PART NUMBERS (Including, but not inclusive)

AD14PH1ALFS	AD14PP1ALFS	AD14TO1ALFS
AD14PH2ALFS	AD14PP2ALFS	AD14TO2ALFS
AD14PH3ALFS	AD14PP3ALFS	AD14TO3ALFS
AD14PH4ALFS	AD14PP4ALFS	AD14TO4ALFS
AD14PH5ALFS	AD14PP5ALFS	AD14TO5ALFS
		AD14TO6ALFS
		AD14TO7ALFS

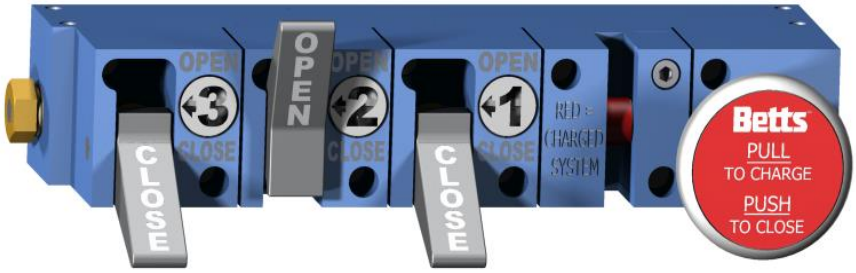


Table of Contents:

1.0 General
2.0 Parts List
3.0 Description and Intended Use
4.0 Installation
5.0 Inspection and Testing
6.0 Disassembly and Rebuild Instructions
7.0 Trouble Shooting Guide

1.0 General

1.1 It is strongly recommended that this entire manual be read prior to any operation, disassembly, or assembly of this equipment.

1.2 Betts Industries, Inc. provides this manual as a guideline for reference only and assumes no responsibility for personal or property damage that may occur in conjunction with this manual. Betts Industries, Inc. cannot be held responsible for incorrect installation, operation or maintenance of product.

1.3 Betts Industries, Inc. recommends all equipment be placed on a regular maintenance schedule that includes the routine replacement of seals and gaskets and visual inspection for leaks and corrosion. The end user must make their own determination and set their own schedule based upon use and environment. In some cases, regulations may dictate the minimum testing frequency of items. Make sure operators are aware of all applicable codes.

1.4 Only trained personnel should attempt to perform maintenance on this equipment.

1.5 As with any maintenance work, proper safety gear and procedures must be used at all times. A list of hazards may include but are not limited to contents under pressure, loaded springs, residual product, flammable liquid and vapors, pinch points.

1.6 Safety alert symbols are used to alert operator to potential personal injury hazards. These symbols are per ANSI Z535.5 and are listed below. Operator MUST obey all instructions that follow a safety symbol.

Alerts will be used to indicate known safety concerns. Additional concerns are possible and should be identified and avoided by the operator.

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, **will result** in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, **could result** in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, **may result** in minor or moderate injury. It may also be used to alert against unsafe practices.

1.7 Product Warranty shall be void if product is subject to misapplication, misuse, neglect, alteration or damage.

1.8 Specific design details described in this document are for reference only and are subject to change without notice. See Betts Industries, Inc. web page for the most recent revision to this document. www.bettsind.com

1.9 For additional questions or more detailed technical assistance, contact the Betts Industries, Inc. Sales or Engineering Department at (814)723-1250.

