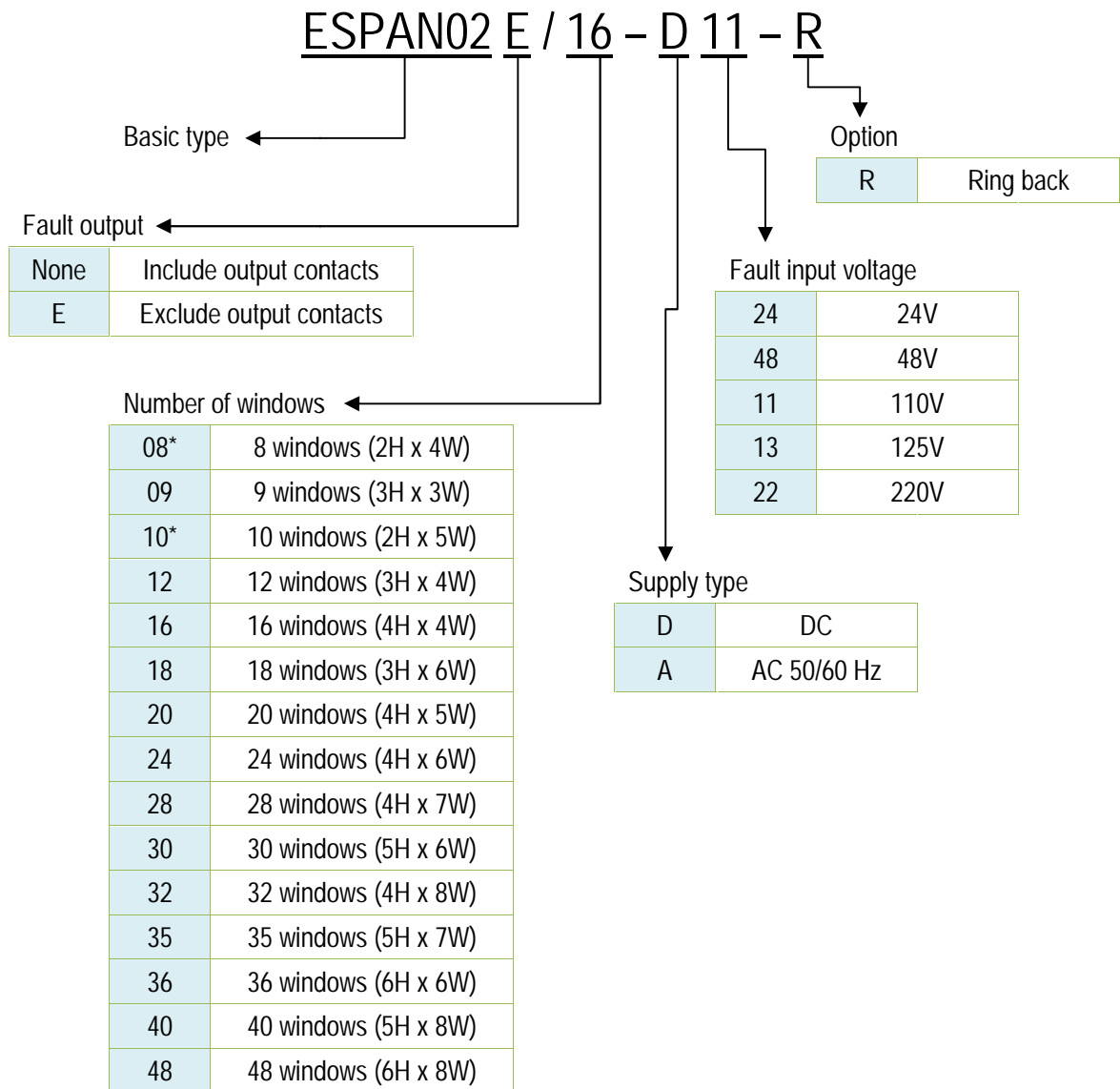
Window (H x W)	Dimension (mm.)		Cut out (mm.)	
	H1	W1	h2	w2
8 (2 x 4)	122	242	90	207
9 (3 x 3)	162	192	130	157
10 (2 x 5)	122	292	90	257
12 (3 x 4)	162	242	130	207
16 (4 x 4)	202	242	170	207
18 (3 x 6)	162	342	130	307
20 (4 x 5)	202	292	170	257
24 (4 x 6)	202	342	170	307
28 (4 x 7)	202	392	170	357
30 (5 x 6)	242	342	210	307
32 (4 x 8)	202	442	170	407
35 (5 x 7)	242	392	210	357
36 (6 x 6)	282	342	250	307
40 (5 x 8)	242	442	210	407
48 (6 x 8)	282	442	250	407

Dimension



Section A

Product Coding



*Note: shall be excluded output contacts only.



Description

ESPAN - 03 series is designed to use as an alarm for general switchgear cubicle or local control panel of GIS, local control cabinet of power transformer and all of control panel, which need alarm function. It indicates fault status by using special high brightness LED. The ESPAN - 03 series can be selected by the number of alarm input 8 alarm or 16 alarm which specified when order.

Features

- ✓ DIN format 96 x 96 mm.
- ✓ Large space savings on the front panel of the cabinet.
- ✓ Built-in three push buttons for Acknowledge/Reset/Test.
- ✓ The label is a single paper sheet which slides into a small transparent envelope recessed in the front panel.
- ✓ All inputs are isolated with opto - couple NO or NC volt-free contact can be selected by software.
- ✓ Alarm sequences (Auto/Manual Reset /Indicator) of each input can be selected by software.
- ✓ Alarm type (Bell/Buzzer) of each input can be selected by software.
- ✓ High brightness LED display (5 mm.)
- ✓ Integrated two test functions (Lamp Test / Function Test) in only one push button ("TEST")
- ✓ Auto acknowledge function time can be set from 1 - 240 seconds.
- ✓ Direct power supply 24, 48, 110, 125, 220Vdc. (specify when order also same as Fault input voltage)
- ✓ Built-in heart beat function by LED lamp to display healthy status as self-supervision function.
- ✓ Supervisory contact (watchdog) for remote alarm or warning status.
- ✓ Communication port: RS232

Option

- ✓ Serial Interface (RS232 or RS485 - Modbus RTU).

Technical Data

Auxiliary Power Supply	VDC 24V, 48V, 110V, 125V, 220V and 250V
Power consumption (max)	10W
Alarm type relay contact	VDC30V/10A , VAC120V/5A
Response time (Operating time)	20 ms
Operating temperature	0 - 55°C
Storage temperature	up to 70°C
Relative Humidity	up to 90% (no dew drop)

Operating Principle

When an alarm signal is occurred, it will initiate Bell/Buzzer to operate. In the meantime, it will produce output direct to the display LED, which makes LED flicking. After pressing an acknowledged push button, Bell or Buzzer remains silence but LED is steady on. If an alarm signal is return to normal status then the alarm is cancelled. However, the light of the indicating display LED will be sustained. Unless the reset push button switch is activated. Then the LED will be turn off and return to its initial condition. The "TEST" push button included two functions. The first function is "Lamp TEST" if push and hold this push button less than 3 seconds, it will light up all LED lamp at the front panel only. The second function is "Function Test" if push and hold this push button more than 3 seconds, the LED lamp will start flicking and Bell/Buzzer alarm. This "TEST" push button is provided for the purpose of checking all LED and operating function at normal condition. While checking all LED and suddenly some of the alarm signals are occurred, the alarm sequence will be operated as usual without effect from the lamp test sequence. Alarm sequence can be selected by software for manual reset sequence or auto reset sequence, which described as below:

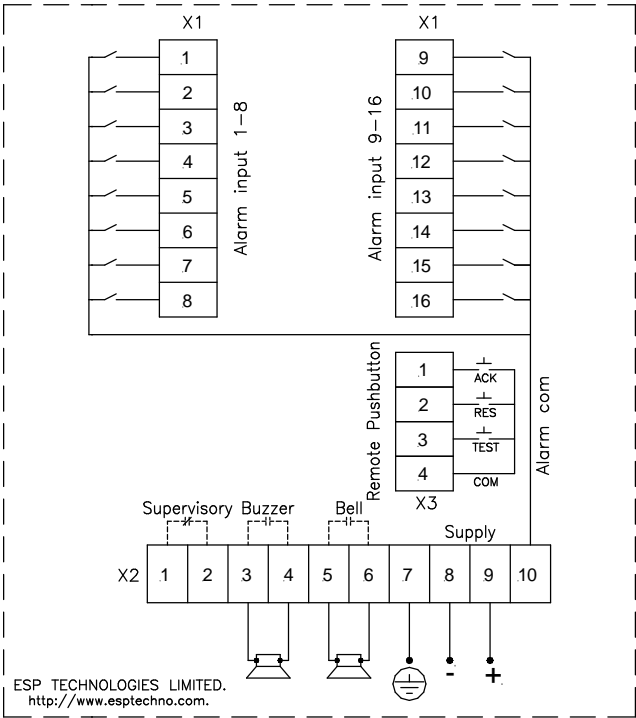
SEQUENCE1: MANUAL RESET

When an alarm signal is occurred, the LED would gently flash and Bell or Buzzer will activate continuously. To stop the sound of Bell or Buzzer, "ACK" push button has to be pressed. Then Bell/Buzzer is silenced but LED is still steady on. Reset is only possible by "RESET" push button when alarm input returns to normal status.

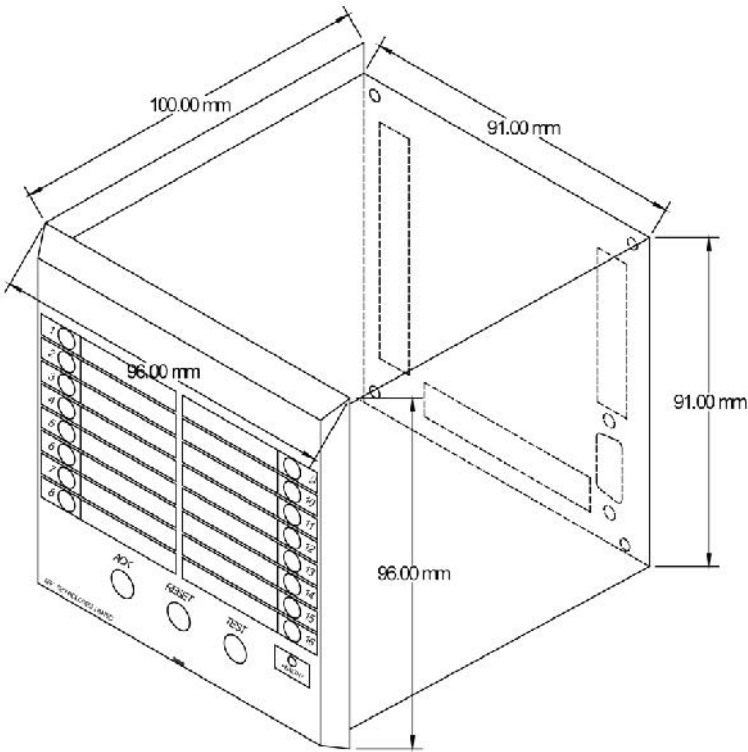
SEQUENCE2: AUTO RESET

When an alarm signal is occurred, the LED would gently flash and Bell or Buzzer will activate continuously. To stop the sound of Bell or Buzzer, "ACK" push button has to be pressed. Then Bell/Buzzer is silenced but lamp is steady on. Auto reset will take place when alarm input returns to normal status.

