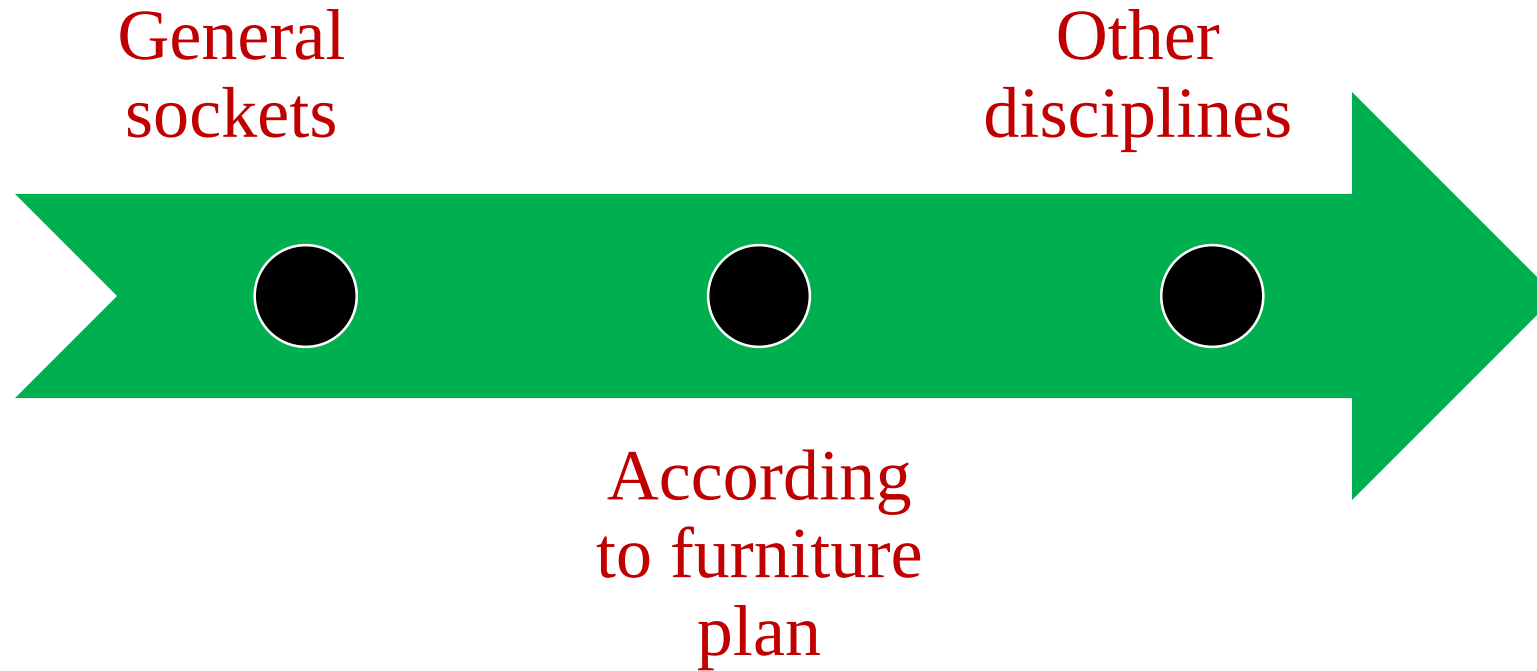


General Use Power

Content

1. Power Distribution Concept
2. Differences between Plugs and Sockets
3. Types of Sockets and Plugs according to Shape
4. Classification of Sockets according to Usage
5. Outlets
6. Disconnectors and Load Break Switches
7. Gulf Area Special Wiring Accessories

1. Power Distribution Concept

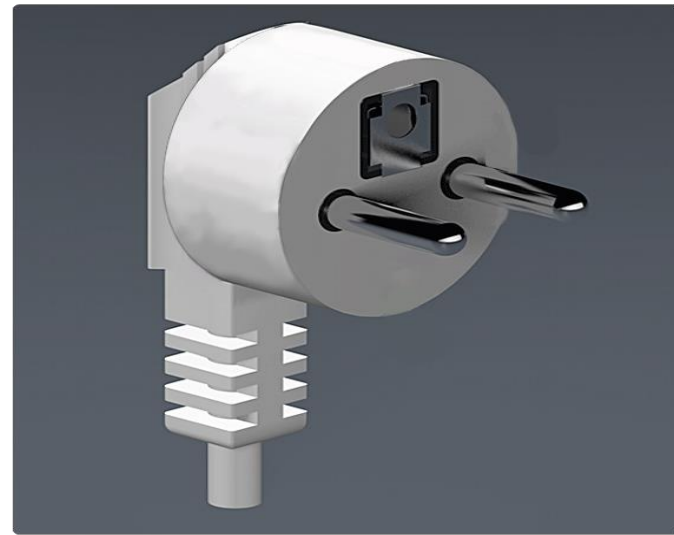


2. Differences between Plugs and Sockets

- AC power plugs and sockets are devices that allow electrically operated equipment to be connected to the primary alternating current (AC) power supply in a building



