BULLETIN A101

ROTH PUMP COMPANY

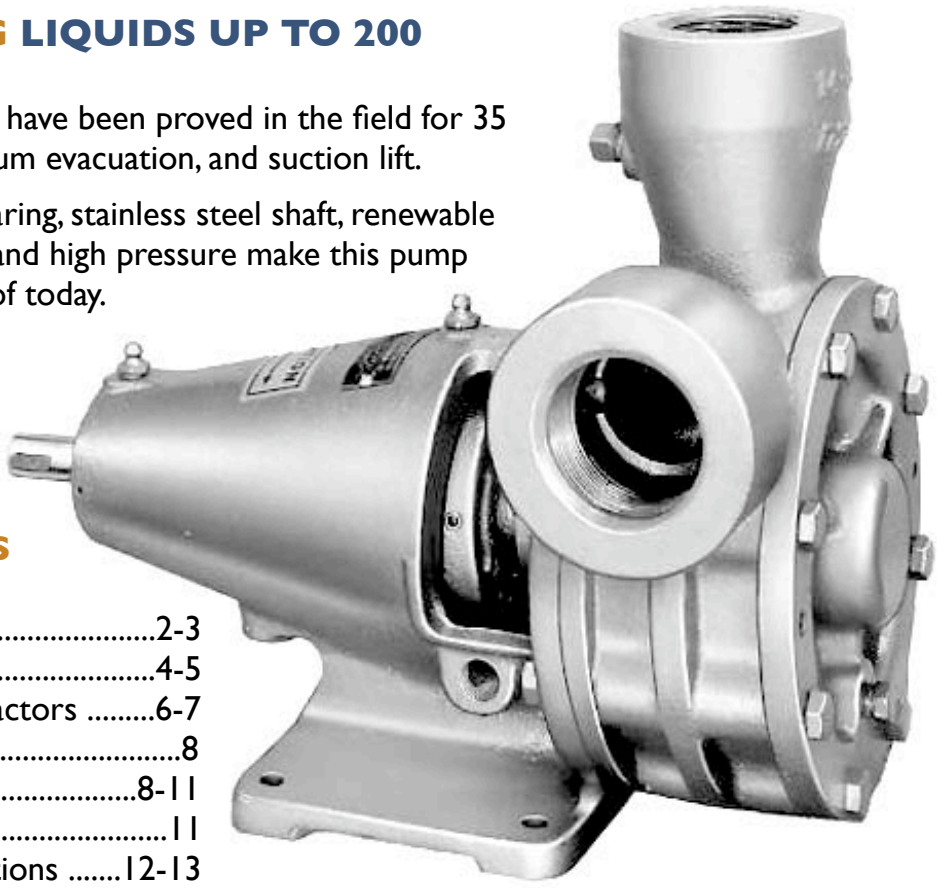
REGENERATIVE CENTRIFUGAL | TURBINE PUMPS

End Mounted Industrial Pumps

FOR NON-LUBRICATING LIQUIDS UP TO 200 GPM & 200 PSI

Roth end mounted industrial pumps have been proved in the field for 35 years on hot water, low NSPH, vacuum evacuation, and suction lift.

Drip proof bearing frame, sealed bearing, stainless steel shaft, renewable liners, and mechanical seals for low and high pressure make this pump the most versatile industrial design of today.



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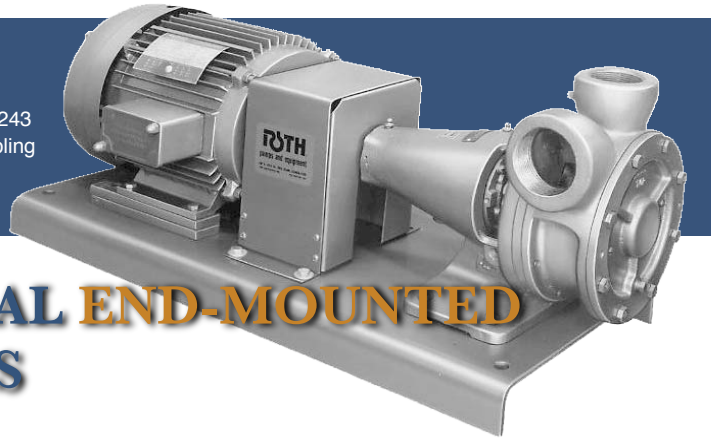
ROTH PUMP COMPANY P.O. Box 4330, Rock Island, Illinois 61204



Showing model 243 with flexible coupling & motor

REGENERATIVE CENTRIFUGAL END-MOUNTED INDUSTRIAL TURBINE PUMPS

A CENTRIFUGAL Pump with Many Superior Advantages

The ROTH regenerative turbine pump is basically a centriful pump with important modifications. Some authorities have tried to classify the turbine pump with rotary positive displacement pumps, neglecting to take into consideration the recycling centrifugal forces within the pump. This regenerating internal flow phenomena is proved by many laboratory test and by actual observation of the liquid motion within the pump. The fundamental centrifugal nature of this ROTH turbine design is further proved by the similarity of performance characteristics.

This similarity between ROTH turbine and conventional centrifugal pumps is apparent in these respects:

1. Capacity increases proportionally with the speed ratio. Head increases as the square of the speed ratios. Power input increases with the cube of the speed ratio.
2. Capacity and head in feet of liquid are uniform for all specific gravities in liquid range.
3. The power input is proportionate to the specific gravity of the liquid.
4. The viscosity limitation of both is about 200 centistrokes or 1000 SSU.

ROTH TURBINE DESIGN INCREASES the CENTRIFUGAL'S PRESSURE and LOWERS the OPERATING SPEED

The regenerative action turbine pump takes over where the centrifugal stops. Following are those areas in which the ROTH turbine pump surpasses the conventional centrifugal pumps:

1. Turbine impellers develop pressures many times higher than those of the centrifugal running at twice the speed of the turbine.
2. Many applications which require 3500 RPM with conventional centrifugal impellers are better handled at only 1750 RPM with the ROTH turbine.
3. ROTH turbine pumps in many installations can run quieter and outlast the conventional centrifugal pump in the same service because they develop pressure at slower speeds; pump hot water with low suction head; and are free of the cavitation inherent in centrifugals under certain conditions.

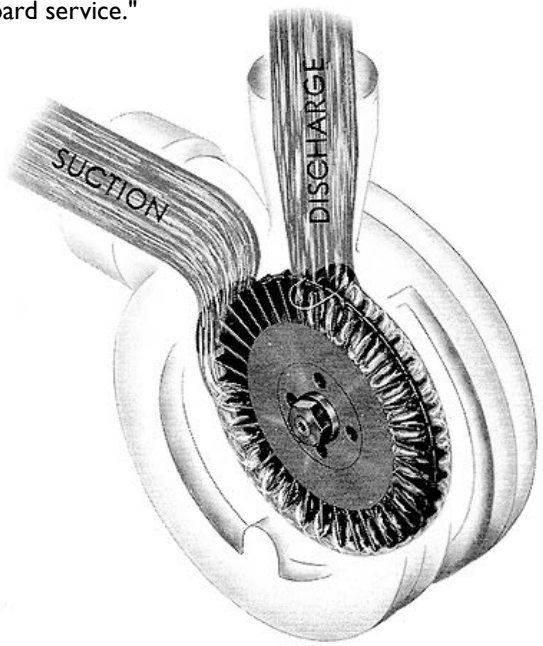
More and more engineers are specifying "centrifugal or turbine" pumps for application within range up to 200 GPM and up to 300 PSI in order to permit cost and performance comparisons with conventional centrifugal pumps.

In such cases it is recommended that electric motors for drivers be specified as "non overloading at design point with overload and under voltage protection." This permits consideration of smaller motors when the pump selected has improved efficiency.

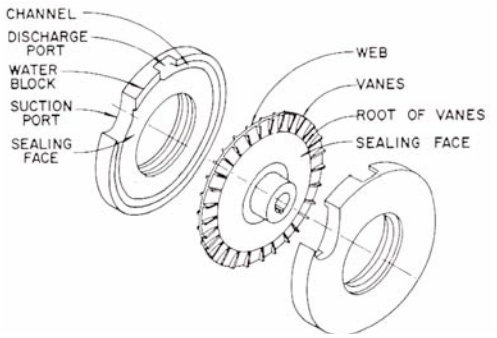
Many engineers today prefer to specify only turbine pumps for applications involving low NPSH, low capacity at high heads, or to take advantage of the steep turbine pump curve which remains relatively uniform capacity over a considerable head range.

Standard Heating Specification Public Building Service, Washington, D.C. of the General Services Administration paragraph 178 (covering condensate pumps) calls for turbine or centrifugal type impellers. Paragraph 185 (covering hot water circulating pumps) contains the same wording.

U.S. Navy specification MIL-P-17945 (ships) describes turbine pumps for shipboard application under the title "Pumps, centrifugal, peripheral (turbine) type, miscellaneous naval shipboard service."



A GRAPHIC ANALYSIS of REGENERATIVE ACTION showing the actual helilical (or spiral) course of the liquid from suction to discharge. (Note increased frequency of helilical action as liquid nears discharge.)



THE PRINCIPLE of REGENERATIVE CENTRIFUGAL (Turbine) OPERATION

ROTH turbine pumps are so named because of the appearance of the impeller which is essentially a double suction open vane centrifugal impeller completely machined from solid metal.

Maximum shut-off head developed is normally about ten times the shut' off head of a single stage centrifugal impeller of the same diameter running at the same speed.

PERFORMANCE COMPARISON BETWEEN ROTH REGENERATIVE and CONVENTIONAL CENTRIFUGAL DESIGNS

The performance curve shown below shows typical ROTH turbine performance. It will be noted that brake horsepower, which represents power input, increases with head and reaches a peak at shut-off head. This is the similarity to rotary positive displacement pumps which has led to some confusion in the classification of turbine pumps.

The following phenomena lend themselves to a conclusion separating this equipment from rotary positive displacement pumps:

1. Liquid can be forced through the pump with the impeller locked. Only a partial pressure drop will be noted.
2. Turbine pumps cannot be used on highly viscous liquids.
3. Vapor can be moved only when the pump is liquid filled.

THE REGENERATIVE ACTION of the ROTH TURBINE DISCUSSED

Pressure in a ROTH turbine pump increases gradually in the direction of flow. High pressure at the discharge is sealed off from low pressure at the suction.

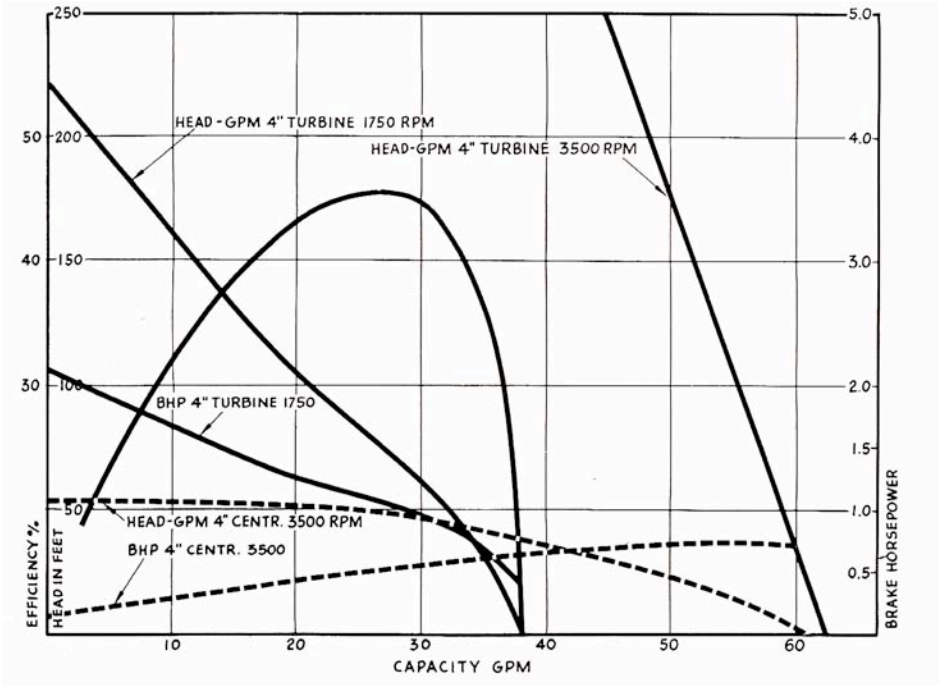
Pressure at the center of the impeller or stuffing box is midway between suction and discharge pressures.

In operation the liquid is introduced to the periphery of the impeller directly from the suction entrance. It then passes around the water channel from suction to discharge developing pressure head with each forward increment. ROTH laboratory models with clear plastic fronts and lighted interiors have been studied to determine the pattern of flow within the pump. Air particles introduced at the suction by means of low vacuum have been observed to develop two parallel helixes between suction and discharge.

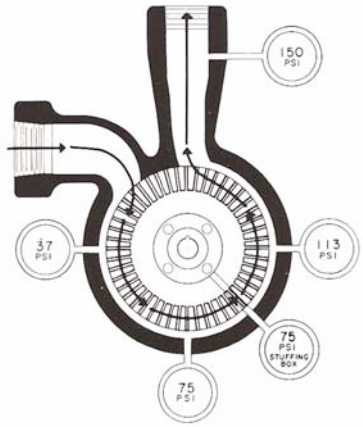
ROTH TURBINES CREATE A MULTI· STAGE CENTRIFUGAL EFFECT

Our laboratory observations indicate the pressure head developed is a function of the number of recirculations that take place in the flow from suction to discharge.

The special brake horsepower curve with its increased power input at increased head



SIMILARITIES & DIFFERENCES of ROTH Regenerative Turbine & conventional centrifugal pumps as interpreted through performance curves on similar models. (Note: Roth Turbine shown in solid lines, centrifugal in dotted lines.)



serves to highlight the regenerative character of this special centrifugal design.

In effect, ROTH can pump liquids with a single stage regerative turbine pump that would require the use of a multistage centrifugal pump. Running at high differential pressure it is said to be in high turbine phase. Rugged construction is essential.

The same model at the opposite end of the curve performs in similar fashion to a conventional centrifugal design. Running at low differential pressures it is said to be operating in centrifugal phase.

At low differential pressures a low pressure area (or eye) is created at the center of the turbine impeller with the pump reverting to centrifugal phase. Required running clearances are similar to those at the eye of a centrifugal when running in centrifugal phase.

Between centrifugal phase and high turbine phase is a range of differential pressures up to' 150 PSI or 350 ft. TDH in which the pumps operate in low turbine phase.

The turbine or regenerative centrifugal pump may be said to have certain advantages in three operating ranges. This three-phase characteristic makes it a versatile and valuable industrial performer.

Similarities:

1. Speed ratio conversion identical.
2. Specific gravity does not affect head GPM.
3. Specific gravity changes power input. Viscosity limits about the same.

Centrifugal advantages:

1. Less machine work.
2. Flat performance curve - large capacity variation with slight head variation.
3. Utilizes low cost high speed motors.

Turbine pump advantages:

1. Smaller size - less weight.
2. Steep performance curve - dependable capacity in spite of pressure variations.
3. Slower speed - longer bearing and seal life - less coupling noise.
4. Pumps hot water with low suction head without destructive cavitation. Resists vapor binding.

PERFORMANCE & SELECTION TABLE (All End-Mounted Industrial Pumps)

This condensed table gives in terms of GPM; TDH; and NPSH, most of the information necessary to the fast, easy selection of the right ROTH End Mounted Industrial Pump for any specific job. For more critical applications, please see performance curves in section C-101. Please read carefully the following instructions on how to use this table.

How to Use Table - The following explanation graphically shows what each element of the digits in the table stand for.

