OMRON

Ingress Protection (IP) Rating

Note: IP rating mentioned on the datasheet is confirmed by our company in accordance with the following test method defined in the standard. Please check the Sealability in advance under the actual environment and application condition.

IEC (International Electrotechnical Commission) Standard (IEC60529: 2001)

IP-□□

Protection specification code (International Protection)

"First Digit" Protection against solid object

Code	Level of protection	
0		No protection
1		Ingress of solid object diameter 50 mm is protected
2		Ingress of solid object diameter 12.5 mm is protected
3		Ingress of solid object diameter 2.5 mm is totally protected
4		Ingress of solid object diameter 1.0 mm is totally protected
5		Protected against harmful dust
6		Totally protected against dust

Internal standard of oil endurance

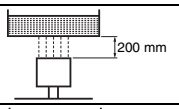
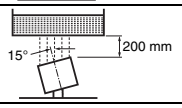
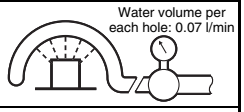
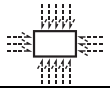
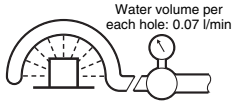
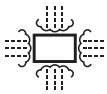
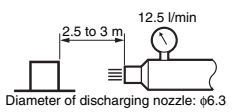
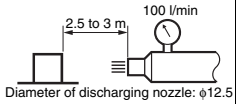
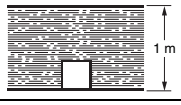
Level of protection	
Prevention	Protected against oil dripping and splashing from all direction
Endurance	Internal part is protected against oil dripping and splashing from all direction

Note: We use standardized oil for the above test. (Equivalent to former JEM standard [Standards of the Japan Electrical Manufacturers' Association])

*1. Our company Test Method
IP67 for proximity sensor:
In addition to the following test, heat shock cycle test (0°C cold water for 1 hour, 70°C hot water for 1 hour) is conducted repeatedly for 5 times, confirming no CR and detection distance problem

*2. Note for our test outline
Proximity sensor E2F term of use: inside water in 10 m depth, in natural condition.
1) sink into 2 atm of water for 1 hour, no water ingress
2) repeat the heatshock cycle for 20 times, confirming no CR and detection distance problem

"Second Digit" Protection against liquid object

Code	Level of protection		Test method outline (test performed using pure water)
0	No protection	no protection against liquid object	No test
1	Protection against water drop 	No harmful effect of vertical water drip	By using water drip tool vertically dropping water for 10 min 
2	Protection against water drop 	No harmful effect of water drip from vertical direction when the enclosure is tilted at 15° from its normal position	By using water drip tool, move it in angle of 15°, dripping water for 10 min (2.5 min per direction) 
3	Protection against water spray 	No harmful effect of water spray at any angle up to 60° from the vertical direction	By using tool as descripted in right picture, spraying water vertically in angle up to 60° for 10 min 
4	Protection from water splash 	No harmful effect of water spray from all direction	By using tool as descripted in right picture, splashing water from all direction for 10 min 
5	Protection from water jets 	No harmful effect of water splash from all direction	By using tool as descripted in right picture, Jet the water from all direction to the object surface for 1 m^2/min, at least for 3 min in total. 
6	Protection from strong water jets 	No harmful effect of strong water jets from all direction	By using tool as described in right picture, Jet the water from all direction to the object surface for 1 m^2/min, at least for 3 min in total. 
7	Protection from water dip  *1	No harmful effect of water dip in certain level of pressure and length of time	Dip into 1 m depth water for 30 min 
8	Protection from water sink  *2	No harmful effect against water sink which the condition is decided between customer & manufacturer (in severer condition comparing to no.7)	Should be decided between customer and manufacturer

Specification of IP69K

IP69K is a protection provision of high temperatured and pressured water which prescribed by Germany standard DIN 40050 PART9.

The test specifies a spray nozzle that is fed with 80°C water at 80 to 100 bar and a flow rate of 14 to 16 L/min. The nozzle is held 10 to 15 cm from the tested device at angles of 0°, 40°, 60° and 90° for 30 s each. The test device sits on a turntable that rotates.

Note: Connected part doesn't satisfy the Degree of protection mentioned in the Ratings/Characteristics in case that the wiring is not normally done, connector does not have the protection performance or e-CON connector is used.