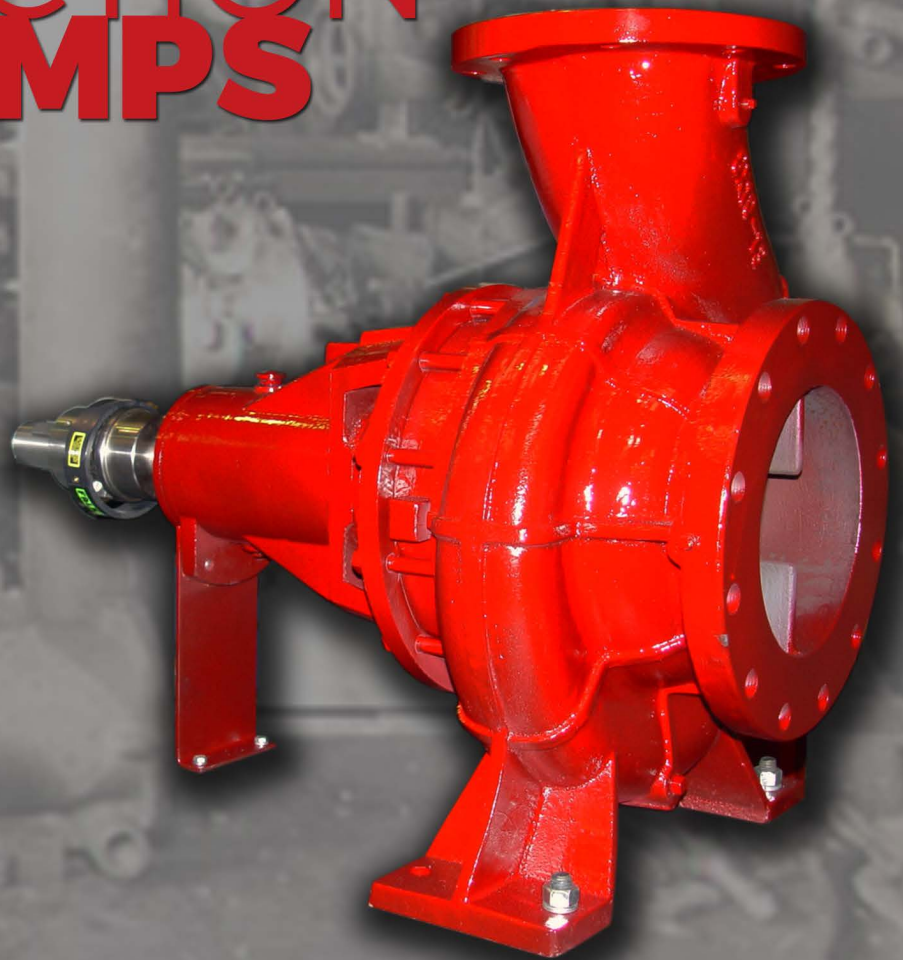




AMERICAN-MARSH PUMPS

FLEX-COUPLED END SUCTION FIRE PUMPS



www.american-marsh.com

DURABILITY BY DESIGN SINCE 1873.

Product Overview

American-Marsh Model FP-REF End Suction pumps are used in a variety of fire protection services every day. These rugged and efficient centrifugal pumps are designed for long life and low operational costs. The FP-REF series end suction pumps feature back pull out impellers, centerline discharges, casted integral feet on all casings with heavy casing thickness, impellers with back pump out vanes and oversized shafts to provide the end user with a superior, reliable product. All pumps have been tested to fully meet UL & FM specifications.

