

IronMan ϵ 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 through energy cost savings
- 7 models available
- 3-year warranty

Standard Features:

- Ratios reflect typical worm ratios up to 60:1
- Available preassembled with LEESON WATTSAYERe® premium efficiency motors
- Filled with premium synthetic lubricant - meets USDA Class H1 standards
- Viton® double-lip seals

	Worm Drive	£ Series
Gearbox Description	3" worm	24HE
Input Speed (rpm)	1750	
Gearbox Ratio (Input RPM / Output RPM)	60	59.79
Desired Output Torque (in-lbs)	1950	
Gearbox Operating Efficiency (%)	68.0%	90.0%
Select Motor	Standard 3-ph	LEESON WATTSAYERe®
Motor HP	1.50	1.00
Motor Efficiency	83.0%	85.0%
Duty Cycle (hrs/day)	24	
Duty Cycle (days/week)	7	
Energy Cost (\$/kW-hr)	\$0.10	

Cost of usable power	\$588	\$590
Cost of gearbox inefficiency (unusable energy)	\$277	\$66
Cost of motor inefficiency (unusable energy)	\$177	\$116

Annual Energy Cost Savings (\$)	\$270	
Annual Energy Savings (kW-hrs)	2,704	

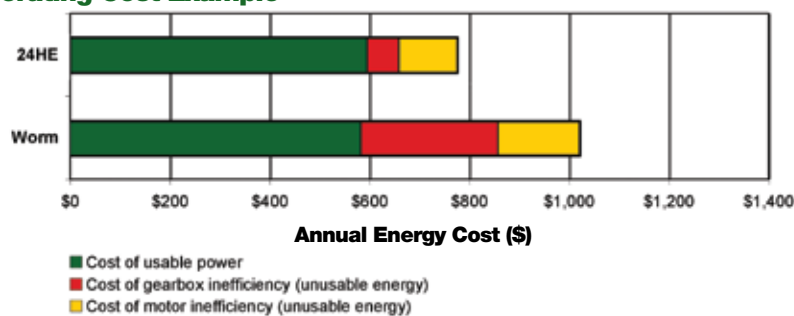
Typical operating example, actual savings will vary.



ALL RATIOS, ALL SPEEDS
90% EFFICIENT

Go online to calculate your savings!
www.grovegear.com/efficiency

Operating Cost Example



Rating Tables

Style HMQ Style HM



Maximum Ratings - 24HE

Ratio	Input RPM	Output RPM	Input HP	Output TQ (lb-in)	NEMA Input Frame	Quill Input / Hollow Output Catalog No. ▼	Coupling Input / Hollow Output Catalog No. ▼
7.80	1750	224.4	8.50	2149	56C 143-5TC 182-4TC	E240511.XX E240521.XX E240531.XX	E240541.XX E240551.XX E240561.XX
	1150	147.4	6.76				
	850	109.0	5.00				
	100	12.8	0.59				
11.36	1750	154.0	7.06	2600	56C 143-5TC 182-4TC	E240513.XX E240523.XX E240533.XX	E240543.XX E240553.XX E240563.XX
	1150	101.2	4.64				
	850	74.8	3.43				
	100	8.80	0.40				
15.60	1750	112.2	5.14	2600	56C 143-5TC 182-4TC	E240514.XX E240524.XX E240534.XX	E240544.XX E240554.XX E240564.XX
	1150	73.7	3.38				
	850	54.5	2.50				
	100	6.40	0.29				
19.50	1750	89.7	4.11	2600	56C 143-5TC 182-4TC	E240515.XX E240525.XX E240535.XX	E240545.XX E240555.XX E240565.XX
	1150	59.0	2.70				
	850	43.6	2.00				
	100	5.1	0.24				
28.01	1750	62.5	2.86	2600	56C 143-5TC 182-4TC	E240516.XX E240526.XX E240536.XX	E240546.XX E240556.XX E240566.XX
	1150	41.1	1.88				
	850	30.3	1.39				
	100	3.60	0.16				
39.98	1750	43.8	2.01	2600	56C 143-5TC 182-4TC	E240518.XX E240528.XX E240538.XX	E240548.XX E240558.XX E240568.XX
	1150	28.8	1.32				
	850	21.3	0.97				
	100	2.50	0.11				
52.50	1750	33.3	1.53	2600	56C 143-5TC 182-4TC	E240519.XX E240529.XX E240539.XX	E240549.XX E240559.XX E240569.XX
	1150	21.9	1.00				
	850	16.2	0.74				
	100	1.90	0.09				
59.79	1750	29.3	1.34	2600	56C 143-5TC 182-4TC	E240520.XX E240530.XX E240540.XX	E240550.XX E240560.XX E240570.XX
	1150	19.2	0.88				
	850	14.2	0.65				
	100	1.70	0.08				

