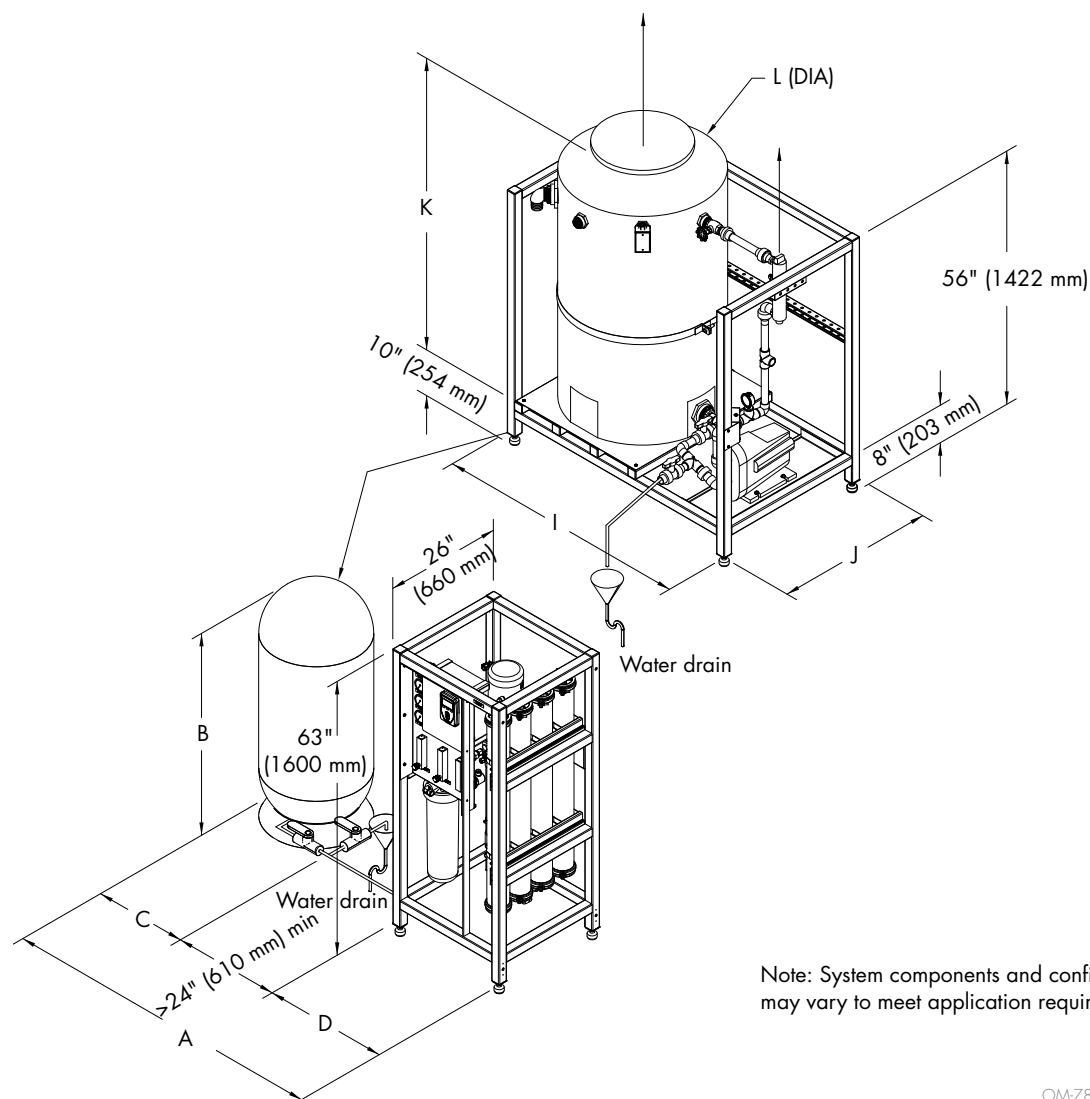


# 400 series water treatment system

**FIGURE 1-1: DRISTEEM 400 SERIES REVERSE-OSMOSIS SYSTEM OVERVIEW (SEE TABLES 1-1 AND 1-2)**



Note: System components and configuration may vary to meet application requirements.

