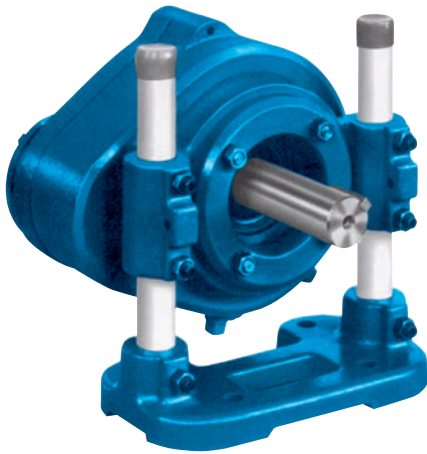




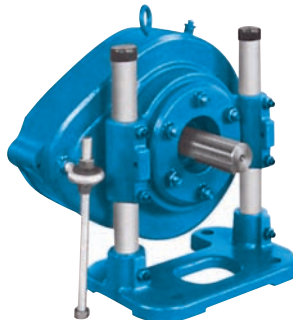
## HROF, HRA, HRB, HRO-GX, HRA-GX, HRB-GX Helical Gear Reducers



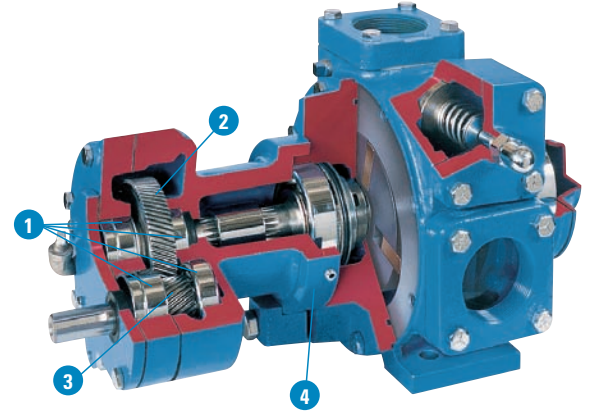
**HRA, HRA-GX – 7 ratios**  
Close-coupled or bracket  
mounting



**HROF, HRO-GX - 5 ratios**  
Closed coupled or  
bracket mounting

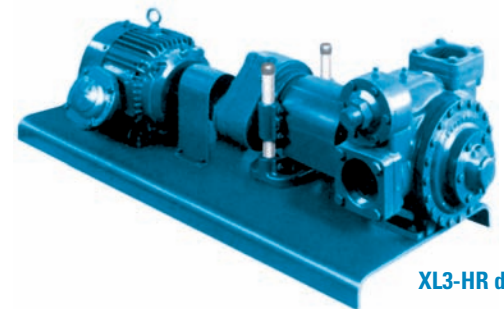


**HRB, HRB-GX - 6 ratios**  
Close-coupled or  
bracket mountings



**Close-coupled gear reduction  
mounting with Blackmer GX pump**

1. Ball bearing gear and shaft supports
2. Heat treated gear
3. Heat treated pinion
4. Spool for close coupling



**XL3-HR drive**

### Design

Blackmer helical gear reducers are designed for use with 1750, 1150, 1450, and 950 rpm motors up to 30 hp. A full range of standard reduction ratios are available from 2.24:1 to 9.08:1 to provide standard operation speeds for Blackmer pumps as well as other brands of positive displacement pumps.

Blackmer gear reducers are rated in accordance with practices of ANSI/AGMA 6010. They are manufactured in three sizes (HROF, HRA, and HRB) to accommodate a variety of pump speeds for low to high-viscosity transfer applications.

Gear reducers are available in either close-coupled, head-mounted configuration for Blackmer GX pump models

(allowing reducer's shaft height to swivel easily into alignment with driver), fixed bracket mounted (HROF), or adjustable bracket mounted versions (HRA and HRB) for fast, accurate alignment of pumps/reducers and prime movers.

### Benefit

Blackmer gear reducers are constructed on hardened, heat-treated, precision helical gears and pinions to provide years of trouble-free operation. For smooth, quiet running, the gears and pinions are immersed in oil, while shafts are supported at both ends by large ball bearings for added strength and reliability.



