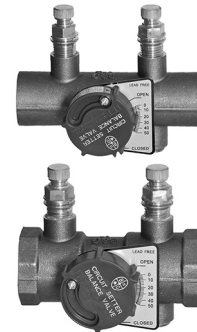




Circuit Setter® Plus Calibrated Balance Valves



<https://qr.xylemsales.com/v1000187>

1 Introduction and safety

Installer

NOTICE:

PLEASE LEAVE THIS MANUAL FOR OWNER'S USE

Note: Bell & Gossett recommends Lead Free Brass or Stainless Steel Booster Pumps be used for pumping potable water.



SAFETY INSTRUCTIONS

This safety alert symbol will be used in this manual and on the unit safety instruction decals to draw attention to safety related instructions. When used, the safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.

1.1 Safety message levels

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Definitions

Safety message level	Indication
DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury
Electrical Hazard:	The possibility of electrical risks if instructions are not followed in a proper manner

Safety message level	Indication
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

2 Product description

2.1 Description

Circuit Setter Plus Balance Valves are precision engineered valves used in heating and cooling systems which function as precise system balancing valves and highly accurate variable orifice flow meters.

CSA Certified: AB1953; Vermont S152; Maryland House Bill 372 (Statute 12-605) NSF/ANSI-372

Figure 1: 1/2" to 3" NPT size

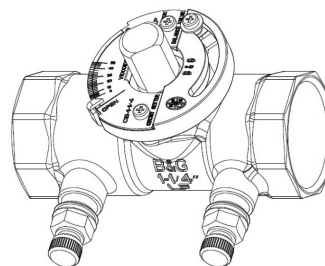


Figure 2: 1/2" to 2" Sweat size

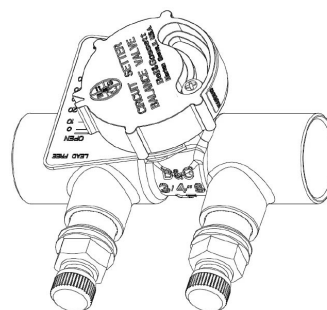
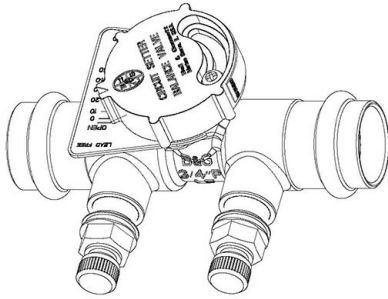


Figure 3: 1/2" to 2" Press size



WARNING:

This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov.

2.2 Operational limits

Valve		Temperature	Max Working Pressure
Circuit Setter	NPT	-4°F (-20°C) to 250°F (120°C)	400 PSI (2758 kPa)
	Sweat	Based on Solder Type	ASTM Std. B16.18
	Press	32°F (0°C) to 200°F (93°C)	200 PSI (1380kPa)

Type Solder	Maximum Limitations 1/2" - 1"		Maximum Limitations 1-1/4" - 2"	
	Pressure PSI (kPa)	Temp °F (°C)	Pressure PSI (kPa)	Temp °F (°C)
95-5 Tin-Antimony	300 (2069)	200 (93)	300 (2069)	175 (79)
	250 (1724)	225 (107)	250 (1724)	200 (93)
	200 (1379)	250 (121)	175 (1207)	250 (121)

3 Installation

3.1 Installation instructions

Circuit Setter Balance Valves are bidirectional valves and can be installed in most attitudes; however, they should be installed in a position to facilitate the ease of balancing the system. NPT and sweat style Circuit Setter Balance Valves are equipped with 1/4" NPT plugged drain port. If the drain port is to be used to drain a riser on the downstream side of a terminal unit, it should be situated on the terminal unit side of the riser when installing the Circuit Setter.

