

150 • 250 • 160 • 260 • 170 • 270 Series

Regenerative Turbine Pumps



- Capacities to 150 GPM
- Heads to 1150 Feet



MTH PUMPS

150 • 250 • 160 • 260 • 170 • 270 Series
**Regenerative
 Turbine Pump**

MTH 150 • 250 • 160 • 260 • 170 • 270 Series regenerative turbine pumps represent the most economical, high performance alternative for low flow (to 150 GPM) applications involving moderate to high pressures (heads to 1150 feet). By combining years of regenerative turbine pump designs with precision computer controlled manufacturing, the 150 • 250 • 160 • 260 • 170 • 270 Series delivers high efficiency pumping operation, even at low NPSH. High quality parts and an easily serviceable design provide low maintenance and long life.

WATER PASSAGE DESIGN

MTH has combined sixty years of water passage design with a multistage mechanical concept to achieve maximum capacity and pressure while minimizing horsepower requirements. By optimizing the number of pumping stages with each water passageway, MTH improves both efficiency and pressure in the 150 • 250 • 160 • 260 • 170 • 270 Series, exceeding the standards realized by previous techniques.

IMPELLER PROFILE

One of the most notable improvements in regenerative turbine pump technology incorporated in 150 • 250 • 160 • 260 • 170 • 270 Series pumps involves the ability to determine the optimum impeller width and blade length. These factors have a significant effect on the required horsepower versus pressure curve for regenerative turbine pumps. By optimizing these for each 150 • 250 • 160 • 260 • 170 • 270 Series pump, peak efficiency is improved and “off peak” horsepower requirements are reduced as well.

IMPELLER BLADES

After the most favorable impeller profile has been determined for a particular water passageway cross-section, MTH calculates the number of blades needed to maximize the performance of that pump. Current blade design in 150 • 250 • 160 • 260 • 170 • 270 Series pumps increases both efficiency and design pressure without the manufacturing difficulties associated with producing contoured blade impellers.

State-of-the-art computer controlled machines simplify manufacturing of the various MTH impellers utilized in the 150 • 250 • 160 • 260 • 170 • 270 Series. The result is a high performance pump providing efficiency characteristics exceeding those of more expensive units.

NPSH REQUIREMENTS

150 • 250 • 160 • 260 • 170 • 270 Series regenerative turbine pumps meet low net positive suction head (NPSH) requirements without efficiency loss. This is achieved by keeping the inlet fluid velocity low and then gently accelerating to passageway velocities.

LOW NPSH REQUIREMENTS

250 • 260 • 270 Series regenerative turbine pumps provide exceptionally low NPSH requirements to suit boiler feed water deaerator applications. This reduced NPSH is obtained by using a first stage centrifugal Francis vane impeller with inlet flow paths shaped to maintain a constant fluid velocity. This reduces entry losses to the impeller as well as maintaining pump efficiency. A multi-vane diffuser is used in conjunction with the centrifugal impeller for balancing radial loads and extracting the maximum pressure from the flow produced by the first stage impeller. Pressure and flow produced by the low NPSH inducer assures that the succeeding stages are adequately fed.

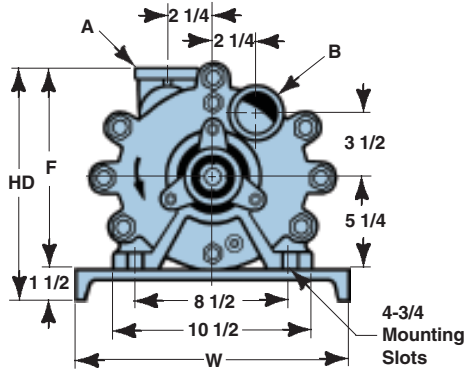
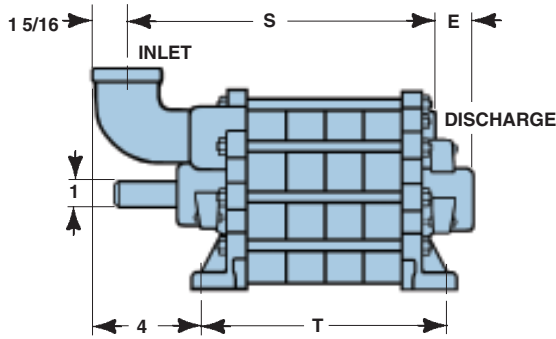
STANDARD MATERIALS

