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SPECIFICATION

Flow rates	1 GPM (3.8 LPM) bottle fill 4 GPM (15.2 LPM) bucket fill
Back flow preventer	Flex-gap or Aire-Gap
Temperature	Max: 140° F (60° C)
Ideal operating pressure	40-50 PSI (2.8 - 3.5 bar)
Minimum Pressure	20 PSI (1.4 bar)
Maximum Pressure	100 PSI (6.9 bar)
MATERIAL	
Cover	ABS
Flex-gap	Polypropylene
O-ring	EPDM
Water Valve	Acetal
Water Inlet	Brass

OPERATION



1 Select the desired product with the selector knob.



2 Press the button on the front cover—release button when container is full.



3 If desired, the button can be “locked” in the ON position for filling large containers such as mop buckets or floor scrubbers. Simply turn the button slightly clockwise when pressed in. To release, turn button counter-clockwise.

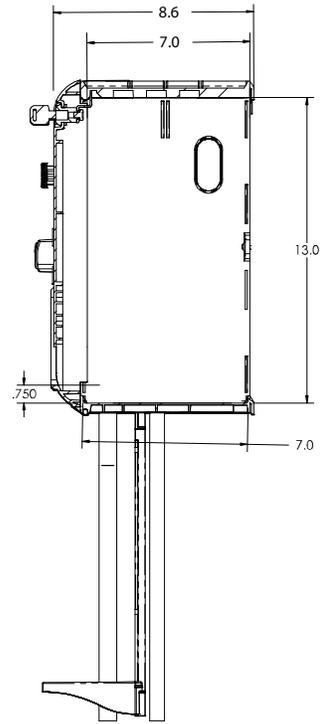
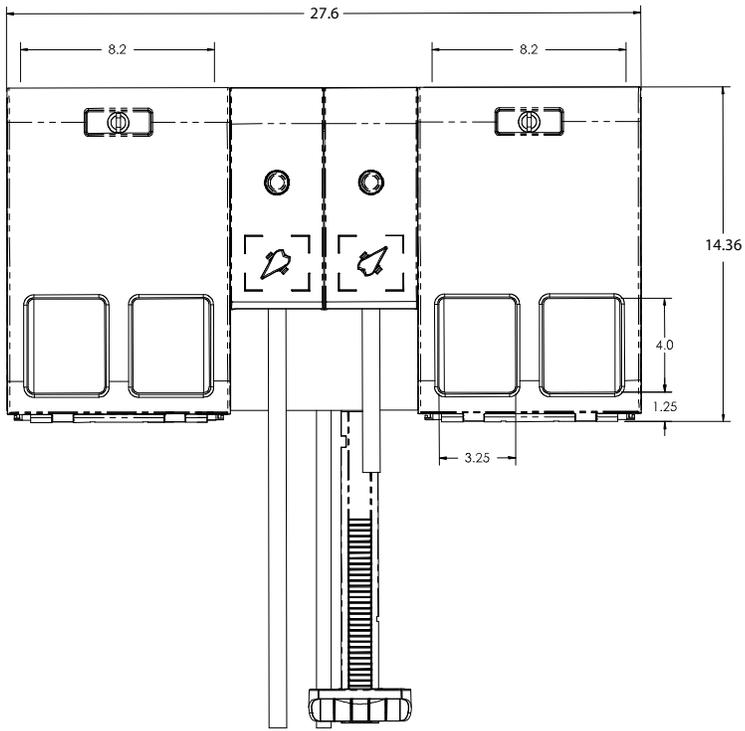


CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.

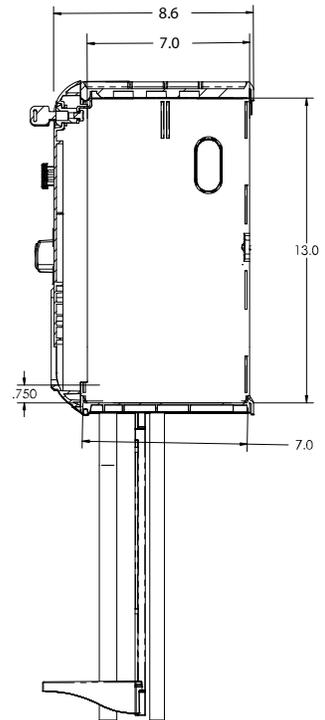
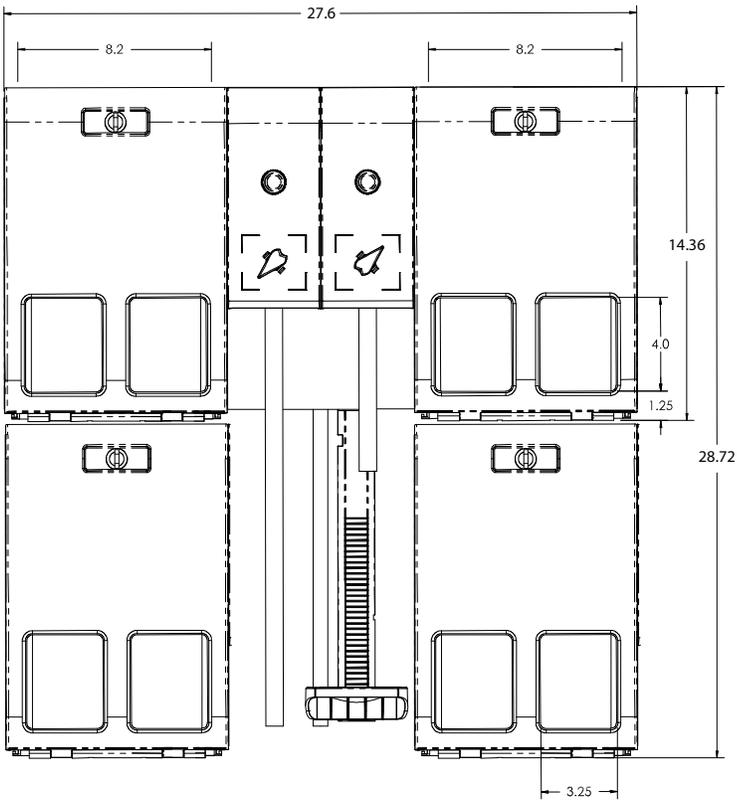


