

NH3 KIT

ASSEMBLY GUIDE



MIINST

NH3 KIT GUIDE

The DyTerra NH3 Kit Assembly Guide covers all of our available NH3 kits.
Please locate your item in the table of contents and disregard any
items that do not apply to the kit you have purchased.

If you need assistance, or have any questions that are not
answered in this guide, please give us a call.

The DyTerra NH3 Kit Assembly Guide is also available online at www.dyterra.com/kits

DISCLAIMER

We've done our best to ensure the accuracy of this guide. It is intended to assist you in installing various manufacturer's components. In no event will DyTerra be liable to any party for any direct, indirect, special or other consequential damages related to the use of this Assembly Guide.

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TABLE OF CONTENTS

SETTING UP AN NH3 KIT	2
CONTINENTAL SUPERFLOW	4
CONTINENTAL COOLER BREAKDOWN	5
RAVEN COOLER	6
CONTINENTAL METER SETUP	7
MVD MANIFOLD - NO SECTION CONTROL	8
MVD MANIFOLD - SECTION CONTROL	9
JOHN BLUE MANIFOLD - NO SECTION CONTROL	10
JOHN BLUE MANIFOLD - SECTION CONTROL.....	11
JOHN BLUE SPLITTER	12
CHECK VALVE - SECTION CONTROL ONLY	13
HIGH FLOW BREAKAWAY KIT.....	14
HOSE LENGTHS	15
RAVEN 440 CONSOLE	16
RAVEN TROUBLESHOOTING.....	18
DICKEY-JOHN TROUBLESHOOTING	20
DICKEY-JOHN COMMON REPLACEMENT PARTS.....	21
RAVEN VALVES AND ACTUATORS	23



SETTING UP AN NH3 KIT

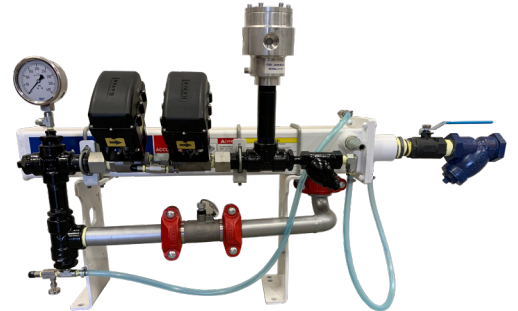
STEP 1 SUPERCOOLER

Assemble the cooler according to the manufacturer's instructions. Once the cooler is assembled, measure where it will best fit on your applicator and bolt it down. Run the supplied wiring harnesses to the tractor. Keep in mind where the applicator folds up.



STEP 2 SPLITTER

Thread the 1 1/4" x 6" pipe nipple into the 1 1/4" tee coming off of the cooler. The splitter should be level and facing upright. If you want to mount the splitter remotely, use the John Blue Splitter Stand.



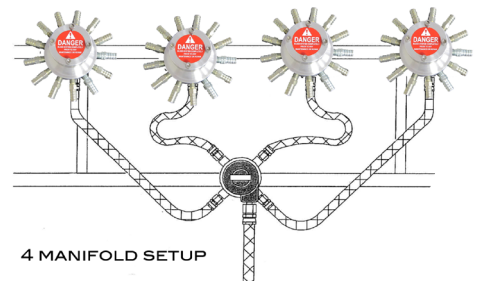
STEP 3 MANIFOLDS

Thread the manifolds onto the manifold stands using the 1" nipple and a 1" tee. Then thread in the hosebarbs. Once the manifolds are assembled they can be attached to your applicator. Mount the pressure gauges so you can see them from the tractor cab (if possible). When running lines, keep in mind how many folds your applicator has, and where it folds up.



STEP 4 HOSE FROM SPLITTER TO MANIFOLDS

Cut a piece of hose to fit between the splitter and the furthest manifold. According to the manifold assembly instructions, all other hoses should be cut the same length as your longest hose. Failing to do so will distribute NH3 unevenly to each manifold, which will result in streaking.



FAQ

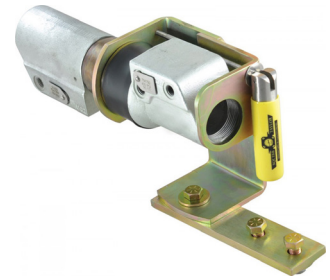
Q. Can I plug my manifold ports?

