262-97

Tri-Flo® Air-Actuated Valves

Series 262 • Tank & Kettle Valves

Service & Installation Manual

Tri-Clover Inc.

CONTENTS

Thank you for purchasing a Tri-Clover Product!

This manual contains disassembly and assembly instructions, maintenance procedures, troubleshooting, and a complete parts list for all Series 262 Air-Actuated Valves and actuators designed and manufactured by Tri-Clover Inc., Kenosha, Wisconsin.

READ THIS MANUAL carefully to learn how to service these valves. Failure to do so could result in personal injury or equipment damage.

SAFETY

MAINTENANCE

PARTS LIST

SAFETY

IMPORTANT SAFETY INFORMATION

Safety is very important!

DO NOT attempt to modify any Tri-Clover product. To do so could create unsafe conditions and void all warranties. ***DO NOT place any Tri-Clover product in an application where general product service ratings are exceeded.***

The following DANGER, WARNING, AND CAUTION signs and their meanings are used within these instructions.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, ***will*** result in death or serious injury. The word Danger is used in the most extreme cases.

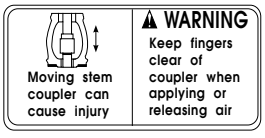
⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, ***may*** result in minor or moderate injury. May also be used to alert against an unsafe operating or maintenance practice.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, ***could*** result in death or serious injury.

The SAFETY LABELS below are placed on every valve. Do not remove any labeling on any Tri-Clover product. Immediately replace any label that is missing.



Part Number 38-297

Part Number 38-264

MAINTENANCE

DISASSEMBLY

⚠ WARNING

To prevent personal injury, keep hands and tools away from valve coupler, bodies, and stems when applying or releasing air. The actuator stem assembly may move with extreme force and suddenness when air pressure is applied or released.

When disassembling and assembling valve, bench area should be clean.

KETTLE (ELBOW) VALVES

Normally Closed: Type 220 Actuator

1. Remove valve from kettle.
2. Apply air to actuator so the valve stem extends away from the actuator and off its seat.
3. Lift sleeve on coupling unit and remove valve stem by pulling it through the body.
4. Remove actuator clamp and separate the actuator from the open yoke.
5. Remove air supply.

Tank (Tee Type) Valves

Normally Closed: Type 220 Actuator

1. Remove the valve from the tank.
2. Apply air to actuator so the valve stem retracts towards the actuator and off its seat.
3. Remove body clamp, lower body, and gasket.
4. Release air supply.
5. Lift sleeve on coupling unit and remove valve stem by pulling it through the bonnet.
6. Remove actuator clamp and separate the actuator from the open yoke .

MAINTENANCE

INSPECTION

STEM & SEATS

Carefully examine the hard rubber valve seats for signs of cracking, tearing, checking or excessive wear. Inspect the valve stem and stem bore in the valve body for signs of galling.

SURFACE FINISH

Inspect the valve stem and its bore in valve body or bonnet for signs of galling. Replace both components if galling exists. Galling will continue to occur if only one part is replaced and the other is damaged.

VALVE BODY

Inspect the valve seats for nicks, scratches and other irregularities. Leakage past the seats may result from these type of irregularities.

GASKETS & O-RINGS

Carefully examine port connection gaskets, body gasket and o-rings for cuts, abrasions or other damage that could cause leakage or ineffective cleaning.

COUPLER

Check the coupler to see that the three balls are in place and move freely when the coupler sleeve is raised. If coupler replacement is required, see the Type 220 Actuator section in this manual.

REASSEMBLY

⚠ WARNING

To prevent personal injury, keep hands and tools away from valve coupler, bodies, and stems when applying or releasing air. The actuator stem assembly may move with extreme force and suddenness when air pressure is applied or released.

When disassembling and assembling the valve, the bench area should be clean to prevent marring and nicking of seats.

KETTLE (ELBOW) VALVES

Normally Closed: Type 220 Actuator

1. Clamp actuator to body with actuator clamp.
2. Install o-ring on the valve stem.
3. Apply air supply to the actuator so the coupler extends away from the actuator.
4. Lift sleeve on coupling unit, insert valve stem into coupling unit and release sleeve.
5. Release air supply.