Model FP-REF Specifications

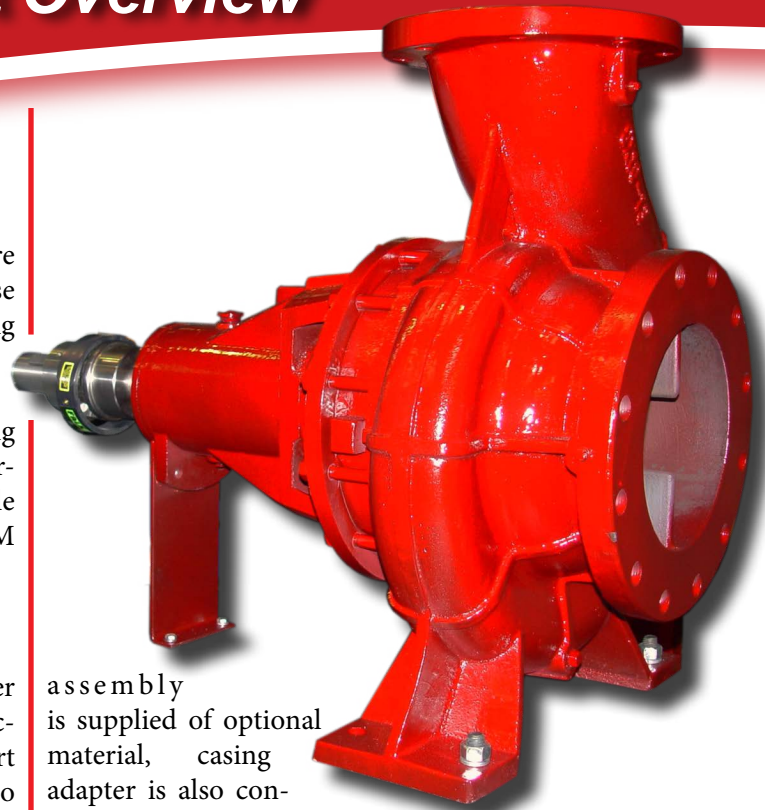
CASING is constructed of high-tensile cast iron or other specified material. It is of the volute type, carefully and accurately proportioned to permit smooth flow and to convert high velocity energy of fluid as it leaves the impeller into pressure. Suction and discharge nozzles are casted integral with the volute and are of 250 psi dimensions. All REF models feature a 250 psi case working pressure. The casing has cast integral feet standard. The discharge port is of the vertical centerline type. Necessary vent and drain openings are provided.

IMPELLER is of the end suction type, casted in one piece of 304 stainless steel or other specified material. All impellers are hydraulically and dynamically balanced prior to assembly and have pump out vanes standard on it's back side to reduce material from building up near the stuffing box.

CASE WEAR RING standard enclosed impellers are designed with integral case wear rings, accurately turned, to provide close running fits in casing. The diameters of these rings are such as to reduce end thrust to a minimum. On larger models, a rear case wear ring is provided for additional wear resistance.

SHAFT is of high-strength 420 stainless steel, ground to accurate dimensions and polished to a smooth surface. It is designed for extra stiffness to avoid all critical speeds in operation. The shaft is protected by a shaft sleeve of ample thickness to ensure long life. The shaft sleeve can be supplied in various materials.

CASING ADAPTER is of cast iron or other specified material. It connects the six power frame assemblies to the 43 casing assemblies. It also houses the packing and has an integral flush line standard for stuffing box lubrication. When casing



assembly is supplied of optional material, casing adapter is also constructed of same material, as it is also in contact with the pumped fluid.

POWER FRAME is of high-tensile cast iron and provides support for the inboard and outboard bearings. Each bearing is of the deep-groove, single-row type, designed to carry all thrust and radial loads encountered by the pump. All bearings are sized to maintain a minimum of 50,000-hour bearing life. Each bearing housing is sealed from water leakage by the use of an oil lip seal. The power frame has re-greasable bearings to ensure clean and cool bearing operation.

STUFFING BOX: Sized for packing with a lantern ring standard.

Performance Specifications

SIZES: 1^{1/4}" to 10" (80-350 mm)