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**Table 1-1:  
DriSteem 400 series RO system dimensions**

Model	Dimensions							
	A		B		C*		D	
	inches	mm	inches	mm	inches	mm	inches	mm
401	55	1397	24	610	28	711	28	711
402	55	1397	24	610	28	711	28	711
403	55	610	24	610	28	711	28	711
404	55	610	24	610	28	711	28	711
406	80	2032	24	610	37	940	37	940
408	72	1829	30	762	37	940	37	940
412	90	2286	30	762	46.5	1181	46	1181

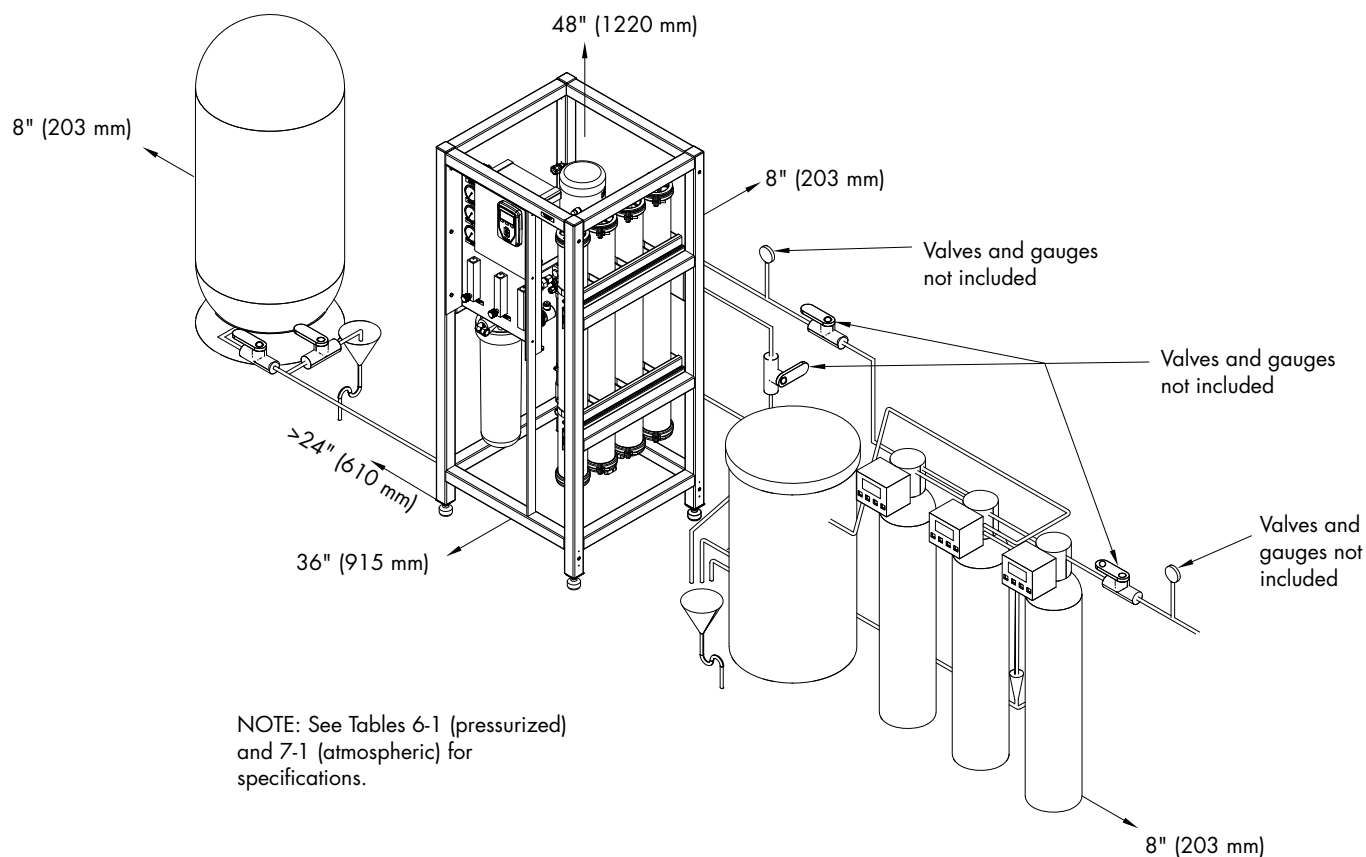
\*Typical storage tank pairing. Larger tank available (See Table 6-1).

