

LKEH



MP3 compatible annunciator with LED Signal Tower



24V Type

105dB at 1m*

MP3 (LKEH-FV)

32 Sounds (LKEH-F□)

IP53

NPN Open Collector



*Actual sound level may vary depending on sound type.

Get the attention you need with PATLITE's Field Programmable LKEH series signal tower with audible alarm hybrid unit.

- Visible from great distance with ultra bright LEDs and 100mm diameter lens.
- Safe for use at high vibration environment with robust 2G vibration resistant design.
- Easy to control with only one common wire for both LEDs and audible signals.
- CE, RoHS, IP53, (UL, c-UL pending).
- Field programmable with SD card. (Sold separately) (LKEH-FV)
Message capacity is up to 64 seconds (64kbit/s) with 5 channels by a bit input and 31 channels by binary input.
- Volume is adjustable from 0 to 105dB (at 1m) to fit various environments.
- Smooth LED lens surface.

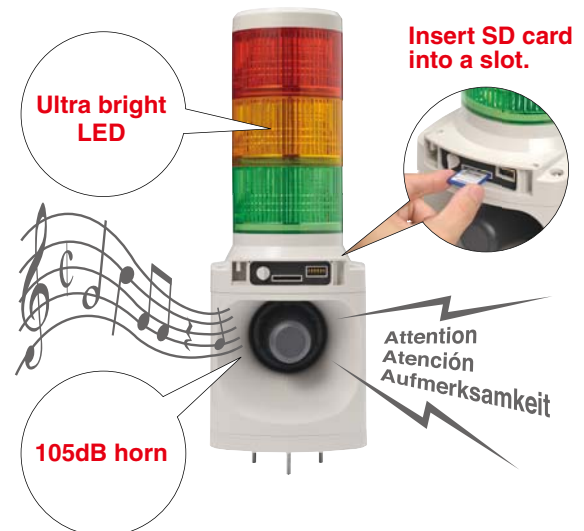
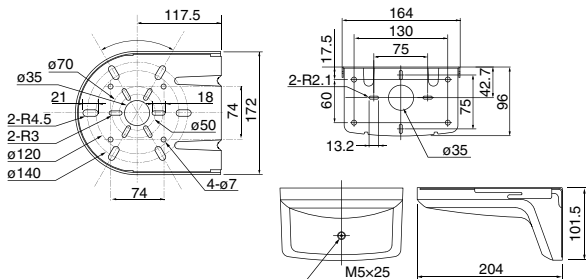
Available by Special Order

- PNP open collector transistor type.

Optional Parts

Wall mount bracket SZ-023

Bracket: steel (powder coating)
Bracket cover: AES resin



Voice Synthesizer (LKEH-FV)

- Total recording time of up to 64 seconds (64kbit/s) can be divided up to 5 channels with a bit input, or 31 channels with binary input.

32 sounds are pre-recorded in one unit (LKEH-FA/FC/FD/FE)

- 32 sounds are pre-recorded in one unit. 4 sound types are available.
- 8 sounds can be played back by a bit input, and 32 sounds by binary input.



T-06B0152
T-0710139
T-0710140

Type A

Beep (slow intermittent horn)	Stutter (rapid intermittent horn)	Bell (clear high pitched bell)	Yelp (rapid siren)
Rapid Hi-Lo	Melody Chime	Synthesized Piano	Synthesized Bell
Stutter (rapid intermittent horn) Bell (clear high pitched bell)	Synthesized Melody Chime	Chime	Call sign
Fur Elise	Maiden's Prayer	Minuet	Annie Laurie
London Bridge is Falling Down	Holdiridia	Mary Had a Little Lamb	Camptown Races
Kuck kuck	Der Schmied im Walde	On the Bridge of Avignon	Daydream Believer
Amaryllis	Mozart Symphony No. 40	Itsy Bitsy Spider	Ich bin ein Musikante
Jeux Interdits	Katuscha	Grandfather's Clock	Ave Maria

Type C

Beep (slow intermittent horn)	Stutter (rapid intermittent horn)	Bell (clear high pitched bell)	Yelp (rapid siren)
Rapid Hi-Lo	Melody Chime	Synthesized Piano	Synthesized Bell
Stutter (rapid intermittent horn) Bell (clear high pitched bell)	Synthesized Melody Chime	Chime	Call sign
Can't Take My Eyes off of You	Top of the World	The Entertainer	Amazing Grace
Amairono Kamino Otome	Les Champs-Elysees	Canon	Rara Sanshain
Uchuusenkan Yamato	Oshiete	Makenaide	Gonna Fly Now (Theme for 'Rocky')
I Don't Want to Miss a Thing	Yozorano Mukou	Aiwa Katsu	Haruyo Koi
Gattsudaze	Odoru Ponpokorin	Imasugu Kisu Mi	Truth

Type D

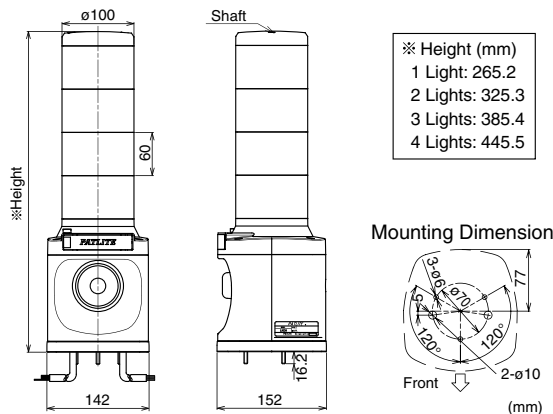
Beep (slow intermittent horn)	Stutter (rapid intermittent horn)	Bell (clear high pitched bell)	Yelp (rapid siren)
Rapid Hi-Lo	Melody Chime	Synthesized Piano	Synthesized Bell
Runner	Mamotte Agetai	Chime	Call sign
Oribiao Kikinagara	A September	Doyoubino Koibito	Akino Kehai
Saafu Tengoku Sukii Tengoku	Iro Howaitoburendo	Happy Birthday	Hi Ho
I've been working on the Railroad	Bear Song	Toys Go Cha Cha Cha	Konnako Irukana
Wiegenlied	Rudolph the Red-nosed Reindeer	She Wore a Yellow Ribbon	Oh My Darling Clementine
Yellow Rose of Texas	Yankee Doodle	When the Saints Go Marching In	Londonderry Air

Type E

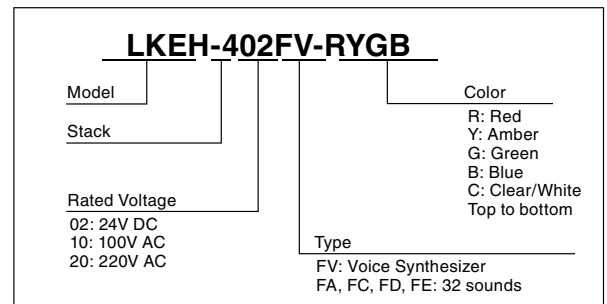
Beep (slow intermittent horn)	Stutter (rapid intermittent horn)	Inverted Reccelle	Annie Laurie
Stutter (rapid intermittent horn)	Synthesized Melody Chime	Galactic Motor	London Bridge is Falling Down
Bell (clear high pitched bell)	Chime	Ringin Phone	Mary Had a Little Lamb
Yelp (rapid siren)	Call Sign	Two Tone	Camptown Races
Rapid Hi-Lo	Train Ride	Alarm Clock	Amaryllis
Melody Chime	Galloping Hi-Lo	Ringin Hi-Lo	Mozart Symphony No.40
Synthesized Piano	Alien Chatter	Fur Elise	Ave Maria
Synthesized Bell	Falling Crystals	Minuet in G	Grandfather's Clock

PATLITE Corporation has not applied for permission to use certain copyrighted music or songs recorded in LKEH-FA, FC and FD types outside of Japan; therefore, please contact the local copyright association for permission before using the product in case this product is used outside of Japan. LKEH-FE type is recommended for use outside of Japan as this model does not include copyrighted music or songs, and the permission is not require.

