

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED**DEC 07 2012**DEPT. OF WATER RESOURCES
SOUTHERN REGION

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 37-22667

1. Owner U.S. Dept. of Agriculture and Valley Entertainment Group, Inc. Phone No. _____
Current address Fairfield Ranger Dist., Box 189, Fairfield, ID 83327 / 126 S. Main St. Ste 89, Hailey, ID 83333
2. Examiner's name Charles G. Brockway, P.E. EXAM DATE October 30, 2012
3. Accompanied by Doug Schiermeier, Shelly Scott Email _____
Address _____
Relationship to permit holder Volunteer / Employee Phone No. (208) 788-1051
4. Source Groundwater tributary to _____

B. OVERLAP REVIEW

1. Other water rights with the same place of use None
2. Other water rights with the same source and point of diversion None

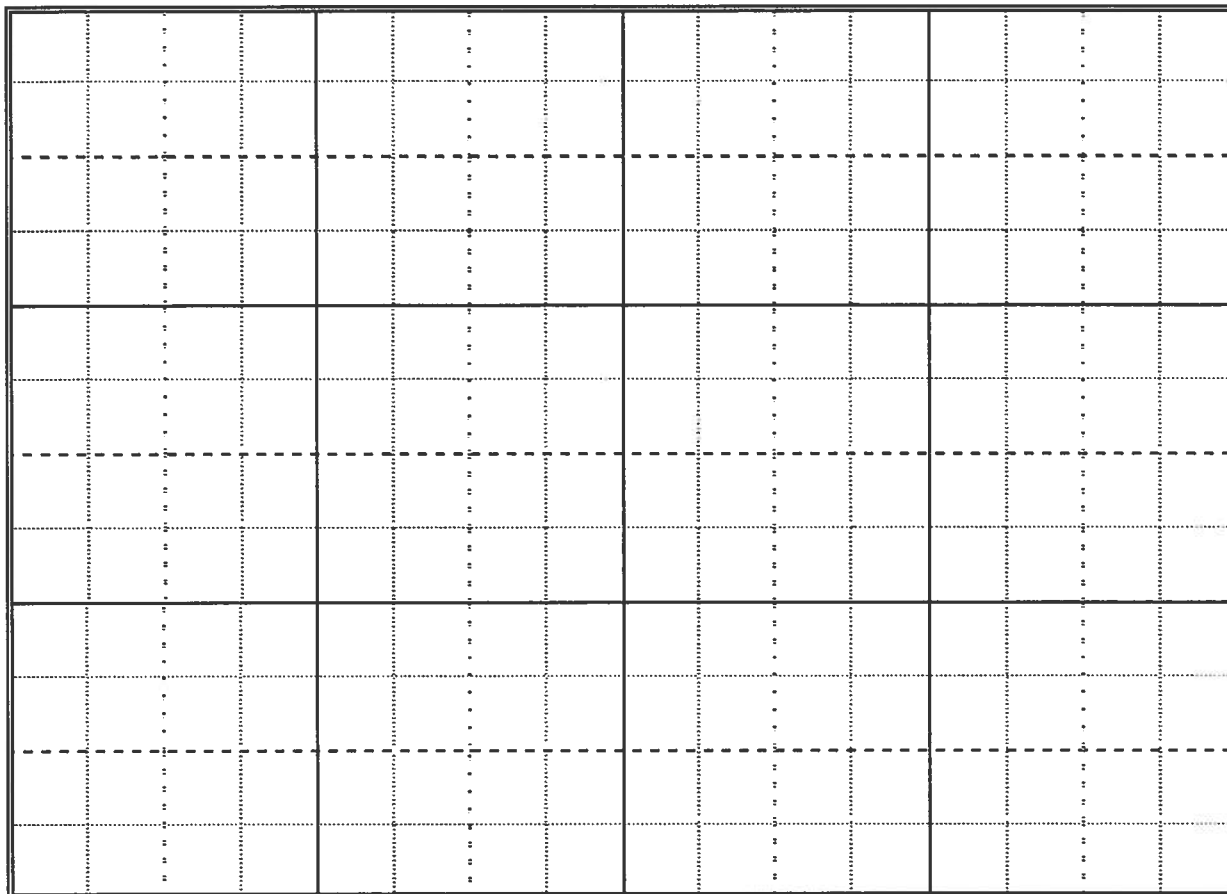
C. DIVERSION AND DELIVERY SYSTEM**1. Point(s) of Diversion:**

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			SW	SE	19	2N	14E	Blaine	GPS lat/long 43.48852, -114.83358

2. Place(s) of Use: Method of determination GPS, aerial photo

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
2N	14E	30	C																

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.



Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Supply Well	Pentek XE	2	n/a	StaRite L30P4GH	2" discharge

*Code to correspond with no. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Installed meter	Impeller	Sensus	Omni C2	73774332	2"	New

2. **Measurements:** _____
 See attached narrative. _____

F. FLOW CALCULATIONS☒ Additional computation sheets attached

Measured Method:

See attached narrative.

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

 $V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$ _____ $V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$ _____ $V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$ _____

2. Volume Calculations for Other Uses:

See attached narrative.

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
Commercial	1/1	12/31	0.074 cfs	1.0 afa
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Totals:			_____	_____

2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☒ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**

Field Examiner's Signature

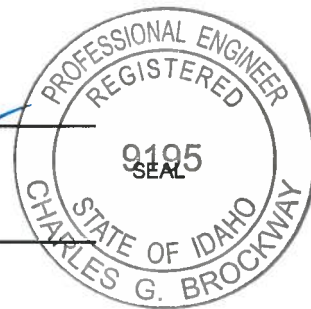


Date

12/7/2012

Reviewer

Date



Narrative for Beneficial Use Field Report for Permit 37-22667

U.S. Department of Agriculture / Valley Entertainment Group

Prepared by Charles G. Brockway, P.E.

December 7, 2012

This permit is applicable to a central water system supplying potable water to the Soldier Mountain Ski Resort located 10 miles north of Fairfield, Idaho. Ownership of this permit rests jointly between the USDA-Forest Service (USFS) and Valley Entertainment Group, Inc. The latter holds a special use permit from the USFS to operate the ski resort and owns the property buildings and infrastructure. The process of transferring ownership from Valley Entertainment to a non-profit group is nearly complete, but at the time of the exam the transfer had not been codified. Valley Entertainment is obligated to complete the beneficial use exam and licensing process for the permit.

The system is supplied by a single 6-inch well completed in 1996 by Wood River Drilling (drilling record attached). The well is located northwest of the resort facilities as shown on the attached map. The well has a depth of 140 feet and is fully cased with a 6-inch steel casing with perforations from 110 to 140 feet. Static water level at the time of drilling was 13 feet and the well yielded 50 gpm with 59 feet of drawdown at the time of drilling.

The resort facility was previously supplied by spring water via a common system constructed many years ago. The present water system supplying the facility was constructed from 2009 through 2011 and was fully complete at the time of the exam. The well pump is a 4" submersible delivering water via a 2-inch pipe to a wellhouse located about 50 feet northeast of the well. From the wellhouse, water is conveyed via a 2-inch line which expands to a 3-inch line to an elevated storage tank situated 495 feet west of the well and 60 feet higher in elevation. The tank is a fiberglass-reinforced unit with a nominal capacity of 10,000 gallons and is fully buried. Float switches are situated in the tank to activate the well pump at a certain level and deactivate the pump when the tank fills. The floats are set such that the active storage of the reservoir is approximately 2,000 gallons, leaving 8,000 gallons available for chlorine contact time and for fire protection purposes. Water is supplied to the resort facility via a 4-inch pipe running eastward, then southward to the facility. A pressure of 75 psi can be supplied at the resort by gravity.

Infrastructure within the wellhouse includes 2-inch galvanized piping, flow meter, control valving, chlorine injection system, and pressure tanks. The pressure tanks are isolated from the system and would only be used if the elevated storage tank described below must be isolated for cleaning or repair. Under normal operation pressure to the resort facility is supplied by gravity from the storage tank.

Included with this report are selected pages from as-built water system plans prepared by Benchmark Associates, the general engineer for the resort facility upgrades.

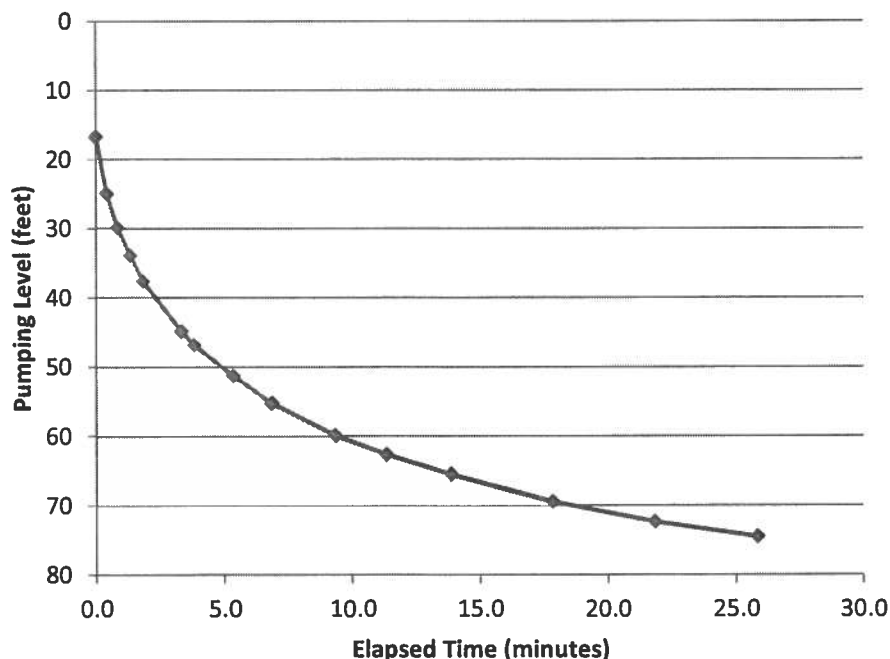
Flow measurements were made using the installed flow meter in the wellhouse. The meter is a Sensus OMNI C2, 2-inch cast iron impeller meter with a magnetic pickup and digital

readout. This meter is nearly new, having been installed in 2011 with very little water usage occurring since then. The meter is properly installed with adequate clear distance upstream and downstream. The manufacturer's specifications for this meter indicate an accuracy of $\pm 1.5\%$. It was determined that the accuracy of this meter is likely better than the accuracy of a strap-on ultrasonic meter on a 2-inch galvanized pipe; therefore the installed meter was used to determine the system capacity.

