

IronHorse® Cast-Iron Helical Gearboxes

Helical Gearbox Overview



IronHorse Cast-Iron Helical Gearbox

Gearbox Overview

Gearboxes, also known as enclosed gear drives or speed reducers, are mechanical drive components that can control a load at a reduced fixed ratio of the motor speed. The output torque is also increased by the same ratio, while the horsepower remains the same (less efficiency losses). For example, a 10:1 ratio gearbox outputs approximately the same motor output horsepower, but motor speed is divided by 10 and motor torque is multiplied by 10.

Helical gearboxes use helical gears to provide quiet startup and smooth operation.

IronHorse helical gearboxes are manufactured in an ISO9001- certified plant by one of the leading and most internationally acclaimed gearbox manufacturers in the world today. Only the highest quality materials are tested, certified, and used in the manufacturing process. Strict adherence to and compliance with the toughest international and U.S. testing standards and manufacturing procedures assures you the highest quality products.

We offer straight-through helical gearboxes with cast-iron frames. The output shaft is parallel to the input. Our gearboxes utilize C-face mounting interfaces for C-face motors.

Features

- C-face and TC-face input; inline, parallel output
- FC-20 cast iron one-piece housing
- 1045 carbon steel shaft
- Heat-treated and ground high strength steel gears, AGMA Class 10
- Shaft sleeves protect all shafts
- Heavy duty bearings on the output shaft
- Interior channel guides oil to directly and constantly lube bearings
- Double-lipped embedded oil seals to prevent leakage
- Universally interchangeable compact design ensures easy OEM replacement
- Mountable in most directions
- Two-year warranty

Applications

- Use with electric motors for reducing output speed, increasing torque.
- Use for conveyors, packaging machines, rotary tables, etc.

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Specifications

IronHorse Cast-Iron Helical Gearbox Specifications (continued from previous page)																	
Part Number	Price	Box Size	Nominal Ratio	Actual Ratio	Output RPM @ 1750 rpm Input	Nominal HP @ 1.0 Service Factor ¹	NEMA Motor Frame	Output Shaft Diameter (in)	Input Power (hp)	Output Torque (lb-in)	OHL (lbs) ²	Stages	Efficiency (%)	Approx Weight (lb)			
HGR-37-005-A	\$527.00	37	5:1	4.88	359	1.0	56C	1	1.00	160	465	2	96	32			
HGR-37-005-B	\$527.00					2.0	145TC		2.00	330	440						
HGR-37-010-A	\$527.00		10:1	10.02	175	1.0	56C		1.00	340	575						
HGR-37-010-B	\$527.00					2.0	145TC		2.00	670	530						
HGR-37-015-A	\$527.00		15:1	15.75	111	1.0	56C		1.00	530	650	3					
HGR-37-015-B	\$527.00			14.08	124	2.0	145TC		2.00	950	580						
HGR-37-020-A	\$527.00		20:1	19.95	88	1.0	56C		1.00	670	690	2					
HGR-37-020-B	\$527.00					2.0	145TC		2.00	1350	630						
HGR-37-030-A	\$527.00		30:1	31.02	56	1.5	56C		1.00	1010	760	3	94				
HGR-37-030-B	\$527.00					2.0	145TC		2.00	2020	700						
HGR-37-040-A	\$527.00		40:1	40.08	44	1.0	56C		1.00	1310	800						
HGR-37-060-A	\$527.00		60:1	60.84	29	1.0			0.82	1770	705						
HGR-47-005-B	\$606.00		47	5:1	4.85	361	2.0		145TC	1-1/4	2.00	330	670		2	96	45
HGR-47-005-C	\$606.00						5.0		182/4TC		3.00	490	645				51
HGR-47-010-C	\$606.00	10:1		11.27	155	3.0	1140	820				2	45				
HGR-47-015-C	\$606.00	15:1		15.18	115	3.0	1520	880									
HGR-47-020-B	\$606.00	20:1		18.37	95	2.0	145TC	2.00	1240		975	3	94	51			
HGR-47-020-C	\$606.00			19.18	91	3.0	182TC	3.00	1860		910			3	45		
HGR-47-030-B	\$606.00	30:1		31.83	55	2.0	145TC	2.00	2080		1070					3	51
HGR-47-030-C	\$606.00					3.0	182/4TC	3.00	3120		1005						
HGR-47-040-A	\$606.00	40:1		41.51	42	1.0	56C	1.00	1360		1215	2		45			
HGR-47-060-A	\$606.00	60:1		63.37	28	1.0			2070		1215						
HGR-67-005-B	\$862.00	67	5:1	5.23	335	2.0	145TC	1-3/8	2.00	350	770	2	96	63			
HGR-67-005-C	\$862.00					5.0	182/4TC		5.00	880	710			69			
HGR-67-010-C	\$862.00		10:1	9.90	177	5.0				1670	845			2	63		
HGR-67-015-B	\$862.00		15:1	15.41	114	2.0	145TC		2.00	1040	1060					3	94
HGR-67-015-C	\$862.00					3.0	182TC		3.00	1560	1020	3		63			
HGR-67-020-C	\$862.00		20:1	21.33	82	5.0			2160	1100	2				63		
HGR-67-030-B	\$862.00		30:1	28.77	61	2.0	145TC		2.00	1880		1220	3	63			
HGR-67-040-B	\$862.00		40:1	41.22	42	2.0				2690	1320						
HGR-67-060-A	\$862.00		60:1	63.07	28	1.0	56C		1.00	2060	1630						
HGR-77-005-C	\$1,010.00	77	5:1	4.78	366	5.0	182/4TC	1-5/8	5.00	800	800	2	96	82			
HGR-77-005-D	\$1,010.00					7.5	213/5TC		7.50	1210	765			93			
HGR-77-010-D	\$1,010.00		10:1	10.91	160	7.5				2760	935			3	94	82	
HGR-77-020-C	\$1,010.00		20:1	23.31	75	5.0	182/4TC		3.00	2350	1300						
HGR-77-030-C	\$1,010.00		30:1	31.97	55	5.0				3130	1370						
HGR-77-040-C	\$1,010.00		40:1	39.31	45	3.0	3850		1420								
HGR-77-060-B	\$1,010.00		60:1	57.73	30	2.0	145TC		2.00	3770	1710						