Dimensions



How to Order



Note: See page 174 for wiring diagram

LKEH-FV Type

60 flashes per minute						
	Model	Rated Voltage	Voltage Range	Number of stacks	Power Consumption	Mass
Voice Type	LKEH-102FV	24V DC	24V DC±10%	1	14W	1.8kg
	LKEH-202FV			2	16W	2.0kg
	LKEH-302FV			3	18W	2.2kg
	LKEH-402FV			4	20W	2.4kg
	LKEH-110FV	100V AC	100V AC±10%	1	17W	2.5kg
	LKEH-210FV			2	20W	2.7kg
	LKEH-310FV			3	23W	2.9kg
	LKEH-410FV			4	26W	3.1kg
	LKEH-120FV	220V AC	220V AC±10%	1	17W	2.5kg
	LKEH-220FV			2	20W	2.7kg
	LKEH-320FV			3	23W	2.9kg
	LKEH-420FV			4	26W	3.1kg

LKEH-F□ Type

60 flashes per minute						
	Model	Rated Voltage	Voltage Range	Number of stacks	Power Consumption	Mass
Sound Type	LKEH-102FA/FC/FD/FE	24V DC	24V DC±10%	1	10.6W	1.8kg
	LKEH-202FA/FC/FD/FE			2	12.4W	2.0kg
	LKEH-302FA/FC/FD/FE			3	14.2W	2.2kg
	LKEH-402FA/FC/FD/FE			4	16W	2.4kg
	LKEH-110FA/FC/FD/FE	100V AC	100V AC±10%	1	17W	2.5kg
	LKEH-210FA/FC/FD/FE			2	20W	2.7kg
	LKEH-310FA/FC/FD/FE			3	23W	2.9kg
	LKEH-410FA/FC/FD/FE			4	26W	3.1kg
	LKEH-120FA/FC/FD/FE	220V AC	220V AC±10%	1	17W	2.5kg
	LKEH-220FA/FC/FD/FE			2	20W	2.7kg
	LKEH-320FA/FC/FD/FE			3	23W	2.9kg
	LKEH-420FA/FC/FD/FE			4	26W	3.1kg

Audible Alarm with LED Signal Light

Instruction Manual

[TYPE:LKEH]

Thank you very much for purchasing **the Audible Alarm with LED Signal Light**.

Before use, please read this Instruction Manual thoroughly and use the product correctly. In addition, keep this manual in a safe place.

When carrying out maintenance/check, repair etc., be sure to reread this manual.

If an unclear point arises, please inquire to each sales office or technical consultation service written in the last page.

● Safety Precautions

In order to prevent harm on users or other persons and damage on properties, the matters to be kept without fail are explained as follows.

■ The degree of harm and damage that will occur when misuse is made by ignoring the contents of indication is classified and explained by the following indications.



The column with this indication shows the contents in which "possibility of death or being seriously injured is assumed."



The column with this indication shows the contents in which "possibility of being injured or only occurrence of property damage is assumed."

1 Matters to be kept without fail for Safety Purpose



- At the wiring and mounting of products, be sure to cut off power source. There is a risk of electrical shock.
- Do not disassemble or modify the product. There is a risk of fire, electrical shock etc. For repair, check etc of inside the product, please inquire to each sales office or technical consultation service written in the last page.
- Pay attention not to mistake wiring work. If wiring is mistaken, the internal circuit may burn out and it will become a cause of fire.
- Be sure to use the power supply within the allowable voltage range of the product. Otherwise, it may become a cause of fire and/or failure.
- For the installation with execution of work, be sure to ask a professional company. Otherwise, there is a risk of electrical shock, fire and/or falling etc.
- If it is used outside, be sure to perform insulation treatment at the connection part of cables. Otherwise, there is a risk of failure or electric shock.



- Be sure to connect the outside fuse for protection of the power supply circuit and internal circuit of the main body.
- Do not leave or use it under the condition in which the LED light unit and/or head cover are detached. Or else, it may become a cause of failure.

The trouble occurred due to mishandling against the warning and caution matters, and/or due to disassembling, modification, natural disaster etc. cannot be guaranteed. Further, avoid the usage under conditions other than the contents described in this manual.

Request

- Use it in the environment where strong radio waves and/or inductive noise do not exist. Otherwise, there is a risk of noise generation from the horn.
- Use it in the environment where corrosive gas does not exist. Otherwise, it will become a cause of failure.
- In order to avoid electrostatic breakdown, start to work after discharging static electricity which is charged on a human body.
By touching an earthed metallic part with a bare hand, static electricity can be discharged.
- Perform fitting of each part at a recommended torque value.
- Pay attention not to lose the parts such as the hand screw, front covers etc. which are to be detached at performing work.
- If this product is used for the safety-sensitive security purpose, be sure to perform daily check, and establish the system design that can cope with the occurrence of accidental trouble and failure.
- Do not use it at the place where vibration exists that is exceeding the specification. There is a risk of damage and/or falling of the main body.

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LKEH-FE type is recommended for use outside of Japan as this model does not include copyrighted music or songs, and the permission is not required.

2 Indication Method of Models

L K E H - 4 0 2 F A P U L - R Y G B ^{*3)}

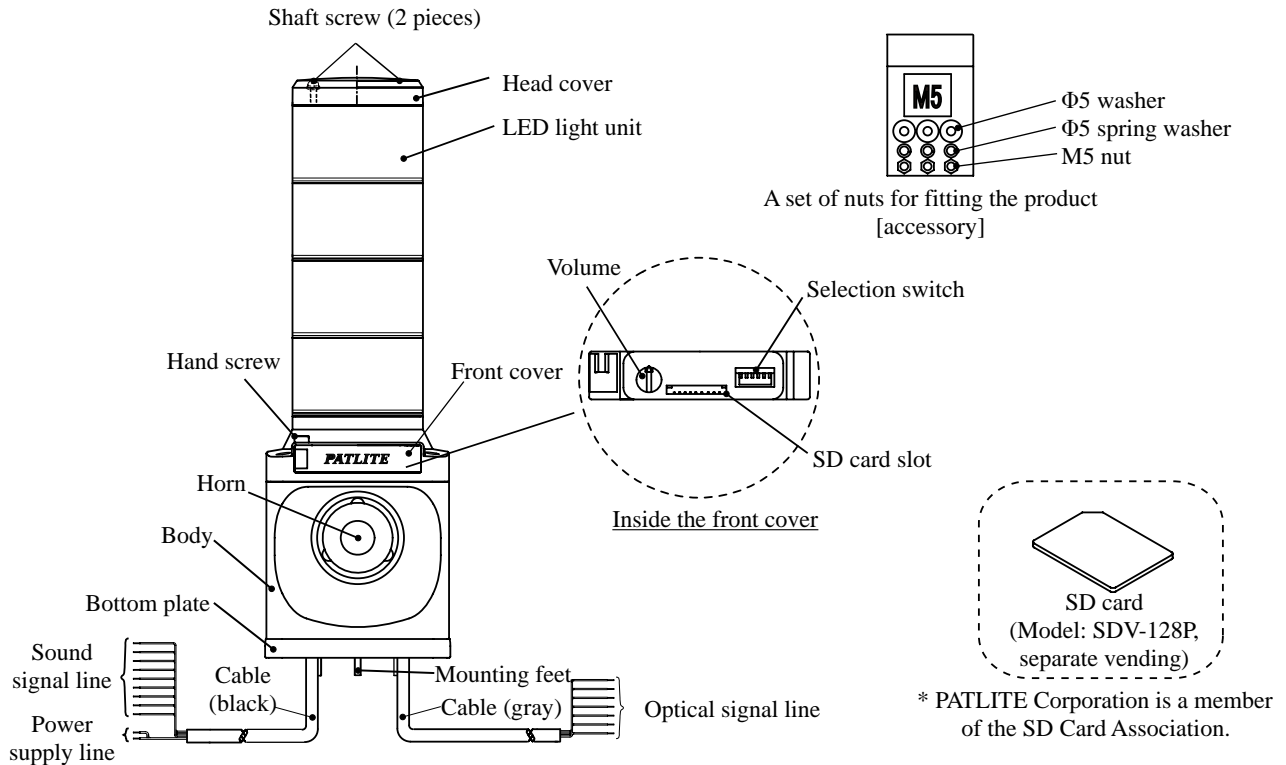
- Number of stacks
1: One stack
2: Two stacks
3: Three stacks
4: Four stacks
- Rated voltage
02: 24V DC
10: 100V AC
12: 120V AC
20: 220V AC
- Sound type
A: Type A
C: Type C
D: Type D
E: Type E
- Connectable transistor
None: NPN type
P: PNP type ^{*1)}
- Standard ^{*2)}
UL: UL standard
- Unit color of the LED light unit
R: Red
Y: Yellow
G: Green
B: Blue
C: White

*1) PNP type is custom made product. Regarding the model number, please inquire to each sales office or technical consultation service.

