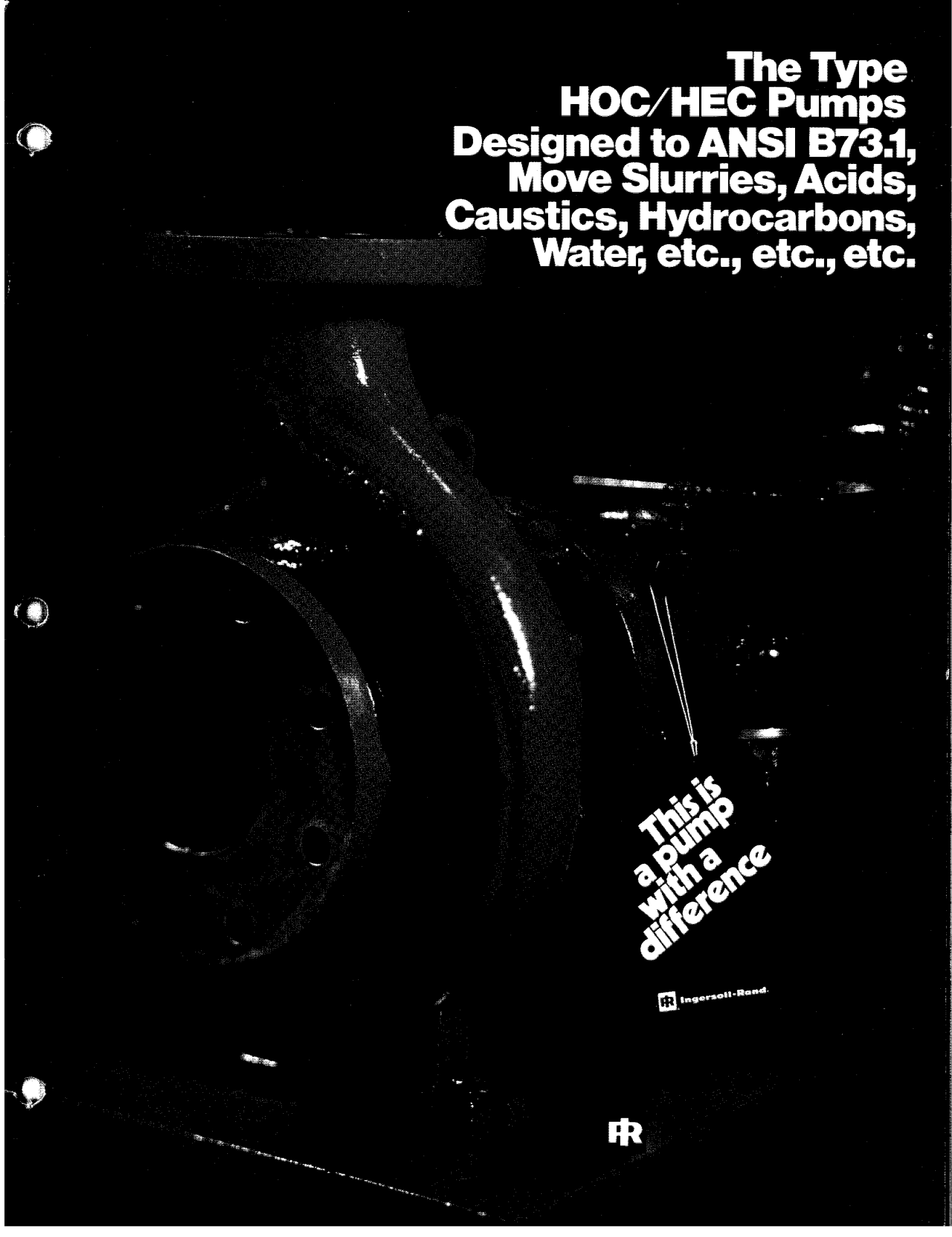
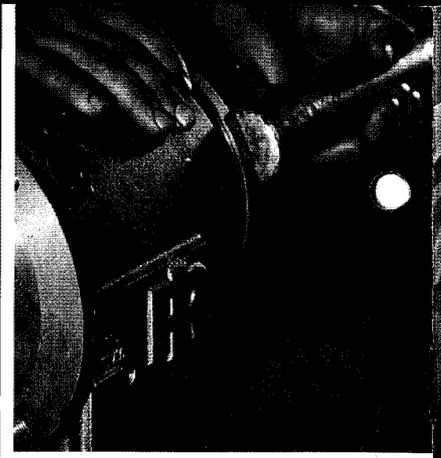
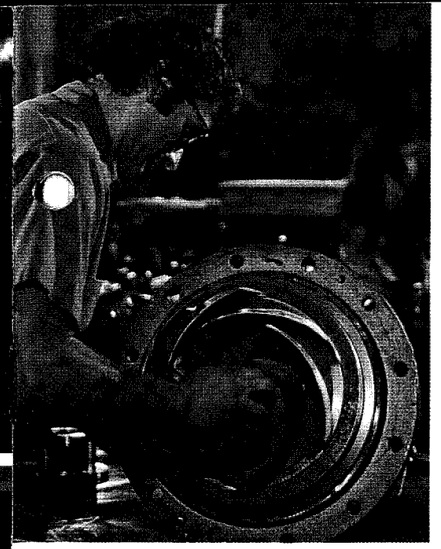
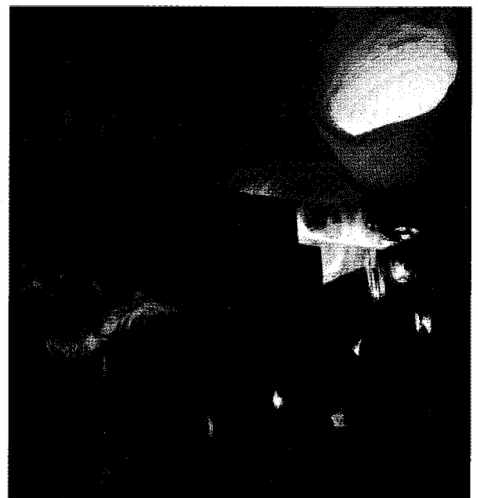
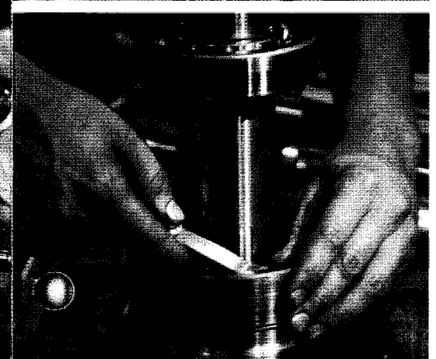
The Type HOC/HEC Pumps Designed to ANSI B73.1, Move Slurries, Acids, Caustics, Hydrocarbons, Water, etc., etc., etc.

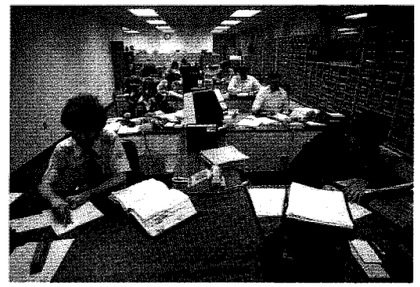


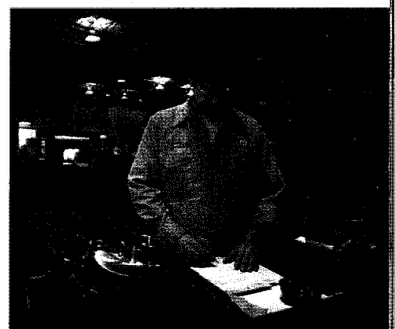












A Century of Leadership

The Ingersoll-Rand Pump Group traces its history back to 1860 to a young immigrant named Adam Scott Cameron who developed a pump of remarkable simplicity, reliability and efficiency. Within a decade, the Cameron Steam Pump was being used in such varied enterprises as mining, pipe lines, power plants, and food processing.

Today, the Pump Group operates around the world, wherever pumps are used, with an integrated network of manufacturing plants, foundries, research labs, parts and service centers, repair depots, sales and administrative offices. Through the years the Group has been responsible for many of the great developments in hydraulic technology.

Early in this century I-R literally led the way in developing the centrifugal pump; today the centrifugal pump is the workhorse of the industry. In the '20s, I-R's design of high-temperature pumps made possible the thermal cracking of crude oil. In the '30s, I-R research worked with the power utilities to double the pressure of their boiler-feed pumps. Indicative of the rising stature of the I-R Pump Group is the fact that, during World War II, three-fourths of all the fuel used in the Allied arsenal flowed through its pumps. In the 1950's the Pump Group developed an entire family of pumps for nuclear submarines; that pioneering technology is today's standard. And most recently, I-R again responded to the requirements of the age by engineering the world's largest pipeline plunger pump.

It is this kind of history—this calibre of excellence—which is a part of every pump produced by Ingersoll-Rand.

Photos clockwise from top: Stacker crane at Ingersoll-Rand's Allentown facility selects pump parts for delivery to machining and assembly stations; a large casing pour at the foundry; x-ray fluorescence and diffraction equipment in the Chemical Lab of I-R's Central Materials Service Laboratory; The world's largest slurry pipeline plunger pump—an Aldrich 9X9V-7 - on test at the I-R Allentown plant.

Broad Applications

The 20 type HOC and 15 type HEC pumps are designed to conform to specifications outlined by ANSI B73.1-1977. The wide coverage of all sizes with discharges ranging from 1 inch to 8 inches diameter assures that a complete selection will be available in a wide range of alloys, including ductile iron, 316 stainless steel, alloy 20, nickel, hastelloys and CD-4MCu to handle the widest range of process fluids. The pumps handle temperatures and pressures ranging to 600° F and 400 psig.

And because of their design flexibility, Ingersoll-Rand HOC/HEC pumps are applicable in all major industry segments in the world.

Because of their ability to handle most liquids with suitable sealing arrangements and pipe plan configurations, the type HOC/HEC pumps can be used in almost all state-of-the-art chemical processes.

The refining industry, so very conscious of high-quality equipment, is discovering more and more applications for the mechanical specifications of the ANSI design. In many cases, the HOC/HEC pumps can be quoted to API-610 specifications with only very minor deviations.

Primary metal industries are also very aware of the need for a heavy-duty pump that will last for years and years in continuous service. The HOC/HEC pumps are applicable in many services throughout the mills: coking, smelting, refining, metal making, rolling, pickling, and all other operations.

The pulp and paper industries depend on the simplicity, interchangeability, and ease of maintenance of the ANSI pumps to handle most of their liquid-moving requirements. The difficult services encountered in paper mills require pumps like the Ingersoll-Rand HOC/HEC that are built with the maintenance man in mind.

Photos clockwise from upper right: Assembling the I-R ANSI Pump ... open impeller; bearing assembly; inspection and testing; shaft assembly.