2.0 Parts List

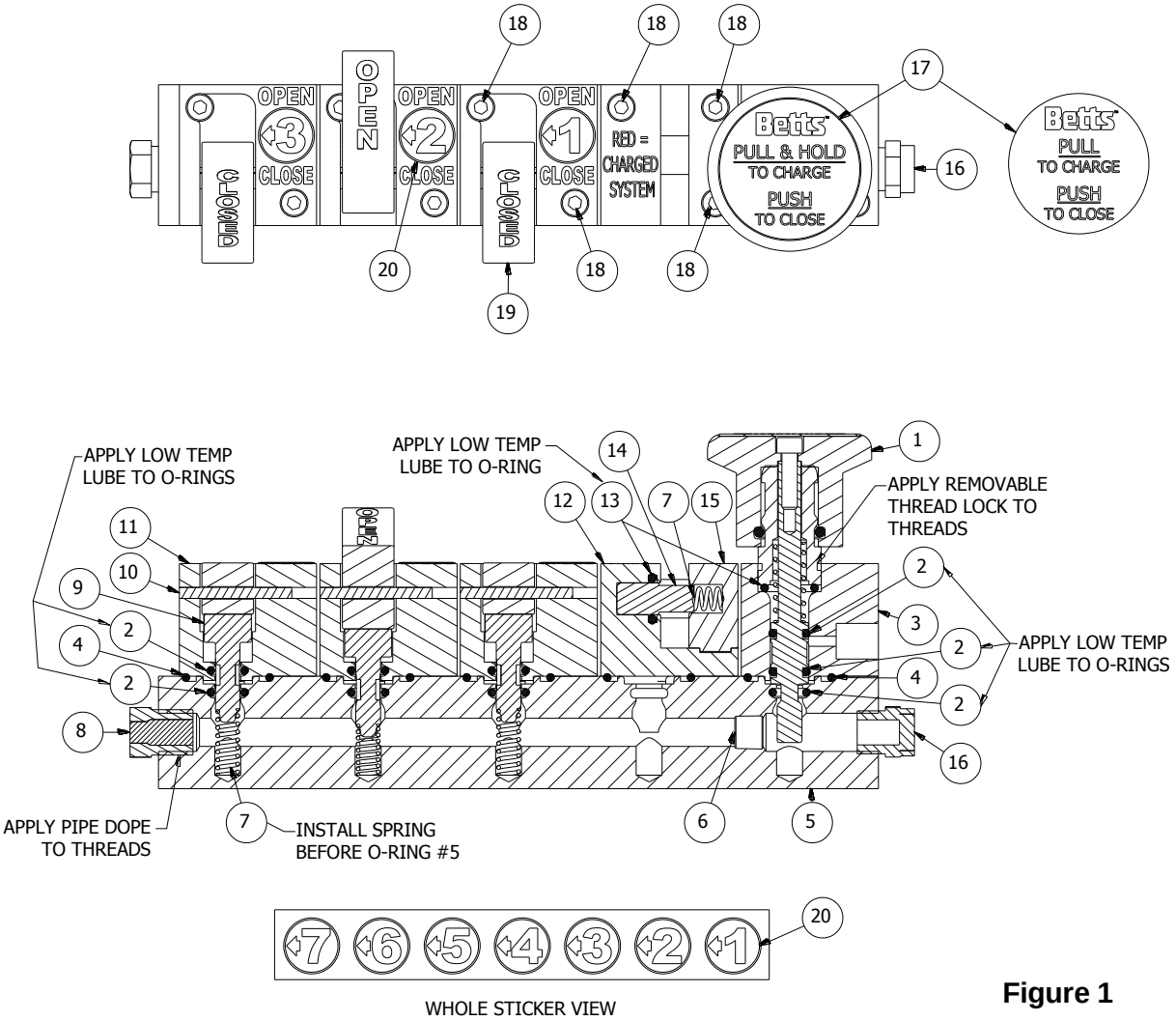


Figure 1

3.0

No.	Description	Req.	Material	Part No.	No.	Description	Req.	Material	Part No.
1	Push-Pull Master Control	1	Alum./Stainless	75838ALSL	11	Toggle Block	*	Aluminum	28698AA
	Pull & Hold Master Control	1	Alum./Stainless	75839ALSL	12	Wink Holder	1	Aluminum	75720AA
2	O-ring	*	Fluorosilicone	75621FS	13	Wink O-ring	2	Fluorosilicone	17781FS
3	Master Control Block	1	Aluminum	28624AA	14	Wink Piston	1	Aluminum	75703AL
4	Manifold O-ring	*	Fluorosilicone	3926FS	15	Wink Spring Holder	1	Aluminum	75721AA
5	Manifold	1	Aluminum	75705AA-XX	16	Exhaust Port	1	Nickel Steel/Bronze	9Z4895
6	Hex Head Plug	1	Brass/Teflon Tape	9V4852	17	Label - Pull & Hold	1	Acrylic	AD75701
7	Toggle/Wink Spring	1	Stainless	75698SL		Label - Push - Pull			AD75702
8	Fusible Plug	1	Brass w/ Solder	FP15003BR	18	Cap Screw 6-32 x 3/4	1	Zinc Plated Steel	9Q5978
9	Toggle Piston		Brass	75697BR	19	Toggle Bat	*	Aluminum	75696AE
10	Drive Pin	*	Stainless Steel	9Q4920	20	Toggle Number Sticker	1	Vinyl	AD75722

4.0 Description and Intended Use

4.1 The Betts Air Commander™ is a reliable universal air distribution system designed to control the operation of air operated bottom discharge valves and vapor recovery systems on cargo tanks. The air distributor can be plumbed to function sequentially or non-sequentially and is versatile enough to satisfy a wide variety of uses.

