

# IronMan $\epsilon$ Series High Efficiency Gear Reducers

Reduce. Conserve. Evolve.



*Patent Pending*

**GROVE GEAR** *ELECTRA-GEAR*

*Geared To Be The Best*



# Features / Energy Saving Calculator



## Product Highlights:

- Green product: 90% operating efficiency
- Up to 60% torque increase
- Interchangeable to major brands
- Rapid Payback – Up to \$550 savings annually per motor horsepower
- 4 models available

## Standard Features:

- 2 stage ratios to 60:1; 3 stage ratios to 450:1
- Available preassembled with LEESON WATTSaver® premium efficiency motors
- Filled with premium synthetic lubricant - meets USDA Class H1 standards
- Viton® double-lip seals

	Worm Drive	£ Series
Product Description	2.62" worm	24HE
Input Speed (rpm)	1750	
Gearbox Ratio (Input RPM / Output RPM)	40	39.98
Output torque (in-lbs)	1900	
Calculated Output HP	1.32	1.32
Gearbox Operating Efficiency (%)	65.4%	90.0%
Input HP, required	2.02	1.47
Select Actual Motor HP	2.00	1.50
Select Motor	Standard 3-ph	LEESON WATTSaver e
Motor Efficiency	77.0%	85.0%
Electrical Requirement (kW)	1.95	1.29
Duty Cycle (hrs/day)	24	
Duty Cycle (days/week)	5	
Energy Cost (\$/kW-hr)	\$0.10	

Output Torque Available (in-lbs at rated motor HP)	1,884	1,944
Cost of usable power	\$614	\$614
Cost of gearbox inefficiency (unusable energy)	\$325	\$68
Cost of motor inefficiency (unusable energy)	\$280	\$120
Annual Operating Cost (total)	<b>\$1,219</b>	<b>\$803</b>

<b>Annual Energy Cost Savings (\$)</b>	<b>\$416</b>
<b>Annual Energy Savings (kW-hrs)</b>	<b>4,161</b>

Typical operating example, actual savings will vary.

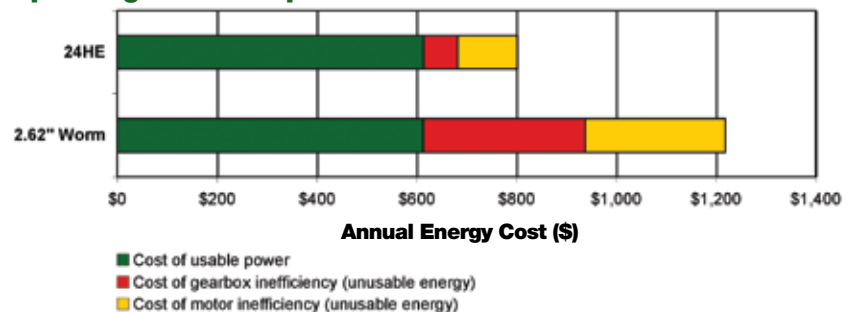


**ALL RATIOS, ALL SPEEDS**

**90% EFFICIENT**

**Go online to calculate your savings!**

Operating Cost Example



# Rating Table

## Maximum Ratings - All Sizes

Ratio	Input RPM	Output RPM	Input HP	Output TQ (lb-in)	NEMA Input Frame	Style HMQ	Style HM
						Quill Input / Hollow Output Catalog No. ▼	Coupling Input / Hollow Output Catalog No. ▼
<b>7.80</b>	1750	224.4	8.50	2149	56C	E240511.XX	E240541.XX
	1150	147.4	6.76		143-5TC	E240521.XX	E240551.XX
	850	109.0	5.00		182-4TC	E240531.XX	E240561.XX
	100	12.8	0.59				
<b>11.36</b>	1750	154.0	7.06	2600	56C	E240513.XX	E240543.XX
	1150	101.2	4.64		143-5TC	E240523.XX	E240553.XX
	850	74.8	3.43		182-4TC	E240533.XX	E240563.XX
	100	8.8	0.40				
<b>15.60</b>	1750	112.2	5.14	2600	56C	E240514.XX	E240544.XX
	1150	73.7	3.38		143-5TC	E240524.XX	E240554.XX
	850	54.5	2.50		182-4TC	E240534.XX	E240564.XX
	100	6.4	0.29				
<b>19.50</b>	1750	89.7	4.11	2600	56C	E240515.XX	E240545.XX
	1150	59.0	2.70		143-5TC	E240525.XX	E240555.XX
	850	43.6	2.00		182-4TC	E240535.XX	E240565.XX
	100	5.1	0.24				
<b>28.01</b>	1750	62.5	2.86	2600	56C	E240516.XX	E240546.XX
	1150	41.1	1.88		143-5TC	E240526.XX	E240556.XX
	850	30.3	1.39		182-4TC	E240536.XX	E240566.XX
	100	3.6	0.16				
<b>39.98</b>	1750	43.8	2.01	2600	56C	E240518.XX	E240548.XX
	1150	28.8	1.32		143-5TC	E240528.XX	E240558.XX
	850	21.3	0.97		182-4TC	E240538.XX	E240568.XX
	100	2.5	0.11				
<b>52.50</b>	1750	33.3	1.53	2600	56C	E240519.XX	E240549.XX
	1150	21.9	1.00		143-5TC	E240529.XX	E240559.XX
	850	16.2	0.74		182-4TC	E240539.XX	E240569.XX
	100	1.9	0.09				
<b>59.79</b>	1750	29.3	1.34	2600	56C	E240520.XX	E240550.XX
	1150	19.2	0.88		143-5TC	E240530.XX	E240560.XX
	850	14.2	0.65		182-4TC	E240540.XX	E240570.XX
	100	1.7	0.08				

