

A RUTHMAN COMPANY

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Molten Metal Pumps

Installation, Operation & Maintenance Manual

MAINTENANCE • INSTALLATION • OPERATIONS

Installation Manual

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PUMP SAFETY TIPS

SAFETY APPAREL

- Insulated work gloves when handling hot bearings or using bearing heater
- Heavy work gloves when handling parts that have sharp edges, especially impellers
- Safety glasses (with side shields) to protect eyes, especially in machine shop areas
- Steel-toed shoes to protect feet when handling parts, heavy tools, etc.
- Any other equipment needed to protect against hazardous/toxic fluids

COUPLING GUARDS

- Never operate a pump without coupling guards properly installed

FLANGED CONNECTIONS

- Never force piping to make connection with a pump
- Use only fasteners of proper size and material
- Ensure there are no missing fasteners
- Beware of corroded or loose fasteners

OPERATION

- Do not operate below minimum rated flow, or with suction/discharge valves closed
- Do not open vent or drain valves, or remove plugs while the system is pressurized

MAINTENANCE SAFETY

- Always lockout power
- Ensure pump is isolated from the system and pressure is relieved before disassembling pump, removing plugs, or disconnecting piping
- Use proper lifting and supporting equipment to prevent serious injury
- Observe proper decontamination procedures
- Know and follow company safety regulations
- Never apply heat to remove impeller

FOREWORD

The design, craftsmanship, and materials used in Gusher pumps provides for optimum performance and long, trouble-free service. As with any mechanical device, proper use and periodic maintenance will enhance the performance and life of your pump. This manual is provided as a guideline for proper installation, operation and maintenance. **THIS MANUAL MUST BE READ AND UNDERSTOOD BEFORE INSTALLING AND OPERATING ANY PUMP.**

GUSHER PUMPS INC. SHALL NOT BE LIABLE FOR PHYSICAL INJURY, DAMAGE OR DELAYS CAUSED BY A FAILURE TO OBSERVE THE INSTRUCTIONS FOR INSTALLATION, OPERATION, AND MAINTENANCE CONTAINED IN THIS MANUAL.

WARRANTY

Gusher Pumps, Inc. will replace or repair, within one year of shipment from our plant, any pump in our judgment that has failed due to defects in materials or workmanship, provided the pump has been properly installed and maintained and has not been subject to abuse. These pumps must return to Gusher Pumps, Inc. with complete history of service for inspection and warranty consideration. Gusher Pumps, Inc. does not accept the responsibility for transportation to and from our plant. Furthermore, we do not assume any responsibility for consequential damage or loss of production.

WARRANTY IS ONLY VALID WHEN GENUINE GUSHER PARTS ARE USED.

Supervision by an authorized Gusher representative is recommended to ensure proper installation.

Additional manuals can be obtained by contacting your local Gusher representative or by calling (606) 824-5001.

PRECAUTIONS

!Warning!

Personal injury will result if procedures outlined in this manual are not followed.

- **NEVER** apply heat to remove impeller. It may explode due to trapped liquid.
- **NEVER** use heat to disassemble pump. Explosion could occur due to trapped liquid.
- **NEVER** operate pump without coupling guard correctly installed.
- **NEVER** operate pump beyond the rated conditions to which the pump was sold.
- **NEVER** start pump without proper prime (sufficient liquid in pump casing).
- **NEVER** operate pump below recommended minimum flow or when dry.
- **ALWAYS** lock out power to the motor before performing pump maintenance.
- **NEVER** operate pump without safety devices installed.
- **NEVER** operate pump with discharge valve closed.
- **NEVER** operate pump with suction valve closed.
- **DO NOT** change conditions of service without approval of an authorized Gusher representative.

NAMEPLATE INFORMATION

On the casing of every Gusher pump is a nameplate that provides information about the pump's hydraulic characteristics. This information will be used when ordering spare or replacement parts for your pump.

Gusher LOW VOLTAGE HIGH VOLTAGE TO REV. NOT INTERCHANGE 00 1 00

MODEL

SERIAL HP

VOLTS

AMP. PH.

R.P.M. CY.

REF IMP.

GPM TDH IN FT.

RECEIVING and INSPECTION

Gusher Pumps, Inc. has taken great care in preparing your pump for shipment, however, due to circumstances beyond our control, your shipment may be received damaged. Therefore, we strongly recommend that you take a few minutes to check your pump upon receipt. Check for cracked, bent, severely misaligned (minor misalignments almost always occur during shipment), or even missing parts. If any such damage has occurred, you must report it to the delivering carrier and Gusher Pumps, Inc. immediately.

We also recommend that you check the model number, horsepower, current characteristics, g.p.m., and ft. head of pump received to ensure that you have received the pump you ordered for your specific operating conditions. If you should find some discrepancy, report it to Gusher at once.

If your pump is not going to be installed within six months, several precautions must be taken;

1. Preservative treatment of bearings and machined surfaces is required.
2. Remove packing on pumps with packed stuffing box, the stuffing box and shaft sleeve must be oil lubricated to also protect against moisture.
3. Units equipped with mechanical seals must also be oil lubricated with an oil can through the NPT port while rotating the shaft by hand.
4. Pump suction and discharge ports must be covered to prevent foreign material from getting into the pump and causing damage when pump is started at a later date.
5. Pump must be stored in a dry location.
6. Rotate pump shaft several times every other month.

OPERATION & MAINTENANCE

• OPERATION

Before starting the pump the reservoir should be filled to the minimum level so as to completely submerge the bottom pump impeller housing in the liquid which assures priming of the pump.

