

# 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.

# IronHorse® Cast-Iron Helical Gearboxes

## Specifications

IronHorse Cast-Iron Helical Gearbox Specifications																
Part Number	Price	Box Size	Nominal Ratio	Actual Ratio	Output RPM @ 1750 rpm Input	Nominal HP @ 1.0 Service Factor <sup>1</sup>	NEMA Motor Frame	Output Shaft Diameter (in)	Input Power (hp)	Output Torque (lb-in)	OHL (lbs) <sup>2</sup>	Stages	Efficiency (%)	Approx Weight (lb)		
HGR-37-005-A	\$410.00	37	5:1	4.88	359	1.0	56C	1	5.91	970	305	2	96	32		
HGR-37-005-B	\$410.00					2.0	145TC									
HGR-37-010-A	\$410.00		10:1	10.02	175	1.0	56C		4.04	1360	388					
HGR-37-010-B	\$410.00					2.0	145TC									
HGR-37-015-A	\$410.00		15:1	15.75	111	1.0	56C		2.99	1580	451					
HGR-37-015-B	\$410.00					2.0	145TC									
HGR-37-020-A	\$410.00		20:1	19.95	88	1.0	56C		2.49	1670	489					
HGR-37-020-B	\$410.00					2.0	145TC									
HGR-37-030-A	\$410.00		30:1	31.02	56	1.5	56C		1.75	1770	565					
HGR-37-030-B	\$410.00					2.0	145TC									
HGR-37-040-A	\$410.00		40:1	40.08	44	1.0	56C		1.35	1770	615					
HGR-37-060-A	\$410.00		60:1	60.84	29	1.0	56C		0.89	1770	705					
HGR-47-005-B	\$472.00	47	5:1	4.85	361	2.0	145TC	1-1/4	9.59	1565	440	2	96	45		
HGR-47-005-C	\$472.00					5.0	182/4TC							51		
HGR-47-010-C	\$472.00		10:1	11.27	155	3.0	182TC		5.95	2255	590					
HGR-47-015-C	\$472.00		15:1	15.18	115	3.0	182TC		4.87	2490	650					
HGR-47-020-B	\$472.00		20:1	18.37	95	2.0	145TC		4.29	2650	690					
HGR-47-020-C	\$472.00					3.0	182TC							45		
HGR-47-030-B	\$472.00		30:1	31.83	55	2.0	145TC		2.73	2830	835					
HGR-47-030-C	\$472.00					3.0	182/4TC					51				
HGR-47-040-A	\$472.00		40:1	41.51	42	1.0	56C		2.09	2830	910					
HGR-47-060-A	\$472.00		60:1	63.37	28	1.0	56C		1.37	2830	1050					
HGR-67-005-B	\$670.00		67	5:1	5.23	335	2.0		145TC	1-3/8	15.38	2710	710	2	96	63
HGR-67-005-C	\$670.00						5.0		182/4TC							69
HGR-67-010-C	\$670.00	10:1		9.90	177	5.0	182/4TC	12.39	4130		880					
HGR-67-015-B	\$670.00	15:1		15.41	114	2.0	145TC	9.23	4785		1020					
HGR-67-015-C	\$670.00					3.0	182TC					63				
HGR-67-020-C	\$670.00	20:1		22.90	76	5.0	182/4TC	6.87	4720		1165					
HGR-67-030-B	\$670.00	30:1		32.02	55	2.0	145TC	4.83	5045		1305					
HGR-67-040-B	\$670.00					2.0	145TC					69				
HGR-67-060-A	\$670.00	60:1		63.07	28	1.0	56C	2.45	5045		1480					
HGR-77-005-C	\$786.00	77		5:1	4.78	366	5.0	182/4TC	1-5/8		25.13	4040	785	2	96	82
HGR-77-005-D	\$786.00						7.5	213/5TC								93
HGR-77-010-D	\$786.00			10:1	10.91	160	7.5	213/5TC			16.89	6205	1035			
HGR-77-020-C	\$786.00		20:1	23.31	75	5.0	182/4TC	7.84		6150	1330					
HGR-77-030-C	\$786.00					5.0	182/4TC					82				
HGR-77-040-C	\$786.00		40:1	39.31	45	3.0	182TC	5.49		6640	1555					
HGR-77-060-B	\$786.00		60:1	57.73	30	2.0	145TC	3.52		6640	1800					

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.