- **PUMP MODEL NUMBER** appears as the first group of digits on the first line. In ordering be sure to indicate pump model prefixes and suffixes (given below) to indicate selection of materials of construction and stuffing box or mechanical seal.
- **SUCTION & DISCHARGE SIZE in INCHES** - The second group of digits on the first line indicate suction diameter (first digit) and discharge diameter (second digit).
- **MINIMUM NPSH in FEET** is given in the third group of digits and provides only an indication of the minimum necessary suction head when pumping liquified gases, boiling liquids, or evacuation from vacuum. See Section C101 for full data and performance curves on critical applications of the above.

1021-1x1-3'
1/4-1750

- **MOTOR HORSEPOWER** (recommended) - First digit of second line. Motor sizes given include allowances for recommended motor service factor in 40° rise motors. (Refer to performance curves for motor selection requiring 50° rise motors.)
- **MOTOR SPEED (RPM)**-Second group of digits of second line.

How to Designate Materials of Construction - When ordering, the following designations showing material wanted should follow pump model number thus:

000-**SF**

SF: Standard Fitted
BF: Bronze Fitted
AB: All Bronze
AI: All Iron
BC: All Iron w/ 416SS Impeller

How to Designate Seals - One of the following designations giving the various seals desired should precede pump model number thus:

1SE-0000

1SE: Roth unbalanced seal; stainless steel, Buna N, carbon, and ceramic. Pump equipped with renewable liners.

31S: Roth balanced seal with brass metal parts, Buna N gaskets, and ceramic.

Note: Not all pumps are built in all constructions.

LIQUIDS & TEMPERATURES

Liquid	Sp. Gr.	Mat.	Seal	Temperature
Cold Water	1.0	BF	1SE-31S	33-160˚F
Hot Water	.96	SF or BF	1SE-31S	160-210˚F
Alcohol (Ethanol)	.80	BF-AB	1SE-31S	20-120˚F
Ethylene Glycol	1.12	BF-AB	1SE-31S	100 F MAX.
Gas Oil	.85	SF	1SE-31S	100 F MAX.
Gasoline	.74	SF	1SE-31S	100 F
Hexane	.66	SF	1SE-31S	100 F
Hydraulic Oils	.92	SF	1SE-31S	100 F
Jet Fuels	.82	SF	1SE-31S	100 F
Kerosene	.82	SF	1SE-31S	100 F
Methanol	.80	BF-AB	1SE-31S	100 F
Mineral Spirits	.82	SF	1SE-31S	100 F

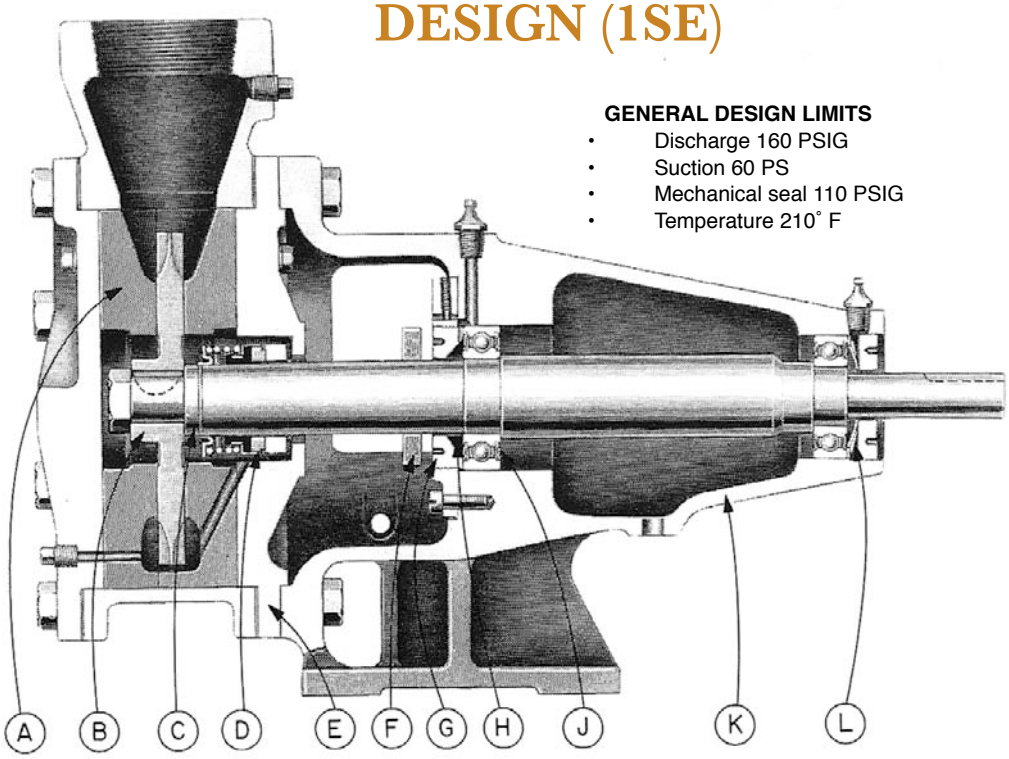
TOTAL DYNAMIC HEAD (TDH) IN FEET					
GPM	25	50	75	100	125
1	1020-1 x 1-3' ¼-1750	1020-1 x 1-3' ¼-1750	1020-1 x 1-3' ¼-1750	1021-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750
2	1020-1 x 1-3' ¼-1750	1020-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750	1022A-1 x 1-3' ⅓-1750
3	1022-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750	1022A-1 x 1-3' ¼-1750	130-1½ x 1¼-3' ⅓-1750
4	1022-1 x 1-3' ¼-1750	1022-1 x 1-3' ¼-1750	1023-1 x 1-3' ¼-1750	131-1½ x 1¼-3' ⅓-1750	133-1½ x 1¼-3' ½-1750
5	1022-1 x 1-3' ¼-1750	1023-1 x 1-3' ¼-1750	1027-1 x 1-3' ⅓-1750	133-1½ x 1¼-3' ½-1750	141-1½ x 1¼-3' ½-1750
6	1023-1 x 1-3' ¼-1750	1027-1 x 1-3' ¼-1750	1027-1 x 1-3' ⅓-1750	141-1½ x 1¼-3' ½-1750	141-1½ x 1¼-3' ½-1750
8	1027-1 x 1-3' ¼-1750	1027-1 x 1-3' ¼-1750	133-1½ x 1¼-3' ⅓-1750	142-1½ x 1¼-3' ¾-1750	142-1½ x 1¼-3' ¾-1750
10	1027-1 x 1-3' ¼-1750	1028-1 x 1-3' ⅓-1750	141-1½ x 1¼-3' ½-1750	142-1½ x 1¼-3' ¾-1750	143-1½ x 1¼-3' ¾-1750
12	1027-1 x 1-3' ¼-1750	141-1½ x 1¼-3' ⅓-1750	142-1½ x 1¼-3' ½-1750	143-1½ x 1¼-3' ¾-1750	H149-1½ x 1¼-3' 1½-1750
14	1028-1 x 1-3' ¼-1750	143-1½ x 1¼-3' ½-1750	143-1½ x 1¼-3' ½-1750	145-1½ x 1¼-3' 1-1750	H149-1½ x 1¼-3' 1½-1750
16	143-1½ x 1¼-3' ⅓-1750	143-1½ x 1¼-3' ½-1750	145-1½ x 1¼-3' ¾-1750	147-1½ x 1¼-3' 1-1750	H149-1½ x 1¼-3' 1½-1750
18	143-1½ x 1¼-3' ⅓-1750	145-1½ x 1¼-3' ½-1750	147-1½ x 1¼-3' ¾-1750	149-1½ x 1¼-3' 1-1750	H150-1½ x 1¼-3' 2-1750
20	145-1½ x 1¼-3' ½-1750	147-1½ x 1¼-3' ¾-1750	147-1½ x 1¼-3' ¾-1750	149-1½ x 1¼-3' 1-1750	H150-1½ x 1¼-3' 2-1750
25	147-1½ x 1¼-3' ½-1750	149-1½ x 1¼-3' ¾-1750	149-1½ x 1¼-2' 1-1750	150-1½ x 1¼-3' 1½-1750	H151-1½ x 1¼-6' 2-1750
30	149-1½ x 1¼-3' ¾-1750	149-1½ x 1¼-3' ¾-1750	151-1½ x 1¼-6' 1½-1750	H151-1½ x 1¼-6' 1½-1750	263-2½ x 2-3' 3-1750
35	149-1½ x 1¼-3' ¾-1750	151-1½ x 1¼-6' 1-1750	151-1½ x 1¼-6' 1½-1750	263-2½ x 2-3' 2-1750	263-2½ x 2-3' 3-1750
40	151-1½ x 1¼-6' ¾-1750	151-1½ x 1¼-6' 1-1750	163-2½ x 2-3' 2-1750	263-2½ x 2-3' 2-1750	265-2½ x 2-4' 3-1750
50	163-2½ x 2-7' 1½-1750	165-2½ x 2-7' 2-1750	165-2½ x 2-6' 2-1750	268-2½ x 2-6' 3-1750	H268-2½ x 2-6' 3-1750
60	165-2½ x 2-7' 1½-1750	165-2½ x 2-7' 2-1750	267-2½ x 2-7' 3-1750	267-2½ x 2-7' 3-1750	H269-2½ x 2-7' 5-1750
70	167-2½ x 2-8' 1½-1750	167-2½ x 2-9' 2-1750	269-2½ x 2-7' 3-1750	269-2½ x 2-7' 5-1750	H269-2½ x 2-7' 5-1750
80	267-2½ x 2-7' 1½-1750	269-2½ x 2-7' 3-1750	269-2½ x 2-7' 3-1750	269-2½ x 2-7' 5-1750	M375-3 x 2½-7' 5-1750
100	269-2½ x 2-9' 2-1750	278-2½ x 2-11' 5-1750	H278-2½ x 2-11' 5-1750	H278-2½ x 2-11' 7½-1750	M377D-3 x 2½-7' 7½-1750
120	278-2½ x 2-11' 3-1750	278-2½ x 2-11' 5-1750	H278-2½ x 2-11' 5-1750	M379B-3 x 2½-11' 7½-1750	M379B-3 x 2½-11' 7½-1750
140	278-2½ x 2-11' 3-1750	M379B-3 x 2½-11' 5-1750	M379B-3 x 2½-11' 7½-1750	M379B-3 x 2½-11' 7½-1750	M379B-3 x 2½-11' 7½-1750
160	M379B-3 x 2½-11' 5-1750	M379B-3 x 2½-11' 5-1750	M379B-3 x 2½-11' 7½-1750	M380A-3 x 2½-15' 10-1750	
180	M380A-3 x 2½-15' 5-1750	M380A-3 x 2½-15' 5-1750	M380A-3 x 2½-15' 7½-1750		