Upon initial start up we recommend that you check and maintain the minimum liquid level in your reservoir, it is also advisable to check your piping for leaks at this time. We also recommend that you check and record the pump discharge pressure, line voltage and amperage being drawn by the motor and operating temperature of the bearings.

Temperature should be checked with a pyrometer, do not check by touch. Temperatures that are hot to the touch are often well within the maximum operating temperature of 225° F.

If a problem develops check the trouble shooting list on page 10. If you are unable to solve your problem please feel free to contact the factory.

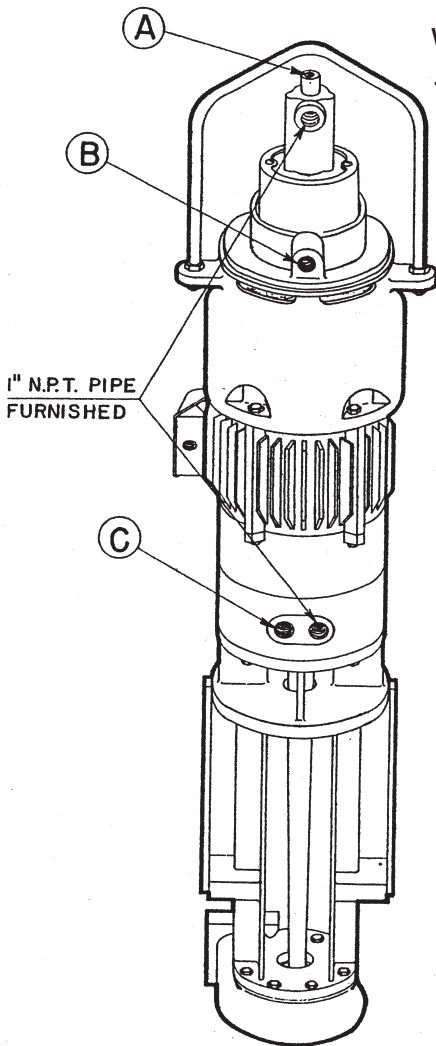
• MAINTENANCE

Normally after proper installation and under normal operating conditions (8 hours daily duty in clean liquid with SG of 1) the pump requires very little attention.

Before shipment all Gusher pumps have been tested and greased at the plant, therefore lubrication is not necessary for approximately six to eight months. Remember, when lubricating ball bearings that too much grease will cause bearings to run hot, so grease bearings sparingly when it is necessary. We recommend the use of Chevron SRI #2 grease.

Because of the vast range of operating conditions it is difficult to recommend one set schedule for periodic maintenance. The more severe the application the more attention the pump will require. When a pump operates in a high temperature application (over 150°F) it is recommended to grease the ball bearings sparingly once a month (approx. 1 gram). In hostile environments where abrasives are present the pump may need to be inspected for wear quarterly. This should include inspection of the impellers, bushings and seals.

WATER COOLING INSTRUCTIONS FOR **GUSHER**[®] 15028XE & XEB MOLTEN METAL PUMPS.



(A) 1/4" N.P.T. WATER INLET

CONNECT WATER SUPPLY FOR COOLING AT THIS POINT **ONLY**. 3 TO 5 G.P.M. SHOULD PROVIDE ADEQUATE CIRCULATION FOR COOLING. CONTROL FLOW BY USE OF VALVE IN WATER SUPPLY LINE **ONLY**. DO NOT CONTROL FLOW OF WATER OUTLET BY USE OF VALVE IN OUTLET PIPING. (C)

(B) 1" SAFETY DRAIN

THE PURPOSE OF THE SAFETY DRAIN IS TO PIPE AWAY ANY POSSIBLE LEAKAGE FROM SEAL OR PACKING WITHIN COOLING SYSTEM.

IT IS IMPORTANT THAT THIS OUTLET BE PIPED SEPARATELY TO DRAIN.

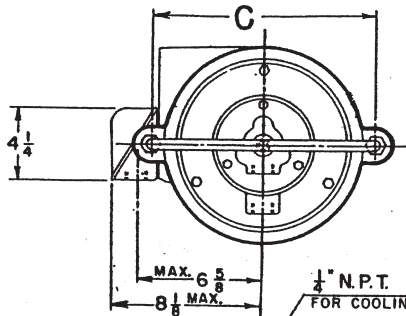
(C) 1" N.P.T. WATER OUTLET

THE WATER OUTLET CARRIES ALL THE WATER WITHIN THE CIRCULATING COOLING SYSTEM. THIS OUTLET SHOULD BE PIPED SEPARATELY TO DRAIN.

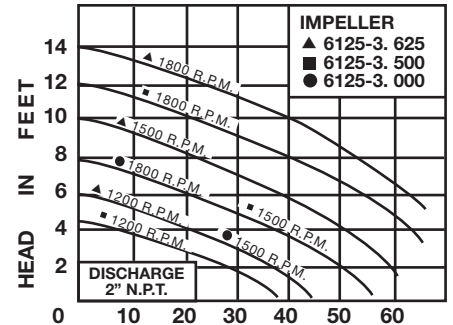
CAUTION: DO NOT USE ANY VALVES IN PIPING FROM OUTLET TO DRAIN.

{ WATER CIRCULATION SHOULD CONTINUE BEFORE AND AFTER CYCLE OF OPERATION OR UNTIL PUMP PARTS HAVE COOLED TO A TEMPERATURE OF 200° F. THIS APPLIES TO BOTH PORTABLE AND PERMANENT INSTALLATIONS.

