

E52-E

The E52-E PT100 and thermocouples provide accurate temperature sensing for standard as well as challenging environments, special applications and special mounting requirements. The E52-E series is optimized to work with the range of E5 temperature controllers.






- Thermocouples and PT100 elements
- Wide range of housing, mounting and connection options
- Best performance match with E5 temperature controller portfolio
- Line up for best fitting application performance



Ordering information

| Line | Shape type ¹ | Type | | | Temperature range | | Sensing tube | | | Connection | | | Order code | | | | | | | | | | | | | | | | | | |
|------|-------------------------|-------------|---------------|----------|-------------------|--------------------|------------------|-------------|---------------|------------|--------------------------------|------------|------------------------|-------------|-------|---------|---------|------------------|--------------------------------|--------------------------|-------------------|-------------------|--------------------------------|-----|-----------------|-----|---------|--------|--------------------------|---|------------------|
| | | Series | Tech-nology | Sub-type | Min [°C] | Max [°C] | Diameter [mm] | Length [mm] | Material | Type | Fixing | Length [m] | | | | | | | | | | | | | | | | | | | |
| PRO | | smooth tube | Thermo-couple | T | -80 | 400 | 3 | 100 | SUS 316 | 2-wire | pre-wired with cable end shoes | 2 | E52-ETT3-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | 6 | | | | | | E52-ETT6-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | 1 | | | | | | E52-ETJ1-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | 2 | E52-ETJ2-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 3 | E52-ETJ3-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 4.5 | E52-ETJ4,5-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | E52-ETJ6-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | LITE | | smooth tube | Thermo-couple | | J | | | | 0 | 400 | 4 | 100 | SUS 304 | 2-wire | pre-wired with cable end shoes | 2 | E52-ELTJ4-100-2-A | | | | | | | | | | |
| | | | | | | | | | | | | | | | 5 | | | | | | E52-ELTJ5-100-2-A | | | | | | | | | | |
| | | | | | | | | | | | | | | | 6 | | | | | | E52-ELTJ6-100-2-A | | | | | | | | | | |
| | | | | | | | | | | | | | | | 8 | | | | | | E52-ELTJ8-100-2-A | | | | | | | | | | |
| | | | | | | | | | | | | | | | 1 | | | | | | E52-ETK1-100-2-A | | | | | | | | | | |
| 2 | E52-ETK2-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PRO | | smooth tube | Thermo-couple | K | -80 | 1100 | 2 | 100 | INCONEL 600 | 2-wire | pre-wired with cable end shoes | 2 | E52-ETK3-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | 3 | | | | | | E52-ETK4,5-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | 4.5 | | | | | | E52-ETK6-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | 6 | E52-ELTK4-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 4 | E52-ELTK5-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 5 | E52-ELTK6-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | |
| LITE | | smooth tube | Thermo-couple | K | 0 | 400 | 6 | 100 | SUS 304 | 2-wire | pre-wired with cable end shoes | 2 | E52-ELTK8-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | 8 | | | | | | E52-ELTK8-100-2-A | | | | | | | | | | | | | | | | | | |
| | | | | | | | PRO | | | | | | | smooth tube | PT100 | class B | -50 | 500 | 3 | 100 | SUS 316 | 3-wire | pre-wired with open cable ends | - | E52-EP3-250-2-B | | | | | | |
| | | | | | | | | | | | | | | | | | | | 6 | | | | | | E52-EP6-250-2-B | | | | | | |
| | | | | | | | | | | | | | | | | | | | 4 | | | | | | E52-ELP4-50-2-A | | | | | | |
| | | | | | | | | | | | | | | | | | 5 | E52-ELP5-100-2-A | | | | | | | | | | | | | |
| 6 | E52-ELP6-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | E52-ELP8-100-2-A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LITE | | smooth tube | PT100 | class B | 0 | 400 | 5 | 100 | SUS 304 | 3-wire | pre-wired with cable end shoes | - | E52-EP6-35-2-BG1/4G-B | | | | | | | | | | | | | | | | | | |
| | | | | | | | 6 | | | | | | E52-ETJ6-15-2-BG1/4G-B | | | | | | | | | | | | | | | | | | |
| | | | | | | | 8 | | | | | | E52-ETJ6-15-2-BG1/4G-B | | | | | | | | | | | | | | | | | | |
| | | | | | PRO | | bajonet mounting | | Thermo-couple | | | | J | 0 | 1150 | 6 | 200 | INCONEL 600 | 2-wire | enclosed screw terminals | - | E52-ETK6-200-T2-B | | | | | | | | | |
| | | | | | | | | | | | | | | | | K | | | | | | class B | -50 | 500 | 6 | 200 | SUS 316 | 2-wire | enclosed screw terminals | - | E52-EP6-200-T2-B |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

