# Ratings and Specifications

| Item | | Type | Standard models | | Advanced models | Model for Sensor Communications Unit *1 |
|---|---|---|---|---|---|---|
| | | NPN output | E3NX-CA11 | E3NX-CA6 | E3NX-CA21 | E3NX-CA0 |
| | | PNP output | E3NX-CA41 | E3NX-CA8 | E3NX-CA51 | |
| | | Connecting method | Pre-wired | Wire-saving Connector | Pre-wired | Connector for Sensor Communications Unit |
| I/O | Outputs | | 1 output | | 2 outputs | --- *3 |
| | External input | | --- | | 1 input *2 | |
| Light source (wavelength) | | | White LED (420 to 700 nm) | | | |
| Supply voltage | | | 10 to 30 VDC, including 10% ripple (p-p) | | | Supplied from the connector through the Sensor Communications Unit. |
| Power consumption *4 | | | At Power Supply Voltage of 24 VDC<br>Normal mode: 960 mW max. (Current consumption: 65 mA max.)<br>Eco function ON: 720 mW max. (Current consumption: 30 mA max.)<br>Eco function LO: 800 mW max. (Current consumption: 33 mA max.) | | | |
| Control output | | | Load power supply voltage: 30 VDC max., open-collector output<br>Load current: Groups of 1 to 3 Amplifiers: 100 mA max., Groups of 4 to 30 Amplifiers: 20 mA max.<br>(Residual voltage: At load current of less than 10 mA: 1 V max. At load current of 10 to 100 mA: 2 V max.)<br>OFF current: 0.1 mA max. | | | --- |
| Indications | | | 7-segment displays (Sub digital display: green, Main digital display: white)<br>Display direction: Switchable between normal and reversed.<br>OUT indicator (orange), NO/NC indicator (orange), Smart Tuning indicator (blue), and OUT selection indicator (orange, only on models with 2 outputs) | | | |
| Protection circuits | | | Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection | | | Power supply reverse polarity protection |
| Sensing method | | | Contrast Mode: Light intensity discrimination for RGB (initial state/after 2-point tuning) (R+G+B light intensity discrimination for 1-point tuning)<br>Color Mode: RGB ratio discrimination | | | |
| Response time | Super-high-speed Mode (SHS) *5 | | Operate or reset: 50 μs (only in Contrast Mode) | | | |
| | High-speed Mode (HS) | | Operate or reset: 250 μs | | | |
| | Standard Mode (Stnd) | | Operate or reset: 1 ms | | | |
| | Giga-power Mode (GIGA) | | Operate or reset: 16 ms | | | |
| Sensitivity adjustment | | | Smart Tuning (2-point tuning, full autotuning, or 1-point tuning (1% to 99%)) or manual adjustment | | | |
| Maximum connectable Units | | | 30 Units | | | 30 Units (When connected to OMRON NJ-series Unit) |
| No. of Units for mutual interference prevention *6 | Super-high-speed Mode (SHS) *5 | | --- | | | |
| | High-speed Mode (HS) | | 10 Units | | | |
| | Standard Mode (Stnd) | | 10 Units | | | |
| | Giga-power Mode (GIGA) | | 10 Units | | | |

***1.** The E3NW-ECT Sensor Communications Unit can be used, but the E3NW-CRT/CCL, E3X-DRT21-S, and E3X-CRT/ECT Sensor Communications Units cannot be used.

***2.** The following details apply to the input.

| | Contact input (relay or switch) | Non-contact input (transistor) |
|---|---|---|
| NPN | ON: Shorted to 0 V (Sourcing current: 2 mA max.).<br>OFF: Open or shorted to Vcc. | ON: 1.5 V max. (Sourcing current: 2 mA max.)<br>OFF: Vcc - 1.5 V to Vcc (Leakage current: 0.1 mA max.) |
| PNP | ON: Shorted to Vcc (Sinking current: 3 mA max.).<br>OFF: Open or shorted to 0 V. | ON: Vcc - 1.5 V to Vcc (sinking current: 3 mA max.)<br>OFF: 1.5 V max. (Leakage current: 0.1 mA max.) |

***3.** Two sensor outputs are allocated in the programmable logic controller (PLC) I/O table.
PLC operation via Communications Unit enables reading detected values and changing settings.

