DIRECT CURRENT MOTORS
NEMA FRAME • SCR (THYRISTOR)

NEMA FRAME MOTORS • SCR RATED

General Specifications:

High voltage permanent magnet DC motors are typically used with an SCR (thyristor) controller in applications requiring adjustable speed and constant torque throughout the speed range. They are also widely used in applications requiring dynamic braking or adjustable speed/reversing capabilities.

Mechanical Features:

Low profile space-saving design. Unique brush holder design provides easy access to brushes and integral constant pressure brush/spring assembly for servicing. Large over-sized brushes assure longer brush life. Heavy-duty, stamped steel, bolt-on base (removable). NEMA C face mounting at no additional cost. Rugged die cast aluminum endshields with cast iron bearing inserts. Permanently lubricated sealed ball bearings. May be converted NEMA 48 base and/or C face using modification kits noted below.

Electrical Features:

Input power of 115 or 230 volts rectified AC when used with an appropriate SCR control. Linear speed/torque characteristics over entire speed range. High starting torque for heavy load applications. Capable of dynamic braking for faster stops. Reversible rotation with simple two-lead connection. For further information on Direct Current Motors, request Bulletin 1600.

PWM RATED PM DC MOTORS

The DC motors listed above have been designed for use on unfiltered SCR (Thyristor) type rectified AC input. These motors may also be used with PWM (pulse width modulated) type DC adjustable speed drives at a higher HP rating. See the chart on page 149 for re-rating data.

TEFC • SCR RATED 90 & 180 VOLTS
NEMA 56C • C FACE WITH REMOVABLE BASEΣ

HP	Full Load RPM	NEMA Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
.17	1750	SS56C	**108220**	$448	A	20	90	115	-	-
1/4	1750	SS56C	**098002**	427	A	19	90	115	2.5	10.81
	1750	SS56C	**098003**	452	A	22	180	230	1.4	11.31
1/3	1750	SS56C	**098004**	437	A	23	90	115	3.5	11.31
	1750	SS56C	**098005**	480	A	22	180	230	1.7	11.31
	1140	S56C	**109098**	358	A	32	90	115	3.5	12.81
1/2	2500	SS56C	**098006**	548	A	21	90	115	5.0	10.81
	2500	SS56C	**098007**	548	A	22	180	230	2.5	10.81
	1750	SS56C	**098000**	489	A	24	90	115	5.0	11.81
	1750	SS56C	**098008**	548	A	25	180	230	2.5	11.81
	1140	S56C	**109099**	398	A	40	90	115	5.0	13.81
3/4	2500	SS56C	**098009**	615	A	25	90	115	7.6	11.81
	2500	SS56C	**098010**	615	A	25	180	230	3.8	11.81
	1750	SS56C	**098032**	559	A	27	90	115	7.6	13.81
	1750	S56C	**108018**	727	A	35	90	115	7.6	13.81
	1750	SS56C	**098069**	702	A	27	180	230	3.8	13.81
	1750	S56C	**108019**	727	A	35	180	230	3.8	13.81
	1140	S56C	**109100**	525	A	49	90	115	7.5	16.81
1	2500	S56C	**108020**	712	A	34	90	115	10.0	13.81
	2500	S56C	**108021**	712	A	34	180	230	5.0	13.81
	1750	S56C	**108022**	782	A	40	90	115	10.0	15.81
	1750	S56C	**108023**	782	A	40	180	230	5.0	14.81
	1140	S56C	**128023**	1500	A	82	90	115	11.0	18.34
1½	2500	S56C	**108265**	998	A	41	180	230	7.5	14.81
	1750	S56C	**108092**	985	A	51	180	230	7.6	16.81
	1750	S56/145TC	**108262**■	1008	A	51	180	230	7.6	17.38
	1750	145TC	**128000**	1585	A	68	180	230	7.5	18.34
2	2500	S56/145TC	**108266**■	1423	A	51	180	230	8.6	16.81
	1750	145TC	**128010**	1758	A	78	180	230	9.5	20.15
	1750	182/145TC	**128001**◀	1758	A	78	180	230	9.5	19.34
3	1750	182/145TC	**108502**◀	2655	A	89	180	230	14.0	19.60

TACH ADAPTER KITS

All necessary parts to mount listed tachometers to stock TEFC SCR motors. Consists of machined cast fan cover, coupling and hardware. Does not include tachometer. Tach adapter kit is not suitable for catalogue number 108502.

Tachometer Type	Frame	Catalogue Number	List Price	Disc. Sym.	App. Wt.(lbs.)
GE 5PY Series	SS56	**175156**	$163	A	5
	S56	**175193**	212	A	5
	56/145	**175158**	458	A	5
Servo-tek SA740 Series	SS56	**175157**	219	A	8
	S56	**175194**	212	A	8
	56/145	**175159**	515	A	8
Airpax	SS56	**175173**	206	A	8
	S56	**175174**	232	A	8
REO-315	SS56	**175155**	194	A	5
	S56	**175197**	215	A	5
	56/145	**175198**	350	A	5

MODIFICATION KITS

DC motors in NEMA 56C frame may be converted to 42/48 C face using the following:

Frame	Catalogue No.	List Price	Disc. Sym.
SS56C	**175182**	$45	A
S56C	**175082**◇	45	A

DC motors in NEMA S56 frame may be converted to 48 base using the following:

Frame	Catalogue No.	List Price	Disc. Sym.
S56C	**175080**◇	$13	A

◇ Addition of base kit will result in non-NEMA BA dimension of $2^{3}/_{4}$". Addition of C face kit will result in conduit box located at 1 o'clock facing lead end.
Σ If base is removed, do not reinstall bolts without using washers to compensate for thickness of base.
◀ NEMA 145TC face mounting with removable NEMA 182T rigid base.
■ NEMA 145TC frame shaft $^{7}/_{8}$" x $2^{1}/_{4}$" and NEMA 56 removable base.

Catalogue numbers in blue are NEW items.

NEMA FRAME • EXPLOSION-PROOF FOR HAZARDOUS LOCATIONS

General Specifications:

These explosion-proof motors are designed and approved for application in hazardous environments having certain explosive gases or materials present.

