Voice Synthesizer with LED Signal Light
Instruction Manual
[TYPE:LKEH-FV]

Thank you very much for purchasing **the Voice Synthesizer 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.

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

⚠CAUTION 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

⚠WARNING
● 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.
● Do not connect the load exceeding DC 24V, 500mA or AC load to the BUSY output. Or else, there is a risk of fire.

⚠CAUTION
● 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.

2 Indication Method of Models

L K E H − [4] [0 2] F V [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
- ■ Connectable transistor
  - None: NPN type
  - P: PNP type [*1)]
- ■ Standard [*2)]
  - UL: UL standard
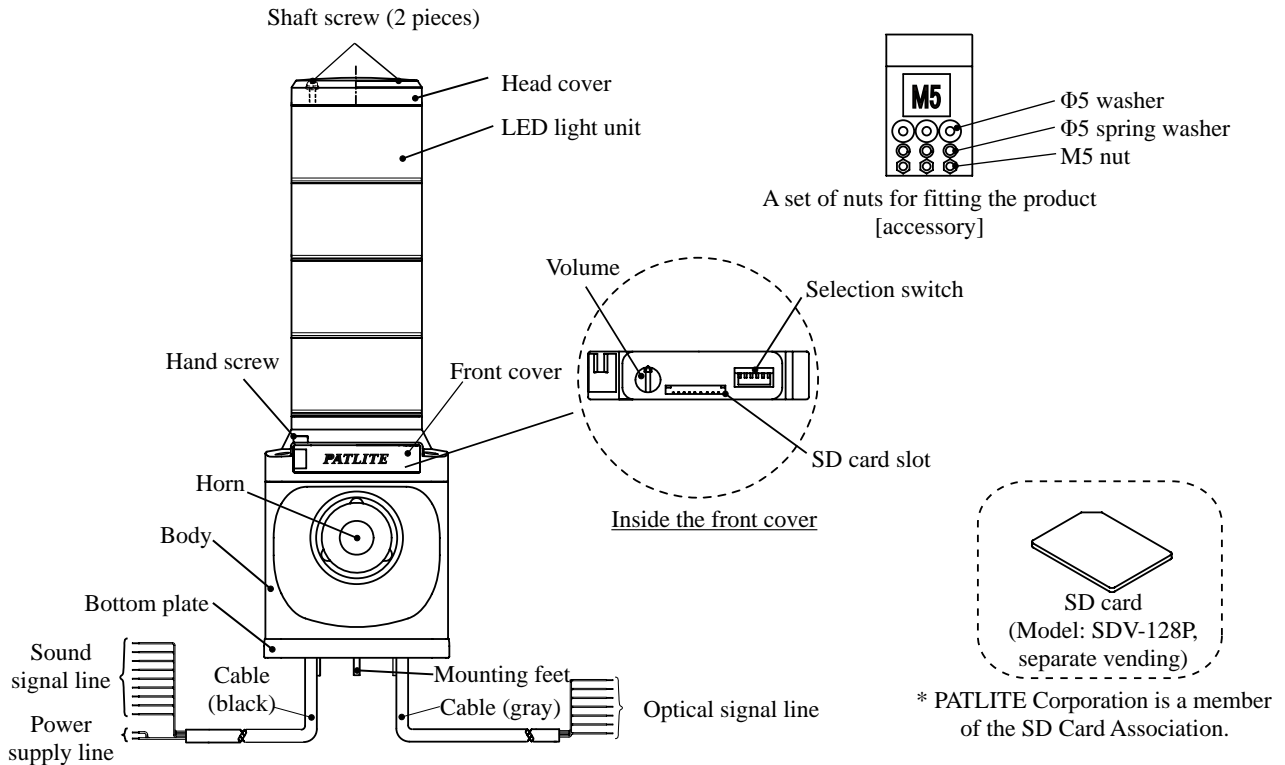- ■ Unit color of the LED light unit
  - R: Red
  - Y: Yellow
  - G: Green
  - B: Blue
  - C: White

