



<b>ТЕХНИЧЕСКОЕ ЗАДАНИЕ</b> на закупку волоконно оптических датчиков и интеллектуальных оптоволоконных усилителей для нужд ООО «Шуртанский ГХК»				<b>TECHNICAL ASSIGNMENT</b> for the purchase fiber optic sensors and smart fiber amplifier for the needs of LLC "SGCC"			
<b>1. ОБЩИЕ СВЕДЕНИЯ</b>				<b>1.GENERAL INFORMATION</b>			
<b>1.1 Наименование</b>				<b>1.1 Name</b>			
Волоконно оптических датчики и интеллектуальные оптоволоконные усилители				Fiber optic sensors and smart fiber amplifier			
<b>1.2 Основание приобретения товара</b>				<b>1.2 Basis of goods purchasing.</b>			
Основание: Протокол аппаратного совещания за № 044/6-7 от 08.06.2022 года.				Basis: minutes of the hardware meeting for no 044/6-7 from 08.06.2022 year.			
<b>1.3 Сведения о новизне (год производства /выпуска товара)</b>				<b>1.3 Information on novelty / (production/manufacture year of goods).</b>			
Поставляемая продукция должна быть изготовлена в год поставки или предшествующий ему и быть новой, ранее не использованной.				The delivered products shall be manufactured in or prior to the year of delivery and shall be new, not previously used.			
<b>2.ОБЛАСТЬ ПРИМЕНЕНИЯ</b>				<b>2.SCOPE OF USE</b>			
Волоконно-оптические датчики E32- ZD200E и интеллектуальные оптоволоконные усилители E3X-NB10 необходимы для преобразования потока ультрафиолетового излучения и выдачи сигнала контроллеру для управления экструдерной линии SJ 60/38, цеха Каршитермопласт.				Fiber optic sensors E32-ZD200E and smart fiber optic amplifiers E3X-NB10 are required to convert the ultraviolet radiation flux and issue a signal to the controller to control the extruder line SJ 60/38, Carshithermoplast workshop.			
<b>3. УСЛОВИЯ ЭКСПЛУАТАЦИИ</b>				<b>3. OPERATING CONDITIONS</b>			
Климатическое исполнение по ГОСТ 12997-84 – У2; Температура окружающего воздуха: от -20 до +75°С; Относительная влажность: 95% при +35°С;				Climatic design as per GOST 12997-84 - U2; Ambient air temperature:from -20 to + 75 ° C; Relative humidity: 95% at + 35 ° C;			
<b>4. ТЕХНИЧЕСКИЕ ТРЕБОВАНИЯ</b>				<b>4. TECHNICAL REQUIREMENTS</b>			
<b>4.1 Основные технические требования</b>				<b>4.1 Basic technical requirements</b>			
Название продукта	Краткая характеристика и комплектация оборудования	Ед. изм	Кол-во	Name of product	Brief description and completing of equipment	Unit	Qty
Волоконно-оптические датчики E32- ZD200E	Тип сенсор: E32- ZD200E - Степень защиты: IP67 - Размеры: 11x M3 x 0.5мм - Длина: 11мм - Волоконно-оптический тип: Пластмасса - Источник света: Red LED - Категория продукта: Волокно-оптические	Шт.	4	Fiber optic sensors E32- ZD200E	Sensor type: E32- ZD200E - Degree of protection: IP67 - Dimensions: 11x M3 x 0.5mm - Length: 11mm - Fiber Optic Type: Plastic	Pcs.	4