Features:

Rugged mechanical construction meeting all requirements for safety. UL and CSA listed. NEMA 56C face with removable 56 frame base. Leads exit through ¾"-14NPT pipe-nipple in the top of the motor frame, opposite the shaft end. **Conduit box is not provided.** See optional conduit box below. These motors have pilot-duty thermostats as standard that must be connected to the SCR control. They are rated for continuous duty with full wave SCR (thyristor) controls. Double-shielded, pre-lubricated ball bearings are standard. Easy brush access for field service. These motor are UL and CSA listed.

Application Notes:

These motors must be applied in accordance with the National Electrical Code, Article #500. For a listing of explosive agents, consult NFPA Publication 497M.

EXPLOSION-PROOF • CLASS I, GROUPS C & D – CLASS II, GROUPS F & G • SCR RATED 90 & 180V C FACE WITH REMOVABLE BASE

HP	Full Load RPM	NEMA Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/3	1750	S56C	**118015**	$2256	A	23	90	115	3.5	13.41
1/2	1750	S56C	**118016**	2673	A	30	90	115	4.7	14.41
	1750	S56C	**118017**	2610	A	30	180	230	2.5	14.41
3/4	1750	S56C	**118018**	3200	A	36	90	115	7.1	16.41
	1750	S56C	**118019**	3200	A	36	180	230	3.3	16.41

EXPLOSION-PROOF CONDUIT BOX

UL and CSA listed for Class I, Group C & D, and Class II, Groups F & G locations. Has grounding screw and all hardware provided. Mounts to motor by 3/4"-14NPT opening at rear of box. For NEMA 56 frame motors only.

Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)
175026	$68	A	2
175755*	68	A	2

*For use with motors having a date code ending in the letter "P".

NEMA FRAME • WASHGUARD™❖

LEESON WASHGUARD™ motors are designed for extended life in applications requiring regular washdown as in food processing, or otherwise wet, high humidity environments. WASHGUARD™ motors retard the entrance of water during cleaning operations and release any water that does enter the motor. Extra protection for the motor's interior prevents rust and corrosion build-up and drains release trapped moisture to insure a longer life than possible with a standard motor.

Mechanical Protection Features:

High quality, corrosion resistant *303 stainless steel* shaft plus lubricated spring-loaded contact seals and patented, "V" ring Forsheda seal deflect water, protect bearings and the motor's interior. Double sealed, oversized bearings with high temperature moisture resistant lubricant are used.

Frame, base, endshields, armature and interior components protected by enamel and polyester compounds of outstanding adhesion and resistance to moisture, acids, alkalies and oil.

Cast conduit box with threaded entrance, drain holes and tough, high temperature Nitrile gaskets keep water out and resist deflection under high pressure washdowns Conduit box cover and fan cover, when used, are type 304 stainless steel.

Four drains in *each* endshield at 3,6,9,and 12 o'clock purge water, and can be repositioned for maximum effectiveness regardless of the motor's mounting. Machined fits are sealed, and nylon gaskets are used to seal bolt heads. Stainless steel data plate.

Chemically inert static free fan is positively positioned on the shaft by opposing flats, shoulder and snap ring arrangement and protected by heavy gauge, stainless steel fan guards. Finished in USDA approved tough white epoxy for superior corrosion resistance and protection against harsh caustic cleaning solutions.

WASHGUARD™ • NEMA C FACE • REMOVABLE BASE TENV • SCR RATED 90 & 180 VOLTS

HP	Full Load RPM	NEMA Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/4	1750	S56C	**108423**	$794	A	23	90	115	2.7	10.69
	1750	SS56C	**098375**	429	A	21	189	230	1.4	10.22
1/3	1750	S56C	**108424**	809	A	26	90	115	3.5	11.69
	1750	SS56C	**098376**	430	A	22	180	230	1.7	10.22
1/2	1750	S56C	**108226**	980	A	38	90	115	4.9	13.69
	1750	S56C	**108227**	980	A	39	180	230	2.4	13.69
3/4	1750	S56C	**108228**	1072	A	50	90	115	7.0	15.69
	1750	S56C	**108229**	1072	A	50	180	230	3.5	15.69
1	1750	S56C	**108230****	1093	A	42	90	115	10.0	15.81
	1750	S56C	**108231****	1093	A	42	180	230	5.0	14.81
1½	1750	S56C	**108232****	1210	A	50	180	230	7.6	16.81

WASHGUARD™ • IEC FRAME • TENV IP55 B5 FLANGE WITH REMOVABLE B3 BASE⑦▲ SCR RATED 180 VOLTS

HP	Output kW	Full Load RPM	IEC Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	F.L. Amps DC	"C" Dim. (Inches)
1/2	.37	1750	71	**098040**	$645	A	22	180	2.5	10.69
3/4	.55	1750	80	**108407**	874	A	52	180	3.5	16.02

** These motors are totally enclosed fan cooled.
❖ These motors meet IEEE 45 and military specification CCM-1807 including fungus proofing conforming to MIL-173.
⑦ If base is removed, do not reinstall bolts without using washers to compensate for the thickness of base.
▲ These WASHGUARD™ motors are modular design but stocked with B5 flange and B3 foot. The foot is removable. The B5 flange can be replaced with a B14 face or other diameter B5 flanges noted on page 75.

Catalogue numbers in blue are NEW items.

DC MOTORS

NEMA & METRIC (IEC) FRAME • SCR RATED

PREMIUM STAINLESS STEEL DUCK

General Specifications:

Designed specifically to meet the demanding sanitation requirements of the pharmaceutical, food processing, and beverage industries. These motors are also ideal in clean room and severe chemical-processing applications involving frequent washdown with nitric acid and caustic lye. In fact, WASHGUARD™ All-Stainless Motors include IEEE 841 severe-duty features right out of the box!

