IP / NEMA Ratings

ENCLOSURE PROTECTION RATING SYSTEMS

The International Electrotechnical Commission (IEC) has established an enclosure grading system that produces an IP rating. Many BeLuce products are rated in accordance with the IEC standards and display the IP rating they have achieved. The IP rating is quickly becoming a critical element for emergency lighting fixtures. Since emergency lighting fixtures are typically mounted in close proximity to sprinkler heads (for example wall mounted battery units along a corridor), the potential of water related damage arising from activated or damaged sprinkler heads is an important consideration.

Provided below are IP / NEMA rating charts. These are designed to show the correlation of the IP and NEMA rating systems. IMPORTANT: NEMA claims that because IEC 60529-1 does not specify protection against corrosion, rust, oil or coolants, a direct correlation between the standards cannot be made. Because the NEMA rating meets or exceeds the corresponding IP rating, you can only translate NEMA to IP, not IP to NEMA. The following table outlines the IP system of enclosure ratings:

0	No Protection
1	Protection against solid objects up to 50mm, (accidental touch by hands).
2	Protection against solid objects up to 12mm, (fingers).
3	Protection against solid objects over 2.5mm, (tools & wires).
4	Protected against solid objects over 1mm.
5	Protection against dust, (limited ingress, no harmful deposit).
6	Protection against live or moving parts, including dust.

0	No Protection
1	Protection against vertically falling drops of water, (condensation).
2	Protection against direct sprays of water up to 15 degrees from vertical.
3	Protection against sprays up to 60 degrees from vertical.
4	Protection against water sprayed from all directions, (limited ingress permitted).
5	Protection against low pressure jets of water from all directions, (limited ingress permitted).
6	Protection against strong jets of water from all directions.
7	Protection against the effects of immersion between 15cm and 1m.
8	Protection against long periods of immersion under pressure.

NEMA Enclosures

NEMA uses a standard rating system that defines the types of environments in which an electrical enclosure can be used, and signifies a fixed enclosure's ability to withstand certain environmental conditions.

NEMA 1

- Indoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt)

NEMA 3

- Indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow)
- And that will be undamaged by the external formation of ice on the enclosure

NEMA 3R

- Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow)
- And that will be undamaged by the external formation of ice on the enclosure

NEMA 4

- Indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water)
- And that will be undamaged by the external formation of ice on the enclosure

NEMA 4X

- Indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (windblown dust)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water)
- That provides an additional level of protection against corrosion
- And that will be undamaged by the external formation of ice on the enclosure

NEMA 6

- Indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (hose directed water and the entry of water during occasional temporary submersion at a limited depth)
- And that will be undamaged by the external formation of ice on the enclosure

NEMA 6P

- Indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt)
- To provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (hose directed water and the entry of water during prolonged submersion at a limited depth)
- That provides an additional level of protection against corrosion and that will be undamaged by the external formation of ice on the enclosure.

NEMA 12

- Constructed (without knockouts) for indoor use to provide a degree of protection to personnel against access to hazardous parts
- To provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and circulating dust, lint, fibers, and flyings)
- And to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing)

NEMA Enclosures

COMPARISON OF SPECIAL APPLICATIONS OF ENCLOSURES FOR NON-HAZARDOUS LOCATIONS

Provides a degree of protection against the following environmental conditions	Types of Enclosures									
	1*	2*	4	4X	5	6	6P	12	12K	13
Access to hazardous parts	X	X	X	X	X	X	X	X	X	X
Ingress of solid falling objects (falling dirt)	X	X	X	X	X	X	X	X	X	X
Ingress of water (drip and light splashing)	-	X	X	X	X	X	X	X	X	X
**Ingress of solid foreign objects (circulating dust, lint, fibers and flyings)	-	-	X	X	-	X	X	X	X	X
**Ingress of solid foreign objects (settling airborne dust, lint, fibers & flyings)	-	-	X	X	X	X	X	X	X	X
Ingress of water (hose down and splashing water)	-	-	X	X	-	X	X	-	-	-
Oil and coolant seepage	-	-	-	-	-	-	-	X	X	X
Oil or coolant spraying and splashing	-	-	-	-	-	-	-	-	-	X
Corrosive agents	-	-	-	X	-	-	X	-	-	-
Ingress of water (occasional temporary submersion)	-	-	-	-	-	X	X	-	-	-
Ingress of water (occasional prolonged submersion)	-	-	-	-	-	-	X	-	-	-
*Rain, snow and sleet	-	X	X	X	-	X	X	-	-	-
Windblown dust	-	X	X	X	-	X	X	-	-	-

NOTE: *External operating mechanisms are not required to be operable when the enclosure is ice covered
**External operating mechanisms are operable when the enclosure is ice covered