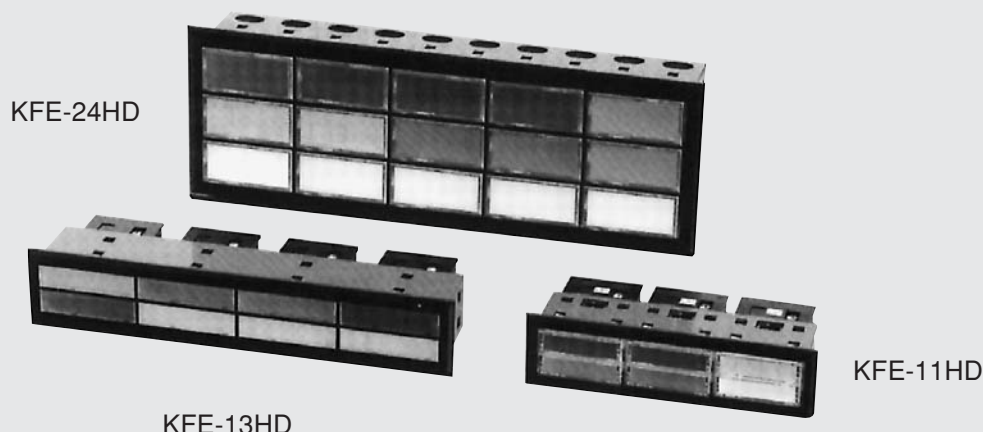


# LED Annunciator Lights

## KFE-HD Series



### ■ Features

- A variety of lighting areas, ranging from 8 × 34mm to 18 × 42mm are available.
- Five vivid lighting colors are available: milky white, red, green, orange, and yellow.
- Along with full voltage models, separate type adapters are available to provide access to various power sources.
- A built-in protective diode efficiently resists reverse voltage.
- A short bar makes wiring much easier.
- RoHS directive compliant .

### ■ Model Designation

**KFE -** ※1  (high) ×  (wide) - **4** ※2

Model Name
No. of Windows
No. of Windows
Rated Voltage
Lighting Color

4: 24V DC

※1

Model Name	Display Panel Size	Lighting Method
<b>11HD</b>	11 × 40mm	Full window/one color
<b>13HD</b>	13 × 48mm	
<b>24HD</b>	24 × 48mm	

Note: The bezel color is black.

※2

Code	Lighting Color
<b>W</b>	Milky white
<b>R</b>	Red
<b>G</b>	Green
<b>O</b>	Orange
<b>Y</b>	Yellow



- When used in a circuit with induced or leakage current, the LED may light unintentionally. To prevent this malfunction, insert a resistor parallel to the indicator terminal.
- Use a separate adapter for models with rated voltage of 100V DC or 200V AC, when an attachable adapter is not being used. (see page 2-40)
- See page 2-45 for the possible number of annunciator lights that can be produced.

## ■ Coding Example for Lighting Color

H Type →		No. of Windows				
		1	2	3	4	
No. of Windows	1	W	R	G	O	
	2					
	3					

The figure to the left is a coding sample of 1 vertical window of 4 horizontal windows, indicating the lighting color.

## ■ Specifications

Item \ Model	KFE-11HD	KFE-13HD	KFE-24HD
Rated Voltage	24V DC±10%		
Rated Current	15mA	20mA	
Insulation Resistance	100MΩ between live parts (unit - unit) measured by a 500V DC megohmmeter 100MΩ between live parts and ground (unit - display box) measured by a 500V DC megohmmeter		
Withstand Voltage	2000V AC for one minute between live parts (unit - unit) 2000V AC for one minute between live parts and ground (unit - display box)		
Heat Resistance	For 2 hours at −40 ±3°C and 2 hours at 70 ±3°C		
Humidity Resistance	For 48 hours at 40 ±2°C and 95% RH		
Vibration Resistance	3-dimensional vibration for 1 hour with a sweep time of 1 minute (amplitude: 1.5mm, frequency: 10~50Hz)		
Shock Resistance	3-dimensional shock of 500 m/s <sup>2</sup> 5 times to all 6 surfaces		
Operating Environment	Temperature: −10~40°C, Humidity: 45~85% RH (No freezing or condensation)		
Reverse Voltage	400V		
Lighting Color	Milky white, red, green, orange, yellow		
Panel Thickness	1~6mm	1~5mm	
Wiring	M3 × 6 screws (recommended torque: 0.6~0.9N·m)		
Applicable Standard	JIS C8151 for industrial indicators		
Weight (g)	22.4 × No. of windows + 56	35.5 × No. of windows + 27	45.5 × No. of windows + 70

