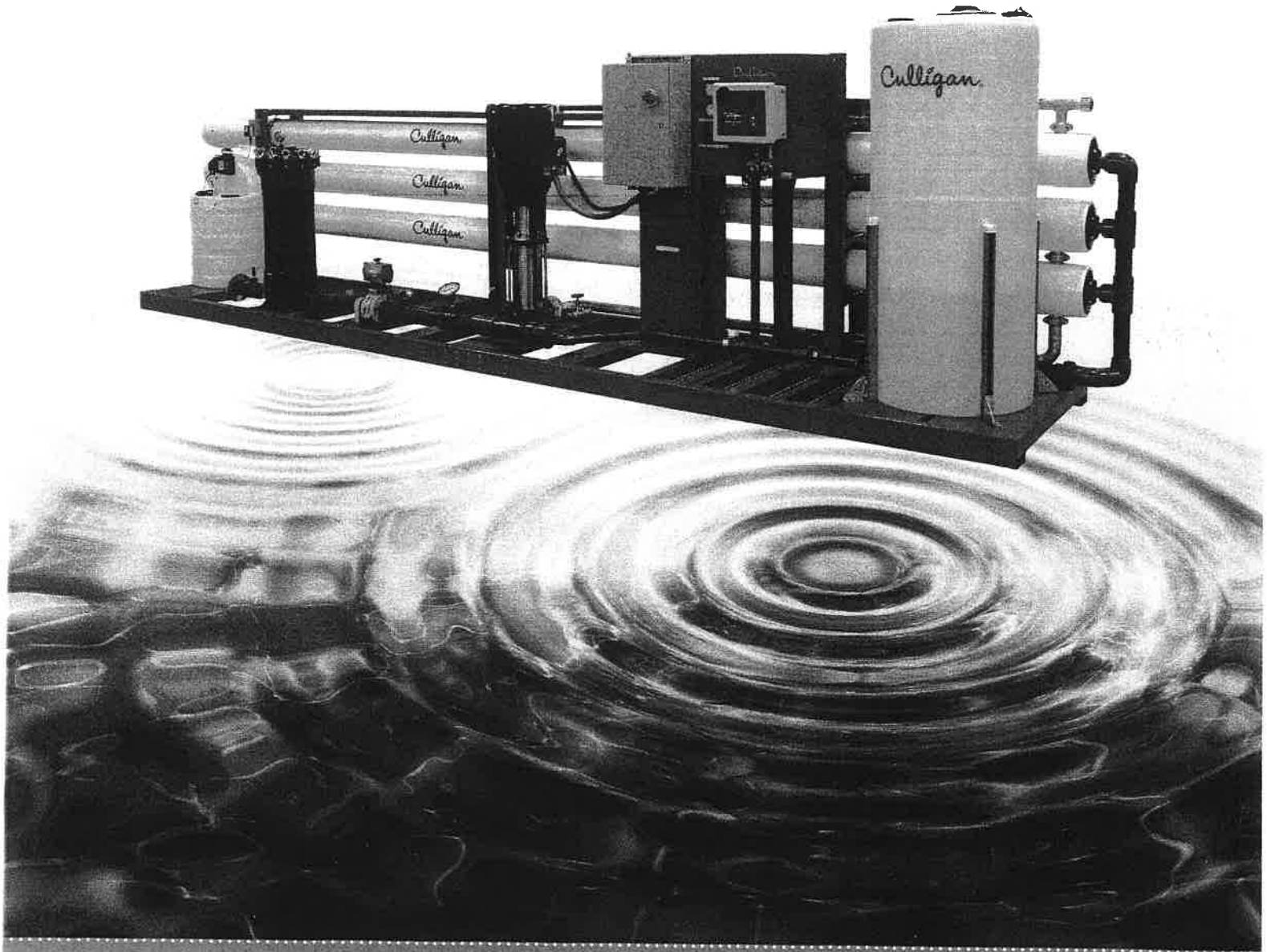
Culligan®

IW REVERSE OSMOSIS SYSTEM



A **CUSTOM** SOLUTION. A **COMPLETE** SOLUTION.

Table of Contents

Introduction

The employees and owners of our local Culligan dealership have a combined 100+ years of experience treating all sorts of water problems. Our dealership's customers are scattered over the western United States; from as far east as Missouri to California in the west and nearly every state in between. Water quality varies from place to place and because we have such a wide range of customers over such long distances, we've seen and dealt with a large array of problem water. We have implemented dozens of commercial reverse osmosis systems all over the western half of the United States and have every confidence that the Chekshani Cliffs project is well within our field of expertise.

We feel that one of best things we can say about ourselves in relation to this project is that we are local. With a project like this, it will be a major benefit to the end users to have service people that are local and don't have to travel long distances to provide service when it is needed. Not to say that service can't be performed over long distances, but it can be expensive and can take time to get people here in a timely manner when needed. In a case like this, local is a definite benefit. We've been locally owned and operated since 1977.

Qualifications

1.

a) Mike Pace is the project manager and the other key members of the project are, Matt Pace, Greg Jensen, John Pace, Roger Smith, with John Pace Sr. (retired) as a consultant. The responsibilities of the team members are to assist one another and to facilitate in the design and installation of the system. All of the members of the project team have vast experience dealing with commercial, industrial, and residential water treatment applications. Many of our customers require industrial sized water treatment equipment and we've been installing, maintaining, and servicing this equipment for over 30 years. Our customers range from car washes, restaurants, hotels/motels, hospitals and medical clinics, manufacturing, laboratories, farming, etc etc. In addition to his experience with Culligan as a water treatment specialist, Greg Jensen brings a unique skill set to the job in that he has worked as a licensed electrician for many years and is extremely skilled with electronics and troubleshooting electrical problems. Roger Smith is a licensed plumber here in Cedar City. While we are licensed to install water treatment equipment, we have found it to be helpful to use Roger on larger jobs like this.

One of our previous jobs that is very similar to the Chekshani Cliffs project was at the copper mine in Milford, UT. They required an industrial reverse osmosis system for the processing and extraction of the copper from their raw ore. We consulted with them to determine what their needs and requirements were, and then sized and designed a system accordingly. They opted to select our bid out of several other companies and with this particular project the customer also decided for us to do the plumbing installation rather than sub it out to a plumbing contractor. We believe that the layout of the plumbing system is critical to the future success of this project. If the quality of water that is being pumped out of the well at Chekshani ever deteriorates, it

would be very helpful if there was some consideration given now to that future possibility. While they may not be necessary now, mixing valves, test ports, coagulant injection ports, etc need to be planned for inside the building in the event that they are needed in the future.

For the copper mine, we sold and delivered an industrial reverse osmosis system. For pre treatment we used back washing depth filters to reduce particulates and sediment, and injected a coagulant as well as an anti scale chemical into the feed water. Finally, a 'Shelco' 1 micron filtration system was employed just before the water was introduced to the RO membranes.

b) We plan on using Reverse osmosis (RO) as the method to treat the problem water at Chekshani. RO is a water treatment process that removes contaminates from water by using pressure to force water through semipermeable membranes. During this process, the contaminants are filtered out and flushed away while the purified water is allowed through the membranes and is then stored for use. RO can remove contaminants that are 1/10,000 of a micron in size (a micron is 1/1,000,000 of a meter) so it is a very effective way to remove dissolved solids like what is dissolved in the water at Chekshani Cliffs. The permeate (product) water is stored, and the waste water in the case at Chekshani is planned to go to a pond. The expected recovery rate is up to 75%, meaning that for every gallon of water that enters the RO system, we expect to keep 75% as permeate, and 25% as waste/concentrate.

The size of the system will depend on which system is selected. Please see appendix 1 for sizing and specification of the various RO system options and pre treatment.

We contacted Paul Monroe asking about our role in the R317-3 requirements. We received an email back from Justin Christensen at Ensign Engineering stating that Ensign is taking the lead in obtaining a permit for the selected water treatment system. Reverse osmosis waste is approved to to be discharged to a sanitary sewer in the state of Utah.

Regarding the size of the evaporation pond needed to hold waste water, the rule of thumb is you will lose 1/4" to evaporation per day from the surface of your pond. So, the larger the pond's

surface area and the shallower the depth of the pond, the better the evaporation rate of the pond. Evaporation is a very complex process that is difficult to estimate using equations. This is because the rate of evaporation is controlled by many factors including ambient air temperature, air pressure, wind speed, and humidity. As anyone that is from here knows, we have higher than average winds, and our humidity is very low so it is likely that and evaporation pond at Chekshani could evaporate more than the average. But again, a rule of thumb is 1/4" surface loss per day due to evaporation on average. Assuming that the Chekshani Cliffs subdivision uses 50,000 gallons of water per day in their day to day operations, this would mean that the RO and pre treatment together will have generated nearly 20,000 gallons of waste per day.

If you had a swimming pool that was evaporating 1/4" of water per day from the surface, and the pool's surface area was 500 square feet, you would lose roughly 78 gallons per day on average to evaporation. Since we are dealing with much more water than that (20,000 gallons per day), the surface area would need to be 128,000 square feet to evaporate all of that water in a single day. This assumes that virtually ALL of the water was surface water. You could build a smaller pond and have it be deeper, then you could lose some of the water to seepage. As we understand it, the Ensign engineers are working on engineering a pond, but these numbers should be helpful. Keep in mind that as the neighborhood grows and more water is used, the waste water numbers will grow as well.

c) The RO's operation is pretty simple. The RO starts and stops automatically using a float system in a storage tank. When the float in the storage tank drops, it sends a signal to the RO to open the inlet solenoid, which floods the booster pump with water. The pump boosts water pressure up to between 180-300 psi which is a suitable pressure to push the water through the membranes. The purified water is delivered to the storage tank, while the waste is diverted to a pond. When the float in the storage tank goes up, the RO will shut off. The operator can monitor several things from the digital display. Things like permeate TDS, inlet flow rates,

and because of the high levels of sulfate in the Chekshani water, we will also need to add a supplementary chemical to keep calcium sulfate scale from forming in the membranes. Without it, your membranes will only last for a couple of months based on our previous experience with calcium sulfate scaling.

Deliverables

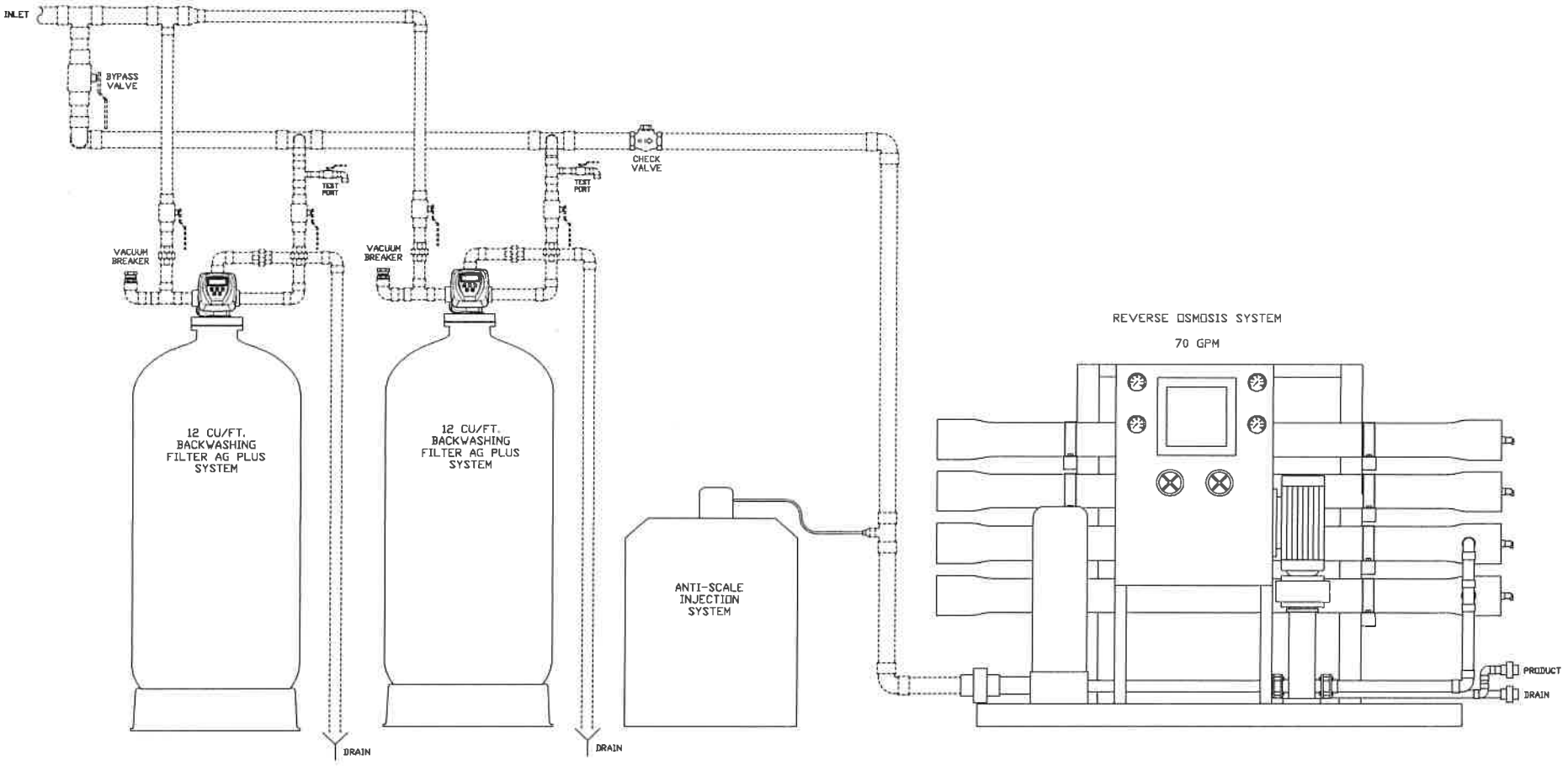
2. Deliverable Schedule, Schematics, Manuals, and Warranty

a) The time frame for manufacturing this equipment is up to 4 weeks from the time we make the order and nearly 1 week to transport it from the Chicago, IL area. Once we have it here, we'd need up to 2 weeks to deliver it to the job site and install the various components. During this time we could also perform startup, perform any necessary troubleshooting, and train the district operators on the entire system.