The storage tank was drained until the well pump activated. The well pump was run for 43 minutes, during which the volume pumped and the water level in the well was recorded, and the tank drain valve regulated to hold approximately a constant level in the tank. The flow rate was nearly steady during the test. Volume data recorded is shown in the following table:

Totalizer (gal)	Elapsed time (min)
42065	0 (start of test)
42290	7.0
42543	15.0
42761	22.0
43008	30.0
43405	43.0
Average flow over 43 minutes = 31.2 gpm	

The well is not highly productive, and over the duration of the above test the water level dropped from a static level of 16.73 feet (below top of casing) to 70+ feet, and was still dropping at a rate of about 0.75 feet per minute. A classic drawdown curve was obtained, as shown below:



Because the drawdown in the well was large, it was presumed that a higher instantaneous flow could be obtained from the pump if the test were conducted for a short duration such as 5 minutes, over the period when the drawdown in the well was moderate and therefore the pumping lift was lower. The well was allowed to recover to within a few feet of the static water level, and the flow test was conducted again for 5 minutes with the resulting data as follows:

Totalizer (gal)	Elapsed time (min)
43423	0 (start of test)
43431	0.25
43439	0.50
43449	0.75
43457	1.0
43491	2.0
43524	3.0
43556	4.0
43589	5.0
Average flow over 5 minutes = 33.2 gpm	

The 5-minute flow was only slightly greater than the longer-term average. For licensing purposes, the recommended diversion rate is 33.2 gpm or 0.074 cfs.

Water usage occurs in three (3) locations on the resort complex: the lodge, the kitchen (which is located within the lodge), and the outside toilet facilities. Other buildings exist within the complex but have no water usage. A description of each use is given below:

Lodge

Hose bibs (2)
 Bar with two sinks
 Mens restroom with 2 stalls, 2 urinals, and 3 sinks
 Womens restroom with 4 stalls and 3 sinks
 Water fountains (2)

Kitchen

Automatic coffee pot
 Automatic hot chocolate machine
 Sink
 Hand wash sink
 3-bay sink (dish washing)
 Employee restroom with one toilet and one sink
 Floor sink (mop rinsing etc.)

Outside toilets

Hydrant on exterior of building
 Mens restroom with 3 urinals, 3 toilets, and 1 sink

Womens restroom with 3 toilets and 2 sinks

Annual water requirements for licensing purposes were computed using data for the number of skier visits, number of employees, and length of season for the past XX years, provided by the permittee. Value used were conservatively high numbers so that the annual volume allowance will be sufficient for maximum-use years.

Reliable data on daily water demands for skiers is sparse to nonexistent. For this case, a value of 8 gpd was used which is a conservatively high number based on water usage studies performed by Brockway Engineering for another similar ski resort using actual measured data. Employee water use was assumed to be 30 gpd based on guidance from the IDWR Field Examiner's Handbook. There is no specific category for employees of ski resorts, but 25 gpd appears to be reasonable based on similar types of uses.

Data on operating period, skier visits, and number of employees was provided by the resort operator. The maximum number of skier visits and operating days was 229 and 70, respectively during the 2007-2008 season. The maximum number of employees was 66. In order to allow adequate annual volume to cover fluctuations in the above parameters, it is recommended that the 95% probability level be used assuming a normal distribution for each parameter. Based on the 95% levels, the seasonal water demand for wintertime use is 299,900 gallons or 0.9 ac-ft (see attached spreadsheet).

Off-season usage consists of approximately 4 employees from September to opening, and 1 employee from close through August, working on maintenance of the ski lifts and other facilities. Assuming a daily demand of 30 gpd per employee, total off-season use is minimal at 17,400 gallons or 0.1 ac-ft.

Recommended annual volume for licensing is 1.0 ac-ft.

Conditions

No part of the water usage is of a nature which is normally considered consumptive by the Department. Therefore, the condition that the water usage under this permit be non-consumptive appears to be met.

Soldier Mountain Resort
Estimation of Maximum Annual Water Requirements
CGB 12/7/2012

WINTERTIME USES

Number of skier visits per day	233
Operating days	76
Number of employees	69

Average daily demand	
Per skier visit	8 gpd
Per employee	30 gpd

Total average daily demand	3934 gpd
Total seasonal demand	298984 gallons
	0.92 ac-ft

OFF-SEASON USES - Lift Maintenance etc.

Number of employees	4
Number of working days	105 days (Sept to open)
Number of employees	1
Number of working days	160 days (close through Aug)
Average daily demand per employee	30 gpd

