

Industrial Automation Guide 2016



Industrial Products & Systems

industrial.omron.eu

Targeted Technologies

Creating maximum output with minimum input

By identifying the many ways of innovation in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples on our website.

industrial.omron.eu/technologies



PROplus Line

If you have a complex application or one where you need to address special needs, then the PROplus Line is the answer. That's because PROplus products are designed to be customisable.

The possibility to modify a PROplus product means that your application is unique. However, this does not mean that the PROplus Line is not a ready-made solution. On the contrary, it is a challenge.

For example, the PROplus 4000 series is designed to be modified to meet your needs. It can be modified to meet your needs in terms of I/O, communication, and more. This makes the PROplus 4000 series a challenge.

EE-NH temperature controller

The new EE-NH series is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

The 361° Approach



OMRON

Industrial Automation Europe

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Technologies

Creating maximum output with minimum input

Whatever type of automated machinery you are specialized in, you know that there are many ways to innovate. You are already aware that there are many possible areas for improvement. But where do you start? Where do you focus your efforts? Where can you make the biggest difference with the least amount of effort?

At Omron, we asked ourselves these questions too. And by identifying the answers in specific industries we developed the 'targeted technologies' concept. It's a way of thinking about technology in a prioritized format. Prioritized according to our customers' most pressing needs. The result? A set of solutions that make immediate impact on the core of our customers' businesses. A set of solutions that hit the target every time. Take a look at the examples below.

Technologies

Sysmac: the all-in-one platform

We know that machine builders prefer different product solutions for different challenges. But this can cause hierarchy headaches and communications issues. That's why we developed Sysmac: a single unified platform that is open, scalable, flexible, and totally focused on maximising the speed and flexibility of machines. A platform that integrates robotic, motion and sequential logic control into a single multitasking system.

[Learn more](#)



361°: the perfect match

When it comes to sensors and components, we know that our customers all have different needs. That's why our product development in this area is driven by the 361° Approach. It produces product families that offer a total all-round choice. From quality products suited to standard environments to specialist devices that can handle extremes. A full circle of choice, all with an extra degree of quality and proven reliability.

[Learn more](#)



361° in one view

First ever 361° range



The 361° portfolio

PRO Line
PROplus products are designed for specialty applications or customer demands.

[Learn more](#)



LITE Line

LITE sensors are the effective solution for maximum quality.

[Learn more](#)



PRO Line

If you want extra performance in your sensors and components the Omron PRO Line is your perfect choice.

[Learn more](#)



Product groups

Sysmac controller

The Sysmac controller is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

Sensor

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Robotics

The Sysmac controller is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

Image sensors

The Sysmac controller is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

Integrated safety

The Sysmac controller is the most powerful and precise temperature controller. It features a 16-bit ADC and a 16-bit DAC. It also has a 16-bit timer and a 16-bit counter. It is designed to be modified to meet your needs.

Related product news



With new G2 sensors, you only pay for what you need. Optimizing relative placement sensors in the new G2 range has been specifically designed to offer a more effective sensing solution or standard sensing conditions, making it unnecessary to buy more sensors than you actually need.

[Learn more](#)

Related product news



ES16 - Omron's new photo sensors combine simplicity with performance. Drawing on our experience of manufacturing over a million photoelectric sensors a year, we have developed a new generation of photoelectric products that combine simple selection, installation with reliability, versatility, rugged construction and value for money.

[Learn more](#)

Related product news



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[Learn more](#)

Welcome to our world

Our best-in-class devices for your automation system

Welcome to Omron's world of advanced industrial automation. The INDUSTRIAL AUTOMATION GUIDE is your essential tool to select best-in-class devices for your automation system. It highlights our core competences in sensing, control, visualisation, motion and panel components.

Of course, Omron offers a much larger range of products than you can find on the attached DVD. For more information on services and company competence visit our website.

