

Padilla, Cherie

From: Terry Scanlan [TScanlan@spfwater.com]
Sent: Tuesday, May 24, 2011 12:12 PM
To: Padilla, Cherie
Cc: rmooney@whitetailclub.com
Subject: RE: Sabala Permit-License Review Questions
Attachments: Sept 5 2000 design letter.pdf

Hi Cherie –

My files indicate that the pump originally used to pump water from Betsey Pond to Whitetail Pond for 63-13704 is a 5 hp Goulds 3888D4 rated to produce 175 gpm at 40 feet total head. The pump was set up on float switches, so that it could cycle as needed. It is the same pump now used to supply the pond recirculating system.

Wells 2 and 7 (65-13751) were originally tied into the pipeline between Betsey Pond pump and Whitetail Lake. That pipeline was 8-inch diameter, and I believe that it was installed in the fall of 2000. Attached is the original “design” of the system that I put together in September 2000. It appears that in approximately 2005, the pipe from Wells 2 and 7 pipe was rerouted into Annie Lake.

With regard to Betsey Lake, my understanding is that the pond is kept full year-round. I don’t know for sure how much the well pump runs, but I suspect it is operated on a daily basis.

Terry

From: Padilla, Cherie [mailto:Cherie.Padilla@idwr.idaho.gov]
Sent: Tuesday, May 24, 2011 11:34 AM
To: Terry Scanlan
Subject: Sabala Permit-License Review Questions

Hi Terry,

I am the agent that is assigned to Sabala’s permits for licensure. I have a couple questions that I hoped you could help me with in order for me to complete my review. The point of diversion for permits 65-13704 and 65-13751 appears to have been at Betsey Pond originally. Can you tell me what the timeline is for the change in system and the capacity of the pump that was used to pump water from Betsey Pond to Whitetail Pond? And any other information you have on the original system would be helpful in my review. And in regard to Betsey Pond, do you have any idea of how often the pump runs in any given year and/or is the pond full year round? I really appreciate any help that you can offer and I look forward to your response.

Sincerely,

*Cherie Padilla, Sr. Water Resource Agent
Idaho Dept of Water Resources
Water Allocation Bureau
322 E. Front Street (Front St. & Broadway Ave)
Mail: PO BOX 322*

*Boise, ID 83720-0098
email: cherie.padilla@idwr.idaho.gov*

*phone: (208) 287-4944
fax: (208) 287-6700*

SCANLAN ENGINEERING

Groundwater and Environmental Engineering

September 5, 2000

Mr. Bob McKenna
M Resorts
P.O. Box 1006
McCall, ID 83638

Subject: Final Pumping Equipment Recommendations for M Resorts Irrigation Wells

Dear Bob:

Following our meeting on Friday, this letter provides final pumping equipment and pipeline recommendations for the golf course irrigation wells.

Pipelines. There are no changes to the approximate pipeline locations in my letter of August 15. Per our discussions with Dan Place on Friday, you plan to use pipe burial depth to provide freeze protection rather than draining the pipe. Also, Dan will install air release and/or air and vacuum valves at high points in the system. Specifically, I recommend a combination valve (3-inch Waterman CR-101) at the high point between Betsey Lake and Whitetail Lake. Air release valves (Waterman 1-inch CAV-6) should be installed at any intermediate highpoints where air might accumulate. I recommend installing at least one air release valve for every 1000 feet of pipe.

Well No. 1 (Betsey Lake) Equipment. After reviewing the elevation and head loss data, I think the best approach will be to install a 5 hp pump at the lake. I have informed Alan Lattimer of this change. He is checking on the best option for supplying power to the pump (single-phase 240-volt or 3-phase 480-volt).

The pump shall be a 5-hp Goulds 3888D4, rated to produce 175 gpm at 40 feet of total head. The pump will be installed in a wet well (square concrete box) connected to the existing pond overflow pipe. The existing screen for the pond overflow will prevent trash and large debris from entering the wet well. The wet well will be located on the downstream side of the pond embankment, and will include a canal gate (Waterman C-11) to allow draining of the box during times when the pump is not operating. The top of the wet well (or overflow pipe near the top of the wet well) should be set approximate 2 to 4 inches above the existing pond overflow box. Other components of the system will be a 4-inch diameter flow meter, 4-inch check valve, and 4-inch gate valve. A drain tap would be installed on the outlet side of the check valve to drain the discharge pipe for winterization.

The pump will be set to operate on float switches, utilizing approximately 2-inches of pond level for cycling purposes. Pump controls can be mounted to the side of the wet well.

Well No. 2 Equipment. The pump at Well No. 2 will be a 10 hp submersible pump (Berkeley 6T150) rated for 170 gpm at 170 feet total head. The pump will be set at a depth of 175 feet on 3-inch column pipe with a column check valve. A 1-inch diameter sounding tube should be provided for water level measurement. The pump will discharge below ground through a pitless adapter. A combination air and vacuum valve (2-inch Waterman CR-101) valve shall be provided at the high point of the discharge. Other components include a pressure gage, 4-inch gate valve, 4-inch check valve, and 4-inch flow meter. These components can be installed in a vault or small shelter near the well. The pump will be started and stopped manually. Pump electrical controls would be mounted adjacent to the well on unistrut framing or at the meter vault.

Well No. 7 Equipment. The pump at Well No. 7 will be a 15-hp submersible pump (6T200) rated for 225 gpm @ 200 feet total head. The pump will be set at an approximate depth of 240 feet on 4-inch column pipe with a column check valve. A 1-inch diameter sounding tube should be provided for water level measurement. The pump can discharge either above ground through a discharge tee at the top of the casing or below ground through a pitless adapter. A combination air and vacuum valve (2-inch Waterman CR-101) valve shall be provided at the high point of the discharge. Other components include a pressure gage, 4-inch gate valve, 4-inch check valve, and 4-inch flow meter. The pump would be started and stopped manually. These components can be installed in a vault or small shelter near the well. The pump would be started and stopped manually. Pump electrical controls would be mounted adjacent to the well on unistrut framing or at the meter vault.

Responsibilities for Installation

This project will involve three separate contractors working for M Resorts.

Pipeline Contractor. The pipeline contractor (Dan Place) shall install the following.

- 800 feet (+/-) of 4-inch pipe
- 800 feet (+/-) of 6-inch pipe
- 3,000 feet (+/-) of 8-inch pipe
- 3-inch Waterman CR-101 combination air valve
- approximately four 1-inch Waterman CAV-6 air release valves.
- concrete wet well at Betsey Lake with Waterman C-11 canal gate
- miscellaneous fittings as needed

Dan will stub 4-inch buried pipe within 20 feet of each well, and will stub 6-inch buried pipe within 20 feet of the Betsey Lake wet well. Pipe shall have a 125 psi or higher pressure rating.

Electrical Contractor. The electrical contractor (Tri-State Electric, Alan Lattimer, 861-7533 cell) shall be responsible for coordinating for power service with Idaho Power Company. The electrical contractor shall coordinate with the pipeline contractor for installation of conduit, and with the pump contractor for connection of pumps. The electrical contractor shall bring conduit from the panels to the well head or wet well at each pump site. The electrical contractor shall install the following.

- all conduit and wire (except submersible pump cable)
- 5 hp panel at Betsey Lake pump

- 10 hp panel at Well No. 2
- 15 hp panel at Well No. 7
- meter base(s)
- miscellaneous electrical and motor control equipment.

Pump panels shall be standard pumping plant panels suitable for outdoor installation and mounted on unistrut type framing. The panels shall be equipped with HOA switches.

Pump Contractor. The pump contractor (Dale's Pump, 634-3157, or Interwest Supply, 466-0224) shall install pumps, submersible pump wire, valve vaults, flow meters, valves, and related equipment. The pump contractor shall coordinate with the electrical contractor for final connection of the pumps. All exposed pipe shall be paint-coated or galvanized steel. Buried pipe shall be coal tar coated steel or PVC (Class 200 or Schedule 40). Specific equipment items to be furnished at each site are listed below.