CAUTION: When installing any equipment, ensure that all national and local safety and plumbing codes are met.

OVERALL DIMENSIONS



OVERALL DIMENSIONS



INSTALLATION

It is recommended to pre-route and pre-connect the water lines and chemical lines before you mount the system on the wall. This will make installation quicker and easier.

Connecting Water Supply

This proportioner operates best with a flowing water pressure of 40 - 50 PSI. If water pressure exceeds 50 PSI, Knight recommends using a 45 PSI fixed pressure regulator (P/N 7407117). Fluctuating pressure can affect dilution ratios — use a water source that is not feeding other equipment whenever possible. Water temperature should be between 40°F and 140°F.

IMPORTANT NOTE:

If proportioner is connected to a janitor's sink with an atmospheric vacuum breaker, a special connection kit is required by A.S.S.E. specification 1055. Failure to use this kit, or equivalent connection means, will invalidate the A.S.S.E. and I.A.P.M.O. (UPC) certification. Specify P/N 7600187 when ordering the kit.



Attach male connector on high pressure supply hose to the proportioner. Water inlet can be located on the backside of the unit.



Dial Positions

The selector dial has 4 positions that correspond to the 4 chemical inlet ports (see figure below). Labels can be applied to the cover of the unit to identify where to point the dial for each particular chemical. When inserting metering tips, be sure to match up the correct tip for the chemical that will be used on each port.

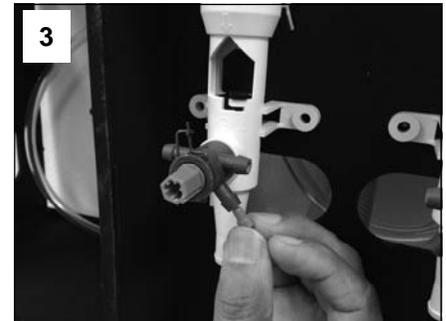
Connecting the chemical supply lines



1 Snap off cover by gently pulling at the bottom and top of the cover. Repeat for the second cover.



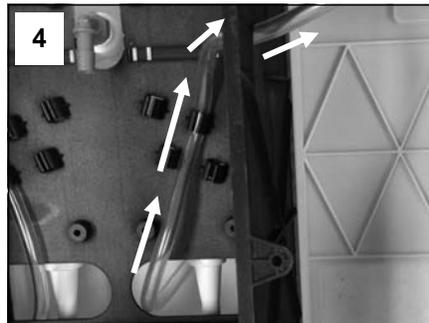
2 Refer to the Choosing Dilution Rates section on page 5 & 6 as a guide to selecting the proper metering tip.



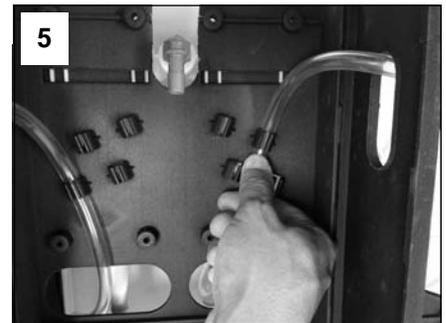
3 Thread the proper metering tip into the chemical inlet port on the of the venturi body. Hand tighten the tip only.



3 Take the 3/8" O.D. chemical suction tube and slide it over chemical inlet port. When ready, secure the tube onto the inlet port with the supplied zip ties.