Total seasonal demand	17400 gallons
	0.05 ac-ft



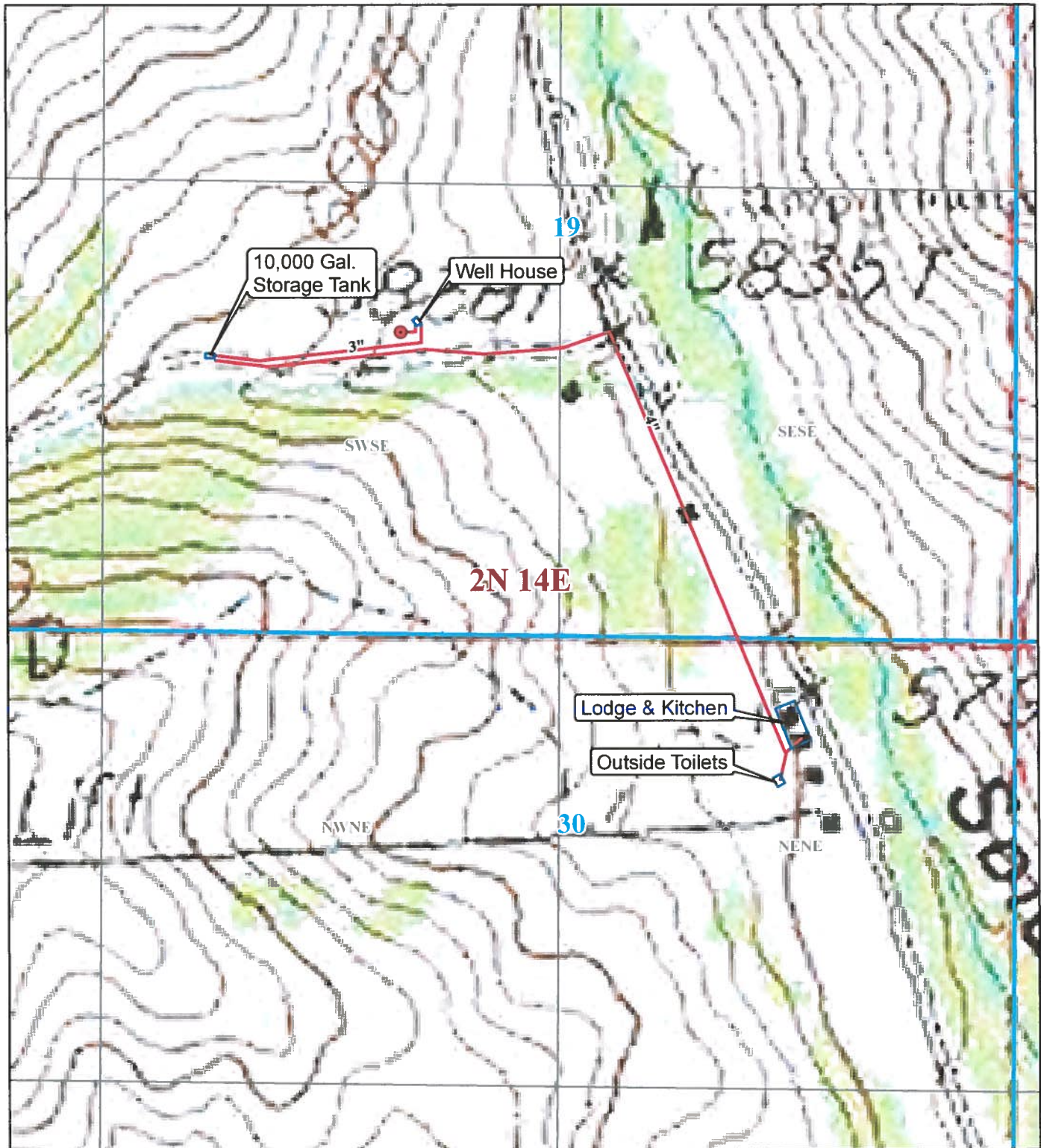
0 175 350 700 Feet

**SOLDIER MOUNTAIN SKI RESORT
PERMIT 37-22667
USFS/VALLEY ENTERTAINMENT, INC.
NAIP 2011 AERIAL PHOTO**

Legend

- Well
- Pipes
- twship
- Sections
- QQ lines





0 195 390 780 Feet

**SOLDIER MOUNTAIN SKI RESORT
PERMIT 37-22667
USFS/VALLEY ENTERTAINMENT, INC.
7.5' USGS TOPOGRAPHIC BASE**

Legend

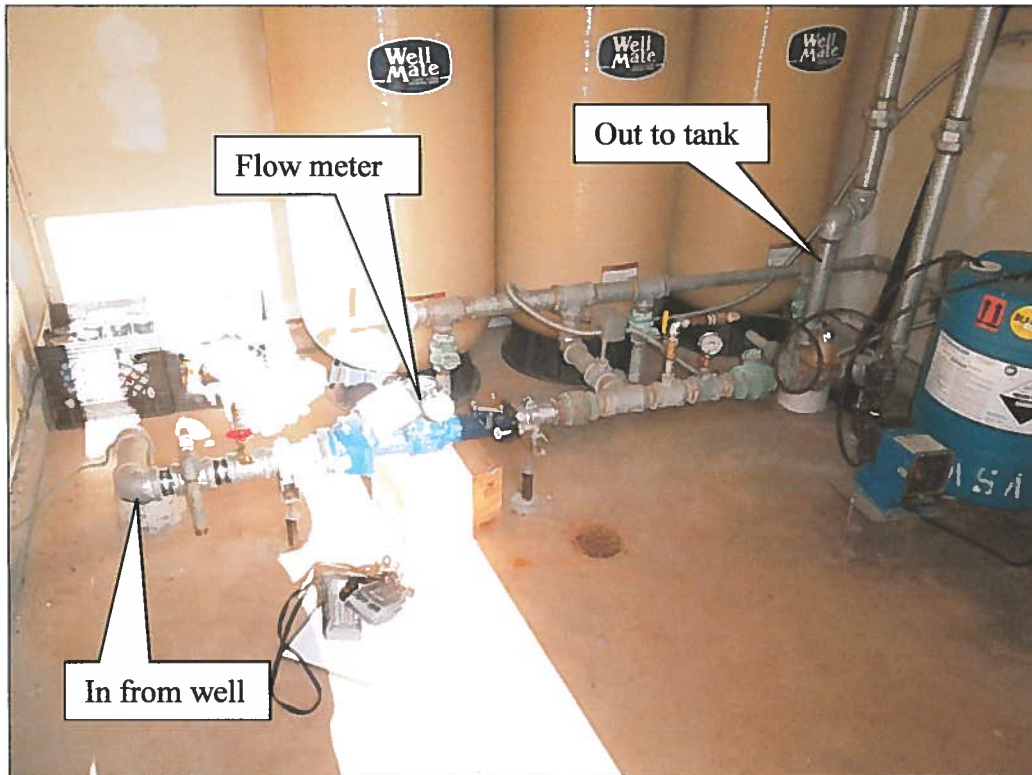
- Well
- Pipes
- township
- Sections
- QQ lines



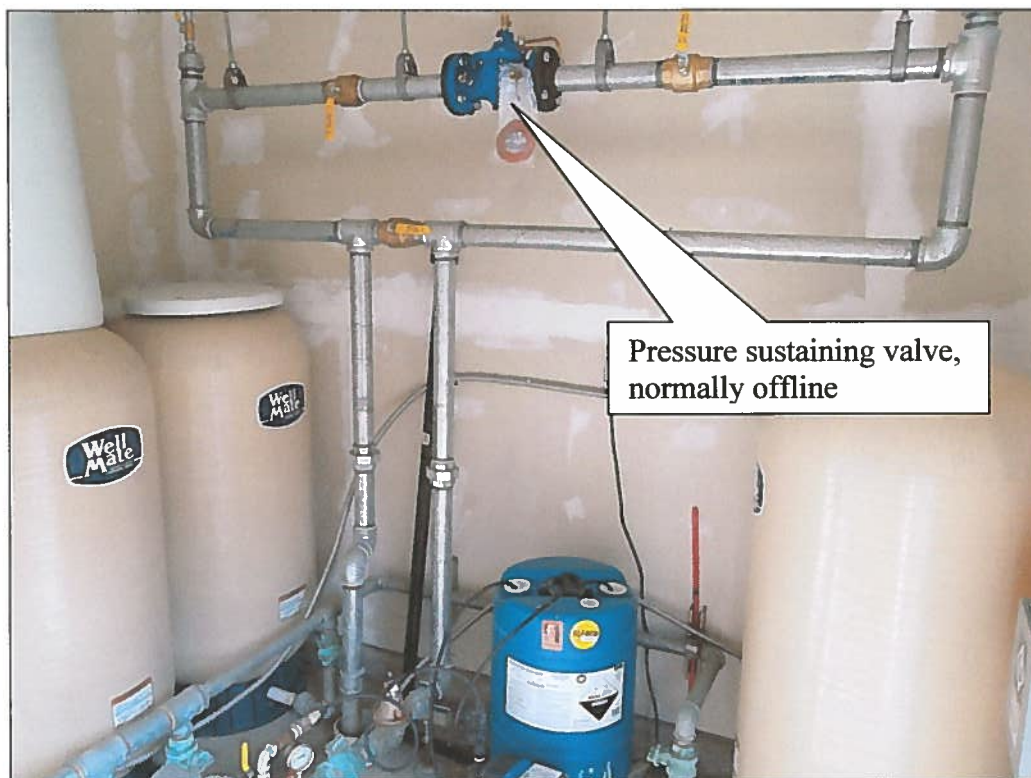
Wellhead



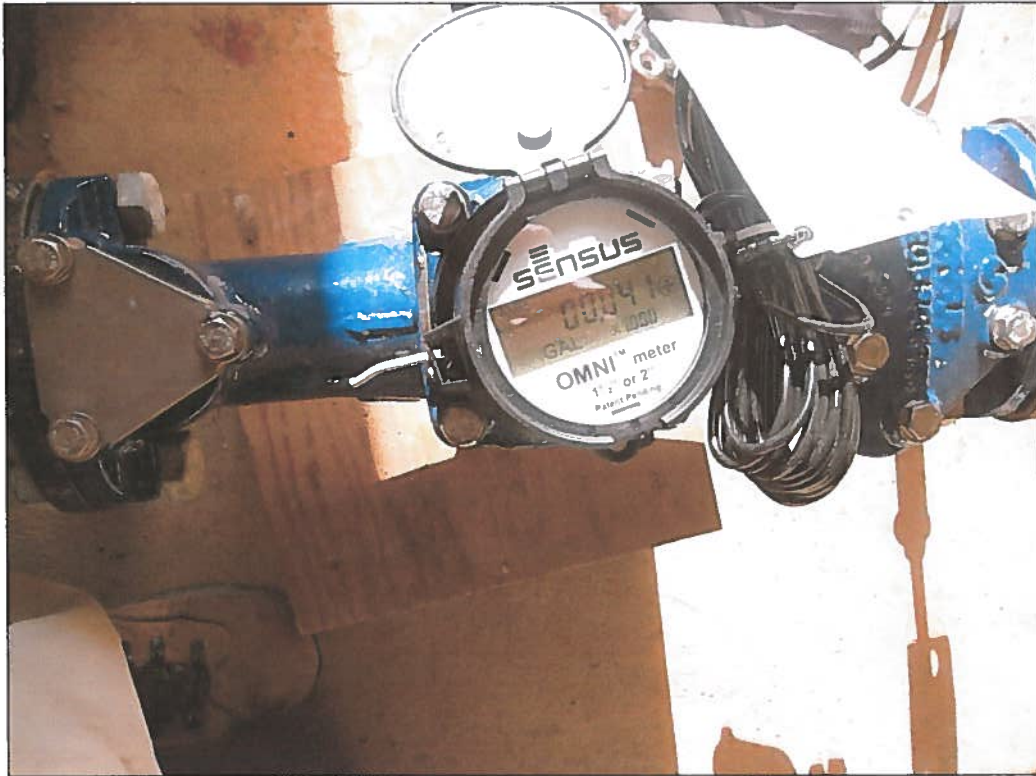
Wellhouse in relation to wellhead, looking west