Project Schedule

Project Task	Schedule
Manufacturing	Four weeks
Delivery / Shipping	One week
Installation, Start up and Training	Two Weeks

Reverse Osmosis and Depth Filtration Schematics



REVERSE OSMOSIS DIAGRAM

OPTION 1

NO.	BY	REVISION	DATE

Pace's Culligan

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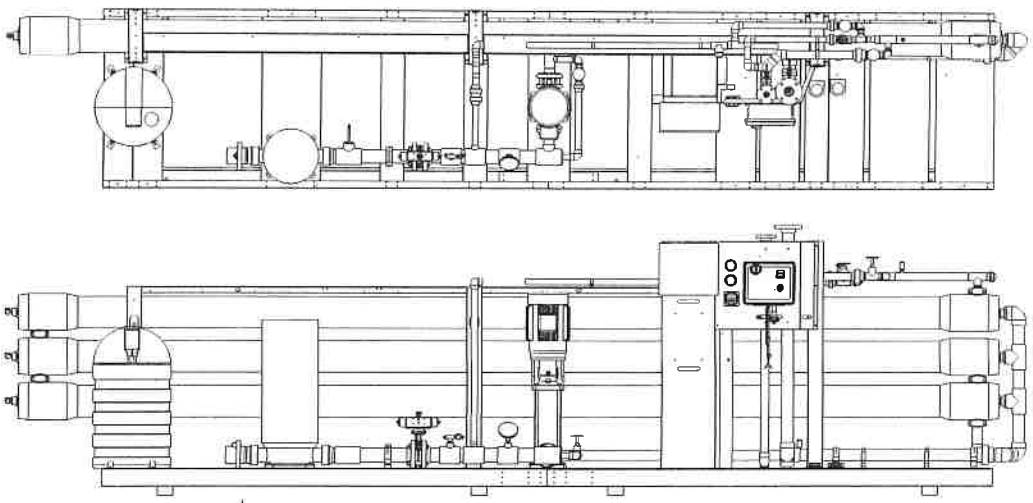
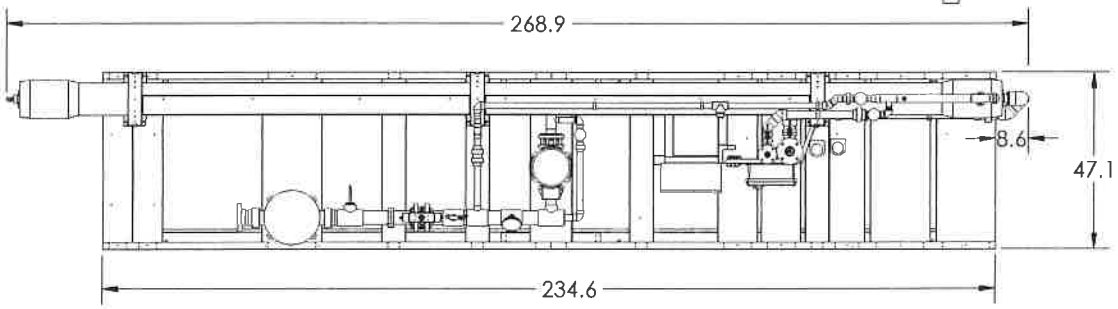
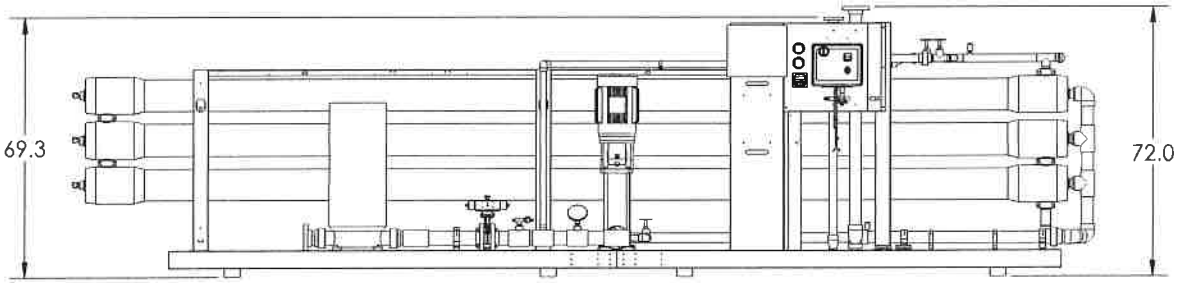
CHECKED BY			
APPROVED BY			



IWUS RO 100 GPM GBE
W/ANTI-SCALANT AND
FAST FUSH





IWUS RO 100 GPM
GBE W/PRE-FILTER

REVISION DESCRIPTION	DCO#	BY	DATE
	-	-	-

Culligan
www.Culligan.com

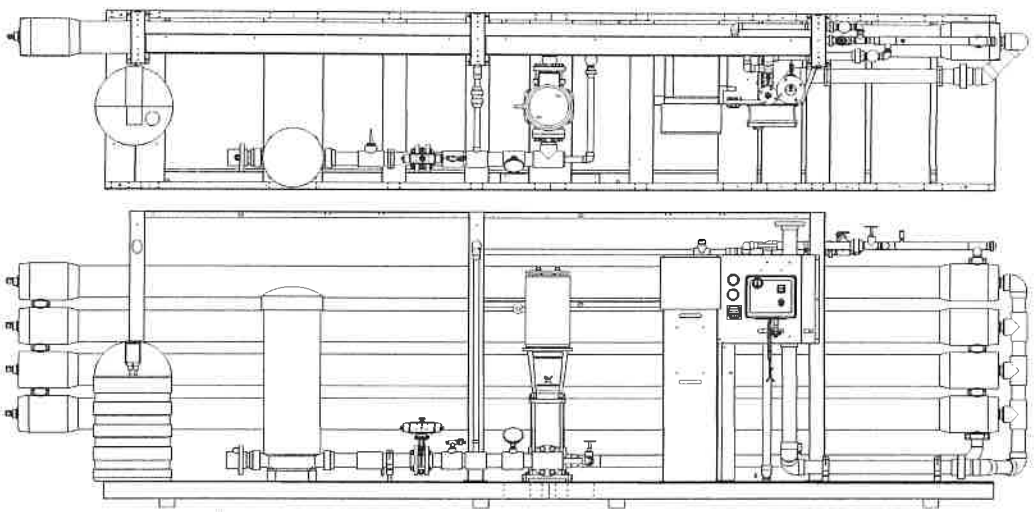
The 3-D file for this item is the controlling document, from which all component and feature dimensions should be referenced and held, excluding threads. The intent of this drawing is to identify critical dimensions and tolerances for inspection.

MATERIAL	SIZE	DRAWN BY
Material <not specified>	B	MKM
	SCALE	APPROVED BY
	1:32	-
	SHEET	APPROVED DATE
	1 OF 1	-

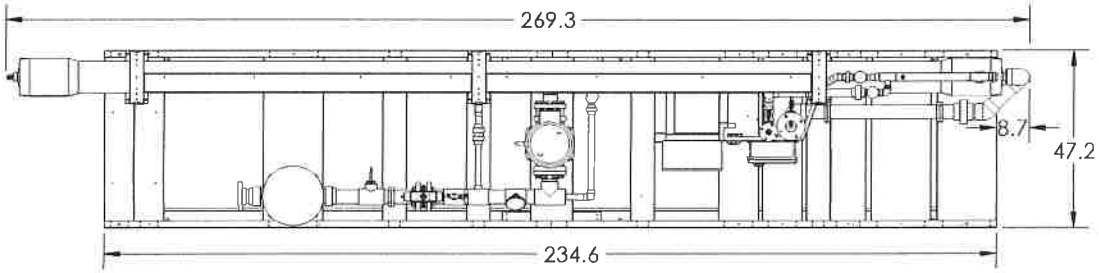
TOLERANCES, UNLESS OTHERWISE SPECIFIED

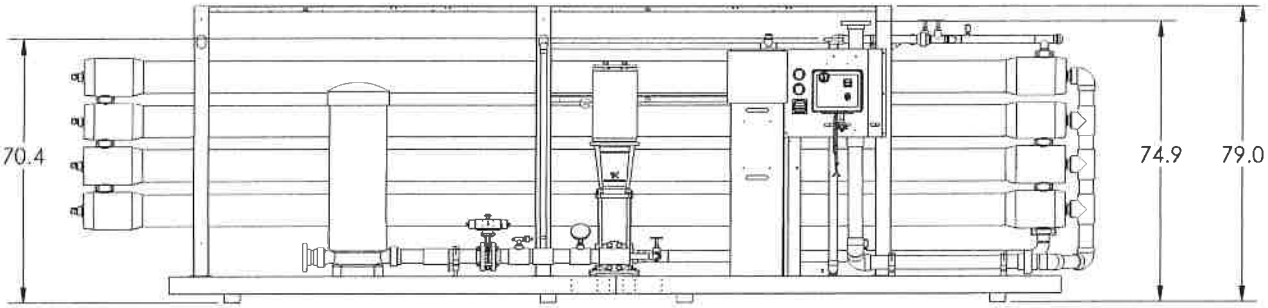
LAST DIGIT	TOLERANCE (Inches)	TOLERANCE (millimeters)
0.	± 0.030	± 0.76
0.0	± 0.015	± 0.38
0.00	± 0.010	± 0.25
0.000	± 0.005	± 0.13
ANGULAR	± 0.5°	± 0.5°

PART DESCRIPTION	PART NUMBER	REV
IWUS RO 100 GPM	-	+



IWUS RO 140 GPM GBE
W/ANTI-SCALANT AND
FAST FUSH





IWUS RO 140 GPM
GBE W/PRE-FILTER

REVISION DESCRIPTION	DCO#	BY	DATE
	-	-	-

Culligan
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The 3-D file for this item is the controlling document, from which all component and feature dimensions should be referenced and held, excluding threads. The intent of this drawing is to identify critical dimensions and tolerances for inspection.

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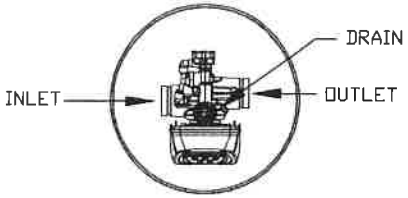
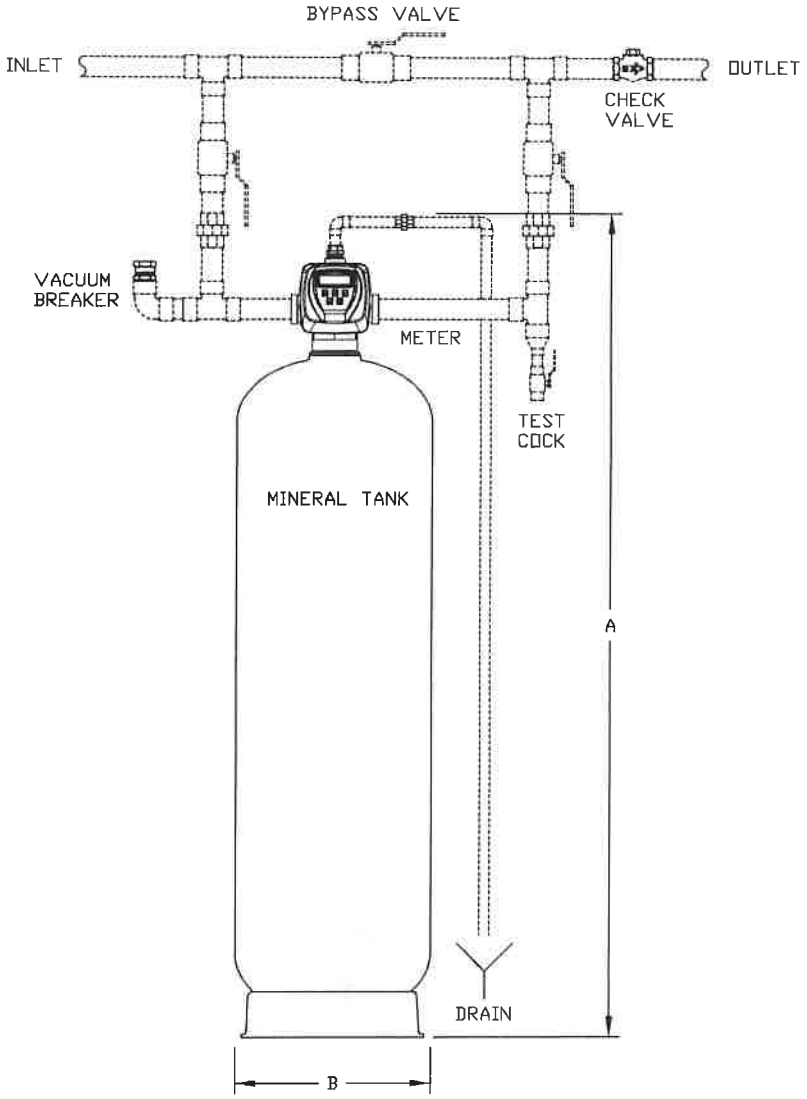
MATERIAL	SIZE	DRAWN BY
	B	MKM
	SCALE	APPROVED BY
	1:32	-
	SHEET	APPROVED DATE
	1 OF 1	-