4.2 Three different styles are available for the Air Commander™ distributor.

4.2.1 Push/Pull Master Control with Toggles – Style AD14PP

- Pulling out the master control knob supplies constant air to the system and toggles. It can be plumbed sequential or non-sequential and includes integral pressure indicator slide that moves to red position when system is charged. Toggles are used to activate desired compartment valves. When loading or unloading is complete, move all toggles to "CLOSE" positions and push master control to shut off air and exhaust entire system.

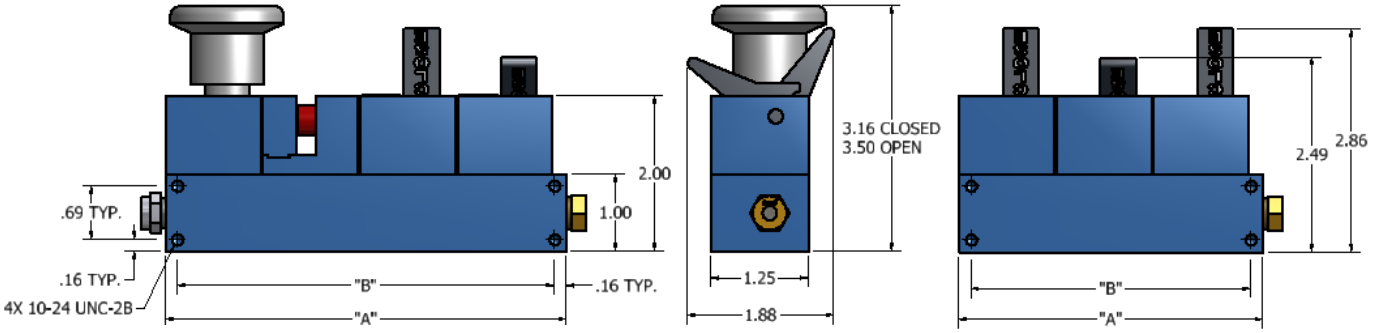
4.2.2 Pull and Hold Master Control with Toggles – Style AD14PH

- The Pull and Hold master control isolates the air supply to allow for more effective emergency shut-down if required by fusible plug or end-of-line remote. This style should only be used on properly maintained systems with minimal airline leakage. To operate, first select which compartment toggle to open, then pull and hold master control knob until system is fully charged. When master control is released it springs to neutral position locking in the system air while blocking the supply air. If additional compartment valves need opened, pull and hold master control knob while selecting desired toggle. Once system is charged, release master control. Shut down same as Push/Pull.

