

Next-generation safety switches

D4N SERIES

clever switches with more contacts and features



Advanced Industrial Automation



OMRON

Omron's industrial safety switches are well known for their quality and reliability around the world. Now Omron introduces the D4N series, a new range of switches that combines practical, cost-effective solutions with innovative features for the safeguarding and interlocking of machinery doors. There are six sub-families in the range, each providing its own capabilities for door-safety applications. These universal switches provide customers with a choice of over 1500 configurations, so there's literally a model for every requirement!

Total safety switching solutions from Omron

Many of the new features in these switches are unique. Make-before-break contacts, for example, provide enough time for vital process information to be saved before the system is shut down. More contacts have been added to the switches so that one is available to provide feedback data to the control system. Gold-clad contacts have been included for switching micro-loads and higher current more reliably. And all switches are tested to guarantee at least 1 million operations. No matter how safety-critical the requirement, Omron's D4N series has an excellent product solution for your application!



L D4NR
Rubber roller

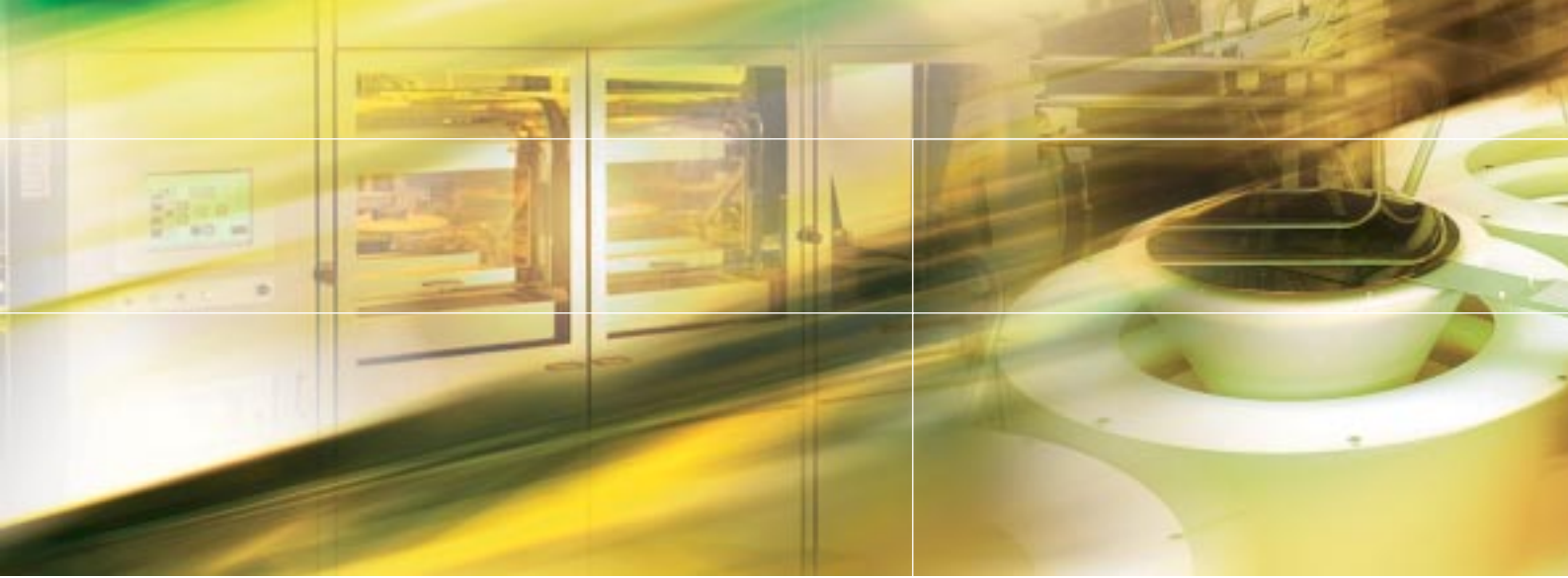
L D4N
Plunger

L D4N M12
Roller lever

L D4NS

L D4N
Roller arm lever

L D4N
General limit switch



The six sub-families in this safety switch range include:

D4N

This basic safety limit switch can have different actuators (for example roller lever and roller plunger) to suit the application. Designed for door monitoring, it is the ideal additional safety measure in case the main safety switch fails. In addition to machine directive related standards the D4N conforms to EN115 (for escalators) and EN81 (for lifts).