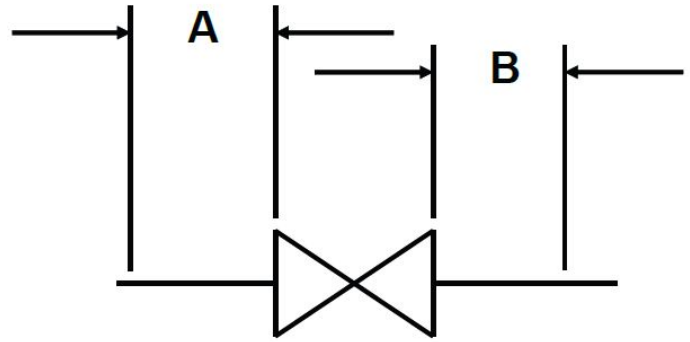
NOTICE:

Bell & Gossett Circuit Setter Balance Valves are not recommended for use with meter connections pointing down. Dirt and debris will collect in the connections and foul up the readout valves and readout meters.

To retain calibrated accuracy, a minimum length of unrestricted straight pipe adjacent to the valve should be maintained as follows:

Size	Upstream "A" (In pipe diameter)	Downstream "B" (In pipe diameter)
1/2" - 3"	3	1

Figure 4



When installing the Circuit Setter in a coil hook-up kit, the valve should be installed on the return side of the coil with union end adapter on the upstream side and other end on the downstream side, except when used on the bypass line. Be aware of water weight in the valve and connected piping when installing your system.

NOTICE:

Never use the valve itself as a form of piping support. Please support valves and piping according to the local building code. Failure to follow these instructions may result in property damage.

3.2 Circuit setter balance valves with sweat connections

1. Use a torch with a sharp pointed flame.
2. Clean tube ends and Circuit Setter connections thoroughly.
3. Use 95-5 (Tin-Antimony) solder and a good grade of flux.



CAUTION:

Heat associated with the use of silver solder may damage valve and void the warranty. Do not use silver solder. Failure to follow these instructions could result in property damage and/or moderate personal injury.



CAUTION:

Excessive use of solder in a vertical installation may result in damage to the valve seat and ball. Do not use excessive flux. Failure to follow these instructions could result in property damage and/or moderate personal injury.

4. When sweating the joints, first wrap the valve body with a cool wet rag, then direct the flame with care to avoid subjecting the Circuit Setter to too much heat. Let the valve body to cool below 200°F (93°C) before installing the (2) Model RV-125A Readout Valves packaged with the Circuit Setter Balance Valve.



CAUTION:

The use of PTFE impregnated pipe compound and PTFE tape on pipe threads provides lubricity which can lead to overtightening and breakage. Do not overtighten. Failure to follow this instruction can result in personal injury from hot water and/or property damage.

5. Check soldered connections for leaks. If resoldering is needed, remove the readout valves before applying the torch to one or more connections.

3.3 Circuit setter balance valves with NPT connections

1. Apply pipe compound conservatively to male connecting fittings only.

**CAUTION:**

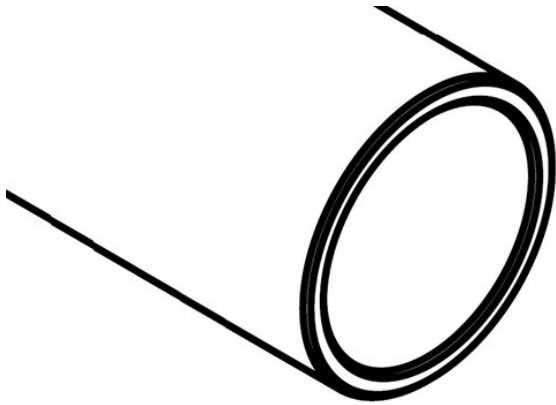
The use of PTFE impregnated pipe compound and PTFE tape on pipe threads provides lubricity which can lead to overtightening and breakage. Do not over-tighten. Failure to follow this instruction can result in personal injury from hot water and/or property damage.

2. Check connections for leaks.

3.4 For installing press connections

Bell & Gossett Press Connections are designed to join Circuit Setter valves with ASTM B88 Type K, L, and M copper tubes.

