

Dump Valve and Third Purge Valve Kits

312786J

EN

For use with ProMix[®] 2KS Electronic Proportioners. For professional use only.

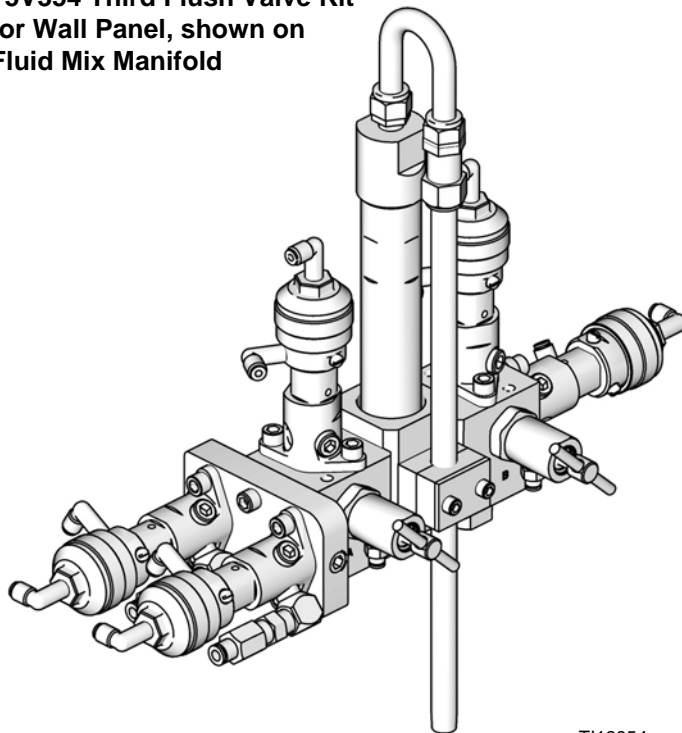
See page 2 for kit part numbers and maximum working pressure.



Important Safety Instructions

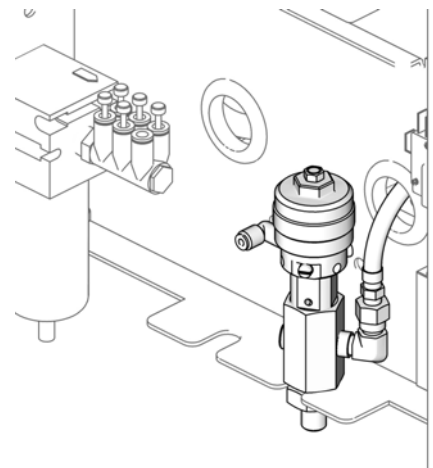
Read all warnings and instructions in this manual. For complete warnings and instructions see your proportioning system manual. Hazard symbols refer to specific procedure risks. Save all instructions.

15V354 Third Flush Valve Kit for Wall Panel, shown on Fluid Mix Manifold



T112954a

15V821 Dump Valve Kit for Wall Panel



T112743a

Contents

Kits	2	System Electrical Schematic	13
Installation	3	Parts	14
15V821 and 17L060 Dump Valve Kits for Wall Panel 3		15V821 Dump Valve Kit for Wall Panel	14
15V354 Third Flush Valve Kit for Wall Panel . . .	5	17L060 Dump Valve Kit for Wall Panel	15
15V822 Dump Valve Kit for RoboMix	6	15V354 Third Flush Valve Kit for Wall Panel . . .	16
15V202 Third Flush Valve Kit for RoboMix	7	15V822 Dump Valve Kit for RoboMix	17
15X247 Auto Dump Valve Kit	8	15V202 Third Flush Valve Kit for RoboMix	18
Schematic Diagrams	10	15X247 Auto Dump Valve Kit	19
System Pneumatic Schematic	10	Graco Standard Warranty	20
Tubing Schematic	11	Graco Information	20

Kits

15V821 and 17L060 Dump Valve Kits

For wall mount ProMix 2KS Electronic Proportioners
3000 psi (21 MPa, 210 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Working Pressure
See pages 3 and 14

15V822 Robo Dump Valve Kit

For robo mount ProMix 2KS Electronic Proportioners
300 psi (2.1 MPa, 21 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Working Pressure
See pages 6 and 17

15V354 Third Flush Valve Kit

For wall mount ProMix 2KS Electronic Proportioners
4000 psi (28 MPa, 280 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Working Pressure
See pages 5 and 16

15V202 Robo Third Flush Valve Kit

For robo mount ProMix 2KS Electronic Proportioners
300 psi (2.1 MPa, 21 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Working Pressure
See pages 7 and 18

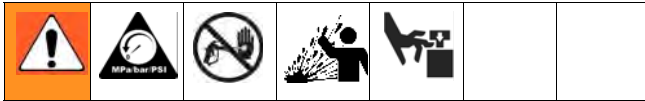
15X247 Auto Dump Valve Kit

For wall mount ProMix 2KS Electronic Proportioners
3000 psi (21 MPa, 210 bar) Maximum Fluid Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Working Pressure
See pages 8 and 19

Installation

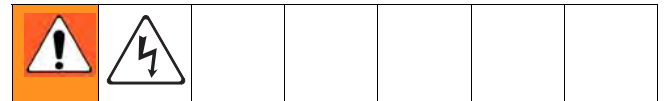
15V821 and 17L060 Dump Valve Kits for Wall Panel

NOTE: These instructions show this kit being installed on the A side. It may also be installed on the B side.



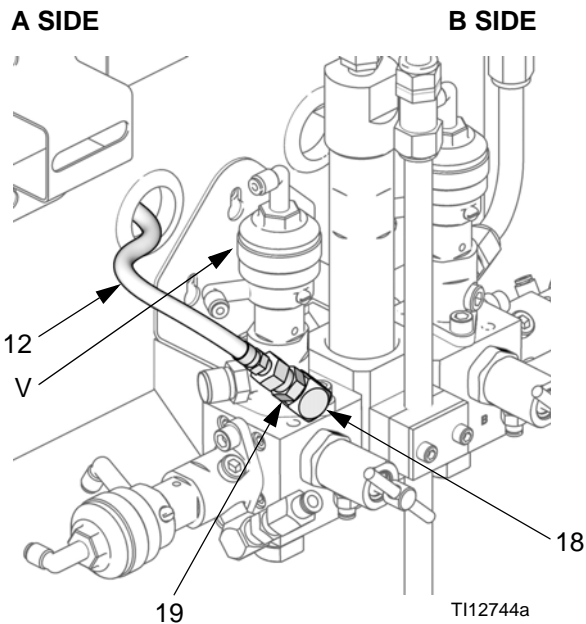
1. Shut off the fluid supply to the dose valve (V) at the front of the wall panel.
2. Actuate the dose valve to relieve fluid pressure in the valve.
3. Relieve fluid pressure upstream and downstream of the dose valve. See your ProMix 2KS Operation Manual.
4. See FIG. 1. Remove the plug from the dose valve adapter. Install the street elbow (18) in this port. Install the nipple (19) in the elbow.

5. Install the dump valve assembly (includes 1, 2, 4, and 11) in a slot of the flange (F) at the back of the wall panel. Secure with the nut (8).
6. Install the elbow (6) in the open port of the dump valve adapter (2). Connect a 1/4 npsm(f) hose (12) between the elbow (6) and nipple (19).



7. Shut off all power to the fluid panel. Open the fluid panel. See the **Wall Panel** detail in FIG. 2. Install the solenoid (9) at the correct position (Dump Valve A or Dump Valve B) on the solenoid manifold. Connect the solenoid wires to the fluid panel control board as shown in FIG. 3. Also see the **System Electrical Schematic** on page 13.
8. Connect the tubing (7) between the solenoid manifold and the tube fitting (T) on the dump valve (1). See **System Pneumatic Schematic**, page 10.