**Table 1-2:  
Atmospheric RO holding tank specifications**

Tank model	Dimensions							
	I		J		K		L	
	inches	mm	inches	mm	inches	mm	inches	mm
AT-165	56	1422	35	889	65	1651	31	787
AT-300	61	1537	40	1003	88	2235	35.5	902

# System clearances

**FIGURE 2-1: DRISTEEM 400 SERIES REVERSE-OSMOSIS SYSTEM CLEARANCES**



OM-7817

Table 2-1: RO membrane specification	
Element Configuration	Spiral wound, FRP wrapping
Typical Ionic Rejection (Nominal)	99.40%
Membrane Type	Thin film composite
Membrane material	Polyamide (PA)
Effective Membrane Area	85 ft <sup>2</sup>
Permeate flow rate	2,400 GPD
Membrane length	40"
Membrane Diameter	3.9"
Maximum operating pressure	600 psig
Maximum feed flow rate	18 gpm <sup>(1)</sup>
Test conditions: 2,000 ppm NaCl at 225 psig applied pressure, 15% recovery, 77°F, pH 6.5-7.0, permeate flow rate for each element may vary +25%/-15%	
<sup>(1)</sup> Per membrane manufacturer specification, not total system specification.	

# Specification

## REVERSE OSMOSIS STATION

The reverse-osmosis (RO) station is floor-mounted and removes approximately 98% of total dissolved solids.

Table 3-1:  
400 series RO station specifications

Model	401*	402*	403**	404**	406**	408**	412**
Permeate flow rate, GPD (LPD) 50 °F (10 °C) or lbs/hr (kg/hr) (see Note 4)	1,429 (5,409) 498 (226)	2,381 (9,013) 829 (376)	4,127 (15,622) 1,436 (651)	5,159 (19,528) 1,795 (814)	7,937 (30,044) 2,762 (1,253)	10,317 (39,054) 3,590 (1,628)	15,808 (59,840) 5,500 (2,495)
Permeate flow rate, GPD (LPD) 77 °F (25 °C) or lbs/hr (kg/hr) (see Note 4)	1,800 (6,810) 620 (280)	3,000 (11,350) 1,040 (470)	5,170 (19,570) 1,800 (821)	6,500 (24,600) 2,250 (1,020)	10,000 (37,850) 3,475 (1,580)	13,000 (49,200) 4,510 (2,050)	19,000 (71,910) 6,600 (3,000)
System voltage/phase, Amp draw with RO components (see Note 1)	480/3, 2.5 220-240 /1, 10.0 120/1, 19.2	480/3, 2.5 220-240 /1, 10.0 120/1, 19.2	480/3, 6.0 208-240 /1, 15.4	480/3, 6.0 208-240 /1, 15.4	480/3, 6.0 208-240 /1, 15.4	480/3, 6.0 208-240 /1, 15.4	480/3, 6.0 208-240 /1, 15.4
Fuse size with RO components (see Note 2)	480/3, 15 220/1, 15 120/1, 25	480/3, 15 220/1, 15 120/1, 25	480/3, 15 220/1, 20	480/3, 15 220/1, 20	480/3, 15 220/1, 20	480/3, 15 220/1, 20	480/3, 15 220/1, 20
Dimensions (W/D/H), inches (mm)	28/26/63 (711/660/1600)				37/26/63 (940/660/1600)		46/26/63 (1181/660/1600)
Shipping weight, lbs (kg)	440 (200)	470 (213)	510 (231)	540 (245)	645 (293)	705 (320)	870 (395)
Operating weight, lbs (kg) (see Note 5)	460 (209)	510 (231)	570 (259)	620 (281)	775 (352)	875 (397)	1100 (499)
Supply water connection dia., inches (see Note 3)	¾" FNPT						
Notes: 1. 220V/1-phase systems can also operate on 208V/1-phase and 240V/1-phase power. 2. Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with NEC requirements. 3. 40 psi (280 kPa) minimum supply water pressure. 4. Extra low energy membranes. 5. Without tank weight * RO-401 and 402 220V/1-phase systems can also operate on 240V/1-phase power. ** RO-403 thru RO-412 220V/1-phase systems can also operate on 208V/1-phase and 240V-1 phase power.							

