

GETTING STARTED



In This Chapter...

Manual Overview	1-2
Overview of This Publication	1-2
Who Should Read This Manual	1-2
Technical Support	1-2
Special Symbols	1-2
IronHorse™ Worm Gearbox Introduction	1-3
Purpose of Worm Gearboxes	1-3
Package Contents	1-3
Part Number Explanation	1-4
Nameplate Information	1-4
IronHorse™ Worm Gearbox Specifications	1-5
Gearbox Selection Factors	1-9
Service Factors and K Factors	1-9

Manual Overview

Overview of This Publication

The IronHorse Worm Gearbox User Manual describes the installation, operation, and preventative maintenance of IronHorse Worm Gearboxes.

Who Should Read This Manual

This manual contains important information for people who will install, maintain, and/or operate any of the IronHorse Worm Gearboxes.

Technical Support

Our technical support group is glad to work with you to answer your questions. Please call the technical support group if you need technical assistance, or visit our web site. Our website contains technical and non-technical information about our products and our company.

By telephone: (770) 844-4200 (Mon – Fri, 9:00 am – 6:00 pm ET)

On the Web: www.automationdirect.com

Special Symbols



When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a special note which presents information that may make your work quicker or more efficient. The word “NOTE” will mark the beginning of the text.



When you see the “exclamation point” icon in the left-hand margin, the paragraph to its immediate right will be a warning. This information could prevent injury, loss of property, or even death (in extreme cases). Any warning in this manual should be regarded as critical information that should be read in its entirety. The word “WARNING” in boldface will mark the beginning of the text.

IronHorse™ Worm Gearbox Introduction

Purpose of Worm Gearboxes

Gearboxes, also known as enclosed gear drives or speed reducers, are mechanical drive components that can drive 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). 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.

Worm gearboxes contain a worm-type gear on the input shaft, and a spur-type mating gear on the output shaft. Worm gearboxes also change the drive direction by 90 degrees. Our worm gearboxes are manufactured in an ISO9001 certified plant by one of the leading and most internationally acclaimed worm 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 assure you the highest quality products.

We offer right angle worm gearboxes with right-hand and dual (both right and left) output shafts, and with hollow-shaft outputs (all the way through from one side to the other). These outputs are perpendicular to the inputs, and change the drive direction(s) by 90°. Our gearboxes utilize C-face mounting interfaces for C-face motors.

We also offer optional gearbox mounting bases for ease of installation.

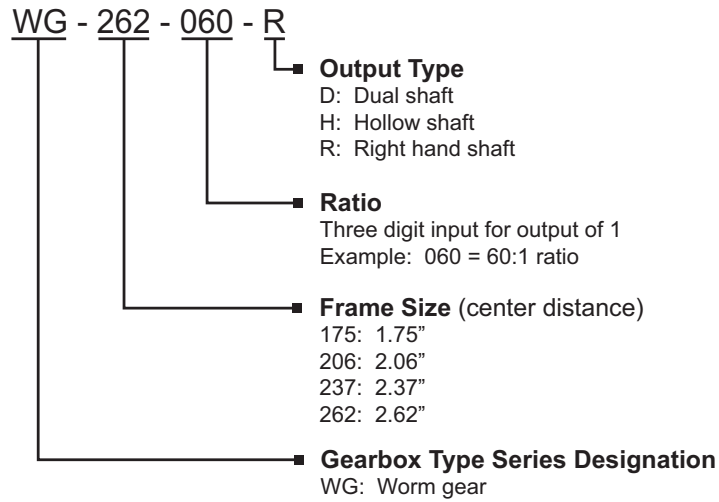
Package Contents

After receiving the IronHorse Worm Gearbox, please check for the following:

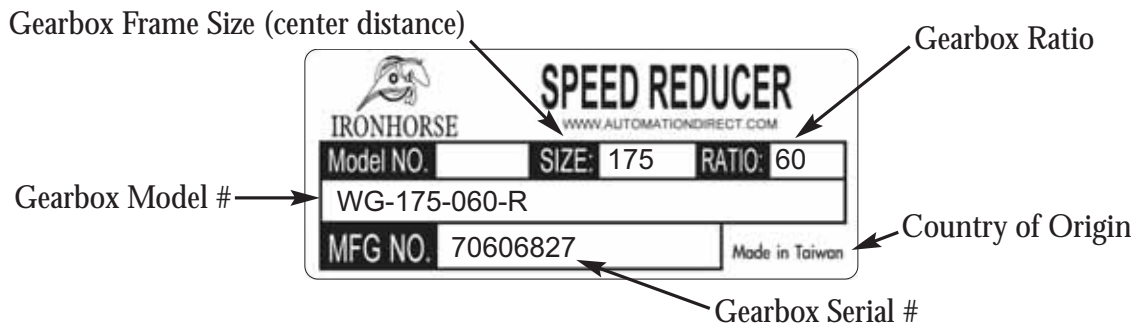
- Make sure the package includes the speed reducer and the vent plug.
- Inspect the unit to insure it was not damaged during shipment.
- Make sure that the part number on the gearbox nameplate is the same as the part number that you ordered.