TOTAL DYNAMIC HEAD (TDH) IN FEET									
GPM	150	175	200	235	270	300	350	400	450
1	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-7′ ½-3500	1128-1½ x 1¼-6′ 1½-3500	7S-1128-1½ x 1¼-10′ 1½-3500	7S-1128-1½ x 1¼-15′ 2-3500
2	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-7′ ½-3500	1128-1½ x 1¼-6′ 1½-3500	7S-1128-1½ x 1¼-10′ 1½-3500	7S-1128-1½ x 1¼-15′ 2-3500
3	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	1020-1 x 1-3′ ½-3500	250-1½ x 1¼-3′ 1-1750 1020-1 x 1-3′ ½-3500	1021-1 x 1-3′ ¾-3500	1021-1 x 1-7′ ¾-3500	1128-1½ x 1¼-6′ 1½-3500	7S-1128-1½ x 1¼-10′ 1½-3500	7S-1128A-1½ x 1¼-15′ 2-3500
4	1020-1 x 1-3′ ½-3500	1021-1 x 1-3′ ½-3500	250-1½ x 1¼-3′ ¾-1750 1021-1 x 1-3′ ½-3500	250-1½ x 1¼-3′ 1-1750 1021-1 x 1-3′ ¾-3500	252-1½ x 1¼-3′ 1½-1750 1022-1 x 1-3′ 1-3500	252-1½ x 1¼-3′ 1½-1750 1021A-1 x 1-7′ 1-3500	1128-1½ x 1¼-6′ 1½-3500	7S-1128A-1½ x 1¼-10′ 2-3500	7S-1128A-1½ x 1¼-15′ 2-3500
5	1021-1 x 1-3′ ½-3500	250-1½ x 1¼-3′ ¾-1750 1022-1 x 1-3′ ¾-3500	251-1½ x 1¼-3′ 1-1750 1022-1 x 1-3′ 1-3500	251-1½ x 1¼-3′ 1½-1750 1022-1 x 1-3′ 1-3500	252-1½ x 1¼-3′ 1½-1750 1022A-1 x 1-3′ 1½-3500	253-1½ x 1¼-3′ 2-1750 1022A-1 x 1-7′ 1½-3500	1128A-1½ x 1¼-6′ 1½-3500	7S-1128A-1½ x 1¼-10′ 2-3500	7S-1128A-1½ x 1¼-15′ 2-3500
6	H142-1½ x 1¼-3′ ¾-1750 1022-1 x 1-3′ ¾-3500	251-1½ x 1¼-3′ 1-1750 1022-1 x 1-3′ ¾-3500	251-1½ x 1¼-3′ 1-1750 1022-1 x 1-3′ 1-3500	252-1½ x 1¼-3′ 1½-1750 1022-1 x 1-3′ 1-3500	253-1½ x 1¼-3′ 2-1750 1022A-1 x 1-3′ 1½-3500	253-1½ x 1¼-3′ 2-1750 1023-1 x 1-7′ 1½-3500	1128A-1½ x 1¼-6′ 1½-3500	7S-1128A-1½ x 1¼-10′ 2-3500	7S-1128A-1½ x 1¼-15′ 2-3500
8	H142-1½ x 1¼-3′ ¾-1750 1022A-1 x 1-3′ 1-3500	252-1½ x 1¼-3′ 1-1750 1022A-1 x 1-3′ 1-3500	252-1½ x 1¼-3′ 1½-1750 1023-1 x 1-3′ 1½-3500	253-1½ x 1¼-3′ 1½-1750 1023-1 x 1-3′ 1½-3500	H256-1½ x 1¼-3′ 3-1750 1023-1 x 1-3′ 1½-3500	H256-1½ x 1¼-3′ 3-1750 1128A-1½ x 1¼-6′ 1½-3500	1128A-1½ x 1¼-6′ 1½-3500	7S-1130-1½ x 1¼-10′ 3-3500	7S-1250-1½ x 1¼-9′ 5-3500
10	252-1½ x 1¼-3′ 1-1750 1023-1 x 1-3′ 1-3500	253-1½ x 1¼-3′ 1½-1750 1023-1 x 1-3′ 1½-3500	253-1½ x 1¼-3′ 1½-1750 1023-1 x 1-3′ 1½-3500	H256-1½ x 1¼-3′ 2-1750 1128A-1½ x 1¼-3′ 1½-3500	H256-1½ x 1¼-3′ 3-1750 1130-1½ x 1¼-3′ 1½-3500	H256-1½ x 1¼-3′ 3-1750 1130-1½ x 1¼-6′ 2-3500	H256-1½ x 1¼-3′ 5-1750 1133-1½ x 1¼-6′ 3-3500	7S-1250-1½ x 1¼-12′ 5-3500	7S-1250-1½ x 1¼-15′ 5-3500
12	253-1½ x 1¼-3′ 1-1750 1130-1½ x 1¼-3′ 1-3500	255-1½ x 1¼-3′ 1½-1750 1130-1½ x 1¼-3′ 1½-3500	255-1½ x 1¼-3′ 1½-1750 1130-1½ x 1¼-3′ 1½-3500	H256-1½ x 1¼-3′ 2-1750 1130-1½ x 1¼-3′ 1½-3500	H256-1½ x 1¼-3′ 3-1750 1131-1½ x 1¼-3′ 2-3500	H256-1½ x 1¼-3′ 3-1750 1133-1½ x 1¼-6′ 3-3500	G371-2 x 1½-3′ 5-1750 1133-1½ x 1¼-6′ 3-3500	7S-1250-1½ x 1¼-15′ 5-3500	7S-1250-1½ x 1¼-20′ 5-3500
14	255-1½ x 1¼-3′ 1½-1750 1130-1½ x 1¼-3′ 1-3500	257-1½ x 1¼-3′ 2-1750 1131-1½ x 1¼-3′ 1½-3500	256-1½ x 1¼-3′ 2-1750 1131-1½ x 1¼-3′ 1½-3500	H256-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 2-3500	H256-1½ x 1¼-3′ 3-1750 1133-1½ x 1¼-6′ 3-3500	H256-1½ x 1¼-3′ 3-1750 1133-1½ x 1¼-6′ 3-3500	G371-2 x 1½-3′ 5-1750 1133-1½ x 1¼-6′ 3-3500	7S-1251-1½ x 1¼-6′ 5-3500	7S-1251-1½ x 1¼-6′ 7½-3500
16	257-1½ x 1¼-3′ 1½-1750 1133-1½ x 1¼-6′ 1½-3500	257-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 1½-3500	256-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 2-3500	H256-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 2-3500	H256-1½ x 1¼-3′ 3-1750 1133-1½ x 1¼-6′ 3-3500	H371-2 x 1½-3′ 3-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 5-1750 1141-1½ x 1¼-9′ 3-3500	7S-1251-1½ x 1¼-6′ 5-3500	7S-1251-1½ x 1¼-6′ 7½-3500
18	257-1½ x 1¼-3′ 1½-1750 1133-1½ x 1¼-6′ 1½-3500	256-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 1½-3500	256-1½ x 1¼-3′ 2-1750 1133-1½ x 1¼-6′ 2-3500	H256-1½ x 1¼-3′ 2-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 3-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 3-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 5-1750 1251-1½ x 1¼-6′ 5-3500	7S-1251-1½ x 1¼-6′ 5-3500	7S-1251-1½ x 1¼-6′ 7½-3500
20	257-1½ x 1¼-3′ 1½-1750 1141-1½ x 1¼-11′ 2-3500	256-1½ x 1¼-3′ 2-1750 1141-1½ x 1¼-9′ 2-3500	H263-2½ x 2-3′ 3-1750 1141-1½ x 1¼-9′ 2-3500	G371-2 x 1½-3′ 3-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 3-1750 1141-1½ x 1¼-9′ 3-3500	G371-2 x 1½-3′ 3-1750 1143-1½ x 1¼-9′ 5-3500	G372-2 x 1½-5′ 5-1750 1251-1½ x 1¼-6′ 5-3500	7S-1251-1½ x 1¼-9′ 5-3500	7S-1251-1½ x 1¼-9′ 7½-3500
25	258-1½ x 1¼-3′ 2-1750 1141-1½ x 1¼-11′ 2-3500	H263-2½ x 2-3′ 3-1750 1143-1½ x 1¼-11′ 3-3500	H265-2½ x 2-4′ 5-1750 1143-1½ x 1¼-11′ 3-3500	G372-2 x 1½-5′ 3-1750 1143-1½ x 1¼-11′ 5-3500	G372-2 x 1½-5′ 5-1750 1143-1½ x 1¼-11′ 5-3500	G372-2 x 1½-5′ 5-1750 1143-1½ x 1¼-11′ 5-3500.	G372-2 x 1½-5′ 5-1750 1251-1½x 1¼-9′ 5-3500	7S-1253-1½ x 1¼-12′ 7½-3500	7S-1253-1½ x 1¼-15′ 7½-3500
30	263-2½ x 2-3′ 3-1750 1143-1½ x 1¼-12′ 3-3500	H265-2½ x 2-4′ 3-1750 1143-1½ x 1¼-12′ 3-3500	H265-2½ x 2-4′ 5-1750 1143-1½ x 1¼-12′ 3-3500	G372-2 x 1½-5′ 3-1750 1143-1½ x 1¼-12′ 5-3500	G374B-2 x 1½-5′ 5-1750 1143-1½ x 1¼-12′ 5-3500	G374B-2 x 1½-5′ 7½-1750 1253-1½ x 1¼-9′ 5-3500	G374B-2 x 1½-5′ 7½-1750 1254-1½ x 1¼-9′ 7½-3500	7S-1255-2½ x 2-9′ 10-3500	7S-1255-2½ x 2-9′ 10-3500
35	H265-2½ x 2-4′ 3-1750 1143-1½ x 1¼-12′ 3-3500	H268-2½ x 2-6′ 5-1750 1145-1½ x 1¼-12′ 5-3500	H268-2½ x 2-6′ 5-1750 1145-1½ x 1¼-12′ 5-3500	G374-2 x 1½-5′ 5-1750 1145-1½ x 1¼-12′ 5-3500	G374B-2 x 1½-5′ 5-1750 1255-2½ x 2-9′ 7½-3500	G374B-2 x 1½-5′ 7½-1750 1255-2½ x 2-9′ 7½-3500	G374B-2 x 1½-5′ 7½-1750 1255-2½ x 2-9′ 7½-3500	7S-1255-2½ x 2-9′ 10-3500	7S-1255-2½ x 2-12′ 10-3500
40	H265-2½ x 2-4′ 3-1750 1145-1½ x 1¼-12′ 5-3500	M374B-2 x 1½-5′ 5-1750 1145-1½ x 1¼-12′ 5-3500	M374-2 x 1½-5′ 5-1750 1145-1½ x 1¼-12′ 5-3500	G374-2 x 1½-5′ 5-1750 1145-1½ x 1¼-12′ 5-3500	G374B-2 x 1½-5′ 5-1750 1255-2½ x 2-9′ 7½-3500	G374B-2 x 1½-5′ 7½-1750 1255-2½ x 2-9′ 7½-3500	G374F-2 x 1½-5′ 7½-1750 1255-2½ x 2-9′ 7½-3500	7S-H1257-2½ x 2-20′ 10-3500	7S-H1257-2½ x 2-20′ 10-3500
50	H268-2½ x 2-6′ 3-1750	M374B-2 x 1½-5′ 5-1750	M374B-2 x 1½-5′ 5-1750	G374F-2 x 1½-5′ 7½-1750 1257-2½ x 2-9′ 7½-3500	G375-3 x 2½-7′ 10-1750 1257-2½ x 2-12′ 7½-3500	G1261-2½ x 2-14′ 10-3500	H1261-2½ x 2-14′ 10-3500	7S-H1261-2½ x 2-20′ 15-3500	
60	H269-2½ x 2-7′ 5-1750	M375-3 x 2½-7′ 7½-1750	M375-3 x 2½-7′ 7½-1750	G375-3 x 2½-7′ 7½-1750 H1261-2½ x 2-14′ 10-3500	H1261-2½ x 2-14′ 10-3500	H1261-2½ x 2-14′ 10-3500	H1261-2½ x 2-14′ 10-3500		
70	M375-3 x 2½-7′ 5-1750	M377D-3 x 2½-7′ 7½-1750	M377-3 x 2½-7′ 10-1750	G377-3 x 2½-7′ 10-1750 H1263-2½ x 2-14′ 10-3500	H1263-2½ x 2-14′ 10-3500	H1263-2½ x 2-14′ 15-3500	H1263-2½ x 2-14′ 15-3500		
80	M375-3 x 2½-7′ 5-1750	M377D-3 x 2½-7′ 7½-1750	M377-3 x 2½-7′ 10-1750	G379-3 x 2½-7′ 15-1750 H1263-2½ x 2-14′ 10-3500	H1263-2½ x 2-14′ 10-3500	H1263-2½ x 2-14′ 15-3500	H1263-2½ x 2-14′ 15-3500		
100	M377D-3 x 2½-7′ 7½-1750	M379B-3 x 2½-7′ 10-1750	M379-3 x 2½-7′ 10-1750	G379-3 x 2½-7′ 15-1750					
120	M379B-3 x 2½-11′ 10-1750	M379B-3 x 2½-7′ 10-1750	M379-3 x 2½-7′ 10-1750						
140									
160									
180									

SUCT PRESS. PSIG	
120	(31S) Balanced Seals
90	(31S) Balanced Seals
60	(1SE) Seals / (31S) Balanced Seals
30	(1SE) Unbalanced Seals / (31S) Bal. Seals
0	(1SE) Unbalanced Seals / (1SE) Seals / (31S) Bal. Seals

CONSTRUCTION DATA

DESIGN (1SE)



GENERAL DESIGN LIMITS

- Discharge 160 PSIG
- Suction 60 PS
- Mechanical seal 110 PSIG
- Temperature 210˚ F

BOOSTER DESIGN (1SE)

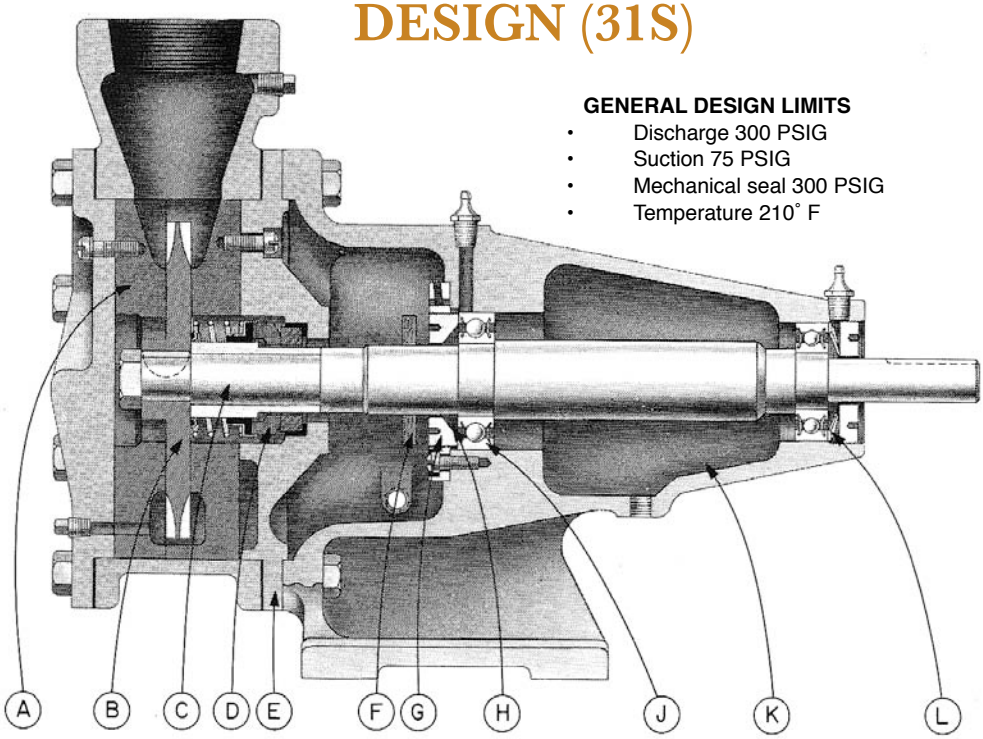
For booster service up to 60 PSIG suction. Boiler feed, condensate return, transfer, or circulation, in locations lacking weekly maintenance of packing.

PLUS FACTORS

A. Renewable liners for easy field repair.
B. Rigid impeller mounting squared against shaft shoulder.
C. Heavy stainless steel shaft.
D. Mechanical seal eliminates packing drip.
E. Separable liquid end isolated from bearing frame.
F. Extra heavy water slinger.
G. Adjusting collar for positive impeller location.
H. Layer of water resistant grease to protect bearings from moisture.
J. Lifetime lubricated factory sealed ball bearings.
K. Drip proof bearing housing insures against bearing failure.
L. Preloading spring to hold diagonal loading on both ball bearings doubles bearing life.

SEE CATALOG SECTION C101 FOR PERFORMANCE CURVES & INDIVIDUAL MODEL LIMITS.

DESIGN (31S)



GENERAL DESIGN LIMITS

- Discharge 300 PSIG
- Suction 75 PSIG
- Mechanical seal 300 PSIG
- Temperature 210˚ F

DESIGN (31S)

For water and industrial liquids at high discharge and suction pressures.

PLUS FACTORS

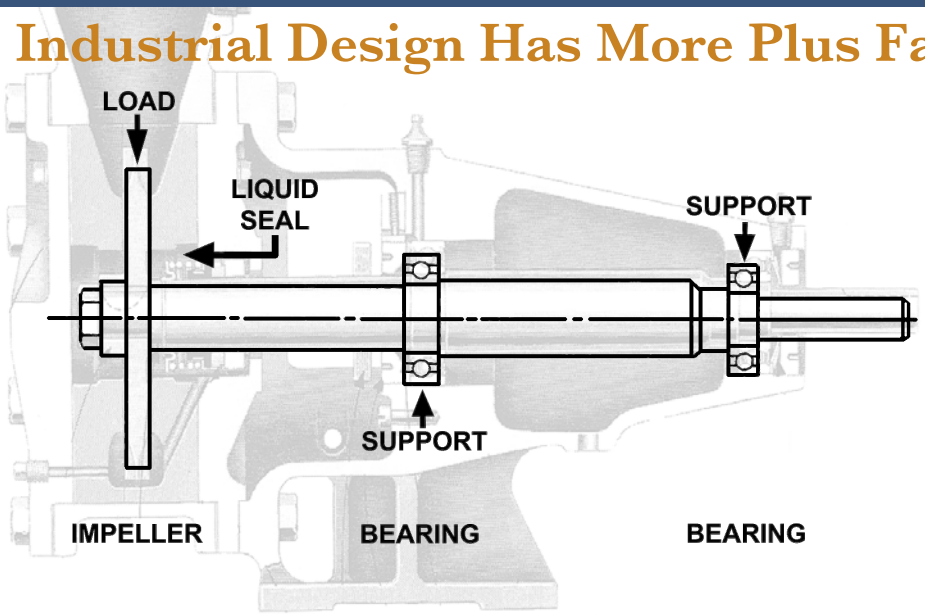
A. Renewable liners for easy field repair.
B. Rigid impeller mounting squared against shaft shoulder.
C. Heavy stainless steel shaft.
D. Balanced mechanical seal for higher pressures.
E. Separable liquid end isolated from bearing frame.
F. Extra heavy water slinger.
G. Adjusting collar for positive impeller location.
H. Layer of water resistant grease to protect bearings from moisture.
J. Lifetime lubricated factory sealed ball bearings.
K. Drip proof bearinq housing insures against bearing failure.
L. Preloading spring to hold diagonal loading on both ball bearings doubles bearing life.

SEE CATALOG SECTION C101 FOR PERFORMANCE CURVES & INDIVIDUAL MODEL LIMITS.

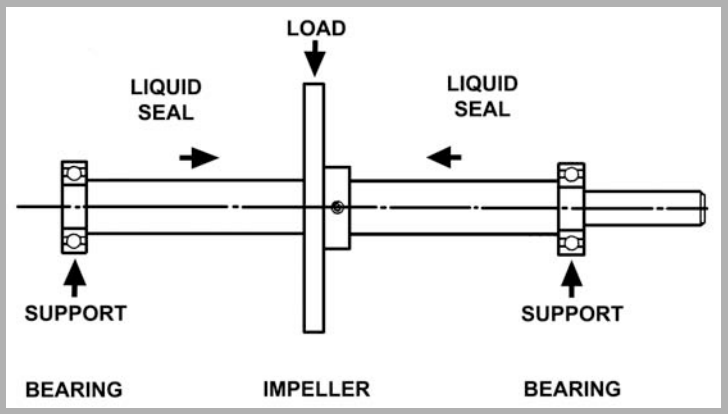
Roth's Versatile Industrial Design Has More Plus Factors!

