

NEMA vs IP Protection Ratings

IEC Enclosure Classification Designation	NEMA Enclosure Type Number
IP10	1
IP11	2
IP14	3R
IP20	1
IP22	3R 3RX
IP23	1
IP30	2
IP32	3R
IP52	5, 12, 12K
IP54	3, 3S, 13
IP55	12
IP56	4, 4X
IP64	3, 3S
IP65	13
IP66	4, 4X
IP67	6, 6P
IP68	6P
IP69K*	PW12*

Note: It is not possible to state that an IP rating is equivalent to a NEMA Type Designation. However, it is possible to state that a NEMA Type is equivalent to an IP rating. An IP rating only considers protection against ingress of solid foreign objects and ingress of water. The NEMA Types consider these but also consider other items such as corrosions and construction details.

* The PW12 standard is similar to IP69K. However, PW12 is slightly less rigorous.

NEMA Type Definition

Type 1	Intended for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and a degree of protection from falling dirt.
Type 2	Intended for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and a degree of protection against falling dirt and dripping and light splashing of water.
Type 3	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt, rain, sleet, snow and windblown dust; undamaged by the external formation of ice on the enclosure.
Type 3R	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt, rain, sleet, snow; undamaged by the external formation of ice on the enclosure.
Type 3S	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt, rain, sleet, snow and windblown dust; external mechanisms remain operable when ice laden.
Type 4	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; undamaged by the external formation of ice on the enclosure.
Type 4X	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water, and corrosion; undamaged by the external formation of ice on the enclosure.
Type 5	Intended for indoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt and dripping or light splashing of liquids; against settling airborne dust, lint, fibers, and flyings.
Type 6	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt; against hose-directed water and entry of water during occasional temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure.
Type 6P	Intended for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt; <u>against hose-directed water and entry of water during prolonged submersion at a limited depth; undamaged by the external formation of ice on the enclosure.</u>
Type 12	Intended for indoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt; against dripping or light splashing of liquids; against circulating dust, lint, fibers, and flyings.
Type 12K	Intended for indoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt; against dripping or light splashing of liquids; against circulating dust, lint, fibers, and flyings.
Type 13	Intended for indoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; provide a degree of protection against falling dirt; against circulating dust, lint, fibers, and flyings; against spraying, splashing and seepage of water, oil, and noncorrosive coolants.

IEC Description for IP (International Protection) Code

The first characteristic numeral indicates the level of contact and foreign body protection, and the second characteristic numeral indicates the water protection.

Degree of Protection Against Access to Dangerous Parts and Against Solid Foreign Bodies

0	No special protection.
1	Protected against touching dangerous parts with back of hand. Protected against solid foreign bodies 50mm and larger.
2	Protected against touching dangerous parts with finger. Protected against solid foreign bodies 12mm and larger.
3	Protected against touching dangerous parts with a tool. Protected against solid foreign bodies 2.5mm and larger.
4	Protected against touching dangerous parts with a wire. Protected against solid foreign bodies 1.0mm and larger.
5	Dust protected.
6	Dust proof.

Degree of Protection Against Water

0	No special protection.
1	Protected against dripping water.
2	Protected against drips if the housing is bent at an angle of 15 degrees.
3	Protected against spray water.
4	Protected against splash water.
5	Protected against jet-water.
6	Protected against strong jet-water.
7	Protected against the effects of temporary submersion in water.
8	Protected against the effects of permanent submersion in water.

JIS Class for product protection

Japanese Industrial Standards (JIS) specifies the standards used for industrial activities in Japan. The standardization process is coordinated by Japanese Industrial Standards Committee and published through Japanese Standards Association.

The Division of JIS and significant standards for the Optio WP are:
C - Electronic and Electrical Engineering
JIS C 0920:2003 : Degrees of protection provided by enclosures (IP Code)

The JIS rating for dust ranges form 0-6 and 0-8 for water

So how does JIS Class 8 waterproof and JIS Class 5 dustproof relate to the IP rating represented in the PENTAX description? Simple, The IP rating is a combined representation of both dust and waterproof JIS classifications. Represented as: IP 58 which is an International Electro technical Commission (IEC standard) stating the Optio WP is dust-protected and protected against submersion.

IP Rating

IP rating is the protection class against ingress of moisture or dust according as IEC standard. (IEC 60529 Standard) IEC: International Electro technical Commission

IP Rating is described by 2 digits. The first digit relates to dust protection, the second digit relates to liquid protection, refer to the following table

IP rating of OptioWP is IP58 which means they are Dust-protected and are protected against submersion

Dust protection		Water protection	
First characteristic numeral	description	Second characteristic numeral	description
0	Non-protected	0	Non-protected
1	Protected against solid objects greater than 50mm	1	Protected against dripping water
2	Protected against solid objects greater than 12.5mm	2	Protected against dripping water when tilted up to 15°
3	Protected against solid objects greater than 2.5mm	3	Protected against spraying water
4	Protected against solid objects greater than 1mm	4	Protected against splashing water
5	Dust-protected	5	Protected against water jets
6	Dust tight	6	Protected against heavy seas
		7	Protected against the effects of immersion
		8	Protected against submersion