

**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 161 for re-rating data.

**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 catalog number 108502.



**MODIFICATION KITS**

Motors with S56C or SS56c frame sizes may be converted to 42/48 C face using the following:

Frame	Catalog No.	List Price	Disc. Sym.
SS56C	175182	\$26	A
S56C	175082◇	26	A

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

Frame	Catalog No.	List Price	Disc. Sym.
S56C	175080◇	\$20	A

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

HP	Full Load RPM	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	SS56C	098002	\$369	A	19	90	115	2.5	10.81
	1750	SS56C	098003	369	A	22	180	230	1.4	11.31
1/3	1750	SS56C	098004	391	A	23	90	115	3.5	11.31
	1750	SS56C	098005	391	A	23	180	230	1.7	11.31
1/2	2500	SS56C	098006	391	A	22	90	115	5.0	10.81
	2500	SS56C	098007	391	A	22	180	230	2.5	10.81
1750	1750	SS56C	098000	436	A	26	90	115	5.0	11.81
	1750	S56C	108014	457	A	29	90	115	5.0	12.81
	1750	SS56C	098008	436	A	25	180	230	2.5	11.81
	1750	S56C	108015	457	A	30	180	230	2.5	12.81
	1750	S56C	108015	457	A	30	180	230	2.5	12.81
3/4	2500	SS56C	098009	469	A	26	90	115	7.6	11.81
	2500	S56C	108016	492	A	29	90	115	7.6	12.81
	2500	SS56C	098010	469	A	25	180	230	3.8	11.81
	2500	S56C	108017	492	A	29	180	230	3.8	12.81
	2500	S56C	108017	492	A	29	180	230	3.8	12.81
1750	1750	SS56C	098032	529	A	36	90	115	7.6	13.81
	1750	S56C	108018	556	A	38	90	115	7.6	13.81
	1750	SS56C	098069	529	A	36	180	230	3.8	13.81
	1750	S56C	108019	556	A	35	180	230	3.8	13.81
	1750	S56C	108019	556	A	35	180	230	3.8	13.81
1	2500	S56C	108020	529	A	34	90	115	10.0	13.81
	2500	S56C	108021	529	A	38	180	230	5.0	13.81
1750	1750	S56C	108022	646	A	47	90	115	10.0	16.31
	1750	S56C	108023	646	A	39	180	230	5.0	14.81
1 1/2	2500	S56C	108265	783	A	43	180	230	7.5	14.81
	1750	S56C	108092	808	A	53	180	230	7.6	16.88
	1750	S56/145TC	108262■	808	A	54	180	230	7.6	17.38
	1750	145TC	128000	1227	B	70	180	230	7.5	18.34
	1750	145TC	128000	1227	B	70	180	230	7.5	18.34
2	2500	S56/145TC	108266■	1227	A	51	180	230	8.6	16.88
	1750	145TC	128010	1464	B	83	180	230	9.5	19.34
1750	1750	182/145TC	128001◀	1464	B	84	180	230	9.5	19.34
	1750	182/145TC	128001◀	1464	B	84	180	230	9.5	19.34
3	1750	182/145TC	108502◀	1771	B	88	180	230	14.0	21.75
	1750	182/145TC	108502◀	1771	B	88	180	230	14.0	21.75

Tachometer Type	Frame	Catalog Number	List Price	Disc. Sym.	App. Wt. (lbs.)
GE 5PY Series	SS56	175156	\$157	A	5
	S56	175193	164	A	5
	56/145	175158	321	A	5
Servo-tek SA740 Series	SS56	175157	165	A	8
	S56	175194	174	A	8
Airpax	56/145	175159	367	A	8
	SS56	175173	165	A	8
REO-315	S56	175174	174	A	8
	SS56	175155	157	A	5
	S56	175197	164	A	5
56/145	175198	321	A	5	

◇ Addition of base kit will result in non-NEMA BA dimension of 2<sup>3</sup>/<sub>4</sub>". 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.

## 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 3/4"-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	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	1750	S56C	<b>118015</b>	\$1294	A	23	90	115	3.5	13.41
	1750	S56C	<b>118016</b>	1461	A	30	90	115	4.7	14.41
1/2	1750	S56C	<b>118017</b>	1461	A	30	180	230	2.5	14.41
	1750	S56C	<b>118018</b>	1809	A	36	90	115	7.1	16.41
3/4	1750	S56C	<b>118019</b>	1809	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.



Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)
<b>175026</b>	\$50	A	2

## 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, alkalis 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	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	<b>108423</b>	\$480	A	23	90	115	2.7	10.69
1/3	1750	S56C	<b>108424</b>	507	A	26	90	115	3.5	11.69
1/2	1750	S56C	<b>108226</b>	568	A	38	90	115	4.9	13.69
	1750	S56C	<b>108227</b>	568	A	43	180	230	2.4	13.69
3/4	1750	S56C	<b>108228</b>	688	A	53	90	115	7.0	15.69
	1750	S56C	<b>108229</b>	688	A	50	180	230	3.5	15.69
1	1750	S56C	<b>108230**</b>	841	A	45	90	115	10.0	15.81
	1750	S56C	<b>108231**</b>	841	A	42	180	230	5.0	14.81
1 1/2	1750	S56C	<b>108232**</b>	1073	A	50	180	230	7.6	16.81

## WASHGUARD® • IEC FRAME • TENV IP55 B5 FLANGE WITH REMOVABLE B3 BASE® ▲ SCR RATED 180 VOLTS

Rated HP	Output kW	Full Load RPM	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	F.L. Amps DC	"C" Dim. (Inches)
1/2	.37	1750	71	<b>098040</b>	\$503	A	22	180	2.5	10.69
3/4	.55	1750	80	<b>108407</b>	681	A	52	180	3.5	16.02

\*\* These motors are totally enclosed fan cooled.  
 Ⓢ 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 78.



**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.

**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.

**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.



31/34 Frame



25 Frame

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

HP	Full Load RPM	Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	Arm. Volts DC	Control Volts AC Input	F.L. Amps DC
1/25	3500	25AS	M1110014 <sup>(B)</sup>	\$171	S	3	90	115	0.5
	1750	25CS	M1110003 <sup>(B)</sup>	177	S	3	90	115	0.5
	1750	31AS	M1120064	177	S	5	180	230	0.3
1/15	3500	25CS	M1110015 <sup>(B)</sup>	183	S	2	90	115	0.7
	1750	31BS	M1120013	189	S	5	90	115	0.8
	1750	31BS	M1120039	189	S	7	180	230	0.4
1/10	3500	31BS	M1120060	189	S	5	90	115	1.3
	1750	31CS	M1120014	224	S	7	90	115	1.1
	1750	31CS	M1120041	224	S	7	180	230	0.6
1/8	3500	31CS	M1120059	224	S	6	90	115	1.5
	1750	31ES	M1120027	243	S	7	90	115	1.3
	1750	31ES	M1120045	243	S	7	180	230	0.7
	1750	34D42CZ	M1130053	252	S	8	90	115	1.4
	1750	34D42CZ	M1130118	252	S	7	180	230	0.7
1/6	3500	31ES	M1120058	243	S	9	90	115	1.9
	1750	31GS	M1120042	246	S	9	90	115	1.8
	1750	31GS	M1120043	246	S	11	180	230	0.9
	1750	34E56C	M1130054	258	S	11	90	115	1.7
	1750	34E56C	M1130119	258	S	11	180	230	0.9
1/4	3500	31GS	M1120062	257	S	9	90	115	2.6
	1750	34G56C	M1130055**	266	S	13	90	115	2.7
	1750	34G56C	M1130120**	266	S	13	180	230	1.3

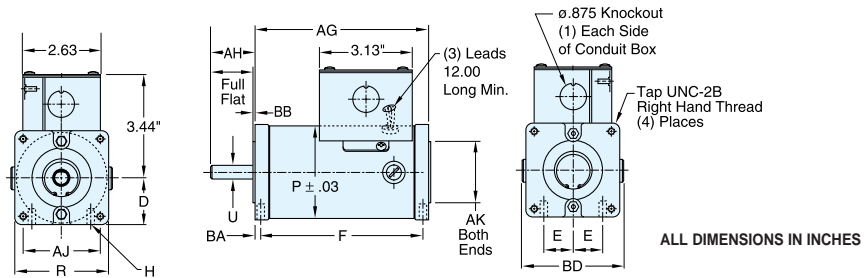
<sup>(B)</sup> 24 frame motors have provisions for an optional conduit box catalog number M1760000, see page 150.

