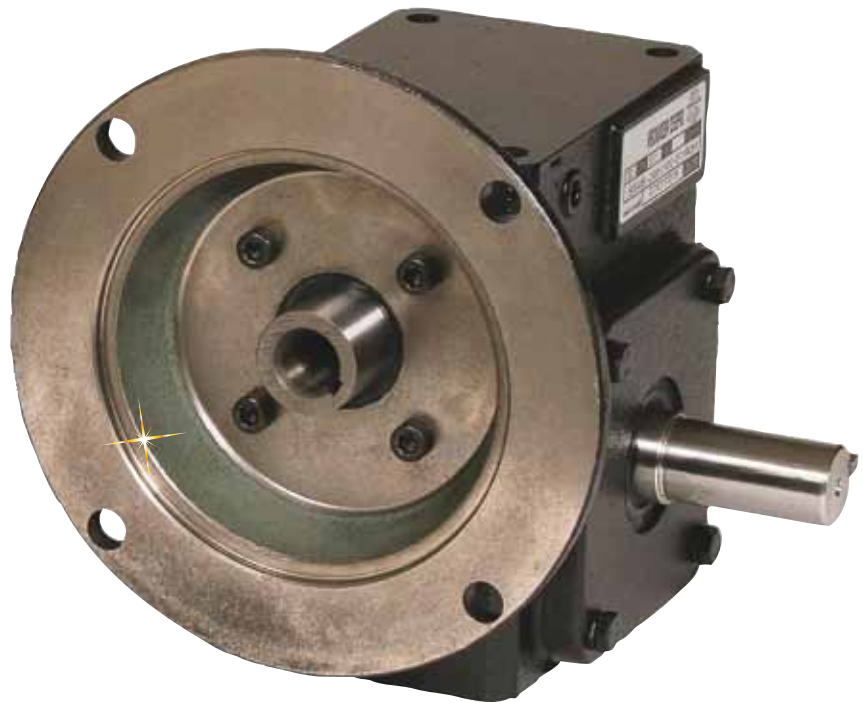


# GEARBOXES

## WORM GEAR

### SPEED REDUCERS

### HDR Series



HDRF133-20/1-R-56C right hand flange mount gearbox with box size 133, mounts directly to 56C-frame motors shown smaller than actual size.

- 8 Ratios Available from 5:1 to 60:1
- 7 Gear Box Sizes from 1.33 to 3.25"
- Universally Interchangeable Design for OEM Replacement
- Double Bearings Used on Both Shaft Ends
- Anti-Rust Primer Applied Inside and Outside Gearbox
- Shaft Sleeve Protects All Shafts
- S45C Carbon Steel Shafts

### Applications

- Food Processing
- Warehouse Material Handling
- Conveyors (Belt, Direct-Drive, Inclined, etc.)
- Packaging Machinery (Shrink Wrappers, Stretch Wrappers, Case Sealers, etc.)
- Special Machinery

The HDR Series worm gear reducers are used in low to moderate horsepower applications to reduce speeds and increase torque. Worm gear reducers are available in direct or indirect drive, direct drive models are 56C flange mount with either right, left or dual output shafts or a hollow bore output. The indirect drive models are shaft input-shaft output boxes for use with sprocket or pulley drive systems. They provide an effective low cost solution to speed reduction and increased torque, with higher tolerances for shock loading than helical gear reducers.



Flange input, shaft output, left hand output.



Flange input, shaft output, right hand output.



Flange input, shaft output, double end output.