TANK (TEE TYPE) VALVES

Normally Closed: Type 220 Actuator

1. Clamp actuator to bonnet with actuator clamp.
2. Install o-ring on the valve stem.
3. Lift sleeve on coupling unit, insert valve stem into coupling unit and release sleeve.
4. Apply air supply to the actuator so the coupler and stem retracts towards the actuator.
5. Replace gasket, lower body and body clamp.
6. Release air supply.

MAINTENANCE

TYPE 220 ACTUATOR

INTRODUCTION

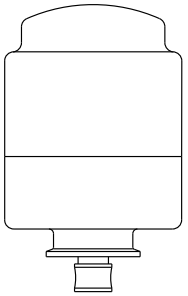
The actuator is an air to open spring to close unit, used when a normally closed valve is required.

INSTALLATION

Connect air supply to the quick coupler fitting or the 1/8-27 FNPT port it is screwed into. Air supply specifications: 35-50 psig. Refer to the table on the following page if additional product holding pressure is required.

⚠ WARNING

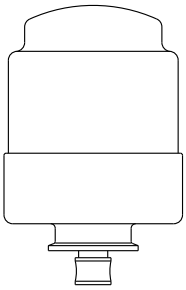
To prevent personal injury, remove actuator from valve before disassembling actuator. Actuator cylinder may eject with sufficient force to cause serious injury.



OLD (No Step)

⚠ WARNING

To prevent personal injury, do not attempt to repair an old style actuator. The old style actuator has a preloaded spring which will eject from the actuator body with sufficient force to cause serious injury to anyone in the immediate area. An old style actuator has no "step" between the cylinder and the bonnet.



NEW (Step)

ACTUATOR DISASSEMBLY

1. Place the two flats on the actuator bonnet in a vise. This will prevent the actuator bonnet from turning when removing the actuator cylinder.
2. Remove actuator cylinder from bonnet by applying a strap wrench to the cylinder and turning in a counterclockwise direction until cylinder and bonnet can be separated.
3. Slide the cylinder off of the piston.
4. Remove the spring from the piston.
5. Remove the actuator stem nut and lockwasher. To prevent the stem from rotating, apply a wench to the stem flat above the coupler.
6. Slide the piston and spring off the actuator stem and remove the bonnet from the vice.
7. Remove the actuator stem from the bonnet.
8. Remove the actuator stem o-ring.
9. Remove the coupler from the actuator stem by applying wrenches to the flats on both parts. Turn the coupler counterclockwise.

ACTUATOR REASSEMBLY

1. If the bushing in the bonnet has been removed, install a new retaining ring and packing. Press a new bushing into the bonnet until it is firmly seated. Be sure the packing is installed with vee opening away from the bushing.
2. Replace the cylinder o-ring seal in the bonnet below the thread.
3. Attach coupler to actuator stem and insert stem in the bushing. Check the clearance between the stem and the bushing. Ream the bushing if necessary until the stem travels freely in the bore.
4. Replace the o-ring on the actuator stem.
5. Install new packings on the piston if required.
6. Be sure upper packing lip is facing toward the top of the piston, and the lower packing must be toward the bottom of the piston.
7. Apply Tri-Clover OCP-V1 lubricant to the packings and felt seal prior to installation on the piston.
8. Install the spring and piston.

IMPORTANT:

Additional air supply must be relieved when product pressure is not present. Failure to do so will result in pressure damage to the seat.

When using additional air loading it should exceed the minimum required by no more than 1 to 5 psig to minimize seat loading.

Valve Size	*Add'l Air Pressure	Add'l Air Pressure Maximum	Maximum Product Holding Pressure
1	1	10	200
1½	1	5	200
2	2	12	150
2½	3	15	100
3	4½	30	100
4	15	0	100

Air pressure measured in psig.

* Additional air pressure required to hold against 10 psig product pressure

Type 220 (Kettle)

- Place the spring into the body with the small retainer diameter up.
- Place the piston over the spring with the counter bore down.
- Install the lockwasher and nut and tighten to 20 ft-lb.

Type 220 (Tank)

- Place the piston into the bonnet with the counter bore down.
- Install the lockwasher and nut and tighten to 20 ft-lb.
- Place the spring into the piston counter bore with its small retainer diameter facing up.