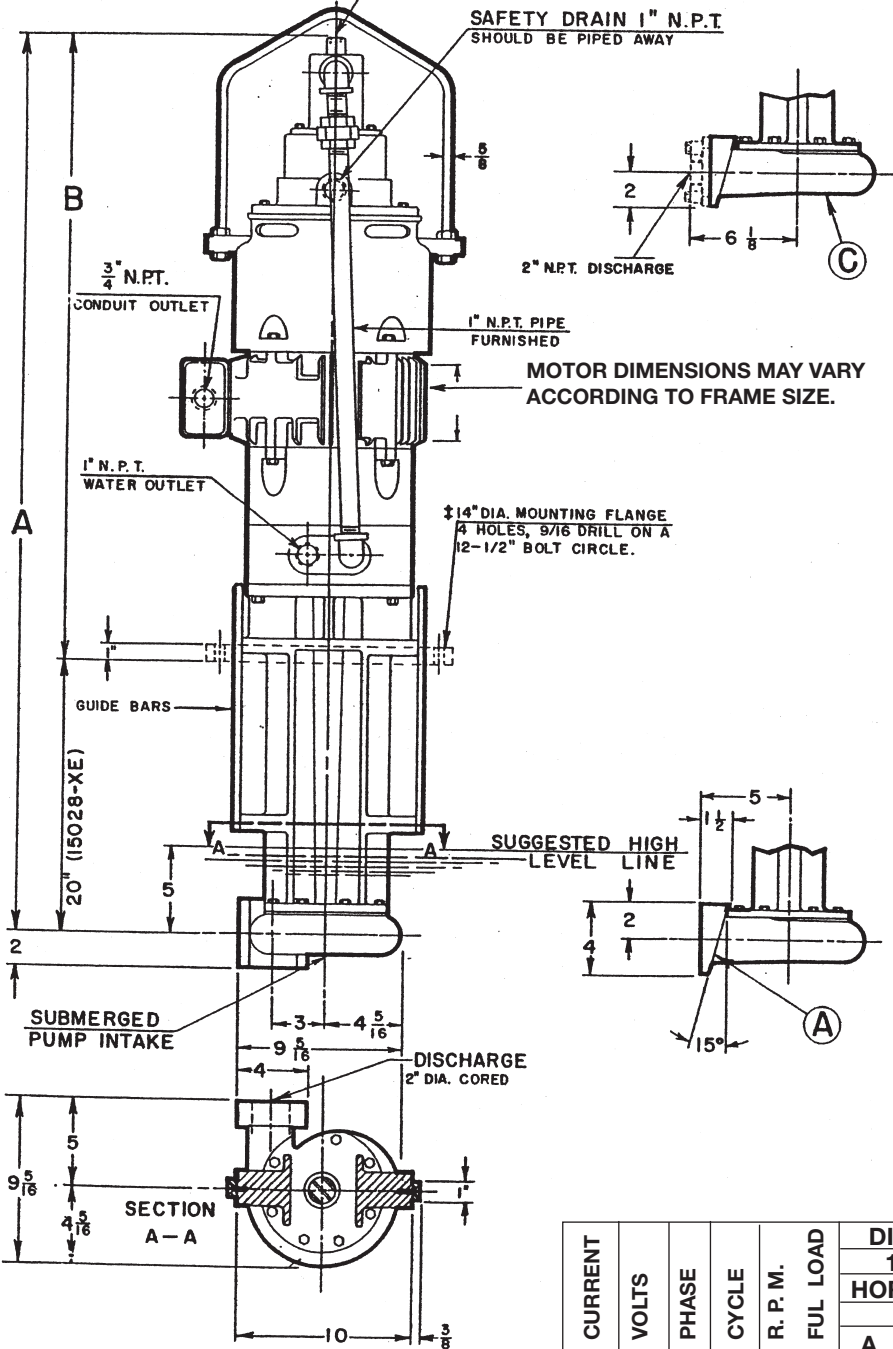
IF THE ABOVE INSTRUCTIONS ARE FOLLOWED, SATISFACTORY RESULTS SHOULD BE OBTAINED. UNLESS THESE INSTRUCTIONS ARE COMPLIED WITH, THE MANUFACTURER IS NOT RESPONSABLE FOR PUMP WARRANTY.



FEATURES
 BALL BEARING T.E.F.C. MOTOR,
 ● WATER COOLED SHAFT, BALL BEARINGS AND MOTOR,
 QUICK MAKE-AND-BREAK SELF-LOCKING WEDGE,
 DISCHARGE CONNECTIONS,
 HANDLES MATERIALS UP TO 1200° FAHRENHEIT.



GALLONS PER MINUTE — TIN AT 850°F.
 HEAD AND G.P.M. MEASURED AT DISCHARGE.
 TO APPROXIMATE CAPACITY IN POUNDS
 AND FOR DIFFERENT WEIGHT MATERIALS. ☉



R.P.M.	H.P.	POUNDS PER GALLON		
		IMPELLER NUMBER		
		6125-3.000	6125-3.500	6125-3.625
1725	7 1/2	—	—	81 to 120
1140	—	—	—	—

MODEL
GUSHER® 15028-XE

MOLTEN METAL PUMP, FOR MOLTEN LEAD, BABBIT, SOLDERS, TIN AND ALLOYS AT TEMPERATURES UP TO 1200° F. FOR SPELTER OR ZINC, RECOMMENDED TEMPERATURE 875° F.