PART	BRONZE FITTED	ALL IRON	BRONZE RING	ALL BRONZE	STAINLESS STEEL
Cover	Cast Iron ASTM A48	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62	Stainless Steel AISI 316
Seal Cup	Cast Iron ASTM A48	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62	Stainless Steel AISI 316
Bearing Arm	Cast Iron ASTM A48	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62	Stainless Steel AISI 316
Channel Ring	Cast Iron ASTM A48	Cast Iron ASTM A48	Bronze ASTM B62	Bronze ASTM B62	Stainless Steel AISI 316
Impeller	Bronze ASTM B62	Carbon Steel	Bronze ASTM B62	Bronze ASTM B62	Stainless Steel Waukesha 88
Shaft	Stainless Steel AISI 416	Stainless Steel AISI 416	Stainless Steel AISI 416	Stainless Steel AISI 316	Stainless Steel AISI 316
"O"Rings	Buna N	Buna N	Buna N	Buna N	Viton A
Seals	EPR/Ceramic	EPR/Ni-Resist	EPR/Ni-Resist	Buna/Ceramic	Viton/Ceramic
Ball bearing	#206	#206	#206	#206	#206

LIMITATIONS

Discharge Pressure	500 PSI
Seal Pressure*	200 PSI
Suction Pressure (Min.)	26" Hg Vac.
Speed	1750 RPM
Horsepower	60 HP
Temperature	
Standard Construction	-20°F
Ceramic Seal Seat - Water	230°F
Silicon Carbide Seal Seat & External Seal Flush	250°F
*Suction Pressure Plus a Percentage of Differential Pressure	

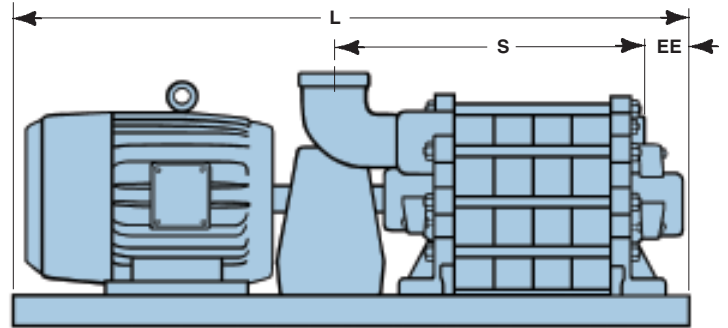
Dimensions



PUMP ONLY

PUMP SERIES	A	B	E	F	S	T
151 • 161	2	2	1 7/16	11	10 1/8	7
152 • 162	2	2	1 7/16	11	12 1/8	9
153 • 163	2	2	1 7/16	11	14 1/8	11
154 • 164	2	2	1 7/16	11	16 1/8	13
171	2 1/2	2 1/2	1 5/16	11 1/2	12 1/2	9
172	2 1/2	2 1/2	1 5/16	11 1/2	16 1/2	13
173	2 1/2	2 1/2	1 5/16	11 1/2	20 1/2	17
174	2 1/2	2 1/2	1 5/16	11 1/2	24 1/2	21

ROTATION: Clockwise when viewed from driver end.