Wellhouse



Wellhouse



Flow meter



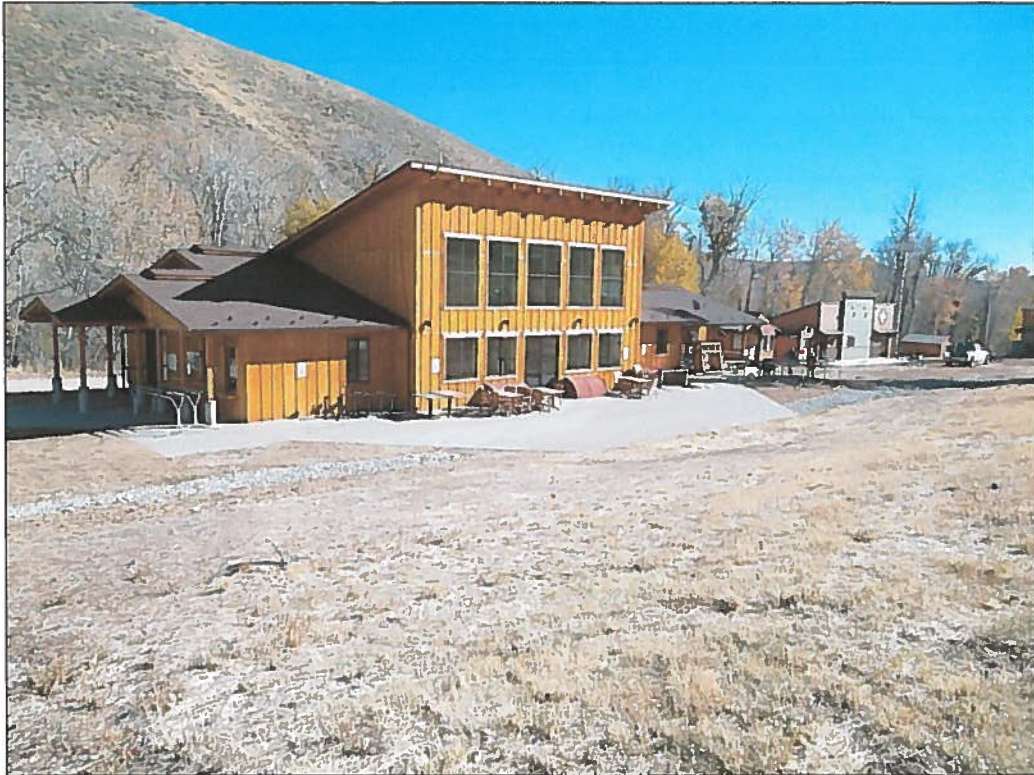
Buried 10,000 gallon tank, looking north



Looking east from tank toward well and wellhouse



Crawl space of lodge – water line entry, filter and control devices



Lodge



Outside restrooms

4" Submersible Pumps



Precision-engineered, high-quality, rugged Signature 2000® Stainless Steel Series Pumps deliver efficient, dependable performance even in rough, aggressive water. Heads to 1,950 feet and capacities to 65 GPM. Built to deliver long-term, trouble-free service. Floating impeller design resists sand and reduces sand locking. These pumps feature the proven SignaSeal™ staging system.

APPLICATIONS

- **Water systems...** for residential, industrial, commercial, multiple housing and farm use.

SPECIFICATIONS

Shell – Stainless steel
Diameter – 3-7/8"
Discharge – Stainless steel
Discharge Bearing – Nylatron®
Intermediate Bearing – (On larger units) Polycarbonate, nitrile rubber and stainless steel
Impellers – Acetal
Diffusers – Polycarbonate
Suction Caps – Polycarbonate with stainless steel insert
Thrust Pads – Proprietary spec.
Shaft and Coupling – Stainless steel
Intake – Stainless steel
Intake Screen – Polypropylene
Cable Guard – Stainless steel
Check Valve – Acetal†
Agency Listings – CSA

FEATURES

Proven Staging System – Our proven SignaSeal staging system incorporates a harder-than-sand ceramic wear surface that when incorporated with our floating impeller design, greatly reduces problems with abrasives, sand lock-up and running dry.

Discharge – Corrosion-resistant 300 grade stainless steel for durability in aggressive water. Large octagon wrench area for ease of installation.

Discharge Bearing – Self-lubricating Nylatron bearing resists wear from sand.

Intake – Corrosion-resistant 300 grade stainless steel for durability in aggressive water.

Shaft – Positive drive from 7/16" hexagonal heavy-duty 300 grade stainless steel.

Coupling – Stainless steel press fit to pump shaft. Couples to all standard NEMA motors.

Shell – Highest grade, heavy-walled corrosion-resistant stainless steel. Threaded for easy servicing.

Hardware – All screws, washers and nuts are corrosion-resistant 300 grade stainless steel.

Check Valve† – Durable internal spring-loaded check valve.

Cable Guard – Corrosion-resistant stainless steel guard protects motor leads. Tapered ends prevent pump from catching on well.

Intake Screen – Corrosion-proof.

PENTEK® XE Series™ Motor – 2 and 3 wire NEMA standard all stainless construction water-filled motors.

† Except where noted.

Nylatron® is a registered trademark of Polymer Corp. PENTEK® and Signature 2000® are registered trademarks of Pentair Water. PRO-Source™, SignaSeal™, TrimLine™, and XE Series™ are trademarks of Pentair Water.

In order to provide the best products possible, specifications are subject to change.



Signature
2000

HS stainless steel series

4" Submersible Pumps

ORDERING INFORMATION

GPM	Motor Type	HP	Stgs.	PH	Volt	Assembled Pump			Pump End			Motor		Control Box	
						Catalog Number	Length Inches*	Weight Pounds*	Catalog Number	Length Inches*	Weight Pounds*	Catalog Number	Weight Pounds*	Catalog Number	Weight Pounds*
20**	2 Wire	3/4	5	1	230	S20P4HS07221	23-3/4	30	L20P4DH	12-1/2	8-1/2	P42B0007A2	23		
		1	7	1	230	S20P4HS10221	27-1/4	34	L20P4EH	14-3/4	9-3/4	P42B0010A2	25		
		1-1/2	9	1	230	S20P4HS15221	32	39	L20P4FH	16-3/4	10-3/4	P42B0015A2	29		
	3 Wire	3/4	5	1	230	S20P4HS07231	23-3/4	30	L20P4DH	12-1/2	8-1/2	P43B0007A2	23	SMC-CR0721	5
		1	7	1	230	S20P4HS10231	27-1/4	34	L20P4EH	14-3/4	9-3/4	P43B0010A2	25	SMC-CR1021	5
		1-1/2	9	1	230	S20P4HS15231	30-1/2	39	L20P4FH	16-3/4	10-3/4	P43B0015A2	29	SMC-CR1521	7
		1-1/2	9	3	230				L20P4FH	16-3/4	10-3/4	P43B0015A3	23		
		1-1/2	9	3	460				L20P4FH	16-3/4	10-3/4	P43B0015A4	23		
		2	12	1	230				L20P4GH	20-1/4	12-1/2	P43B0020A2	31	SMC-CR2021	7
		2	12	3	230				L20P4GH	20-1/4	12-1/2	P43B0020A3	32		
		2	12	3	460				L20P4GH	20-1/4	12-1/2	P43B0020A4	32		
		3	17	1	230				L20P4HH	25-3/4	15	P43B0030A2	40	SMC-CR3021	7
		3	17	3	230				L20P4HH	25-3/4	15	P43B0030A3	32		
		3	17	3	460				L20P4HH	25-3/4	15	P43B0030A4	32		
		5	28	1	230				L20P4JH	38	21	P43B0050A2	70	SMC-CR5021	8
		5	28	3	230				L20P4JH	38	21	P43B0050A3	55		
		5	28	3	460				L20P4JH	38	21	P43B0050A4	55		
		7-1/2	40	3	230				L20P4KH	53-3/4	30	P43B0075A3	70		
		7-1/2	40	3	460				L20P4KH	53-3/4	30	P43B0075A4	70		
		10	54	3	460				L20P4LH	71	41	P43B0100A4	78		
30***	2 Wire	1	5	1	230	S30P4HS10221	26-1/2	35	L30P4EH	14	9-3/4	P42B0010A2	25		
		1-1/2	6	1	230	S30P4HS15221	30-1/2	39	L30P4FH	15-1/4	10-3/4	P42B0015A2	29		
	3 Wire	1	5	1	230	S30P4HS10231	26-1/2	35	L30P4EH	14	10	P43B0010A2	25	SMC-CR1021	5
		1-1/2	6	1	230	S30P4HS15231	29	39	L30P4FH	15-1/4	11	P43B0015A2	29	SMC-CR-1521	7
		1-1/2	6	3	230				L30P4FH	15-1/4	11	P43B0015A3	23		
		1-1/2	6	3	460				L30P4FH	15-1/4	11	P43B0015A4	23		
		2	8	1	230				L30P4GH	18-1/4	12	P43B0020A2	31	SMC-CR2021	7
		2	8	3	230				L30P4GH	18-1/4	12	P43B0020A3	23		
		2	8	3	460				L30P4GH	18-1/4	12	P43B0020A4	23		
		3	12	1	230				L30P4HH	24	15	P43B0030A2	40	SMC-CR3021	7
		3	12	3	230				L30P4HH	24	15	P43B0030A3	32		
		3	12	3	460				L30P4HH	24	15	P43B0030A4	32		
		5	20	1	230				L30P4JH	35-3/4	20	P43B0050A2	70	SMC-CR5021	8
		5	20	3	230				L30P4JH	35-3/4	20	P43B0050A3	55		
		5	20	3	460				L30P4JH	35-3/4	20	P43B0050A4	55		
		7-1/2	28	3	230				L30P4KH	50	27	P43B0075A3	70		
		7-1/2	28	3	460				L30P4KH	50	27	P43B0075A4	70		
		10	38	3	460				L30P4LH	65-1/2	35	P43B0100A4	70		

* Length and Weight are approximate.

** For 10 GPM, 15 GPM, and 20 GPM, discharge is 1-1/4" NPT.

*** For 30 GPM and 50 GPM discharge is 2" NPT.

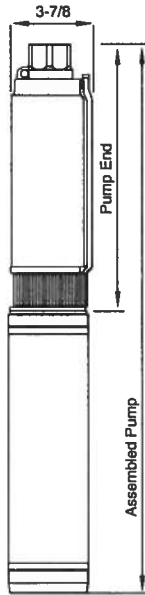
NOTE: On 2 HP and larger – Pump, Motor, Control Box or Magnetic Starter must be ordered separately.