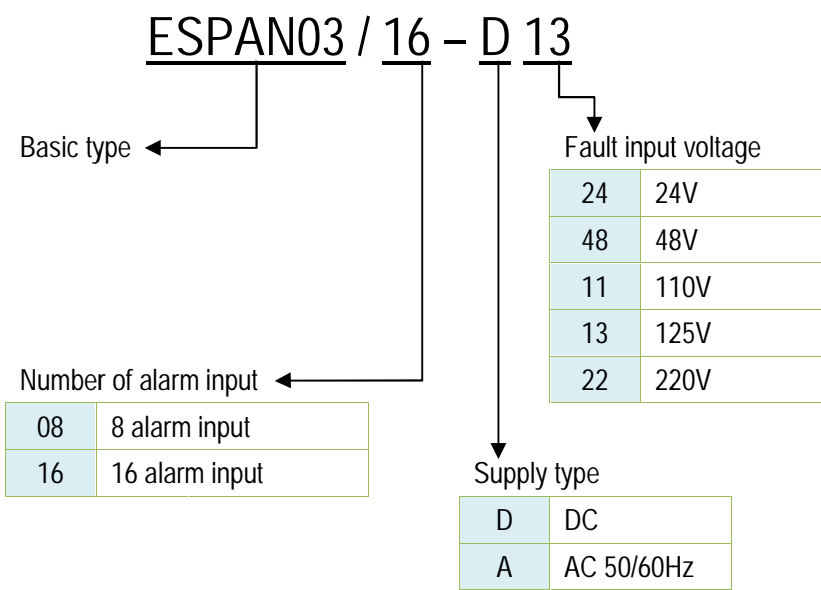
Connection Diagram



Cut – out Dimension



Product Coding





Description

ESPAN-04 series is designed to use as an alarm for general switchgear cubicle or local control panel of GIS, local control cabinet of power transformer and all of control panel, which needs alarm function. It indicates fault status by using special high brightness LED. The ESPAN-04 series can be selected by the number of alarm input 8, 10, 16 alarm or 20 alarm which specified when order.

Features

- ✓ Aluminum housing, DIN format 96 x 96 mm.
- ✓ Operating delay time can be selected by software starting from 200 ms. Up to 2400 ms.
- ✓ Built-in three push buttons for Acknowledge, Reset and Test
- ✓ The label is a single paper sheet which slides into a small transparent envelope recessed in the front panel.
- ✓ All inputs are isolated with opto-couple, NO or NC volt-free contact can be selected by software.
- ✓ Alarm sequences (Auto/Manual Reset /Indicator) of each input can be selected by software.
- ✓ Alarm sound type (Bell/Buzzer) of each input can be selected by software.
- ✓ High brightness LED display (3 mm.) in 3 colors (R,G,A) can be selected by Software
- ✓ Integrated two test functions (Lamp Test & Function Test) in one push button ("TEST")
- ✓ Time of auto acknowledge function can be set from 1-240 seconds.
- ✓ Aux. power supply 24, 48Vdc and 95-265Vac/dc (specify when order also same as Fault input voltage)
- ✓ Built-in heart beat function which illuminated by LED lamp to display healthy status as self-supervision function.
- ✓ Supervisory contact (watchdog) for warning status
- ✓ Communication port : USB for configuration, RS485 – Modbus RTU for serial interface
- ✓ Alarm monitor software for remote monitoring and control (Ack / Reset / Test)

Option

- ✓ Relay output module : The auxiliary contact output or repeat relay module, normally used for remote alarm or remote control as given design

Technical Data

Auxiliary Power Supply	VDC 24V, 48V and 95 – 265 VAC/DC
Power consumption (max)	10W
Relay contact rating	VDC 30V/10A , VAC 120V/5A
Response time (Operating time)	5 - 50 ms
Operating temperature	0-55°C
Storage temperature	up to 70°C
Relative Humidity	up to 90% (no dew drop)

Operating Principle

When an alarm signal is occurred, it will initiate Bell/Buzzer to operate. Meanwhile, it will produce output direct to the display LED, which makes LED flicking. After pressing an acknowledged push button, Bell or Buzzer remains silence but LED is steady on. If an alarm signal is return to normal status then the alarm is cancelled. However, the light of the indicating display LED will be sustained. Unless the reset push button switch is activated. Then the LED will be turn off and return to its initial condition. The "TEST" push button includes two functions; the first function is "Lamp TEST" if push and hold this push button less than 3 seconds, it will light up all LED lamps at the front panel only. The second function is "Function Test" if push and hold this push button more than 3 seconds, the LED lamp will start flicking and Bell/Buzzer alarms. This "TEST" push button is provided for checking purpose of all LED and operating functions at normal condition. While checking all LED and suddenly some of the alarm signals are occurred, the alarm sequence will be operated as usual without effect from the lamp test sequence. Alarm sequence can be selected by software for manual reset sequence or auto reset sequence as described as below.

SEQUENCE1 : MANUAL RESET

When an alarm signal is occurred, the LED would gently flash and Bell or Buzzer will activate continuously. To stop the sound of Bell or Buzzer, "ACK" push button has to be pressed. Then Bell/Buzzer is silenced but LED is still steady on. Reset is only possible by pressing "RESET" push button when alarm input returns to normal status.

SEQUENCE2 : AUTO RESET

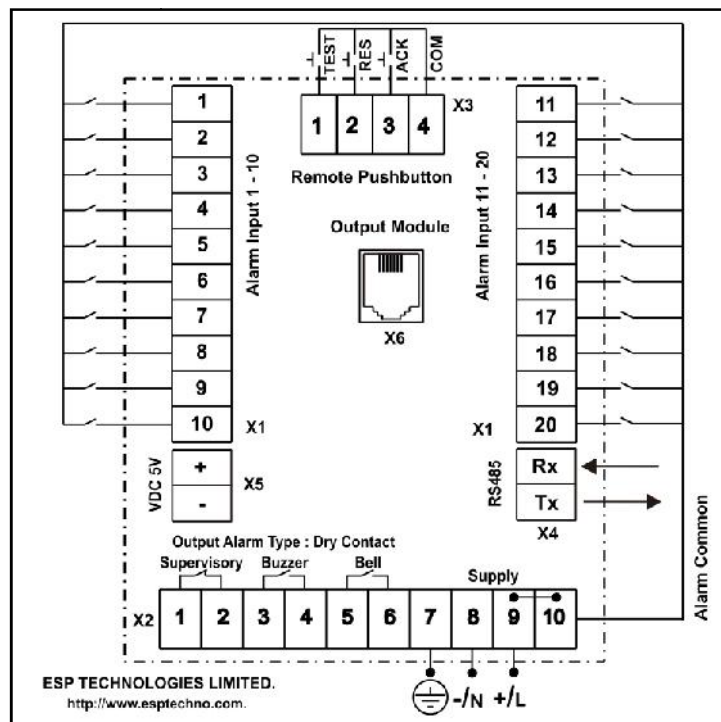
When an alarm signal is occurred, the LED would gently flash and Bell or Buzzer will activate continuously. To stop the sound of Bell or Buzzer, "ACK" push button has to be pressed. Then Bell/Buzzer is silenced but lamp is steady on. Auto reset will take place simultaneously when alarm input returns to normal status.

INPUT INDICATOR FUNCTION

This function is same as indicator lamp. When an alarm signal feed through an assigned input of Annunciator, the LED display lamp of that design fault will lid or steady on. After alarm input returns to normal then the display lamp will automatically switch off.

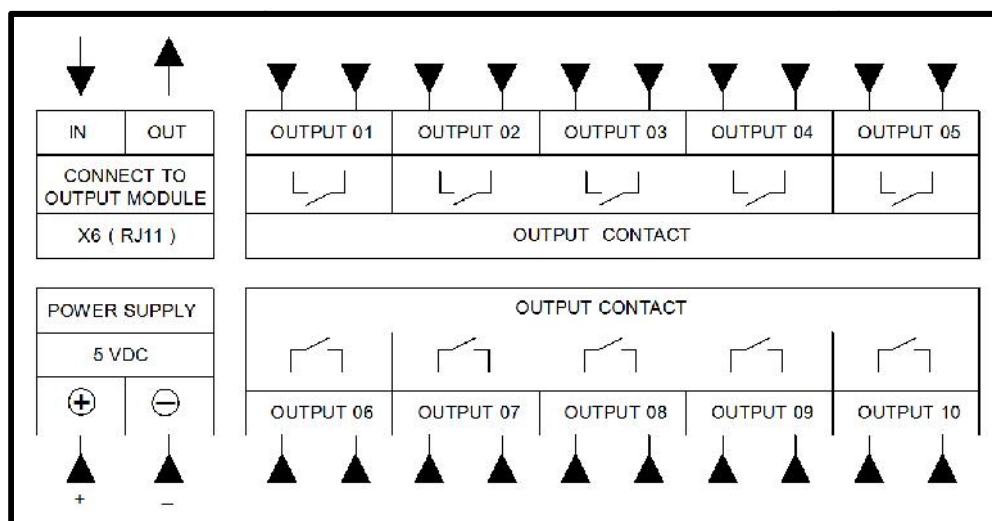
Connection Diagram

Connection diagram at the rear side of ESPAN04

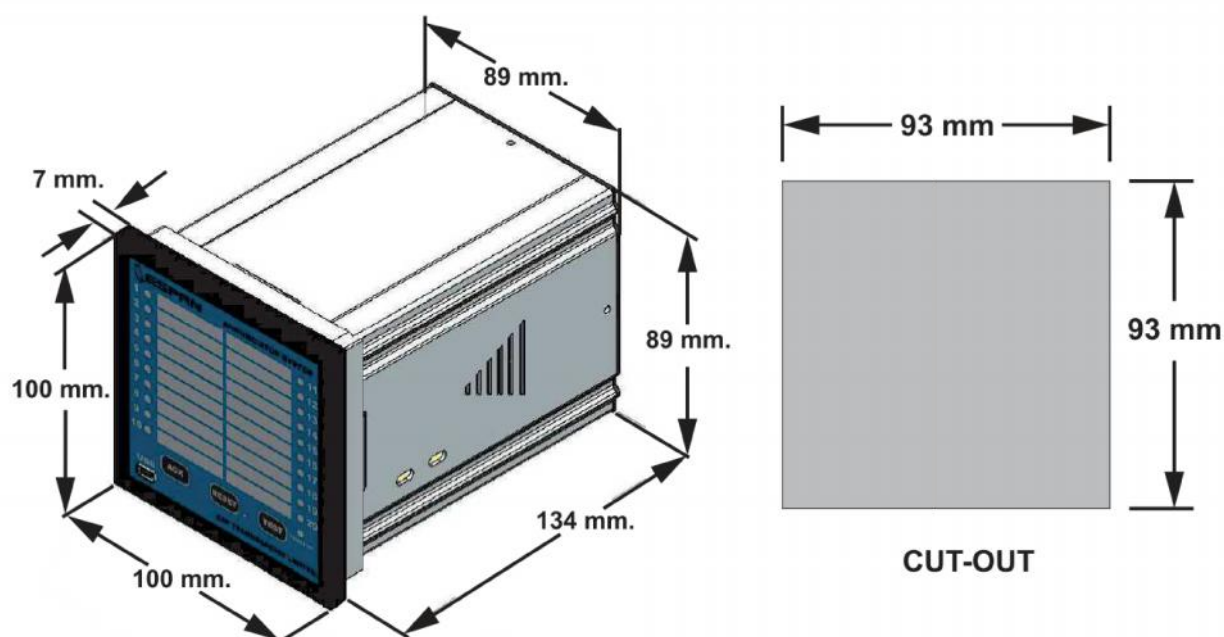


Remark: Aux. supply and Fault input voltage shall be the same source.