Socket



Plug

3. Types of Sockets and Plugs according to Shape

- The reason for this is historical. At each country manufacturers developed their own plugs and sockets. Standardization came too late



3.1. Type A (NEMA)

- Used in: mainly in USA, Canada , Mexico & Japan
- Ungrounded plug
- 15A
- 2 pins
- Almost always 100 – 127 V
- Socket compatible with plug type A
- The neutral pin on the American plug is wider than the live pin



3.2. Type B (NEMA)

- Used in: mainly in USA, Canada, Mexico & Japan
- Grounded plug
- 15A
- 3 pins
- Almost always 100 – 127 V
- Socket compatible with plug types A & B
- The neutral pin on the American plug is wider than the live pin



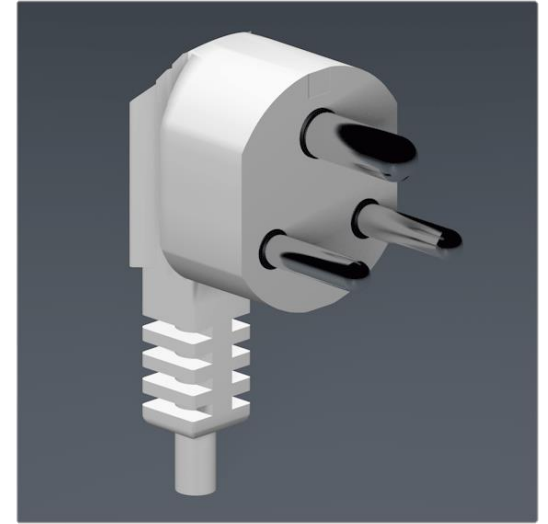
3.3. Type C (EURO)

- Used in: Europe, South America & Asia
- Not grounded plug
- 2.5A
- 2 pins
- Almost always 220 – 240 V
- Socket compatible with plug types C



3.4. Type D

- Used in: mainly in India.
- Grounded plug
- 5A
- 3 pins
- 220 – 240 V
- socket compatible with plug types D (partial and unsafe compatibility with C, E & F)



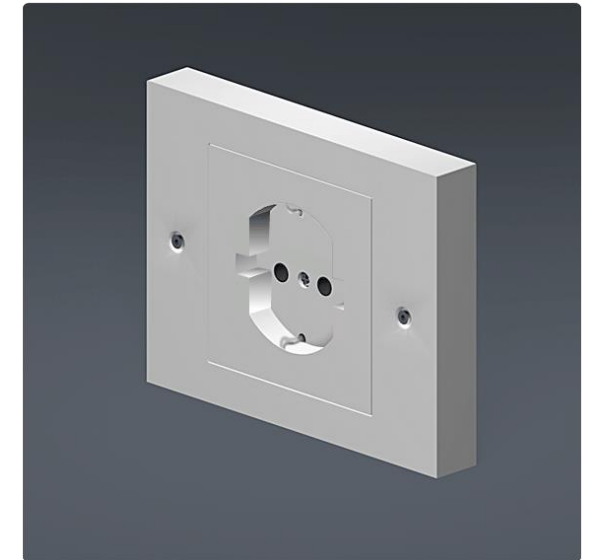
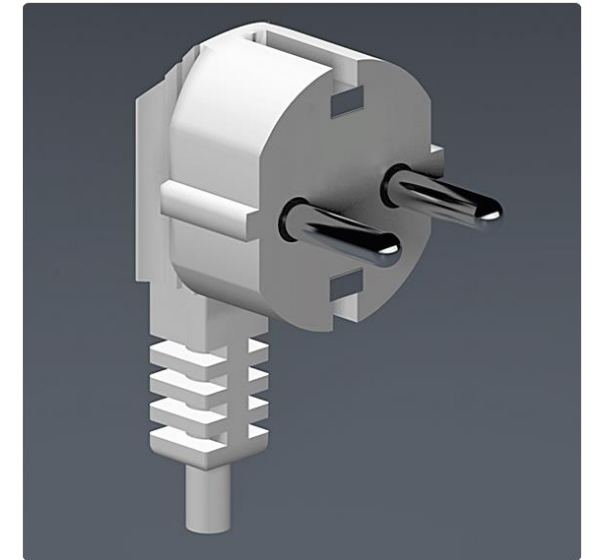
3.5. Type E