▼ Catalog numbers are for hollow output shaft reducers.

When ordering, substitute the XX suffix with the required output bore code.

Style HMQ Style HM



Maximum Ratings - 33HE

Ratio	Input RPM	Output RPM	Input HP	Output TQ (lb-in)	NEMA Input Frame	Quill Input / Hollow Output Catalog No. ▼	Coupling Input / Hollow Output Catalog No. ▼
7.94	1750	220.4	13.00	3346	56C 143-5TC 182-4TC 213-5TC	E330508.XX E330516.XX E330524.XX E330532.XX	E330548.XX E330556.XX E330564.XX E330572.XX
	1150	144.8	11.49				
	850	107.1	8.49				
	100	12.59	1.00				
10.77	1750	162.5	12.89	4500	56C 143-5TC 182-4TC 213-5TC	E330509.XX E330517.XX E330525.XX E330533.XX	E330549.XX E330557.XX E330565.XX E330573.XX
	1150	106.8	8.47				
	850	78.9	6.26				
	100	9.29	0.74				
15.05	1750	116.3	9.22	4500	56C 143-5TC 182-4TC 213-5TC	E330510.XX E330518.XX E330526.XX E330534.XX	E330550.XX E330558.XX E330566.XX E330574.XX
	1150	76.4	6.06				
	850	56.5	4.48				
	100	6.64	0.53				
21.15	1750	82.7	6.56	4500	56C 143-5TC 182-4TC 213-5TC	E330511.XX E330519.XX E330527.XX E330535.XX	E330551.XX E330559.XX E330567.XX E330575.XX
	1150	54.4	4.31				
	850	40.2	3.19				
	100	4.73	0.38				
30.14	1750	58.1	4.61	4500	56C 143-5TC 182-4TC 213-5TC	E330512.XX E330520.XX E330528.XX E330536.XX	E330552.XX E330560.XX E330568.XX E330576.XX
	1150	38.2	3.03				
	850	28.2	2.24				
	100	3.32	0.26				
43.97	1750	39.8	3.16	4500	56C 143-5TC 182-4TC 213-5TC	E330513.XX E330521.XX E330529.XX E330537.XX	E330553.XX E330561.XX E330569.XX E330577.XX
	1150	26.2	2.07				
	850	19.3	1.53				
	100	2.27	0.18				
53.03	1750	33.0	2.62	4500	56C 143-5TC 182-4TC 213-5TC	E330514.XX E330522.XX E330530.XX E330538.XX	E330554.XX E330562.XX E330570.XX E330578.XX
	1150	21.7	1.72				
	850	16.0	1.27				
	100	1.89	0.15				
58.92	1750	29.7	2.36	4500	56C 143-5TC 182-4TC 213-5TC	E330515.XX E330523.XX E330531.XX E330539.XX	E330555.XX E330563.XX E330571.XX E330579.XX
	1150	19.5	1.55				
	850	14.4	1.14				
	100	1.70	0.13				

Simple 4-Step Selection Process



1:
Select Basic Reducer
(Size 24HE or 33HE)

2:
Add Output Shaft

(if solid output shaft is needed)

Single Output P/N	Double Output P/N	Shaft Length (in)	Shaft Dia. (in)	Interchange to Traditional Worm Center Distance
S185000	S185004	5.14	1.125	2.38"
S185001	S185005	5.63	1.125	2.62"
S185002	S185006	6.75	1.250	3.00"
S185003	S185007	7.06	1.375	3.25"
S185020	S185023	7.06	1.375	3.25"
S185021	S185024	7.75	1.625	3.75"
S185022	S185025	8.12	1.875	4.25"

If a solid output shaft is required for size 24HE, replace "XX" with "23" output bore code on basic reducer.