Chapter 1: Getting Started

Part Number Explanation



Nameplate Information



IronHorse™ Worm Gearbox Specifications

IronHorse™ Worm Gearbox Specifications – Frame Size 175																	
Part Number	Ratio	Output RPM @ 1750 rpm Input	Nominal Motor HP ¹ @ 1800 rpm	NEMA Motor Frame	Output Type ²	Center Distance ³ (in)	Overhung Load ⁴ (lb)	Thrust Load ⁵ (lb)	Efficiency (%)	Approx Weight (lb)	Maximum Ratings @ 1750 rpm Input						Maximum Input Speed (rpm)
											Mechanical ⁶			Thermal ⁷			
											Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	
WG-175-005-D	5:1	350	1-1/2	56C	D	1.75	650	550	93	23	2.83	2.62	499	2.28	2.11	402	2500
WG-175-005-H					H												
WG-175-005-R					R												
WG-175-010-D	10:1	175	1	56C	D				88	23	1.57	1.38	515	1.36	1.19	445	
WG-175-010-H					H												
WG-175-010-R					R												
WG-175-015-D	15:1	117	3/4	56C	D				85	23	1.24	1.06	554	1.13	0.96	506	
WG-175-015-H					H												
WG-175-015-R					R												
WG-175-020-D	20:1	88	3/4	56C	D				83	23	1.26	1.04	737	0.98	0.81	572	
WG-175-020-H					H												
WG-175-020-R					R												
WG-175-040-D	40:1	44	1/3	56C	D				62	23	0.79	0.49	714	0.45	0.28	404	
WG-175-040-H					H												
WG-175-040-R					R												
WG-175-060-D	60:1	29	1/4	56C	D	52	23	0.38	0.20	433	0.35	0.19	404				
WG-175-060-H					H												
WG-175-060-R					R												

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) Output Type: D = Dual Shaft; H = Hollow Shaft; R = Right-Hand Shaft

3) The Center Distance is the distance between the centerlines of the input and output shafts; serves as the gearbox frame size.

4) 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.

5) Thrust Load ratings are for forces along the axis of the output shaft, usually encountered in vertical-drive applications from agitators, mixers, fans, blowers, etc.

6) 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.

7) Maximum Thermal Ratings are limits for gearbox continuous use without overheating.

IronHorse™ Worm Gearbox Specifications (continued)

IronHorse™ Worm Gearbox Specifications – Frame Size 206																	
Part Number	Ratio	Output RPM @ 1750 rpm Input	Nominal Motor HP ¹ @ 1800 rpm	NEMA Motor Frame	Output Type ²	Center Distance ³ (in)	Overhung Load ⁴ (lb)	Thrust Load ⁵ (lb)	Efficiency (%)	Approx Weight (lb)	Maximum Ratings @ 1750 rpm Input						Maximum Input Speed (rpm)
											Mechanical ⁶			Thermal ⁷			
											Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	
WG-206-005-D	5:1	350	2	56C	D	2.06	700	750	92	27.9	3.62	3.33	925	2.57	2.36	657	2500
WG-206-005-H					H					32							
WG-206-005-R					R					27.3							
WG-206-010-D	10:1	175	1-1/2	56C	D				90	27.9	2.77	2.50	935	2.10	1.89	708	
WG-206-010-H					H					32							
WG-206-010-R					R					27.3							
WG-206-015-D	15:1	117	1	56C	D				85	27.9	2.09	1.78	1002	1.40	1.20	673	
WG-206-015-H					H					32							
WG-206-015-R					R					27.3							
WG-206-020-D	20:1	88	1	56C	D				82	27.9	1.57	1.29	914	1.17	0.96	681	
WG-206-020-H					H					32							
WG-206-020-R					R					27.3							
WG-206-040-D	40:1	44	1/2	56C	D				71	27.9	1.09	0.77	1120	0.71	0.50	726	
WG-206-040-H					H					32							
WG-206-040-R					R					27.3							
WG-206-060-D	60:1	29	1/3	56C	D	58	27.9	0.60	0.35	750	0.48	0.28	606				
WG-206-060-H					H		32										
WG-206-060-R					R		27.3										

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) Output Type: D = Dual Shaft; H = Hollow Shaft; R = Right-Hand Shaft

3) The Center Distance is the distance between the centerlines of the input and output shafts; serves as the gearbox frame size.

4) 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.

5) Thrust Load ratings are for forces along the axis of the output shaft, usually encountered in vertical-drive applications from agitators, mixers, fans, blowers, etc.

6) 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.

7) Maximum Thermal Ratings are limits for gearbox continuous use without overheating.