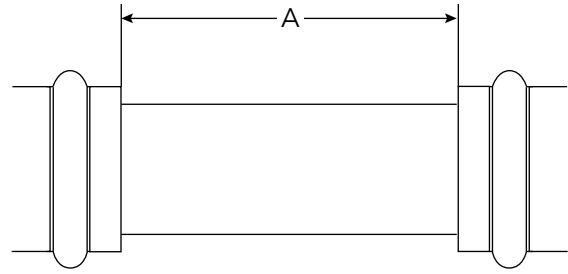
1. Using clean and undamaged copper tube, cut the tube to the desired length, keeping the ends square, at a right angle, using a dedicated displacement type tube or pipe cutting tool. Do not cut through any scratches, grooves, manufacturing marks, or identification etchings present on the tube, as this may cause it to deform. Perform a visual inspection to make sure that the copper tube has stayed within round.
2. Use dedicated pipe deburring tools to deburr the pipe inner and outer diameters. This will add a gentle chamfer to the tube that will facilitate tube insertion into the component. Burrs must also be removed to prevent damage to the press connection sealing element (O-ring) and to ensure uniform tube insertion. Further, clean tube ends thoroughly per good piping practices with a fine grade emery cloth or extra fine grit sandpaper. The tube end should be clean and free of all dirt and debris.



3. After cleaning, mark the tube with a pencil or magic marker to show the proper minimum tube insertion depth. Refer to the table below for the correct insertion depth.

Minimum Tube Insertion Depth						
Nominal Pipe Size	½"	¾"	1"	1¼"	1½"	2"
Insertion Depth (inch)	0.89	0.91	1.03	1.03	1.41	1.66
Insertion Depth (mm)	22.6	23.0	26.0	26.1	35.9	42.3

4. Crimping or mechanical pressing of the component-tube connection causes some deformity of the tubing. To prevent leaks, maintain minimum distance between connections as indicated below:



Minimum Distance Between Press Connections						
Nominal Pipe Size	½"	¾"	1"	1¼"	1½"	2"
Minimum Tube Length (A)	1"	1½"	2"	2½"	3"	4"

5. Check the press connection of the Circuit Setter valve to make sure that the sealing element (O-ring) is seated in place and clean and free from all dirt and debris. Lubricate the seal and the inside of the press connection with water.

**WARNING:**

Never lubricate the press connection sealing element (O-ring) with anything other than water. Petroleum-based or mineral-based lubricants and oils, dirt or debris may damage the sealing element. Failure to follow these instructions could result in serious personal injury or death and property damage.

To make sure the press connection sealing element (O-ring) is not damaged, all sweat, soldered, or brazed connections must be completed prior to pressing or crimping any press connection components to the tube.

6. Lubricate the outside of the tube with water. Carefully insert the tube into the press connection of the component with a gentle twisting motion until the tube firmly stops. Make sure the tube is fully inserted into the Circuit Setter valve to the proper depth. Failure to fully insert the tube into the press connection may result in an improper seal.
7. Follow press tool manufacturer's instructions for proper use, maintenance, and service of the press tool. Using the appropriately sized crimp tool with the correct jaws for the desired pipe size, place the open jaws around the press connection of the component and ensure that the contour of the jaw is properly aligned with the contour of the press connection on the component. Make sure that the crimp tool is perpendicular to the tube and perform the press crimping action to join the component to the tube.

**CAUTION:**

Use appropriate Personal Protective Equipment (PPE) and avoid handling sharp edges that may have formed on the component during the crimping operation.

8. Inspect the crimped fitting to ensure proper crimp and check the connection to make sure none of the following problems exist:
 - Tube not in line with the Circuit Setter valve
 - The tube is not fully inserted into the Circuit Setter valve
 - Crimp tool not aligned with press feature on Circuit Setter valve
9. Check all connections for leaks.
10. If any problems are found at this time, a new section of tubing and a new Circuit Setter valve will need to be prepared, installed, and crimped into place.

4 Operation

4.1 How to use bell & gossett circuit setter balance valves for pre-set flow balancing

All Circuit Setter balance valves within a common zone, circuit, or system, with a common pump, are brought into balance with each other by establishing a common BALANCE GOVERNING HEAD LOSS as noted.



CAUTION:

Hot uninsulated surfaces can cause burns to the skin. Do not touch hot surfaces. Failure to follow these instructions could result in moderate personal injury.