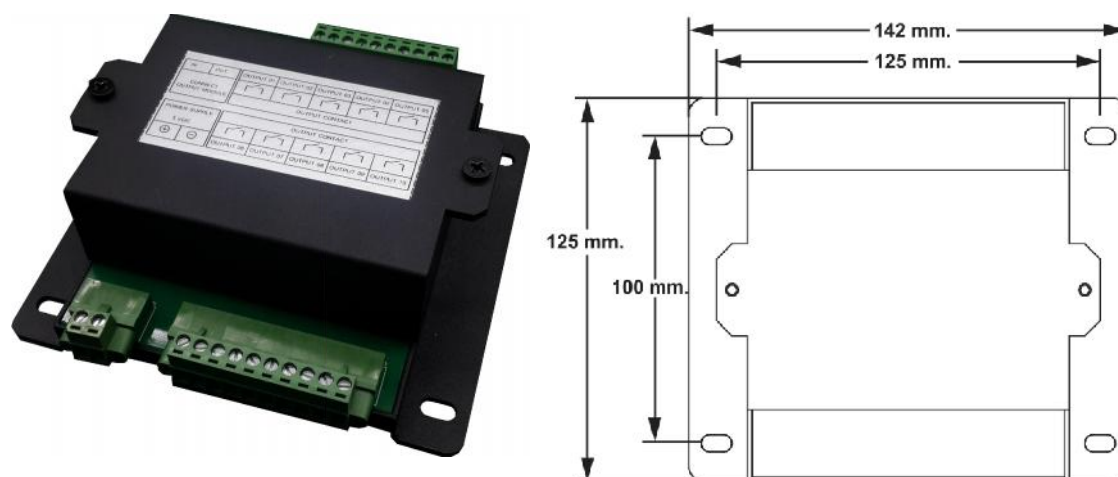
Connection diagram of ESPAN04 Relay Output Module



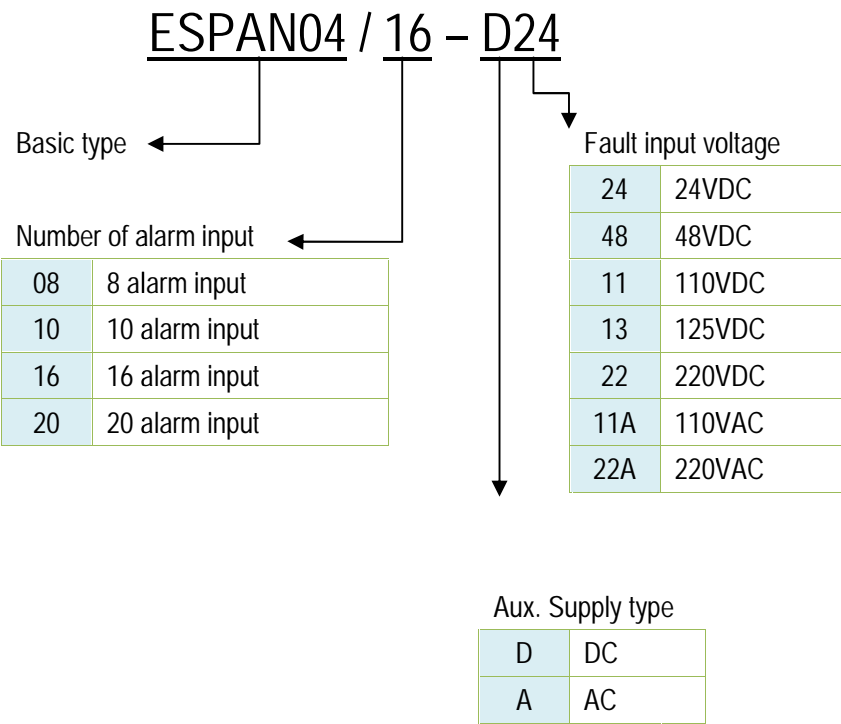
Dimension and Cut – Out



Relay Output Module



Product Coding





AUDIBLE ALARM SOUND



Description

The ESPAN POWER BUZZER type PBZ is manufactured for general purpose alarm and warning applications. Installing is quick and simply by tightening the four screws onto panel boards.

Applications include: panel boards, switchboards, ceilings and walls for building hallways, corridors and manufacturing sites.

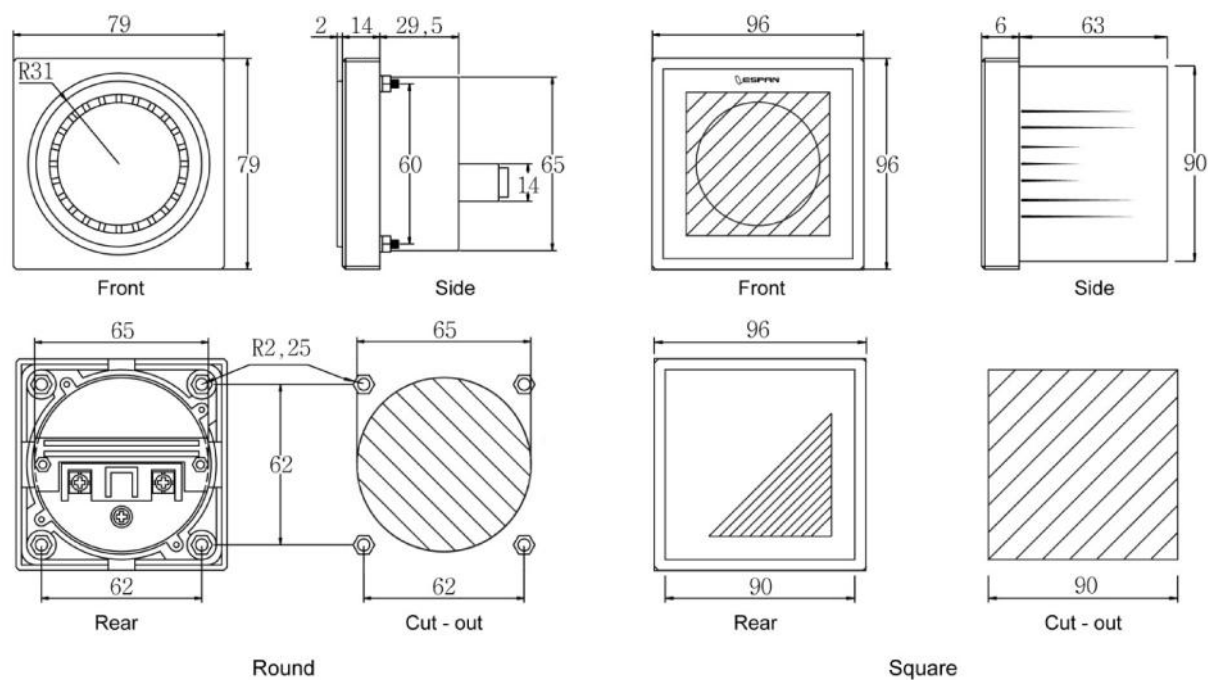
Features

- ✓ Electronic type, low power consumption.
- ✓ Power supply DC type or AC type.
- ✓ Wide operating range: -10% to +10% of nominal voltage.
- ✓ Protection class: IP40

Technical Data

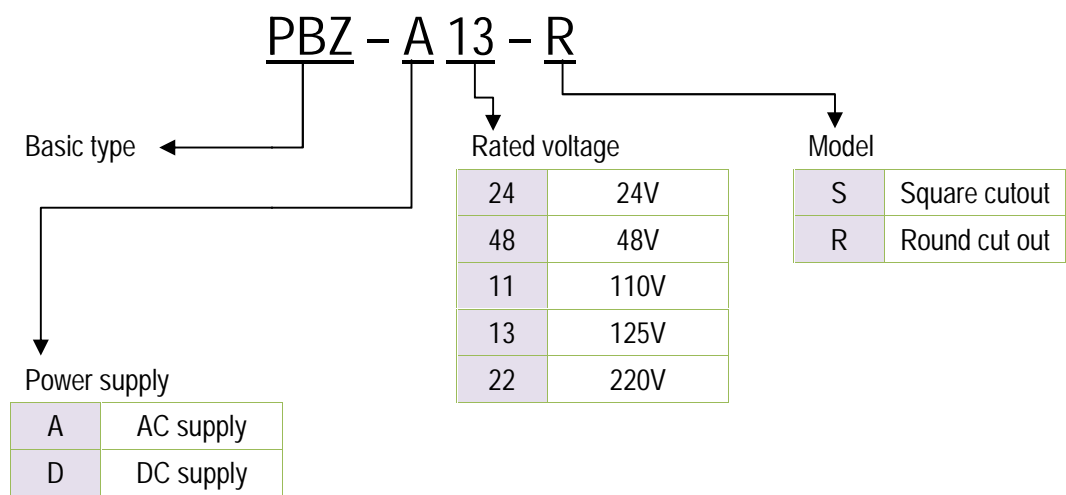
Model	Description	VA (W)	Sound output
PBZ-D24	Power buzzer I/P DC 24V	4	85 db at 1 ft.
PBZ-D48	Power buzzer I/P DC 48V	4	85 db at 1 ft.
PBZ-D11	Power buzzer I/P DC 110V	4	85 db at 1 ft.
PBZ-D13	Power buzzer I/P DC 125V	4	85 db at 1 ft.
PBZ-D22	Power buzzer I/P DC 220V	4	85 db at 1 ft.
PBZ-A11	Power buzzer I/P AC 110V	4	85 db at 1 ft.
PBZ-A22	Power buzzer I/P AC 220V	4	85 db at 1 ft.

Dimension



*All dimension are in mm.

Product Coding





Description

High decibel universal vibrating horn for heavy - duty and indoor application use. This device operates from a local power source which makes it possible in a system to connect the device to power sources of different voltages.

The ESPAN electro - mechanical vibrating horn is manufactured for general purpose alarm and warning applications. Installation is quick and simple by tightening the four screws onto panel boards. Applications include: panel boards, switchboards, ceilings and walls for building hallways, corridors and manufacturing sites.