At Front of Wall Panel



At Back of Wall Panel

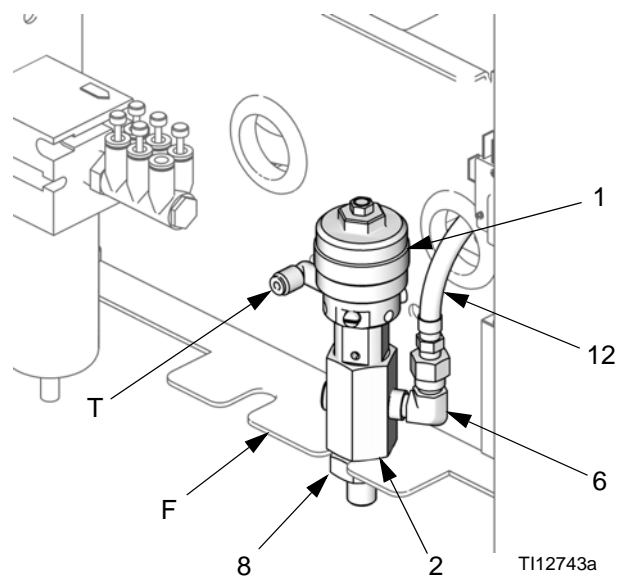


FIG. 1: 15V821 Kit Installation

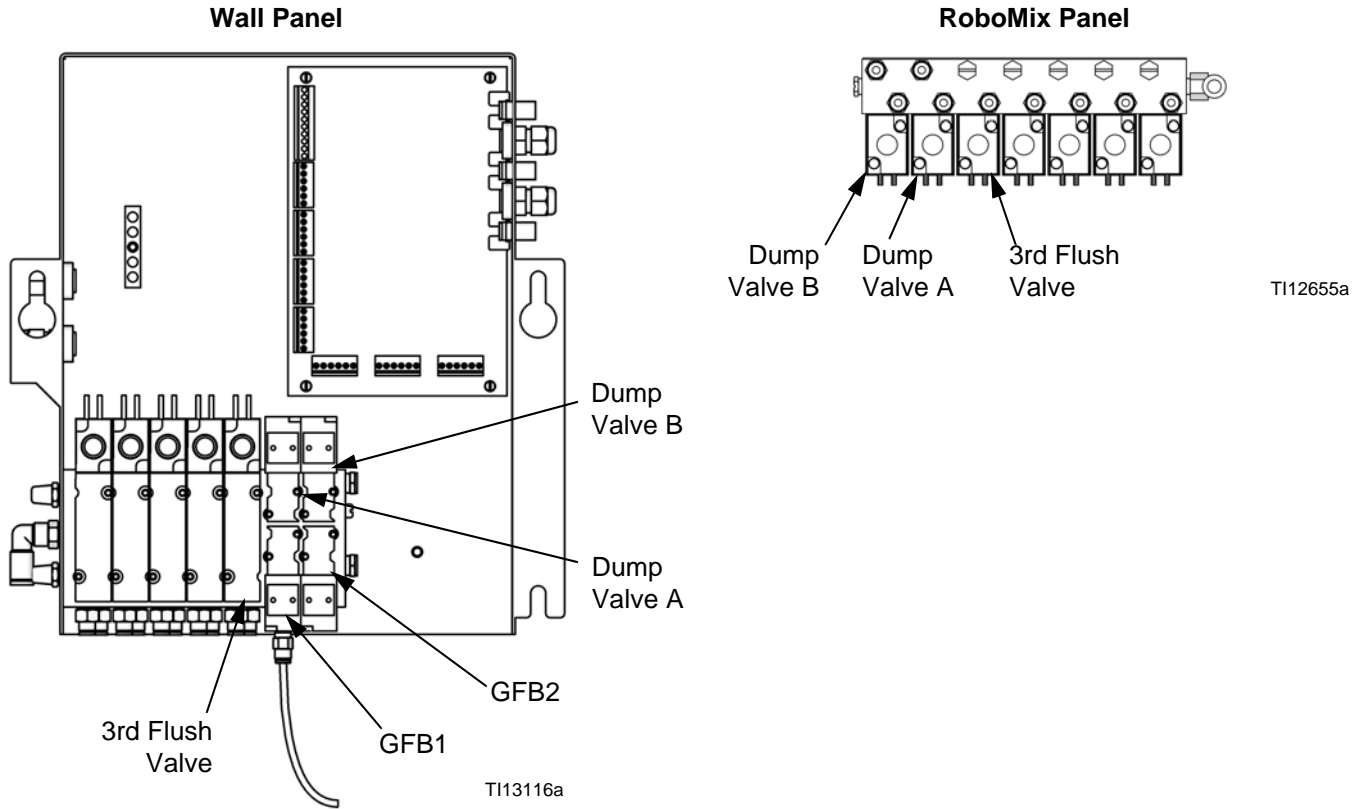
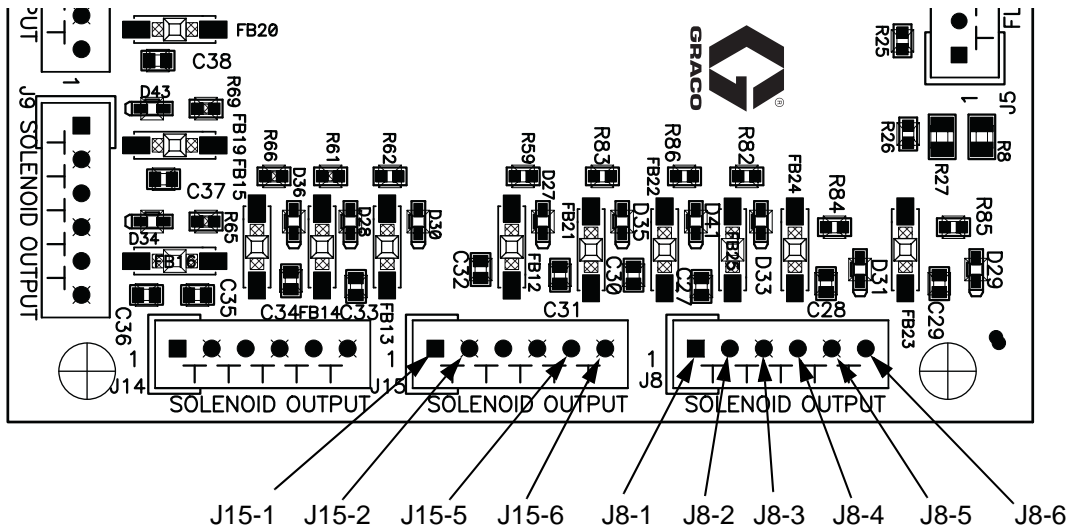


FIG. 2: Solenoid Manifolds



3rd Purge Valve	Dump Valve A	Dump Valve B	Auto Dump Valve A (GFB1)	Auto Dump Valve B (GFB2)	Wire Color
J15-1	J15-5	J8-5	J8-3	J8-1	Red
J15-2	J15-6	J8-6	J8-4	J8-2	Black

FIG. 3: 255765 Fluid Panel Control Board, Detail View of Solenoid Connections

15V354 Third Flush Valve Kit for Wall Panel



1. Shut off the air and fluid supply to the ProMix 2KS.
2. Relieve pressure. See your ProMix 2KS Operation Manual.
3. See FIG. 4. Remove the air flush valve (AFV) from the fluid mix manifold (FM) and set it aside.

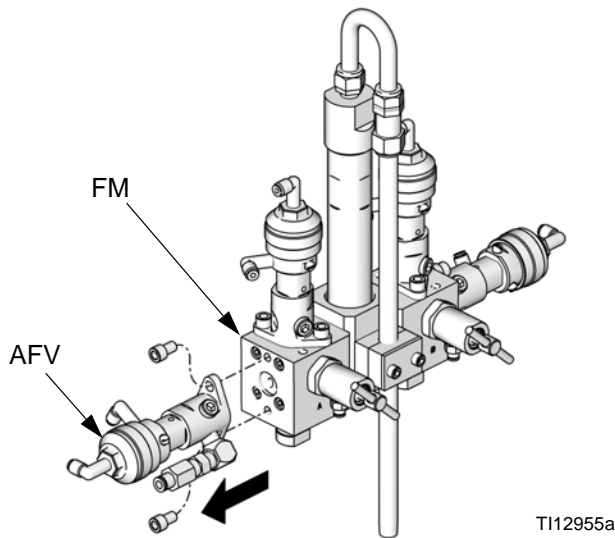
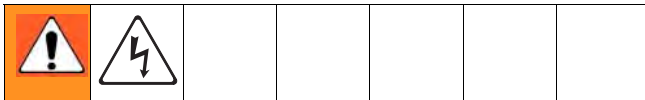


FIG. 4: Disconnect Air Flush Valve

4. See FIG. 5. Install the o-ring (6), double valve mounting block (1), and screws (8).
5. See FIG. 6. Install the air flush valve (AFV) on the double valve block (1). Assemble the third flush valve kit parts (2, 3, 4, 6, 9, 10, 11) as shown on page 16. Install on the mounting block using the screws (7). See FIG. 6.



6. Shut off all power to the fluid panel. Open the fluid panel. See the **Wall Panel** detail in FIG. 2. Install the solenoid (12) and two tube connectors (15) at the correct position (3rd Flush Valve) on the solenoid manifold. Connect the solenoid wires to the fluid panel control board as shown in FIG. 3.

7. Connect the tubing (13, 14) between the solenoid manifold and the tube fittings (T) on the flush valve (2). See **System Pneumatic Schematic**, page 10.

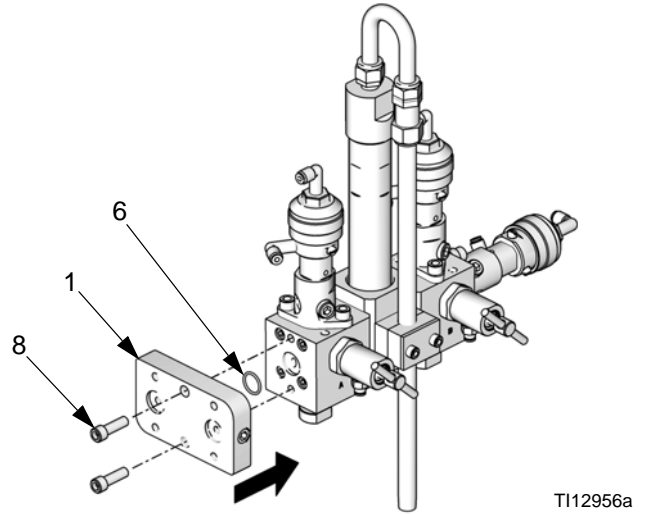


FIG. 5: Install Double Valve Mounting Block

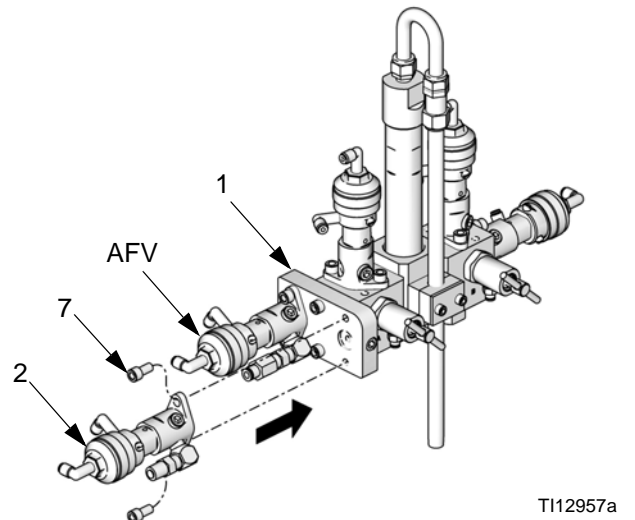


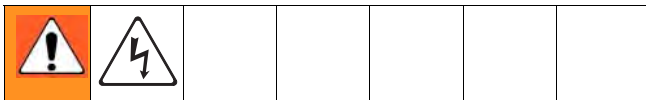
FIG. 6: Install Third Flush Valve

15V822 Dump Valve Kit for RoboMix

NOTE: These instructions show this kit being installed on the B side. It may also be installed on the A side.