	<ul style="list-style-type: none"> <li>- датчики</li> <li>- Подключение: Кабель 2 м</li> <li>- Серия: E32</li> <li>- Измеряемое расстояние: 80мм</li> <li>- Тип клеммы: Проволочный вывод</li> <li>- Материалы: Полиэтилен</li> </ul>				<ul style="list-style-type: none"> <li>- Light source: Red LED</li> <li>- Product Category: Fiber Optic Sensors</li> <li>- Connection: Cable 2 m</li> <li>- Series: E32</li> <li>- Measuring distance: 80mm</li> <li>- Terminal type: Wire lead</li> <li>- Materials: Polyethylene</li> </ul>		
Интеллектуальные оптоволоконные усилители E3X-NB10	<ul style="list-style-type: none"> <li>- Форма: NPN</li> <li>- Выход управления: 1</li> <li>- Источник свет: Красный 4-элемент LED (625nm)</li> <li>- Напряжение питания: от 12 до 24В DC</li> <li>- Потребляемая мощность: 720 мВт макс</li> <li>- Выход управления: 24V DC 100 мА</li> <li>- Изоляционное сопротивление: 20 МОм мин. (при 500 В DC)</li> <li>- Длина: 70 мм</li> <li>- Ширина: 10мм</li> <li>- Материалы: корпус и крышка: Поликарбонат (ПК), кабель: ПВХ</li> </ul>	Шт.	2	Smart fiber optic amplifiers E3X-NB10	<ul style="list-style-type: none"> <li>- Form: NPN</li> <li>- Control output: 1</li> <li>- Light source: Red 4-element LED (625nm)</li> <li>- Supply voltage: 12 to 24V DC</li> <li>- Power consumption: 720 mW max</li> <li>- Control output: 24V DC 100 mA</li> <li>- Insulation resistance: 20 MOhm min. (at 500 VDC)</li> <li>- Length: 70 mm</li> <li>- Width: 10mm</li> <li>- Materials: housing and cover: Polycarbonate (PC), cable: PVC</li> </ul>	Pcs.	2

<b>4.2 Требования по надежности и параметрам при воздействии факторов внешней среды</b>	<b>4.2 Requirements for reliability and parameters under the influence of environmental factors</b>
Средний срок службы приборов 5 лет или более. Каждая позиция поставляемого оборудования должна быть работоспособной и обеспечивать предусмотренную производителем функциональность в качестве отдельного компонента. Необходимо избегать вредных воздействие, таких как высокая температура и агрессивная окружающая среда, а также обеспечивать защиту от механического повреждения при хранении, транспортировке и упаковке.	The average life of devices is 5 years or more. Each item of the supplied equipment must be operable and provide the functionality provided by the manufacturer as a separate component. It is necessary to avoid harmful effects such as high temperature and aggressive environment, as well as to provide protection against mechanical damage during storage, transportation and packing.
<b>5. ТРЕБОВАНИЯ ПО ПРАВИЛАМ СДАЧИ И ПРИЕМКИ</b>	<b>5. REQUIREMENTS AS PER DELIVERY AND ACCEPTANCE RULES</b>
<b>5.1 Порядок сдачи и приемки</b>	<b>5.1 Delivery and Acceptance Procedure</b>
Товар должен приниматься после входного контроля и составления акта в соответствии с договором. Заказчик производит приемку товара по количеству,	The goods shall be accepted after incoming control and drawing up an act in accordance with the contract. The Customer accepts the