TOLERANCES, UNLESS OTHERWISE SPECIFIED

LAST DIGIT	TOLERANCE (inches)	(millimeters)
0.	± 0.030	± 0.76
0.0	± 0.015	± 0.38
0.00	± 0.010	± 0.25
0.000	± 0.005	± 0.13
ANGULAR	± 0.5°	± 0.5°

PART DESCRIPTION	PART NUMBER	REV
IWUS RO 140 GPM	-	+





MODEL NO. ——— B956ST-12FAP
NORMAL FLOW [1] ——— 50 GPM
PEAK FLOW [1] ——— 70 GPM
BW RATE ——— 80 GPM
MINERAL TANK ——— 30" X 72" FIBERGLASS
MEDIA VOL. ——— 12 CU FT

DIMENSIONS:

A: ——— 97"
B: ——— 30"
C: ———

WEIGHT:

SHIPPING ——— 1180 LBS
OPERATING ——— 2850 LBS

PIPE SIZE:

INLET ——— 2"
OUTLET ——— 2"
DRAIN ——— 2"

NOTES:

1 Quality of water may vary depending upon flow rate and water conditions.

BACKWASHING FILTER

GENERAL ARRANGEMENT

DRAWN BY		REF. NO.	DWG. NO.
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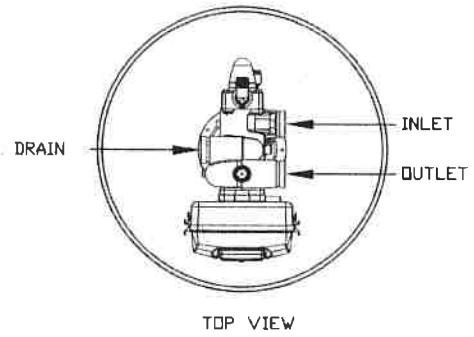
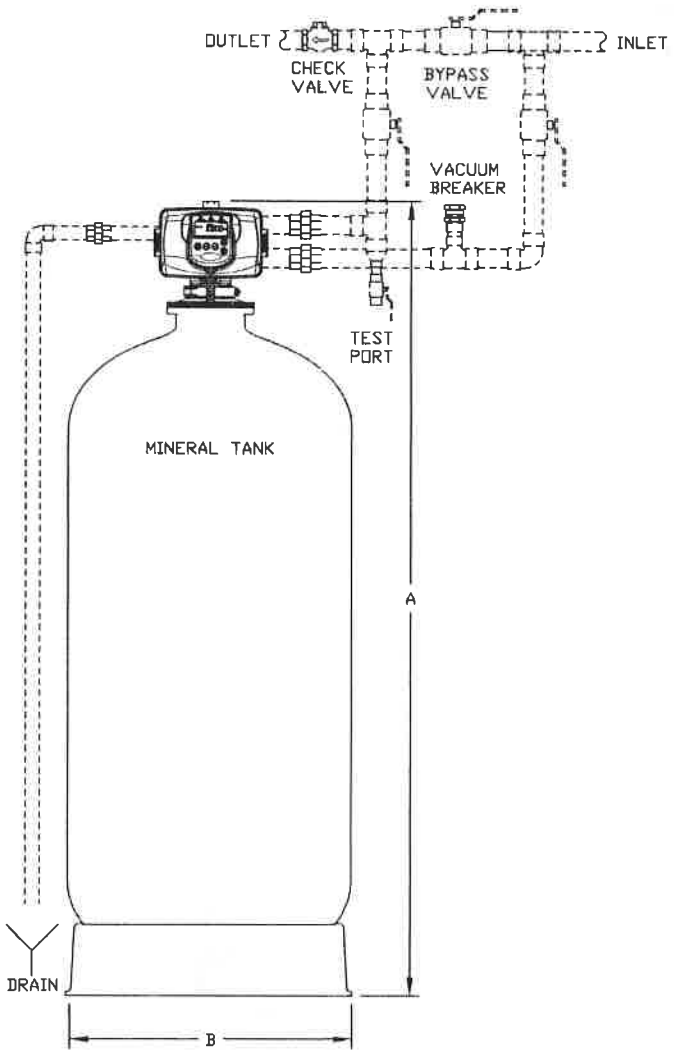
APPROVED BY			



TOP VIEW



MODEL NO. ——— B958TC-18FAP
NORMAL FLOW [1] ——— 70 GPM
PEAK FLOW [1] ——— 90 GPM
BW RATE ——— 125 GPM
MINERAL TANK ——— 36" X 72"
MEDIA VOL. ——— 18

DIMENSIONS:

A: ——— 96"
B: ——— 36"
C: ———

WEIGHT:

SHIPPING ——— 1750 LBS
OPERATING ——— 3940 LBS

PIPE SIZE:

INLET ——— 2"
OUTLET ——— 2"
DRAIN ——— 2"

NOTES:

1 Quality of water may vary depending upon flow rate and water conditions.

BACKWASHING FILTER

GENERAL ARRANGEMENT

DRAWN BY		REF. NO.	DWG. NO.
SCALE		PAGE 1 OF 1	0919-868
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APPROVED BY			

Operations Manual
and
Troubleshooting Guide

Link to download or view the operation manual for the IW series reverse osmosis:

https://cport.culligan.com/getattachment/1b3df2ca-5b95-401c-95c0-2d2653e33f7c/FileAttachment.aspx

(in the interest of not printing out an 84 page document, hopefully the link is sufficient)

The link above also provides a troubleshooting guide.

RO and Chemical Injection System Warranty

Culligan

LIMITED WARRANTY

COMMERCIAL/INDUSTRIAL REVERSE OSMOSIS SYSTEMS

You have just purchased one of the finest reverse osmosis water conditioning units made. As an expression of our confidence in Culligan products, your reverse osmosis water conditioning unit is warranted to the original end-user, when installed in accordance with Culligan International Company specifications, against defects in material and workmanship from the date of original installation, as follows:

For a period of ONE YEAR, { **The entire reverse osmosis conditioning unit, including the reverse osmosis modules, but excluding the expendable filter cartridges used in this unit.**

If a part described above becomes defective, within the specified period, you should notify your independently operated Culligan dealer and arrange a time during normal business hours for the dealer to inspect the reverse osmosis unit on your premises. Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges.

Of course, damage caused by accident, fire, flood, freezing, Act of God, misuse, misapplication, neglect, alteration, installation or operation contrary to our printed instructions, or by the use of accessories or components which do not meet Culligan specifications, is not covered by this warranty.

Our product performance specifications are furnished with each water conditioning unit. TO THE EXTENT PERMITTED BY LAW, CULLIGAN DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE; TO THE EXTENT REQUIRED BY LAW, ANY SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE-YEAR PERIOD SPECIFIED ABOVE FOR THE PARTS DESCRIBED IN THIS LIMITED WARRANTY. As manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing a water conditioner. Please understand that the quality of water supplies may vary seasonally or over a period of time, and that your water usage rate may vary as well. Water characteristics can also change considerably if your water conditioner is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product on a non-potable water source. OUR OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED TO THE REPAIR OR REPLACEMENT OF THE FAILED PARTS OF THE WATER CONDITIONER, AND WE ASSUME NO LIABILITY WHATSOEVER FOR DIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, GENERAL, OR OTHER DAMAGES, WHETHER FROM CORROSION OR OTHER CAUSES.

CONSUMERS:

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Similarly, some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Consult your telephone directory for your local independently-operated Culligan dealer, or write Culligan International Company, for warranty and service information.

CULLIGAN INTERNATIONAL COMPANY
One Culligan Parkway
Northbrook, IL 60062

00881418 (Rev. B 1/12/01)

Printed in USA

Depth Filter Warranty

Culligan

Limited WARRANTY

Culligan® HE 1.5 Series, Hi-Flo® 22 Series, Hi-Flo® 3 Series, Hi-Flo® 3e Series, Soft-Minder Plus, Hi-Flo® 42 Series, Hi-Flo® xN Series, CSM Series and Hi-Flo® 50 Series

You have just purchased one of the finest water conditioners made. As an expression of our confidence in Culligan International Company products, this product is warranted to the original end-user, when installed in accordance with Culligan specifications, against defects in material and workmanship from the date of original installation, as follows:

For a period of ONE YEAR	**The entire conditioner.**
For a period of TWO YEARS	**The control valve internal parts. The brine valve and its component parts. The salt storage container internal components.**
For a period of THREE YEARS	**The control valve body, but excluding its internal parts. Brass body valves only.**
For a period of FIVE YEARS	**The control valve body, excluding internal parts.** **The fiberglass wound container(s), if so equipped*.** **The salt storage container(s), if so equipped.** **The epoxy-lined steel conditioner tank(s), if so equipped.**

* The tank must be protected by a vacuum breaker device as described in the unit's operating manual. Damage to the tank caused by vacuum is not covered by this warranty. The unit must be used in operating conditions that conform to Culligan's recommended design guidelines. This warranty will not apply if the unit has been modified, repaired or altered by someone not authorized by Culligan.

If a part described above is found defective within the specified period, you should notify your independently operated Culligan dealer and arrange a time during normal business hours for the dealer to inspect the water conditioner on your premises. Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges.

We are not responsible for damage caused by accident, fire, flood, freezing, Act of God, misuse, misapplication, neglect, oxidizing agents (such as chlorine, ozone, chloramines and other related components), alteration, installation or operation contrary to our printed instructions, or by the use of accessories or components which do not meet Culligan specifications, is not covered by this warranty. Refer to the specifications section in the Installation and Operating manual for application parameters.

Our product performance specifications are furnished with each water conditioning unit. TO THE EXTENT PERMITTED BY LAW, CULLIGAN DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE; TO THE EXTENT REQUIRED BY LAW, ANY SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE-YEAR PERIOD SPECIFIED ABOVE FOR THE ENTIRE CONDITIONER. As a manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing this product. The quality of water supplies may vary seasonally or over a period of time, and your water usage rate may vary as well. Water characteristics can also differ considerably if this product is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product with a nonpotable water source or a water source which does not meet the conditions for use described in the installation and operation manual(s) that accompany the equipment. OUR OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED TO THE REPAIR OR REPLACEMENT OF THE FAILED PARTS OF THE WATER CONDITIONER, AND WE ASSUME NO LIABILITY WHATSOEVER FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, GENERAL, OR OTHER DAMAGES.

Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Similarly, some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Consult your telephone directory for your local independently operated Culligan dealer, or write Culligan International Company for warranty and service information.

CULLIGAN INTERNATIONAL COMPANY
9399 W. Higgins Road
Rosemont, Illinois 60018

PN 01016557

Rev. D 11/11

Past Performance

Past Performance

3.

a) Project 1 Tamra Mining – Milford, UT (formerly was CS Mining). We installed an industrial reverse osmosis system at their raw ore processing plant. A reference contact for them is Joe Dalton. His number is 435-310-0780.

Perhaps the biggest obstacle we faced at the mine's project was their feed water. It wasn't consistently the same quality from what the analysis showed it would be. In one instance they allowed some of the processed, muddy water from their mill to go into the feed of the RO system which plugged up the pre treatment in a very short time. They also had several wells to choose from for the feed of the RO and some were not suitable for RO feed water. When one well in particular was used, it was full of turbidity which was hard on the membranes and the pre treatment filtration system. We mitigated this by training. Once they understood how important it is to use only the well that had been used in the design of the system, things went very smoothly.

Tamra Mining (formerly CS Mining)

Original Budget	Completed Budget
$142,500.00	$164,055.00

Original Schedule	Completed Schedule
Four Months	Three Months

Their original budget was for us to provide a 50 GPM RO with depth filtration and anti-scale almost identical to what we're suggesting for Chekshani Cliffs. The original budget was

$142,500 with no installation. After they thought about it for a while, they asked us to install it. We've included the change order for you to view.

Regarding the schedule, they didn't really have a timeline because they were still under construction. But they did want it installed in the fall of 2015. We ordered the equipment in July of 2015 and installed it in September of 2015. The team that was used to engineer and install the CS Mining project is the same team we have working on the Chekshani Cliffs project.