1. See FIG. 7. Shut off the fluid supply to the dose valve (V) in the RoboMix.
2. Actuate the dose valve to relieve fluid pressure in the valve.
3. Relieve fluid pressure upstream and downstream of the dose valve. See your ProMix 2KS Operation Manual.
4. Remove the plug from the dose valve adapter. Apply thread sealant and install the elbow (8) in this port.
5. Install the valve adapter (3) in the RoboMix. Secure with four screws (11). Apply thread sealant and install the nipple (9) through the back of the RoboMix and into the adapter. Install the swivel (6) in the opposite side of the adapter.
6. Install the seat (2), o-ring (10), and dump valve (1) in the adapter (3).
7. Connect the hose (5) between the swivel (6) and elbow (8).



8. Shut off all power to the fluid panel. Open the fluid panel. See the **RoboMix Panel** detail in FIG. 2. Install the solenoid (4) at the correct position (Dump Valve A or Dump Valve B) on the solenoid manifold. Connect the solenoid wires to the fluid panel control board as shown in FIG. 3. Also see the **System Electrical Schematic** on page 13.
9. Connect the tubing (13) between the solenoid manifold and the tube fitting (T) on the dump valve (1). See **System Pneumatic Schematic**, page 10.

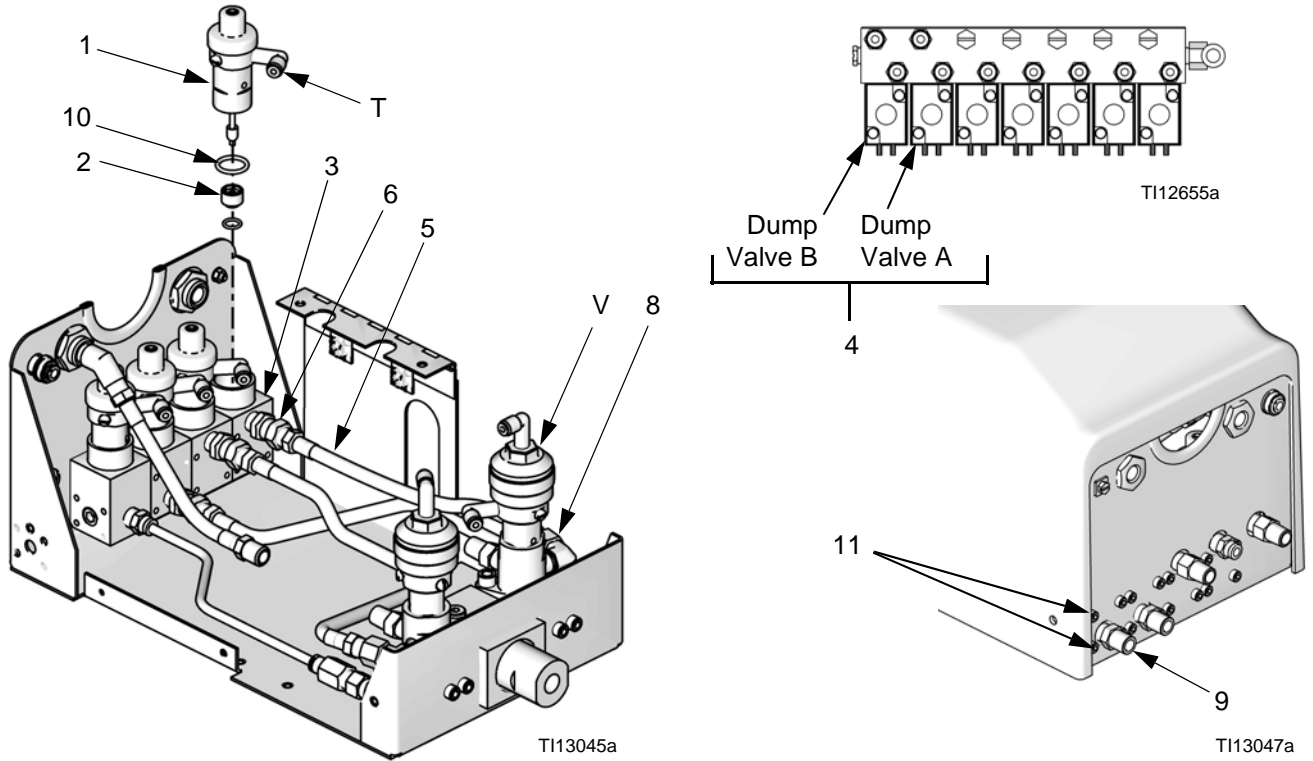


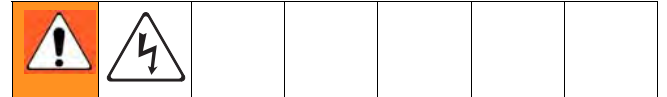
FIG. 7: 15V822 Kit Installation

15V202 Third Flush Valve Kit for RoboMix



1. Shut off the air and fluid supply to the ProMix 2KS.
2. Relieve pressure. See your ProMix 2KS Operation Manual.
3. See FIG. 8. Remove the plug (A) from the air flush valve (AFV). Install an o-ring (6) in this port.
4. Install the third flush valve adapter (3) in the RoboMix. Ensure that the o-ring (6) remains in place to seal between the adapter and the air flush valve adapter.
5. Secure the adapter (3) to the air flush valve adapter with four screws (10) inserted through the side wall of the RoboMix. Torque to 70 in-lb (8 N•m).
6. Apply thread sealant and install the check valve (4) through the back of the RoboMix and into the third flush valve adapter (3).

7. Install the o-ring (2), seat (1), o-ring (6), and third flush valve (5) in the adapter (3).



8. See FIG. 8. Shut off all power to the fluid panel. Open the fluid panel. Install the solenoid (8) in the third flush valve position on the solenoid manifold. Install the tube connector (9). Connect the solenoid wires to the fluid panel control board as shown in FIG. 3. Also see the **System Electrical Schematic** on page 13.
9. Connect the tubing (13) between the solenoid manifold and the tube fitting (T) on the third flush valve (5). See **System Pneumatic Schematic**, page 10.
10. Connect the third flush fluid supply line to the check valve (4).