Mechanical Protection Features:

- All exterior components are 300-series stainless steel
- Nothing on the exterior of the motor is painted or coated in any way
- All sealing components are Viton® for superior chemical resistance.
- Full fact nameplate is laser etched on the motor frame – no separately attached nameplate to trap dirt or contaminants
- Endshields are O-ring sealed to the frame
- Double lip shaft seals on both ends of TEFC motors (shaft end only on TENV motors)
- Removable hydrophobic breathers in opposite shaft endbell and conduit box equalize pressure without allowing moisture to enter
- Exterior fastener use minimized reducing the number of entry points for moisture. There are no holes in the frame for attaching a nameplate. Bearing lock screws are located inside the motor and the conduit box mounted screws have been eliminated.
- Double-sealed bearings are pre-lubricated with moisture-resistant high-temperature grease for long life.
- Interior coatings applied to armature and frame/magnet assemble protect against corrosion
- Brush tubes are sealed with Viton® O-rings to keep moisture out
- New conduit box mounting system provides optimum sealing
- Easy to clean construction is BISSC Certified for bakery applications.

Electrical Performance and Protection Features:

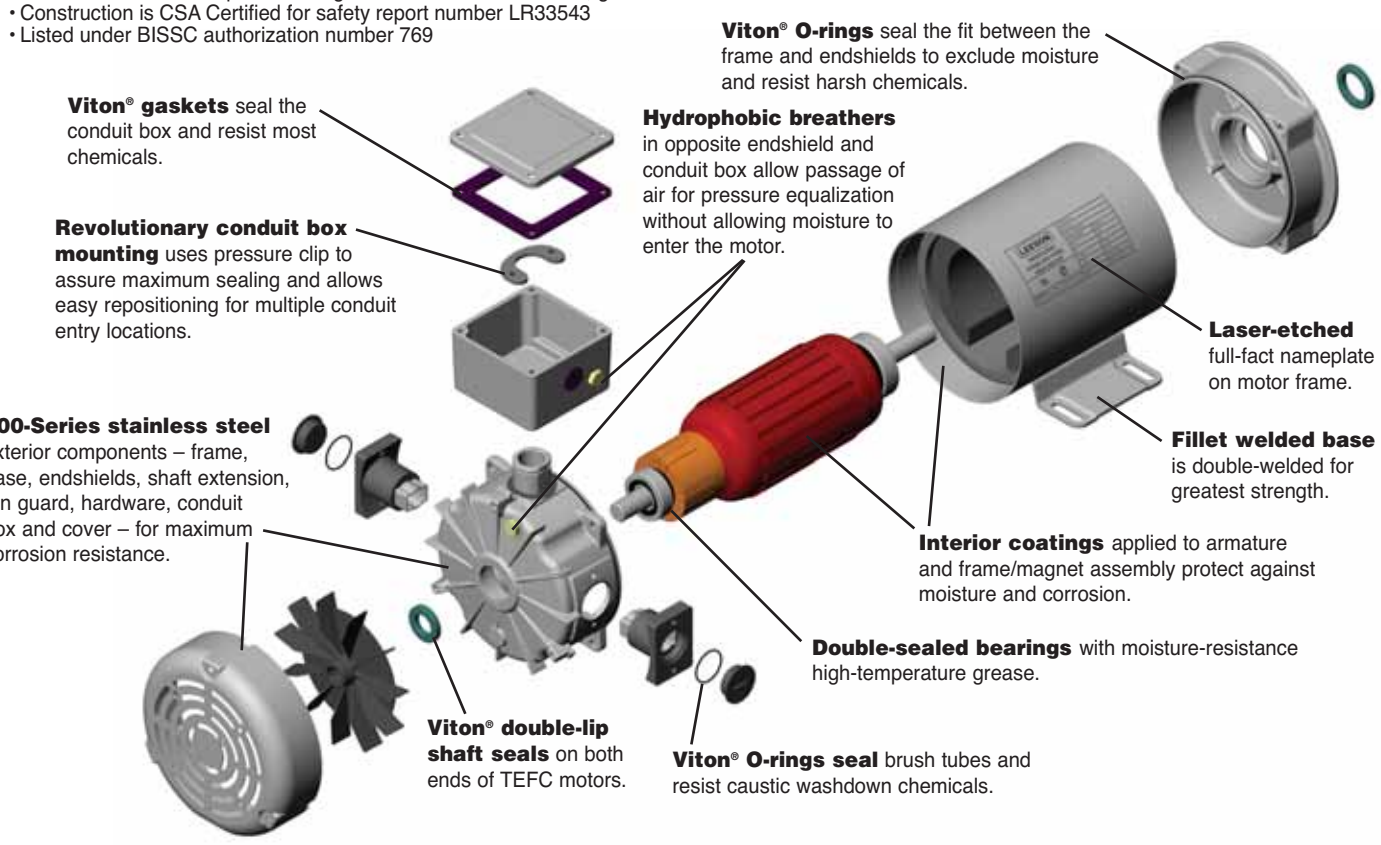
- Linear speed/torque characteristics over entire speed range.
- Armature windings are immersed and cured in a polyester insulating varnish for extra moisture-resistance
- High starting torque for hard to start loads.
- Use with LEESON SPEEDMASTER DC motor controllers for optimum performance.

Standards and Approvals:

- DC motors are UL component recognized - file number E57948, guide number PRGY2
- Construction is CSA Certified for safety report number LR33543
- Listed under BISSC authorization number 769

CHEMICAL RESISTANCE RATING CHART

CHEMICAL	CONCENTRATION	ALL STAINLESS COMPONENTS
WATER:		
De-Ionized Boiling	100%	Excellent
Salt (Immersed)	30%	Excellent
Salt (Spray)	5%	Excellent
Tap - 250°F/120°C @ 10,000 PSI	100%	Excellent
ACIDS:		
Hydrochloric	35%	Poor
Sulfuric	25%	Poor
Nitric	35%	Excellent
Picric	Saturated Solution	Excellent
BASE:		
Caustic	100%	Excellent
Caustic	12.5 pH	Excellent
Caustic - 125°F/50°C	9.5 pH	Excellent
SOLVENTS:	–	Excellent



