

6.3 オフデレイタイマを使用したい時

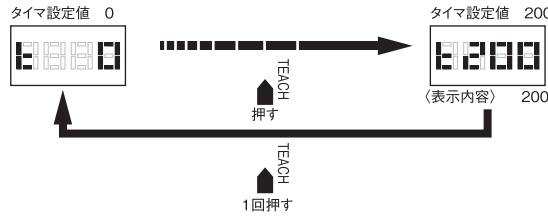
オフデレイタイマを使用する際は、タイマ時間を設定します。

タイマ設定は▲キーの押下により、以下のように設定することができます。(デフォルト時は、オフデレイタイマOFFの状態です。)

タイマ設定時間	設定間隔
0 ~ 20 ms	1 ms 毎
20 ~ 200 ms	5 ms 毎

本機能設定時は、レベル表示灯の最上位に「t」(Timer)が表示され、タイマ時間はレベル表示灯にデジタル表示されます。

一度設定を行うと、以降は設定されているオフデレイ状態で動作します。



6.4 光軸調整を行う場合に、投光スポットを明るくしたい時。

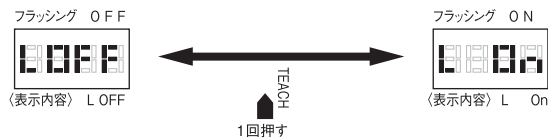
フラッシングはSETモード時のみ行われ、以下の場合に開始され、10分後自動的にフラッシングが止まります。(自動的に止まった場合でも、再度以下の状態になった場合は、再度フラッシングを開始します。)

- ・本設定で「フラッシング ON」に設定された後
- ・「フラッシング ON」に設定されている状態で、他モードに切替え、再度SETモードに切替られた時

デフォルト時は、「フラッシング OFF」が設定されています。▲キーの押下により、「フラッシング ON」が設定できます。

- ・OFF……SETモード時フラッシングなし
- ・ON……SETモード時フラッシングあり

本機能設定時は、レベル表示灯の最上位に「L」(fLashing)が表示されます。一度設定を行うと、以降は設定されている状態で動作します。



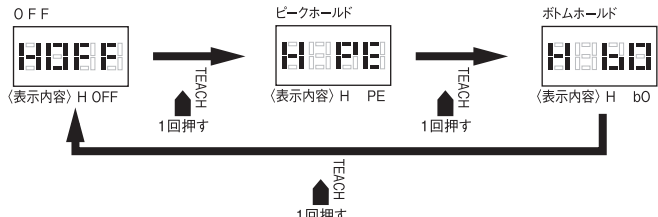
6.5 デジタル表示をホールド表示したい時

デジタル表示 (SETモード時:入光量、ADJモード時:パーセント、RUNモード時:入光量、パーセント)を一定期間ホールド表示することにより、簡単に表示値を読みとることができます。

デフォルト時は、「OFF」が設定されています。▲キーの押下により、「ピークホールド」または「ボトムホールド」が設定できます。

- ・OFF …………… 通常表示。
- ・ピークホールド… 2秒毎に表示値が更新され、その間の最大値が点滅表示されます。
- ・ボトムホールド… 2秒毎に表示値が更新され、その間の最小値が点滅表示されます。

本機能設定時は、レベル表示灯の最上位に「H」(Holding)が表示されます。一度設定を行うと、以降は設定されている状態で動作します。



6.6 デジタル表示の表示方向を反転させたい時

デフォルト時は、「標準」が設定されています。▲キーの押下により、「リバース」が設定できます。

- ・標準……………通常表示方向
- ・リバース……表示方向反転

本機能設定時は、レベル表示灯の最上位に「d」(display)が表示されます。表示方向の設定は、一度設定を行うと、以降は設定されている状態で動作します。

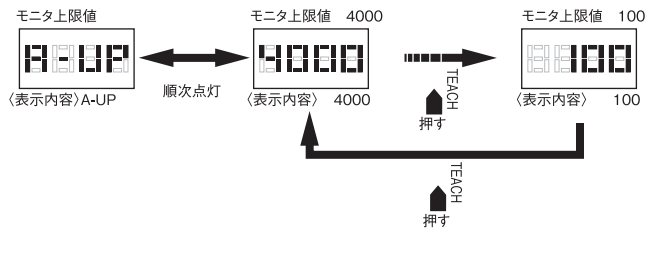


6.7 モニタ出力のレンジをフォーカスしたい時 (モニタ出力付き機種のみ)

モニタ出力の1~5Vを任意の2点間の出力に変更でき、制御に必要なレンジに絞ってより高精度な出力が可能です。

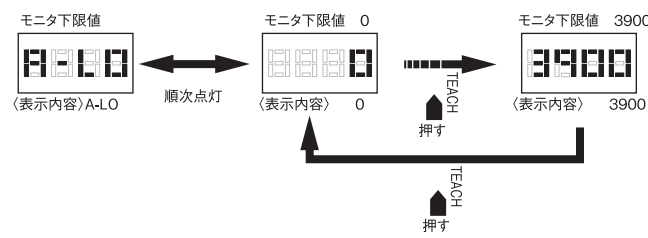
(1)設定範囲の上限を決めます。入光量がこの値以上のとき、モニタ出力が5Vとなります。

本機能設定時はレベル表示灯に「A-UP」(Analog UPper)と設定値(デジタル値)が交互に表示され、▲キーの押下により設定します。設定範囲は100~4000までで、100毎に設定できます。(デフォルト値は4000です。)



(2)設定範囲の下限を決めます。入光量がこの値以下のとき、モニタ出力が1Vとなります。

本機能設定時はレベル表示灯に「A-LO」(Analog LOwer)と設定値(デジタル値)が交互に表示され、▲キーの押下により設定します。設定範囲は0~3900までで、100毎に設定できます。(デフォルト値は0です。)

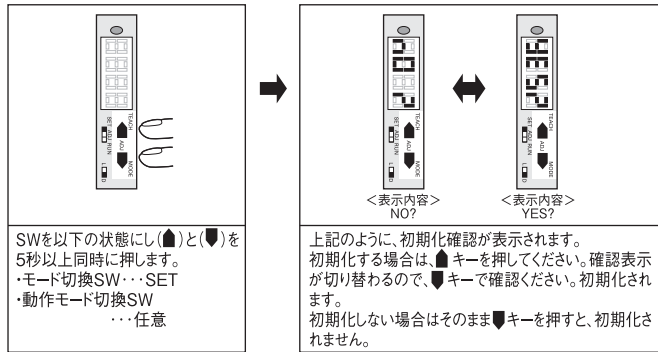


尚、下限値は上限値より大きな値が設定できません。

(3)一度設定を行うと、以降は設定されている状態で動作します。

6.8 各種設定をご購入時の状態に戻したい時

特定のSW、キー設定により各種機能設定を初期化(ご購入時の状態)にできます。



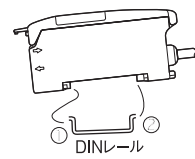
正しい使い方

(1)アンプユニットの取付け

・DINレールを使用される場合
装着

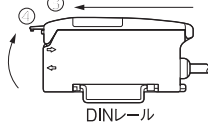
- ①前部を専用取付金具(別売)または、DINレールにはめ込みます。
- ②後部を専用取付金具または、DINレールに押しつけます。

(注)①②の順序を逆に、装着しないでください。取付強度が低下する場合があります。



脱着

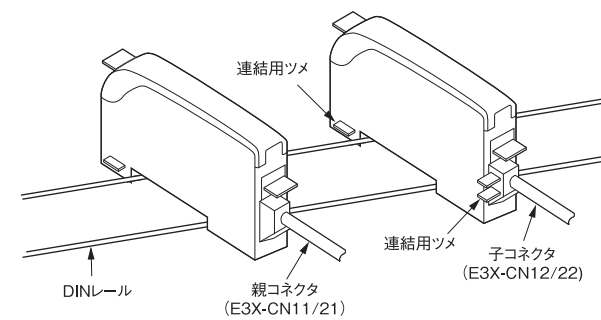
アンプユニットを③の方向へ押しつけたままファイバ挿入部を④の方向へ持ち上げることにより簡単に取外せます。