Worldwide Sales, Service and Parts

Pump users require three specialized forms of assistance from their suppliers—assistance in selecting the correct pump (sales), assistance in maintaining their pumps at peak performance (service), and assistance in keeping them functioning (parts).

Sales. Operating worldwide, I-R pump salesmen are trained as pump experts. Their expertise in hydraulics, metallurgy and pump construction is sought by thousands of customers. Their insights into product application and advanced pump technology are offered to customers at every stage, from planning to installation.

Service. All of I-R's manufacturing facilities are supported by engineers whose major responsibility is customer service. In addition, I-R service offices are strategically located all over the world. As part of a standard maintenance program, repair depots are available to conduct complete overhauls of I-R pumps.

Parts. I-R places as much emphasis on the manufacture and delivery of vital replacement parts as it does on new pumps. A global distribution center in Pennsylvania stocks up to 20,000 different parts and ships 80,000 different items each month. A separate plant produces nothing but replacement parts, manufactured to the same critical specifications as the original equipment. The distribution center maintains strict control over orders, deliveries and inventory with a newly installed computer system. It gives the highest priority to emergency orders, setting itself the goal of same-day shipment on such orders and, as necessary, air-freighting to any point in the world.

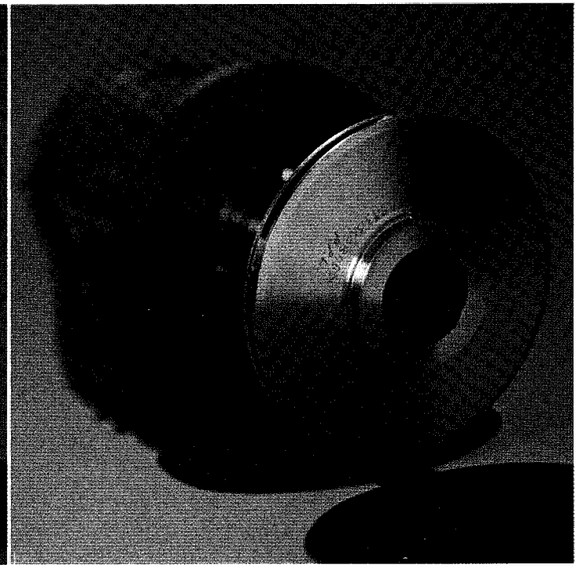
In brief, Ingersoll-Rand sells, builds and maintains pumps that are different—by people who make the difference.

Photos clockwise from upper right: Computerized inventory and orders speed I-R parts delivery, an air shipment rushes parts from I-R's depot to customer; orders are quickly made up and packed in the warehouse; full order processing service at Moosic, Pa. is an example of I-R's parts warehouses; I-R service personnel are on call 24 hours a day.

Ingersoll-Rand

Designed for Versatility...

(Figure 1) Ingersoll-Rand HOC Open Impeller ANSI Pump.



(Figure 2) Ingersoll-Rand HEC Closed Impeller ANSI Pump.

Whether you're pumping clear liquids or slurries, there's an ANSI pump closely suited to the task. Ingersoll-Rand HOC (open impeller) and HEC (closed impeller) pumps let you choose the impeller that's right for you.

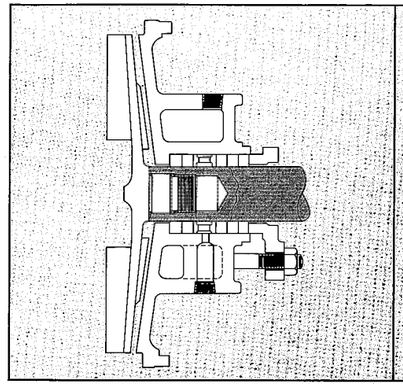
Open Impellers

For clear liquids, slurries, or liquids with suspended solids, choose the HOC (open impeller) pump (see Figure 1). The open impeller system is mounted on an externally-adjustable shaft, making it easy for the operator to make field adjustments to reset operating clearances. Field adjustment compensates for wearing of the shroud plate, and easily brings the open impeller back into close clearances with it.

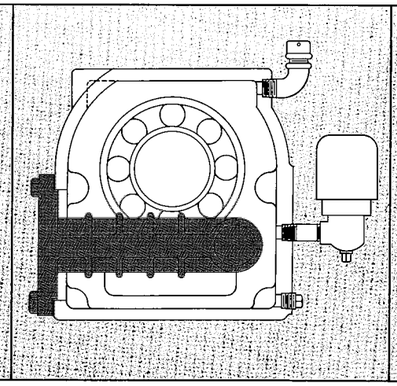
Closed Impellers for Greater Efficiency

For applications pumping clear liquids or light slurries, the Ingersoll-Rand closed impeller pump (HEC) performs like no other pump in the ANSI marketplace. The closed impeller design (see Figure 2) means higher efficiencies...with an added, designed-in plus. Ingersoll-Rand HEC ANSI pumps permit easy and rapid external adjustment of the bearing housing to maintain the close tolerances that assure continuing high operating efficiency.

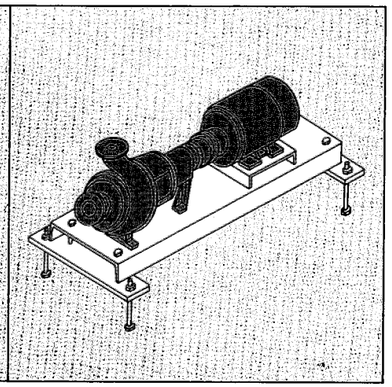
Performance-Engineered for Maximum Durability



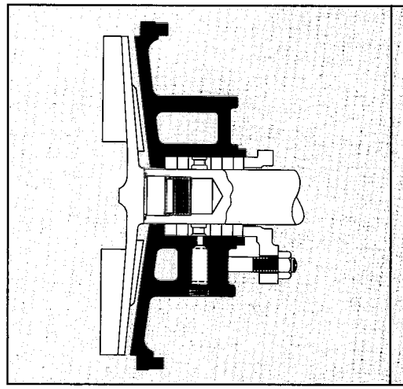
Solid, Unsleeved Shafts Solid, unsleeved shafts are available to reduce stuffing box deflections. The impeller threads are protected from the pumped fluid with a Teflon O-ring secured between shaft and impeller.



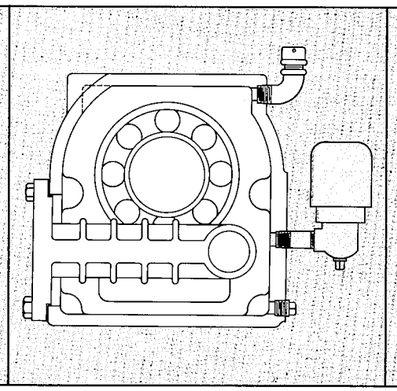
Cartridge Bearing Cooler for High-Temperature Applications The patented Ingersoll-Rand Cartridge Bearing Cooler carries water for cooling the oil for the bearings inside the bearing housing. Since the oil surrounds the cartridge cooler, only the oil is cooled...a far more efficient process than cooling the bearing housing. This patented cooling system eliminates bearing cradle distortion, assuring that costly bearing misalignment does not occur.



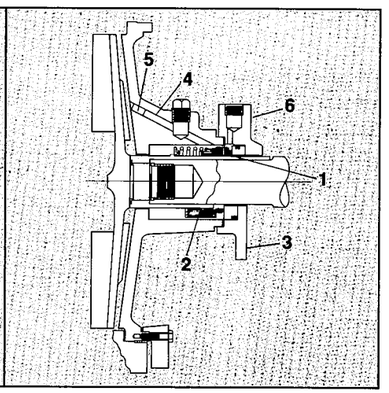
Stilt-Mounted Bedplates Stilt-mounted bedplates are available for under 40 hp at 1800 rpm and 100 hp at 3600 rpm. The stilt-mounted bedplate eliminates the need for grouting the baseplate, allowing the pump to "float" and minimizing pipe-strain.



Jacketed Stuffing Box Cover A jacketed stuffing box cover is available for applications where either cooling or heating is necessary for proper seal operation. The jacket is integrally cast with the stuffing box cover, which greatly reduces the possibility of leakage. Jacketing is designed for operation at temperatures up to 500° F.

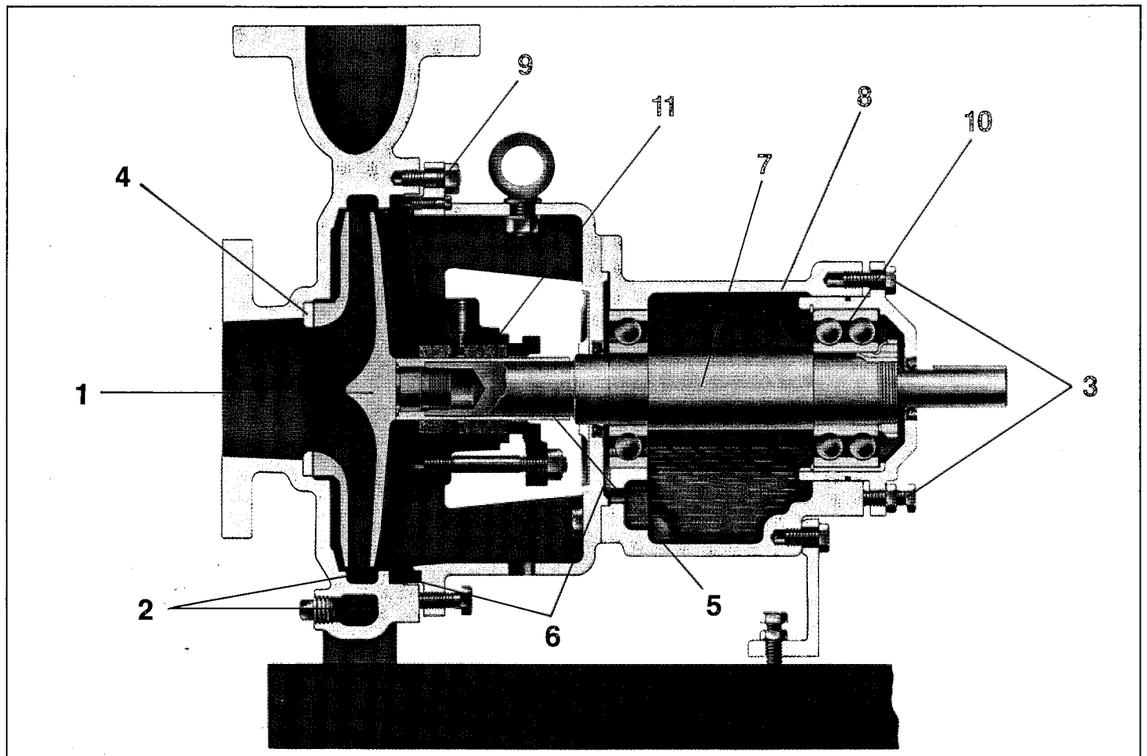


Bearing Housing Lubrication to Suit Your Application Ingersoll-Rand's HOC and HEC ANSI pumps are available with oil lubrication and constant-level Trico oilers as a standard design feature. Either oil-mist lube or grease lube can also be provided when the application requires.