1. Identify the zone within a given circuit or circuit within a given system with the highest head loss.
2. Establish the value of the head loss in feet of water.
3. Establish the corresponding required GPM.
4. Select the appropriate size Circuit Setter balance valve (normally line size) for the required GPM.
5. Using Side #1 of the V91483 Circuit Setter Balance Valve Calculator, set the degree of closure hairline in the red section of the Calculator over the 0° setting for the appropriate size Circuit Setter and read the head loss opposite the required GPM. The setting for this Circuit Setter will remain 0°.
6. Add the head loss in Step #5 to the head loss in Step #2 to establish the Balancing Governing Head Loss for the zone or circuit.
7. Subtract the required head loss for each zone circuit from the Balance Governing Head Loss in Step #6 to establish the head loss difference for each zone or circuit which is to be brought into balance with Step #6.
8. The head loss difference in Step #7 and the required GPM in Step #3 are lined up in the white section of Side #1 of the Calculator and the degree of closure for the specific Circuit Setter balance valve is shown under the degree of closure hairline in the red section of the Calculator for the appropriate size Circuit Setter.
9. Adjust the Circuit Setter by turning the red knob by hand on sizes ½" thru 1" or by placing a wrench on the wrench flats provided on sizes 1-1/4" thru 3" to set the position determined by the preceding procedure.



CAUTION:

It is possible, depending on the age or condition of the stem seal, for some liquid to escape during Circuit Setter adjustment. Do not have eyes or face on a level with the sides of the Circuit Setter. Failure to follow this instruction could result in serious personal injury.

NOTICE:

- Head Loss in Steps #6 and #2 are a fixed head requirement the zone, circuit, or system pump, as required must overcome.
- Refer to the G95872 pre wired tag packaged with the Circuit Setter balance valve and fill in the appropriate information. Attach the tag to the Circuit Setter for future reference.

4.2 How to use bell & gossett circuit setters to proportionally balance a system

1. Open fully all Circuit Setters on a single pump system.
2. If more than one branch circuit is used, start the balance procedure by reading all of the flows to the units in a branch. Each unit (coil) should have its own Circuit Setter for flow balancing. Using Bell & Gossett RP-250B readout probes, sequentially attach a Bell & Gossett differential pressure readout kit to the readout valves on each Circuit Setter Balance Valve.



WARNING:

Hot water leakage can occur from readout valves during probe insertion and during hookup of readout kit. Follow the instructions in instruction manuals supplied with readout probes and readout kits for safe use. Keep eyes protected with safety glasses. Make sure that readout valves are not leaking before removing safety cap. Failure to follow this instruction can result in serious personal injury or death and property damage.

3. Using side 2 of the Bell & Gossett Circuit Setter Balance Valve Calculator, with the top hairline set on zero for the size Circuit Setter being read, read the flow corresponding to the pressure drop read with the readout kit.
4. Calculate the ratio of the actual flow to the design flow for each unit in the branch. This is the proportional flow rate. (Actual flow divide by design flow.)
5. Select the Circuit Setter with the lowest proportional flow rate. This Circuit Setter is left in the full open position. Every other Circuit Setter in the branch is then reset to the same proportional flow rate.
6. If there are additional branches, repeat the steps in 3, 4 and 5 for each branch.
7. After all branches have been proportionately balanced, measure the full open flows on the Circuit Setters installed on the risers. Calculate the proportional ratio of each riser Circuit Setter and select the one with the lowest proportional ratio. This Circuit Setter is left fully open and the other riser Circuit Setters are adjusted to this same ratio as described in Step "5".
8. Adjust pump flow so that circuits are receiving their design flow. This can be accomplished by adjusting a Circuit Setter Balance Valve installed on the pump discharge or by changing the pump impeller size.

NOTICE:

If a high degree of throttling of flow at pump discharge is required, Bell & Gossett recommends that the pump impeller be sized to produce design flow. This will reduce electrical energy consumption.

4.3 How to use bell & gossett circuit setter balance valve as flow meter

1. Energize the zone, circuit and/or system pump(s) as applicable.
2. Using Bell & Gossett Model RP-250B Readout Probes, sequentially attach a Bell & Gossett differential pressure readout kit to the readout valves on each Circuit Setter Balance Valve.
3. Read the differential pressure across the orifice of the Circuit Setter Balance Valve.