D4NR

This manual reset switch works like an ordinary limit switch, but once it's activated, the system that it protects remains in the OFF position until the switch is manually reset. Of course D4NR also conforms to EN115 and EN81.

D4NS

The D4NS is a safety door switch that is suitable for safety guard interlocking according to EN1088 (ISO 14119). The D4NS offers superior features at a very attractive price, in a size that is in accordance with EN 50047.

D4NH

A safety-door hinge switch whose miniature size makes it ideal for use in machines and other equipment where space is a premium. The hinge switch can be hidden in a door, preventing it from being defeated. It is ideal for use in safety-critical applications to provide mechanical redundancy in systems up to Category 4.

D4NL

A completely redesigned version of its predecessor, this guard-lock safety-door switch offers a holding force of 1300N to provide exceptional safety on doors. Its robust housing meets IP67 specifications, enabling it to operate in the harshest environment.

D4GL

This guard-lock safety-door switch is designed for interlocking applications where a slim profile is required. It offers an impressive holding force of 1000N to provide exceptional safety on doors.

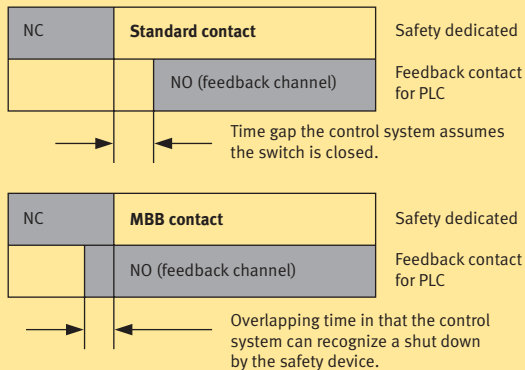


D4NH
Shaft switch

D4N
Roller plunger



Operation pattern



More contacts for increased functionality

To comply with safety requirements, safety systems need built-in redundancy. That's why all of our safety switches have extra contacts. Our D4N, D4NH, D4NS and D4NR models, for example, have versions with 3 contacts; two normally closed contacts for redundancy, and NO contacts to provide a feedback contact to a PLC or HMI for monitoring the system status. Identifying a problem quickly in the system reduces downtime considerably and saves you money. In applications like moulding and machine tooling, where interlock switches are required, our 5-contact D4NL and D4GL switches are ideal. When access to a critical process is required, the internal solenoid-locking device gives the machine time to switch off without damaging the process before enabling the door to be safely opened.

Clever solutions that work for you - make-before-break (MBB) contact

Once a door with a safety switch is opened the Normally Closed (NC) contact in the safety switch opens and the Normally Open (NO) contact closes. If there is an NO contact connected to a PLC, any data inside is lost as soon as the power switches off. That's why Omron has incorporated innovative make-before-break (MBB) contacts in the D4N, D4NS, D4NH and D4NR switches. With an MBB contact the normally open contact closes before the normally closed contact opens. This provides enough time for the control system (PLC) to save the process condition or similar vital data. Now that's clever!

Gold-clad contact for high reliability

A special gold-clad contact makes each switch suitable for switching both standard loads and micro-loads. The switches are tested to operate reliably at least one million times.

Plug and play connection with the M12

All two-contact single conduit switches (D4N, D4NS, D4NH and D4NR) can be ordered with a pre-assembled M12 connector. Installing this four-pin connector is simply a matter of plug and play, which reduces the need for especially skilled personnel during periodic maintenance.



Standard key for safety-door interlocking

The key used in all key-operated switches (D4NS, D4NL and D4GL) is four-times coded to prevent any tampering. And one size fits all models for easy replacement!



Environmentally friendly

In line with Omron's environmental policy for all electronic components, these safety switches contain no lead, cadmium or hexavalent chrome. What's more, they already comply with the EU directive on hazardous substances (RoHS), which will be law in every European country by 2006.



Ready for the Chinese market

The People's Republic of China has implemented a mandatory certification on a wide range of products manufactured or sold in China. Labelled the CCC mark, this certification combines the former CCIB (safety) mark and the CCEE mark for electrical components. All of these safety switches are CCC approved for this market.



