

# PRODUCT INFORMATION PACKET



Model No: 193320.60  
Catalog No: 193320.60  
20 HP General Purpose, 3 phase, 1200 RPM, 230/460 V, 180L Frame, TEFC  
Cast Iron Motors



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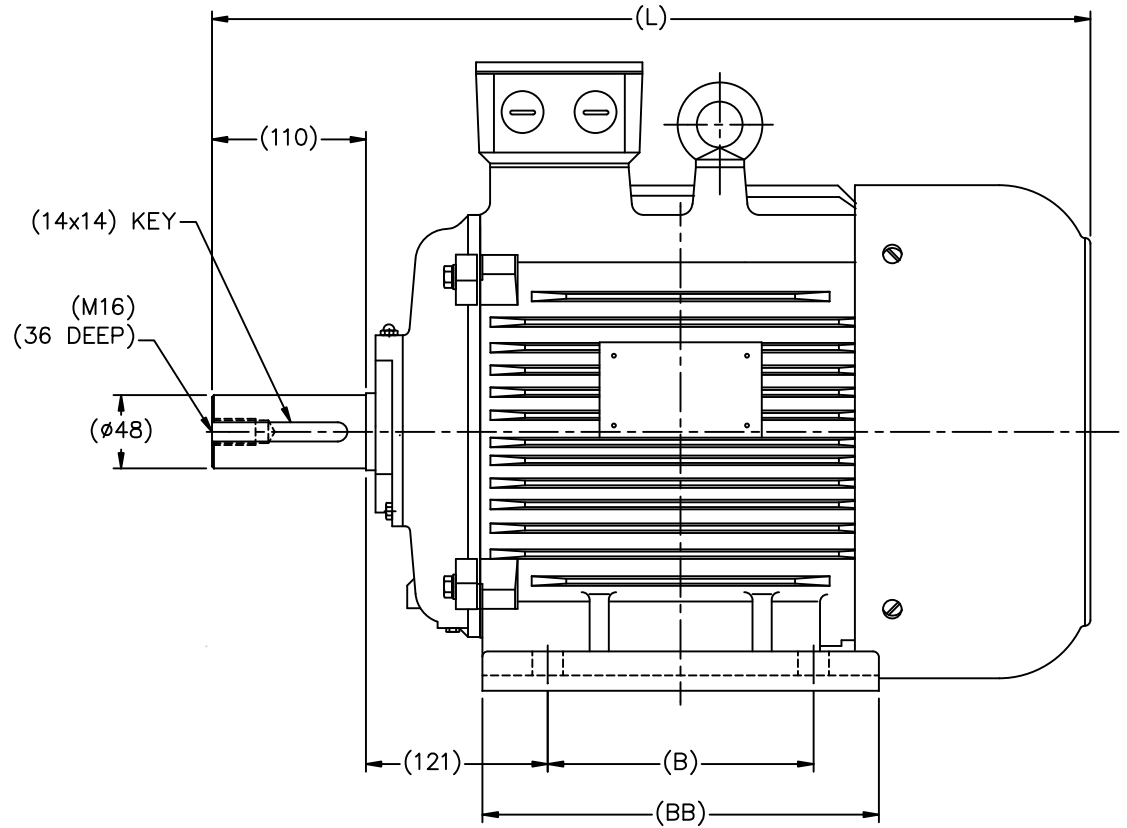
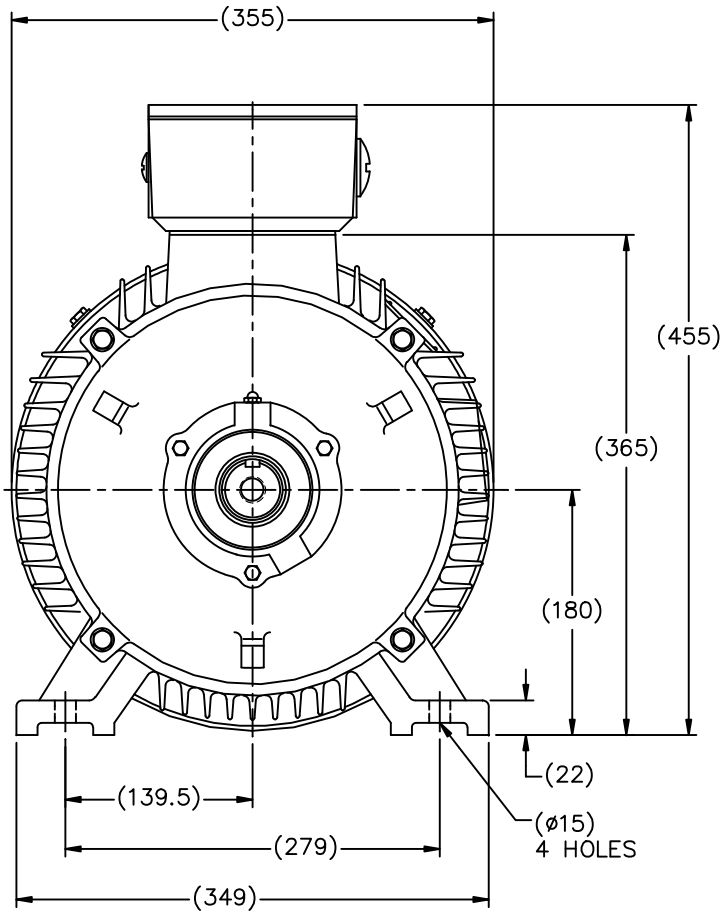
### Nameplate Specifications