Here you will find:

- Latest product news
- Technical product specifications
- 2D / 3D CAD Library
- Customer references
- Technology concepts
- Supporting product documentation
- Knowledge Base - "myOmron"
- Events Calendar
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“To the machine the work of the machine,
to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron

Omron at a glance

200.000 products ranging
input, logic and output

Sensing, Control Systems, Visualization, Drives, Robots, Safety,
Quality Control & Inspection, Control and Switching Components

7%

Investment in Research & Development

Innovation track
record of 80 years

Top 150 global patent assignee

1.200 employees dedicated to R&D

11.000 + issued and pending patents

37.000

Employees worldwide

210

Locations worldwide

22

Countries in EMEA

Working for the
benefit of society



Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.

Your needs, our focus

Solutions perfectly matching your needs

We asked ourselves: 'What do you need in sensors and components?' Well, first you need reliability. Then a variety and choice of performance levels. You may also want advanced functionality, with special features defined by you – or you may want standardized solutions, with highly competitive prices.

Whatever it is, it can all add up to a wish list that is difficult to fulfil. Until now. That's because our new 361° Approach not only provides a complete all-round offer without gaps, it also puts you at the very centre of the product selection process. It's an approach that leads to a Perfect Match – one with the extra degree of confidence that comes from choosing Omron.

361° in one view



Quality



Line-up



Application



Customization



Global availability



Specs

| | Quality | Line-up | Application | Customization | Global availability | Specs |
|---------------------------|---|---|--|--|---------------------|--|
| PRO^{plus} | Premium | Tailored | Special | Yes | Yes | Application oriented |
| PRO | Premium | Complete | Advanced | Yes | Yes | Above Standard |
| LITE | Premium | Standard | Basic | No | No | Basic |
| | 'Quality' refers to the standard of manufacturing and the materials used – this translates into reliability | 'Line-up' refers to the number of model types | 'Application' indicates the complexity of the automation | 'Customization' is the possibility to modify the product | | 'Specs' refers to the choice of performance levels |

The extra degree of advantage

Three distinct lines of sensors and components

Three distinct lines

361° Approach offers three distinct lines within each sensor or component product category. LITE products are cost-effective without any compromise in quality. PRO products represent the “install & forget” option, offering longer lifetime, higher protection, and more features. While PROplus products are designed for specific applications or customer demands.

Optimized reliability

All three lines are backed by the Omron commitment to quality, so even when you need a price-competitive advantage, you can be confident that they will never let you down.

Solutions that perfectly match your needs

The 361° Approach ensures that you can quickly and easily identify the perfect match solution to your needs – nothing more, nothing less.

Optimized costs

Your sensor and component costs are also minimized – because it eliminates over-specification.

Why an extra 1°?

The extra degree is what you get when you do business with Omron, and that means different things to different customers – all depending on their needs. For example, if you need specification advice, the extra degree is ‘service’. But ultimately, to everyone it means “an extra degree of confidence in the perfect match”.



Sysmac: A fully integrated platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.



Machine Automation Controller

FACTORY
AUTOMATION

MACHINE
CONTROL



Motion



Filling line

- Motion Control: Integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct Synchronous control for Position, Speed and Torque



Safety



Assembly

- All safety related data is synchronized with the whole network
- Safety functions such as muting, guard locking, EDM and valve monitoring are simple to manage

- ✓ **One Integrated Development Environment software** for Configuration, Programming, Simulation and Monitoring



Information



Pills blister packing

- Sysmac communicates in real-time with Databases such as SQL
- Secure Data: In the event of a server going down or losing communications, data is automatically stored in internal memory
- Sysmac operates with Databases at high speed [1000 table element/ 100 ms] ensuring realistic Big Data Processing to improve productivity and aid predictive maintenance etc.