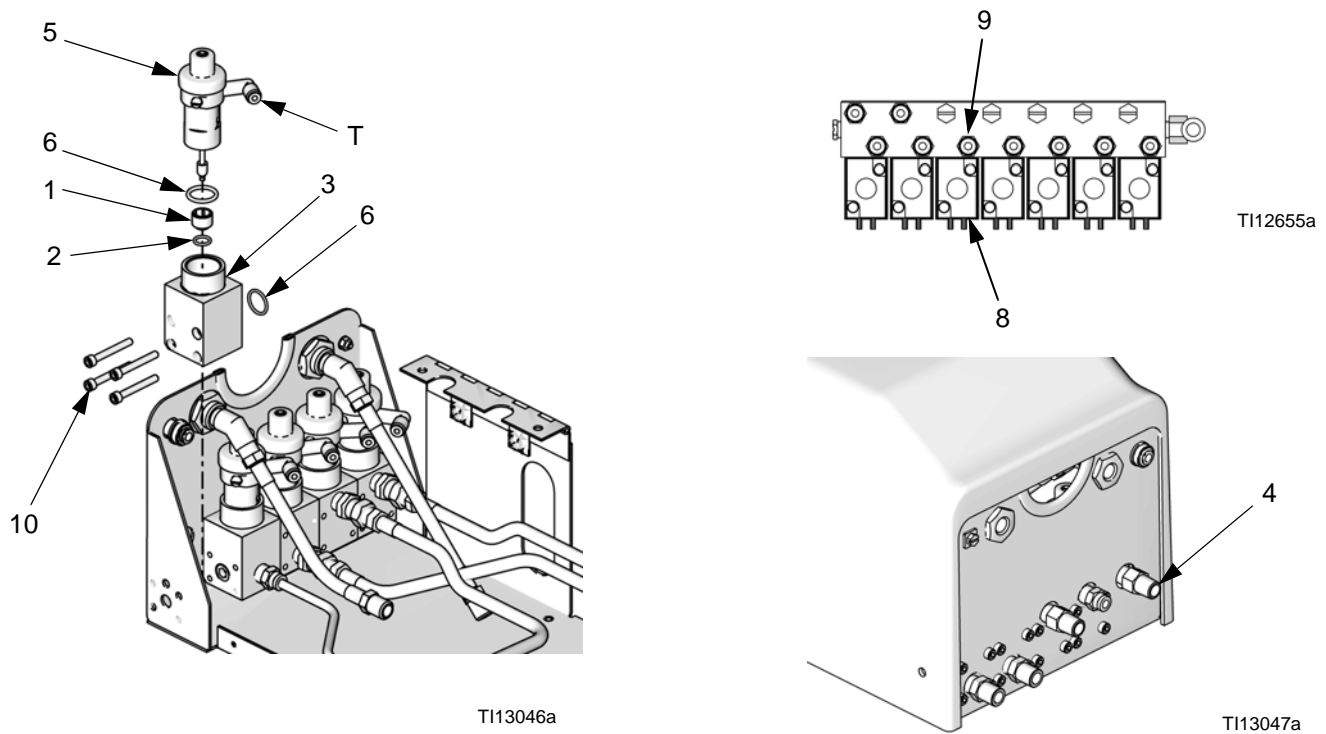


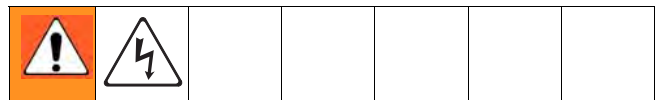
FIG. 8: 15V202 Kit Installation

15X247 Auto Dump Valve Kit



1. Close the component A and component B shutoff valves on the fluid manifold.
 2. Trigger the gun to relieve fluid pressure downstream of the fluid manifold.
 3. See FIG. 9. Install the small o-ring (3), seat retainer (6), large o-ring (7), and dump valve (1) in the valve adapter (2).
 4. Install the valve adapter (2) in the mixed material line, downstream of the static mixer and as close to the gun as possible.
- NOTE:** Connect the static mixer to one 1/4 npt port of the valve adapter.
5. Install the nipple (8) in the other port of the adapter (2). Connect the gun line to this nipple.

6. Connect a 1/4 npsm(f) dump hose (not supplied) to the 1/4 npsm(m) threaded stud at the bottom of the adapter (2). When the gun closes, the dump valve opens and fluid is dumped through the stud.



7. Shut off all power to the fluid panel. Open the fluid panel. See the **Wall Panel** detail in FIG. 9. Install the solenoid (5) at the correct position (GFB1 or GFB2) on the solenoid manifold. Connect the solenoid wires to J8 on the fluid panel control board as shown in FIG. 3. Also see the **System Electrical Schematic** on page 13.
8. Install the tube connector (9) in the solenoid manifold. Connect the tubing (4) between the connector and the tube fitting (T) on the dump valve (1). See **System Pneumatic Schematic**, page 10.

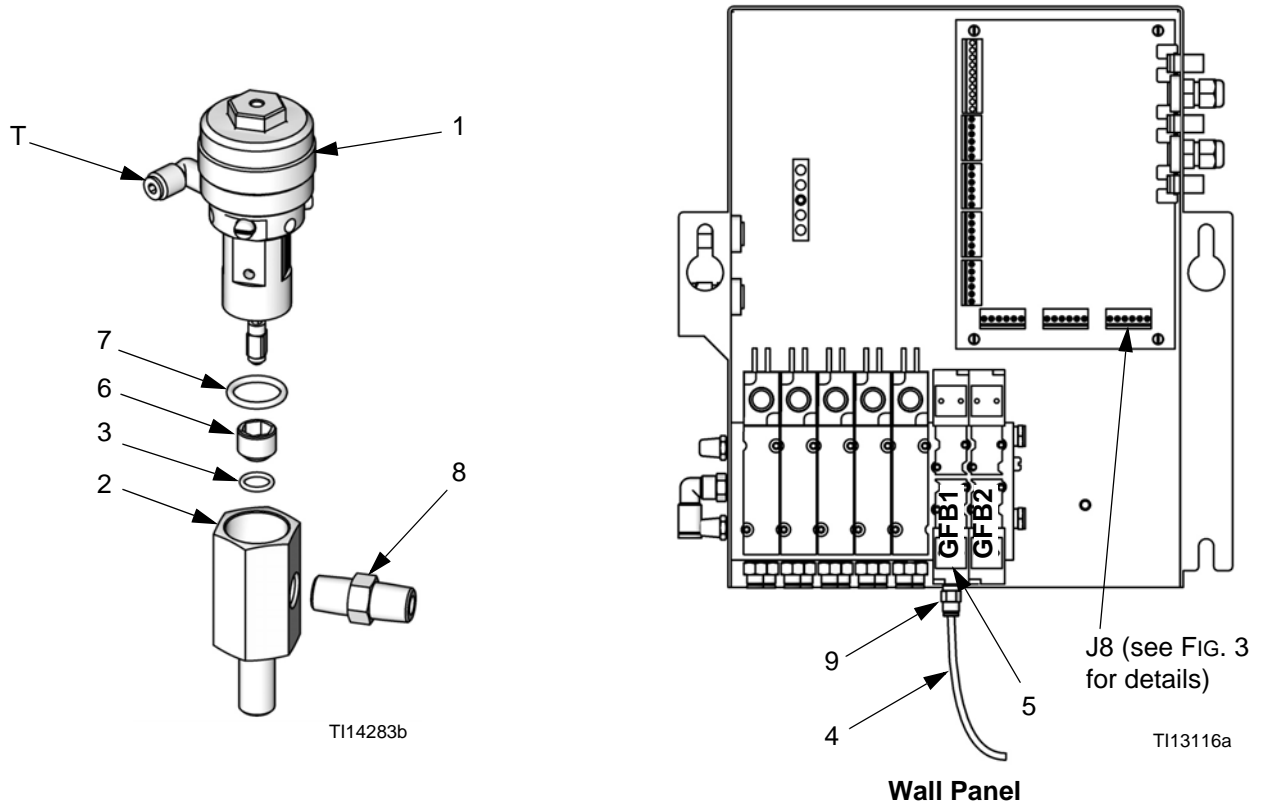
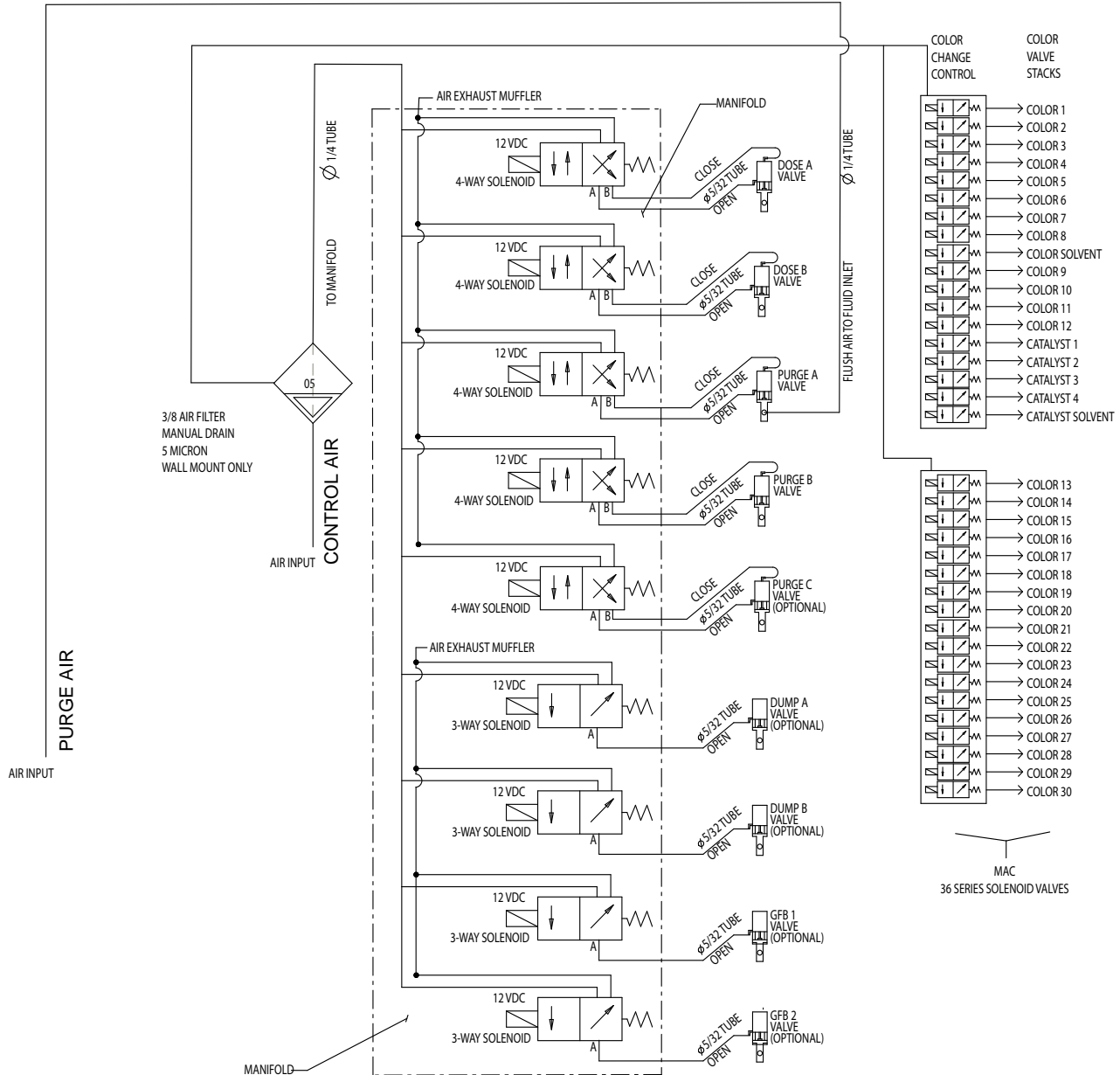


