

Thank you very much for purchasing Panasonic products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product.

WARNING

- Never use this product as a sensing device for personnel protection. In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

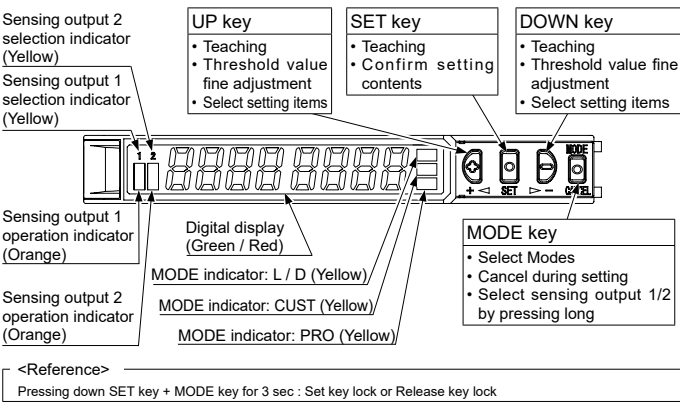
REGULATIONS AND STANDARDS

- This product complies with the following standards / regulations. -Conformity Directives / Conforming Regulations- EU Law : EMC Directive 2014/30/EU British Legislation : EMC Regulations 2016/1091 - Applicable Standards EN IEC 60947-5-2:2020 -Standards in US / Canada- ANS/UL 60947-5-2, CAN/CSA C22.2 No.14



- Caution about UL recognition In case requiring conformity of UL listing mark or C-UL listing mark, Use class 2 power supply unit.

PART DESCRIPTION



MOUNTING

- How to connect: 1. Fit the rear part of the mounting section of the amplifier on a DIN rail. 2. Press down the rear part of the mounting section of the unit on the DIN rail and fit the front part of the mounting section to the DIN rail.

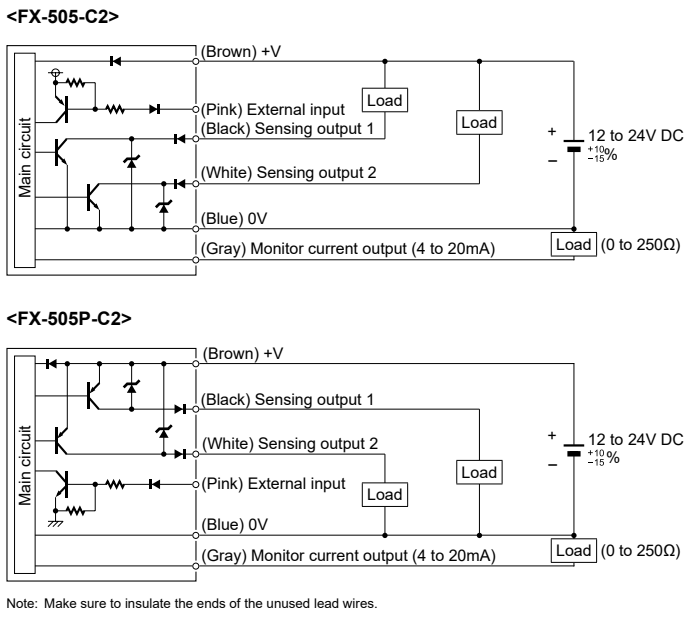
- How to remove: 1. Push the controller forward. 2. Lift up the front part of the amplifier to remove it.

How to connect the fiber cable

- Be sure to fit the attachment to the fibers first before inserting the fibers to the amplifier. For details, refer to the instruction manual enclosed with the fibers. 1. Snap the fiber lock lever down till it stops completely. 2. Insert the fiber cables slowly into the inlets until they stop. (Note) 3. Return the fiber lock lever to the original position till it stops.

Note: With the coaxial reflective type fiber, such as FD-G4 or FD-FM2, insert the single core fiber cable into the beam-emitting inlet "P" and the multi-core fiber cable into the beam-receiving inlet. If they are inserted in reverse, the sensing performance will deteriorate.