✓ Integrated Automation Control:

The Sysmac platform is scalable and provides the performance and functionality for a wide range of solutions from simple machines through to manufacturing cells

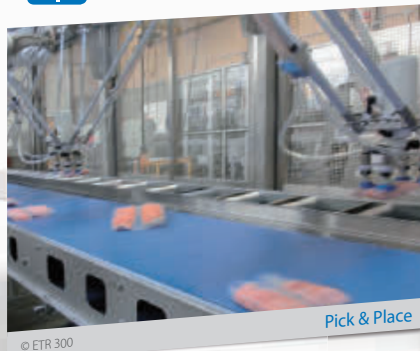
Vision



Quality inspection

- Higher resolution images available without increasing the vision processing time
- Shape search technology: Provides more stable and accurate object detection for Pick & Place projects

Robotics



Pick & Place

© ETR 300

- Up to 8 Delta robots with one controller
- Time-based Robotic Function Blocks make programming easier

Sensing



Presence detection of the rubber seal

- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network

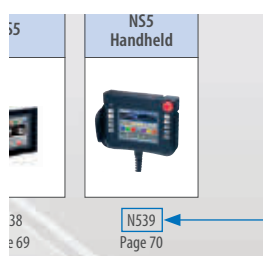
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Safety

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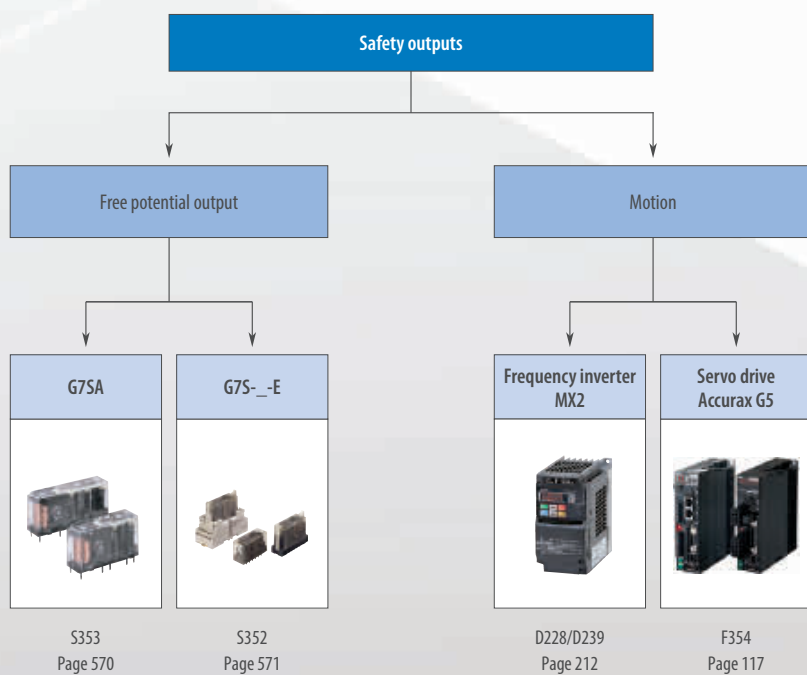
Safety



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STOPPING ALL DANGEROUS MOVEMENTS

Our solution helps you to stop all dangerous movements that you have in your machine. From a switch off the power, until stop some safety motion movement.


- Free potential outputs -Safety relays
- Frequency Inverters
- Servo Drives



| | | Safety relays | |
|--------------------|----------------------------|---|---|
| | |  |  |
| Model | | G7SA | G7S- -E |
| Selection criteria | Housing | Plastic | Plastic |
| | Operating temperature | -40 to 85°C | -25 to 70°C |
| | Flux-tight | ■ | ■ |
| | Number of poles | 4 pole and 6 pole | 6 pole |
| Features | Gold clad contacts | ■ | — |
| | Relay socket | ■ | ■ |
| Application | General safety application | ■ | ■ |
| Supply voltage | 24 VDC | ■ | ■ |
| In- and outputs | 4PST-NO + DPST-NC | ■ | ■ |
| | 3PST-NO + 3PST-NC | ■ | ■ |
| | 3PST-NO + SPST-NC | ■ | — |
| | DPST-NO + DPST-NC | ■ | — |
| | 5PST-NO + SPST-NC | ■ | — |
| Page/Quick Link | | 570/S353 | 571/S352 |