*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.
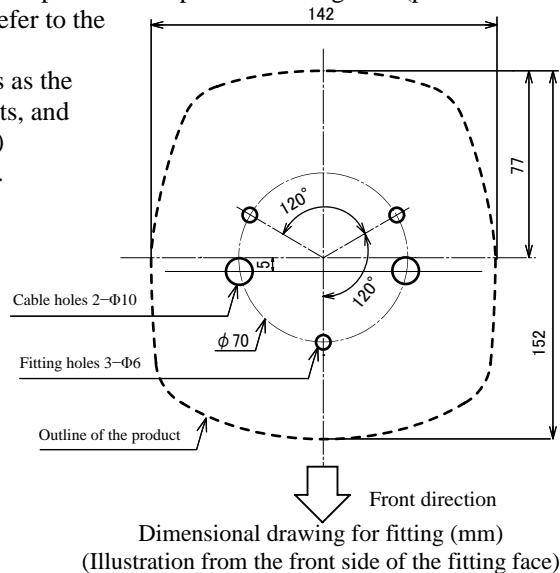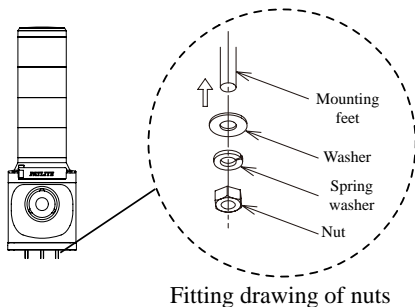
3 Designation of Each Part

Shaft screw (2 pieces)
Head cover
LED light unit

M5
Φ5 washer
Φ5 spring washer
M5 nut

A set of nuts for fitting the product
[accessory]

Volume
Selection switch

Hand screw
Front cover

Horn
Body
Bottom plate

SD card slot

Inside the front cover

Sound signal line
Cable (black)
Power supply line

Mounting feet
Cable (gray)
Optical signal line

SD card
(Model: SDV-128P, separate vending)

* PATLITE Corporation is a member of the SD Card Association.

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.

Mounting feet
Washer
Spring washer
Nut

Fitting drawing of nuts

142
77
152
120°
120°
120°
5
φ70

Cable holes 2−Φ10
Fitting holes 3−Φ6
Outline of the product

Front direction

Dimensional drawing for fitting (mm)
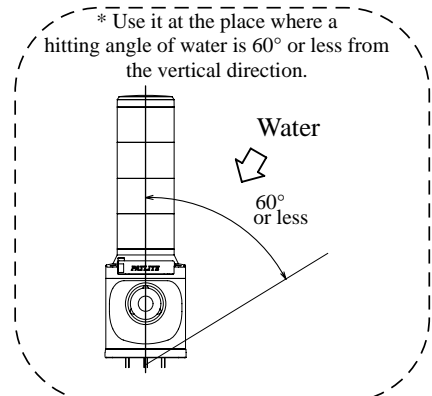(Illustration from the front side of the fitting face)

⚠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.

* Use it at the place where a hitting angle of water is 60° or less from the vertical direction.
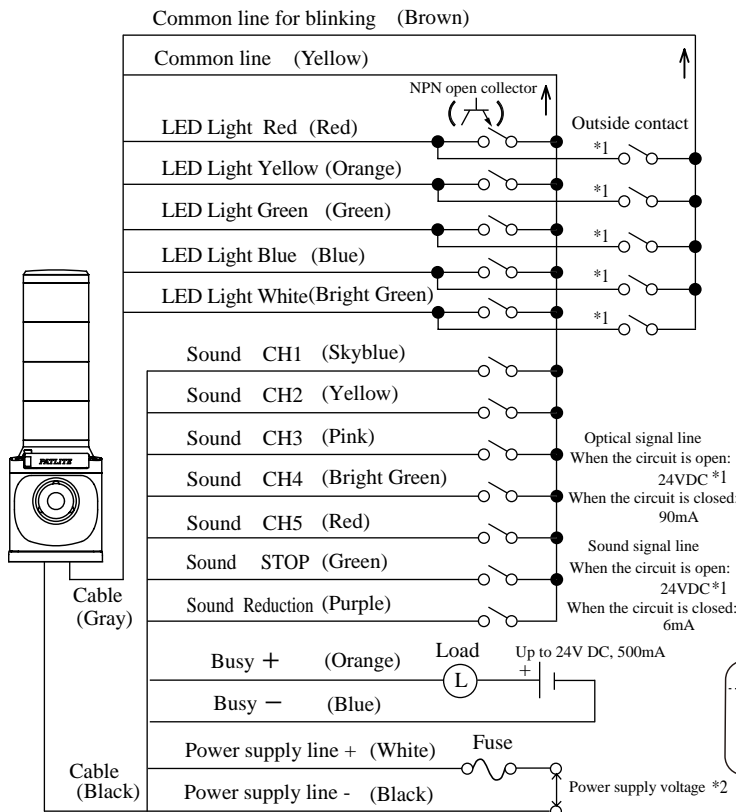
Water