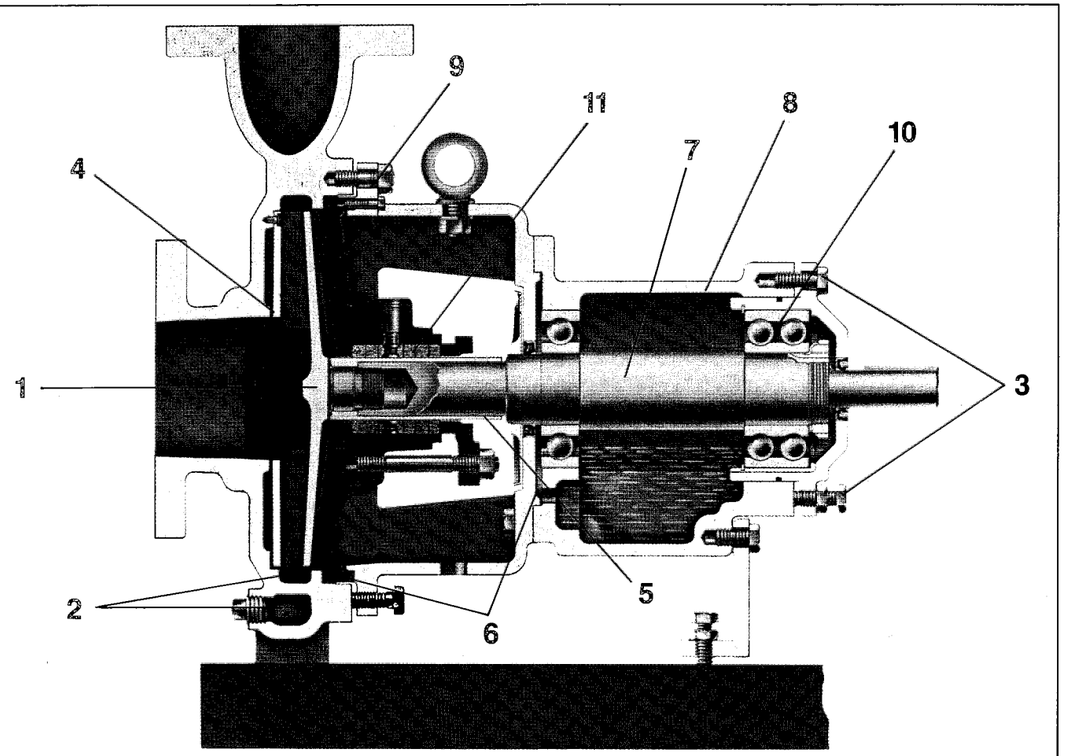
Available Sealing Arrangements:
Single inside unbalanced **1**
Single inside balanced **2**
Double inside
Tandem
Outside
Plain glands **3** are standard, with seal flush-injected through a hole **4** in the stuffing box—which can be plugged **5** if desired—directed to the seal faces. Seal piping arrangements from the internal-circulation hole through Plan 52 piping. As options, Ingersoll-Rand can supply flush glands **6** or flush quench and drain glands with throttle bushings.

Reliable, Versatile, Efficient ANSI Pumps



FEATURE	ADVANTAGE	BENEFIT
1. Open Impellers or Closed Impellers	Allows selection of proper impeller for individual needs. Open impellers handle slurries and particles. Closed impeller handles clear liquid and smaller particles at higher efficiencies.	Increased reliability. Less maintenance downtime. Lowest power costs for specific application.
2. Dual Volute	a. Reduced radial thrust. b. Reduced shaft deflection at face of stuffing box.	Increased bearing life. Less downtime and lower maintenance costs. Extended seal and packing life. Less downtime and lower maintenance costs.
3. External Axial Impeller Adjustment	Allows field setting of impeller clearances to compensate for wear, thus restoring high efficiencies without overhaul.	Less downtime. Lower maintenance costs. Reduced power costs.
4. Replaceable Casing Ring for Closed Impellers and Casing Shroud Plate for Open Impellers	Provides for quick renewal of casing surface with inexpensive flat plate or ring. No need to replace a cast part (casing, stuffing box cover, or cast wear plate).	Lower maintenance costs. Increased availability of replacement parts.
5. Replaceable hook-type sleeve with O-ring seal between shaft sleeve and impeller.	Assures accurate seal setting. Protects shaft and impeller threads from contamination by pumped liquid.	Higher reliability. Less downtime. Lower maintenance costs.
6. Dry Rabbet Fit Construction	Provides for accurate, positive alignment and reduced possibility of crevice corrosion.	Increased reliability. Less downtime. Lower maintenance costs.

Maximize Performance...Minimize Downtime.



FEATURE	ADVANTAGE	BENEFIT
7. Heavy Duty Shaft System (thick shaft, optimum bearing spans, short impeller overhang)	Reduced shaft deflection.	Extends seal and packing life. Less downtime and lower maintenance costs.
8. Three Bearing Cradles for all sizes	Maximum parts interchangeability, reduced spare parts stock levels.	Lower maintenance costs. Increased parts availability.
9. Studded Casing	Reduced possibility of stripping casing threads during assembly and disassembly.	Lower maintenance repair costs. Less downtime.
10. Double Row Thrust Bearings	Enables the bearing to carry high thrust loads at all suction pressures and operating conditions.	Increased bearing life. Reduced downtime and lower maintenance costs.
11. Versatile Stuffing Box designed for Packing and all Seal Types	Provides capability to change from packing to seals without changing the stuffing box cover. All seals (balanced, unbalanced, outside, and tandem) can be interchanged without changing the stuffing box cover.	Greater interchangeability. Lower repair costs.
12. ANSI B73.1-1977 Design	Assures pump is built to a set of demanding construction and maintenance standards as developed by the process industries.	Increased reliability and interchangeability. Reduced downtime and lower maintenance costs.

Exclusive from Ingersoll-Rand...

3 Year Bearing Guarantee

This pump has been built to a most demanding set of engineering and quality control specifications. Ingersoll-Rand guarantees that the bearings will not malfunction within three years of delivery of such pump.

If the pump has been installed and operated as detailed in the instruction booklet (Form SPAD 99-B) and the bearings malfunction within such three year period, Ingersoll-Rand will furnish a new set of bearings at no charge. This guarantee is of course subject to the "Ingersoll-Rand Standard Terms and Conditions of Sale" associated with the pump.

Ingersoll-Rand®
the pump people

Heavy-Duty Shaft System and Dual Volute Design Make Bearings Last

The HOC shaft design is the heaviest-duty system available for comparable hydraulic conditions.

Ingersoll-Rand's large-diameter shafts (d) and short bearing spans (L) provide the lowest L/d ratios available in the marketplace. And the bearings are the heaviest; for instance, the thrust bearing in the HOC/HEC Group II pumps can handle 50 percent more axial thrust loading than most of our competition.

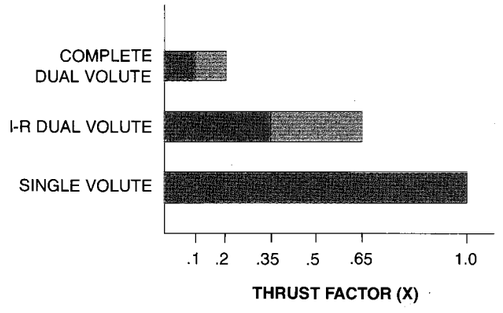
Ingersoll-Rand Gives You a Dual Volute ANSI Pump

All Ingersoll-Rand HOC/HEC ANSI pumps (except 1½x1x8 and 2x1x10 sizes) employ dual volutes. Dual volutes balance radial thrust forces that act on the shaft, minimizing shaft deflections.

This bar graph simplifies the effects of different volute designs on centrifugal pumps.

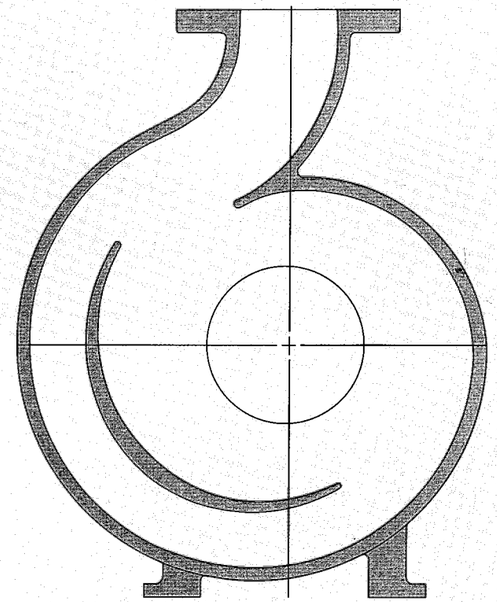
The bar at the bottom represents what the radial thrust loading might be in a single-volute pump. The middle bar indicates what the radial thrust loading would be in a comparable Ingersoll-Rand HOC/HEC ANSI pump with dual volute design. Depending on the particular pump and operating point, Ingersoll-Rand ANSI pumps can eliminate between 35% and 65% of the radial thrust present in a single-volute pump. Additional reductions in radial thrust loadings are possible with the classic complete dual volute (see bar at top of chart); but generally, the radial thrust loading in the Ingersoll-Rand HOC/HEC line will be approximately one-half that of a similar single-volute pump.

Reduced radial thrust means reduced shaft deflections. Reduced shaft deflections mean less seal loading and wear. Consequently, users can expect longer seal life in the Ingersoll-Rand HOC/HEC ANSI pumps.



Effect of Volute Design on Radial Thrust Loading

How the Dual Volute Works



Dual Volute Design of a Typical Ingersoll-Rand ANSI Pump

All pump volutes are designed to generate uniform radial thrust on the impeller shaft and bearings when operating at the best efficiency point on the pump curve. As a result, there is a minimum of radial thrust on the pump components.

However, when the pump is not operating at the best efficiency point, the casing design no longer balances the hydraulic loads and radial thrust increases.

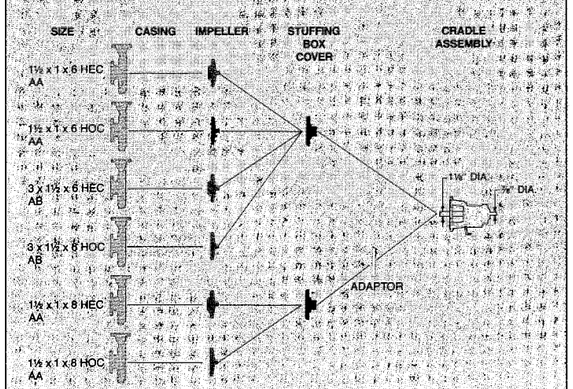
The dual volute incorporates a flow splitter into the casing which directs the liquid into two separate paths through the casing.