| | | Frequency inverters | |
|--|--|--|------|
| | |  | IP54 |

| Model | MX2 |
|-----------------------|---|
| 400 V three-phase | 0.4 kW to 15 kW |
| 200 V three-phase | 0.1 kW to 15 kW |
| 200 V single-phase | 0.1 kW to 2.2 kW |
| Application | Harmonized motor and machine control |
| Control method | Open loop speed and torque control for vector and speed for V/F control |
| Torque features | 200% at 0.5 Hz |
| Connectivity | Modbus, DeviceNet, PROFIBUS, MECHATROLINK-II, EtherCAT, CompoNet, EtherNet IP |
| Logic programming | Standard firmware |
| Safety approvals | ISO13849-1 Category 3, Performance Level PLd |
| Customisation options | IP54 enclosure |
| Page/Quick Link | 212/D228, D239 |

| | | Servo drives | |
|----------------------------|--|---|--|
| | |  | |
| | | Accurax G5 | |
| | | EtherCAT network and safety built-in | |
| Ratings 230 V single-phase | | 100 W to 1.5 kW | |
| Ratings 400 V three-phase | | 600 W to 15 kW | |
| Applicable servomotor | | Accurax G5 and G-Series rotary motors | |
| Position control | | EtherCAT, MECHATROLINK-II or Pulse train input | |
| Speed control | | EtherCAT, MECHATROLINK-II or Analog input ± 10 V | |
| Torque control | | EtherCAT, MECHATROLINK-II or Analog input ± 10 V | |
| | | Embedded indexer functionality | |
| Safety approvals | | ISO13849-1:2008 (PL d), EN 954-1:1996 (Cat-3) | |
| Full closed loop | | Built-in | |
| Page/Quick Link | | 117/F354 | |



Relays with forcibly guided contacts

The slim G7SA relay family with forcibly guided contacts is available as a four- or six-pole type in various contact combinations and offers reinforced insulation. Terminals are arranged for easy PCB layout. It can be soldered directly to a PCB or used together with the P7SA sockets.

- Forcibly guided contacts
- Conforms to EN 50205
- 6 A at 240 VAC and 6 A at 24 VDC for resistive loads
- Reinforced insulation between inputs and outputs and poles
- 4- and 6-pole relays available

Ordering information

Relays with forcibly guided contacts

| Type | Sealing | Poles | Contacts | Rated voltage | Order code |
|----------|------------|---------|------------------|----------------------|------------|
| Standard | Flux-tight | 4 poles | 3PST-NO, SPST-NC | 24 VDC ^{*1} | G7SA-3A1B |
| | | | DPST-NO, DPST-NC | | G7SA-2A2B |
| | | 6 poles | 5PST-NO, SPST-NC | | G7SA-5A1B |
| | | | 4PST-NO, DPST-NC | | G7SA-4A2B |
| | | | 3PST-NO, 3PST-NC | | G7SA-3A3B |
| | | | | | |

^{*1} 12 VDC, 21 VDC, 48 VDC are available on request.

Sockets

| Type | LED indicator | Poles | Rated voltage | Order code |
|----------------|--|---------|---------------|-------------|
| Track-mounting | Track mounting and screw mounting possible | 4 poles | 24 VDC | P7SA-10F-ND |
| | | 6 poles | | P7SA-14F-ND |
| Back-mounting | PCB terminals | 4 poles | – | P7SA-10P |
| | | 6 poles | | P7SA-14P |

Specifications

Coil

| Rated voltage | Rated current | Coil resistance | Must-operate voltage | Must-release voltage | Max. voltage | Power consumption |
|---------------|------------------------------------|--------------------------------------|----------------------|----------------------|--------------|--|
| 24 VDC | 4 poles: 15 mA 6 poles: 20.8 mA | 4 poles: 1,600 Ω 6 poles: 1,152 Ω | 75% max. (V) | 10% min. (V) | 110% (V) | 4 poles: Approx. 360 mW 6 poles: Approx. 500 mW |