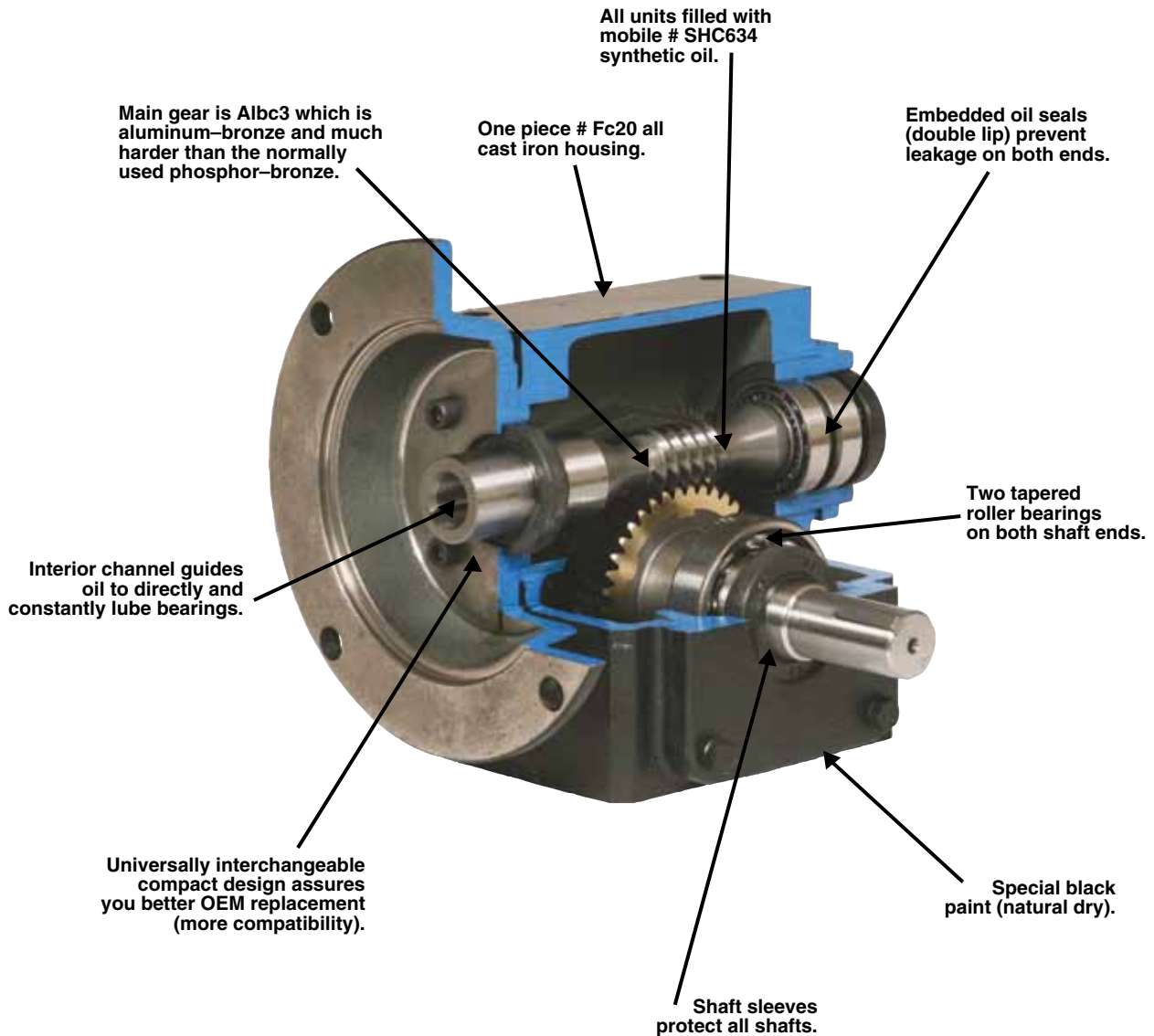
Flange input, hollow bore output.



Shaft input, shaft output, right hand output.



Shaft input, shaft output, left hand output.



### RECOMMENDED SERVICE FACTOR (S.F.)

LOAD CHARACTERISTICS	AVERAGE OPERATING HOURS PER DAY		
	Up to 8	8 to 16	16 to 24
- Uniform load and continuous operation - No reversal - Light Inertia load	1.0	1.1	1.2
- Medium shock, intermittent operation - Frequent start and frequent reversal - Medium inertia load	1.3	1.4	1.5
- Heavy shock, intermittent operation - Frequent start and frequent reversal - Heavy inertia load	1.7	1.9	2.0

In order to select a gearbox speed reducer, you will need to determine the required torque and service factor for the application. The table to the right will assist in determining the service factor. For service factors above 1.0, multiply the required torque by the service factor.

