

Enterprise Environmental Planning

Plug Reference Cheat Sheet v1.0.1



▶ CHEAT SHEET

Use this reference as a quick look up source for power plugs used in North America and International.

▶ NORTH AMERICA

Norther American NEMA plugs are discussed and displayed on page 6 onwards.

▶ INTERNATIONAL

International plugs are discussed and displayed on page 12.

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Introduction

The intent of this document is to provide a quick reference look up for power plugs used in North America and International.

Acronyms and Symbols

NEMA = National Electrical Manufacturers Association

IEC = International Electrotechnical Commission

NEC = National Electric Code

UL® = Underwriters Laboratory

Ph = Phase 1 or Phase 3

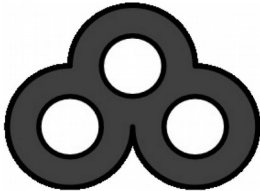
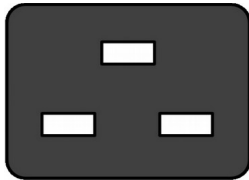
Δ = Delta

Y = Wye

Notes: ph indicates phase (1 or 3), Δ indicates three phase delta, and Y Indicates three phase Wye.

IEC 320 Connectors

The following table displays the plug types for different hardware such as monitors, switches, servers, high-end servers, power distribution units (PDUs), and Uninterpretable Power Supplies (UPSs).

Name	Amp Rating (A)	Connector	Usage
C5 – Female C6 – Male	2.5A		Laptop Power Supplies And Other Portable Power Supplies
C7 – Female C8 – Male	2.5A		Laptop Power Supplies And Other Portable Power Supplies
C13 – Female C14 – Male	10A		Desktop Computers, Monitors, Switches, And Servers
C15 – Female C16 – Male	10A		Used In Hot Conditions Since It Is Rated To 1200 C (2480F), Unlike C13/C14 Which Is Rated To 700 C (1580 F)
C19 – Female C20 – Male	16A		16A Blade Chassis, Flex System, High-power Servers, UPSs, PDUs, And Other High Current Equipment. Note: IEC 320 has changed to IEC 60320 IEC 309

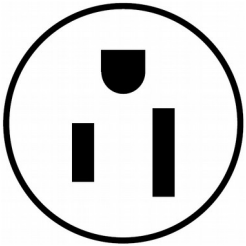
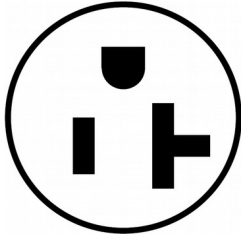
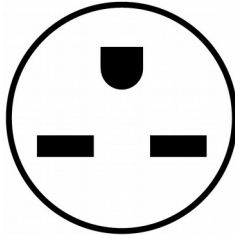
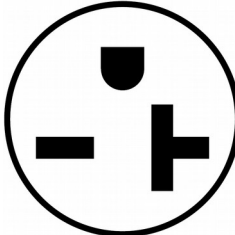
Note: IEC 320 has changed to IEC 60320

North America Plug Reference

The following section covers North American Plugs.

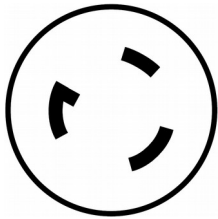
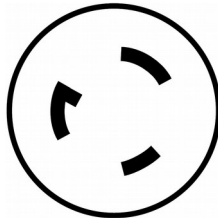
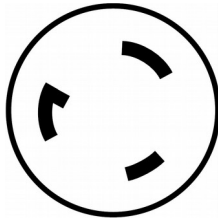
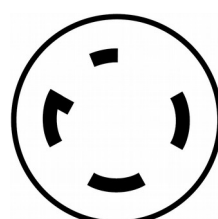
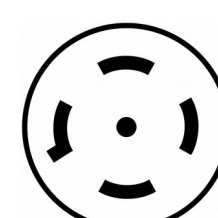
NEMA Straight Blade Connector

These plugs are NEMA Straight Blade Connectors.