・コネクタタイプを連結して使用される場合

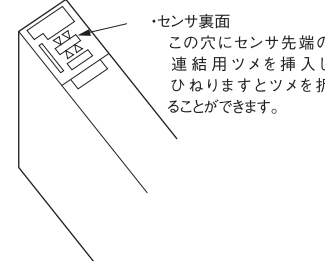
- ①間隔を開けて1台ずつ、DINレールに取り付けます。
- ②アンプをスライドさせ、先端のツメとコネクタ部のツメをそれぞれ合わせた後、カチッと音がするまで密着させます。
- ③振動などにより連結部が離れてくる場合には別売のエンドプレート(形PFP-M)にてしっかりと固定してください。その際、センサ先端のツメがエンドプレートにあたりますのでツメは折ってご使用ください。(2)項参照)

外される場合は逆の手順にてはずしてください。誤ってスライドさせずにはずされるとセンサが破損します。尚、16台まで連結してご使用いただけます。



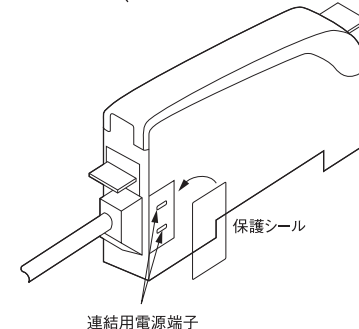
(2)コネクタタイプのツメについて

コネクタタイプの先端には連結用のツメがついています。不要の場合にはニッパやセンサ本体裏面の穴を利用して折ってご使用ください。



(3)コネクタ部の短絡保護について

コネクタタイプを単体でご使用の際や連結して使用される1番外側のセンサについては、コネクタ部の連結用電源端子による感電、短絡防止のため、コネクタ(E3X-CNシリーズ)に付属しております保護用シールを端子部にはってご使用下さい。

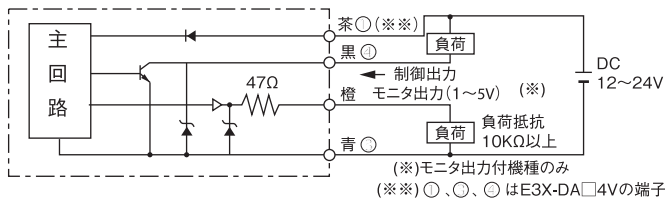


(4)電源投入後のアンプの増設または取り外しについて

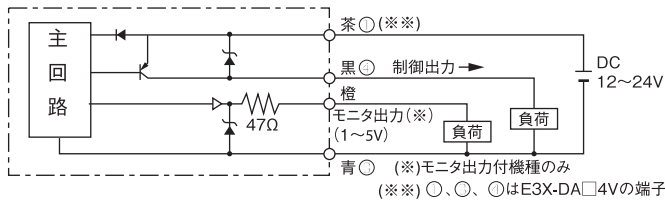
- ・本アンプは電源投入時に、隣接したアンプ間の光通信によりチャンネル認識を行います。
- ・アンプの増設/取り外しや、アンプ間の距離を離すときは、必ず電源を切ってから行ってください。
- ・電源を入れたまま、取り外すとアンプに「SERR」と表示され、動作しなくなります。この場合は、電源を入れ直して「SERR」を解除してください。
- ・電源を入れた状態でアンプを増設するとチャンネル認識が行われず、増設したアンプは「1ch」と設定されます。この場合光通信は行われず、モバイルコンソール E3X-MC11からの操作や、相互干渉防止機能は働きます。再度電源を入れ直し、増設したアンプのチャンネル認識を行わせてください。

出力段回路図

・NPNタイプ

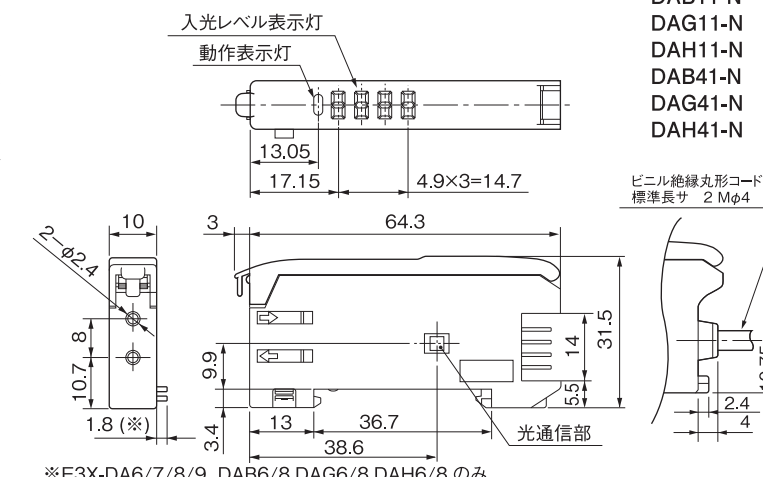


・PNPタイプ



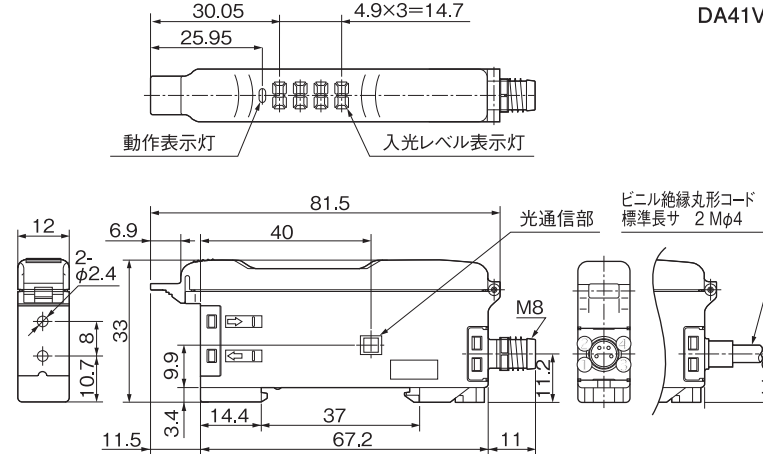
外形寸法図

・E3X-DA6/7/8/9, DAB6/8, DAG6/8, DAH6/8



※E3X-DA6/7/8/9, DAB6/8,DAG6/8,DAH6/8のみ

・E3X-DA14V/44V



ご使用に際してのご承諾事項

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 - a)屋外の用途、潜在的な化学的汚染あるいは電気的妨害を被る用途またはカタログ、取扱説明書等に記載のない条件や環境での使用
 - b)原子力制御設備、焼却設備、鉄道・航空・車両設備、医用機械、娯楽機械、安全装置、および行政機関や個別業界の規制に従う設備
 - c)人命や財産に危険が及ぶうるシステム・機械・装置
 - d)ガス、水道、電気の供給システムや24時間連続運転システムなどの高い信頼性が必要な設備
 - e)その他、上記 a) ~ d) に準ずる、高度な安全性が必要とされる用途
- *上記は適合用途の条件の一部です。当社のベスト、総合カタログ・データシート等最新版のカタログ、マニュアルに記載の保証・免責事項の内容をよく読んでご使用ください。

オムロン株式会社 インダストリアルオートメーションビジネスカンパニー

●お問い合わせ先
カスタマサポートセンター
フリーコール **0120-919-066**

携帯電話・PHSなどをご利用いただけませんので、その場合は下記電話番号へおかけください。
電話 **055-982-5015** (通話料がかかります)

【技術のお問い合わせ時間】
■営業時間:8:00~21:00
■営業日:365日

■上記フリーコール以外のセンシング機器の技術窓口:
電話 **055-982-5002** (通話料がかかります)

【営業のお問い合わせ時間】
■営業時間:9:00~12:00 / 13:00~17:30 (土・日・祝祭日は休業)
■営業日:土・日・祝祭日 / 春期・夏期・年末年始休暇を除く

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カスタマサポートセンター お客様相談室 FAX 055-982-5015

●その他のお問い合わせ先
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OMRON Model E3X-DA-N SERIES

OPICAL FIBER PHOTOELECTRIC SENSOR (DIGITAL LEVEL INDICATION)

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:

Representative in EU: OMRON Europe B.V., Wegalaan 67-69, 2132 JD Hoofddorp, The Netherlands
 Manufacturer: OMRON Corporation, Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN, Shanghai Factory, No.789 Jinji Road, Jinqiao Export Processing District, Pudong New Area, Shanghai, 201206 CHINA

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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PRECAUTIONS FOR SAFE USE

- Do not use the sensor in explosive or ignition gas.
- Do not use the sensor in the water.
- Never disassemble, repair nor tamper with the sensor.
- Do not apply excess voltage and current over rating.
- Do not wire improperly such as reversing polarity.
- Connect the load correctly.
- Do not short-circuit the load.