† Check Valve not included on 5 HP, 7-1/2 HP and 10 HP models. Check valve not included on 50 GPM models.

TrimLine™ version maximum outside diameter 3-3/4". Standard version maximum outside diameter on all models is 3-7/8".

4" Submersible Pumps

OUTLINE DIMENSIONS - 10, 15, AND 20 GPM

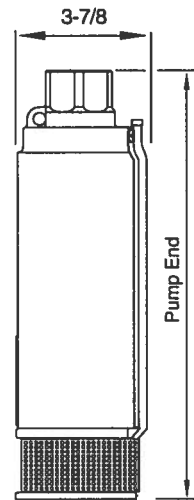


Discharge	
10 GPM	1-1/4" NPT
15 GPM	1-1/4" NPT
20 GPM	1-1/4" NPT

For lengths, refer to Ordering Information tables.

Dimensions (in inches) are for estimating purposes only.

OUTLINE DIMENSIONS - 30 AND 50 GPM

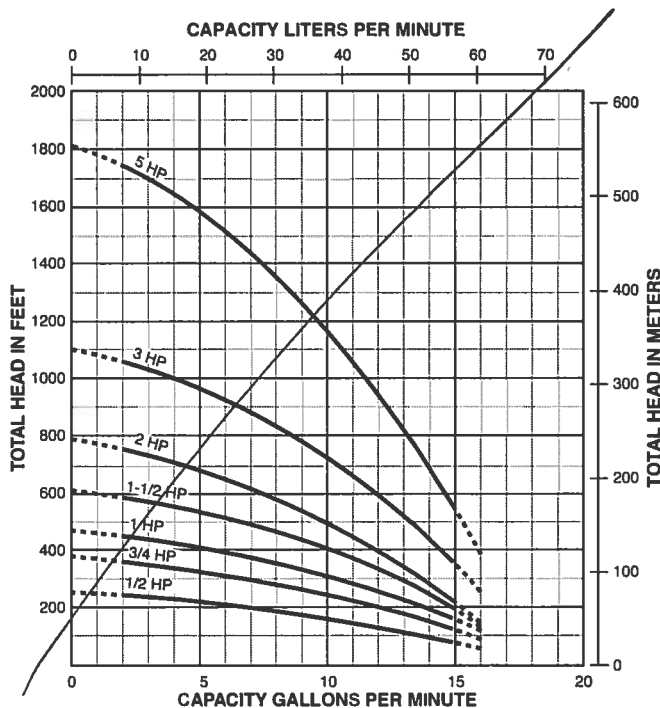


Discharge	
30 GPM	2" NPT
50 GPM	2" NPT

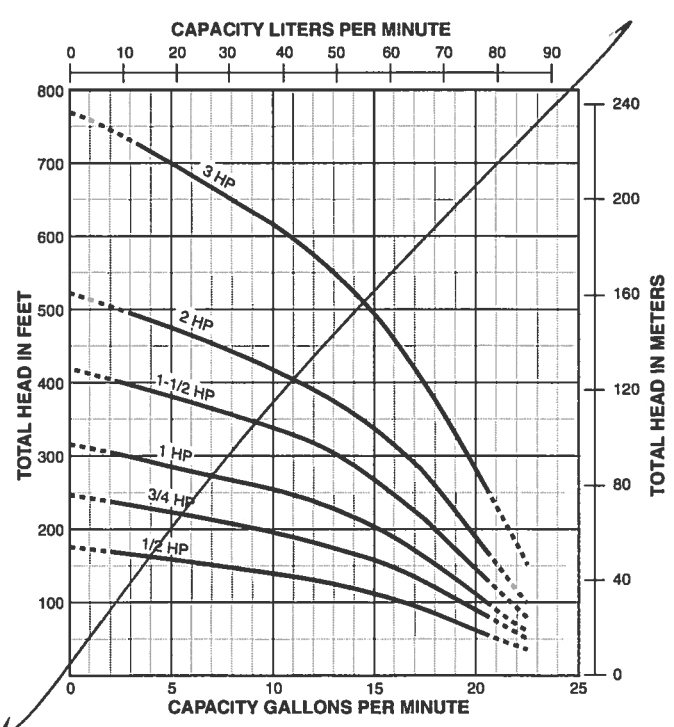
Pump diameter is 3-7/8". For lengths, refer to Ordering Information tables.

Dimensions (in inches) are for estimating purposes only.

PUMP PERFORMANCE - 10 GPM



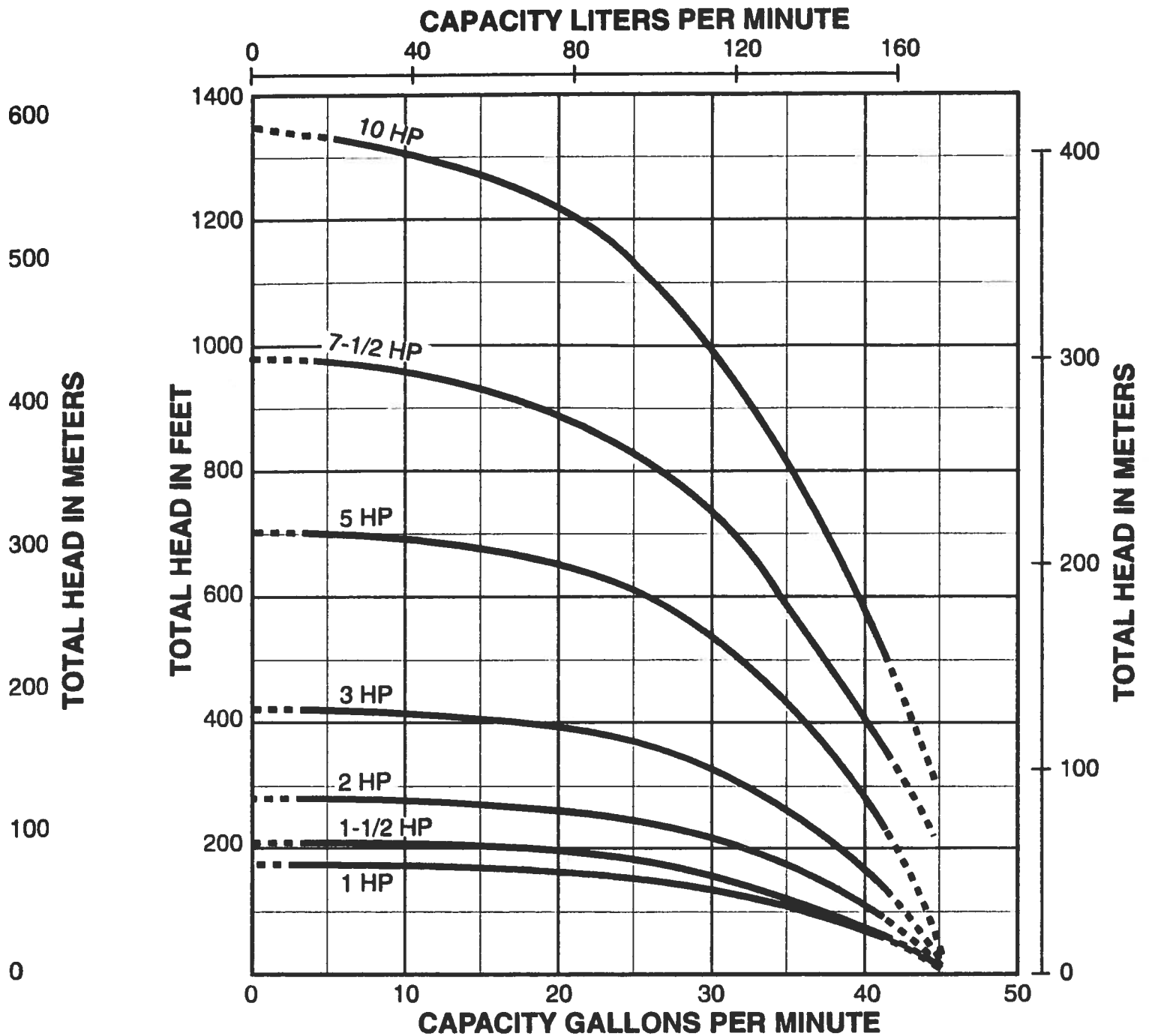
PUMP PERFORMANCE - 15 GPM



Tested and rated in accordance with Water Systems Council standards.

NOTE: Pumps installed with a PRO-Source™ tank require a 100 PSI relief valve. Pumps installed with a conventional tank require a 75 PSI relief valve. Relief valve must be capable of relieving entire flow of pump at relief pressure.

PUMP PERFORMANCE – 30 GPM



1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

SCOPE

These specifications set forth the minimum acceptable design criteria and performance requirements for Compound-type cold water meters including the following potential service applications and general considerations:

- Intended where a wide flow range is anticipated
- Measurement of water usage for critical billing applications
- Measurement intended for typical commercial and industrial applications requiring lower flow sensitivities
- Measurement of low flow usage below OMNI T² Meter threshold levels
- Measurement of constant low to medium flows up to high flow usage

CONFORMANCE TO STANDARDS

The meter package shall meet or exceed all requirements of ANSI/AWWA Standard C701 and C702 for Class II compound and turbine meter assemblies. Each meter assembly shall be performance tested to ensure compliance.