▼ Catalog numbers are for hollow output shaft reducers.  
When ordering, substitute the XX suffix with the required output bore code.

### Available bore codes

Fraction Size	1"	1-1/8"	1-3/16"	1-1/4"	1-7/16"	1-1/2"
Decimal Size	1.000	1.125	1.188	1.250	1.438	1.500
Output Bore Code	16	18	19	20	23	24

## Style HMQ      Style HM



## Simple 4-Step Selection Process

**1: Select Basic Reducer**  
(Size 24HE)

**2: Add Output Shaft**  
(if solid output shaft is needed)

Single Output P/N	Double Output P/N	Shaft Dia. (in)	Interchange to Traditional Worm Center Distance
S185000	S185004	1.125"	2.38"
S185001	S185005	1.125"	2.62"
S185002	S185006	1.250"	3.00"
S185003	S185007	1.375"	3.25"

If a solid output shaft is required, replace "XX" with "23" output bore code on basic reducer. Shaft kits will be assembled into reducer at no charge upon request. Contact Factory for details.

**3: Add "B" Interchange Base**  
(if replacing larger worm reducer)

Base P/N	Interchange to Traditional Worm Center Distance
CB26HE	2.62"
CB30HE	3.00"
CB32HE	3.25"

"B" Base mounts to basic reducer and allows simple interchange to larger size worm reducer. "B" Bases will be assembled to a reducer at no charge upon request. Contact Factory for details.

**4: Add Accessory Kit**  
(if replacing worm reducer)

Worm Reducer Size	Converts 24HE Basic Reducer + "B" Base Kit to Worm Reducers Below:		
	2.38" Horizontal Base (T-Mount)	Vertical Output (VL/VH Mount)	Output Flange (F Mount)
2.38" CD	G185015	G185017	G185134
2.62" CD*	G185020	--	--
3.00" CD*	G185121	--	--
3.25" CD*	G185025	--	--

Accessory kits will be assembled to a reducer at no charge upon request. Contact Factory for details.

\* A "B" Base is required to mount accessories for retrofit to 2.62", 3.00" and 3.25" worm reducers.

# Selection Guide

# Applications

## How to Use

Based on required output RPM and input motor horsepower, read across chart to see where an E Series reducer would be appropriate. As a rule of thumb, use 1.00 service factor chart for applications having uniform loads with up to 10 hours service duration per day. Use 1.25 service factor chart for longer service or shock loading. These charts are to be considered as guides only. Contact Factory with specific application information or go to [grovegear.com](http://grovegear.com) for more selection guides.

### E Series Reducer Quick Selections • 1.0 Service Factor

Nominal Ratio	Output RPM	Ratio	Output Speed (RPM)	Input Horsepower @ 1750 RPM								
				1/2	3/4	1	1-1/2	2	3	5	7-1/2	
7.5	233	7.80	224.4									
10	175	11.36	154.0									
15	117	15.60	112.2									
20	88	19.50	89.7									
25	70	28.01	62.5									
30	58	28.01	62.5									
40	44	39.98	43.8									
50	35	52.50	33.3									
60	29	59.79	29.3									

### E Series Reducer Quick Selections • 1.25 Service Factor

Nominal Ratio	Output RPM	Ratio	Output Speed (RPM)	Input Horsepower @ 1750 RPM								
				1/2	3/4	1	1-1/2	2	3	5	7-1/2	
7.5	233	7.80	224.4									
10	175	11.36	154.0									
15	117	15.60	112.2									
20	88	19.50	89.7									
25	70	28.01	62.5									
30	58	28.01	62.5									
40	44	39.98	43.8									
50	35	52.50	33.3									
60	29	59.79	29.3									

Available for these horsepower ratings or lower.