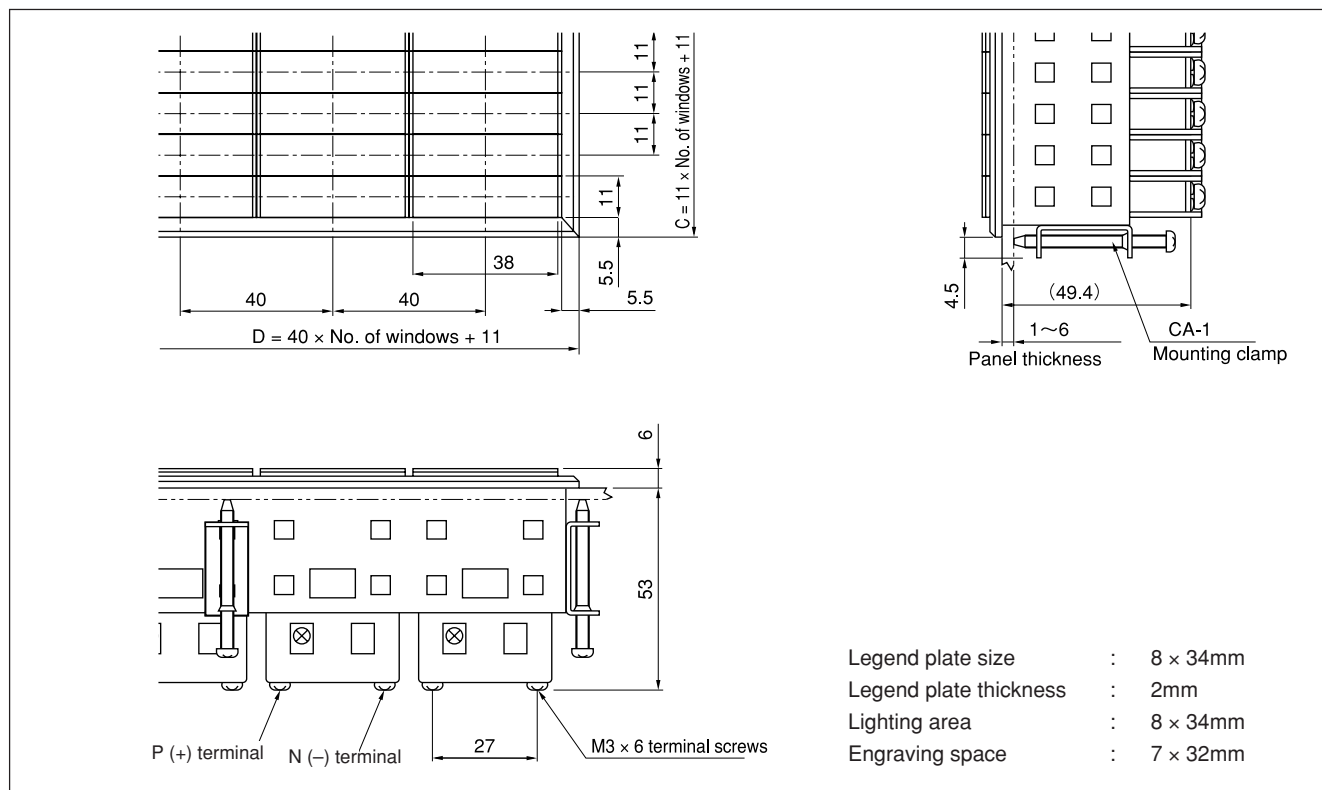
## ■ Materials

Item	Model	KFE-11HD	KFE-13HD	KFE-24HD
Lens		Polycarbonate resin	(transparent)	UL94V-2
Lens Frame		—	Polycarbonate resin UL 94 (black)	—
Legend Plate		Acrylic board (formalized)	(milky white)	2mm
Filter		Acrylic board (formalized)	(transparent, red, green, orange, yellow)	1mm
Bezel		ABS resin	(black)	UL94HB
Metal Box		Steel sheet	(black)	
Reflector		Polycarbonate resin	(white)	
Terminal Screw		Carbon steel	(zinc plated with chrome treatment)	M3 × 6
Mounting Clamp		Steel sheet	(zinc plated with chrome treatment)	
Mounting Screw		Carbon Steel	(zinc plated with chrome treatment)	M3.5 × 40

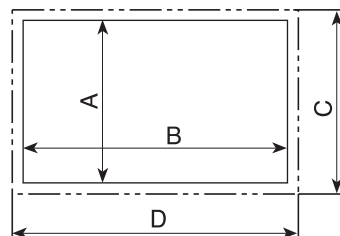
Accessories	KFE-11	KFE-13	KFE-24
● Mounting Clamp	CA-1	CA-1	CA-1
● Short Bar	J-11	J-13	J-24

## KFE-11HD

### ■ Dimensions



### ■ Panel Cut and External Dimensions



**Calculating Panel Cut Dimensions** (unit: mm,  $\pm 0.5$ )

$$A = 11 \times \text{No. of windows (vertical)} + 4$$

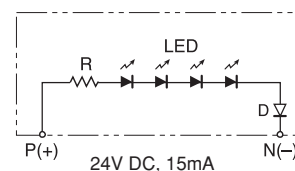
$$B = 40 \times \text{No. of windows (horizontal)} + 4$$