WHEN ORDERING SPECIFY:

- MODEL 15028-E OR 15028-XE
 (IF MOUNTING FLANGE IS DESIRED ADD SUFFIX "MF" TO MODEL DESIRED (15028-EMF OR 15028-XEMF).
- DISCHARGE CONFIGURATIONS:
 (A) MACHINED WEDGE,
 (B) DISCHARGE FLANGE,
- IMPELLER NUMBER.
- MOTOR HORSE POWER AND
- CURRENT CHARACTERISTICS.

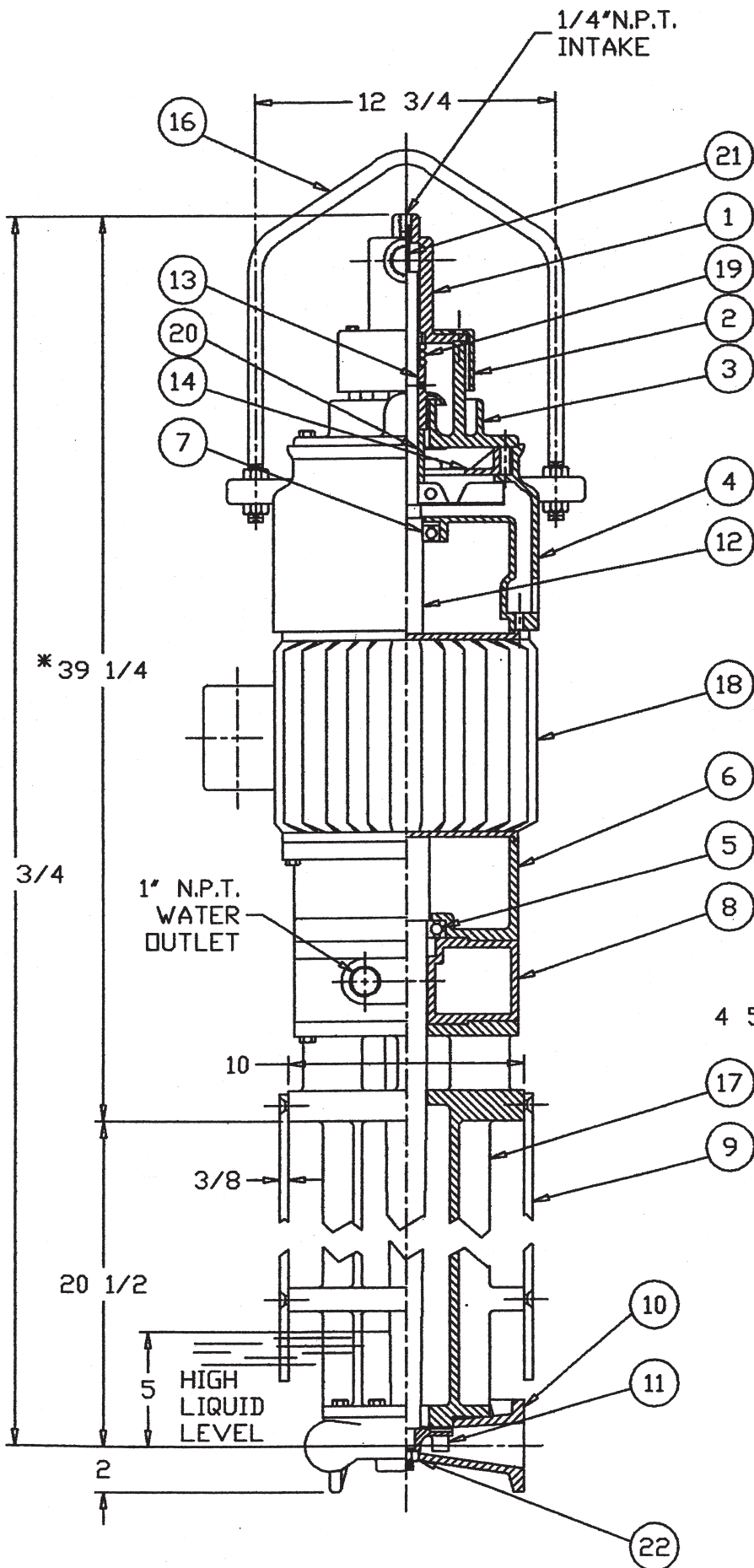
STANDARD MATERIALS:

STAINLESS STEEL SHAFT,
 CAST IRON HOUSING,
 CARBON STEEL SCREWS.

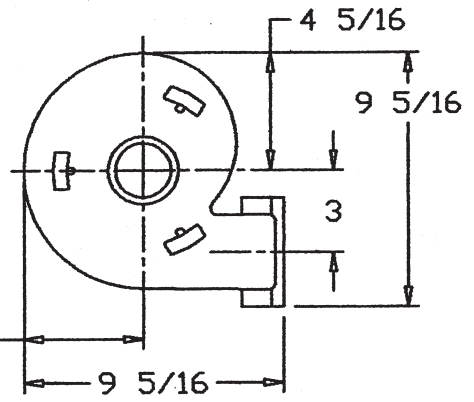
NOTE: OTHER MATERIALS AVAILABLE,
 QUOTATION UPON REQUEST.