- Used in: France, Belgium, Poland, Slovakia & Czechia
- Grounded plug
- 16A
- 2 pins
- 220 – 240 V
- Socket compatible with plug types C, E & F



3.6. Type F (SCHUKO)

- **Used in:** used almost everywhere in Europe & Russia except for UK & Ireland
- **Grounded plug**
- **16A**
- **2 pins**
- **220 – 240 V**
- **Socket compatible with plug types C, E & F**



3.7. Type G (British)

- Used in: United Kingdom, Ireland, Malta, Malaysia & Singapore.
- Grounded plug
- 13A
- 3 pins
- 220 – 240 V
- Socket compatible with plug type G



3.8. Type H

- **Used in:** used exclusively in Israel, the West Bank & the Gaza Strip.
- **Grounded plug**
- **16A**
- **3 pins**
- **220 – 240 V**
- **Socket compatible with plug types C & H (unsafe compatibility with E & F)**



3.9. Type I

- Used in: mainly in Australia, New Zealand, China & Argentina
- 2 pins: not grounded / 3 pins: grounded
- 10A & 15A
- 2 or 3 pins
- 220 – 240 V
- Socket compatible with plug type I



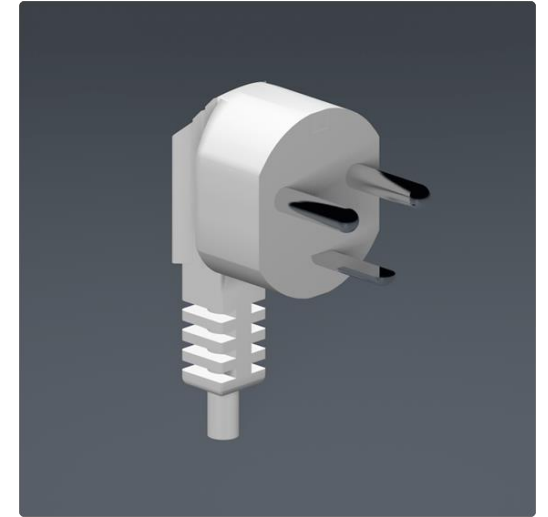
3.10. Type J

- Used in: Switzerland, Lichtenstein and Rwanda
- Grounded plug
- 10A
- 3 pins
- 220 – 240 V
- Socket compatible with plug type J & C



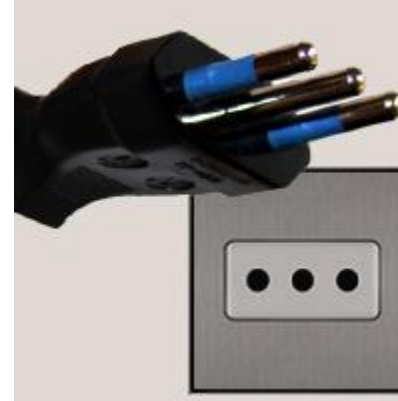
3.11. Type K

- Used in: Denmark and Greenland
- Grounded plug
- 16A
- 3 pins
- 220 – 240 V
- Socket compatible with plug type K & C (unsafe compatibility with E & F)



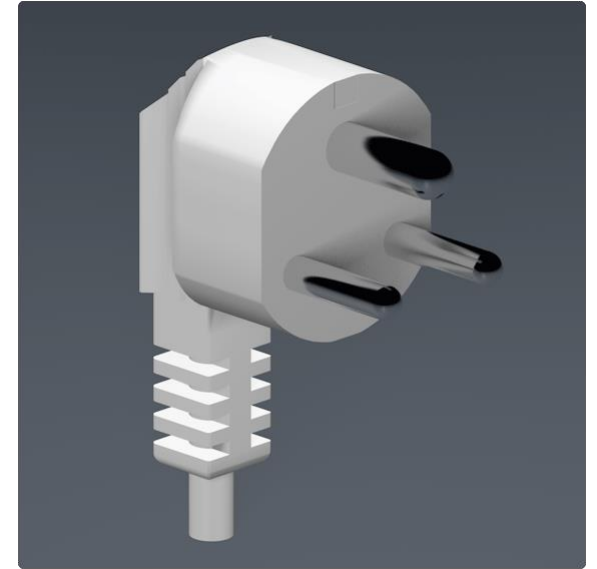
3.12. Type L

- Used in: exclusively in Italy & Chile
- Grounded plug
- 10A & 16A
- 3 pins
- 220 – 240 V
- 10 A socket compatible with plug types C & L (10 A version) / 16 A socket compatible with plug type L (16 A version)