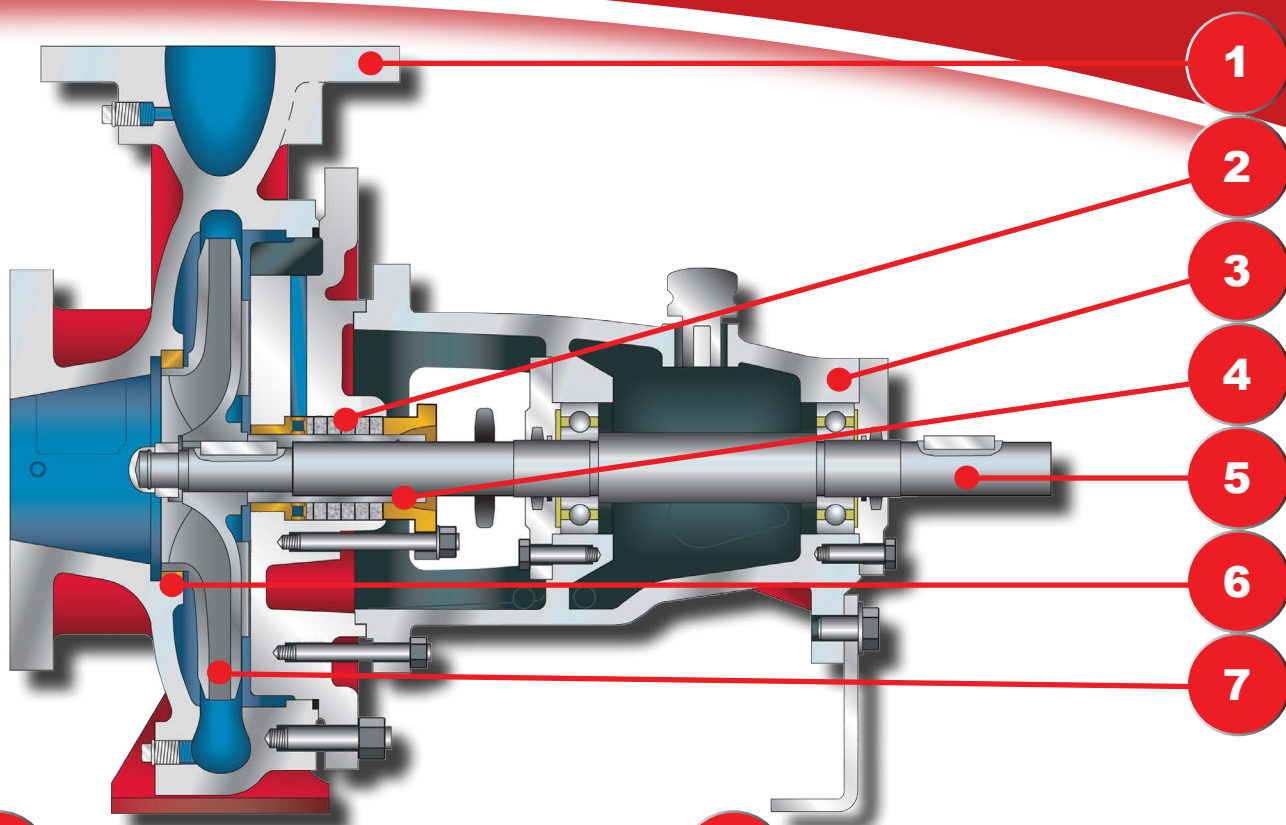
FLOWS: Up to 5,000 gpm (1,817 m³/hr)

HEADS: Up to 840 feet (43 meters)

PRESSURE: Up to 250 psi

- UL Listed Certified & Approved Pumps
- Compliance to NFPA 20 Design Regulations
- Matches FM Approval requirements
- Multiple Range of Flow and Pressures

Product Features



1

CASING

- Centerline discharge is self-venting
- 125 lb. suction and discharge flanges
- Integral vortex suppressor on suction
- Standard ASTM A48 Class 30 cast iron
- Standard 250 lb. case working pressure
- Heavy wall thickness to provide for generous corrosion allowance
- Pressure taps on suction and discharge to verify pump performance
- Centerline discharge transmits residual pipe strain to feet of casing and eliminates the need for left of right-hand casings and impellers
- Fully cast integral feet for support when utilizing “back pull-out” feature

2

STUFFING BOX

- One piece cast iron or other alloy
- Packing with lantern ring standard
- Heavy duty with integral flushline for packing lubrication

3

BEARING HOUSING

- Heavy duty ASTM A48 cast iron
- Re-greasable lubricated power frame
- Single-row inboard and outboard bearings
- Lip seals on each bearing housing cap to keep out contaminants

4

SHAFT SLEEVE

- Protects the shaft from wear
- Heavy duty 304 stainless steel or other alloy
- Can be easily removed and replaced when worn

5

SHAFT

- High strength 420 stainless steel material standard
- Designed and sized specially for the pump and its applications
- Efficiently designed to minimize shaft deflection at the stuffing box

