OMRON

光电传感器（数字显示）

型E3X-DAT□-S
型E32-HB04

使用说明书

感谢您选择欧姆龙产品。使用时，请务必遵守以下内容。
·由具备一定电气知识的人员使用。
·使用本品前，请仔细阅读本说明书，在充分了解产品后，正确使用。
·为了您的方便，请妥善保管好本说明书，以便随时查用。

欧姆龙公司

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安全上的要点

为了确保您的安全，请务必遵守以下内容：
1）请勿在有易燃、易爆气体的环境下使用。
2）请勿在有水、油、化学药品飞沫的环境、及接触到蒸汽的环境下使用。
3）请勿擅自拆卸、修理、改造本产品。
4）使用时请勿超出额定电压、电流的范围。
5）请注意工作电源的极性，勿接错线。
6）请正确连接负载。
7）请勿让负载短路。
8）请不要在外壳破损的状态下使用。
9）废弃时，请作为工业废弃物处理。
10）请注意传感器头部的连接器极性，并正确接线。

使用上的注意

1）传感器头部（E32-HB04）必须连接在专用传感器（E3X-DAT□-S）上后再使用。
2）必须将传感器头部的型号印字面设置在工件落下的一侧。
3）请不要直接将套管穿过传感器的检测部。
4）光纤的成份是异丁烯树脂，请勿在有机溶剂等环境下使用。
5）本产品导线和动力线或电力线装在同一配管中使用时，会受到干扰，有误动作甚至被破坏。
6）延长导线必须使用截面积0.3mm²以上、长度100m以下的导线。
韩国S-mark认证机种作为认证品使用时请设为10m以下。
7）加在导线部的力请设为下值。
拉伸80N以下、扭力0.1N•m以下、压力20N以下、弯曲3Kg以下。
8）接通电源，经过30秒后，才可检测。
如负载和本产品使用不同的电源，请务必先接通本产品的电源。
9）接通电源后，根据使用环境不同，有时需要花一定的时间才能达到受光量稳定状态。
10）拆除或者增加放大器时，请务必先切断电源。
11）请务必在安装保护盖的状态下使用。
12）由于电源遮断或者静电等干扰发生写入错误时（ERR/EEP闪烁），请通过本体上的设定键进行初始化处理。
13）不可使用手持式控制器（E3X-MC11□）。
14）不能与E3X-DA-N系列进行光通信。
15）电源遮断时，有时会发生输出脉冲，所以请先遮断负载或负载线的电源。
16）请不要用稀释剂、汽油、丙酮、煤油等溶剂清理。
17）请勿强行对传感器单元施加拉伸、压缩的力。传感器单元只能承受9.8N•m以内的力。
18）请勿在强磁场、强电场中使用。
19）请勿在有直接振动、冲击的场所使用。
20）装卸传感器头部的连接器时，必须切断电源。
21）设置传感器时，使用M3螺丝，螺丝紧固力矩为0.5～0.6Nm。

包装内容确认

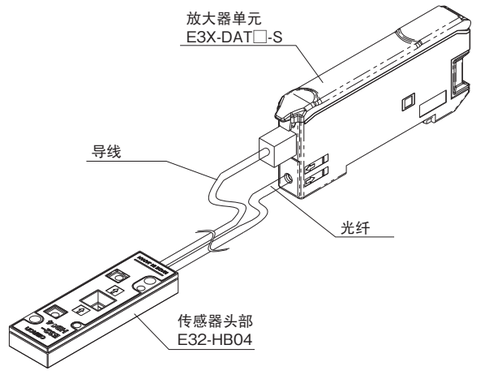
型E3X-DAT□-S	·放大器单元 1台　·使用说明书（本说明书） 1份
型E32-HB04	·传感器头部 1台　·光线切刀 1个 ·传感器头部连接器 1个　·使用说明书（本说明书） 1份

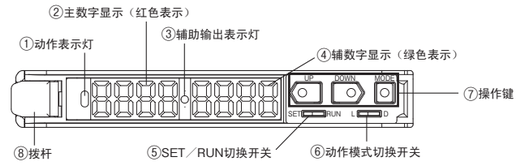
1.额定 / 性能

放大器连接方式		导线引出型
型号	放大器NPN	E3X-DAT11-S
	放大器PNP	E3X-DAT41-S
	传感器头部	E32-HB04
投光用光源		红色发光二极管(650nm)
最小检出物体		□0.15mm立方体(不透明体)
电源电压		DC12～24V±10% 波动10%以下
消费功率		消费功率 960mW以下 （电源电压24V时 消费电流40mA以下）
控制输出		集电极开路 (负载电源电压DC26.4V以下) 负载电流50mA以下(残留电压 1V以下),漏电流10μA以下
远程输入	放大器NPN	ON时 0V短路或1.5V以下 OFF时 开放(漏电流0.1mA以下)
	放大器PNP	ON时 电源电压短路或电源电压－1.5V以内 OFF时 开放(漏电流0.1mA)
应答时间		最高速:135μs 高速:250μs 标准:1ms
周围温度	动作时	1～2台连装时:－25℃～＋55℃ 3～10台连装时:－25℃～＋50℃ 11～16台连装时:－25℃～＋40℃
	保存时	－30℃～＋70℃
周围湿度		动作时／保存时:各 35～85%RH(无结冰•结露)
传感器的连接方式		受光侧：光纤型（光纤：柔软光纤） 投光侧：连接器型 合适的连接器：第一电子工业（株）制232D-02S1A-DA5

*:放大器侧的导线最多延长至100m。

2. 各部分的名称及其功能

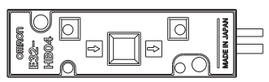




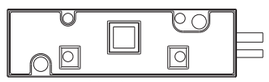
①输出为ON时灯亮。
②显示受光量和功能的名称。
③辅助输出为ON时灯亮。
④显示检测时的辅助性情报和功能的设定值。
⑤进行模式的切换。
⑥选择入光时ON还是遮光时ON。
⑦进行显示的切换和功能的设定操作。
⑧插拔光纤时使用。