CO # 001

CONTRACT CHANGE ORDER

CS Mining, LLC
PO Box 608
1208 S. 200 West
Milford, UT 84751
435.387.5053
www.csmining.com

CS Mining, LLC - Phase II Project

Contractor: Pace's Culligan Water
Address: 950 West Industrial Road
Cedar City, UT
attn: Mike Pace

Date: 10/1/2015
Contract No.: 04851
Purchase Order No.: 04851 CER 129
Agreement Date: 8/13/2015

You are directed to perform the following changes in the above referenced contract. All other provisions of the contract shall, except as specifically changed herein, continue in full and effect. Please furnish all Labor, Equipment, Materials, Supplies, and Incidentals to perform the work required by CS Mining, LLC herewith listed for the described extra work. This Change Order constitutes full compensation for all moneys and time required for the changes listed herein including all markups, labor, equipment, materials, supervision, inefficiencies, production impacts, delays, out of sequence work, and incidentals.

Description: Installation of plumbing for the RO system per Quotation and Order Form dated 14-Sep-15

Item #	Description		Amount
1	All plumbing fittings, including piping, ball valves, test ports, gauges, pressure reducing valves, vacuum breakers, check valves, fittings, etc.	$	6,430.00
2	Assembly of twin depth filtration pre treatment system and 50 GPM reverse osmosis unit including loading tanks and membranes	$	2,975.00
3	All electrical communication between RO, Chemical injection systems, depth filtration, and 7000 gallon storage tank	$	1,950.00
4	All plumbing labor to install and set up Coag chemical injection system, static mixer, depth filtration units, anti scale chemical injection system, and 50 GPM reverse osmosis	$	10,200.00
	Total	**$**	**21,555.00**

Notes:

		Amount
Original Contract Price:	$	142,500.00
Previous Change Orders Amount:	$	-
This Change Order Add/(Delete)	$	21,555.00
Total Revised Contract	**$**	**164,055.00**

Accepted By:

By: M L Pace
Name: Mike Pace
Title: owner / CFO
Date: 10-5-15

Ordered By:
CS Mining, LLC

By: _____
Name: David McMullin
Title: Chief Executive Oficer
Date: _____

Project 2 Three Points Center – Hurricane, UT. We installed a reverse osmosis system at a boys home for the entire compound/community. They have a school in a remote location between Hurricane, UT and Colorado City, AZ where they have water that is very very similar in quality to the water at Chekshani Cliffs. When you have high calcium coupled with high sulfates a phenomenon happens where calcium sulfate scaling occurs. Normal anti scale chemical isn't designed for this situation (it is somewhat uncommon to have this combination; in all of our years in business, we had never encountered it). After a few months of being in service we discovered heavy scaling beginning to form which was cause for alarm. We consulted with several chemical suppliers, one of which sold us a supplement that was designed specifically for a high sulfates and calcium combination to add to the existing anti scale chemical. Once it was employed and put in place, the scaling was instantly arrested and they have now been running with no problems for several years. A reference contact at Three Points Center is Sam Lytle 435-229-4984.

Three Point Center

Original Budget	Completed Budget
$24,900.00	$24,900.00

Original Schedule	Completed Schedule
Two Months	Six Weeks

The original schedule was for the job to be completed within two months of ordering the equipment. We got the equipment and had it installed in one months time. The following two weeks were used to troubleshoot the complex telemetry on their campus.

Project 3 Staheli West Farm Equipment – Cedar City, UT. Through Staheli West, we've sold dozens of commercial RO's all over the western half of the United States. They require reverse osmosis water in certain cases with their steam generating machines for baling hay. Typically the sizes we sell them range from 3–10 gpm so they are smaller than the Chekshani project but the technology is exactly the same for a small or a large RO. Once you leave the residential RO world and enter the commercial/industrial the methodology for sizing, engineering, and application is the same. We have traveled to Fresno, CA on multiple occasions to install commercial RO units that include 5,000-10,000 storage tanks, pre treatment back washing depth filtration, anti scale systems, and telemetry between the various components. We've also traveled to Oregon, Idaho, Arizona, and Missouri to personally install this equipment. In other instances, the customer has opted to install our equipment on their own using us as consultants over the phone. I include Staheli West as a reference simply because we've been exposed to all kinds of bizarre water throughout the country and because of this our skill set has improved with each new challenge we have come across. A reference contact at Staheli West is Spencer Douglas 435-704-4583.

Staheli West / John McLaughlin

Original Budget	Completed Budget
$19,000.00	$19,000.00

Original Schedule	Completed Schedule
Two Months	Two Months

There was no complications with this job even though it was in Fresno, CA other than figuring out the logistics of traveling there with a truck and trailer and all of the equipment.

Example 4 Culligan International – Rosemont, IL. Culligan Corporate manufactures this equipment for us and all of their other dealers and they have nearly 85 years of experience in the water treatment industry. Their engineers and design specialists have designed and sold hundreds of industrial sized Reverse Osmosis systems all over the world. Since we are a Culligan franchise/dealer, they are able to help us with all of our projects from the design phase all the way through installation and troubleshooting if we need it. A reference at Culligan is Tolentino Pacheco at 408-858-7273. He is a field representative for Culligan Corporate and has been involved in implementing many Industrial sized RO's.

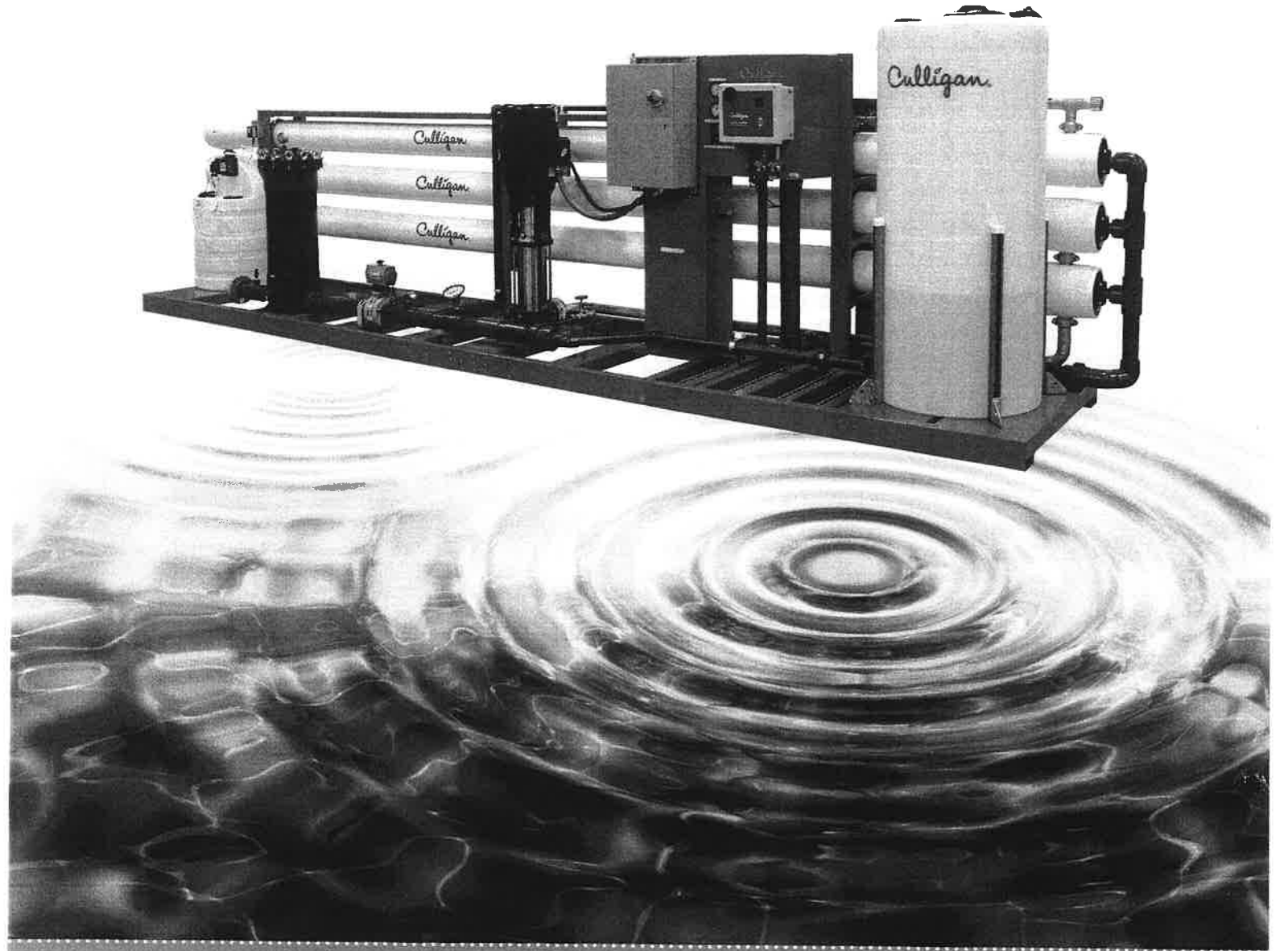
We have many customers that would likely be well known to you. All of the local Chili's, Applebees, and Wal-Marts in St. George and Cedar City, Hurricane and Mesquite, NV, Motel-6, Springhill Marriott, Ramada, Townplace Marriott, Fairfield Marriott, Abby Inn, Holiday Inn Express, Ruby's Inn, Smithfield Foods (pig farms in Milford, UT), Litehouse, Deseret Labs, AMPAC/Wecco, 5N Plus, Metalcraft, Carwashes, Ram Co, Courtyard Marriott, Olive Garden, Village Inn, Dixie Dialysis, Iron Mission Dialysis, IHC Dixie Regional Medical Center and all of their campuses, Viracon, Milliken, Western Quality Foods, GAF, Cerro Flow Copper, Berry's Manufacturing, Nassco, etc etc.

Appendix 1

Reverse Osmosis Specifications

Culligan®

IW REVERSE OSMOSIS SYSTEM



A **CUSTOM** SOLUTION. A **COMPLETE** SOLUTION.

DESIGNED TO MEET THE NEEDS OF THE MOST DEMANDING INDUSTRIAL AND MUNICIPAL APPLICATIONS.

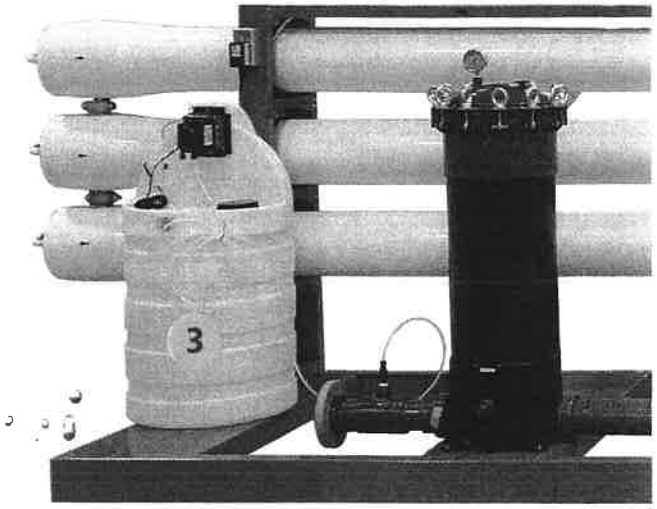
Available in a variety of configurations to cover flow requirements from 22 to 200 GPM with salinity levels up to 3000ppm of TDS. Using an innovative modular design, Culligan® is able to offer the highest quality construction and speedy delivery times at very competitive pricing.

Low-pressure membrane technology can remove over 99% of contaminants such as dissolved minerals, bacteria, and other impurities; producing water suitable for high-purity applications like boiler feed and ingredient water for food and beverage production.

All units are assembled and tested in Culligan's Commercial & Industrial facility in Libertyville, Illinois and shipped skid-mounted for simple installation and easy start-up.

TOTAL FLEXIBILITY

The IW's configurable design offers nearly a hundred different pre-engineered combinations of features to be built into a perfect RO application solution.