9. Lubricate inside wall of cylinder with OCP-V1 lubricant and slide the cylinder over the piston. Use shim stock or a thin flat tool to compress the upper packing on the piston to get it started in the cylinder.
10. Lubricate the cylinder threads with Tri-Clover C137 lubricant. This will prevent stainless steel threads from galling.
11. Thread the cylinder into bonnet and tighten it until it bottoms. It will be necessary to use a strap wrench fro the last few turns as the spring is being compressed approximately 1/8 inch.

TO CONVERT A TYPE 220 ACTUATOR TO A TYPE 210 ACTUATOR

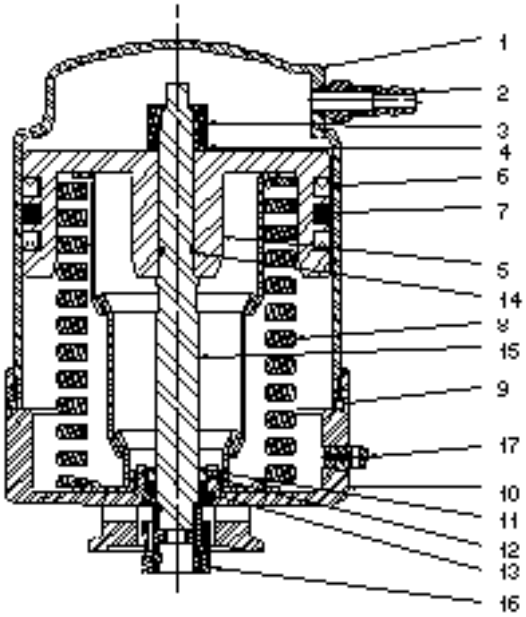
1. Remove the cylinder, actuator stem, nut and lockwasher, piston and spring as outlined in the *Disassembly* instructions.
2. Reassembly as outlined in Steps 8 through 11 in the *Actuator Reassembly* section. Type 220 Kettle and Tank actuators are opposite . For example, if a Type 210 (N.O.) Kettle Valve Actuator is required then assemble it as a Type 220 Tank Valve Actuator.

PARTS LIST: TYPE 220 ACTUATOR

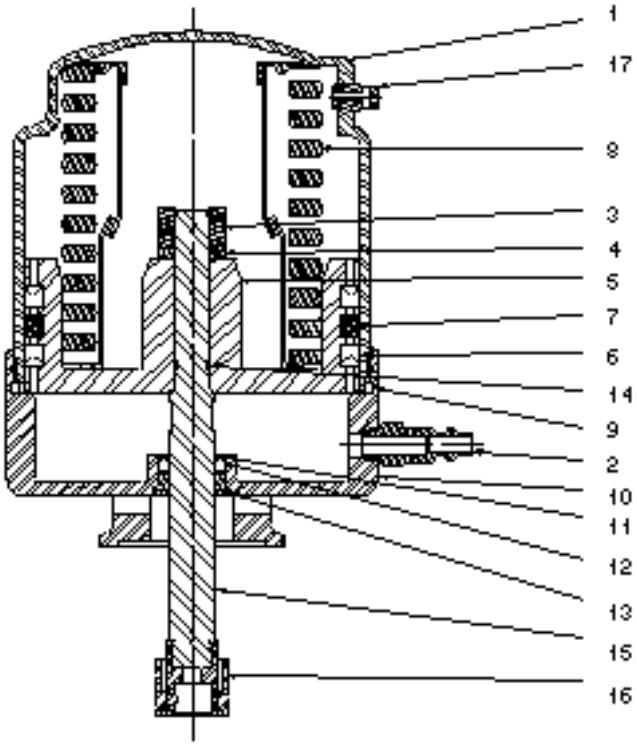
	Key #	Description	Part Number	No. Req'd
	1	Cylinder	25-161-210-1-01-S	1
	2	Air coupler adapter	25-361-210-06-S	1
	3	Nut	NU1700H-SS	1
*	4	Lockwasher	LWA1700-SS	1
	5	Piston	25-361-210-02	1
*	6	Vee block packing	17-97	2
*	7	Felt seal	17-101	1
	8	Spring Assembly	25-361-210-1-07-S	1
*	9	O-ring	10CPLO-3-73-1A-U	1
	10	Bonnet	25-262-210-03-S	1
*	11	Retaining ring	16-70	1
*	12	Vee block packing	17-98	1
*	13	Bushing	25-262-210-08	1
	14	O-ring	17-35-U	1
	15	Stem	25-262-210-09A-01-S	1
*	16	Coupler	37-95A-SS	1
	17	Vented Plug	MS-105-58A-CP	1

It is recommended that one spare part be stocked for each item marked, with the exception of item 4, in which case two spare should be stocked.