150 • 160 SERIES

ALL 150 • 160 MODELS		MODEL 151 • 161			MODEL 152 • 162			MODEL 153 • 163			MODEL 154 • 164			
FRAME	CPLG	EE	D	HD	F	L	W	S	L	W	S	L	W	S
143T	4J	2 1/4	5 1/4	12 1/2	11	28	12	10 1/8	30	12	12 1/8	32	12	14 1/8
145T	4J	2 1/4	5 1/4	12 1/2	11	28	12	10 1/8	30	12	12 1/8	32	12	14 1/8
182T	5J	2 1/4	5 1/4	12 1/2	11	30	12	10 1/8	32	12	12 1/8	35	12	14 1/8
184T	5J	2 1/4	5 1/4	12 1/2	11	30	12	10 1/8	32	12	12 1/8	35	12	14 1/8
213T	6J	2 1/4	5 1/4	12 1/2	11	35	12	10 1/8	35	12	12 1/8	40	12	14 1/8
215T	6J	2 1/4	5 1/4	12 1/2	11	35	12	10 1/8	35	12	12 1/8	40	12	14 1/8
254T	7S	2 1/4	6 1/4	13 1/2	12	40	15	10 1/8	40	15	12 1/8	45	15	14 1/8
256T	8S	2 1/4	6 1/4	13 1/2	12	40	15	10 1/8	40	15	12 1/8	45	15	14 1/8
284T	8S	2 1/4	7	14 1/4	12 3/4	40	15	10 1/8	45	15	12 1/8	45	15	14 1/8
286T	8S	2 1/4	7	14 1/4	12 3/4	40	15	10 1/8	45	15	12 1/8	45	15	14 1/8
324T	8S	2 1/4	8	15 1/4	13 3/4	45	18	10 1/8	45	18	12 1/8	50	18	14 1/8
326T	8S	2 1/4	8	15 1/4	13 3/4	45	18	10 1/8	45	18	12 1/8	50	18	14 1/8
364T	8S	2 1/4	9	16 1/4	14 3/4	50	18	10 1/8	50	18	12 1/8	50	18	14 1/8

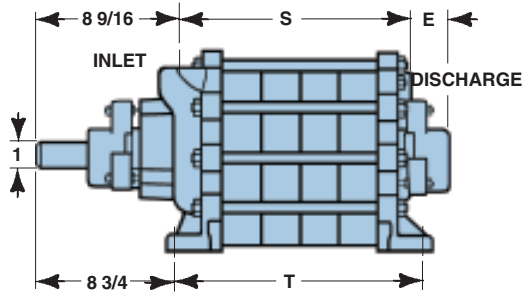
170 SERIES

ALL 170 MODELS		MODEL 171			MODEL 172			MODEL 173			MODEL 174			
FRAME	CPLG	EE	D	HD	F	L	W	S	L	W	S	L	W	S
143T	4J	2 1/8	5 1/4	13 1/4	11	30	12	12 1/2	33	12	16 1/2	40	12	20 1/2
145T	4J	2 1/8	5 1/4	13 1/4	11	30	12	12 1/2	33	12	16 1/2	40	12	20 1/2
182T	5J	2 1/8	5 1/4	13 1/4	11	32	12	12 1/2	38	12	16 1/2	40	12	20 1/2
184T	5J	2 1/8	5 1/4	13 1/4	11	32	12	12 1/2	38	12	16 1/2	40	12	20 1/2
213T	6J	2 1/8	5 1/4	13 1/4	11	35	12	12 1/2	40	12	16 1/2	45	12	20 1/2
215T	6J	2 1/8	5 1/4	13 1/4	11	35	12	12 1/2	40	12	16 1/2	45	12	20 1/2
254T	7S	2 1/8	6 1/4	14 1/4	12	40	15	12 1/2	45	15	16 1/2	50	15	20 1/2
256T	8S	2 1/8	6 1/4	14 1/4	12	40	15	12 1/2	45	15	16 1/2	50	15	20 1/2
284T	8S	2 1/8	7	15	12 3/4	45	15	12 1/2	45	15	16 1/2	50	15	20 1/2
286T	8S	2 1/8	7	15	12 3/4	45	15	12 1/2	45	15	16 1/2	50	15	20 1/2
324T	8S	2 1/8	8	16	13 3/4	45	18	12 1/2	50	18	16 1/2	55	18	20 1/2
326T	8S	2 1/8	8	16	13 3/4	45	18	12 1/2	50	18	16 1/2	55	18	20 1/2
364T	8S	2 1/8	9	17	14 3/4	50	18	12 1/2	50	18	16 1/2	55	18	20 1/2

All dimensions in inches. May vary ± 1/4 inches.