WARNING:

Hot water leakage can occur from readout valves during probe insertion and during hookup of readout kit. Follow the instructions in instruction manuals supplied with readout probes and readout kits for safe use. Keep eyes protected with safety glasses. Make sure that readout valves are not leaking before removing safety cap. Failure to follow this instruction can result in serious personal injury or death and property damage.

4. Using Side #2 of the Circuit Setter Balance Valve Calculator, set the hairline over the degree of closure as indicated by the part of the red plastic knob or indicator plate parallel to the degree of closure noted on the calibration plate, and read actual GPM flowing through the Circuit Setter opposite the gauge reading head loss noted in the white section of Side #2.

NOTICE:

If the system contains a liquid with a specific gravity and/or viscosity higher or lower than that of water, apply the appropriate correction factor noted in these instructions to obtain the actual GPM for the system liquid.

4.4 How to use bell & gossett circuit setter balance valve as an isolation valve

1. Move the adjustment knob or stem until the position indicator aligns with the closed position on the calibration plate.
2. Close the isolation valve on the other side of the equipment to be serviced.
3. Open the drain valve to drain the system between the Circuit Setter and the second isolation valve.



WARNING:

Check for proper sealing when using as an isolation valve. If seat is not sealing properly, liquid will continue to flow from drain valves. In this case valve must be isolated from system pressure and inspected for seat or disc damage. Replace as necessary. Failure to follow this instruction can result in serious personal injury and property damage.

4.5 How to use the memory stop feature

For sizes 1/2" thru 4":

1. Make the final degree of closure setting.
2. Loosen the memory stop locking screw in the slot on the top of the red knob.
3. Slide the memory stop screw in the slot (counter-clockwise for 1/2" thru 1" sizes and clockwise for 1 1/4" thru 4" sizes) until the screw stops.
4. Tighten the memory stop screw.

5 Maintenance

5.1 Service instructions

Periodically inspect the Circuit Setter for signs of leakage or corrosion.



WARNING:

Corrosion or leakage are indications that the Circuit Setter must be replaced. Failure to follow these instructions could result in serious personal injury or death and property damage.

The P/T readout ports and drain plugs found on Bell & Gossett Circuit Setter Plus calibrated balance valves come pre-assembled with a leading industrial thread sealant, Loctite 567, and are tightened to appropriate levels. P/T readout ports on Sweat model Circuit Setters are shipped loose and will need to be installed as per the instructions below. With that in mind, the following information should help to clarify questions regarding the adjustment or servicing of those components when required.



WARNING:

Installation and maintenance must be performed by a qualified professional. Service should not be performed on any valve in an active Hydronic loop. Before attempting to make any required adjustments, properly isolate and drain the branch loops that require service and allow the valves to reach a safe handling temperature and zero pressure condition. Use proper safety equipment including gloves, goggles, or similar tools to avoid contact with system fluids and common hazards. Failure to follow these instructions could result in personal injury and property damage.

Any field adjustment of factory installed components will break the original thread seal and could cause leakage. This will necessitate the removal, cleaning and resealing of those parts per the instructions below.

Should any adjustment or servicing of P/T readout ports or drain plugs be required, please take the following steps:

1. Completely remove the desired component from the valve.
2. Taking care not to damage any threads on the components or the valve, clean off all of the old thread sealant. Use a wire brush and gentle abrasion if necessary. Allow the valve and the component to dry.
3. Starting with the second thread of the NPT male valve component, apply a 360° bead of Loctite 567 thread seal-ant/lubricant as shown below. Follow Loctite handling precautions as noted on the product labeling.



4. If Loctite 567 is unavailable, we recommend Rector Seal No. 5 pipe thread sealant for all non-glycol based applications, or any PTFE thread sealing tape. Be sure to follow the manufacturer specific handling precautions and application instructions as noted on the product labeling.
5. Thread component into valve until it is finger tight.
6. Apply torque to the following specifications:

Component		Torque
Size	Type	
1/4" NPT	P/T Readout Port, Drain Plug	9.0 ft.-lbs + 3.0 ft.-lbs. / -0

NOTICE:

The use of thread sealants/lubricants on threads also provides lubricity. Over application of torque may cause damage to the valve port or component.