*2) UL certification product is only model of 24V DC.

*3) In the case of model indication shown at the left column, the coloration of a LED light unit is in the order of red, yellow, green and blue, from the upper stack.

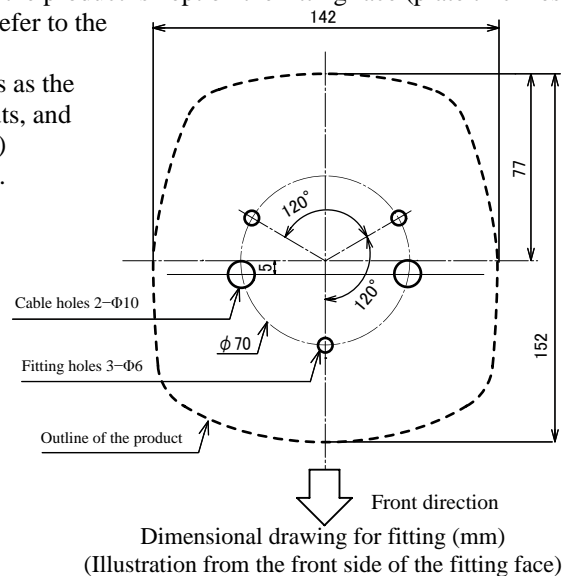
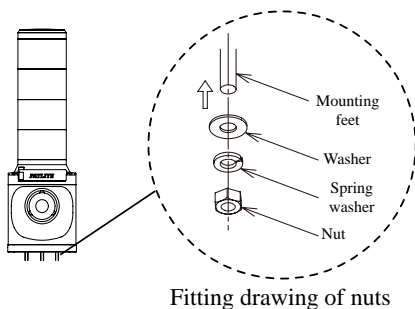
3 Designation of Each Part



4 Fitting Method

Perform fitting work in accordance with the following procedure.

- (1) Confirm that a space of more than outline dimensions of the product is kept on the fitting face (plate thickness: 1 to 10mm), and perform drilling of the fitting holes. (Refer to the dimensional drawing for fitting.)
- (2) Insert the product from the fitting face. Then, fit the nuts as the accessory in the order of the washers, spring washers, nuts, and tighten them. (Recommended tightening torque: 0.7N•m)
- (3) Confirm that the product and the nuts are correctly fitted.

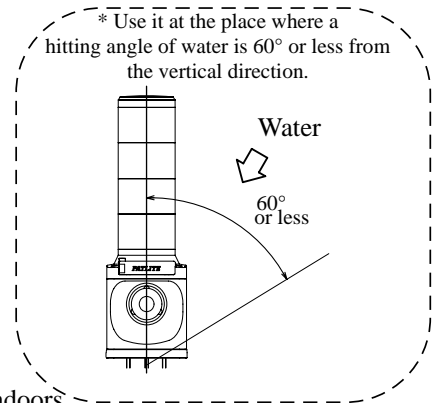


⚠ WARNING

- When fitting the product, be sure to cut off power supply. Otherwise, there is a risk of electrical shock.
- For the installation with execution of work, be sure to ask a professional company. Otherwise, there is a risk of electrical shock, fire and/or falling etc.

⚠ CAUTION

- For the fitting face, keep sufficient strength that can bear the weight of the product. Further, do not use it at the place where vibration exists that is exceeding the specification. Or else, there is a risk of injury due to falling of the product, and/or damage of the product.
- Use all the set of attached nuts, and fix them with recommended torques. Otherwise, there is a risk of injury due to falling of the product, and/or damage of the product.
- For the direction of fitting, it shall be fitted in the vertical forward direction. Do not fit it at the lateral direction or inverse direction. Or else, there is a risk of falling of the product.
- If it is used at the place where water may be poured, a hitting angle of water shall be 60° or less from the vertical direction. Otherwise, there is a risk of failure due to water ingress.
- The model (Type:LKEH-F□UL) to comply UL Standard shall be used indoors, and shall not be used at wet location.
- The model to comply UL Standard shall be used on a flat surface of a Type 1 Enclosure.



Request

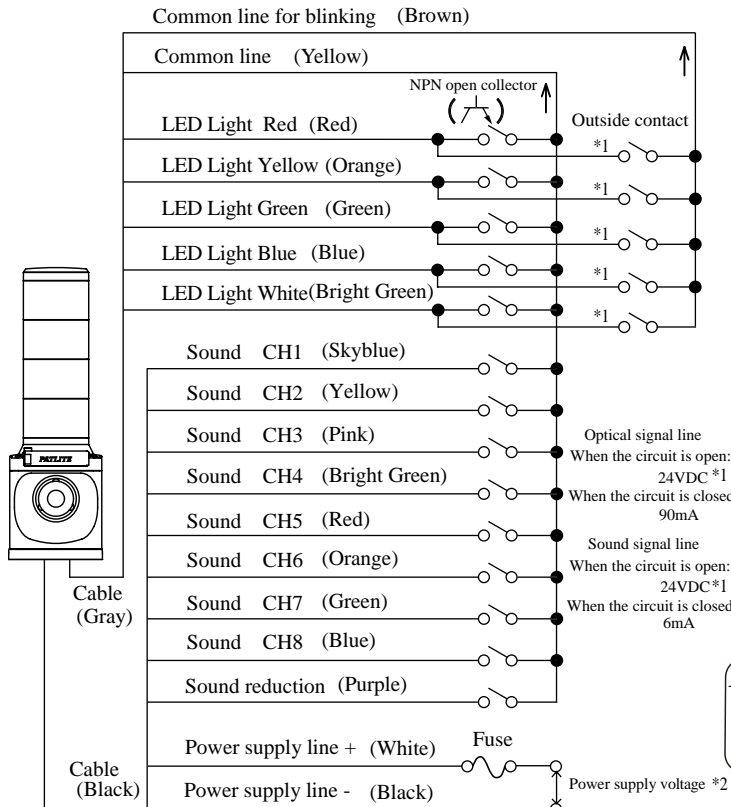
- The product shall be fitted at a plane without concavity and convexity. Otherwise, water proofness and dust proofness of the product will decrease.
- At the place where vibration is generated, perform periodical check of tightening condition of fitting nuts, and application of screw-lock agent etc., in order to prevent the product from falling.
- When mounting it at a high place, choose the place where a foothold exists for facilitating repair work.
- If it is used under the connected state to the power supply, then provide a switch which can easily cut off power supply in proximity to the main body, for the safety purpose.

5 Wiring Method

[In case of NPN transistor type (Type: LKEH-F□)]

- For the outside contact of the signal line, use the no-voltage contact circuit such as relays, switches etc., or the open collector circuit (NPN type).

Regarding the capacity of the circuit & contacts, refer to the table at the right side.



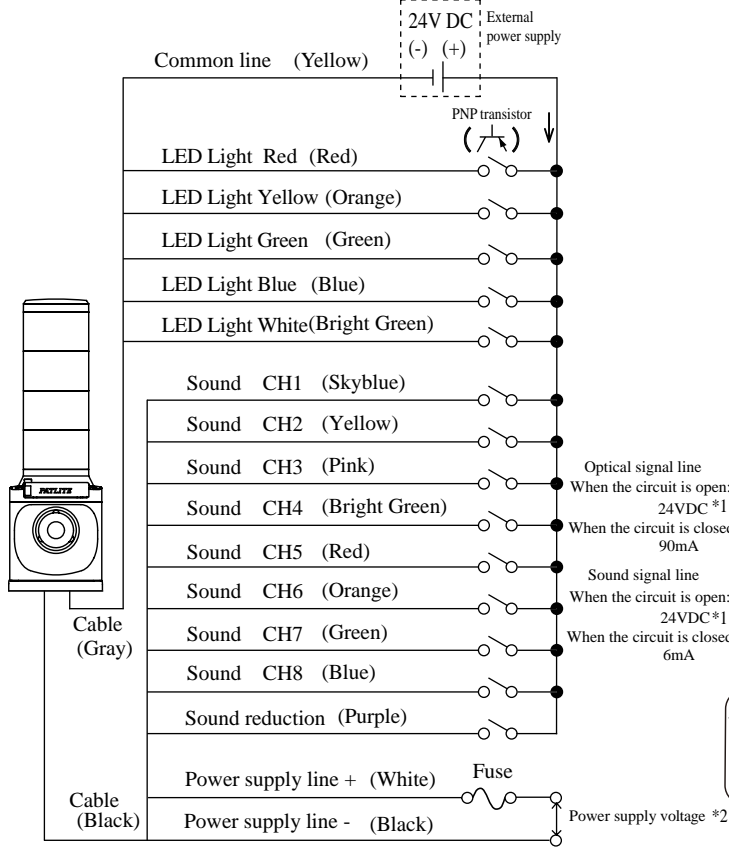
No-voltage contact circuit			
Optical signal line		Sound signal line	
Outside contact	90mA	Outside contact	6mA
NPN open collector circuit			
Optical signal line		Sound signal line	
Outside contact	90mA	Outside contact	6mA
*1. Blinking control is not applicable.			
Capacity of contact			
Optical signal line		Sound signal line	
Current capacity: 100mA or more *3		Current capacity: 6mA or more	
Withstand voltage: 30V DC or more		Withstand voltage: 30V DC or more	
Leakage current: 0.1mA or less		Leakage current: 0.1mA or less	
ON voltage (sat): 1V or less		ON voltage (sat): 1V or less	

