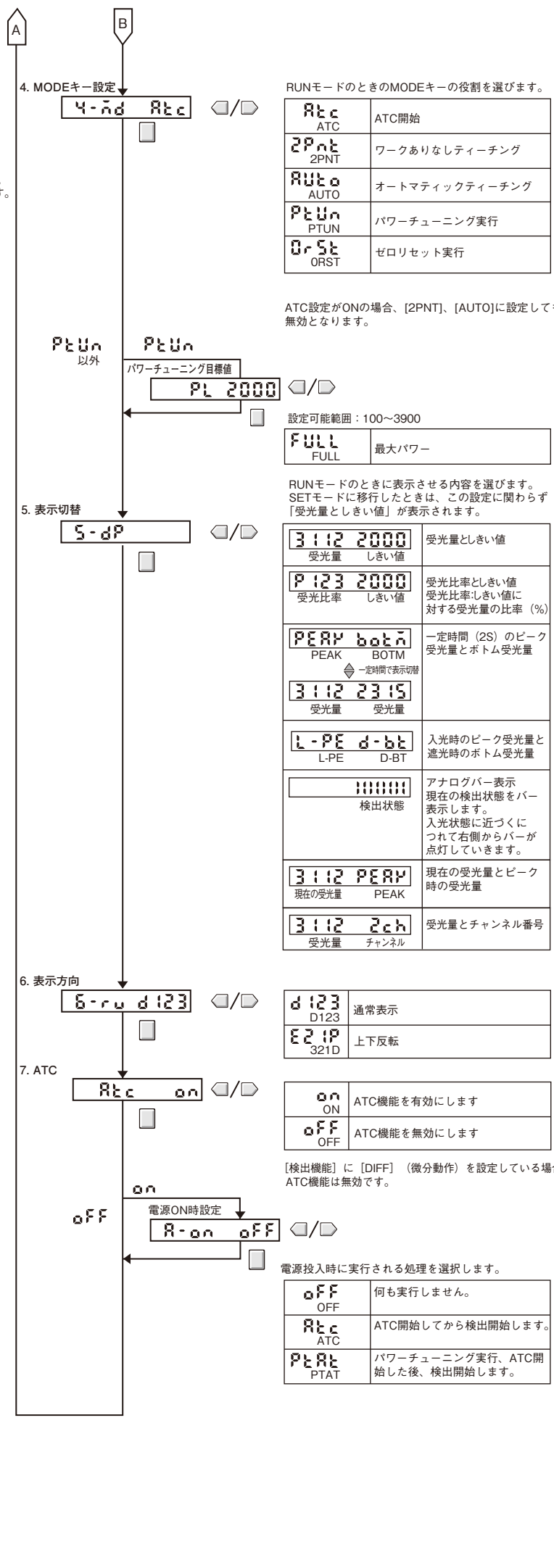
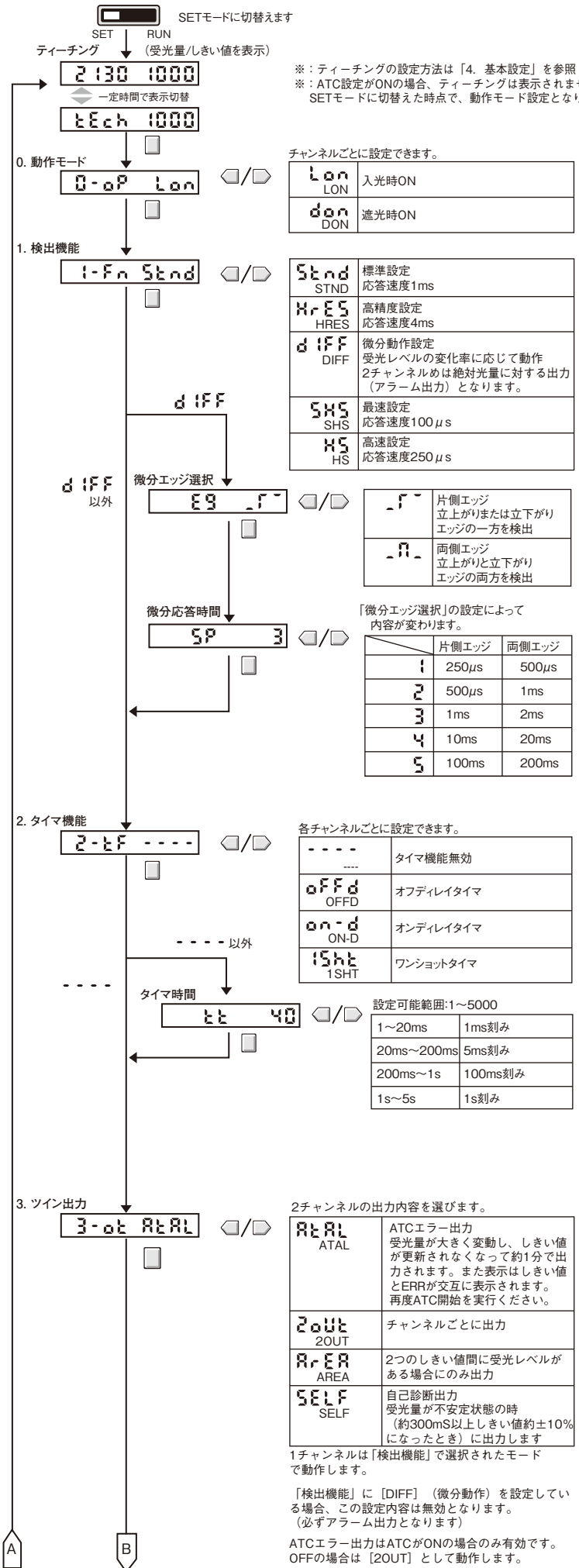