7. Properly assembled valve components will immediately seal to moderate pressure (100 PSI or less). For maximum pressure resistance, allow the Loctite 567 or Rector Seal No. 5 thread sealant to cure for 24 hours. PTFE tape typically does not require curing to achieve maximum pressure resistance.

NOTICE:

Loctite and Loctite 567 are registered trademarks of Henkel A G & Co. Rector Seal No. 5 is a registered trademark of Rector Seal Corporation.

5.2 Insulation

Bell & Gossett recommends that insulation be attached to the Circuit Setter after the system has been balanced and the completed G95872 tag has been wired to the Circuit Setter.

NOTICE:

Tape or other acceptable means should be used to secure the insulation to the Circuit Setter Balance Valve.

5.3 B & G circuit setter correction factors for viscosity and specific gravity

$$GPM_f = \frac{\emptyset}{\sqrt{S.G.}} \quad GPM_s \quad GPM_f - \text{FLUID FLOW}$$

$$f = \frac{\emptyset}{\sqrt{S.G.}} \quad GPM_s - \text{FLOW THRU SETTER (a MEASURED CONDITIONS)}$$

$$GPM_f = f \quad GPM_s \quad \emptyset - \text{VISCOSITY CORRECTION}$$

$$S.G. - \text{SPECIFIC GRAVITY (TO WATER)}$$

VISCOSITY CENTIPOISE		1	10	15	25	35	60	100	200	500
\emptyset		1	.95	.90	.85	.80	.75	.70	.65	.60
S.G.	$\sqrt{S.G.}$	f								
.60	.775	1.29	.123	1.16	1.10	1.03	0.97	0.90	0.84	0.78
.65	.806	1.24	1.18	1.12	1.05	0.99	0.93	0.87	0.81	0.75
.70	.837	1.20	1.14	1.08	1.02	0.96	0.90	0.84	0.78	0.72
.75	.866	1.16	1.10	1.04	0.98	0.92	0.87	0.81	0.75	0.69
.80	.894	1.12	1.06	1.01	0.95	0.89	0.84	0.78	0.73	0.67
.85	.922	1.08	1.03	0.98	0.92	0.87	0.81	0.76	0.71	0.65
.90	.949	1.05	1.00	0.95	0.90	0.84	0.79	0.74	0.69	0.63
.95	.975	1.03	0.97	0.92	0.87	0.82	0.77	0.72	0.67	0.62
1.00	1.00	1.00	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60
1.05	1.025	0.98	0.93	0.88	0.83	0.78	0.73	0.68	0.63	0.59
1.10	1.049	0.95	0.91	0.86	0.81	0.76	0.72	0.67	0.62	0.57
1.15	1.072	0.93	0.89	0.84	0.79	0.75	0.70	0.65	0.61	0.56
1.20	1.096	0.91	0.87	0.82	0.78	0.73	0.68	0.64	0.59	0.54
1.25	1.118	0.89	0.85	0.81	0.76	0.72	0.67	0.63	0.58	0.54
1.30	1.140	0.88	0.84	0.79	0.75	0.70	0.66	0.62	0.57	0.53
1.35	1.162	0.86	0.82	0.78	0.73	0.69	0.65	0.60	0.56	0.52
1.40	1.183	0.85	0.80	0.76	0.72	0.68	0.63	0.59	0.55	0.51

EN

6 Warranty

6.1 Limited consumer warranty

Warranty. For goods sold for personal, family or household purposes, Seller warrants the goods purchased hereunder (with the exception of membranes, seals, gaskets, elastomer materials, coatings and other “wear parts” or consumables all of which are not warranted except as otherwise provided in the quotation or sales form) will be free from defects in material and workmanship for a period of one (1) year from the date of installation or two (2) years from the product date code, whichever shall occur first, unless a longer period is provided by law or is specified in the product documentation (the “Warranty”).