A. Yes. If you have a John Blue Impellicone or Continental MVD manifold you can plug unused manifold outlets. Be sure to plug an even amount of outlets per manifold if possible. Space plugs evenly on manifold to ensure even distribution.



STEP 5 BREAKAWAY KIT

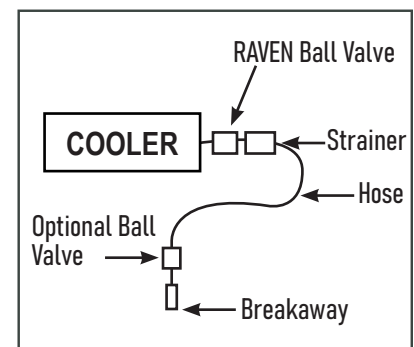
Install the breakaway bracket at the back of your cultivator according to the manufacturer's instructions inside the box. In a vice, thread bleeders, hydrostat, hosebarb and ACME adapter into the breakaway and attach it to the bracket. Make sure the breakaway moves freely up/down and left/right.



STEP 6 HOSE - BREAKAWAY TO COOLER

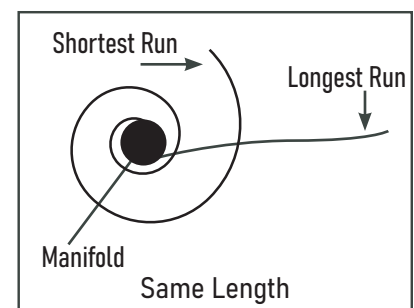
Measure and cut the NH3 hose to fit between the breakaway and cooler. Our kits are supplied with a 15ft length. Try to run the hose as straight as possible. If this is not possible, use a gentle curve in the hose. Using a 45 or 90 degree fitting will restrict flow and decrease maximum rates.

An optional ball valve can be added after the breakaway which will eliminate the need to bleed down your whole hose when changing tanks in the field.



STEP 7 MANIFOLD HOSES

Cut and measure the longest length of manifold hose. All hoses should be cut the same length for maximum accuracy. Failing to do so will distribute NH3 unevenly to each manifold, which will result in streaking. Connect each manifold outlet to a shank or boot.