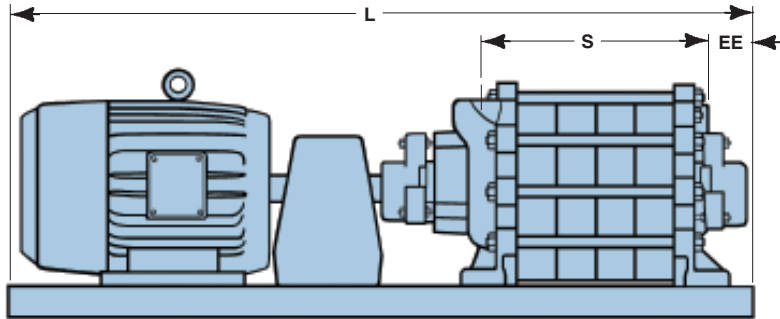
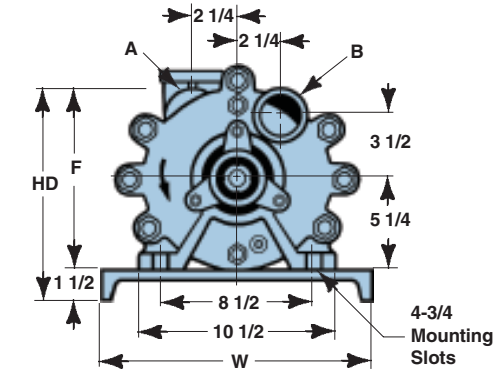
Dimensions

PUMP ONLY



PUMP SERIES	A	B	E	F	S	T
251 • 261	2 1/2	2	1 1/2	10 1/4	8	7
252 • 262	2 1/2	2	1 1/2	10 1/4	10	9
253 • 263	2 1/2	2	1 1/2	10 1/4	12	11
254 • 264	2 1/2	2	1 1/2	10 1/4	14	13
271	2 1/2	2 1/2	1 1/4	10 1/4	10	9
272	2 1/2	2 1/2	1 1/4	10 1/4	17	13
273	2 1/2	2 1/2	1 1/4	10 1/4	18	17
274	2 1/2	2 1/2	1 1/4	10 1/4	22	21

ROTATION: Clockwise when viewed from driver end.



250 • 260 SERIES

ALL 250 • 260 MODELS						MODEL 251 • 261			MODEL 252 • 262			MODEL 253 • 263			MODEL 254 • 264		
FRAME	CPLG	EE	D	HD	F	L	W	S	L	W	S	L	W	S	L	W	S
143T	4J	2 1/4	5 1/4	11 3/4	10 1/4	35	12	8	35	12	10	-	-	-	-	-	-
145T	4J	2 1/4	5 1/4	11 3/4	10 1/4	35	12	8	35	12	10	-	-	-	-	-	-
182T	5J	2 1/4	5 1/4	11 3/4	10 1/4	35	12	8	40	12	10	40	12	12	45	12	14
184T	5J	2 1/4	5 1/4	11 3/4	10 1/4	35	12	8	40	12	10	40	12	12	45	12	14
213T	6J	2 1/4	5 1/4	11 3/4	10 1/4	40	12	8	40	12	10	45	12	12	45	12	14
215T	6J	2 1/4	5 1/4	11 3/4	10 1/4	40	12	8	40	12	10	45	12	12	45	12	14
254T	7S	2 1/4	6 1/4	12 3/4	11 1/4	45	15	8	45	15	10	50	15	12	50	15	14
256T	8S	2 1/4	6 1/4	12 3/4	11 1/4	45	15	8	45	15	10	50	15	12	50	15	14
284T	8S	2 1/4	7	13 1/2	12	45	15	8	50	15	10	50	15	12	50	15	14
286T	8S	2 1/4	7	13 1/2	12	45	15	8	50	15	10	50	15	12	50	15	14
324T	8S	2 1/4	8	14 1/2	13	50	18	8	50	18	10	55	18	12	55	18	14
326T	8S	2 1/4	8	14 1/2	13	50	18	8	50	18	10	55	18	12	55	18	14
364T	8S	2 1/4	9	15 1/2	14	50	18	8	50	18	10	55	18	12	55	18	14