ROTH END MOUNTED DESIGN IS SAFER

The end mounted pump utilizes a cantilever beam loading principle. The impeller is at one end and the two bearings are toward the other end.



CENTER MOUNTED



The center mounted pump utilizes simple beam loading principles. The impeller is at the center and the bearings at each end.

The end mounted arrangement in Roth single stage pumps has numerous advantages over conventional single stage center mounted pumps. These are:

1. Isolating of liquid end from mechanical parts protects them from heat and moisture.
2. Only one liquid seal reduces leakage hazards by half.
3. Heavy stainless steel shaft is designed for minimum deflection.
4. Lifetime lubricated sealed bearings are enclosed in drip proof bearing housing.
5. Liquid end can be opened and new parts installed without removal of piping or motor.

ROTH SINGLE STAGE PUMPS ARE MORE DEPENDABLE

For unattended locations Roth endmounted pumps with their many protective factors are more dependable.

Used at 1750 RPM for up to 40 GPM at 150 PSI or up to 180 GPM at lower pressures, they offer minimum exposure to operating hazards and maximum ease of maintenance.

Used at 3500 RPM their unusual protective factors have resulting operating life exceeding many lower speed pumps. Considerable economies are available through the use of special models designed for 3500 RPM loads.

ROTH TURBINE PUMPS GIVE BETTER LOW NPSH PERFORMANCE

Roth pioneered evaluation of turbine pumps at low NPSH. These studies resulted in design improvements that improved pump performance under low NPSH conditions.

Roth end mounted pumps contain large suction ports and special impeller blades at 3500 RPM. These improvements have stabilized liquid volume and pressure at boiling temperatures and low suction head.

All Roth models are NPSH rated. See the performance curves in Catalog section C101 for exact data on performance at low NPSH.

A LIQUID SEAL FOR EVERY RECOMMENDED PURPOSE

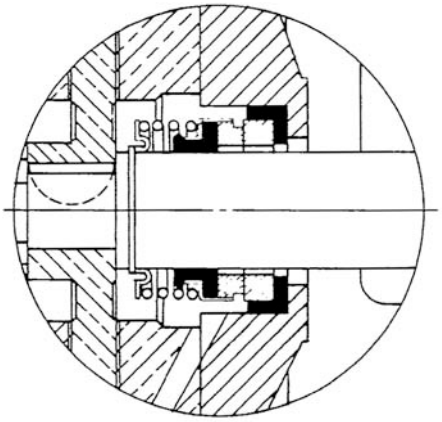
Industrial service requires shaft sealing under many different and difficult conditions. Unfortunately no single design will function properly under all these conditions.

Roth end mounted industrial pumps are furnished with choice of two styles of mechanical seals. (See page 8). Selection information for the proper seal has been given on a previous page.

Hot water such as feed water, or washes with solids in solution require the use of special mechanical seals. Silicon carbide seal seats render seals suitable for 250°F.

Booster service increases sealing pressure beyond packing limits and requires the use of mechanical seals. At extremely high suction pressures a balanced seal is required. A heavy seal with bellows gaskets is necessary for boiler service.

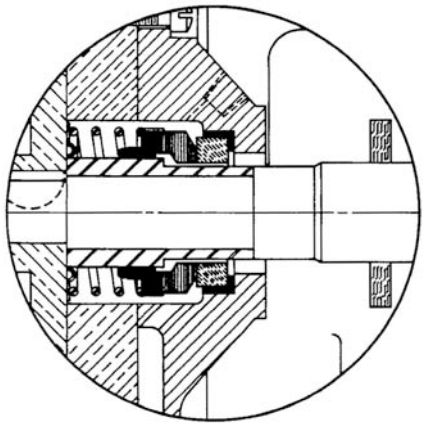
MECHANICAL SEALS



A-4049

UNBALANCED ELASTOMER - SS SEAL

Spring & metal parts	SS
Standard elastomer	Buna N
Alternate elastomers:	Viton A
Standard seat	Ceramic
Alternate seats	Silicon Carbide
Maximum temperature with Ceramic seat	210˚ F
with Silicon Carbide seat	250˚ F
Maxumum pressure at 3500 RPM	75 PSIG



A1102

BALANCED ELASTOMER - SS

Spring & metal parts	SS
Standard elastomer	Buna N
Standard seat	Ceramic
Maximum temperature with Ceramic seat	210˚ F
Maxumum pressure at 3500 RPM	300 PSIG

10 SERIES - 1750 RPM — TABLE III

Model No. Curve	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET 20	30	40	50	60	80	100	125
1012 1033A	1	1	1'	GPM	4.6	4.0	3.4	3.0	2.5	1.6	.7	
				BHP	.12	.13	.145	.16	.175	.21	.24	
1020 1107A	1	1	1'	GPM	2.8	2.5	2.3	2.0	1.8	1.3	.8	
				BHP	.09	.09	.10	.11	.12	.13	.15	
1021 1034A	1	1	1'	GPM	3.1	2.9	2.5	2.3	2.0	1.6	1.2	.67
				BHP	.12	.13	.14	.15	.17	.19	.22	.25
1022 1035A	1	1	1'	GPM	5.2	4.7	4.3	3.9	3.5	2.9	2.4	
				BHP	.14	.15	.16	.18	.19	.21	.24	
1022A 1111A	1	1	1'	GPM	4.4	4.3	4.1	4.0	3.8	3.5	3.1	
				BHP	.16	.17	.19	.20	.21	.24.	.27	
1023 1047A	1	1	2'	GPM	6.5	6.2	5.6	5.1	4.7	3.9	3.1	2.3
				BHP	.18	.20	.22	.24	.26	.28	.32	.40
1027 1057A	1	1	4'	GPM	12.2	11.2	10.0	9.0	8.0			
				BHP	.18	.22	.27	.31	.36			
1028 1122A	1	1	4'	GPM	15.4	14.0	12.5					
				BHP	.24	.27	.30					

10 SERIES - 3500 RPM — TABLE IV

Model No. Curve No.	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET 92.5	115	138	161	185	208	231	254	290
1012 1833	1	1	2'	GPM	8.4	7.7	7.1	6.3	5.6	4.9	4.3		
				BHP	.50	.57	.65	.70	.78	.85	.95		
1020 1849	1	1	7'	GPM	5.2	4.8	4.5	4.1	3.7	3.4	3.0	2.7	2.2
			3'	GMP	3.5	3.3	3.2	3.0	2.9	2.6	2.3	2.0	1.7
				BHP	.40	.42	.45	.50	.51	.55	.60	.61	.67
1021 1850	1	1	7'	GPM	6.0	5.6	5.2	4.9	4.5	4.4	3.8	3.7	3.0
			3'	GMP	4.9	4.7	4.6	4.4	4.1	4.0	3.6	3.4	2.7
				BHP	.51	.55	.59	.60	.65	.71	.77	.80	.89
1022 1851	1	1	7'	GPM	9.2	8.7	8.2	7.6	7.1	6.6	6.1	5.6	
			3'	GMP	7.5	7.4	7.2	6.8	6.4	5.7	5.5	5.2	
				BHP	.57	.65	.78	.87	.98	1.1	1.2	1.3	
1022A 1852	1	1	7'	GPM	9.6	9.3	9.2	8.4	7.8	7.4	7.2	6.3	
			3'	GMP	7.7	7.5	7.3	7.1	6.7	6.5	6.3		
				BHP	.75	.85	.95	1.0	1.1	1.15	1.22	1.3	
1023 1853	1	1	7'	GPM	12.9	12.2	11.5	10.9	10.3	9.8	9.2		
			3'	GMP	10.8	10.4	10.2	10.1	9.6	9.2	8.6		
				BHP	1.0	1.1	1.2	1.2	1.3	1.4	1.5		

Motor BHP is shown at sp. gr. 1.0. Modify for higher specific gravities. For continuous or intermittent service.

1. Select model number and motor BHP in accordance with given operating conditions from the table above.
2. Select design construction from Table I

TABLE I

Suction Pressure in PSIG	Design Construction Suitable
	Sp. gr. .5 to 1.4
-5 to +15	Design E unbalanced seal
15 to 200	Design B balanced seal

1 & H1 SERIES - 1750 RPM — TABLE V

Model No. Curve No.	Suc. Size Inch	Suc. Size Inch	Min. NPSH	TDH Ft	TOTAL HEAD IN									
					20	30	40	50	60	80	100	125	150	175
128 1796	1½	1¼	30'	GPM	4.3	4.1	3.9	3.7	3.5	3.1	2.7	2.3	2.0	
			7'	GPM	3.7	3.5	3.3	3.1	2.9	2.6	2.4	2.1		
			3'	GPM	3.7	3.5	3.3	3.1	2.9	2.6	2.4	2.1		
				BHP	.15	.16	.19	.20	.21	.25	.28	.32	.35	
129 1817	1½	1¼	30'	GPM	5.0	4.7	4.4	4.1	3.9	3.4	3.0	2.5	2.0	
			7'	GPM	4.7	4.4	4.1	3.9	3.7	3.2	2.8	2.3		
			3'	GPM	4.7	4.4	4.1	3.9	3.7	3.2	2.8	2.3		
				BHP	.16	.17	.18	.19	.20	.22	.26	.29	.33	
129B	1½	1¼	30'	GPM	8.7	8.1	7.6	7.2	6.8	6.1	5.4	4.6	3.9	3.1
			7'	GPM	8.7	8.1	7.6	7.2	6.8	6.1	5.4	4.6	3.9	3.1
			3'	GPM	6.6	6.6	6.5	6.4	6.3	5.9	5.3	4.5	3.7	3.0
				BHP	.29	.30	.31	.33	.35	.38	.42	.48	.54	.61
131 1825	1½	1¼	30'	GPM	8.6	8.1	7.7	7.2	6.7	5.7	4.7	3.5	2.5	
			7'	GPM	8.6	8.1	7.7	7.2	6.7	5.7	4.7	3.5	2.5	
			3'	GPM	7.9	7.5	7.1	6.6	6.1	5.2	4.2	3.0		
				BHP	.22	.23	.25	.26	.28	.34	.40	.50	.58	
133 1821	1½	1¼	30'	GPM	11.1	10.4	9.9	9.3	8.7	7.6	6.5	5.2	3.8	
			7'	GPM	11.1	10.4	9.9	9.3	8.7	7.6	6.5	5.2		
			3'	GPM	10.4	9.9	9.4	8.8	8.2	7.1	5.9	4.5		
				BHP	.23	.25	.26	.29	.32	.40	.50	.64	.78	
141 1819	1½	1¼	30'	GPM	14.4	13.5	12.6	11.8	10.9	9.3	7.8	6.1	4.5	
			7'	GPM	12.7	12.2	11.5	10.8	10.0	8.5	7.0	5.3		
			3'	GPM	12.3	12.2	11.5	10.8	10.0	8.5	7.0	5.3		
				BHP	.31	.32	.34	.35	.37	.42	.48	.54	.63	
142 1873	1½	1¼	30'	GPM	15.6	14.8	14.0	13.4	12.8	11.6	10.6	9.1	8.2	7.2
				GPM										
			3'	GPM	13.1	13.0	12.7	12.4	12.0	10.8	9.7	8.8	7.8	6.6
				BHP	.29	.30	.35	.40	.45	.60	.70	.80	.90	1.0
143 1818	1½	1¼	30'	GPM	20.8	19.8	18.8	17.7	16.8	14.8	13.0	10.9	8.7	
			7'	GPM	18.1	17.8	17.4	16.8	16.1	14.6	13.0	10.9		
			3'	GPM	13.6	13.6	13.6	13.6	13.6	13.2	12.5	10.9		
				BHP	.32	.36	.41	.46	.52	.64	.77	.92	1.08	
145 1828	1½	1¼	30'	GPM	25.0	23.0	22.0	20.0	19.0	16.2	13.5	10.2		
			7'	GPM	21.0	21.0	20.0	19.0	17.7	15.2	12.4	9.0		
			3'	GPM	20.0	20.0	19.5	18.2	16.9	14.3	11.6	8.0		
				BHP	.42	.46	.51	.57	.64	.78	.92	1.10		
147 1824	1½	1¼	30'	GPM	29.0	27.0	26.0	24.0	23.0	19.2	15.5	10.5		
			6'	GPM	29.0	27.0	26.0	24.0	23.0	19.2	15.5	10.5		
			3'	GPM	22.0	22.0	22.0	21.0	21.0	17.8	13.1	9.2		
				BHP	.46	.55	.62	.72	.80	.96	1.13	1.34		
H 149 1797	1½	1¼	30'	GPM	36.0	35.0	33.0	31.0	29.0	24.0	21.0	16.5	13.5	
			7'	GPM	36.0	35.0	33.0	31.0	29.0	24.0	21.0	16.5		
			3'	GPM	29.0	29.0	28.0	27.0	26.0	23.0	19.3	15.5		
				BHP	.63	.74	.83	.90	1.0	1.13	1.21	1.34	1.5	
H 150 1763	1½	1¼	30'	GPM	35.5	34.5	33.5	32.0	30.5	27.5	24.0	17.5	15.5	
			9'	GPM	32.5	31.0	30.5	29.0	27.5	24.5	21.0	16.0		
			3'	GPM	30.5	30.0	29.5	28.0	26.5	23.5	20.0	15.0		
				BHP	.90	1.05	1.15	1.14	1.20	1.40	1.60	1.9	2.1	
H 151 1767	1½	1¼	30'	GPM	44.0	42.5	41.0	39.5	37.5	34.5	31.5	26.0	24.0	
			6'	GPM	31.0	31.0	31.0	31.0	30.5	30.0	28.0	24.0		
				GPM										
				BHP	.70	.80	1.0	1.05	1.2	1.5	1.8	2.1	2.3	
H 163	2½	2	30'	GPM	62	58	53	50	48	41	35	27		
			4'	GPM	47	47	46	45	44	40	35			
				BHP	.6	.8	1.0	1.2	1.5	1.7	2.1	2.5		
H 165	2½	2	30'	GPM	77	72	68	63	59	51	43			
			4'	GPM	53	53	52	51	50	46	41			
				BHP	1.1	1.2	1.5	1.7	1.9	2.2	2.7			
H 167	2½	2	30'	GPM	100	90	83	76	70	57				
			8'	GPM	75	74	71	67	62	52				
				BHP	1.5	1.7	1.9	2.1	2.5	3.2				
H 169	2½	2	30'	GPM	119	109	99	90	82	62				
			9'	GPM	95	92	87	80	74	57				
				BHP	1.8	2.1	2.5	2.9	3.1	4.0				

Motor BHP is shown at sp. gr. 1.0. Modify for higher specific gravities. For continuous or intermittent service.

1. Select model number and motor BHP in accordance with given operating conditions from the table above.
2. Select design construction from Table I.