If a solid output shaft is required for size 33HE, replace "XX" with "31" 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"
CB38HE	3.75"
CB42HE	4.25"

"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.

Available bore codes 24HE

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

Available bore codes 33HE

Fraction Size	1-14/16"	1-4/16"	1-7/16"	1-8/16"	1-10/16"	1-11/16"	1-12/16"	1-14/16"	1-15/16"	2	2-3/16"
Decimal Size	1.888	1.250	1.438	1.500	1.625	1.688	1.750	1.875	1.938	2.000	2.188
Output Bore Code	19	20	23	24	26	27	28	30	31	32	35

Selection Guide

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. This chart is to be considered as a guide only. Contact Factory with specific application information or go to grovegear.com for more selection guides.

Nom. Ratio	1/2	3/4	1	1-1/2	2	3	5	7-1/2	10	15	20
7/1						18HE	24HE	24HE	33HE		
10/1						18HE	24HE	33HE	33HE	43HE	43HE
15/1						18HE	24HE	24HE	33HE	43HE	43HE
20/1						18HE	24HE	33HE	43HE	43HE	
30/1						18HE	24HE	33HE	43HE	43HE	
40/1						18HE	24HE	33HE	43HE		
50/1						18HE	24HE	33HE	43HE		
60/1						18HE	24HE	33HE	43HE		

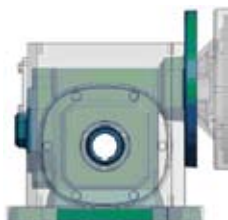
Sample Model Numbers

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 offers more torque density per size than a typical worm reducer. With mounting base kits, the E Series can drop-in and replace several sizes of worm speed reducers.

**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)
24HE			
2.38" CD	E185015.00	E185017.00	E185134.00
2.62" CD*	E185020.00	--	--
3.00" CD*	E185121.00	--	--
3.25" CD*	E185025.00	--	--
33HE			
3.25" CD	E185025.00	E185027.00	E185037.00
3.75" CD	E185026.00	--	--
4.25" CD	E185030.00	--	--

* A "B" Base is required to mount accessories to 24HE for retrofit to 2.62", 3.00" and 3.25" worm reducers and 33HE to 3.75" and 4.25" worm reducers.

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

Applications



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	N/A	2.50	N/A	1.50	1.94												
26HE	4.43					7.11				2.94		3.38		1.69		3/8-16			6.38		1.59														
30HE	5.24					8.11				3.25		4.00		2.00		7/16-14			7.00		1.75														
32HE	5.74					8.49				3.50		4.00		2.00		7/16-14			7.50		1.88														
33HE	N/A	6.53	0.37	0.60	7.50	N/A	9.38	3.68	3.50	3.50	4.00	N/A	2.00	N/A	7/16-14	N/A	6.15	7.50	N/A	3.75	N/A	2.19	2.62												
38HE	6.00					10.00				3.88		4.75		2.38		1/2-13			8.50		4.25														
42HE	6.12					10.25				4.44		5.00		2.50		5/8-11			8.50		4.25														