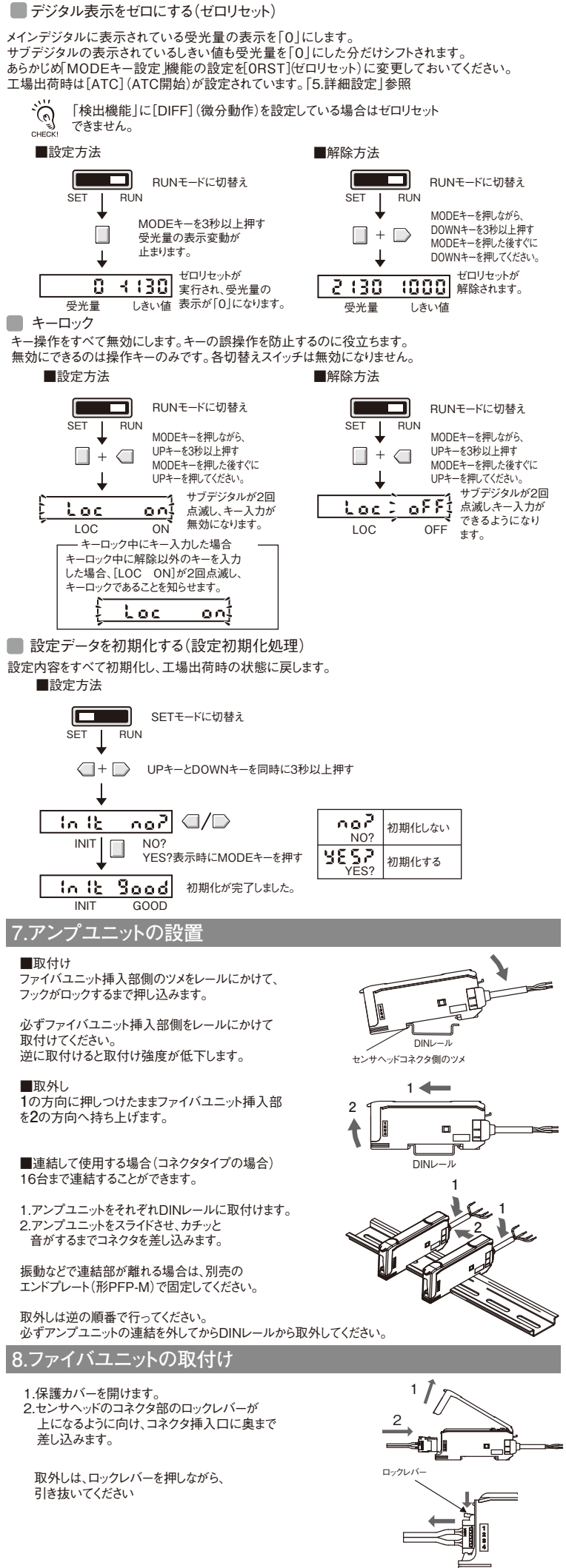


## 5. 詳細設定

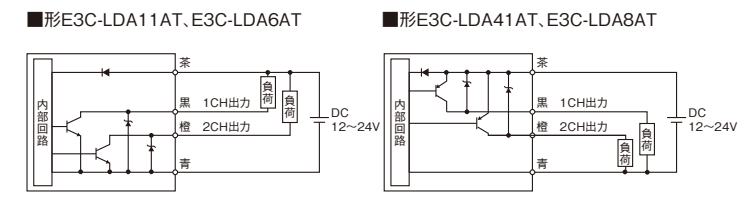
SETモードでは以下の機能設定ができます。  
機能遷移に表示している内容は、工場出荷時の内容です。  
「動作モード」と「タイマ」以外はチャンネル共通の設定となります。  
\*しきい値、受光量、比率など数値の表示内容は一例であり、実際の表示とは異なります。



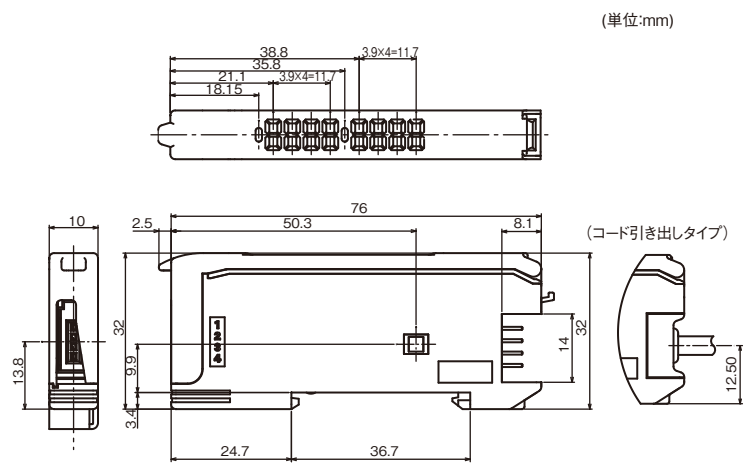
## 6. 便利な機能



## 9. 出力段回路図



## 10. 外形寸法図



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(b) 高い信頼性が必要な用途(例:ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか権利・財産を取扱う用途など)

(c) 厳しい条件または環境での用途(例:屋外に設置する設備、化学的汚染を被る設備、電磁的妨害を被る設備、振動・衝撃を受ける設備など)