3.13. Type M

- Used in: mainly in South Africa
- Grounded plug
- 15A
- 3 pins
- 220 – 240 V
- Socket compatible with plug type M



3.14. Type N

- Used in: Brazil and South Africa
- Grounded plug
- 10A & 20A
- 3 pins
- 100 – 240 V
- Socket compatible with plug type N & C

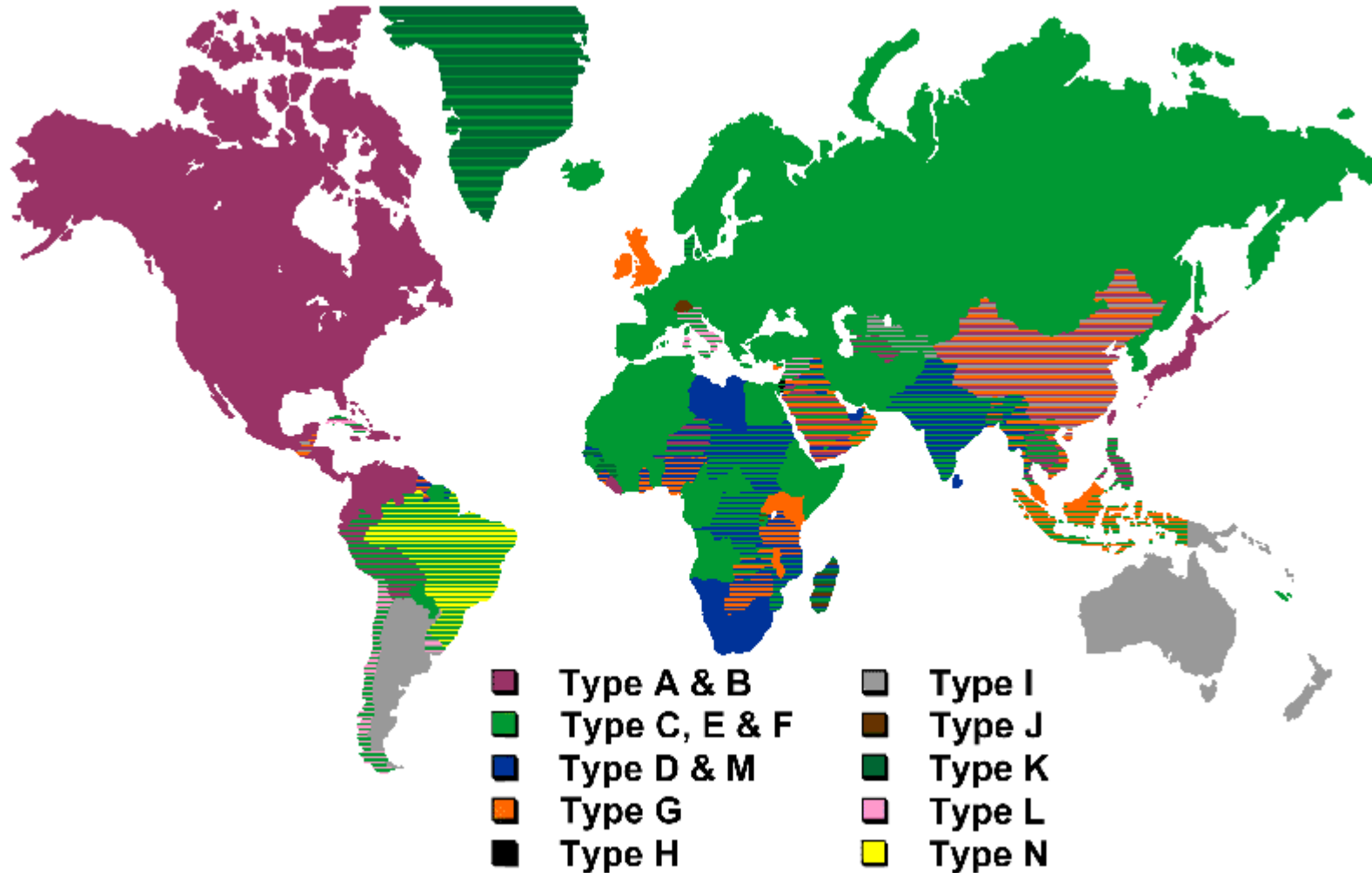


3.15 Universal Socket

- Fit for most world known power plugs (US/UK/AU/EU), including 2 pin and 3 pin type
- Voltage: 250V AC / 13A



Check your need for a travel adapter!



Universal Adapter Plug



4. Classification of Sockets according to Usage

1. Normal Socket
2. Duplex Socket
3. Power Socket
4. Switched Socket
5. Weather Proof Socket
6. 1-Ph. Industrial Socket
7. 3-Ph. Industrial Socket
8. Explosion Proof Socket
9. Shaver Socket
10. Furniture Mounted Socket
11. Floor Box
12. Tamper Resistant Socket
13. Hospital Grade Socket

4.1. Normal Socket (Single Socket)

- Used for general use purposes

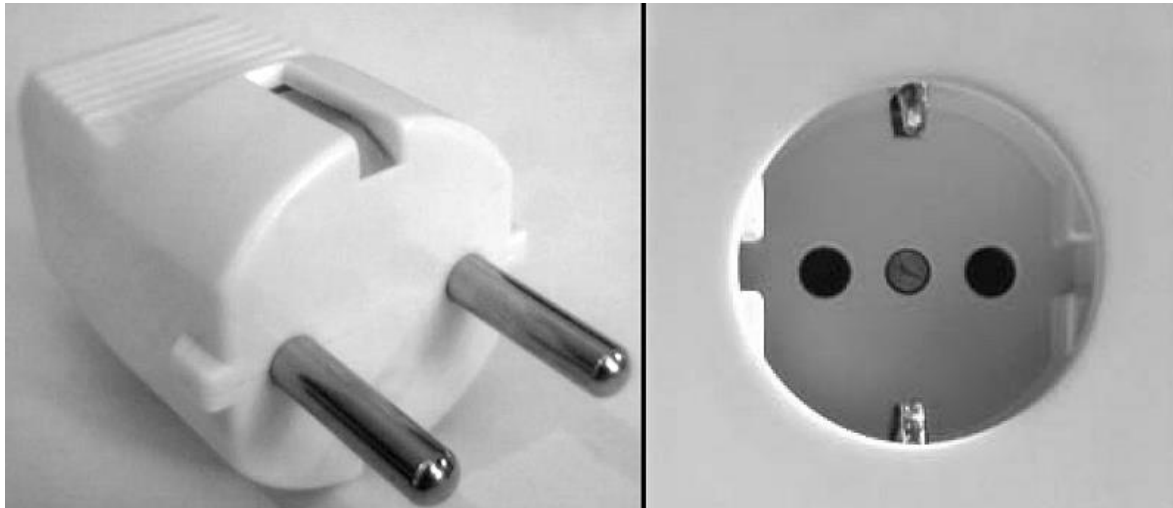


4.2. Duplex Socket (Twin Socket)

- Used for general use purposes



4.3. Power Socket



4.4. Switched Socket

- With an extra built-in control switch



4.5. Weather Proof Socket

- Used in wet areas with a suitable ingress of protection (IP)



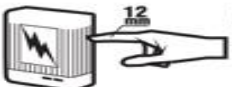
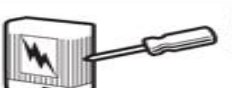
IP55



IP66

4.5.1. Ingress Protection

IP (Ingress Protection) Ratings Guide

SOLIDS		WATER	
1	 Protected against a solid object greater than 50 mm such as a hand.	1	 Protected against vertically falling drops of water. Limited ingress permitted.
2	 Protected against a solid object greater than 12.5 mm such as a finger.	2	 Protected against vertically falling drops of water with enclosure tilted up to 15 degrees from the vertical. Limited ingress permitted.
3	 Protected against a solid object greater than 2.5 mm such as a screwdriver.	3	 Protected against sprays of water up to 60 degrees from the vertical. Limited ingress permitted for three minutes.
4	 Protected against a solid object greater than 1 mm such as a wire.	4	 Protected against water splashed from all directions. Limited ingress permitted.
5	 Dust Protected. Limited ingress of dust permitted. Will not interfere with operation of the equipment. Two to eight hours.	5	 Protected against jets of water. Limited ingress permitted.
6	 Dust tight. No ingress of dust. Two to eight hours.	6	 Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.
Rating Example: IP65 INGRESS PROTECTION		7	 Protection against the effects of immersion in water between 15 cm and 1 m for 30 minutes.
		8	 Protection against the effects of immersion in water under pressure for long periods.