The meter package shall meet or exceed all requirements of NSF/ANSI Standard 61, Annex F and G.

MAINCASES

The meter maincase shall be of epoxy coated ductile iron composition. The epoxy coating shall be provided as standard fusion-bonded and adhere to NSF for nonlead regulation compliance.

PERFORMANCE

The meter assembly shall have performance capability of continuous operation up to the rated maximum flows as listed below without affecting long-term accuracy or causing any undue component wear. The meter assembly shall also provide a 25% flow capacity in excess of the maximum flows listed for intermittent flow demands. Maximum head-loss through the meter / strainer assembly shall not exceed those listed in the following table per meter size.

OPERATING CHARACTERISTICS

Meter Size	Low Flow (95% Min.)	Operating Range (98.5 - 101.5%)	Intermittent Flows (98.5 - 101.5%)	Pressure Loss (Not to Exceed)
1-1/2"	.25 GPM	.5 to 160 GPM	200 GPM	6.9 PSI @ 160 GPM
2"	.25 GPM	.5 to 160 GPM	200 GPM	4.3 PSI @ 160 GPM
3"	.5 GPM	1.0 to 400 GPM	500 GPM	3.2 PSI @ 400 GPM
4"	.75 GPM	1.5 to 800 GPM	1000 GPM	6.4 PSI @ 800 GPM
6"	1.5 GPM	3.0 to 1600 GPM	2000 GPM	5.5 PSI @ 1600 GPM
8"	2.5 GPM	4 to 2700 GPM	3400 GPM	4 PSI @ 2700 GPM
10"	3.5 GPM	5 to 4000 GPM	5000 GPM	4.5 PSI @ 4000 GPM

MEASURING CHAMBER

The measuring chamber shall consist of a measuring element, removable housing, and all-electronic register. The measuring element shall be mounted on a horizontal, stationary stainless steel shaft with sleeve bearings and be essentially weightless in water. The measuring element comes integrated with the advanced Floating Ball Technology design. The measuring chamber shall be capable of operating within the above listed accuracy limits without calibration when transferred from one maincase to another of the same size. The measuring shall be so configured to capture all flows as specified above, without the requirement of an automatic valve.

DIRECT MAGNETIC DRIVE SYSTEM

The direct magnetic drive shall occur between the motion of the measuring element blade position and the electronic register. The OMNI direct drive system with Floating Ball Technology is designed to extend service life, enhance low flow sensitivity and provide extended flow capacity and overall accuracy of the meter assembly. Any and all additional intermediate, magnetic or mechanical, drive couplings are not acceptable.

ELECTRONIC REGISTER

The meter's register is all-electronic and does not contain any mechanical gearing to display flow and accurate totalization. The electronic register includes the following partial list of features:

- AMR resolution units fully programmable
- Pulse output frequency fully programmable
- Integral data logging capability
- Integral resettable accuracy testing feature
- Large, easy-to-read LCD display
- 10-year battery life guarantee

MAXIMUM OPERATING PRESSURE

The meter assembly shall operate properly without leakage, damage, or malfunction up to a maximum working pressure of 200 pounds per square inch (psig).

STRAINERS

The meter strainer shall be integral and cast as part of the meter's maincase. The strainer's screen shall have a minimum net open area of at least two (2) times the pipe opening and be a V-shaped configuration for the purpose of maintaining a full unobstructed flow pattern. The strainer body shall be a coated ductile iron fusion-bonded epoxy identical to that of the meter's maincase. All fasteners shall be stainless steel capable of maintaining the following static pressure ratings and physical dimensions:

Meter Size	Maximum Working Pressure	Centerline to Strainer Base	Overall Length (Not to Exceed)
1-1/2"	200 PSIG	2-5/16 INCHES	13 INCHES
2"	200 PSIG	2-5/16 INCHES	15-1/4 INCHES
3"	200 PSIG	4-1/8 INCHES	17 INCHES
4"	200 PSIG	4-3/4 INCHES	20 INCHES
6"	200 PSIG	5-3/4 INCHES	24 INCHES
8"	200 PSIG	6-3/4 INCHES	30-1/8 INCHES
10"	200 PSIG	8-1/2 INCHES	41-1/8 INCHES

STRAIGHTENING VANES

A straightening vane assembly is mandatory and shall be positioned directly upstream of the measuring element. The straightening vane assembly shall be an integral component of the measuring chamber.

CONNECTIONS

Flanges for the 1-1/2" and 2" size meter assemblies shall be of the 2-bolt oval flange configuration. The 3", 4", 6", 8" and 10" size meter assemblies shall have flanges of the Class 125 round type, flat faced and shall conform to ANSI B16.1 for specified diameter, drilling and thickness.

CERTIFICATIONS AND MARKINGS

All sizes of meter packages shall display the sizes, model, manufacturer name, and direction of flow. Such display shall be cast on the side of the meter maincase.

GUARANTEE AND MAINTENANCE PROGRAM

Meters shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of shipment. In addition, the meter supplier shall submit nationally published literature clearly outlining its factory maintenance program and current price schedule covering complete measuring chamber exchange.

INTENT

Subject meter specifications are designed to establish minimum guidelines for selecting an extremely critical metering device. Areas of concern to be evaluated in the selection process include, but are not limited to, ease of installation, operational features and benefits, readability and future system maintenance expense. A design, which reflects longevity of proper operation in all elements and high degree of sustained accuracy within the entire range of the meter assembly, is to be considered mandatory. Enhanced accuracy levels and performance are desired and will not be compromised.

RECOMMENDATION

Sensus OMNI C² Meter

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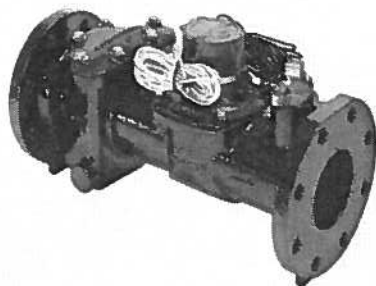
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OMNI™ C²1-1/2", 2", 3", 4", 6", 8" and 10" OMNI C² Meter

Description

1-1/2", 2", 3", 4", 6", 8" and 10" Sizes

The OMNI C² meter operation is based on advanced Floating Ball Technology (FBT).



AMR/AMI Mode



Totalization Mode



Resettable Test Mode

Features

CONFORMANCE TO STANDARDS

The OMNI C² meter meets and far exceeds the most recent revision of AWWA Standard C701 and C702 class II. Additionally, the meter does not require a valve to meet these standards. Each meter is performance tested to ensure compliance. All OMNI meters are NSF/ANSI Standard 61, Annex F and G approved latest standards.

PERFORMANCE

The patented measurement principles of the OMNI C² meter assure enhanced accuracy ranges, an overall greater accuracy, and a longer service life than any other comparable class meter produced. The OMNI C² meter has no restrictions as to sustained flow rates within its continuous operating range. The floating ball measurement technology allows for flows up to its rated maximum capacity without undue wear or accuracy degradation when installed in any orientation.

CONSTRUCTION

The OMNI C² meter consists of two basic assemblies; the maincase and the measuring chamber. The measuring chamber assembly includes the "floating ball" impeller with a coated titanium shaft, hybrid axial bearings, integral flow straightener and an all-electronic programmable register with protective bonnet. The maincase is made from industry proven Ductile Iron with an approved NSF epoxy coating. Maincase features are; easily removable

measuring chamber, unique chamber seal to the maincase using a high pressure o-ring, testing port and an AWWA compliant strainer.

OMNI ELECTRONIC REGISTER

The OMNI C² electronic register is hermetically sealed with an electronic pickup containing no mechanical gearing. The large character LCD displays AMR, Totalization and a Resettable Test Totalizer. OMNI register features; AMR resolution units that are fully programmable, Pulse output frequency that are fully programmable, Integral customer data logging capability, Integral resettable accuracy testing feature compatible with UniPro Testing Assistant Program, Large, easy-to-read LCD also displays both forward and reverse flow directions and all with a 10-year battery life guarantee.

MAGNETIC DRIVE

Meter registration is achieved by utilizing a fully magnetic pickup system. This is accomplished by the magnetic actions of the embedded rotor magnets and the ultra sensitive register pickup probe. The only moving component in water is the "floating ball" impeller.

MEASURING ELEMENT

The revolutionary thermoplastic, hydrodynamically balanced impeller floats between the bearings. The Floating Ball Technology (FBT) allows the measuring element to operate virtually without fric-

tion or wear, thus creating the extended upper and lower flow ranges capable on only the OMNI C² meter.

STRAINER

The OMNI C² with the AWWA compliant "V" shaped strainer using a stainless steel screen along with Floating Ball Technology (FBT) create a design that gives far improved accuracy even in those once thought questionable settings. A removable strainer cover permits easy access to the screen for routine maintenance.