Well No. 2

- Berkeley 6T150 pump with 10-hp 460 volt submersible motor
- submersible motor cable
- 175 feet of 3-inch drop pipe
- 3-inch column check valve
- pitless adapter or pitless unit to fit 6-inch well casing and 3-inch drop pipe
- 175 feet of 1-inch PVC sounding tube
- 4-inch discharge pipe
- pressure gage
- flow meter (Water Specialties ML-03, 4-inch)
- combination air valve (2-inch Waterman CR-101)
- 4-inch gate valve
- 1-inch drain tap
- concrete valve vault with hinged lid

Well No. 7

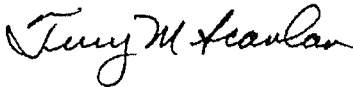
- Berkeley 6T200 pump with 15-hp 460 volt submersible motor
- submersible motor cable
- 250 feet of 4-inch drop pipe
- 4-inch column check valve
- pitless adapter or pitless unit to fit 8-inch well casing and 4-inch drop pipe
- 8-inch well cap (or repair existing well cap)
- 250 feet of 1-inch PVC sounding tube
- 4-inch discharge pipe
- pressure gage
- flow meter (Water Specialties ML-03, 4-inch)
- combination air valve (2-inch Waterman CR-101)
- 4-inch gate valve
- 1-inch drain tap
- concrete valve vault with hinged lid

Betsey Lake Pump

- Goulds 3888D4 submersible sewage pump with 5-hp motor (voltage to be determined)
- 4-inch discharge pipe
- pressure gage
- flow meter (Water Specialties ML-03, 4-inch)
- combination air valve (2-inch Waterman CR-101)
- 4-inch gate valve
- 4-inch check valve (Flowmatic Model 888 or equal)
- 1-inch drain tap
- concrete valve vault with hinged lid

Please contact me to discuss these final recommendations. I will solicit bids and proposed construction schedules from Dale's Pump and Interwest this week.

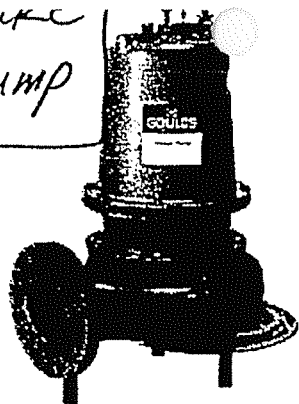
Sincerely,



Terry M. Scanlan

Cc: Dan Place
Alan Lattimer
Interwest Supply
Dale's Pump

Betsey Lake
Outlet pump



Goulds Submersible Sewage Pump

MODEL

3888D4

APPLICATIONS

Used in a variety of residential, commercial and industrial applications such as:

- Sewage systems
- Flood and pollution control
- Dewatering
- Farms
- Hospitals
- Trailer courts
- Motels

SPECIFICATIONS

Pump:

- Solids handling capabilities: 3 1/4" spherical maximum.
- Discharge size: 4" flanged.
- Capacities: up to 550 GPM.
- Total heads: up to 51 feet TDH.
- Mechanical seals: carbon rotary/ceramic stationary 300 series stainless steel metal parts BUNA-N elastomers.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor:

- Single phase: 1 1/2–5 HP, 230 V, 60 Hz, 1750 RPM. Built-in overload with automatic reset on 1 1/2–2 HP. Pilot duty thermal sensors 3 and 5 HP. Over temperature protection must be connected in control panel. Capacitors must be provided in 3 and 5 HP control panel. CP-2 capacitor pak must be used to validate warranty if not using Goulds control panel. Permanent split capacitor type.

- Three phase: 1 1/2–7 1/2 HP, 230/460 V, 60 Hz, 1750 RPM. 200 V models available 1 1/2–5 HP. Overload protection must be provided in starter unit.
- Class B insulation.
- Shaft: 300 series stainless steel keyed design.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard. Single phase – 14/3 STW, 10/3 STW 3 and 5 HP. Three phase – 14/4 STW, 10/4 STW 5 HP, 230 V. Optional lengths available.
- On CSA listed models, 20 foot length SJTW and STW are standard.

FEATURES

- **Impeller:** Cast iron, two vane semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

- **Casing:** Heavy duty cast iron, volute type for maximum efficiency. 4" flange conforms to 125 PSI ANSI standard. Adaptable for A10-40 slide rail system.

- **Dual Mechanical Seals:** Ceramic vs. carbon sealing faces, stainless steel metal parts, BUNA-N elastomers. Upper and lower tandem mounted shaft seals are positioned independently and are separated by an oil-filled chamber. Optional **SILICON CARBIDE OR TUNGSTEN CARBIDE** faced lower seals available.

- **Shaft:** 300 series stainless steel, keyed design.

- **Motor:** Fully submerged in oil-filled chamber. High grade turbine oil surrounds motor for more efficient heat dissipation, permanent lubrication of bearings and mechanical seal for complete protection against outside environment.

- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits and can be operated continuously without damage.

- **Bearings:** Upper and lower heavy duty ball bearings construction for precision positioning of parts and to carry thrust loads.

- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

- **O-Ring:** Assures positive sealing against contaminants and oil leakage.