The contour of the flow splitter follows the contour of the casing wall 180 degrees opposite. Both are approximately equidistant from the center of the impeller; thus, the radial thrust loads acting on the impeller are balanced and greatly reduced.

- **Reduced shaft deflection**
- **Longer bearing life**
- **Longer seal life**

Maximum Interchangeability with Twenty Pump Sizes

Group I

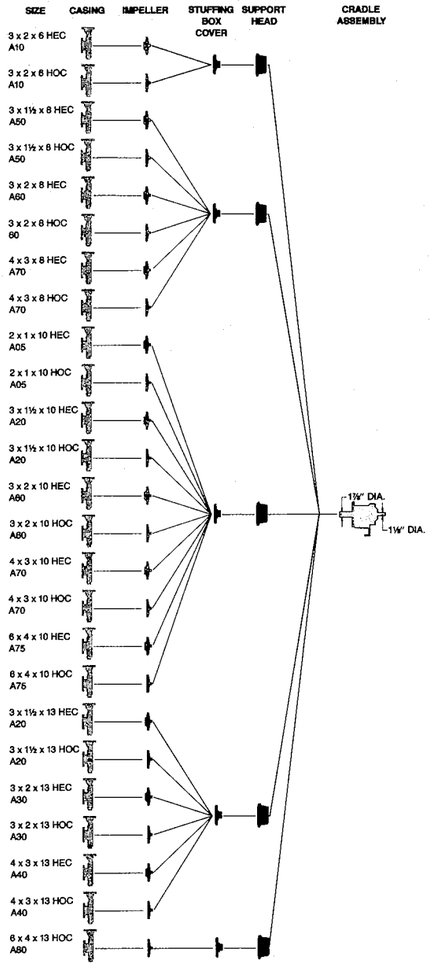


Pump Sizes: 1½x1x6 (ANSI AA)
3x1½x6 (ANSI AB)
1½x1x8 (ANSI AA)

Maximum Temperature:
Standard—350°F
Cooled Stuffing Box—450°F
Cooled Stuffing Box and Cooled Cradle—500°F
With Factory Review—600°F

Maximum Pressure:
Steel Casing—350 PSIG
Ductile Iron Casing—275 PSIG

Group II



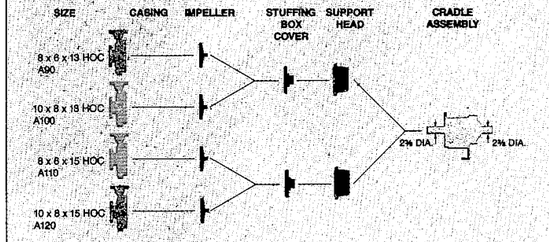
Pump Sizes:

3x2x6	(ANSI A10)	4x3x10	(ANSI A70)
3x1½x8	(ANSI A50)	6x4x10	(ANSI A75)
3x2x8	(ANSI A60)	3x1½x13	(ANSI A20)
4x3x8	(ANSI A70)	3x2x13	(ANSI A30)
2x1x10	(ANSI A05)	4x3x13	(ANSI A40)
3x1½x10	(ANSI A20)	6x4x13	(ANSI A80)
3x2x10	(ANSI A60)		

Maximum Temperature:
Standard Design—325°F
Cooled Stuffing Box—425°F
Cooled Stuffing Box and Cooled Cradle—500°F
Wtih Factory Review—600°F

Maximum Pressure:
Steel Casing—350 PSIG
Ductile Iron Casing—275 PSIG

Group III



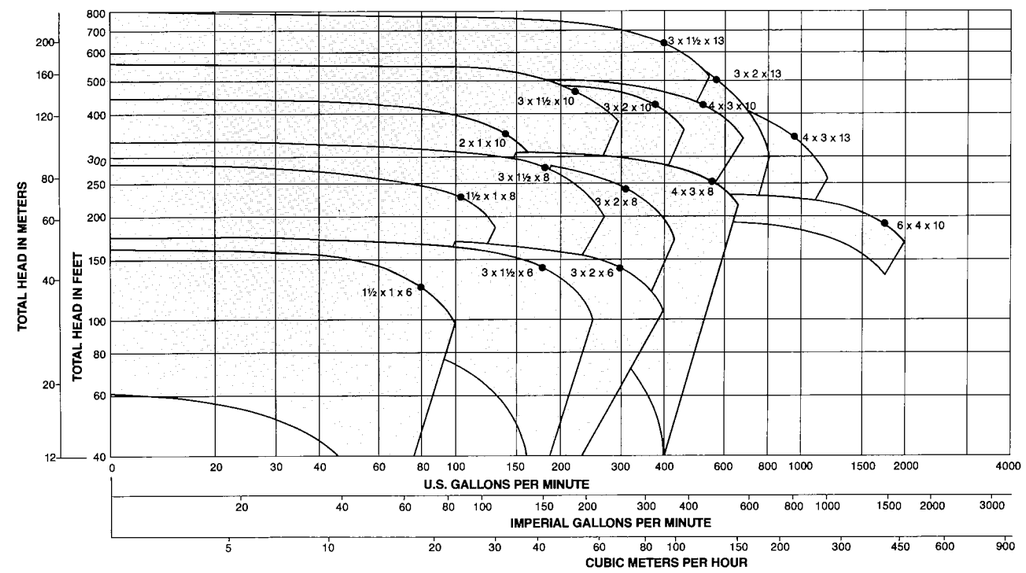
Pump Sizes: 8x6x13 (ANSI A90)
10x8x13 (ANSI A100)
8x6x15 (ANSI A110)
10x8x15 (ANSI A120)

Maximum Temperature:
Standard Design—325°F
Cooled Stuffing Box—425°F
Cooled Stuffing Box and Cooled Cradle—500°F
With Factory Review—600°F

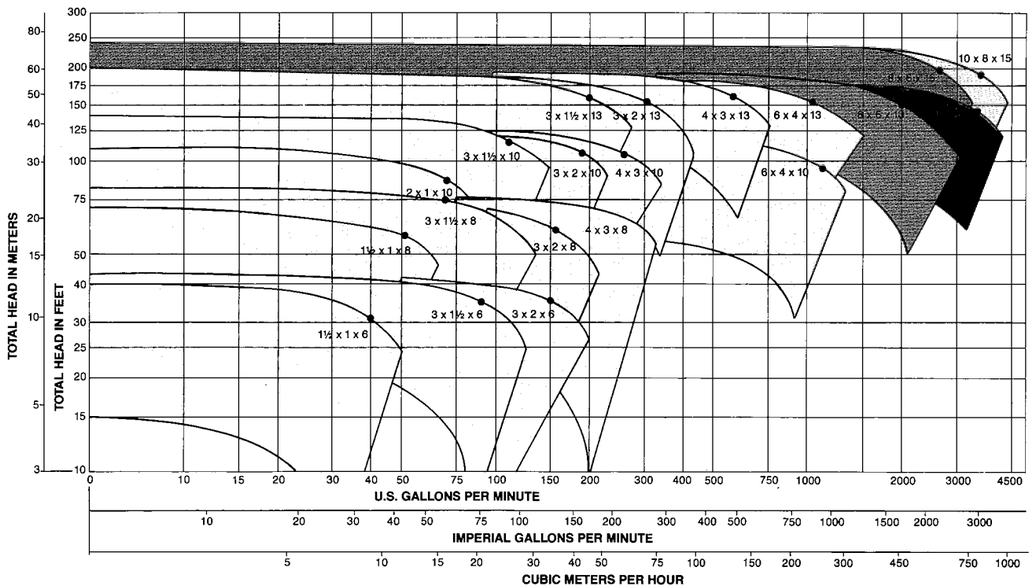
Maximum Pressure:
Steel Casing—400 PSIG with 13" Impellers
350 PSIG with 15" Impellers
Ductile Iron Casing—275 PSIG