- SEE PAGE 7
- ‡ WHEN MOUNTING FLANGE DESIRED, GUIDE BARS ARE REMOVED.
- * SEE PAGE 92 OR

CURRENT	VOLTS	PHASE	CYCLE	R. P. M.	FUL LOAD	DIMENSION		
						15028-XF		
						HORSEPOWER		
						7 1/2		
						A	B	C
A.C.	220 440 OR 550	2 OR 3	60	1140				
			50	950				
			60	1725	*	*		12 3/4
			50	1425				



- 1 SEAL GLAND
- 2 PACKING GLAND COVER
- 3 SEAL HEAD SUPPORT
- 4 UPPER ENDBELL
- 5 #209 BEARING
- 6 LOWER ENDBELL
- 7 #207 BEARING
- 8 LARGE WATER JACKET
- 9 GUILD BARS
- 10 IMPELLER HOUSING
- 11 IMPELLER
- 12 SHAFT
- 13 SLINGER
- 14 BAFFLE
- 16 LIFT LOOP
- 17 STEM
- 18 MOTOR
- 19 MECHANICAL SEAL
- 20 SEAL COLLAR
- 21 .25" BRASS TUBE
- 22 IMP. RETAINING NUT



BOTTOM VIEW OF HOUSING

1" N.P.T. WATER OUTLET

HIGH LIQUID LEVEL

* VARIES WITH MOTOR MANUFACTURER

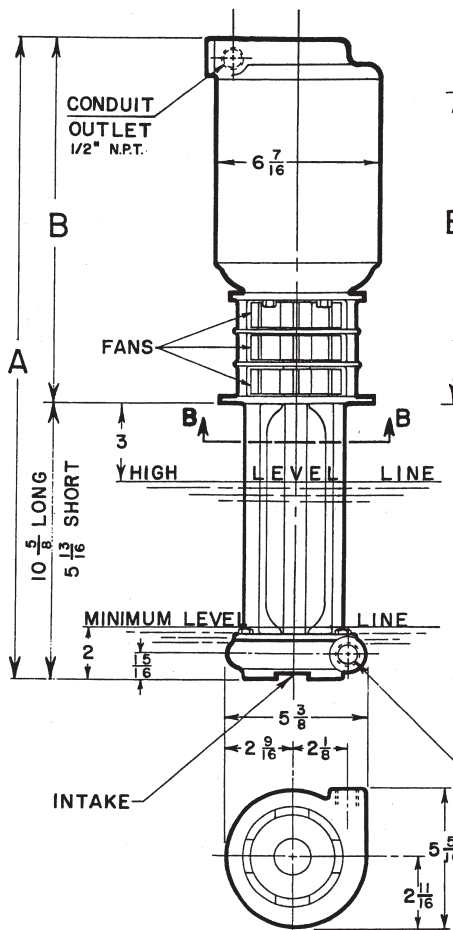
CAN NOT READ THIS	GUSHER PUMPS		
	DIVISION OF RUTHMAN PUMP AND ENGINEERING, INC. RUTHMAN DRIVE-DRY RIDGE, KENTUCKY 41035		
	TITLE 15028-XE 7.5HP 3 PH 1750RPM		
DRAWN BY DINSER	SCALE	MATERIAL	WEIGHT
DATE 8/5/98	REV: 0.1	AK971022-1	

MODEL 9075-M

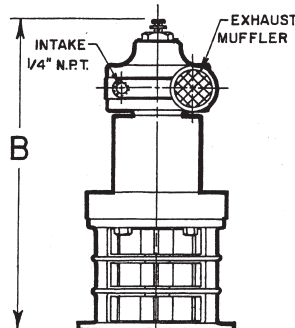
9075M-AM

9075M-BD

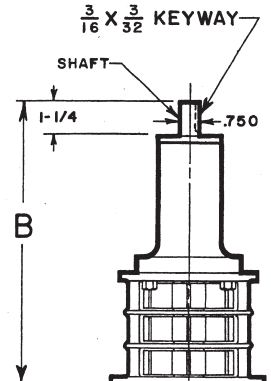
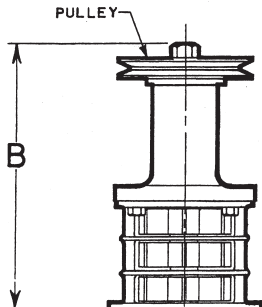
9075M-PD



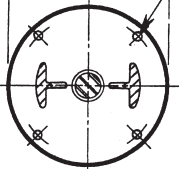
AVAILABLE WITH 4 - AM AIR MOTOR



AVAILABLE WITH 5" OR 7" PITCH DIAMETER PULLEY A SIZE V-BELT.

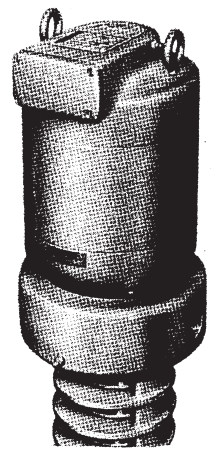


4 HOLES, $\frac{17}{64}$ DRILL, $5 \frac{1}{2}$ B. C.

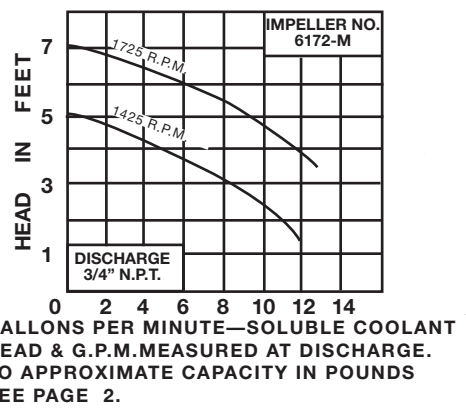


MOUNTING PLATE SECTION B-B

MODELS 9075-M, 9075-MAM, 9075-MBD and 9075-MPD are without water jacket which allows handling of liquids up to 700 F. Models 9075-MW, 9075-MWAM, 9075-MWBD and 9075-MWPD are equipped with a water jacket (as shown in photo) these models will handle liquids up to 800 F.