**Calculating External Dimensions** (unit: mm)

$$C = 11 \times \text{No. of windows (vertical)} + 11$$

$$D = 40 \times \text{No. of windows (horizontal)} + 11$$

### ■ LED Unit Circuit Diagram



LED : Light Emitting Diode  
 R : Resistor  
 D : Protective Diode

### ■ Dimension Tables

Vertical Windows

Windows	Panel Cut Dimensions A $\pm 0.5$	Dimensions C
2	26	33
3	37	44
4	48	55
5	59	66
6	70	77

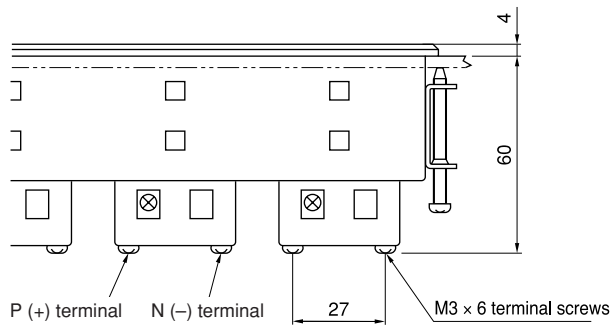
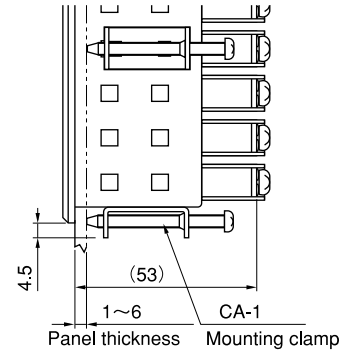
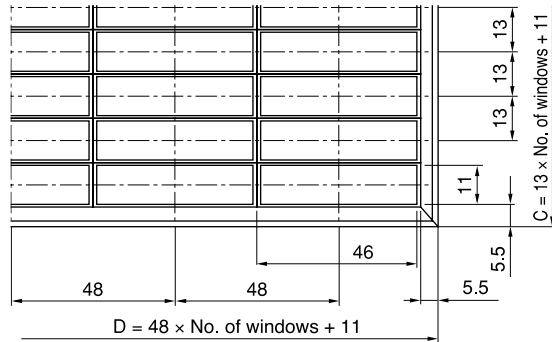
• 1 vertical window is not available.

Horizontal Windows

Windows	Panel Cut Dimensions B $\pm 0.5$	Dimensions D
1	44	51
2	84	91
3	124	131
4	164	171
5	204	211
6	244	251
7	284	291

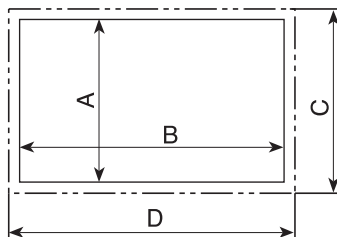
# KFE-13HD

## ■ Dimensions



Legend plate size	: 11 × 46mm
Legend plate thickness	: 2 mm
Lighting area	: 11 × 46mm
Engraving space	: 10 × 44mm

## ■ Panel Cut and External Dimensions



**Calculating Panel Cut Dimensions** (unit: mm, ±0.5)

$$A = 13 \times \text{No. of windows (vertical)} + 4$$

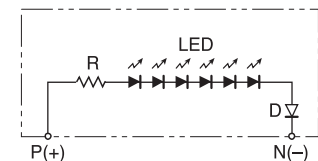
$$B = 48 \times \text{No. of windows (horizontal)} + 4$$