Maximum positioning flexibility

One switch fits all actuation directions. The heads can be turned 4 times 90° for maximum flexibility. The key operated switches can be actuated from the side and top (giving 8 possible directions).



Complete safety solutions – anywhere in the world!

Omron has recognised that in a dynamic market, the only way to be a valuable partner is to offer total system solutions. That's why we have introduced a complete line-up of products with the D4N series to cover safety switch requirements for at least 95% of the market.

And this range is just part of Omron's complete Safety concept to provide technologies and solutions that can seamlessly be integrated and networked to save you time as a machine builder, no matter where in the world you are!

The safety door switch ensures that hazardous movements are stopped, as long the door remains open. Depending on the application, an interlock switch keeps the door closed and safe until the process is in a condition to stop without damaging goods.

DeviceNet safety remote modules support efficient wiring and control safety-related signals in parallel with standard messaging. The status of the safety device is available in the standard PLC for diagnosis. The DST series features preventive maintenance and provides a highly reliable safety solution.

Omron offers a wide range of HMI solutions to manage machine status and enter process data. If the safety system switches off the machine or a problem occurs, the HMI displays instructions on what the user should do to get the machine back in service and ensure safe operation. The smart platform supports preventive maintenance too to support high availability and reliability.

Photoelectric switches, from miniature sizes up to highly precise laser displacement sensors, ensure accurate and reliable signals to control your process and quality.

Clever connection concepts like Plug-and-Play controllers for safety sensors and intelligent DeviceNet safety remote I/O modules support easy installation and maintenance. These concepts support the integrity of the entire safety concept.

OMRON PLC systems provide you with the highest performance in the smallest size. Supporting smart platform functionality, the PLC gives you excellent control of your machine. Via DeviceNet the whole status of the safety system is transparent.

Inverters and servos from Omron provide reliable and powerful muscles for your application. In combination with Omron safety systems, the machine can be stopped safely even if it is an Emergency stop condition or just a door being opened for maintenance.

The 'Safe Network controller' is the heart of the safety system. Via an appropriate number of local I/Os and using DeviceNet safety communication, the Safe Network controller can control all safety-related functions. It handles diagnostics and traces the proper function of maintenance relevant parameters. This very compact device saves space in the cabinet and provides superior features for a highly productive safety solution.

The S8 range of power supplies ensures a constant and reliable power source for your control system. Depending on the series, they can support diagnosis and preventive maintenance.

Safety modules provide dedicated safety functions. In addition to the conventional safety relay units, there are 'intelligent safety units' that define a new area of applications. The G9SX intelligent safety units have a unique and clever dynamic logical combination facility. They gain transparency and reliability by reducing wiring and space.



Smart safety solution

Overview of the D4N series of safety switches

| | D4N | D4NR | D4NS | D4NH | D4NL | D4GL |
|---|--|--|--|--|------------------------------------|----------------------------------|
| Type | Safety limit switch (EN50047) | Manual reset safety limit switch (EN50047) | Safety door switch (EN50047) | Safety door hinge switch (EN50047) | Square interlock switch (1300N) | Slim interlock switch (1000N) |
| Contacts | 2,3 (MBB) | 2,3 (MBB) | 2,3 (MBB) | 2,3 (MBB) | 4,5 | 4,5 |
| IP | 67 | 67 | 67 | 67 | 67 | 67 |
| Safety category (EN954) | Up to Category 4 | Up to Category 4 | Up to Category 4 | Up to Category 4 | Up to Category 4 | Up to Category 4 |
| Conduit | PG 13,5 (1+2 conduit) M20 (1+2 conduit) | PG 13,5 (1+2 conduit) M20 (1+2 conduit) | PG 13,5 (1+2 conduit) M20 (1+2 conduit) | PG 13,5 (1+2 conduit) M20 (1+2 conduit) | 2 x PG 13,5 2 x M20 | 3 x PG 13,5 3 x M20 |
| Connector | M12 | M12 | M12 | M12 | | |
| G1/2 and NPT conduit are available on request | | | | | | |

Keys for D4NS, D4NL and D4GL:

D4DS-K1: Horizontal mounting

D4DS-K2: Vertical mounting

D4DS-K3: Adjustable horizontal mounting

D4DS-K5: Adjustable horizontal and vertical mounting

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