HOC/HEC 60 Hertz Range Charts

3550 R.P.M. HOC/HEC COVERAGE CHART



1750 R.P.M. HOC COVERAGE CHART

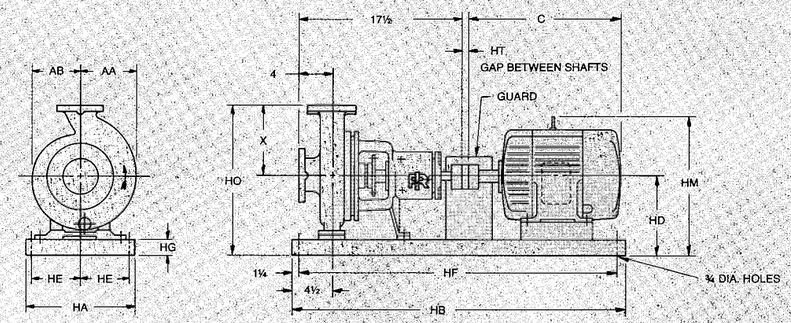


Open and Closed Impeller
● ● ● Open Impeller Only

**50-Cycle Performance Curves and Range Charts available upon request.

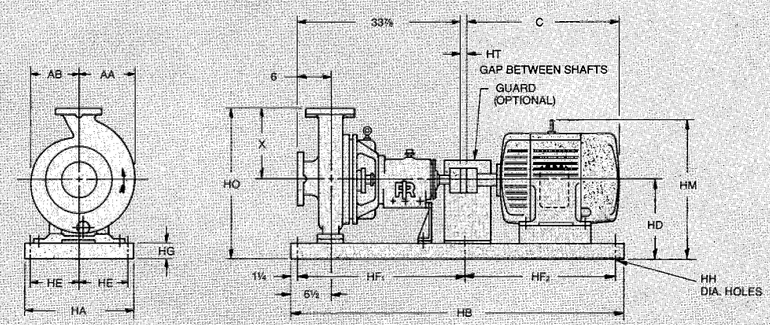
HOC/HEC Dimensions

Group I Dimensions and Weights



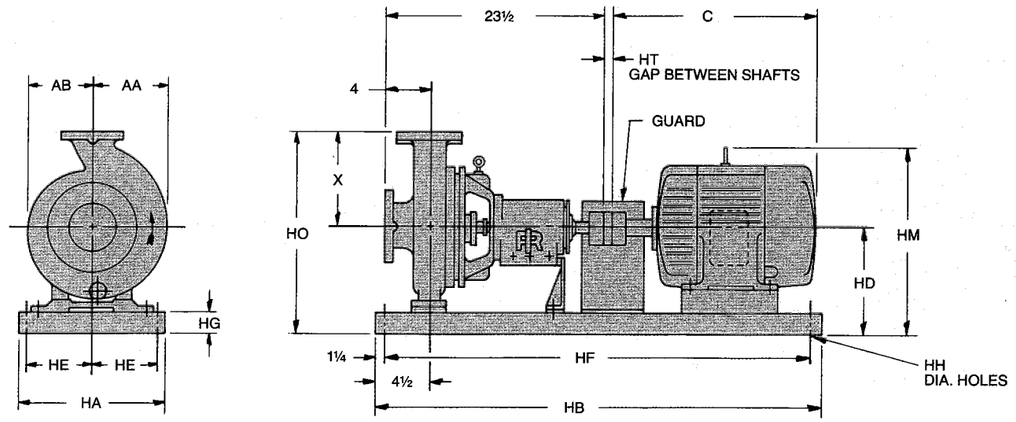
PUMP SIZE	RPM	HP	TOTAL WT.	SUCT	DISC	X	AA	AB	TEFC MOTOR FRAME SIZE	HA	HB	HE	HF	HG	HT	C	HD	HM	HO	ANSI
1½x1x6	3600	5	222	1½	1	6½	4¾	4¾	184T	12	39	4½	36½	3	3½	15¾	8¼	14¾	14¾	AA
1½x1x6	1800	1½	165	1½	1	6½	4¾	4¾	145T	10	35	4	32½	2⅝	3½	13 1/16	7⅞	11½	14⅜	AA
3x1½x6	3600	10	332	3	1½	6½	5	4¾	215T	12	39	4½	36½	3	3½	19⅜	8¼	16	14¾	AB
3x1½x6	1800	1½	175	3	1½	6½	5	4¾	145T	10	35	4	32½	2⅝	3½	13 1/16	7⅞	11½	14⅜	AB
1½x1x8	3600	10	337	1½	1	6½	6	6	215T	12	39	4½	36½	3	3½	19⅜	8¼	16	14¾	AA
1½x1x8	1800	2	180	1½	1	6½	6	6	145T	10	35	4	32½	2⅝	3½	13 1/16	7⅞	11½	14⅜	AA

Group III Dimensions and Weights



PUMP SIZE	RPM	HP	TOTAL WT	SUCT	DISC	X	AA	AB	TEFC MOTOR FRAME SIZE	HA	HB	HE	HF	HG	HH	HT	C	HD	HM	HO
8x6x13	1800	100	1939	8	6	16	12½	9½	405T	22	80	9½	36¾	3	1	5	38 11/16	17½	31¾	33½
8x6x13	1200	30	1420	8	6	16	12½	9½	326T	22	68	9½	32¾	3	1	5	28 11/16	17¼	28 11/16	33½
10x8x13	1800	150	2588	10	8	18	14¾	10¼	445TS	22	80	9½	36¾	3	1	5	40⅞	17½	33¼	35½
10x8x13	1200	40	1625	10	8	18	14¾	10¼	364T	22	68	9½	32¾	3	1	5	33 1/16	17½	30 3/16	35½
8x6x15	1800	150	2598	8	6	18	13¾	10½	445TS	22	80	9½	36¾	3	1	5	40⅞	17½	33¼	35½
8x6x15	1200	50	1755	8	6	18	13¾	10½	365T	22	68	9½	32¾	3	1	5	34 1/16	17½	30 3/16	35½
10x8x15	1800	200	3105	10	8	19	15½	11	447TS	22	80	9½	36¾	3	1	5	46⅛	17½	33¼	36½
10x8x15	1200	60	1966	10	8	19	15½	11	404T	22	80	9½	36¾	3	1	5	37 3/16	17½	31¾	36½

Group II Dimensions and Weights



PUMP	ANSI DESIGN	RPM	HP	TOTAL WT	SUCT	DISC	X	AA	AB	TEFC MOTOR FRAME SIZE	HA	HB	HE	HF	HG	HH	HT	C	HD	HM	HO
3x2x6	A10	3600	115	594	3	2	8¼	5½	4¾	254T	15	52	6	49½	3⅜	¾	3½	21 13/16	11⅝	21⅛	19⅞
3x2x6	A10	1800	2	310	3	2	8¼	5½	4¾	145T	12	45	4½	42½	3	¾	3½	13 1/16	11¼	14⅞	19½
3x1½x8	A50	3600	25	712	3	1½	8½	6	6	284TS	15	52	6	49½	3⅜	¾	3½	23 9/16	11⅝	21¾	20⅛
3x1½x8	A50	1800	3	348	3	1½	8½	6	6	182T	12	45	4½	42½	3	¾	3½	14¾	11¼	17¾	19¾
3x2x8	A60	3600	30	772	3	2	9½	6½	6	286TS	15	52	6	49½	3⅜	¾	3½	24 11/16	11⅝	21¾	21⅛
3x2x8	A60	1800	5	364	3	2	9½	6½	6	184T	12	45	4½	42½	3	¾	3½	15¾	11¼	17¾	20¾
4x3x8	A70	3600	50	1055	4	3	11	7	6	326TS	18	58	7½	55½	4	1	3½	27 3/16	12¼	23 7/16	23¼
4x3x8	A70	1800	7½	446	4	3	11	7	6	213T	12	45	4½	42½	3⅜	¾	3½	17⅞	11¼	19⅛	22¼
2x1x10	A05	3600	40	975	2	1	8½	7⅛	7⅛	324TS	18	58	7½	55½	4	1	3½	25 11/16	12¼	23 7/16	20¾
2x1x10	A05	1800	5	364	2	1	8½	7⅛	7⅛	184T	12	45	4½	42½	3⅜	¾	3½	15¾	11¼	17¾	19¾
3x1½x10	A20	3600	60	1215	3	1½	10½	7⅛	7⅛	364TS	18	58	7½	55½	4	1	3½	30 15/16	13	25¾	22½
3x1½x10	A20	1800	7½	446	3	1½	10½	7⅛	7⅛	213T	12	45	4½	42½	3⅜	¾	3½	17⅞	13	20⅞	23½
3x2x10	A60	3600	75	1340	3	2	9½	7½	7⅛	365TS	18	58	7½	55½	4	1	3½	31 15/16	13	25¾	22½
3x2x10	A60	1800	10	484	3	2	9½	7½	7⅛	215T	12	45	4½	42½	3⅜	¾	3½	19⅜	11¼	19⅛	20¾
4x3x10	A70	3600	100	1589	4	3	11	8	7⅛	405TS	18	60	7½	57½	4	1	3½	35 11/16	14	29¾	27½
4x3x10	A70	1800	15	649	4	3	11	8	7⅛	254T	15	52	6	49½	3⅜	¾	3½	21 13/16	12¼	23 7/16	23¼
6x4x10	A75	3600	150	2228	6	4	13½	10¾	8	445TS	22	68	9½	65½	3	1	3½	40⅞	14	29¾	27½
6x4x10	A75	1800	30	867	6	4	13½	10¾	8	286T	15	52	6	49½	3⅜	¾	3½	26 1/16	13⅜	23½	26⅞
3x1½x13	A20	3600	125	1965	3	1½	10½	8½	8⅜	444TS	22	68	9½	65½	3	1	3½	38⅞	14	29¾	24½
3x1½x13	A20	1800	15	674	3	1½	10½	8½	8⅜	254T	15	52	6	49½	3⅜	¾	3½	21 13/16	13⅜	22⅞	23⅞
3x2x13	A30	3600	150	2198	3	2	11½	9	8⅜	445TS	22	68	9½	65½	3	1	3½	40⅞	14	29¾	25½
3x2x13	A30	1800	20	729	3	2	11½	9	8⅜	256T	15	52	6	49½	3⅜	¾	3½	23 9/16	13⅜	22⅞	24⅞
4x3x13	A40	3600	150	2223	4	3	12½	10	8½	445TS	22	68	9½	65½	3	1	3½	40⅞	14	29¾	26½
4x3x13	A40	1800	40	1065	4	3	12½	10	8½	324T	18	58	7½	55½	4	1	3½	27 3/16	14	25 3/16	26½
6x4x13	A80	1800	60	1390	6	4	13½	10¾	9¼	364T	18	58	7½	55½	4	1	3½	33 1/16	14	26¾	27½
6x4x13	A80	1200	20	962	6	4	13½	10¾	9¼	286T	15	52	6	49½	3⅜	¾	3½	26 1/16	14	24⅛	27½

Complete Engineering Information: HOC/HEC

HOC/ HEC—Engineering Information (Dimensions Shown In Inches)