Except as otherwise required by law, Seller shall, at its option and at no cost to Buyer, either repair or replace any product which fails to conform with the Warranty provided Buyer gives written notice to Seller of any defects in material or workmanship within ten (10) days of the date when any defects or non-conformance are first manifest. Under either repair or replacement option, Seller shall not be obligated to remove or pay for the removal of the defective product or install or pay for the installation of the replaced or repaired product and Buyer shall be responsible for all other costs, including, but not limited to, service costs, shipping fees and expenses. Seller shall have sole discretion as to the method or means of repair or replacement. Buyer's failure to comply with Seller's repair or replacement directions shall terminate Seller's obligations under this Warranty and render this Warranty void. Any parts repaired or replaced under the Warranty are warranted only for the balance of the warranty period on the parts that were repaired or replaced.

Seller shall have no warranty obligations to Buyer with respect to any product or parts of a product that have been: (a) repaired by third parties other than Seller or without Seller's written approval; (b) subject to misuse, misapplication, neglect, alteration, accident, or physical damage; (c) used in a manner contrary to Seller's instructions for installation, operation and maintenance; (d) damaged from ordinary wear and tear, corrosion, or chemical attack; (e) damaged due to abnormal conditions, vibration, failure to properly prime, or operation without flow; (f) damaged due to a defective power supply or improper electrical protection; or (g) damaged resulting from the use of accessory equipment not sold or approved by Seller. In any case of products not manufactured by Seller, there is no warranty from Seller; however, Seller will extend to Buyer any warranty received from Seller's supplier of such products.

THE FOREGOING WARRANTY IS PROVIDED IN PLACE OF ALL OTHER EXPRESS WARRANTIES. ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE(1) YEAR FROM THE DATE OF INSTALLATION OR TWO (2) YEARS FROM THE PRODUCT DATE CODE, WHICHEVER SHALL OCCUR FIRST. EXCEPT AS OTHERWISE REQUIRED BY LAW, BUYER'S EXCLUSIVE REMEDY AND SELLER'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES ARE LIMITED TO REPAIRING OR REPLACING THE PRODUCT AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE BUYER FOR THE DEFECTIVE PRODUCT. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

To make a warranty claim, check first with the dealer from whom you purchased the product or call +1-847-966-3700 for the name and location of the nearest dealer providing warranty service.

6.2 Commercial warranty

Warranty. For goods sold to commercial buyers, Seller warrants the goods sold to Buyer hereunder (with the exception of membranes, seals, gaskets, elastomer materials, coatings and other “wear parts” or consumables all of which are not warranted except as otherwise provided in the quotation or sales form) will be (i) be built in accordance with the specifications referred to in the quotation or sales form, if such specifications are expressly made a part of this Agreement, and (ii) free from defects in material and workmanship for a period of one (1) year from the date of installation or two (2) years from the date of manufacture, whichever shall occur first, unless a longer period is specified in the product documentation (the “Warranty”).

Except as otherwise required by law, Seller shall, at its option and at no cost to Buyer, either repair or replace any product which fails to conform with the Warranty provided Buyer gives written notice to Seller of any defects in material or workmanship within ten (10) days of the date when any defects or non-conformance are first manifest. Under either repair or replacement option, Seller shall not be obligated to remove or pay for the removal of the defective product or install or pay for the installation of the replaced or repaired product and Buyer shall be responsible for all other costs, including, but not limited to, service costs, shipping fees and expenses. Seller shall have sole discretion as to the method or means of repair or replacement. Buyer's failure to comply with Seller's repair or replacement directions shall terminate Seller's obligations under this Warranty and render the Warranty void. Any parts repaired or replaced under the Warranty are warranted only for the balance of the warranty period on the parts that were repaired or replaced. Seller shall have no warranty obligations to Buyer with respect to any product or parts of a product that have been: (a) repaired by third parties other than Seller or without Seller's written approval; (b) subject to misuse, misapplication, neglect, alteration, accident, or physical damage; (c) used in a manner contrary to Seller's instructions for installation, operation and maintenance; (d) damaged from ordinary wear and tear, corrosion, or chemical attack; (e) damaged due to abnormal conditions, vibration, failure to properly prime, or operation without flow; (f) damaged due to a defective power supply or improper electrical protection; or (g) damaged resulting from the use of accessory equipment not sold or approved by Seller. In any case of products not manufactured by Seller, there is no warranty from Seller; however, Seller will extend to Buyer any warranty received from Seller's supplier of such products.

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