60° or less

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-FV)]

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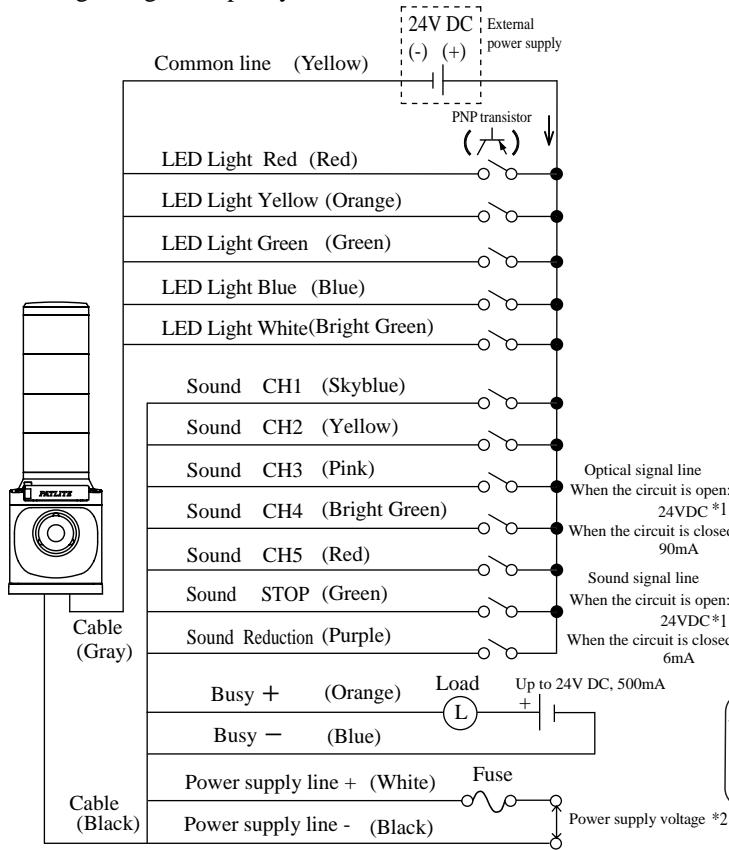Regarding the capacity of the circuit & contacts, refer to the table at the right side.

Common line for blinking　(Brown)
Common line　(Yellow)

NPN open collector

LED Light Red　(Red)
LED Light Yellow (Orange)
LED Light Green　(Green)
LED Light Blue　(Blue)
LED Light White(Bright Green)

Outside contact *1

Sound　CH1　(Skyblue)
Sound　CH2　(Yellow)
Sound　CH3　(Pink)
Sound　CH4　(Bright Green)
Sound　CH5　(Red)
Sound　STOP　(Green)
Sound　Reduction　(Purple)

Optical signal line
When the circuit is open: 24VDC *1
When the circuit is closed: 90mA

Sound signal line
When the circuit is open: 24VDC *1
When the circuit is closed: 6mA

Busy ＋　(Orange)
Busy －　(Blue)

Load L　Up to 24V DC, 500mA

Power supply line + (White)　Fuse
Power supply line - (Black)　Power supply voltage *2

Cable (Gray)
Cable (Black)

No-voltage contact circuit	
Optical signal line	Sound signal line
Outside contact　90mA　LKEH Optical signal line　24V *6　Common line	Outside contact　6mA　LKEH Sound signal line　24V *6　Common line

NPN open collector circuit	
Optical signal line	Sound signal line
Outside contact　90mA　LKEH Optical signal line　24V *6　Common line	Outside contact　6mA　LKEH Sound signal line　24V *6　Common line

*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-FVP)]

● 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.