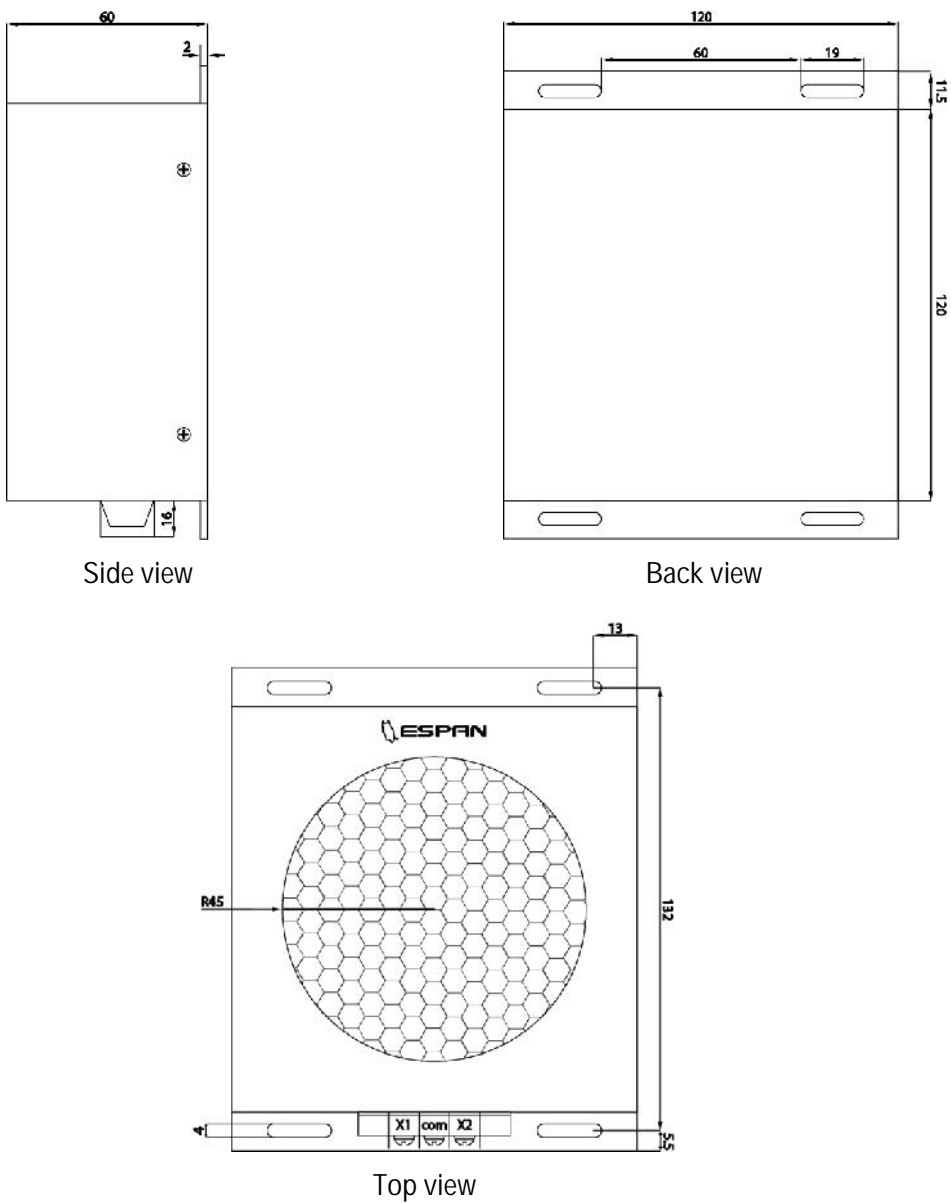
Features

- ✓ Complete assembled, rugged design
- ✓ Universal power supply from 24 VDC to 48 - 240 VAC/DC
- ✓ Low power consumption, only 5VA (maximum)
- ✓ Corrosion resistant finish (Epoxy Resin Color)
- ✓ Wide operating range: -10% to +10% of nominal input voltage
- ✓ Fuse protection in case of overload
- ✓ Kind of sound by selector switch: C = Continuous sound, A = Alternate sound
- ✓ Continuous duty time: 105 minutes

Technical Data

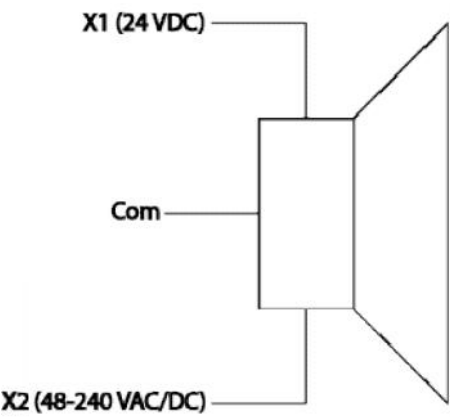
Product coding	Connection	Input voltage	VA (W)	Sound output
VH - U	X1 - Com	24 VDC	5	98 db at 1ft.
	X2 - Com	48 - 240 VAC/VDC		

Dimension



Ratio 1:1 mm.

Wiring Diagram





MONITORING RELAY



Description

The relay type E94 fast trip relay or auxiliary tripping relay is intended to be used in control and protection circuit for applications requiring high reliability and availability such as power stations, substations, railways and industrial plants. The relay has been designed for flush mounting style, the robust contacts are characterized by high making/breaking capacity, overload capacity and continuous current intensity capacity. Their high degree of protection ensure reliable operation in tropical and/or salty sea air ambient conditions.

Regarding to the auxiliary tripping relay or fast trip relay. The Pick-up time of the relay E94 is less than 8ms. and Drop-out time is less than 40ms. The relay type E94 are consist in two versions, the first version is E94-3 which has three changeover contacts, flush mounting type with screw-type terminals at the rear. The second is E94-6 which has six changeover contacts and other specifications are the same as the first one.

Standards and Test

The relays E94 series comply with the IEC/EN, IEEE standards (type test and routine test)

The relay has electrical tests performed according to EN 60255

- | | |
|------------------------------|-------------------------------|
| - Insulation | 2 kV/50 Hz/ 1 min |
| - Impulse withstand strength | 5 kV/1.2/50 μ s |
| - Dielectric strength | >2000 M /500 V (peak to peak) |

Flammability tests according to IEC 60692-2-1

Plastic materials UL 94 : VO

(acc. to IEC 60695)

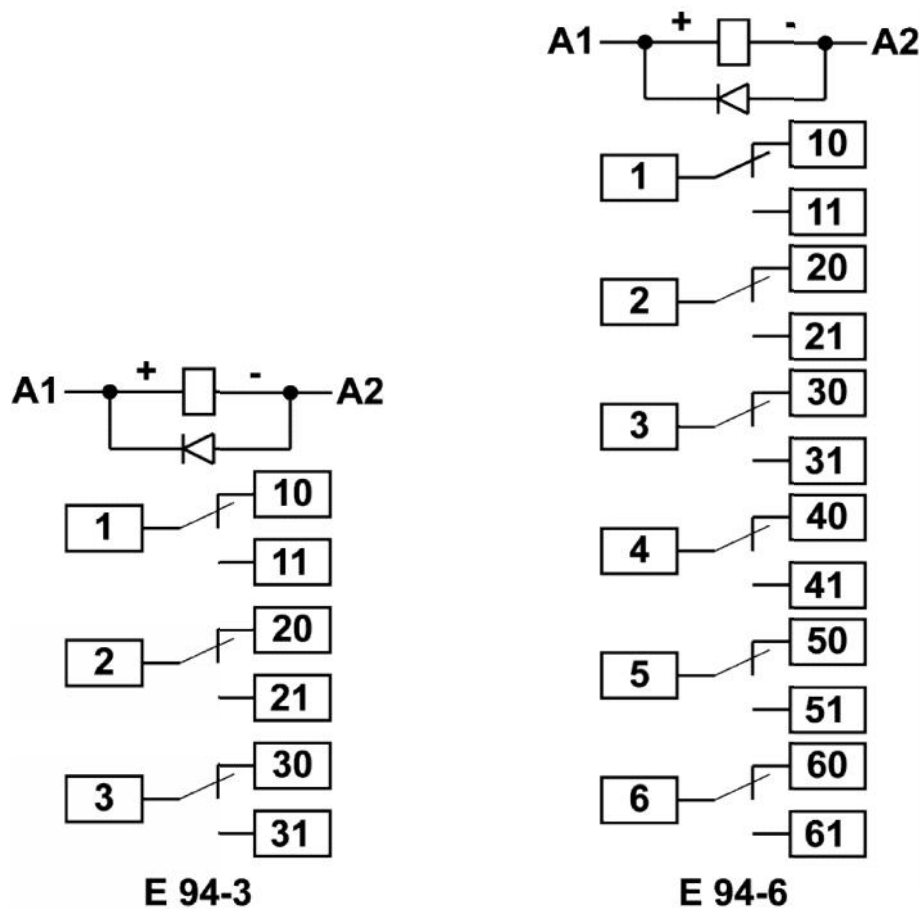
Degree of protection IP50

(acc. to IEC 60529)

Technical Data

Input voltage system	48/110/125/220 VDC
Pick-up time	< 8ms
Drop-out time	< 40ms
Relay output	3 Changeover contacts (E94-3)
	6 Changeover contacts (E94-6)
Switching contact continuous current	10A at 110 Vdc
	40A at 250Vac
Overload capacity	80A/200ms
Operating temperature	0-55°C
Storage temperature	Up to 70°C
Relative humidity	Up to 90% (no dew drop)
Function indicator	Operated (LED color: Red)

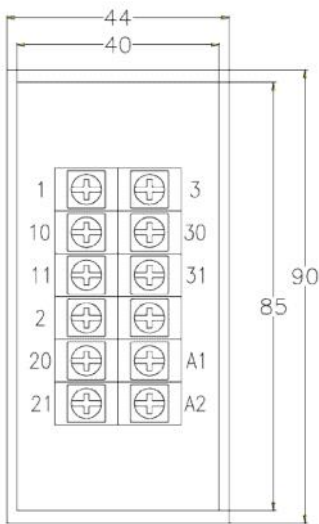
Connection Diagrams



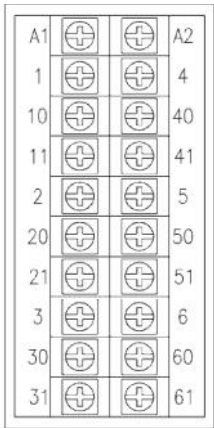
Dimension



Front view
E94-3 and E94-6



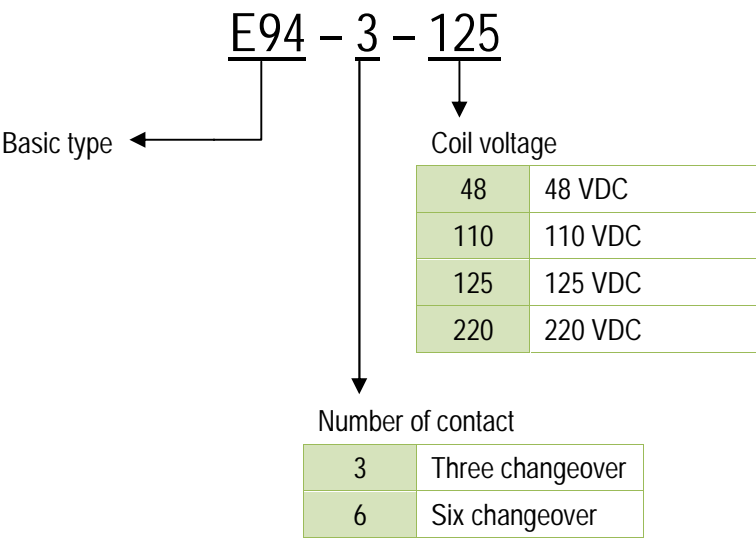
Rear view
E94-3



Rear view
E94-6

Ratio 1:1 mm.

Product Coding





Description

The EL series latching relays has self - holding function using permanent magnets in the magnetic circuit which prevent intermediate position or contact trip while switching. Enables great reliability and a long stable service life. The EL series is designed based on quality and reliability concerns and manufactured according to IEC and IEEE standards. The EL series are adopted either AC or DC supply at same rated voltage. Number of change over contacts of EL series are 4 and 8.

To cut off the input voltage which directs supply to coil after operation is the design concept of EL series by series their own contact with the coil, so it will reduce power consumption and make relay longer life. EL series latching relays are adopted either pulse or permanent supply.

Indicating status of the EL series latching relays can be seen through a viewing window at the top of the cover. Setting status will indicate green and resetting status will indicate red.

The EL series latching relays is designed to mount on standard DIN rail 35 mm. Also terminal plug was designed to use with wire 1.0 – 2.5 mm. diameter.