\*\* These motors are totally enclosed fan cooled.

**25 & 31 FRAME SQUARE FLANGE MOUNT**

Note: Optional conduit box not included on 25 frame models.

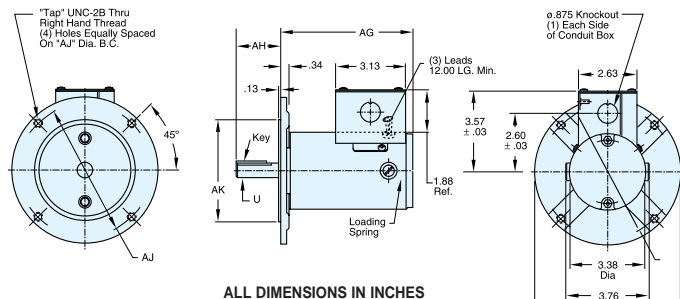
Conduit box dimensions shown here are for 31 frame only.



Frame & Type	AG	P	BD	U	AH	AH-BB	AJ	TAP	R	AK	BB	D	BA	E	F	H	
25	AS	4.08	2.50	3.00	.312	1.5	1.00	1.73	8-32	2.62	.997	.03	1.28	.125	.625	3.83	8-32
	CS	4.94	2.50	3.00	.312	1.5	1.00	1.73	8-32	2.62	.997	.03	1.28	.125	.625	4.69	8-32
31	AS	5.39	3.07	3.45	.5000	1.5	1.00	2.63	1/4-20	3.16	1.97	.07	1.57	.235	1.000	4.92	1/4-20
	BS	5.39	3.07	3.45	.5000	1.5	1.00	2.63	1/4-20	3.16	1.97	.07	1.57	.235	1.000	5.42	1/4-20
	CS**	5.89	3.07	3.45	.5000	1.5	1.00	2.63	1/4-20	3.16	1.97	.07	1.57	.235	1.000	5.42	1/4-20
	ES**	6.89	3.07	3.45	.5000	1.5	1.00	2.63	1/4-20	3.16	1.97	.07	1.57	.235	1.000	6.42	1/4-20
	GS	7.89	3.07	3.45	.5000	1.5	1.00	2.63	1/4-20	3.16	1.97	.07	1.57	.235	1.000	7.42	1/4-20

\*\*Catalog numbers M1120041 & M1120044 have an 'AG' & 'F' dimension that is .5" longer than stated in table.

**34-FRAME, NEMA C FACE, LESS BASE**



ALL DIMENSIONS IN INCHES

**42C FACE MOUNT**

Frame	AG	P	U	AH	AH-BB	KEY	AJ	TAP	AK	BD
34D42C	6.43	3.38	.500	1.38	1.25	.13 SQ	3.750	1/4-20	3.00	4.25

**56C FACE MOUNT**

Frame	AG	P*	U	AH	AH-BB	KEY	AJ	TAP	AK	BD
34E56C	6.87	3.38	.625	2.06	1.93	.19 SQ	5.875	3/8-16	4.50	6.50
34G56C	8.59	3.38	.625	2.06	1.93	.19 SQ	5.875	3/8-16	4.50	6.50

\*For 1/4 HP 34 frame TEFC designs. Fan cover diameter is 3.88".

**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 next page 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—please contact LEESON for data.



B5 IEC 56 & 63



B14 IEC 56 & 63



**B3 FOOT MOUNTING KITS**

**(For DC Metric Motors Only)**

All motors are stocked with provisions to accommodate B3 foot mountings with the packages noted below.