¹ See Dimensions on page 3

| Line | Shape type ¹ | Type | | | Temperature range | | Sensing tube | | | Connection | | | Order code |
|---|---|---|-----------------|------------------|-------------------|----------|---------------|---------------------|-----------------|------------|--------------------------------|------------|---------------------------------------|
| | | Series | Technology | Sub-type | Min [°C] | Max [°C] | Diameter [mm] | Length [mm] | Material | Type | Fixing | Length [m] | |
|  |  | enclosed terminals, G1/2" mounting | Thermocouple | K | 0 | 1150 | 6 | 200 | INCONEL 600 | 2-wire | enclosed screw terminals | - | E52-ETK6-200-T2-CG1/2G-B |
| | | | | J | | 720 | 6 | 200 | | | | | E52-ETJ6-200-T2-CG1/2G-B |
| | | enclosed terminals; Clamp mounting 1.5" | PT100 | class B | -50 | 200 | 6 | 100 | SUS 316 | 3-wire | | | E52-EP6-200-T2-CG1/2G-B |
| | | | | | | | | | | | | | enclosed terminals; Clamp mounting 2" |
|  |  | Surface temperature | Thermocouple | J | 0 | 250 | 10 | dia 4 mm screw hole | Cu (tin plated) | 2-wire | pre-wired with open cable ends | 2 | E52-ETJS1-B |
| | | Environmental temperature | PT100 | class B | -40 | 80 | - | - | Aluminium | 3-wire | enclosed screw terminals | - | E52-EPE1-B |
| | -40 | | | | 80 | PVC | E52-EPE2-B | | | | | | |
| |  | Non-contact | Infrared sensor | up to Sn = 60 mm | 10 | 260 | M18 | 44.5 | ABS | 4-wire | pre-wired with open cable ends | 3 | ES1B |
| | | | | up to Sn = 1 m | 0 | 400 | M18 | 120 | SUS 304 | 5-wire | | | 2 |

¹ See Dimensions on page 3

Note: Models with tube diameters of 2 inches, 3 inches and 4 inches are available. Refer to the separate E52 Inch Temperature Sensor Datasheet.

Accessories

| Type | Temperature range | | Size | Length | Material | Order code | | |
|--|-------------------|----------|------|--------------------------|-----------------|-----------------|--|----------------|
| | Min [°C] | Max [°C] | | | | | | |
| Compression fitting | RC 1/2 | -200 | 800 | 6 | AISI 316 | E52-EACF1/2-6-B | | |
| | RC 1/4 | | | 6 | | E52-EACF1/4-6-B | | |
| Compensation cable | Thermocouple | -40 | 200 | n.a. | Silicone rubber | E52-EACW-K1-B | | |
| | | | | | | K | 25 | E52-EACW-K25-B |
| | | | | | | J | 1 | E52-EACW-J1-B |
| | | | | | | | 25 | E52-EACW-J25-B |
| Compensation connector | male | -50 | 120 | | Thermoplastic | E52-EACC-JM1-B | | |
| | female | | | | | E52-EACC-JF1-B | | |
| | male | | | | | E52-EACC-KM1-B | | |
| | female | | | | | E52-EACC-KF1-B | | |
| Thermo well ¹ | G1/2 gas | -200 | 800 | 10 (for 6) 12 (for 8) | 150 | AISI 316 | E52-EATW1/2G-10-6-150-B E52-EATW1/2G-12-8-150-B | |
| Signal converters (for enclosed terminal type) | DIGITAL | Pt100 | | | | | E52-EASCP1-B | |
| | | K | | | | | E52-EASCK1-B | |
| | | J | | | | | E52-EASCJ1-B | |

¹ Thermo wells with different tube lengths and diameters are available. For solutions with matching pairs of temperature sensors and thermowells with fitting screw connections, contact your Omron representative.

Options (available on request)

1) Sensing head variations

- tip shapes
- lengths please specify required length
- diameters please specify required diameter (metric or inch)

2) Mounting variations

- termowell (different process side thread and well fittings)
- bajonet (different process side thread and bajonet fittings)
- thread (different sizes and types (metric, inch))

3) Connection variations

- pre-wired length please specify length
material (fiberglass, silicone, teflon, PVC)
colour codings (refer to page 5)
ends (open, cable shoes, cable clamps)
- Terminals open
enclosed

4) Special types

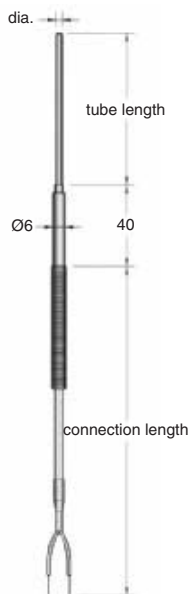
Please contact your OMRON representative for special applications e.g. surface temperature measurement, for hygienic environments, special shapes, mountings, materials, etc.