(d) カタログ等に記載のない条件や環境での用途

\* (a) から (d) に記載されている他、本カタログ等記載の商品は自動車(二輪車含む、以下同じ)向けではありません。自動車に搭載する用途には利用しないで下さい。自動車搭載用商品については当社営業担当者にご相談ください。  
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電話 055-982-5015 (通話料がかかります)  
■営業時間: 8:00~21:00 ■営業日: 365日

●FAXやWebページでもお問い合わせいただけます。  
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●その他のお問い合わせ  
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A 2013年9月

# Photoelectric Sensors with Separate Digital Amplifiers Laser-type Amplifier Units

## E3C-LDA Series

### Active Threshold Control models (E3C-LDA□□AT)

# OMRON

## INSTRUCTION SHEET

TRACEABILITY INFORMATION:  
 Representative in EU:  
 Omron Europe B.V.  
 Wegalaan 67-69  
 11232 JD Hoofddorp,  
 The Netherlands

Manufacturer:  
 Omron Corporation,  
 Shioji Horikawa, Shimogyo-ku,  
 Kyoto 600-8530 JAPAN  
 Ayabe Factory  
 3-2 Narutani, Nakayama-cho,  
 Ayabe-shi, Kyoto 623-0105 JAPAN

The following notice applies only to products that carry the CE mark:  
 Notice:  
 This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.



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(2/2)

### PRECAUTIONS FOR SAFE USE

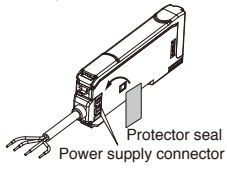
Please observe the following precautions for safe use of the product.

- Do not use the Amplifier Unit in environments subject to flammable or explosive gases.
- Do not use the Amplifier Unit in environments subject to exposure to water, oil, chemicals, etc.
- Do not attempt to disassemble, repair, or modify the Amplifier Unit in any way.
- Do not apply voltages or currents that exceed the rated ranges.
- Wire the Amplifier Unit correctly, e.g., do not reverse the polarity of the power supply.
- Connect the load correctly.
- Do not short both ends of the load.
- Do not use the Amplifier Unit if the case is damaged.
- When disposing of the Amplifier Unit, treat it as industrial waste.

### PRECAUTIONS FOR CORRECT USE

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effects on product performance.

- Wire the Amplifier Unit separately from power supply or high-voltage lines. If the Amplifier Unit wiring is wired together with or placed in the same duct as high-power lines, inductive noise may cause operating errors or damage the Amplifier Unit.
- Do not extend the cable to more than 100 m, and use a wire size of 0.3 mm<sup>2</sup> or larger for the extension cable.
- The Amplifier Unit is ready to operate 200 ms after the power supply is turned ON. If the Amplifier Unit and load are connected to power supplies separately, turn ON the power supply to the Amplifier Unit first. Please turn on the power supply at the same time when you connecting use the Amplifier Units with cables. Mutual interference prevention might not operate normally or mobile console might not be able to be used when the difference between connected Amplifiers at the power supply turning or time is 30ms or more.
- Always keep the protective cover in place when using the Amplifier Unit.
- Connector Short-circuit Protection (for Amplifier Units with Connectors) To prevent electric shock or short-circuits, attach the protector seals provided with E3X-CN-series Connectors to the sides of power supply connectors that are not being used.
- Always turn OFF the power supply before connecting or disconnecting Sensor Heads, joining or separating Amplifier Units, or adding Amplifier Units.
- If the data is not written to the EEPROM correctly due to a power failure or static-electric noise, initialize the settings using the keys on the Amplifier Unit.
- Using a Mobile Console Use the E3X-MC11-SV2 Mobile Console for the E3C-LDA series Amplifier Units. However, there is a function which cannot be used in part. Other Mobile Consoles, such as the E3X-MC11, cannot be used.
- Optical communications are not possible with an E3X-DA-N Amplifier Unit.
- Depending on the application environment, time may be required for the incident light level to stabilize after the power supply is turned ON.
- Output pulses may occur when the power is interrupted and so turn OFF the power to the load or load line before turning OFF the power to the Sensor.
- Do not use thinners, benzene, acetone, or kerosene for cleaning the Amplifier Unit.
- The Sensor Head of E2C cannot be used. It may damage, if it connects.
- At the time of ATC effective, when work speed is slow, a threshold may follow a work and detection may be correctly impossible for it. Please make a threshold ratio small or not effective an ATC function.



### Confirming the Package Contents

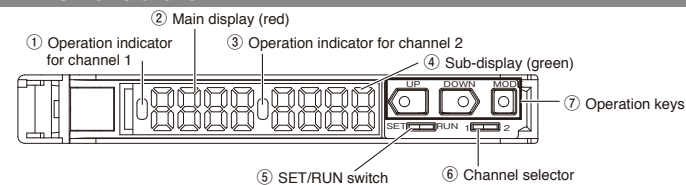
- Amplifier Unit: 1
- Instruction Sheet (this sheet): 1

### 1. Ratings and Specifications

Type	Advanced, ATC function models	
Connection method	Prewired	Separate connector*1
Model number	NPN	E3C-LDA11AT
	PNP	E3C-LDA41AT
Supply voltage	12 to 24 VDC ±10%, ripple (p-p) 10% max.	
Power consumption	1,080 mW max. (45 mA max. at 24 V)	
Control output	Open collector (26.4 V DC max.);	
	load current: 50 mA max.; residual voltage: 1 V max.	
Timer	OFF, OFF-delay, ON-delay, or one-shot	
Timer time	1 ms to 5 s	
Differential detection mode	Supported	
Power tuning	Supported	
ATC(Active Threshold Control) function	Supported(Threshold updates at intervals of about 30 seconds)	
Mutual interference Prevention*2	Supported(optical communications sync method)	
	Possible for up to 10 Units	
I/O settings	Output setting (channel 2 output, area output, self-diagnosis output, or ATC Error output)	

\*1: When using individually or as a master, obtain the E3X-CN21 Master Connector (4-conductor), and when using as a slave, obtain the E3X-CN22 Slave Connector (2-conductor). Either Connector can be used.  
 \*2: Communications are disabled if SHS is selected for the detection mode, and the communications functions for mutual interference prevention and the Mobile Console will not function.