FIG. 9: 15X247 Kit Installation

Schematic Diagrams

System Pneumatic Schematic



Tubing Schematic

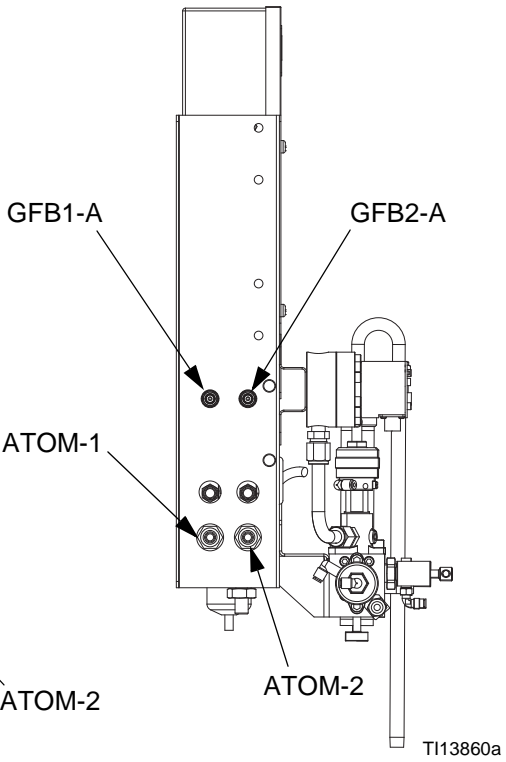
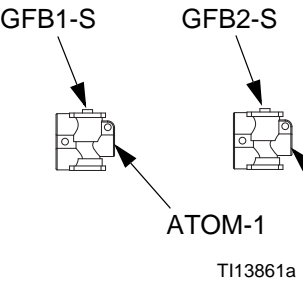
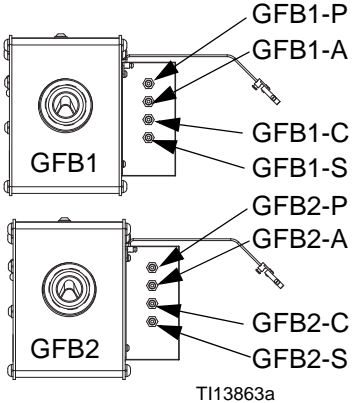
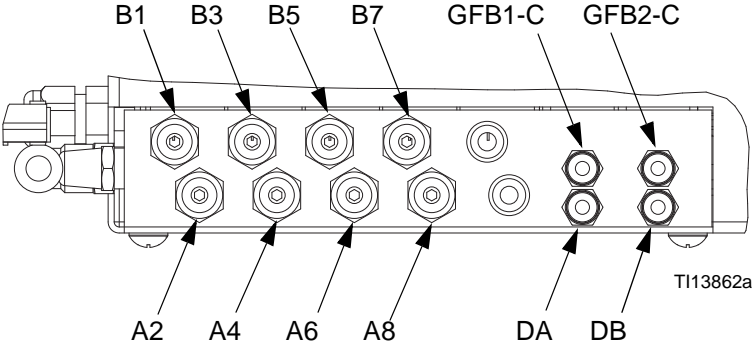
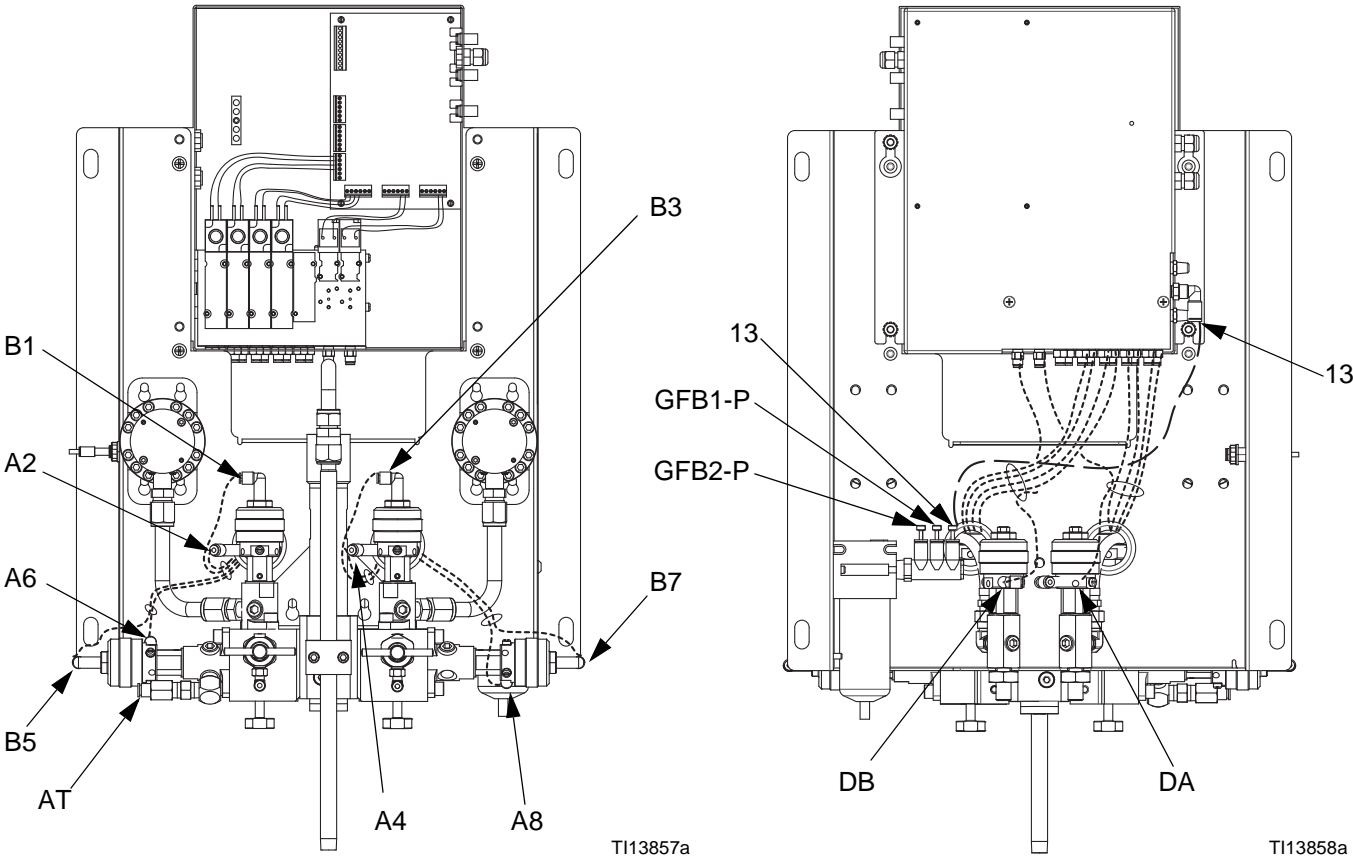
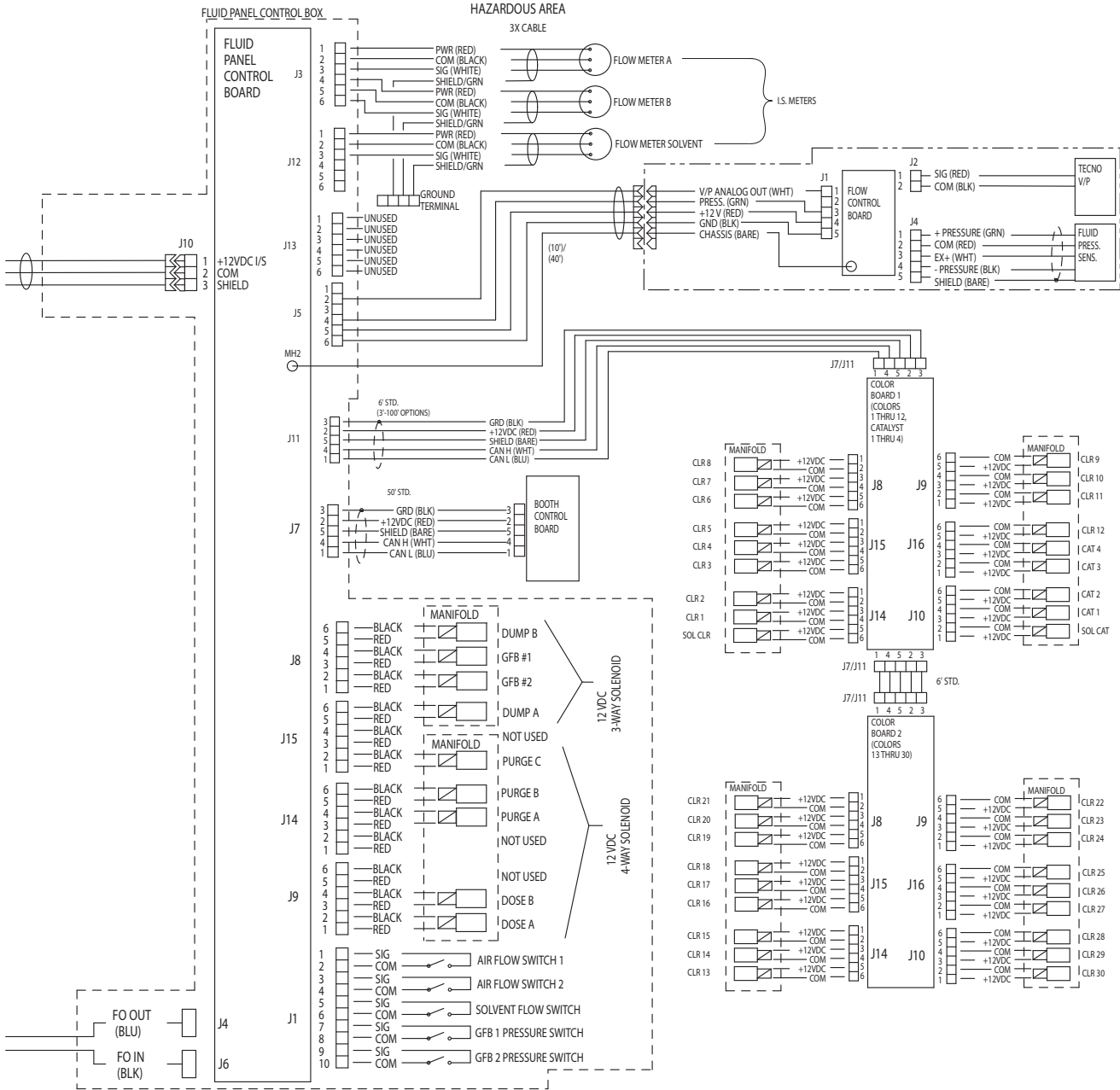