TABLE I

Suction Pressure in PSIG	Design Construction Suitable
	Sp. gr. .5 to 1.4
-5 to +15	Design E unbalanced seal
15 to 200	Design B balanced seal

11 SERIES - 3500 RPM — TABLE VI

Model No. Curve No.	Suc. Size Inch	Suc. Size Inch	Min. NPSH	TDH Ft	TOTAL HEAD IN										
					100	150	200	250	300	350	400	450	500	550	600
1128 1792	1½	1¼	30'	GPM	7.2	6.6	6.1	5.5	5.0	4.5	4.0	3.4	2.9	2.4	1.9
			6'	GPM	6.1	5.8	5.4	5.0	4.6	4.2	3.8	3.3			
			3'	GPM	4.7	4.6	4.5	4.4	4.3	4.1	3.7	3.2			
				BHP	1.55	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.5	2.6
1128A 1750	1½	1¼	30'	GPM	11.6	10.8	10.1	9.5	8.8	8.1	7.5	6.8	6.2	5.4	4.7
				BHP	.85	1.2	1.3	1.5	1.7	1.9	2.2	2.4	2.6	2.8	3.0
1129 1793	1½	1¼	30'	GPM	10.2	9.2	8.3	7.6	6.8	6.1	5.4	4.6	3.9	3.1	2.3
			6'	GPM	8.3	7.9	7.4	6.9	6.3	5.7	5.1	4.5			
			3'	GPM	6.4	6.3	6.2	6.0	5.8	5.4	4.9	4.3			
				BHP	1.4	1.5	1.7	1.8	1.95	2.1	2.3	2.6	2.8	3.0	3.2
1129B 1520	1½	1¼	30'	GPM	16.2	15.1	14.1	13.2	12.2	11.3	10.3	9.4	8.6	7.7	
			12'	GPM	11.5	11.4	11.2	11.1	10.9	10.6	10.0	9.1	8.3	7.9	
			9'	GPM	10.3	10.2	10.1	10.0	9.8	9.6	9.3	8.8	8.0		
			6'	GPM	8.7	8.6	8.5	8.4	8.3	8.2	8.1	7.9			
				BHP	1.5	1.7	2.0	2.3	2.5	2.8	3.2	3.5	3.8	4.2	
1130 1794	1½	1¼	30'	GPM	15.2	13.8	12.4	11.2	10.2	9.3	8.2	7.3	6.3		
			7'	GPM	12.0	11.8	11.5	10.9	10.0	9.0	7.8	6.7			
			3'	GPM	10.0	9.8	9.7	9.4	8.8	8.1	7.2	5.8			
				BHP	1.0	1.2	1.5	1.8	2.1	2.4	2.8	3.2	3.6		
1131 1789	1½	1¼	30'	GPM	18.1	16.7	15.2	13.9	12.6	11.4	10.2	9.1	8.0	6.9	
			6'	GPM	14.1	13.9	13.6	13.2	12.2	11.0	9.9	8.7			
			3'	GPM	10.6	10.6	10.5	10.5	10.3	10.0	9.4	8.3			
				BHP	1.7	2.0	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2	
1133 1788	1½	1¼	30'	GPM	22.0	21.0	19.1	17.6	16.2	14.8	13.4	12.1	10.8		
			6'	GPM	14.3	14.3	14.3	14.2	13.8	13.2	12.0	10.8			
			3'	GPM	11.0	11.0	11.0	10.9	10.3	9.4	8.2	7.0			
				BHP	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5		
1141 1822	1½	1¼	30'	GPM	31.0	29.0	27.0	25.0	23.0	21.0	18.6				
			9'	GPM	21.0	21.0	20.0	19.8	19.0	17.6	16.0				
			6'	GPM	15.7	15.6	15.5	15.2	14.6	13.4	12.0				
				BHP	2.5	2.8	3.1	3.5	3.9	4.3	4.8				
1142 2148	1½	1¼	30'	GPM	30.0	28.5	26.6	25.0	23.2	22.0					
			9'	GPM	18.6	18.6	18.6	18.6	18.6	18.5					
			8'	GPM	16.0	16.0	16.0	16.0	16.0	15.7					
				BHP	2.0	2.5	3.0	3.5	4.0	5.0					
1143 1827	1½	1¼	30'	GPM	37.0	36.0	34.0	32.0	30.0						
			9'	GPM	24.0	24.0	24.0	24.0	24.0						
			6'	GPM	19.6	19.6	19.6	19.6	19.5						
				BHP	3.5	3.7	4.0	4.3	4.7						
1145 1826	1½	1¼	30'	GPM	47.0	45.0	43.0								
			9'	GPM	34.0	34.0	33.0								
			6'	GPM	25.0	25.0	25.0								
				BHP	3.9	4.2	4.8								
1147 1823	1½	1¼	30'	GPM	55.0	52.0									
			9'	GPM	32.0	32.0									
			6'	GPM	22.0	22.0									
				BHP	4.3	5.0									

Motor BHP is shown at sp. gr. 1.0. Modify for higher specific gravities. Select pumps for continuous or intermittent service as follows:

1. Select model number and motor BHP in accordance with given operating conditions from Table VI.

   A. For specific gravities of 0.8 or less the entire table may be used.
   B. For specific gravities of 0.8 to 1.0 selections may be made only to the left of the heavy black line.
   C. For specific gravities of 1.0 to 1.4 selections must be restricted to the area left of the blue line.

2. Select design and mechanical seal from Table II.

TABLE II

SUCTION PRESSURE IN PSIG	TDH FT.	DESIGN CONSTRUCTION SUITABLE			
		CONTINUOUS SERVICE		INTERMITTENT SERVICE*	
		Models 1128-1133	Models 1141-1147	Models 1128-1133	Models 1141-1147
-5 to +15	100-300	Design E unbalanced seal	NA	Design E unbalanced seal	Design E unbalanced seal
-5 to +15	300-600	Design B balanced seal	NA	Design B balanced seal	Design B balanced seal
15 to 200	100-600	Design B balanced seal	NA	Design B balanced seal	Design B balanced seal

*Intermittent or occasional service for not more than 2500 hours per year.

2 & H2 SERIES --1750 RPM — TABLE VII

Model No. Curve No.	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET												
					20	30	40	50	60	80	100	125	150	175	200	225	250
250A 3588	1½	1¼	30'	GPM	10.6	10.3	10.1	9.8	9.7	9.2	8.7	8.1	7.5	6.9	6.5	5.7	5.0
			3'	GPM	7.7	7.7	7.6	7.6	7.6	7.4	7.2	6.9	6.5	6.0	5.5	4.8	4.3
			2'	GPM	7.0	7.0	7.0	7.0	6.9	6.8	6.7	6.3	6.0	5.4	4.8	4.3	3.7
				BHP	.40	.42	.45	.47	.48	.52	.60	.70	.74	.76	.78	.90	1.0
251 1835	1½	1¼	30'	GPM	15.6	15.0	14.3	13.7	13.1	11.9	10.8	9.6	8.4	7.3	6.2	5.2	4.4
			7'	GPM	15.6	15.0	14.3	13.7	13.1	11.9	10.8	9.6	8.4	7.3	6.2	5.2	4.4
			3'	GPM	14.6	14.3	13.6	13.0	12.3	11.2	10.1	9.1	7.9	6.9	5.9		
				BHP	.50	.51	.55	.60	.63	.70	.75	.86	.96	1.1	1.2	1.3	1.4
253 1836	1½	1¼	30'	GPM	17.4	17.1	16.9	16.5	16.2	15.5	14.7	13.8	12.7	11.6	10.4	9.3	8.1
			7'	GPM	17.4	17.1	16.9	16.5	16.2	15.5	14.7	13.8	12.7	11.6	10.4	9.3	8.1
			3'	GPM	14.7	14.7	14.6	14.5	14.5	14.2	13.8	13.1	12.0	10.9	9.7		
				BHP	.77	.78	.79	.80	.81	.86	.93	1.03	1.15	1.32	1.5	1.7	1.88
254 1874	1½	1¼	30'	GPM					17.4	16.4	15.4	14.3	13.2	12.4	11.4	11.8	9.8
			7'	GPM													
			3'	GPM					15.3	14.8	14.1	13.2	12.3	11.5	11.6	9.8	8.8
				BHP					1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.8
255 1837	1½	1¼	30'	GPM	29.0	28.0	27.0	26.0	25.0	22.0	20.0	18.0	15.7	13.6	11.4	9.2	7.2
			7'	GPM	29.0	28.0	27.0	26.0	25.0	22.0	20.0	18.0	15.7	13.6	11.4	9.2	7.2
			3'	GPM	21.0	21.0	21.0	21.0	20.0	20.0	18.5	16.5	14.3	12.2	10.0		
				BHP	.70	.75	.79	.80	.86	.97	1.10	1.27	1.45	1.65	1.85	2.05	2.25
256 1845	1½	1¼	30'	GPM				27.5	27.0	25.5	24.1	23.0	21.5	20.2	19.0	17.8	16.6
			3'	GPM				22.7	22.7	23.3	22.0	21.4	20.4	19.0	17.7	16.6	15.4
			2'	GPM				17.9	17.9	17.9	17.8	17.7	17.6	17.3	16.7	15.5	
				BHP				0.9	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6
257 1838	1½	1¼	30'	GPM	33.0	32.0	31.0	30.0	29.0	27.0	25.0	23.0	20.0	17.8	15.2	12.7	10.1
			8'	GPM	20.0	20.0	20.0	20.0	19.0	19.8	19.6	19.2	17.6	15.4	12.8		
			4'	GPM	16.0	15.9	15.7	15.5	15.3	14.8	14.3	13.5	12.6	11.2	9.7		
				BHP	.90	.95	1.0	1.07	1.12	1.27	1.42	1.67	1.90	2.12	2.40	2.67	2.95
258 1848	1½	1¼	30'	GPM	35.7	34.5	33.5	32.5	31.4	29.5	27.5	25.5	23.2	21.5	19.0	17.7	15.8
			9'	GPM	35.7	34.5	33.5	32.5	31.4	29.5	27.5	25.5	23.2	21.5	19.0	17.7	15.8
			3'	GPM	25.6	25.5	25.0	24.5	24.4	23.5	22.5	21.5	20.4	18.0	17.5	16.4	15.0
			2'	GPM	19.9	19.9	19.6	19.5	19.0	19.0	18.6	18.0	17.5	16.5	15.7	14.7	13.7
				BHP	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.4	2.7	2.9	3.2	3.5
259 1839	1½	1¼	30'	GPM	43.0	42.0	41.0	40.0	38.0	35.0	32.0	28.0	24.0	20.0	16.0	12.0	8.0
			7'	GPM	31.0	30.0	30.0	30.0	30.0	29.0	28.0	26.0	23.0	18.8	14.7		
			3'	GPM	22.0	22.0	22.0	22.0	22.0	22.0	21.0	21.0	20.0	17.4	13.6		
				BHP	1.35	1.37	1.40	1.42	1.50	1.68	1.90	2.20	2.60	3.0	3.4	3.8	4.2
H 263 1840	2½	2	30'	GPM	53.0	51.0	49.0	47.0	46.0	42.0	39.0	35.0	31.0	27.0	24.0	20.0	17.0
			7'	GPM	47.0	47.0	46.0	46.0	45.0	41.0	38.0	34.0	30.0	26.0	22.0		
			3'	GPM	40.0	40.0	40.0	40.0	39.0	37.0	35.0	32.0	29.0	25.0	21.0		
				BHP	1.4	1.5	1.55	1.6	1.8	2.0	2.3	2.7	3.1	3.5	3.8	4.2	4.7
H 265 1841	2½	2	30'	GPM	64.0	62.0	60.0	59.0	57.0	53.0	50.0	45.0	41.0	36.0	32.0	28.0	
			8'	GPM	50.0	50.0	49.0	49.0	49.0	47.0	46.0	42.0	37.0	32.0	28.0		
			4'	GPM	40.0	40.0	40.0	40.0	40.0	39.0	38.0	36.0	32.0	27.0	23.0		
				BHP	1.9	2.0	2.1	2.2	2.3	2.5	2.9	3.3	3.8	4.2	4.8	5.3	
H 267 1842	2½	2	30'	GPM	93.0	87.0	82.0	77.0	72.0	64.0	57.0	49.0	43.0	36.0			
			7'	GPM	56.0	56.0	55.0	55.0	55.0	55.0	53.0	48.0	41.0	35.0			
			3'	GPM	34.0	34.0	34.0	34.0	34.0	34.0	33.0	33.0	32.0	30.0			
				BHP	1.4	1.6	1.8	2.1	2.3	2.9	3.4	4.0	4.6	5.2			
H 268 1754	2½	2	30'	GPM					59.3	57.0	54.0	50.8	47.2	44.0	41.0		
			6'	GPM					39.2	39.1	39.0	38.0	37.0	35.0	33.0		
			3'	GPM					26.2	26.1	26.0	25.8	25.5	25.3	25.0		
				BHP					2.2	2.7	2.8	3.2	3.6	4.0	4.4		
H 269 1843	2½	2	30'	GPM	108.	104.	100.	96.0	92.0	84.0	77.0	68.0	60.0	52.0			
			9'	GPM	80.0	80.0	80.0	80.0	80.0	79.0	77.0	68.0	60.0	52.0			
			6'	GPM	74.0	74.0	74.0	74.0	74.0	73.0	71.0	66.0	60.0	52.0			
			4'	GPM	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.0	38.0	36.0			
				BHP	2.0	2.2	2.4	2.6	2.9	3.5	4.2	5.0	5.9	6.9			
H 278 1844	2½	2	30'	GPM	141.	139.	137.	134.	131.	123.	112.	95.0	74.0				
			14'	GPM	102.	101.	101.	100.	99.0	97.0	93.0	81.0	64.0				
			9'	GPM	70.0	68.0	67.0	65.0	64.0	60.0	56.0	50.0	41.0				
			7'	GPM	54.0	53.0	51.0	50.0	48.0	44.0	40.0	34.0	27.0				
				BHP	4.0	4.2	4.5	4.7	5.0	5.8	6.6	8.0	9.5				

Motor BHP is shown at sp. gr. 1.0. Modify for higher specific gravities. Select pumps for continuous or intermittent service as follows:

1. Select model number and motor BHP in accordance with given operating conditions from Table VII.
2. Select design and mechanical seal from Table IX Area A (left of blue line) or Area B (right of blue line).

TABLE IX

Suction Pressure in PSIG	DESIGN CONSTRUCTION SUITABLE TABLE IX			
	Area A		Area B	
	Sp. gr. .5 to 1.1	Sp. gr. 1.1 to 1.4	Sp.gr. .5 to 1.1	Sp. gr.* 1.1 to 1.4
-5 to + 15	Design E unbalanced seal	Design E unbalanced seal	Design E unbalanced seal	Design B (H) unbalanced seal
15 to 200	Design B balanced seal	Design B balanced seal	Design B balanced seal	Design B (H) balanced seal

*Design B (H) with balanced or unbalanced seals may be substituted for intermittent or occasional service of not more than 2500 hours per year. The symbol (H) involes substitution of H12 series shaft and bearings.