### 2. Nomenclature



- Lit when the output for channel 1 is ON.
- Displays the incident light level or the function name.
- Lit when the output for channel 2 is ON.
- Displays supplemental detection information, the setting of a function, etc.
- Used to switch the mode.
- Used to select the channel to display or set.
- Used to change the display, set functions, etc.

### 3. Basic Operating Information

#### Setting the Mode

The mode is set using the SET/RUN switch. Set this switch according to the operation to be performed.

Mode	Description
SET	Select to set detection conditions, to teach the threshold value, etc.
RUN	Select for actual detection operation or to set the following: Manual adjustment of threshold ratio, starting ATC thres holds, teaching power adjustment, zero reset, or key lock.

#### Key Operations

The operation keys are used to switch the displays and set detection conditions. The functions of the keys depend on the current mode.

Key	Function	
	RUN mode	SET mode
UP key ⬆	Increases the threshold or threshold ratio.	Depends on the setting. • Executes teaching. • Changes the setting forward.
DOWN key ⬇	Decreases the threshold or threshold ratio.	Depends on the setting. • Executes teaching. • Changes the setting in reverse.
MODE key ⬇	Depends on the MODE key setting. • Starting ATC(default setting). • Teaching • Executes power tuning. • Executes a zero reset.	Switches the function to be set on the display.

**Time to Press Keys**  
 If a specific time for pressing a key is not given in a procedure, press the key for approximately 1 second. For example, if the procedure says i press the UP key, i then press the UP key for approximately 1 second and then release it.

#### Reading Displays

The information displayed on the main display and sub-display depends on the current mode. For the default settings, the RUN mode displays will appear when the power supply is turned ON for the first time.

Mode	Main display (red)	Sub-display (green)
SET	Displays the incident light level,* function name, or other information depending on the key operation. *The incident light level will be displayed even if DIFF (differential operation) is set for the detection method.	Displays threshold value* or the setting of the function displayed on the main display depending on the key operation. *The threshold value for the change in the incident light level will be displayed if DIFF (differential operation) is set for the detection method. For the default setting, the current threshold value will be displayed.
RUN (See note.)	ATC ON For the default setting, the current incident light level will be displayed. (default setting)	For the default setting, the current threshold value will be displayed. (default setting)
	ATC OFF The current incident light level will be displayed. The change in the incident light level will be displayed when DIFF (differential operation) is set for the detection mode.	The current threshold value will be displayed. The threshold value for the change in the incident light level will be displayed if DIFF (differential operation) is set for the detection method.

Note: The information that appears on the displays can be set using the display switch function. Refer to 5. Detailed Settings.

### 4. Basic Settings

#### 1. Setting the Operation Mode

Select either light-ON or dark-ON operation. Set as the operation mode in SET mode. Refer to 5. Detailed Settings.

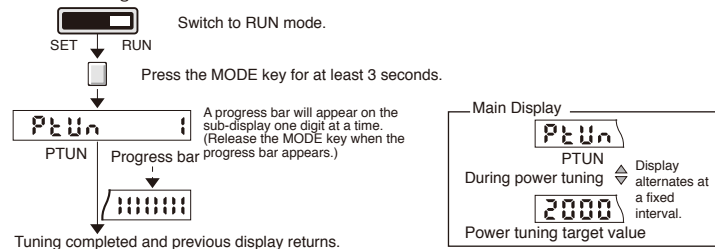
Selection	Description
LON (light-ON) (default)	The output will turn ON when the incident light level is above the threshold. If DIFF (differential operation) is set for the detection method, the output will turn ON when an edge is detected.
DON (dark-ON)	The output will turn ON when the incident light level is below the threshold. If DIFF (differential operation) is set for the detection method, the output will turn OFF when an edge is detected.

#### 2. Adjusting the Power (as Required)

Power tuning can be used to adjust the incident light level that is currently being received to the power tuning target value (default: 2,000). Before tuning ON the power, always secure the detection object and Head and be sure that the incident light level is stable.

#### Setting Method

Confirm that the MODE key setting is PTUN (power tuning) in advance. ATC is the default setting. Refer to 5. Detailed Settings.

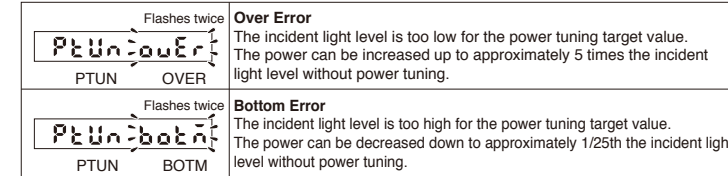


The power tuning target value can be changed. Refer to 5. Detailed Settings.

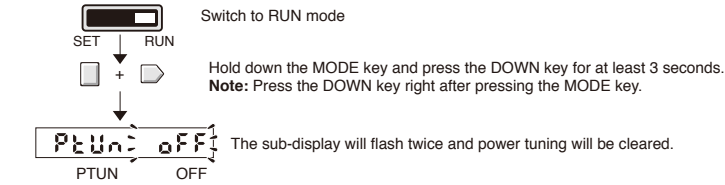
If power is tuned when SHS is selected for the detection method, the power will be set to the minimum value.