270 SERIES

ALL 270 MODELS						MODEL 271			MODEL 272			MODEL 273			MODEL 274		
FRAME	CPLG	EE	D	HD	F	L	W	S	L	W	S	L	W	S	L	W	S
143T	4J	2 1/8	5 1/4	11 3/4	10 1/4	35	12	10	40	12	14	-	-	-	-	-	-
145T	4J	2 1/8	5 1/4	11 3/4	10 1/4	35	12	10	40	12	14	-	-	-	-	-	-
182T	5J	2 1/8	5 1/4	11 3/4	10 1/4	40	12	10	45	12	14	45	12	18	50	12	22
184T	5J	2 1/8	5 1/4	11 3/4	10 1/4	40	12	10	45	12	14	45	12	18	50	12	22
213T	6J	2 1/8	5 1/4	11 3/4	10 1/4	45	12	10	45	12	14	50	12	18	55	12	22
215T	6J	2 1/8	5 1/4	11 3/4	10 1/4	45	12	10	45	12	14	50	12	18	55	12	22
254T	7S	2 1/8	6 1/4	12 3/4	11 1/4	45	15	10	50	15	14	55	15	18	60	15	22
256T	8S	2 1/8	6 1/4	12 3/4	11 1/4	45	15	10	50	15	14	55	15	18	60	15	22
284T	8S	2 1/8	7	13 1/2	12	50	15	10	50	15	14	55	15	18	60	15	22
286T	8S	2 1/8	7	13 1/2	12	50	15	10	50	15	14	55	15	18	60	15	22
324T	8S	2 1/8	8	14 1/2	13	50	18	10	55	18	14	60	18	18	60	18	22
326T	8S	2 1/8	8	14 1/2	13	50	18	10	55	18	14	60	18	18	60	18	22
364T	8S	2 1/8	9	15 1/2	14	50	18	10	55	18	14	60	18	18	60	18	22

All dimensions in inches. May vary ± 1/4 inches.

Design Features

MTH 150 • 250 • 160 • 260 • 170 • 270 Series regenerative turbine pumps are engineered to provide long life, low-maintenance service for low-flow applications involving moderate to high pressures -- such as boiler feed and similar uses. Available in single, two, three, or four stage models, MTH pumps offer these proven design features...

Steep Operating Characteristics. Near-constant deliveries are maintained over wide variations in load.

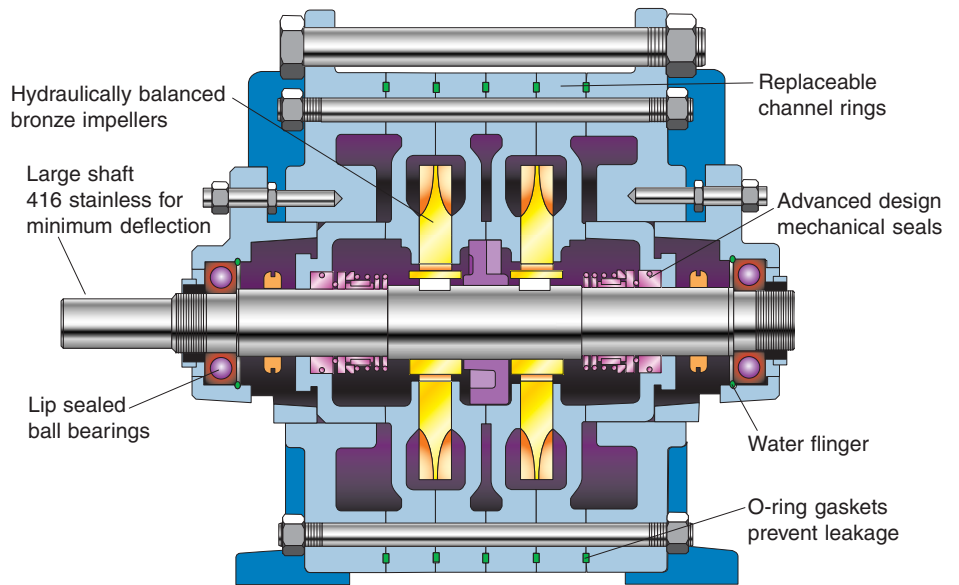
No Vapor Binding. MTH impellers are designed to handle up to 15% vapor in the liquid being pumped.