Model	Rated voltage	Rush current *4	Fuse capacity *5
LKEH-□02	24V DC	10A	2A(Normal)
LKEH-□10	100V AC	12A	0.5A(Time lag)
LKEH-□12	120V AC	12A	0.5A(Time lag)
LKEH-□20	220V AC	6A	0.5A(Normal)

*** Do not apply voltage on each signal line.
Or else, there is a risk of breaking down the product.**

[In case of PNP transistor type (Type: LKEH-F□P)]

- For the outside contact of the signal line, use the PNP transistor. But, PNP type is not applicable for blinking control. Regarding the capacity of the circuit & contacts, refer to the table at the right side.



PNP open collector circuit	
Optical signal line	Sound signal line
*1. Blinking control is not applicable.	
Capacity of contact	
Optical signal line	Sound signal line
Current capacity: 100mA or more*3 Withstand voltage: 30V DC or more Leakage current: 0.1mA or less ON voltage (sat): 1V or less	Current capacity: 6mA or more Withstand voltage: 30V DC or more Leakage current: 0.1mA or less ON voltage (sat): 1V or less

Model	Rated voltage	Rush current*4	Fuse capacity*5
LKEH-□02	24V DC	10A	2A(Normal)
LKEH-□10	100V AC	12A	0.5A(Time lag)
LKEH-□12	120V AC	12A	0.5A(Time lag)
LKEH-□20	220V AC	6A	0.5A(Normal)

- *1. Blinking control is applicable only for the no-voltage contact circuit.
- *2. For the LKEH-□02(P), connect the Power supply line (Black) to the - terminal. And, for the LKEH-□02UL (UL Standard), connect to Class 2 power supply.
- *3. Current capacity of the contact per one stack of the LED light unit. When using a plurality of LED light units with a same color, confirm the contents of following **Request**.
- *4. At the maximum using voltage, and when power supply is switched on.
- *5. For LKEH-□10/12, use a fuse of the time-lag type. If the normal type is used, there is a risk of melting down by rush current.
- *6. In case of LKEH-□02(P), this shows the power supply voltage.

⚠WARNING

- When carrying out wiring, be sure to cut off power supply. Otherwise, there is a risk of electrical shock.
- Pay attention not to make a mistake at wiring. Or else, the internal circuit may be burnt, and it may become a cause of fire.

⚠CAUTION

- For protection of the power circuit and internal circuit of the main body, be sure to use the outside fuse with recommended capacity.

Request

- When using a plurality of units with a same color, current capacity of the contact becomes "Number of the units with a same color × current capacity of the contact per one stack," because all units with the same color are illuminated via one signal line. Select the relay which satisfies the current capacity of the contact when used. (Example) In the case of a four-stack red LED light unit, current capacity of the contact becomes:
 $4 \text{ (stacks)} \times 100 \text{ (mA)} = 400\text{mA}$
- Before switching on the power supply, confirm that the wiring is correctly performed.
- For countermeasure of noise, it is recommended to perform wiring as short as possible, and to use shielded wires. In addition, if a signal line is passing along high voltage cables or its wiring is located at the place likely to receive induction noise, there is a risk of malfunction by the effect of noise.

- If a no-voltage contact such as a relay or a switch etc. is used for power supply line, select the contact for which rush current is considered. If capacity is insufficient, it will become a cause of welding (deposition) of the contact and/or malfunction.
- After wiring, insulating treatment shall be made on respective tips of the signal lines that are not used. Otherwise, it will become a cause of malfunction.
- If the signal line is used along with each signal line of the product other than this product, do not connect each signal line, as well as each common line.
(Since the voltage applied on each signal line is different, the circuit will fail.)
Be sure to use switches and relays for two circuits and divide the contacts.
- Do not short-circuit the sound/sound reduction signal line and the blinking common line. Or else, the tone cannot be played normally.
- Do not connect the common line and the blinking common line. Or else, the LED light unit cannot blink normally.
- If a plurality of these products are used, do not connect the respective signal lines of the plural units to the one and same contact. Or else, current is generated between each product and it will become a cause of malfunction. Be sure to use switches and relays for two circuits and divide the contacts.

Notification

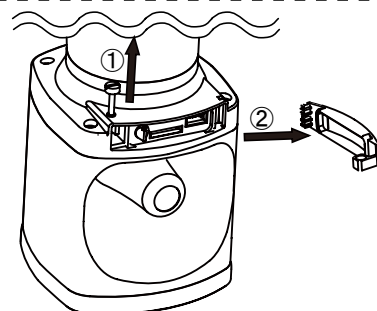
- If power supply or signal lines are switched on simultaneously at the use of plural units, a shift of playing the tone/blinking period will occur.

6 Setting Method

6-1. Opening and closing of the front cover

When carrying out the selection switch manipulation, sound volume adjustment, and change of tone combination, execute opening and closing of the front cover according to the following procedure.

- (1) Detach the hand screw.
- (2) Detach the front cover.
- (3) After finishing the work, fit the parts which were detached at (1) and (2), in the reverse procedure. (Recommended tightening torque of the hand screw: 0.07N•m)



Request

- After finishing the work, be sure to operate the product on the condition that the front cover is fitted. Otherwise, water and dust will enter, and it will become a cause of failure.
- Fit the hand screw with the recommended tightening torque. If the torque is lower than the recommended value, water proofness and dust proofness will decrease.
- Do not forcibly draw out the front cover. Or else, there is a risk of damage.

6-2. Adjustment of sound volume

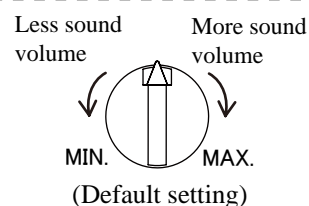
Adjustment of sound volume is possible by means of the volume (knob).

Request

- Turn the volume (knob) lightly. If a torque exceeding 0.2N•m is applied, there is a risk of damage. Further, do not apply shock, or do not pull out.

Notification

- If sound volume is increased, sound cracking may occur depending on a tone.
- Even if the volume is set at the minimum level, the sound condition may not become silent, depending on the environment of usage.

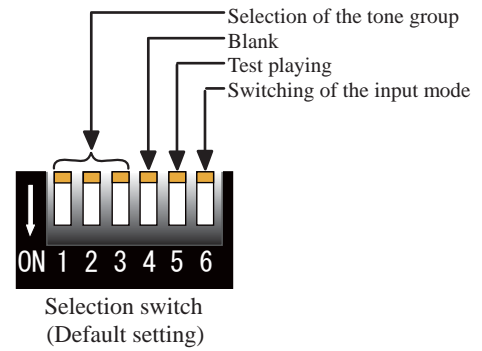


6-3. Selection switch

Selection of the following functions is possible.

- Selection of a tone group (switches 1 to 3)

It is possible to select a tone group among the groups A to H. For the tone groups, refer to the List of the Tones in the following page. By bit input, a tone is played which corresponds to the list of group and channel setting. Regarding the operation, refer to "7. How to Use." In addition, tones can be freely combined by utilizing a SD card in the case of the group H. Refer to "6-4. Combination method of the tones."



- Test playing (switch 5)

By setting to ON, the CH1 in the selected tone group is played. So, use it for confirming operation and at sound volume adjustment. By setting to OFF, playing of the tone is stopped.

- Switching of the input mode (switch 6)

It is used for setting the input method (bit input or binary input) of the sound signal line. By setting to OFF, the bit input mode is selected, and CH1 to CH8 of the sound signal line are set to bit input. By setting to ON, the binary input mode is selected, and CH1 to CH6 of the sound signal line are set to binary input.