4.5.1. Ingress Protection, Continue

First number	Description	Explanation	Second number	Description	Explanation
0	Non-protected	Not protected	0	Non-protected	Not protected against moisture
1	Hand-protected	Protected against solid objects exceeding 50 mm in diameter	1	Drip-proof against vertical water drops	Water drips falling vertically shall have no harmful effect
2	Finger-protected	Protected against finger contact with live parts; and against solid objects exceeding 12 mm in diameter	2	Drip-proof when tilted at angles of up to 15°	Water drips shall have no harmful effect
3	Tool-protected	Protected against contact with live parts by tools, wire or similar objects over 2.5 mm thick; and protection against penetration of solid objects exceeding 2.5 mm in diameter	3	Rain-/spray-proof	Water falling at an angle of up to 60° shall have no harmful effect
4	Wire-protected	Protected against contact with live parts by tools, wire or similar objects over 1 mm thick; protection against penetration of solid objects exceeding 1 mm in diameter	4	Splash-proof	Splashing water from any direction shall have no harmful effect
5	Dust-accumulation-protected	Complete protection against contact with live parts and against harmful accumulation of dust; some dust may penetrate but not to the extent that operation is impaired	5	Jet-proof	Water projected by a nozzle from any direction shall have no harmful effect. (Nozzle diameter 6.3 mm, pressure 30 kPa)
6	Dust-penetration-protected	Complete protection against contact with live parts and against penetration of dust	6	Jet-proof	Water projected by a nozzle from any direction shall have no harmful effect. (Nozzle diameter 12.5 mm, pressure 100 kPa)
			7	Watertight	Watertight; temporary immersion in water under specified conditions of pressure and time possible without ingress of water in harmful quantities
			8	Pressure watertight	Pressure watertight; continuous submersion in water under specified conditions of pressure and time without ingress of water in harmful quantities

4.5.1. Ingress Protection, Continue

الرقم الأول من اليسار	تعريف درجة الرقم الأول	الرقم الثاني من اليسار	تعريف درجة الرقم الثاني
0	لا توجد حماية	0	لا توجد حماية
1	حماية من الأجسام الصلبة الأكبر من 50 ملم (مثل حماية ضد تعرض اليد للملامسة الأجزاء الكهربائية)	1	حماية ضد سقوط قطرات الماء عموديا (التكثيف على سبيل المثال)
2	حماية من الأجسام الصلبة الأكبر من 12 ملم (مثل أصابع اليد)	2	حماية ضد الرش مباشرة من الماء تصل إلى 15 درجة عموديا.
3	حماية من الأجسام الصلبة الأكبر من 2.5 ملم (مثل الأدوات والاسلاك)	3	حماية ضد الرش مباشرة من الماء تصل إلى 60 درجة عموديا.
4	حماية من الأجسام الصلبة الأكبر من 1 ملم (مثل الأدوات والاسلاك الصغيرة)	4	حماية ضد رش المياه من جميع الاتجاهات - دخول محدود مسموح به
5	حماية محدودة لدخول الغبار - لا تشمل الترسبات القوية للغبار	5	محمي ضد تدفق المياه تحت ضغط قليل من كل الاتجاهات - دخول محدود مسموح به
6	حماية كاملة ضد دخول الغبار	6	محمي ضد تدفق المياه تحت ضغط عالي من كل الاتجاهات - دخول محدود مسموح به
		7	حماية ضد آثار غمر الجهاز بالماء بين 15 سم ومتر واحد
		8	حماية ضد آثار غمر الجهاز بالماء تحت الضغط لفترات طويلة