IEC Frame	Catalog Number	List Price	Disc. Sym.
56	175142	\$13	A
63	175143	13	A
71	175144	19	A
80	175145	19	A
90	175146	24	A

**TOTALLY ENCLOSED • SCR RATED 180 VOLTS\* WITH B5 FLANGE**

KW/HP	Full Load RPM	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)
0.06/1/12	1800	56	M1130146●	\$273	S	8	0.5	6.24 (158.6)
	3000	56	M1130150●	273	S	9	0.7	6.74 (171.3)
0.09/1/8	1800	56	M1130147●	294	S	10	0.7	7.55 (191.7)
	3000	56	M1130151●	284	S	9	0.9	7.55 (191.7)
0.12/1/6	1800	63	M1130148	334	S	7	0.9	8.30 (210.8)
	3000	63	M1130152●	308	S	11	1.3	8.78 (223.1)
0.18/1/4	1800	63	M1130149	359	S	13	1.3	9.50 (241.3)
	3000	63	M1130153	341	S	11	1.7	9.50 (241.3)

These motors have accommodations for B3 base mountings with the kits below.

**TOTALLY ENCLOSED • SCR RATED 180 VOLTS\* WITH B14 FACE**

KW/HP	Full Load RPM	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)
0.06/1/12	3000	56	M1110024●	\$244	S	6	0.4	6.34 (177.0)
	1800	56	M1130136●	273	S	8	0.5	6.24 (158.6)
0.09/1/8	3000	56	M1130140●	273	S	9	0.7	6.74 (171.3)
	1800	56	M1130137●	294	S	14	0.7	7.55 (191.7)
0.12/1/6	3000	56	M1130141●	284	S	10	0.9	7.55 (191.7)
	1800	63	M1130138	334	S	8	0.9	8.30 (210.8)
0.18/1/4	3000	63	M1130142●	308	S	10	1.3	8.78 (223.1)
	1800	63	M1130139	359	S	10	1.3	9.50 (241.3)
0.25/1/3	3000	63	M1130143	341	S	10	1.7	9.50 (241.3)

Except for M1110024, these motors have accommodations for B3 base mountings with the kits below.

**TEFC • SCR RATED 180 VOLTS\* • ROUND BODY**

KW/HP	Full Load RPM	IEC Frame	Catalog Number	List Price	Disc. Sym.	App. Wgt. (lbs.)	F.L. Amps DC	"C" Dim. Inches (mm)	
0.25/1/3	1800	71	098014	\$346	A	23	1.7	11.28 (286.5)	
	0.37/1/2	3000	71	098016	370	A	21	2.5	10.78 (273.8)
1800		71	098015	393	A	26	2.5	11.78 (299.2)	
0.55/3/4	3000	71	098017	426	A	24	3.6	11.78 (299.2)	
	1800	80	108369	486	A	34	3.5	14.64 (371.9)	
0.75/1	3000	80	108372	486	A	45	4.9	14.64 (371.9)	
	1800	80	108370	601	A	48	4.6	17.14 (435.4)	
1.1/1 1/2	3000	80	108373	538	A	47	7.1	16.14 (410.0)	
	1.5/2	1800	80	108371	793	A	52	7.0	17.14 (435.4)
		1800	90L	118007	1181	B	64	7.5	18.97 (481.8)
2.2/3	3000	90L	118009	1181	B	72	10.0	18.47 (469.1)	
	1800	90L	118008	1416	B	84	9.5	20.47 (519.9)	
2.2/3	3000	90L	118010	1416	B	82	16.0	19.47 (494.5)	
		112M	118014	1799	B	90	14.0	21.79 (553.5)	

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

\* For 230 VAC input controls.  
 ● These motors are totally enclosed, non-ventilated. Other ratings utilize IC41 cooling—external cooling fan on motor shaft.