24V DC External power supply
(-) (+)

Common line (Yellow)

PNP transistor

LED Light Red (Red)
LED Light Yellow (Orange)
LED Light Green (Green)
LED Light Blue (Blue)
LED Light White (Bright Green)

Sound CH1 (Skyblue)
Sound CH2 (Yellow)
Sound CH3 (Pink)
Sound CH4 (Bright Green)
Sound CH5 (Red)
Sound STOP (Green)
Sound Reduction (Purple)

Optical signal line
When the circuit is open: 24VDC *1
When the circuit is closed: 90mA

Sound signal line
When the circuit is open: 24VDC *1
When the circuit is closed: 6mA

Cable (Gray)

Busy + (Orange)
Busy − (Blue)

Load (L) Up to 24V DC, 500mA

Power supply line + (White) Fuse
Power supply line - (Black) Power supply voltage *2

Cable (Black)

PNP open collector circuit

Optical signal line	Sound signal line
Outside contact — 90mA → LKEH Optical signal line, 24V *6, Common line	Outside contact — 6mA → LKEH Sound signal line, 24V *6, Common line

*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)

*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 (stacks) × 100 (mA) = 400mA
● 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 insufficie nt, 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.
- In the case of driving the inductive load such as a relay by means of BUSY output, connect the diode for preventing back electromotive force between relay terminals of the coil.
- 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.
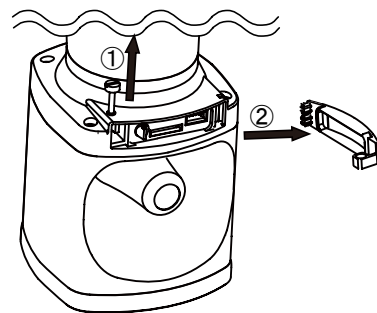
Notification
- If power supply or signal lines are switched on simultaneously at the use of plural units, a shift of playing the tone/blinking period will occur.

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 forcedly draw out the front cover.　Or else, there is a risk of damage.
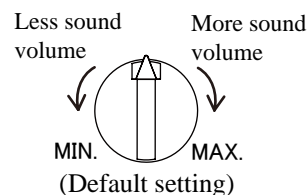
6-2. Adjustment of sound volume

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

Less sound volume　　More sound volume

MIN.　　MAX.
(Default setting)

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

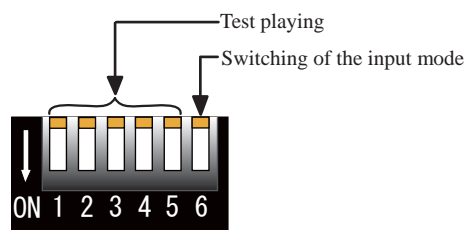Selection of the following functions is possible.

● Test playing

In case of Bit input, By setting the switches 1-5 to ON, the voices of CH1 to CH5 corresponding to each number of the switches are played. So, use them for confirming operation and at sound volume adjustment. By setting to OFF, playing of the voices is stopped.

In case of Binary input, the test playing switch corresponds to the Binary input. Refer to the <u>Corresponding table for binary input</u> of next page.

● Switching of the input mode

It is used for setting the input method (bit input or binary input) of the sound signal line. By setting the switch 6 to OFF, the bit input mode is selected, and CH1 to CH5 of the sound signal line are set to bit input. By setting to ON, the binary input mode is selected, and CH1 to CH5 of the sound signal line are set to binary input.

Test playing
Switching of the input mode

Selection switch (Default setting)*

Default setting* ;
If message registration is up to No.5:
Bit input mode
If message registration is No.6 and
above: Binary input mode

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

● When the selection switches are changed over during operation, the changed contents are reflected.
● When a sound signal line is being input, the CH with higher priority is played.