Request

- Manipulate the selection switches by means of tools such as tweezers etc.
- Do not handle the selection switches with excessive force. There is a risk of breaking the selection switches.

Notification

- The selection switch 4 is not used. Further, even if setting of the selection switch 4 is changed, it does not affect operation of the product.
- When a sound signal line is selected, the corresponding tone is played by priority, even if the test playing switch is set to ON.

★List of the Tones

- Tone type A (Model: LKEH-□A)

1	Beep (slow intermittent horn)	5	Rapid Hi-Lo	9	Stutter + Bell	13	Fur Elise	17	London bridge is falling down	21	Cuckoo	25	Amaryllis	29	Romance De Amour
2	Stutter (rapid intermittent horn)	6	Melody Chime	10	Synthesized Melody	14	Maiden's Prayer	18	Holdiridia	22	Blacksmith in the village	26	Symphony No.40	30	Petrouchka
3	Bell (clear highpitched bell)	7	Synthesized Piano	11	Chime	15	Minuet	19	Marry had a little Lamb	23	On the Avignon bridge	27	Silent Lakeside	31	Grandfather's Clock
4	Yelp (rapid siren)	8	Synthesized Bell	12	Call sign	16	Annie Laurie	20	The camptown Races	24	Daydream Believer	28	Mountain musician	32	Ave Maria

Author 13:LUDWIG VAN BEETHOVEN 14:BADARZEWSKA BARANOWSKA TEKLA 15:BACH JOHANN SEBASTIAN 16:SCOTT LADY JOHN DOUGLAS
17:18·21·25·28·29:TRADITIONAL 19·27:PD 20:FOSTER STEPHEN COLLINS 22:Song authorized by the Ministry of Education 23:WERNER HEINRICH (DE 2)
24:STEWART JOHN C 26:MOZART WOLFGANG AMADEUS 30:BLANTER MATVEJ ISAAKOVICH 31:WORK HENRY CLAY 32:SCHUBERT FRANZ

★List of setting the group and channele (Setting at ex-works: Group A)

※In this case of the group H, tones can be freely combined among 32 tones, by utilizing a SD card.

	GroupA	GroupB	GroupC	GroupD	GroupE	GroupF	GroupG	GroupH※
CH1	Fur Elise	Marry had a little Lamb	Amaryllis	Grandfather's Clock	Romance De Amour	Marry had a little Lamb	Beep (slow intermittent horn)	The camptown Races
CH2	Maiden's Prayer	The camptown Races	Symphony No.40	Ave Maria	The camptown Races	Symphony No.40	Stutter (rapid intermittent horn)	Cuckoo
CH3	Minuet	Cuckoo	Silent Lakeside	Daydream Believer	Minuet	Holdiridia	Bell (clear highpitched bell)	Petrouchka
CH4	Annie Laurie	Blacksmith in the village	Mountain musician	London bridge is falling down	Ave Maria	Daydream Believer	Yelp (rapid siren)	Grandfather's Clock
CH5	London bridge is falling down	On the Avignon bridge	Romance De Amour	Bell (clear highpitched bell)	Stutter + Bell	Rapid Hi-Lo	Rapid Hi-Lo	London bridge is falling down
CH6	Holdiridia	Daydream Believer	Petrouchka	Yelp (rapid siren)	Synthesized Melody	Melody Chime	Melody Chime	Marry had a little Lamb
CH7	Chime	Chime	Chime	Synthesized Piano	Synthesized Piano	Synthesized Piano	Synthesized Piano	Silent Lakeside
CH8	Call sign	Call sign	Call sign	Synthesized Bell	Synthesized Bell	Synthesized Bell	Synthesized Bell	Mountain musician

- Tone type C (Model: LKEH-□C)

1	Beep (slow intermittent horn)	5	Rapid Hi-Lo	9	Stutter + Bell	13	Can't Take My Eyes off of You	17	Amairono Kamino Otome	21	Uchuusenkan Yamato	25	I Don't Want to Miss a Thing	29	Gattsudaze
2	Stutter (rapid intermittent horn)	6	Melody Chime	10	Synthesized Melody	14	Top of the World	18	Les Champs-Elysees	22	Oshiete	26	Yozorano Mukou	30	Odoru Ponpokorin
3	Bell (clear highpitched bell)	7	Synthesized Piano	11	Chime	15	The Entertainer	19	Canon	23	Makenaide	27	Aiwa Katsu	31	Imasugu Kisu Mi
4	Yelp (rapid siren)	8	Synthesized Bell	12	Call sign	16	Amazing Grace	20	Rara Sanshain	24	Corona Fly Now (Theme for "Rocky")	28	Truth	32	Haruru Koi

Author 13:CREWE BOB 14:CARPENTER RICHARD LYNN 15:JOPLIN SCOTT 16:CARRELL JAMES P 17:Kouichi Sugiyama 18:WILSHAW MICHAEL 19:PACHELBEL JOHANN
20:Hinomasa Ijichi 21:Hiroshi Miyagawa 22:Takeo Watanabe 23·30:Tetsuro Oda 24:CONTI BILL 25:WARREN DIANE EVE 26:Yuka Kawamura 27:KAN 28:Masahiro Andoh
29:Totatsu Matsumoto 31:Tatsuya Hirokawa 32:Yumi Matsutoya

★List of setting the group and channele (Setting at ex-works: Group A)

※In this case of the group H, tones can be freely combined among 32 tones, by utilizing a SD card.

	GroupA	GroupB	GroupC	GroupD	GroupE	GroupF	GroupG	GroupH※
CH1	Can't Take My Eyes off of You	Canon	I Don't Want to Miss a Thing	Imasugu Kisu Mi	Romance De Amour	Beep (slow intermittent horn)	Odoru Ponpokorin	Rara Sanshain
CH2	Top of the World	Rara Sanshain	Yozorano Mukou	Haruru Koi	The camptown Races	Stutter (rapid intermittent horn)	Aiwa Katsu	Uchuusenkan Yamato
CH3	The Entertainer	Uchuusenkan Yamato	Aiwa Katsu	Uchuusenkan Yamato	Minuet	Stutter + Bell	Truth	Odoru Ponpokorin
CH4	Amazing Grace	Oshiete	Truth	Rara Sanshain	Ave Maria	Synthesized Melody	Les Champs-Elysees	Imasugu Kisu Mi
CH5	Amairono Kamino Otome	Makenaide	Gattsudaze	Can't Take My Eyes off of You	Stutter + Bell	Synthesized Piano	Amazing Grace	Amairono Kamino Otome
CH6	Les Champs-Elysees	Corona Fly Now (Theme for "Rocky")	Odoru Ponpokorin	Corona Fly Now (Theme for "Rocky")	Synthesized Melody	Synthesized Bell	Yozorano Mukou	Les Champs-Elysees
CH7	Chime	Chime	Chime	Chime	Chime	Chime	Chime	Aiwa Katsu
CH8	Call sign	Call sign	Call sign	Call sign	Call sign	Call sign	Call sign	Truth

● Tone type D (Model: LKEH-□D)

1	Beep (slow intermittent horn)	5	Rapid Hi-Lo	9	Chime	13	Oribiao Kikinagara	17	Saafu Tengoku Sukii Tengoku	21	I've been working on the Railroad	25	Wiegenlied	29	Yellow Rose of Texas
2	Stutter (rapid intermittent horn)	6	Melody Chime	10	Call sign	14	A September	18	Iro Howaitoburendo	22	Bear Song	26	Rudolph the Red-nosed Reindeer	30	Yankee Doodle
3	Bell (clear highpitched bell)	7	Synthesized Piano	11	Runner	15	Doyoubino Koibito	19	Happy Birthday	23	Toys Go Cha Cha Cha	27	She Wore a Yellow Ribbon	31	When the Saint Go Marching In
4	Yelp (rapid siren)	8	Synthesized Bell	12	Mamotte Agetai	16	Akino Kehai	20	Hi Ho	24	Konnako Irukana	28	Oh My Darling Clementine	32	Londonderry Air

Author 11:New Funky Sueyoshi 12:17:Yumi Matsutoya 13:Ami Ozaki 14:Tetsuji Hayashi 15:Tatsuro Yamashita 16:Kazumasa Oda 18:Maria Takeuchi 19:HILL MILDRED J 20:CHURCHILL FRANK E 21:22:27:29:30:31:32:TRADITIONAL 23:Nobuyoshi Koshibe 24:Takeshi Shibuya 25:SCHUBERT FRANZ 26:MARKS JOHN D 28:American folk song

★List of setting the group and channele (Setting at ex-works: Group A)

※In this case of the group H, tones can be freely combined among 32 tones, by utilizing a SD card.