Model in EL series:

EL04 : 4 transfer contacts, 5A at 250Vac/28Vdc

EL08 : 8 transfer contacts, 5A at 250Vac/28Vdc

Application

The main application for these relays is as “change over” contacts in these control systems where two different stable positions are required. The use of the relays reduces wiring from the outside switchgear to the control board, reduce the cost and assure a contact simultaneous operation thereby dramatically reducing the possibility of miss operation. Other important usages are for remote control demands signals

Technical Data

Contact resistance	50 m max.	
Contact material	Silver Alloy	
Operate time	15 ms max.	
Release time	15 ms max.	
Insulation resistance	100 M min. (at 500Vdc)	
Dielectric strength	between open contact	750Vac 50/60 Hz (1 min.)
	coil & contact	2000Vac 50/60 Hz (1 min.)
Vibration	10 - 55 Hz; 1.5mm.	
Shock	500 m/s ² (approx. 50G)	
Ambient temperature	Operating: - 40°C to 70°C	
Humidity	45% to 90% RH	
Service life	Mechanical: 500,000 operations	
	Electrical: 100,000 operations	
Weight	250 g. for EL04	
	350 g. for EL08	

COIL RATING

Rated voltage (V)	Item	Set coil		Reset coil		Maximum voltage
		Rated current (mA)	Coil resistance ()	Rated current (mA)	Coil resistance ()	
AC/DC	24	12	87	12	87	10% of rated voltage
	48	12	134	12	134	
	110	12	257	12	257	
	125	12	287	12	287	
	220	20	477	20	477	

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15% to -20% for current and ±15% for rated coil resistance.

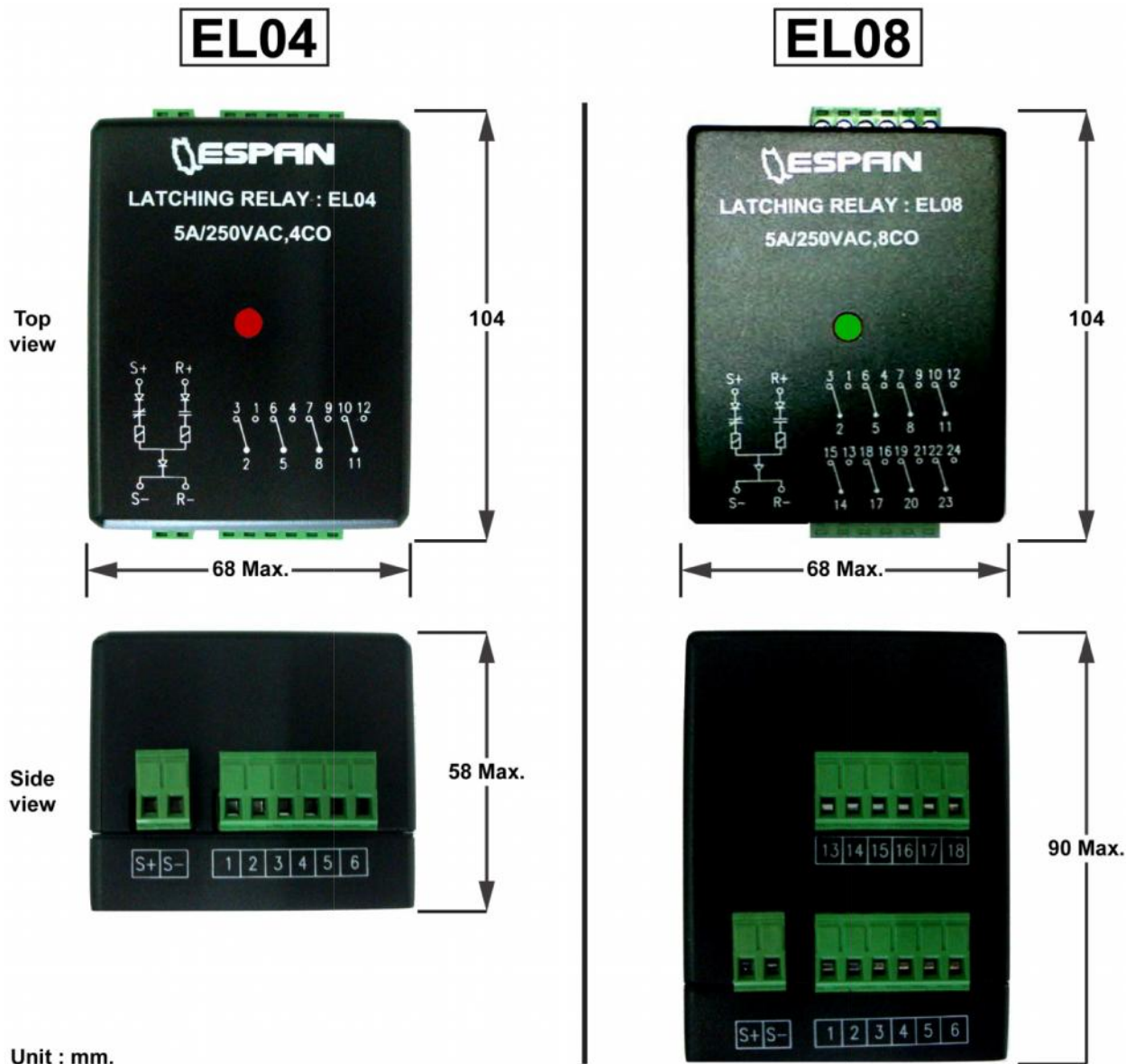
2. The rated current and performance characteristics are measured at a coil temperature of 5 to 35°C.

3. Peak reverse voltage of the built-in diode is 1 kV

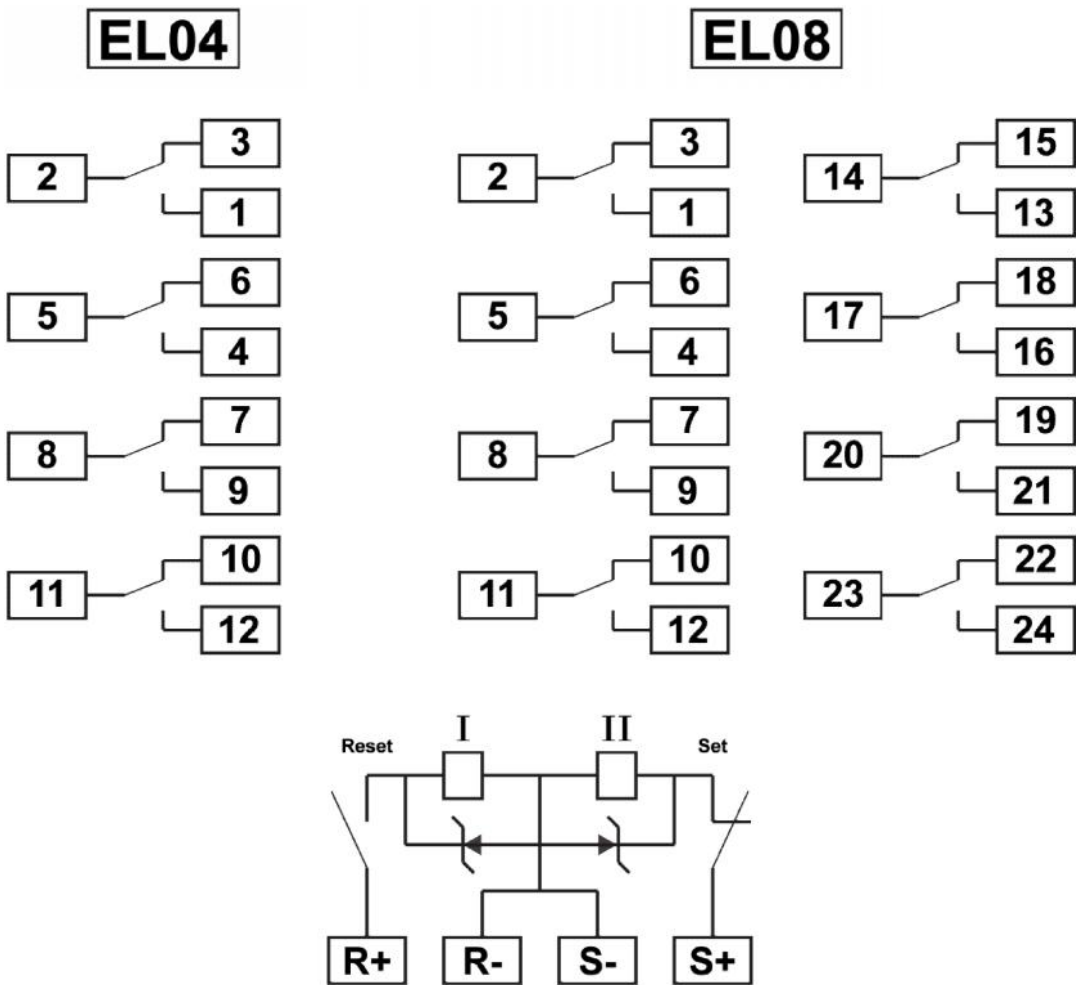
CONTACT RATING

Item	Load	Resistance load	Inductive load
		(cos{ = 1)	(cos{ = 0.4)
Rated load		250 Vac 5A	250 Vac 2A
Carry current		5 A	
Max. operating voltage		250 Vac	
Max. operating current		5 A	
Max. switching capacity		1,250 VA	
Minimum permissible load		1 Vdc 1 mA (ref. value)	

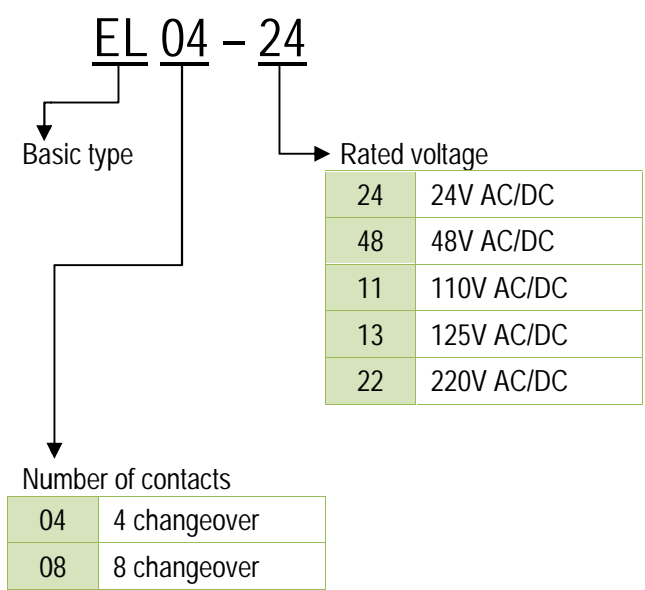
Dimension



Connection Diagrams



Product Coding





Description

The AC voltage relay type E27/59A is a digital relay and designed to monitor a three phase supply by checking all phase are pleasant and within set voltage limit. An adjustable time delay is incorporated to avoid nuisance tripping. When power is applied to relay, the green LED will illuminate (While watchdog function is working). The relay is provided with an adjustable voltage of 40 - 100% U_n on under voltage unit and 100 - 120% U_n on over voltage unit with time delay 0 - 60 seconds set point.

Under Voltage Function (E27A)

When the monitor voltage falls below the set point, the time delay is started and the red LED (Under voltage LED display) start flashing until time delay has reached the set point value. (The response time of the relay is adjustable between 0 to 60 seconds) Then the red LED stop flashing but steady on, simultaneously with relay energises or switches to its operating position. The relay will automatically reset once the monitored voltage rises above the set point. When reset, the LED will extinguish at the same time if time delay is not activated.

Over Voltage Function (E59A)

As it is common with all AC voltage monitoring relays, on over voltage unit the relay energises when the monitor voltage exceeds and the response value is selected, the time delay is started and the red LED (Over voltage LED display) start flashing until time delay has reached the set point value. Then the red LED stop flashing but steady on, simultaneously with relay energises. The relay will automatically reset once the monitored voltage falls below the set point. When reset, the LED will extinguish together if time delay is not activated.