I/O CIRCUIT DIAGRAMS

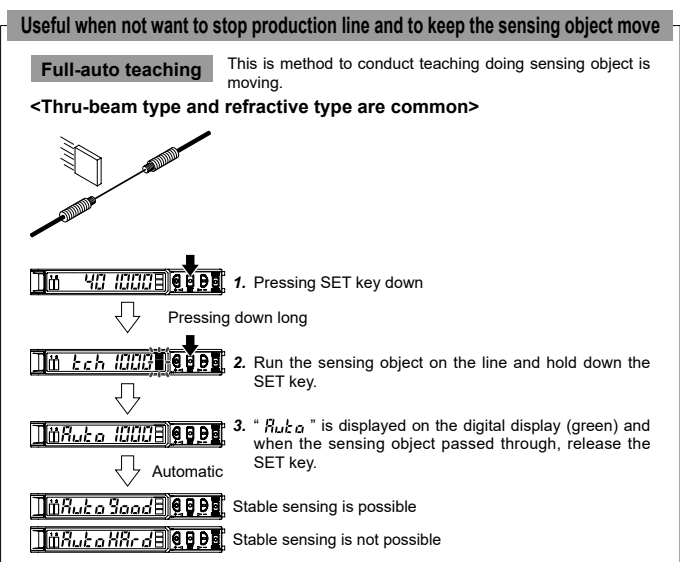
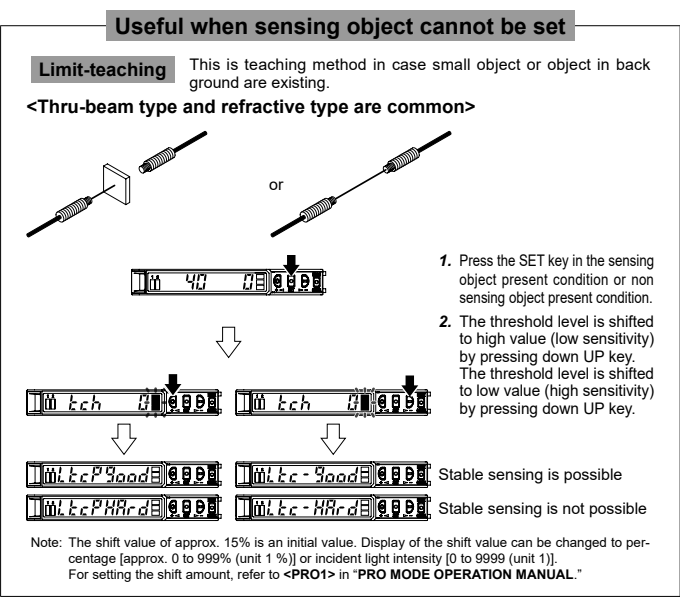
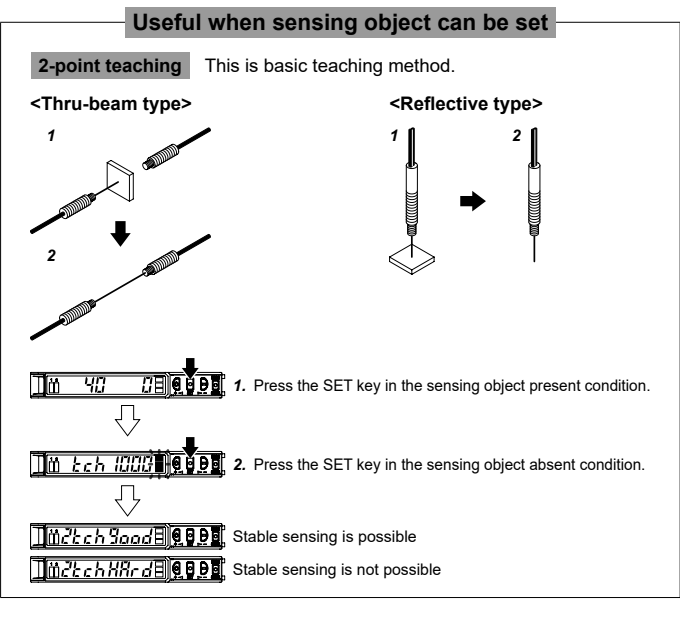