#### Power tuning Errors

An error has occurred if one of the following displays appears after the progress bar is displayed.



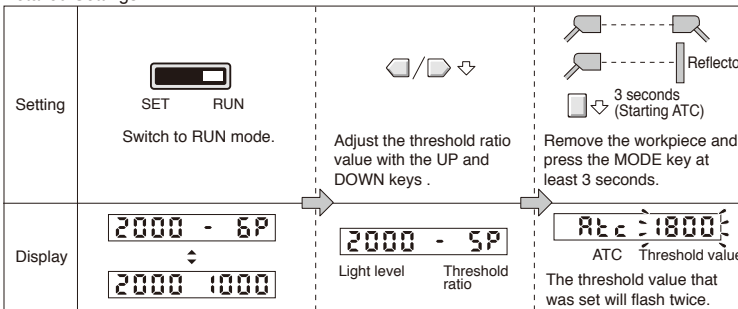
#### Clearing Method



### 3. Setting Thresholds

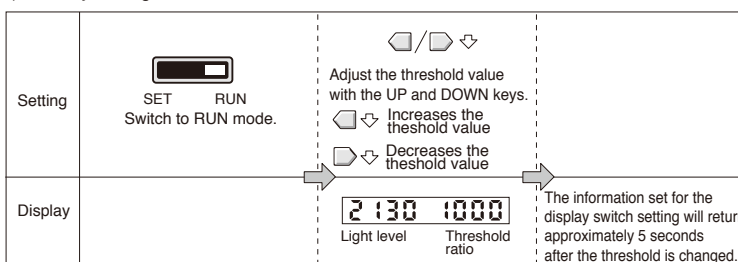
#### Effective set for ATC function

The threshold ratio is adjusted and the threshold is updated by the incident level every about 30 seconds by ATC start. Confirm that the MODE key setting is ATC in advance. ATC is the default setting. Refer to 5. Detailed Settings.



#### Disable ATC function

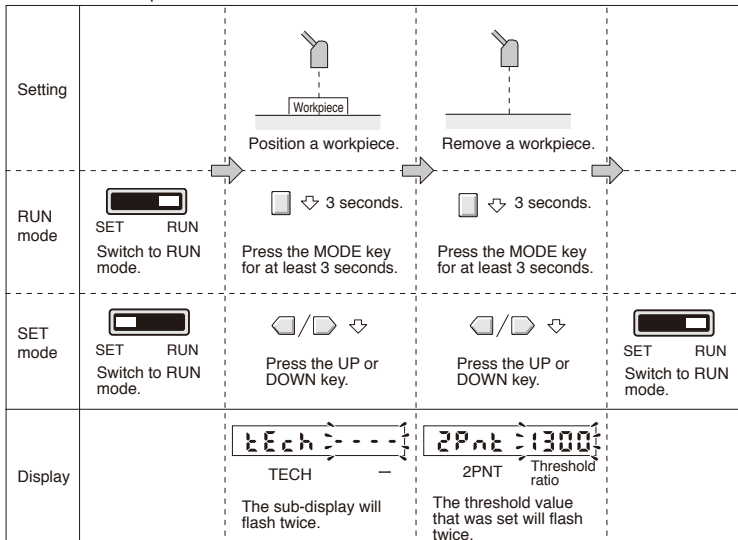
##### 1) Manually Setting



##### 2) Teaching

###### Teaching With and Without a Workpiece

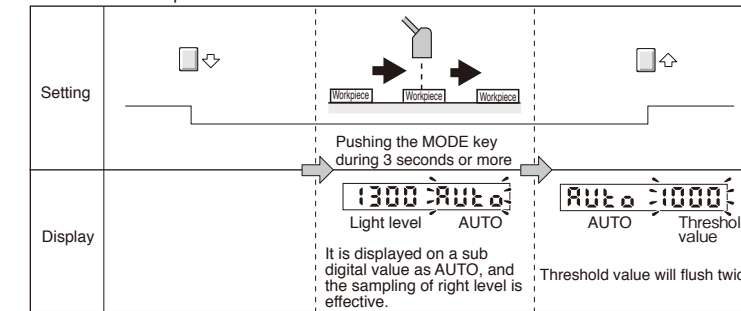
Teaching can be performed twice, once with and once without a workpiece, and the value between the two measured values is set as the threshold. RUN mode and SET mode – each mode can be set up.



If DIFF (differential operation) is set for the detection method, the threshold value will be set to half of the difference between the two measured values.

#### Automatic-teaching (It sets up at move work.)

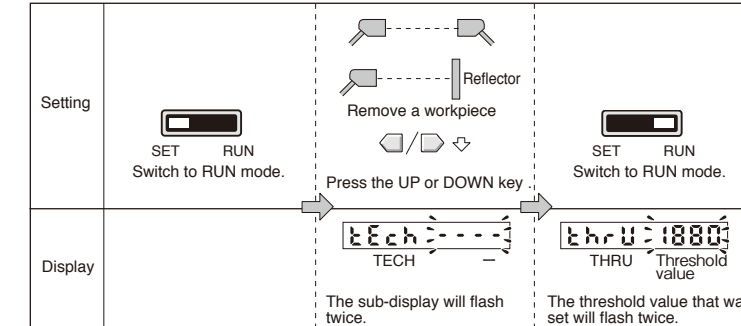
While continuing pushing a key, the middle of the detected maximum and the minimum value can be set up as a threshold.