Table 1: Tubing Chart

Color	Description	Starting Point	Ending Point	Tube OD in. (mm)	Tube Ref. No.
Green	Dose A On	A2	A2	5/32 (4)	336
Green	Dose B On	A4	A4	5/32 (4)	336
Green	Purge A On	A6	A6	5/32 (4)	336
Green	Purge B On	A8	A8	5/32 (4)	336
Green	Dump A	DA	DA	5/32 (4)	Included in optional Dump Valve Kit 15V821
Green	Dump B	DB	DB	5/32 (4)	
Red	Dose A Off	B1	B1	5/32 (4)	337
Red	Dose B Off	B3	B3	5/32 (4)	337
Red	Purge A Off	B5	B5	5/32 (4)	337
Red	Purge B Off	B7	B7	5/32 (4)	337
Natural	Solenoid Air Supply	13	13	1/4 (6)	334
Natural	Gun Flush Box 1 Pressure Switch Signal	GFB1-A	GFB1-A	5/32 (4)	Included in optional Gun Flush Box Kit 15V826
Natural	Gun Flush Box 2 Pressure Switch Air	GFB2-A	GFB2-A	5/32 (4)	
Natural	Gun Flush Box 1 Trigger Air	GFB1-C	GFB1-C	5/32 (4)	
Natural	Gun Flush Box 2 Trigger Air	GFB2-C	GFB2-C	5/32 (4)	
Natural	Gun Flush Box 1 Supply Air	GFB1-P	GFB1-P	5/32 (4)	
Natural	Gun Flush Box 2 Supply Air	GFB2-P	GFB2-P	5/32 (4)	
Natural	Gun Flush Box 1 Safety Interlock	GFB1-S	GFB1-S	5/32 (4)	
Natural	Gun Flush Box 2 Safety Interlock	GFB2-S	GFB2-S	5/32 (4)	
Natural	Gun 1 Atomizing Air	ATOM-1	ATOM-1	1/4 (6)	User supplied. Connects air flow switch to gun air shutoff valve.
Natural	Gun 2 Atomizing Air	ATOM-2	ATOM-2	1/4 (6)	
Natural	Purge Air Supply	Use as a separate line connected directly to the main shop air line. Do not connect to the unit's main air supply or to the air manifold (335).	AT	1/4 (6)	338

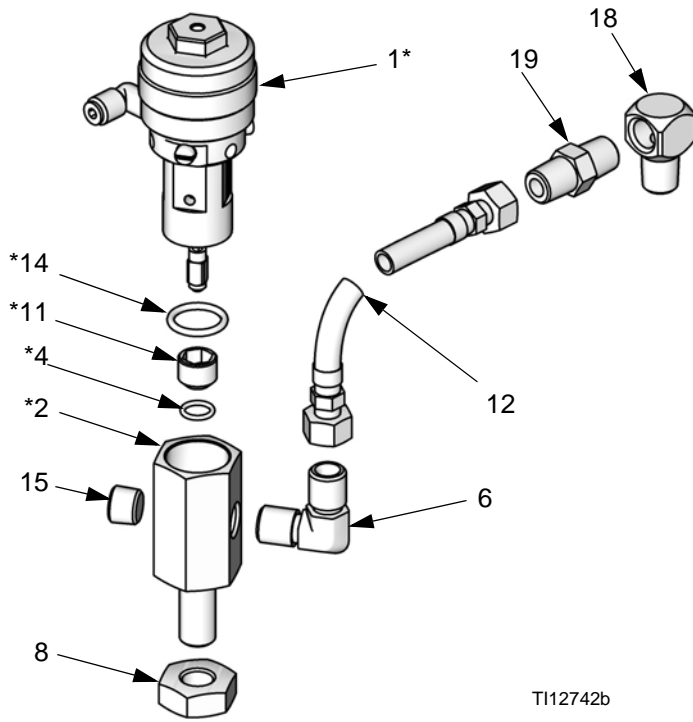
System Electrical Schematic

Hazardous Area

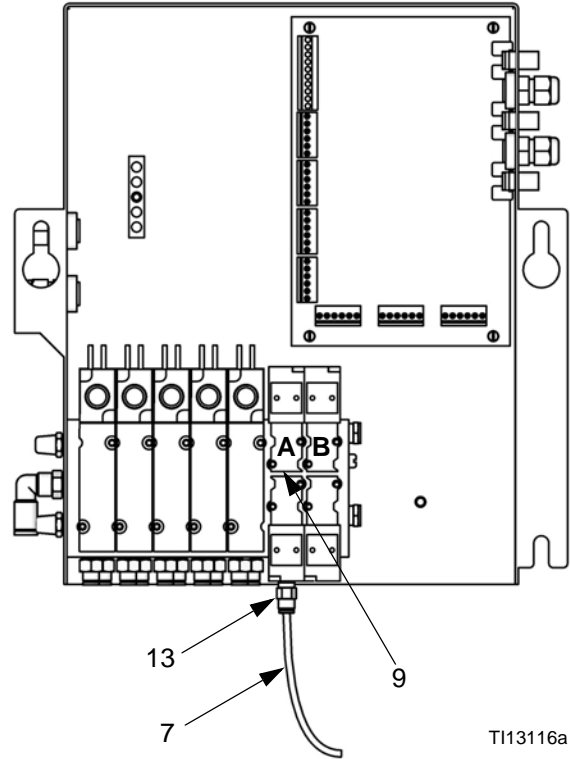


Parts

15V821 Dump Valve Kit for Wall Panel



TI12742b



TI13116a

Ref. No.	Part No.	Description	Qty
1*	24W310	VALVE, dispense; includes 14; see manual 312782	1
2*	17X718	ADAPTER, dump valve	1
4*†	111457	O-RING; ptfе	1
6	114342	ELBOW; 1/4 npt (mbe)	1
7	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 2 ft (0.61 m)	1
8*	n/a	NUT, hex; 9/16-18	1
9	121324	VALVE, solenoid, dump valve	1
11*†	n/a	SEAT, dump valve; sst	1

Ref. No.	Part No.	Description	Qty
12	206966	HOSE; 1-1/2 ft (0.46 m)	1
13	111328	CONNECTOR; 10-32 x 5/32 in. (4 mm) OD tube	1
14*†	n/a	O-RING; ptfе	1
15	101970	PLUG	1
18	166866	ELBOW, street; 1/4 npt (m x f)	1
19	C20482	NIPPLE; 1/4 npt	1

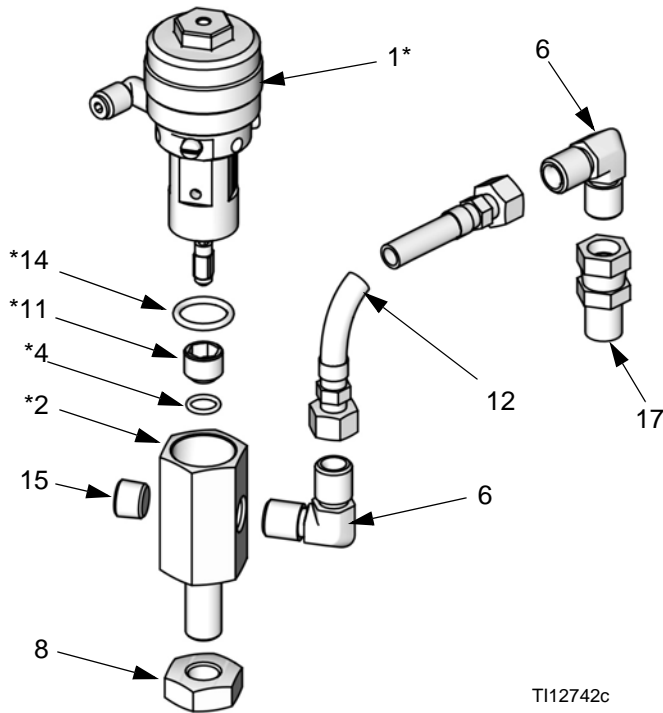
* Parts included in 16A079 Dump Valve Replacement Kit (purchase separately).