# HROF, HRA, HRB, HRO-GX, HRA-GX, HRB-GX Helical Gear Reducers

## Gearbox Selection Data

Gearbox	Reduction Ratio	60 Hz Motors									50 Hz Motors						
		1,750 RPM					1,150 RPM				1,450 RPM				960 RPM		
		Approx. Pump RPM	H.P. Rating*			Approx. Pump RPM	H.P. Rating*			Approx. Pump RPM	H.P. Rating*			Approx. Pump RPM	H.P. Rating*		
			3 Hr. Duty	3-8 Hr. Duty	8-24 Hr. Duty		3 Hr. Duty	3-8 Hr. Duty	8-24 Hr. Duty		3 Hr. Duty	3-8 Hr. Duty	8-24 Hr. Duty		3 Hr. Duty	3-8 Hr. Duty	8-24 Hr. Duty
HROF HRO-GX <sup>1</sup>	2.24	780	9.3	8.3	6.6	510	6.8	5.4	4.3	650	8.6	6.9	5.5	420	5.6	4.5	3.6
	2.72	640	7.8	7.1	5.7	420	5.8	4.7	3.7	520	7.3	5.9	4.7	350	4.8	3.8	3.1
	3.32	520	6.9	5.7	4.6	350	4.7	3.8	3.0	420	5.9	4.7	3.8	280	3.9	3.1	2.5
	4.10	420	5.4	4.3	3.5	280	3.6	2.9	2.3	350	4.5	3.6	2.9	230	2.9	2.4	1.9
	4.94	350	4.1	3.3	2.6	230	2.7	2.2	1.7	280	3.4	2.7	2.2	190	2.2	1.8	1.4
HRA HRA-GX <sup>2</sup>	2.24	780	30.0	30.0	25.0	520	27.6	22.1	17.7	640	30.0	27.8	22.2	420	22.8	18.3	14.6
	2.76	640	25.0	25.0	19.9	420	20.5	16.4	13.1	520	25.7	20.6	16.5	350	16.9	13.5	10.8
	3.40	520	24.3	19.4	15.5	340	16.4	13.1	10.5	420	20.1	16.1	13.3	280	13.6	10.9	8.7
	4.19	420	17.8	14.3	11.4	280	12.1	9.7	7.7	350	14.8	11.9	9.7	230	10.0	8.0	6.4
	5.06	350	14.4	11.5	9.2	230	10.2	8.2	6.5	290	12.9	10.3	8.3	190	8.4	6.8	5.4
	6.27	280	10.6	8.5	7.3	190	7.5	6.0	4.8	230	9.4	7.5	6.0	155	6.2	4.9	4.0
	7.65	230	8.0	6.9	5.5	150	5.7	4.5	3.6	190	7.1	5.7	4.6	125	4.7	3.7	3.0
HRB HRB-GX <sup>3</sup>	2.70	640	30.0	30.0	30.0	420	30.0	27.5	22.0	530	30.0	30.0	27.7	355	28.4	22.7	18.1
	3.52	500	30.0	30.0	26.6	330	27.3	21.8	17.5	410	30.0	27.5	22.0	270	22.5	18.0	14.4
	4.36	400	30.0	25.4	20.3	260	20.9	16.7	13.4	330	26.3	21.1	16.8	220	17.2	13.8	11.0
	5.77	300	22.4	17.9	14.3	200	14.7	11.8	9.4	250	18.6	14.8	11.9	160	12.2	9.7	7.8
	7.71	230	15.9	12.7	10.2	150	10.5	8.4	6.7	190	13.2	10.6	8.5	125	8.7	6.9	5.5
	9.18	190	10.9	8.7	7.0	125	7.2	5.7	4.6	160	9.0	7.2	5.8	105	5.9	4.7	3.8

\* Rated in accordance with practices of ANSI/AGMA 6010.

<sup>1</sup> HRO-GX is used with Blackmer pump models GX2 and GX2.5.

<sup>2</sup> HRA-GX is used with Blackmer pump model GX3.

<sup>3</sup> HRB-GX is used with Blackmer pump model GX4.

## The following assumptions apply to the rating tables above:

- Ratings calculated at sea level elevation. Increased elevations will decrease HP ratings.
- Multiply rated HP by 0.67 for single cylinder engines and by 0.80 for multi-cylinder engines.
- Calculations are based on 75°F (24°C) ambient air temperature; 200°F (93°C) max oil temperature using 100% synthetic oil compatible with Buna-N elastomers. Use synthetic oil as noted in the Instruction Manual.
- For applications with air temperature other than 75°F (24°C), multiply the 8-24 Hr. Duty limit by the following:

Ambient	Multiplier	Ambient	Multiplier
50°F (10°C)	1.15	100°F (38°C)	0.83
65°F (18°C)	1.07	110°F (43°C)	0.75
85°F (29°C)	0.93	120°F (49°C)	0.67

**NOTE:** Reducers are shipped from the factory without lubricant. Customer must provide lubricant.

Distributed By:



Process | Energy | Military & Marine

World Headquarters

1809 Century Avenue SW, Grand Rapids, MI 49503-1530 USA

T 616.241.1611 F 616.241.3752 www.blackmer.com