4.6. 1-Ph. Industrial Socket

- Used for industrial applications and IT Racks



4.7. 3-Ph. Industrial Socket

- Used for industrial applications and IT Racks



4.7.1. Raised Floor



4.8. Explosion Proof Socket

- Used in hazardous environments like oil and gas applications

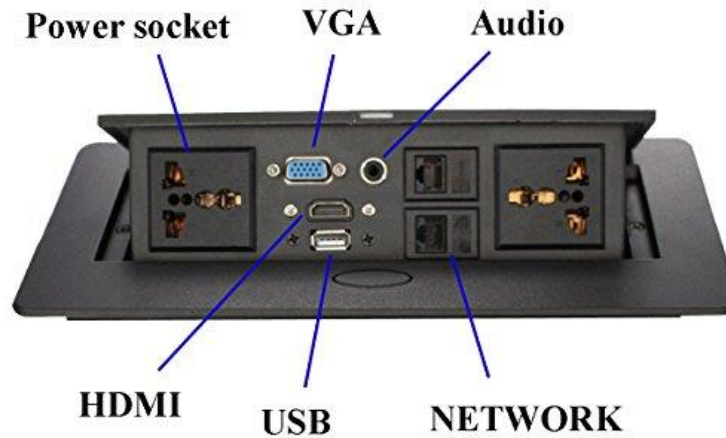


4.9. Shaver Socket

- Used in toilets for shaving equipment.
- It contains a built-in transformer in order to provide two outlets with two difference voltages: 230V & 115V.

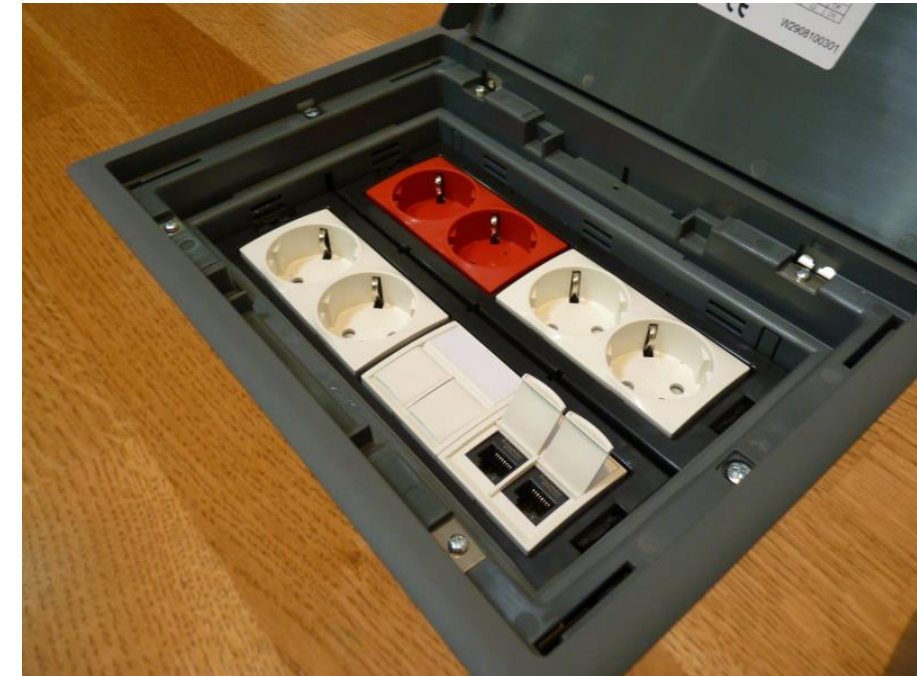


4.10. Furniture Mounted Socket



4.11. Floor Box

- It contains a specific number of sockets based on the designer's point of view.
- It is used at open areas like reception hall in a bank and wherever there is no availability to install sockets on walls.
- Must be coordinated with light current discipline"



4.12. Tamper Resistant Socket

- These receptacles have spring-loaded shutters that close off the contact openings
- Because both springs must be compressed at the same time, the shutters do not open when a child attempts to insert an object into only one contact opening



4.13. Hospital Grade Socket

- It is used to ensure that a receptacle with a greater contact tension is provided to minimize possibilities that an attachment plug supplying medical or life support equipment may be disconnected
- It is used in operation and patient rooms



5. Outlets

- used for wall mounted electrical loads like: wall mounted luminaires and any other loads needs that type of termination