3. 传感器头部的设置

1)传感器头部的设置
对于工件通过方向来说，传感器头部分为正反两面（IN侧、OUT侧）。
请正确设置，使其与工件通过方向相吻合。请作水平设置。

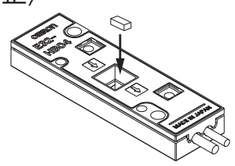


IN侧(有型号等印字)



OUT侧(空白)

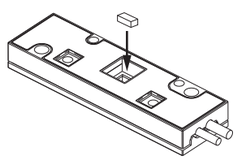
〈正〉



将IN侧设置在工件落下的一侧

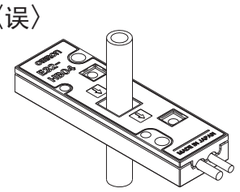
CHECK! 请勿作以下设置。
否则会降低检测性能、引起检测错误。

〈误〉



将OUT侧设置在工件落下的一侧

〈误〉



将透明套管穿过本体。
※)使用套管时，请使用专用配件(形E39-K12)。

2)连接器的安装方法
投光侧的导线长度变更的场合，请使用添附的连接器作如下连接。

①将导线切断至目标长度后，剥下外皮。
外皮请剥除15mm左右。
屏蔽线是捆在一起的，请将芯线外皮剥除8mm左右。
（参考图1）

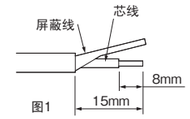


图1

②将导线穿过连接器罩壳。（参考图2）
连接器压接后，连接器罩壳就无法安装了，请务必注意。

注意：连接器压接仅1次，请务必注意。

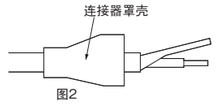


图2

③按照屏蔽线，芯线、端子配置表，
牢牢地插入连接器插入口。（参考图3）

连接器的端子配置表

连接器的端子No.	导线
1	屏蔽线
2	芯线

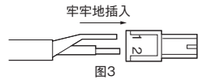


图3

④使用钳子等工具推入，直至罩壳锁住为止。（参考图4）

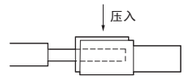


图4

⑤将连接器罩壳装在连接器上。（参考图5）

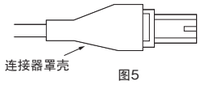


图5

4. 操作的基础知识

模式的切换

用「SET/RUN切换开关」进行模式切换。
请切换为目标模式进行操作。

模式	内　容
SET	设定检测条件以及设定示教阈值时选择。
RUN	实际进行检测时或者进行以下设定时选择。 手动调整阈值、示教、光量调整、归零、按键锁定

※)阈值：表示希望检测的光量差（希望检测10的差时为－10）。

按键操作

切换显示和检测条件的设定操作，用操作键进行。
按键的作用，根据当前正在选择的模式不同而变化。

按键的种类	按键的作用	
	RUN模式	SET模式
UP键	调高阈值 (～1999)	设定以下功能 •顺方向变更设定值 •实行自动示教
DOWN键	调低阈值 (－1999～)	·逆方向变更设定值
MODE键	通过MODE键设定以下功能。 （按键3秒以上） •实行通过检测开始 •实行自动示教 •实行计数器重置	切换成需要设定的功能。

显示内容的阅读方法

在主数字显示和辅数字显示上显示的内容，根据当前选择的模式而不同。出厂后初次接通电源时，默认显示为RUN模式的内容。

模式	主数字显示（红色显示）	辅数字显示（绿色显示）
SET	通过按键操作，依次显示受光量和功能名称	通过按键操作，会依次显示阈值以及主数字显示上显示的功能的设定值。
RUN※	显示当前的受光量的最大值， 每隔1秒更新一次	显示当前的阈值。

※显示内容可以通过「显示切换」功能进行变更。请参照「6. 详细设定」
※受光量：显示对比于当前受光量的变化部分

5.基本设定

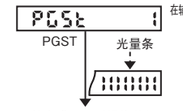
1. 动作模式的设定

选择入光时ON还是遮光时ON。
用动作模式切替开关进行设定。请参照「2. 各部分的名称及其功能」

选择	内容
LON（Light ON）	入光时输出ON。
DON(Dark ON) (出厂时)	遮光时输出ON。

2. 接通电源（试行通过检测开始）

接通电源时，检测最优化将自动实行。
（请确认：切替开关为RUN）
接通电源前必须连接、固定传感器头部。实行优化期间将无法检测，所以此时请勿让检测物体通过。



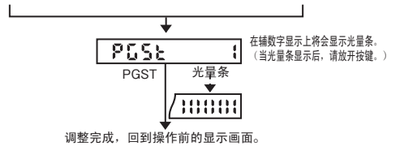
在辅数字显示上将会显示光量条。

调整完成，回到操作前的显示画面。

CHECK! 除了电源投入时，其他的按下记设定进行通过检测开始。

SET→RUN模式切换
SET RUN
切换为RUN模式
SET模式下功能设定确认/变更后，回到RUN模式时，自动进行通过检测开始

MODE键操作
按MODE键3秒以上
请确认：切替开关为RUN，MODE键设定为PGST。



在辅数字显示上将会显示光量条。
（当光量条显示后，请放开按键。）

调整完成，回到操作前的显示画面。

●通过检测开始错误

闪烁2次 PGSt ouEr PGST OVER	OVER ERROR 受光量过小而引起的错误 不实施最优化设定。 请确认以下几点，再次实施通过检测开始。 •传感器头部为：E32-HB04？ •传感器头是否正确连接上了？ •传感器的检测部被工件等干扰了？ •传感器头检测部有无脏污？
闪烁2次 PGSt botA PGST BOTM	BOTTOM ERROR 受光量过大引起的错误 不实施最优化设定。 请确认以下几点，再次实施通过检测开始。 •传感器头为：E32-HB04？

3. 设定阈值

1)手动设定
手动设定阈值。检测额定最小检测物体时，请将阈值设定为－6

操　作	SET RUN 切换为RUN模式		用UP键或者DOWN键设定阈值 阈值变大 阈值变小	
表　示			-100 -6 受光量 阈值	阈值改变约5秒后，将返回正在设定的显示。