**Calculating External Dimensions** (unit: mm)

$$C = 13 \times \text{No. of windows (vertical)} + 11$$

$$D = 48 \times \text{No. of windows (horizontal)} + 11$$

## ■ LED Unit Circuit Diagram



24V DC, 20mA

LED	: Light Emitting Diode
R	: Resistor
D	: Protective Diode

## ■ Dimension Tables

Vertical Windows

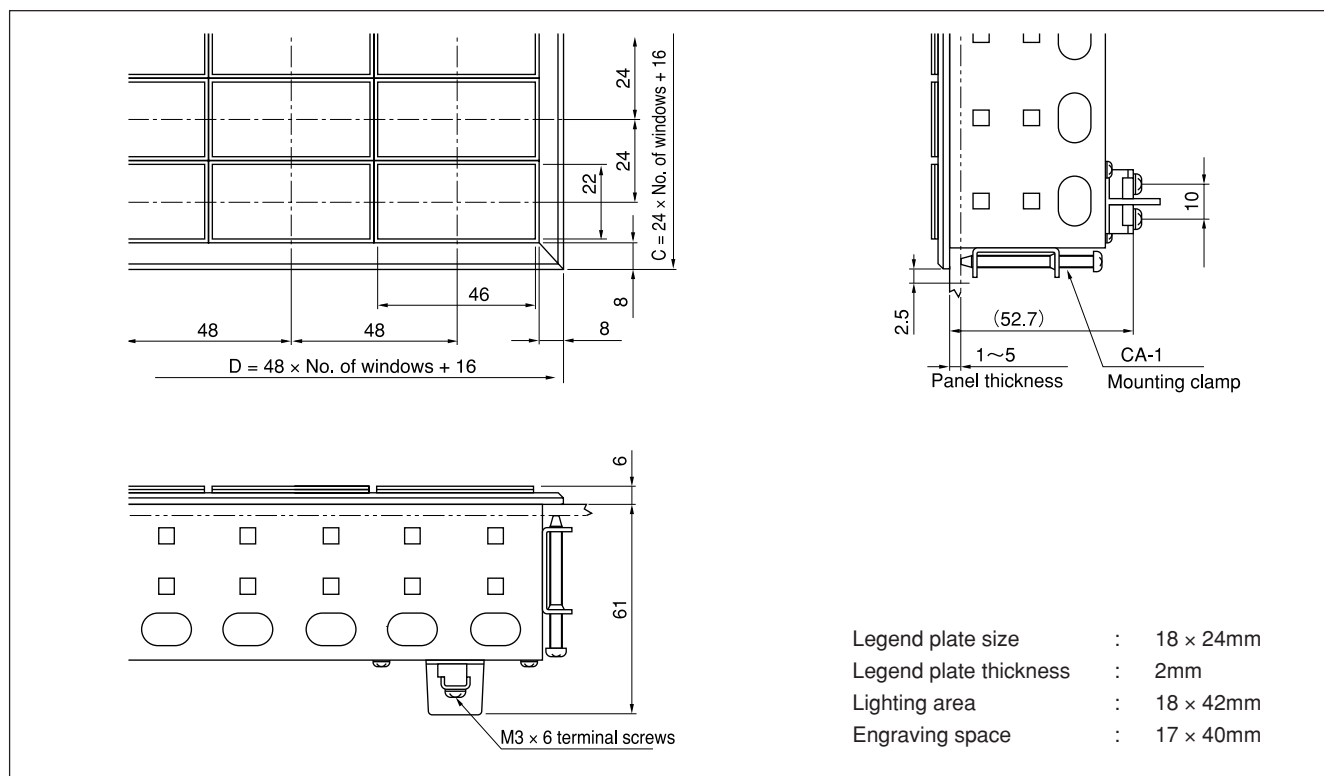
Windows	Panel Cut Dimensions A±0.5	Dimensions C
1	17	24
2	30	37
3	43	50
4	56	63
5	69	76
6	82	89

Horizontal Windows

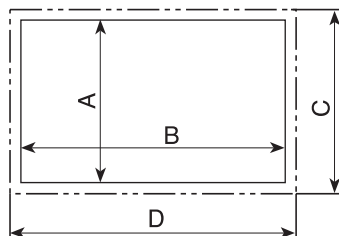
Windows	Panel Cut Dimensions B±0.5	Dimensions D
1	52	59
2	100	107
3	148	155
4	196	203
5	244	251
6	292	299
7	340	347

## KFE-24HD

### ■ Dimensions



### ■ Panel Cut and External Dimensions



Calculating Panel Cut Dimensions (unit: mm,  $\pm 1$ )

$A = 13 \times \text{No. of windows (vertical)} + 5$

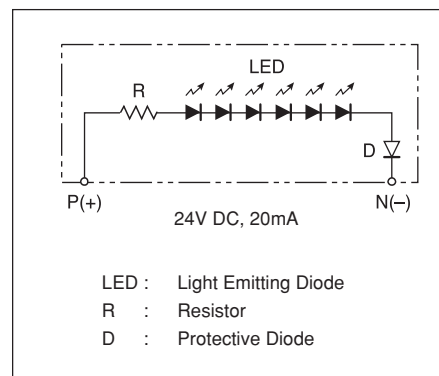
$B = 48 \times \text{No. of windows (horizontal)} + 5$

Calculating External Dimensions (unit: mm)

$C = 24 \times \text{No. of windows (vertical)} + 16$

$D = 48 \times \text{No. of windows (horizontal)} + 16$

### ■ LED Unit Circuit Diagram



### ■ Dimension Tables

Vertical Windows

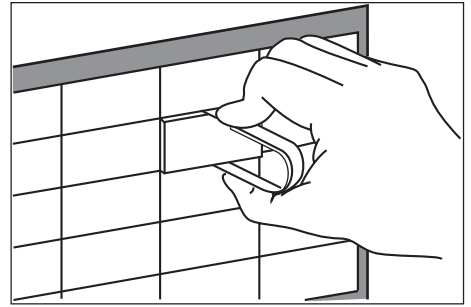
Windows	Panel Cut Dimensions $A \pm 1$	Dimensions C
1	29	40
2	53	64
3	77	88
4	101	112
5	125	136
6	149	160

Horizontal Windows

Windows	Panel Cut Dimensions $B \pm 1$	Dimensions D
1	53	64
2	101	112
3	149	160
4	197	208
5	245	256
6	293	304
7	341	352
8	389	400
9	437	448
10	485	496