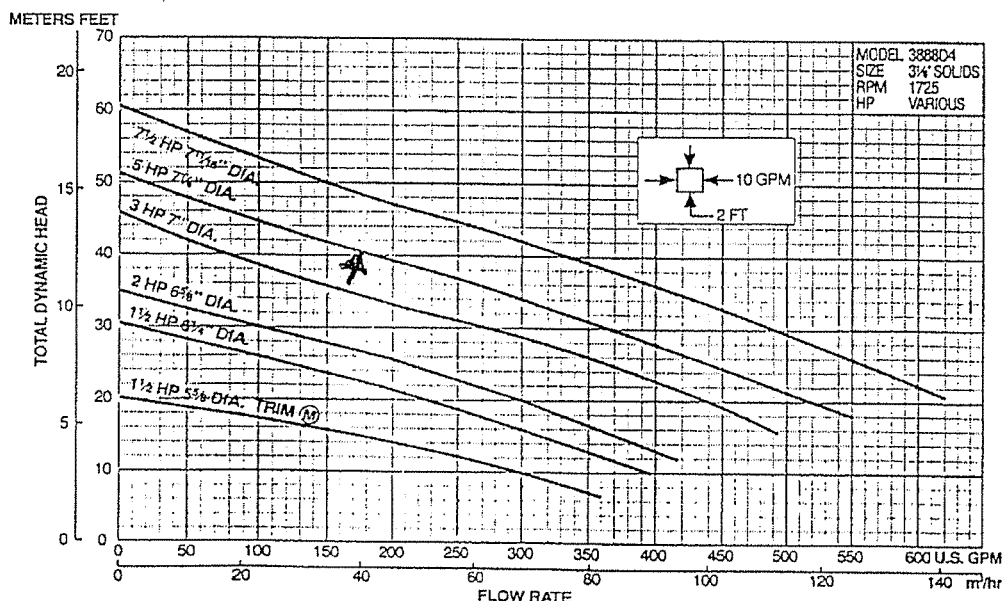
AGENCY LISTINGS



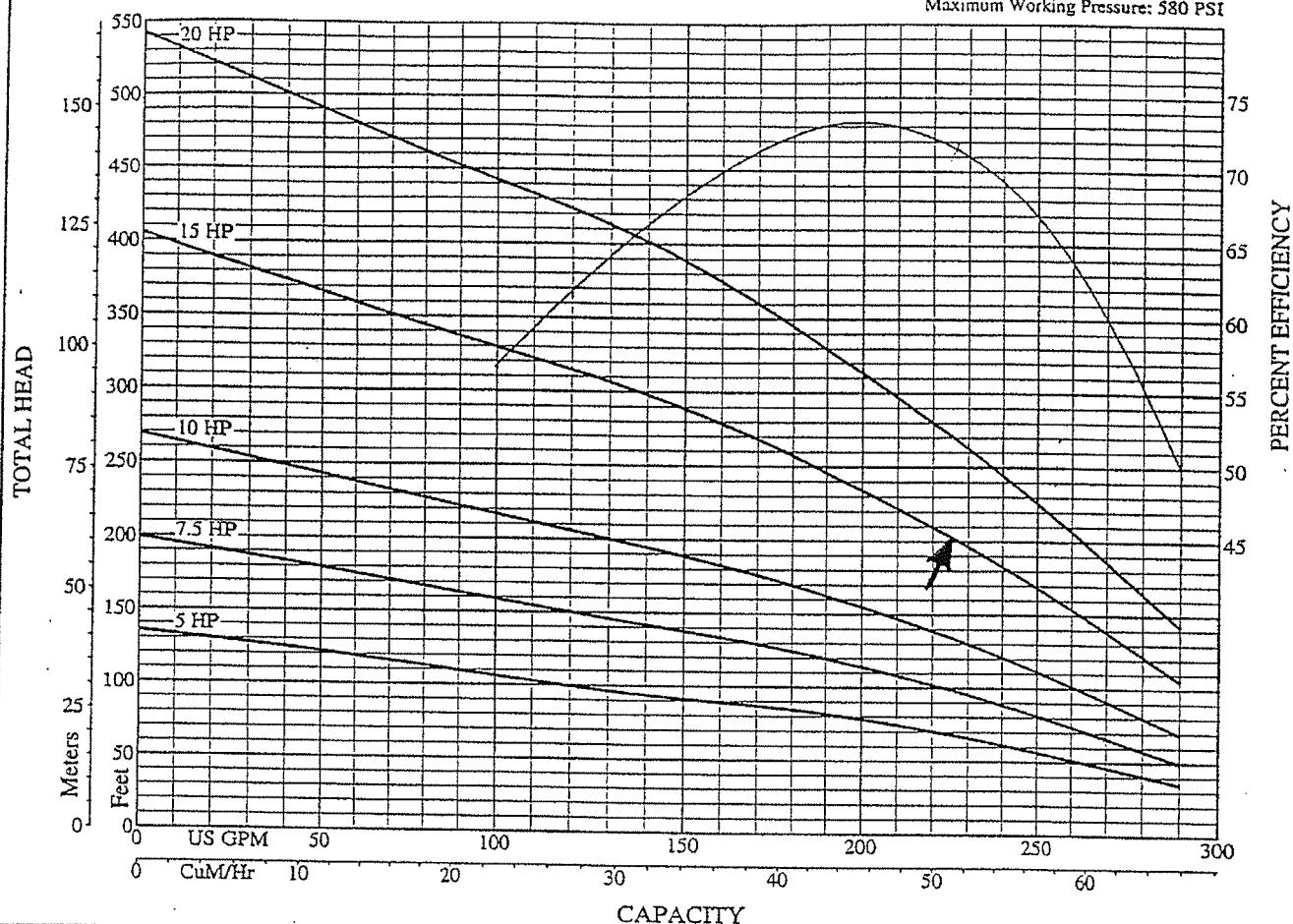
Canadian Standards Association



Underwriters Laboratories



Nominal RPM: 3450
Based on Fresh Water @ 68° F.
Maximum Working Pressure: 580 PSI



OUTLINE DIMENSIONS / WEIGHTS

HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
5	2	6"	23.98	25.44	5.38	105	76
7.5	3	6"	28.98	28.00	5.38	120	95
10	4	6"	33.98	30.56	5.38	135	115
15	6	6"	43.98	33.13	5.38	146	154
20	8	6"	53.98	30.56	5.38	135	193

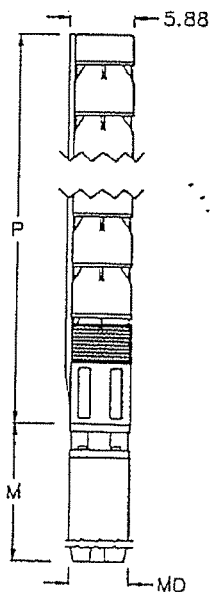
Note: dimensions = inches; weight = U.S. lbs.

M* Maximum length (Franklin Electric Motor)

MD* Motor diameter (Franklin Electric Motor)

SPECIFICATIONS

Minimum Well I.D.	6.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	95 - 290 GPM
Discharge	3" F NPT
See manufacturer's data for motor cooling requirements	



SUPERSEDES

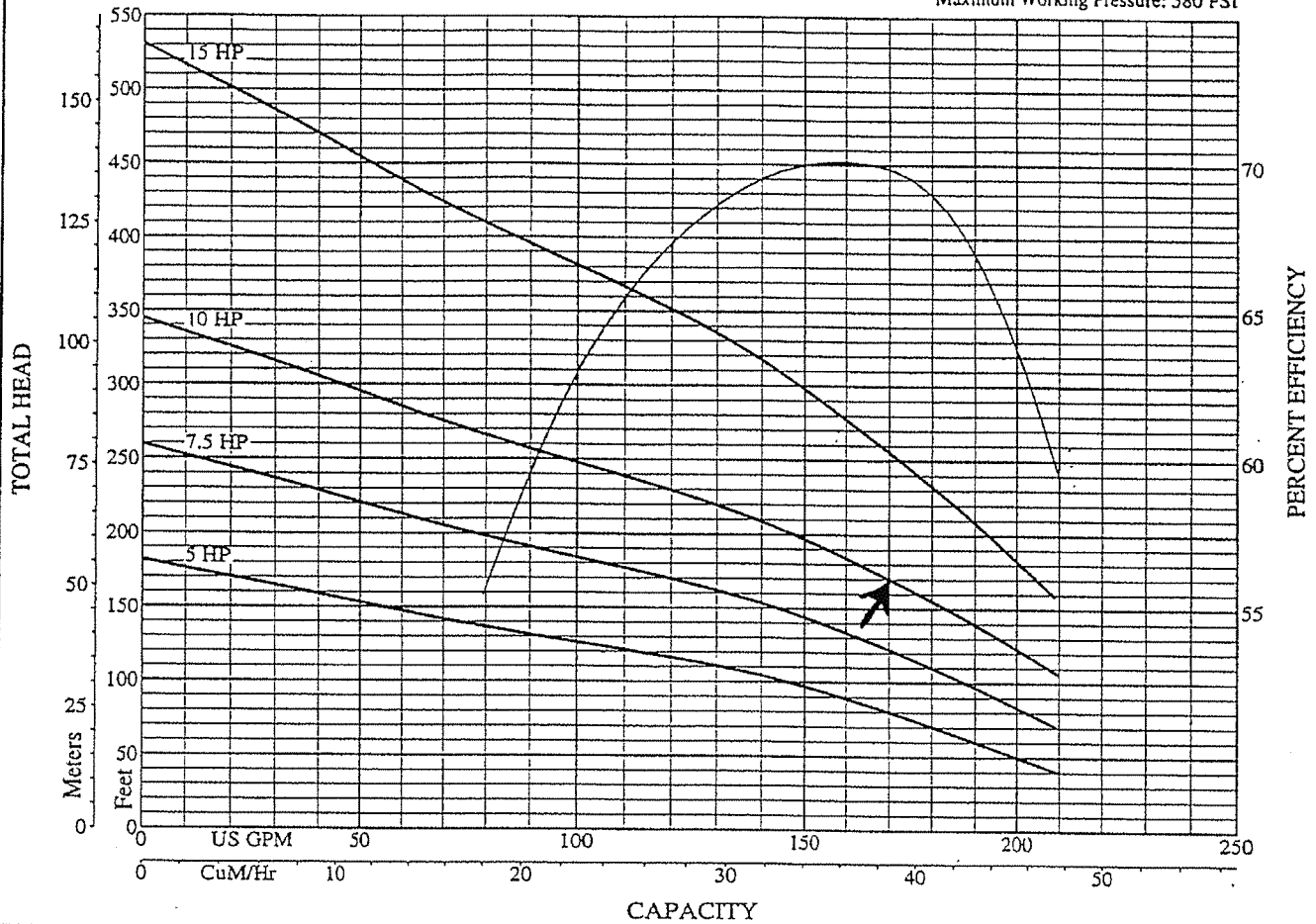
All Previous

Date **04/15/96**

Section **ST**

Page **13.01**

Nominal RPM: 3450
Based on Fresh Water @ 68° F.
Maximum Working Pressure: 580 PSI



OUTLINE DIMENSIONS / WEIGHTS

HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
5	3	6"	28.98	25.44	5.38	105	94
7.5	4	6"	33.98	28.00	5.38	120	113
10	5	6"	38.98	30.56	5.38	135	132
15	8	6"	53.98	33.13	5.38	146	190

Note: dimensions = inches; weight = U.S. lbs.

M* Maximum length (Franklin Electric Motor)

MD* Motor diameter (Franklin Electric Motor)

SPECIFICATIONS

Minimum Well I.D.	6.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	72 - 210 GPM
Discharge	3" F NPT
See manufacturer's data for motor cooling requirements	

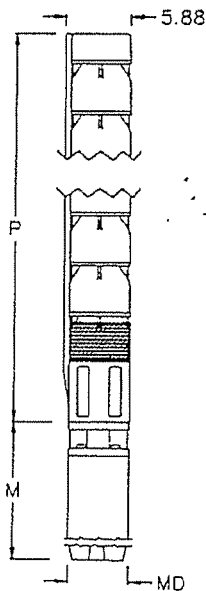
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All Previous