**Example:** Review the mechanical ratings table (next page): A torque requirement of 675 in. lbs. and a ratio of 20:1 (88 RPM), you would choose a box size 175 and it would require a 1.26 input HP, or a

1.5 HP motor. However, if the service factor is determined to be 1.4, then your required torque would be 1.4 x 675, or 945 lbs in. In

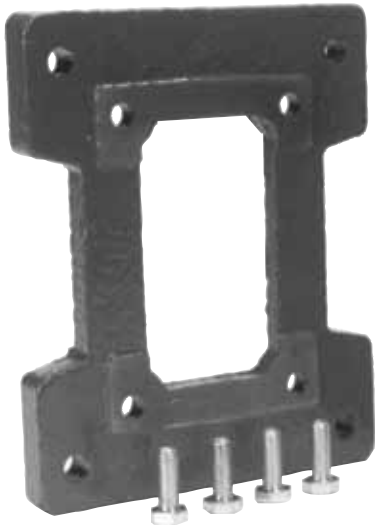
this case you would select a box size 237 rated at 1195 in. lbs and require an input HP of 2.06, or a 2 HP motor.

## MECHANICAL RATING AND SPECIFICATIONS

Input Speed		1750 RPM									
Box* Size	Ratio	1.0 Service Factor			1.2 Service Factor			Efficiency (%)	Over Hung Load (lbs.)	Output Shaft Thrust Load (lbs.)	Backlash (Angular Minutes) (ft.)
		Input HP	Output Torque (lbs. in.)	Output HP	Input HP	Output Torque (lbs. in.)	Output HP				
133	5:1	1.15	209	1.05	1.21	221	1.11	91	300	300	27
	10:1	0.77	247	0.66	0.75	240	0.64				
	15:1	0.63	283	0.5	0.53	238	0.42				
	20:1	0.5	276	0.39	0.48	266	0.38				
	30:1	0.47	336	0.31	0.31	221	0.20				
	40:1	0.38	356	0.25	0.30	282	0.19				
	60:1	0.29	312	0.17	0.26	282	0.16				
154	5:1	2.04	341	1.88	2.06	345	1.90	92	450	400	23
	10:1	1.03	327	0.9	1.29	411	1.13				
	15:1	0.78	363	0.67	1.11	518	0.95				
	20:1	0.65	384	0.53	0.86	509	0.70				
	30:1	0.48	388	0.36	0.62	504	0.46				
	40:1	0.4	397	0.27	0.51	503	0.35				
	60:1	0.34	407	0.22	0.47	565	0.31				
175	5:1	2.83	499	2.62	2.28	402	2.11	93	650	550	20
	10:1	1.57	515	1.38	1.36	445	1.19				
	15:1	1.24	554	1.06	1.13	506	0.96				
	20:1	1.26	737	1.04	0.98	572	0.81				
	30:1	0.89	666	0.61	0.54	405	0.37				
	40:1	0.79	714	0.49	0.45	404	0.28				
	60:1	0.5	538	0.3	0.41	446	0.25				
206	5:1	3.62	925	3.33	2.57	657	2.36	92	700	750	17
	10:1	2.77	935	2.5	2.10	708	1.89				
	15:1	2.09	1002	1.78	1.40	673	1.20				
	20:1	1.57	914	1.29	1.17	681	0.96				
	30:1	1.65	1310	1.21	0.76	606	0.56				
	40:1	1.09	1120	0.77	0.71	726	0.50				
	60:1	0.74	830	0.46	0.54	606	0.33				
237	5:1	4.32	766	4.02	3.56	630	3.31	93	900	900	17
	10:1	3.47	1158	3.09	2.24	746	1.99				
	15:1	2.64	1249	2.22	1.55	732	1.30				
	20:1	2.06	1195	1.69	1.36	791	1.12				
	30:1	1.82	1507	1.39	1.02	847	0.78				
	40:1	1.45	1483	1.02	0.83	845	0.58				
	60:1	1.32	1527	0.84	0.67	779	0.43				
262	5:1	5.24	924	4.86	4.32	761	4.00	93	1000	1000	17
	10:1	4.17	1445	3.74	3.06	1061	2.75				
	15:1	3.22	1577	2.81	2.47	1212	2.16				
	20:1	2.67	1563	2.21	1.84	1078	1.53				
	30:1	2.22	1827	1.68	1.30	1072	0.99				
	40:1	1.85	1919	1.32	1.11	1153	0.80				
	60:1	1.37	1658	0.92	0.95	1152	0.64				
325	5:1	9.72	1724	9.06	6.93	1228	6.46	93	1200	1200	15
	10:1	7.19	2419	6.46	4.63	1558	4.16				
	15:1	5.45	2611	4.65	3.19	1527	2.72				
	20:1	4.74	2875	4.07	3.31	2011	2.85				
	30:1	3.66	3045	2.8	2.00	1661	1.53				
	40:1	3.35	3692	2.55	1.96	2156	1.49				
	60:1	2.49	3413	1.88	1.92	2637	1.46				
	2.03	3127	1.44	1.61	2476	1.14					