Note: Refer to datasheet for details

Contacts

| Load | Resistive load (cosφ = 1) |
|------------------------|-------------------------------|
| Rated load | 6 A at 250 VAC, 6 A at 30 VDC |
| Rated carry current | 6 A |
| Max. switching voltage | 250 VAC, 125 VDC |

| Load | Resistive load (cosφ = 1) |
|---|---------------------------|
| Max. switching current | 6 A |
| Max. switching capacity (reference value) | 1,500 VA, 180 W |

Relays with forcibly guided contacts

| | | |
|--------------------------------------|------------|---|
| Contact resistance | | 100 mΩ max. (The contact resistance was measured with 1 A at 5 VDC using the voltage-drop method.) |
| Operating time ^{*1} | | 20 ms max. |
| Response time ^{*1} | | 10 ms max. (The response time is the time it takes for the normally open contacts to open after the coil voltage is turned OFF.) |
| Release time ^{*1} | | 20 ms max. |
| Insulation resistance | | 100 MΩ min. (at 500 VDC) (The insulation resistance was measured with a 500 VDC megger at the same places that the dielectric strength was measured.) |
| Dielectric strength ^{*2 *3} | | Between coil contacts/different poles: 4,000 VAC, 50/60 Hz for 1 min (2,500 VAC between poles 3-4 in 4-pole Relays or poles 3-5, 4-6, and 5-6 in 6-pole Relays.) Between contacts of same polarity: 1,500 VAC, 50/60 Hz for 1 min |
| Durability | Mechanical | 10,000,000 operations min. (at approx. 36,000 operations/hr) |
| | Electrical | 100,000 operations min. (at the rated load and approx. 1,800 operations/hr) |
| Min. permissible load ^{*4} | | 5 VDC, 1 mA (reference value) |
| Ambient temperature ^{*5} | | Operating: –40 to 85°C (with no icing or condensation) |
| Ambient humidity | | Operating: 35 to 85% |
| Approved standards | | EN61810-1 (IEC61810-1), EN50205, UL508, CSA22.2 No. 14 |

^{*1} These times were measured at the rated voltage and an ambient temperature of 23°C. Contact bounce time is not included.

^{*2} Pole 3 refers to terminals 31-32 or 33-34, pole 4 refers to terminals 43-44, pole 5 refers to terminals 53-54, and pole 6 refers to terminals 63-64.

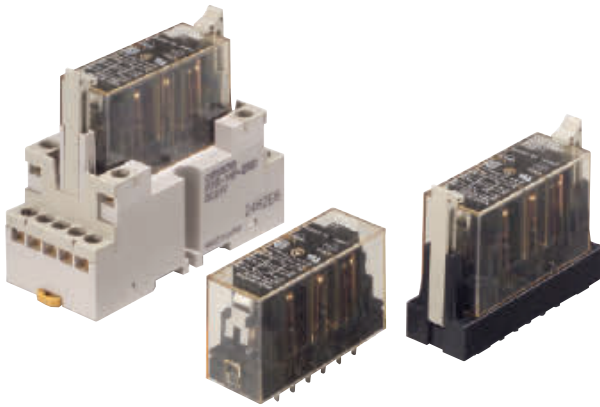
^{*3} When using a P7SA socket, the dielectric strength between coil contacts/different poles is 2,500 VAC, 50/60 Hz for 1 min.

^{*4} Min. permissible load is for a switching frequency of 300 operations/min.

^{*5} When operating at a temperature between 70°C and 85°C, reduce the rated carry current (6 A at 70°C or less) by 0.1 A for each degree above 70°C.

Note: The values listed above are initial values.

Please check Omron in the Internet for updated information on product reliability data and the SISTEMA libraries: <http://industrial.omron.eu/safety>



Relays with forcibly guided contacts

The slim G7S-_-E relay family with forcibly guided contacts is available as a six-pole type in two different contact combinations. Terminals are arranged for easy PCB layout. It can be soldered directly to a PCB or used together with the P7SA sockets.