<p>качеству и комплектности партии, и внешним признакам сохранности товара (наличие механических повреждений, видимая деформация отдельных узлов и деталей товара и иные подобные явные признаки повреждений) в соответствии с транспортными и сопроводительными документами, сертификатами качества завода-изготовителя. Настоящим, стороны договариваются, что визуальный осмотр товара, произведенный представителем Заказчика, должен быть абсолютным и окончательным для сторон для определения соответствия по количеству, комплектности и внешним признакам сохранности товара при его транспортировке. Продукция должна иметь сертификаты соответствия и протоколы сертификационных испытаний, подтверждающие заявленные характеристики, сопровождаться документацией по монтажу, наладке и эксплуатации. Вся сопроводительная документация должна быть составлена на русском и английском языках и передана Заказчику вместе с поставляемой продукцией. Поставляемое оборудование должно быть рассчитано на эксплуатацию в непрерывном режиме круглосуточно в заданных условиях в течение установленного срока службы. Маркировка оборудования должна выполняться на русском и английском языках, и иметь четкие обозначения. Также указывается изготовитель, номер партии и дата изготовления. Маркировка должна сохраняться на весь срок службы поставляемого оборудования. Предлагаемые участником варианты технических параметров и характеристик оборудования и материалов не указанные в ТЗ, согласовываются дополнительно. При приемке товара от перевозчика, Заказчик (грузополучатель) обязан проверить соответствие товара сведениям, указанным в договоре, спецификациях или дополнительных соглашениях к нему, а также в транспортных, сопроводительных документах, сертификатах качества завода-изготовителя. В случае, если при приемке товара после его получения от перевозчика будет выявлено несоответствие товара по качеству/количеству, Заказчик (грузополучатель) обязан приостановить приемку.</p>	<p>goods according to the quantity, quality and completeness of the batch, and external signs of preservation of the goods (presence of mechanical damages, visible deformation of individual units and parts of the goods and other similar obvious signs of damage) in accordance with transport and accompanying documents, quality certificates of the manufacturer. Hereby, the parties agree that the visual inspection of the goods performed by the representative of the Customer shall be absolute and final for the parties to determine compliance by quantity, completeness and external signs of preservation of the goods during its transportation. The products shall have certificates of conformity and certification test reports confirming the declared characteristics, accompanied with installation, adjustment and operation documentation. All accompanying documentation shall be in Russian and English and shall be provided to the Customer together with the products supplied. The supplied equipment shall be designed for continuous operation 24 hours a day, 7 days a week under specified conditions during the specified service life. The equipment shall be marked in Russian and English and have clear marking. The manufacturer, batch number and date of manufacture are also indicated. Marking shall be maintained for the entire service life of the supplied equipment. The options proposed by the participant for technical parameters and characteristics of equipment and materials not specified in the TA are agreed additionally. Upon acceptance of the goods from the carrier, the Customer (consignee) shall check the conformity of the goods with the information specified in the contract, specifications or additional agreements to it, as well as in transport, accompanying documents, quality certificates of the manufacturer. If upon acceptance of the goods after their receipt from the carrier there is a non-conformity of the goods by quality/quantity, the Customer (consignee) shall suspend the acceptance of the goods</p>
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**5.2 Требования по передаче заказчику технических и иных документов.**

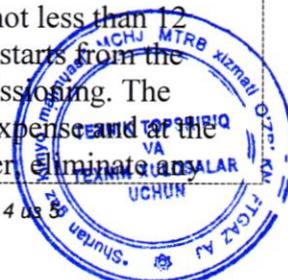
Поставщик обязан предоставить следующие документы, подтверждающие соответствие продукции установленным требованиям:

**5.2 Requirements for handing-over the technical and other documents to the customer.**

The Supplier shall provide the following documents confirming compliance of the products with the established requirements:



<p>-Сертификаты (декларации) соответствия требованиям ГОСТ и безопасности;</p> <p>-Спецификация основных комплектующих оборудования с указанием производителей, а также приложением сертификатов соответствия на них;</p> <p>-Документация по монтажу, наладке и эксплуатации на русском и английском языках; Все поставляемое оборудование проходит входной контроль, с представителем участника при получении оборудования на склад.</p> <p>Товар должен сопровождаться следующей документацией:</p> <p>-необходимо предоставить сертификат соответствия товара;</p> <p>- счёт-фактура (инвойс) Продавца с описанием товара, указанием количества, цены единицы товара и общей суммы;</p> <p>- транспортная накладная, выпущенная на имя грузополучателя, наименование Заказчика, номер и даты подписания действующего контракта;</p> <p>- сертификат о происхождении страны товара с указанием номера и даты инвойса;</p> <p>- упаковочный лист, сертификат о качестве товара, выписанного производителем, паспорт безопасности товара.</p>	<p>- Certificates (declarations) of compliance with GOST and safety requirements;</p> <p>-Specification of main components of equipment with indication of manufacturers, as well as application of certificates of conformity for them;</p> <p>-Documentation for installation, adjustment and operation in Russian and English; All supplied equipment is subject to incoming inspection with the participant's representative when receiving the equipment at the warehouse. The goods shall be accompanied with the following documentation:</p> <p>- the certificate of conformity of the goods;</p> <p>- invoice (invoice) of the Seller with description of the goods, indication of the quantity, price of the unit of goods and total amount;</p> <p>- consignment note issued in the name of the consignee, the name of the Customer, the number and dates of signing the existing contract;</p> <p>- Certificate of origin of the country of goods indicating the invoice number and date;</p> <p>- packing list, Certificate of quality of goods issued by the manufacturer, product safety passport.</p>
<p><b>6. ТРЕБОВАНИЯ К ТРАНСПОРТИРОВАНИЮ</b></p>	<p><b>6. TRANSPORTATION REQUIREMENTS</b></p>
<p>Товар должен быть отгружен в экспортной стандартной таре/упаковке (закрытая, герметичная упаковка, исправная) изготовителя, обеспечивающей полную её сохранность от всякого рода повреждений при длительном хранении и перевозке продукции с учётом нескольких перегрузок в пути (в соответствии с требованием изготовителя). Тара и упаковка должны иметь товарный вид. Доставка оборудования осуществляется за счет Поставщика. При ошибочной отгрузке оборудования не по адресу, Поставщик своими силами за свой счет производит переадресацию продукции в пункт назначения, указанный в договоре.</p>	<p>The goods must be shipped in the export standard tare / packing (closed, sealed package, serviceable) of the manufacturer, ensuring its complete safety from all kinds of damage during long-term storage and transportation of products, taking into account several transshipments in transit(in accordance with the manufacturer's requirement). Tare and packing shall be of a commercial type. The equipment shall be delivered at the Supplier's expense. In case of erroneous shipment of equipment not to the address, the Supplier shall, at its own expense, forward the products to the destination specified in the contract.</p>
<p><b>7. ТРЕБОВАНИЯ К ОБЪЕМУ И/ЛИ СРОКУ ПРЕДОСТАВЛЕНИЯ ГАРАНТИЙ</b></p>	<p><b>7. REQUIREMENTS FOR THE SCOPE AND/OR PERIOD OF GUARANTEES</b></p>
<p>Срок гарантии на поставляемые материалы и оборудование в соответствии с паспортом завода-изготовителя, но не менее 12 месяцев. Время начала исчисления гарантийного срока с момента ввода оборудования в эксплуатацию. Участник должен за свой счет и сроки, согласованные с заказчиком, устранять любые дефекты в поставляемом</p>	<p>Warranty period for supplied materials and equipment is in accordance with the manufacturer's passport, but not less than 12 months. The warranty period starts from the moment of equipment commissioning. The Participant shall, at his own expense and at the time agreed with the Customer, eliminate any</p>



<p>оборудовании, материалах, выявленные в течение гарантийного срока. В случае выхода из строя оборудования участник обязан направить своего представителя для участия в составлении акта, фиксирующего дефекты, согласования порядка и сроков их устранения не позднее 5 дней со дня получения письменного извещения заказчика. Гарантийный срок в этом случае продлевается соответственно на период устранения дефектов.</p>	<p>defects in the supplied equipment, materials identified during the warranty period. In case of equipment failure, the participant is obliged to send his representative to participate in drawing up an act fixing the defects, agreeing on the procedure and terms for their elimination not later than 5 days from the date of receipt of the customer's written notice. The warranty period in this case is extended accordingly for the period of elimination of defects.</p>
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**8. ЭКОЛОГИЧЕСКИЕ И САНИТАРНЫЕ ТРЕБОВАНИЯ**

**8. ENVIRONMENTAL AND SANITARY REQUIREMENTS**

Товар не должен причинять какой-либо ущерб окружающей среде.

The goods shall not cause any damage to the environment.

**9. ТРЕБОВАНИЯ ПО БЕЗОПАСНОСТИ**

**9. SAFETY REQUIREMENTS**

Товар должно быть безопасным при его эксплуатации, хранении, а также утилизации.

The goods shall be safe during their operation, storage and disposal.