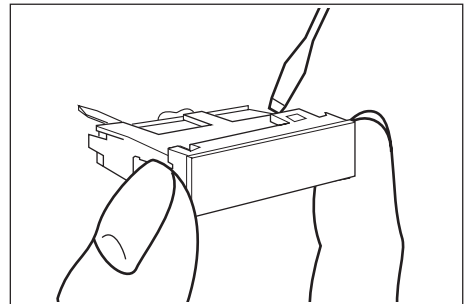
## ■ Removing LED Lens

- For KFE-11HD and 13 HD, insert the removing tool (KX-9) in the space at the side of the lens and pull out.  
For KFE-24 HD, insert the removing tool (KX-1) in the space at the side of the lens and pull out.
- When mounting, insert with the letters TOP on the reflector facing up.



## ■ Removing Lens, Legend Plate, and Filter

- An LED unit consists of a lens, legend plate, filter, and reflector (KFE-13HD also has a lens frame). The lens reflector sections (lens frame and reflector for KFE-13HD) are engaged. To remove the legend plate and filter, insert a flat-head screwdriver into the joining part and slightly lift up.



## ■ Mounting to the Panel

- Insert the unit from the front with terminal section "P" facing up. From the back, attach the hook of the mounting clamp to the square hole on the frame board tightly screws.
- Place the mounting clamp (CA-1) evenly around the display lamp, Fasten with the Recommended torque 0.4~0.5N·m.

## ■ Wiring

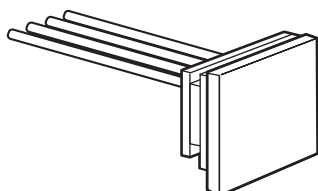
- In accordance with the P/N polarity indication of the terminal section, tighten the terminal screws (M3 × 6) to the application terminal. Recommended torque is between 0.6~0.9 N·m.

## Accessories & Replacement Parts

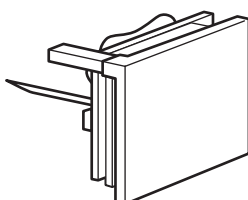
### LED Units (UN Model)

#### ■ Unit Configuration

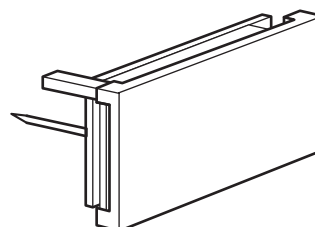
▼ UN-20F



▼ UN-30F



▼ UN-30H



#### ■ Model Designation

One color/full window

UN - ※1 - ※2 A - ※3

※1

Code	Applicable Models
20	20
30	30

Two colors/split window

UN - ※1 - ※2 B - ※3 + ※3

Left side                      Right side  
facing the lamp              facing the lamp

※2

Code	Display Panel
F	FD
H	HD

Alternate colors/full window

UN - ※1 - ※2 C - R/ + ※3

Color other than red

※3

Code	Lens Color
W	Milky white
R	Red
G	Green
O	Orange
Y	Yellow

#### ■ Unit Chart

Model	Lighting Method	Diagonal Types	Weight
UN-20FA		—	2.7 g
UN-20FC			
UN-30FA			6.4 g
UN-30HA			14.0 g
UN-30HB			
UN-30HC			

## Accessories & Replacement Parts

### LED Units (UA Model)

#### ■ Model Designation

UA - ※1 D ※2

※1




Code	Applicable Models
11H	11
13H	13
24H	24

※2

Code	Lens Color
W	Milky white*
R	Red
G	Green
O	Orange
Y	Yellow

\* The milky white is the similar color to that of incandescent lamps.

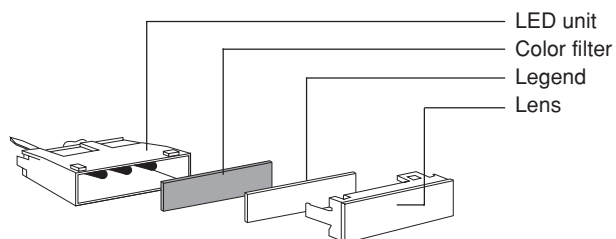
#### ■ Unit Charts

Model	Lighting Method	Diagonal Types	Lens Frame	Weight
UA-11HDA		—	—	7g
UA-13HDA		—	Black	12g
UA-24HDA		—	—	15g

#### ■ Unit Configuration

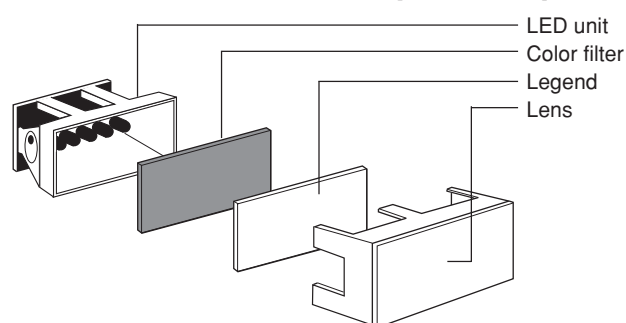
##### ▼ UA-11HD

[LED Unit Set]