- 1) Nominal Motor HP is the highest HP 1800 rpm motor to be used with the gearbox under conditions of 1.0 service factor. Gearbox input power capacity decreases as motor speed decreases and as service factor increases.
- 2) OHL = Overhung Load ratings are for forces perpendicular to the output shaft and located at the shaft midpoint, such as from a gear, pulley, or sprocket with a belt or chain. Divide OHL ratings by the applicable OHL K factors shown separately in the Selection Factors tables. OHL ratings should also be divided by applicable service factors.
- 3) Maximum Mechanical Ratings are limits based on strength and durability of gearbox components; applicable when operating time is short and stopped time is greater than or equal to operating time. These ratings are applicable for 1.0 service factor loads, and may require modification depending upon characteristics of the applicable driven loads. Refer to the "Service Factors" table for more information.

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Specifications

IronHorse Cast-Iron Helical Gearbox Specifications (continued from previous page)

Part Number	Price	Box Size	Nominal Ratio	Actual Ratio	Output RPM @ 1750 rpm Input	Nominal HP @ 1.0 Service Factor ¹	NEMA Motor Frame	Output Shaft Diameter (in)	Input Power (hp)	Output Torque (lb-in)	OHL (lbs) ²	Stages	Efficiency (%)	Approx Weight (lb)
HGR-87-005-D	\$1,603.00	87	5:1	4.73	370	10.0	213/5TC	2-1/8	10.00	1590	1790	2	96	163
HGR-87-005-E	\$1,603.00					20.0	254/6TC		15.00	2390	1730			169
HGR-87-010-D	\$1,603.00		10:1	10.66	164	10.0	213/5TC		10.00	3590	2260			163
HGR-87-015-D	\$1,603.00		15:1	15.29	114	10.0			7.50	3860	2570			
HGR-87-020-C	\$1,603.00		20:1	20.06	87	5.0	182/4TC		5.00	3280	2840	3	94	156
HGR-87-020-D	\$1,603.00					10.0	213/5TC		7.50	4910	2710			163
HGR-87-030-C	\$1,603.00		30:1	31.73	55	5.0	182/4TC		5.00	5180	3200			156
HGR-87-040-C	\$1,603.00		40:1	38.20	46	5.0				6240	3420			
HGR-87-060-B	\$1,603.00		60:1	61.54	28	2.0	145TC		2.00	4070	3790			150
HGR-87-060-C	\$1,603.00					5.0	182TC		3.00	6030	3790			156

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- 2) OHL = Overhung Load ratings are for forces perpendicular to the output shaft and located at the shaft midpoint, such as from a gear, pulley, or sprocket with a belt or chain. Divide OHL ratings by the applicable OHL K factors shown separately in the Selection Factors tables. OHL ratings should also be divided by applicable service factors.
- 3) Maximum Mechanical Ratings are limits based on strength and durability of gearbox components; applicable when operating time is short and stopped time is greater than or equal to operating time. These ratings are applicable for 1.0 service factor loads, and may require modification depending upon characteristics of the applicable driven loads. Refer to the "Service Factors" table for more information.