OPERATION PROCEDURE

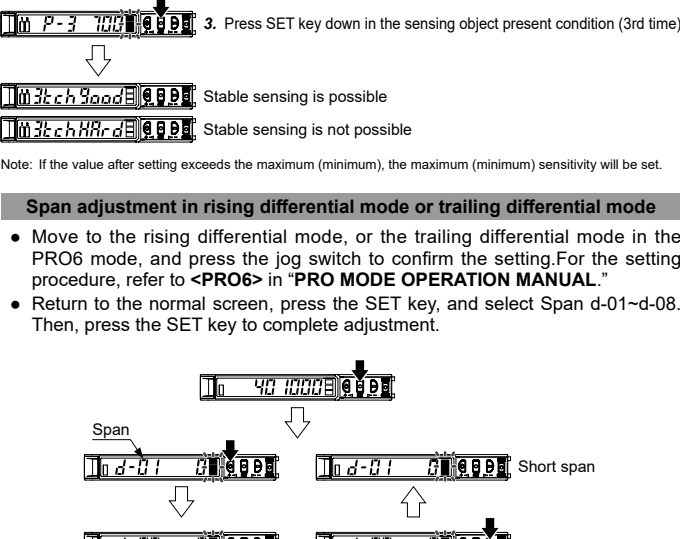
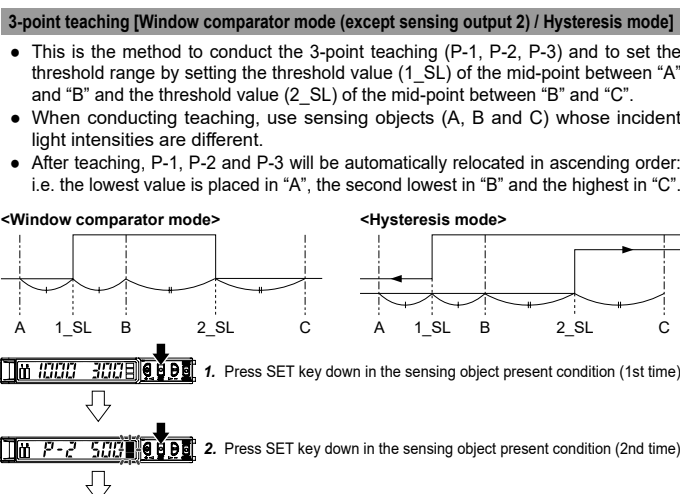
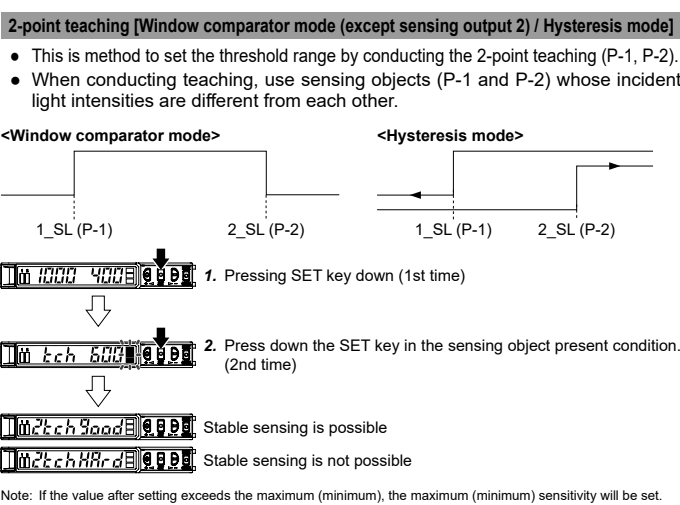
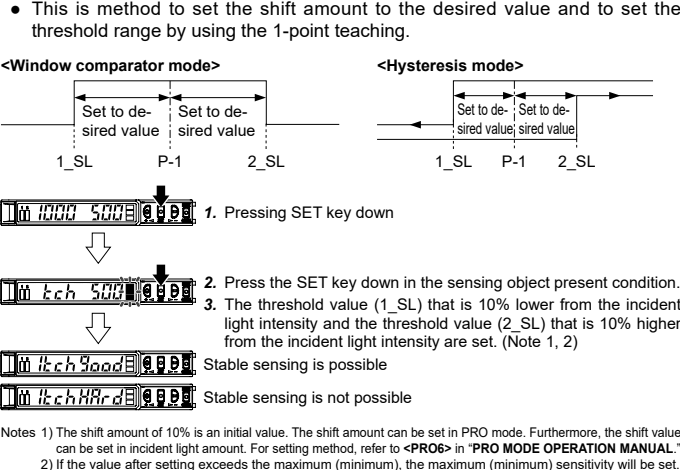
- The sensing output can be switched to sensing output 1 or sensing output 2 by holding down the mode key. The changed settings are not stored if turning the power OFF while setting. Therefore, confirm the settings by pressing the SET key before turning the power OFF. When turning ON the power, RUN mode is displayed and the digital display shows the threshold value (green) and the incident light intensity (red).