# Specification

Table 4-1: 400 series RO station specifications (Continued)							
Model	401*	402*	403**	404**	406**	408**	412**
RO system permeate water outlet connection dia., inches	¾" FNPT						
Connection to pressurized RO storage tank dia., inches	1						
Common drain outlet connection dia., inches	1" FNPT						
5-micron RO prefilter diameter x height, inches (mm)	4 x 20 (102 x 508)						
RO pump motor power, hp (kW)	1 (0.75)		3 (2.2)				
Qty. of RO membranes	1	2	3	4	6	8	12
RO membrane diameter x height, inches (mm)	4 x 40 (102 x 1016)						
Notes:							
1. 220V/1-phase systems can also operate on 208V/1-phase and 240V/1-phase power.							
2. Wiring and branch circuit protection (Type RK1, J, or T fusing) to be provided by installer in accordance with NEC requirements.							
3. 40 psi (280 kPa) minimum supply water pressure.							
4. Extra low energy membranes.							
5. Without tank weight							
* RO-401 and 402 220V/1-phase systems can also operate on 240V/1-phase power.							
** RO-403 thru RO-412 220V/1-phase systems can also operate on 208V/1-phase and 240V-1phase power.							

# System operation temperature

DriSteem rates reverse-osmosis systems at 50°F (10°C). This is lower than the industry standard of 77°F (25°C).

To find the membrane permeate rate at a different temperature, follow these steps:

1. Find the temperature correction factor (TCF) from the below table.
2. Divide the rated permeate flow from Table 3-1 on page 3 by the temperature correction factor.

The result is the permeate flow at the desired temperature.

**Table 5-1:**  
Optional permeate rate

Feed water temperature		Temperature correction factor (TCF)									
°C	°F	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	41.0	2.093	2.085	2.077	2.069	2.060	2.052	2.044	2.036	2.028	2.020
6	42.8	2.012	2.004	1.997	1.989	1.981	1.973	1.966	1.958	1.950	1.943
7	44.6	1.935	1.927	1.920	1.913	1.905	1.898	1.890	1.883	1.876	1.868
8	46.4	1.861	1.854	1.847	1.840	1.833	1.826	1.819	1.812	1.805	1.798
9	48.2	1.791	1.784	1.777	1.770	1.763	1.757	1.750	1.743	1.737	1.730
10	50.0	1.723	1.717	1.710	1.704	1.697	1.691	1.684	1.678	1.672	1.665
11	51.8	1.659	1.653	1.646	1.640	1.634	1.628	1.622	1.616	1.610	1.603
12	53.6	1.597	1.591	1.585	1.579	1.574	1.568	1.562	1.556	1.550	1.544
13	55.4	1.539	1.533	1.527	1.521	1.516	1.510	1.504	1.499	1.493	1.488
14	57.2	1.482	1.477	1.471	1.466	1.460	1.455	1.450	1.444	1.439	1.434
15	59.0	1.428	1.423	1.418	1.413	1.407	1.402	1.397	1.392	1.387	1.382
16	60.8	1.377	1.372	1.367	1.362	1.357	1.352	1.347	1.342	1.337	1.332
17	62.6	1.327	1.323	1.318	1.313	1.308	1.304	1.299	1.294	1.289	1.285
18	64.4	1.280	1.276	1.271	1.266	1.262	1.257	1.253	1.248	1.244	1.239
19	66.2	1.235	1.230	1.226	1.222	1.217	1.213	1.209	1.204	1.200	1.196
20	68.0	1.192	1.187	1.183	1.179	1.175	1.171	1.166	1.162	1.158	1.154
21	69.8	1.150	1.146	1.142	1.138	1.134	1.130	1.126	1.122	1.118	1.114
22	71.6	1.110	1.106	1.102	1.098	1.095	1.091	1.087	1.083	1.079	1.076
23	73.4	1.072	1.068	1.064	1.061	1.057	1.053	1.050	1.046	1.042	1.039
24	75.2	1.035	1.032	1.028	1.024	1.021	1.017	1.014	1.010	1.007	1.003
25	77.0	1.000	0.997	0.993	0.990	0.986	0.983	0.980	0.976	0.973	0.970
26	78.8	0.971	0.968	0.965	0.962	0.959	0.956	0.953	0.951	0.948	0.945
27	80.6	0.942	0.939	0.937	0.934	0.931	0.928	0.926	0.923	0.920	0.918
28	82.4	0.915	0.912	0.910	0.907	0.904	0.902	0.899	0.896	0.894	0.891
29	84.2	0.888	0.886	0.883	0.881	0.878	0.876	0.873	0.871	0.868	0.866
30	86.0	0.863	0.861	0.858	0.856	0.853	0.851	0.848	0.846	0.843	0.841
31	87.8	0.838	0.836	0.834	0.831	0.829	0.827	0.824	0.822	0.819	0.817
32	89.6	0.815	0.812	0.810	0.808	0.806	0.803	0.801	0.799	0.796	0.794
33	91.4	0.792	0.790	0.787	0.785	0.783	0.781	0.779	0.776	0.774	0.772
34	93.2	0.770	0.768	0.765	0.763	0.761	0.759	0.757	0.755	0.753	0.751
35	95.0	0.748	0.746	0.744	0.742	0.740	0.738	0.736	0.734	0.732	0.730
36	96.8	0.728	0.726	0.724	0.722	0.720	0.718	0.716	0.714	0.712	0.710
37	98.4	0.708	0.706	0.704	0.702	0.700	0.698	0.696	0.694	0.692	0.690
38	100.4	0.689	0.687	0.685	0.683	0.681	0.679	0.677	0.675	0.674	0.672
39	102.2	0.67	0.668	0.666	0.664	0.663	0.661	0.659	0.657	0.656	0.654
40	104.0	0.652	0.650	0.648	0.647	0.645	0.643	0.641	0.640	0.638	0.636