PRECAUTIONS FOR CORRECT USE

- The E32-TC and E32-DC optical fibers consist of methacrylate resin. Do not use them near organic solvents and other adverse materials.
- There are some cases where the photoelectric switch cable is unavoidably wired in a tube or duct together with a noisy or power line. This causes an induction, possibly resulting in malfunction or damage. In principal, the cable should be wired separately or shielded.
- For extending wires, use a cable 0.3mm² min., and 100m max. in length. When using the cable as a Korea's S-mark certified product, use the cable of less than 10m in length.
- Do not exceed the following force values applied to the cable. Tensile 80 N max., torque : 0.1 N·m max., pressure : 20 N max., flexure : 3 kg max.
- Operation after the power is turned on.
The E3X-DA will begin sensing no later than 200ms after the power is turned on. If the load and the E3X-DA connect to different power supply, the E3X-DA must be always turned on 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 on time is 30ms or more.
- EEPROM write errors
If a write error (output indicator : flashing) occurs during teaching due to a power failure or noise from static electricity, execute the teaching again using the button on the main unit.
- When using the sensor, protective cover must be put on the sensor.

RATINGS/PERFORMANCE AMPLIFIER UNIT

Connecting type	Prewire type						Connector type (*)						M8 connector
Type (E3X-)	NPN	DA11-N	DA21-N	DA11V	DAB11-N	DAG11-N	DAH11-N	DA6	DA7	DAB6	DAG6	DAH6	DA14V
	PNP	DA41-N	DA51-N	DA41V	DAB41-N	DAG41-N	DAH41-N	DA8	DA9	DAB8	DAG8	DAH8	DA44V
Monitor output	None	Have	None	None	None	None	None	Have	None	None	None	None	None
	1 to 5V (Output impedance 47Ω, Load resistance more than 10kΩ.)												
Light source	Red LED	Blue LED	Green LED	Infrared LED	Red LED	Blue LED	Green LED	Infrared LED	Red LED	Blue LED	Green LED	Infrared LED	Red LED
Supply voltage	12 to 24V DC ±10% ripple 10% max.												
Power consumption (**)	Normal position : Power consumption 960mW (Supply voltage 24V Current consumption 40mA) Ecological mode : Power consumption 720mW (Supply voltage 24V Current consumption 30mA) Digital display OFF : Power consumption 600mW (Supply voltage 24V Current consumption 25mA)												
Control output	Open collector 26.4V DC max., 50mA max. Residual Voltage : 1V DC max., Off-state current : 10μA max.												
Timer function	0~200ms												

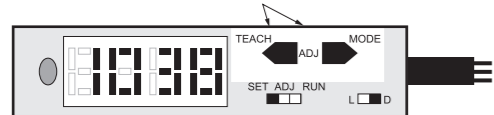
(*) Applied connector

For E3X-DA□6/DA□8: Both E3X-CN11(Main connector 3 cores) and E3X-CN12 (Extension connector 1core) are available.
 For E3X-DA□7/DA□9: Both E3X-CN21(Main connector 4 cores) and E3X-CN22 (Extension connector 2 cores) are available.

(**) The Ecological mode and the Digital display OFF mode can be set from extra mobile console "E3X-MC11" only.

NOMENCLATURE

- SET Key: Used for adjustment of the threshold level
- TEACH Key: Used for teaching, etc.



Level Indicator
 Operation Indicator (orange) • Lit during output operation
 Mode Selector SET, ADJ, RUN
 Operation Mode Selector L, ON/D, ON

OPERATION PROCEDURE

1. Standard procedures...setting each mode (SET/ADJ/RUN)

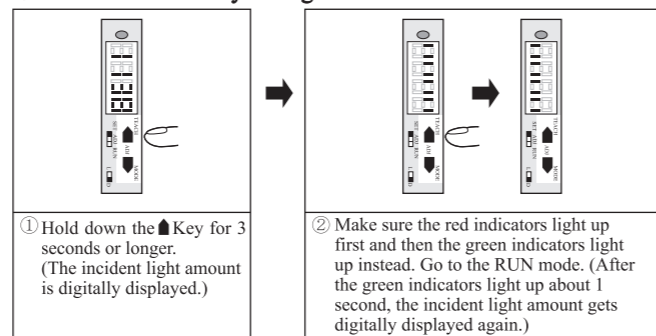
	switch	Setting & operation	Display
SET mode	SET ADJ RUN	1. Teaching the automatic sensitivity level. ① Maximum sensitivity setting ② One-point (without work) teaching ③ Two-point (with/without work) teaching ④ Pin-point (to settle Position) teaching Press the TEACH key Press the MODE key to select function Press the TEACH key to set up procedures Refer to subsection 6 「Setting procedures」.	Digital display shows incident light amount
ADJ mode	SET ADJ RUN	1. Sensitivity adjustment By pressing TEACH key, the sensitivity level gets higher. (the threshold level gets lower.) By pressing MODE key, the sensitivity level gets lower. (the threshold level gets higher.) Refer to subsection 2.2 「Adjustment the sensitivity level」. Refer to subsection 4 「Switching the display type」 as to the display.	Digital display shows threshold level and percentage allowance. Analog display shows light amount and threshold level.
RUN mode	SET ADJ RUN	1. Detection * It's possible to do without any key. 2. Switching the display type ① Digitally displayed ② Digitally displayed in percentage ③ Analog display in bars Pressing Mode key to switch. Refer to subsection 4 「Switching the display type」. 3. Zero reset Pressing TEACH key to reset display. Refer to subsection 5 「Resetting display」	Digital display shows light amount and percentage allowance. Analog display shows light amount and threshold level.

2. Sensitivity Setting

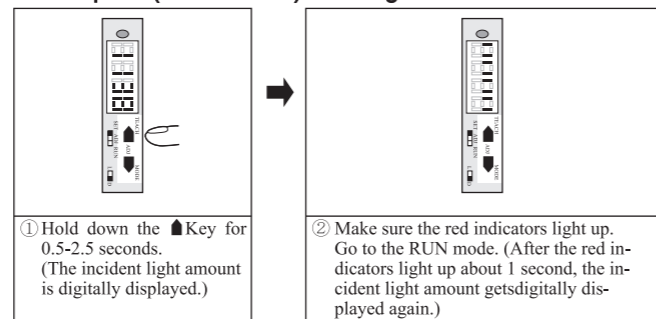
2. 1 Teaching the automatic sensitivity level.

(1) Set the mode selector to the SET position.

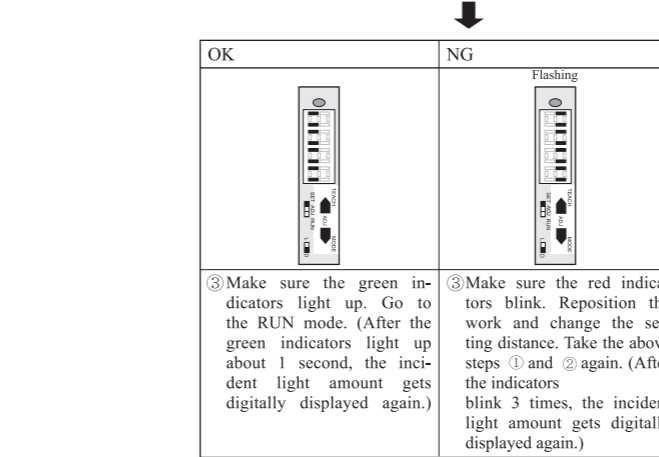
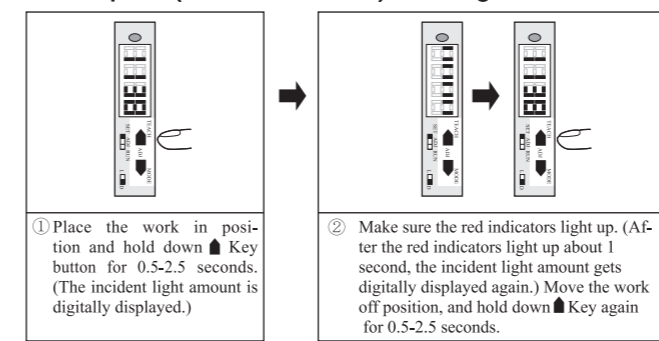
① Maximum sensitivity setting