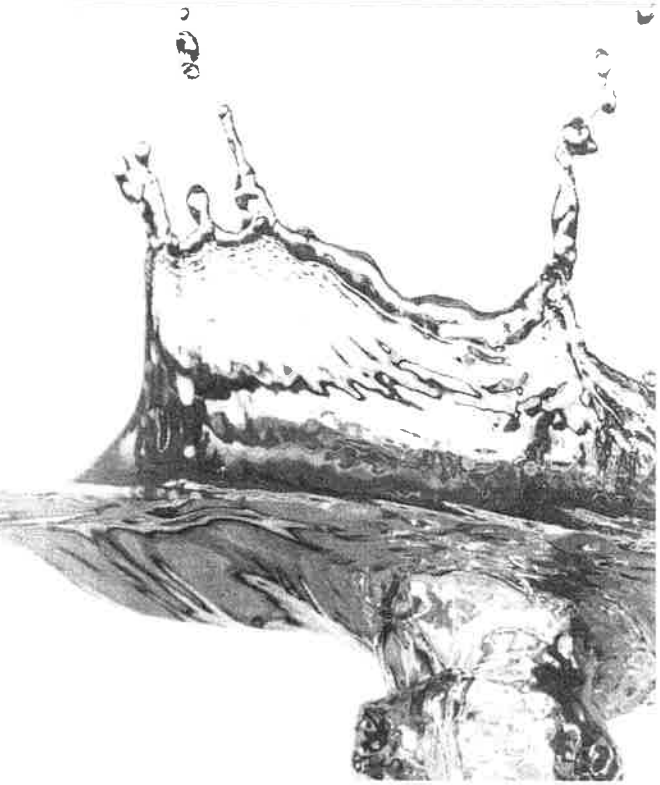


VALUES & BENEFITS

- The configurator tool can quickly create a RO solution tailored for maximum cost-effectiveness. No extra accessories and instrumentation to drive up project costs.
- The low-energy membranes on the IW require smaller pumps that save on operational costs.
- The Culligan® Global Electronics (GBE) system controllers used on the IW are familiar to hundreds of Culligan® Service Technicians around the world.
- Culligan® offers worldwide technical support for installations and start-ups.
- The IW is built in the USA with a quality guarantee by Culligan®.

STANDARD FEATURES

- Mounted on a galvanized steel frame with anti-corrosion paint coating.
- Multi-stage high pressure pump with high grade AISI 316 Stainless Steel, dry running protection and low noise / high efficiency IE3 motor.
- Ultra-low pressure, high rejection 8" membranes.
- 5 micron pre-filtration with PVC housing.
- Culligan® Smart Controller automates operation with digital flow meters, pressure transducers and conductivity measurements along with other advanced functionality more commonly found in PLC controls.



OPTIONS & UPGRADES TO MAXIMIZE PERFORMANCE

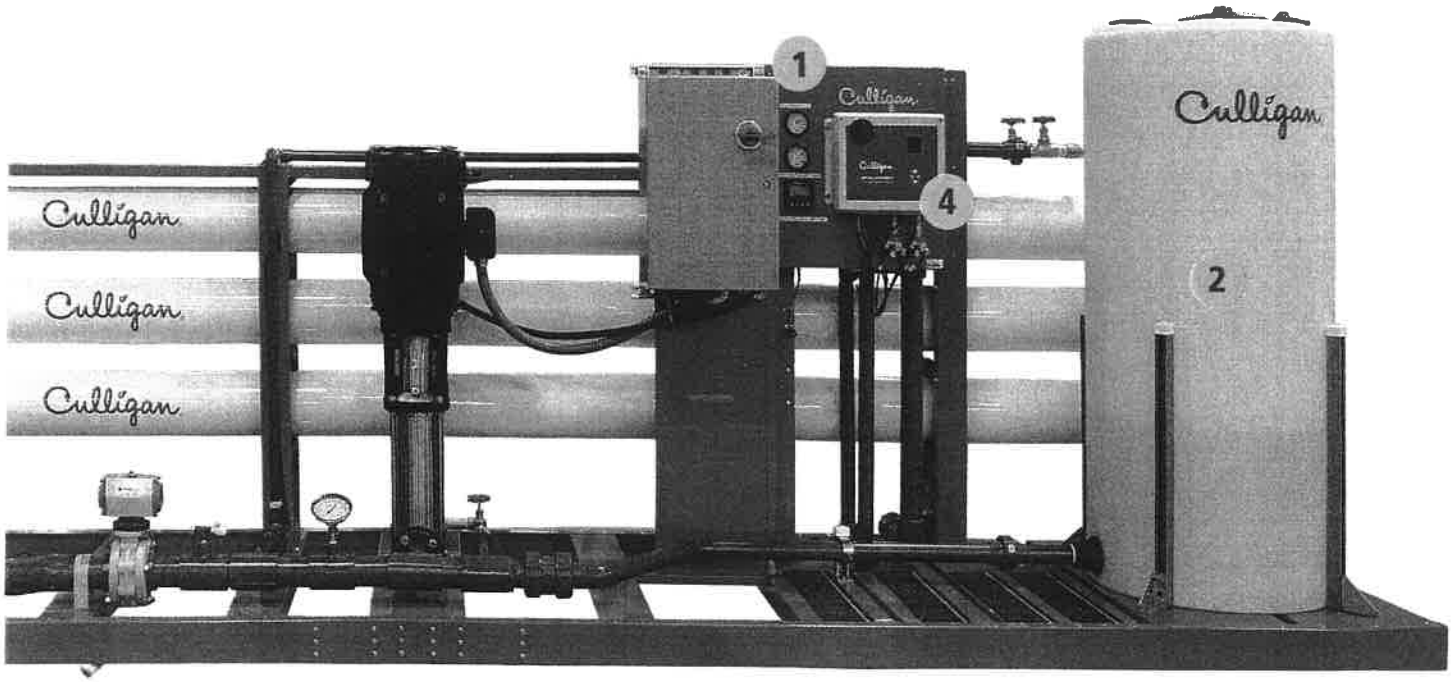
1 Advanced Instrumentation Options

Monitor every aspect of the units operation with advanced instrumentation.

- Conductivity *
- Inlet REDOX (ORP)
- Inlet and Product pH

2 Integrated Permeate Flushing Tank Option

Extend the life of the membranes by flushing them with treated product water each time the unit shuts down or during alarm conditions.
Permeate tank can be dual-purposed for use with the detachable CIP skid option.



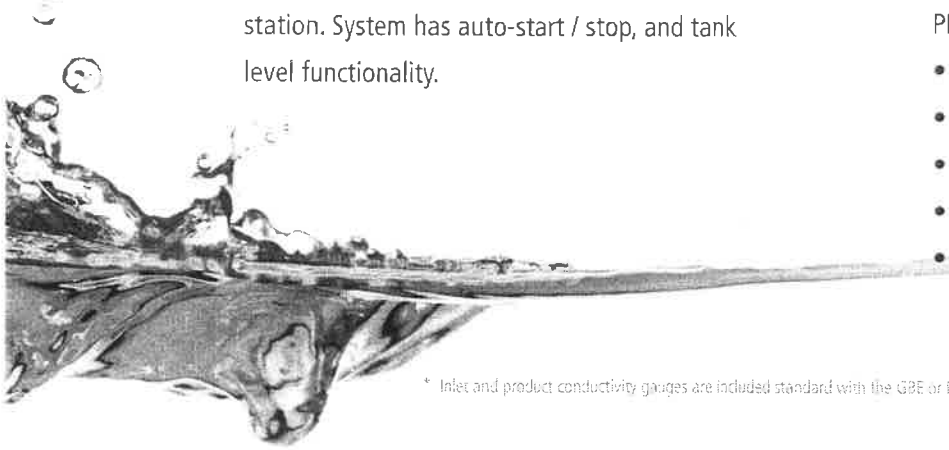
3 Integrated Chemical Dosing Station

prevent membrane scaling with antiscalant or remove chlorine with sodium bisulfite to protect RO membranes with the integrated dosing station. System has auto-start / stop, and tank level functionality.

4 Power & Control Options

Standard Electrical Power Requirements are 460V, 3-ph, 60 Hz., 380-415V/50Hz. and 575V/60Hz. power options available
PLC options includes:

- A-B MicroLogix 1400
- Color touch screen display
- Ethernet communications
- Audible and graphic alarm
- A full suite of instrumentation and controls to program and monitor



* Inlet and product conductivity gauges are included standard with the GBE or PLC controls.

IW BASE SYSTEM SPECIFICATIONS

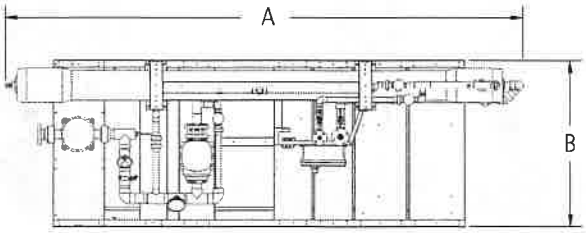
IW Reverse Osmosis System

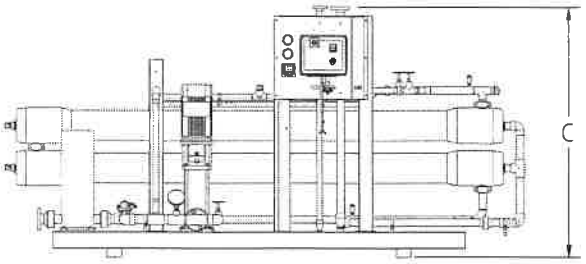
MODEL	IW - 22	IW - 35	IW - 50	IW - 70	IW - 100	IW - 140	IW - 155	IW - 200
Designed Permeate Flow* (GPM)	22	35	53	70	100	141	158	200
Membrane Quantity	4	6	9	12	18	24	30	36
Vessels x Membranes per stage	1x4	1x3	1x3	2x6	2x6	3x6	3x6	4x6
			1x3					
		1x3	1x3		1x6	1x6	2x6	2x6
			1x3					
Pump Size (HP) 60Hz, SS Housing	7.5	7.5	15	20	20	30	30	40
Connections Feed Product Reject	 1.5" 1.5" 1"	 2" 1.5" 1"	 2" 2" 1.5"	 3" 2" 1.5"	 3" 2.5" 2"	 3" 3" 2"	 3" 3" 2"	 3" 3" 2"
Dimensions (in.) A x B x C	187 x 47 x 72	148 x 47 x 72	148 x 47 x 72	268 x 47 x 72	268 x 47 x 72	269 x 47 x 79	269 x 47 x 87	269 x 62 x 87
Weight (lbs)	1,400	1,550	2,000	2,800	3,000	3,500	4,000	5,000

* Flow based on 3 year old RO membranes operating at 75% recovery on properly pretreated feed water of 1500 ppm TDS as NaCl, 68°F (20°C), Silt Density Index (SDI) below 3, and supplying water to atmosphere. Productivity will vary depending on the actual feed water quality and temperature.

MATERIALS OF CONSTRUCTION

Frame	Epoxy painted galvanized steel
Membrane Elements	Hydranautics ESPA Max ultra low pressure, high rejection 8" membranes
Membrane Housing	FRP
Low Pressure Pipe	Schedule 80 PVC
High Pressure Pipe	Stainless Steel 316
Cartridge Filter Housing	PVC





Culligan®

www.culligan.com • 866-787-4293

Place your industrial water treatment needs in the hands of a global leader.

For over 80 years, Culligan® has made better water. Our global network, comprised of 800+ dealers and international licensees in over 90 countries, is dedicated to addressing your water-related problems. As a worldwide leader in water treatment, our sales representatives and service technicians are familiar with the local water conditions in your area. Being global and local position us to deliver customized solutions to commercial and industrial water issues that affect your business and your bottom line.

9/17 Part No.34990

Depth Filtration Specifications

NOTES:

(1) ITEMS SHOWN IN BROKEN LINES TO BE FURNISHED BY OTHERS.

(2) ALL DIMENSIONS ARE ±1" (25mm) AND SUBJECT TO TO CHANGE WITHOUT NOTICE.

(3) UNIONS SHOULD BE LOCATED ON INLET AND OUTLET CONNECTIONS OF CONTROL VALVE TO FACILITATE SERVICING.

(4) THE USE OF DISSIMILAR METALS IN A PIPING SYSTEM IS NOT RECOMMENDED. WHERE DISSIMILAR METALS MUST BE CONNECTED IN A WATER SYSTEM, THE USE OF NONCONDUCTIVE (DIELECTRIC) FITTINGS MAY REDUCE GALVANIC CORROSION.

(5) A TEN FOOT POWER CORD (LONGER LENGTHS AVAILABLE) AND WALL MOUNT TRANSFORMER ARE PROVIDED. THE CUSTOMER SHOULD PROVIDE A RECEPTACLE, PREFERABLE ONE NOT CONTROLLED BY A SWITCH THAT CAN BE TURNED OFF ACCIDENTALLY, OBSERVE THE LOCAL ELECTRICAL CODES.

(6) ALLOW 6–12 INCHES BEHIND THE UNIT FOR PLUMBING AND DRAIN LINES AND 12 INCHES ABOVE OVERALL HEIGHT FOR SERVICE ACCESS AND FILLING THE SALT CONTAINER.

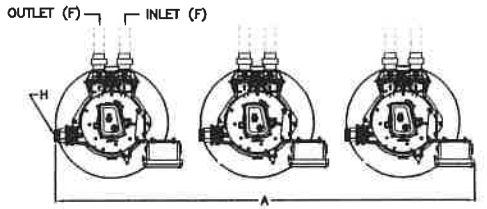
(7) SYSTEM USES FRP TANKS WHICH MUST NOT BE SUBJECTED TO VACUUM CONDITIONS. SYSTEM CONTROL VALVE DESIGN HAS INTEGRATED VACUUM BREAKER TO PREVENT SUCH CONDITIONS WHICH SHOULD NOT BE REMOVED DURING OPERATION.

(8) TO PERMIT THE OBSERVATION OF THE DRAIN FLOW DO NOT MAKE A DIRECT CONNECTION TO THE DRAIN. PROVIDE AN AIR GAP OF AT LEAST TWO TIMES THE DIAMETER OF THE DRAIN PIPE OR CONFORM TO LOCAL SANITATION CODES.