4.2.3 Toggles Only – Style AD14TO

- Toggles used to activate desired compartment valves. When loading or unloading is complete, move all toggles to "CLOSE" position to exhaust lines.

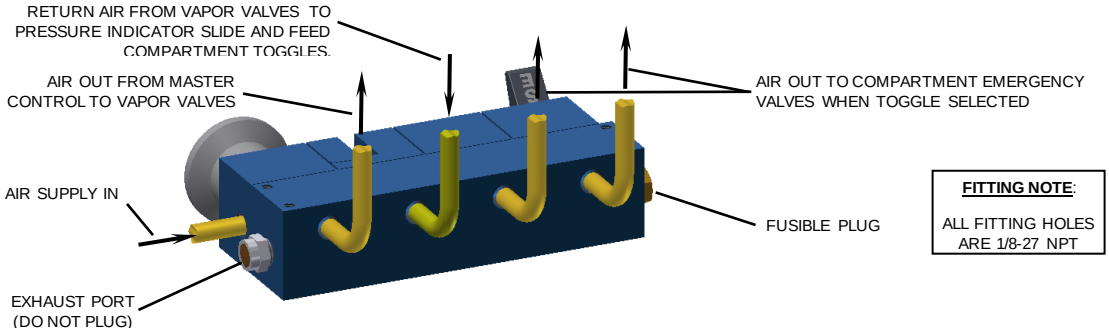
5.0 Installation



PART NUMBERS			
Pull and Hold	Push/Pull	"A"	"B"
AD14PH1ALFS	AD14PP1ALFS	3.91	3.59
AD14PH2ALFS	AD14PP2ALFS	5.16	4.84
AD14PH3ALFS	AD14PP3ALFS	6.41	6.09
AD14PH4ALFS	AD14PP4ALFS	7.66	7.34
AD14PH5ALFS	AD14PP5ALFS	8.91	8.59

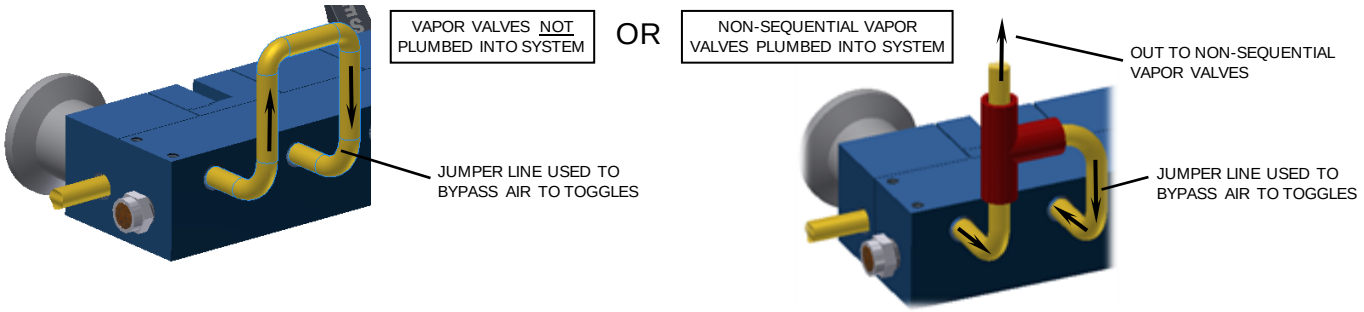
PART NUMBERS		
Toggles Only	"A"	"B"
AD14TO1ALFS	1.41	1.09
AD14TO2ALFS	2.66	2.34
AD14TO3ALFS	3.91	3.59
AD14TO4ALFS	5.16	4.84
AD14TO5ALFS	6.41	6.09
AD14TO6ALFS	7.66	7.34
AD14TO7ALFS	8.91	8.59