Accessories

IronHorse Cast-Iron Helical Gearbox Accessories

Part Number	Price	Description	For Use With:
HBR-3777V	\$5.00	Breather plug; replacement; for use with HBR & HGR gearboxes sizes 37 thru 77	HB(G)R-37-xx through HB(G)R-77-xx
HBR-8797V	\$7.50	Breather plug; replacement; for use with HBR & HGR gearboxes size 87	HB(G)R-87-xx

Gearbox Selection Factors

Overhung Load K Factors for Various Drive Types

Chain & Sprocket	1.00
Gear	1.25
V-belt	1.50
Flat Belt	2.50
Variable Pitch Belt	3.50

Divide gearbox OHL ratings by the applicable OHL K factors.

Service Factors for Selecting Gearboxes (when used with electric motors)

Service Continuity (per day)	Load Characteristics			
	Uniform	Moderate Shock*	Heavy Shock*	Extreme Shock*
Occasional 1/2 hour	1.00	1.00	1.00	1.25
Less than 3 hours	1.00	1.00	1.25	1.50
3-10 hours	1.00	1.25	1.50	1.75
More than 10 hours	1.25	1.50	1.75	2.00

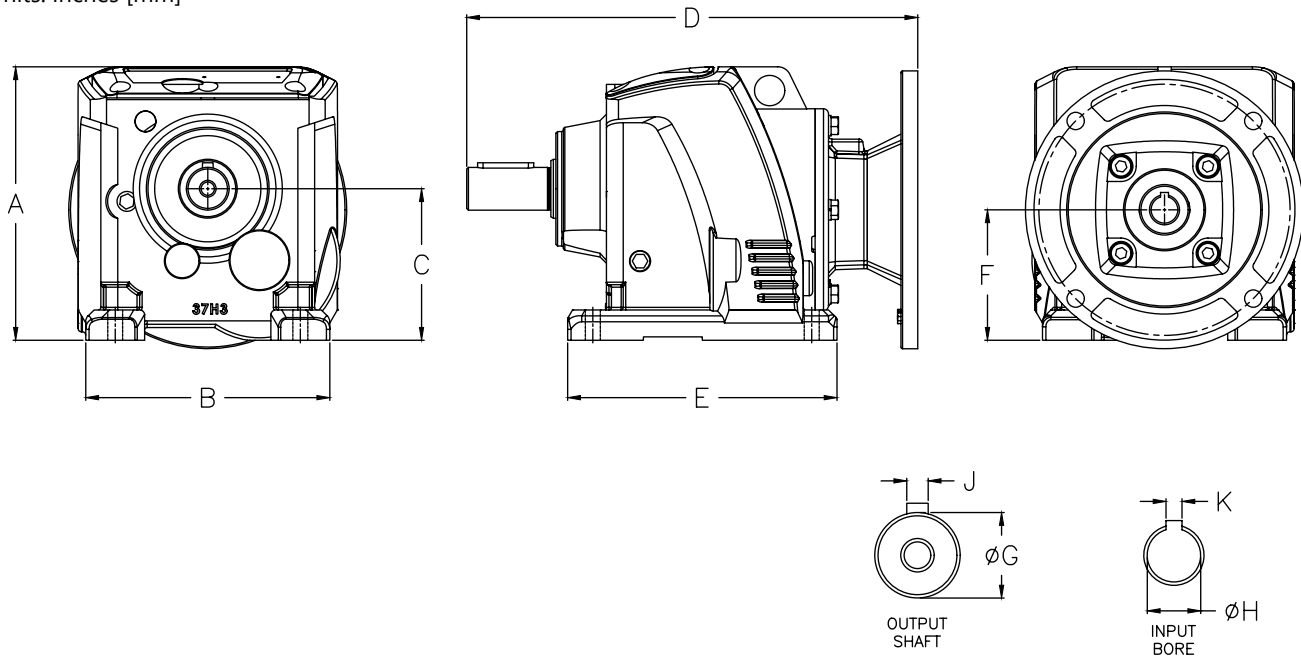
* Shock results from sudden increases in the torque demand of the load, such as: sudden stopping, restarting, and/or reversing; significantly heavy loads dropped onto a moving conveyor; impact loads such as punch press operations.