2)自动示教
在连续按键的过程中检测微受光量变化部分，可以设定最小值的一半为阈值。
在RUN模式下操作时，请重新确认：MODE键设定为AUTO。

操　作	无工件 工件通过		按MODE键	
RUN模式操作	SET RUN 切换为RUN模式	按MODE键	按MODE键3秒以上	放开MODE键
SET模式操作	SET RUN 切换为SET模式	按UP键或者DOWN键	按UP键或者 DOWN键3秒以上	放开UP键或DOWN键
远程输入操作	SET RUN 切换为RUN模式	将输入线短路	将输入线持续 短路3秒以上	断开输入线
表　示			-500 AUto 受光量 AUTO 辅数字显示板上显示AUTO，同时受光量的抽样被显示	AUto -250 AUTO 阈值 设定的阈值闪烁

·示教错误
实行示教后，辅数字显示上显示下列内容是表示发生错误。

闪烁2次 nEAr NEAR	NEAR ERROR 受光量的变化过小时会发生（阈值不变更）。 请确认工件确实通过受光部后，再度实行示教。

6.详细设定

在SET模式中，能够进行以下的功能设定。
功能迁移上显示的内容，是出厂时的内容。
*:阈值、受光量等数值的显示内容只是一个例子，与实际显示不同。

SET RUN 切换为SET模式

0 -6 ⇔ 一定时间后显示切换 tEch -6

1. 检测功能 1-Fn SHS

SHS	最高速设定
HS	高速设定
Stnd STND	标准设定

2. 定时功能 2-tF ----

----	定时器功能无效
oFFd OFFD	OFF延时定时器
on-d ON-D	ON延时定时器
1Sht 1SHT	单触发定时器

---- 以外

定时时间 tt 40

可以设定的范围:1～5000

1～20ms	1ms单位
20ms～200ms	5ms单位
200ms～1s	100ms单位
1s～5s	1s单位

3. 远程输入功能 3-rA PGSt

选择远程输入端子的作用

PGSt PGST	通过检测开始
AUto AUTO	自动示教
LOFF LOFF	投光off
crSt CRST	计数器重置

4. MODE键设定 4-Md PGSt

选择RUN模式时的MODE按键的作用。

PGSt PGST	通过检测开始
AUto AUTO	自动示教
crSt CRST	计数器重置

5. 显示切换 5-dP

选择RUN模式时的显示内容。
当切换到SET模式时，显示「受光量和阈值」。

bton dIFF 受光量 阈值	受光量和阈值
c123 3286 计数器值	计数器值

A B

6. 显示方向 6-ru d123

d123 D123	一般显示
E21P 321D	上下反转

7. 外部输入 7-EP on

选择是否将远程输入的实行结果写入至EEPROM。
频繁进行远程输入的话，请设为OFF。
（写入次数：约10万次）

on ON	将实行结果写入EEPROM
oFF OFF	不将实行结果写入EEPROM

8. 计数器 8-ct oFF

oFF OFF	计数器功能无效
cUP CUP	物体检测时加上计数
cdo CDO	物体检测时减去计数

计数器有效 → c 0 可以设定的范围:1～9999999

计数器无效

辅助输出设定 ot oFF

分摊在辅助输出上时选择通过检测错误。

oFF OFF	通过检测错误无效
PGAL PGAL	通过检测错误有效

7.方便的功能

按键锁定

使按键操作全部无效，起到防止按键误操作的作用。
无效的仅是操作按键，无法使各切换开关无效。

■设定方法

SET RUN 切换为RUN模式

＋ 边按MODE键，一边按UP键3秒以上。请在按下MODE键后，马上按UP键。

Loc on（LOC ON） 辅数字显示闪烁2次，按键输入变为无效。

■解除方法

SET RUN 切换为RUN模式

＋ 一边按MODE键，一边按UP键3秒以上。请在按下MODE键后，马上按UP键

Loc oFF（LOC OFF） 辅数字显示闪烁2次，按键输入变为有效。

按键锁定时，按按键的场合
按键锁定时按下按键，或者按下解除以外的按键时，「LOC ON」闪烁2次，表示处于按键锁定状态。

Loc on

设定数据初始化（设定初始化处理）

设定内容全部初始化，回到出厂时的状态。

■设定方法

SET RUN 切换为SET模式

＋ 同时按UP键和DOWN键3秒以上

InIt noP（INIT） NO? YES?显示时按MODE键

InIt Good（INIT GOOD） 初始化完成。

noP NO?	不实行初始化
YESP YES?	实行初始化

无法稳定检测时弹出警告（通过检测错误）

按照以下条件，无法稳定检测时，就会出现警告显示。出现警告显示时，请改善检测环境，再次实行通过检测开始（PGST）。
•光量衰减到稳定检测水准以下
•由于振动、干扰等影响，无法稳定检测的场合
※）辅助输出设定为PGAL的场合下，辅助输出和显示同时ON。

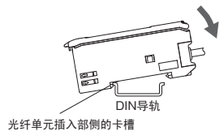
0 -6 ⇔ 一定时间后显示切换 0 Err

环境改善后，实施PGST

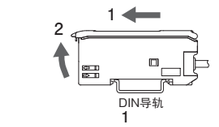
8.放大器单元的设置

■安装
将光纤单元插入部侧的卡槽卡在导轨上，一直按到卡槽扣住为止。

请务必将光纤单元插入部侧搭在导轨上安装。
如果反装的话，会降低安装强度。



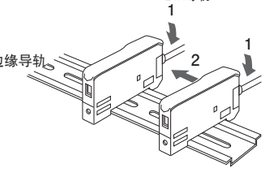
■拆卸
朝方向1按住，光纤单元朝方向2提起。



■连接使用的场合
可连接16台。

放大器单元各自装在DIN轨道上。

因振动等原因导致放大器移动时，请安装另售的边缘导轨进行固定（型号PFP-M）。

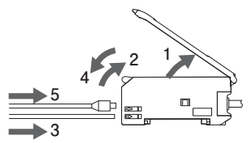


拆卸时请按照相反的顺序进行。

9.放大器•传感器件的连接

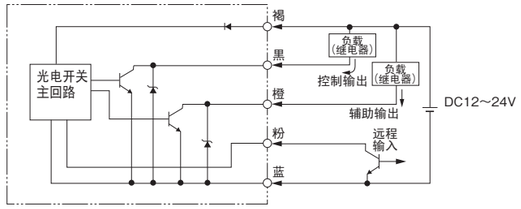
1. 打开保护盖。
2. 提起Lock拨杆。
3. 将光纤牢牢插入光纤单元插入口。
4. 将Lock摆杆拉回原来的方向，固定光纤。
5. 将连接器牢牢插入连接器插入口。