12 & H12 SERIES --3500 RPM — TABLE VIII

Model No. Curve No.	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET												
					100	150	200	250	300	350	400	450	500	550	600	650	700
1250A 3443A	1½	1¼	30'	GPM	20.0	19.7	19.4	18.8	18.1	17.2	16.5	15.6	14.8	14.1	13.2	12.6	11.8
			12'	GPM	15.5	15.5	15.5	15.4	15.2	15.0	14.7	14.3					
			8'	GPM	13.5	13.5	13.5	13.4	13.2	13.0	12.7	12.2					
				BHP	3.2	3.5	3.8	4.2	4.5	4.8	5.2	5.5	6.0	6.5	7.0	7.6	8.2
1251 1860	1½	1¼	30'	GPM	32.0	30.0	29.0	28.0	26.0	25.0	24.0	22.0	21.0	20.0	19.0	17.5	16.5
			9'	GPM	25.0	25.0	24.0	24.0	23.0	22.0	21.0	20.0					
			6'	GPM	22.0	21.0	21.0	21.0	20.0	20.0	19.7	19.0					
				BHP	4.2	4.6	5.0	5.2	5.6	6.0	6.5	6.9	7.2	7.7	8.2	8.9	9.0
1253 1870	1½	1¼	30'	GPM	39.0	37.0	36.0	34.0	32.0	31.0	29.0	27.0	26.0	25.0	24.0	23.1	21.0
			9'	GPM	28.0	28.0	28.0	28.0	27.0	27.0	26.0	25.0					
			6'	GPM	24.0	24.0	24.0	24.0	23.0	23.0	22.0	22.0					
				BHP	3.5	4.0	4.7	5.3	6.0	6.7	7.2	7.9	8.3	9.0	9.4	10.0	10.5
H1254 1874	1½	1¼	30'	GPM	36.8	35.4	34.0	32.0	30.8	29.5	27.6	26.1	24.8	23.9	23.0		
			9'	GPM	22.7	22.6	22.6	22.3	20.8	20.4	20.0	19.8					
			6'	GPM	17.0	16.5	16.0	15.5	15.0	14.6	14.2	13.9					
				BHP	5.5	6.0	6.5	7.0	7.5	8.3	9.0	9.6	10.1	10.6	11.0		
H1255 1861	2½	2	30'	GPM	55.0	52.0	50.0	47.0	44.0	42.0	40.0	38.0	36.0	34.0	32.0	29.5	28.0
			9'	GPM	37.0	37.0	37.0	37.0	37.0	36.0	35.0	33.0					
			6'	GPM	30.0	30.0	29.0	29.0	28.0	27.0	27.0	26.0					
				BHP	5.5	6.0	6.8	7.5	8.3	9.0	10.0	10.7	11.5	12.3	13.0	14.0	14.7
H1256 1879	2½	2	30'	GPM	56.5	54.5	52.0	49.8	47.5	45.5	43.5	41.8	39.8	37.7			
			12'	GPM	39.0	38.9	38.8	38.7	38.5	38.2	37.8	37.2	36.5	35.7			
			9'	GPM	33.8	33.7	33.6	33.4	33.3	33.0	32.8	32.5					
				BHP	7.0	7.8	8.8	9.5	10.4	11.3	12.4	13.0	14.0	15.0			
H1257 1873	2½	2	30'	GPM	56.0	54.0	52.0	50.0	47.0	45.0	42.0	40.0	37.0	34.0	31.0		
			14'	GPM	42.0	42.0	42.0	42.0	42.0	41.0	39.0	37.0					
			9'	GPM	33.0	33.0	33.0	33.0	33.0	33.0	32.0	31.0					
				BHP	6.6	7.0	7.3	8.0	8.5	9.1	10.0	11.0	12.0	13.3	14.7		
H1258 1877	2½	2	30'	GPM	65.5	63.8	62.0	60.2	58.2	56.4							
			20'	GPM			51.1	50.5	49.6	48.7							
			14'	GPM			41.9	41.8	41.5	41.0							
			12'	GPM			34.8	34.7	34.5	34.1							
				BHP	8.5	10.0	11.0	12.2	13.6	15.0							
H1259 1876	2½	2	30'	GPM	70.0	70.0	69.0	68.0	67.0	64.0	60.0						
			14'	GPM	48.0	48.0	47.0	47.0	47.0	46.0	45.0						
			9'	GPM	35.0	35.0	34.0	34.0	33.0	33.0	32.0						
				BHP	8.0	8.5	9.5	10.8	11.8	12.6	14.0						
H1261 1878	2½	2	30'	GPM	70.0	68.0	66.0	64.0	62.0	59.0	56.0	53.0	49.0				
			14'	GPM	50.0	49.0	49.0	48.0	48.0	47.0	46.0	46.0					
			9'	GPM	37.0	37.0	37.0	36.0	35.0	34.0	33.0	32.0					
				BHP	7.0	8.0	9.0	10.0	11.0	12.0	13.0	13.9	14.7				
H1263 1881	2½	2	30'	GPM	99.0	98.0	97.0	95.0	93.0	90.0							
			14'	GPM	64.0	64.0	64.0	64.0	64.0	64.0							
			9'	GPM	49.0	49.0	49.0	49.0	49.0	49.0							
				BHP	8.0	9.0	10.5	12.0	13.5	15.0							
H1265 1880	2½	2	30'	GPM		112.	111.	109.									
			21'	GPM		88.0	87.0										
			14'	GPM		66.0	65.0										
				BHP		11.0	13.0	15.0									

Motor BHP is shown at sp. gr. 1.0. Modify for higher specific gravities. Select pumps for continuous or intermittent service as follows:

1. Select model number and motor BHP in accordance with given operating conditions from Table VI.

   A. For specific gravities of 0.8 or less the entire table may be used.
   B. For specific gravities of 0.8 to 1.0 selections may be made only to the left of the heavy black line.
   C. For specific gravities of 1.0 to 1.4 selections must be restricted to the area left of the blue line.

2. Select design and mechanical seal from Table X.

TABLE X

Suction Pressure	TDH FT.	DESIGN CONSTRUCTION SUITABLE	
		Models 1250A-1253	Models H1254-H1265
-5 to +15	100-300	Design E unbalanced seal	Design E (H) unbalanced seal
-5 to +15	300-700	Design B balanced seal	Design B balanced seal
15 to 200	100-700	Design B balanced seal	Design B (H) balanced seal

G3 SERIES - 1750 RPM TABLE XI

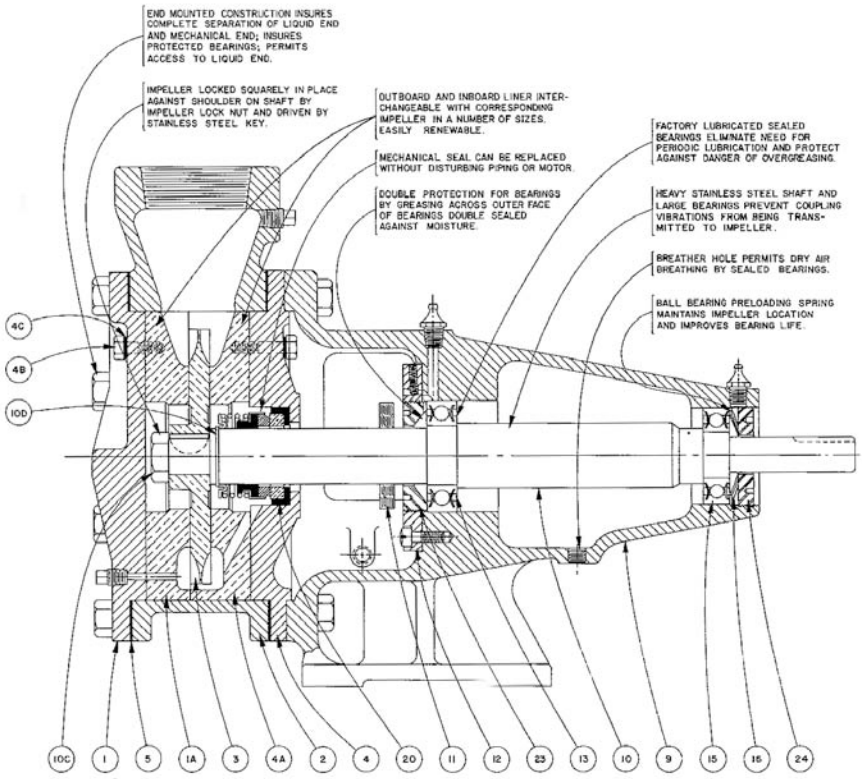
Model No. Curve No.	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET									
					30	40	60	80	100	125	150	200	300	350
G371 20235	2"	1½"	30	GPM	32.6	31.5	29.7	28.3	26.8	25.2	23.8	21.1	16.1	13.7
			11	GPM	31.5	30.3	28.5	27.2	25.8	24.3	23.0	20.3	15.4	12.9
			7	GPM	30.4	29.5	27.9	26.5	25.2	23.8	22.4	19.6	14.6	12.3
			3	GPM	22.8	22.7	22.5	22.4	22.1	21.6	20.9	18.8	13.7	11.1
				BHP	1.9	2.0	2.1	2.2	2.4	2.6	2.9	3.5	4.6	5.2
G372 19342	2"	1½"	30	GPM	40.0	39.0	37.0	35.0	33.3	30.8	28.8	24.6	17.4	
			11	GPM	36.5	36.0	34.8	33.4	31.9	29..8	27.8	23.8	16.3	
			7	GPM	34.5	34.2	33.4	32.5	31.5	29.8	27.8	23.8	16.3	
			5	GPM	28.0	27.9	27.7	27.6	27.4	26.9	25.8	22.5	15.5	
			3	GPM	21.2	21.1	21.0	20.8	20.5	20.0	19.4	17.5		
				BHP	2.1	2.2	2.5	2.8	3.1	3.7	4.1	5.0	7.1	
G374F 19478	2"	1½"	30	GPM	81.0	79.5	76.3	73.4	70.6	67.5	64.0	57.8	45.8	
			7	GPM	54.0	54.0	53.9	53.8	53.6	53.3	53.0	51.5	44.9	
			5	GPM	45.5	45.5	45.5	45.5	45.5	45.3	45.1	44.8	41.9	
				BHP	2.0	2.1	2.4	2.8	3.3	3.8	4.3	5.5	8.0	
G374B 19420	2"	1½"	30	GPM	70.5	68.0	64.3	61.2	58.3	55.0	51.7	45.8	34.8	29.7
			11	GPM	64.9	64.5	63.6	61.2	58.3	55.0	51.7	45.8	34.8	29.7
			7	GPM	51.0	51.0	51.0	51.0	51.0	50.7	49.5	44.2	33.5	28.0
			5	GPM	42.5	42.3	42.2	42.1	42.0	41.9	41.7	40.9	32.5	26.9
				BHP	2.2	2.3	2.6	2.9	3.3	3.8	4.3	5.4	7.5	8.7
G375 3840	3" *	2½" **	30	GPM	125	120	112	104	97.5	90.0	82.5	69.0		
			11	GPM	112	110	105	99.0	94.5	87.5	80.0	66.0		
			7	GPM	101	100	97.0	92.0	89.5	84.5	78.0	63.0		
			5	GPM	92.0	91.5	90.0	87.0	85.5	82.0	76.5	61.5		
				BHP	3.5	3.9	4.3	5.0	5.6	6.2	6.8	8.5		

G3 SERIES - 1750 RPM TABLE XI

Model No. Curve No.	Suc. Size Inch	Dis. Size Inch	Min. NPSH		TOTAL HEAD IN FEET									
					30	40	60	80	100	125	150	200	300	350
G377A 3838	3" *	2½" **	30	GMP	133	130	123	117	110	102	95.0	73.0		
			11	GMP	124	123	120	116	110	102	95.0	73.0		
			7	GMP	107	107	107	107	106	100	90.0	67.5		
			5	GMP	90.0	90.0	90.0	89.0	89.0	88.0	82.0	62.5		
				BHP	5.0	5.0	5.5	6.5	7.0	7.5	8.0	11.0		
G377D 3818	3" *	2½" **	30	GMP	132	127	120	113	106	97.0	88.0	72.5		
			11	GMP	123	121	116	110	103	94.0	85.5	70.0		
			7	GMP	110	110	108	106	101	93.0	84.5	69.0		
			5	GMP	102	102	101	98.0	96.0	91.0	82.5	67.0		
				BHP	5.4	5.5	6.0	6.7	7.0	8.0	9.0	11.0		
G379 3819	3" *	2½" **'	30	GMP		168	160	152	146	136	127	109		
			11	GMP		152	149	146	142	133	123	105		
			7	GMP		121	121	120	120	119	116	101		
			5	GMP		110	109	108	107	106	104	98.0		
				BHP		6.0	6.8	7.5	8.0	9.5	10.5	13.5		
G380A 3816	3" *	2½" **	30	GMP		210	200	190	179	165	152	126		
			11	GMP		188	181	174	165	154	142	117		
			7	GMP		147	147	146	144	140	134	114		
				BHP		7.0	8.0	9.2	10.4	12.0	13.0	15.5		

*125 lb. ANSI Flange
**250 lb. ANSI Flange

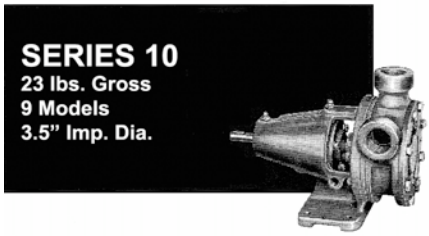
MATERIALS OF CONSTRUCTION

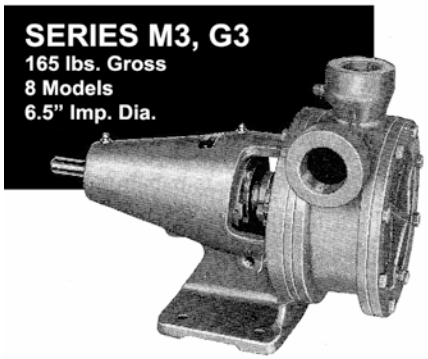


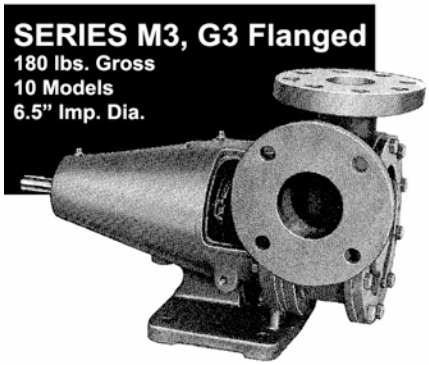
	Construction	Bronze Fitted	Standard Fitted	All Bronze	All Iron	BC
	Symbol	BF	SF	AB	AI	BC
ITEM	NAME					
1A	Outer Liner	Brz.	CI	Brz.	CI	CI
2	Case	CI	CI	Brz.	CI	CI
3	Impeller	Brz.	Brz.	Brz.	DI	416SS
4	Inboard Cover	CI	CI	Brz.	CI	CI
4A	Inner Liner	Brz.	CI	Brz.	CI	CI
5	Case Gasket	Parchment	Parchment	Parchment	Parchment	Parchment
9	Frame	CI	CI	CI	CI	CI
10	Shaft	416SS	416SS	416SS	416SS	416SS
11	Water Slinger	Buna N	Buna N	Buna N	Buna N	Buna N
12	Inner Hsg. Cap	CI	CI	CI	CI	CI
13	I.B. Bearing	single row, ball	single row, ball	single row, ball	single row, ball	single row, ball
15	O.B. Bearing	single row, ball	single row, ball	single row, ball	single row, ball	single row, ball
16	Loading Spring	Stl.	Stl.	Stl.	Stl.	Stl.
20	Mech. Seal: Rotary Unit	SS metal parts	SS metal parts	SS metal parts	SS metal parts	SS metal parts
	Seal Seat	Ceramic	Ceramic	Ceramic	Ceramic	Silicon Carbide
23	Inner Adj. Cllr.	Stl.	Stl.	Stl.	Stl.	Stl.
24	Outer Adj. Cllr.	Stl.	Stl.	Stl.	Stl.	Stl.

Brz. == 85-5-5-5 Bronze
CI == Cast Iron
Note: 31S seal not available for all iron construction

SERIES, MODELS, VARIATIONS, and ORDERING PROCEDURE







STEAM CONDENSATE PUMP SELECTION

Pumps are normally selected for intermittent service at two times the actual condensation rate of the complete equivalent direct radiation of the system. This is the equivalent of 1.0 GPM for each 1000 square feet EDR.

Sealed pumps are recommended for steam condensate service.

Because of the steep performance curve, the pump will maintain a fairly constant capacity over a considerable range of discharge pressures. This is a distinct advantage, in cases of line restriction, over comparable models of various centrifugal designs.

BOILER FEED PUMP SELECTION

The pumps are selected to deliver about 200% of the rated evaporation of the boiler handling water up to 200°F. At temperatures from 200 to 210 the pump capacity will exceed 150% of the rated evaporation of the boilers. No harmful cavitation is experienced. The pumps will not vapor bind at higher temperatures but temperatures above 210°F will affect the mechanical seal and gaskets adversely. All pumps supplied for normal feedwater units are provided with permanent lubrication and mechanical seals to insure automatic operation unattended.