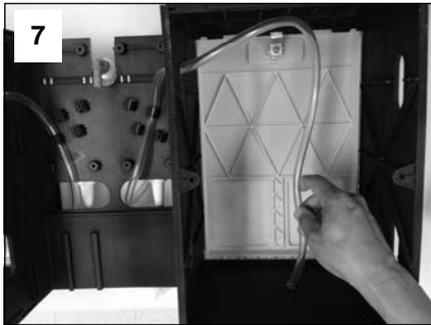


4 Run chemical tubes through the back of the casing through the side holes in the chemical cabinet storage area.

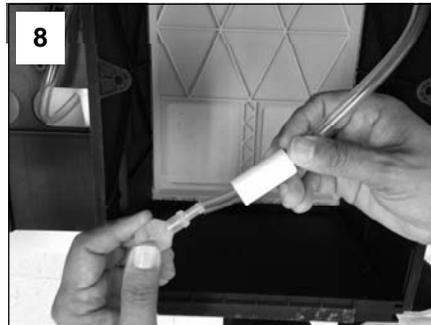


5 If needed, snap the tubes into the tabs to organize the chemical lines and prevent possible kinking of tubes.

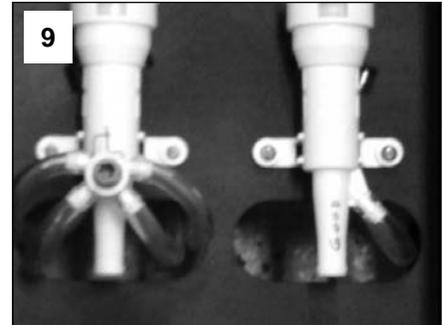
Connecting the chemical supply lines (Continued)



7
Measure enough chemical tube needed to run to the bottom of the chemical container. Cut the tube to desired length.



8
Take the ceramic weight from the accessory kit and slide it onto the free end of the chemical tube. Insert the foot-valve into the tube end. You will drop the foot-valve into the chemical container after the unit is installed onto the wall and the chemical containers are placed into the cabinet



9
Repeat steps 1 through 6 for the other chemical ports.

Connecting the discharge tube

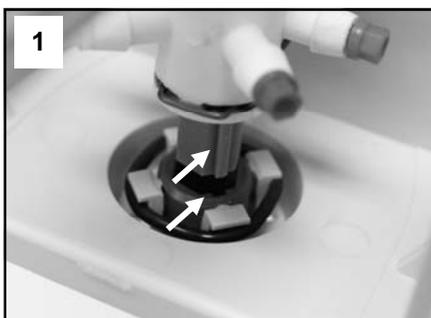


1
Connect the bucket and bottle fill tube with the flow restrictor (plastic insert) end closest to the venturi body.

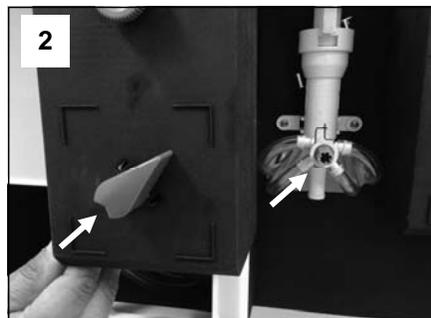


2
Secure tube to venturi body with tie wraps provided.

Reattaching the cover



1
When reattaching the cover, be sure that the button lines up properly with the dial. There is a groove in shaft of the button on the large end that should line up with a raised ridge on the dial so that the cover can only be put on one way.

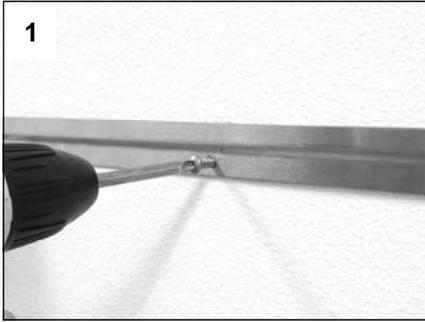


2
A quick guide is to line up the backside of the dial is pointing in the same direction as the groove in the shaft.



3
Snap cover back onto the unit and repeat for the second cover.

Mounting the dispenser



1
Choose a convenient location close to water supply. Use supplied joggle bracket and mark the keyholes - use a level for marking the holes



2
Drill holes and use supplied mounting screws to mount the joggle bracket to the wall. Hang the unit on the wall.



3
Open the chemical storage doors, and locate additional mounting holes. Drill holes and use mounting screws to secure cabinet to the wall. Repeat steps in other chemical storage areas.

Mounting the drip tray

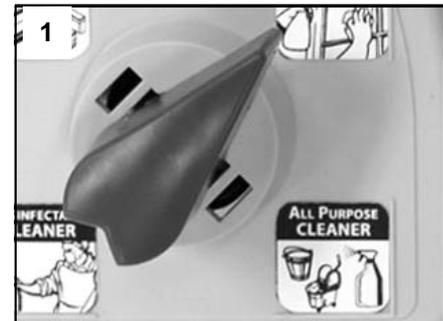


1
Place drip tray rail onto the wall. Make sure the drip tray is centered under the bottle fill spout. Mark the keyholes. Drill the holes and mount the rail to the wall using the mounting screws.



2
Slide drip tray onto the rail and adjust to appropriate height.

Chemical Labels



1
Add chemical labels as needed.

CHOOSING DILUTION RATES

METERING TIP SELECTION

The dilution chart for Flex-Gap and Aire-Gap venturi are the same for both 1 GPM and 4 GPM flow rates. For each valve in the system, install appropriate metering tip from the chart below. Be sure the metering tip is threaded in hand-tight only.