拆除时请按照相反的顺序进行。

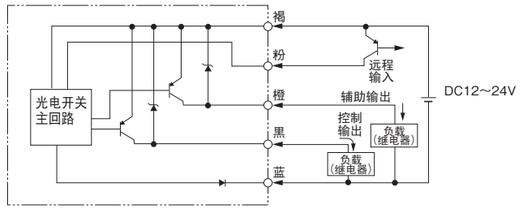


10.输出段回路图

■NPN型

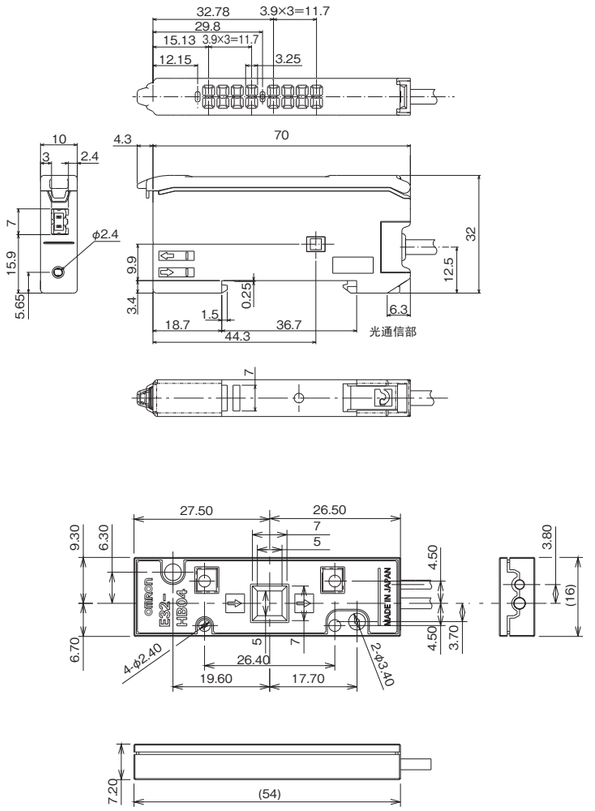


■PNP型



11.外形尺寸图

(单位:mm)



使用时的承诺事项

①为了确保安全，直接或间接用于人体检测时，请勿使用本产品。需使用该用途时，请选用本公司传感器综合样本中刊登的安全传感器。
②使用于下列用途时，与本公司营业担当者商谈之后，根据规格书等确认的同时，对额定值性能方面请想出有余裕度的使用方法及采取即使万一出故障也能使危险降低到最小的安全回路等的安全对策。
a) 屋外的用途、潜在化学污染或者受到电气的妨害的用途或者在商品目录、使用说明书等中没有记载的条件及环境下使用。
b) 原子力控制设备、焚烧设备、铁道•航空•车辆设备、医用设备、娱乐机械、安全装置及行政机关及根据个别业界的规定制造的设备。
c) 可能危及生命、财产的系统•机械•装置
d) 煤气、水道、电气的供给系统记24小时连续运转系统等需要高信赖的设备。
e) 其他，以上述的 a) ～ d) 为基准，需要高度安全性的用途。
＊上述内容是适用条件的一部分。仔细阅读本公司的综合商品目录、数据表等最新版商品目录、手册中记载的保证免责事项的内容后再使用。

联络处所在地

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OMRON

Photoelectric sensor (DIGITAL INDICATOR)

E3X-DAT□-S
E32-HB04

Instruction Sheet

TRACEABILITY INFORMATION:
Representative in EU:
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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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2114738-3B(2/2)

PRECAUTIONS FOR SAFE USE

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

1) Do not use the Amplifier Unit in environments subject to flammable or explosive gases.
2) Do not use the Amplifier Unit in environments subject to exposure to water, oil, chemicals, etc.
3) Do not attempt to disassemble, repair, or modify the Amplifier Unit in any way.
4) Do not apply voltages or currents that exceed the rated ranges.
5) Wire the Amplifier Unit correctly, e.g., do not reverse the polarity of the power supply.
6) A control output should Connect the load correctly.
7) A control output should not short both ends of the load.
8) Do not use the Amplifier Unit if the case is damaged.
9) When disposing of the Amplifier Unit, treat it as industrial waste.
10) Wire the sensor head cable correctly.

PRECAUTIONS FOR CORRECT USE

1) The sensor unit (E32-HB04) must be connected to its own amplifier unit (E3X-DAT□-S), othewise the sensor unit may be damaged.
2) Set up the sensor head noting the direction where workpiece falls.
3) Do not penetrate the tube directly to the detection part of the sensor.
4) The optical fibers are made out of methacrylic resin. Do not use them in atmospheres where organic solvents are present.
5) 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.
6) For extending wires,use a cable 0.3 mm2 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.
7) Do not exceed the following force values applied to the cable. Tencil:80N max.,torque:0.1N・m max.,pressure:20N max.,flexure:3Kg max.
8) The Amplifier Unit is ready to operate 30s 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.
9) Depending on the application environment, time may be required for the incident light level to stabilize after the power supply is turned ON.
10) Always keep the protective cover in place when using the Amplifier Unit.
11) Always turn OFF the power supply before connecting, separating, or adding Amplifier Units.
12) 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.
13) Mobile console (E3X-MC11-SV2) cannot be used.
14) Optical communications are not possible at the time of connection use with an E3X-DA-N Amplifier Unit.
15) Do not use thinners, benzine, acetone, or kerosene for cleaning the Amplifier Unit.
16) Do not pull or apply excessive pressure or force (exceeding 9.8 N・m) on the Sensor Unit when it is mounted to the Amplifier Unit.
17) 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.
18) Do not use the sensor in the place in a strong electric field and a strong magnetic field.
19) Do not use it in the place where the vibration and the impact join directly.
20) Do not connect or disconnect connector or attempt wiring work while power is supplied.
21) The screw tightening torque is 0.5 to 0.6Nm with M3 screw, when the sensor unit is set up.