This method cannot be used to set the threshold when the detection method has been set to DIFF (differential operation).

#### Teaching for Through-beam or Retroflective Sensor Heads

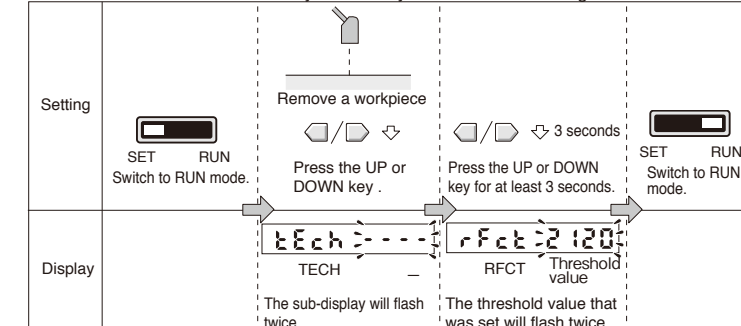
Teaching for a Through-beam or Retroflective Sensor Head is performed without a workpiece. A value about 6% less than the incident light level with no workpiece is set as the threshold value. This method is ideal to stably detect very small differences in light level.



If DIFF (differential operation) is set for the detection method, the threshold value will be set to the minimum value below the incident light level without a workpiece that will enable stable detection.

#### Teaching for Reflective Sensor Heads

Teaching for a Reflective Sensor Head is performed without a workpiece (i.e., for the background). A value about 6% greater than the incident light level is set as the threshold value. This method is ideal to stably detect very small differences in light level.



If DIFF (differential operation) is set for the detection method, the threshold value will be set to the minimum value above the incident light level without a workpiece that will enable stable detection.

#### Teaching Error

After performing teaching, when the following is displayed on sub digital display, the error has occurred. However, the threshold might not be able to be detected correctly though is set within the possible range.

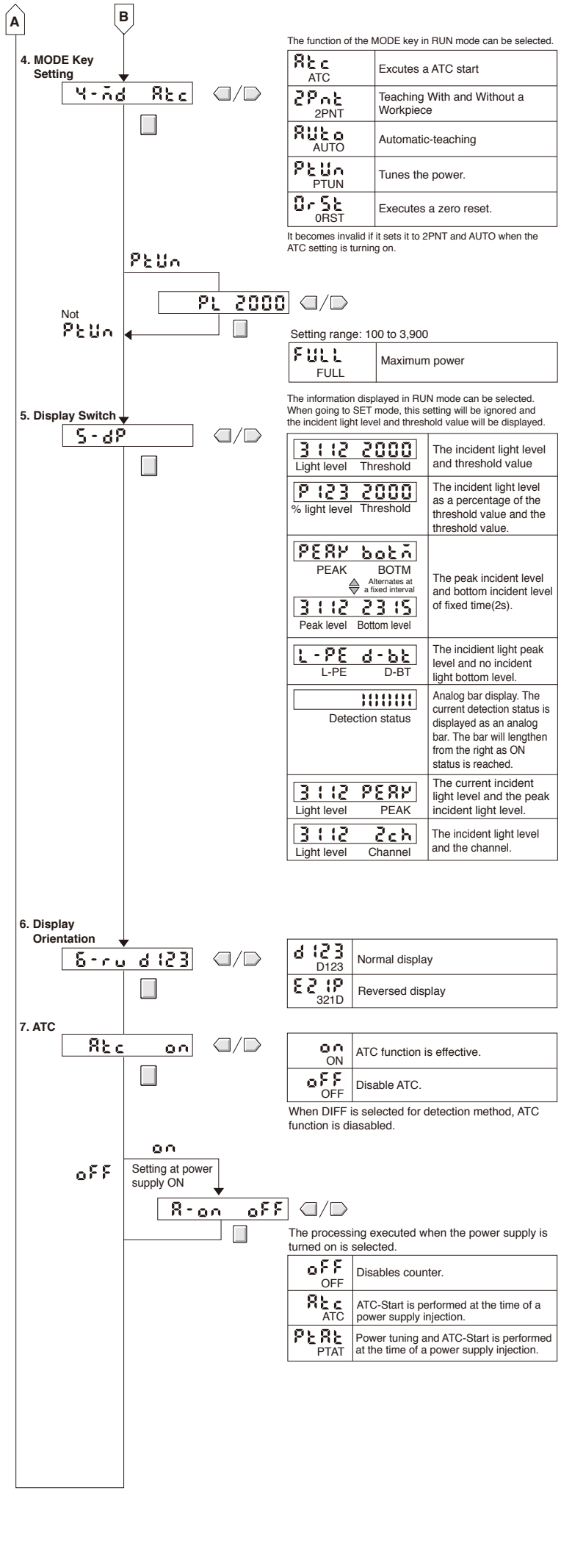
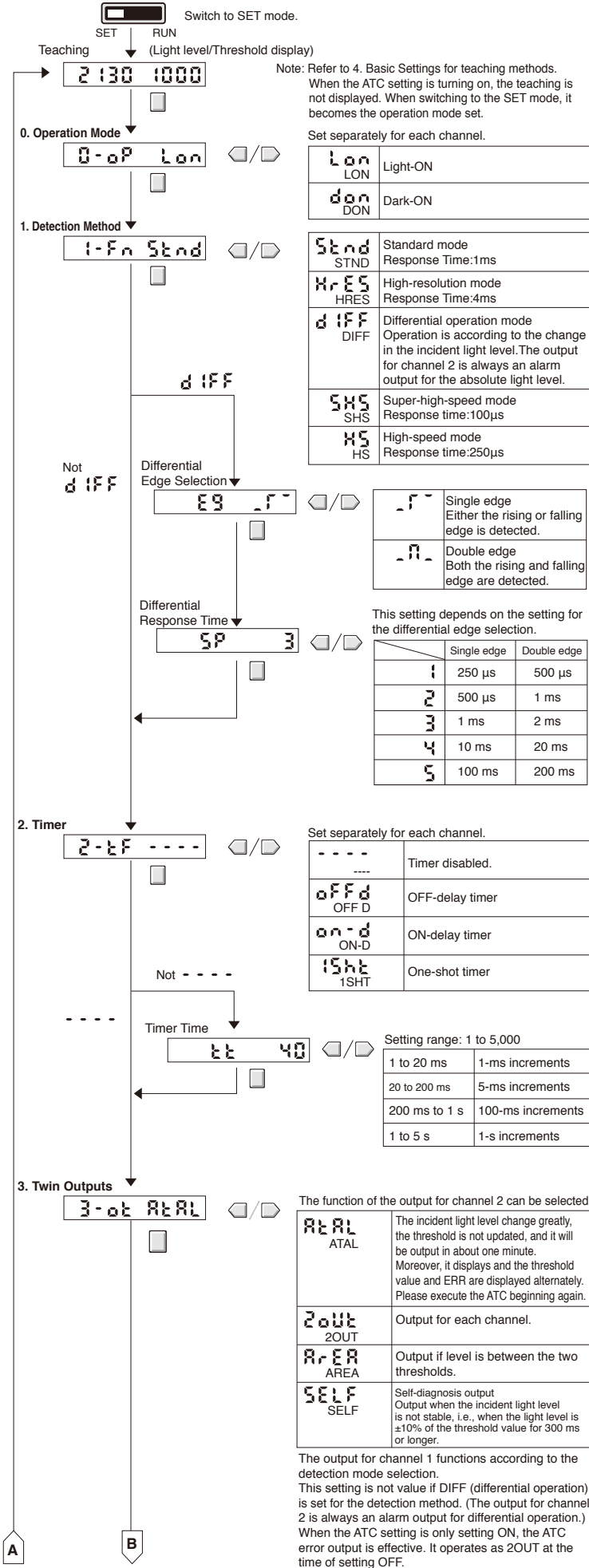
flash twice. Over	<b>Over error</b>	Light level is too large. Do one of the following and then repeat the operation. • Adjust the Head to decrease the incident light level. • Execute power tuning.
flash twice. Lo	<b>Lo error</b>	Light level is too small. Do one of the following and then repeat the operation. • Adjust the Head to increase the incident light level. • Execute power tuning.
flash twice. Near	<b>Near error</b>	The difference of incident light level is too small. Do one of the following and then repeat the operation. • Adjust the Head to increase the difference between the two incident light levels.