IronHorse™ Worm Gearbox Specifications (continued)

IronHorse™ Worm Gearbox Specifications – Frame Size 237																													
Part Number	Ratio	Output RPM @ 1750 rpm Input	Nominal Motor HP 1 @ 1800 rpm	NEMA Motor Frame	Output Type 2	Center Distance 3 (in)	Overhung Load 4 (lb)	Thrust Load 5 (lb)	Efficiency (%)	Approx Weight (lb)	Maximum Ratings @ 1750 rpm Input					Maximum Input Speed (rpm)													
											Mechanical 6			Thermal 7															
											Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	Input Power (hp)	Output Power (hp)		Output Torque (lb-in)												
WG-237-005-D	5:1	350	3	56C	D	2.37	900	900	93	37.6	4.32	4.02	766	3.56	3.31	630	2500												
WG-237-005-H					H					38																			
WG-237-005-R					R					36.7																			
WG-237-010-D	10:1	175	1-1/2		D				2.37	900	900	89	37.6	3.47	3.09	1158		2.24	1.99	746	2500								
WG-237-010-H					H								38																
WG-237-010-R					R								36.7																
WG-237-015-D	15:1	117	1		D							2.37	900	900	84	37.6		2.64	2.22	1249		1.55	1.30	732	2500				
WG-237-015-H					H											38													
WG-237-015-R					R											36.7													
WG-237-020-D	20:1	88	1		D										2.37	900		900	82	37.6		2.06	1.69	1195		1.36	1.12	791	2500
WG-237-020-H					H															38									
WG-237-020-R					R															36.7									
WG-237-040-D	40:1	44	1/2	D	2.37	900	900	71									37.6		1.45	1.02		1483	0.83	0.58		845	2500		
WG-237-040-H				H													38												
WG-237-040-R				R													36.7												
WG-237-060-D	60:1	29	1/2	D				2.37	900	900	61						37.6		0.86	0.53	1149	0.63	0.39	844		2500			
WG-237-060-H				H													38												
WG-237-060-R				R													36.7												

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) Output Type: D = Dual Shaft; H = Hollow Shaft; R = Right-Hand Shaft

3) The Center Distance is the distance between the centerlines of the input and output shafts; serves as the gearbox frame size.

4) 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.

5) Thrust Load ratings are for forces along the axis of the output shaft, usually encountered in vertical-drive applications from agitators, mixers, fans, blowers, etc.

6) 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.

7) Maximum Thermal Ratings are limits for gearbox continuous use without overheating.

Chapter 1: Getting Started

IronHorse™ Worm Gearbox Specifications (continued)

IronHorse™ Worm Gearbox Specifications – Frame Size 262																	
Part Number	Ratio	Output RPM @ 1750 rpm Input	Nominal Motor HP 1 @ 1800 rpm	NEMA Motor Frame	Output Type 2	Center Distance 3 (in)	Overhung Load 4 (lb)	Thrust Load 5 (lb)	Efficiency (%)	Approx Weight (lb)	Maximum Ratings @ 1750 rpm Input						Maximum Input Speed (rpm)
											Mechanical 6			Thermal 7			
											Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	Input Power (hp)	Output Power (hp)	Output Torque (lb-in)	
WG-262-005-D	5:1	350	3	182TC	D	2.62	1000	1000	93	57.0	5.24	4.86	924	4.32	4.00	761	2500
WG-262-005-H					H					50							
WG-262-005-R					R					55.7							
WG-262-010-D	10:1	175	2	182TC	D	2.62	1000	1000	90	57.0	4.17	3.74	1445	3.06	2.75	1061	2500
WG-262-010-H					H					50							
WG-262-010-R					R					55.7							
WG-262-015-D	15:1	117	2	56C	D	2.62	1000	1000	87	49.9	3.22	2.81	1577	2.47	2.16	1212	2500
WG-262-015-H					H					50							
WG-262-015-R					R					48.6							
WG-262-020-D	20:1	88	1-1/2	56C	D	2.62	1000	1000	83	49.9	2.67	2.21	1563	1.84	1.53	1078	2500
WG-262-020-H					H					50							
WG-262-020-R					R					48.6							
WG-262-040-D	40:1	44	3/4	56C	D	2.62	1000	1000	72	49.9	1.85	1.32	1919	1.11	0.80	1153	2500
WG-262-040-H					H					50							
WG-262-040-R					R					48.6							
WG-262-060-D	60:1	29	3/4	56C	D	2.62	1000	1000	66	49.9	1.16	0.77	1670	0.94	0.62	1346	2500
WG-262-060-H					H					50							
WG-262-060-R					R					48.6							

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) Output Type: D = Dual Shaft; H = Hollow Shaft; R = Right-Hand Shaft

3) The Center Distance is the distance between the centerlines of the input and output shafts; serves as the gearbox frame size.

4) 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.

5) Thrust Load ratings are for forces along the axis of the output shaft, usually encountered in vertical-drive applications from agitators, mixers, fans, blowers, etc.

6) 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.

7) Maximum Thermal Ratings are limits for gearbox continuous use without overheating.

Gearbox Selection Factors

Service Factors and 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.				

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.	