Option IP68

Degrees of protection according to IEC 60529

The IP classification describes the protection provided by an enclosure for electrical equipment against solids (dust) and liquids (water, oil). The degree of protection is defined in the international standard IEC 60529.
The protection provided by a housing is described by a system of two digits (IPXX). The first digit indicates protection against solid foreign bodies.
The second digit indicates protection against liquids.

Number 1	Protection against foreign bodies	Number 2	Protection against liquids
0	No protection	0	Kein Schutz
1	protected against the penetration of solid foreign bodies with a diameter of 50 mm or more	1	protected against vertically falling dripping water
2	protected against the penetration of solid foreign bodies with a diameter of 12.5 mm or more	2	protected against dripping water, if the housing is inclined 15°.
3	protected against the penetration of solid foreign bodies with a diameter of 2.5 mm or more	3	protected against falling spray water up to 60° against the vertical
4	protected against the ingress of solid foreign bodies with a diameter of 1 mm or more	4	protected against splashing water on all sides
5	protected against dust (limited access, no damaging amount)	5	protected against water jets (nozzle) from any angle
6	dust-tight	6	protected against strong water jets
		7	protected against temporary submersion (up to 1 meter depth for 30 minutes)
		8	protected against permanent immersion. conditions: more than 1 meter depth; depth and duration according to specification)

ME-Meßsysteme GmbH
Eduard-Maurer-Str. 9
16761 Hennigsdorf
Tel.: +49 3302 89824 60
Fax: +49 3302 89824 69
Mail: info@me-systeme.de
Web: www.me-systeme.de

The IEC 60529 standard (Article 6) stipulates that a housing in which the second digit is a 7 or 8 (protection against temporary or accidental damage) is to be protected by a protective device. permanent submersion), for which protection against jet water may be unsuitable. If protection against water jets AND submersion is required, a double coding must be provided, e.g. IP55/IP57 or IP66/IP67.

Protection class IP68

Depending on manufacturer. Product and application have different test conditions for IP68 protection. The test is performed on clear, still water, without any additives, such as Salts or surfactants provided.

Specification of IP68 for ME measuring systems

The maximum duration of use under water is 8 hours.
The maximum depth under water is 2m.
After use a complete drying of the sensor is necessary. Drying at 50°C for at least 24 hours is recommended.
The use of force sensors under water is always associated with the risk of water damage and is therefore at your own risk. ME-Meßsysteme does not accept any liability for damage caused by the use of sensors under water.

Side effects due to increased protection class

The accuracy of the sensor is impaired by the additional potting compound. With a smaller nominal force, the reaction of the casting compound to the accuracy is increased.
The additional full encapsulation for option IP68 is therefore only recommended from a nominal force of 2kN.
When salt water is used, only stainless steel sensors are recommended.
The reason for the increase in drift is the thermal expansion of the casting compound.
Linearity and zero signal return and hysteresis can also be affected by additional potting compound.
The table gives a guideline value for the retroactivity.

50 N <= F <= 200 N	200 N < F < 2000 N	F >= 2000 N
Very high feedback effect on accuracy	High feedback effect on accuracy	Low feedback effect on accuracy.
Factor 5 ... 10	Factor 2 … 5	Factor 1...2

Measures to increase service life

Humidity finds its way to the strain gauge along the connecting cables and over the outer edges of the casting compound. Larger sensors offer better protection against moisture and water because larger areas are sealed and the distances from the outer edges to the strain gage are greater.
Additional measures to increase the service life are

- Sealing of the cable glands, e.g. with silicone and shrink tubing
- Sealing the outer edges with silicone or ABM75 masking film

Suitable sensors for IP68

The following sensors are suitable for additional encapsulation for protection class IP68, 8h, 2m.

- KD140 50N to 1kN (anodized surface, large coverage, low backlash)
  KD80s 200N to 100kN
  KD40s 200N to
  KD24s 50N to 1kN
  KM26 to KM115 200N to 200kN
  KM26z to KM70z 200N to 200kN
  K3D120 to K3D400 200N to 500kN
  K6D40 from 200N to K6D300 200N to 400kN

Unsuitable sensors for IP68

- KD24s 2N to 20N
  KD40s 2N to 100N
  K3D40 2N to 50N
  K3D60a 10N to 500N
  K6D27, K6D154
  F6D Sensors (F6D45, F6D80, F6D100)