

Electrical Formulas

To Find	Alternating Current		
	Single-Phase	Three-Phase	Direct Current
Amperes when horsepower is known	$\frac{hp \times 746}{E \times \text{Eff} \times pf}$	$\frac{hp \times 746}{1.73 \times E \times \text{Eff} \times pf}$	$\frac{hp \times 746}{E \times \text{Eff}}$
Amperes when kilowatts are known	$\frac{Kw \times 1000}{E \times pf}$	$\frac{Kw \times 1000}{1.73 \times E \times pf}$	$\frac{Kw \times 1000}{E}$
Amperes when Kva are known	$\frac{Kva \times 1000}{E}$	$\frac{Kva \times 1000}{1.73 \times E}$	-
Kilowatts	$\frac{I \times E \times pf}{1000}$	$\frac{1.73 \times I \times E \times pf}{1000}$	$\frac{I \times E}{1000}$
Kva	$\frac{I \times E}{1000}$	$\frac{1.73 \times I \times E}{1000}$	-
Horsepower = (Output)	$\frac{I \times E \times \text{Eff} \times pf}{746}$	$\frac{1.73 \times I \times E \times \text{Eff} \times pf}{746}$	$\frac{I \times E \times \text{Eff}}{746}$

I = Amperes; E = Volts; Eff = Efficiency; pf = power factor;
Kva = Kilovolt Amperes; Kw = Kilowatts; R = Ohms.

To Find	Alternating or Direct Current
Amperes when voltage and resistance are known	$\frac{E}{R}$
Voltage when resistance and current are known	$I \times R$
Resistance when voltage and current are known	$\frac{E}{I}$

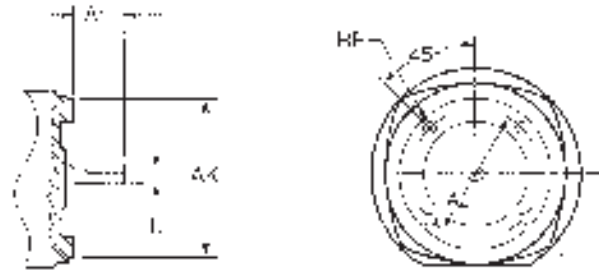
General Information (Approximation)

All Values At 100% Load

- At 1800 rpm, a motor develops 36 lb.-in. per hp
- At 1200 rpm, a motor develops 54 lb.-in. per hp
- At 575 volts, a 3-phase motor draws 1 amp per hp
- At 460 volts, a 3-phase motor draws 1.25 amp per hp
- At 230 volts, a 3-phase motor draws 2.5 amp per hp
- At 230 volts, a single-phase motor draws 5 amp per hp
- At 115 volts, a single-phase motor draws 10 amp per hp

Critical Motor Mounting Dimensions

C-FACE 56C-365TC



Frame Size	AH	AJ	AK	BF	No.	Depth	U	Key Sq.	Key Length
56C	2.06	5.88	4.500	3/8-16	4	0.56	0.625	0.188	1.25
143-145TC	2.12	5.88	4.500	3/8-16	4	0.56	0.875	0.188	1.25
182-184TC	2.62	7.25	8.500	1/2-13	4	0.75	1.125	0.250	1.75
213-215TC	3.12	7.25	8.500	1/2-13	4	0.75	1.375	0.312	2.38
254-256TC	3.75	7.25	8.500	1/2-13	4	0.75	1.625	0.375	2.88
284-286TC	4.38	9.00	10.500	1/2-13	4	0.75	1.875	0.500	3.25
324-326TC	5.00	11.00	12.500	5/8-11	4	0.94	2.125	0.500	3.88
364-365TC	5.62	11.00	12.500	5/8-11	4	0.94	2.375	0.625	4.25

Note: Dimensions are for estimating purposes only.

Motor Amps @ Full Load*

hp	Alternating Current			hp	Alternating Current			hp	Alternating Current			hp	Alternating Current		
	Single-Phase	3-Phase	DC		Single-Phase	3-Phase	DC		Single-Phase	3-Phase	DC		Single-Phase	3-Phase	DC
1/2	4.9	2.0	2.7	5	28	14.4	20	25	-	60	92	75	-	180	268
1	8.0	3.4	4.8	7-1/2	40	21.0	29	30	-	75	110	100	-	240	355
1-1/2	10.0	4.8	6.6	10	50	26.0	38	40	-	100	146	125	-	300	443
2	12.0	6.2	8.5	15	-	38.0	56	50	-	120	180	150	-	360	534
3	17.0	8.6	12.5	20	-	50.0	74	60	-	150	215	200	-	480	712

* Baseline only; varies by manufacturer.

Values are for all speeds and frequencies @ 230 volts. Amperage other than 230 volts can be figured:

$$A = \frac{230 \times \text{Amp from Table}}{\text{New Voltage}}$$

Example:

$$\text{For 60 hp, 3 phase @ 550 volts: } \left(\frac{230 \times 150}{550} \right) = 62 \text{ amps.}$$

Power Factor estimated @ 80% for most motors. Efficiency is usually 80-90%.

NEMA Electrical Enclosure Types

Type	Description	Type	Description
NEMA Type 1 (General Purpose)	For indoor use wherever oil, dust or water is not a problem	NEMA Type 5 Dust Tight (Non-Hazardous)	Used for excluding dust (All NEMA 12 enclosures are usually suitable for NEMA 5 use)
NEMA Type 2 (Driptight)	Used indoors to exclude falling moisture and dirt	NEMA Type 9 Dust Tight (Hazardous)**	For locations where combustible dusts are present
NEMA Type 3 (Weatherproof)	Provides protection against rain, sleet and snow		
NEMA Type 4 (Watertight)*	Needed when subject to great amounts of water from any angle—such as areas which are repeatedly hosed down	NEMA Type 12 (Industrial Use)	Used for excluding oil, coolant, flying dust, lint, etc.
NEMA Type 4x (Corrosion-Resistant)	Needed when subject to great amounts of water from any angle—such as areas which are repeatedly hosed down, corrosion-resistant		

* Not designed to be submerged.

** Class II Groups E, F and G.

