



# DC MOTORS

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

DC Motors

## 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 81.

### 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.



## DC METRIC (IEC) FRAME 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 85 for B5 flange and B14 face kits. B3 rigid base kits are listed below.

### 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.



B5 IEC 56 & 63

B14 IEC 56 & 63

71 & 80 IEC with Modular Flange & Base Kits

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

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	\$530	A	21	12	21.0	10.44
	1800	S56C	108050	559	A	22	24	13.5	10.94
1/2	1800	S56C	108047	607	A	29	12	39.0	12.44
	1800	S56C	108051	579	A	29	24	20.0	11.94
	1800	SS56C	098381	551	A	29	36	13.5	10.81
	1800	SS56C	098382	533	A	29	48	11.0	10.81
3/4	1800	S56C	108048	670	A	30	12	58.0	13.81
	1800	S56C	108052	606	A	30	24	29.0	12.81
1	1800	S56C	108322	799	A	39	12	80.0	13.81
	1800	S56C	108053	735	A	37	24	39.0	13.81
	1800	S56C	109101	704	A	37	36	25.5	13.81
	1800	S56C	109102	679	A	37	48	18.5	13.81
1 1/2	1800	S56CZ	109103	1072	A	39	24	60.0	15.25
	1800	S56CZ	109104	1059	A	37	36	36.0	17.38
	1800	S56CZ	109105	1022	A	37	48	27.0	17.38
2	1800	S56CZ	109106	1342	A	42	24	70.0	16.74
	1800	S56CZ	109107	1241	A	42	36	49.0	16.74
	1800	S56CZ	109108	1193	A	42	48	38.0	16.74

- ◆ 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	\$288	5	3.3	5.34
	1800	56	M1110026	326	6	3.4	6.34
0.18/1/4	3000	63	M1130206*	368	13	11.0	7.75
	3000	63	M1130296^	368	9	11.0	7.75
	1800	63	M1130207*	421	13	10.0	8.75
	1800	63	M1130297^	421	9	10.0	8.75
0.37/1/2	3000	71	098065	504	19	11.0	10.77
	1800	71	098066	521	23	20.0	11.27
		71	098067	551	23	20.0	12.27
0.75/1	3000	80	108456	605	33	40.0	14.14
	1800	80	108455	708	52	39.0	14.64
1.1/1 1/2	3000	80	108457	673	33	65.0	15.64
1.5/2	3000	80	108458	774	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 84-85.

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

## 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 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 may be 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.

## 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*	\$210	S	3	12	4.4
1/10	4200						24	4.4
1/14	1750	31AS	M1120040	246	S	4	12	7.7
1/7	4200						24	7.7
1/7	1750	31ES	M1120044	326	S	9	12	13.0
1/4	3500						24	13.0
1/6	1800	31GS	M1120046	344	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 107.

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

Input Voltage	Max. Amp Ratings	Catalog Number	List Price	App. Wgt. (lbs.)	Disc. Sym.
12/24	16	175290	\$424	2	A
12/24	60	175291	517	4	A
36/48	60	175292	517	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.

## 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	\$146	2.3	12	6.4
	3000	56	980.143	146	2.3	24	3.2
	3000	56	980.549	141	2.3	90	.75
1/8	3000	56	970.600	169	3.0	12	12.0
	3000	56	970.601	169	3.0	24	5.3
	3000	56	970.576	163	3.0	90	1.2
1/6	3000	56	970.620	183	3.5	12	13.1
	3000	56	970.621	183	3.5	24	6.8
	3000	56	970.577	174	3.5	90	1.6

▲ Use "S" Discount Symbol.

For dimensions, see drawings on page 317.

Input Voltage	Max. Amp Ratings	Catalog Number	List Price	App. Wgt. (lbs.)	Disc. Sym.
12/24	120	174298	\$917	3	A
36/48	100	174299	917	3	A