Date **04/15/96**

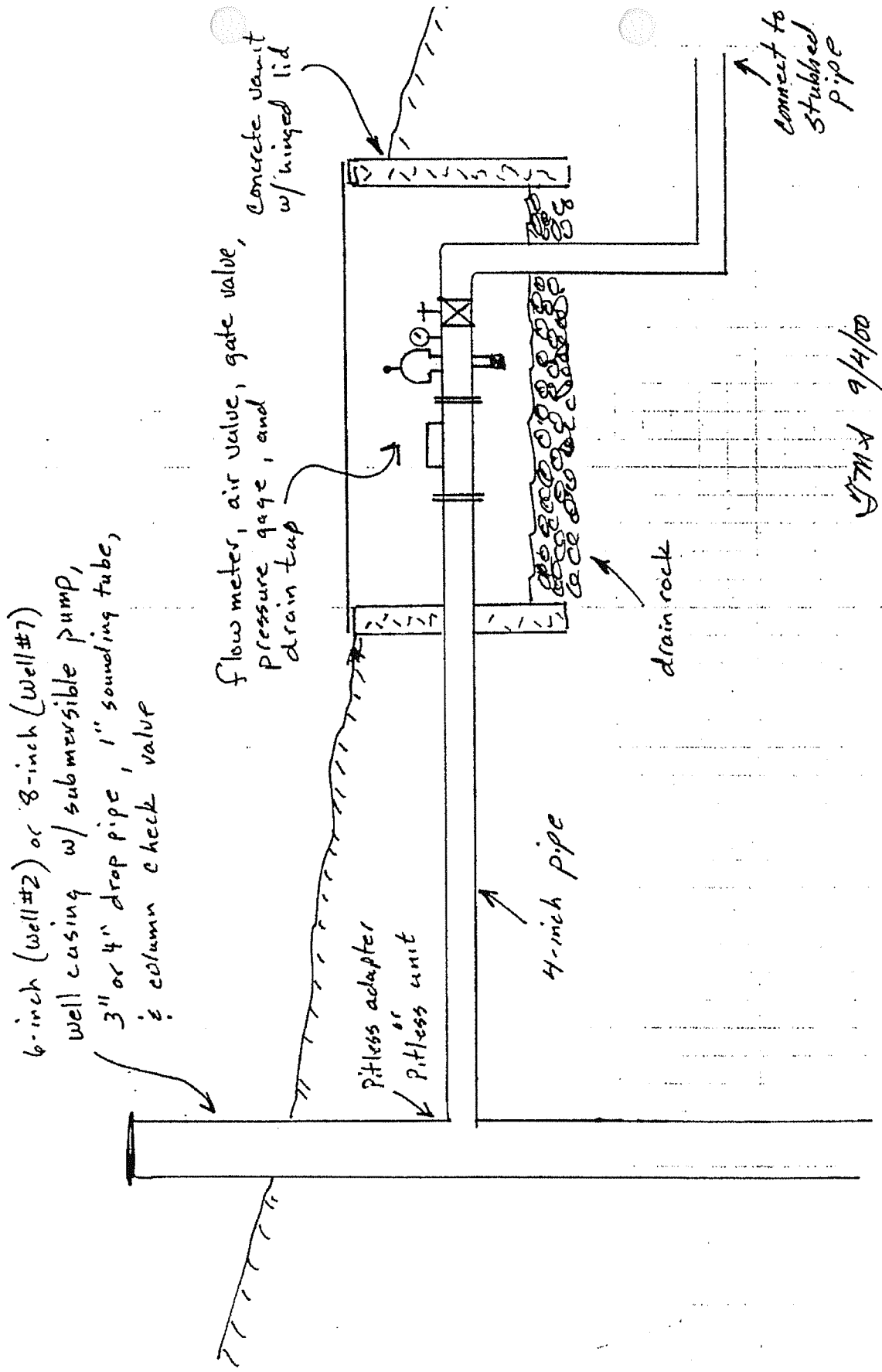
Section **ST**

Page **11.01**



M Resorts Well Nos. 2 and 7 - Discharge Pipe Concept

not to scale

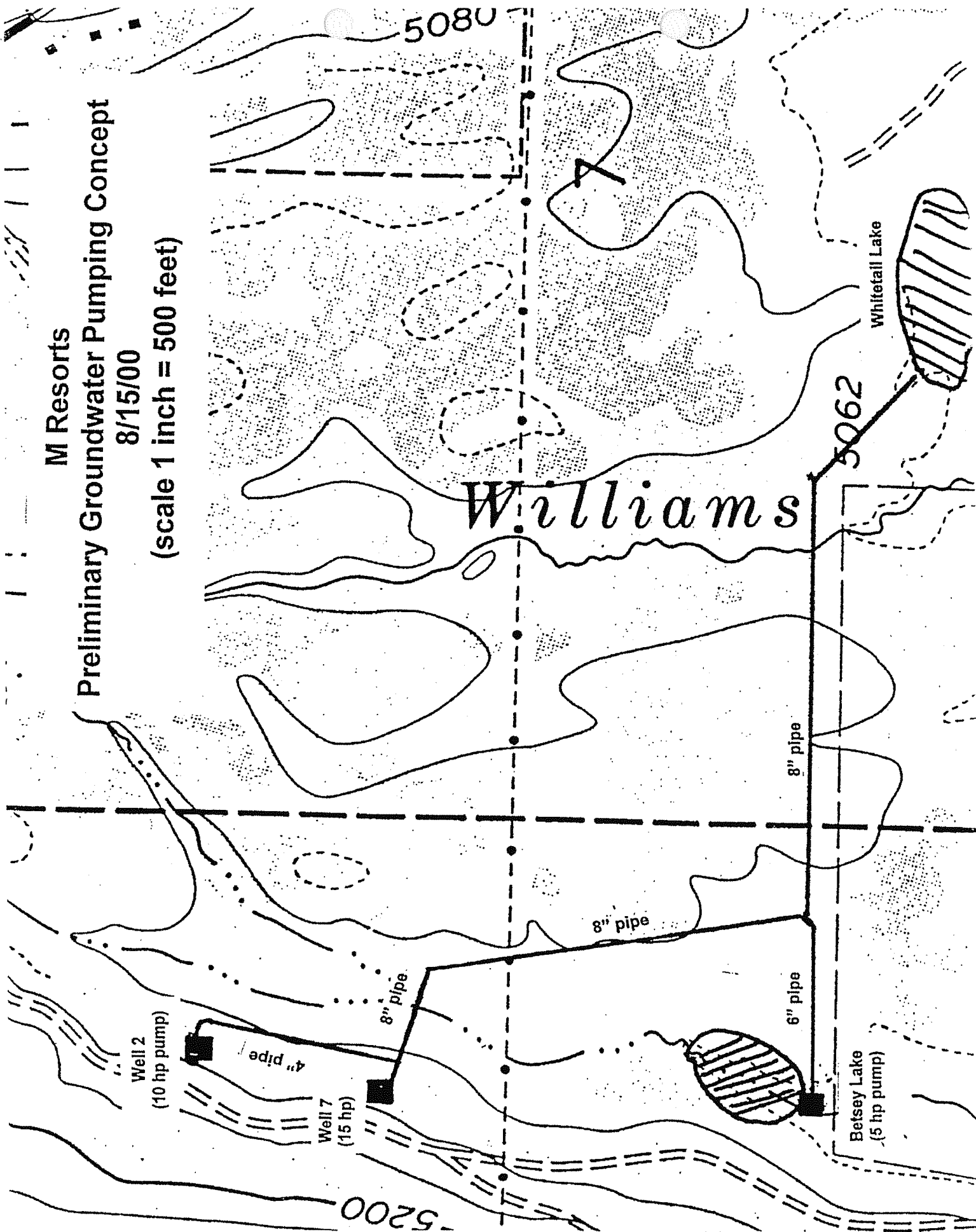


M Resorts

Preliminary Groundwater Pumping Concept

8/15/00

(scale 1 inch = 500 feet)



MODEL CL-11 "SAHARA" LEAK-TIGHT CAST IRON CANAL GATE

- Tapered Slide for Low Friction Leak-Proof Closure
- Seating and Unseating Heads to 10 Feet
- Spigotback for CMP or Flatback for Wall Mounting
- Exclusive Flat Bottom Slide and O-Ring Seat

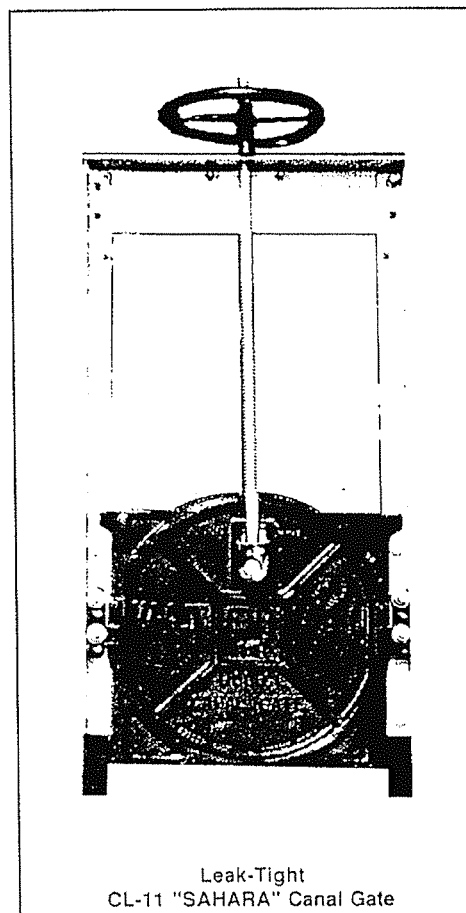
The CL-11 "SAHARA" leak-tight canal gate is designed to fill the need for a canal gate that prevents water loss to the delivery systems of water conscious irrigation districts. The slide is machined on a taper to allow full travel without wearing on the neoprene seat ring. Testing has produced no wear on the seal after 5000 cycles while still maintaining a leak tight seal. Options are the same for the CL-11 as for the C-10.