TEACHING MODE

- Be sure that detection may become unstable depending on the use environment in teaching if less margin is applied. When teaching in Window comparator mode or Hysteresis mode, a setting has to be made in PRO mode beforehand. In case 1-point teaching, make sure to set the shift amount. (initial value is 10% or 100) For the setting, refer to <PRO> in "PRO MODE OPERATION MANUAL."

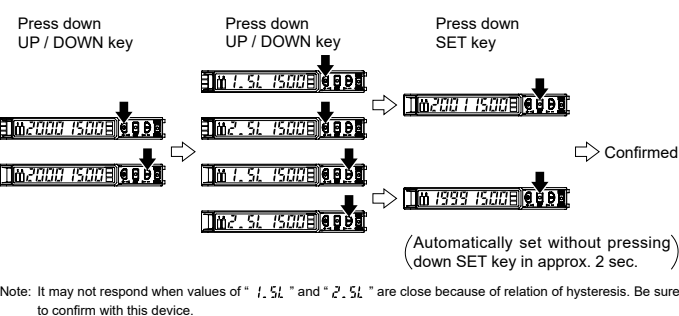
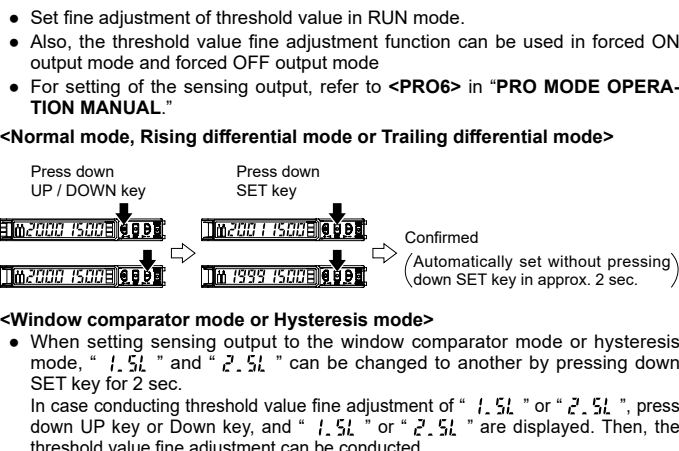


1-point teaching (Window comparator mode (except sensing output 2) / Hysteresis mode)



- The threshold can be set by using the threshold value fine adjustment function. For the threshold value fine adjustment function, refer to "THRESHOLD VALUE FINE ADJUSTMENT FUNCTION"

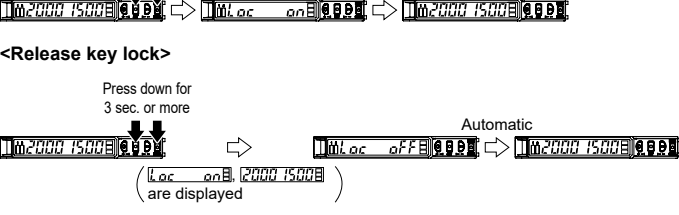
THRESHOLD VALUE FINE ADJUSTMENT FUNCTION



KEY LOCK FUNCTION

- The key lock function prevents key operations so that the conditions set in each setting mode are not inadvertently changed. If operating key switch after key lock is set, 'Loc on' is indicated on the digital display. <Set key lock> Press down for 3 sec. or more. <Release key lock> Press down for 3 sec. or more.