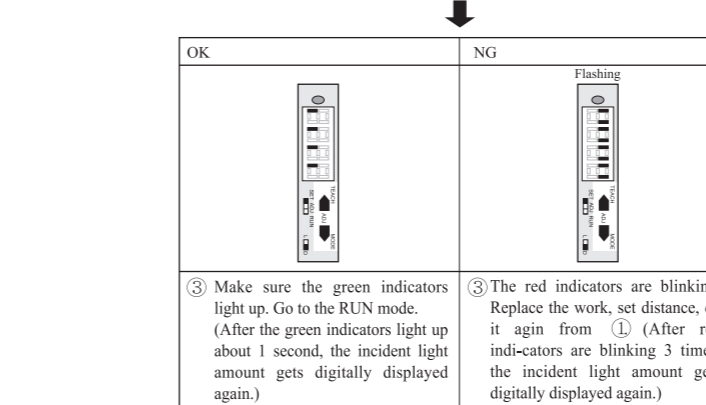
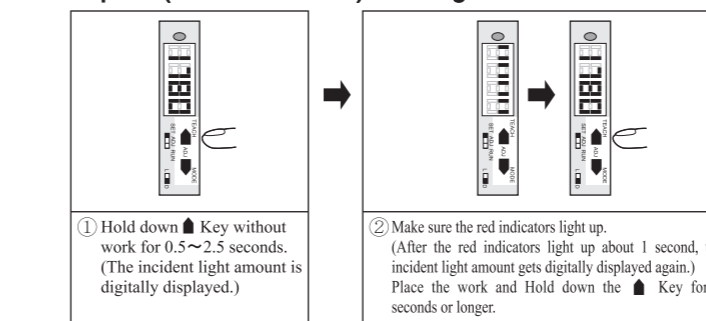
② One-point (without work) teaching



③ Two-point (with/without work) teaching



④ Pin-point (to settle Position) teaching



2. 2 Adjustment the sensitivity level (manual adjustment).

- Set the mode selector to the ADJ position.
- Press the TEACH key to adjust the sensitivity level.

By pressing TEACH key, the sensitivity level gets higher. (the threshold level gets lower.)
 Hold down the key to change the number faster.

By pressing MODE key, the sensitivity level gets lower. (the threshold level gets higher.)
 Hold down the key to change the number faster.

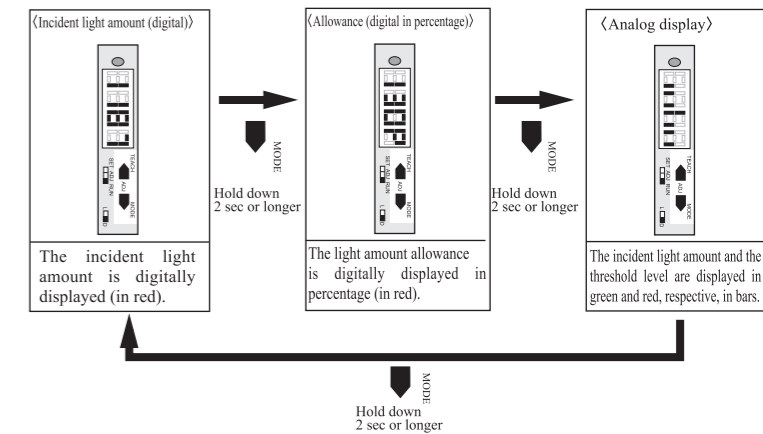
*It's possible to adjust the sensitivity without teaching.
 *During adjustment the sensitivity, sensor is working.

3. To make detection

- Set the mode selector to the RUN position.
- Make detection. (No more procedures)

4. Switching display

- Set the mode selector to the RUN position.
- To switch display, hold down the SET key for 2 seconds or longer.



5. Zero reset (Switch display to [0] in a flash.)

- Set the mode selector to the RUN position. (Make sure it's the digital light amount.)
- To show 「0」 on the display, hold down the key for 1 second or longer.
 *Each time do this, 「0」 is on the display.
 *The threshold level will sift same time.
- Hold down the key and the key at the same time for 1 second or longer to cancel the zero reset. (Return to it's former state.)

6. Setting functions

These functions are helpful for the cases below.

- Detecting a long distance or detecting more quickly (changing the detection function): Detection function setting
- Using the off-delay timer: Timer setting
- Upgrading the spot recognition in adjusting the optical axis: Flashing setting
- Keeping the digital data displayed: Display hold setting
- Changing the digital display direction: Display direction setting
- Changing output range of the monitor: Set output range of the monitor. (only for type having monitor output)

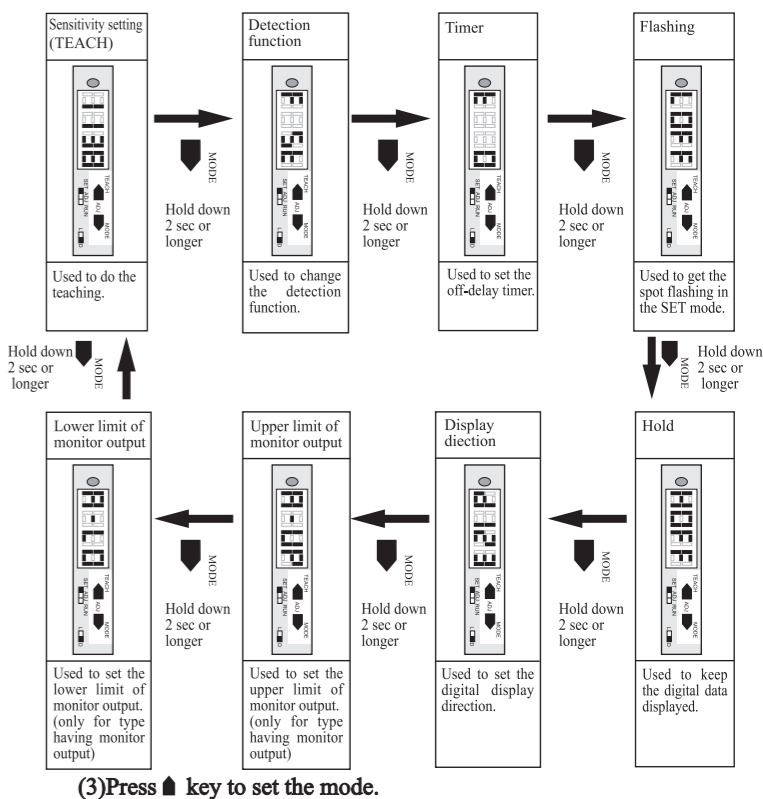
Setting standard procedures

(The following settings can be made.)

- Detection function [STANDARD/LONG DISTANCE/HIGH SPEED]
- Timer [0-200ms (0~20ms : every 1ms 20~200ms : every 5ms)]
- Flashing [ON/OFF]
- Hold [OFF/PEAK/BOTTOM]
- Display direction [STANDARD/REVERSE]
- The upper limit of Monitor output [100~4000 (every 100)]
- The lower limit of Monitor output [0~3900 (every 100)]

6. 1 Selecting functions

- Set the mode selector to the SET position.
- Hold down the SET key for 2 seconds or longer to select a desired function.



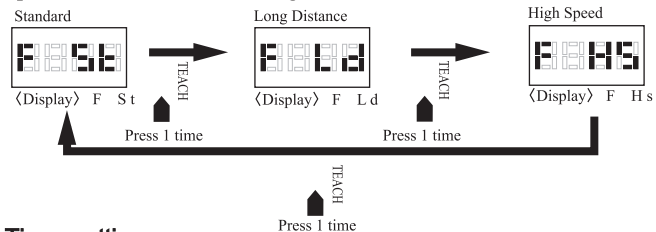
6. 2 To make detection in the setting of High Speed or Long Distance.
The "Standard" measurement is default setting. Just press **▲** Key to change the setting to High Speed or Long Distance.

• **Standard** : Standard measurement with response speed of 1 ms.

• **Long Distance** : Long-distance measurement with response speed of 4 ms. Detection distance about 1.3 times of the standard distance (diffuse fiber in use).

• **High Speed**: High-speed measurement with response speed of 0.25 ms. Detection distance about one-third of the standard distance (diffuse fiber in use).

When setting this function, "F" (Function) is displayed at the top of the level display. Once the detection function is set, it stays in the same status even after the power is turned off and on again.