Confirming the Package Contents

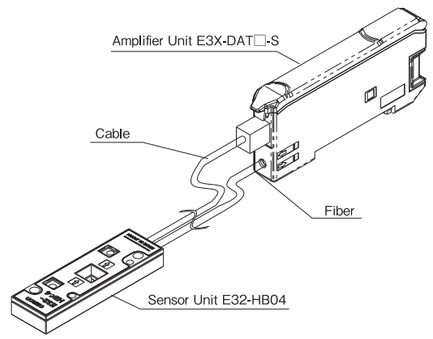
E3X-DAT□-S	・Amplifier Unit 1	・Instruction Sheet (this sheet) 1
E32-HB04	・Sensor Unit 1 ・Connector 1	・Instruction Sheet (this sheet) 1 ・Fiber cutter 1

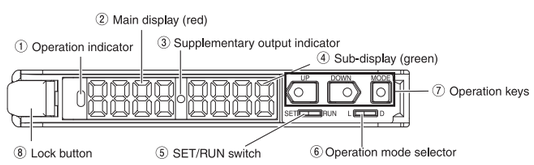
1. Ratings and Specifications

Connection method		Prewired
Model number	NPN	E3X-DAT11-S
	PNP	E3X-DAT41-S
	Sensor Unit	E32-HB04
Light source (wavelength)		Red LED (650nm)
Minimum detection object		0.15mm cube (Opaque object)
Supply voltage		12 to 24V DC±10% ripple (p-p)10%max.
Power consumption		960mW Max. (40mA max. at 24V DC)
Control output		Open collector (26.4VDC max.) Lead current : 50mA max.; residual voltage : 1V max.,Off-state current:10μA max.
External input setting		Optimization setting (PGST), light off or counter reset
Response time		SHS : 135μs HS : 250μs STND : 1ms
Ambient temperature	Operation	Groups of 1 to 2 Sensors : -25℃ to +55℃ Groups of 3 to 10 Sensors : -25℃ to +50℃ Groups of 11 to 16 Sensors : -25℃ to +40℃
	Storage	-30℃～+70℃
Ambient humidity		Operation / Storage : 35 to 85%RH(With no condensation) (With no freezing and condensation)
Sensor Unit Connection method		Receiver : Fiber Emitter : Connector

(*) Te extension of the code becomes it up to 100m

2. Nomenclature

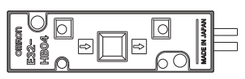




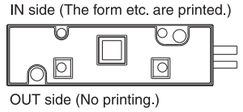
① Lit when the output is ON.
② Displays the incident light level or the function name.
③ Lit when the supplementary output is ON.
④ Displays supplemental detection information, the setting of a function, etc.
⑤ Used to switch the mode.
⑥ Used to select dark-ON or light-ON operation.
⑦ Used to change the display, set functions, etc.
⑧ Used to connect and disconnect the Fiber Unit.

3. Installation of sensor unit

1) Installation of sensor unit
There is an inside and outside (IN side and OUT side) on the sensor head for the direction where workpiece is passed.
Set it up correctly according to the direction where workpiece is passed.
Set it up horizontally.

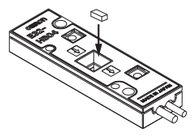


IN side (The form etc. are printed.)



OUT side (No printing.)

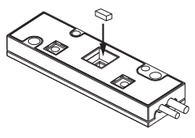
(Collect)



The IN side is adjusted to the workpiece fall side.

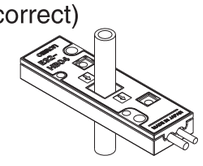
CHECK! Please do not do the following installations.
The detection performance is decreased, and it causes the misdetection.

(Incorrect)



The OUT side is adjusted to the workpiece fall side

(Incorrect)



Penetrate the tube directly to the detection part of the sensor
(*) Please use a special attachment (E39-K12) when using the tube.

2) Method of installing connector
When you want to shorten the cable length,please assemble the connector parts by using the attached connector and it's cover as follows.

①Cut the cable in determined length.
Peel the covering as about 15mm and twist the sheildwires.
Peel the innercable as about 8mm.
(Refer to Figure 1)

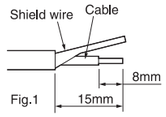


Fig.1

②Put the cable through the connector cover.
(Refer to Figure 2)

③Terminal numbers are engraved on the connector.
Special care must be taken to insert the wires collectly referring to the following table.
Make sure that the wires are fully inserted into the connector.
(Refer to Figure 3)

Terminal number	Wire
1	Shield
2	Cable

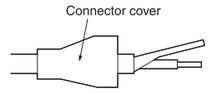


Fig.2

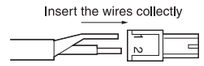


Fig.3

④Press the connector body by a plier. (Refer to Figure 4)
Note : Pressed connector can not be disassembled.

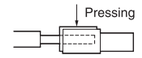


Fig.4

⑤Put the connector cover on the connector to insulate the conductors of the wires. (Refer to Figure 5)

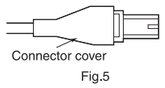


Fig.5

4. 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 value, Manual adjustment of threshold value, Optimization setting, Automatic-teaching or key rock.

(*) Threshold value: Quantities of light difference that wants to be detected.

