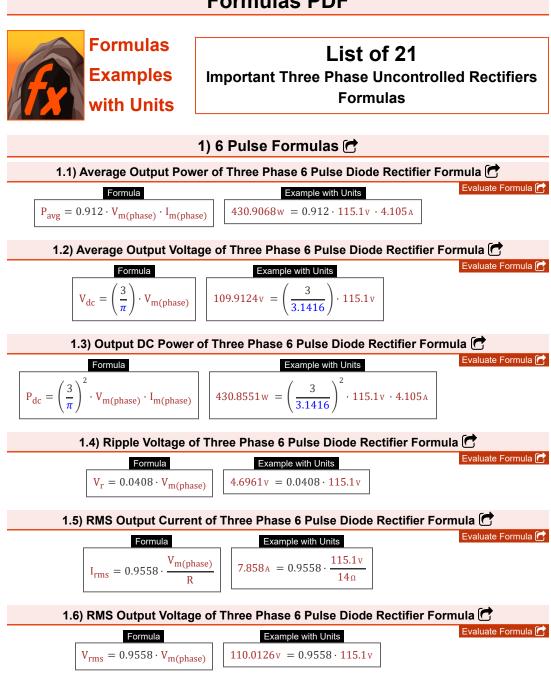
# Important Three Phase Uncontrolled Rectifiers Formulas PDF





# 2) Full Wave Formulas 🕝

#### 2.1) Average Diode Current of Three Phase Uncontrolled Rectifier Formula 🕝

Formula  
$$I_{d(avg)} = \frac{\sqrt{3} \cdot n \cdot V_{max}}{2 \cdot \pi \cdot R_{L}}$$

#### Example with Units

$$130.142_{\text{A}} = \frac{\sqrt{3} \cdot 15 \cdot 220_{\text{V}}}{2 \cdot 3.1416 \cdot 6.99_{\Omega}}$$

Evaluate Formula 🕝

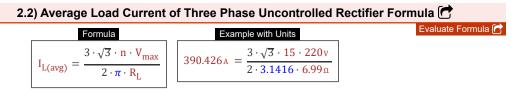
Evaluate Formula

Evaluate Formula

Evaluate Formula

Evaluate Formula

Evaluate Formula



### 2.3) Load Current of DC Three Phase Uncontrolled Rectifier Formula 🕝

Formula	Example with Units
$I_{L(dc)} = \frac{3 \cdot \sqrt{3} \cdot V_{max}}{2 \cdot \pi \cdot R_{L}}$	$26.0284_{\rm A} = \frac{3 \cdot \sqrt{3} \cdot 220 v}{2 \cdot 3.1416 \cdot 6.99 \Omega}$

2.4) Load Voltage of DC Three Phase Uncontrolled Rectifier Formula 🕝

Formula	Example with Units
$V_{L(dc)} = \frac{3 \cdot \sqrt{3} \cdot V_{max}}{2 \cdot \pi}$	$181.9385v = \frac{3 \cdot \sqrt{3} \cdot 220v}{2 \cdot 3.1416}$

2.5) Load Voltage of Full Wave Three Phase Uncontrolled Rectifier Formula 🕝

Formula	Example with Units
$V_{ac} = \frac{2 \cdot n \cdot V_{max}}{\pi}$	$2100.8452v = \frac{2 \cdot 15 \cdot 220v}{3.1416}$

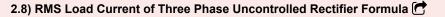
2.6) Power Delivered to Load in Three Phase Uncontrolled Rectifier Formula

FormulaExample with Units
$$P_{out} = V_{ac} \cdot V_{dc}$$
230882.8655 w = 2100.845 v \cdot 109.9 v

#### 2.7) RMS Diode Current of Three Phase Uncontrolled Rectifier Formula 🕝







Evaluate Formula (

Evaluate Formula

Formula	 Example with Units
$I_{L(rms)} = \frac{n \cdot V_{max}}{R_L \cdot \sqrt{2}} \cdot \sqrt{1 + \frac{3 \cdot \sqrt{3}}{2 \cdot \pi}}$	$451.222  \text{A} = \frac{15 \cdot 220  \text{v}}{6.99  \text{a} \cdot \sqrt{2}} \cdot \sqrt{1 + \frac{3 \cdot \sqrt{3}}{2 \cdot 3.1416}}$