Materials:

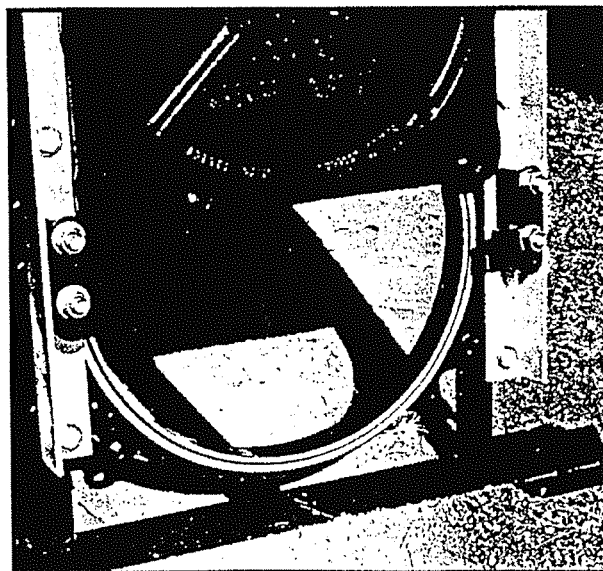
- Rugged galvanized or painted ASTM A-36 Steel Guide Rails and Head Rails
- ASTM A-36 Steel Stem
- A-126 Cast Iron Frame, Cover and Wedges
- Bronze Lift Nut w/Cast Iron Handwheel
- Seat Seal - Neoprene

Available with:

- Flatback Frame
- Spigotback Frame
- Type 4 Frame
- CIP Frame
- All C-10 Options

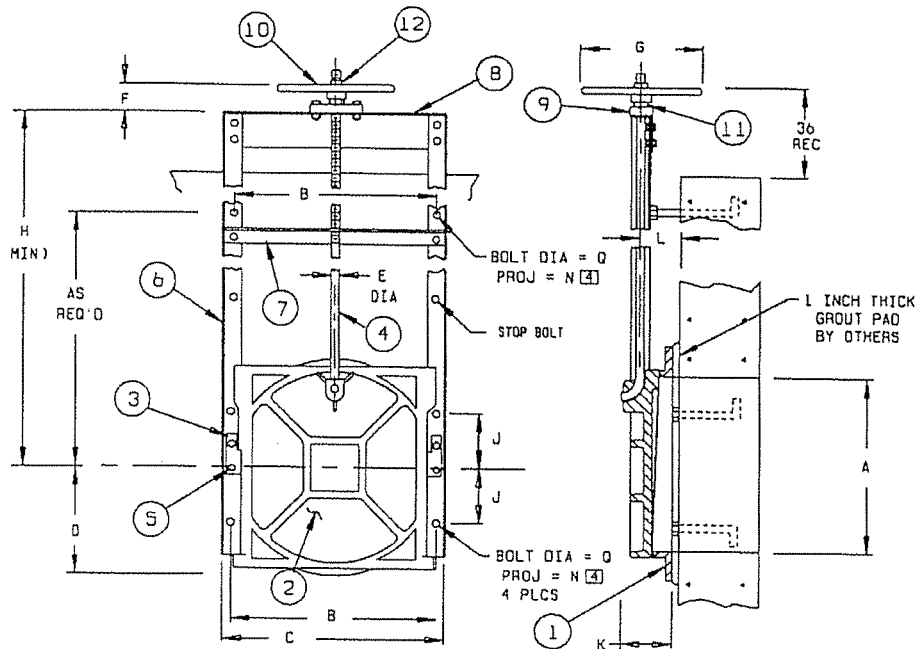


Leak-Tight
CL-11 "SAHARA" Canal Gate



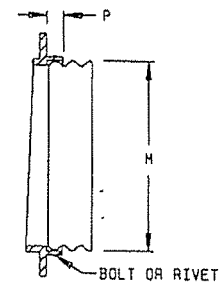
Neoprene Seat for Tight Seal

MODEL CL-11 "SAHARA" C. T IRON CANAL GATE



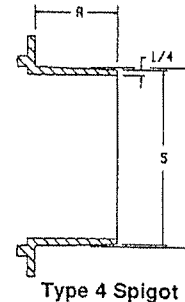
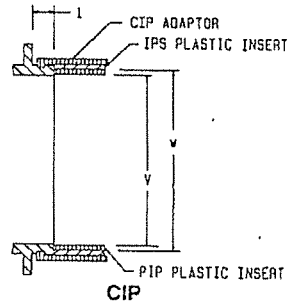
NOTES

1. Applies to spigotback gate only. Optional spigot, shown in separate detail.
2. All dimensions are also applicable for model CK-10, CL-10 & CM-10 gates.
3. Add grout pad thickness to anchor bolt projection.



Corrugated Pipe
Attached to
Spigot Back
Frame

PARTS LIST		
No.	Name	Qty.
1	Frame	1
2	Cover	1
3	Wedge (R&L)	1 ea.
4	Stem	1
5	Wedge Bolts	4
6	Guide Rail	2
7	Stem Support	A/R
8	Headrail	1
9	Lift Collar	1
10	Handwheel	1
11	Lift Nut	1
12	Limit Nut	1



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W
6	8	9 7/8	4	7/8	2 1/2	10	24	3	3 1/2	2 1/2	7	3 1/2	2	1/2	-	-	-	6.160	6.645
8	10	12	4 7/8	7/8	2 1/2	10	24	3	3 3/4	2 1/2	9	3 1/2	2	1/2	4	7 13/16	8	8.180	8.645
10	12	13 7/8	6	7/8	2 1/2	10	24	3 1/2	3 3/4	2 1/2	11	3 1/2	2	1/2	3 7/8	9 7/8	10	10.220	10.770
12	14	15 7/8	7	7/8	2 1/2	10	24	4	3 1/2	3	13	4	2	1/2	4	11 7/8	12	12.270	12.780
14	16	17 7/8	8	7/8	2 1/2	10	27 1/2	4 3/4	3 3/4	3 3/4	15	4	2	1/2	-	-	-	-	-
15	17	18 7/8	8 7/8	7/8	2 1/2	10	30	5	4 1/2	3 1/2	16	4	2 1/8	1/2	4	14 7/8	15	-	-
16	18 3/4	20 7/8	9 7/8	7/8	2 1/2	10	32	5 1/2	4 1/2	3 1/2	17	4 1/2	2	5/8	-	-	-	-	-
18	21	22 7/8	10 1/2	1	3 1/2	12	34	6	4 1/2	4 1/4	19	4 1/2	2	5/8	4	17 13/16	18	-	-
20	23 1/4	25 1/8	11 3/4	1	3 1/2	12	38	7	4 3/4	4	21	4 1/2	2	5/8	-	-	-	-	-
21	24	25 7/8	12 5/8	1	3 1/2	12	40	7	4 3/4	4	22	4 1/2	2	5/8	-	-	-	-	-
24	27 1/4	29 7/8	13 3/8	1	3 1/2	12	44	8	5 1/4	4 1/8	25	4 1/2	2	5/8	-	-	-	-	-

GATE DIMENSIONS IN INCHES

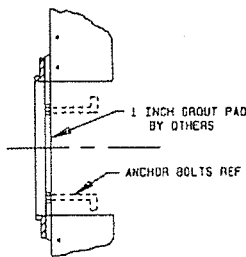
RED TOP

CANAL GATE FRAME TYPES

FOR C-10, CL-10, FC-10 AND CM-10 GATES

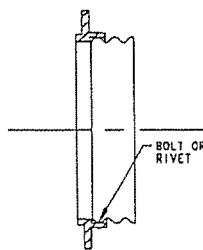
The Waterman C-10 gate and its variations can be furnished to suit many installation requirements. These include: "F" flatback for headwall mounting with anchor bolts; "SB" spigotback for attaching to annular or spiral corrugated metal pipe; "C" galvanized steel tapered setting collar for installation on concrete pipe; "CIP" for quick, easy, rugged mounting onto plastic pipe using standard PVC solvent cement, and "Type 4" for mounting gate to plastic pipe utilizing two part epoxy.