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 value. 1999 max.	Depends on the setting. ・Automatic-teaching. ・Changes the setting forward.
DOWN key	Decreases the threshold value. -1999 min..	Depends on the setting. ・Automatic-teaching. ・Changes the setting in reverse.
MODE key	Depends on the MODE key setting. Press the MODE key for at least 3 seconds. ・Automatic-teaching ・Optimization setting. ・Counter reset.	Switches the function to be set on the display.

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.	Displays threshold value or the setting of the function displayed on the main display depending on the key operation.
RUN (See note.)	The maximum value of present receiving quantities of light is updated every second, and displayed	The current threshold value will be displayed.

Note: The information that appears on the displays can be set using the display switch function. Refer to **6. Detailed Settings.**

5. Basic Settings

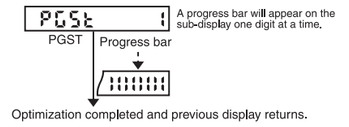
1. Setting the Operation Mode

Select either light-ON or dark-ON operation.
Set as the operation mode in SET mode. Refer to **6. Detailed Settings.**

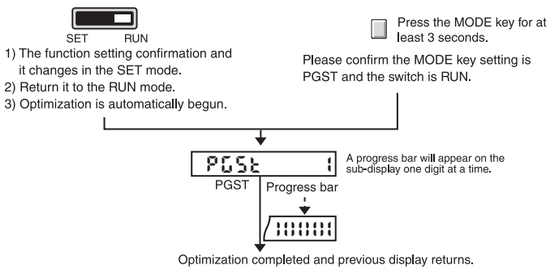
Selection	Description
LON (light-ON)	The output will turn ON when the incident light level is above the threshold.
DON (dark-ON) (default)	The output will turn ON when the incident light level is below the threshold.

2. Optimization setting

When the power supply is turned on, the detection optimization is automatically executed.
(Please confirm the switch is "RUNÓ)
It is not possible to detect it while optimizing it.
Please do not let me pass the detection object while optimizing it.



CHECK! The sensor is optimized on the following conditions.

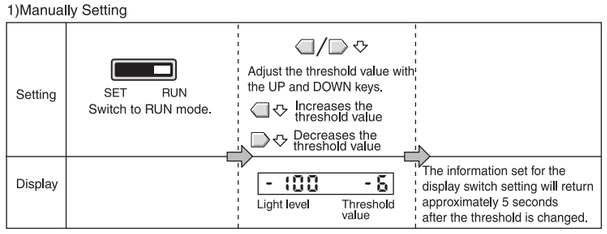


● **Optimization setting Error**

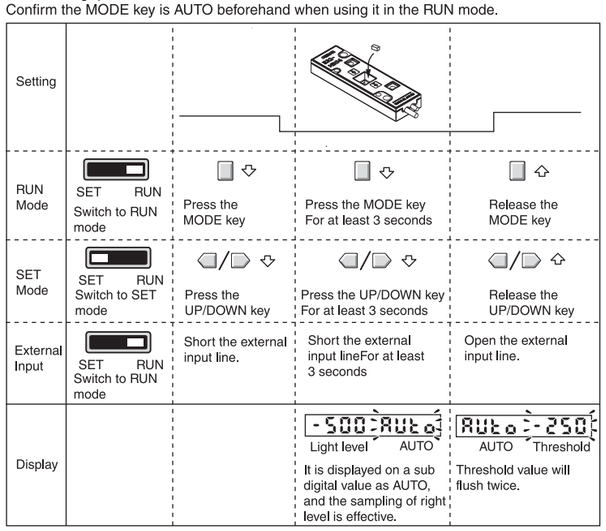
Flashes twice PGST OVER	**Over Error** The incident level is too low. The optimization setting is not executed. Please confirm the following points, and execute the optimization setting again. ・Is the sensor unit E32-HB04? ・Is the sensor unit correctly connected with the amplifier? ・Is not the detection part of the sensor unit interrupted by workpiece etc. ・Is the sensor unit detection part clean?
Flashes twice PGST BOTM	**Bottom Error** The incident level is too high. The optimization setting is not executed. Please confirm the following points, and execute the optimization setting again. ・Is the sensor unit E32-HB04?

3. Setting Thresholds

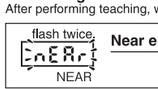
1)Manually Setting



2) Automatic-teaching
While continuing pushing a key, the half of the minimum value is set as a threshold detecting the receiving quantities.
Confirm the MODE key is AUTO beforehand when using it in the RUN mode.



● **Teaching Error**
After performing teaching, when the following is displayed on sub digital display, the error has occurred.