Name	Amperage / Phase	Voltage	Connector
NEMA 5-15	15A Single phase	120V	
NEMA 5-20	20A Single phase	120V	
NEMA 6-15	15A Single phase	200V-240V	
NEMA 6-20	20A Single phase	200V-240V	

NEMA Twist Lock Connections

These plugs are NEMA Twist Lock Connectors.

Name	Amperage / Phase	Voltage	Connector
NEMA L5-30	30A Single phase	120V	
NEMA L6-20	20A Single phase	200V-240V	
NEMA L6-30	30A Single phase	200V-240V	
NEMA L15-30	30A Three phase Δ	208V	
NEMA L21-20	20A Three phase Δ or Y	208V	
L21-30	30A Three phase Δ or Y	208V	

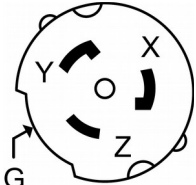
Non-NEMA Twist Lock Connector

This plug is a non-NEMA Twist Lock Connector

Plug: CS8365

Receptacle: CS8369

Connector: CS8364

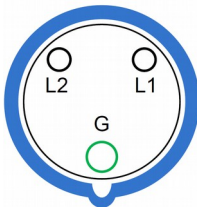
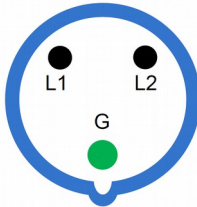
Name	Amperage / Phase	Voltage	Connector
Non-NEMA	50A Three phase Δ	208V	

IEC 390 Connectors

Hubbell Plug P/N: HBL360P6W

Hubbell Receptacle P/N: HBL360R6W

Hubbell Connector P/N: HBL360C6W

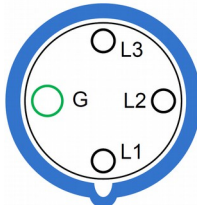
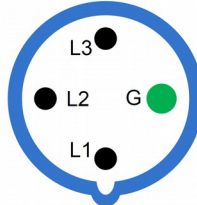
Name	Amperage / Phase	Voltage	Connector
2P+G	60A Single phase (Derated 48A*)	200V-240V	Female Sleeve  Male Pin 

* Derated, in the context to above reference, is the limiting of circuit load to 80% of capacity. For example, if a circuit has a 30 amp capacity the 80% derated load capacity is 24 amps.

Hubbell Plug P/N: HBL460P9W

Hubbell Connector P/N: HBL460C9W

Hubbell Receptacle P/N: HBL460R9W

Name	Amperage / Phase	Voltage	Connector
3P+G	60A Δ Three phase (Derated 27.7A*)	200V-240V	Female Sleeve  Male Pin 

*Derated, in the context to above reference, is the limiting of circuit load to 80% of capacity. For example, if a circuit has a 30 amp capacity the 80% derated load capacity is 24 amps.

IEC 309 Plug Sleeve Ratings

The color of the sleeve around a plug indicates its voltage rating. The colors and ratings are listed here.

Color	Voltage Rating
Yellow	100V - 130V
Orange	125V/250V
Blue	200V - 250V
Gray	277V
Red	380V - 480V
Black	500V - 690V

IEC 309 Pin Decode

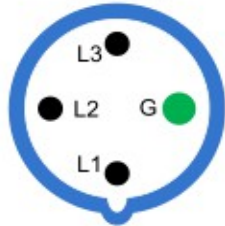
The following table is a break down of the Hubbell (HBL) part number. The numbers and letters circled in red below is an example HBL part number: HBL460R9W.