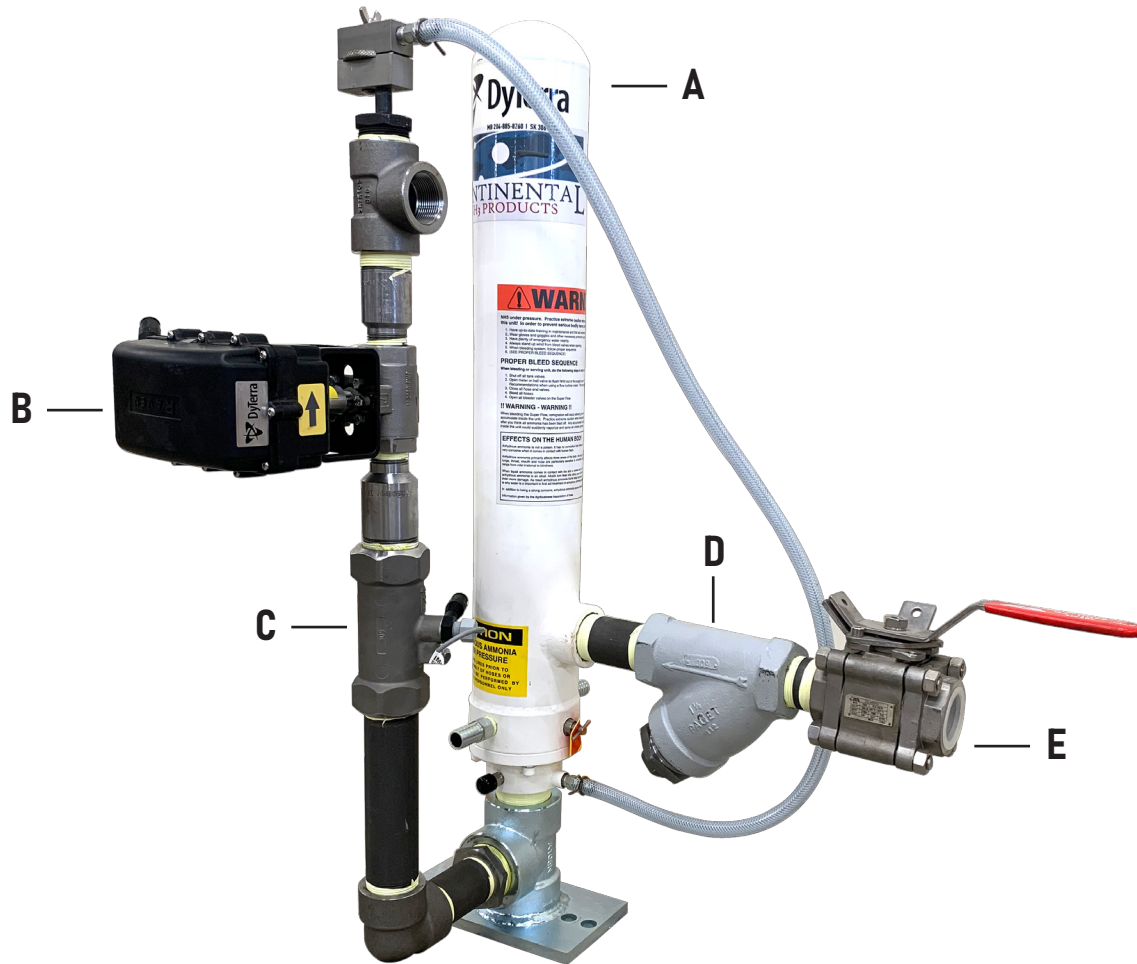
FAQ

Q. Why are people using smaller EVA hose from their manifolds to the ground? What are the advantages?

A. Smaller diameter EVA hose will increase the pressure in the lines. This will keep the NH3 liquid for longer which will cause less frost. The increase in pressure will also prevent tubes from plugging up.