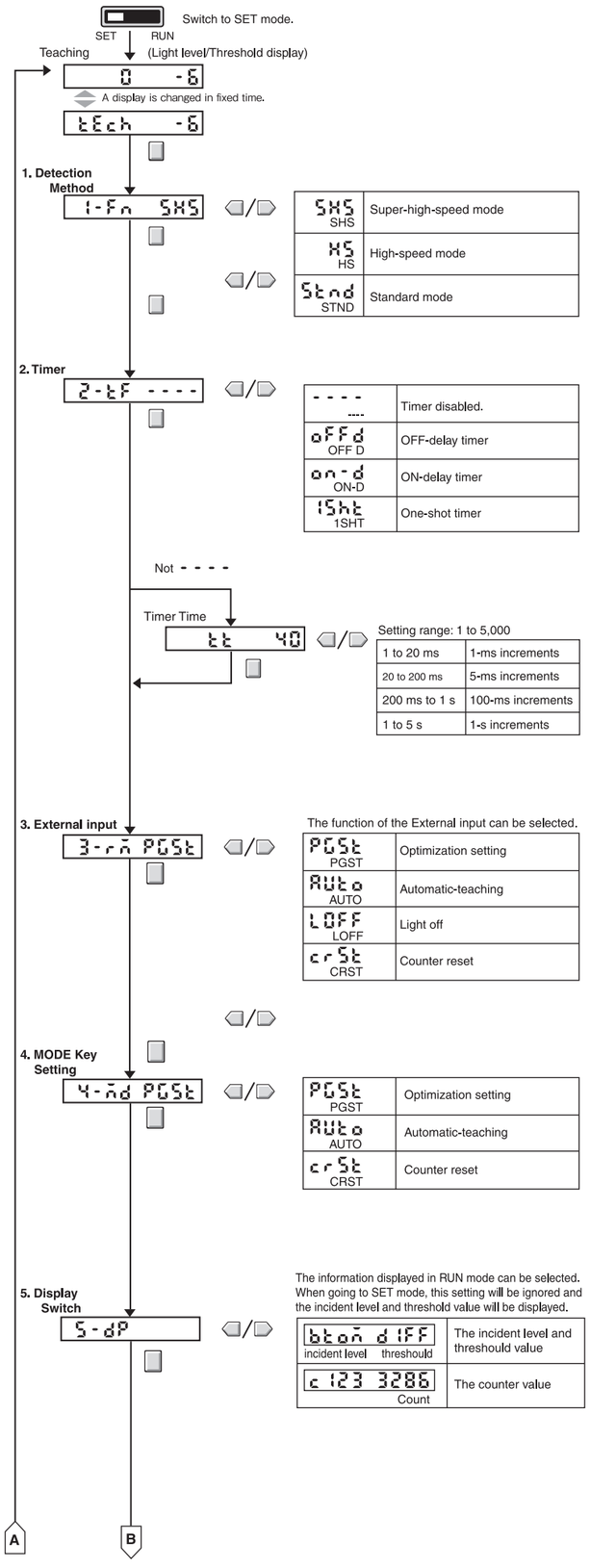


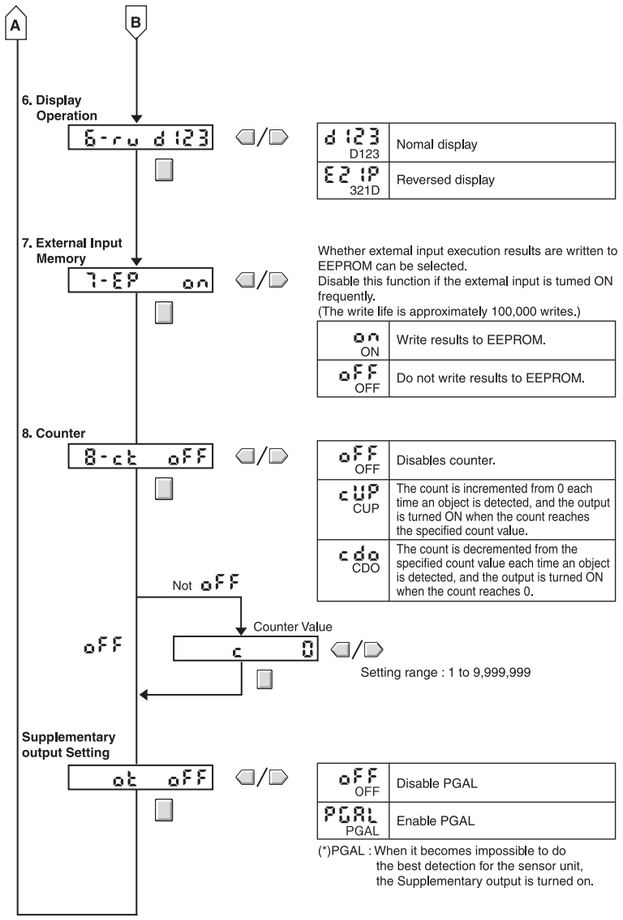
Near error The difference of incident level is too small. (The threshold is not changed.) It is confirmed that work neatly passes over the light part of receiving, and execute the teaching again.

6. Detailed Settings

The following functions can be set in SET mode.
The default settings are shown in the transition boxes between functions.

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

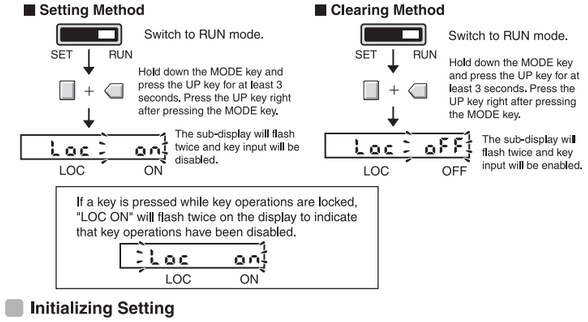

SET
RUN
Switch to SET mode.
Teaching
(Light level/Threshold display)
0 -6
A display is changed in fixed time.
tEch -6
1. Detection Method
1-Fn SHS
SHS Super-high-speed mode
HS High-speed mode
Stnd STND Standard mode
2. Timer
2-tF ----
---- Timer disabled.
oFFd OFF D OFF-delay timer
on-d ON-D ON-delay timer
1SHt 1SHT One-shot timer
Not ----
Timer Time
tt 40
Setting range: 1 to 5,000
1 to 20 ms 1-ms increments
20 to 200 ms 5-ms increments
200 ms to 1 s 100-ms increments
1 to 5 s 1-s increments
3. External input
3-rn PGSt
The function of the External input can be selected.
PGSt PGST Optimization setting
AUto AUTO Automatic-teaching
LOFF LOFF Light off
crSt CRST Counter reset
4. MODE Key Setting
4-nd PGSt
PGSt PGST Optimization setting
AUto AUTO Automatic-teaching
crSt CRST Counter reset
5. Display Switch
5-dP
The information displayed in RUN mode can be selected.
When going to SET mode, this setting will be ignored and the incident level and threshold value will be displayed.
bton diFF incident level threshold The incident level and threshold value
c123 3286 Count The counter value
A
B



7. Convenient Functions

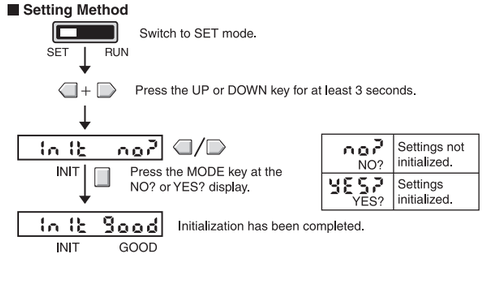
Key Lock

All key operations can be disabled to help prevent key operating errors.
Only the operation keys are disabled. The switches and selectors will still function.