220 KETTLE ACTUATOR



220 TANK ACTUATOR



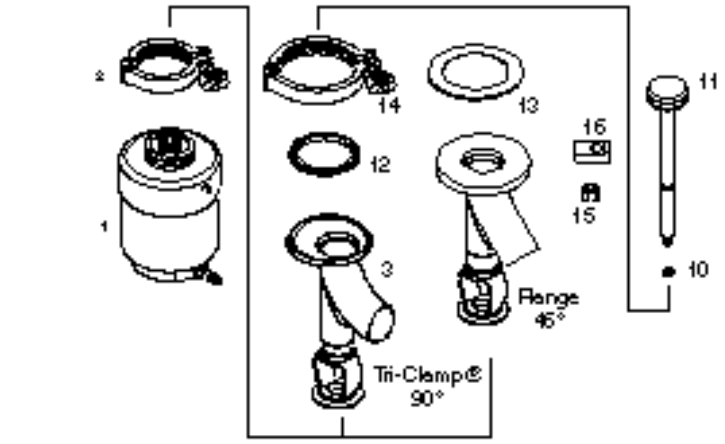
KETTLE (ELBOW VALVES)

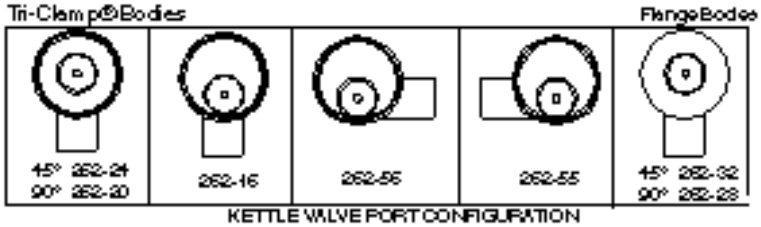
All orders for repair parts must contain the following data:

1. Complete model number (located on the actuator nameplate), including size.
2. Valve serial number (located on the nameplate).
3. Description and part number from the parts list.

The following exploded view and accompanying parts list facilitate ordering repair parts from the factory. All parts illustrated are indexed to the parts list by key numbers.

Model	Ferrule	Size	Valve Unit
262-21 Size	32-82-3	2, 2½	262-20 Size
	32-82-4	3, 4	
262-22 Size	32-154	2, 2½	262-16 Size
	32-595	3, 4	
262-29 Size	32-121	2, 2½,3	262-28 Size
	32-180	4	
262-31 Size	32-84-3	2, 2½	262-20 Size
	32-84-4	3, 4	
262-33 Size	32-121	2, 2½,3	262-32 Size
	32-180	4	
262-35 Size	32-84-3	2, 2½	262-24 Size
	32-84-4	3, 4	
262-57 Size	32-154	2, 2½	262-55 Size
	32-595	3, 4	
262-58 Size	32-154	2, 2½	262-56 Size
	32-595	3, 4	





KETTLE VALVE PORT CONFIGURATION
Bottom View - Looking into valve body through mounting end.