CALIBRATING ACTUAL PRODUCT RATIOS

To easily calculate the ounces per gallon for a specific product:

- (1) Fill a graduated cylinder or spray bottle (that has ounce markings) with product.
- (2) Install metering tip closest to desired ounces per gallon — see dilution charts.
- (3) Drop chemical pick-up tube into the container holding the product.
- (4) Activate valve until chemical line is primed up to the metering tip.
- (5) Note how many ounces (of product) are in the container.
- (6) Activate valve again, and fill a one gallon container with water/product mix.
- (7) Note how many ounces (of product) were used.
- (8) You now have determined actual ounces per gallon for this product. Repeat this procedure as desired for other valves and products.

METERING TIP CHART

METERING TIP CHART (Flex-Gap & Aire-Gap Venturi)				
TIP COLOR	1 GPM		4 GPM	
	OZ/GAL	RATIO	OZ/GAL	RATIO
NO INSERT	28	3.6:1	25	4.3:1
WHITE	22	4.8:1	20	5.4:1
YELLOW	18	6.1:1	18	6.1:1
PINK	16	7.0:1	16	7.0:1
GREEN	15	7.8:1	12	12:1
BLACK	14	8.5:1	10	15:1
BROWN	12	10:1	7	20:1
GRAY	8	15:1	5	31:1
BLUE	6	20:1	4	42:1
RED	3	42:1	3	63:1
PEACH	2.5	50:1	2	72:1
LT BLUE	2.0	63:1	1.5	101:1
PURPLE	1.75	74:1	1	127:1
LT GREEN	1.5	84:1	0.75	170:1
ORANGE	1	127:1	0.50	255:1
LT BROWN	0.5	255:1	0.25	511:1

This chart is based upon the chemical viscosity of water (CPS = 1.0) and should only be used as a guide. Actual ratios and flow rates may vary due to product viscosity, flow pressure, and tubing

TORTUOUS PATH METERING DEVICE (TPMD)

Many sink sanitizers and concentrated cleaning products require dilution rates that exceed 250 to 1. For these products, the TPMD was developed to meter precise amounts of chemical to water without plugging, and with unparalleled accuracy. Dilution rates range from 250:1 to 1500:1 with the Flex Gap or Aire Gap backflow preventers. The following table will guide your selection of the TPMD that suits your needs. Tortuous paths metering devices are optional items.

DILUTION	DYNAMIC WATER PRESSURE		
	30 PSI	40 PSI	50 PSI
1 GPM Flex Gap			
512:1	P/N 2201221-35	P/N 2201221-30	P/N 2201221-25
1 GPM Aire Gap			
512:1	P/N 2201221-40	P/N 2201221-30	P/N 2201221-25
4 GPM Flex Gap			
512:1	P/N 2201221-05	P/N 2201221-05	P/N 2201221-05
750:1	P/N 2201221-10	P/N 2201221-10	P/N 2201221-10
935:1	P/N 2201221-15	P/N 2201221-15	P/N 2201221-15
1400:1	P/N 2201221-25	P/N 2201221-25	P/N 2201221-25
3 GPM Aire Gap			
512:1	P/N 2201221-15	P/N 2201221-10	P/N 2201221-10
750:1	P/N 2201221-15	P/N 2201221-20	P/N 2201221-20
935:1	P/N 2201221-25	P/N 2201221-25	P/N 2201221-20
1400:1	P/N 2201221-50	P/N 2201221-40	P/N 2201221-35

Note: Mixing Ratios should be used for reference only. Ratios and flow rate will vary depending on water pressure, chemical viscosity, and length of chemical lines.

CHANGING THE FLOW RATE

FLEX-GAP VENTURI

For the Flex-Gap systems, the flow rate is controlled by a venturi insert located inside bottom of the Flex-gap housing.

WHITE Venturi insert (2200106) = 1 GPM

BLACK Venturi insert (2200105) = 4 GPM

To change the venturi insert.

- (1) Remove the cover by gently snapping it away from the unit.
- (2) Disconnect tubing from Flex-Gap housing
- (3) Twist the Flex-Gap housing counter-clockwise to remove it from the water valve body
- (4) Push out existing venturi tube by inserting a pen up through the bottom of the Flex-Gap housing (note the order of the parts as they are removed from the flex-gap/venturi housing). **See Figure 1**
- (5) Insert the new venturi insert (for the desired flow rate) into the Flex-Gap housing, ensuring that it seats firmly. Place the flex-gap parts in the order removed from the previous step.