† Order Kit 16A560 to replace a single seat. The kit includes a seat (11) and o-rings (4 and 14).

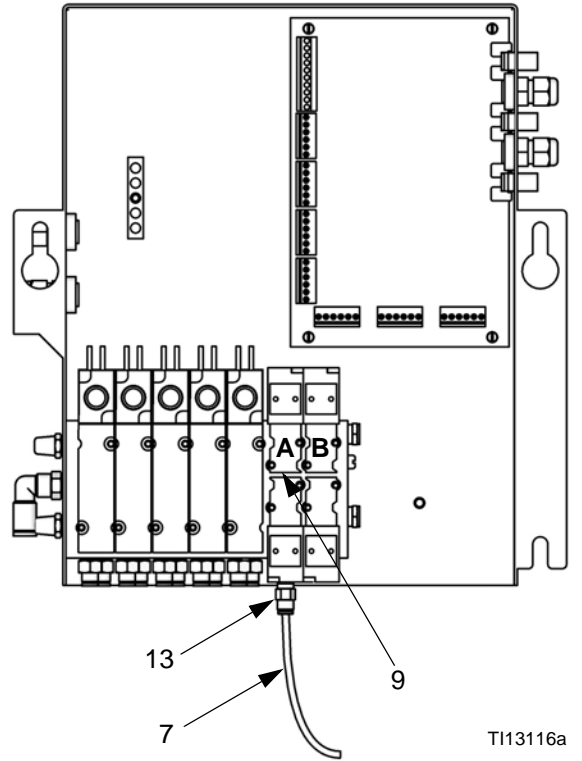
NOTE: The standard valve seat (11) is SST. To install a carbide seat, order Kit 24U054. The kit includes a single carbide seat and o-rings 4 and 14.

Parts labeled n/a are not available separately.

17L060 Dump Valve Kit for Wall Panel



TI12742c



TI13116a

Ref. No.	Part No.	Description	Qty
1*	26A016	VALVE, dispense; includes 14; see manual 312782	1
2*	15T717	ADAPTER, dump valve	1
4*†	111457	O-RING; ptfe	1
6	114342	ELBOW; 1/4 npt (mbe)	2
7	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 2 ft (0.61 m)	2
8*	121569	NUT, hex; 9/16-18	1
9	121324	VALVE, solenoid, .25W	1
11*†	n/a	SEAT, dump valve; PEEK	1

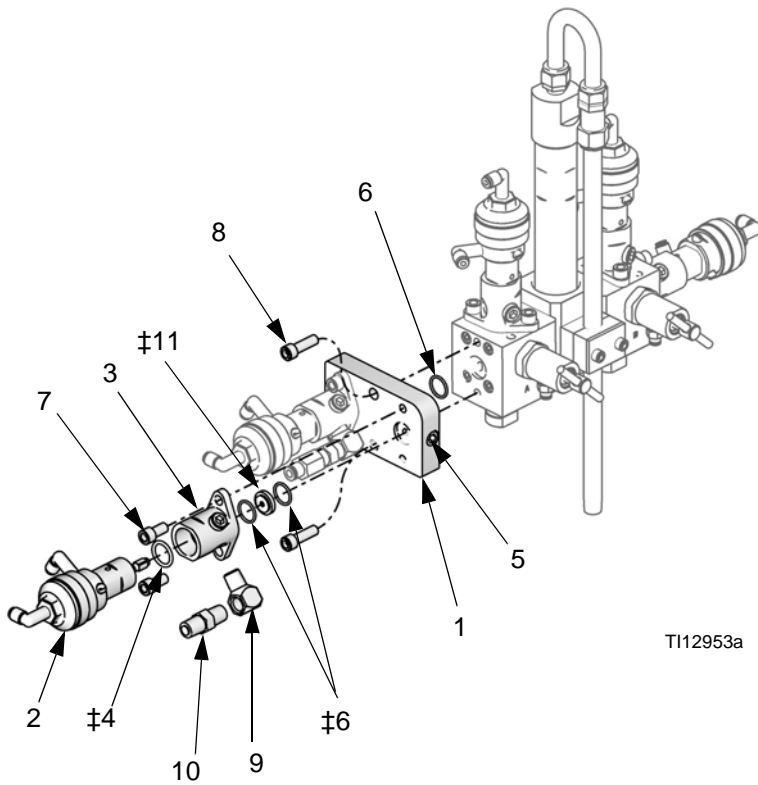
Ref. No.	Part No.	Description	Qty
12	24N345	HOSE; 1-1/2 ft (0.46 m)	1
13	111328	CONNECTOR; 10-32 x 5/32 in. (4 mm) OD tube	1
14*†	n/a	O-RING; ptfe	1
15	101970	PLUG	1
17	17K624	FITTING, SWIVEL; 1/4 npt	1
19	C20482	NIPPLE; 1/4 npt	1

* Parts included in 17P788 Dump Valve Replacement Kit (purchase separately).

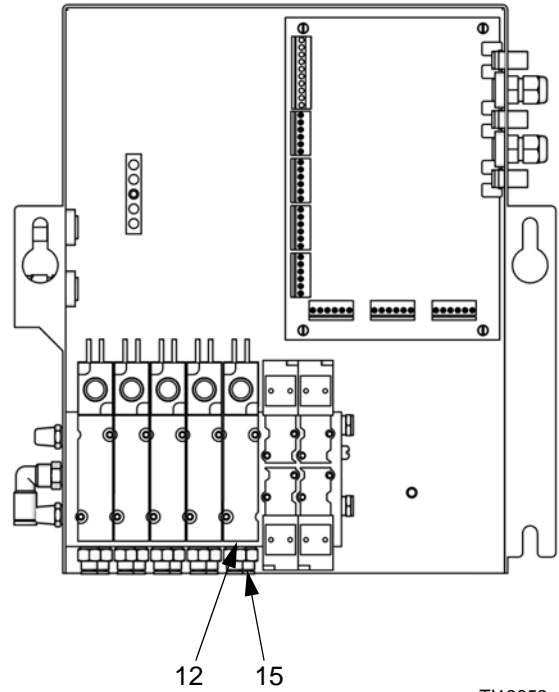
† Order Kit 26A035 to replace a single seat. The kit includes a seat (11) and o-rings (4 and 14).

Parts labeled n/a are not available separately.

15V354 Third Flush Valve Kit for Wall Panel



T112953a



T112652a

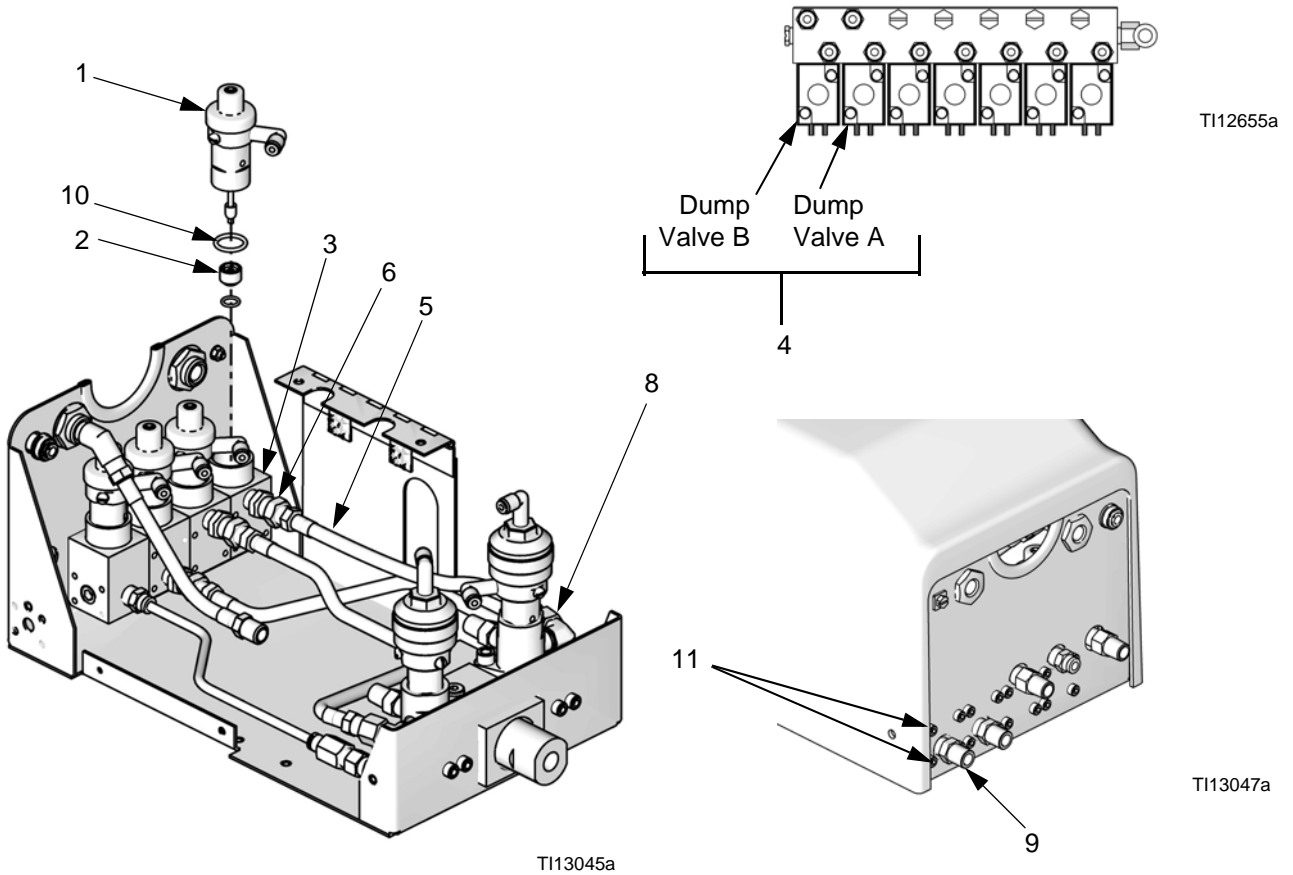
Ref. No.	Part No.	Description	Qty
1	15U673	BLOCK, double valve mount	1
2	15X303	VALVE, dispense; includes item 4; see manual 312782	1
3	15T600	ADAPTER, valve	1
4‡	n/a	O-RING; ptfe	2
5	101970	PLUG, pipe; 1/4 npt	3
6‡	109450	O-RING; ptfe	5
7	n/a	SCREW, cap, socket-hd; 5/16-24 x 3/4 in. (19 mm)	2
8	109031	SCREW, cap, socket-hd; 5/16-24 x 1 in. (25 mm)	2
9	166866	ELBOW, street; 1/4 npt (m x f)	1
10	501867	VALVE, check	1