	GroupA	GroupB	GroupC	GroupD	GroupE	GroupF	GroupG	GroupH※
CH1	Runner	Happy Birthday	She Wore a Yellow Ribbon	Yellow Rose of Texas	Runner	Saafu Tengoku Sukii Tengoku	Doyoubino Koibito	Hi Ho
CH2	Mamotte Agetai	Hi Ho	Oh My Darling Clementine	Yankee Doodle	Iro Howaitoburendo	Konnako Irukana	I've been working on the Railroad	I've been working on the Railroad
CH3	Oribiao Kikinagara	I've been working on the Railroad	Yellow Rose of Texas	When the Saint Go Marching In	Wiegenlied	Oribiao Kikinagara	She Wore a Yellow Ribbon	Yankee Doodle
CH4	A September	Bear Song	Yankee Doodle	Londonderry Air	Hi Ho	Iro Howaitoburendo	Yankee Doodle	When the Saint Go Marching In
CH5	Doyoubino Koibito	Toys Go Cha Cha Cha	When the Saint Go Marching In	Beep (slow intermittent horn)	I've been working on the Railroad	Rapid Hi-Lo	Synthesized Piano	Saafu Tengoku Sukii Tengoku
CH6	Akino Kehai	Konnako Irukana	Londonderry Air	Stutter (rapid intermittent horn)	Bear Song	Melody Chime	Synthesized Bell	Iro Howaitoburendo
CH7	Saafu Tengoku Sukii Tengoku	Wiegenlied	Runner	Chime	Toys Go Cha Cha Cha	Chime	Chime	She Wore a Yellow Ribbon
CH8	Iro Howaitoburendo	Rudolph the Red-nosed Reindeer	Mamotte Agetai	Call sign	Konnako Irukana	Call sign	Call sign	Oh My Darling Clementine

● Tone type E (Model: LKEH-□E)



1	Beep (slow intermittent horn)	5	Rapid Hi-Lo	9	Stutter + Bell	13	Train Ride	17	Inverted Revellie	21	Alarm Clock	25	Annie Laurie	29	Amaryllis
2	Stutter (rapid intermittent horn)	6	Melody Chime	10	Synthesized Melody	14	Galloping Hi-Lo	18	Galactic Motor	22	Ringin Hi-Lo	26	London bridge is falling down	30	Symphony No.40
3	Bell (clear highpitched bell)	7	Synthesized Piano	11	Chime	15	Alien Chatter	19	Ringin Phone	23	Fur Elise	27	Marry had a little Lamb	31	Grandfather's Clock
4	Yelp (rapid siren)	8	Synthesized Bell	12	Call sign	16	Falling Crystals	20	Two Tone	24	Minuet	28	The camptown Races	32	Ave Maria

Author 23:LUDWIG VAN BEETHOVEN 24:BACH JOHANN SEBASTIAN 25:SCOTT LADY JOHN DOUGLAS 26-29:TRADITIONAL 27:PD 28:FOSTER STEPHEN COLLINS 30:MOZART WOLFGANG AMADEUS 31:SCHUBERT FRANZ 32:WORK HENRY CLAY

★List of setting the group and channele (Setting at ex-works: Group A)

※In this case of the group H, tones can be freely combined among 32 tones, by utilizing a SD card.

	GroupA	GroupB	GroupC	GroupD	GroupE	GroupF	GroupG	GroupH※
CH1	Fur Elise	Minuet	Fur Elise	Alien Chatter	Train Ride	Rapid Hi-Lo	Beep (slow intermittent horn)	Two Tone
CH2	Minuet	Annie Laurie	London bridge is falling down	Falling Crystals	Galloping Hi-Lo	Chime	Stutter (rapid intermittent horn)	Alarm Clock
CH3	Annie Laurie	Amaryllis	Marry had a little Lamb	Inverted Revellie	Inverted Revellie	Stutter (rapid intermittent horn)	Bell (clear highpitched bell)	Symphony No.40
CH4	London bridge is falling down	Symphony No.40	The camptown Races	Galactic Motor	Galactic Motor	Ringin Phone	Yelp (rapid siren)	Ave Maria
CH5	Marry had a little Lamb	Grandfather's Clock	Amaryllis	Ringin Phone	Alarm Clock	Stutter + Bell	Rapid Hi-Lo	Inverted Revellie
CH6	The camptown Races	Ave Maria	Grandfather's Clock	Two Tone	Ringin Hi-Lo	Synthesized Melody	Melody Chime	Galactic Motor
CH7	Chime	Chime	Chime	Alarm Clock	Synthesized Piano	Synthesized Piano	Synthesized Piano	Marry had a little Lamb
CH8	Call sign	Call sign	Call sign	Ringin Hi-Lo	Synthesized Bell	Synthesized Bell	Synthesized Bell	The camptown Races

6-4. Combination method of the tones

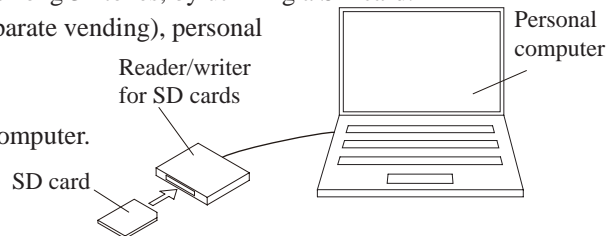
In the case of the group H, tones can be freely combined among 32 tones, by utilizing a SD card.

● Articles to be prepared: SD card (Model SDV-128P, separate vending), personal computer, Reader/writer for SD cards.

6-4-1. Preparation of tone combination data

Tone combination data are prepared by using a personal computer.

- Connect a personal computer and a reader/writer for SD cards. Then, insert a SD card.
- From the "My Computer" of the personal computer, open the drive in which the SD card is inserted.

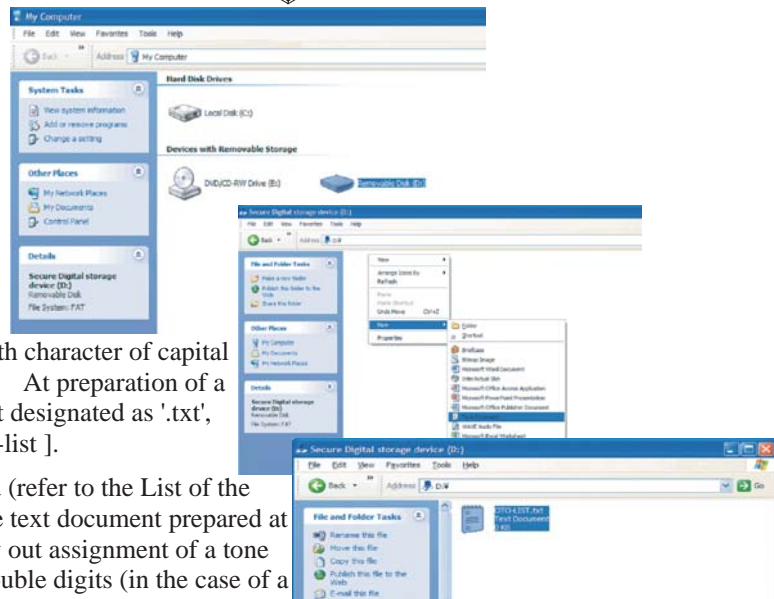


- Click a mouse with a right hand on the opened window, and select the "Text document" from the "New document."
 - * The name may differ by the version of OS (operating system), such as "Memo," for example.

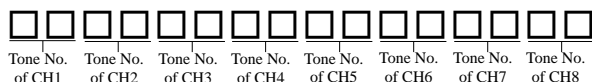
- Change the file name of the prepared document into [oto-list.txt].

* Input the file name with the half-width character of capital letters or lower cases (small letters). At preparation of a text document, if the file name is not designated as '.txt', then designate the file name as [oto-list].

- Input the tone numbers to be combined (refer to the List of the Tones in "6-3. Selection switch") in the text document prepared at (4), and store it in the SD card. Carry out assignment of a tone number with half-width character of double digits (in the case of a tone number "1," it shall be "01"), and be sure to input 16 digits.



If it is less than 16 digits, a writing error occurs.