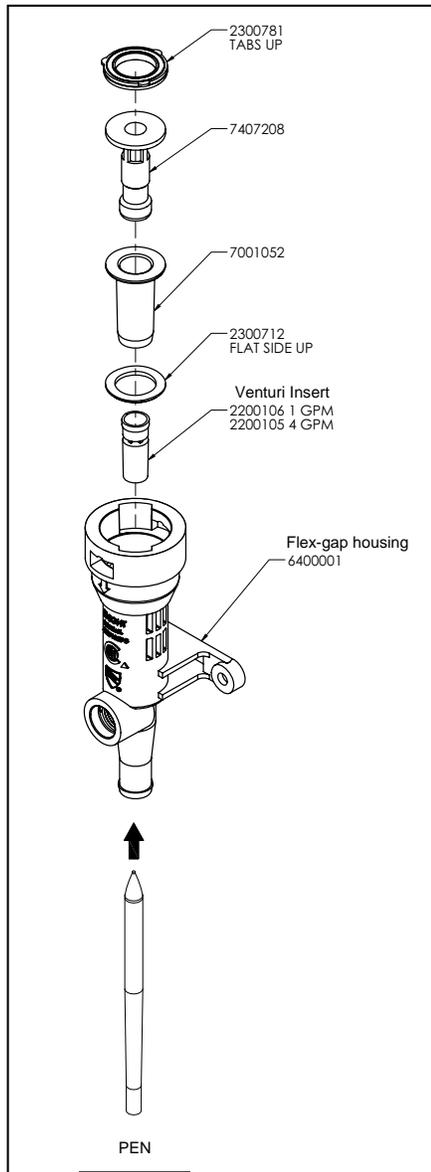


Figure 1 (Flex-Gap Assembly)

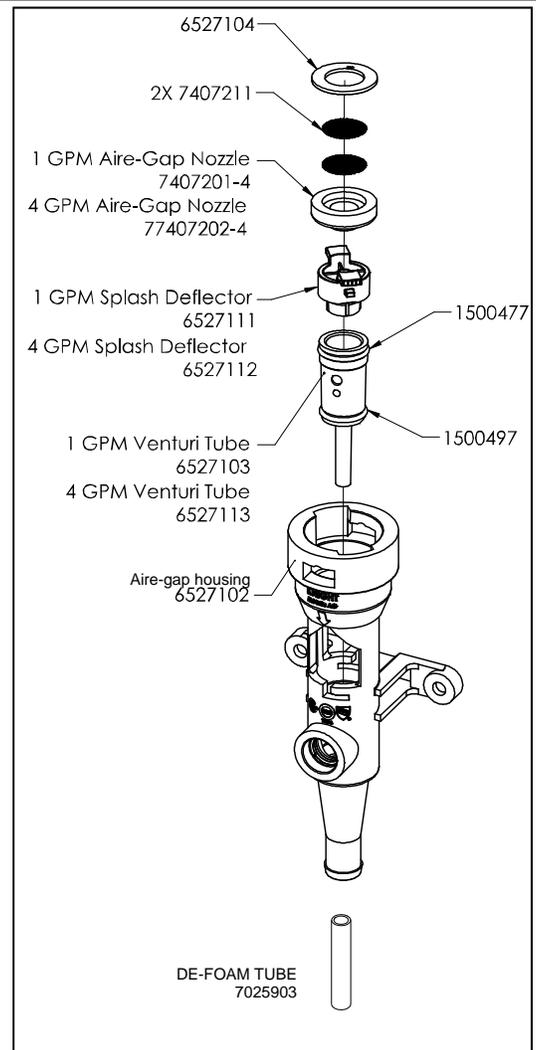


Figure 2 (Aire-Gap Assembly)

(6) Twist the Flex-Gap housing clockwise to reattach it to the water valve.

(6) Twist the Flex-Gap housing clockwise to reattach it to the water valve.

AIRE-GAP VENTURI

For Aire-Gap venturi systems, the flow rate is controlled by a nozzle, deflector plate, and venturi insert. These internal parts are color coded to identify their GPM rating: Aire-Gap Nozzle: LIGHT GREY = 1 GPM / LEAF GREEN = 4 GPM
Spash Deflector & Venuri tube: WHITE = 1 GPM / BLACK = 4 GPM

To change the aire-gap venturi.

- (1) Remove the cover by gently snapping it away from the unit. Disconnect tubing from Aire-gap housing.
- (2) Twist and disconnect Aire-Gap housing counter-clockwise to remove fwater valve body
- (3) Remove existing nozzle, deflector plate, and venturi tube by disassembling the Aire-Gap assembly — **See Figure 2.**
- (4) Reassemble the Aire-Gap using new nozzle, splash deflector, and venturi tube (for the desired flow rate). To avoid leakage, install the rubber washer with the 3 “ears” facing upwards.
- (5) Put Aire-Gap assembly back in place in the order that they were removed
- (6) Twist and reconnect Aire-gap assembly back onto the water valve body

SAFETY AND SERVICING TIPS

- Avoid direct contact with chemicals — handle containers with caution. To avoid spillage, be careful not to tip containers.
- Insert chemical suction line into container so that footvalve and ceramic weight sink to the bottom.
- If valve fails to draw chemical, check the metering tip and footvalve for blockage — soak in warm water to clear.