NOTE: Temperature correction factor only includes membrane performance and doesn't include mechanical design considerations.

# Components overview

## PRESSURIZED RO HOLDING TANK

The pressurized RO holding tank holds RO water in reserve to be available for high-pressure pumping when there is a demand.

FIGURE 6-1: PRESSURIZED RO HOLDING TANK



Table 6-1:  
Pressurized RO holding tank total capacity

Tank Capacity	Active Capacity <sup>(1)</sup>	Dimensions		Weight		Connections	
		Diameter	Height	Empty	Full		
80 gal (303 L)	23.6 gal (89 L)	24" (610 mm)	55.5" (1410 mm)	58 lbs (26 kg)	295 lbs (134 kg)	1 ¼" male NPT	FRP with rubber bladder
120 gal (454 L)	35.4 gal (134 L)	24" (610 mm)	66 (1676 mm)	335 lbs (152 kg)	1235 lbs (560 kg)	2" female NPT	Painted steel with rubber bladder
158 gal (598 L)	46.6 gal (176 L)	30" (762 mm)	58 (1473 mm)	435 lbs (197 kg)	1620 lbs (735 kg)	2" female NPT	
211 gal (799 L)	62.2 gal (235 L)	30" (762 mm)	76 (1930 mm)	515 lbs (234 kg)	2100 lbs (953 kg)	2" female NPT	

Notes:

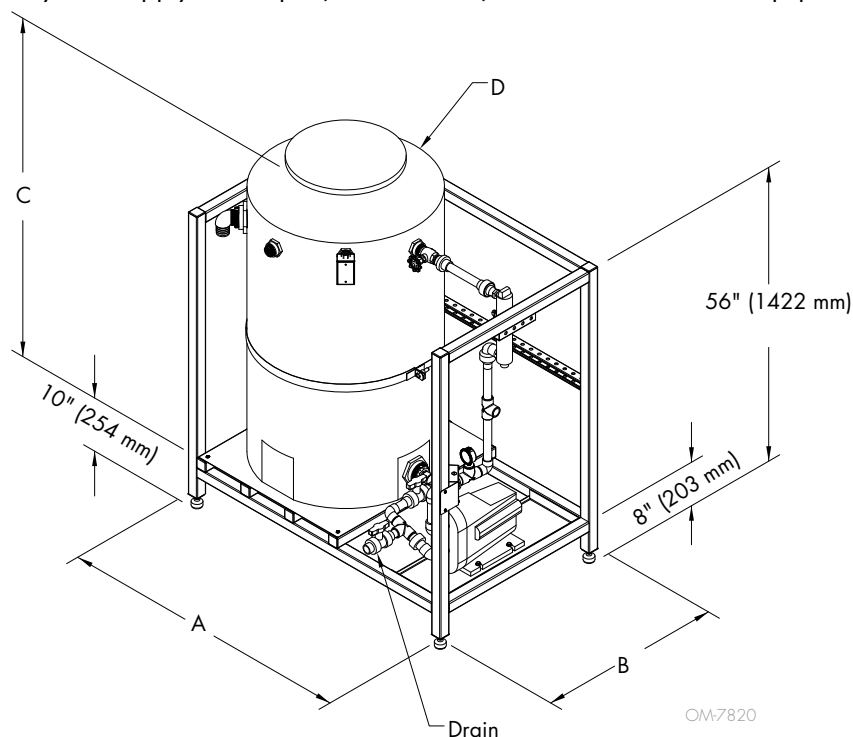
- There is a possibility that the tank becomes much heavier if the air balloon is emptied or if precharge is different than 28 psi (195 kPa).
- Listed water volumes and weights are at an operating pressure of 30 to 50 psi (210 to 345 kPa) with a precharge of 28 psi (195 kPa).

