

## International Protection Classes According to DIN EN 60529 (IEC 529/VDE 047 T1)

**The International Electrotechnical Commission (IEC)** is the international standards and conformity assessment body for all fields of electro technology.

IEC International Standard 60529 (Edition 2.1: 2001-02) is a classification of degrees of protection provided by enclosures as a system for specifying the enclosures of electrical equipment on the basis of the degree of protection provided by the enclosure.

Ingress Protection as it relates to sealing against the entry of solid and liquid objects. Complete details of this standard can be obtained from the IEC. This uniform and widely




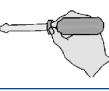
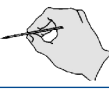

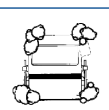
acknowledged classification system provides equipment designers and specifying agents with a convenient and reliable method of comparing relative levels of sealing between competing (connector) products. In its simplest form, the classification system consists of the letters "IP" followed by two separate digits, which denote increasingly greater sealing from solid objects and from water.

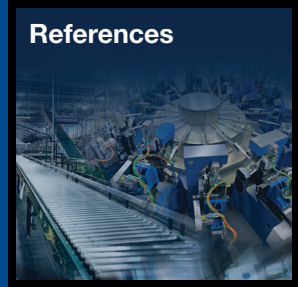
For example, a product rated as being sealed to IP55 will provide some degree of protection from penetration by dust and a jet spray of water, but it would not be expected to completely seal against all dust or being immersed in water.

With an IP67 rating a product will be "dust tight" and remain completely sealed when immersed in water for 30 minutes. The chart below clearly defines levels of IP ratings and should be used as a guide during the specification and design process.

### Protection Against Solid Foreign Objects Penetrating the Product.

|                                 |  |   |
|---------------------------------|--|---|
| <b>IP</b><br>Ingress Protection | <b>6</b><br>First Index Figure<br>Protection Against Foreign Objects | <b>7</b><br>Second Index Figure<br>Protection Against Water |
|---------------------------------|--|---|

| 1st Index Number | Icon  | Brief Description  | Definition  |
|------------------|---|--|---|
| <b>0</b>         |  | No protection  | Not applicable  |
| <b>1</b>         |  | Protected against solid foreign objects of 50 mm Ø and >   | The object probe, sphere of 50 mm Ø, shall not fully penetrate**  |
| <b>2</b>         |  | Protected against solid foreign objects of 12.5 mm Ø and > | The object probe, sphere of 12.5 mm Ø, shall not fully penetrate**  |
| <b>3</b>         |  | Protected against solid foreign objects of 2.5 mm Ø and >  | The object probe, sphere of 2.5 mm Ø, shall not fully penetrate**   |
| <b>4</b>         |  | Protected against solid foreign objects of 1.0 mm Ø and >  | The object probe, sphere of 1.0 mm Ø, shall not fully penetrate**   |
| <b>5</b>         |  | Dust protected   | Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety. |
| <b>6</b>         |  | Dust tight   | No ingress of dust  |



Be Certain with Belden

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**Protection Class - Protection Against Ingress of Water with Adverse Effects.**

**IP**

Ingress Protection










**6**

First Index Figure  
Protection Against  
Foreign Objects

**7**

Second Index Figure

**Protection Against Water**

| 1st Index Number | Icon  | Brief Description   | Definition   |
|------------------|---|---|--|
| <b>0</b>         |   | No protection.  | Not applicable.  |
| <b>1</b>         |    | Protected against vertically falling water drops.                                     | Vertically falling drops shall have no harmful effects.  |
| <b>2</b>         |   | Protected against vertically falling water drops when the enclosure is tilted up 15°. | Vertically falling drops shall have no harmful effects when the enclosure is tilted at an angle up to 15° on either side of the vertical.  |
| <b>3</b>         |  | Protected against spraying water.   | Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects.  |
| <b>4</b>         |  | Protected against splashing water.  | Water splashed against the enclosure from any direction shall have no harmful effect.  |
| <b>5</b>         |  | Protected against water jets.   | Water projected in jets against the enclosure from any direction shall have no harmful effects.  |
| <b>6</b>         |  | Protected against powerful water jets   | Water projected in powerful jets against the enclosure shall have no harmful effects.  |
| <b>7</b>         |  | Protected against the effects of temporary immersion in water.                        | Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time.   |
| <b>8</b>         |  | Protected against the effects of continuous immersion in water.                       | Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under the conditions which shall be agreed between the manufacturer and user, but which are more severe than for numeral 7, above. |
| <b>9K</b>        |  | Protected against water from high-pressure / steam jet cleaners.                      | Water directed against the enclosure from any direction under extremely high pressure and must have no adverse effects.  |