WASHGUARD™ ALL-STAINLESS DC MOTORS

NEMA & IEC FRAME • SCR RATED

PREMIUM STAINLESS STEEL DUCK

NEMA FRAME ALL-STAINLESS PMDC MOTORS

TEFC • SCR RATED 90 & 180V • NEMA ALL-STAINLESS STEEL • C-FACE WITH BASE*

HP	RPM 60 Hz	NEMA Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/4	1750	S56C	109065●	$982	A	38	90	115	3.1	11.81
1/3	1750	S56C	109066●	995	A	44	90	115	3.8	12.81
	1750	S56C	109067●	1039	A	44	180	230	1.9	12.81
1/2	1750	S56C	109069	1020	A	46	90	115	5.2	13.87
	1750	S56C	109070	1063	A	46	180	230	2.7	13.87
3/4	1750	S56C	109072	1058	A	47	90	115	7.5	15.37
	1750	S56C	109073	1103	A	48	180	230	3.7	15.37
1	1750	S56C	109075	1109	A	51	90	115	9.5	16.37
	1750	S56C	109076	1157	A	50	180	230	5.0	16.37

● These motors are totally enclosed non-ventilated, others are TEFC.
* Base is welded to frame and not removable.

TEFC • SCR RATED 90 & 180V • NEMA ALL-STAINLESS STEEL • C-FACE LESS BASE

HP	RPM 60 Hz	NEMA Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/4	1750	S56C	109078●	$935	A	38	90	115	3.1	11.81
1/3	1750	S56C	109079●	959	A	44	90	115	3.8	12.81
	1750	S56C	109080●	952	A	44	180	230	1.9	12.81
1/2	1750	S56C	109082	975	A	46	90	115	5.2	13.87
	1750	S56C	109083	973	A	46	180	230	2.7	13.87
3/4	1750	S56C	109085	1017	A	47	90	115	7.5	15.37
	1750	S56C	109086	1015	A	48	180	230	3.7	15.37
1	1750	S56C	109088	1065	A	51	90	115	9.5	16.37
	1750	S56C	109089	1068	A	50	180	230	5.0	16.37

● These motors are totally enclosed non-ventilated, others are TEFC.

METRIC (IEC) FRAME PMDC MOTORS

TEFC • SCR RATED 90 & 180V • METRIC (IEC) ALL-STAINLESS STEEL • C-FACE WITH BASE*

HP	Kw	RPM 60 Hz	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/3	0.25	1750	80D	109068●	$1079	A	44	180	230	1.9	12.81
1/2	0.37	1750	80D	109071	1101	A	46	180	230	2.7	13.87
3/4	0.55	1750	80D	109074	1144	A	48	180	230	3.7	15.37
1	0.75	1750	80D	109077	1192	A	50	180	230	5.0	16.37

● These motors are totally enclosed non-ventilated, others are TEFC.
* Base is welded to frame and not removable.

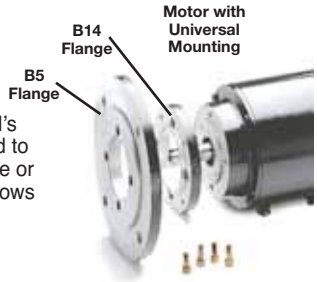
TEFC • SCR RATED 90 & 180V • METRIC (IEC) ALL-STAINLESS STEEL • C-FACE LESS BASE

HP	Kw	RPM 60 Hz	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC	"C" Dim. (Inches)
1/3	0.25	1750	80D	109081●	$1016	A	44	180	230	1.9	12.81
1/2	0.37	1750	80D	109084	1027	A	46	180	230	2.7	13.87
3/4	0.55	1750	80D	109087	1070	A	48	180	230	3.7	15.37
1	0.75	1750	80D	109090	1122	A	50	180	230	5.0	16.37

● These motors are totally enclosed non-ventilated, others are TEFC.

FLANGE AND FACE KITS FOR DC METRIC (IEC) FRAME MOTORS

The modular design concept of LEESON's other metric DC motors has been applied to the all-stainless metric motors. Any flange or face kit can mount on any motor. This allows the greatest flexibility from the smallest inventory of motors.



B5 FLANGE KITS (For Stainless DC Metric Motors)

IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	BD Flange Dia. (mm)	AK Register (mm)	BF Hole (mm)	AJ Bolt Circle (mm)
71	175593	$102	A	2	160	110	9	130
80	175594	156	A	3	200	130	12	165
90S/90L	175594	156	A	3	200	130	12	165
100L/112M	175595	225	A	5	250	180	15	215

B14 FLANGE KITS (For Stainless DC Metric Motors)

IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	BD Flange Dia. (mm)	AK Register (mm)	BF Tap (mm)	AJ Bolt Circle (mm)
71	175596	$60	A	1	105	70	6	85
80	175597	70	A	1	120	80	6	100
90S/90L	175598	85	A	1	140	95	6	115
100L/112M	175599	104	A	2	160	110	6	130

Catalog numbers in blue are NEW items.

DC MOTORS

NEMA FRAME • LOW VOLTAGE 12, 24, 36 & 48 VOLTS

NEMA FRAME LOW VOLTAGE MOTORS

General Specifications:

Low voltage permanent magnet DC motors are suitable for installations having battery or solar powered operations, or generator supplied low voltage DC.

Mechanical Features:

Unique brush holder design provides easy access to brushes and integral, constant pressure brush/spring assembly for servicing. Larger over-sized brushes assure longer brush life. Heavy-duty, stamped steel, bolt-on base (removable). NEMA C face mounting flange at no additional cost. High strength rolled steel frame. Rugged die cast aluminum endshields with steel bearing inserts. Permanently lubricated sealed ball bearings. May be converted to NEMA 48 frame base dimensions or NEMA 42/48 frame C face dimensions using modification kits noted on page 79.

Electrical Features:

High starting torques for heavy load applications. Linear speed/torque characteristics over entire speed range. Capable of dynamic braking for faster stops. Reversible rotation and simple two-lead connection. Convenient wiring access.

METRIC (IEC) FRAME • LOW VOLTAGE MOTORS IP54

General Specifications:

These metric dimensioned motors are built to IEC 34-1 electrical and mechanical standards.

The IEC 63 and smaller frames are stocked with an integral B5 flange or B14 face less base. An optional B3 rigid base kit is available.