Standard models are equipped with stainless steel shaft and bronze impeller. All models are end mounted for easy maintenance.

112 Models of end mounted pumps are produced in four basic frame sizes.

Internal construction for 3500 RPM pumps is heavier and includes special impellers except in 10 series which is used at both 1750 and 3500 RPM speeds. Larger shaft extensions are provided.

12 series pumps for 3500 RPM and 3 series pumps at 1750 are now available with heavier shafts and bearings than standard for new higher pressure models. These then become H12 and G3 series.

2 series pumps are also furnished with 12 series bearings but standard impellers for high pressure models at 1750 and become H2 series.

10 series is furnished with 1" suction and 1" discharge for all models.

All other series are split with smaller connections for lower capacities and larger connections for larger capacities.

The M3 and G3 series are furnished with flanged case in the larger capacities.

SHIPPING COMBINATIONS

Pumps can be shipped in four different ways:

- Pump only (less base and coupling)
- Pump, base and coupling (knocked down)
- Pump, base and coupling (assembled)
- Pump, base, coupling, and motor (assembled)

STANDARD and NON-STANDARD ROTATION

Standard rotation is clock-wise facing the shaft end of the pump.

All models are available in nonstandard rotation at slight additional charge. Pumps with non-standard rotation are built to order.

SEALS

Roth 31S seals are available on all models except 150, 151, 163, 165, 167, 278, 380 and all G3 series. Roth ISE seals are available on all models.

Steel channel base drilled and tapped for both pump and motor and painted with blue machinery enamel is standard.

Flexible insert type couplings are standard. All metal couplings can be substituted at extra cost.

TESTING

All Roth pumps are tested after assembly for leaks, noise, and for cold water capacity and head at two points on the curve. —Witness tests can be provided when required on the purchase order. —Certified test curves can be furnished at extra cost when specified. The purchase order should stipulate whether cold water tests or low NPSH tests are required. All certified curves will contain certified brake horsepower.

ORDERING

To order a pumping unit select model, motor, seal, and materials of construction from the tables on pages 4-8. Double check brake horsepower and NPSH capacity from curves.

ROTH DESIGNS AGAINST SHAFT BREAKAGE

The pump shaft is the keystone to good pump design. A rigid shaft properly supported by well protected ball bearings will prolong pump life by many years.

All Roth pumps are equipped with unusually heavy shafts or protected by balanced loads or both. Because of superior pump design, cases of shaft failure are extremely rare.

CERTIFIED HOT WATER PERFORMANCE

The Roth Pump Company will certify the hot water NPSHr performance of any model upon receipt of request for certification with the purchase order. A slight charge will be made to cover the cost of a special hot water NPSHr test.

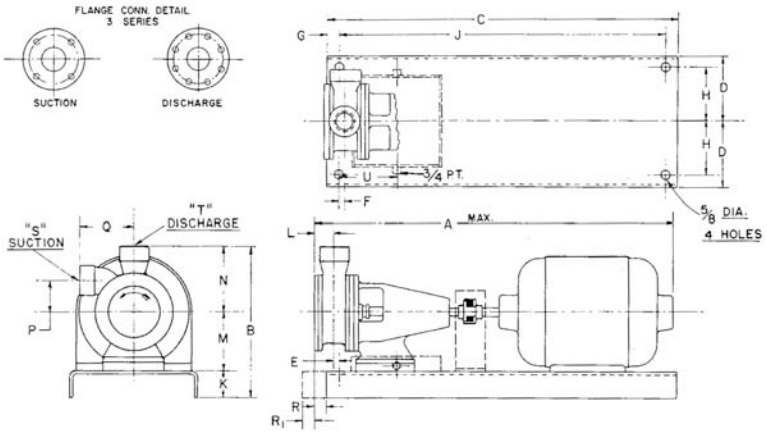
MECHANICAL DATA: General description -- Roth turbine pump, single stage, horizontal shaft, end mounted pump head, vertical split case.

	10 Series	1 Series		11 Series	2 Series		H2 Series		12 Series		H12 Series	M3 Series		G3 Series	
	1012-1028	128-151	163-169	1128-1147	251-259	263-278	H251-H259	H263-H278	1251-1253	1255-1265	H1255-H1265	M371B-M374F	M375A-M380A	G371-G374F	G375A-G380A
Hydrotest PSI	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
Suct. Inches	1	1½	2½	1½	1½	2½	1½	2½	1½	2½	2½	2	3 fl.	2	3 fl.
Suct. Rating PSA(USAS)	125	125	125	125	250	125	250	125	250	125	125	125	125	125	125
Disch. Inches	1	1¼	2	1¼	1¼	2	1¼	2	1¼	2	2	1½	2½	1½	2½
Disch. Rating PSI(USAS)	125	125	125	125	250	250	250	250	250	250	250	250	250	250	250
Imp. Dia. Inches	3¼	4	4	4	5¼	5¼	5¼	5¼	5¼	5¼	5¼	6½	6½	6½	6½
Side Clear Inches	.004	.004	.004	.004	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006	.006
Dia. Shaft at Cplg.	.500	.500	.500	.625	.750	.750	.875	.875	.875	.875	.875	.875	.875	.875	.875
Dia Shaft at IB Brg.	.669	.787	.787	.984	1.181	1.181	1.378	1.378	1.378	1.378	1.574	1.574	1.574	1.968	1.968
Dia. Shaft at OB Brg.	.590	.669	.669	.669	.984	.984	.984	.984	.984	.984	.984	.984	.984	.984	.984
Dia. Between Brgs.	13/16	15/16	15/16	1⅛	1⅜	1⅜	1 9/16	1 9/16	1 9/16	1 9/16	1¾	1¾	1¾	2 3/16	2 3/16
OB Brg. No.	99502	99503	99503	99503	99505	99505	99505	99505	99505	99505	99505	99505	99505	(2)99505	(2)99505
IB Brg. No.	99503	99504	99504	993L05	99506	99506	993L07	993L07	993L07	993L07	99508	993L08	993L08	(2)993L10	(2)993L10
Center Dist. Brgs.	3.313	4.437	4.437	4.437	5.907	5.907	5.938	5.938	5.938	5.938	5.846	8.344	8.344	7.563	7.563
Dist. IB Brg. to Imp.	3.313	3.930	3.930	3.930	5.327	5.327	5.291	5.291	5.291	5.291	5.187	8.027	8.027	7.125	7.125
Rotation Shaft End	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW	CW
Ship. Weight Lbs.	23	36	36	42	82	82	96	96	96	96	100	145	175	165	185
Gasket Thickness	.005	.005	.005	.005	.007	.007	.007	.007	.007	.007	.007	.010	.010	.010	.010
Packing Size Inches	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	¼ Sq.	⅜ Sq.	⅜ Sq.	⅜ Sq.	⅜ Sq.
No. of Rings	3	4	4	4	6	6	6	6	6	6	6	6	6	6	6
Maximim RPM	4000	2000	2000	4000	2000	2000	2000	2000	4000	4000	4000	2000	2000	2000	2000

INSTALLATION DIMENSIONS (not to be used for construction purposes unless certified)

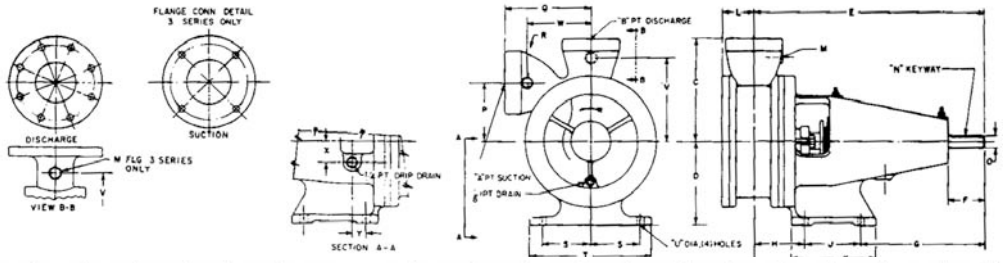
Suction	Pump Models	Discharge
1"	1012-1028	1"
1½"	128-151	1¼"
1½"	1128-1147	1¼"
2½"	H163-H169	2"
1½"	250A-259	1¼"
2½"	263-278 H263-H278	2"
1½"	1250A-1254	1¼"
2½"	1255-1265 H1255-H1265	2"
2"	G371-G374F M371-M374F	1½"
3"*	G375-G380A M375-M380A	2½" **

*125 lb. ANSI Flange
**250 lb. ANSI Flange



NEMA FRAME NO.	A_1	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	R_1	U
10 SERIES MODELS 1012-1028																		
48	21 1/16	9 5/8	23 3/4	4 3/8	—	1 13/16	7/8	3 3/8	22	2	1 13/32	3 1/2	4 1/8	1 11/16	3 5/8	—	1 5/16	4 3/4
*56	23 3/4	9 5/8	23 3/4	4 3/8	—	1 13/16	7/8	3 3/8	22	2	1 13/32	3 1/2	4 1/8	1 11/16	3 5/8	—	1 5/16	4 3/4
56 1 HP 1750 1½ HP 3500 2 HP 3500	24 1/4	9 5/8	27 1/8	5 1/8	—	1 13/16	7/8	4 1/8	25 3/8	2	1 13/32	3 1/2	4 1/8	1 11/16	3 5/8	—	1 5/16	4 3/4
143T-145T	23 7/8	9 5/8	23 3/4	4 3/8	1/32	—	7/8	3 3/8	22	2	1 13/32	3 1/2	4 1/8	1 11/16	3 5/8	1 1/8	—	2 3/16
182T-184T	24 1 3/16	10 5/8	27 1/8	5 1/8	—	1 23/32	7/8	4 1/8	25 3/8	2	1 13/32	4 1/2	4 1/8	1 11/16	3 5/8	—	1 5/16	4 1/2
1, H1, & 11 SERIES MODELS H163-H169																		
48	24 9/32	11 3/4	23 3/4	4 3/8	—	31/32	7/8	3 3/8	22	2	1 3/4	3 1/2	6 1/4	2 15/32	4 7/16	—	—	5
*56	25 9/32	11 3/4	23 3/4	4 3/8	—	31/32	7/8	3 3/8	22	2	1 3/4	3 1/2	6 1/4	2 15/32	4 7/16	—	—	5
56 1 HP 1750 1½ HP 3500 2 HP 3500	26 1/2	11 3/4	27 1/8	5 1/8	—	31/32	7/8	4 1/8	25 3/8	2	1 3/4	3 1/2	6 1/4	2 15/32	4 7/16	—	—	5
143T-145T	26 1/8	11 3/4	23 3/4	4 3/8	2 1/32	—	7/8	3 3/8	22	2	1 3/4	3 1/2	6 1/4	2 15/32	4 7/16	2 29/32	—	1 13/16
182T-184T	27 1/8	12 3/4	27 1/8	5 1/8	—	—	7/8	4 1/8	25 3/8	2	1 3/4	4 1/2	6 1/4	2 15/32	4 7/16	7/8	—	4
213T-215T	30 3/4	13 1/2	30	6 3/8	3/32	–	7/8	5	28 1/4	2	1 3/4	5 1/4	6 1/4	2 15/32	4 7/16	1 29/32	—	3 1/16
H160 SERIES MODELS H163-H169																		
48	24 31/32	11 3/4	23 3/4	4 3/8	—	9/32	7/8	3 3/8	22	2	2 1/2 Max.	3 1/2	6 1/4 Max.	3	5 1/4 Max.	—	—	5
*56	26 31/32	11 3/4	23 3/4	4 3/8	—	9/32	7/8	3 3/8	22	2	2 1/2 Max.	3 1/2	6 1/4 Max.	3	5 1/4 Max.	—	—	5
56 1 HP 1750 1½ HP 3500 2 HP 3500	27 3/16	11 3/4	27 1/8	5 1/8	—	9/32	7/8	4 1/8	25 3/8	2	2 1/2 Max.	3 1/2	6 1/4 Max.	3	5 1/4 Max.	—	—	5
143T-145T	27 5/16	11 3/4	23 3/4	4 3/8	2 23/32	—	7/8	3 3/8	22	2	2 1/2 Max.	3 1/2	6 1/4 Max.	3	5 1/4 Max.	4 1/32	—	1 13/16
182T-184T	28 1/2	12 3/4	27 1/8	5 1/8	23/32	—	7/8	4 1/8	25 3/8	2	2 1/2 Max.	4 1/2	6 1/4 Max.	3	5 1/4 Max.	2 1/32	—	3 1/16
213T-215T	32 5/16	13 1/2	30	6 3/8	1 3/32	—	7/8	5	28 1/4	2	2 1/2 Max.	5 1/4	6 1/4 Max.	3	5 1/4 Max.	3 7/32	—	3 1/16
2, H2, 12 & H12 SERIES MODELS 250-278, H263-H278, 1250A-1265, H1255-H1265																		
56	30 1/32	13 1/2	27 1/8	5 1/8	2 5/8	—	7/8	4 1/8	25 3/8	2	2 1/4	5 1/4	6 1/4	3 1/16	5 1/4	4	—	2 3/8
143T-145T	30 1/4	13 1/2	27 1/8	5 1/8	2 5/8	—	7/8	4 1/8	25 3/8	2	2 1/4	5 1/4	6 1/4	3 1/16	5 1/4	4	—	2 3/16
182T-184T	31 1/4	13 1/2	27 1/8	5 1/8	2 5/8	—	7/8	4 1/8	25 3/8	2	2 1/4	5 1/4	6 1/4	3 1/16	5 1/4	4	—	2 3/16
213T-215T	34 3/4	13 1/2	30	6 3/8	2 1/4	—	7/8	5	28 1/4	2	2 1/4	5 1/4	6 1/4	3 1/16	5 1/4	3 5/8	—	2 1/16
254T	38	14 1/2	40	6 3/8	—	3/4	7/8	4 7/8	38 1/4	3	2 1/4	6 1/4	6 1/4	3 1/16	5 1/4	5/8	—	5 1/16
M & G 3 SERIES MODELS M371-M374F, G371-G374F																		
143T-145T	34 1 1/16	16 1/2	30	6 3/8	3/4	—	7/8	5	28 1/4	3	2 5/8	6 1/4	7 1/4	3 3/4	6 1/4	2 1/2	—	4 3/4
182T-184T	35 5/8	16 1/2	40	6 3/8	—	3/4	7/8	5	38 1/4	3	2 5/8	6 1/4	7 1/4	3 3/4	6 1/4	1	—	6 1/4
213T-215T	39 5/16	16 1/2	40	6 3/8	—	3/4	7/8	5	38 1/4	3	2 5/8	6 1/4	7 1/4	3 3/4	6 1/4	1	—	6 1/4
254T	42 5/8	16 1/2	40	6 3/8	—	1/4	7/8	5	38 1/4	3	2 5/8	6 1/4	7 1/4	3 3/4	6 1/4	1 1/2	—	5 3/4
M & G SERIES FLANGED MODELS M375-M380A, G375-G380A																		
143T-145T	35 1 1/16	16 3/4	30	6 3/8	3/4	—	7/8	5	28 1/4	3	3 3/4	6 1/4	7 1/2	3	7	3 5/8	—	4 3/4
182T-184T	36 3/4	16 3/4	40	6 3/8	—	3/4	7/8	5	38 1/4	3	3 3/4	6 1/4	7 1/2	3	7	2 1/8	—	6 1/4
213T-215T	40 7/16	16 3/4	40	6 3/8	—	3/4	7/8	5	38 1/4	3	3 3/4	6 1/4	7 1/2	3	7	2 1/8	—	6 1/4
254T	43 3/4	16 3/4	40	6 3/8	—	3/4	7/8	5	38 1/4	3	3 3/4	6 1/4	7 1/2	3	7	2 5/8	—	5 3/4