				1½ x 1 x 6	3 x 1½ x 6	1½ x 1 x 8	3 x 2 x 6	6 x 4 x 13	4 x 3 x 13	3 x 2 x 13	3 x 1½ x 13	6 x 4 x 10	4 x 3 x 10	3 x 2 x 10	3 x 1½ x 10	2 x 1 x 10	10 x 8 x 15	8 x 6 x 15	10 x 8 x 13	8 x 6 x 13
PUMP DATA	Suction Flange			1½	3	1½	3	6	4	3	3	6	4	3	3	2	10	8	10	8
	Discharge Flange			1	1½	1	2	4	3	2	1½	4	3	2	1½	1	8	6	8	6
	Max. Imp. Dia.	3600RPM		6.25	6.25	8.0	6.25	—	—	10.5	—	8.75	10.75	10.75	—	—	—	—	—	—
		1750 RPM		6.25	6.25	8.0	6.25	13.25	13.25	13.25	13.25	10.75	10.75	10.75	13.25	10.75	15	15	13.25	13.25
	Impeller Eye Area (sq. in.)		HOC	2.76	6.49	3.14	8.29	28.3	17.72	11.04	10.32	26.97	14.19	14.19	10.32	4.43	65.5	50.2	58.5	50.2
			HEC	2.78	4.91	3.14	7.07	—	17.72	11.04	9.62	27.15	11.04	9.62	7.07	4.45	—	—	—	—
	Max Sphere Size		HOC	.22	.34	.23	.56	.81	.62	.41	.34	.88	.53	.34	.34	.22	1.25	.94	1.12	1.00
			HEC	.19	.34	.12	.44	—	.62	.38	.34	.81	.50	.34	.25	.22	—	—	—	—
	WR² (less motor) #-FT.² (wet)		HOC	.10	.11	.30	.14	4.5	3.2	2.9	2.6	1.8	1.3	1.1	1.1	.95	12.0	10.2	8.1	6.0
			HEC	.19	.20	.49	.24	—	5.6	5.1	4.5	3.0	2.3	1.9	1.8	1.7	—	—	—	—
CASING DATA	Imp. Clearances	HOC	Front	.010	.010	.010	.010	.020	.010	.010	.010	.010	.010	.010	.010	.010	.020	.020	.020	.020
			Back	—	—	.015	.010	—	—	—	—	—	—	—	—	—	—	—	—	—
		HEC	Front	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010	.010
			Back	—	—	.015 .026	.010	—	—	—	—	—	—	—	—	—	.015 .026	.015 .026	.015 .026	.015 .026
	Casing Thickness		Guage	.62	.375	.62	.375	1.12	.375	.375	.375	1.25	.375	.375	.375	1.25	1.25	1.25	1.25	1.25
				.32	.32	.32	.32	1.62	.44	.44	.44	1.62	.44	.44	.44	1.62	1.62	1.62	1.62	1.62
	Corrosion Allowance			.125	.125	.125	.125	2.17/2.17	.125	.125	.125	2.17/2.17	.125	.125	.125	2.17/2.17	2.17/2.17	2.17/2.17	2.17/2.17	2.17/2.17
	Aux. Connections (NPT)		Vent	.375	.375	.375	.375	2.44	.375	.375	.375	2.44	.375	.375	.375	2.44	2.44	2.44	2.44	2.44
			Drain	.50	.50	.50	.50	6.50	.50	.50	.50	6.50	.50	.50	.50	6.50	6.50	6.50	6.50	6.50
			Guage	.375	.375	.375	.375	6.50	.375	.375	.375	6.50	.375	.375	.375	6.50	6.50	6.50	6.50	6.50
SHAFT AND BEARING DATA	Diameter @ Impeller			.62	.62	.62	1.25	6.50	1.25	1.25	1.25	6.50	1.25	1.25	1.25	6.50	6.50	6.50	6.50	6.50
	Diameter Under Sleeve			.88	.88	.88	1.62	6.50	1.62	1.62	1.62	6.50	1.62	1.62	1.62	6.50	6.50	6.50	6.50	6.50
	Diameter @ Bearings I.B./O.B.			1.18/.98	1.18/.98	1.18/.98	2.17/2.17	6.50	2.17/2.17	2.17/2.17	2.17/2.17	6.50	2.17/2.17	2.17/2.17	2.17/2.17	6.50	6.50	6.50	6.50	6.50
	Dia. Between Bearings			1.31	1.31	1.31	2.44	6.50	2.44	2.44	2.44	6.50	2.44	2.44	2.44	6.50	6.50	6.50	6.50	6.50
	Bearing Span			4.00	4.00	4.00	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
	Dia. @ Coupling			.88	.88	.88	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	Bearing Number—Inboard			206	206	206	311	311	311	311	311	311	311	311	311	311	313	313	313	313
	Bearing Number—Outboard			5305	5305	5305	5311	5311	5311	5311	5311	5311	5311	5311	5311	5311	5313	5313	5313	5313
	Impeller Overhang			5.86	5.90	5.83	7.80	7.64	8.06	7.96	7.94	8.30	7.94	7.84	7.78	7.64	10.57	10.38	10.56	10.38
	1st Critical Speed (RPM)			12175	11364	6226	17523	15625	10417	9282	9817	10653	10965	11943	11943	13393	5823	6356	6168	7211
	Shaft H.P./ 100 RPM			1.25	1.25	1.25	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	13.4	13.4	13.4	13.4
	B-10 Life			Minimum 3 Years																
	Bearing Cradle Group			I	I	I	II	II	II	II	II	II	II	II	II	II	III	III	III	III
	Oil Capacity (Pints)			.50	.50	.50	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	4.5	4.5
STUFFING BOX DATA	Sleeve O.D.			1.13	1.13	1.13	1.88	1.88	1.88*	1.88	1.88	1.88*	1.88	1.88	1.88	1.88	2.38	2.38	2.38	2.38
	Stuffing Box Bore			1.81	1.81	1.81	2.69	2.69	2.69**	2.69	2.69	2.69**	2.69	2.69	2.69	2.69	3.44	3.44	3.44	3.44
	Depth of Box			2.25	2.25	2.25	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	3.56	3.56	3.56	3.56
	Packing Size			5/16x5/16	5/16x5/16	5/16 x 5/16	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	⅜ x ⅜	½ x ½	½ x ½	½ x ½	½ x ½
	Packing Arrangement			2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3	2-C-3
	Width of Seal Cage			⅜	⅜	⅜	¾	¾	¾	¾	¾	¾	¾	¾	¾	1	1	1	1	1
	Distance to 1st Obstruction			1.82	1.82	1.82	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	3.13	3.13	3.38	3.38

*6x4x10, 4x3x13—2.13 @ 3550 RPM.
**6x4x10, 4x3x13—2.94 @ 3550 RPM.

HOC/ HEC Standard Materials

	COL. DI	COL. S/DI***	COL. S	COL. R		
	Ductile Iron	Steel	316SS	ALLOY 20	HAST. B	HAST. C
Casing	543F	383	383	372	HAST. B	HAST. C
Casing foot (when used)	816	816	816	816	816	816
Casing Gasket	Asbestos	Asbestos	Asbestos	Asbestos	Asbestos	Asbestos
Casing Studs	314	314	828	828	828	828
Casing Nuts	377	377	669	669	669	669
Casing Rings/ Stuffing Box Rings	241	241	AISI 316	A-20	HAST. B	HAST. C
Pipe Plug (Drain)	C.S.	C.S.	379	400	HAST. B	HAST. C
Impeller	543F	543F	383	372	HAST. B	HAST. C
"O" Ring	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon
Stuffing Box Cover (Non-cooled)	543F	383	383	372	HAST. B	HAST. B
Stuffing Box Cover (Cooled)	383	383	383	372	HAST. B	HAST. C
Gland (Mech. Seal)	543F	543F	383	372	HAST. B	HAST. C
Gland (Packed Box)	543F	543F	383	372	HAST. B	HAST. C
Gland Studs & Nuts	669	669	669	669	669	669
Shaft (Less Sleeve)	379	379	379	400	HAST. B	HAST. C
Shaft (With Sleeve)	320	320	320	320	320	320
Sleeve (Packed box or mech. seal)	20	20	379	400	HAST. B	HAST. C
Shaft Key	266					
Seal Cage	Teflon					
Stuffing Box Packing	Asbestos					
Flinger Group I & II (except 6x4x13)	Glass Filled Nylon					
Flinger Group III	Buna					
* Support Head	816					
Bearing Housing	816					
Bearing End Cover	816					
* Bearing Housing foot	816					
** Shroud Plate	241	241	AISI 316	A-20	HAST. B	HAST. C
** Shroud Pins	400					

* Does not apply to Group I pumps.
** Does not apply to Closed Impeller Design Pumps nor Group III.
*** Used for applications where customer requires steel casing.

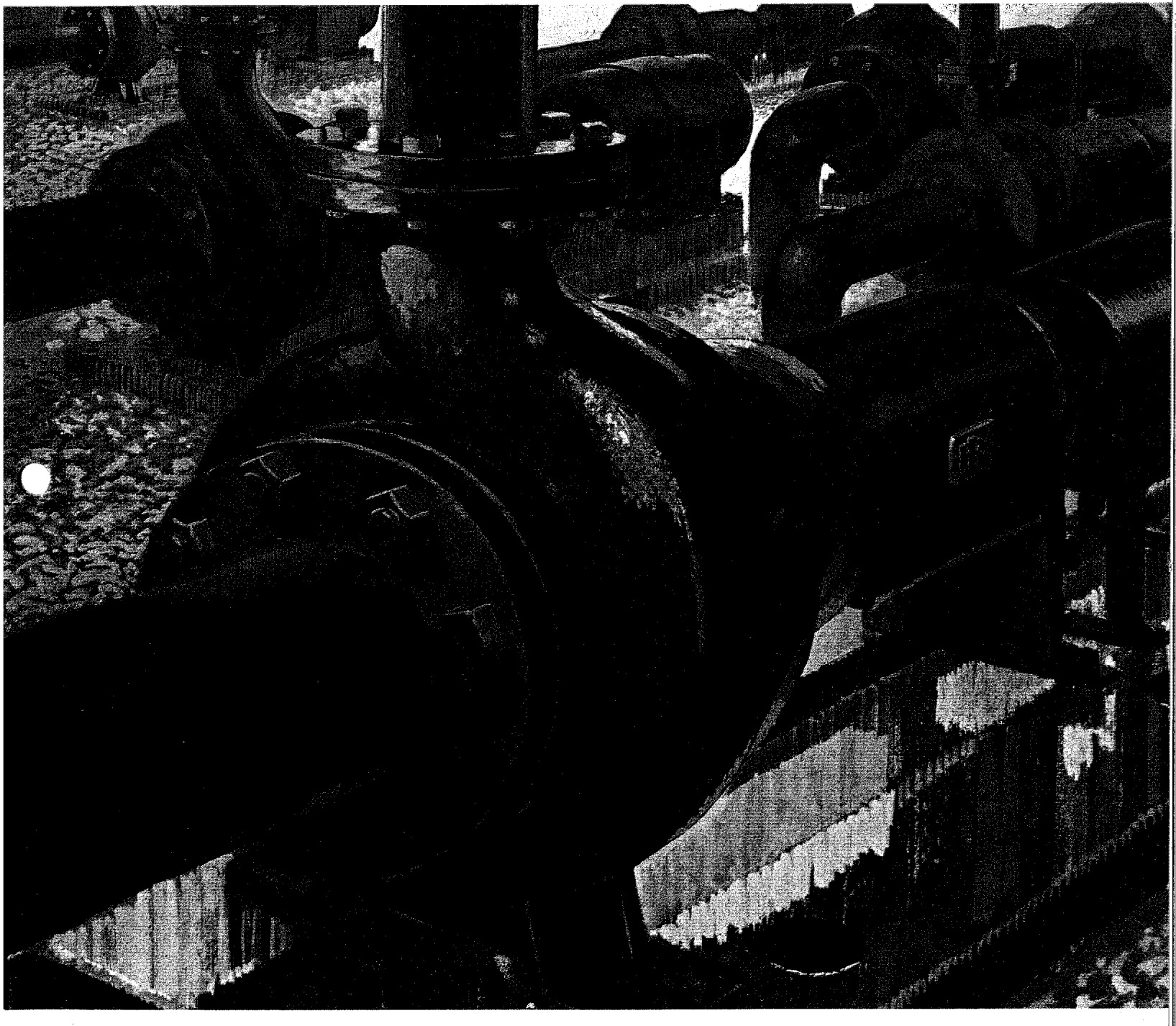
Material	I-R Spec.	Commercial Spec.[1]
Cast Iron	816	Cast Iron—ASTM A48 CL 30
Ductile Iron (D.I.)	543F	Cast Ductile Iron—ASTM A395
Steel	241	Carbon Steel Plate
	266	AISI 1018 Cold-Drawn Key Stock
	320	Wrought Carbon Steel—AISI 1045
AISI 316	383	Cast Stainless—ASTM A296 GR. CF-SM
	379	Wrought Stainless—ASTM A276 Type 316
Alloy 20	372	Cast Stainless ASTM A296 GR. CN-7M
	400	Wrought Stainless—Carpenter 20
Hast. B	—	Cast Stainless—ASTM A494
	—	Wrought Stainless—ASTM B336
Hast. C	—	Cast Stainless—ASTM A494
	—	Wrought Stainless—ASTM B336
AISI 304	669	Wrought Stainless—ASTM A276 Type 304
AISI 416	20	Wrought Stainless—ASTM A276 Type 416
Stainless Steel	828	ASTM A193 Class 2 GR. B8
AISI 316	—	316 Stainless Steel Plate

1. Material furnished is commercial in quality. Reference to ASTM or other commercial specifications applies to chemical and mechanical properties only.