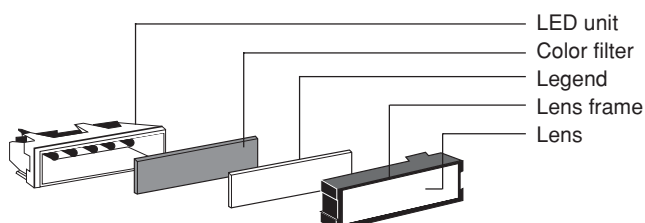
##### ▼ UA-24HD

[LED Unit Set]



##### ▼ UA-13HD

[LED Unit Set]



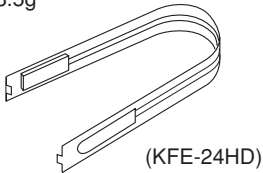


# Accessories & Replacement Parts

## Tools for Removing LED Units

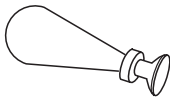
▼ KX-1

Weight: 8.5g



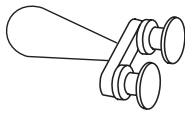
▼ KX-7

Weight: 8.4g



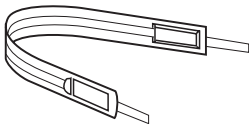
▼ KX-7W

Weight: 11.8g



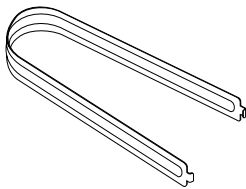
▼ KX-9

Weight: 6.3g

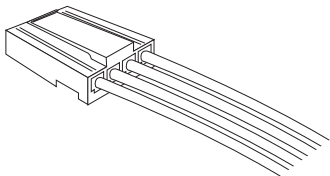


▼ KX-20

Weight: 8.5g



## Wire Harness FA (W) 20F type only



■ Model Designation

**WH - 20 - 2**

Length of lead wire: 2 meters (standard)

Model Name

■ Parts

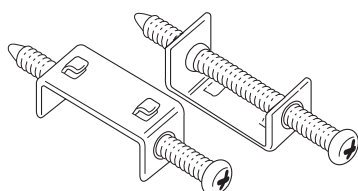
Housing	P I 011-04F	Sumiko Tec
Receptacle	702062-2M	Sumiko Tec
Wire	0.3 mm <sup>2</sup>	PVC wire blue

## Accessories & Replacement Parts

### Mounting Clamp

## ▼ CA-1

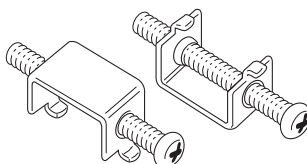
Weight: 6.2g



(FAW30FD/ FAW30HD)

## ▼ CA-2

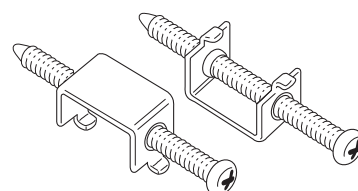
Weight: 5.9g



(FA30FD/ FA30HD)

## ▼ CA-3

Weight: 5.3g



(FA(W)20FD)

**Note:** Use torque of 0.4~0.5N·m.

### Short-circuiting Bar

## ▼ J-11



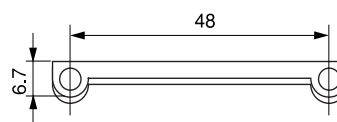
(KFE-11HD)

## ▼ J-13



(KFE-13HD)

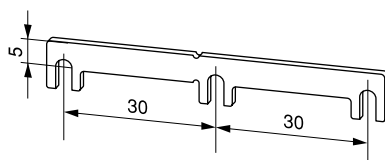
## ▼ J-24



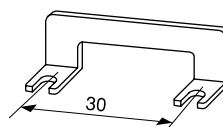
(KFE-24HD)

Item \ Model	J-11	J-13	J-24
Current	8A		3A
Weight (g)	0.7	0.9	0.7
Materials	Brass (nickel plating)		

## ▼ J-30A



## ▼ J-30C



(FA(W)30FD/ FA(W30HD))

# ET/ER/EB-8 Separate type adapters



## ■ Features

- Separate type adapter E□-8 is small in size and corresponds to DIN rail (AR-LH).
- As three types are available (with transformer, with bridge, with resistor), the use of various types of power supplies and voltages is possible.