**10. ТРЕБОВАНИЯ К КОЛИЧЕСТВУ**

**10. REQUIREMENTS FOR QUANTITY**

№	Наименование МТР /Name of goods	Требования к МТР/ Requirements for the goods	Ед.Изм./Unit	КОЛ-ВО /Qty
1.	Волоконно-оптические датчики/ Fiber optic sensors	E32- ZD200E	Шт/ Pcs.	4
2.	Интеллектуальные оптоволоконные усилители/ Smart fiber optic amplifiers	E3X-NB10	Шт/ Pcs.	2

**11. ПЕРЕЧЕНЬ ПРИНЯТЫХ СОКРАЩЕНИЙ**

**11. LIST OF ACCEPTED ABBREVIATIONS**

№	Сокращение / Reduction	Расшифровка сокращения/Explanation of the abbreviation
1.		

**12. ПЕРЕЧЕНЬ ПРИЛОЖЕНИЙ**

**12. ATTACHED APPENDIXES**

№	Наименование приложения / Name of appendixes	Количество страниц/ Number of pages
1.	Data sheet	2

<p><b>Разработчик:/Developed by:</b></p>	<p><b>Ш. Уринов ✓</b> Sh. Urinov</p>
<p><b>Начальник участка цеха КИП и А: Supervising foreman of The instrumentation and automation shop:</b></p>	<p><b>Н. Шодиев</b> N. Shodiyev</p>
<p><b>Заместитель главного метролога: Deputy Chief Metrologist:</b></p>	<p><b>О. Ачилов</b> O. Achilov</p>
<p><b>Начальник цеха КИП и А: Chief of The instrumentation and automation shop:</b></p>	<p><b>З. Жалилов</b> Z. Jalilov</p>
<p><b>Начальник участка АСУ: Chief of the area of The automatic control system:</b></p>	<p><b>У. Абдуллаев</b> U. Abdullaev</p>
<p><b>Инженер СУМР: Engineer of The Material and technical resource management service:</b></p>	<p><b>С. Кодиоров</b> S. Kodirov</p>



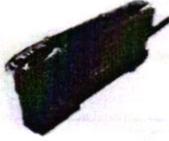
# Smart Fiber Amplifier

# Series

## INSTRUCTION SHEET

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

- A specialist who has the knowledge of electricity must treat the product.
- Please read this manual carefully, and use it correctly after thoroughly understanding the product.
- Please keep this manual properly for future reference whenever it is necessary.



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### WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

#### Warning Indications

### WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purpose.



Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.



Never use the product with an AC power supply. Otherwise, explosion may result.



### PRECAUTIONS FOR SAFE USE

The following precautions must be observed to ensure safe operation of the product. Doing so may cause damage or fire.

Do not install the product in the following locations.

- ① Locations subject to direct sunlight
  - ② Locations subject to condensation due to high humidity
  - ③ Locations subject to corrosive gas
  - ④ Locations subject to vibration or mechanical shocks exceeding the rated values
  - ⑤ Locations subject to exposure to water, oil, chemicals
  - ⑥ Locations subject to steam
  - ⑦ Locations subjected to strong magnetic field or electric field
- Do not use the product in environments subject to flammable or explosive gases.  
Do not use the product in any atmosphere or environment that exceeds the ratings.  
To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices.

High-Voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage. Do not apply any load exceeding the ratings. Otherwise damage or fire may result. Do not short the load. Otherwise damage or fire may result. Connect the load correctly.

Do not miswire such as the polarity of the power supply.  
Do not use the product if the case is damaged.

Burn injury may occur. The product surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Attention must be paid during operation or cleaning.

When setting the sensor, be sure to check safety such as by stopping the equipment.  
Be sure to turn off the power supply before connecting or disconnecting wires.

### PRECAUTIONS FOR CORRECT USE

Be sure to mount the unit to the DIN track until it clicks.

The length for the cable extension must be 30m or less (or less than 10m for S-mark certified models). Be sure to use a cable of at least 0.3mm<sup>2</sup> for extension. The power voltage must be 24 to 30V when connecting amplifier units with extension cable and wire-saving connector.