Electrical outlet



Junction box outlet

6. Disconnectors and Load Break Switches

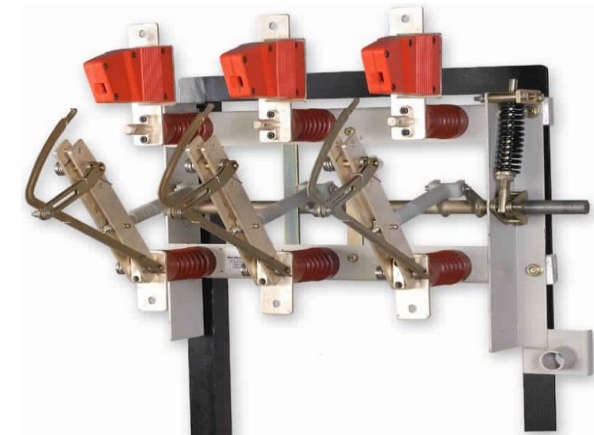
■ Disconnecter

- Operates on “off-load” condition
- Used for maintenance: AHU, FCU, SPLIT UNITS ...ETC.



■ Load Break Switch

- Operates on “On-load” condition
- Used for maintenance & switching: R.M.U



6.1. Load Break Switch (LBS)



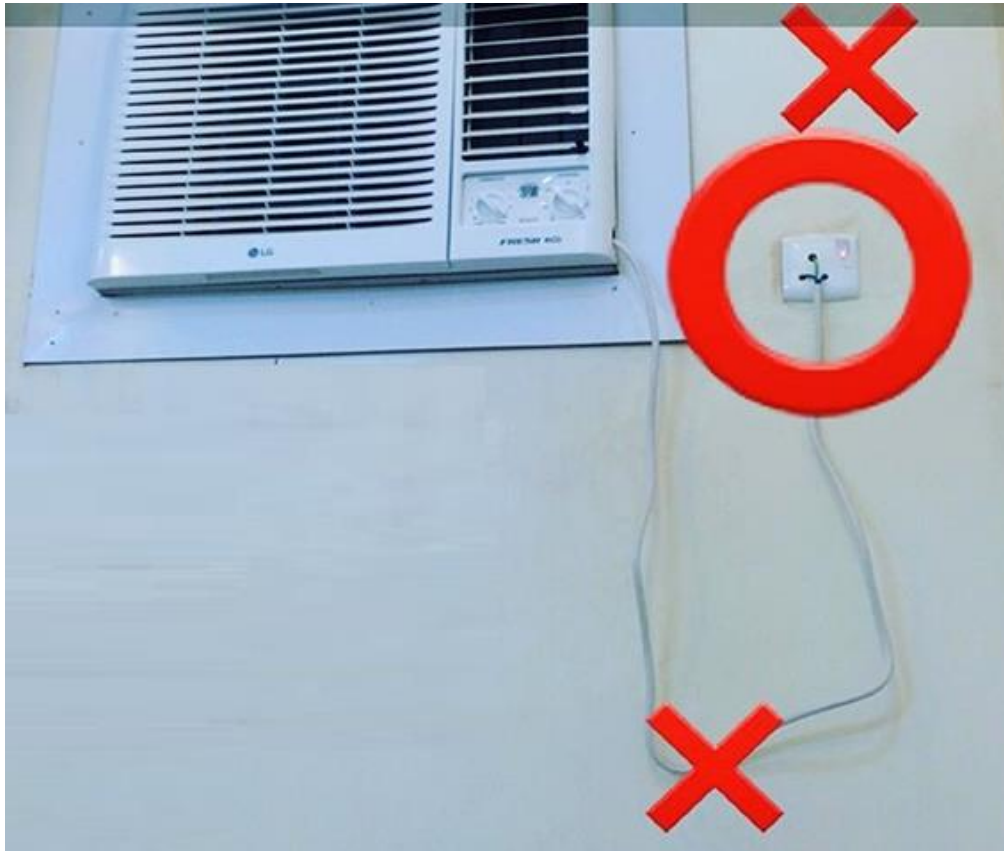
6.2. Disconnectors according to Application

1. Commercial Types



6.2. Disconnectors according to Application, Continue

- WATCH OUT from making termination like THIS



6.2. Disconnectors according to Application , Continue

2. Industrial Types



6.3. Disconnectors according to number of poles

- Single Pole
 - Two Poles
 - Three Poles
 - Four Poles
 - Six Poles
- Usage of them depends on:
 1. Type of load (1-ph or 3-ph)
 2. Starting method for motors
 3. Location of starter
 4. Earthing system

7. Gulf Area Special Wiring Accessories

■ Cooker Unit

- most commonly used ratings are: 20A, 45A & 63A.



■ Spur Outlet

- most commonly used ratings are: 20A, 30A, 45A. It is used for A/C equipment



Thank You