DC Auxiliary Supply (Option)

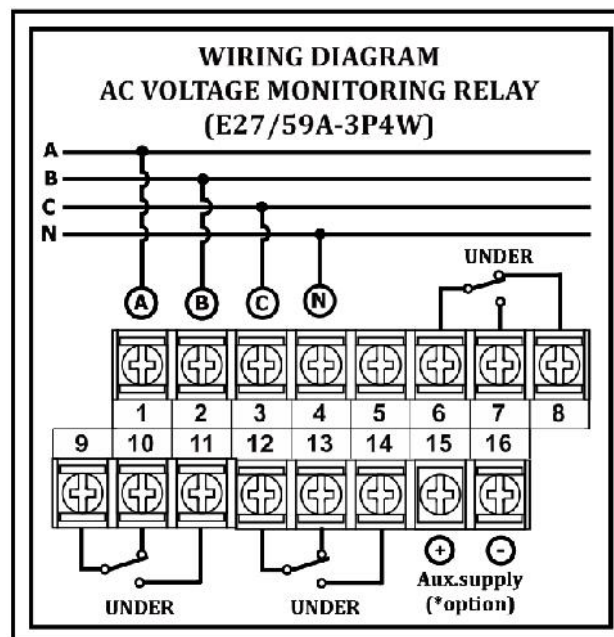
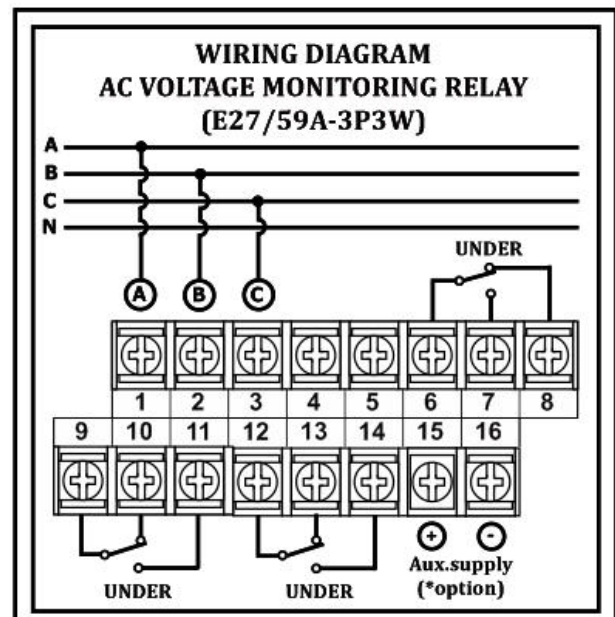
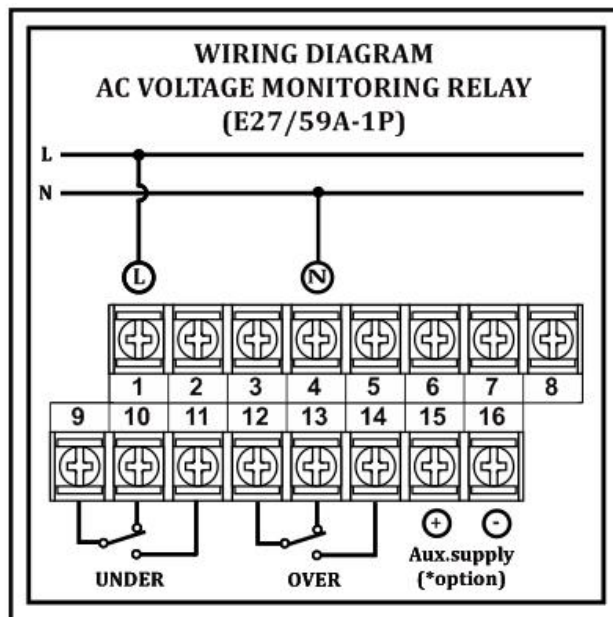
This type is also designed to use with the auxiliary supply source from 90 to 250 VDC. In case of AC voltage from VT are failed, the relay will still work (or status of relay is O.K. when AC input voltage are failed)

Technical Data

Input voltage system	90 - 250*Vac
Voltage set point range	40 - 120% (of rated voltage)
Under voltage setting range	40 - 100% (of rated voltage)
Over voltage setting range	100 - 120% (of rated voltage)
Response time delay	0 - 60 seconds
Burden	<5VA
Overload	1.2 x Un continuously 2.0 x Un for 3 seconds
Relay output	2 contacts
Outputs relay contact	5A at 24Vdc or 240Vac non-inductive
Auxiliary power supply	Self supply (DC supply as an option)
Option for aux. supply	90 to 250 VDC
Operating temperature	0 - 55°C
Storage temperature	Up to 70°C
Relative humidity	Up to 90% (no dew drop)
Function indicator	Healthy (LED color: Green) Over (LED color: Orange) Under (LED color: Red)

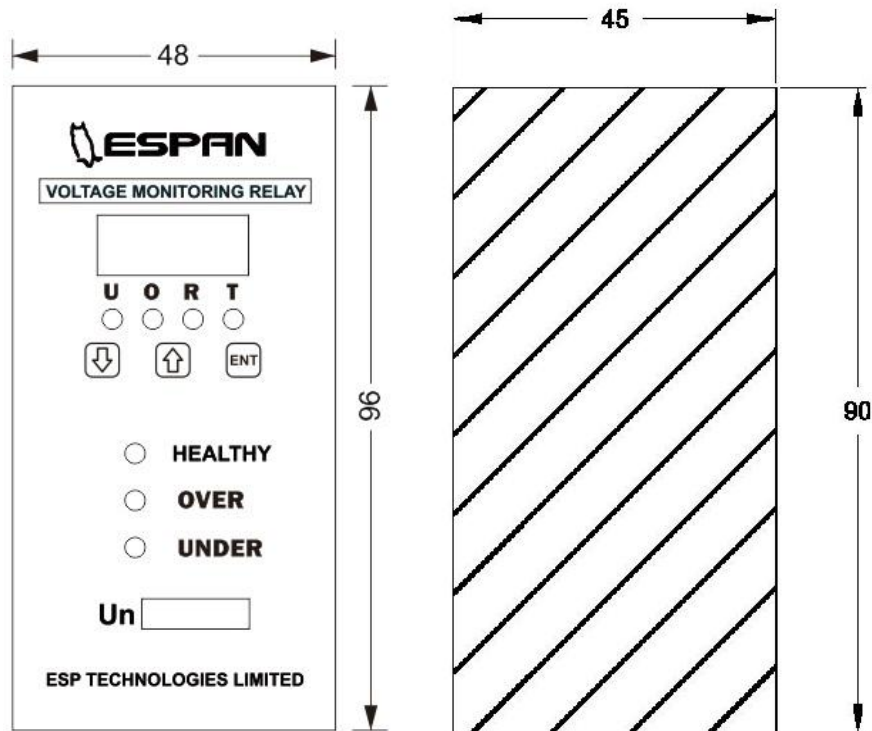
*Note : Other monitoring ranges and voltages are available upon request.

Connection Diagram



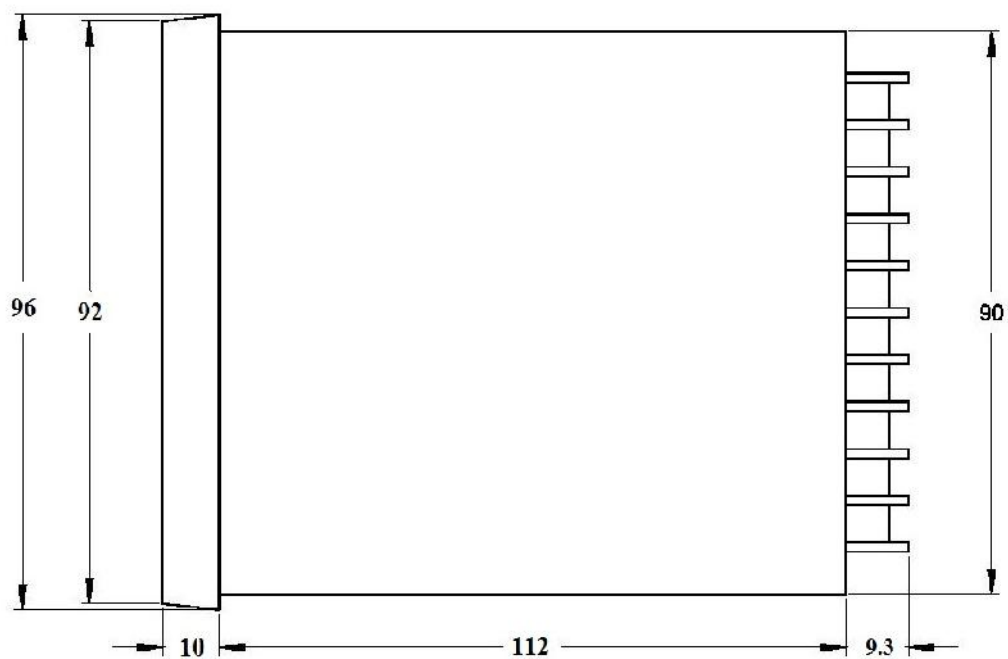
Flush Mounting Type

Connection Diagram



Front view

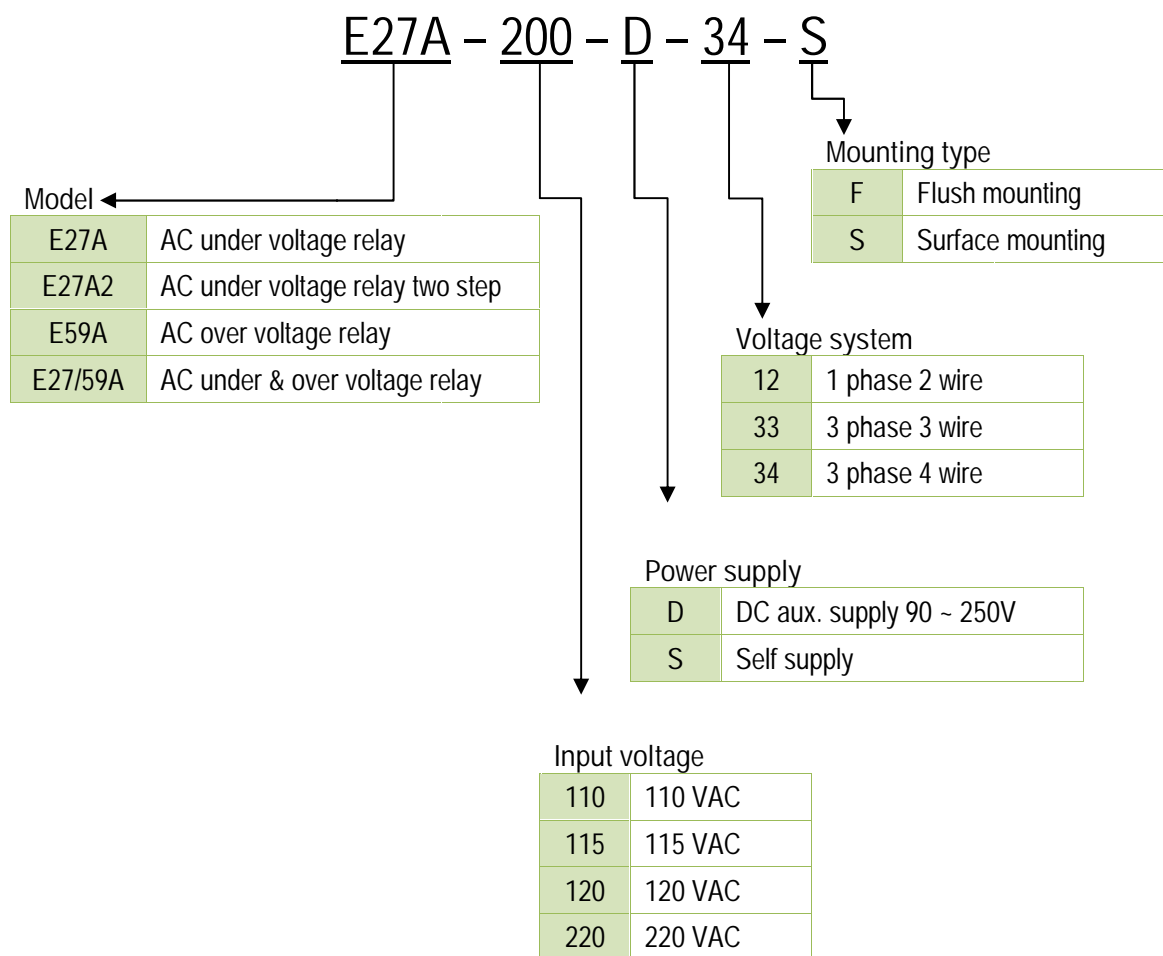
Cut out



Side view

Flush mounting type Ratio 1:1 mm.