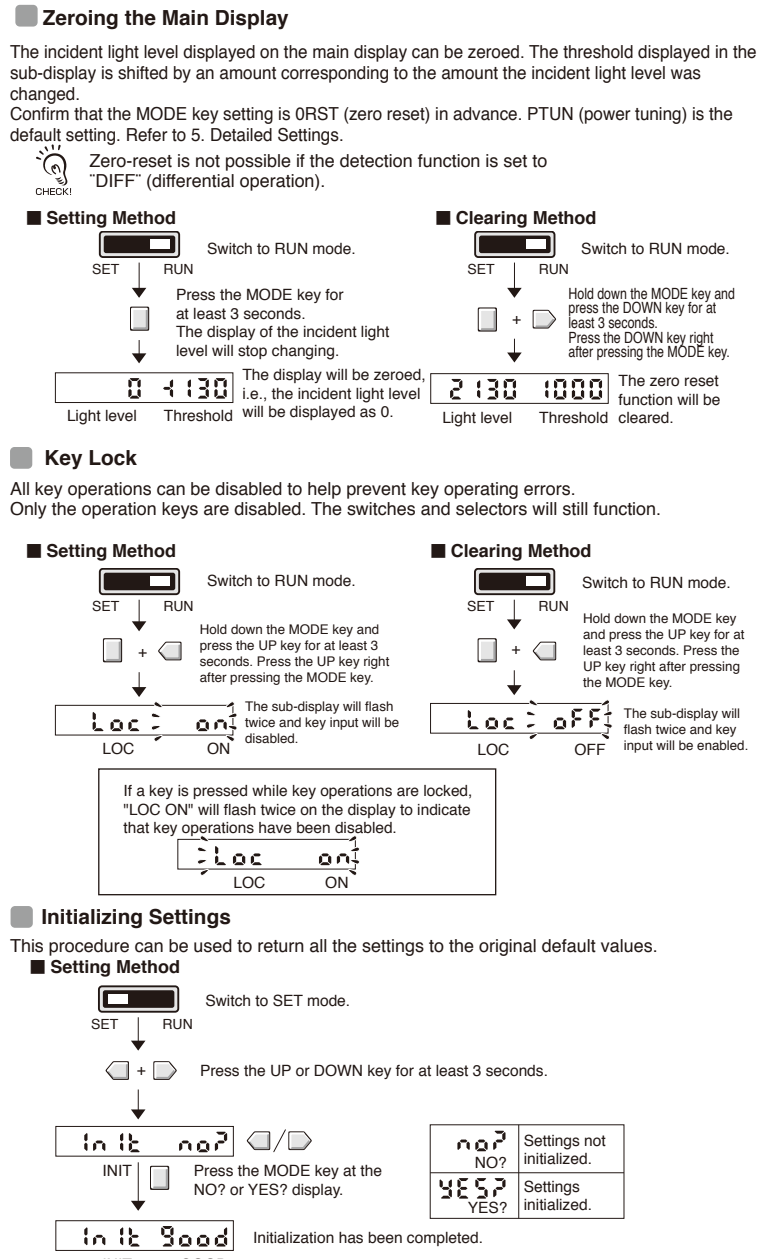
## 5. Detailed Settings

The following functions can be set in SET mode. The default settings are shown in the transition boxes between functions. All settings except for the operation mode and timer settings are the same for both channels.