Depending upon the load characteristics, divide the gearbox HP, Overhung Load, and Maximum Mechanical Capacity ratings by the applicable service factor.

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Dimensions

Units: inches [mm]



Dimensions – inches [mm] – IronHorse Cast-Iron Helical Gearboxes											
Part Number	Frame	A	B	C	D	E	F	G	H	J	K
HGR-37-xxx-A	56C	6.40 [162.5]	5.71 [145.0]	3.54 [90.0]	10.55 [268.0]	6.30 [160.0]	3.05 [77.5]	1.00 [25.4]	0.63 [15.9]	0.25 [6.4]	0.19 [4.8]
HGR-47-xxx-A		8.25 [209.5]	6.69 [170.0]	4.53 [115.0]	11.63 [295.4]	7.68 [195.0]	3.98 [101.0]	1.25 [31.8]		0.31 [7.9]	
HGR-67-xxx-A		8.89 [226.0]	8.27 [210.0]	5.12 [130.0]	13.13 [333.5]	9.25 [235.0]	4.45 [113.0]	1.38 [34.9]		0.38 [9.7]	
HGR-37-xxx-B	145TC	6.40 [162.5]	5.71 [145.0]	3.54 [90.0]	10.94 [278.0]	6.30 [160.0]	3.05 [77.5]	1.00 [25.4]	0.88 [22.2]	0.25 [6.4]	
HGR-47-xxx-B		8.25 [209.5]	6.69 [170.0]	4.53 [115.0]	12.03 [305.5]	7.68 [195.0]	3.98 [101.0]	1.25 [31.8]		0.31 [7.9]	
HGR-67-xxx-B		8.89 [226.0]	8.27 [210.0]	5.12 [130.0]	13.52 [343.5]	9.25 [235.0]	4.45 [113.0]	1.38 [34.9]		0.50 [12.7]	
HGR-77-xxx-B		10.04 [255.0]	9.06 [230.0]	5.51 [140.0]	14.23 [361.5]	9.65 [245.0]	6.38 [162.0]	1.63 [41.4]		0.38 [9.7]	
HGR-87-xxx-B		12.99 [330.0]	11.42 [290.0]	7.09 [180.0]	17.20 [437.0]	12.20 [310.0]	8.05 [204.5]	2.13 [54.1]		0.50 [12.7]	
HGR-47-xxx-C	182/4TC*	8.25 [209.5]	6.69 [170.0]	4.53 [115.0]	12.76 [324.0]	7.68 [195.0]	3.98 [101.0]	1.25 [31.8]	1.13 [28.7]	0.25 [6.4]	0.25 [6.4]
HGR-67-xxx-C		8.89 [226.0]	8.27 [210.0]	5.12 [130.0]	14.25 [362.0]	9.25 [235.0]	4.45 [113.0]	1.38 [34.9]		0.31 [7.9]	
HGR-77-xxx-C		10.04 [255.0]	9.06 [230.0]	5.51 [140.0]	14.96 [380.0]	9.65 [245.0]	6.38 [162.0]	1.63 [41.4]		0.38 [9.7]	
HGR-87-xxx-C		12.99 [330.0]	11.42 [290.0]	7.09 [180.0]	17.32 [440.0]	12.20 [310.0]	8.05 [204.5]	2.13 [54.1]		0.50 [12.7]	
HGR-77-xxx-D	213/5TC	10.04 [255.0]	9.06 [230.0]	5.51 [140.0]	17.22 [437.5]	9.65 [245.0]	6.38 [162.0]	1.63 [41.4]	1.38 [35.0]	0.38 [9.7]	0.31 [7.9]
HGR-87-xxx-D		12.99 [330.0]	11.42 [290.0]	7.09 [180.0]	19.59 [497.5]	12.20 [310.0]	8.05 [204.5]	2.13 [54.1]		0.50 [12.7]	
HGR-87-xxx-E	254/6TC	12.99 [330.0]	11.42 [290.0]	7.09 [180.0]	20.57 [522.5]	12.20 [310.0]	8.05 [204.5]	2.13 [54.1]	1.63 [41.4]	0.50 [12.7]	0.38 [9.7]

*Note: 184TC motor frame sizes where applicable. See gearbox specifications for more information.
See our website: www.AutomationDirect.com for complete engineering drawings.