

IEC Enclosures

Degree of Protection

IEC Publication 529 describes standard Degrees of Protection that enclosures of a product are designed to provide when properly installed.

Summary

The publication defines degrees of protection with respect to:

- Persons
- Equipment within the enclosure
- Ingress of water

It does not define:

- Protection against risk of explosion
- Environmental protection (e.g. against humidity, corrosive atmospheres or fluids, fungus or the ingress of vermin)

Note: The IEC test requirements for Degrees of Protection against liquid ingress refer only to water. Those products in this catalog, which have a high degree of protection against ingress of liquid, in most cases include Nitrile seals. These have good resistance to a wide range of oils, coolants and cutting fluids. However, some of the available lubricants, hydraulic fluids and solvents can cause severe deterioration of Nitrile and other polymers. Some of the products listed are available with seals of Viton or other materials for improved resistance to such liquids. For specific advice of this subject refer to your nearest Allen-Bradley Sales Office.

IEC Enclosure Classification

The degree of protection is indicated by two letters (IP) and two numerals. International Standard IEC 529 contains descriptions and associated test requirements that define the degree of protection each numeral specifies. The following table indicates the *general* degree of protection — refer to Abridged Descriptions of IEC Enclosure Test Requirements below. For complete test requirements refer to IEC 529.

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FIRST NUMERAL *	SECOND NUMERAL *
Protection of persons against access to hazardous parts and protection against penetration of solid foreign objects.	Protection against ingress of water under test conditions specified in IEC 529.
0 Non-protected 1 Back of hand; objects greater than 50mm in diameter 2 Finger, objects greater than 12.5mm in diameter 3 Tools or objects greater than 2.5mm in diameter 4 Tools or objects greater than 1.0mm in diameter 5 Dust-protected (dust may enter during specified test but must not interfere with operation of the equipment or impair safety) 6 Dust-tight (no dust observable inside enclosure at end of test)	0 Non-protected 1 Vertically falling drops of water 2 Vertically falling drops of water with enclosure tilted 15 degrees 3 Spraying water 4 Splashing water 5 Water jets 6 Powerful water jets 7 Temporary submersion 8 Continuous submersion
<p>Example: IP41 describes an enclosure that is designed to protect against the entry of tools or objects greater than 1.0 mm in diameter and to protect against vertically dripping water under specified test conditions.</p>	
<p>Note: All first numerals and second numerals up to and including characteristic numeral 6, imply compliance also with the requirements for all lower characteristic numerals in their respective series (first or second). Second numerals 7 and 8 do not imply suitability for exposure to water jets (second characteristic numeral 5 or 6) unless dual coded; e.g., IP_5/IP_7.</p> <p>* The IEC standard permits use of certain supplementary letters with the characteristic numerals. If such letters are used, refer to IEC 529 for the explanation.</p>	