TROUBLESHOOTING

1. Proportioner will not draw chemical:
 - A. Check metering tip for obstruction.
 - B. Check water pressure for 30 – 60 PSI.
 - C. Check or change footvalve.
2. Proportioner leaks at joints:
 - A. Ensure that both ends of the valve body have sufficient PTFE tape.
3. Mixed chemical concentration is too weak:
 - A. Check water pressure for a minimum of 25 PSI of flow pressure.
 - B. Change metering tip to a higher dilution ratio.
4. Supply line loses chemical prime:
 - A. Check or change foot valve.
5. Water leaks at cap on valve assembly:
 - A. Loose or “stripped” screw. Replace screw.
 - B. Excessive water pressure. Use Regulator.
6. Button activator will not activate valve:
 - A. The cover is loose or damaged, snap on cover or replace the cover,
 - B. Adjust calibration screw until full flow is achieved. **See Figure 5**
7. Dial 4 will not draw chemical:
 - A. Check condition of o-ring on dial selector knob. **See Figure 6**
 - B. Ensure Dial “Clicks” to selected product.
8. Low water flow:
 - A. Check that diaphragm cover is firmly attached.
 - B. Check for sediment in screen washer or valve body.
 - C. Check water pressure.
9. “Aire-Gap” Proportioner is spraying a fan pattern or dripping water
 - A. Clean mineral deposits from Aire-Gap nozzle and screen.