"F" FLATBACK



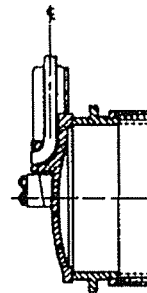
WALL MOUNTED

"SB" SPIGOTBACK



FOR ANNULAR OR SPIRAL CORRUGATED PIPE

"CIP" PLASTIC PIPE



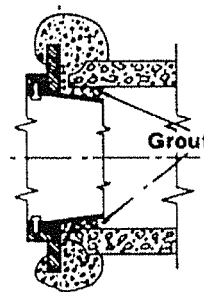
HEAVY DUTY FEMALE SPIGOT FOR SOLVENT CEMENT BONDING ONTO O.D. OF PLASTIC PIPE.

"TYPE 4" FRAME



MALE SPIGOT FOR MOUNTING GATE TO PLASTIC PIPE I.D. UTILIZING TWO PART EPOXY.

"C" TAPER SETTING COLLAR



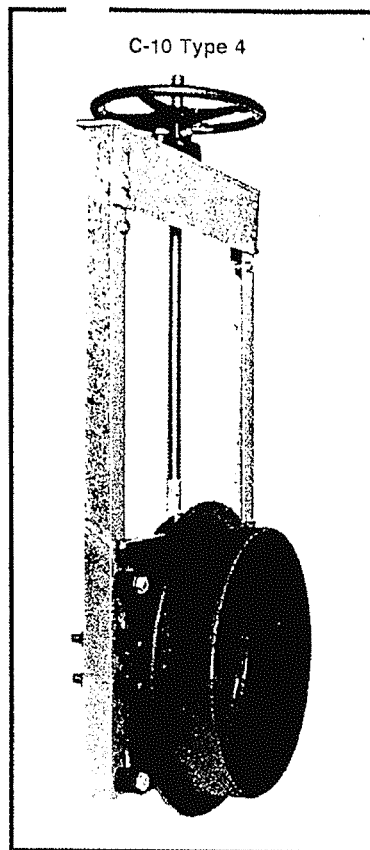
WITH GALVANIZED STEEL TAPER SETTING COLLAR FOR CONCRETE PIPE OR ASBESTOS CEMENT.

RED TOP

C-10 TYPE 4

CANAL GATE

The Waterman C-10 Canal Gate with Type 4 frame is designed for direct bonding onto PVC plastic pipe utilizing a two part epoxy cement such as IPS #1950 or #10. The frame is quick and easy to install, simply apply epoxy to the special spigot and inside wall of pipe and push into I.D. of low head pipe. It is recommended that additional frame support be provided to reduce stress on the plastic pipe; particularly on extended frames. This can be accomplished with the use of anchor bolts.



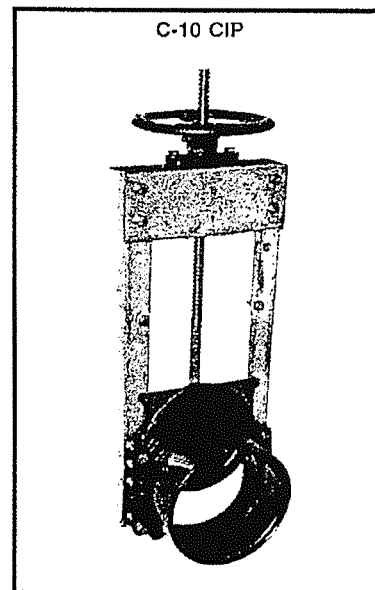
RED TOP C-10 CIP

WITH CIP FRAME

The Waterman C-10 Canal Gate with CIP frame is designed for direct solvent cement bonding onto PVC plastic pipe. The need for costly, high labor epoxy cement is eliminated.

The CIP is a rugged, long-lasting, patented frame that is quick and easy to install. It is recommended that additional headrail or frame support be provided to reduce stress on the plastic pipe, particularly on extended frames. This can be accomplished with the use of anchor bolts.

The CIP frame, along with the other frame types on this page, is an example of Waterman's leadership in design and response to water control needs.



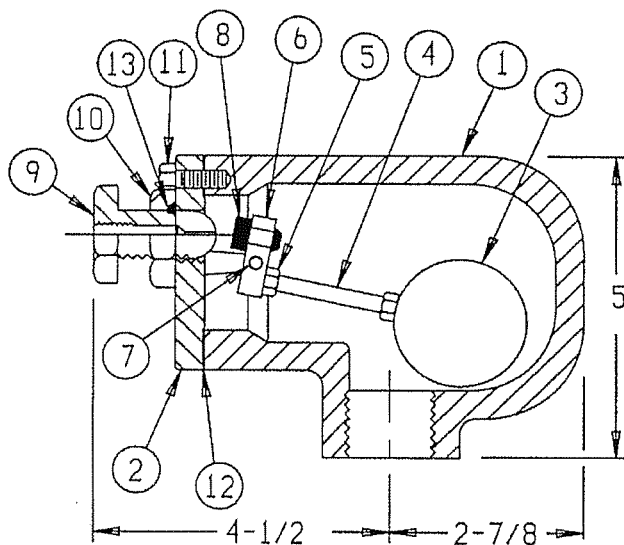
CAV-6 CONTINUOUS ACTING AIR RELEASE VALVE

USES:

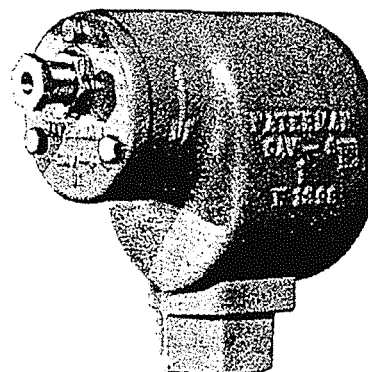
Pipe line systems, sewage lines, centrifugal pumps and hydropneumatic pressure tanks. This simple lever valve is designed for operating pressures to 150 p.s.i.

FEATURES:

The Waterman Model CAV-6 Continuous Acting Air Release Valve has a small venting orifice and is used wherever air is entrained in water under pressure. Air in the line can reduce the flow of water and/or increase pumping costs to overcome resistance. All points that can accumulate air should be provided with an air release valve. The CAV-6 provides release of trapped air on a continuous basis but does not incorporate a large orifice for use when filling the pipeline.



1" CAV-6



PARTS LIST

No.	Name	Qty.
1	Body (Cast Iron)	1
2	End Cap (Cast Iron)	1
3	Float (Plastic or Stainless Steel)	1
4	Float Stem (Stainless Steel)	1
5	Lock Nut (Stainless Steel)	1
6	Hinge Block (Brass)	1
7	Hinge Pin (Stainless Steel)	1
8	Valve Seat (Neoprene Rubber)	1
9	Venting Valve Body (Brass)	1
10	Valve Lock Nut (Brass)	1
11	Cover Bolt	1
12	Gasket (Neoprene Rubber)	1
13	O-Ring (Neoprene Rubber)	1

CR-101 CONTINUOUS ACTING AIR VENT & VACUUM RELIEF VALVE

- LIGHTWEIGHT ALUMINUM BODY
- LARGE VOLUME EXHAUST AS LINE IS FILLED.
- CONTINUOUSLY RELEASES SMALL POCKETS OF AIR WHILE LINE IS IN OPERATION.
- FOR LINE PRESSURES TO 100 P.S.I.
- WON'T LEAK AT LOW PRESSURES

USES:

This continuous acting valve provides air and vacuum protection, insures full line capacity, and conserves pump horsepower. The CR-101 is newly designed to provide sealing at pressures as low as 2 psi.

FEATURES:

The Model CR-101 has been especially designed to meet irrigation requirements of dependability, light weight and moderate price. Construction includes high strength aluminum alloy body, baffle, and rubber bonded poppet and a specially designed cylindrical float. The guide rod and assembly hardware are stainless steel. Cast iron is used for the threaded base to provide easy installation and removal without the thread damage which can occur with aluminum threads.