Dimensions

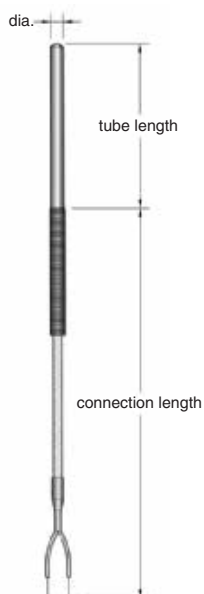
(Detailed dimension drawings are available for each model on request)

Smooth tube types (thermocouples T, J and K and PT100)

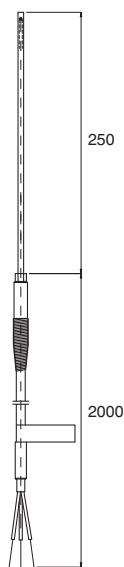
E52-ET_



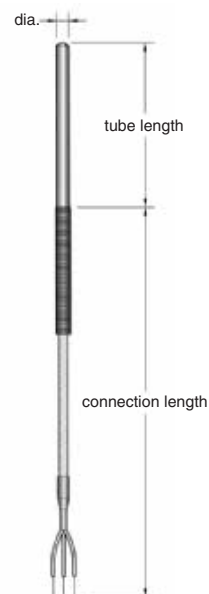
E52-ELT_



E52-EP_

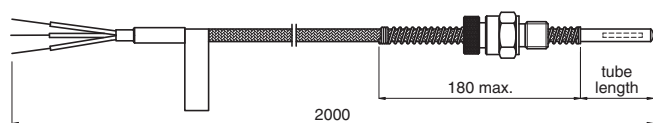


E52-ELP_



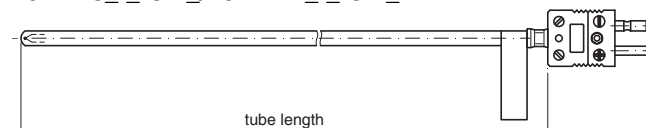
Bayonet mounting types (PT100)

E52-EP6-_-2-B-_-



Compensation connector 1 types (thermocouples J and K)

E52-ETJ-_-C1-_/E52-ETK-_-C1-_-

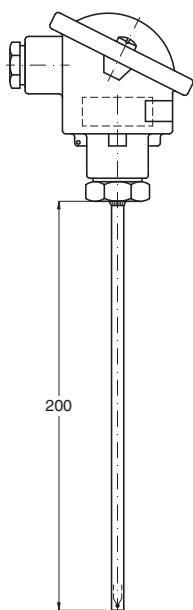


Note: compatible with female connectors E52-EACC-JF1-_/E52-EACC-KF1-_-

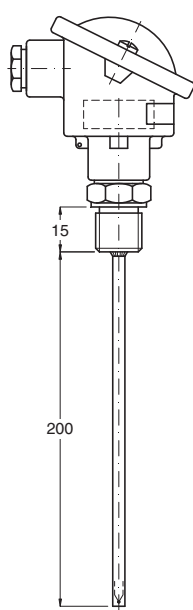
Enclosed terminal types (thermocouples J and K and PT100)