A unique modular approach for IEC 71 frame and larger allows the motor to be field modified to B3 rigid base mounted construction, B5 flange mounted or B14 face mounted construction using conversion kits. Please note that one or more of the mounting kits must be used with IEC motors of these frame sizes. See listing on page 83 for B5 flange and B14 face kits. B3 rigid base kits are listed below.

B5 IEC 56 & 63

B14 IEC 56 & 63

Electrical & Mechanical Features:

A terminal board is provided for connections. All fasteners are metric. Electrical and mechanical features are the same as listed for the NEMA frame motors on the opposite page. Tachometer mounting kits are available for 71 and 80 frames only.

71 & 80 IEC with Modular Flange & Base Kits

LOW VOLTAGE (12, 24, 36 & 48V) • TENV/TEFC NEMA C FACE WITH REMOVABLE BASE[Σ]

HP	Full Load RPM	NEMA Frame■	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	F.L. Amps DC	"C" Dim. (Inches)
1/4	1800	S56C	**108045♣●**	$574	A	21	12	21.0	10.44
1/3	1800	S56C	**108046♣●**	625	A	24	12	27.0	11.44
	1800	S56C	**108050♣●**	600	A	22	24	13.5	10.94
1/2	1800	S56C	**108047♣●**	651	A	29	12	39.0	12.44
	1800	S56C	**108051♣●**	625	A	29	24	20.0	11.94
	1800	SS56C	**098381**	314	A	29	36	13.5	10.81
	1800	SS56C	**098382**	314	A	29	48	11.0	10.81
3/4	1800	S56C	**108048◆**	712	A	30	12	58.0	13.81
	1800	S56C	**108052**	651	A	30	24	29.0	12.81
1	1800	S56C	**108322◆**	995	A	39	12	80.0	13.81
	1800	S56C	**108053◆**	780	A	37	24	39.0	13.81
	1800	S56C	**109101**	397	A	37	36	25.5	13.81
	1800	S56C	**109102**	405	A	37	48	18.5	13.81
1½	1800	S56CZ	**109103◆❑**	652	A	39	24	60.0	17.38
	1800	S56CZ	**109104◆❑**	583	A	37	36	36.0	17.38
	1800	S56CZ	**109105◆❑**	593	A	37	48	27.0	17.38
2	1800	S56CZ	**109106◆❑**	934	A	42	24	70.0	16.31
	1800	S56CZ	**109107◆❑**	944	A	42	36	49.0	16.31
	1800	S56CZ	**109108◆❑**	938	A	42	48	38.0	16.31

♣ Built-in conduit box located at 12:00.
◆ Studs at 12:00.
Σ If base is removed, do not reinstall bolts without using washers to compensate for thickness of base.
❑ S56CZ motors have mounting bases with NEMA 56 mounting holes, NEMA 56/143-5T C-face and a NEMA 143-5T shaft extension (7/8" dia. x 2 1/4" long).
● These motors are totally enclosed, non-ventilated.
■ SS56C motors have a 4.88 inch diameter frame.
S56C motors have a 5.61 inch diameter frame.

METRIC (IEC) FRAME • LOW VOLTAGE (24V) • TEFC/TENV • MODULAR DESIGN

kW/HP	Full Load RPM	IEC Frame	Catalog Number	List Price	App. Wgt. (lbs.)	F.L. Amps DC	C Dim. (inches)
0.06/1/12	3000	56	**M1110025^●**	$338	5	3.3	5.34
	1800	56	**M1110026^●**	338	6	3.4	6.34
0.18/1/4	3000	63	**M1130206***	347	13	11.0	7.75
	3000	63	**M1130296^**	339	9	11.0	7.75
	1800	63	**M1130207***	363	13	10.0	8.75
	1800	63	**M1130297^**	359	9	10.0	8.75
	1800	71	**098065**	673	19	11.0	10.77
0.37/1/2	3000	71	**098066**	419	23	20.0	11.27
	1800	71	**098067**	399	23	20.0	12.27
0.75/1	3000	80	**108456◆**	426	33	40.0	14.14
	1800	80	**108455◆**	399	52	39.0	14.64
1.1/1½	3000	80	**108457◆**	590	33	65.0	15.64
1.5/2	3000	80	**108458◆**	676	43	78.0	17.14

IMPORTANT: IEC 71 and 80 frame motors in this chart are round body and require either B14 face, B5 flange or B3 foot from kits shown on pages 82-83.

* Dedicated B5 Flange
^ Dedicated B14 Face
● These motors are totally enclosed, non-ventilated. Others are TEFC/IC41 cooling – external cooling fan on motor shaft.

Catalog numbers in blue are NEW items.

SUB-FHP LOW VOLTAGE MOTORS

General Specifications:
Precision sub-fractional horsepower low voltage direct current permanent magnet motors designed for battery or solar powered operations, or generator supplied low voltage DC.

Mechanical Features:
Compact space saving designs. Standard conduit box simplifies connections. Ball bearings. Long-life brushes for demanding applications. Brushes easily replaced without disassembly of motor.

Electrical Features:
High starting torques for heavy load applications. Linear speed/torque characteristics over entire speed range. Capable of dynamic braking for faster stops. Reversible rotation from a simple two lead connection. Class F insulated with high temperature welded commutators.

LOW VOLTAGE (12 & 24V) • TENV • SQUARE FLANGE

HP▲	Full Load RPM	Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Input Volts DC	F.L. Amps DC
1/20	1750	25CS	**M1110006✷**	$281	S	3	12	4.4
1/10	4200						24	4.4
1/14	1750	31AS	**M1120040**	294	S	4	12	7.7
1/7	4200						24	7.7
1/7	1750	31ES	**M1120044**	357	S	9	12	13.0
1/4	3500						24	13.0
1/6	1800	31GS	**M1120046**	377	S	8	12	14.0
1/3	3900						24	14.0

✷ 25 frame motors have provision for an optional conduit box catalog number M1760000, see page 171.

▲ These motors may be operated at 12, 24V, or at intermediate voltages between 12 and 24V, within horsepower ranges noted.