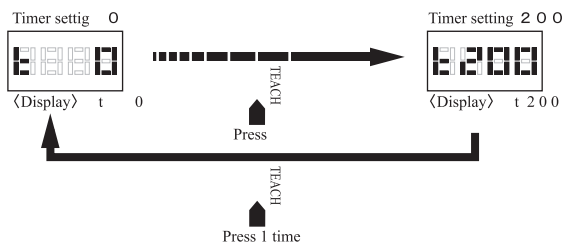


6. 3 Timer setting

Set the off-delay timer by **▲** Key. The timer is preset in the range of 0-200 ms as follows. (The timer off is default setting.)

The range of timer setting	Increment
0~20ms	1ms
20~200ms	5ms

When setting this function, "t" (Timer) appears at the top of the level display. The timer setting is digitally shown in the level display. Once off-delay timer is set, it stays in the same status even after the power is turned off and on again.



6. 4 Get the light spot brightly in adjusting the optical axis.

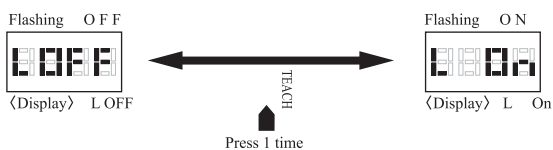
This function is available in the SET mode only. In the following cases, flashing starts and stops itself 10 minutes later. (If any of the following cases occurs again even after an automatic stop, flashing restarts.)

- When "FLASHING ON" is preset.
- When the SET mode is changed to any other mode in the "FLASHING ON" state and SET mode is set again.

"FLASHING OFF" is default setting. Press the **▲** Key to turn on the flashing.

- OFF: No flashing in the SET mode
- ON: Flashing in the SET mode

When setting this function, "L" (flashing) appears at the top of the level display. Once the flashing is set, it stays in the same status even after the power is turned off and on again.

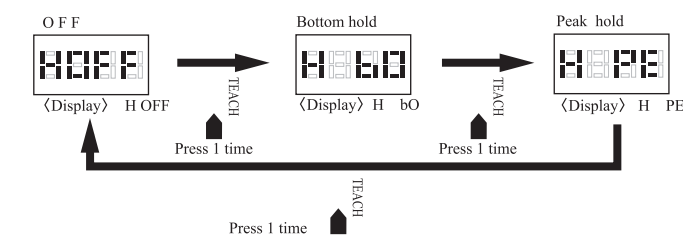


6. 5 To keep the digital data displayed.

The digital display (incident light amount in the SET mode, allowance in percentage in the ADJ mode, or incident light amount and allowance in percentage in the RUN mode) is held for a certain period of time for easy data reading. "OFF" is default setting. Press **▲** Key to set the peak hold or bottom hold.

- OFF: Usual display
- Peak hold: Displayed data gets updated every 2 seconds. The maximum value for the 2 seconds is displayed by flashing.
- Bottom hold: Displayed data gets updated every 2 seconds. The minimum value for the 2 seconds is displayed by flashing.

When setting this function, "H" (Holding) appears at the top of the level display. Once this function is set, it stays in the same status even after the power is turned off and on again.

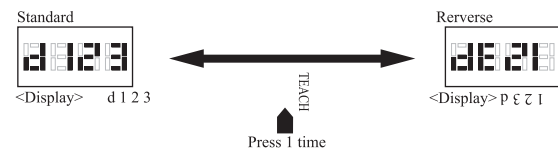


6. 6 To set the digital display other direction.

"STANDARD" is default setting. Press **▲** Key to make the reverse setting.

- Standard: Normal display direction
- Reverse: Reverse display direction

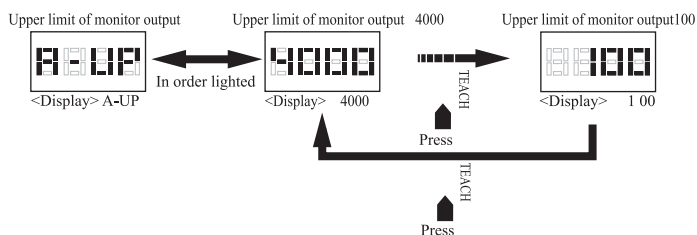
When setting this function, "d" (display) appears at the top of the level display. Once this function is set, it stays in the same status even after the power is turned off and on again.



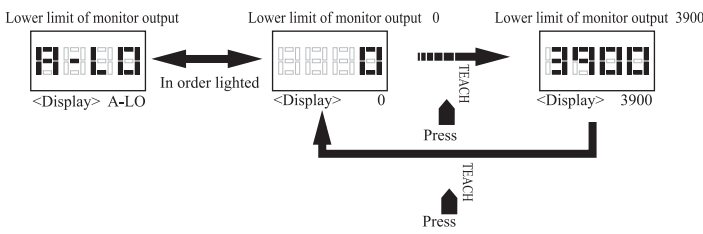
6. 7 Focusing output range of the monitor. (only for type having monitor output)

Monitor output (1~5V) can set any two points and narrow range to control and improve the precision of it.

(1) Set the upper limit. If the light amount is more than this, monitor output will be 5V. Setting this function, 「A-UP」 (Analog UPPER) and established amount is digitally displayed by turns. Pressing **▲** key to set this. The range is from 100 to 4000, it can be set every 100. (4000 is default setting.)



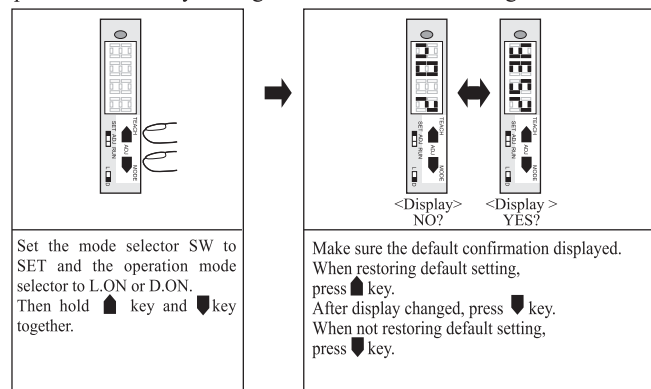
(2) Set the lower limit. If the light amount is less than this, monitor output will be 1V. Setting this function, 「A-LO」 (Analog LOWER) and established amount is digitally displayed by turns. Pressing key to set this. The range is from 0 to 3900, it can be set every 100. (0 is default setting.) The lower limit can not be set more than the upper limit.



(3) Once this function is set, it stays in the same status even after the power is turned off and on again.

6. 8 Restore default setting

Special SW and key setting can restore default setting.

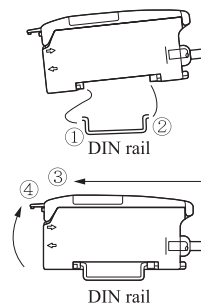


■Precautions for use

(1) Mounting of the amplifier unit

• **Using the DIN rail**

- Mounting
- ① Engage the front slot of the amplifier on to the DIN rail.
 - ② Push the back slot on to the DIN rail. Note: Engage the front slot ① first, otherwise it may cause deterioration of mechanical strength.



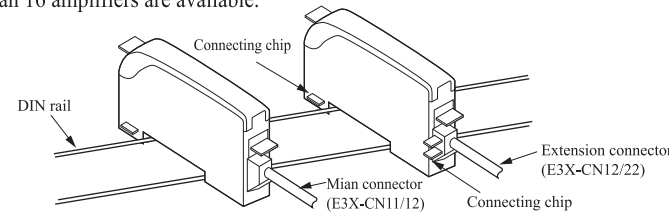
Removing

- Push forward ③ and raise the front slot ④.

• **Connecting connector type amplifier**

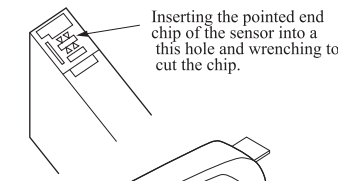
- ① Mounting each amplifier (leave a space), using the DIN rail.
- ② Slide the amplifier unit to set the chip on the pointed end and the chip on the connector. Make sure to get adhere them until the sound of click is heard.
- ③ If it can't get adhere by vibrations, use extra End plate (Type PFP-M) to do. Make sure to cut the chip of the pointed end of the amplifier. See section (2)

To remove it, follow the procedure backward. Do not remove without sliding amplifier, or it damages the amplifier. Less than 16 amplifiers are available.

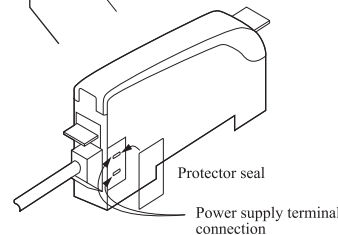


(2) Chip of the connector type

There is a chip on the pointed end of the connector type to connect amplifier. If it's unnecessary, wrench the chip by nippers or the hole on the back of the amplifier.