MAINTENANCE

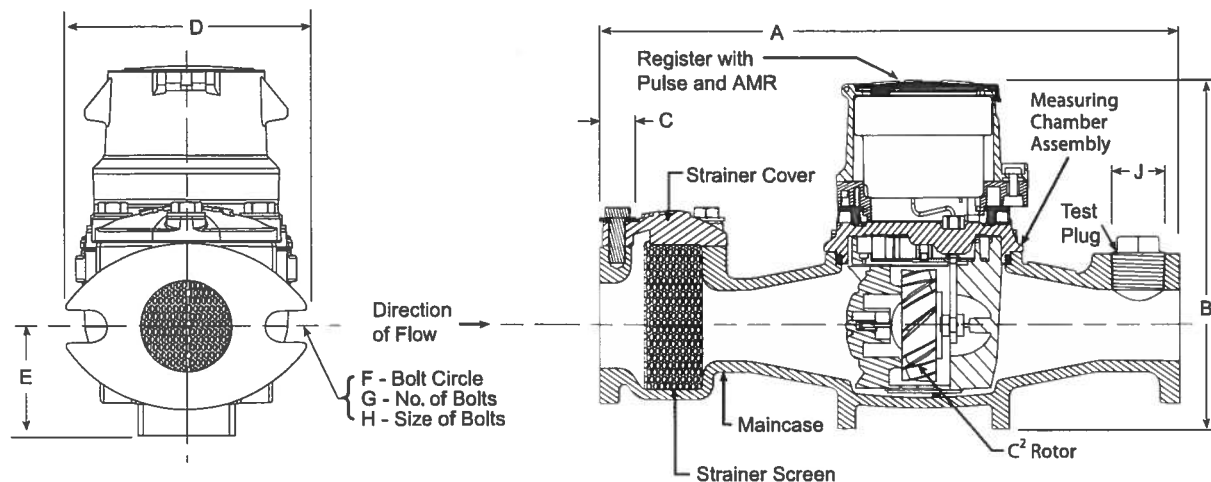
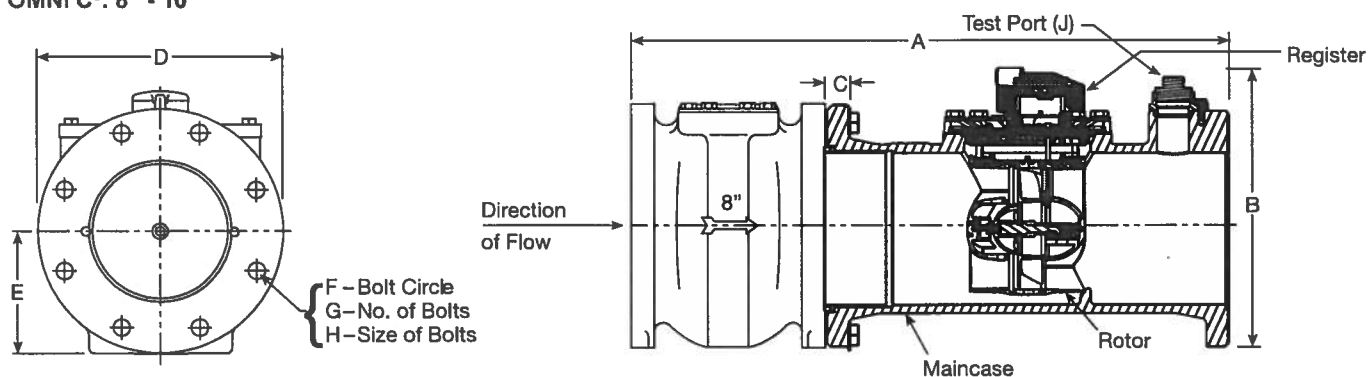
The OMNI C² meter is designed for easy maintenance. Should any maintenance be required, the measuring chamber and / or strainer cover can be removed independently. Parts and or a replacement measuring chamber may be utilized in the event repairs are needed. Replacement Measuring Chambers are available for the OMNI C² meters and may also be utilized for retrofitting to competitive meters to achieve increased accuracy and extended service life.

AMR / AMI SYSTEMS:

Meters and encoders are compatible with current Sensus AMR/AMI systems.

GUARANTEE:

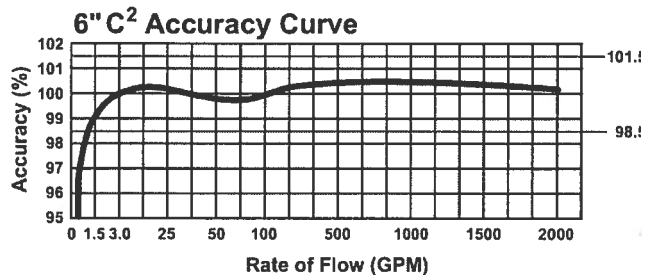
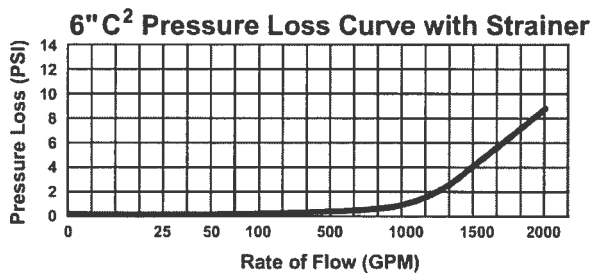
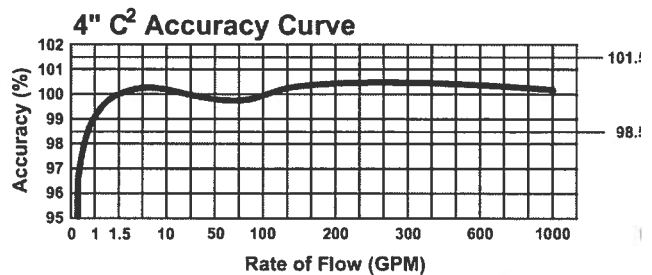
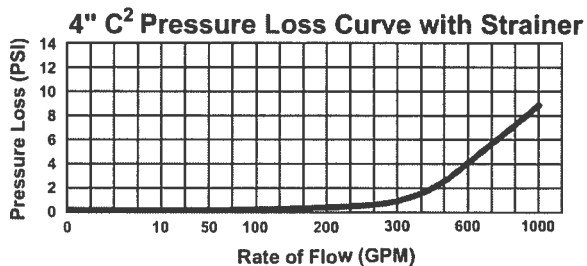
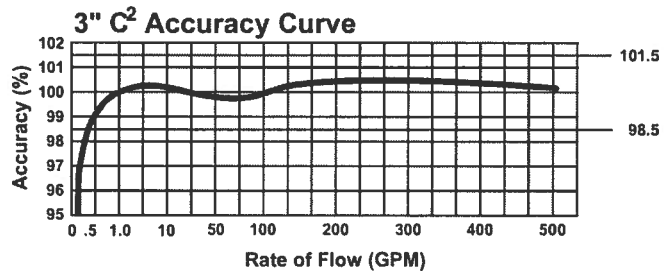
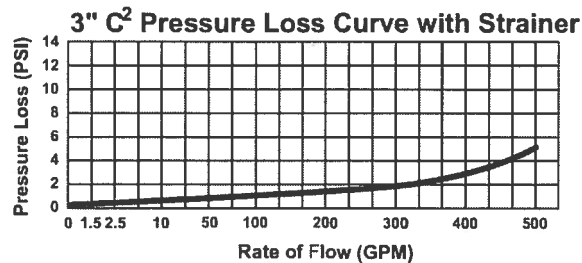
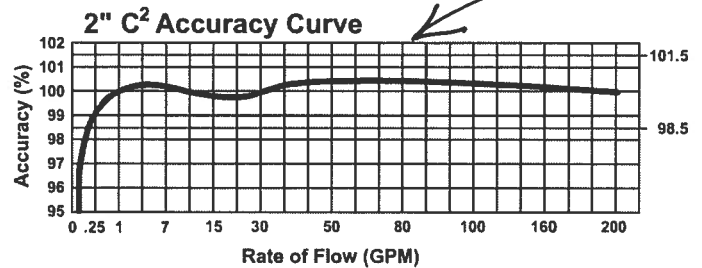
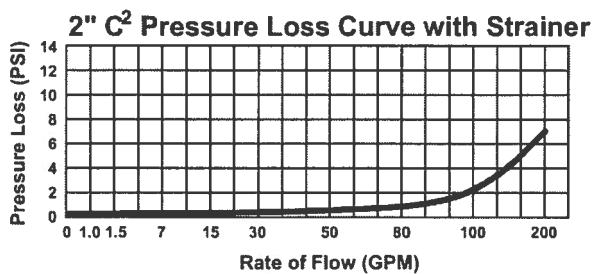
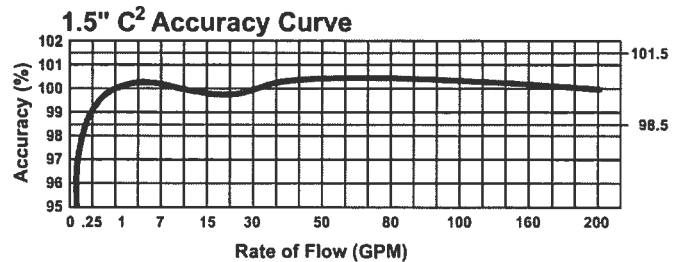
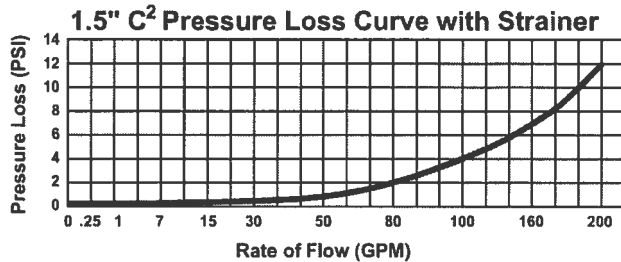
Sensus OMNI C² Meters are backed by "The Sensus Guarantee." Ask your Sensus representative for details or see Bulletin G-500.