E52-E-_-T2-_-

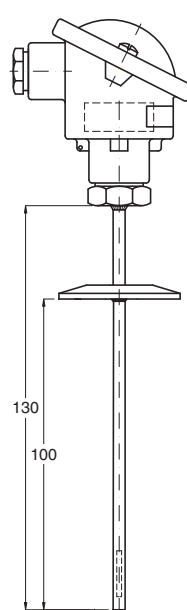
Smooth tube



G $\frac{1}{2}$ " mounting

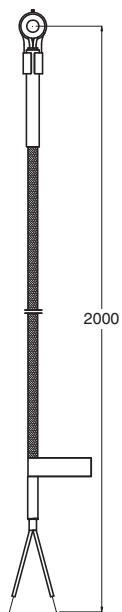


Clamp mounting

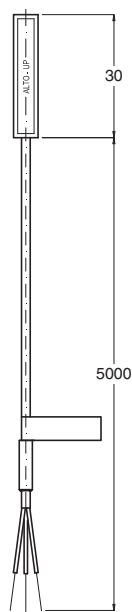


Surface temperature measurement types

E52-ETJS1-B

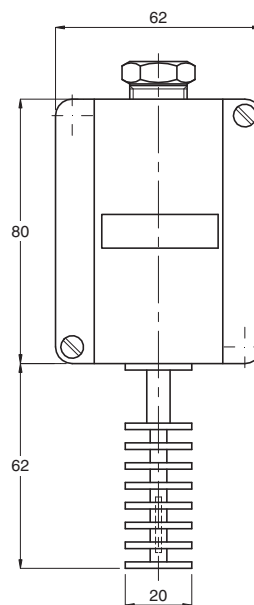


E52-ESTPCPAN_

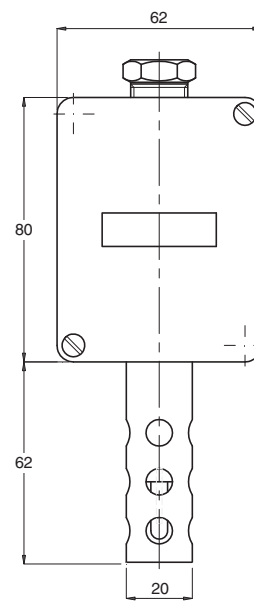


Environment temperature measurement types

E52-EPE1-B

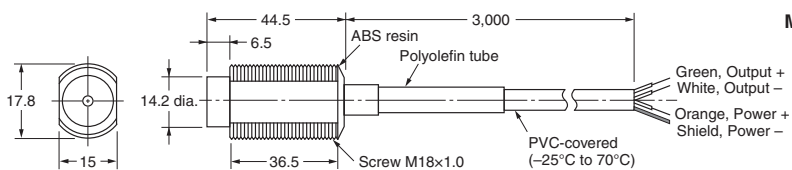
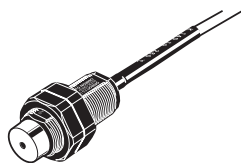


E52-EPE2-B

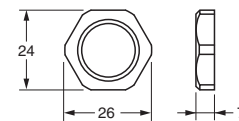


Non-contact – Infrared sensor types

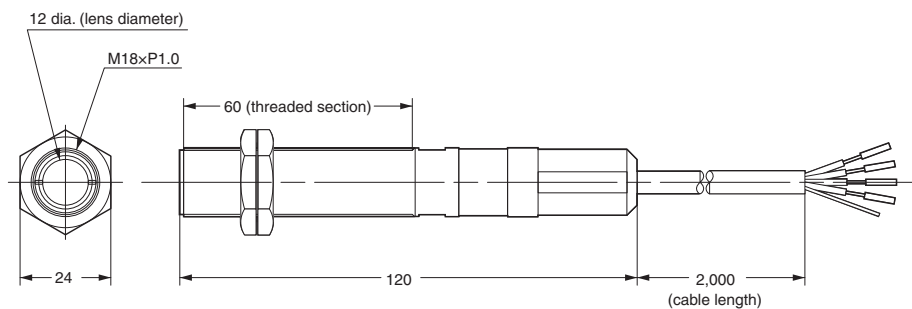
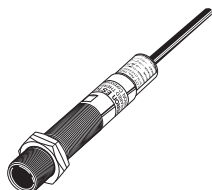
ES1B



Mounting Lock Nuts (Two) (Provided)



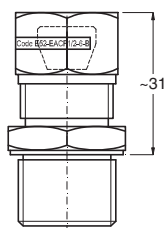
ES1C



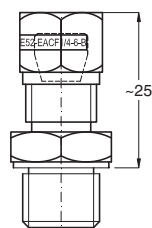
Accessories

Compression fittings

E52-EACF1/2_

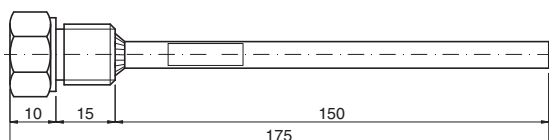


E52-EACF1/4_



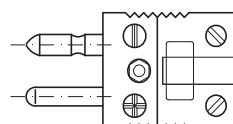
Thermowells

E52-EATW_

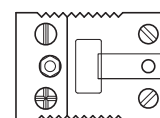


Compensation connectors

E52-EACC- M _-

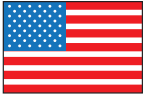






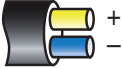


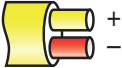

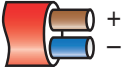


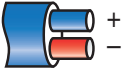
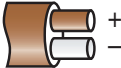