COMMERCIAL DUTY METRIC (IEC) FRAME MOTORS

Specially designed low voltage DC motors for use in OEM applications. Combination of features and low cost makes these motors excellent for many uses. All feature IP44 (TENV) enclosure and dedicated B14 face mount. Rated S1 for continuous duty, and zinc plated steel frame construction.

12, 24V & 90 VOLT • TENV B14 FACE MOUNT

HP	Full Load RPM	IEC Frame▲	Catalog Number	List Price△	App. Wgt. (lbs.)	Arm. Volts DC	F.L. Amps DC
1/15	3000	56	980.159	$150	2,3	12	6,0
	3000	56	980.143	149	2,3	24	3,2
	3000	56	980.549	148	2,3	90	.8
1/8	3000	56	970.600	152	3,0	12	12,0
	3000	56	970.601	160	3,0	24	5,30
	3000	56	970.576	204	3,0	90	1.6
1/6	3000	56	970.620	153	3,5	12	13,0
	3000	56	970.621	161	3,5	24	6,50
	3000	56	970.577	227	3,5	90	1.9

▲ Use "S" Discount Symbol.

For dimensions, see drawings on page 226.

LOW VOLTAGE ADJUSTABLE SPEED CONTROLLERS

LEESON's DC to DC controllers are a chassis type design, that accept a DC input voltage and output a DC power voltage to control the motor speed. The speed maybe varied with the potentiometer that is shipped loose with the control or an external voltage signal.

Higher design efficiency results in longer running time between battery charges than is possible with traditional methods of speed control using resistance in series with the battery.

Typical Operating Features: Provides smooth 40 to 1 speed range capability for mobile equipment. Maintains variable speed control as batteries discharge. Adjustable min/max speed, IR compensation, and 200 % current limit overload protection. Inhibit pin terminals provide customer optional start-stop without breaking battery lines. Green LED power on indicator is provided.

Catalog number 175290 does not require a heat sink, and measures 6.9L x 4.44W x 2.19D. Catalog numbers 175291 & 175292 do require heat sink, which is included and measures 7.78L x 6.9W x 3.25D.

Input Voltage	Max. Amp Ratings	Catalog Number	List Price	App. Wgt.(lbs.)	Disc. Sym.
12/24	16	**175290**	$331	2	A
12/24	60	**175291**	378	4	A
36/48	60	**175292**	557	4	A

LOW VOLTAGE ADJUSTABLE SPEED CONTROLS FOUR QUADRANT CONTROL

General Specifications: This series of drives is a chassis type design that accepts DC input to output up to 100% of the input voltage. The 12/24-volt drive is rated at 120 amps continuous and the 36/48-volt drive is rated at 100 amps continuous. The speed is adjustable with a speed potentiometer that is shipped loose with the controls. This control also offers extended battery life through a sleep mode feature and has an inhibit circuit for convenient remote starting and stopping.

Additional Features Include: Simple reversing and braking using a switch closure to the drive. Controls have a built-in short circuit to protect itself from a shorted motor. They offer a 1.01 Form Factor, which offers clean DC output for quiet motor operation and efficiency. They also have a temperature sensor, which automatically reduces the current limit if the controller heats up. On Board trim pots for calibration, speed and forward and reverse settings.

Units include heat sink and measure 6.9L x 5.0W (including terminals) x 2.5D and have mounting slots.

Input Voltage	Max. Amp Ratings	Catalog Number	List Price	App. Wgt.(lbs.)	Disc. Sym.
12/24	120	174298	$1127	3	A
36/48	100	174299	1127	3	A

Catalog numbers in blue are NEW items.

DIRECT CURRENT MOTORS

METRIC (IEC) FRAME • SCR

IEC FRAME MOTORS • SCR RATED • IP54 ENCLOSURE

General Specifications:

These metric dimensioned motors are built to IEC 34-1 electrical and mechanical standards.

A unique modular approach for IEC 71 frame and larger allows the motor to be field modified to B3 rigid base mounted construction, B5 flange mounted or B14 face mounted construction using the kits listed below. Please note that one or more of the mounting kits must be used with IEC motors of these frame sizes.

The IEC 63 and smaller frames are stocked with an integral B5 flange or B14 face less base. An optional B3 rigid base kit is available.

B5 IEC 56 & 63

Electrical & Mechanical Features:

A terminal board is provided for connections. All fasteners are metric. Electrical and mechanical features are the same as listed for the NEMA frame motors on the opposite page.

Tachometer mounting kits are available for 71 and 80 frames only.

B14 IEC 56 & 63

TOTALLY ENCLOSED • SCR RATED 180 VOLTS✣ B5 FLANGE

KW/HP	Full Load RPM	IEC Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)
0.06/1/12	1800	56	**M1130146•**	$400	A	8	0.5	6.24 (158.6)
0.09/1/8	3000	56	**M1130150•**	399	A	10	0.7	6.74 (171.3)
	1800	56	**M1130147•**	429	A	11	0.7	7.55 (191.7)
0.12/1/6	3000	56	**M1130151•**	411	A	10	0.9	7.55 (191.7)
	1800	63	**M1130148**	485	A	11	0.9	8.30 (210.8)
0.18/1/4	3000	63	**M1130152•**	444	A	13	1.3	8.78 (223.1)
	1800	63	**M1130149**	528	A	13	1.3	9.50 (241.3)
0.25/1/3	3000	63	**M1130153**	498	A	13	1.7	9.50 (241.3)

These mountings have accommodations for B3 base mountings with the kits on left.

TOTALLY ENCLOSED • SCR RATED 180 VOLTS✣ B14 FACE

KW/HP	Full Load RPM	IEC Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)
0.06/1/12	3000	56	**M1110024•**	$380	A	6	0.4	6.34 (177.0)
	1800	56	**M1130136•**	401	A	8	0.5	6.24 (158.6)
0.09/1/8	3000	56	**M1130140•**	400	A	9	0.7	6.74 (171.3)
	1800	56	**M1130137•**	428	A	10	0.7	7.54 (191.7)
0.12/1/6	3000	56	**M1130141•**	413	A	10	0.9	7.54 (191.7)
	1800	63	**M1130138**	484	A	8	0.9	8.30 (210.8)
0.18/1/4	3000	63	**M1130142•**	416	A	10	1.3	8.78 (223.1)
	1800	63	**M1130139**	517	A	10	1.3	9.50 (241.3)
0.25/1/3	3000	63	**M1130143**	497	A	10	1.7	9.50 (241.3)

These mountings have accommodations for B3 base mountings with the kits on left.