Output HP	<b>20 Hp</b>	Output KW	<b>14.9 kW</b>
Frequency	<b>60 Hz</b>	Voltage	<b>230/460 V</b>
Current	<b>54.0/27.0 A</b>	Speed	<b>1185 rpm</b>
Service Factor	<b>1.15</b>	Phase	<b>3</b>
Efficiency	<b>92.4 %</b>	Power Factor	<b>75</b>
Duty	<b>Continuous</b>	Insulation Class	<b>F</b>
Design Code	<b>B</b>	KVA Code	<b>G</b>
Frame	<b>180L</b>	Enclosure	<b>Totally Enclosed Fan Cooled</b>
Thermal Protection	<b>No</b>	Ambient Temperature	<b>40 °C</b>
Drive End Bearing Size	<b>6311</b>	Opp Drive End Bearing Size	<b>6211</b>
UL	<b>Recognized</b>	CSA	<b>Y</b>
CE	<b>Y</b>	IP Code	<b>55</b>
Number of Speeds	<b>1</b>		

### Technical Specifications

Electrical Type	<b>Squirrel Cage Inverter Rated</b>	Starting Method	<b>Wye Start Delta Run Or Inverter</b>
Poles	<b>6</b>	Rotation	<b>Reversible</b>
Mounting	<b>Rigid Base</b>	Motor Orientation	<b>Horizontal</b>
Drive End Bearing	<b>Ball</b>	Opp Drive End Bearing	<b>Ball</b>
Frame Material	<b>Cast Iron</b>	Shaft Type	<b>IEC</b>
Overall Length	<b>26.77 in</b>	Shaft Diameter	<b>1.875 in</b>
Shaft Extension	<b>4.33 in</b>	Assembly/Box Mounting	<b>F3</b>
Inverter Load	<b>CONSTANT 10:1</b>		
Connection Drawing	<b>004172.01</b>	Outline Drawing	<b>B-SS622257</b>

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(MAY NOT BE DRAWN TO SCALE)

(DIMENSIONS ARE IN MILLIMETERS)

Cat.No	FRAME	B	BB	L
193324.60 193322.60	DF180M	241	311	680
193325.60 193320.60	DF180L	279	349	718

NO.		REVISION	BY & DATE	CHK	ANG	FINISH	PREV
THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS IS AN ELECTRONICALLY GENERATED DOCUMENT - DO NOT SCALE THIS PRINT				RFP	12-22-2010	CAD FILE	SS622257
				DIST		SIZE	DRAWING NO. PAGE OF REV.
						B	SS622257