4	60	R	9	W
Pin Configuration	Amperage	Device Type	Polarization	Environmental Rating
3 - 2 Pole + G 4 - 3 Pole + G 5 - 3 Pole + N + G	20 30 32 60 63 100	P - Plug C - Connector R - Receptacle B - Inlet	Clock Position Of Female Sleeve	W-WATERTIGHT (SCREW CAP & LOCKING RING)

Female Sleeve



Male Pin

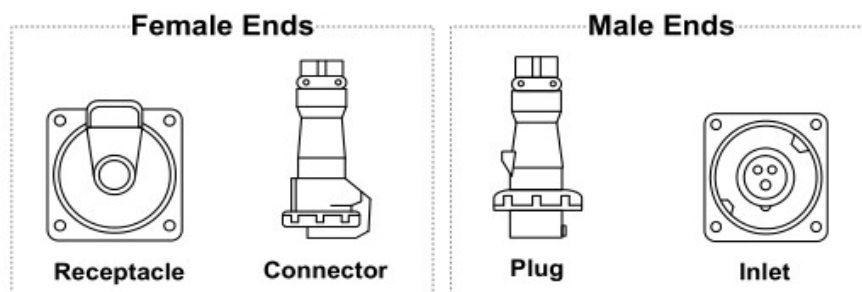


The P/N: HBL460R9W plug description is listed below:

HBL460R9W = 4 pin (3ph), 60A, Receptacle, 9 ground (G) clock face pin position, Watertight.

Note: The number of pins indicates the phase: 3 pins = 1ph, 4 pins = 3ph Δ, and 5 pins = 3 ph Y

The device types: (R, C, P, and B) are pictured here.



Copper Wire Gauge Requirements per NEC / UL®

The following table displays the copper wire gauge requirements per NEC/UL.

Branch Circuit Rating	Derated Value (per phase)	Derated Watts	AWG*	Number of Conductors
15A / 120V 1ph	12A / 120V 1ph	1440W	14	3 (P+N+G)
15A / 208V 1ph	12A / 208V 1ph	2946W	14	3 (2P+G)
20A / 120V 1ph	16A / 120V 1ph	1920W	12	3 (P+N+G)
20A / 208V 1ph	16A / 208V 1ph	3328W	12	3 (2P+G)
20A / 208V 3ph Δ	16 A / 208V 3ph Δ (9.23A / 208V)	5764W	12	4 (3P+G)
20A / 208V 3ph Y	16A / 208V 3ph Y (16A / 120V)	5764W	12	5 (3P+N+G)
30A / 120V 1ph	24A / 120V 1ph	2880W	10	3 (P+N+G)
30A / 208V 1ph	24A / 208V 1ph	4992W	10	3 (2P+G)
30A / 208V 3ph Δ	24 A / 208V 3ph Δ (13.85A / 208V)	8646W	10	4 (3P+G)
30A / 208V 3ph Y	24A / 208V 3ph Y (24A / 120V)	8646W	10	5 (3P+N+G)
40A / 208V 1ph	32A / 208V 1ph	6656W	8	3 (2P+G)
50A / 208V 1ph	40A / 208V 1ph	8320W	6	3 (2P+G)
50A / 208V 3ph Δ	40 A / 208V 3ph Δ (23.09A / 208V)	14410W	6	4 (3P+G)
60A / 208V 1ph	48A / 208V 1ph	9984W	6	3 (2P+G)
60A / 208V 3ph Δ	48 A / 208V 3ph Δ (27.7A / 208V)	17292W	4	4 (3P+G)
80A / 208V 1ph	64A / 208V 1ph	13312W	4	3 (2P+G)

* AWG = America Wire Gauge

Flexible Cord & Cable Jacket Designations per UL®

E = Thermoplastic Elastomer Insulation

H = Heater Cord

O = Oil Resistant¹

P = Parallel Conductor Cord – Always Light Duty

S = Extra Hard Usage Flexible Cord

SJ = Hard Usage Flexible Cord

SV = Not Hard Usage Flexible Cord

T = Thermoplastic Insulation

W = Moisture & Sunlight Resistant

-1, -2, -3 = Insulation Thickness for Parallel Cords²

VW-1 = Flame Retardant (UL® designation)

FT2 = Flame Retardant (CSA® designation)

1 - Single "O" means jacket only is oil resistant (i.e.