CONTINENTAL SUPERFLOW

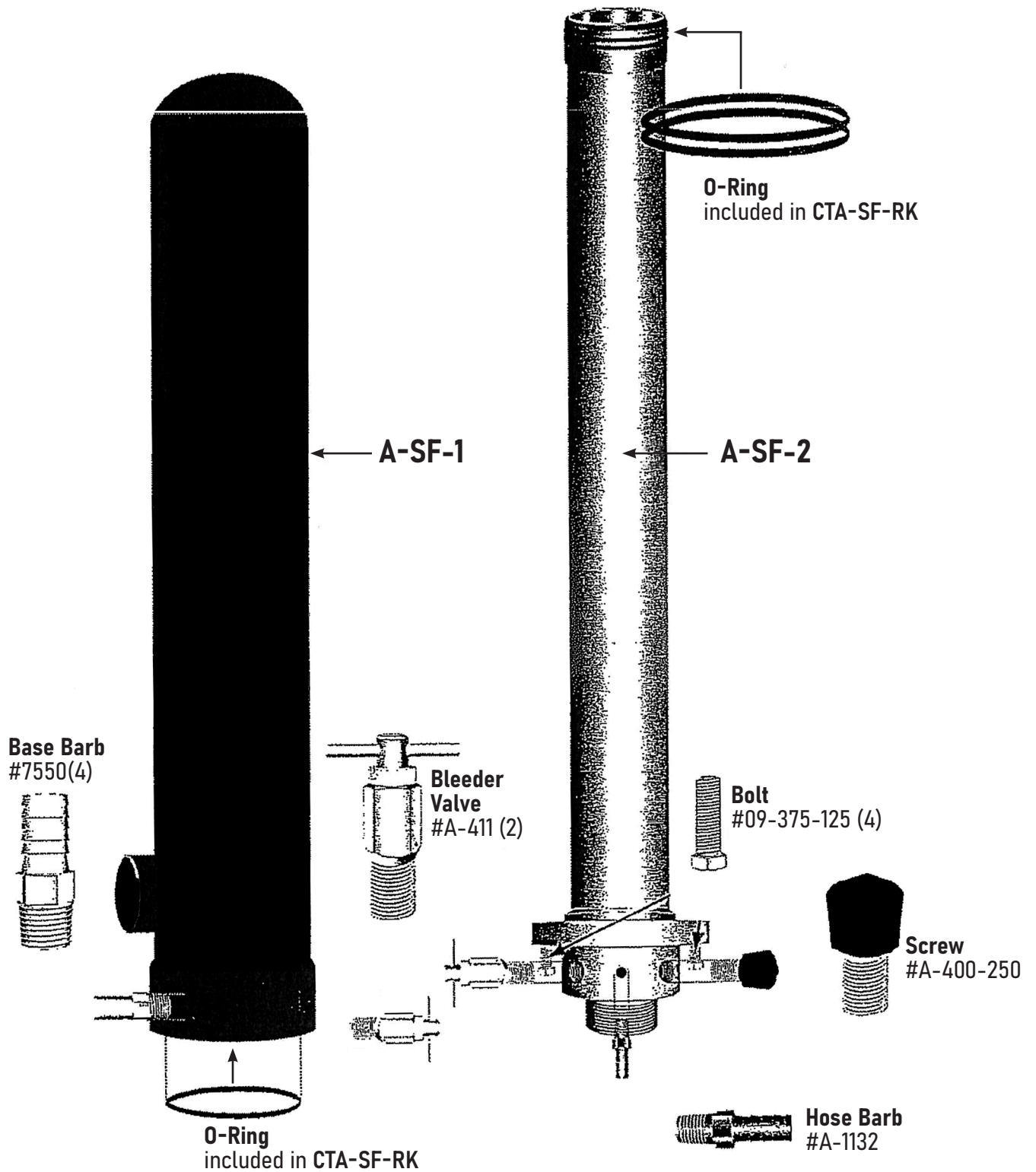
CONTINENTAL SUPERFLOW WITH RAVEN VALVES AND FLOWMETER



Part	Part Number
A Continental Superflow Cooler	CTA-SF-3000GT
B Raven Fast Valve 1"	RV1-063-0173-878
C Raven Flowmeter	RV1-063-0173-867
D 1 1/2" Strainer	MIPAGET24-100
E 1 1/2" Ball Valve	BVSS243