VOLTS	CYCLE	PHASE	R. P. M.	MODEL	DIMENSION IN INCHES								
					HORSE POWER OF MOTOR								
					A (long)			A (short)			B		
1/4	1/2	3/4	1/4	1/2	3/4	1/4	1/2	3/4	1/4	1/2	3/4		
230 460	60	3	1725	9075-M WITH ELECTRIC MOTOR	23 1/4	24 5/8	24 7/16	18 7/16	19 13/16	19 5/8	12 5/8	14	13 19/16
230 460	60	3	1140	9075-MAM	23 1/4	24 1/8	—	18 7/16	19 5/16	—	12 5/8	13 1/2	—
NOTE: WHEN WATER JACKET IS NEEDED FOR HIGHER TEMPERATURES, ADD 3-1/2" TO A AND B DIMENSIONS.					9075-MAM	23 3/8	—	—	18 9/16	—	12 3/4	—	—
					9075-MBD	21 5/16	—	—	16 1/2	—	10 11/16	—	—
					9075-MPD	21 9/16	—	—	16 3/4	—	10 15/16	—	—



NOTE: 208/ 230/ 460 VOLT 60 CYCLES — 220 / 380 VOLTS 50 CYCLE — 575 VOLTS 60 CYCLE SAME DIMENSIONS AS 230/ 460 VOLTS 60 CYCLE. EXCEPT SINGLE PHASE. (OTHER CURRENT CHARACTERISTICS AVAILABLE).

● MUST BE T. E. F. C.

R.P.M	H.P.	POUNDS PER GALLON	
IMPELLER NUMBER 6172-M			
1725	1/4	1	UP TO 30
		1	UP TO 60
1725	1/2	31	UP TO 80
		61	UP TO 120
1725	3/4	81	UP TO 120

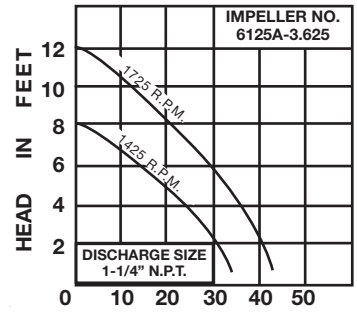
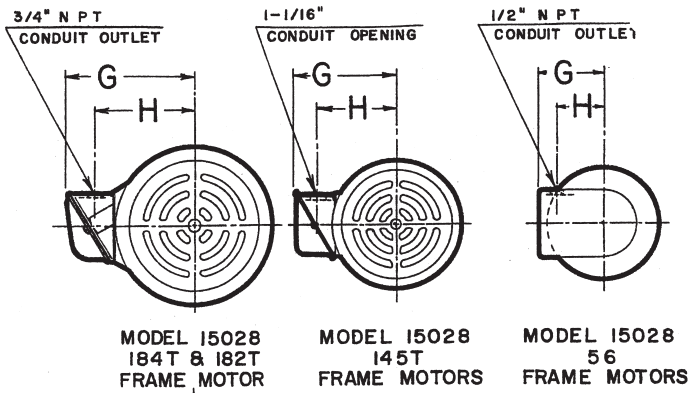
SEE TABLE ON PAGE 2 FOR DIFFERENT WEIGHT MATERIALS.

STANDARD MATERIAL:
STAINLESS STEEL SHAFT,
CAST IRON HOUSING,
CARBON STEEL SCREWS.