**Note:** Maximum input speed is 2000 RPM.

\*Box size is distance between center line of input and outputs shafts.



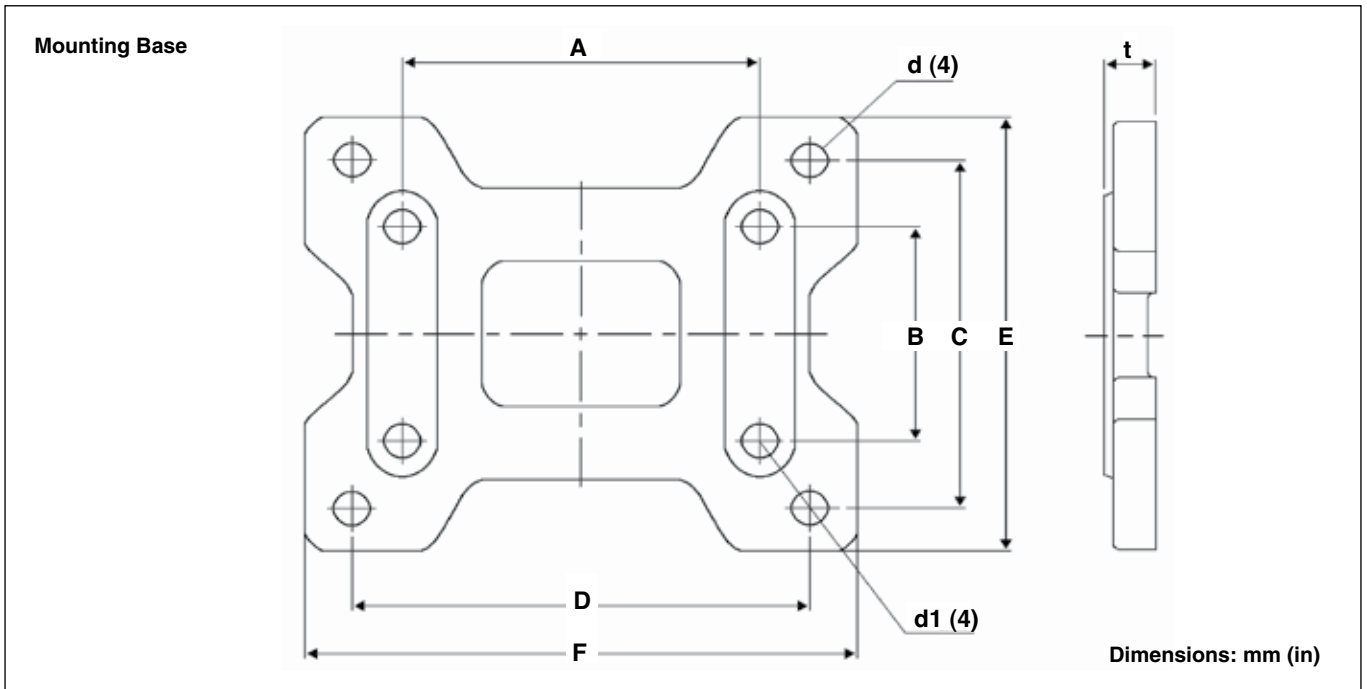
HDRBASE133 shown smaller than actual size.