(3) To protect from electric shock by Power supply terminal connection or short-circuit, put the protector seal (accessory of the E3X-CN series) on the terminal of the outermost amplifier or single use amplifier.

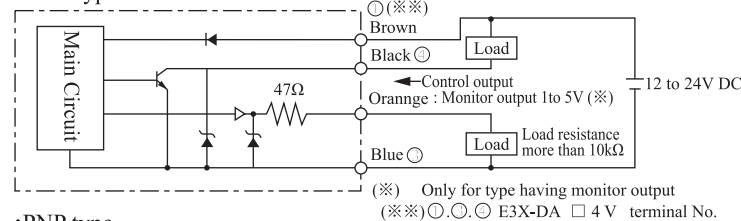


(4) Disconnecting or additionally installing an amplifier while the power is turned on:

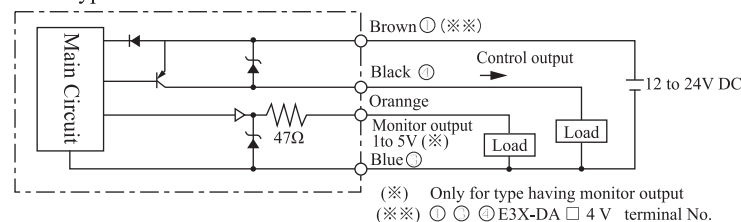
- This amplifier sets the channel of itself via. optical communication between the next located amplifiers each other at the time the power is turned on.
- Disconnecting or additionally installing an amplifier and separation of distance between amplifiers should at all times be conducted upon turning off the power.
- When disconnecting an amplifier with power on, the amplifier gets not worked with the indication of "SERR" on it. In this case, "SERR" should be canceled by means of turning off and reactivating the power.
- When additionally installing an amplifier with power on, the amplifier dose not set the channel of itself properly. (It may be set as "1ch.") In this case, optical communication dose not work. Therefore, the mutual interference protection between amplifiers and operation from mobile console E3X-MC11 dose not work. Power should be turned off and reactivated so that the amplifier can set the channel of itself properly.

■OUTPUT STAGE CIRCUIT DIAGRAM

• NPN type



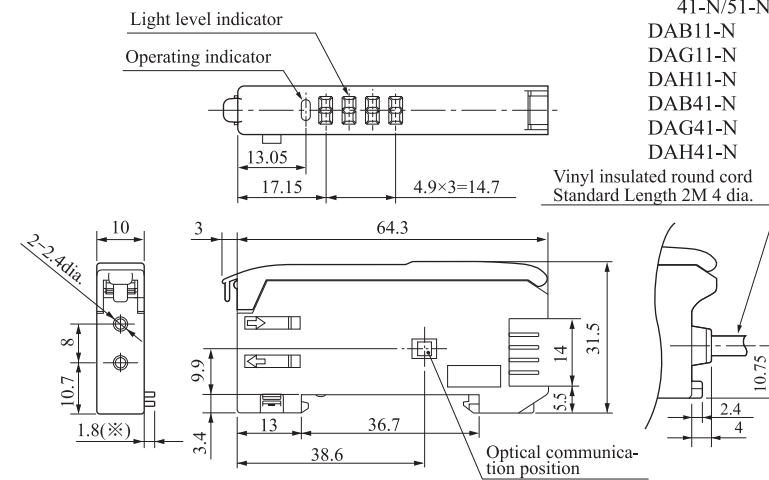
• PNP type



■OUTLINE DRAWING

• E3X-DA6/7/8/9, DAB6/8, DAG6/8, DAH6/8

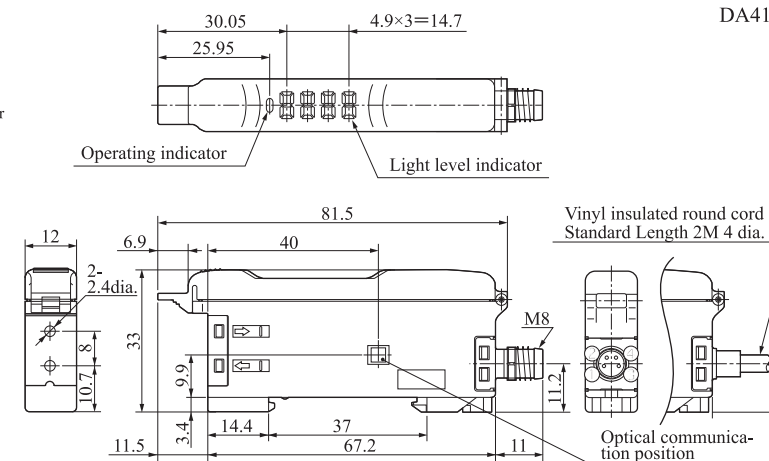
• E3X-DA11-N/21-N/41-N/51-N



(※) Only for E3X-DA 6 / 7 / 8 / 9, DAB6/8, DAG6/8, DAH6/8

• E3X-DA14V/44V

• E3X-DA11V DA41V



Suitability for Use

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES. Please refer to separate catalogs for OMRON's safety rated products.

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

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OMRON Corporation

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모델 E3X-DA-N 시리즈

디지털 하이버 광전 스위치

사용설명서

오른쪽 제품을 구입해 주셔서 대단히 감사합니다.
본 제품을 안전하고 바르게 사용하기 위해, 사용 전에 본 사용설명서를 읽고 내용을 충분히 숙지하여 주십시오.
읽으신 후에는 항상 가까운 곳에 두고 이용하여 주십시오.

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안전상의 요점

- 이하에 나타내는 항목은 안전을 확보하기 위해서 필요한 것이므로 반드시 지켜 주십시오.
- 1) 인화성, 폭발성 가스가 있는 환경에서는 사용하지 마십시오.
 - 2) 물속에서는 사용하지 마십시오.
 - 3) 제품의 분해, 수리, 개조를 하지 마십시오.
 - 4) 정격 범위를 초과하는 전압, 전류를 인가하지 마십시오.
 - 5) 전원의 극성 등, 오배선을 하지 마십시오.
 - 6) 부하의 접속을 올바르게 해 주십시오.
 - 7) 부하의 양단을 단락시키지 마십시오.

올바른 사용법

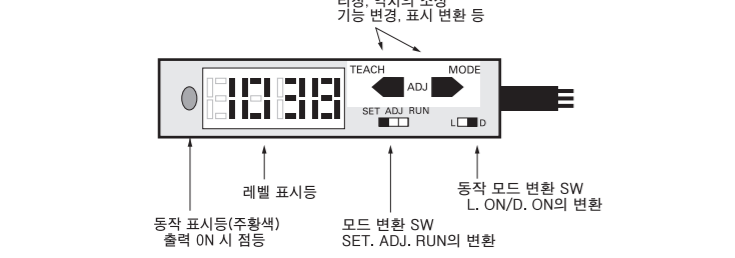
- 1) 광화이버는 메타크릴수지이므로 유기용제 등을 사용하는 환경에서는 사용하지 마십시오.
- 2) 전력선, 동력선과 광전 스위치의 배선을 동일배관 또는 동일덕트로 하면 유도되어, 오동작이나 파손의 원인이 될 수 있으므로, 별도로 배선하거나 실드코드의 사용을 원칙으로 하십시오.
- 3) 코드의 연장은 0.3mm² 이상의 선을 사용하여, 100m 이하로 하십시오. 한국 S-mark 인증품으로서 사용될 경우에는 10m 미만으로 하여 주십시오.
- 4) 코드부에 가하는 힘은 아래의 수치 이하로 하여 주십시오. 인장 80N 이하, 토크 0.1N·m 이하, 누르는 압력 20N 이하, 굴곡 3kg 이하.
- 5) 전원 투입 시의 동작 전원을 투입하고 나서, E3X-DA가 검출이 가능하도록 되는 시간은 200ms 이하입니다. 부하와 E3X-DA가 별도 전원으로 접속되어 있는 경우는, 반드시 E3X-DA의 전원을 먼저 투입하여 주십시오.
- 6) 코드인출터미널에 연결하여 사용할 경우에는 전원은 동시에 넣어주십시오. 열결된 센서사이와의 전원투입시간이 30ms 이상일 경우에는 서로 간섭방지 기능이 정상적으로 동작하지 않고 또는 모바일트랜슬루시 사용되지 않을 때 두 있습니다.
- 7) EEPROM 기입 에러에 대하여 감도설정(티칭) 시의 전원차단과 정전기 등의 노이즈에 의해 기입 에러(동작표시등(주황색)점멸)가 발생한 경우, 본체의 설정 키로 감도설정(티칭)을 다시 실행하여 주십시오.
- 8) 반드시 보호 커버를 장착한 상태에서 사용하여 주십시오.