No Metal to Metal Contact. MTH clearances enable handling of non-lubricating fluids while maintaining adequate heads.

Low Head Requirements. MTH pumps have excellent NPSH characteristics, which makes them ideally suited for difficult applications.

Minimum Shaft Deflection provided by heavy-duty outboard bearing supports on both sides of the impeller.

Balanced Radial Loads. On multi-stage MTH pumps, radial load equalization is designed into the pump.



Standard Pumps Are Bronze Fitted and have hydraulically balanced impellers, one-inch stainless steel shafts, and corrosion-resistant seals throughout.

Mechanical Seals incorporate EPR seals, Ni-resist faces, and stainless steel components. These advanced seals permit elevated-temperature operation even with aggressive fluids.

Lip-Sealed #204 Ball Bearings on both inboard and outboard ends, operate within rugged cast-iron bearing supports and are permanently lubricated for maintenance-free long life.

Replaceable Channel Rings of 30,000 PSI cast iron, and Buna "O" rings at all sealing points, contribute to trouble-free operation

Optional Features

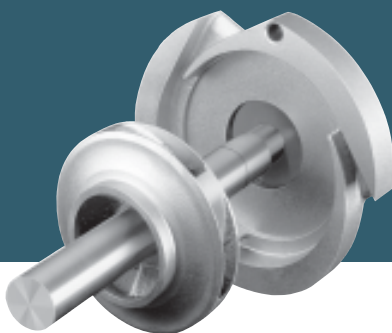
Construction Materials. Bronze fitted, all iron, all bronze and 316 stainless steel are available as stock materials.

"O" Ring Gaskets. Buna, EPR, viton, neoprene or teflon are all available.

Mechanical Seals. Buna, EPR, viton, Neoprene or teflon elastomers, tungsten or silicone carbide seats and balanced or double seal arrangements are all available.

External Water Seal Connection. Tapped openings can be provided for seal flushing from an external source.

200 Series Inducer for Low NPSH



The 200 Series inducer style pumps are ideally suited to applications where available NPSH at the pump inlet is limited, such as boiler feed water deaerator service.

A centrifugal Francis vane impeller with low NPSH characteristics is utilized as the pump's first stage impeller, accounting for the lower inlet head requirement.

This first stage impeller is used in conjunction with a multi-vane diffuser to provide the NPSH required by the second stage regenerative turbine.

Available NPSH as low as two feet can be effectively handled with 250 • 260 • 270 Series pumps, depending on the pump model and capacity.

Selection Chart

HEAD IN FEET	U.S. GALLONS PER MINUTE													
	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP	Model HP
50	*	*	151L 2	161D 2	161E 3	161E 3	161G 3	161G 3	171H 5	171H 5	171J 5	171J 5	171K 5	171K 5
100	*	*	151L 2	151K 3	161E 5	161F 5	161G 5	171H 5	171H 5	171J 7.5	171K 7.5	171K 7.5	172K 10	173K 15
150	*	*	161D 3	161E 5	161F 5	161G 7.5	171H 7.5	171J 7.5	171K 10	171K 10	172J 10	172K 15	173K 15	174K 15
200	*	151L 3	161D 5	161E 7.5	161G 7.5	171H 10	171J 10	171K 10	172H 10	172J 15	172K 15	173K 15	173K 15	
250	*	151L 5	151K 5	152K 7.5	161G 10	162G 10	163G 15	172H 15	172J 15	172K 15	172K 15	173K 20	173K 20	
300	*	151L 5	151L 7.5	162E 10	162F 10	162G 15	172H 15	172J 15	172K 20	172K 20	173K 20	174K 20		
350	*	161D 7.5	162D 7.5	162E 10	162G 15	172H 15	172J 20	172K 20	173J 20	173K 25	174K 25			
400	*	151L 10	162D 10	162E 15	162G 15	172H 20	172J 20	172K 20	173J 20	173K 25	174K 25			
450	151L 7.5	152L 7.5	152K 10	162F 15	162G 15	172J 20	173H 20	173J 25	173K 25	174K 30				
500	151L 7.5	152L 7.5	163D 10	163E 15	163G 20	164G 20	173J 25	174J 25	174K 30	174K 30				
550	161D 10	162D 10	162E 15	163E 15	163G 20	164G 20	173J 25	173K 30	174K 30					
600	161D 10	162D 10	152L 15	162G 20	163G 20	164G 25	173K 30	174J 30	174K 30					
700	152L 10	162D 15	163E 20	164E 20	164G 25	174H 30	174J 40	174K 40						
800	152L 10	163D 15	163E 20	164F 25	164G 30	174J 40								
900	152L 15	163D 15	164E 25	164G 30	174J 40									
1000	152L 15	163D 20	164E 25	164G 40										
1100	153L 20	164D 20	154L 30											