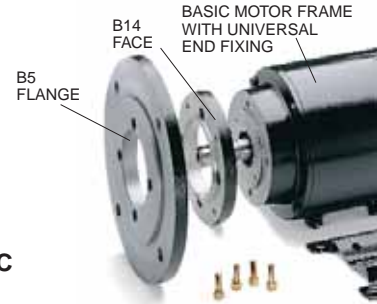
# DC MOTORS

METRIC (IEC) FRAME • SCR RATED

DC Motors

## 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.



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

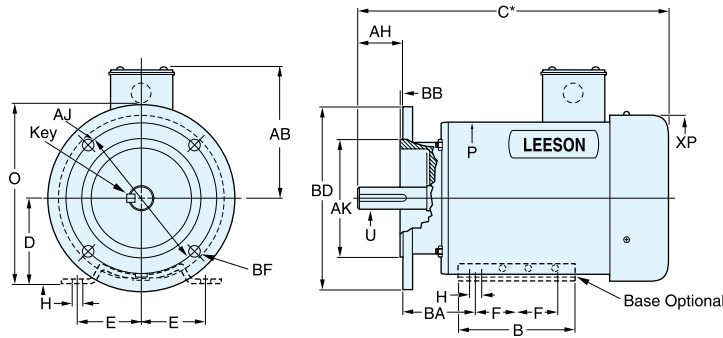
### B5 FLANGE KITS (For DC Metric Motors Only)

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	\$40	A	2	160	110	9	130
80	175108	40	A	3	200	130	12	165
90S/90L	175108	40	A	3	200	130	12	165
100L/112M	175137	99	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	\$40	A	1	105	70	6	85
80	175109	40	A	1	120	80	6	100
90S/90L	175129	40	A	1	140	95	6	115
100L/112M	175130	99	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 <sup>◇</sup>	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)

**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 74.



**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.

**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.

Input Voltage	Max. Amp Ratings	Catalog Number	List Price	App. Wgt.(lbs.)	Disc. Sym.
12/24	16	<b>175290</b>	\$344	2	A
12/24	60	<b>175291</b>	420	4	A
36/48	60	<b>175292</b>	420	4	A

**LOW VOLTAGE (12 & 24V) • 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	<b>108045</b> ♣	\$397	A	21	12	21.0	10.44
1/3	1800	S56C	<b>108046</b> ♣	437	A	24	12	27.0	11.44
	1800	S56C	<b>108050</b> ♣	417	A	22	24	13.5	10.94
1/2	1800	S56C	<b>108047</b> ♣	453	A	29	12	39.0	12.44
	1800	S56C	<b>108051</b> ♣	433	A	29	24	20.0	11.94
3/4	1800	S56C	<b>108048</b> ♣**	501	A	30	12	58.0	13.81
	1800	S56C	<b>108052</b> **	452	A	30	24	29.0	12.81
1	1800	S56C	<b>108322</b> ♣**	596	A	39	12	80.0	13.81
	1800	S56C	<b>108053</b> ♣**	550	A	37	24	39.0	13.81

**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	<b>M1110025</b> ▲●	\$215	5	3.3	5.34
	1800	56	<b>M1110026</b> ▲●	244	6	3.4	6.34
0.18/1/4	3000	63	<b>M1130206</b> *	275	13	11.0	7.75
	3000	63	<b>M1130296</b> ▲	275	9	11.0	7.75
	1800	63	<b>M1130207</b> *	315	13	10.0	8.75
	1800	63	<b>M1130297</b> ▲	315	9	10.0	8.75
0.37/1/2	1800	71	<b>098065</b>	377	19	11.0	10.77
	3000	71	<b>098066</b>	390	23	20.0	11.27
	1800	71	<b>098067</b>	412	23	20.0	12.27
0.75/1	3000	80	<b>108456</b> ♣	451	33	40.0	14.14
	1800	80	<b>108455</b> ♣	529	52	39.0	14.64
1.1/1 1/2	3000	80	<b>108457</b> ♣	503	33	65.0	15.64
1.5/2	3000	80	<b>108458</b> ♣	578	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 77-78.

\* 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 (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	<b>M1110006</b> Ⓟ	\$162	S	3	12	4.4
	24						4.4	
1/10	4200	31AS	<b>M1120040</b>	189	S	4	12	7.7
1/14	1750						24	7.7
1/7	4200	31ES	<b>M1120044</b>	251	S	9	12	13.0
1/7	1750						24	13.0
1/4	3500	31GS	<b>M1120046</b>	265	S	8	12	14.0
1/6	1800						24	14.0
1/3	3900							

**For dimensions, see drawings on page 76.**

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

♣ Built-in conduit box located at 12:00.  
 ▲ Studs at 12:00.  
 Ⓟ If base is removed, do not reinstall bolts without using washers to compensate for thickness of base.  
 \*\* These motors are totally enclosed fan cooled.  
 Ⓟ 25 frame motors have provision for an optional conduit box catalog number M1760000, see page 156.