SENSING OUTPUT OPERATION MODE



CUSTOM MODE

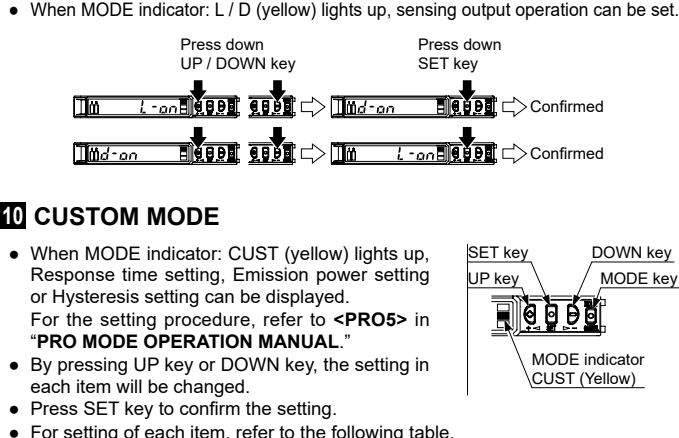
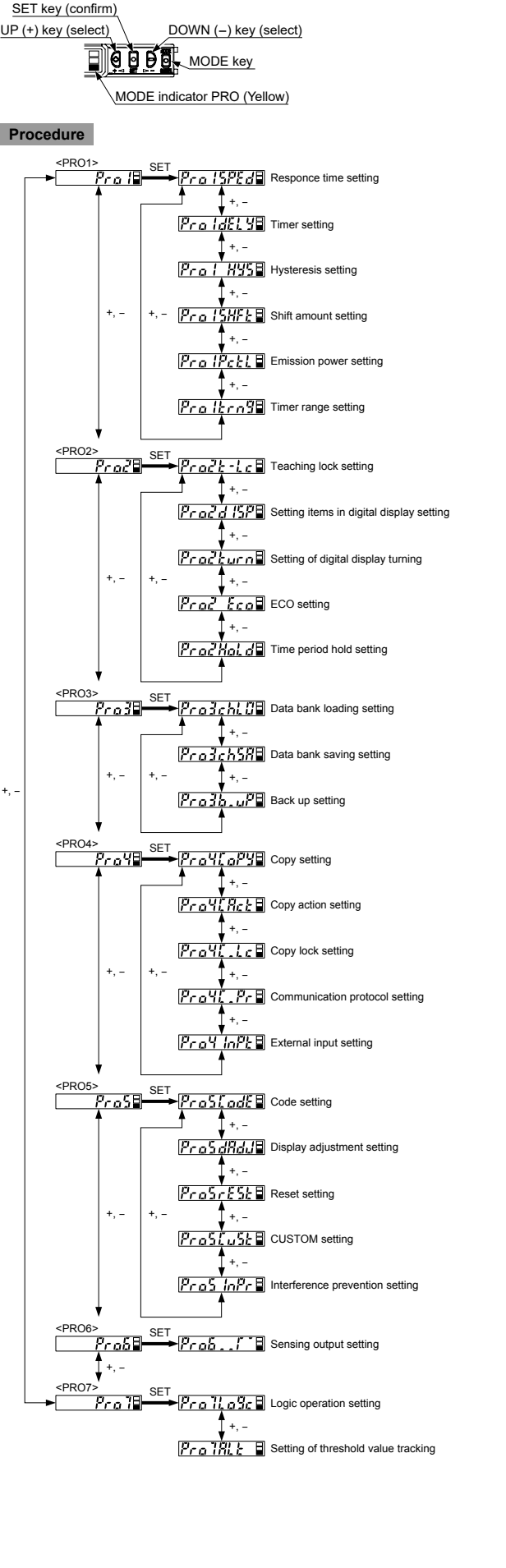


Table with 3 columns: Item, Digital display, Reference item. Rows include Response time setting (SPE d-St d), Emission power setting (Pct L H-P), and Hysteresis setting (HYS H-D2).

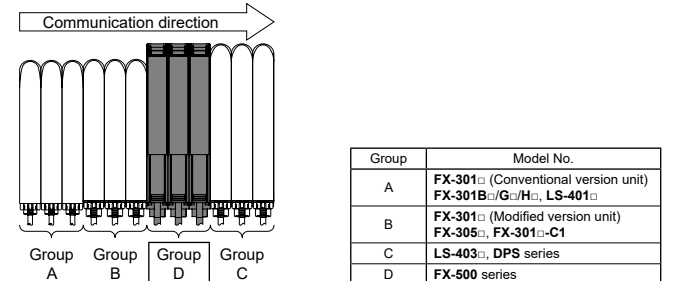
PRO MODE

- When MODE indicator: PRO (yellow) lights up, PRO mode can be set. For detail of PRO mode, refer to "PRO MODE OPERATION MANUAL."