Click here to Order Parts

PARTS LIST

Kettle (Elbow) Valves

	1	Actuator	25-262-210-S	25-262-210-S	25-262-210-s	25-405-210-S	1
	2	Actuator Clamp	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	1
*	3	Valve Body, Model 262-16	7-835A-2-316	7-835A-2½-316	7-835E-3-316	7-835A-4-316	1
*	4	Valve Body, Model 262-20A	7-830A-2-316	7-830A-2½-316	7-830E-3-316	7-830B-4-316	1
*	5	Valve Body, Model 262-24A	7-825A-2-316	7-825A-2½-316	7-825E-3-316	7-825D-4-316	1
*	6	Valve Body, Model 262-28A	7-831A-2-316	7-831A-2½-316	7-831A-3-316	7-831B-4-316	1
*	7	Valve Body, Model 262-32	7-826C-2-316	7-826C-2½-316	7-826C-3-316	7-826D-4-316	1
*	8	Valve Body, Model 262-55A	7-833A-2-316	7-833A-2½-316	7-833C-3-316	7-833B-4-316	1
*	9	Valve Body, Model 262-56A	7-834A-2-316	7-834A-2½-316	7-834C-3-316	7-834B-4-316	1
•	10	O-ring, Valve body stem	17-1-U	17-5-U	17-5-U	17-17-U	1
•	11	Valve plug assembly	19-1068B-2-316	19-1068B-2½-316	19-1068B-3-316	19-1222-4-316	1
*	11A	Coupler Nut				Nu2000J-SS	1
•	12	Gasket-all Models except 262-28 & 32	17-62-3-U	17-62-3-U	17-62-4½-U	17-62-4½-U	1
•	13	Gasket-Models 262-28 &32	17-64-U	17-64-U	17-64-U	17-90-U	1
	14	Body clamp, Models 262-16, 20, 24, 55 & 56	H13MHHM-3-S	H13MHHM-3-S	H13MHHM-4-S	H13MHHM-4-S	1
	15	Nut-Models 262-28 & 32	13-38-S	13-38-S	13-38-S	13-38-S	4
	16	Clamp-Models 262-28 & 32	16-41-S	16-41-S	16-41-S	16-41-S	4

* Note: Specify the type of port connections required.

* Note: It is recommended that one each of these items be stocked as parts.

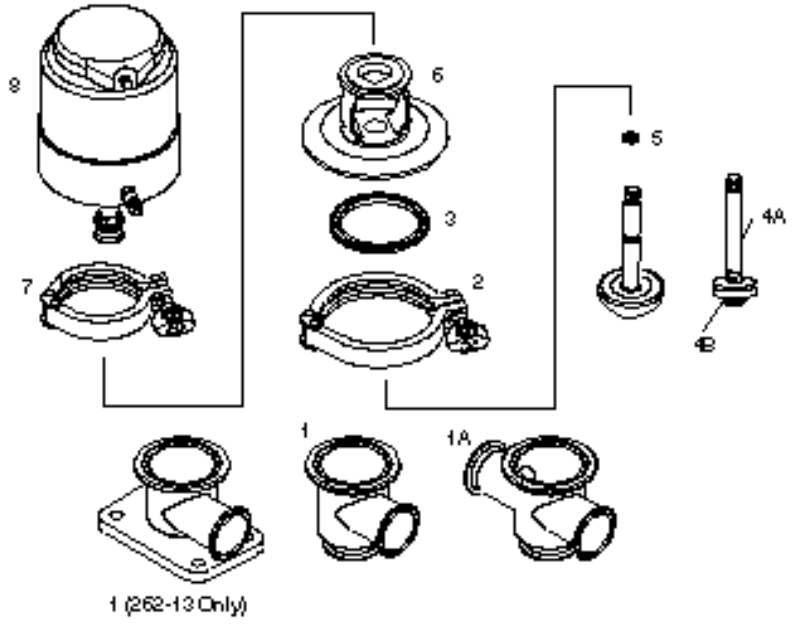
\+ Note: For 4" valve models with extra heavy stem option, refer to parts list shown below.

TANK (TEE TYPE) VALVES

All orders fro repair parts must contain the following data.

1. Complete model number (located on actuator nameplate), including size.
2. Valve serial number (located on actuator nameplate), including size.
3. Description and part number from the parts list.

The following exploded view and accompanying parts list facilitate ordering repair parts from the factor. All parts illustrated are indexed tot he parts list by key numbers.