Model CR-101
2", 3", and 4"



Small Orifice Size:
2" Valve + 1/16"
3" & 4" Valve + 1/32"

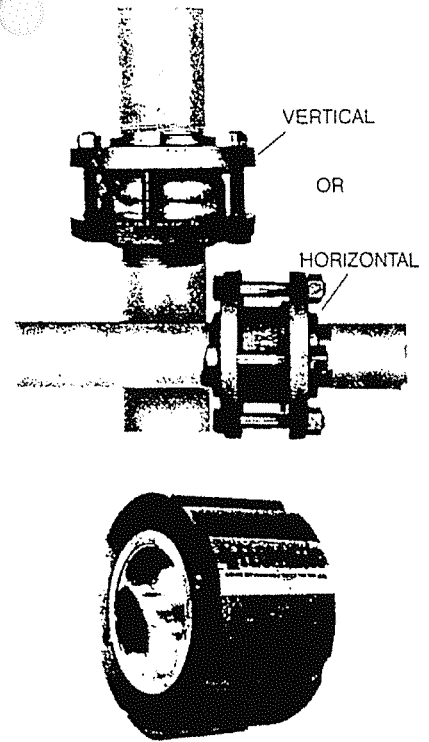
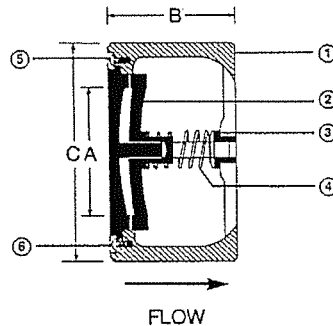
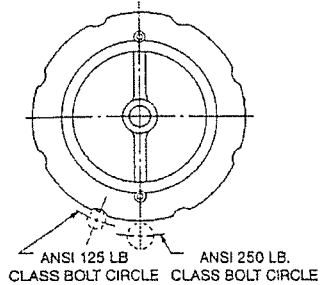
Flomatic Model 888 Silent Check Valves

Installation

The Model 888 valve is designed for simple flange-supported installation and will operate equally well in any position. Suitable for ANSI 125 and 250 mountings.

Operation

The convex inlet* double guided spring loaded poppet system maximizes efficiency and reduces water hammer. Easy field exchangeable internal system.



WEIGHTS AND DIMENSIONS					BOLT SELECTION				MATERIALS OF CONSTRUCTION		
Part No.	A Valve Size In.	B In.	C In.	Weight Lbs.	No. of Bolts		Bolt Size		Item No.	Name	Material
					125#	250#	125#	250#			
2434	2	2 5/8	4 1/4	5	4	8	5/8" x 5 1/4"	5/8" x 5 1/2"	1	Body	Cast Iron ASTM A126, Class B
2440	2 1/2	2 7/8	5	7	4	8	5/8" x 5 3/4"	3/4" x 6 1/2"	2	Disc	Bronze ASTM B 271 (844)*
2435	3	3 1/8	5 3/4	11	4	8	5/8" x 6 1/4"	3/4" x 7"	3	Bushing	Bronze ASTM B 271 (844)
2436	4	4	7	18	8	8	5/8" x 7"	3/4" x 8"	4	Spring	Stainless Steel AISI 304
2441	5	4 3/4	8 3/8	25	8	8	3/4" x 7 3/4"	3/4" x 9"	5	Seat Ring	Bronze ASTM B 271 (844)
2437	6	5 1/2	9 3/4	36	8	12	3/4" x 8 3/4"	3/4" x 10"	6	Fasteners	Stainless Steel AISI 304
2438	8*	6 1/2	13 3/8	80	8	12	3/4" x 9"		*Optional resilient seat (Nitrile) available. Add "R" to part number.		
2439	10*	8 1/4	16	129	12	16	7/8" x 12 1/2"				

*Concave inlet design in 8" and 10" sizes. Class 125 lb. only.

General Applications

- Mechanical Contractors
- HVAC—Liquid Service
- General Utilities
- Irrigation
- Booster Pump Systems

Temperature/Pressure Rating

Temperature Range: Max. 180°F (80°C)

Pressure Class: 125 ANSI Class and 250 ANSI Class Flange Standard

Warranty

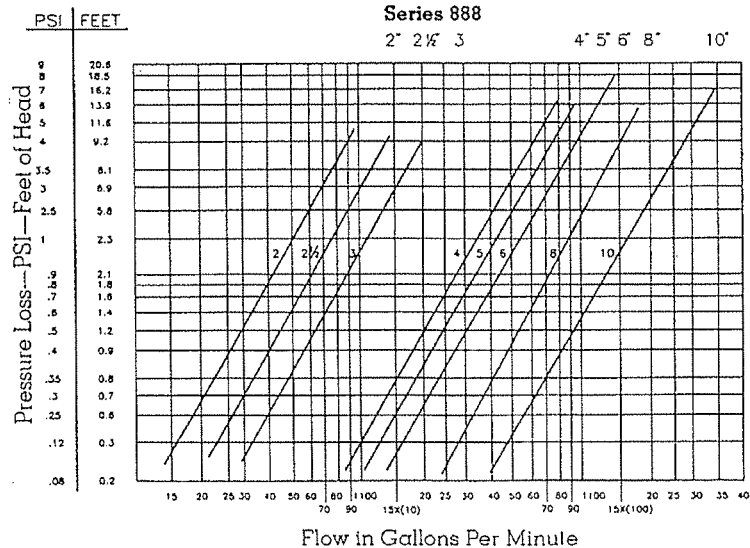
LIMITED ONE YEAR WARRANTY: The Flomatic Corporation warrants that its Water Check Valves in all sizes are free from defects in materials and workmanship. Flomatic will replace any valve covered by this warranty and found to be defective within one year from the time of sale. This warranty will be void if the product has been modified in any way by the purchaser, or is subjected to unreasonable use.

HEAD LOSS CHART

Series 888

2" 2 1/2" 3"

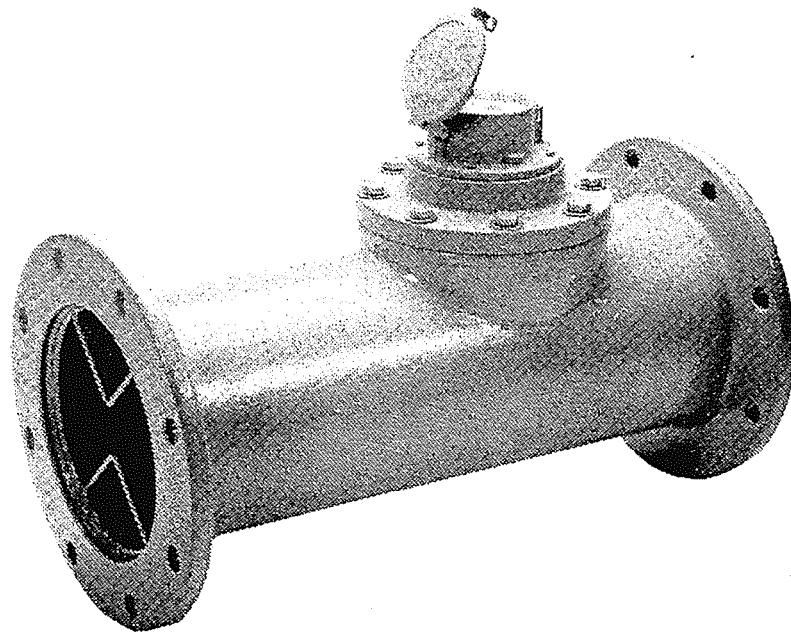
4" 5" 6" 8" 10"



MODEL ML-03 AND ML-04 (150 PSI)

MODEL ML-07 AND ML-08 (300 PSI)

3"- 48" STEEL FLANGED TUBE METER



Model ML-03-5G and ML-04-5G, 5 Year Guarantee Meters are available. Consult factory for price.

ML-03 and ML-07 meters are equipped with standard totalizers. ML-04 and ML-08 meters are equipped with indicator-totalizers. Installation is made by bolting meter tube to flanges of adjoining pipe.