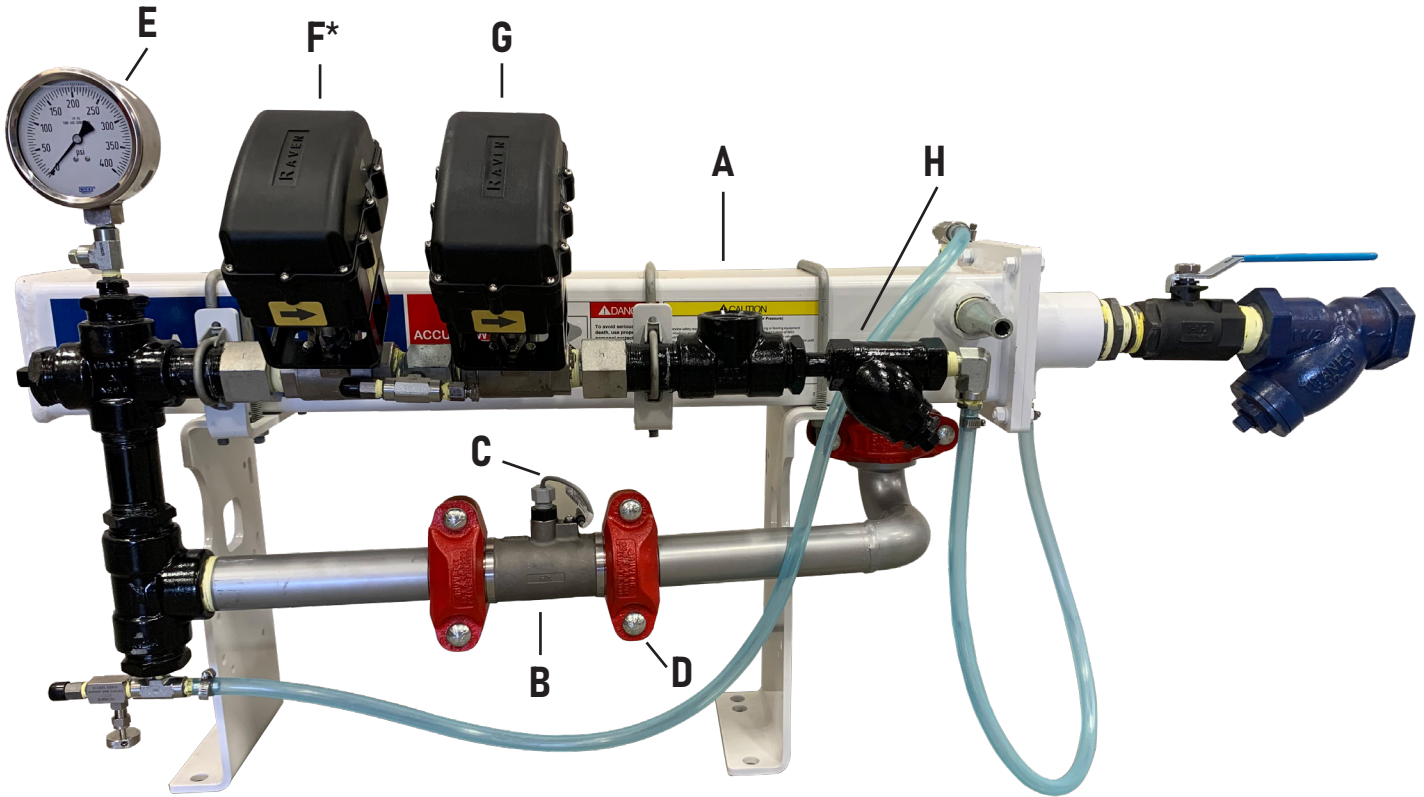


CONTINENTAL COOLER BREAKDOWN



RAVEN COOLER

2-valve cooler shown below

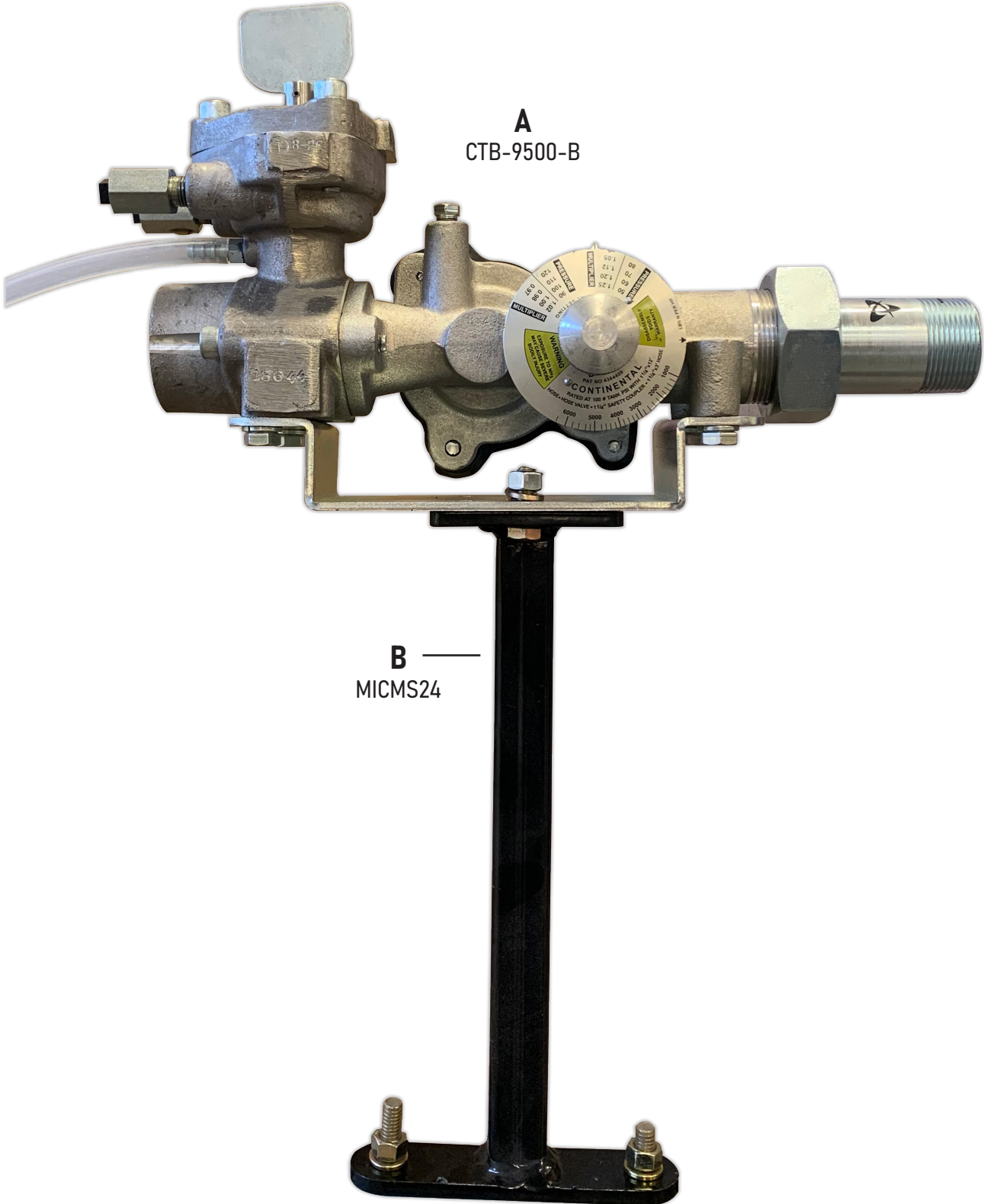


Part	Part Number
A Vortex Cooler	RV1-063-0173-663
B RAVEN Flowmeter	RV1-063-0173-869
C RAVEN Flowmeter Sensor	RV1-063-0171-669
D Gruvlock Coupling	RV1-333-0006-032
E 0-400 PSI Liquid Gauge	PGA4004L
F RAVEN Control Valve	RV1-117-0171-706
G RAVEN On-Off Valve	RV1-117-0171-705
H Strainer Kit	RVS08

*If RAVEN has optional single fast valve RV1-117-0171-707:



CONTINENTAL B-9500 METER SETUP

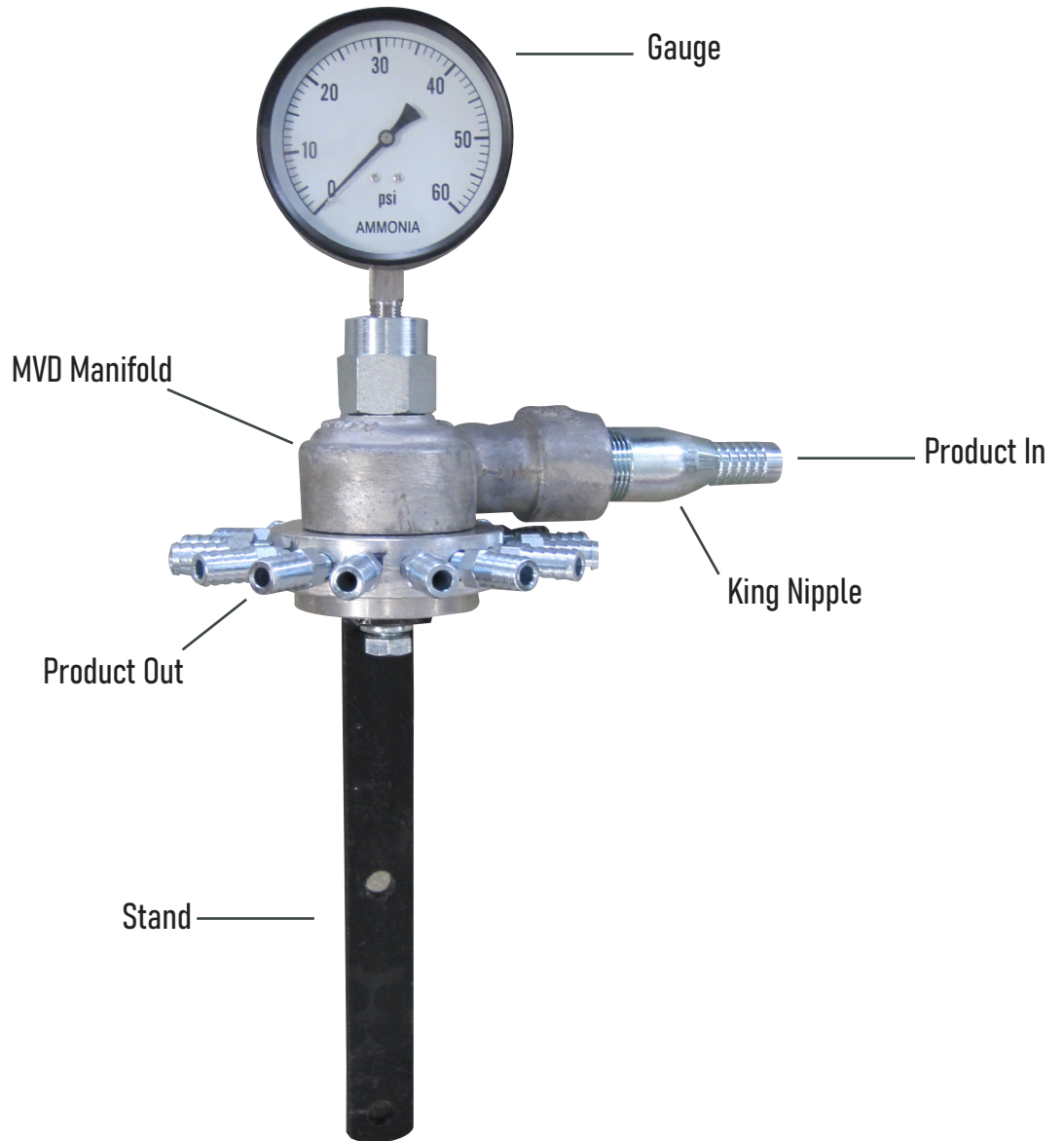


A
CTB-9500-B

B ———
MICMS24



MVD MANIFOLD NO SECTION CONTROL

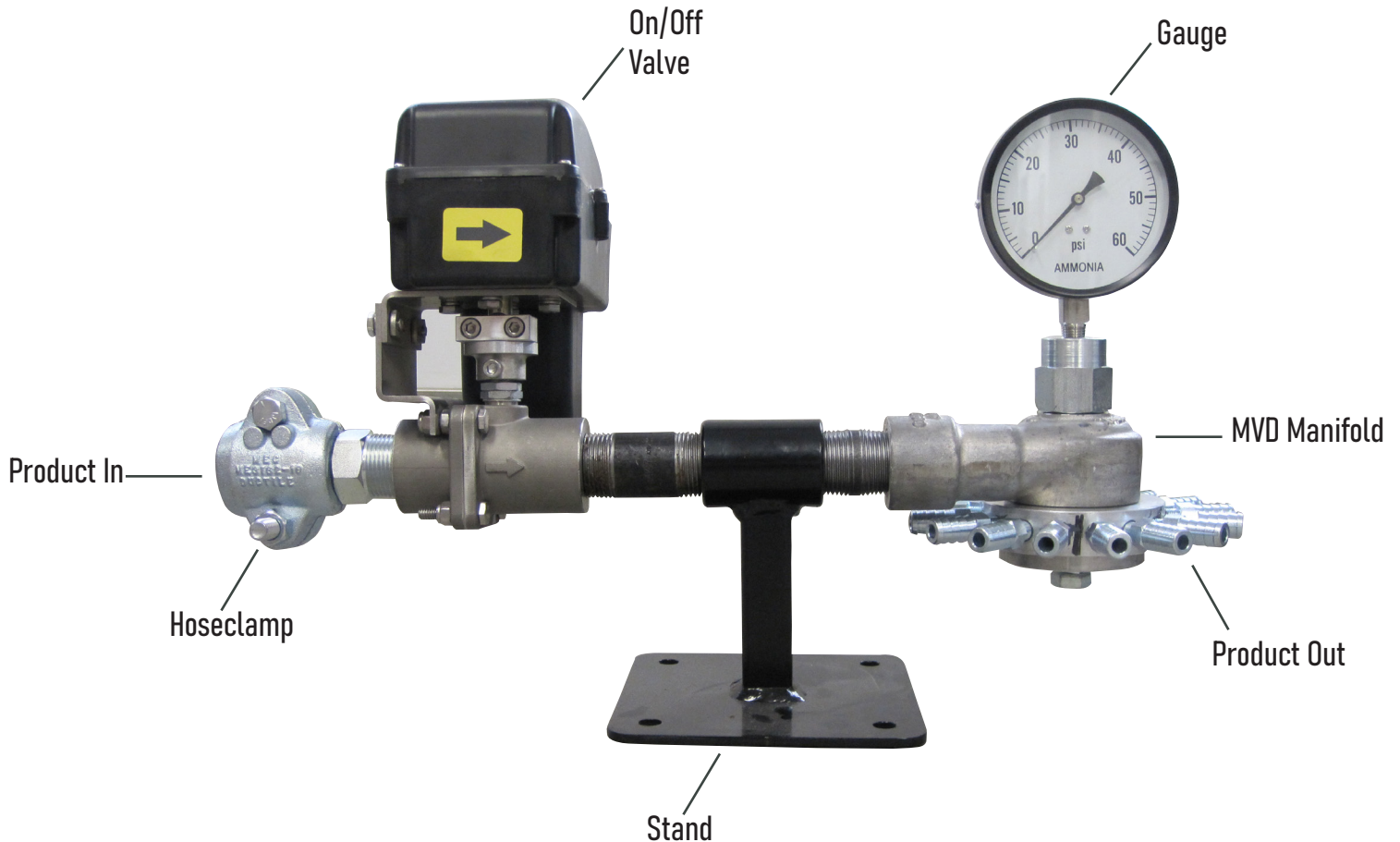


! HELPFUL POINTERS

. Use thread tape and thread sealant when installing the king nipple



MVD MANIFOLD SECTION CONTROL



FAQ

Q. Where should I mount my section on/off valves? Why?

A. Mounting your section on/off valves at the manifold ensures a quicker