### 2.9) RMS Load Voltage of Three Phase Uncontrolled Rectifier Formula 🕝

Formula	Example with Units	
$V_{L(rms)} = \frac{n \cdot V_{max}}{\sqrt{2}} \cdot \sqrt{1 + \frac{3 \cdot \sqrt{3}}{2 \cdot \pi}}$	$3154.0417v = \frac{15 \cdot 220v}{\sqrt{2}} \cdot \sqrt{1 + \frac{3 \cdot \sqrt{3}}{2 \cdot 3.1416}}$	

# 3) Half Wave Formulas 🕝

### 3.1) Average Output Power of Three Phase Half Wave Diode Rectifier with R Load Formula 🕝

FormulaExample with UnitsEvaluate Formula
$$P_{avg} = 0.684 \cdot V_{m(phase)} \cdot I_{m(phase)}$$
 $323.1801w = 0.684 \cdot 115.1v \cdot 4.105 A$  $4.105 A$ 

3.2) Average Output Voltage of Three Phase Half Wave Diode Rectifier with R Load in Line Voltage Terms Formula

FormulaExample with UnitsEvaluate Formula
$$V_{dc} = \left(\frac{3}{2 \cdot \pi}\right) \cdot V_{m(line)}$$
114.2191 v =  $\left(\frac{3}{2 \cdot 3.1416}\right) \cdot 239.22 v$ 

3.3) Average Output Voltage of Three Phase Half Wave Diode Rectifier with R Load in Phase Voltage Terms Formula

FormulaExample with UnitsEvaluate Formula
$$V_{dc} = \left(\frac{3 \cdot \sqrt{3}}{2 \cdot \pi}\right) \cdot V_{m(phase)}$$
95.1869v =  $\left(\frac{3 \cdot \sqrt{3}}{2 \cdot 3.1416}\right) \cdot 115.1v$ 

3.4) Ripple Voltage of Three Phase Half Wave Diode Rectifier Formula 🗂

Example with Units	Evaluate Formula 🔂
$7.3801v = 0.151 \cdot 115.1v$	

3.5) RMS Output Current of Three Phase Half Wave Diode Rectifier with R Load Formula 🕝



### 3.6) RMS Output Voltage of Three Phase Half Wave Diode Rectifier with Resistive Load Formula

—						
Formula	Example with Units	Evaluate Formula 🕝				
$V_{\rm rms} = 0.84068 \cdot V_{\rm m(phase)}$	$96.7623v = 0.84068 \cdot 115.1v$					



# Variables used in list of Three Phase Uncontrolled Rectifiers Formulas above

- Id(avg) Average Diode Current (Ampere)
- Id(rms) RMS Diode Current (Ampere)
- IL(avg) Average Load Current (Ampere)
- IL(dc) DC Load Current (Ampere)
- IL(rms) RMS Load Current (Ampere)
- Im(phase) Peak Phase Current (Ampere)
- Irms Root Mean Square Current (Ampere)
- **n** Winding Ratio
- Pavg Average Output Power (Watt)
- Pdc DC Power Output (Watt)
- Pout Delivery Power (Watt)
- R Resistance (Ohm)
- R<sub>L</sub> Load Resistance (Ohm)
- Vac AC Voltage (Volt)
- Vdc Average Output Voltage (Volt)
- V<sub>L(dc)</sub> DC Load Voltage (Volt)
- V<sub>L(rms)</sub> RMS Load Voltage (Volt)
- Vm(line) Peak Line Voltage (Volt)
- Vm(phase) Peak Phase Voltage (Volt)
- Vmax Peak Input Voltage (Volt)
- V<sub>r</sub> Ripple Voltage (Volt)
- V<sub>rms</sub> RMS Output Voltage (Volt)

# Constants, Functions, Measurements used in list of Three Phase Uncontrolled Rectifiers Formulas above

- constant(s): pi,
  3.14159265358979323846264338327950288
  Archimedes' constant
- Functions: sqrt, sqrt(Number) A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: Electric Current in Ampere (A) Electric Current Unit Conversion
- Measurement: Power in Watt (W) Power Unit Conversion
- Measurement: Electric Resistance in Ohm (Ω)
  Electric Resistance Unit Conversion
- Measurement: Electric Potential in Volt (V) Electric Potential Unit Conversion



Important Single Phase Uncontrolled
 Important Three Phase Uncontrolled
 Rectifiers Formulas C
 Rectifiers Formulas C

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• 🔀 Percentage error 🕝

LCM of three numbers

Subtract fraction C

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