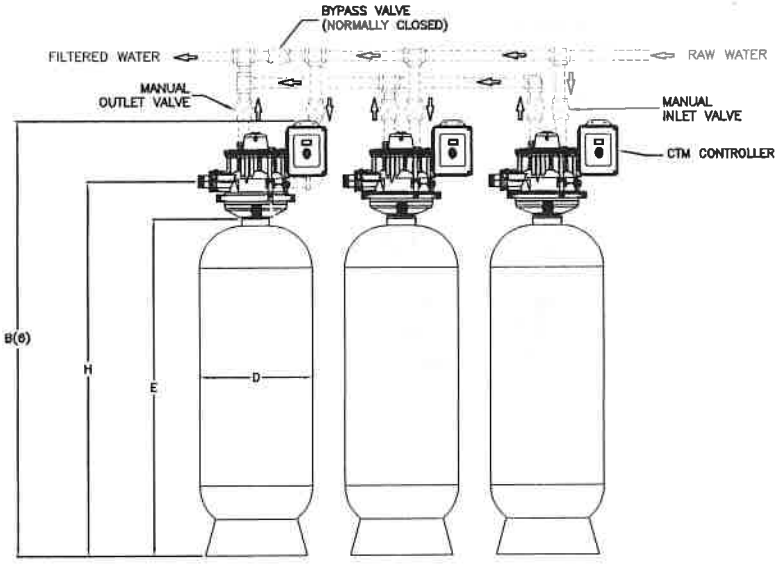
(9) BRINE TANK DIMENSIONS SHOWN ARE FOR THE BRINE TANK MOST COMMONLY SELECTED FOR USE WITH THIS SIZE SYSTEM.

(10) SHIPPING AND OPERATING WEIGHTS SHOWN ON THIS DRAWING INCLUDE THE BRINE SYSTEM.

	DIMENSIONS (INCHES)							UNIT DATA PER TANK						
MODEL	WIDTH A	HEIGHT B(6)	TANK DIA. D	TANK HEIGHT E	INLET OUTLET PIPE SIZES F	DRAIN SIZE H	FLOOR TO INLET J	NORMAL FLOW gpm @ 15 psi drop	PEAK FLOW gpm @ 25 psi drop	RESIN VOLUME ft^3	DRAIN FLOW gpm	MIN. DRAIN PIPE SIZE IN.	TRIPLEX OPER. WT. lbs.	TRIPLEX SHIP. WT. lbs.
CTM-21-DF	82	85.5	21	62	2.0	2.0	74	24 @ 5	36 @ 10	7.4	30	1.5	1686	1410
CTM-24-DF	86	92.7	24	72	2.0	2.0	81.3	32 @ 5	48 @ 9	11.1	48	1.5	2793	1665
CTM-30-DF	102	97.4	30	72	2.0	2.0	86	50 @ 7	74 @ 11	15.6	70	2.0	4467	2460
CTM-36-DF	120	99.8	36	72	2.0	2.0	88.4	71 @ 10	107 @ 19	23.6	90	2.0	6324	3405



TOP VIEW



TRIPLEX INSTALLATION

DO NOT SCALE DRAWING
TOLERANCES: ±1/8" UNLESS OTHERWISE NOTED

Let.	Change	By	App	Date
A	Remove 15" system & dimension C.	MM		2/10/17
B	Modify resin volume.	MM		4/1/17

Culligan® ENGINEERED SYSTEMS
ROSEMONT, ILLINOIS

NAME
CTM 2.0" METERED AUTOMATIC DEPTH–CULSORB FILTER TRIPLEX TECHNICAL DATA SHEET

DETAILED BY:	APP. BY:	SHEET
MKM 8/04/15	LW 8/18/15	1 OF 1

REF. NO.
PART NO. DRW–2157

Pre Treatment

Clack®

WS2H

- 2" top mount or side mount control valve suited for commercial and industrial applications
- Epoxy coated lead free brass valve body
- Built-in Internal Flow Meter standard with all valves
- Service flow rate 125 gpm (473 lpm) (28.4 m3/h), Backwash flow rate 125 gpm (473 lpm) (28.4 m3/h)
- Solid state microprocessor with easy access front removable POD
- Front panel display for Time of Day, Current Flow Rate, Totalizer and Volume/Days until Regeneration
- Four methods to initiate the down flow regeneration; meter delayed, meter immediate, time clock delayed, or pressure differential
- Fully programmable regeneration cycle sequences (maximum 9)
- Fully programmable regeneration cycle times
- Pre or Post treated water regenerant refill
- Days override feature; 1-28 days available
- 20-volt output AC adapter provides safe and easy installation
- Reliable and proven DC drive
- Patented one piece expanding seal spacer stack assembly U.S. Patent 6,402,944
- Patented linearly reciprocating piston operation U.S. Patent 6,444,127

Water Specialist 2" H Control Specifications

Inlet/Outlet (1)	2" Female NPT or BSPT/ 2.5" Groove Lock
Cycles	up to 9
Valve Material	Lead free brass
Regeneration	Downflow

CONTROL VALVE FLOW RATES

Service @ 15 psi/1 bar drop (includes meter)	125 gpm (473 lpm) (28.4 m^3/h)
Backwash @ 25 psi/1.7 bar drop	125 gpm (473 lpm) (28.4 m^3/h)
Cv Service	32.3
Cv Backwash	25.0

OPERATING PRESSURES

Minimum/Maximum	20 - 125 psi (1.4 - 8.6 bar)

OPERATING TEMPERATURES

Minimum/Maximum	40° - 110° F (4° - 43° C)

METER SPECIFICATIONS

Accuracy	± 5%
Flow Rate Range	1.5 - 125 gpm (5.7 - 473 lpm)
Volume Range	10 - 999,000 gallons (38 - 3,796.2 liters x1000)
Totalizer	1,000 - 999,999,000 gallons (3,786 - 3,785,407.9 liters x1000)

DIMENSIONS & WEIGHT

Distributor Pilot	
Valve Bodies with 2" Female NPT Inlet & Outlet	2.375" OD (2" NPS)
Valve Bodies with 2" Female BSPT Inlet & Outlet	63mm OD
Drain Line Connection	2" Female NPT/BSPT/2.5" Groove Lock
Brine Line Adapters Included	1" Male NPT elbow and ¾" x 1" solvent weld elbow
Optional Adapters	½" or ⅝" OD Poly Tube Compression
Mounting Base	4" - 8 UN, 6" Flange or Side Mount
Height From Top Of Tank with 4" - 8 UN QC Base	11.5" (292mm)
Height From Top Of Tank with 6" Flange QC Base	11.6" (294.6mm)
Shipping Weight With Internal Meter	50 lbs (22.7 Kg)

ELECTRICAL SPECIFICATIONS

	AC Adapter	
	U.S.	International
Supply Voltage	120V AC	230V AC
Supply Frequency	60 Hz	50Hz
Output Voltage	20V AC	20V AC
Output Current	750 mA	750mA

TANK APPLICATIONS

Water Softener	18" - 63" Diameter
Water Filter (2)	18" - 48" Diameter

CYCLES OF OPERATION

Choose up to nine regeneration cycles, in any order, with a wide range of available values:

Cycle	Range of values
Backwash	1 - 95 minutes
Brine (draw)	1 - 180 minutes
Slow Rinse	1 - 95 minutes
Fast Rinse	1 - 95 minutes
Refill	0.1 - 99 minutes
Hold (service)	1 - 480 minutes

Options: Backwash Filter

Compatible with the following typical concentrations of regenerants or chemicals: Sodium chloride, potassium chloride, potassium permanganate, sodium bisulfite, chlorine and chloramines

1. See Distributor Pilot.
2. Filter tank size calculated @ 10 gpm of backwash per square foot of bed area/407 lpm per m^2 of bed area

U.S. Patents: 6,402,944 • 6,444,127

Form No. 2678 • 5/20/2016

Clack Filter-Ag Plus® is a clinoptilolite natural media with a large surface area and microporous structure, which can be used as a highly efficient filter media for the reduction of suspended matter.

Filter-Ag Plus®

ADVANTAGES

- Deep bed filtration results in superior water quality and reduces the load on downstream equipment.
- High sediment removal capacity results in longer filter runs, with a substantial savings in backwash water and time out of service.
- High service flow rates result in lower equipment costs and a savings in space.
- Reduced shipping cost due to lighter weight/cu.ft.
- Replacement of multimedia with Filter-Ag Plus in existing installations may increase filter capacity.
- Filter-Ag Plus is an all-natural, environmentally safe product.

PHYSICAL PROPERTIES

- Color: White to off white
- Dry Bulk Density: 50 lbs/cu.ft
- Specific Gravity: 2.2 g/cc
- Mesh Size: 14x30
- Effective Size: 0.55mm
- Uniformity Coefficient: 1.8
- Hardness: 4-5 (Mohs Scale)

CONDITIONS FOR OPERATION

- Water pH: Wide range
- Max. Water Temp.: 140°F/60°C
- Bed Depth: 24"-48" (36" for optimal filtration)
- Freeboard: 50% of bed depth
- Backwash Flow Rate: 14-18 gpm/sq.ft.
- Backwash Bed Expansion: 30-40% of bed depth
- Service Flow Rate: 12-20 gpm/sq.ft.
- Influent water quality and effluent requirements may affect operating parameters
- A gravel support bed is required
- Allow bed to saturate before initial backwash

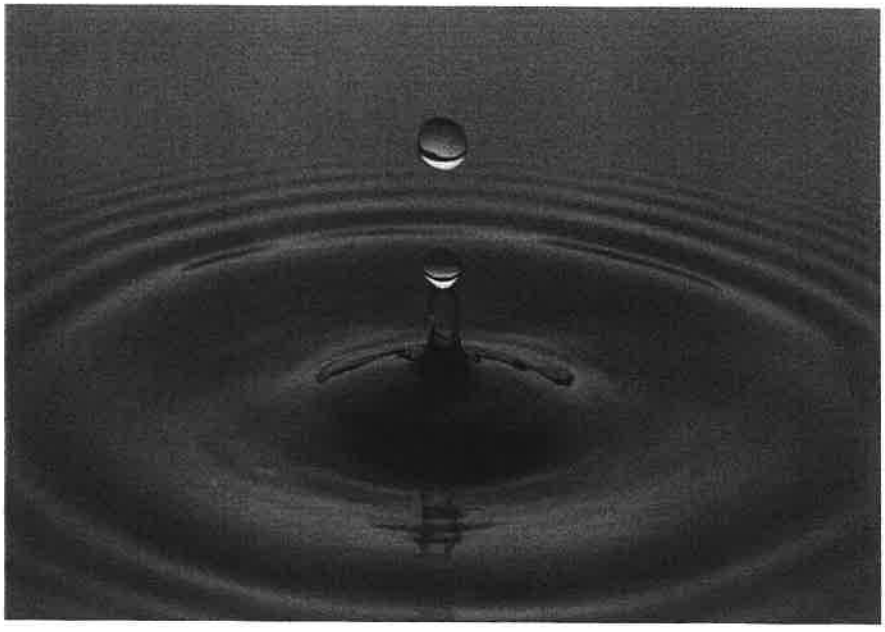
Clack Filter-Ag Plus is a unique natural ore called clinoptilolite that has many outstanding advantages over common granular filter sands and multimedia used for suspended solids reduction. Viewed under an electron scanning microscope, the granules reveal an angular shape, rough surface and microporous void spaces as small as 3 microns. This creates a surface area over 100 times greater than silica sand. The angularity of the granules and the tapered internal pore spaces allow for reduction of dirt, silt and organic matter suspended in water by bridging, straining and adhesion. The rough surface and internal porosity provide a high surface area for efficient reduction of suspended matter. Utilizing deep bed filtration can typically reduce suspended solids down to the 5 micron or less range. Filter-Ag Plus' structure typically creates less pressure loss through the filter and allows deeper sediment penetration into the bed for higher sediment loading and longer filter runs. The deep bed filtration capacity of Filter-Ag Plus prevents a rapid buildup of head loss and blinding problems that are associated with typical sand filters. The longer filter run times reduce backwash frequency, which provides conservation of water. This ideal combination of particle shape, texture and porosity make it a good choice where quality water filtration and water conservation are important.

Substantial savings can be realized when designing a system using Clack Filter-Ag Plus. Its low pressure drop, high service flow rates and high bed loadings combined with lower backwash frequency allow economy in equipment downsizing and reduced pumping requirements. Its low density also saves on handling expense and shipping costs.