Product Coding



*Input voltage are available upon request



Description

The DC voltage monitoring relay type E27D is a digital or microcontroller base relay, commonly used for monitoring battery voltage conditions, but can be used in any applications which dc voltage level is critical too. The relay is provided with 1 volt step adjustable pickup and dropout voltage with time delay 0 - 60 seconds set point. Moreover, it has watchdog function to monitor the healthy of itself.

Under Voltage Function

When power is applied to the relay the green LED(Healthy) will start flashing (watchdog function is working), simultaneously the yellow LED(Un) will light up to show that the DC voltage is on normal condition or the input voltage exceeds the pickup setting (P/U). When the monitor voltage falls below the dropout setting (D/O), the time delay is initiated and the red LED (27 - Under voltage LED display) start flashing until time delay reached the set point value.(the response time delay of the relay can be adjusted between 0 to 60 seconds) Then the LED stop flashing but steady on, simultaneously with relay energizes or switches to its operating position. The relay will reset once the monitored voltage rises above the pickup setpoint, the time delay is initiated and the yellow LED (Un, P/U) start flashing until time delay reached the set point value. Then the LED stop flashing but steady on, simultaneously with relay reset to normal.

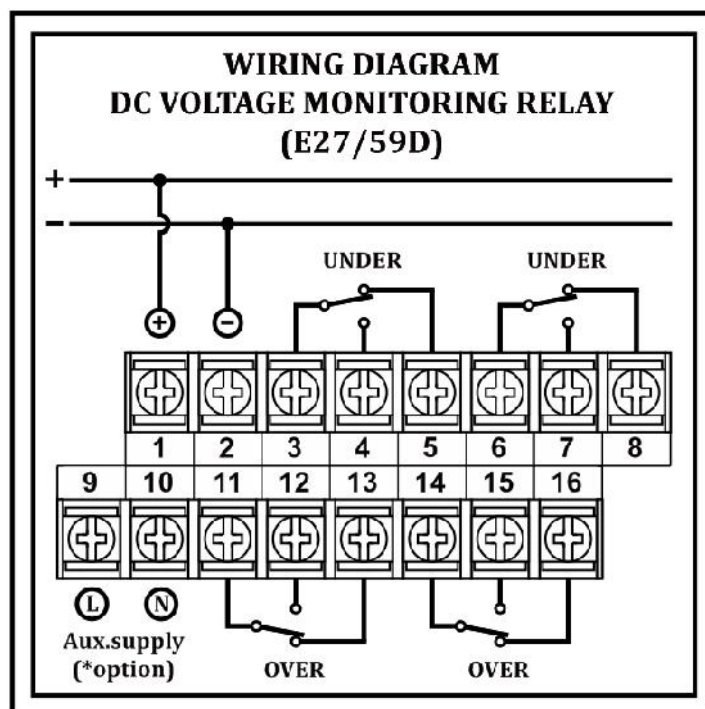
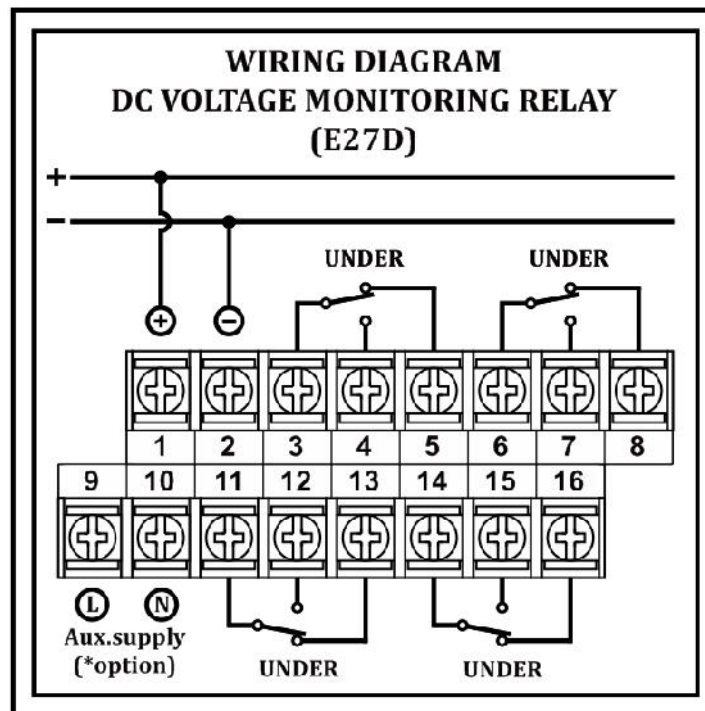
Over Voltage Function

In case of voltage incread to the over voltage set point the orange LED (over) will flashing to show that voltage had reached the set point value until the set up time delay is time out than the orange LED (over) stop flashing but study on and over voltage contact output close or become NC status.

Technical Data

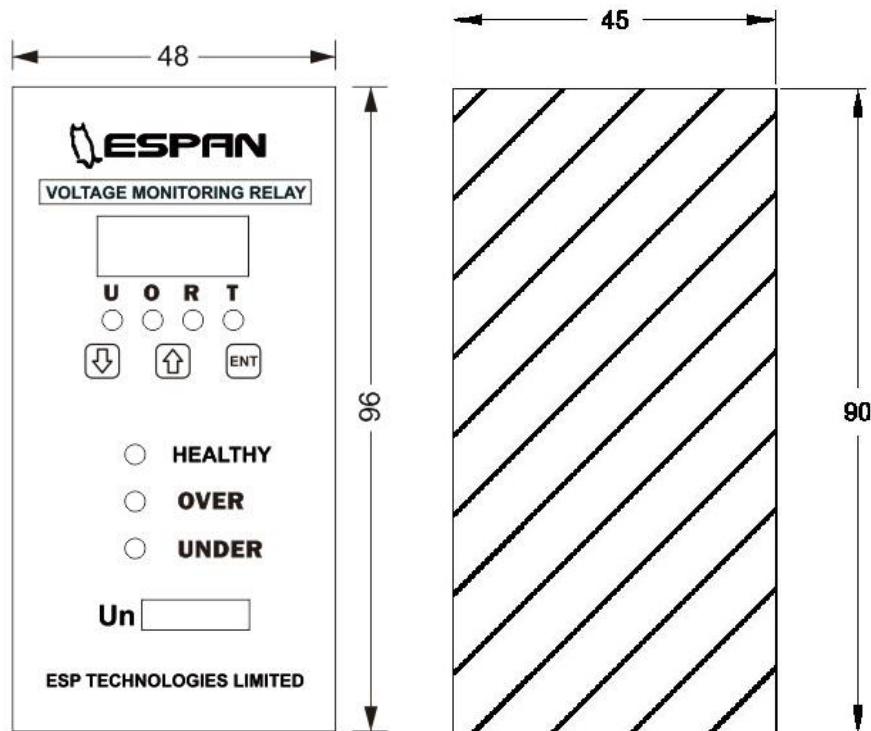
Input voltage	24, 48, 110, 125, 220VDC
Under voltage setting range Accuracy class 3% (of reading)	24VDC : 18 - 30VDC
	48VDC : 36 - 60VDC
	110VDC : 90 - 150VDC
	125VDC : 90 - 150VDC
	220VDC : 150 - 250VDC
Response time delay setting range	0 - 60 seconds
Operating time accuracy (of reading)	±3%
Burden	< 5VA
Overload	1.2 x Un continuously
	2.0 x Un for 3 seconds
Relay output	4CO
Outputs relay contact	5A at 240Vac non - inductive
Auxiliary power supply (Option)	Self supply
	(AC 100 - 250V)
Operating temperature	0 - 55°C
Storage temperature	Up to 70°C
Relative humidity	Up to 90% (no dew drop)
Function indicator (E27D)	Healthy(LED color: Green)
	Un (P/U) (LED color: Orange)
	27 (D/O) (LED color: Red)
Function indicator (E27/59D)	Healthy (LED color: Green)
	Over (LED color: Orange)
	Under (LED color: Red)