정격/성능 앰프 유닛

접속 방식	프리 와이어 타입					커넥터 타입(*)					M8 커넥터	
	NPN	DA11-DA21	DA11V-DA11V	DA811-DA811	DA6 DA7	DA6 DA7	DA6 DA7	DA6 DA7	DA6 DA7	DA6 DA7	DA6 DA7	DA6 DA7
(E3X-)	PNP	DA41-DA51	DA41V-DA41V	DA841-DA841	DA8 DA9	DA8 DA9	DA8 DA9	DA8 DA9	DA8 DA9	DA8 DA9	DA8 DA9	DA8 DA9
모니터 출력	무	유	무	무	무	유	무	무	무	무	무	무
	1~5V(출력 임피던스 47Ω, 허용부하 저항 10kΩ 이상)											
투광 소자	적색LED	적색LED	적색LED	적외LED	적색LED	적색LED	적외LED	적외LED	적외LED	적외LED	적외LED	적외LED
전원 전압	DC 12~24V ± 10% 리플 10% 이하											
소비 전력(**)	통상 시	: 소비전력 960mW (전원전압 24V 시 소비전류 40mA)										
	에코모드 시	: 소비전력 720mW (전원전압 24V 시 소비전류 30mA)										
	디지털표시 소등 시	: 소비전력 600mW (전원전압 24V 시 소비전류 25mA)										
제어 출력	오픈 콜렉터 (DC26.4V 이하) 부하 전류: 50mA 이하, 잔류 전압: 1V 이하, OFF 상태 전류 10μA 이하											
타이머 기능	0~200ms (1~20ms : 1ms 단위, 20~200ms: 5ms 단위)											

(*) 적용 커넥터 E3X-DA□6/DA□8용 : E3X-CN11(메인 커넥터 3심), E3X-CN12(서브 커넥터 1심 제어출력만) 양쪽 모두 사용할 수 있습니다.
E3X-DA□7/DA□9용 : E3X-CN21(메인 커넥터 4심), E3X-CN22(서브 커넥터 2심 제어출력, 모니터출력만) 양쪽 모두 사용할 수 있습니다.

각부의 명칭 · 기능

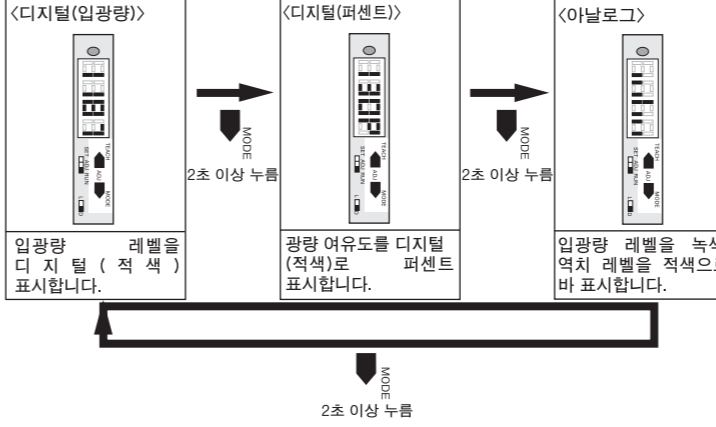
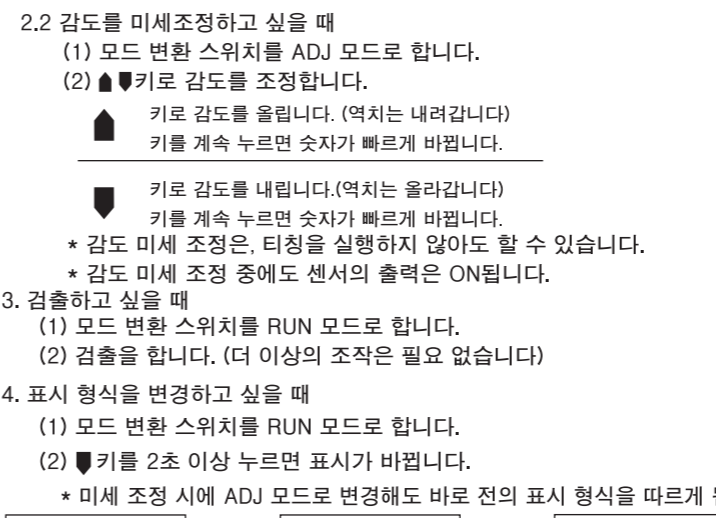
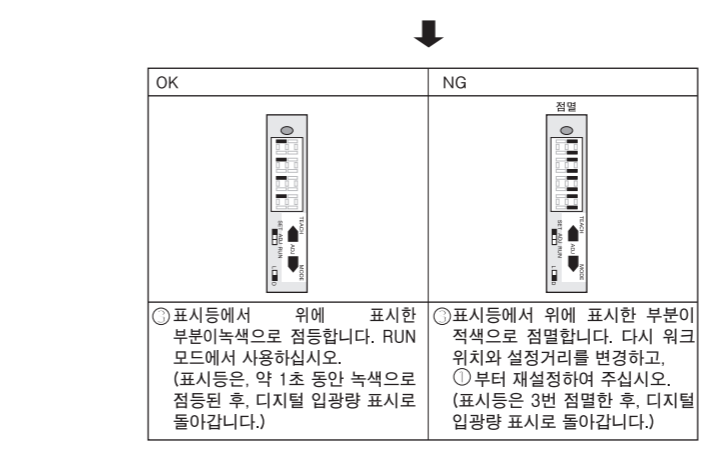
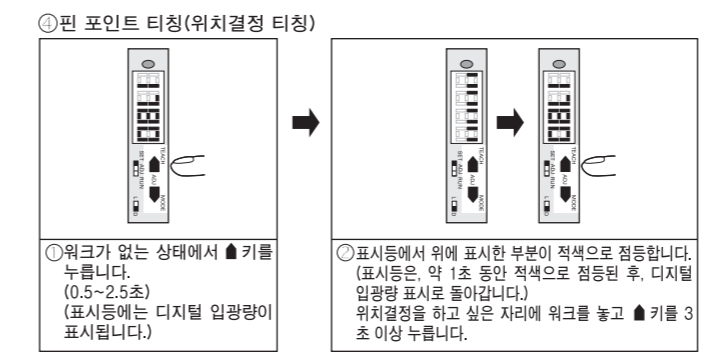
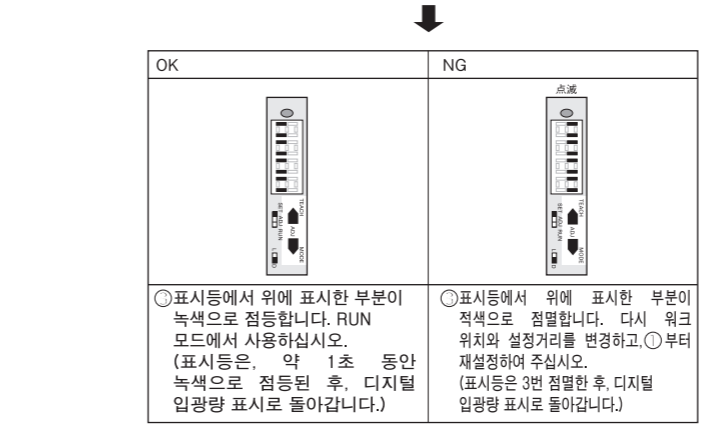
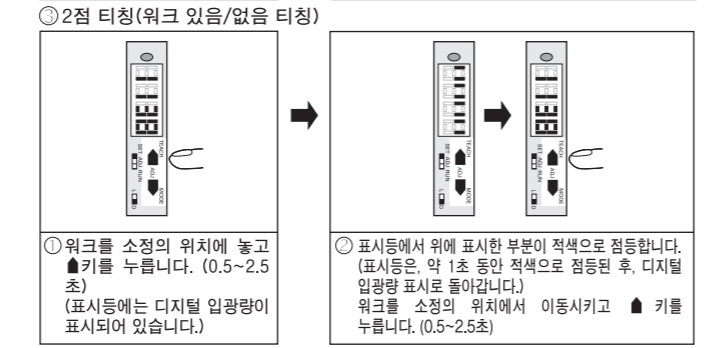
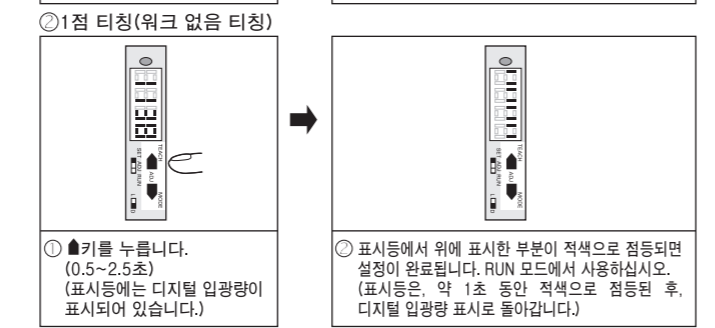
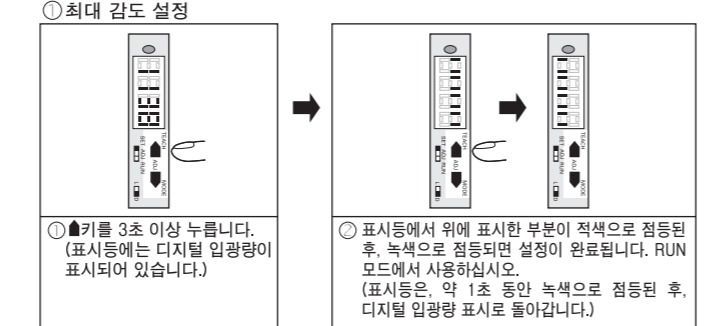