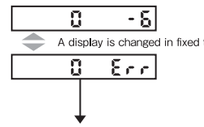
Initializing Setting

This procedure can used to return all the settings to the original default values.



Stability detection warning

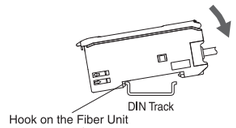
When steady detection becomes difficult, the warning display is done.
Please improve the detection environment, and execute the optimization setting when warning is displayed.
(*) A supplementary output is turned on at the same time as displaying it when a supplementary output is set to "PGAL".



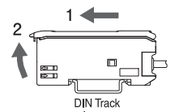
8. Installing the Amplifier Unit

■ **Mounting Units**
Catch the hook on the Fiber Unit connector end of the Unit on the DIN Track and then press down on the other end of the Unit until it locks into place.

Always attach the Fiber Unit connector end first. If the incorrect end is attached first, the mounting strength will be reduced.

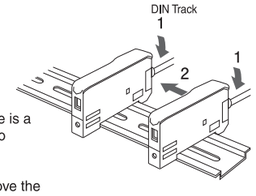


■ **Removing Units**
Press the Unit in the direction indicated by "1" and then lift up on the Fiber Unit connector end of the Unit in the direction indicated by "2."



■ **Joining Amplifier Units**
Up to 16 Units can be joined.

Mount the Amplifier Units one at a time onto the DIN Track.

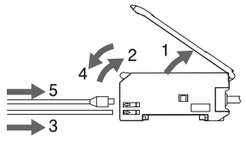


Secure the Units with an End Plate (PFP-M) if there is a possibility of the Amplifier Units moving, e.g., due to vibration.

Reverse the above procedure to separate and remove the Units.

9. Connecting the Fiber Unit

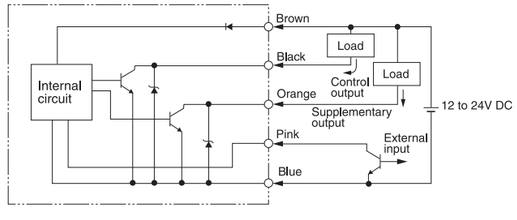
1. Open the protective cover
2. Press up the lock button.
3. Insert the fibers all the way to the back of the connector insertion opening.
4. Return the lock button to its original position to secure the fibers.
5. The connector is surely pushed into the interior at the connector insertion entrance.



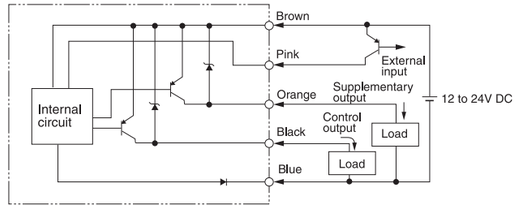
Reverse the above procedure to disconnect the Fiber Unit.

10. I/O Circuits

■ NPN Models

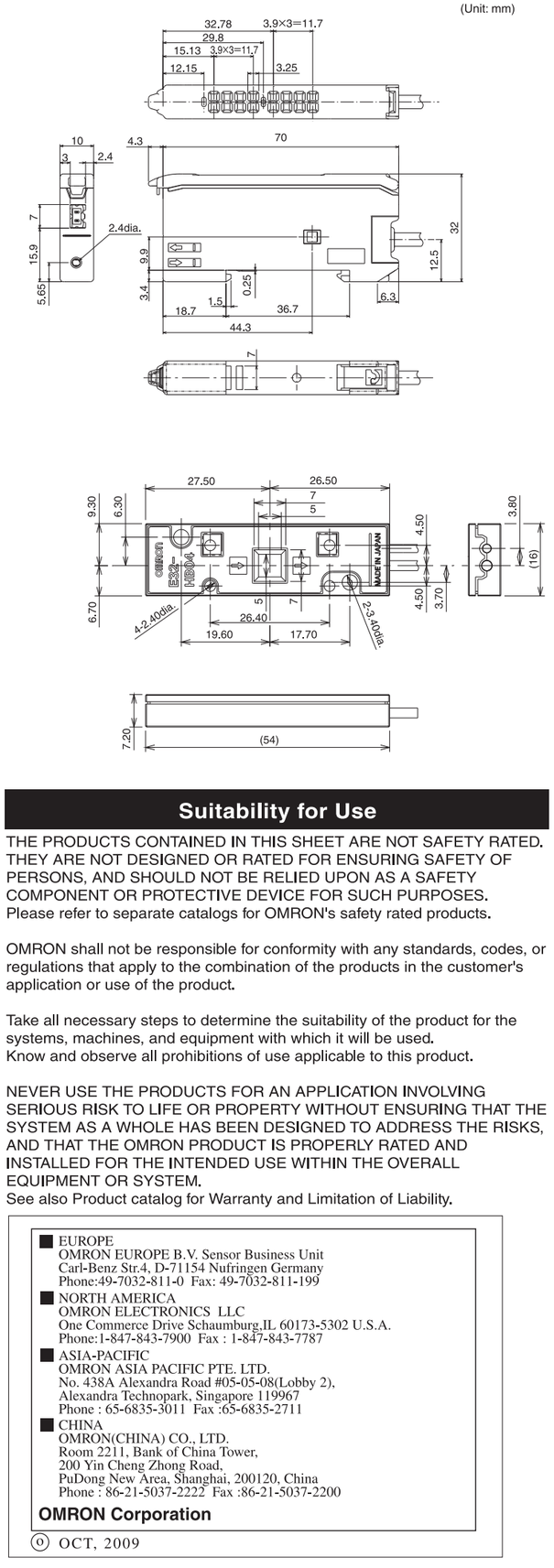


■ PNP Models



11. Dimensions

(Unit: mm)



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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