## Sample Model Numbers

### Solid Output Shaft - E Series

**BMQ 24HE - 11.36 - L - 56**  
 Style Size Ratio Shaft Orientation Input Type

### Hollow Output Shaft - E Series

**HMQ 26HE - 11.36 - H - 56 - 23**  
 Style Size Ratio Shaft Orientation Input Type Bore Code



The Grove Gear E Series has the torque density of a typical 3.25" CD worm reducer in the design envelope of a 2.38" worm reducer. With mounting base kits, the E Series can drop-in and replace up to four sizes of worm speed reducers.



# Dimensions



## Style HMQ, HM, H • Hollow Output Shaft

Reducer Size	A	AD	AE1	AE2	AG	B	C	CD	D	D1▼	F	F1▼	G	G1▼	H	H1▼	I	J	J1▼	K	K1▼	T MAX BORE -0.0000 +0.0015	W	
24HE	4.06	5.50	0.27	0.49	6.25	6.28	6.94	3.26	2.50	N/A	2.88	N/A	1.44	N/A	3/8-16	N/A	4.73	5.00	J1▼	2.50	K1▼	N/A	1.50	1.94
26HE	4.43					7.11				3.25		1.69		3/8-16		6.38								
30HE	5.24					8.11				4.00		2.00		7/16-14		1.59								
32HE	5.74					8.49				4.00		2.00		7/16-14		1.75								

## Style B, H

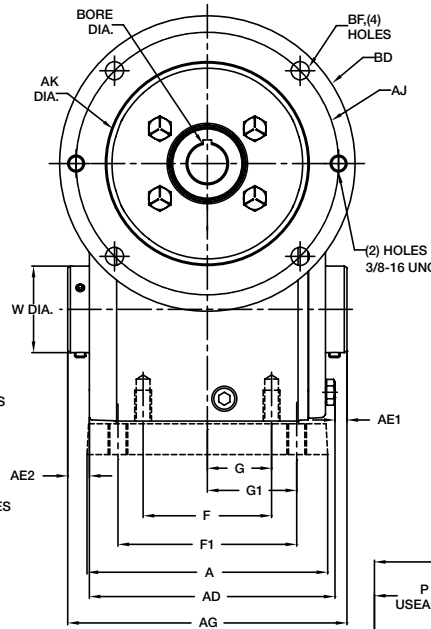
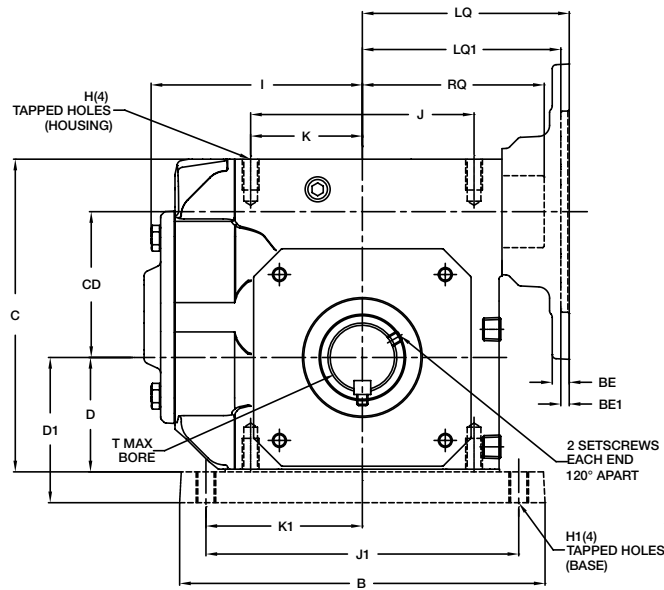
Reducer Size	L	M	U1 +0.0000 -0.0015
24HE	5.50	2.00	0.750
26HE	6.31	2.51	
30HE	6.88	3.44	0.875
32HE	7.44	4.00	

## Style BMQ, BM, B • Solid Output Shaft Model (Bore Code 23)

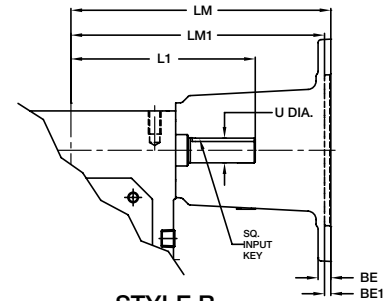
Size	N	O	O*	T +0.0000 -0.0015	U +0.0000 -0.0015	Input Key (Style BM, B)	Output Key
24HE	5.14	1.77	1.69	1.125	0.750	3/16 sq x 1.50	1/4 sq x 1.50
26HE	5.63	2.25	2.18	1.125*			1/4 sq x 2.00
30HE	6.75	3.38	3.30	1.250			1/4 sq x 2.25
32HE	7.06	3.69	3.64	1.375			5/16 sq x 2.50

\* Shaft diameter of 1.250" is also available.