6

CASE WEAR RING

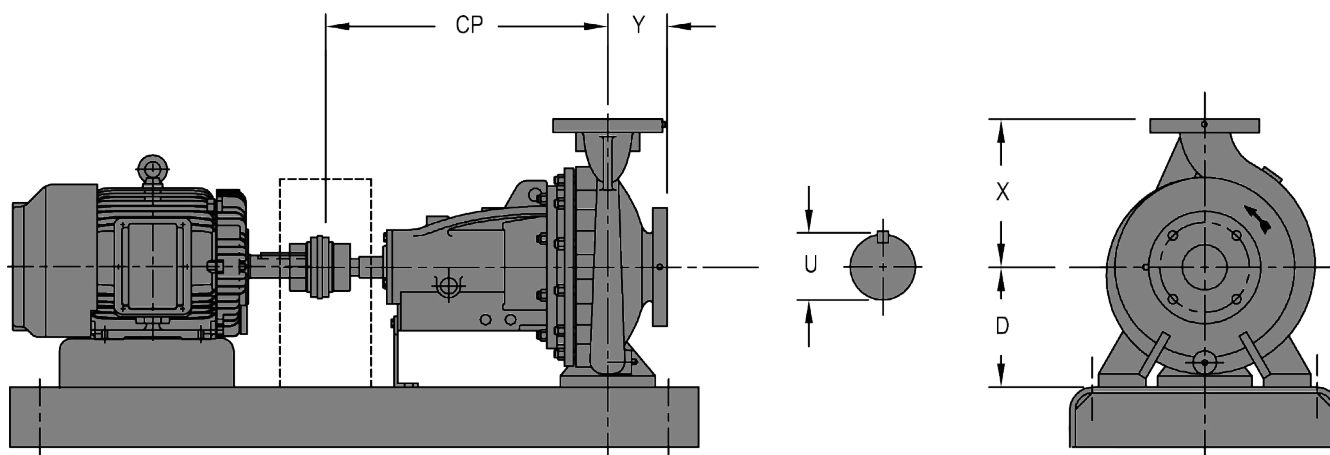
- Standard bronze or other alloy
- Can be easily removed and replaced when worn
- For additional support, larger models have a front and back case wear ring

7

IMPELLER

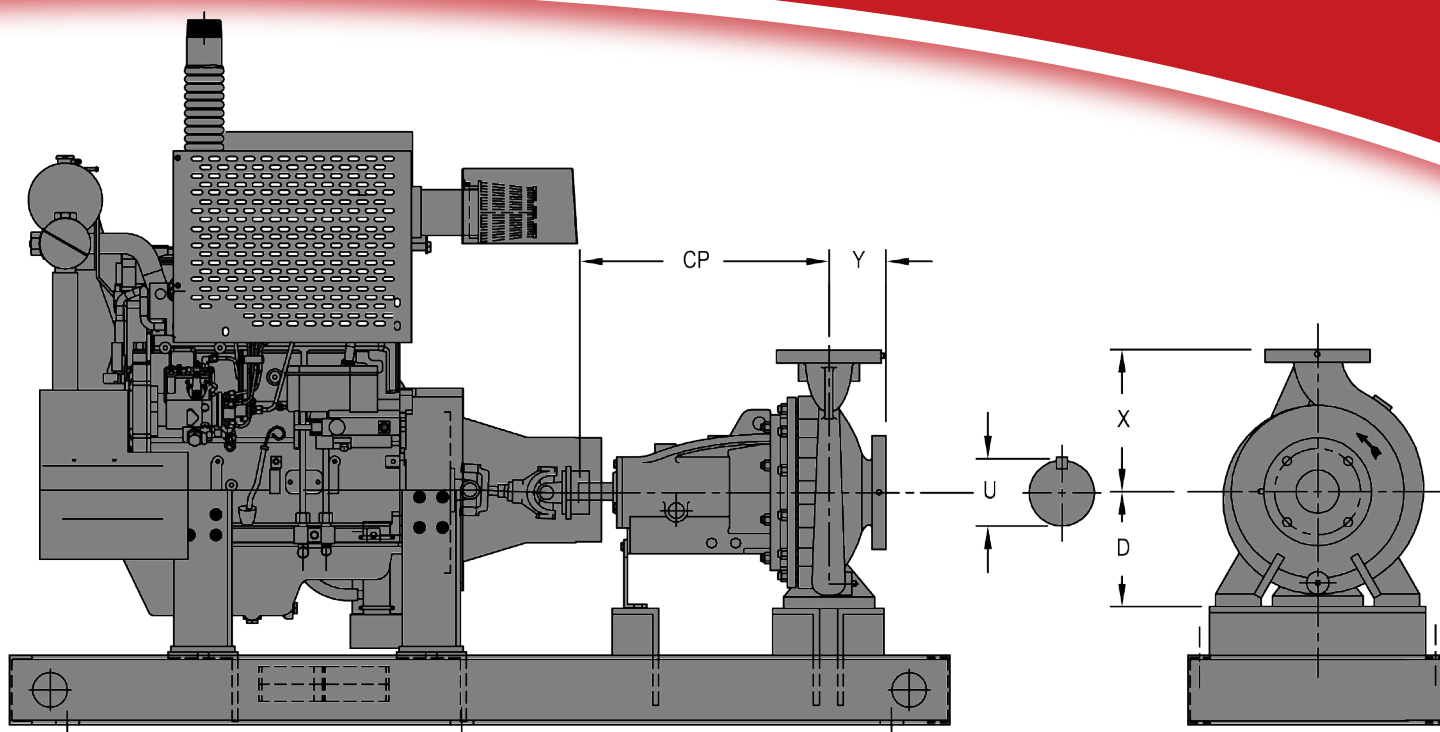
- Hydraulically balanced
- Fully balanced prior to assembly
- One piece stainless steel or other alloy
- Expertly machined to customer specifications
- Back pump-out vanes prohibit material from building up behind impeller