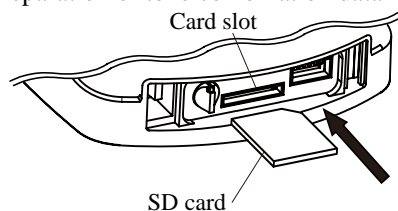
■ Example of preparation

In the case of preparing the following combination at the tone type A:
CH1. Beep (slow intermittent horn) CH2. Amaryllis CH3. Synthesized Piano
CH4. Grandfather's Clock CH5. The camptown Races CH6. Shutter
CH7. Cuckoo CH8. Mary had a little Lamb
Input the number [0125073120022119] in the text file, and store the file.

6-4-2. Transfer of tone combination data

Transfer the tone combination data prepared at the "6-4-1. Preparation of tone combination data" to this product.

- (1) Open the front cover. (Refer to the "6-1. Opening and closing of the front cover.")
- (2) By inserting the SD card in which the data was written at the "6-4-1. Preparation of tone combination data" into the card slot, data transfer is started.
- (3) When data transfer has finished, it is informed by the sound "Pee."
Then pull out the SD card.
* Writing will be completed within 1 second. If it is informed by the sound "Pipipipi" or there is no reaction, the data transfer is not normally completed.
Confirm the contents of data and operation procedure.
In addition, pay attention that, if the volume is at the minimum level, the informing sound cannot be heard.
- (4) Adjust the tone group selection switch to H, and confirm the tone of each CH.



*Take care for the inserting direction.

Request

- For the SD card, use the model SDV-128P (separate vending). If a SD card of other type is used, its operation is not guaranteed.
- When "formatting" of a SD card is performed, use the FAT16.
- At inserting the SD card into the card slot, pay attention to the direction of the card.
Further, do not press the SD card forcedly into the card slot. Otherwise, there is a risk of damaging this product and the SD card.
- Pay attention so that foreign objects do not enter into the card slot.
- Do not pull out the SD card nor cut off power supply when the SD card is reading.

Notification

- During input of the sound signal line, reading by the SD card is not performed even if it is inserted.
- If the SD card is inserted during playing of a tone, data transfer is performed after playing of the tone has been finished.
- When the SD card is reading, input of the sound signal line has no effect.

7 How to use

Turn on power supply of the product. By short-circuiting the common line and each signal line, it operates as follows.

- LED light: The LED light lights during short circuit of the common line and each optical signal line.
The LED light blinks during short circuit of the common blink line and each optical signal line.
- Tone: A tone is played by short-circuit of the common line and each sound signal line.
For the playing method by each operation mode, refer to "7-1. Bit input mode" and, "7-2. Binary input mode".
- Sound reduction: When the common line and the sound reduction signal line are short circuited, a sound pressure level of the played tone is lowered.

7-1. Bit input mode

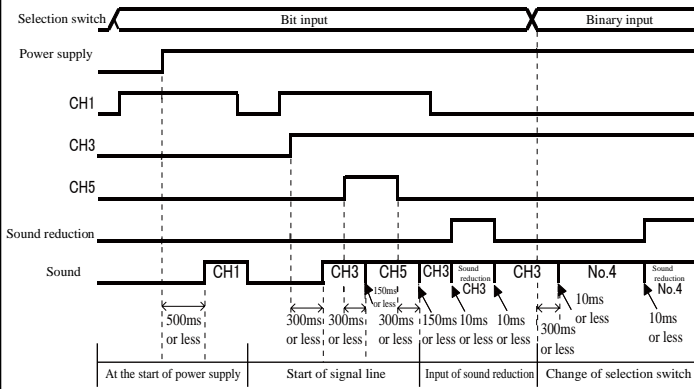
- By short-circuiting the common line and each sound signal line, a tone is played that corresponds to each channel.
- If there is short circuit of the two or more sound signal lines and the common line at the same time, a tone of the CH with a larger number is played.

Priority order of signal input

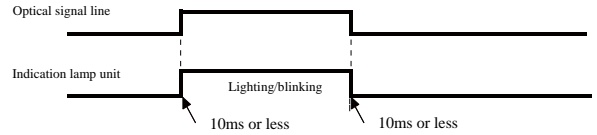
CH8>CH7>CH6>CH5>CH4>CH3>CH2>CH1

- When this product is operated by the start of power supply, it takes about 0.5sec. until a tone is played.
- Regarding the timing chart in the case of operating this product by control of the signal line, refer to the figure at the right side.

Input timing chart of the sound signal line



Input timing chart of the optical signal line



7-2. Binary input mode

- By short-circuiting the common line and each sound signal line, a tone among the No.1 to 32 is played, depending on the state of each short circuit. (Refer to the Corresponding table for binary input.)
- When this product is operated by the start of power supply, it takes about 0.5sec. until a tone is played.
- Regarding the timing chart in the case of operating this product by control of the signal line, refer to the figure at the right side.

Corresponding table for binary input (Example: Type D)

Tones	Input contacts								Tones	Input contacts							
	CH1 (Skyblue)	CH2 (Yellow)	CH3 (Pink)	CH4 (Bright green)	CH5 (Red)	CH6 (Orange)	CH7 (Green)	CH8 (Blue)		CH1 (Skyblue)	CH2 (Yellow)	CH3 (Pink)	CH4 (Bright green)	CH5 (Red)	CH6 (Orange)	CH7 (Green)	CH8 (Blue)
No.1	1	0	0	0	0	0	0	No.17	1	0	0	0	1	0	0	0	
No.2	0	1	0	0	0	0	0	No.18	0	1	0	0	1	0	0	0	
No.3	1	1	0	0	0	0	0	No.19	1	1	0	0	1	0	0	0	
No.4	0	0	1	0	0	0	0	No.20	0	0	1	0	1	0	0	0	
No.5	1	0	1	0	0	0	0	No.21	1	0	1	0	1	0	0	0	
No.6	0	1	1	0	0	0	0	No.22	0	1	1	0	1	0	0	0	
No.7	1	1	1	0	0	0	0	No.23	1	1	1	0	1	0	0	0	
No.8	0	0	0	1	0	0	0	No.24	0	0	0	1	1	0	0	0	
No.9	1	0	0	1	0	0	0	No.25	1	0	0	1	1	0	0	0	
No.10	0	1	0	1	0	0	0	No.26	0	1	0	1	1	0	0	0	
No.11	1	1	0	1	0	0	0	No.27	1	1	0	1	1	0	0	0	
No.12	0	0	1	1	0	0	0	No.28	0	0	1	1	1	0	0	0	
No.13	1	0	1	1	0	0	0	No.29	1	0	1	1	1	0	0	0	
No.14	0	1	1	1	0	0	0	No.30	0	1	1	1	1	0	0	0	
No.15	1	1	1	1	0	0	0	No.31	1	1	1	1	1	0	0	0	
No.16	0	0	0	0	1	0	0	No.32	0	0	0	0	0	1	0	0	

- * The "1" in this table means short circuit of the sound signal line and the common line.
- * In the case of input contacts which are not described in the table, the sound "5. Rapid Hi-Lo" is played.

Notification

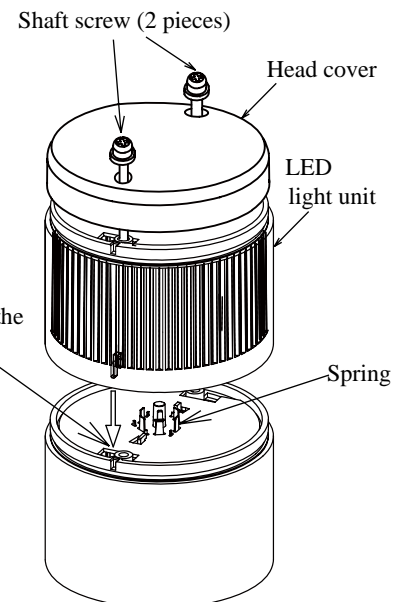
- Although pop noise is sometimes generated at ON/OFF of power supply, it is not a failure.
- If power supply or signal lines are switched on simultaneously at the use of plural units, a shift of playing the tone/blinking period will occur.

8 Rearranging Method of the Color Arrangement

It is possible to rearrange the arrangement of the LED light unit. Detach the head cover in accordance with the following procedure.

- (1) Loosen the shaft screws and detach the head cover.
- (2) Rearrange the LED light unit.
- (3) After finishing the work, fit the parts which were detached at (1) and (2), in the reverse procedure. (Recommended tightening torque of the shaft screw: 0.7N•m)

* Combine them while aligning into the notch of the LED light unit.



⚠WARNING

- Be sure to carry out the work after cutting off the power supply.