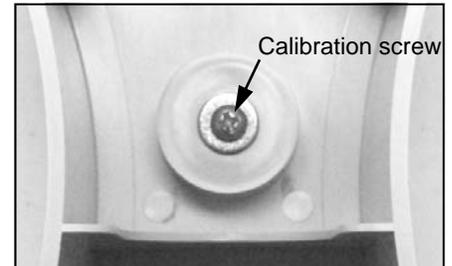


Figure 5

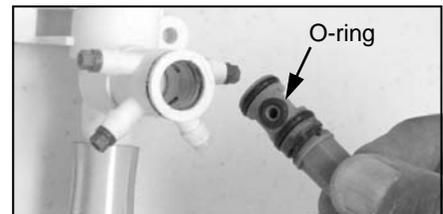
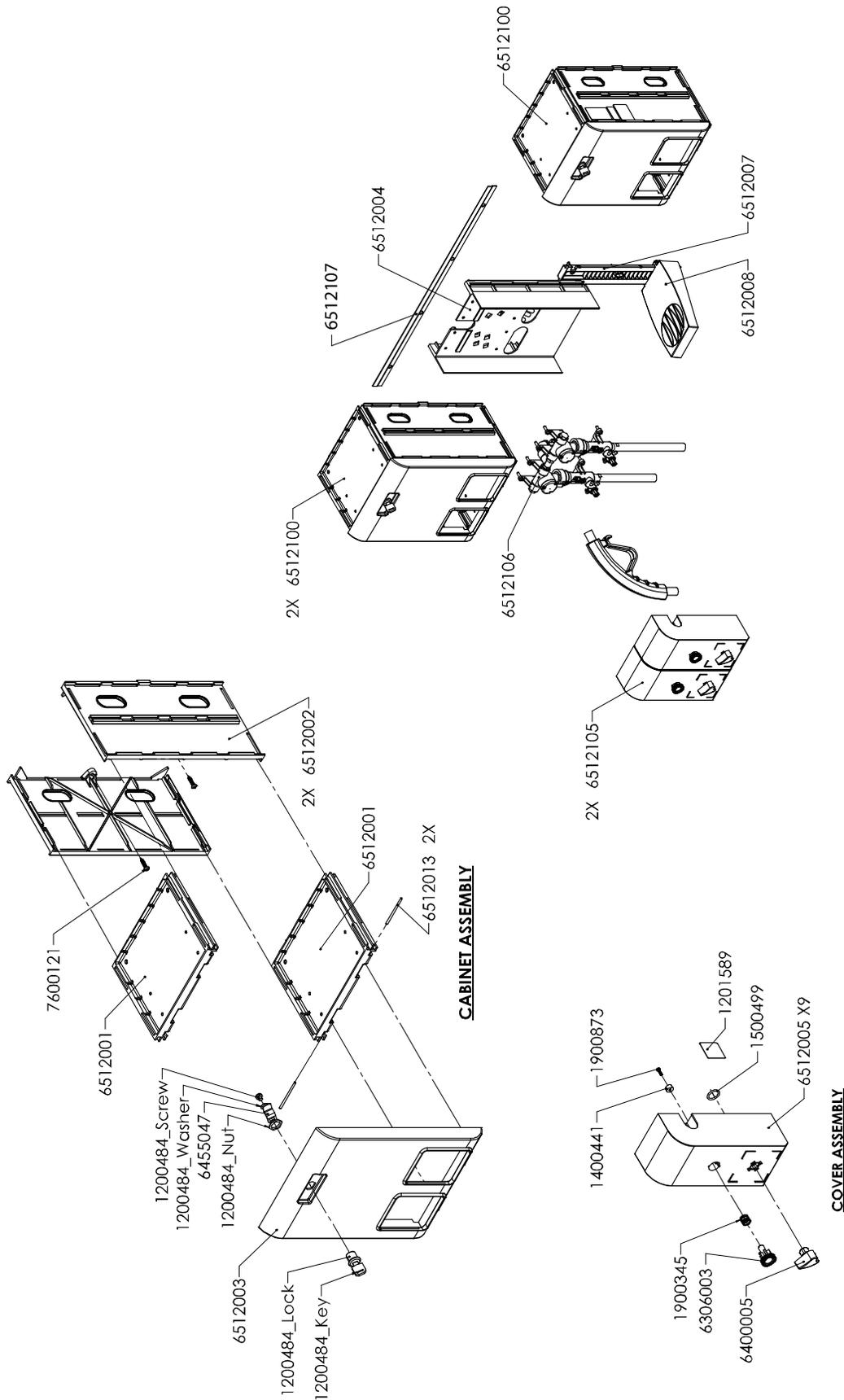
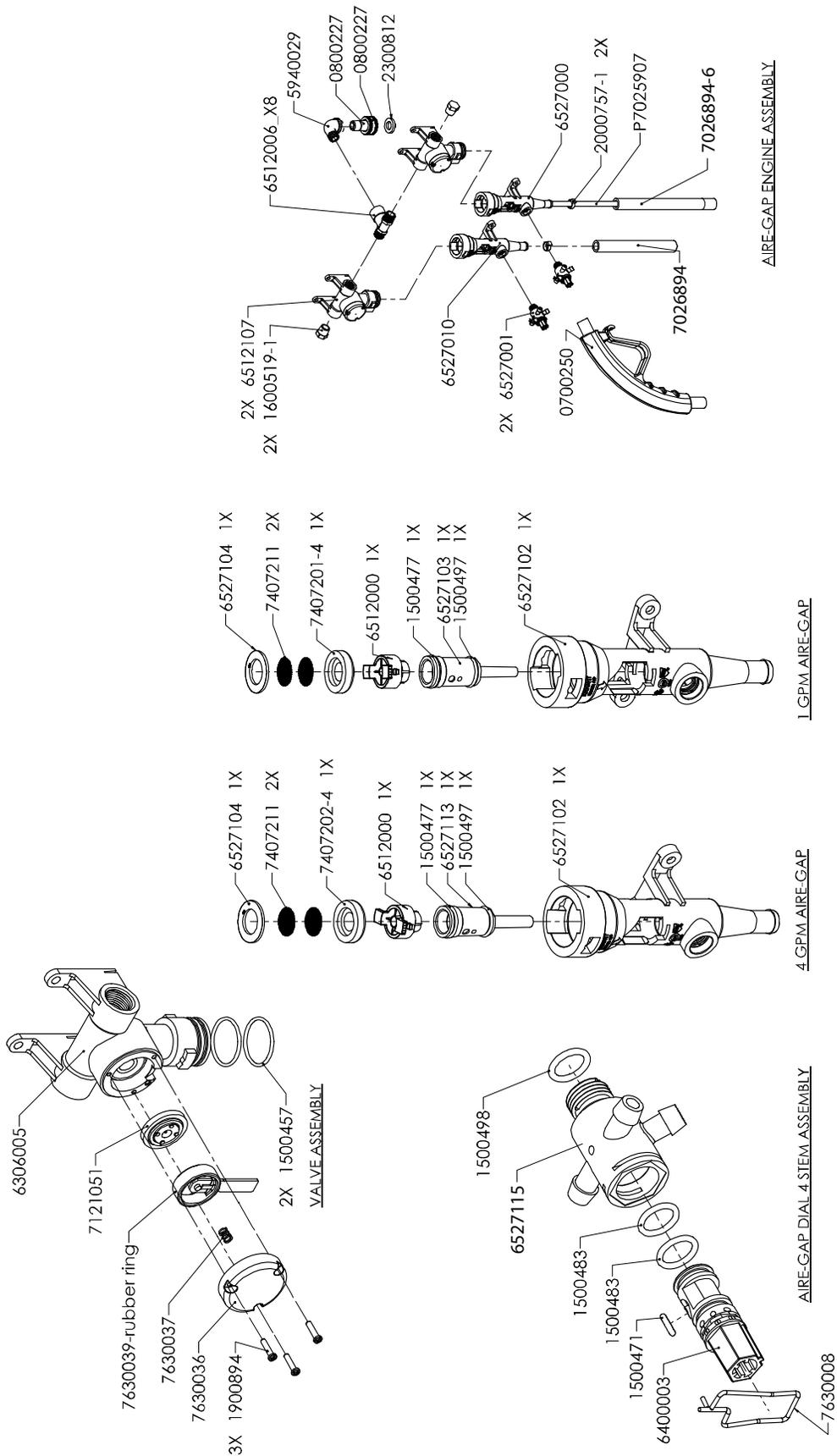