■ 조작 순서

모드	설정 내용 및 조작	표시
SET 모드 SET ADJ RUN	1. 티칭(자동 감도 조정) ○ 최대 감도 조정 ○ 1점 티칭(워크 없음 티칭) ○ 2점 티칭(워크 있음/없음 티칭) ○ 핀 포인트 티칭(위치결정 티칭) TEACH 키로 조작합니다. MODE 키로 기능을 선택하고 TEACH 키로 내용을 설정합니다. 자세한 내용은 6항 「각종 기능 설정에 대하여」를 참조하여 주십시오.	디지털값으로 입광량을 표시
ADJ 모드 SET ADJ RUN	1. 감도 미세조정 TEACH 키로 감도를 올립니다(역치를 내립니다) MODE 키로 감도를 내립니다(역치를 올립니다) 자세한 내용은, 2.2항 「감도를 미세조정하고 싶을 때」를 참조하여 주십시오. 표시에 대해서는 4항 「표시 형식을 변경하고 싶을 때」를 참조하여 주십시오.	디지털값으로 역치, 퍼센트(여유도)를 표시 아날로그로 광량과 역치를 표시 (역치) (퍼센트) (아날로그)
RUN 모드 SET ADJ RUN	1. 검출 * 키 조작은 필요 없습니다. 2. 표시 형식의 변환 ○ 디지털 표시 ○ 퍼센트 표시 ○ 아날로그 바 표시 MODE 키로 변환할 수 있습니다. 3. 제로 리셋 TEACH 키로 표시를 「0」로 합니다. 자세한 내용은 5항 「제로 리셋을 하고 싶을 때」를 참조하여 주십시오.	디지털값으로 입광량, 퍼센트(여유도)를 표시 아날로그로 광량과 역치를 표시 (입광량) (퍼센트) (아날로그)

2. 감도를 조정하고 싶을 때

2.1 티칭(자동 감도 설정을 하고 싶을 때)

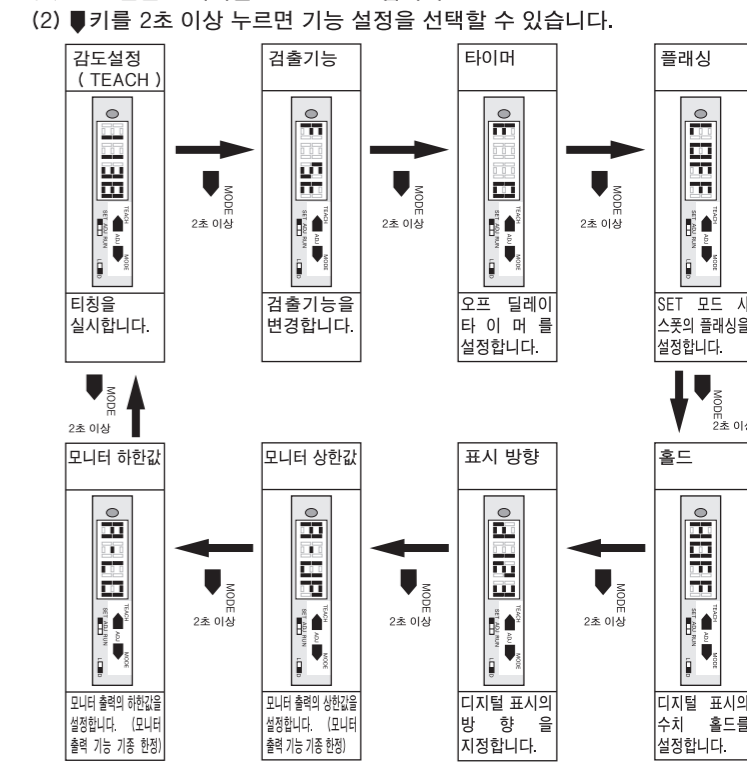


5. 제로 리셋을 하고 싶을 때(표시를 순식간에 「0」으로 바꿀 수 있습니다)
 - (1) 모드 변환 스위치를 RUN 모드로 합니다. (디지털 입광량 표시로 되어 있는지 확인하여 주십시오.)
 - (2) ▲키를 1초 이상 누르면 표시를 「0」으로 만들 수 있습니다. * 키를 1초 이상 누를 때마다 「0」으로 바뀝니다. * 역치도 동시에 시프트됩니다.
 - (3) ▲키와 ▼키를 동시에 3초 이상 누르면 제로 리셋을 해제합니다. (원래 표시로 돌아갑니다)
6. 각종 기능 설정에 대하여

- 아래와 같은 용도인 경우에 각종 기능 설정을 할 수 있습니다.
- 초장거리 검출 또는 고속으로 검출하고 싶을 때(검출 기능을 변경하고 싶을 때) 검출 기능 설정
 - 오프 딜레이 타이머를 사용하고 싶을 때 타이머 설정
 - 광축 조정 시 스폿을 밝게 하고 싶을 때 플래싱 설정
 - 디지털 표시를 홀드 표시하고 싶을 때 표시값 홀드 설정
 - 디지털 표시 방향을 반전시키고 싶을 때 표시 방향 설정
 - 모니터 출력의 범위를 변경하고 싶을 때 모니터 범위 설정 (모니터 출력 기능이 있는 기종 한정)

- 각종 설정의 기본 (다음과 같은 설정을 할 수 있습니다.)
- ① 검출 기능 [표준/초장거리/고속응답]
 - ② 타이머 [0~200ms (0~20ms : 1ms 간격 20~200ms : 5ms 간격)]
 - ③ 플래싱 [ON/OFF]
 - ④ 홀드 [OFF/Peak/Bottom]
 - ⑤ 표시 방향 [표준/반전]
 - ⑥ 모니터 상한값 [100~4000 (100 간격)]
 - ⑦ 모니터 하한값 [0~3900 (100 간격)]

6.1 조작 방법



- (3) ▲키를 누르면 설정 내용을 변경할 수 있습니다.
- 6.2 초장거리 또는 고속 검출을 하고 싶을 때
공장출하 시에는, 「표준」으로 설정되어 있습니다. ▲키를 누르면 「초장거리」 또는 「고속응답」으로 설정할 수 있습니다.
 - 표준 (Standard) 응답속도 1ms.
 - 초장거리 (Long Distance) 응답속도 4ms.
 - 검출거리 표준의 약 1.3배 (반사형 화이버 사용 시)
 - 고속응답 (High Speed) 응답속도 0.25ms.
 - 검출거리 표준의 약 1/3 (반사형 화이버 사용 시)

본 기능을 설정할 때는, 레벨 표시등의 최상위에 「F」(Function)이 표시됩니다. 한 번 설정을 실행하면 이후는 설정되어 있는 검출 기능 상태에서 동작합니다.