## MOUNTING BASES

To Order	
MODEL NO.	BOX SIZE
HDRBASE133	133
HDRBASE154	154
HDRBASE175	175
HDRBASE206	206
HDRBASE237	237
HDRBASE262	262
HDRBASE325	325

Mounting base comes complete with bolts.

RATIO	5:1	10:1	15:1	20:1	30:1	40:1	50:1	60:1
RPM @ 1750 INPUT SPEED	350	175	120	88	58	44	35	29
RATIO CODE	5/1	10/1	15/1	20/1	30/1	40/1	50/1	60/1



BOX SIZE	A	B	C	D	E	F	t	d	d1
133	82.5 (3.25)	51 (2)	84 (3.31)	111 (4.38)	106 (4.19)	137 (5.38)	0.53	$\frac{11}{32}$	$\frac{3}{8}$
154	106 (4.19)	70 (2.75)	109 (4.31)	133 (5.25)	138 (5.44)	164 (6.44)	0.59	$\frac{11}{32}$	$\frac{3}{8}$
175	106 (4.19)	70 (2.75)	114 (4.5)	146 (5.75)	145 (5.69)	178 (7)	0.69	$\frac{13}{32}$	$\frac{3}{8}$
206	127 (5)	73 (2.88)	119 (4.69)	162 (6.38)	151 (5.94)	192 (7.55)	0.72	$\frac{15}{32}$	$\frac{7}{16}$
237	127 (5)	73 (2.88)	124 (4.88)	179 (7.06)	158 (6.22)	216 (8.5)	0.75	$\frac{15}{32}$	$\frac{7}{16}$
262	162 (6.38)	86 (3.38)	133 (5.25)	203 (8)	169 (6.66)	245 (9.63)	0.75	$\frac{17}{32}$	$\frac{7}{16}$
325	190 (7.5)	102 (4)	156 (6.13)	241 (9.5)	195 (7.66)	284 (11.19)	0.88	$\frac{17}{32}$	$\frac{1}{2}$

Gearboxes come in fixed ratio units that provide the user with speed reduction along with a mechanical advantage to increase torque. A 1 HP motor at 1750 RPM provides 35 in. lbs. of torque.

Adding a 10:1 ratio gearbox will reduce the speed to 175 RPM and increase the torque to 350 in. lbs. and the resulting HP will remain close to 1 HP with little loss efficiency.