OPTICAL COMMUNICATION

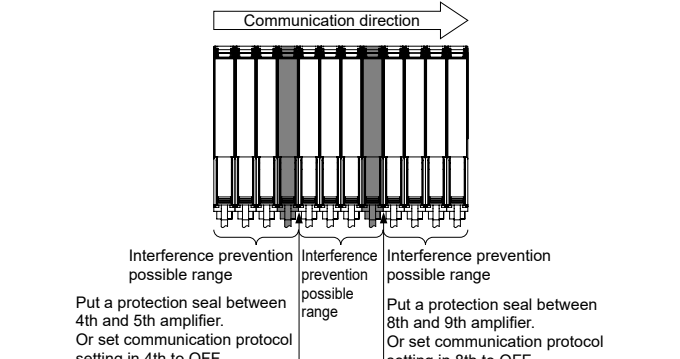
- When the setting of data bank loading / saving, copy setting, or copy action setting is conducted via optical communications, cascade the sub amplifiers right side to the main amplifier as follows. However, in case using data bank loading / saving, use FX-502 or FX-505-C2 as main amplifier. If an amplifier is under any of the following conditions, the setting of data bank loading / saving, or copy setting cannot be carried out. Digital display is blinking. External input setting of main amplifier is set to "InPr SEL F." (Only data-bank loading / saving). When communication protocol of a sub amplifier is set to communication emission halt "L.Pr oFF" the setting of data bank loading / saving, or copy setting cannot be carried out to sub amplifiers subsequent to the mentioned amplifier. Make sure to mount closely like follows since interference prevention function is conducted by optical communication. When this product and other products (e.g. fiber sensor amplifiers, pressure sensor controllers, etc.) are connected together in cascade, install those products so that they are in order of Group A, B, D and C as shown in the right figure. This product is included in Group D.



- As for the products that are located between different groups, affix the amplifier protection seal FX-MB1 (optional) on the communication window of each corresponding product. Within each group, identical models should be connected in a lump. In case conducting copy setting of this device and other FX-500 series together, functions which are incorporated in this device will be copied but functions which are not incorporated in this device will not be copied.

INTERFERENCE PREVENTION FUNCTION

- This device incorporates an interference prevention function by setting different emitting frequencies different from an interference prevention function by optical communication. For interference prevention function setting procedure, refer to <PRO5> in "PRO MODE OPERATION MANUAL." Possible number of amplifiers for interference prevention function is different as shown in table below. Response time: H-SP, FAST, STD, LONG, U-LG, HYPR. Interference prevention function setting: IP-1. In case putting in more amplifiers than limit of interference prevention function, put the amplifier protection seal to amplifier which is adjacent end of an amplifier that the interference function is valid or set OFF in communication protocol setting of the end of amplifier that the interference prevention function is valid. Example: Putting in 12 of this device and set STD of response time setting. Possible number of interference prevention is 4. Put the amplifier protection seals 4th and 5th amplifiers and between 8th and 9th amplifiers or change the communication protocol setting of 4th and 8th or OFF since interference prevention works from 1st to 4th, from 5th to 8th and 9th to 12th.



- In case mounting more amplifiers whose response time setting are different, put protection seal between amplifiers that have different response time setting or set communication protocol setting of the upper amplifier to OFF. For communication protocol setting procedure, refer to <PRO4> in "PRO MODE OPERATION MANUAL."

ERROR INDICATION

Table with 3 columns: Error indication, Description, Remedy. Rows include E-01 (EEPROM broken), E-02 (EEPROM writing error), E-11 (Load of sensing output 1), E-12 (Load of sensing output 2), E-52 (Communication error), and E-53 (Communication error).

SPECIFICATIONS

Table with 2 columns: Item and Specification. Rows include Type, Model No., Supply voltage, Power consumption, Sensing output, Short-circuit protection, Response time, Monitor current output, External input, Protection, Ambient temperature, Ambient humidity, Material, Cable, Weight, and Accessory.

CAUTIONS

- This product has been developed / produced for industrial use only. Make sure that the power supply is OFF while adding or removing the amplifiers. Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the product may get burnt or be damaged. Take care that short-circuit of the load or wrong wiring may burn or damage the product. Do not run the wires together with high-voltage lines or power lines, or put them in the same raceway. This can cause malfunction due to induction. The specification may not be satisfied in a strong magnetic field. Verify that the supply voltage variation is within the rating. If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground. In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground. The ultra long distance (U-LG, HYPR) mode is more likely to be affected by extraneous noise since the sensitivity of that is higher than the other modes. Make sure to check the environment before use. Do not use during the initial transient time (H-SP, FAST, STD: 0.5 sec., LONG, U-LG, HYPR: 1 sec.) after the power supply is switched ON. Use same power supply when mounting adjacently. Extension up to total 100m is possible. When you extend the cable, be sure the power supply voltage is 12V DC or more and use cables which have 0.3mm² or more of conductor cross-section area. However, in order to reduce noise, make the wiring as short as possible. Make sure that stress by forcible bend or pulling is not applied to the sensor cable joint and fiber cable. This product is suitable for indoor use only. Avoid dust, dirt, and steam. Take care that the product does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid or alkaline. This product cannot be used in an environment containing inflammable or explosive gasses. Never disassemble or modify the product. This product adopts EEPROM. Settings cannot be done 100 thousand times or more because of the EEPROM's lifetime.