Master Control Sequential Plumbing Layout

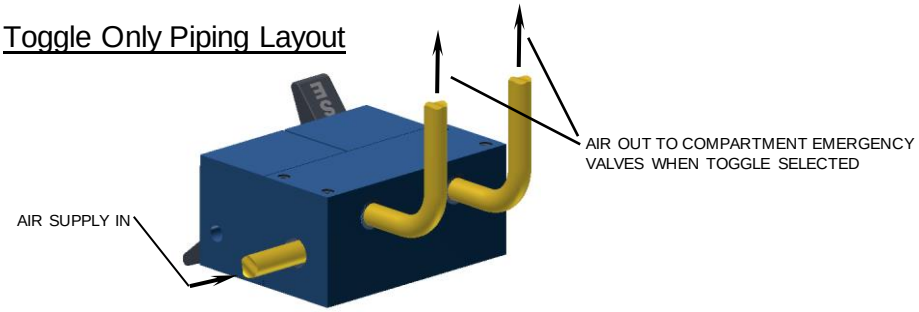


FITTING NOTE:
ALL FITTING HOLES ARE 1/8-27 NPT

Master Control Non-Sequential Plumbing Layout – (SAME AS SEQUENTIAL BUT WITH JUMPER LINE AS SHOWN BELOW)



Toggle Only Piping Layout



6.0 Inspection and Testing

6.1 Hook up air lines accordingly.

6.2 Apply air pressure, 125 psi max, to the system.

6.2.1 Inspect for leaks.

6.2.2 If leaks are present, see Trouble Shooting Guide.

7.0 Disassembly and Rebuild Instructions

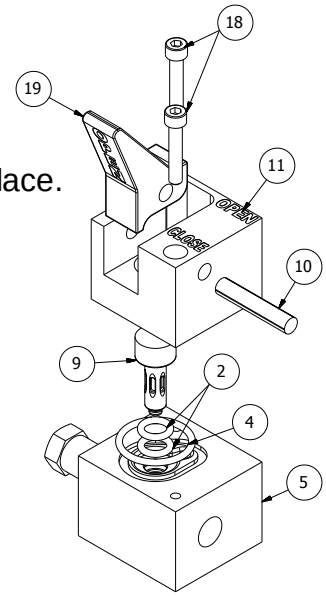
NOTE: No need to remove air distributor from system; it can be rebuilt in place.

7.1 To repair/rebuild toggle:

7.1.1 Disconnect from air supply and relieve all pressure prior to disassembly.

7.1.2 Remove 2 cap screws (18) and drive pin (10) and set aside with toggle bat (19).

- If toggle piston (9) or toggle bat (9) are worn, replace.
- Be sure grooves in toggle piston (9) are clear of debris.



7.1.3 Remove O-ring (2) from toggle block (11) and replace.

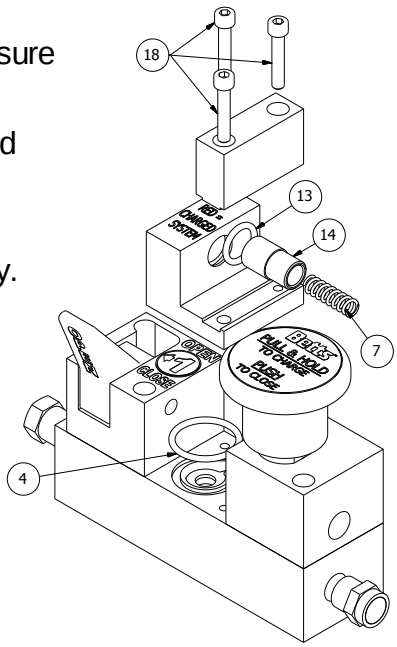
7.1.4 Remove O-ring (2) from manifold (5) and manifold O-ring (4) and replace.

7.1.5 Reassemble toggle piston (9) and toggle bat (19) to toggle block (11) and reassemble drive pin (10).

- Be sure drive pin is inserted as shown in figure 1 and is inserted until flush with opposite side.

7.1.6 Apply low temperature lubricant to toggle piston (9) being sure not to fill grooves with lubricant. Replace cap screws (18) and torque to approximately 10-16 in-lbs.