## ■ Model Designation

※1 - 8 ※2 ※3 ※4

※1	※2			※3		※4	
Model Name	Circuit Type	Code	Rated Voltage	Code	Rated Secondary Voltage	Code	Rated Secondary Current
ET	Transformer/ Bridge	6	48V AC	1	6V	2	17-20mA
				2	12V	2	17-20mA
						4	34-40mA
		7 8 9 U	100V AC 110V AC 200V AC 220V AC	3	18V	2	17-20mA
				4	24V	0	9-11mA
						1	13-15mA
						2	17-20mA
						3	26-28mA
						4	34-40mA
						8	68-80mA
5	15V					3	26-28mA
ER	Resistor	6 7 8	48V DC 100V DC 110V DC	1	6V	2	17-20mA
				2	12V	2	17-20mA
						4	34-40mA
		6 7 8 G	48V DC 100V DC 110V DC 125V DC	3	18V	2	17-20mA
				4	24V	2	17-20mA
						3	26-28mA
				4	34-40mA		
		5	15V	3	26-28mA		
		6 7 8 G 9 U	48V DC 100V DC 110V DC 125V DC 200V DC 220V DC	4	24V	0	9-11mA
						1	13-15mA
EB	Bridge	4	24V AC	4	24V	8	less than 80mA
	Resistor/Bridge	6	48V AC/DC	1	6V	2	17-20mA
				2	12V	2	17-20mA
						4	34-40mA
		7 8	100V AC/DC 110V AC/DC	3	18V	2	17-20mA
				4	24V	2	17-20mA
						4	34-40mA
		5	15V	3	26-28mA		
		6 7 8 9 U	48V AC/DC 100V AC/DC 110V AC/DC 200V AC/DC 220V AC/DC	4	24V	0	9-11mA
						1	13-15mA

Production on orders

## ■ Specifications

Item	Model	ET-8	ER-8	EB-8
Rated Voltage		48V AC ±10%	48V DC ±10%	24V AC/DC ±10%*1
		100V AC ±10%	100V DC ±10%	48V AC/DC ±10%
		110V AC ±10%	110V DC ±10%	100V AC/DC ±10%
		125V DC ±10%	125V DC ±10%	110V AC/DC ±10%
		200V AC ±10%	200V DC ±10%	200V AC/DC ±10%
		220V AC ±10%	220V DC ±10%	220V AC/DC ±10%
Secondary Voltage		24V DC		
Rated Secondary Current		13~15mA	12~15mA 17~20mA 34~40mA	13~15mA
		17~20mA		17~20mA
		26~28mA		34~40mA
		34~40mA		80mA (24V AC only)
		68~80mA		
Capacity		2VA	6W or 12W *2	
Transformer Coil		multiple coils	—————	
Insulation Resistance		primary – secondary coil primary coil – core secondary coil – core	100MΩ or more measured by 500V megohmmeter	
Withstand Voltage		primary - secondary coil	2000V AC for one minute	
		primary coil - core	2000V AC for one minute	
		secondary coil - core	1000V AC for one minute	
Operating Environment		Temperature: −10~40°C, Humidity: 45~85% RH (No freezing or condensation)		
Wiring		M3.5×8 self-up screws (torque:1~1.3N·m)		
Weight		107g	49g	50g

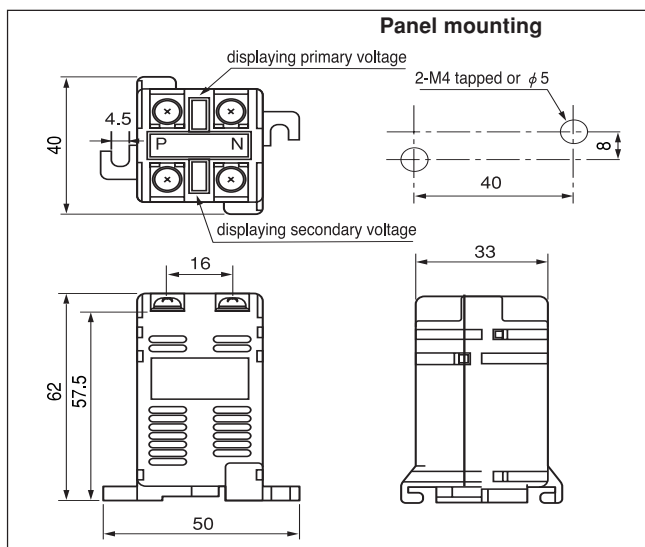
\*1 Only bridge circuits are available for 24V AC.

\*2 12W is the rated capacity for 100V, 110V/36mA of ER-8 or EB-8.

## ■ Materials

Terminal Screws	Carbon steel	M3.5 $\times$ 8 (zinc plated with chrome treatment)
Mounting Clamp	Brass or phosphor bronze	(nickel plated)
Case	Polycarbonate resin	(smoke)
Model Name Seal	YUPO#80	

## ■ Dimensions



# EC-8 Separate type converters

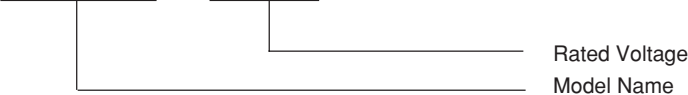


## ■ Features

- Separate type adapters for LED annunciator lights.
- Used for a wide AC/DC input voltage regulation range.
- Inner transformer insulates primary and secondary voltages.
- Brightness of LED will not change even when the input voltage changes because output voltage is constant.
- Mounting DIN rail (AR-LH) is possible.