TEFC • SCR RATED 180 VOLTS✣ • ROUND BODY

KW/HP	Full Load RPM	IEC Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)
0.25/1/3	1800	71	**098014**	$736	A	23	1.7	11.28 (286.5)
0.37/1/2	3000	71	**098016**	693	A	21	2.5	10.78 (273.8)
	1800	71	**098015**	731	A	26	2.5	11.78 (299.2)
0.55/3/4	3000	71	**098017**	701	A	24	3.6	11.78 (299.2)
	1800	80	**108369**	797	A	34	3.5	14.64 (371.9)
0.75/1	3000	80	**108372**	818	A	45	4.9	14.64 (371.9)
	1800	80	**108370**	917	A	48	4.6	17.14 (435.4)
1.1/1 1/2	3000	80	**108373**	892	A	47	7.1	16.14 (410.0)
	1800	80	**108371**	937	A	52	7.0	17.14 (435.4)
	1800	90L	**118007**	2102	A	64	7.5	18.99 (481.8)
1.5/2	3000	90L	**118009**	2055	A	72	10.0	18.47 (469.1)
	1800	90L	**118008**	2264	A	84	9.5	20.47 (519.9)
2.2/3	3000	90L	**118010**	2251	A	82	16.0	19.47 (494.5)
	1800	112M	**118014**	2890	A	90	14.0	21.79 (553.5)

IMPORTANT: These round body motors require either a B3 rigid base, B14 face or B5 flange kit. Catalogue number 118014 comes complete with IEC 112 B14 face and B3 foot; shaft dia. is 24 mm.

B3 MOUNTING KITS

All motors are stocked with provisions to accommodate B3 base mounting with the kits noted below.

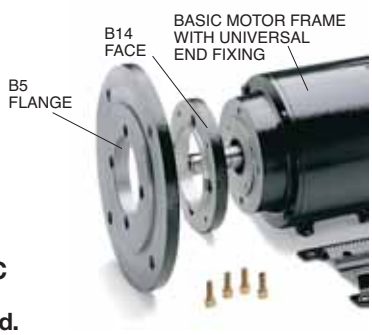
Frame	Catalogue No.	List Price	Disc. Sym.
56	**175142**	$27	A
63	**175143**	31	A
71	**175144**	31	A
80	**175145**	43	A
90	**175146**	49	A
100	**175147**	57	A

✣ Control input is 230 volts AC.
• These motors are totally enclosed, non-ventilated. Other ratings utilize IC41 cooling—external cooling fan on motor shaft.

FLANGE AND FACE KITS FOR DC METRIC (IEC) FRAME MOTORS

An advantage of LEESON'S modular design concept is the possible use of a different diameter B5 flange or B14 face than is normally assigned to a motor by IEC dimensional standards. This flexibility makes it possible to accommodate a wide variety of gear reducers, pumps and similar close coupled motor mounted loads.

B5 B14



Round body DC Metric IEC motors will accept any of the flange or face kits listed.

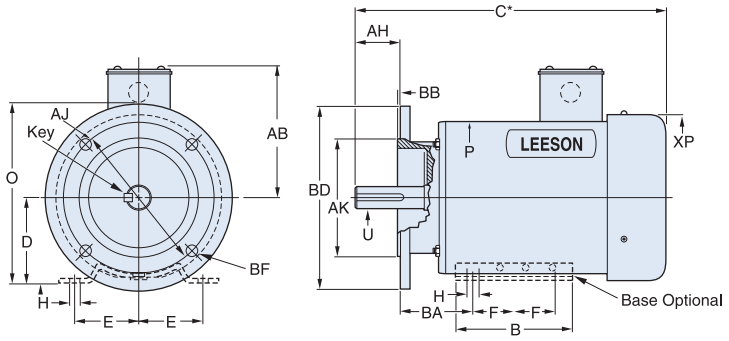
B5 FLANGE KITS (For DC Metric Motors Only)

IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	BD Flange Dia. (mm)	AK Register (mm)	BF Hole (mm)	AJ Bolt Circle (mm)
71	**175106**	$46	A	2	160	110	9	130
80	**175108**	61	A	3	200	130	12	165
90S/90L	**175108**	61	A	3	200	130	12	165
100L/112M	**175137**	82	A	5	250	180	15	215

B14 FACE KITS (For DC Metric Motors Only)

IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	BD Flange Dia. (mm)	AK Register (mm)	BF Tap (mm)	AJ Bolt Circle (mm)
71	**175107**	$37	A	1	105	70	6	85
80	**175109**	39	A	1	120	80	6	100
90S/90L	**175129**	47	A	1	140	95	6	115
100L/112M	**175130**	50	A	2	160	110	6	130

CONDENSED DIMENSIONS • DC METRIC (IEC) FRAME MOTORS



*For overall length, see motor listing.

IEC FRAME DIMENSIONS (Millimeters)

IEC Frame	Mounting					Shaft						B14 Face/B5 Flange					General			
	2E	2F	BA	D	H	U	AH✧	KEY	S	R	TAP	AJ	AK	BD	BF	BB	AB	XP	B	O
56	90	71	36	56	6	9	20	15	3	7.0	M3	65 100	50 80	80 120	M5 7	2.5 2.5	83	96	90	99
63	100	80	40	63	7	11	23	19	4	9.0	M4	75 115	60 95	90 140	M5 9	2.5 3.0	116	96	96	108
71	112	90	45	71	7	14	30	26	5	11.5	M5	85 130	70 110	105 160	M6 9	2.5 3.5	114	130	105	132
80	125	100	50	80	10	19	40	33	6	16.0	M6	100 165	80 130	120 200	M6 12	3.0 3.5	124	149	127	151
90S	140	100	56	90	10	24	50	36	8	20.5	M8	115 165	95 130	140 200	M8 12	3.0 3.5	135	182	152	173
90L	140	125	56	90	10	24	50	36	8	20.5	M8	115 165	95 130	140 200	M8 12	3.0 3.5	135	182	152	173
100L	160	140	63	100	12	28	60	41	8	24.5	M10	130 215	110 180	160 250	M8 15	3.5 4.0	135	182	176	173
112M	190	140	70	112	12	28	60	41	8	24.5	M10	130 215	110 180	160 250	M8 15	3.5 4.0	162	231	176	225

✧ Without face or flange AH shaft dimension is 12mm longer.