SJEOW); double "O" means jacket and conductor insulation are oil resistant (i.e. SEOOW)

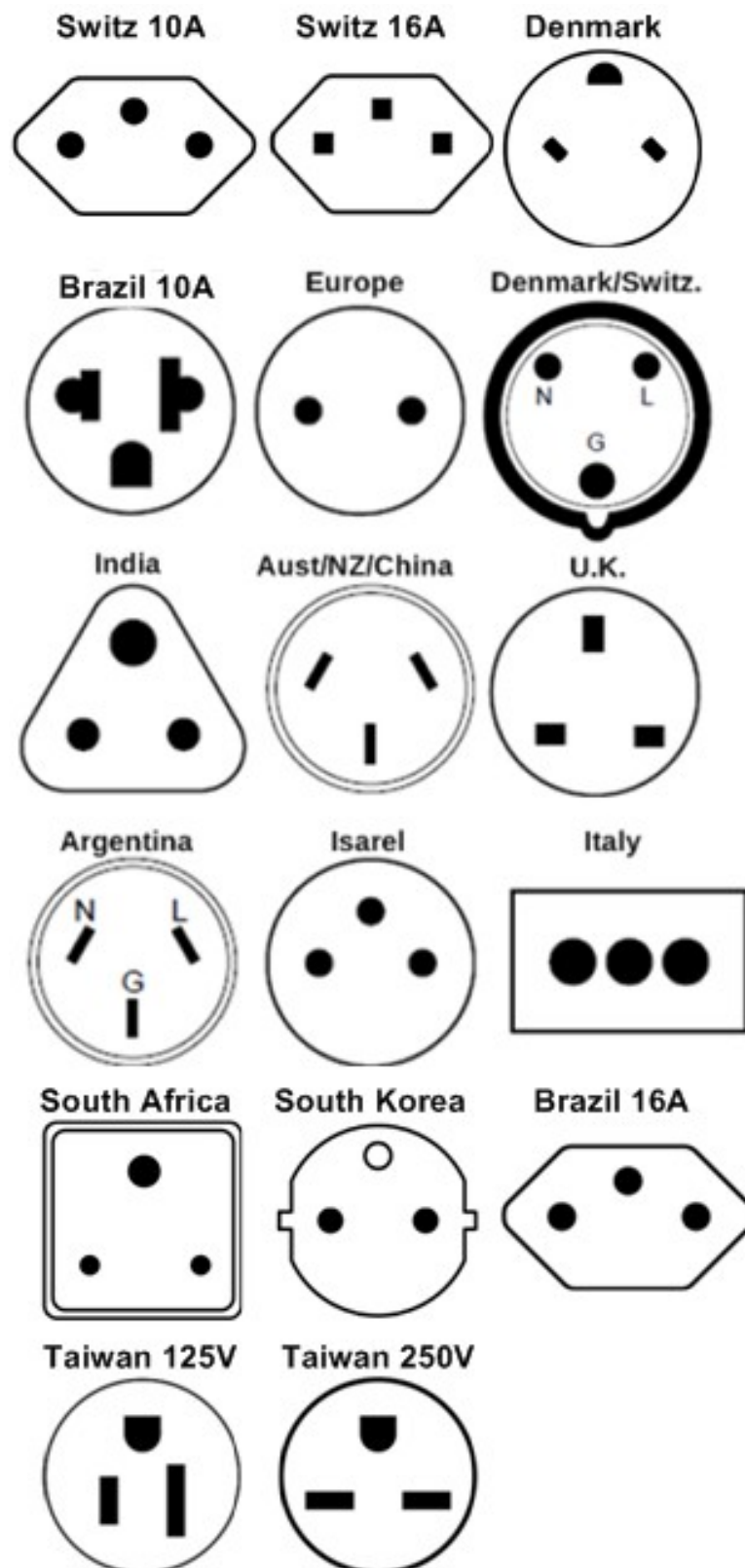
2 - Insulation thinnest to thickest, actual thickest varies with AWG size and cord type

Examples: SJT – Hard usage, thermoplastic

SPT-1 – Parallel cord, thermoplastic

International Plug Reference

The following section shows the International Plugs.



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