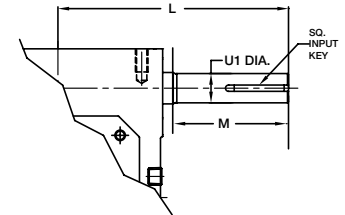
▼ Dimensions refer to "B Base" mounted to Size 24HE reducer (optional for sizes 26HE, 30HE, 32HE).



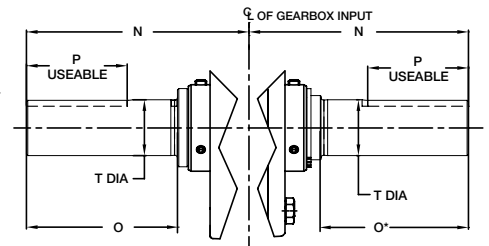
## STYLE BM



## STYLE B



## SOLID O/P SHAFT



## NEMA Dimensions (Inches)

Frame	AJ	AK	BD	BE	BE1	Bore Dia.	Keyway	BF
56C	5.88	4.50	6.50	0.38	N/A	.625	3/16 X 3/32	0.41
140TC	5.88	4.50	6.50	0.38	N/A	.875	3/16 X 3/32	0.41
180TC	7.25	8.50	9.00	N/A	0.50	1.125	1/4 X 1/8	0.53

## Motor Mounting Dimensions

Size	L1 All	LM 56/140TC	LM1 180TC	LQ 56/140TC	LQ1 180TC	RQ All
24HE	5.50	7.76	8.76	4.63	5.06	4.07
26HE						
30HE						
32HE						

# Cross Reference



Grove Gear Ironman High Efficiency  $\mathcal{E}$  Series gear reducers are designed to be dimensional and functional replacements of most worm reducer brands. This chart is meant to be a quick reference guide only. For specific dimensions and ratings of brands listed below, consult manufacturer's catalog information.

## Grove Gear Style B



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
B24HE	S924	724	237U	23S	1238WB	B724
B26HE	S926	726	262U	26S	1262WB	B726
B30HE	S930	730	300U	30S	1230WB	B730
B32HE	S932	732	325U	--	1325WB	B732

## Grove Gear Style BM



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
BM24HE	LF924	RF724	237C	23A	1238WB	B724
BM26HE	LF926	RF726	262C	26A	1262WB	B726
BM30HE	LF930	RF730	300C	30A	1230WB	B730
BM32HE	LF932	RF732	325C	--	1325WB	B732

## Grove Gear Style BMQ



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
BMQ24HE	F924	F724	237Q	23Q	1238WB	B724
BMQ26HE	F926	F726	262Q	26Q	1262WB	B726
BMQ30HE	F930	F730	300Q	30Q	1230WB	B730
BMQ32HE	F932	F732	325Q	--	1325WB	B732

## Grove Gear Style H



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
H24HE	HS924	H724	237UH	23S	1238WB	B724
H26HE	HS926	H726	262UH	26S	1262WB	B726
H30HE	HS930	H730	300UH	--	1230WB	B730
H32HE	HS932	H732	325UH	--	1325WB	B732

## Grove Gear Style HM



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
HM24HE	HF924	HRF724	237CH	23A	1238WB	B724
HM26HE	HF926	HRF726	262CH	26A	1262WB	B726
HM30HE	HF930	HRF730	300CH	--	1230WB	B730
HM32HE	HF932	HRF732	325CH	--	1325WB	B732

## Grove Gear Style HMQ



Grove Gear	Baldor	Boston	Browning	Dodge	Falk	Morse
HMQ24HE	HLF924	HF724	237QH	23Q	1238WB	B724
HMQ26HE	HLF926	HF726	262QH	26Q	1262WB	B726
HMQ30HE	HLF930	HF730	300QH	--	1230WB	B730
HMQ32HE	HLF932	HF732	325QH	--	1325WB	B732

Visit [grovegear.com](http://grovegear.com) for additional cross references to worm, helical-bevel and helical-worm products.



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