FP-REF Dimensions



Pump Size	CP	D	U	X	Y	Weight (lbs.)
1.5x2.5-7	14.188	5.250	0.875	6.313	3.188	82
2x2.5-7	14.250	6.250	0.875	7.125	3.938	84
2.5x3-7	14.438	6.250	0.875	7.875	3.938	97
3x4-7	14.500	7.125	0.875	8.875	4.938	121
4x5-7	14.250	7.000	0.875	8.875	5.000	192
1.25x2-8	14.125	6.250	0.875	7.125	3.125	95
1.5x2.5-8	14.125	6.250	0.875	7.125	3.938	101
2x2.5-8	14.188	6.250	0.875	7.875	3.938	106
2.5x3-8	14.250	7.125	0.875	8.875	3.938	119
3x4-8	18.563	7.125	1.125	9.875	4.938	159
4x5-8	18.563	8.000	1.125	11.000	4.938	192
2x2.5-10	14.125	7.000	0.875	8.875	3.938	143
2.5x3-10	14.500	8.000	1.125	9.875	3.938	183
3x4-10	18.563	7.875	1.125	11.000	4.938	203
4x5-10	18.563	9.000	1.125	11.000	5.500	243
2.5x3-13	18.375	8.875	1.125	11.000	4.938	243
3x4-13	18.563	9.875	1.125	12.438	4.938	287
4x5-13	18.563	9.875	1.125	12.438	5.500	295
4x5-16	18.813	11.000	1.625	14.000	5.500	391
5x6-16	18.813	12.438	1.625	15.750	5.500	419
6x8-16	19.063	12.438	1.625	17.750	6.313	463