- Forcibly guided contacts
- Conforms to EN 50205
- NO contacts: 10 A at 250 VAC and 10 A at 30 VDC
NC contacts: 6 A at 250 VAC and 6 A at 30 VDC (for resistive loads)
- Reinforced insulation between inputs and outputs and poles
- 4- and 6-pole relays available

Ordering information

Relays with forcibly guided contacts

| Type | Sealing | Poles | Contacts | Rated voltage | Order code |
|----------|------------|---------|------------------|---------------|------------|
| Standard | Flux-tight | 6 poles | 4PST-NO, DPST-NC | 24 VDC | G7S-4A2B-E |
| | | | 3PST-NO, 3PST-NC | | G7S-3A3B-E |

Sockets

| Type | | LED indicator | Rated voltage | Order code |
|----------------|--|---------------|---------------|-------------|
| Track-mounting | Track mounting and screw mounting possible | Yes | 24 VDC | P7S-14F-END |
| Back-mounting | PCB terminals | No | – | P7S-14P-E |

Specifications

Ratings

Coil

| Rated voltage | Rated current (mA) ^{*1} | Coil resistance (Ω) ^{*1} | Max. voltage (V) ^{*2} | Power consumption (W) |
|---------------|----------------------------------|-----------------------------------|--------------------------------|-----------------------|
| 24 VDC | 30 | 800 | 110% | Approx. 0.8 |

^{*1} The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of ±15%.

^{*2} The maximum voltage is based on an ambient operating temperature of 23°C maximum.

Contacts

| Item | | Resistive load |
|---------------------|------------|---------------------------------|
| Rated load | NO contact | 10 A at 250 VAC, 10 A at 30 VDC |
| | NC contact | 6 A at 250 VAC, 6 A at 30 VDC |
| Rated carry current | NO contact | 10 A |
| | NC contact | 6 A |

| Item | | Resistive load |
|---------------------------|------------|-----------------|
| Maximum switching voltage | | 250 VAC, 30 VDC |
| Maximum switching current | NO contact | 10 A |
| | NC contact | 6 A |

G7S-_-E Characteristics of Sockets

| Model | P7S-14F-END | P7S-14P-E |
|----------------------------|---------------------------------------|-----------|
| Continuous current | 10 A | |
| Dielectric strength | 2000 VAC for 1 min. between terminals | |
| Insulation resistance | 1000 MΩ min. ^{*1} | |
| Ambient operating humidity | 25 to 85% | 5 to 85% |

^{*1} Measurement conditions: Measurement of the same points as for the dielectric strength at 500 VDC.

Characteristics

| | | |
|--|------------|--|
| Contact resistance ^{*1} | | 100 mΩ max. |
| Operating time ^{*2} | | 50 ms max. |
| Release time ^{*2} | | 50 ms max. |
| Maximum operating frequency | Mechanical | 18,000 operations/h |
| | Rated load | 1,800 operations/h |
| Insulation resistance | | 100 MΩ min. |
| Durability ^{*3} | Mechanical | 10,000,000 operations min. (at approx. 18,000 operations/h) |
| | Electrical | 100,000 operations min. (at the rated load and approx. 1,800 operations/h) |
| Inductive load switching capability ^{*4} (IEC60947-5-1) | NO Contact | AC15 AC240V 5A, DC13 DC24V 2A |
| | NC Contact | AC15 AC240V 3A, DC13 DC24V 2A |
| Ambient operating temperature | | –25 to 70°C (with no icing or condensation) |
| Ambient operating humidity | | 5% to 85% |

^{*1} Measurement conditions: 5 VDC, 10 mA, voltage drop method.

^{*2} Measurement conditions: Rated voltage operation, ambient operating temperature: 23°C, contact bounce time is not included.

^{*3} The durability is for an ambient temperature of 15 to 35°C and an ambient humidity of 25% to 75%.

^{*4} AC15: cosφ = 0.3, DC13: L/R = 96-ms

Note: The values listed above are initial values.

Please check Omron in the Internet for updated information on product reliability data and the SISTEMA libraries: <http://industrial.omron.eu/safety>