Connection Diagrams



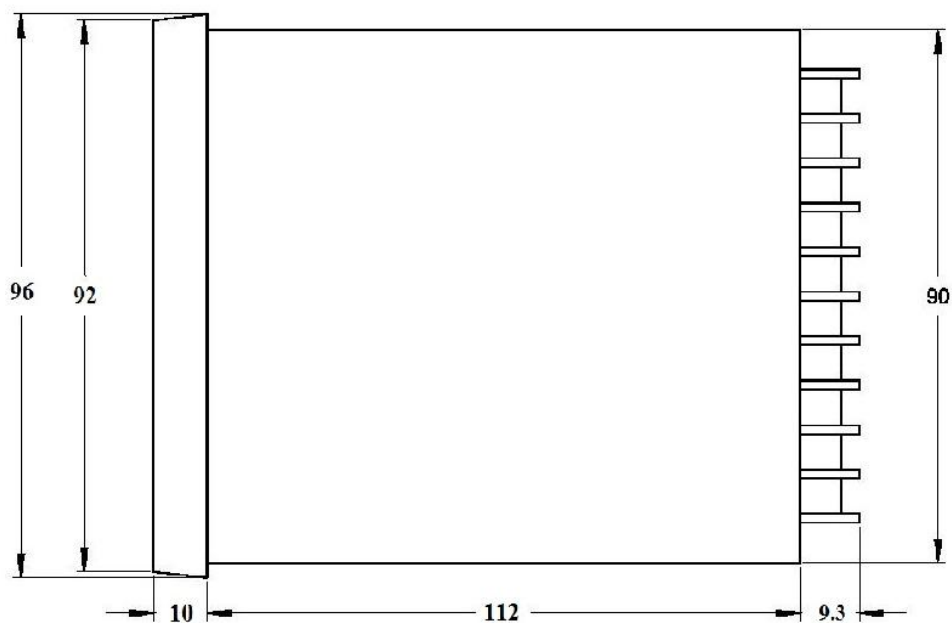
Flush mounting type

Dimension



Front view

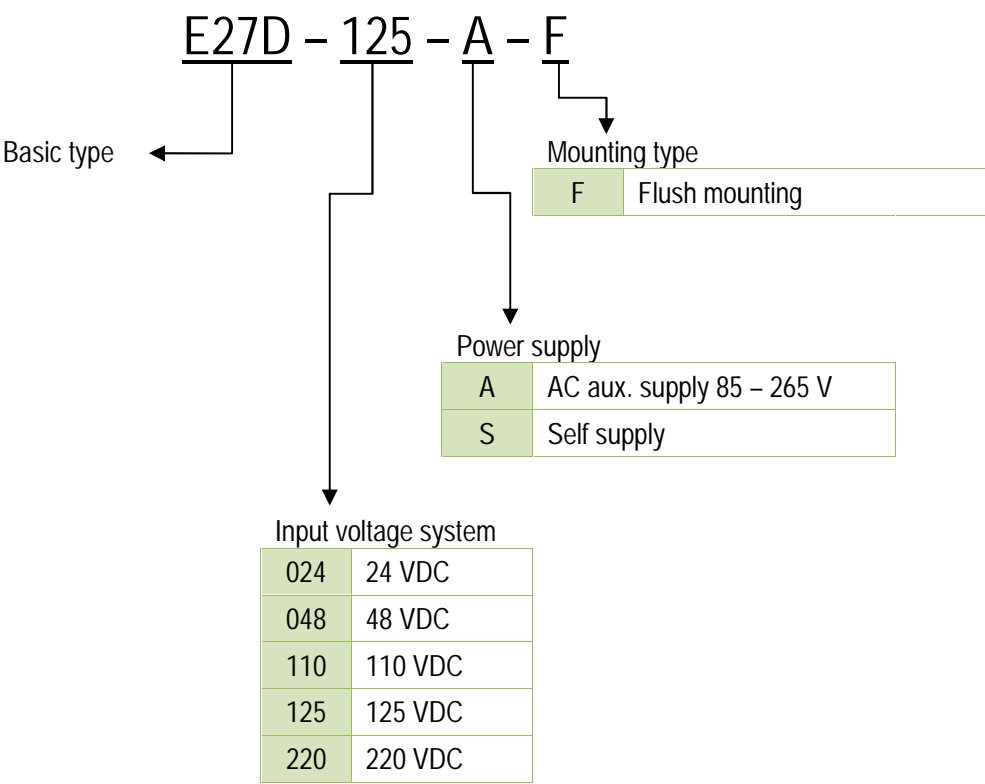
Cut out

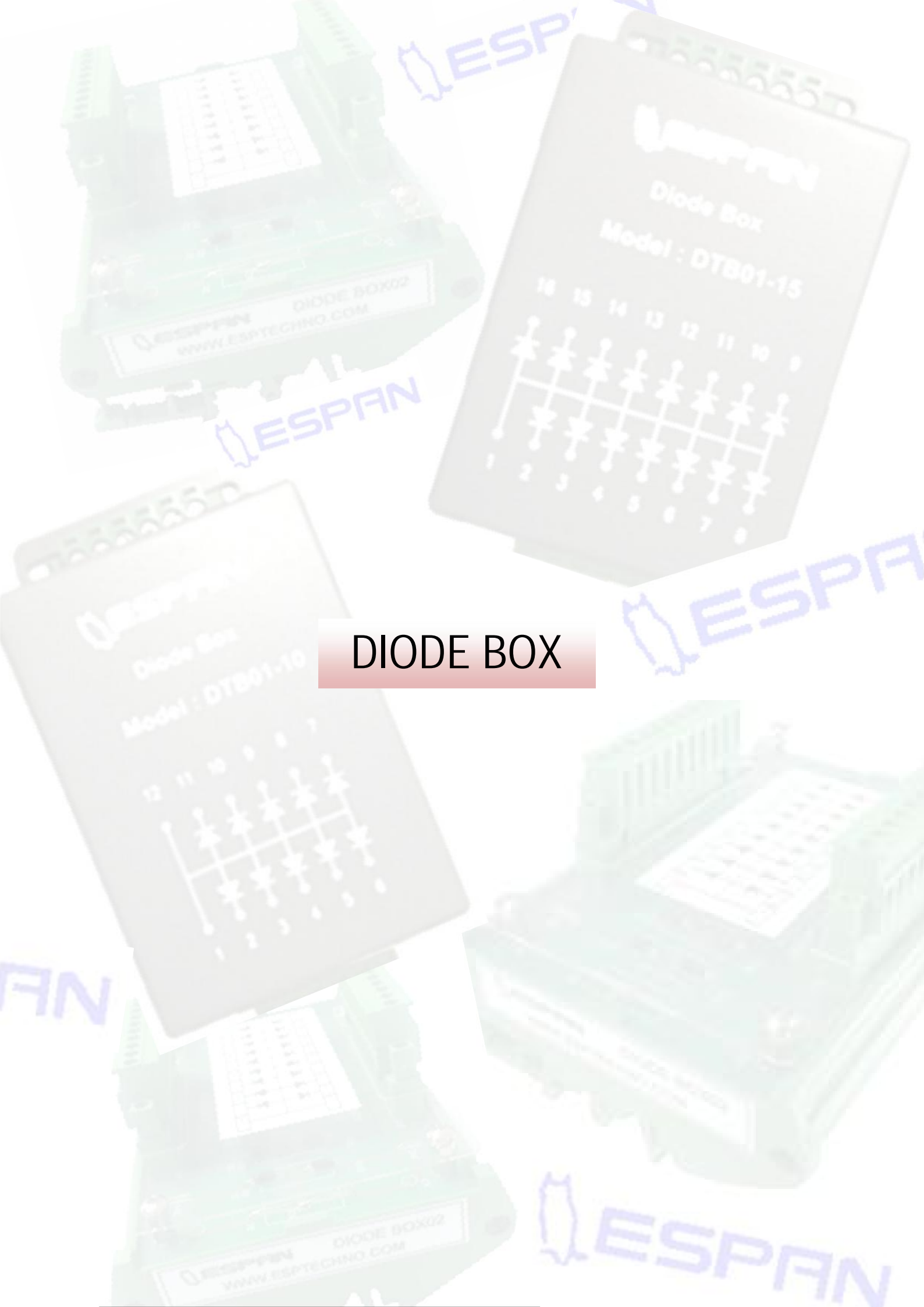


Side view

Flush mounting type

Product Coding





DIODE BOX



Description

Diode box is use for rectifier, polarity reverse protect, suppressor spike voltage from DC relay coil (Back EMF), blocking DC volt, bypass DC volt etc. Safety from electric shock and easy to install with din rail mount or surface mount. High current circuit, 1A or 3A (specify when order).

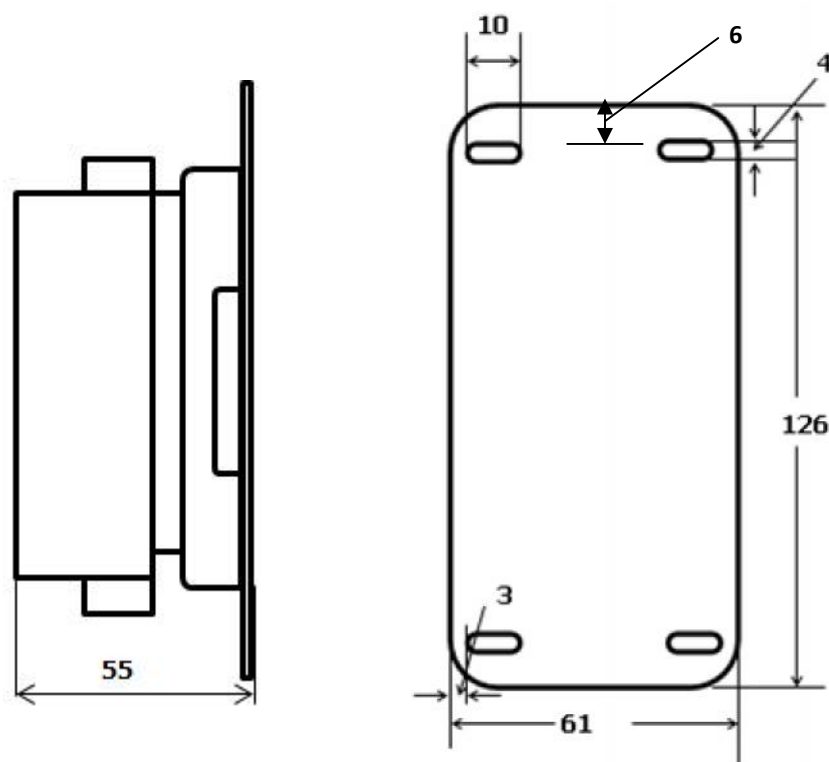
Features

- ✓ 10 or 15 Chanel of Diode
- ✓ High current circuit (1A or 3A)
- ✓ Low forward voltage drop
- ✓ High surge current duration
- ✓ High reliability and stability
- ✓ Easy install with din rail mount & surface mount.

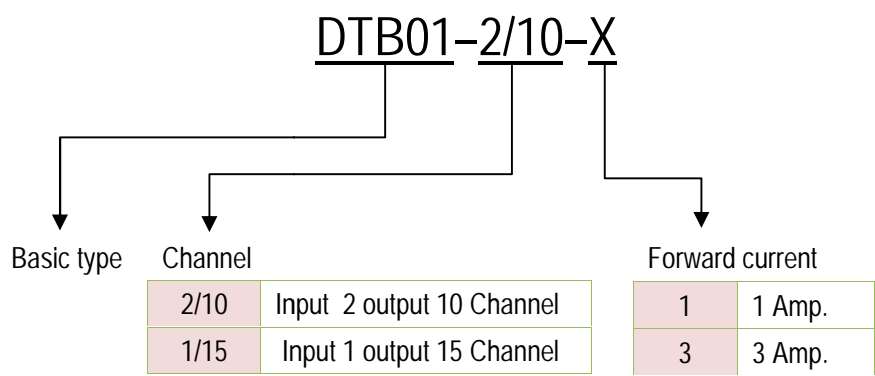
Specification

Type	D - BOX
Input / Output	2/10 , 1/15 Channel
Power Rating	1A , 3A
Reverse Voltage	1,000V
Insulation	100 M at DC 500V
Ambient temp.	0°C ~ 60°C
Storage temp.	-20°C ~ 85°C

Dimension



Product Coding





Description

Diode box is use for rectifier, polarity reverse protect, suppressor spike voltage from DC relay coil (Back EMF), blocking DC Polarity, bypass DC volt, etc. Easy to install with din rail mount. High current circuit 1A or 3A (specify when order).

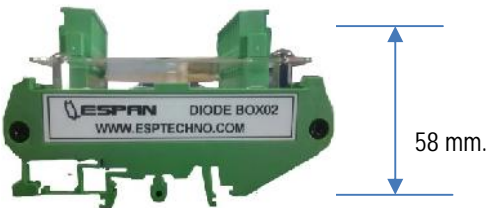
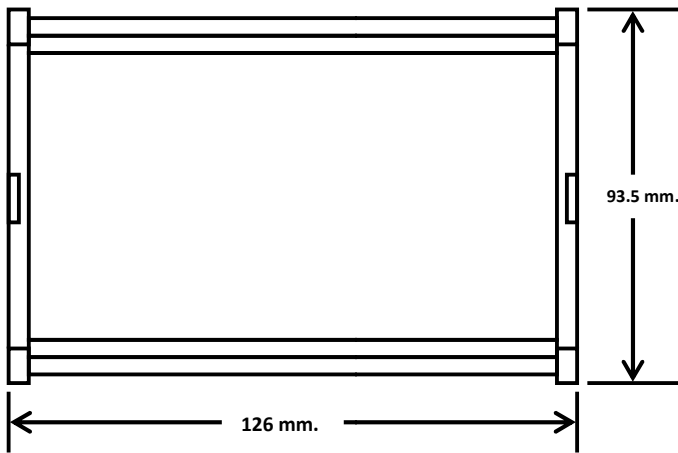
Features

- ✓ 18 Chanel Diode
- ✓ High current (1A, 3A)
- ✓ High reliability
- ✓ Low forward voltage drop
- ✓ High surge current duration
- ✓ Easy install with din rail mount.

Specification

Type	D-BOX
Channel	18 Channel
Power Rating	1A , 3A
Reverse Voltage	1,000V
Insulation	100 M at DC 500V
Ambient temp.	0°C ~ 60°C
Storage temp.	-20°C ~ 85°C

Dimension



Product Coding