FP-REF Dimensions



Pump Size	CP	D	U	X	Y	Weight (lbs.)
1.5x2.5-7	14.188	5.250	0.875	6.313	3.188	82
2x2.5-7	14.250	6.250	0.875	7.125	3.938	84
2.5x3-7	14.438	6.250	0.875	7.875	3.938	97
3x4-7	14.500	7.125	0.875	8.875	4.938	121
4x5-7	14.250	7.000	0.875	8.875	5.000	192
1.25x2-8	14.125	6.250	0.875	7.125	3.125	95
1.5x2.5-8	14.125	6.250	0.875	7.125	3.938	101
2x2.5-8	14.188	6.250	0.875	7.875	3.938	106
2.5x3-8	14.250	7.125	0.875	8.875	3.938	119
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4x5-8	18.563	8.000	1.125	11.000	4.938	192
2x2.5-10	14.125	7.000	0.875	8.875	3.938	143
2.5x3-10	14.500	8.000	1.125	9.875	3.938	183
3x4-10	18.563	7.875	1.125	11.000	4.938	203
4x5-10	18.563	9.000	1.125	11.000	5.500	243
2.5x3-13	18.375	8.875	1.125	11.000	4.938	243
3x4-13	18.563	9.875	1.125	12.438	4.938	287
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4x5-16	18.813	11.000	1.625	14.000	5.500	391
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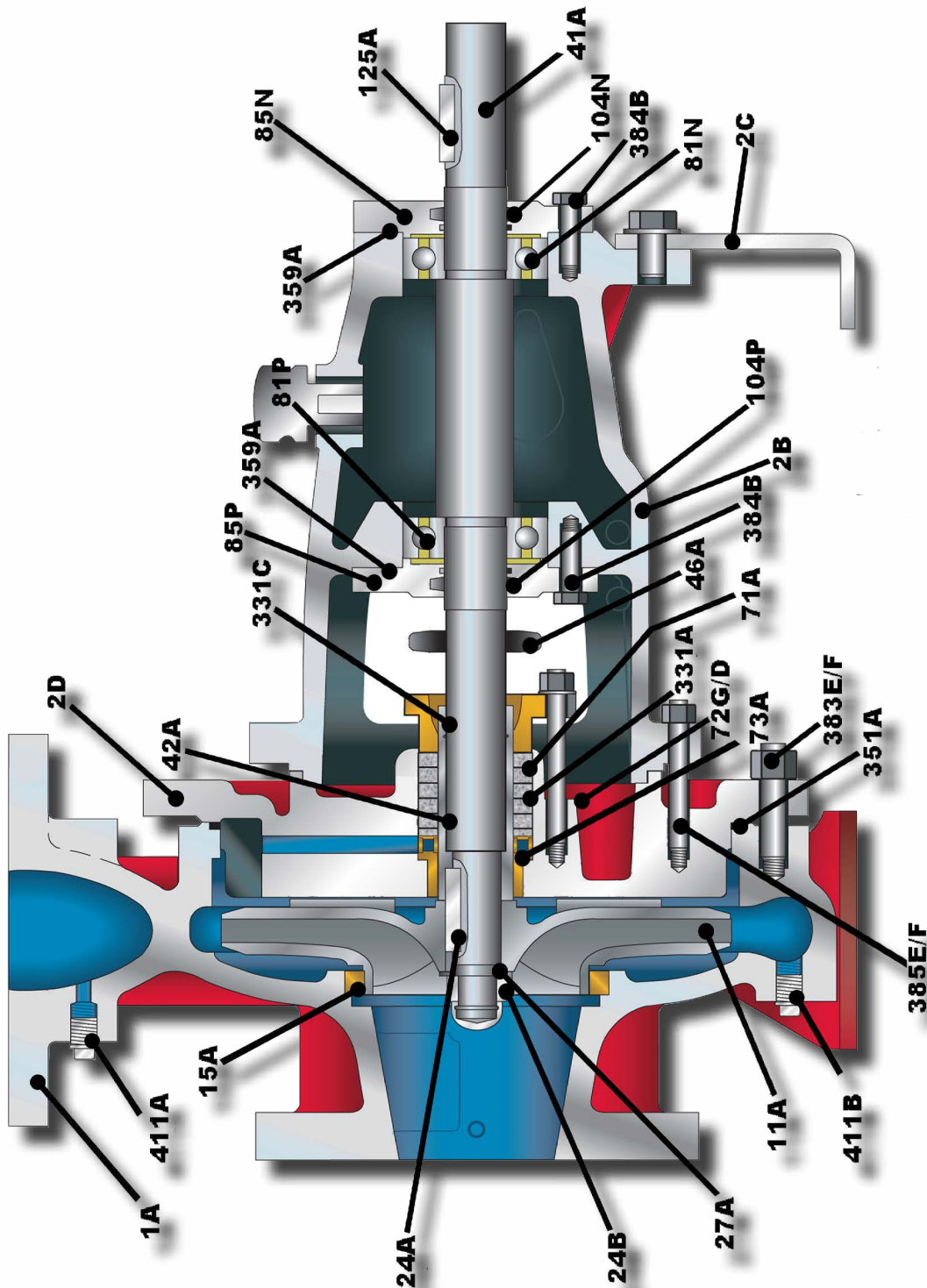
UL Listed/FM Approved Range of Pumps