( table continued next page )

# IronHorse® Cast-Iron Helical Gearboxes

## 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 <sup>1</sup>	NEMA Motor Frame	Output Shaft Diameter (in)	Input Power (hp)	Output Torque (lb-in)	OHL (lbf <sup>2</sup> )	Stages	Efficiency (%)	Approx Weight (lb)
HGR-87-005-D	\$1,247.00	87	5:1	4.73	370	10.0	213/5TC	2-1/8	38.49	6120	1800	2	96	163
HGR-87-005-E	\$1,247.00					20.0	254/6TC							169
HGR-87-010-D	\$1,247.00		10:1	10.66	164	10.0	213/5TC		27.28	9790	2375			163
HGR-87-015-D	\$1,247.00		15:1	15.29	114	10.0	213/5TC		21.45	11040	2680			156
HGR-87-020-C	\$1,247.00		20:1	20.06	87	5.0	182/4TC		15.13	9915	2925	3	94	156
HGR-87-020-D	\$1,247.00					10.0	213/5TC							163
HGR-87-030-C	\$1,247.00		30:1	31.73	55	5.0	182/4TC		11.15	11550	3010			156
HGR-87-040-C	\$1,247.00		40:1	38.20	46	5.0	182/4TC		11.36	14170	3010			150
HGR-87-060-B	\$1,247.00		60:1	61.54	28	2.0	145TC		7.05	14170	3010	150		
HGR-87-060-C	\$1,247.00					5.0	182/4TC					156		

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.

## Accessories

IronHorse Cast-Iron Helical Gearbox Accessories			
Part Number	Price	Description	For Use With:
HBR-3777V	\$4.00	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	\$6.00	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

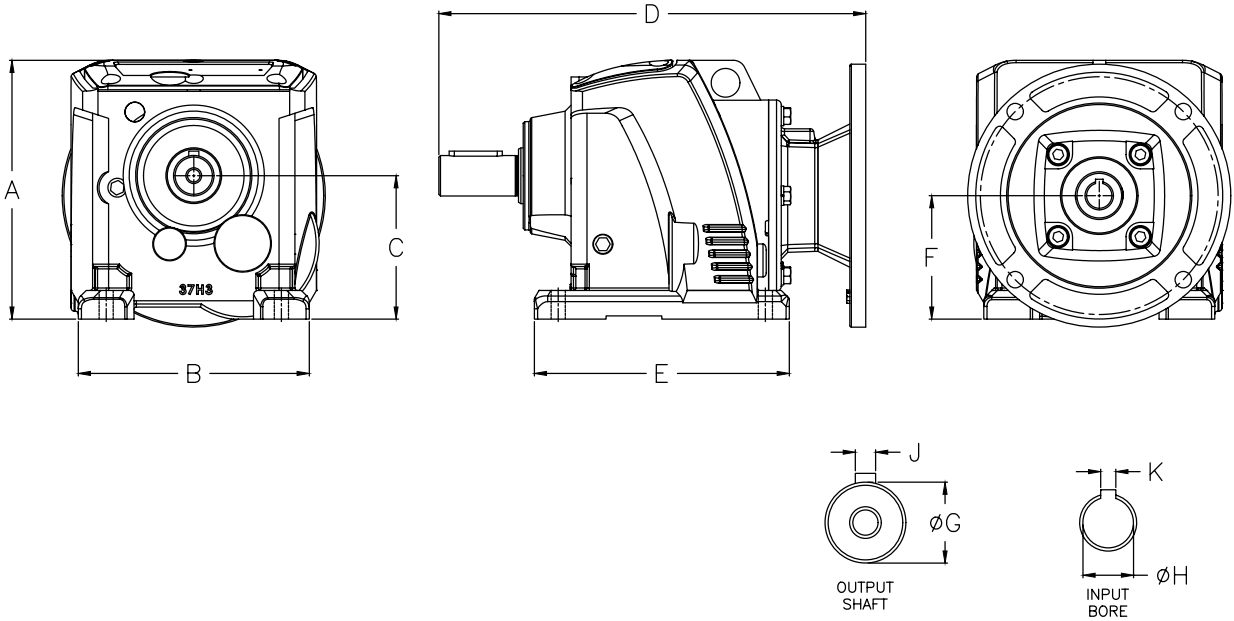
\* Shock results from sudden increases in the torque demand of the load, such as: sudden stopping, restarting, and/or reversing; significantly heavy loads dropped onto a moving conveyor; impact loads such as punch press operations.

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

# IronHorse® Cast-Iron Helical Gearboxes

## 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](http://www.AutomationDirect.com) for complete engineering drawings.