6-4. Rewriting of messages

Messages can be rewritten by using the SD card (Model SDV-128P, separate vending) and the voice writing tool (Model FV-Win, separate vending, or the playlist editor software). The maximum period of messages (sec.) is 63 seconds in total (at an internal memory capacity of 504KB, 64kbit/s, Fs = 44.1kHz). For preparation of data and the storing method into the SD card, refer to the "HELP" of each voice writing tool.
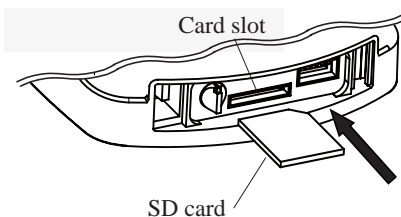
<Message rewriting procedure>

(1) Open the front cover. (Refer to "6-1. Opening and closing of the front cover.")
(2) By inserting the SD card that has stored the rewriting data into the card slot, it is informed by the sound "Pipo," and rewriting is started.
(3) When rewriting of the data has finished, it is informed by the sound "Pee." Then, pull out the SD card.
  * Writing will be finished within 60seconds. If it is informed by the sound "Pipipipi" or there is no reaction, the rewriting is not normally completed.
    Confirm "9. Before Asking for Repair."
    In addition, pay attention that, the informing sound cannot be heard if the volume is at the minimum level.
(4) Play the voice of each CH, and confirm that rewriting has been normally completed.

Card slot

SD card
*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 SDcard.
● 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

● If the SD card is inserted during playing of a voice, rewriting of messages is started after the voice playing 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.
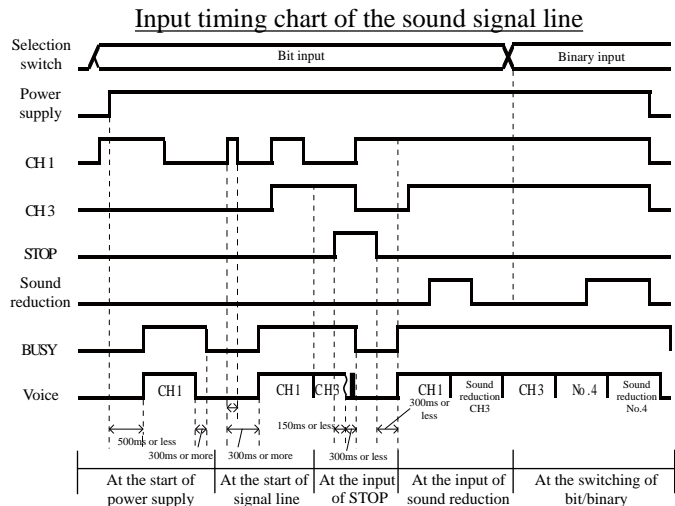- ● LED light: The LED light lights during short circuit of the common line and each optical signal line.
                        The LED light blink s during short circuit of the commonblink line and each optical signal line.
- ● Tone: A tone is played by short-circuit of the common line and each sound 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.
                        Timing of starting the sound reduction changes depending on the registered contents of messages.
- ● STOP: Voice playing is stopped by short circuit of the common line and the STOP signal line.
- ● BUSY: Output of the open collector transistor is set to ON during voice reproduction.
                        The maximum load that can be connected is DC 24V, 500mA.

7-1. Bit input mode
- ● Up to five messages can be played.
- ● If there is short-circuit of the two or more sound signal lines and the common line at the same time, a message of the CH with a larger number is played.
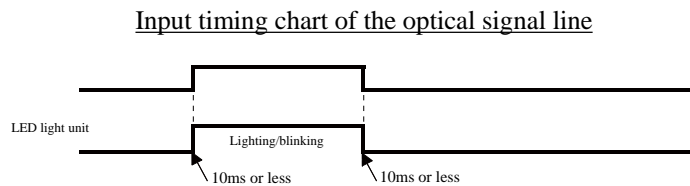
Priority order of signal input
STOP>CH5>CH4>CH3>CH2>CH1

- ● 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

7-2. Binary input mode
- ● Up to 31 messages can be played.
- ● By short-circuiting the sound signal line and the common line, a voice among the playing CH (No.1 to 31) is played that corresponds to the undermentioned Corresponding table for binary input.
- ● When this product is operated by the start of power supply, it takes about 0.5sec. until a voice 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 optical signal line

Corresponding table for binary input

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

* The "1" in this table represents short circuit of each sound signal line and the common line.