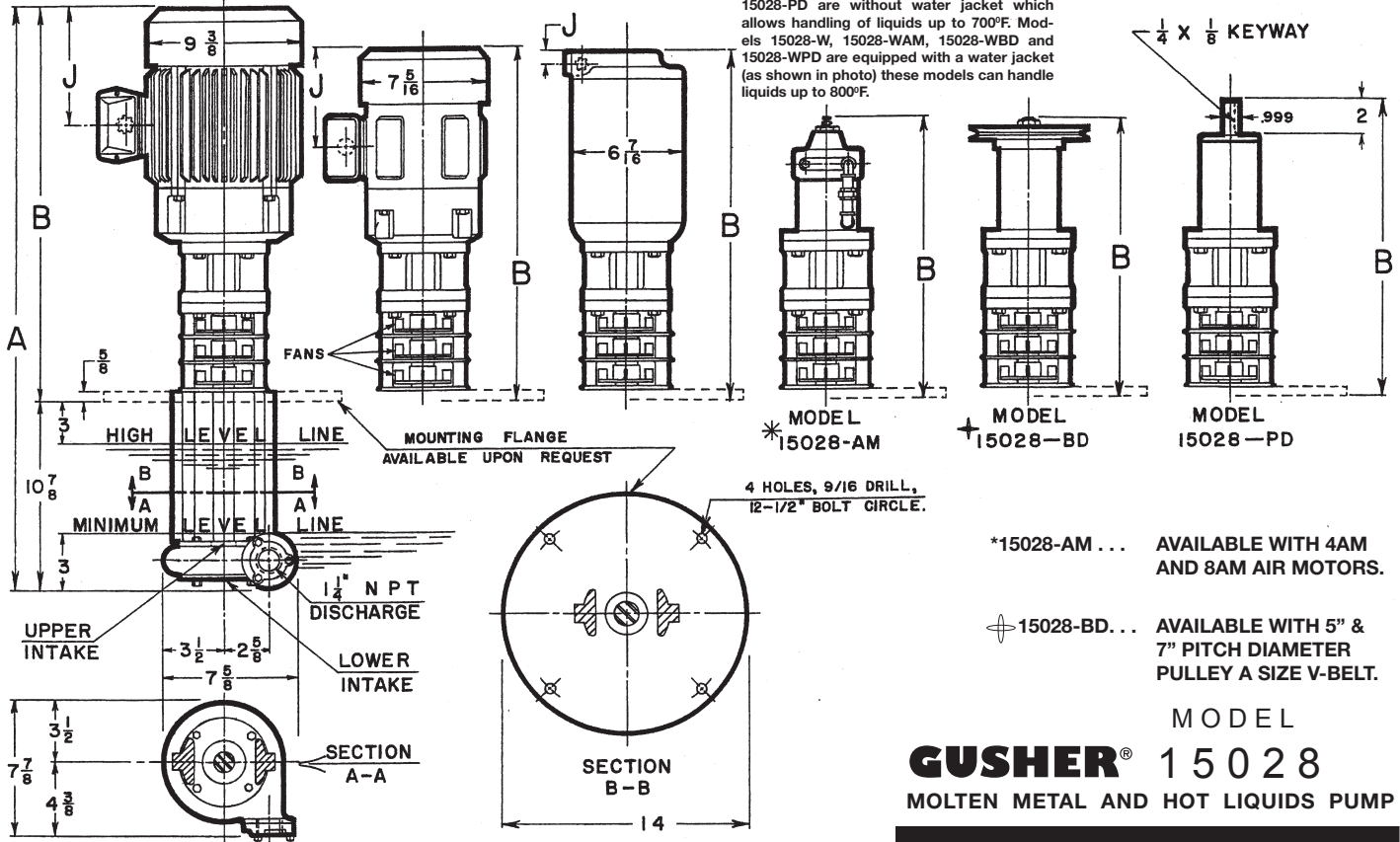
NOTE:
OTHER MATERIALS
AVAILABLE, QUOTATION
UPON REQUEST.

MODEL
GUSHER® 9075 — M
MOLTEN METAL AND HOT LIQUIDS PUMP

- WHEN ORDERING SPECIFY:**
- MODEL 9075-M, 9075-MAM, 9075-MBD, 9075-MPD, 9075-MW, 9075-MWAM, 9075-MWBD, OR 9075-MWPD (SHORT OR LONG)
 - IMPELLER NUMBER,
 - MOTOR HORSE POWER AND
 - CURRENT CHARACTERISTICS.



Models 15028, 15028-AM, 15028-BD and 15028-PD are without water jacket which allows handling of liquids up to 700°F. Models 15028-W, 15028-WAM, 15028-WBD and 15028-WPD are equipped with a water jacket (as shown in photo) these models can handle liquids up to 800°F.



*15028-AM... AVAILABLE WITH 4AM AND 8AM AIR MOTORS.

15028-BD... AVAILABLE WITH 5" & 7" PITCH DIAMETER PULLEY A SIZE V-BELT.

MODEL GUSHER® 15028

MOLTEN METAL AND HOT LIQUIDS PUMP

WHEN ORDERING SPECIFY:

- MODEL 15028, 15028-AM, 15028-BD, 15028-PD, 15028-W, 15028-WAM, 15028-WBD OR 15028-WPD (WHEN MOUNTING FLANGE IS DESIRED ADD SUFFIX "MF" TO MODEL DESIRED (15028-MF, 15028-WMF ECT.).
- IMPELLER NUMBER,
- MOTOR HORSE POWER AND
- CURRENT CHARACTERISTICS.

STANDARD MATERIALS:

STAINLESS STEEL SHAFT,
CAST IRON HOUSING,
CARBON STEEL SCREWS.

NOTE: OTHER MATERIALS AVAILABLE,
QUOTATION UPON REQUEST.

HORSE POWER RECOMMENDED FOR DIFFERENT WEIGHT MATERIALS					
POUNDS PER GALLON OF MATERIAL PUMPED	1 to 20	21 to 40	41 to 50	51 to 80	81 to 120
H.P. RECOMMENDED FOR 1725 R. P. M.	3/4	1-1/2	2	3	5

SEE TABLE ON PAGE 2 FOR DIFFERENT WEIGHT MATERIALS.

HORSE POWER	FRAME	VOLTS	R.P.M.	CYCLE	PHASE	DIMENSIONS					OTHER MEANS OF DRIVING PUMP		
						A	B	G	H	J	A	B	
3/4	56	230 460	1725	60	3	29 1/2	18 5/8	4 5/16	2 5/8	11 1/16	AIR MOTOR 15028-AM,	27 15/16	17 1/16
1 1/2 & 2	145T					32 7/16	2 19/16	5 3/4	4 9/16	6 1/4	4 AM AIR MOTOR	33 15/16	23 7/16
3	182T					32 15/16	22 1/16	7 1/4	5 3/4	6 13/16	8 AM AIR MOTOR	27 1/4	16 3/8
5	184T					33 15/16	23 1/16	7 1/4	5 3/4	7 5/16	BELT DRIVE 15028-BD	28 1/16	17 3/16
▲ ALL "B" DIMENSIONS GO TO BOTTOM OF MOUNTING FLANGE.						PLAIN DRIVE 15028-PD							
■ PUMPS WITH WATER JACKET HAVE THE SAME DIMENSIONS.													