***4.** Power consumption
At Power Supply Voltage of 10 to 30 VDC
Normal mode: 1,080 mW max. (Current consumption: 36 mA max. at 30 VDC, 74 mA max. at 10 VDC)
Eco function ON: 840 mW max. (Current consumption: 28 mA max. at 30 VDC, 50mA max. at 10 VDC)
Eco function LO: 930 mW max. (Current consumption: 31 mA max. at 30 VDC, 55 mA max. at 10 VDC)

***5.** The mutual interference prevention function is disabled if the detection mode is set to Super-high-speed Mode.

***6.** The tuning will not change the number of units.
The least unit count among the mutual interference prevention units of E3NX and E3NC.
Check the mutual interference prevention unit count and response speed of each model.

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| | | PNP output | E3NX-CA41 | E3NX-CA8 | E3NX-CA51 | |
| | | Connecting method | Pre-wired | Wire-saving Connector | Pre-wired | Connector for Sensor Communications Unit |
| Functions | Operation mode | | Contrast Mode: NO (Light-ON) or NC (Dark-ON)<br>Color Mode: NO (ON for match: ON for same color as registered color) or NC (ON for mismatch: ON for different color from registered color) | | | |
| | Timer | | Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer (Counted by 0.1 s in a range of 0.1 to 0.5 ms, by 0.5 ms for 0.5 to 5 ms, and by 1 ms for 5 to 9999 ms. Default: 10 ms, Error: 0.1 ms) | | | |
| | Zero reset | | Contrast Mode only<br>Negative values can be displayed. (Threshold level is shifted.) | | | |
| | Resetting settings *7 | | Select from initial reset (factory defaults), user reset (saved settings), or bank reset. | | | |
| | Eco mode | | Select from OFF (digital display lit), Eco ON (digital display not lit), and Eco LO (digital display dimmed). | | | |
| | Bank switching | | Select from banks 1 to 8. | | | |
| | Power tuning level | | Set from 100 to 9,999. (The RGB maximum incident level at Smart Tuning is adjusted to the power tuning level.) | | | |
| | Output 2 | | --- | | Normal, error output, AND output, or OR output | --- |
| | External input | | --- | | Select from input OFF, tuning, full-auto tuning, emission OFF, bank 1 and 2 switching, bank 1 through 8 switching, or zero reset. | --- |
| | Changing the displays | | Threshold level and incident level, channel number and incident level, RGB display and incident level, or bank display and incident level | | | |
| Ambient illumination (Receiver side) | | | Incandescent lamp: 20,000 lx max., Sunlight: 30,000 lx max. | | | |
| Ambient temperature range | | | Operating:<br>Groups of 1 or 2 Amplifier Units: −25 to 55°C,<br>Groups of 3 to 10 Amplifier Units: −25 to 50°C,<br>Groups of 11 to 16 Amplifier Units: −25 to 45°C,<br>Groups of 17 to 30 Amplifier Units: −25 to 40°C<br>Storage: −30 to 70°C (with no icing or condensation) | | | Operating:<br>Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units: 0 to 40°C<br>Storage: −30 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 | | | |
| Installation environment | | | Pollution degree 3 (as per IEC 60947-1) | | | |
| Insulation resistance | | | 20 MΩ min. (at 500 VDC) | | | |
| Dielectric strength | | | 1,000 VAC at 50/60 Hz for 1 minute | | | |
| Vibration resistance | | | 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | | |
| Shock resistance (destruction) | | | 500 m/s$^2$ for 3 times each in X, Y, and Z directions | | | 150 m/s$^2$ for 3 times each in X, Y, and Z directions |
| Weight (packed state/Sensor only) | | | Approx. 115 g/ approx. 75 g | Approx. 60g/ approx. 20g | Approx. 115 g/approx. 75 g | Approx. 65 g/approx. 25 g |
| Materials | Case | | Polycarbonate (PC) | | | |
| | Cover | | Polycarbonate (PC) | | | |
| | Cable covering | | Polyvinyl chloride (PVC) | | | --- |
| Accessories | | | Instruction manual | | | |

***7.** The bank is not reset by the user reset function or saved by the user save function.