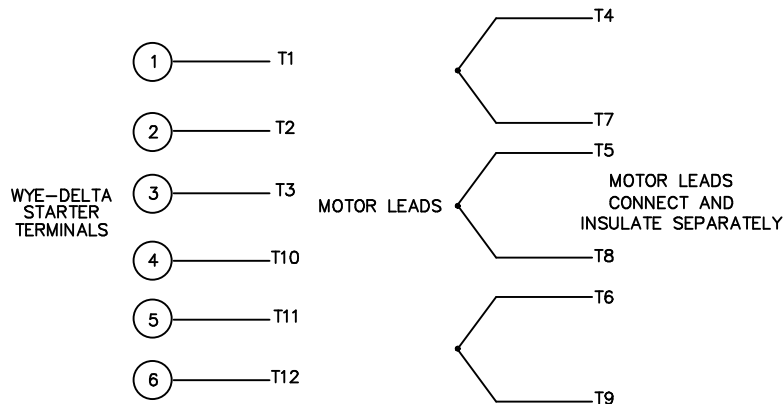
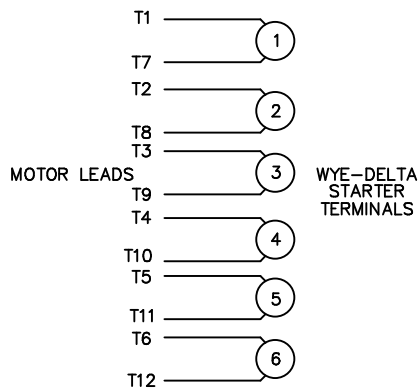
<table border="1"> <tr><th colspan="2">TOLERANCES UNLESS SPECIFIED</th></tr> <tr><td>DEC.</td><td>METRIC</td></tr> <tr><td>.X</td><td>±2.5</td></tr> <tr><td>.XX</td><td>±.76</td></tr> <tr><td>.XXX</td><td>±.127</td></tr> <tr><td>.XXXX</td><td>±.0127</td></tr> </table>	TOLERANCES UNLESS SPECIFIED		DEC.	METRIC	.X	±2.5	.XX	±.76	.XXX	±.127	.XXXX	±.0127		DRAWN HLB 12-06-2010 CHK DJK 12-17-2010 APPD SB 12-13-2010 SCALE 1=18 REF FMF HEBE1 PREV
TOLERANCES UNLESS SPECIFIED														
DEC.	METRIC													
.X	±2.5													
.XX	±.76													
.XXX	±.127													
.XXXX	±.0127													

TITLE OUTLINE  
DF180M,L-4,6

WYE - DELTA STARTING USEABLE ON 2,4 AND 6 POLE MOTORS.