Figure 6

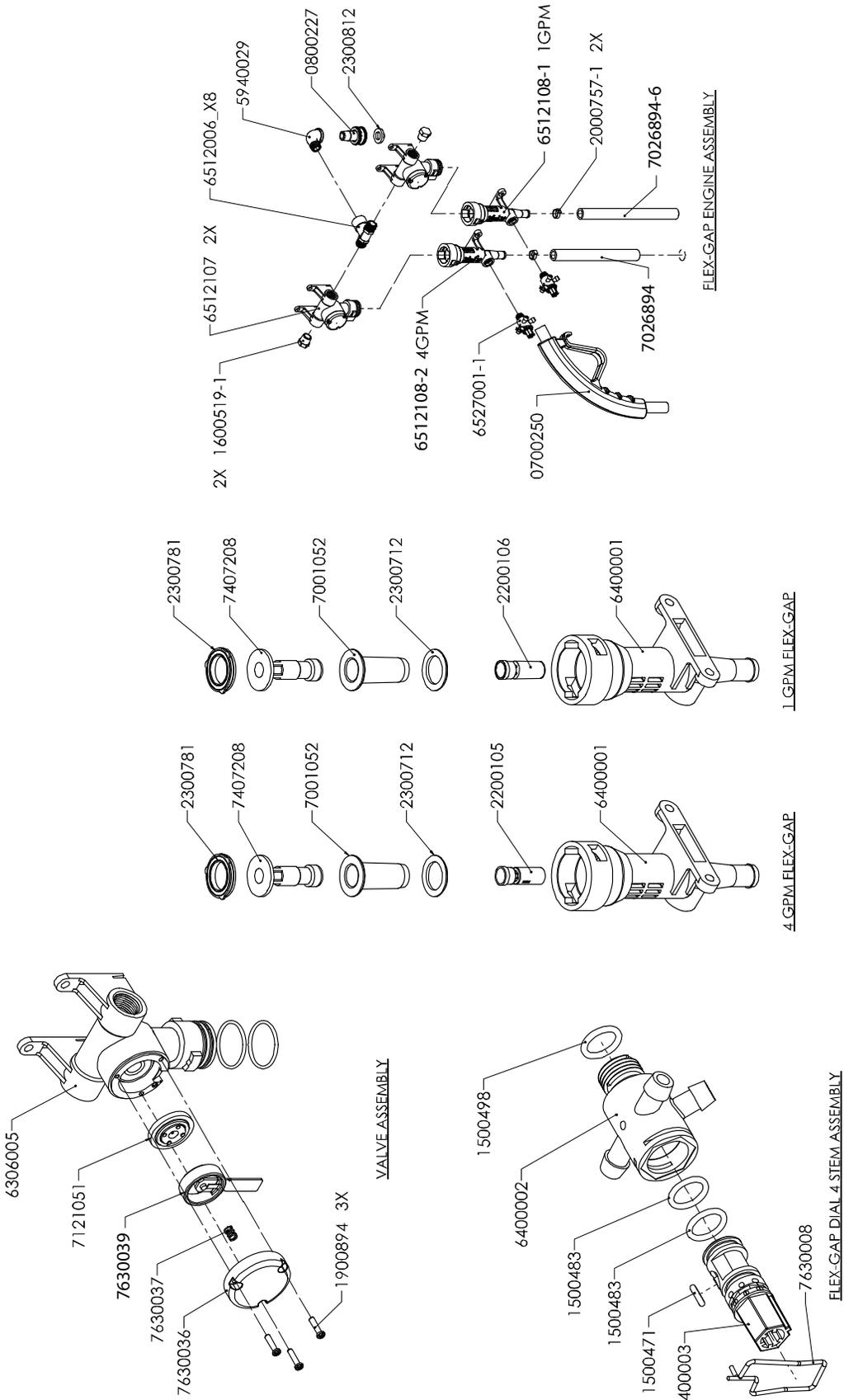
MX HOSPITALITY PROPORTIONING CABINET PARTS DIAGRAM



AIRE-GAP PARTS DIAGRAM



FLEX-GAP PARTS DIAGRAM



FLEX-GAP ANNUAL CLEANING AND TEST PROCEDURES FOR UNITS INSTALLED IN CANADA

Each year, your chemical dispenser must be cleaned and its backflow prevention performance verified. As this device is an end-of-line device (versus an in-line device) and evidence of effective backflow prevention is determined visually, a two-minute pressure test is not necessary.

If the Flex-Gap device cannot readily be seen during the test procedure, the housing of the chemical dispensing unit must be removed during testing. Apply the appropriate test procedure below as applicable for your chemical dispensing unit.

4 GPM VENTURIS

1. Fill discharge hose with water by opening the valve.
2. When water begins to exit the discharge hose turn off the water and raise the end of the hose above the Flex-Gap.
3. Observe that water is exiting the Flex-Gap.
4. If the water is exiting the Flex-Gap it has passed the test.
5. If the water is not exiting from the Flex-Gap, replace the Flex-Gap sleeve as per the instruction manual and re-test.
6. If the water is not exiting from the Flex-Gap after replacing the sleeve and re-testing, replace the complete Flex-Gap assembly and re-test.
7. If the water is not exiting from the Flex-Gap after replacing the Flex-Gap assembly, disconnect the water supply and replace the complete unit.

1 GPM VENTURIS

1. Remove the Fill Tube Spout and replace with a 4-foot length of 1/2" ID hose.
2. Fill the discharge hose with water by opening the valve.
3. When water begins to exit the discharge hose, turn off the water and raise the end of the hose above the Flex-Gap.
4. Observe that water is exiting the Flex-Gap.
5. If the water is exiting the Flex-Gap, it has passed the test.
6. If the water is not exiting from the Flex-Gap, replace the Flex-Gap sleeve and re-test.
7. If the water is not exiting from the Flex-Gap after replacing the sleeve and re-testing, replace the complete Flex-Gap assembly and re-test.
8. If the water is not exiting from the Flex-Gap after replacing the Flex-Gap assembly, disconnect the water supply and replace the complete unit.

DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.

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