HOC

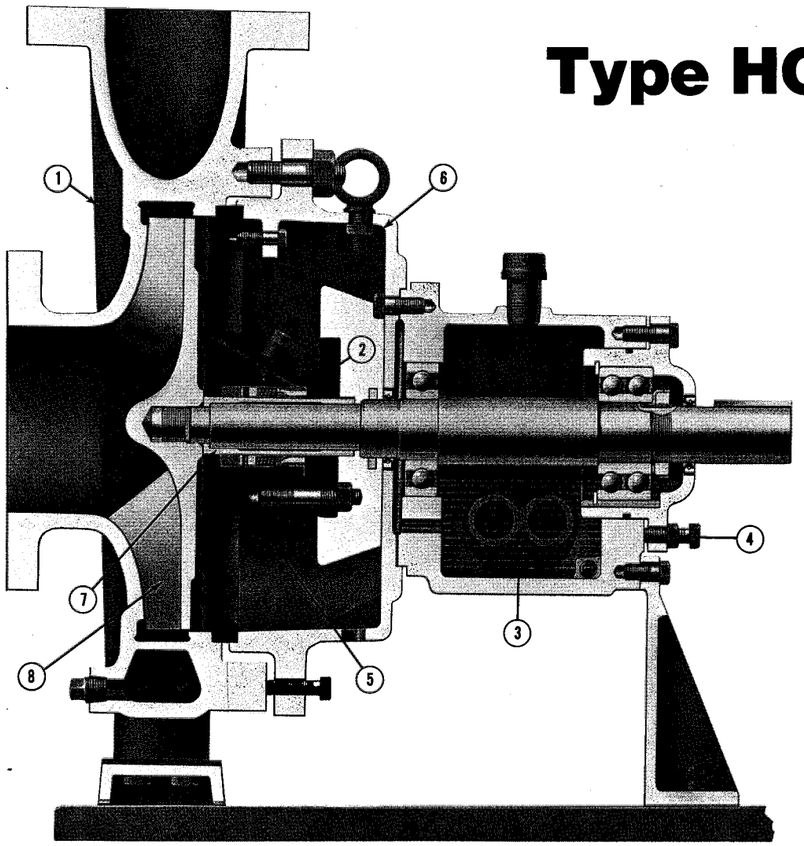
CRADLE MOUNTED CENTRIFUGAL PUMPS

- Wide range of materials
- Back pullout
- Capacities to 4500 gpm
- Heads to 240 ft.



Ingersoll-Rand

Type HOC



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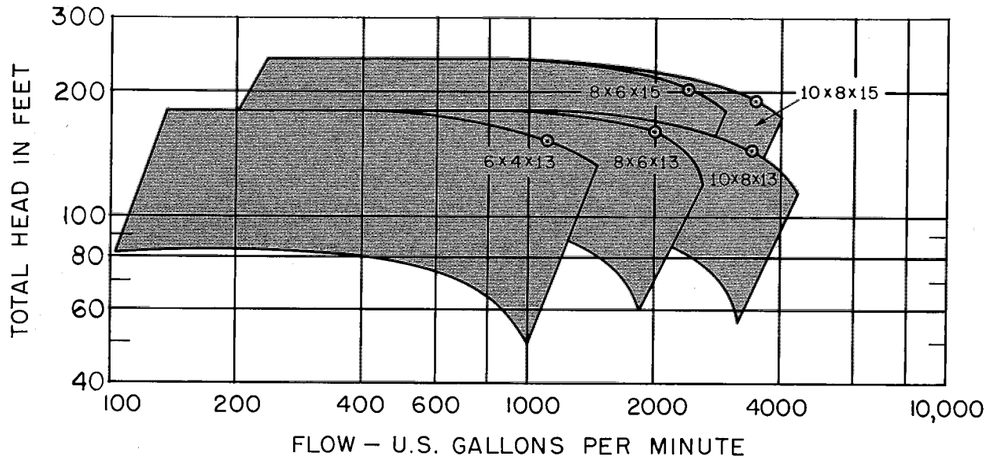


COVERAGE CHART 1750 RPM

DESIGN FEATURES

1. **Dual Volute Casings** reduce hydraulic thrust, helping to hold shaft deflections to under .002" maximum and insure optimum seal life. Casings are centerline discharge and self-venting with alternative flange ratings to match the required pressure rating.

2. **Internal Flush** is standard on all HOC units, thus eliminating the need for tubing and connections from discharge to stuffing box. Angular drilling allows pumpage to circulate over the seal faces, eliminating the need of a flush gland. If external flushing of seals is desired, the flushing hole is closed at the casing cover and the seal can be externally flushed through the tap into the stuffing box.

3. **Cartridge Cooler** is an optional feature designed to maintain high bearing life on high temperature applications.

4. **Externally Adjustable Impeller Clearances** are standard on all HOC's allowing quick and simple adjustment for normal casing wear. Difficult shimming has been eliminated.

5. **Stuffing Box Cover** accommodates either packing or mechanical seal. It is available with jacketing for either water cooling or steam injection.

6. **Back Pullout Design** allows easy access to stuffing box and pump internals. The HOC incorporates a spacer coupling as standard equipment, permitting disassembly of pump without disturbing either piping or driver. Jacking bolts allow easy removal of casing cover assembly even in extremely corrosive services. Rabbet fits insure easy reassembly with minimal alignment.

7. **Renewable Shaft Sleeves** sealed with a Teflon "O" ring are standard, preventing expensive shaft corrosion.

8. **Balanced Open Impeller** handles slurries and clear liquids equally well making it ideally suited for a variety of applications. Back vanes insure a low stuffing box pressure for improved seal and packing life.

The HOC pump line allows Ingersoll-Rand to give its customers the most comprehensive pump coverage in the chemical industry today. A horizontal, open impeller pump, the HOC will handle flows to 4500 GPM and heads to 240 feet. Available in any machineable alloy, the HOC is designed for working pressures to 400 PSI and temperatures to 600° F.

The HOC will accommodate either balanced or unbalanced mechanical seals, and the back pullout with standard spacer coupling insures easy seal replacement when necessary.

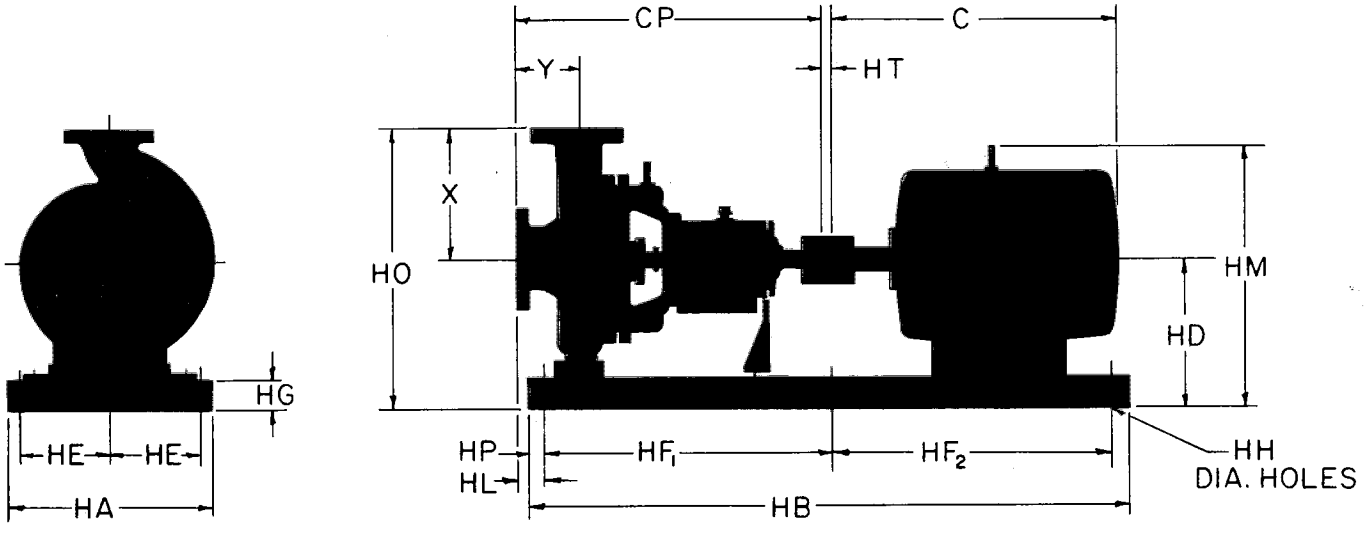
MATERIALS OF CONSTRUCTION

Part	COL DI	COL S
Casing	Ductile iron	316
Impeller	Ductile iron	316
Stuffing Box Cover	Ductile iron	316
Shaft (less sleeve)	320	303 SS
Sleeve	416 SS	316
Gland	Ductile iron	316
Casing Studs & Nuts	304 SS	304 SS
Impeller "O" ring	Teflon	
Casing Gasket	Blue African Asbestos	

Although the HOC is available in any machineable alloy, the above materials are carried in stock.

Type HOC Cradle Mounted Pumps

APPROXIMATE DIMENSIONS AND WEIGHT



PUMP	R.P.M.	H.P.	TOTAL WT.	SUC.	DISC.	CP	X	Y	MOTOR T.E.F.C.	C	HA	HB	HD	HE	HF_1	HF_2	HG	HH	HL	HM	HO	HP	HT
6x4x13	1780	60	1344#	6	4	23½	13½	4	364 TS	30 15/16	18	55	14	7⅜	28½	24¼	4	1	1⅛	26 11/16	27½	1⅛	3½
6x4x13	1180	20	960#	6	4	23½	13½	4	286 TS	24 11/16	18	51	14	7⅜	24⅞	23⅞	4	1	1⅛	24⅛	27½	1⅛	3½
8x6x13	1780	100	1949#	8	6	33⅞	16	6	405 TS	35 11/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	31¾	33½	1⅛	5¼
8x6x13	1180	30	1450#	8	6	33⅞	16	6	326 TS	27 3/16	18	66	18½	7⅜	28½	35½	4	1	1⅛	29 11/16	34½	1⅛	5¼
10x8x13	1780	150	2526#	10	8	33⅞	18	6	445 TS	40⅞	22	76	17½	9⅜	33⅞	39⅞	3	1	1⅛	33¼	35½	1⅛	5¼
10x8x13	1180	50	1815#	10	8	33⅞	18	6	365 T	34 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	35½	1⅛	5¼
8x6x15	1780	150	2536#	8	6	33⅞	18	6	445 TS	40⅞	22	76	17½	9⅜	33⅞	39⅞	3	1	1⅛	33¼	35½	1⅛	5¼
8x6x15	1180	50	1825#	8	6	33⅞	18	6	365 T	34 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	35½	1⅛	5¼
8x6x15	880	20	1305#	8	6	33⅞	18	6	286 TS	24 11/16	18	62	18½	7⅜	28½	31¼	4	1	1⅛	28⅝	36½	1⅛	5¾
10x8x15	1780	200	3195#	10	8	33⅞	19	6	447 TS	46⅛	22	80	17½	9⅜	35⅞	41⅞	3	1	1⅛	33¼	36½	1⅛	5¼
10x8x15	1180	60	2021#	10	8	33⅞	19	6	404 T	37 3/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	31¾	36½	1⅛	5¼
10x8x15	880	30	1775#	10	8	33⅞	19	6	364 T	33 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	36½	1⅛	5¼

Form 70739-A
Printed in U.S.A.