Do not apply the forces on the cord exceeding the following limits.

Pull: 40N; torque: 0.1N·m; pressure: 20N; bending: 29.4N

Do not apply excessive force such as tension, compression or torsion to the amplifier unit with the fiber unit fixed to the amplifier unit.

Always keep the protective cover in place when using the product. Not doing so may cause malfunction. It may take time until the received light intensity and measured value become stable immediately after the power is turned on depending on use environment.

The product is ready to operate 200 ms after the power supply is turned ON.

Output pulses may occur when the power supply is turned OFF. Turn OFF the power supply to the load or load line first.

The Mobile Console E3X-MC11, E3X-MC11-SV2 and E3X-MC11-S cannot be connected.

The mutual interference prevention function does not work when in combination with E3C/E2C/E3X.

This product does not have the mutual interference prevention function.

The Communication Unit E3X-DRT21-S, E3X-CRT, E3X-ECT and E3NW cannot be connected.

If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke, immediately stop using the product, turn off the power, and consult your dealer.

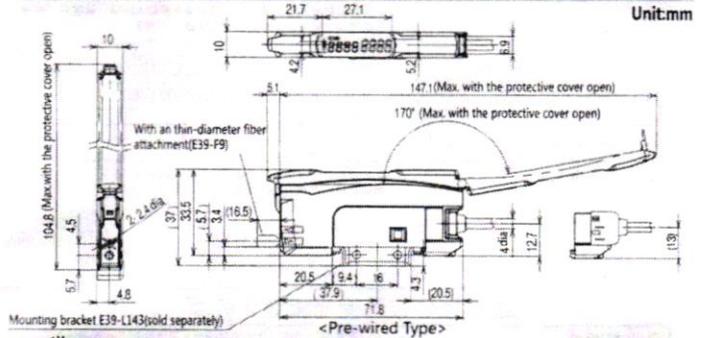
Do not use thinner, benzene, acetone, and lamp oil for cleaning.

### Checking the Package Content

· Amplifier Unit: 1 · Instruction Sheet (this sheet): 1 (English and Chinese)

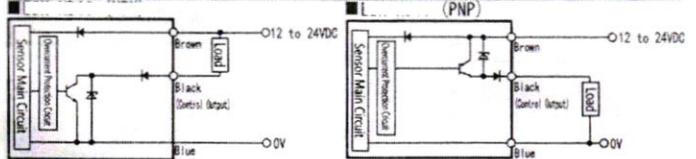
## 1 Installation

### 1-1 Dimensions



Dimensions in parentheses ( ) indicates the ones with related components. The cover could come off if it is tilted by 170 degrees or more.

### 1-2 Input/Output Circuit Diagram



### 1-3 Mounting the Amplifier Unit

#### Mounting on DIN Track

- Let the hook on the Amplifier Unit's Fiber Unit connection side catch the track.
- Push the unit until the hook clicks into place.

DIN track ( PFP-□N ) is sold separately.

#### Removing from DIN Track

- Push the unit in the direction 1.
- Lift the unit in the direction of arrow 2 while performing step (1).

#### Joining Amplifier Units

- Mount the Amplifier Units one at a time onto the DIN track. Slide the Amplifier Unit until the communication connector is closely attached (Arrow 3).
- Use End Plates (PFP-M, separately sold) at the both ends of the grouped Amplifier Units to prevent them from separating due to vibration or other cause (Arrow 4).
- Tighten the screw on the End Plates using a driver (Arrow 5).

Up to 16 Amplifier Units can be joined. Under environments such as vibration, use an End Plate even with a single amplifier unit.

Tighten the screw while pressing the End Plate.