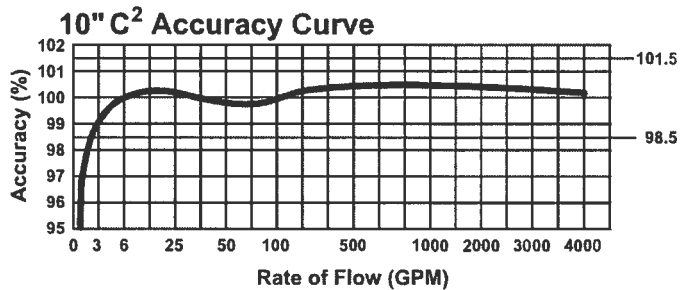
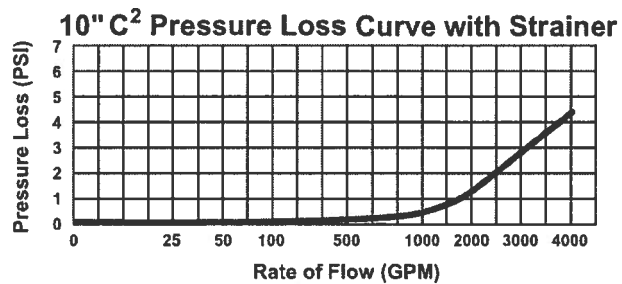
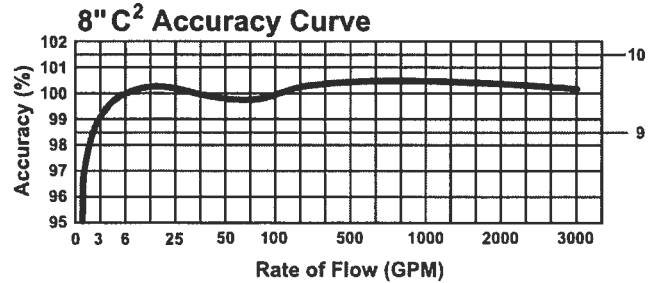
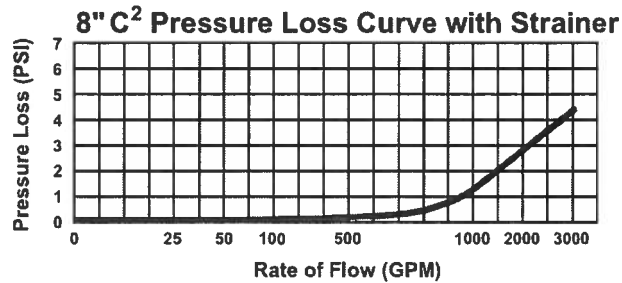
OMNI C²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes**OMNI C²: 1 1/2" - 6"****OMNI C²: 8" - 10"****DIMENSIONS AND NET WEIGHTS**

Meter and Pipe Size	Normal Operating Range		Connections	A	B	C	D	E	F	G	H	J	Net Weight	Shipping Weight
1-1/2" DN 40mm	.5 gpm .11 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	13" 330mm	7-7/8" 200mm	15/16" 24mm	5-1/8" 130mm	2-5/16" 59mm	4" 102mm	2	5/8" 16mm	1" 25mm	18.8 lbs. 8.53 kg.	22.5 lbs. 10.20 kg.
2" DN 50mm	.5 gpm .11 m ³ /hr	200 gpm 45 m ³ /hr	Flanged	15-1/4" 387mm	7-7/8" 200mm	1" 25mm	5-3/4" 146mm	2-5/16" 59mm	4-1/2" 114mm	2	3/4" 19mm	1" 25mm	25.4 lbs. 11.39 kg.	32.5 lbs. 14.74 kg.
3" DN 80mm	1 gpm .23 m ³ /hr	500 gpm 114 m ³ /hr	Flanged	17" 432mm	8-3/4" 222mm	3/4" 19mm	7-7/8" 200mm	4-1/8" 105mm	6" 153mm	4	5/8" 16mm	1" 25mm	45 lbs. 20.41 kg.	72.8 lbs. 33.02 kg.
4" DN 100mm	1.5 gpm .34 m ³ /hr	1000 gpm 227 m ³ /hr	Flanged	20" 508mm	11-3/16" 284mm	15/16" 24mm	9-1/8" 232mm	4-3/4" 121mm	7-1/2" 191mm	8	5/8" 16mm	1-1/2" 40mm	64.9 lbs. 29.44 kg.	72.8 lbs. 33.02 kg.
6" DN 150mm	3 gpm .68 m ³ /hr	2500 gpm 5687 m ³ /hr	Flanged	24" 610mm	13-1/4" 336mm	15/16" 24mm	11" 279mm	5-3/4" 146mm	9-1/2" 242mm	8	3/4" 19mm	1-1/2" 40mm	130 lbs. 48.5 kg.	155 lbs. 57.8 kg.
8" DN 200mm	4 gpm .91 m ³ /hr	2700 gpm 614 m ³ /hr	Flanged	30-1/8" 765 mm	15" 381 mm	11/16" 17 mm	13-1/2" 343 mm	6-3/4" 172 mm	11-3/4" 300 mm	8	3/4" 19 mm	2" NPT	471 lbs. 214 kg.	521 lbs. 236 kg.
10" DN 250mm	5 gpm 1.1 m ³ /hr	4000 gpm 908 m ³ /hr	Flanged	41-1/8" 1045mm	19" 485mm	11/16" 17mm	16" 406mm	8-1/2" 216mm	14-1/4" 362mm	12	7/8" 22mm	2" NPT	685 lbs. 311 kg.	745 lbs. 338 kg.

OMNI C²: 1-1/2", 2", 3", 4", 6", 8" and 10" Sizes**SPECIFICATIONS**

SERVICE	Measurement of potable and reclaim water. Operating temperature range of 33 °F (56 °C) - 150 °F (65.6 °C)	
OPERATING RANGE (100% ± 1.5%)	1-1/2": .5 – 200 GPM (.11 - 45 m ³ /hr) 2": .5 – 200 GPM (.11 - 45 m ³ /hr) 3": 1.0 – 500 GPM (.23 - 114 m ³ /hr) 4": 1.5 – 1000 GPM (.34 - 227 m ³ /hr) 6": 3 – 2000 GPM (.68 - 454 m ³ /hr) 8": 4 – 2700 GPM (0.91 – 614 m ³ /hr) 10": 5-4000 GPM (1.1-908 m ³ /hr)	
LOW FLOW (95% – 101.5%)	1-1/2": .25 GPM (.06 m ³ /hr) 2": .25 GPM (.06 m ³ /hr) 3": .5 GPM (.11 m ³ /hr) 4": .75 GPM (.17 m ³ /hr) 6": 1.5 GPM (.34 m ³ /hr) 8": 2.5 GPM (0.57 m ³ /hr) 10": 3.5 GPM (0.8 m ³ /hr)	
MAXIMUM CONTINUOUS OPERATION	1-1/2": 160 GPM (36m ³ /hr) 2": 160 GPM (36 m ³ /hr) 3": 400 GPM (91 m ³ /hr) 4": 800 GPM (182 m ³ /hr) 6": 1600 GPM (363 m ³ /hr) 8": 2700 GPM (614 m ³ /hr) 10": 4000 GPM (908 m ³ /hr)	
MAXIMUM INTERMITTENT OPERATION	1-1/2": 200 GPM (45 m ³ /hr) 2": 200 GPM (45 m ³ /hr) 3": 500 GPM (114 m ³ /hr) 4": 1000 GPM (227 m ³ /hr) 6": 2000 GPM (454 m ³ /hr) 8": 3400 GPM (773 m ³ /hr) 10": 5000 GPM (1136 m ³ /hr)	
PRESSURE LOSS	1-1/2": 6.9 psi @ 160 GPM (48 bar @ 36 m ³ /hr) 2": 4.3 psi @ 160 GPM (.30 bar @ 36 m ³ /hr) 3": 3.2 psi @ 400 GPM (.22 bar @ 91 m ³ /hr) 4": 6.4 psi @ 800 GPM (.51 bar @ 182 m ³ /hr) 6": 5.5 psi @ 1600 GPM (.56 bar @ 363 m ³ /hr) 8": 4 psi @ 2700 GPM (.27 bar @ 614 m ³ /hr) 10": 4.5 psi @ 4000 GPM (.31 bar @ 908 m ³ /hr)	
MAXIMUM OPERATING PRESSURE	200 PSI (13.8 bar)	
FLANGE CONNECTIONS	U.S. ANSI B16.1 / AWWA Class 125	
REGISTER	Fully electronic sealed register with programmable registration (Gal. /Cu.Fl. / Cu. Mtr. / Imp.Gal / Acre Ft.) Programmable AMR/AMI reading and pulse outputs Guaranteed 10 year battery life	
NSF APPROVED MATERIALS	Maincase: Coated Ductile Iron Measuring Chamber: Thermoplastic Rotor "Floating Ball": Thermoplastic Radial Bearings: Hybrid Thermoplastic Thrust Bearings: Sapphire/Ceramic Jewel Magnets: Ceramic Magnet Strainer Screen: Stainless Steel Strainer Cover: Coated Ductile Iron Test Plug: Coated Ductile Iron	

OMNI C²: 1-1/2", 2", 3", 4", and 6" Sizes**Headloss Curves**

OMNI C²: 8" and 10" Sizes**Headloss Curves**

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