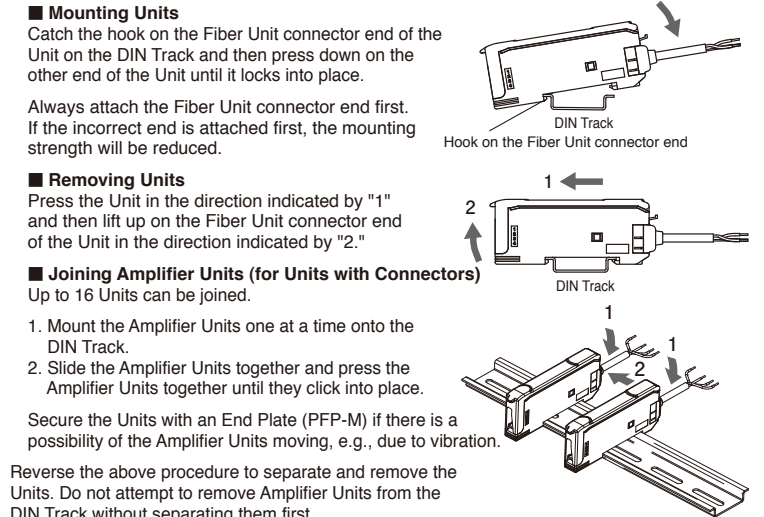
\*: The values shown for thresholds, incident light levels, percentages, etc., are examples only. Actual displays may vary.



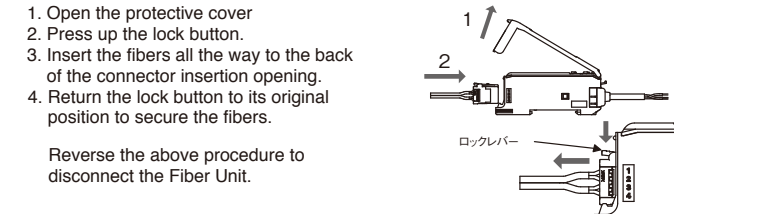
## 6. Convenient Functions



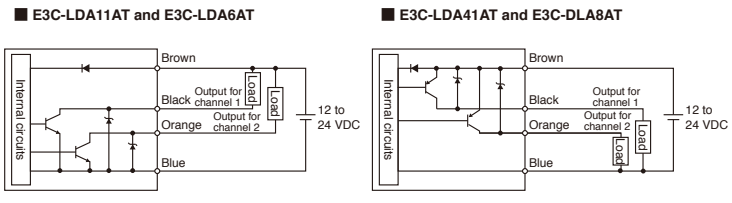
## 7. Installing the Amplifier Unit



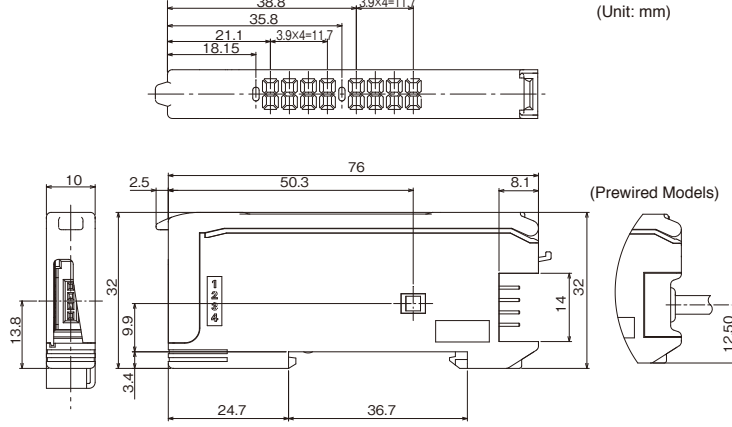
## 8. Connecting the Fiber Unit



## 9. I/O Circuits



## 10. Dimensions



## Suitability for Use

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**OMRON Corporation** Industrial Automation Company  
 Tokyo, JAPAN Contact: [www.ia.omron.com](http://www.ia.omron.com)

**Regional Headquarters**

- OMRON EUROPE B.V.**  
 Sensor Business Unit  
 Carl-Benz-Str. 4, D-71154 Nufringen, Germany  
 Tel: (49) 7032-811-0/Fax: (49) 7032-811-199
- OMRON ELECTRONICS LLC**  
 One Commerce Drive Schaumburg, IL 60173-5302 U.S.A.  
 Tel: (1) 847-843-7900/Fax: (1) 847-843-7787
- OMRON ASIA PACIFIC PTE. LTD.**  
 No. 438A Alexandra Road # 05-05/08 (Lobby 2), Alexandra Technopark, Singapore 119967  
 Tel: (65) 6835-3011/Fax: (65) 6835-2711
- OMRON (CHINA) CO., LTD.**  
 Room 2211, Bank of China Tower, 200 Yin Cheng Zhong Road, PuDong New Area, Shanghai, 200120, China  
 Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200