<sup>(1)</sup> Based on 30 to 50 psi (210 to 345 kPa) water set point and 28 psi (195 kPa) air precharge.

# Components overview

## ATMOSPHERIC RO HOLDING TANK

The atmospheric RO hold tank holds a large amount of RO water for large jobs or when additional runtime needs to be guaranteed. System includes a recirculation/booster pump and an UV sterilization system to ensure water purity and supply 30-50 psi (207-345 kPa) water to downstream equipment.



**FIGURE 7-1: ATMOSPHERIC RO HOLDING TANK**



**Table 7-1:**  
Atmospheric RO holding tank specifications

Tank model	Capacity	A	B	C	D	Weight		Connections
						Shipping	Operating	
AT-165	165 gal (567 L)	56" (1422 mm)	35" (889 mm)	65" (1651 mm)	31" (787 mm)	320 lbs (145.15 kg)	1695 lbs (768.84 kg)	1" (25 mm) PVC, In: Female NPT Out: Socket
AT-300	300 gal (1135 L)	60.5" (1536.7 mm)	39.5" (1003 mm)	88" (2235.2 mm)	35.5" (901.7 mm)	360 lbs (163.3 kg)	2860 lbs (1297.27 kg)	1" (25 mm) PVC In: Female NPT Out: Socket

**Table 7-2:**  
Pumps and disinfection

	Make	Model	Voltage	Phase	Frequency	Running Amps	Noise level dB(A)
UV system	Viqua	VT4	120V	Single	60 Hz	0.28A	-
Forwarding pump	Grundfos	Scala2	120V	Single	60 Hz	2.8A	<47

# Interconnecting tubing requirements

**Table 8-1:**  
Maximum length of interconnecting tubing between pump station and RO holding tank

RO station model	Volume		Tubing nominal diameter	Minimum tube I.D.		Maximum developed length*	
	gpm	L/m		in.	mm	ft	m
401	1	3.8	1/2"	0.375	10	>100	>30
			3/4"	0.625	16	>100	>30
			1"	0.875	23	>100	>30
402	1.65	6.4	1/2"	0.375	10	64	>20
			3/4"	0.625	16	>100	>30
			1"	0.875	23	>100	>30
403	2.9	11.0	1/2"	0.375	10	18	5.5
			3/4"	0.625	16	>100	>30
			1"	0.875	23	>100	>30
404	3.6	13.6	1/2"	0.375	10	—	—
			3/4"	0.625	16	>100	>30
			1"	0.875	23	>100	>30
406	5.50	20.8	1/2"	0.375	10	—	—
			3/4"	0.625	16	95	29
			1"	0.875	23	>100	>30
408	7.20	27.3	1/2"	0.375	10	—	—
			3/4"	0.625	16	51	16
			1"	0.875	23	>100	>30
412	11	41.6	1/2"	0.375	10	—	—
			3/4"	0.625	16	22	7
			1"	0.875	23	89	27

\* Calculations are based on pipe finish factor of 130 and low-pressure piping length of 1' (0.3 m).

\*\* Installation must meet the minimum and maximum inlet pressures for all components, as stated in the specification tables in the "Installation" section of this manual.