NOTE: 208/ 220/440 VOLTS 50/60 CYCLES — 220/380 VOLTS 50 CYCLES — 550 VOLTS 50/60 CYCLES SAME DIMENSIONS AS 2230/460 VOLTS 60 CYCLES. EXCEPT SINGLE PHASE. OTHER CURRENT CHARACTERISTICS AVAILABLE.

TROUBLE SHOOTING

No liquid delivered

- Pump not primed
- Speed too low *
- Discharge head too high
- Suction line or suction strainer is clogged
- Impeller completely clogged
- Wrong direction of rotation.
- Too much clearance between impeller and intake flange.

Not enough water delivered

- Air leaks in suction or stuffing boxes
- Speed too low *
- Discharge head higher than anticipated
- Too much clearance between impeller and intake flange
- Impeller partially clogged
- Not enough suction head for hot water
- Mechanical defects:
 - Wear ring is worn
 - Impeller damaged
- Impeller diameter is too small
- Foot valve is too small
- Foot valve or suction opening not submerged deep enough

Vibration

- Bent shaft
- Pipe strain
- Impeller clogged
- Coupling alignment off

Not enough pressure

- Speed too low *
- Air in water
- Mechanical defects:
 - Wear ring is worn
 - Impeller damaged
- Impeller diameter too small

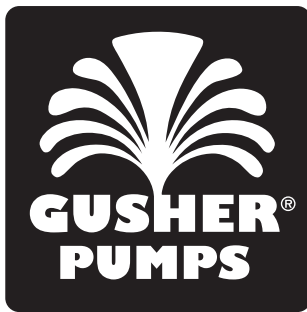
Pump works for a while then loses suction

- Leaky suction line
- Water seal plugged
- Impeller clogged
- Air or gasses in liquid

Pump takes too much power

- Speed too high *
- Head lower than rating, pumps too much water
- Specific gravity or viscosity too high
- Mechanical defects:
 - Shaft bent
 - Power frame in bind
 - Wear ring is worn
- Impeller diameter too large
- Pump delivering too many gallons

* When directly connected to electric motors, check for full voltage across all electrical leads



A RUTHMAN COMPANY

**Gusher Pumps is a Division of
Ruthman Companies
Corporate Headquarters**

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Gusher Pumps of Dry Ridge

22 Ruthman Drive
Dry Ridge, KY 41035
Phone: 859-824-5001
Fax: 859-824-3011
Web: www.gusher.com

Gusher Pumps of Williamstown

115 Industrial Drive
Williamstown, KY 41097
Phone: 859-824-3100
Fax: 859-824-7248
Web: www.gusher.com

Gusher Pumps of Cincinnati

1212 Streng Street
Cincinnati, OH 45233
Phone: 513-559-1901
Fax: 513-559-0035
Web: www.gusher.com

Gusher Pumps of California

8226 Salt Lake Avenue
Cudahy, CA 90201
Phone: 323-773-0847
Fax: 323-773-0958
Email: www.gusherca@aol.com

Gusher Pumps of New Castle

403 North Ninth Street
New Castle, IN 47362
Phone: 765-529-5624
Fax: 765-521-0008
Email: www.gusherpump@insightbb.com

BSM Pump Corp.

180 Frenchtown Road
North Kingstown, RI 02852
Phone: 401-471-6350
Fax: 401-471-6370
Web: www.bsmpump.com

Nagle Pumps

1249 Center Avenue
Chicago Heights, IL 60411
Phone: 708-754-2940
Fax: 708-754-2944
Web: www.naglepumps.com



Ruthman... Another Word for Innovation



It began in 1913, servicing mechanical components of the steamboats on the Ohio River. The company founder, Alois Ruthman, was a man of vision and saw part of the future of the company was in the development of a reliable industrial pump.

In 1924, with the conception of the first vertical ball bearing seal-less centrifugal pump, Ruthman Pump and Engineering furthered the design on a unit with a one piece motor driven shaft. The pump was called "Gusher", giving birth to the trade name Gusher Pumps, and the coining of the term "coolant pump".

Wanting to carry on the tradition of quality and reliability started by his father, Thomas R. Ruthman joined the company in 1949. In the early 1990's Thomas R. Ruthman's son, Thomas G. Ruthman joined the company, continuing this same tradition. Maintaining the reputation of Gusher Pumps by innovation and customer service, the company has grown to service companies worldwide.

Wagner Processing – Bay Area

23510 Bernhardt Street
Hayward, CA 94545
Phone: 510-786-3929
Fax: 510-786-3722
Web: www.wagnerprocess.com

Wagner Processing – Central Valley

3675 N. Wilcox Street #C
Stockton, CA 95215
Phone: 209-931-0100
Fax: 209-931-7910
Web: www.wagnerprocess.com

Great Lakes Pump & Supply Co.

1075 Naughton
Troy, MI 48083
Phone: 248-528-9100
Fax: 248-528-9015
Web: www.greatlakespump.com

Process Systems, Inc.

Michigan, Main Headquarters
23633 Pinewood
Warren, MI 48091
Phone: 586-757-5711
Fax: 586-758-6996
Web: www.INFOatpsi4pumps.com

Indiana
485 N State Route 3431 South
Mellott, IN 47958
Phone: 765-295-2206
Fax: 765-295-2243
Web: www.process-systems-inc.com

Worldwide:

Ruthmann Pumpen

Northberger Strabe 60
Eschweiler Germany D-52249
Phone: +49 (0) 2403 5595 0
Fax: +49 (0) 2403 5595 20
Web: www.ruthmannpumpen.de

Birmingham Pump

Unit 7 Network Park
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