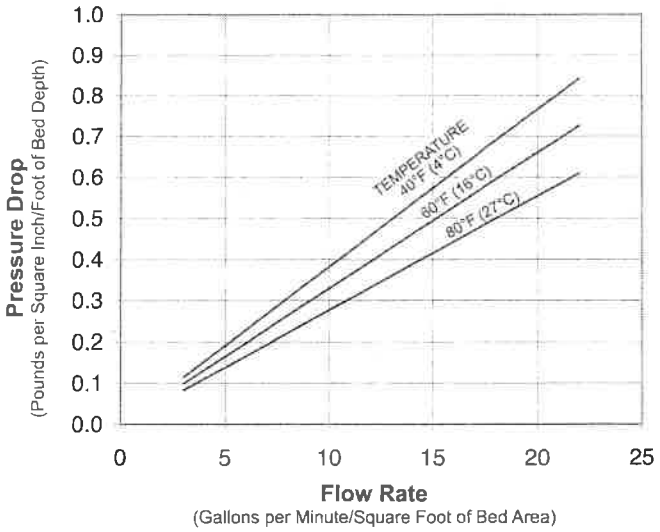
Clack Filter-Ag Plus can be applied to systems designed for either pressure or gravity flow. Because of its unique physical characteristics, Filter-Ag Plus can be used to replace multimedia (graded density) filter designs.

Air scour is possible and helpful when there is heavy loading in the bed. It has to be done minimally in order to prevent too much bed lift and/or advanced attrition.

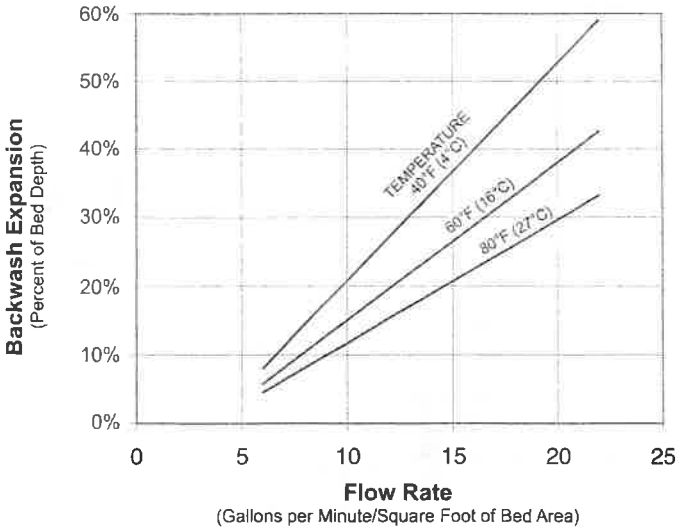
An air scour of 1 to 2 cfm/ft² at backwash rates of 15 to 20 gpm/ft² would be sufficient. The pressure required would be static head pressure plus the psi necessary to deliver 1 to 2 cfm/ft². Bed expansion should be observed to ensure that media is not being discharged in the back wash water. A one minute air scour at the beginning of the backwash cycle should be sufficient. Prolonged air scour may cause stratification of the smaller media to the top of the bed which could affect future head loss.



Service Flow Pressure Drop



Backwash Bed Expansion



NSF

Certified to NSF/ANSI Standard 61

ORDER INFORMATION

Part No.	Description	Cu. Ft./Bag	Wt./Cu. Ft.*	Bags/Pallet	Weight/Pallet	Pallet Dimensions
A8023	Filter-Ag Plus®	1	50 lbs.	40	2050 lbs.	40" x 48" x 44"

*Weight per cubic foot is approximate.

The information and recommendations in this publication are based on data we believe to be reliable. They are offered in good faith, but do not imply any warranty or performance guarantee, as conditions and methods of use of our products are beyond our control. As such, Clack makes no express or implied warranties of any kind with respect to this product, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. We recommend that the user determine whether the products and the information given are appropriate, and the suitability and performance of our products are appropriate, by testing with its own equipment. Specifications are subject to change without notice.

The information and recommendations given in this publication should not be understood as recommending the use of our products in violation of any patent or as a license to use any patents of the Clack Corporation.

The filter medias listed in this brochure do not remove or kill bacteria. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

Clack will not be liable under any circumstance for consequential or incidental damages, including but not limited to, lost profits resulting from the use of our products.

CALIFORNIA PROPOSITION 65 WARNING: This product contains crystalline silica which is known to the State of California to cause cancer and other substances which are known to the State of California to cause cancer, birth defects and reproductive harm.

Clack®
www.clackcorp.com

Clack Corporation
4462 DURAFORM LANE • WINDSOR, WISCONSIN 53598-9716 USA
PHONE (608) 846-3010 FAX (608) 846-2586 SALES/CUSTOMER SERVICE FAX (800) 755-3010

Form No. 2718 • 4/28/2015

Delivery Pump Specifications

GOULDS WATER TECHNOLOGY
a xylem brand

Customer	Date 12.09.2019
Contact	Project
Phone number	Project no.
Email	

Technical Data

15SV6GJ4F60

Operating Data

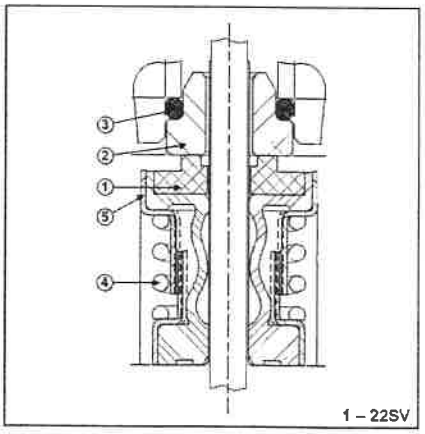
Pump type		Multi-Stage Pumps	Fluid		Water
No. of pumps / Reserve		1 / 0	Operating temperature t A	°F	39.2
Nominal flow	US g.p.m.	99.99	pH-value at t A		7
Nominal head	ft	265	Density at t A	lb/ft³	62.4
Static head	ft	0	Kin. viscosity at t A	ft²/s	1.689E-5
Inlet pressure	psi	0	Vapor pressure at t A	psi	14.5
Environmental temperature	°F	68	Solids		0
Available system NPSH	ft	0	Altitude	ft	0

Pump Data

Make	Goulds Water Technology			Nominal	US g.p.m.	103.1	(103.1)
Speed	rpm	3500	Flow	Max-	US g.p.m.	126	
Number of stages		6		Min-	US g.p.m.		
Max. working pressure	psi	172.2		Nominal	ft	281.9	
Head H(Q=0)	ft	400	Head	at Qmax	ft	197.2	
Weight	lb	285		at Qmin	ft	397.1	
Max.	inch	0	Shaft power		hp	10.9	(10.9)
Impeller R Designed	inch	0	Max. shaft power		hp	11.2	
Min.	inch	0	Efficiency		%	69.14	
			NPSH 3%		ft	10.5	

Shaft Seal

Single Seal	Xylem
Mechanical Seals	
1 - Rotating Face	Carbon
2 - Stationary Face	Silicon Carbide Graphite Filled
3 - Elastomers	Viton
4 - Spring	316SS
5 - Metal Components	316SS



1 – 22SV

Motor Data

Manufacturer	Baldor	Electric voltage	460 V	Speed	3500 rpm	Insulation class	F
Specific design	3ph TPE			Frame size	215TC	Colour	RAL 5010
Type	208-230/460V 215TC (V12A32E5BE2S)			Degree of protection	IP 55		
Rated power	10 hp	Electric current	11.8 A				

Remarks:

GOULDS WATER TECHNOLOGY
a xylem brand

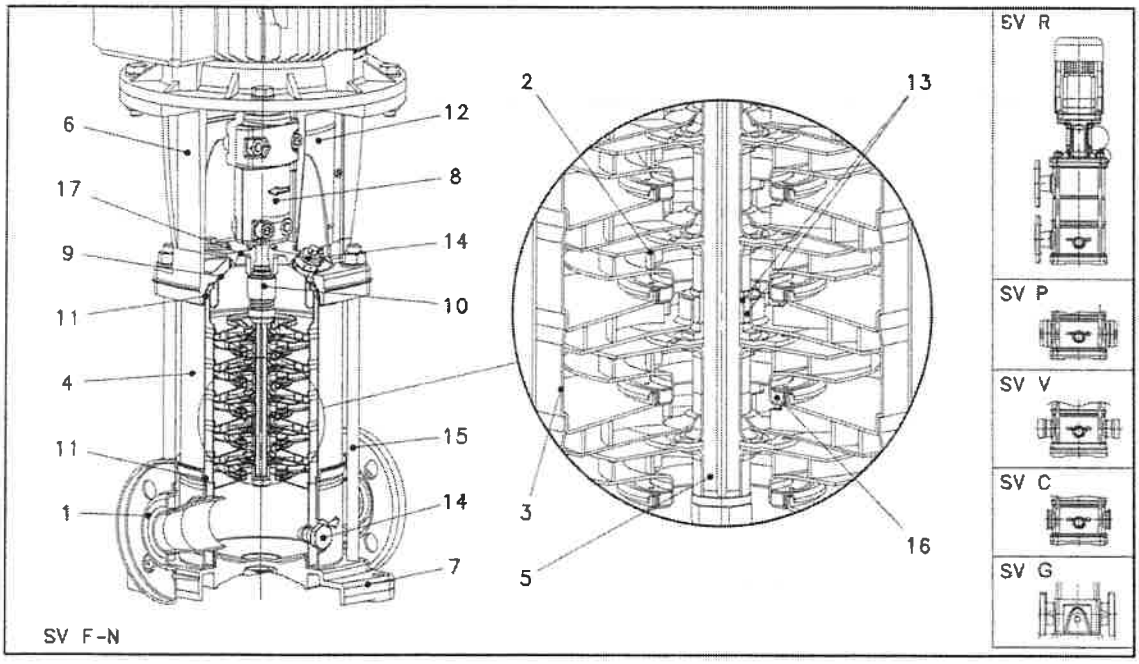
Customer	Date 12.09.2019
Contact	Project
Phone number	Project no.
Email	

15SV6GJ4F60

Construction Data

Pump Materials

1 - Pump Body	Cast Iron (ASTM Class 35/40B)
2 - Impeller	Stainless Steel (AISI 304)
3 - Diffuser	Stainless Steel (AISI 304)
4 - Casing	Stainless Steel (AISI 316L)
5 - Shaft	Stainless Steel (AISI 316)
6 - Adapter	Cast Iron (ASTM Class 35/40B)
7 - Base	N/A
8 - Coupling	Aluminum (A384.0-F)
9 - Seal Plate	Stainless Steel (AISI 316L)
12 - Coupling Guard	Stainless Steel (AISI 304)
13 - Shaft Sleeve and Bushing	Tungsten carbide
14 - Fill/Drain Plugs	Stainless Steel (AISI 316)
15 - Tie Rods	Carbon Steel / Zinc Plated (A29 Gr. 1045)
16 - Wear Ring	PPS
17 - Seal Gland	Stainless Steel (AISI 316)



Remarks:

GOULDS WATER TECHNOLOGY
a xylem brand

Tender Hydraulic

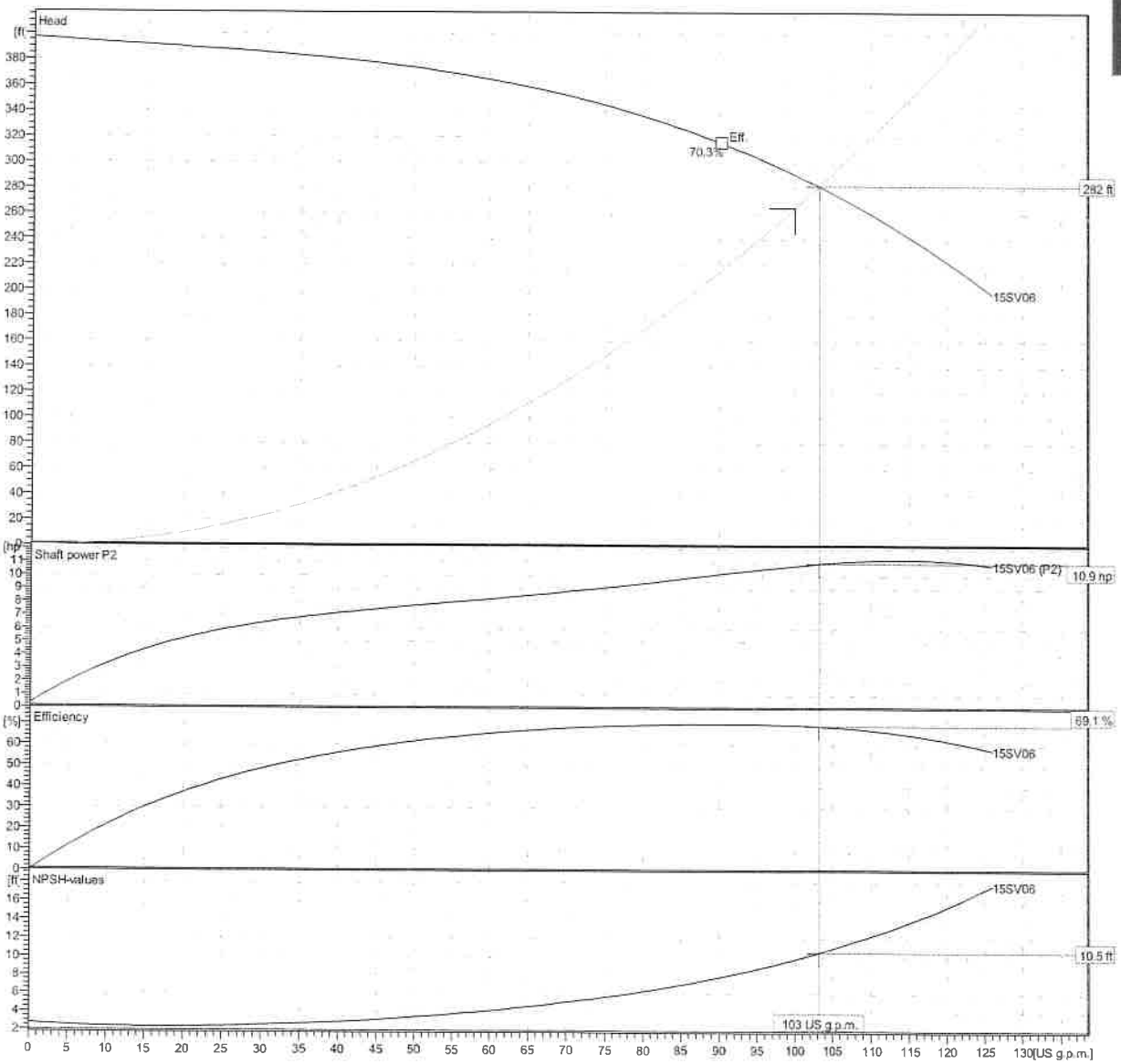
Customer		Date	12.09.2019
Contact		Project	
Phone number		Project no.	
Email			