Kettle (Elbow) Valves

	Key #	Description	1½"	2"	2½"	3"
*	1	Valve Body, Model 262-47	7--676R-1½-316	7--676R-2-316	7--676R-2½-316	7--676R-3-316
*	1	Valve Body, Model 262-48	7--676L-1½-316	7--676L-2-316	7--676L-2½-316	7--676L-3-316
*	1	Valve Body, Model 262-49	7-947-1½-316	7-947-2-316	7-947-2½-316	7-947-3-316
*	1	Valve Body, Model 262-50	7-948-1½-316	7-948-2-316	7-948-2½-316	7-948-3-316
+	1	Valve Body, Model 262-13	7--575T-1½-316	7--575T-2-316	7--575T-2½-316	7--575T-3-316
*	1	Valve Body, Model 262-123	7--531T-1½-316	7--531T-2-316	7--531T-2½-316	7--531T-3-316
*	1A	Valve Body, Model 262-51	7--676C-1½-316	7--676C-2-316	7--676C-2½-316	7--676C-3-316
*	1A	Valve Body, Model 262-52	7-969-1½-316	7-969-2-316	7-969-2½-316	7-969-3-316
	2	Body clamp	13MHHM-3-S	13MHHVM-3-S	13MHHVM-4-S	13MHHM-5-S
*	3	Body gasket	17-62-2-316	17-62-2½-316	17-62-3½-316	17-62-4-316
*	4	Valve plug assembly, Model 262-47 & 52	19-1024-1½-316	19-1024-2-316	19-1024-2½-316	19-1024-3-316
*	4	Valve plug assembly, Models 262-13 & 123	19-571-1½-316	19-571-2-316	19-571-2½-316	19-571-3-316
	4A	"TR" Seat Assembly	19TR1301-1½-316L	19TR1301-2-316L	19TR1301-2½-316L	19TR1301-3-316L
	4B	"TR" Snap-On Seat	20-514C-1½	20-514C-2	20-514C-2½	20-514C-3
*	5	O-ring, valve plug stem	17-1	17-1	17-5	17-5
	6	Valve bonnet	12-146-1½-316	12-146-2-316	12-146-2½-316	12-146-3-316
	7	Actuator clamp	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S
	8	Actuator - Type 220 Normally closed, Air to open	25-361-220-S	25-361-220-S	25-361-220-S	25-361-220-S

* Note: Specify the type of port connections required.

* Note: It is recommended that one each of these items be stocked as parts.

\+ Note: 2: has two holes, 2½" and 3" have four holes.

Tri-Clover

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AUTOMATED FLOW CONTROL SYSTEMS

Terms, Warranty Provisions, Notice of Claims and Limitation of Liability

Prices and all terms and conditions of sale are established in current price sheets and are subject to change without notice. All orders are subject to acceptance by Tri-Clover Inc. at its Kenosha, Wisconsin or Distribution Center* offices only. No assignment of the purchaser's rights may be made without consent of Tri-Clover Inc.

Each Tri-Clover item is warranted to be free from manufacturing defects for a period of one (1) year from the date of shipment, providing it has been used as recommended and in accordance with recognized piping practice, and providing it has not been worn out due to severe service, such as encountered under extremely corrosive or abrasive conditions.

This warranty is expressly in lieu of any other warranties, express or implied, including but not limited to, any implied warranty of merchantability or fitness for a particular purpose.

All claims must be in writing and must be mailed or delivered by purchaser within thirty (30) days after purchaser learns of the facts upon which such claim is based. Any claim not made in writing and within the time period specified above shall be deemed waived.

Purchaser's sole and exclusive remedy and Tri-Clover Inc.'s maximum liability for claims arising hereunder or for negligence for any and all losses and damages resulting from any cause shall be either the repair or replacement of defective items or, at Tri-Clover Inc.'s option, the refund of the purchase price for such items. In no event, including in the case of a claim for negligence, shall Tri-Clover be liable for incidental or consequential damages including loss of profits.

No person, including any representative, employee or agent of Tri-Clover, is authorized to assume on behalf of Tri-Clover Inc., any liability or responsibility in addition to or different from that described in this provision. Any and all representations, promises, warranties or statements that are in addition to or different from the terms of this provision are of no force or effect.

**Distribution Centers in Union City, California and Memphis, Tennessee*

Tri-Clover Inc.

Food & Dairy Division
9201 Wilmot Road
Kenosha, Wisconsin 53141-1413
PHONE: 1-800-242-4000
FAX: 414-694-7104

Distribution Centers
Memphis, TN
PHONE: 1-800-238-0142
Union City, CA
PHONE: 1-800-852-3178

Bio-Pharm Division
PHONE: 1-800-511-5444
FAX: 414-694-2454

Tri-Clover Canada
101 Milner Avenue
Scarborough, Ontario M1S4S6
PHONE: 416-297-3400
FAX: 416-299-5095

Export Division
PHONE: +1-414-697-3170
FAX: +1-414-694-8188

Tri-Clover Mexico
Recursos Petroleros No. 7
Fracc. Ind. La Loma
54060 Tlalnepantla, Edo. de Mexico
PHONE: 52-5-397-0601
FAX: 52-5-362-3246

Alfa Laval

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