⚠CAUTION

- When wiping off the dirt on the surface of the LED light unit and head cover, do not use benzine, thinner, and/or alcohol. Or else, there is a risk of deformation and/or discoloration.
- Do not perform rearrangement with the LED light unit of another product. Or else, it will become a cause of failure.
- Be sure to tighten the shaft screw with the recommended tightening torque value. If the torque is lower than the recommended value, water proofness, dust proofness and resistance to earthquakes will decrease.
- When a plurality of units with a same color are used, current capacity of the contact becomes "Number of the units with a same color × current capacity of the contact per one stack," because all units with the same color are illuminated via one signal line. Select the relay which satisfies the current capacity of the contact when used.
(Example) In the case of a four-stack red LED light unit, current capacity of the contact becomes:
 $4 \text{ (stacks)} \times 100 \text{ (mA)} = 400\text{mA}$
- Use the shafts which are exclusive for each number of stack, adapted to the stack number of the LED light unit. Otherwise, it will become a cause of failure.
- Do not touch the spring of the LED light unit. Otherwise, it will become a cause of failure.
- Do not rotate the LED light unit after combining the LED light unit. Otherwise, there is a risk of damage.

Notification

- For the LED light unit, it is possible to increase or decrease the number of stack from 1 to 4. When the LED light unit and the shaft for exclusive use are necessary due to increase or decrease of the number of stages, please inquire to each sales office or technical consultation service written in the last page.

9 Before Asking for Repair

Contents of trouble	Matters to be confirmed	Method of action/treatment
Sound is not generated.	Is the power supplied?	Confirm the wiring and voltage of power supply. (5. Wiring Method)
	Are the common line and the signal line correctly short-circuited?	Confirm the wiring. (5. Wiring Method)
	Is the volume of sound set to the minimum level or not?	Adjust the volume. (6-2. Adjustment of sound volume)
A different channel is played.	Are the common line and the signal line correctly short-circuited?	Confirm the wiring. (5. Wiring Method)
	Are the selection switches correctly chosen?	Confirm the selection switches. (6-3. Selection switch)
SD card is not read.	Is the power supplied?	Confirm the wiring. (5. Wiring Method)
	Are the data for tone combination stored in the SD card?	Confirm the data in the SD card. (6-4-1. Preparation of tone combination data)
	Are the name and contents of the file for tone combination correct?	
	Is the location of data storage correct?	
	Is the SD card inserted correctly?	Confirm the SD card. (6-4-2. Transfer of tone combination data)
	Is the SD card of our company's optional item used?	
Is the volume of sound set to the minimum level or not?	Adjust the volume. (6-2. Adjustment of sound volume)	
The LED light unit cannot be lit.	Is the power supplied?	Confirm the wiring and voltage of power supply. (5. Wiring Method)
	Are the common line and signal line correctly short-circuited?	Confirm the wiring. (5. Wiring Method)
The LED light unit cannot blink.	Is the power supplied?	Confirm the wiring and voltage of power supply. (5. Wiring Method)
	Are the blinking common line and the signal line correctly short-circuited?	Confirm the wiring. (5. Wiring Method)

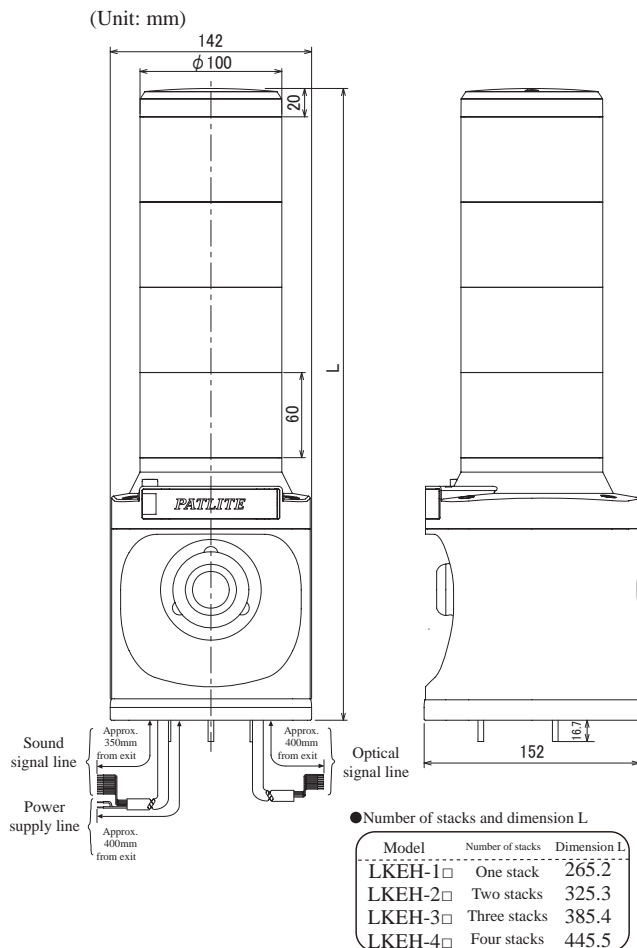
* If the product does not operate even if it is mounted and manipulated correctly, please inquire to each sales office or technical consultation service written in the last page.

10 Specification

Specification

Name of the model	LKEH-□02F□	LKEH-□10F□	LKEH-□20F□	LKEH-□12F□	LKEH-□02F□UL
Rated voltage	24V DC	100V AC (50/60Hz)	220V AC (50/60Hz)	120V AC (50/60Hz)	24V DC Class 2
Operating voltage range	24V DC±10%	100V AC±10%	220V AC±10%	120V AC±10%	24V DC±10%
Power consumption	1stack 10.6W	1stack 17.0W		1stack 10.6W	
	2stacks 12.4W	2stacks 20.0W		2stacks 12.4W	
	3stacks 14.2W	3stacks 23.0W		3stacks 14.2W	
	4stacks 16.0W	4stacks 26.0W		4stacks 16.0W	
Maximum current consumption	0.65A	0.33A	0.16A	0.30A	0.65A
Sound pressure level	* Fit the product on the plate of □ 300mm, and measure the level with the sound 5."Rapid Hi-Lo" at the distance of 1m from the center of the product, in the front direction. * The sound pressure level may be lowered depending on the tone and environment of usage.				
Sound reduction level	20dB ± 2dB (Playing of the sound 5."Rapid Hi-Lo," at the maximum volume level)				
Signal input method	Bit input / binary input				
Fixing time of sound input signal	100ms or more (level input)				
Starting time	At the start of power supply: 500ms or less / At the start of signal line: 300ms or less				
Number of playing channels	Bit input: 8 channels / Binary input : 32 channels				
Priority order of channels	CH8 > CH7 > CH6 > CH5 > CH4 > CH3 > CH2 > CH1				
Input interface	16 signal lines (optical: 5 lines/ sound: 8 lines/ sound reduction/ common line/ blinking common line) Selection switch / SD card slot				
Incorporated number of sounds	32 kinds				
Light source of the LED light unit	LED				
Number of blinks	60 times/min. ± 3 times				
Operating temperature range	-10 to 50°C (Maximum surrounding air temperature rating of 50°C)				
Relative humidity	85%RH or less (No dew condensation shall exist.)				
Mounting direction	Forward direction only				
Protection structure	IP53 (Mounting only in the forward direction)				
Insulation resistance	500V DC, 1MΩ or more (charged metal part – non-charged metal part)				
Withstand voltage	500V AC, 1 min. (Between charged metal part – non-charged metal part)	1000V AC, 1 min. (Between charged metal part – non-charged metal part)	1500V AC, 1 min. (Between charged metal part – non-charged metal part)	1000V AC, 1 min. (Between charged metal part – non-charged metal part)	500V AC, 1 min. (Between charged metal part – non-charged metal part)
Resistance against vibration	19.6m/s ²				
Mass	One stack 1.8 kg ±10%	One stack 2.5 kg ±10%		One stack 1.8 kg ±10%	
	Two stacks 2.0kg ±10%	Two stacks 2.7kg ±10%		Two stacks 2.0kg ±10%	
	Three stacks 2.2kg ±10%	Three stacks 2.9kg ±10%		Three stacks 2.2kg ±10%	
	Four stacks 2.4 kg ±10%	Four stacks 3.1 kg ±10%		Four stacks 2.4 kg ±10%	

Outline dimensional drawing



● Please note that our company is not responsible to the trouble and damage etc. occurred due to mishandling against the warning matters/ caution matters described in this manual.

● Please note that the contents of this manual may be revised for improvement without prior notice.

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Y2X

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