### 1-4 Mounting Fiber Unit

#### Use Fiber Cutter

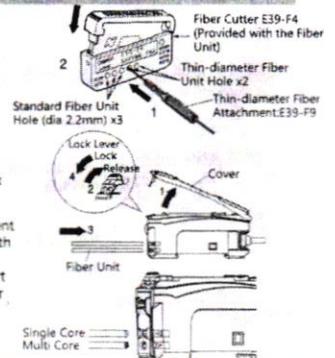
- Insert a Fiber Unit into a fiber cutter hole.
- Press down the blade at a single stroke to cut the Fiber Unit.

#### Mount Fiber Unit

- Open the cover.
- Raise the lock lever (Release).
- Insert the Fiber Unit in the fiber unit hole to the bottom.
- Return the lock lever to the original position and fix the Fiber Unit (Lock).

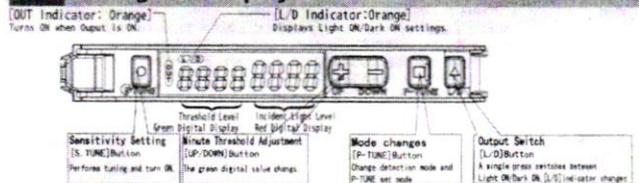
To mount the thin-diameter Fiber Unit an attachment (E39-F9) is required. (The attachment is included with the applicable Fiber Unit.)

When mounting a coaxial reflective Fiber Unit, insert the single-core Fiber Unit to the upper hole (Emitter side) and the multi-core Fiber Unit to the lower hole (Receiver side).



## 2 Settings

### 2-1 Setting and Display Overview



### 2-2 Output switching

Press button

Through-beam: Set to "Dark ON" to turn the output ON with a workpiece in the detection area. [L/D Indicator] turns ON.

Reflective: Set to "Light ON" to turn the output ON with a workpiece in the detection area. [L/D Indicator] turns ON.



## 2-3 Smart Tuning [Easy Sensitivity Setting]

### 1 Detecting Presence/Absence of Workpiece

#### 2-point Turning

Received light intensity setting: Adjust to the either higher value of Point 1 and Point 2 power tuning levels. Threshold setting: Set to the middle between Point 1 and Point 2 received light intensity values.

Execution can be done even if the order of workpiece exists/ngt exist is reversed.



### 2 Increasing Resistance to Dust and Dirt

#### Maximum Sensitivity Tuning

Received light intensity setting: Adjust the received light amount to "0" when the button is pressed. Threshold setting: Received light amount after light amount adjustment when the button is pressed.

It will become susceptible to the influence of background objects.



### 3 Initializing the Light Intensity Level Change Caused by Dust or Dirt

#### Power Tuning

Received light intensity setting: Adjust the power tuning level to the received light amount when the button is pressed. Threshold setting: Not changed.

Adjustment for a reflective type requires the presence of a workpiece. Both thru-beam and reflective types require the presence of a workpiece if the setting is made after position tuning.



#### Smart Tuning Error

Error/Display/Cause	Error Origin Tuning Type	Remedy
Near Error nErr Err The light level difference between Points 1 and 2 are extremely small.	2-point Tuning	Narrow the distance between emitter and receiver. (Through-beam model) Move the Fiber head closer to the sensing object. (Reflection model)
Over Error oVer Err Incident light level is too high.	All	Widen the distance between emitter and receiver. (Through-beam model) Move the Fiber head away from the sensing object. (Reflection model) Increase the power tuning level. Use a thin-diameter Fiber.
Low Error Lo Err Incident light level is too low.	Other than maximum sensitivity tuning	Make the distance between emitter and receiver close. (Through-beam model) Move the Fiber Head close to the sensing object. (Reflection model) Devalue the power tuning level.

## 2-4 Minute Adjustment of Threshold Level

Press button to adjust the threshold level. The threshold level becomes higher. The threshold level becomes lower.