Style B

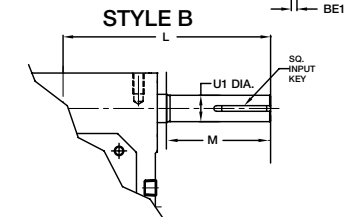
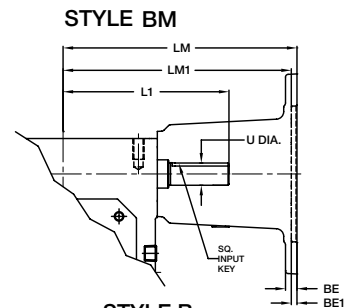
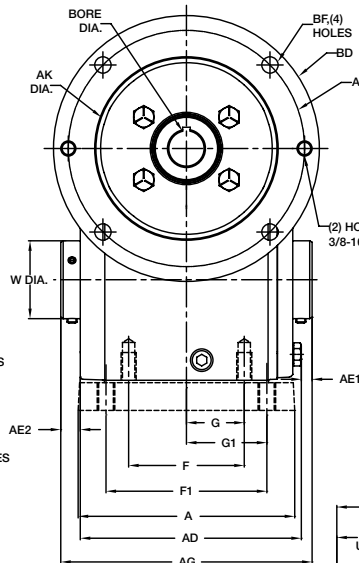
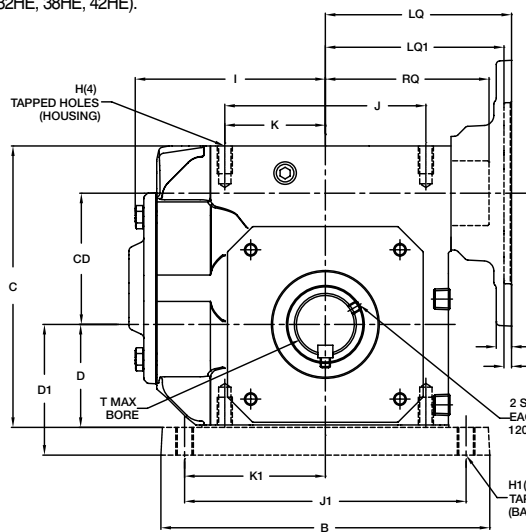
Reducer Size	L	M	U1 +0.0000 -0.0015
24HE	5.50	2.00	0.750
26HE	6.31	2.51	
30HE	6.88	3.44	0.875
32HE	7.44	4.00	
33HE	6.75	2.07	0.875
38HE	8.38	3.70	1.000
42HE	9.56	4.88	1.250

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

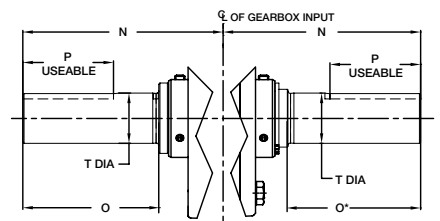
Size	N	O	O*	T +0.0000 -0.0015	T MAX BORE -0.0000 +0.0015	U +0.0000 -0.0015	Input Key (Style BM, B)	Output Key
24HE	5.14	1.77	1.69	1.125	1.50	0.750	3/16 sq x 1.50	1/4 sq x 1-1/2
26HE	5.63	2.25	2.18	1.125*				1/4 sq x 1-3/4
30HE	6.75	3.38	3.30	1.250				1/4 sq x 2-1/4
32HE	7.06	3.69	3.64	1.375				5/16 sq x 2-3/8
33HE	7.06	3.91	3.68	1.38	2.19	0.875	1/4 sq x 2-1/4	3/8 sq x 2-1/2
38HE	7.75	4.60	4.37	1.63				1/2 sq x 3-1/4
42HE	8.12	4.97	4.74	1.88				

* Shaft diameter of 1.250" is also available.

▼ Dimensions refer to "B Base" mounted to size 24HE or 33HE reducer (optional for sizes 26HE, 30HE, 32HE, 38HE, 42HE).



SOLID O/P SHAFT



Motor Mounting Dimensions

Size	L1 All	LM 56/140TC	LM1 180TC/ 210TC/ 250TC	LQ 56/140TC	LQ1 180TC/ 210TC/ 250TC	RQ All
24HE	5.50	7.76	8.76	4.63	5.06	4.07
26HE						
30HE						
32HE						
33HE	6.75	9.00	10.00	5.57	6.33	5.01
38HE						
42HE						

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
210TC	7.25	8.50	9.00	N/A	0.50	1.375	5/16 X 5/32	0.53
250TC	7.25	8.50	9.00	N/A	0.50	1.625	3/8 X 3/16	0.53