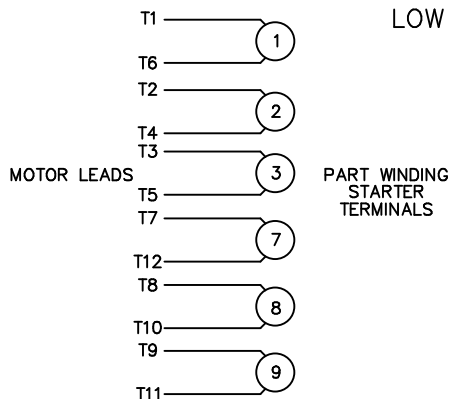
LOW VOLTAGE CONNECTION

HIGH VOLTAGE CONNECTION



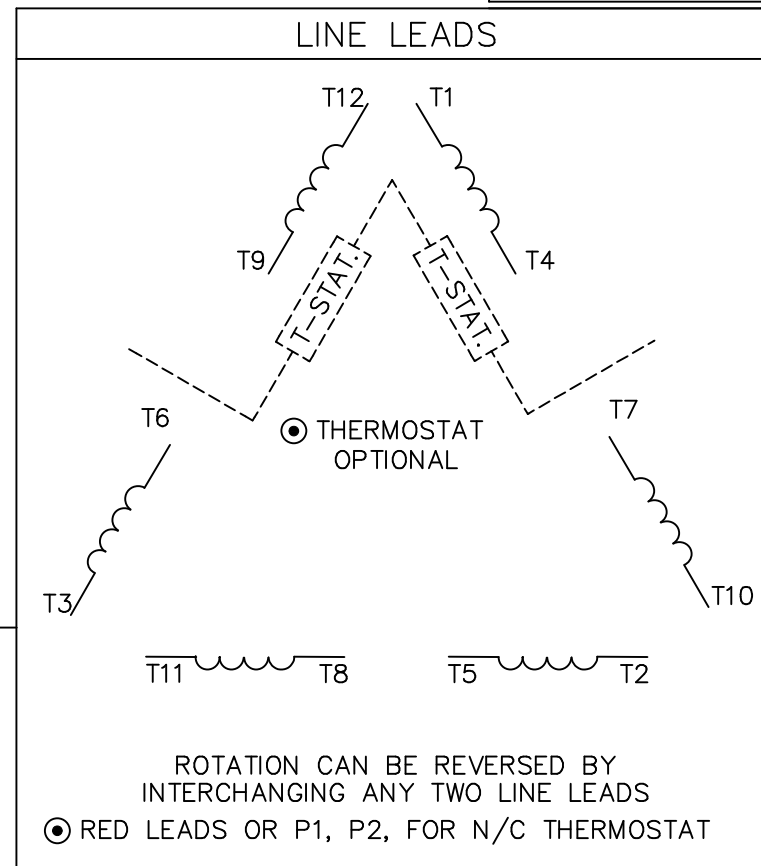
REFER TO THE WYE-DELTA STARTER CONNECTION INSTRUCTIONS FOR PROPER CONNECTION OF POWER LINES TO STARTER.

PART WINDING START USABLE ON 4 & 6 POLE MOTORS  
LOW VOLTAGE CONNECTION ONLY



REFER TO THE PART WINDING STARTER INSTRUCTIONS FOR PROPER CONNECTION OF POWER LINES TO STARTER.

REFER TO THE CUTLER - HAMMER OR EQUIV. FOR PROPER SELECTION OF OVERLOAD HEATER COILS.



ACROSS THE LINE START & RUN				
	LINE 1	LINE 2	LINE 3	JOIN & INSULATE SEPARATELY
HIGH VOLT	T1, T12	T2, T10	T3, T11	(T4, T7) (T5, T8) (T6, T9)
LOW VOLT	T1, T6 T7, T12	T2, T4 T8, T10	T3, T5 T9, T11	

				TOLERANCES UNLESS SPECIFIED		ELECTRIC MOTORS GEARMOTORS AND DRIVES	DRAWN WLW 09/08/77		
				DEC.	INCHES		CHK RPB 09/12/77		
				.X	±.1		APPD JCW 09/12/77		
03	REV'D LOW VOLTAGE CONN. LEADS PER ELEC.	BJB 06/07/00	.XX	±.01	TITLE	DELTA - WYE CONNECTION DIAGRAM	SCALE	1=1	
02	ADDED T-STAT. NOTES PER ELECTRICAL	KMM 06/02/98	.XXX	±.005			REF		
01	REDRAWN TO CAD	DBT 06/02/97	.XXXX	±.0005	MAT'L.		FMF		
NO.	REVISION	BY & DATE	CHK	ANG	±1/2"	FINISH	PREV		
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				DIST			A	004172-01	03



**CERTIFICATION DATA SHEET**

**1051 CHEYENNE AVE.  
GRAFTON, WI 53024  
PH. 262-377-8810**

**CATALOG #:** 193320.60

**CONN. DIAGRAM:** 004172.01

**OUTLINE:** B-SS622257

**MOUNTING:** F3

**WINDING #:** T14506013 FR 3

**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
20&15	14.9&11.2	1200	1185&985	180L	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&200/400	54/27&50/25	Y START D RUN OR INV	CONTINUOUS	F5	1.15/1.15	40

FULL LOAD EFF:	92.4&91	3/4 LOAD EFF:	92.4	1/2 LOAD EFF:	91	GTD. EFF		ELEC. TYPE	
FULL LOAD PF:	75&69	3/4 LOAD PF:	70	1/2 LOAD PF:	59.2	91		SQ CAGE INV RATED	

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
88 LB-FT	290 / 145	142 LB-FT 160 %	230 LB-FT 260 %	50

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
55.5 dBA	65.5 dBA	6.64 LB-FT^2	6.6 LB-FT^2	15 SEC.	2	400 LBS.