7.2 **To repair/rebuild wink**:



7.2.1 Disconnect from air supply and relieve all pressure prior to disassembly.

7.2.2 Remove 3 cap screws (18) wink piston (14) and wink spring (7).

7.2.3 Inspect wink piston (14) for damage and be sure red color is still intact, replace if necessary.

7.2.4 Remove wink O-ring (13) and replace.

7.2.5 Remove manifold O-ring (4) and replace.

7.2.6 Apply low temperature lubricant to wink piston (14) in the red area, reassemble and replace cap screws (18) and torque to approximately 10-16 in-lbs.

7.3 **To repair/rebuild master control**:

7.3.1 Disconnect from air supply and relieve all pressure prior to disassembly.

7.3.2 Pull up on master control knob (1) and remove master control assembly (1) by unthreading from master control block (3).

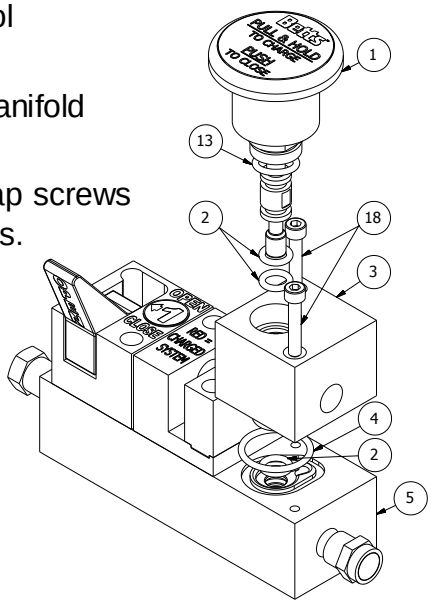
7.3.3 Remove O-rings (2) from master control piston and replace.

7.3.4 Remove cap screws (18) from master control block (3).

7.3.5 Remove O-ring (2) from manifold (5) and manifold O-ring (7) and replace.

7.3.6 Reassemble master control block (3) and cap screws (18) and torque to approximately 10-16 in-lbs.

7.3.7 Replace O-ring (13) (see EB-1-17) and apply low temperature lubricant to master control piston O-rings (2) and removable thread lock to threads of button holder and reassemble master control assembly (1) and torque to approximately 25-30 in-lbs.



SEE TROUBLE SHOOTING GUIDE ON PAGE 9

8.0 Trouble Shooting Guide

Problem	Potential Cause	Potential Solution
Valve drifts closed	Leak in air system	Check fittings and air lines for damage or leaking.
		Check for leaks in toggle. See section 6.1 and replace O-rings (2).
		Check for leaks in wink. See section 6.2 and replace O-rings (2).
		Check for leaks in master control. See section 6.3 and replace O-rings (2).
System will not stay charged	Master control knob is damaged and will not stay at charged position	See section 6.3 and replace master control assembly (1).
Master control knob will not pull up	Master control assembly (1) detent spring has damaged button holder.	See section 6.3 and replace master control assembly (1).
System will not exhaust when toggle is switched to the CLOSED position	Toggle is clogged or not operating correctly.	See section 6.1 and replace O-rings (2).
System will not exhaust when master control knob is in closed position	O-rings (2) on master control assembly (1) and/or manifold (5) are damaged.	See section 6.3 and replace O-rings (2).
Wink does not shift to red when system is charged	Wink O-ring (13) is damaged	See section 6.2 and replace wink O-ring (13)
	Wink spring (14) or wink piston (7) are damaged.	See section 6.2 and replace wink piston (7) and/or wink spring (14).
Air is leaking out of Master Control Knob	O-rings on Master control piston are damaged or missing	See section 6.3 and replace O-rings (2).
Master control knob will not stay down when pushed into the exhaust position	Breather plug is plugged off and not exhausting air	Replace breather plug.