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	Morse (Browning) Raider	Dodge Tigear-2	Falk Omnibox	Morse Invader
B24HE	S924	724	237U	23S	1238WB	--
B26HE	S926	726	262U	26S	1262WB	726B
B30HE	S930	730	300U	30S	1230WB	730B
B32HE	S932	732	325U	35S	1325WB	732B
B33HE	S932	732	325U	35S	1325WB	732B
B38HE	S938	738	375U	--	--	738B
B42HE	--	--	--	40S	1425WB	--

Grove Gear Style BM



BM24HE	LF924	RF724	237C	23A	1238WBF	--
BM26HE	LF926	RF726	262C	26A	1262WBF	726RF
BM30HE	LF930	RF730	300C	30A	1230WBF	730RF
BM32HE	LF932	RF732	325C	35A	1325WBF	732RF
BM33HE	LF932	RF732	325C	35A	1325WBF	732RF
BM38HE	FL938	RF738	375C	--	--	738RF
BM42HE	--	--	--	40A	1425WBF	--

Grove Gear Style BMQ



BMQ24HE	F924	F724	237Q	23Q	1238WBM	--
BMQ26HE	F926	F726	262Q	26Q	1262WBM	726F
BMQ30HE	F930	F730	300Q	30Q	1230WBM	730F
BMQ32HE	F932	F732	325Q	35Q	1325WBM	732F
BMQ33HE	F932	F732	325Q	35Q	1325WBM	732F
BMQ38HE	F928	F738	375Q	--	--	738F
BMQ42HE	--	--	--	40Q	1425WBM	--

Grove Gear Style H



H24HE	HS924	H724	237UH	23S	1238WBQ	724S
H26HE	HS926	H726	262UH	26S	1262WBQ	726S
H30HE	HS930	H730	300UH	30S	1230WBQ	730S
H32HE	HS932	H732	325UH	35S	1325WBQ	732S
H33HE	HS932	H732	325UH	35S	1325WBQ	732S
H38HE	HS938	H738	375UH	--	--	738S
H42HE	--	--	--	40S	1425WBQ	--

Grove Gear Style HM



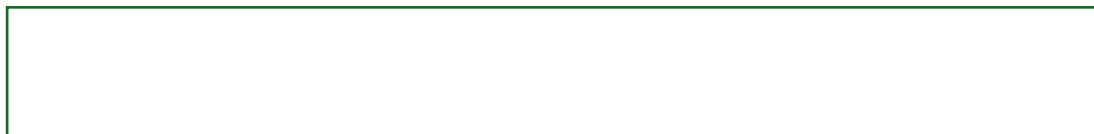
HM24HE	HLF924	HRF724	237CH	23A	1238WBQF	724SRF
HM26HE	HLF926	HRF726	262CH	26A	1262WBQF	726SRF
HM30HE	HLF930	HRF730	300CH	30A	1230WBQF	730SRF
HM32HE	HLF932	HRF732	325CH	35A	1325WBQF	732SRF
HM33HE	HLF932	HRF732	325CH	35A	1325WBQF	732SRF
HM38HE	HLF938	HRF738	375CH	--	--	738SRF
HM42HE	--	--	--	40A	1342WBQF	--

Grove Gear Style HMQ



HMQ24HE	HF924	HF724	237QH	23Q	1238WBQM	724SF
HMQ26HE	HF926	HF726	262QH	26Q	1262WBQM	726SF
HMQ30HE	HF930	HF730	300QH	30Q	1230WBQM	730SF
HMQ32HE	HF932	HF732	325QH	35Q	1325WBQM	732SF
HMQ33HE	HF932	HF732	325QH	35Q	1325WBQM	732SF
HMQ38HE	HF938	HF738	375QH	--	--	738SF
HMQ42HE	--	--	--	40Q	1425WQM	--

Visit grovegear.com for additional cross references to worm, helical-bevel and helical-worm products.



GROVE GEAR
ELECTRA-GEAR

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MOTORS

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PROTECH
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