**\*\*\* SUPPLEMENTAL INFORMATION \*\*\***

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	PREMIUM SEVERE DUTY	NONE	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	STANDARD IEC	NONE	NONE	AISI 1045 (C-240)	CAST IRON
6311	6211						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
TSTATS (N/C)	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

\*  
N  
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T  
E

<b>INVERTER TORQUE:</b> CONSTANT 10:1
<b>INV. HP SPEED RANGE:</b> NONE
<b>ENCODER:</b> NONE NONE NONE NONE NONE PPR
<b>BRAKE:</b> NONE NONE NONE P/N NONE NONE NONE NONE FT-LB NONE V NONE Hz

Data Sheet

Date: 1/17/2018

193320.60



Data @ 460 V

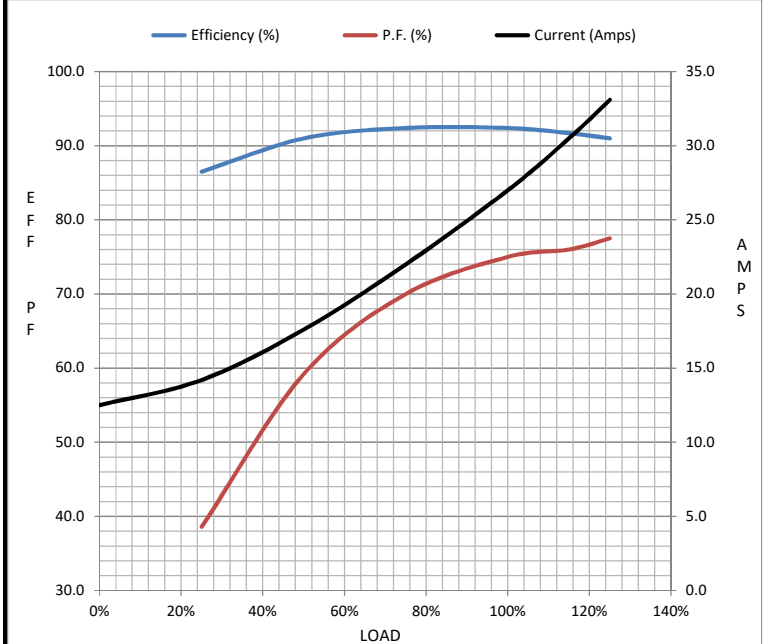
Motor Load Data

Load	0%	25%	50%	75%	100%	115%	125%	LR
Current (Amps)	12.5	14.2	17.6	22.0	27.0	30.5	33.1	145
Torque (ft-lb)	0.00	22.0	45.0	67.0	88.0	103	112	142
RPM	1200	1197	1192	1190	1185	1,180	1180	0
Efficiency (%)		86.5	91.0	92.4	92.4	91.7	91.0	
P.F. (%)	5.1	38.6	59.2	70.0	75.0	76.0	77.5	0.0

Motor Speed Data

	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	850	1110	1185	1200
Current (Amps)	145	135	99.0	27.0	12.5
Torque (ft-lb)	142	123	230	88.0	0.00

Information Block				
HP	20.0			
Sync. RPM	1200			
Frame	286			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#200/400 V			
Frequency	60 Hz			
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	55 °C			
Duty	CONT			
Ambient	40 °C			
Elevation	1,000 feet			
Rotor/Shaft wk <sup>2</sup>	6.6 Lb-Ft <sup>2</sup>			
Ref Wdg	T14506013 FR			
Sound Pressure @ 1M	56 dBA			
VFD Rating	CONSTANT 10:1			
Outline Dwg	B-SS622257			
Conn. Diag	004172.01			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0000	0.0000	0.0000	0.0000	0.0000



Speed - Torque Curve