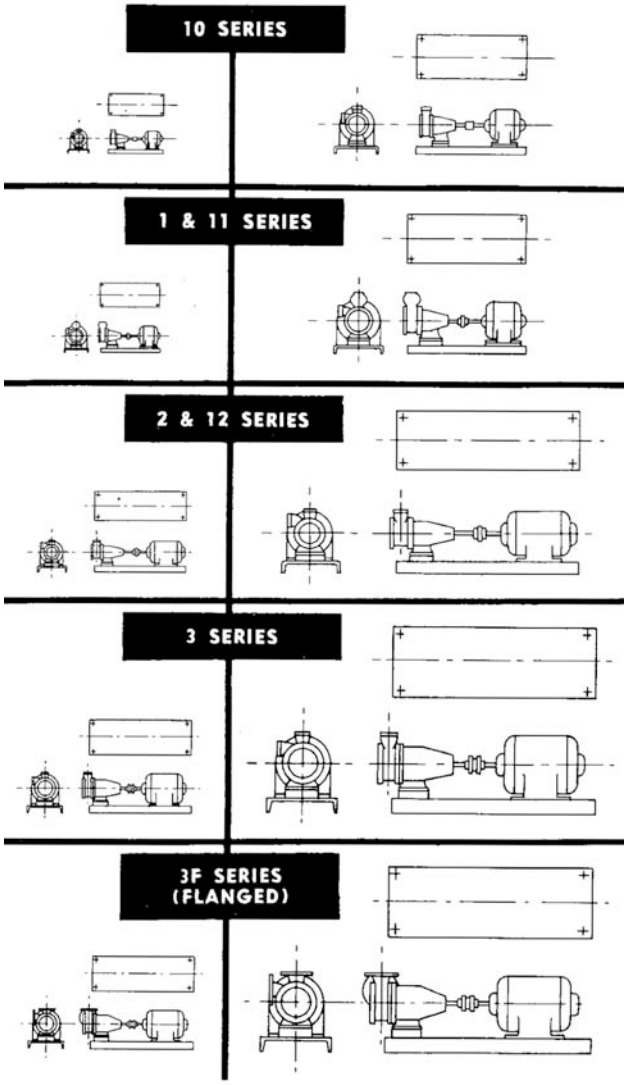
PUMP ONLY DIMENSIONS



SERIES	A	B	C	D	E max.	F max.	G max.	H	J	K	L	M P.T.	N	O	P	Q	R	S	T	U	V	W	X	Y
1012 thru 1028	1	1	4 1/8	3 1/2	8 5/32	1 5/8	4 13/16	1 23/32	2 1/8	3 1/8	1 13/32	—	No. 3 WDRF.	.500	1 11/16	3 5/8	—	2	5	1 1/32	—	—	1 3/16	1 3/16
128 thru 151	1 1/2	1 1/4	6 1/4	3 1/2	10 21/32	1 11/16	4 13/16	2 7/32	3 1/2	4 1/2	1 3/4	1/4	No. 3 WDRF.	.500	2 1/32	4 7/16	1/8	2	5	1 1/32	4 3/4	3 1/16	1 7/16	1 1/16
H128 thru H151 1128 thru 1147	1 1/2	1 1/4	6 1/4	3 1/2	10 21/32	1 11/16	4 13/16	2 7/32	3 1/2	4 1/2	1 3/4	1/4	No. 61 WDRF.	.625	2 1/32	4 7/16	1/8	2	5	1 1/32	4 3/4	3 1/16	1 7/16	1 1/16
H163 thru H169	2 1/2	2	6 1/4	3 1/2	11 11/32	1 11/16	4 13/16	2 23/32	3 1/2	4 1/2	2 1/2	1/4	No. 61 WDRF.	.625	3	5 1/4	1/4	2	5	1 1/32	—	—	1 7/16	1 1/16
250A thru 259	1 1/2	1 1/4	6 1/4	5 1/4	14 3/32	2 3/16	7 5/8	3 3/32	3 3/8	5 1/4	2 1/4	1/4	3/16 x 3/32	.750	3 11/16	5 1/4	1/4	3	7 1/2	7/16	5 1/16	4 7/8	2 1/8	3/4
1250A thru 1254	1 1/2	1 1/4	6 1/4	5 1/4	14 3/32	2 3/16	7 5/8	3 3/32	3 3/8	5 1/4	2 1/4	1/4	3/16 x 3/32	.875	3 11/16	5 1/4	1/4	3	7 1/2	7/16	5 1/16	4 7/8	2 1/8	3/4
263 thru 278 H263 thru H278	2 1/2	2	6 1/4	5 1/4	14 3/32	2 3/8	7 13/16	3 3/32	3 3/8	5 1/4	2 1/4	1/4	3/16 x 3/32	.750 .875	3 11/16	5 1/4	1/4	3	7 1/2	7/16	5 1/16	4 7/8	2 1/8	3/4
1255 thru 1265 H1255 thru H1265	2 1/2	2	6 1/4	5 1/4	14 3/32	2 3/16	7 5/8	3 3/32	3 3/8	5 1/4	2 1/4	1/4	3/16 x 3/32	.875	3 11/16	5 1/4	1/4	3	7 1/2	7/16	5 1/16	4 7/8	2 1/8	3/4
M371 thru M374F G371 thru G374F	2	1 1/2	7 1/4	6 1/4	18 11/32	2 11/16	10 7/32	2 7/8	5 1/4	7	2 5/8	—	3/16 x 3/32	.875	3 3/4	6 1/4	1/4	3 1/2	9	11/16	—	—	2 15/16	3
M375 thru M380A G375 thru M380A	3 flg. 125 lb.	2 1/2 flg. 250 lb.	7 1/2	6 1/4	18 11/32	2 11/16	10 7/32	2 7/8	5 1/4	7	3 3/4	1/4	3/16 x 3/32	.875	3	7	—	3 1/2	9	11/16	5 1/4	—	2 15/16	3

SCALE TEMPLATES

To assist the engineer or draftsman with his drawings, a complete set of templates are given at the right covering all ROTH industrial pumps. For further convenience these are given two scales: 1/4"= 1'0" and 1/8"= 1'0". These may be traced directly to drawing or tracing.



SPECIFICATIONS for END-MOUNTED PUMPS

PUMP with MECHANICAL SEAL

Pump shall be Roth single-stage turbine with one mechanical seal and stainless steel shaft. Pump shall be standard fitted or bronze fitted with bronze impeller and iron or bronze liners. Bearing housing shall contain pre-lubricated sealed ball bearings rated for 10,000 hours. Bearings installed in a drip proof enclosure and protected from moisture and wash down hazards by a double thick slinger and layer of water resistant grease.

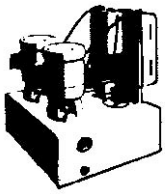
MOTOR

Pump shall be mounted on a steel channel base and flexible connected to an Bakdor, Marathon or equal electric motor. Motor shall be non-overloading at design point and shall be installed with overload and undervoltage protection.

ROTH CUSTOMERS are widely-respected, internationally-known companies with locations all over the United States and Canada, as well as overseas. Major units are installed in well over 100 Air Force bases, Army posts and proving grounds, armories, Naval Stations and radar stations on the North American continent. In addition, thousands of installations in hospitals, institutions, schools and manufacturing plants have won the recognition and respect of leading companies throughout the United States and Canada.

OTHER ROTH PUMPS DESIGNED TO MEET YOUR PUMPING REQUIREMENTS

ROTH CONDENSATE TRANSFER STATIONS



Roth transfer stations are provided for the collection of condensate from low return lines. They are furnished with cast iron or steel receivers for steam condensates and equipped with liquid submerged pumps

The natural advantage of the regenerative turbine pump in this design makes possible discharge pressures up to 60 PSI at 1750 RPM. Motor and switch are mounted high and dry ahove the liquid level, making possible shallow pit installation. The pump provided is bronze fitted with stainless steel shaft for steam condensate.

Range: 10-60 PSI, 1-60 GPM.

Ask for Bulletin 212

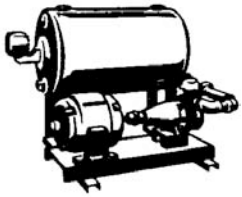
ROTH UNDERGROUND CONDENSATE STATIONS

ROTH Underground Condensate Units are indicated where condensate must be drained from underground piping_ The floor-to-inlet distance is 12 inches to make possible a pipe slope for draining purposes. Low silhouette design pemits flush floor installation, locating under storage tanks, etc. Motor, motor mounts, and pump are essentially the same as used on the vertical condensate unit. All underground condensate units operate at 1750 RPM providing a full range of pressures up to 60 PSI for radiation up to 50,000 sq. ft. EDR. This unusually low operating speed plus special bronze bearing makes for unusually long, trouble free service.

Range: 10-60 PSI. 1,000-50,000 sq. ft. EDR.

Ask for Bulletin 215.

ROTH CONDENSATE COLLECTION STATIONS

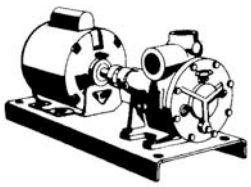


These units are essentially collection stations for condensed steam in heating or process systems. The package unit consists of a receiver tank and a motor driven pump controlled by a float switch mounted in the receiver. Successful pumping of water at temperatures in the 190˚F to 200˚F range from low leg receivers requires special pumps designed for those temperatures.

Range: 10-150 PSI 1,000-100,000 sq. ft. EDR

Ask for Bulletin B210

ROTH FRACTIONAL HP PUMPS



Roth Fractional HP pumps are a group of horizontal flexible coupled regenerative pumps based on a simplified design for loads up to 1 HP.

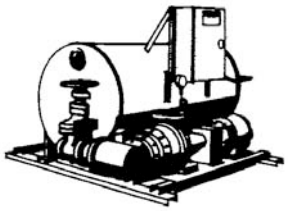
Within the load limitations indicated the pumps are used on a variety of equipment requiring small volume of liquid up to pressures of 105 PSI.

Pumps are used on small domestic and shipboard water systems, for water pressure boosting in homes and spot industrial locations, for wetting sweeper brushes, for condensate return in small and medium steam systems, and for collection and return of cooling water in industrial plants.

Range: 2 to 30 GPM at 10 to 50 PSI at 1750 RPM.
5 to 11 GPM at 20 to 105 PSI at 3500 RPM.

Ask for Bulletin A102.

ROTH 212˚F CONDENSATE STATIONS



Roth 212˚F Condensate Stations provide the heating engineer with return pumping equipment capable of handling water at boiling point.

Roth 212˚F Condensate Stations are equipped with Roth patented one foot NPSH pumps operating at 1750 RPM.

These pumps handle boiling water, developing almost the same capacity and head as when pumping cold water. This characteristic remains constant during the entire operating life of the pump.

The use of pumps with this capability assures the engineer of uninterrupted pump performance in situations where an open steam trap allows enough return of steam with the condensate to bring the water temperature in the receiver to a rolling boil.

Roth 212˚F Condensate stations are equipped with horizontal receivers mounted at low level and provided with Roth patented drain-vent to allow release of a tell-tale tracer of steam and provide for drain of overflow in the event water temperature rises above 212˚F. All receivers are made of 3/16 inch thick steel with flat flanged heads.

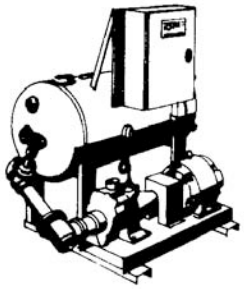
The low profile vessel mounting permits return lines draining to the receiver at very low level

A float switch in the receiver closes and starts the pump motor whenever the condensate dumped by the traps reaches a specified high level in the receiver. The float switch opens and stops the motor when the condensate has been pumped down to a specified low level.

Range: 4 to 150 GPM at pressures from 10 to 75 PSI.

Ask for Bulletin C204

ROTH 2S0°F CONDENSATE STATIONS



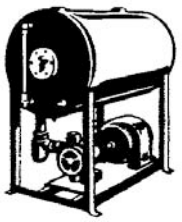
The Roth 250˚F Condensate Station is a completely automatic factory assembled unit ready to install for flashing hot condensate so that steam at reduced pressure can be used for other services. An unusually durable pump runs intermittently returning the remaining condensate to the boiler. The 250˚F Condensate Station is ideal for the collection of high temperature condensate from absorption coolers, drying rolls, autoclaves, veneer presses, plastics presses, steam turbines and other sources of reduced pressure steam.

Equipped with Roth Hot Condensate pumps designed for 15 to 150 PSI discharge pressure handling 250˚F condensate at one foot NPSH. The receiver is nonvented and rated 50 PSI, ASME code stamp included. A special float switch starts pump at high condensate level and stops pump at low level.

Range: 10·150 PSI differential pressure, 10-175 GPM.

Ask for Bulletin A204

ROTH BOILER FEED SYSTEMS



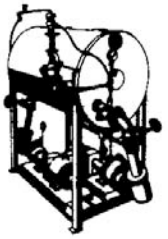
Roth Packaged Boiler Feed Units are completely automatic factory assembled systems designed for injecting collection and feed water into boilers up to 750 HP at pressures up to 300 PSI.

Each unit is provided with a vented receiver made of steel, a float controlled valve for the addition of make-up water, and simplex or duplex pumps controlled by the water level in the boiler.

A wide selection of pumps at 1750 and 3500 RPM with cast iron or bronze liners and with mechanical seals is provided

Ask for Bulletin A201,B201, C201.

ROTH 212°F BOILER FEED SYSTEMS



Roth 212"F Feedwater Systems are a line of units equipped with Roth one foot NPSH pumps guaranteed to deliver full rated capaclty of boiling water to the boiler.

Preheating equipment when supplied consists of a pressure reducing valve, a mechanical temperature regulating valve controlled by a remote vapor tension thermostat and one or more perforated tube heaters.

All systems are equipped with Roth patented drain vent with tell-tale device for detecting internal steaming and drain capacity to cover overflow requirements in the event of la steaming rate in excess of the normal atmospheric vent.

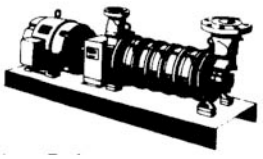
Make-up water is introduced through the drain vent at the top of the vessel. An air gap serves as a vacuum breaker assuring against back siphonage hazards. A non-slam solenoid valve controlled by a float switch in the receiver opens when additional feedwater above normal return is required.

All Roth feedwater systems are designed for pump control by the electrical boiler controller mounted on the boiler water column. When the pump has provided sufficient feedwater to the boiler the switch opens stopping the pump motor.

Range: 100 to 800 boiler horsepower.
20 to 200 PSIG operating pressure.

Ask for Bulletin D204

ROTH MULTISTAGE BOILER FEED PUMPS



Roth Multistage Feedwater pumps are a completely new design concept in high pressure regenerative pumps operating at 1750 RPM.

The Roth multistage design incorporates the possibility of module staging so that operation is at the point of peak efficiency, thus reducing power input and driver size and increasing pump life.

The Roth multistage pump offers the maintenance engineer the easiest disassembly and assembly procedures ever provided in regenerative pump design utilizing removable bearing capsules, field replaceable mechanical seals, separable suction and discharge connections, module case construction, and simple impeller setting procedures.

Range: for capacities up to 125 GPM. For boilers up to 500 PSI. For temperatures up to 250°F. For NPSH as low as 3 feet.

Ask for Bulletin A108

ROTH PUMP COMPANY P.O. Box 4430, Rock Island, Illinois 61204

Phone: 309-787-1791 Fax:309-787-5142 Toll Free: 1-888-444-ROTH

www.rothpump.com