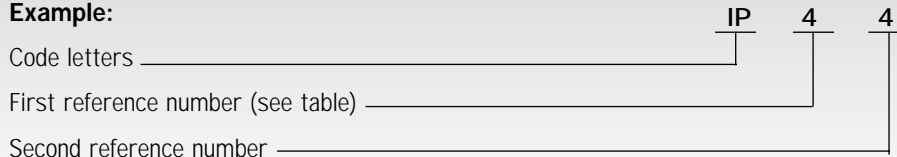


## European Enclosure Standards

The IEC publication 529 and DIN Standard number 40050 both address the classification of degrees of protection provided by enclosures. The following is brief overview of the coding system described in these standards.

**General:** The degrees of protection are indicated by a symbol consisting of the two code letters IP, always the same, (international Protection) and two reference numbers indicating the degree of protection.

**Example:**



An enclosure with this designation is protected against the penetration of solid objects of more than 1mm diameter and against splashed water.

### First Number

*\*\*Test and assessment in italic*

- 0 = no special protection. *\*no test*
- 1 = protected against a rigid sphere of 50mm  $\varnothing$   
*\*A rigid 50 mm sphere must not pass through an opening with an applied force of 50 N.*
- 2 = protected against solid objects greater than 12.5mm  $\varnothing$   
*\*A rigid 12 mm sphere must not pass through an opening with an applied force of 30 N.*
- 3 = protected against solid objects greater than 2.5mm.  
*\*A straight rigid steel wire 2.5 mm in dia. must not enter the equipment with an applied force of 3 N.*
- 4 = protected against solid objects greater than 1mm.  
*\*A straight rigid steel wire 1 mm in dia. must not enter the equipment with an applied force of 1 N.*
- 5 = dust protected  
*\*A straight rigid steel wire 1 mm in dia. must not enter the equipment with an applied force of 1 N. Also dust chamber test to DIN 40 052.*
- 6 = dust-tight and complete protection against contact.  
*\*A straight rigid steel wire 1 mm in dia. must not enter the equipment with an applied force of 1 N. Also dust chamber test to DIN 40 052.*

### Second Number

*\*\*Test and assessment in italic*

- 0 = no special protection. *\*no test*
- 1 = protected against vertical falling water  
*\*Dripping device or sprinkler nozzle in accordance with DIN 40 053 part 1 or part 5 respectively.*
- 2 = protected against vertical falling water drops when enclosure tilted at 15°  
*\*Dripping device or sprinkler nozzle in accordance with DIN 40 053 part 1 or part 5 respectively.*
- 3 = protected against splashing water at an angle up to 60°  
*\*Oscillating tube or spray nozzle in accordance with DIN 40 053 part 2 or part 3 respectively depending on the shape and size of sample.*
- 4 = protected against splashing water from any direction  
*\*Oscillating tube or spray nozzle in accordance with DIN 40 053 part 2 or part 3 respectively depending on the shape and size of sample.*
- 5 = protected against water jets  
*\*Jet nozzle of nominal size 6 in accordance with DIN 40 053 part 4.*
- 6 = protected against powerful water jets  
*\*Jet nozzle of nominal size 12 in accordance with DIN 40 053 part 4.*
- 7 = protected from the effects of temporary immersion  
*\*Enclosure is completely immersed in water and the following conditions must be met:*
  - a) water must be at least 150mm over the highest point of the enclosure
  - b) lowest part of the enclosure must be at least 1m below the surface
  - c) test must last for at least 30 minutes
  - d) water temperature must not deviate by more than 5°C; water must not enter in harmful quantities.
- 8 = protected from the effects of continuous immersion  
*\*Test conditions have to be agreed to by the manufacturer and the customer, but can not be less stringent than those described in 7 above.*

## European Hazardous Area Protection Concepts Used By Westlock

Westlock Valve Monitoring Systems are designed with specific safety measures to prevent ignition of a surrounding explosive substance during normal operation when installed in a hazardous area. The following are the most commonly used methods of protection incorporated into the design of Westlock equipment.

Protection Concept	European International Electromechanical Commission (I.E.C.)	CENELEC or BASEEFA Standard	USA National Electrical Code (N.E.C.)	Description	I.E.C.	N.E.C.
EEx'ia'	Intrinsically Safe	EN.50020 (BS.5501 Pt. 7)	Intrinsically Safe	Apparatus or system which is incapable of causing ignition of a mixture of flammable or combustible material in air due to the limitation of electrical energy in the circuit.	Zone 0 Zone 1 Zone 2	Class I & II, Div. 1 Class I & II, Div. 1 Class I & II, Div. 2
EEx'd'	Flameproof	EN.50018 (BS.5501 Pt. 5)	Explosionproof	Designed to withstand an internal explosion and prevent the ignition of the surrounding atmosphere.	Zone 1 Zone 2	Class I & II, Div. 1 Class I & II, Div. 2
EEx'e'	Increased Safety	EN.50019 (BS.5501 Pt. 6)	Not yet recognized by N.E.C.	Increased measures are taken to prevent the possibility of excessive heat, arcs or sparks igniting flammable gases or combustible materials.	Zone 1 Zone 2	Not yet recognized by N.E.C.
EEx'N'	Non-incendive	BS.6941	Non-incendive	Electrical circuits that under normal conditions do not release sufficient energy to ignite the surrounding atmosphere.	Zone 2	Class I & II, Div. 2
EEx'me'	Encapsulated/ Increased Safety	EN.50014/ EN.50019/ EN.50028	Not yet recognized by N.E.C.	Encapsulated/Increased Safety equipment refers to an apparatus certified to CENELEC standards which is designed so as the components capable of igniting an explosive atmosphere by either sparking or heating are enclosed in compound in such a way to prevent the possibility of ignition.	Zone 1 Zone 2	Not yet recognized by N.E.C.