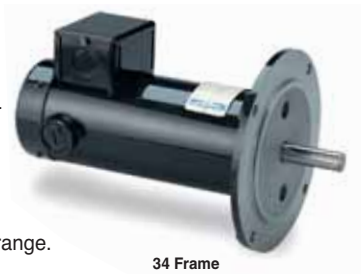
All dimensions in millimeters (1 inch = 25.4mm)

DIRECT CURRENT MOTORS
SUB-FHP • SCR RATED

SUB-FHP MOTORS

General Specifications:

Precision subfractional horsepower DC permanent magnet motors designed for use with full wave non-filtered SCR controls for adjustable speed applications requiring dynamic braking and constant torque throughout the speed range.



34 Frame

Mechanical Features:

Compact space saving designs. Ball bearings. Long-life brushes for demanding applications. Brushes easily replaced without disassembly of the motor. Standard mounted conduit box on 31 and 34 frame models simplifies connections.

25/31 Frame

Electrical Features:

Continuous duty with full wave un-filtered rectified SCR (thyristor) controls. Linear speed torque characteristics throughout the speed range. High starting torques. Reversible rotation from a simple two lead connection. Class F insulated with high temperature welded commutators.

SUB-FHP IP55 WASHGUARD™ MOTORS

General Specifications:

Precision subfractional horsepower DC permanent magnet motors. Designed for use with fullwave non-filtered SCR controls or battery supplied low voltage for adjustable speed applications requiring constant torque throughout the speed range.

Mechanical Features:

Corrosion resistant 303 stainless steel. shaft with spring-loaded contact shaft seal protect the double sealed ball bearings and motor interior.

Frame, endshields, armature and interior components protected by enamel and polyester compounds for resistance to moisture, acids, alkalies and oil.

Cast conduit box with threaded conduit holes and Nitrile gaskets keep water out. The conduit box cover is made from 304 stainless steel.

For any condensation that may accumulate inside the motor a one-way stainless steel vapor vent is provided. All hardware is stainless steel. Motor painted with white epoxy for superior corrosion resistance and protection. Machined fits between the endbells and motor frame and sealed with gaskets. Thru-bolt heads and nuts sealed with fiber washers. O-rings under each threaded brush cover.

Application Notes:

LEESON WASHGUARD™ motors are designed for extended life in applications requiring regular washdown or otherwise wet environments. Washguard™ motors retard the entrance of water. Extra protection for the motor's interior prevents rust and corrosion build-up and releases trapped moisture to insure a longer life than possible with a standard motor.

Dimensions:

Found on page 226.

SCR RATED (90 & 180 V) • TENV • SQUARE FLANGE OR C FACE

HP	Full Load RPM	Frame	Catalogue Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC
1/25	3500	25AS	**M1110014Ⓑ**	$253	A	3	90	115	0.5
	1750	25CS	**M1110003Ⓑ**	294	A	3	90	115	0.5
	1750	31AS	**M1120064**	314	A	5	180	230	0.3
1/15	3500	25CS	**M1110015Ⓑ**	278	A	2	90	115	0.7
	1750	31BS	**M1120013**	319	A	5	90	115	0.8
	1750	31BS	**M1120039**	319	A	7	180	230	0.4
1/10	3500	31BS	**M1120060**	319	A	5	90	115	1.3
	1750	31CS	**M1120014**	329	A	7	90	115	1.1
	1750	31CS	**M1120041**	329	A	7	180	230	0.6
1/8	3500	31CS	**M1120059**	332	A	6	90	115	1.5
	1750	31ES	**M1120027**	355	A	7	90	115	1.3
	1750	31ES	**M1120045**	355	A	7	180	230	0.7
	1750	34D42CZ	**M1130053**	367	A	8	90	115	1.4
	1750	34D42CZ	**M1130118**	367	A	7	180	230	0.7
1/6	3500	31ES	**M1120058**	370	A	9	90	115	1.9
	1750	31GS	**M1120042**	380	A	9	90	115	1.8
	1750	31GS	**M1120043**	380	A	11	180	230	0.9
	1750	34E56C	**M1130054**	391	A	11	90	115	1.7
	1750	34E56C	**M1130119**	391	A	11	180	230	0.9
1/4	3500	31GS	**M1120062**	383	A	9	90	115	2.6
	1750	34G56C	**M1130055****	408	A	13	90	115	2.7
	1750	34G56C	**M1130120****	408	A	13	180	230	1.3

Ⓑ 25 frame motors have provisions for an optional conduit box catalogue number M1760000, see page 137.
** These motors are totally enclosed fan cooled.

SCR RATED (90 V) • TENV • SQUARE FLANGE OR C FACE

HP	Full Load RPM	Frame	Catalog Number	List Price	Disc. Sym.	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC
1/8	1750	31S	**M1120181**	$393	S	90	115	1.5
1/6	1750	31S	**M1120183**	408	S	90	115	1.9
1/4	2500	32F42CZ	**M1120185**	484	S	90	115	1.9

LOW VOLTAGE (12 V) • TENV SQUARE FLANGE OR C FACE

HP	Full Load RPM	Frame	Catalog Number	List Price	Disc. Sym.	Arm. Volts DC	F.L. Amps DC
1/8	1750	31S	**M1120182**	$400	S	12	10.5
1/6	1750	31S	**M1120184**	426	S	12	14.5
1/4	2500	32F42CZ	**M1120186**	508	S	12	20

Catalog numbers in blue are NEW items.