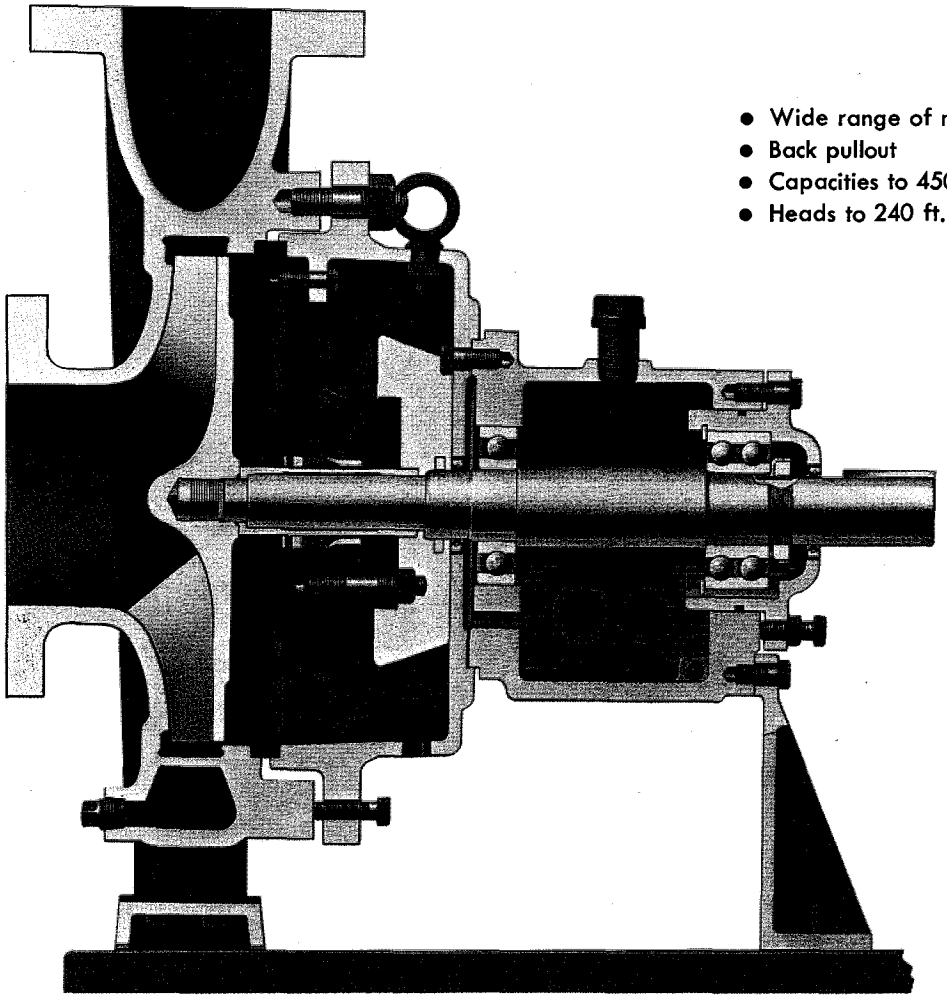
Ingersoll-Rand
STANDARD PUMP - ALDRICH DIVISION
ALLENTOWN, PA. 18105

Ingersoll-Rand

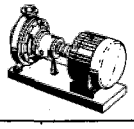
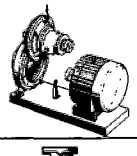
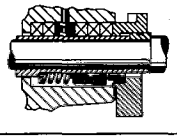
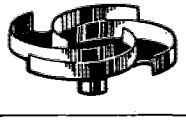
Standard Pump—Aldrich Division
Allentown, Pa. 18105

Type HOC

Type HOC pumps are cradle mounted, open impeller, flexible coupled, and driven by standard motors. The pump and motor are mounted on a steel base with pack pull-out assembly for ease of maintenance.

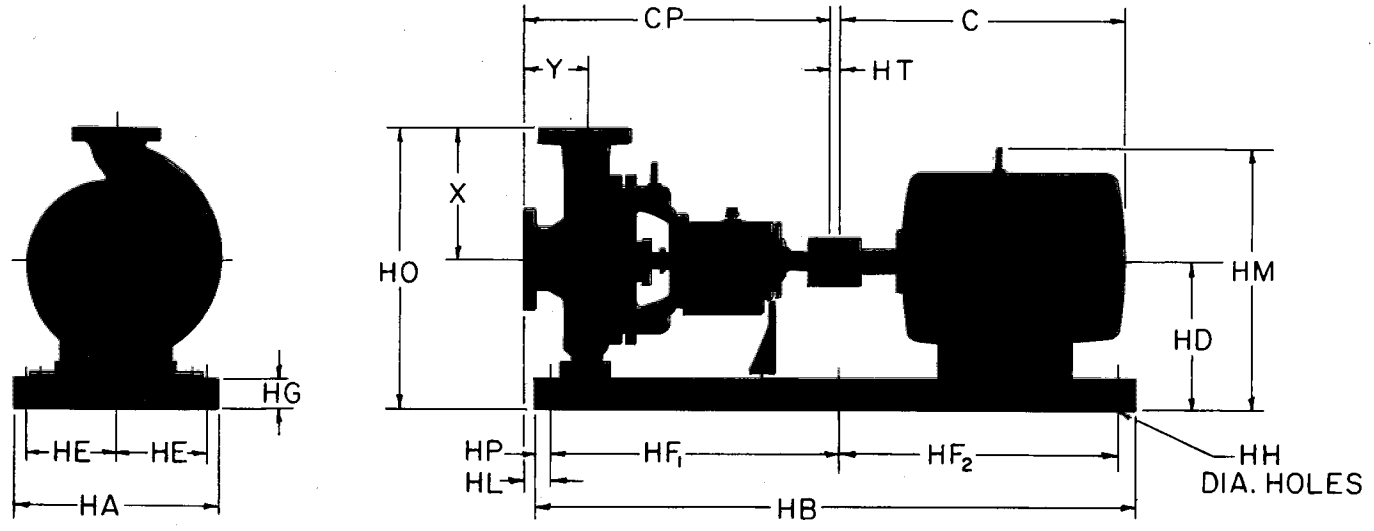


- Wide range of materials
- Back pullout
- Capacities to 4500 gpm
- Heads to 240 ft.

	PUMP FEATURES		CUSTOMER BENEFITS
CRADLE MOUNTED DESIGN		Standard NEMA motors	Fast, economical, motor replacement Versatility of drives
BACK PULLOUT DESIGN		Spacer couplings are standard	Ease of maintenance without disconnecting piping or moving the motor
VERTICAL CENTERLINE DISCHARGE		Foot mounted casing Dual volute on all sizes	Simplified piping - Support at casing prevents misalignment. Longer bearing life
VERSATILE STUFFING BOXES		Cooled jackets 5 packing rings and cage Mechanical seal fits same box Single, double, balanced, unbalanced seals	Correct sealing arrangement at minimum cost
OPEN IMPELLERS		Externally adjustable impeller clearances.	Handle both slurry and clear liquids. Low cost replacement—Minimum parts inventory Maintains constant NPSH and pump performance
STOCK SHIPMENT			Quick availability

Type HOC Cradle Mounted Pumps

APPROXIMATE DIMENSIONS AND WEIGHT



PUMP	R.P.M.	H.P.	TOTAL WT.	SUC.	DISC.	CP	X	Y	MOTOR T.E.F.C.	C	HA	HB	HD	HE	HF_1	HF_2	HG	HH	HL	HM	HO	HP	HT
6x4x13	1780	60	1344#	6	4	23½	13½	4	364 TS	30 15/16	18	55	14	7⅜	28½	24¼	4	1	1⅛	26 11/16	27½	1⅛	3½
6x4x13	1180	20	960#	6	4	23½	13½	4	286 TS	24 11/16	18	51	14	7⅜	24⅞	23⅞	4	1	1⅛	24⅞	27½	1⅛	3½
8x6x13	1780	100	1949#	8	6	33⅞	16	6	405 TS	35 11/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	31¾	33½	1⅛	5¼
8x6x13	1180	30	1450#	8	6	33⅞	16	6	326 TS	27 3/16	18	66	18½	7⅜	28½	35½	4	1	1⅛	29 11/16	34½	1⅛	5¼
10x8x13	1780	150	2526#	10	8	33⅞	18	6	445 TS	40⅞	22	76	17½	9⅜	33⅞	39⅞	3	1	1⅛	33¼	35½	1⅛	5¼
10x8x13	1180	50	1815#	10	8	33⅞	18	6	365 T	34 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	35½	1⅛	5¼
8x6x15	1780	150	2536#	8	6	33⅞	18	6	445 TS	40⅞	22	76	17½	9⅜	33⅞	39⅞	3	1	1⅛	33¼	35½	1⅛	5¼
8x6x15	1180	50	1825#	8	6	33⅞	18	6	365 T	34 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	35½	1⅛	5¼
8x6x15	880	20	1305#	8	6	33⅞	18	6	286 TS	24 11/16	18	62	18½	7⅜	28½	31¼	4	1	1⅛	28⅝	36½	1⅛	5¾
10x8x15	1780	200	3195#	10	8	33⅞	19	6	447 TS	46⅛	22	80	17½	9⅜	35⅞	41⅞	3	1	1⅛	33¼	36½	1⅛	5¼
10x8x15	1180	60	2021#	10	8	33⅞	19	6	404 T	37 3/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	31¾	36½	1⅛	5¼
10x8x15	880	30	1775#	10	8	33⅞	19	6	364 T	33 1/16	22	71	17½	9⅜	30⅞	37⅞	3	1	1⅛	30 3/16	36½	1⅛	5¼

Do not use for construction.
All dimensions are in inches.