Selections based on coldwater flooded suction 1.0 S.G. Open Dripproof Motor. Consult individual pump curve for final selection. *Refer to 140 • 240 • 180 • 280 Series Bulletin.

Engineering Specifications

150 • 160 • 170 Series

The contractor shall furnish (and install as shown on the plans) an MTH Turboflex regenerative type pump model _____ size _____ of (BRONZE FITTED) (BRONZE RING) (ALL IRON) (ALL BRONZE) (316 STAINLESS STEEL) construction. Each pump shall have a capacity of _____ GPM when operating at a total head of _____ feet at the specified temperature, viscosity, specific gravity, and with _____ feet NPSHA. The maximum speed shall not exceed 1750 RPM. Pump shall be of the vertically split case design with removable bearing housings and is to be furnished with mechanical seals. The channel rings shall be replaceable external type. The suction connection shall be _____" NPT located in the top vertical position and be cast separately from the discharge. The discharge shall be _____" NPT in the top horizontal position and the pump shall be self-venting. The impeller(s) shall be located on a stainless steel shaft between sealed grease lubricated ball bearings. The impeller(s) shall be hydraulically self positioning with no external adjustment necessary. Each pump shall be tested at the specified capacity and head prior to shipment. The pump shall be mounted on a

steel baseplate, flexibly coupled with aluminum guard to a _____HP _____phase _____Hertz _____volt _____RPM horizontal (DRIP-PROOF) (TOTALY ENCLOSED) (EXPLOSION PROOF) motor. The motor is to be sized to prevent overloading at the highest head condition listed in the specification.

250 • 260 • 270 Series

The contractor shall furnish (and install as shown on the plans) an MTH Turboflex low NPSH inducer style regenerative type pump model _____ size _____ of (BRONZE FITTED) (BRONZE RING) (ALL IRON) (ALL BRONZE) (316 STAINLESS STEEL) construction. Each pump shall have a capacity of _____GPM when operating at a total head of _____feet at the specified temperature, viscosity, specific gravity, and with _____feet NPSHA. The maximum speed shall not exceed 1750 RPM. Pump shall be low NPSHR inducer style design with a centrifugal Francis vane design impeller and a multi-vane diffuser for balancing radial loads. Pump shall be of the vertically split case design with removable bearing housings and is to be furnished with mechanical seals. The channel rings shall be replaceable external type. The suction

connection shall be _____" NPT located in the top vertical position and be cast separately from the discharge. The discharge shall be _____" NPT in the top horizontal position and the pump shall be self-venting. The impeller(s) shall be located on a stainless steel shaft between sealed grease lubricated ball bearings. The impeller(s) shall be hydraulically self positioning with no external adjustment necessary. Each pump shall be tested at the specified capacity and head prior to shipment. The pump shall be mounted on a steel baseplate, flexibly coupled with aluminum guard to a _____HP _____phase _____Hertz _____volt _____RPM horizontal (DRIP-PROOF) (TOTALY ENCLOSED) (EXPLOSION PROOF) motor. The motor is to be sized to prevent overloading at the highest head condition listed in the specification.



MTH PUMPS

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