### WORM GEAR REDUCERS FOR 56C FRAME MOTORS

BOX SIZE	OUTPUT RPM INPUT ( RATIO) at 1800 RPM	OUTPUT TORQUE (lbs. in.)	OUTPUT HP	INPUT HP	MODEL NO. GEAR REDUCER	AC MOTORS		
						H.P.	SINGLE PHASE	3-PHASE
175 (1.75")	175 (10:1)	445	1.19	1.36	HDRF175-10/1-R-56C	1.5	OMT1.5-18-56C	OMAT1.5-18-56C
	120 (15:1)	506	0.96	1.13	HDRF175-15/1-R-56C	1.5	OMT1.5-18-56C	OMAT1.5-18-56C
	88 (20:1)	572	0.81	0.98	HDRF175-20/1-R-56C	1	OMT1-18-56C	OMAT1-18-56C
	44 (40:1)	404	0.28	0.45	HDRF175-40/1-R-56C	1/2	OMT12-18-56C	OMAT12-18-56C
	35 (50:1)	446	0.25	0.41	HDRF175-50/1-R-56C	1/2	OMT12-18-56C	OMAT12-18-56C
	29 (60:1)	404	0.19	0.35	HDRF175-60/1-R-56C	1/2	OMT12-18-56C	OMAT12-18-56C
206 (2.06")	44 (40:1)	726	0.5	0.71	HDRF206-40/1-R-56C	3/4	OMT34-18-56C	OMAT34-18-56C
	35 (50:1)	606	0.33	0.54	HDRF206-50/1-R-56C	3/4	OMT34-18-56C	OMAT34-18-56C
	29 (60:1)	606	0.28	0.48	HDRF206-60/1-R-56C	1/2	OMT12-18-56C	OMAT12-18-56C
237 (2.37")	44 (40:1)	845	0.58	0.83	HDRF237-40/1-R-56C	1	OMT1-18-56C	OMAT1-18-56C
	35 (50:1)	779	0.43	0.67	HDRF237-50/1-R-56C	3/4	OMT34-18-56C	OMAT34-18-56C
	29 (60:1)	844	0.39	0.63	HDRF237-60/1-R-56C	3/4	OMT34-18-56C	OMAT34-18-56C
262 (2.62")	44 (40:1)	1153	0.8	1.11	HDRF262-40/1-R-56C	1.5	OMT1.5-18-56C	OMAT1.5-18-56C
	35 (50:1)	1152	0.64	0.95	HDRF262-50/1-R-56C	1	OMT1-18-56C	OMAT1-18-56C
	29 (60:1)	1346	0.62	0.94	HDRF262-60/1-R-56C	1	OMT1-18-56C	OMAT1-18-56C

**Note:** Box size is distance between center line of input shaft and center line of output shaft.

To Order	
MODEL NO.	DESCRIPTION
<b>GEARBOX MODELS WITH FLANGE INPUT—SHAFT OUTPUT</b>	
HDRF133-**-56C	Gear speed reducer with box size 1.33" for 56C frame motor
HDRF154-**-56C	Gear speed reducer with box size 1.54" for 56C frame motor
HDRF175-**-56C	Gear speed reducer with box size 1.75" for 56C frame motor
HDRF206-**-56C	Gear speed reducer with box size 2.06" for 56C frame motor
HDRF237-**-56C	Gear speed reducer with box size 2.37" for 56C frame motor
HDRF262-**-56C	Gear speed reducer with box size 2.62" for 56C frame motor
HDRF325-**-56C	Gear speed reducer with box size 3.25" for 56C frame motor
<b>GEARBOX MODELS WITH FLANGE INPUT—HOLLOW BORE OUTPUT</b>	
HDRF133-*-H-56C	Hollow bore gearbox with 1.33" box size
HDRF175-*-H-56C	Hollow bore gearbox with 1.75" box size
HDRF206-*-H-56C	Hollow bore gearbox with 2.06" box size
HDRF237-*-H-56C	Hollow bore gearbox with 2.37" box size
HDRF262-*-H-56C	Hollow bore gearbox with 2.62" box size
HDRF325-*-H-56C	Hollow bore gearbox with 3.25" box size
<b>GEARBOX MODELS WITH SHAFT INPUT—SHAFT OUTPUT</b>	
HDRS133-***	Shaft-to-shaft indirect drive gearbox with 1.33" box size
HDRS175-***	Shaft-to-shaft indirect drive gearbox with 1.75" box size
HDRS206-***	Shaft-to-shaft indirect drive gearbox with 2.06" box size
HDRS237-***	Shaft-to-shaft indirect drive gearbox with 2.37" box size
HDRS262-***	Shaft-to-shaft indirect drive gearbox with 2.62" box size
HDRS325-***	Shaft-to-shaft indirect drive gearbox with 3.25" box size

\* Insert ratio code into model number, see chart on previous page for ratio codes; "5/1", "10/1", "15/1", "20/1", "30/1", "40/1", "50/1", "60/1".

\*\* For right hand shaft insert "R", for left hand shaft "L", or for double end shaft "DE" (dual shaft not available on shaft-to-shaft models).

**Order Examples:** HDRF154-15/1-R-56C, for 15:1 ratio right hand flange mount gearbox, with a 1.54" box size.

HDRS133-5/1-R, 5:1 ratio, 350 RPM shaft input-shaft output gearbox with 1.33" box size.