15SV6GJ4F60

Hydraulic Data

Operating Data Specification		Hydraulic data (duty point)		Impeller design	
Flow	100 US g.p.m.			Impeller R	"
Head	265 ft	Flow	103 US g.p.m.	Frequency	60 Hz
Static head	0 ft	Head	282 ft	Speed	3500 rpm

Power datas referced to:
Water [100%] ; 39.2°F; 62.4lb/ft³; 1.69E-5ft²/s
Performance according to ISO 9906 - Annex A



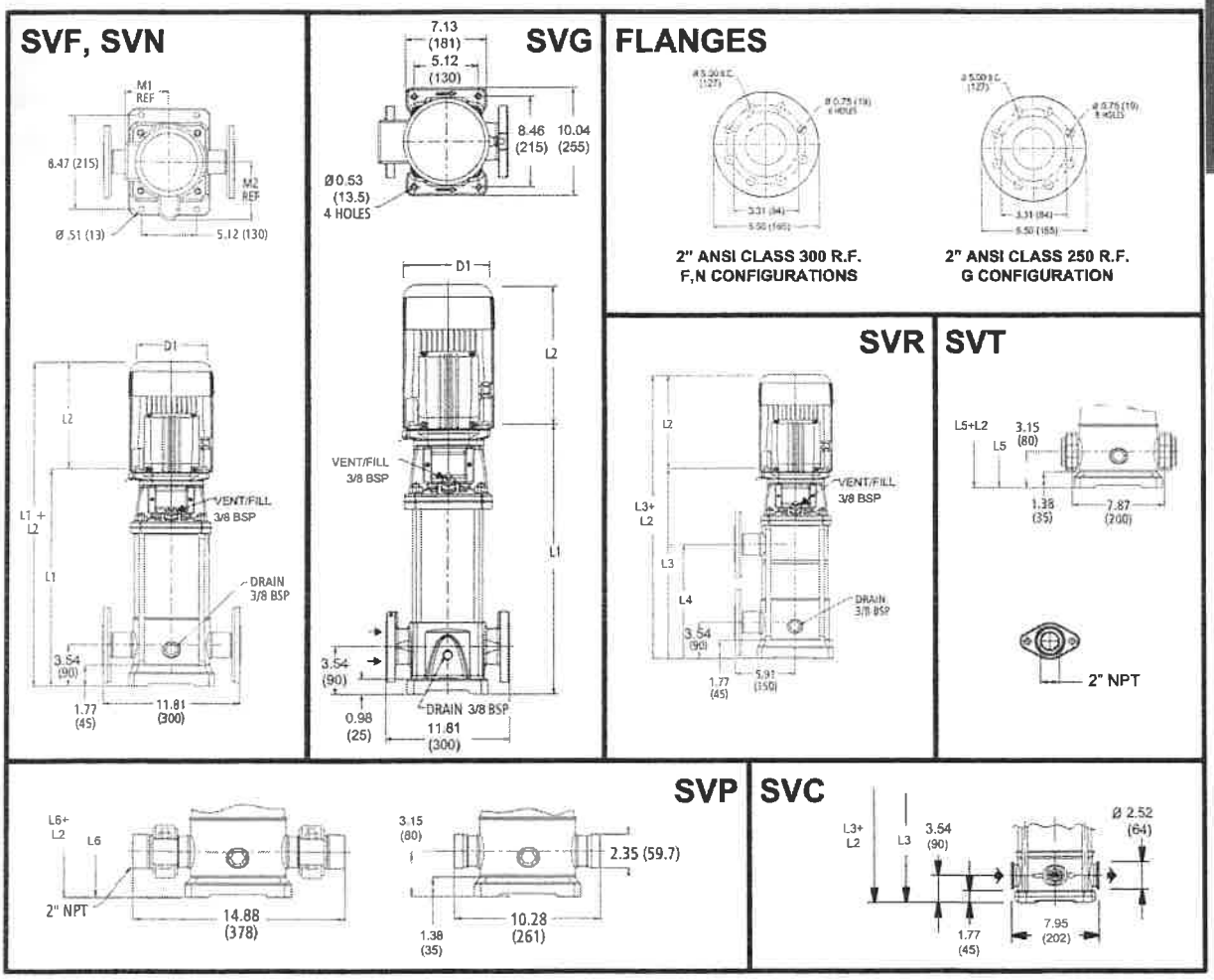
GOULDS WATER TECHNOLOGY
a xylem brand

Dimensional Data

Customer	Date 12.09.2019
Contact	Project
Phone number	Project no.
Email	

15SV6GJ4F60

Drawing



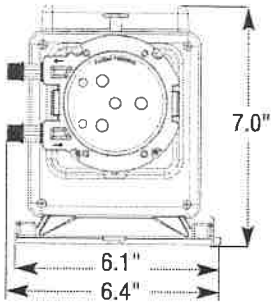
Dimensions inch

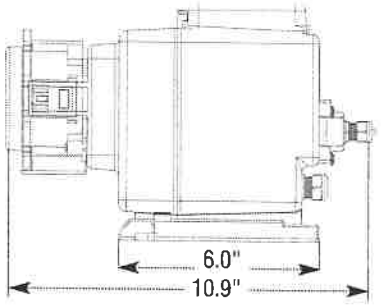
D1 max	$10^{1}/_{4}$	NEMA Frame	215TC			Weight
D2	$9^{1}/_{16}$					284.5 lb
L1	$26^{7}/_{8}$					
L2	$15^{1}/_{4}$					
L3	$26^{7}/_{8}$					
L4	$15^{5}/_{8}$					
L5	$26^{1}/_{2}$					
L6	$26^{1}/_{2}$					
M. Ref	$9^{3}/_{16}$					

Chemical Pump Specifications

S SERIES SPECIFICATIONS

STENNER PUMPS





SHIPPING WEIGHT 9 lbs (3.7 kg)

c UL us
LISTED
METERING PUMP
4TF1

CE IP65

IAPMO R&T ®
THIS PUMP IS TESTED AND CERTIFIED BY IAPMO ACCORDING TO ANSI/NSF 61 FOR CONTACT WITH SODIUM HYPOCHLORITE AND WATER ONLY AND NSF/ANSI 372.

FEATURES

- Digital keypad with OLED display
- Tube leak detector
- Tube change timer
- Password protection
- Multiple operational modes
- Various performance indicators
- Tube replacement without tools with patent pending QuickPro® pump head
- Totally enclosed housing, outdoor rated NEMA 4X
- Brushless DC motor with ball bearing support
- Switch mode power supply
- 3-point roller design assists in anti-siphon protection
- Self-priming against maximum working pressure, foot valve not required
- Pump does not lose prime or vapor lock
- Pumps off-gassing solutions and can run dry
- Output volume is not affected by back pressure
- Models (Santoprene® only) tested by IAPMO to conform to ANSI/NSF STD 61 & 372

S SERIES SPECIFICATIONS

STENNER PUMPS

FLOW RATE OUTPUT CONTROL
Varies per control mode; digital keypad

REPRODUCIBILITY ±2%

MAXIMUM WORKING PRESSURE
25 psi (1.7 bar), 100 psi (6.9 bar)

MAXIMUM OPERATING TEMPERATURE
104°F (40°C)

MAXIMUM SUCTION LIFT
25 ft (7.6 m) vertical lift, based on water

MOTOR TYPE Brushless DC motor

DUTY CYCLE Continuous

MOTOR VOLTAGE (Amp Draw)
120V 60Hz 1PH (0.6), 230V 50Hz 1PH (0.3)

POWER CORD TYPE
120V 60Hz: SJTOWA, 230V 50Hz: H05RN-F

POWER CORD PLUG END
120V 60Hz 5-15P, 230V 50Hz CEE7/7

HALL EFFECT MAX. INPUT FREQUENCY
100 KHz

SHAFT RPM (average maximum) 45

MAXIMUM ALTITUDE 6562 ft. (2000 m)

MAXIMUM VISCOSITY 1500 Centipoise

PULSE DURATION REQUIRED
10 milliseconds
Minimum duration required for pump to read signal.

MATERIALS OF CONSTRUCTION

All Housings Polycarbonate

Pump Tube
Santoprene**, FDA approved or Versilon***

Check Valve Duckbill
Santoprene**, FDA approved or Pellethane*†

Pump Head Rollers Polyethylene

Roller Bushings Oil impregnated bronze

Suction/Discharge Tubing, Ferrules
Polyethylene, FDA approved

Tube and Injection Fittings
PVC or Polypropylene, NSF listed, with Ceramic Weight

Connecting Nuts PVC, NSF listed

3/8" Adapter
PVC or Polypropylene, NSF listed

Suction Line Strainer and Cap
PVC or Polypropylene, NSF listed, with Ceramic Weight

All Fasteners Stainless steel

Pump Head Latches Polypropylene

Leak Detect Clips, Springs, Pins Hastelloy*††

ACCESSORY KIT SHIPPED WITH EACH PUMP

- **3** Connecting nuts 1/4" or 3/8"
- **3** Ferrules 1/4" or 6 mm *Europe*
- **1** Injection check valve 100 psi (6.9 bar) max OR 1 injection fitting 25 psi (1.7 bar) max.
- **1** Weighted suction line strainer 1/4", 3/8" or 6 mm *Europe*
- **1** 20' roll suction/discharge tubing 1/4" or 3/8", white or UV black OR 6 mm white *Europe*
- **1** Additional pump tube
- **2** Additional latches
- **1** Mounting bracket
- **1** Quick Start Guide

* Santoprene® is a registered trademark of Exxon Mobil Corporation.

** Versilon® is a registered trademark of Saint-Gobain Performance Plastics.

† Pellethane® is a registered trademark of Lubrizol Advanced Materials, Inc.

†† Hastelloy® is a registered trademark of Haynes International, Inc.

FLOW RATE OUTPUT CHART

25 psi (1.7 bar) maximum

Model	Item Number Prefix	Pump Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute
S3003	**S3003**	3	100:1	0.40 to 40	0.017 to 1.67	2.13 to 213	0.036 to 3.56	1.51 to 151	0.063 to 6.31	63.09 to 6309	1.05 to 105
S3004	**S3004**	4	100:1	0.60 to 60	0.025 to 2.50	3.20 to 320	0.053 to 5.33	2.27 to 227	0.095 to 9.46	94.64 to 9464	1.58 to 158
S3005	**S3005**	5	100:1	0.85 to 85	0.035 to 3.54	4.53 to 453	0.076 to 7.56	3.22 to 322	0.134 to 13.41	134.07 to 13407	2.23 to 223
				Approximate Outputs @ 50/60Hz							

100 psi (6.9 bar) maximum

Model	Item Number Prefix	Pump Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute
S3001	**S3001**	1	100:1	0.05 to 5	0.002 to 0.21	0.27 to 27	0.004 to 0.44	0.19 to 19	0.008 to 0.79	7.89 to 789	0.13 to 13
S3002	**S3002**	2	100:1	0.17 to 17	0.007 to 0.71	0.91 to 91	0.015 to 1.51	0.64 to 64	0.027 to 2.68	26.81 to 2681	0.45 to 45
S3007	**S3007**	7	100:1	0.40 to 40	0.017 to 1.67	2.13 to 213	0.036 to 3.56	1.51 to 151	0.063 to 6.31	63.09 to 6309	1.05 to 105
				Approximate Outputs @ 50/60Hz							

NOTE: Injection check valve included with pumps rated 100 psi (6.9 bar) maximum.

NOTICE: The information within this chart is solely intended for use as a guide. The output data is an approximation based on pumping water under a controlled testing environment. Many variables can affect the output of the pump. Stenner Pump Company recommends that all metering pumps undergo field calibration by means of analytical testing to confirm their outputs. The information contained in this flyer is not intended for specific application purposes. Stenner Pump Company reserves the right to make changes to prices, products, and specifications at any time without prior notice.