Model	Flow (GPM)	Speed (RPM)	Size	Pressure Range (PSI)	UL Listing	FM Approval	Max Working Pressure (PSI)
1.25 x 2-8 FP-REF	50	2900	1.25 x 2 x 2	54-94	•	•	230
1.5 x 2.5-7 FP-REF	100	2900	1.5 x 2.5	42-56	•	•	230
1.5 x 2.5-8 FP-REF	100	2900	1.5 x 2.5	73-92	•	•	230
1.5 x 3-8 RV	100	3600	1.5 x 3	93-127	•	•	200
2.5 x 3-13 FP-REF	150	1450	2.5 x 3	44-53	•	•	230
2 x 2.5-7 FP-REF	150	2900	2 x 2.5	45-61	•	•	230
2.5 x 3-8 FP-REF	150	2900	2 x 2.5	64-89	•		230
2 x 2.5-8 FP-REF	150	2900	2 x 2.5	64-91		•	230
1.5 x 3-8 RV	150	3600	1.5 x 3	86-121	•		200
1.5 x 3-8 RV	150	3600	1.5 x 3	86-122		•	200
2 x 2.5-10 FP-REF	150	2900	2 x 2.5	120-145		•	230
2 x 2.5-10 FP-REF	150	3500	2 x 2.5	120-145		•	230
2.5 x 3-13 FP-REF	200	1450	2.5 x 3	41-52	•	•	230
2 x 2.5-7 FP-REF	200	2900	2 x 2.5	42-60	•	•	230
2.5 x 3-8 FP-REF	200	2900	2 x 2.5	60-86	•		230
2 x 2.5-8 FP-REF	200	2900	2 x 2.5	60-88		•	230
2.5 x 3-13 FP-REF	200	1760	2.5 x 3	61-77	•	•	230
2 x 3-8 RV	200	3600	2 x 3	110	•	•	200
2 x 2.5-10 FP-REF	200	2900	2 x 2.5	116-143		•	230
2 x 2.5-10 FP-REF	200	3500	2 x 2.5	116-143		•	230
2.5 x 3-13 FP-REF	250	1760	2.5 x 3	60-77	•	•	230
2.5 x 3-8 FP-REF	250	2900	2.5 x 3	64-93	•	•	230
2 x 2.5-10 FP-REF	250	3500	2 x 2.5	113-138		•	230
2 x 2.5-10 FP-REF	250	2900	2 x 2.5	113-140		•	230
2.5 x 3-10 FP-REF	250	3500	2.5 x 3	117-141	•		230
2.5 x 3-13 FP-REF	250	3500	2.5 x 3	117-141		•	230
2.5 x 3-8 FP-REF	300	2900	2.5 x 3	64-92	•	•	230
2.5 x 3-13 FP-REF	300	2900	2.5 x 3	108-138		•	230
2.5 x 3-10 FP-REF	300	2900	2.5 x 3	108-138	•		230
2.5 x 3-10 FP-REF	300	3500	2.5 x 3	116-141	•		230
2.5 x 3-13 FP-REF	300	3500	2.5 x 3	116-141		•	230
2.5 x 3-13H FP-REF	300	2900	2.5 x 3	169-210	•	•	230
3 x 4-7 FP-REF	400	2900	3 x 4	40-55	•	•	230
4 x 5-13 FP-REF	400	1450	4 x 5	45-54	•		230
2.5 x 3-8 FP-REF	400	2900	2.5 x 3	60-90	•	•	230
3 x 4-8 FP-REF	400	2900	3 x 4	61-92	•	•	230
4 x 5-16 FP-REF	400	1450	4 x 5	67-83	•	•	230
3 x 4-10 FP-REF	400	2900	3 x 4	92-141	•	•	230
2.5 x 3-10 FP-REF	400	2900	2.5 x 3	105-137	•		230
2.5 x 3-13 FP-REF	400	2900	2.5 x 3	105-137		•	230
2.5 x 3-10 FP-REF	400	3500	2.5 x 3	112-138	•		230
2.5 x 3-13 FP-REF	400	3500	2.5 x 3	112-138		•	230
2.5 x 3-13H FP-REF	400	2900	2.5 x 3	165-208	•	•	230