Ref. No.	Part No.	Description	Qty
11‡	n/a	SEAT, valve	1
12	121374	VALVE, solenoid, 4-way	1
13	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 3 ft (0.9 m); green	1
14	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 3 ft (0.9 m); red	1
15	114263	CONNECTOR; 1/8 npt(m) x 5/32 in. (4 mm) OD tube	2

‡ Parts included in Valve Seat Kit 2 separately. 4A861 (purchase separately).

Parts labeled n/a are not available s

15V822 Dump Valve Kit for RoboMix

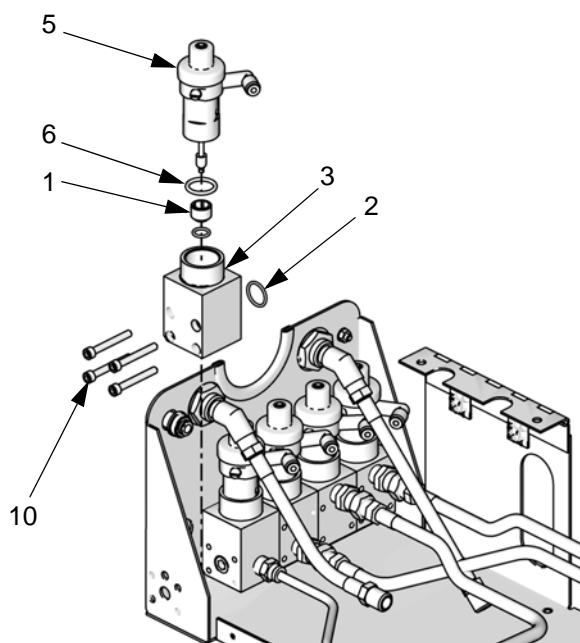


Ref. No.	Part No.	Description	Qty
1	15X304	VALVE, dispense; includes item 10; see manual 312782	1
2	15V888	RETAINER, seat, RoboMix	1
3	15U713	VALVE, adapter; RoboMix	1
4	121795	VALVE, solenoid, 4-way	1
5	15U720	HOSE; 1/4 npt (mbe); 15-1/2 in. (394 mm); ptf	1
6	114339	UNION, swivel; 1/4 npt	1
8	114446	ELBOW; 1/4 npt(m) x 1/4 npsm(f)	1
9	166421	NIPPLE; 1/4 npt	1
10	n/a	O-RING; ptf	1

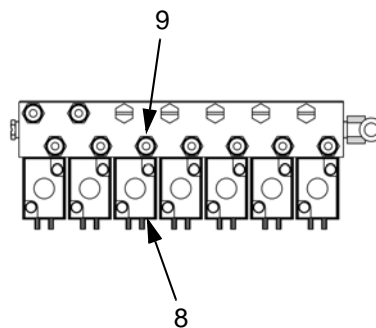
Ref. No.	Part No.	Description	Qty
11	C19979	SCREW, cap, socket-hd; 10-24 x 3/8 in. (10 mm)	4
12	111328	CONNECTOR; 10-32 x 5/32 in. (4 mm) OD tube	1
13	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 3 ft (0.9 m); green	1
14	114342	ELBOW; 1/4 npt (mbe)	1
15	104644	PLUG, screw	1
16	104640	GASKET; buna-N	1

Parts labeled n/a are not available separately.

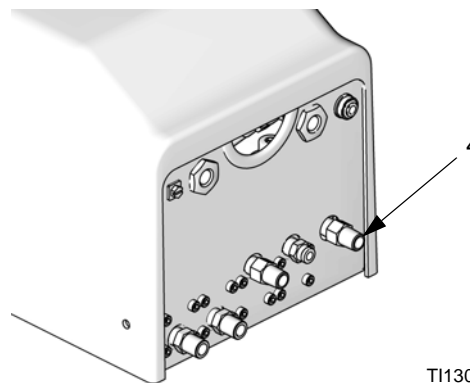
15V202 Third Flush Valve Kit for RoboMix



TI13046a



TI12655a

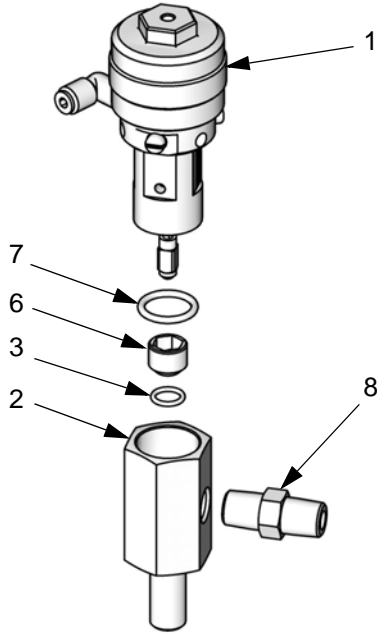


TI13047a

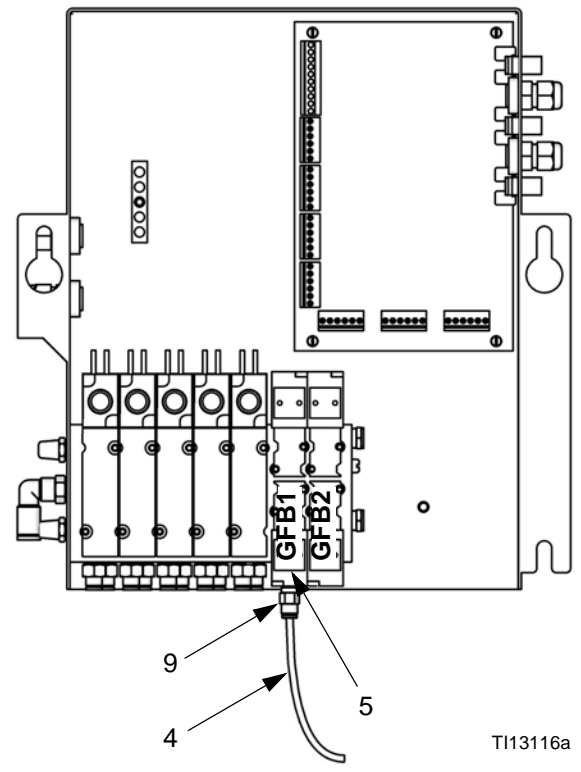
Ref. No.	Part No.	Description	Qty
1	15V888	RETAINER, seat, RoboMix	1
2	109450	O-RING; ptfe	1
3	15U715	VALVE, adapter; RoboMix	1
4	501867	VALVE, check	1
5	15X304	VALVE, dispense; includes item 6; see manual 312782	1
6	n/a	O-RING; ptfe	2
8	121795	VALVE, solenoid, 4-way	1
9	111328	CONNECTOR; 10-32 x 5/32 in. (4 mm) OD tube	1
10	110420	SCREW, cap, socket-hd; 10-24 x 1-1/2 in. (38 mm)	4
13	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 2 ft (0.61 m); green	1

Parts labeled n/a are not available separately.

15X247 Auto Dump Valve Kit



TI14283a



TI13116a

Ref. No.	Part No.	Description	Qty
1	24W310	VALVE, dispense; includes 7 ; see manual 312782	1
2	17X718	ADAPTER, dump valve	1
3†	111457	O-RING; ptfе	1
4	n/a	TUBE; nylon; 5/32 in. (4 mm) OD; 5 ft (1.52 m)	1
5	121324	VALVE, solenoid, dump valve	1
6†	n/a	SEAT, dump valve; sst	1
7†	n/a	O-RING; ptfе	1
8	C20482	NIPPLE; 1/4 npt	1
9	111328	CONNECTOR; 10-32 x 5/32 in. (4 mm) OD tube	1

† Order Kit 16A560 to replace a single seat. The kit includes a seat (6) and o-rings (3 and 7).

NOTE: The standard valve seat (6) is SST. To install a carbide seat, order Kit 24U054. The kit includes a single carbide seat and o-rings 3 and 7.

Parts labeled n/a are not available separately.

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 312786

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS, MN 55440-1441 • USA

Copyright 2008, Graco Inc. All Graco manufacturing locations are registered to ISO 9001.

www.graco.com

Revision J, June 2018