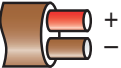



E52-EACC- F _-



Colour codings of compensation cables

(unless otherwise specified the colour coding for sensors is according to IEC 584-3)

| Thermocouple type | ANSI MC96.1  | IEC 584-3  | BS 1843  | DIN 43714  | JIS C1610  |
|-------------------|--|--|--|--|--|
| J, L |  |  |  |  |  |
| K |  |  |  |  |  |
| T |  |  |  |  |  |

PT100 reference table temperature – resistance (EN 60751)

| °C | 0 | -10 | -20 | -30 | -40 | -50 | -60 | -70 | -80 | -90 |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Ohm | | | | | | | | | |
| -200 | 18.49 | 14.45 | 10.49 | 6.99 | 4.26 | 2.51 | | | | |
| -100 | 60.26 | 56.19 | 52.11 | 48.00 | 43.88 | 39.72 | 35.54 | 31.34 | 27.10 | 22.83 |
| 0 | 100.00 | 96.09 | 92.16 | 88.22 | 84.27 | 80.31 | 76.33 | 72.33 | 68.33 | 64.30 |

| °C | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Ohm | | | | | | | | | |
| 0 | 100.00 | 103.90 | 107.79 | 111.67 | 115.54 | 119.40 | 123.24 | 127.08 | 130.90 | 134.71 |
| 100 | 138.51 | 142.29 | 146.07 | 149.83 | 153.58 | 157.33 | 161.05 | 164.77 | 168.48 | 172.17 |
| 200 | 175.86 | 179.53 | 183.19 | 186.84 | 190.47 | 194.10 | 197.71 | 201.31 | 204.90 | 208.48 |
| 300 | 212.05 | 215.61 | 219.15 | 222.68 | 226.21 | 229.72 | 233.21 | 236.70 | 240.18 | 243.64 |
| 400 | 247.09 | 250.53 | 253.96 | 257.38 | 260.78 | 264.18 | 267.56 | 270.93 | 274.29 | 277.64 |
| 500 | 280.98 | 284.30 | 287.62 | 290.92 | 294.21 | 297.49 | 300.75 | 304.01 | 307.25 | 310.49 |
| 600 | 313.71 | 316.92 | 320.12 | 323.30 | 326.48 | 329.64 | 332.79 | 335.93 | 339.06 | 342.18 |
| 700 | 345.28 | 348.38 | 351.46 | 354.53 | 357.59 | 360.64 | 363.67 | 366.70 | 369.71 | 372.71 |
| 800 | 375.70 | 378.68 | 381.65 | 384.60 | 387.55 | 390.48 | | | | |

PT 100 tolerance class definition

| Tolerance class | Temperature range of validity [°C] | | Tolerance values [°C] |
|-----------------|------------------------------------|----------------|------------------------|
| | Wire wound resistors | Film resistors | |
| AA | -50 ÷ +250 | 0 ÷ +150 | ± (0,1 + 0,0017 × t) |
| A | -100 ÷ +450 | -30 ÷ +300 | ± (0,15 + 0,002 × t) |
| B | -196 ÷ +600 | -50 ÷ +500 | ± (0,3 + 0,005 × t) |
| C | -196 ÷ +600 | -50 ÷ +600 | ± (0,6 + 0,01 × t) |

IP rating

| Type | Order code | IP rating (IEC 60529) |
|-----------------------|-------------|--|
| Smooth tube type PRO | E52-ETT_-A | IP45 (IP65 ¹) (IP67, IP68 ²) |
| | E52-ETJ_-A | |
| | E52-ETK_-A | IP67, IP68 |
| | E52-EP_-B | |
| Smooth tube type LITE | E52ELTJ_-A | IP45 |
| | E52-ELTK_-A | |
| | E52-ELP_-A | |
| Bayonet mounting | E52-E_-B_-B | IP67, IP68 Tube |
| Enclosed terminals | E52-E_-T2-B | IP68 Tube IP66 Terminal head |

| Type | Order code | IP rating (IEC 60529) |
|---------------------------|-------------|-----------------------|
| Surface temperature | E52-ET_S_-B | IP44 |
| Environmental temperature | E52-EPE_-B | IP66 |
| Contact free | ES1B | IP65 |
| | ES1C | IP67 |

¹ Models with fluoro polymere outer cable sheath and IP65 rating are available. Contact your Omron representative

² Models with IP67, IP68 protective structure are available. Contact your Omron representative.

Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

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Application Considerations

SUITABILITY FOR USE

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

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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 PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

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In the interest of product improvement, specifications are subject to change without notice.

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