UL Listed/FM Approved Range of Pumps

Model	Flow (GPM)	Speed (RPM)	Size	Pressure Range (PSI)	UL Listing	FM Approval	Max Working Pressure (PSI)
3 x 4-8 FP-REF	450	2900	3 x 4	60-92	•	•	230
4 x 5-16 FP-REF	450	1450	4 x 5	67-82	•	•	230
3 x 4-10 FP-REF	450	2900	3 x 4	90-141	•	•	230
2.5 x 3-10 FP-REF	450	2900	2.5 x 3	102-135	•		230
2.5 x 3-13 FP-REF	450	2900	2.5 x 3	102-135		•	230
4 x 5-16 FP-REF	450	1760	4 x 5	107-121	•	•	230
3 x 4-7 FP-REF	500	2900	3 x 4	40-53	•	•	230
4 x 5-13 FP-REF	500	1760	4 x 5	48-80	•		230
3 x 4-8 FP-REF	500	2900	3 x 4	60-92	•	•	230
4 x 5-8 FP-REF	500	2900	4 x 5	64-88		•	230
4 x 5-8 FP-REF	500	1450	4 x 5	66-82		•	230
4 x 5-16 FP-REF	500	1450	4 x 5	66-82	•	•	230
3 x 4-10 FP-REF	500	2900	3 x 4	90-140	•	•	230
3 x 4-13H FP-REF	500	2900	3 x 4	120-212	•		230
5 x 6-16 FP-REF	750	1450	5 x 6	51-83	•		230
4 x 5-8 FP-REF	750	2900	4 x 5	60-86		•	230
4 x 5-10 FP-REF	750	2900	4 x 5	90-140	•		230
4 x 5-16 FP-REF	750	1760	4 x 5	100-113	•	•	230
6 x 8-16 FP-REF	1000	1450	6 x 8	62-84	•	•	230
6 x 8-16 FP-REF	1000	1450	6 x 8	76-89		•	230
6 x 8-16 FP-REF	1000	1760	6 x 8	74-88	•		230
5 x 6-16 FP-REF	1000	1760	5 x 6	80-120	•		230
6 x 8-16 FP-REF	1250	1450	6 x 8	60-83	•	•	230
6 x 8-16 FP-REF	1250	1760	6 x 8	74-88	•	•	230
6 x 8-16 FP-REF	1500	1450	6 x 8	56-79	•	•	230
6 x 8-16 FP-REF	1500	1760	6 x 8	70-85	•		230

Sectional Drawing



Material Construction Details/Parts List

PARTS LIST

NO.	PART	MATERIAL	# REQUIRED
1A	CASING	CAST IRON	1
2B	POWER FRAME	CAST IRON	1
2C	FOOT, POWER FRAME	CAST IRON	1
2D	CASING ADAPTER	CAST IRON	1
11A	IMPELLER	STAINLESS STEEL	1
15A	CASE WEAR RING, FRONT	BRONZE	1
15B	CASE WEAR RING, REAR	BRONZE	VARIES
24A	IMPELLER KEY	18-8 STAINLESS STEEL	1
24B	IMPELLER NUT	316 STAINLESS STEEL	1
27A	IMPELLER WASHER	316 STAINLESS STEEL	1
41A	SHAFT	420 STAINLESS STEEL	1
42A	SHAFT SLEEVE	BRONZE	1
46A	WATER SLINGER	RUBBER	1
71A	STUFFING BOX GLAND	BRONZE	1
72G/D	HINGE NUT & BOLT	18-8 STAINLESS STEEL	2
73A	LANTERN RING	BRONZE	1
81N	OUTBOARD BEARING, THRUST	STEEL	1
81P	INBOARD BEARING, RADIAL	STEEL	1
85N	OUTBOARD BEARING CAP	CAST IRON	1
85P	INBOARD BEARING CAP	CAST IRON	1
104N	OUTBOARD LIP SEAL	RUBBER	1
104P	INBOARD LIP SEAL	RUBBER	1
125A	COUPLING KEY	STEEL	1
331A	PACKING	CARBON GRAPHITE	VARIES
331C	SHAFT SLEEVE O-RING	BUNA-N	1
351A	CASING GASKET	BUNA-N	1
359A	BEARING HOUSING GASKET	FIBER	2
383E/F	CASING STUD & NUT	STEEL	VARIES
384B	BEARING CAP CAPSCREW	18-8 STAINLESS STEEL	1
385E/F	BEARING HOUSING STUD & NUT	18-8 STAINLESS STEEL	VARIES
411A	PLUG, VENT	STEEL	1
411B	PLUG, DRAIN	STEEL	1



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