## ■ Model Designation

EC - 8 - ※1 - 4



※1

Code	Rated Voltage
7	100V AC/DC
9	200V AC/DC



### NOTICE

- Do not short-circuit secondary terminals during the voltage is applied to the primary terminals. This may damage the inner elements.
- The semiconductors may deteriorate or break when used in circuits with switching surge or inductive lightening surges. As a preventive measure, install a surge prevention element (such as varistors or Z laps) to the indicator terminals.
- Unless otherwise mentioned, all dimensions are indicated in “mm” in this book.

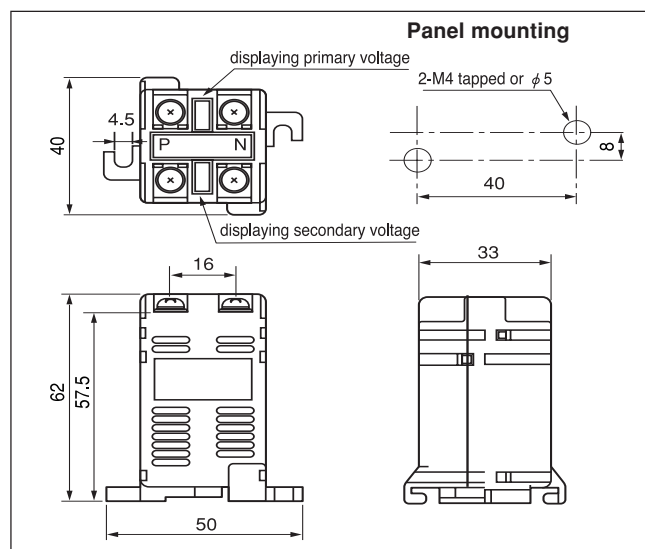
## ■ Specifications

Item		100V	200V
Input	Rated Voltage	100V AC/DC	200V AC/DC
	Rated Current	25mA or less	13mA or less
	Voltage Regulation	90~121V AC/90~150V DC	180~242V AC/180~264V DC
	Frequency	45~440Hz	
	Rush Current	0.3A or less	0.5A or less
Output	Rated Voltage	24V DC	
	Rated Current	40mA or less	
	Constant Voltage	22.8~25.2V (when output current is 10~40mA and Ta = 25°C)	
	Insulation Resistance	100MΩ or more between live parts and ground measured by 500V DC megohmmeter	
Withstand Voltage		Applying 2000V AC for 1 minute between live parts and ground	
Noise Resistance		a: Pulse width 100ns 2000V b: 1.2/50μs 1000V	a: Pulse width 100ns 2000V b: 1.2/50μs 2000V
Lighting Start Voltage		50V AC or more	100V AC or more
Operating Environment		Temperature: -10~40°C, Humidity: 45~85% RH (No freezing or condensation)	
Storage Environment		Temperature: -30~70°C, Humidity: 45~85% RH (No freezing or condensation)	
Wiring		M3.5×8 self-up screws (torque:1~1.3N·m)	
Weight		46g	

## ■ Materials

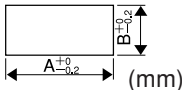
Terminal Screws	Carbon steel	M3.5×10 (zinc plated with chrome treatment)
Mounting Clamp	Brass plate	(nickel plated)
Case	Polycarbonate resin	(smoke)
Model Name Seal	YUPO#80	

## ■ Dimensions



## Accessories & Replacement Parts

### Legend Plates

Item  Model	Applicable Models	Filter Shape		Thickness (mm)	Weight (g)	Material
						
		A	B			
NP-11HD	KFE-11HD	33.8	7.9	2	0.7	Acrylic resin
NP -13HD	KFE-13HD	45.9	10.9	2	1.2	
NP -20F	FA(W)-20F	16	16	1	0.3	
NP -24	KFE-24HD	41.8	18	2	2.0	
NP -30F	FA(W)-30F	25	25	2	1.5	
NP -30H	FA(W)-30H	55	25	2	3.4	
NP -27FD8	KFE-27F□8	26.5	26.5	1.5	1.3	Acrylic resin (moulded)
NP -27HD8	KFE-27H□8	56.5	26.5	1.5	2.8	
NP -37FD8	KFE-37F□8	36.5	36.5	1.5	2.5	
NP -37HD8	KFE-37H□8	76.5	36.5	1.5	5.3	

- In order to change the lighting color, the LED unit must be replaced. Replacement of color filter alone is not sufficient.

## Integration Chart

Model	No. of Vertical Windows	No. of Horizontal Windows
KFE-11HD	72	24
KFE-13HD	60	20
KFE-24H	32	20
FA20F	10	20
FAW20F	10	20
FA30F	33	33
FAW30F	33	33
FA30H	33	16
FAW30H	33	16



#### NOTICE

- The above chart indicates the range of possible integration, not the range of possible continuous lighting.
- Unless otherwise mentioned, all dimensions are indicated in "mm" in this book.