FLOW RANGE ACCURACY SELECTION CHART

METER SIZE	ACCURACY $\pm 2\%$ *LOW VELOCITY CONSTRUCTION FLOW RATE GPM MIN. - MAX.	ACCURACY $\pm 2\%$ STANDARD CONSTRUCTION FLOW RATE GPM MIN. - MAX. - INT.	ACCURACY $\pm 2\%$ HIGH VELOCITY CONSTRUCTION FLOW RATE GPM MIN. - MAX.	STANDARD CONSTRUCTION HEAD LOSS @ MAX FLOW INCH PSI
2	35 - 120	40 - 160 - 225	N/A	49 1.77
3	40 - 250	45 - 250 - 350	N/A	25 .90
4	50 - 500	55 - 500 - 700	200 - 700	22 .79
6	90 - 1200	120 - 1200 - 1500	300 - 1500	18 .65
8	100 - 1500	150 - 1500 - 2000	400 - 2500	4.0 .15
10	125 - 2000	180 - 2000 - 3000	500 - 3500	3.0 .11
12	150 - 2800	200 - 3000 - 3500	800 - 5000	3.0 .11
14	250 - 3750	300 - 4000 - 4500	1000 - 6000	2.2 .08
16	350 - 4750	400 - 5000 - 6000	1200 - 7500	1.9 .07
18	450 - 5625	700 - 6000 - 7500	1500 - 9000	1.9 .07
20	550 - 6875	850 - 8000 - 9000	2000 - 12,000	1.4 .05
24	800 - 10,000	1000 - 10,000 - 13,500	3000 - 15,000	.83 .03
30	1200 - 15,000	1800 - 15,000 - 21,000	4000 - 25,000	.5 .018
36	1500 - 20,000	2000 - 20,000 - 30,000	5000 - 35,000	.5 .018
42	2000 - 28,000	3000 - 30,000 - 40,000	6000 - 50,000	.5 .018
48	2500 - 35,000	5500 - 35,000 - 50,000	7000 - 60,000	.5 .018
54	3200 - 45,000	6500 - 45,000 - 55,000	8000 - 65,000	.4 .014
60	4000 - 60,000	7500 - 60,000 - 80,000	10,000 - 90,000	.4 .014
66	4750 - 75,000	8500 - 75,000 - 95,000	12,000 - 105,000	.4 .014
72	5500 - 90,000	9500 - 90,000 - 115,000	15,000 - 125,000	.3 .014
84	**	** - 125,000 - 150,000	**	.3 .011
96	**	** - 160,000 - 200,000	**	.3 .011
108	**	** - 200,000 - 250,000	**	.3 .011
120	**	** - 250,000 - 300,000	**	.3 .011

Standard construction will be supplied for all main line meters unless special flow range, materials, or construction are required. Refer to individual data sheets for flow range of each model.

* Low velocity (LV) construction has the same low and maximum flow rates as AWWA C704. Low velocity meter sizes 2" thru 48" are only available as main line tube type. Sizes 54" thru 120" are available on all other main line meters. For lower flows refer to Model TM-01 turbine meters on page 9.

** Consult factory for flow range or special construction.

The meter must have a full flow of liquid for proper accuracy. Valves, fittings or other obstructions that tend to set up flow disturbances, should be a minimum of five pipe diameters upstream and one pipe diameter downstream from the meter. Meters not equipped with straightening vanes must have a minimum of ten pipe diameters upstream and two pipe diameters downstream from the meter.

THE STATE OF THE ART PROPELLER METER

WATER SPECIALTIES propeller meters are designed and manufactured utilizing the most precise techniques and superior materials to give you, the customer, the highest quality propeller meter available. Meters are available for a variety of applications, in sizes 2" through 120" with working pressures up to 3000 PSI. Don't accept any less, insist on Water Specialties low maintenance, long life design.

CHANGE GEARS are utilized allowing dial changes or recalibration for different pipe sizes to be done in the field, without removing pressure from the line.

BONNETS are injection molded thermoplastic, o-ring sealed and attached to the meter head by screws with seal wire holes. Hinged lid has padlock hasp to prevent unauthorized entry.

METER TUBES are fabricated steel with straightening vanes. They are protected internally and externally with 12-15 mils of fusion epoxy coating applied by the fluidized bed method.

METER HEADS are cast iron or fabricated steel and are also protected with 12-15 mils of fusion epoxy coating.

THRUST BEARINGS on 2" - 54" are long life ceramic type. Dual thrust bearings handle flow for both forward and reverse directions.

PROPELLER BEARINGS on 2" - 54" utilize a water lubricated ceramic sleeve bearing which rides on a ceramic coated stainless steel spindle. On 60" - 120", sealed stainless steel dual ball bearings are used.

INDICATOR-TOTALIZER is optional to provide an instantaneous flow rate indication and a totalization of flow volume. It features a full 4" diameter, 250 degree sweep dial with a six digit totalizer and test sweep hand. The indicator dial can be furnished in GPM, CFS, MGD or any standard liquid measuring units, with a choice of standard totalizer measuring units.

TOTALIZER is standard on all meters to provide a totalization of flow volume. It features a six digit totalizer with a full 3" diameter, 100 division, center sweep dial. The totalizer can be furnished in gallons, cubic feet, acre feet, or any standard liquid measuring unit. Magnetic drive assures a moisture tight seal.

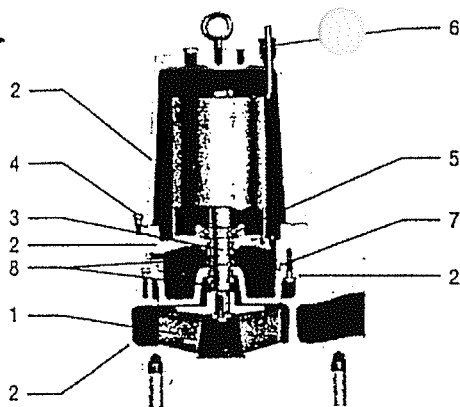
GEARBOX is cast bronze with propeller spindle permanently attached into removable stainless steel separator.

O-RING seals are used at the meter head and all other points where seals are required.

MITER GEARS are suspended between essentially frictionless precision shielded stainless steel ball bearings for smoother operation and are contained in a sealed oil filled gearbox.

MAGNETIC DRIVE on all Water Specialties meters is the strongest on the market. Four pole radial, permanent ceramic type will not demagnetize or rust.

PROPELLER is injection molded thermoplastic and handles temperatures up to 140 degrees. Propellers are also available for temperatures up to 350 degrees. Neither propeller will change pitch even at the highest velocities or through their specified temperature range.



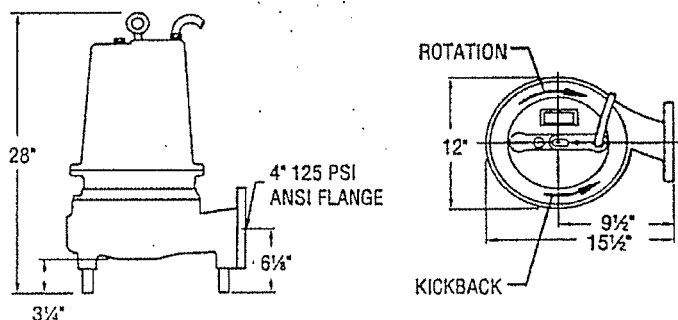
Goulds Submersible Sewage Pump

MODEL

3888D4

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



MATERIALS OF CONSTRUCTION

Item No.	Part Name	Material	
		Standard	Optional
1	Impeller, non-clog	1001	1101
2	Castings	1001	
3	Shaft-keyed	300 Series SS	
4	Fasteners	300 Series SS	
5	Ball bearings	Steel	
6	Power cable	STO, 20 feet	Additional lengths
7	O-ring	BUNA-N	
8	Mechanical Seals	No.	Service
	STD	10K21	General
	OPT	10K22	Heavy duty
	OPT	10K28	Mild abrasives
Material Code		Engineering Standard	
1001		Cast iron — ASTM A48 Class 20	
1101		Bronze — ASTM C87500	

MODELS

Series	HP	Volts*	Phase	RPM	Overload Heaters	Max. Amp.	Wt. (lbs.)
WS1512D4,D4M	1 1/2	230	1	1750	N/A	13.2	195
WS1518D4,D4M	1 1/2	200				15.2	200
WS2012D4	2	230				16.3	200
WS2018D4	2	200				18.7	208
WS3012D4	3	230				K63	21.5
WS3018D4	3	200	3	1750	K65	24.7	213
WS5012D4	5	230			K68	26.5	213
WS1538D4,D4M	1 1/2	200			K54	11.5	195
WS2038D4	2	200			K54	13.3	200
WS3038D4	3	200			K56	16.6	205
WS5038D4	5	200			K60	19.1	210
WS1532D4,D4M	1 1/2	230			K53	10.0	195
WS2032D4	2	230			K53	11.6	200
WS3032D4	3	230			K55	14.4	205
WS5032D4	5	230			K60	16.6	210
WS1534D4,D4M	1 1/2	460			K37	5.0	195
WS2034D4	2	460			K41	5.8	200
WS3034D4	3	460			K43	7.2	205
WS5034D4	5	460			K50	8.3	210
WS7532D4	7 1/2	460			K64	23.0	225
WS7534D4	7 1/2	460			K54	11.5	225

* For 575 V consult factory.

PERFORMANCE RATINGS (gallons per minute)

Series No.	WS1512D4M	WS1538D4M	WS2012D4	WS3012D4	WS5012D4	WS7532D4
HP	1 1/2	1 1/2	2	3	5	7 1/2
RPM	1750					
Total Head Feet of Water	10	300	395			
	15	170	320	370		
	20		230	300	440	520
	25		120	205	365	440
	30			100	270	360
	35				160	275
	40				80	175
	45					85
	50					
	55					

GOULDS PUMPS
ITT Industries

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

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