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 voice/blinking period may 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
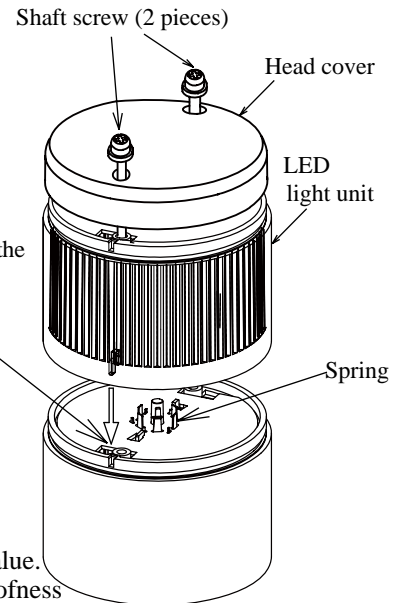 torque of the shaft screw: 0.7N•m)

Shaft screw (2 pieces)

Head cover

LED light unit

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

Spring

⚠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 rlse, 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 (stacks) × 100 (mA) = 400mA
● 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)
BUSY output doesn't operate.	Is the BUSY input 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
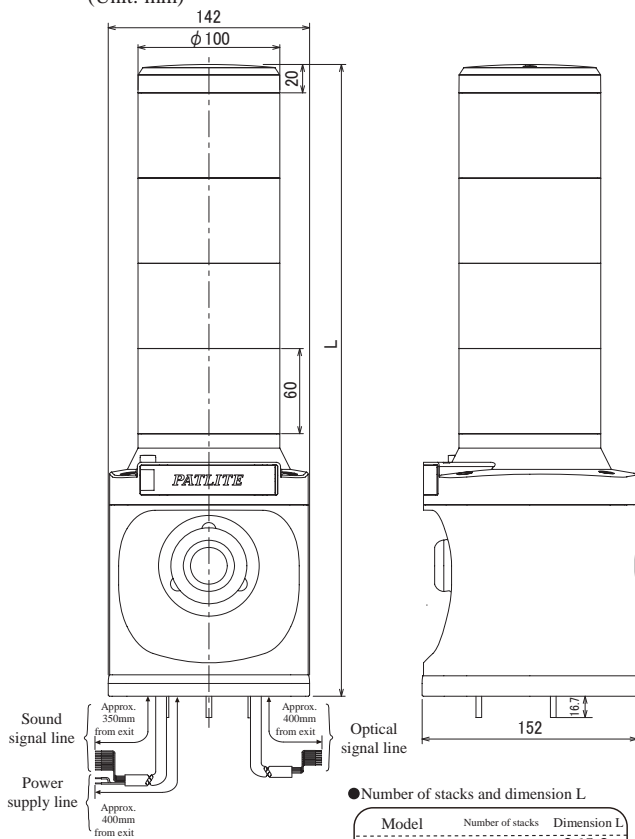 office or technical consultation service written in the last page.

10 Specification

■ Specification

Name of the model	LKEH-□02FV	LKEH-□10FV	LKEH-□20FV	LKEH-□12FV	LKEH-□02FVUL
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	Maximum 105dB (Volume is adjustable.) * 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)				
Voice file	MPEG1-Audio Layer Ⅲ (MP3), Standard bit rate: 64kbit/s, Fs = 44.1kHz				
Corresponding data format	SD card FAT 16				
Internal memory size	504KB (total of MP3 data) / Maximum playing time: 63 sec.(at playing of the standard bit rate data)				
Signal input method	Bit input / binary input				
Starting time	At the start of power supply: 500ms or less / At the start of signal line: 300ms or less				
Fixing time of sound input signal	100ms or more (level input)				
Number of playing channels	Bit input: 8 channels / Binary input : 32 channels				
Priority order of channels	STOP > CH5 > CH4 > CH3 > CH2 > CH1				
Input interface	14 signal lines (optical: 5 lines/ sound: 5 lines/ sound reduction/ common line/ blinking common line) Selection switch / SD card slot				
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

(Unit: mm)

● 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.

142
φ100
20
60
L

Sound signal line — Approx. 350mm from exit
Power supply line — Approx. 400mm from exit
Approx. 400mm from exit — Optical signal line
152
16.7

● Number of stacks and dimension L

Model	Number of stacks	Dimension L
LKEH-1□FV	One stack	265.2
LKEH-2□FV	Two stacks	325.3
LKEH-3□FV	Three stacks	385.4
LKEH-4□FV	Four stacks	445.5

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