## 5 Maintenance

### 5-1 Troubleshooting

#### Troubleshooting

Problem	Cause	Remedy
Nothing is shown on the indication	No power supplied or the cable broken	Check the wiring, connector connection, power supply voltage and power supply capacity again. Refer to "1-2 Input/Output Circuit Diagram"
Sensing/Detection not possible despite the minimum threshold level	Detection set to a small light level mode Dust or dirt influences	When the P-TUNE function is AUTO, Refresh the Auto Power Tuning. When the P-TUNE function is a percent number, please increase the emission power and light intensity. Refer to "3-2 Detailed Setting"
The OUT indicator blinking	Mutual interference or other reason	This product does not have the mutual interference prevention function, please do use within the range that does not affect the amount of light received. Refer to "1-3 Mounting Amplifier Unit"

#### Error Display

Error Name/Display	Cause	Remedy
EEPROM time-out error E-nE 01	Failed internal date read/out	Turn ON the power again.
EEPROM checksum error E-nE 02	Failed internal date read/out	Turn ON the power again.
Load short circuit detection error E-SL	Over current following to the control output	Check wiring and connector connection again. Refer to "1-2 Input/Output Circuit Diagram" and "5-2 Ratings and Specifications"

## 5-2 Ratings and Specifications

Model	NPN Output PNP Output
Control output	1
Connection method	Pre-wired type
Light source (Wavelength)	Red 4-element LED (625nm)
Power supply voltage	12 to 24 VDC, including ripple (p-p) 10%
Power consumption	720mW max. (Power supply voltage 24V, current consumption 30mA)
Control output	Load power supply voltage: 24 VDC open collector output type (depends on the NPN/PNP output format) Load current: 100mA max for 1 to 3 units use, 20mA max for 4 to more units connected Residual voltage: Load current less than 10mA, 1V max, load current 10 to 100mA, 2V max. Off-state current: 0.1mA max.
Protection circuit	Power supply reverse polarity/output short-circuit protection and output incorrect connection protection
Maximum connectable Units	16 Units
Mutual interference prevention	without this function
Ambient illumination	Illumination intensity incandescent lamp: 20,000lx max/Sunlight: 30,000lx max.
Surrounding air Temperature range*3	Operating: 1 to 2 amplifiers connected: -25°C to 55°C, 3 to 10 amplifiers connected: -25°C to 50°C; 11 to 16 amplifiers connected: -25°C to 45°C. Storage: -30°C to 70°C (with no icing or condensation)
Ambient humidity range	Operating and storage 35 to 85% (with no condensation) within the surrounding air temperature range shown above
Altitude	2000m max.
Installation environment	Pollution degree 3 (as per IEC60947-1)
Insulation resistance	20MΩ Min. (at 500VDC)
Dielectric strength	1,000VAC, 50/60Hz, 1 minute
Vibration resistance	10 to 55Hz with a 1.5mm double amplitude for 2 hrs each in X, Y and Z directions
Shock resistance	500m/s for 3 times each in X, Y and Z directions
Weight (sensor)	Approx. 75g
Materials	Case and cover: Polycarbonate (PC), Cable: PVC

## 3 Convenient Setting Features

### 3-1 Initializing Settings

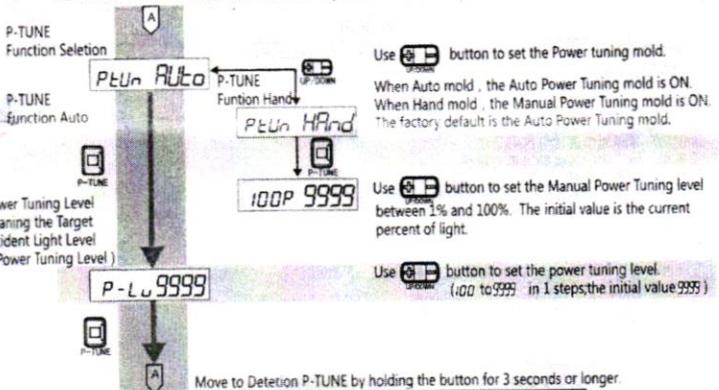
Setting Reset Initialize all settings to the factory-set defaults.



## 4 Detailed Settings

Hold button for 3 seconds or longer to enter SET mode.

SET mode provides the following function setting. The initial display shown after transition from one function to another represents the factory default.



### Suitability for Use

Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT 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 PRODUCT(S) 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.