on/off response time for each section. If you mount the on/off valves at the splitter, it will take longer for product in the lines to get to the ground when turning that section on, and will allow more product to flow to the ground when turning that section off.

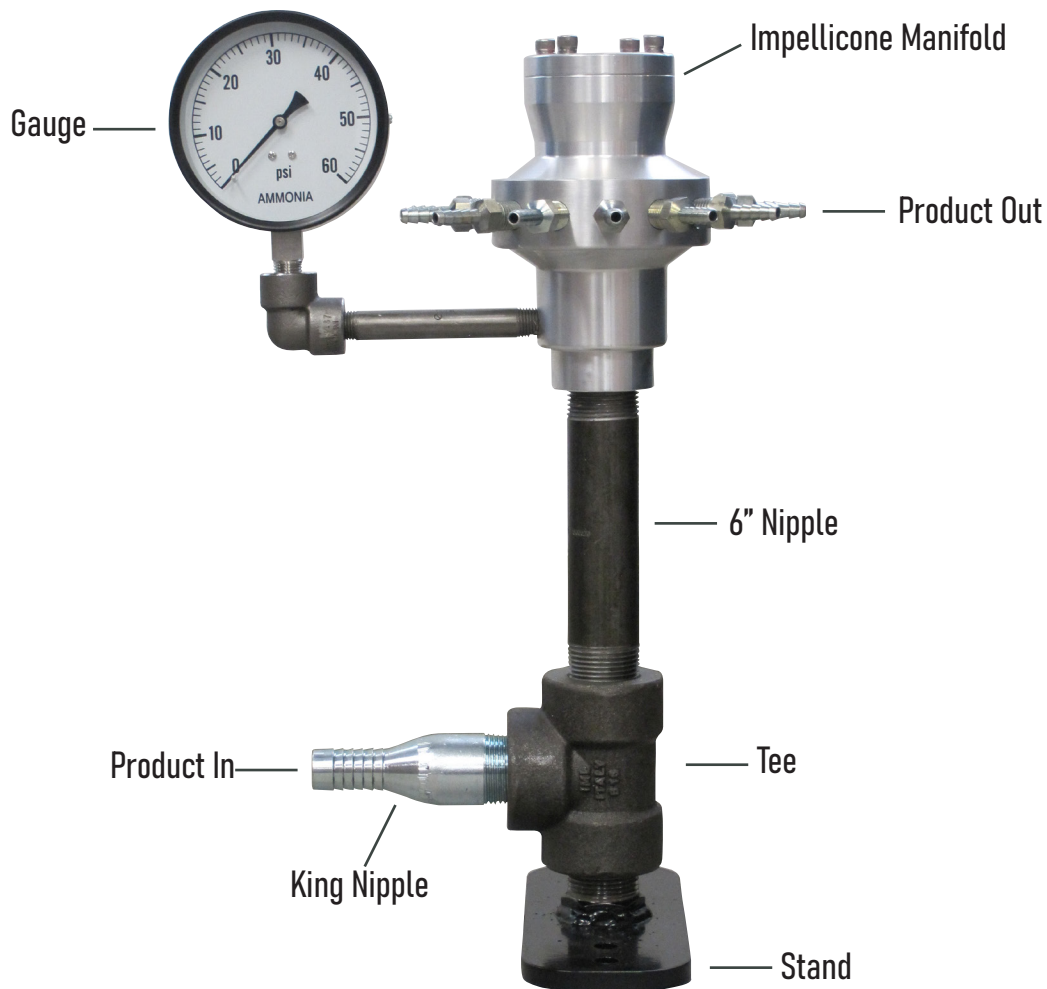


HELPFUL POINTERS

. Use thread tape and thread sealant when installing connecting plumbing



JOHN BLUE MANIFOLD NO SECTION CONTROL

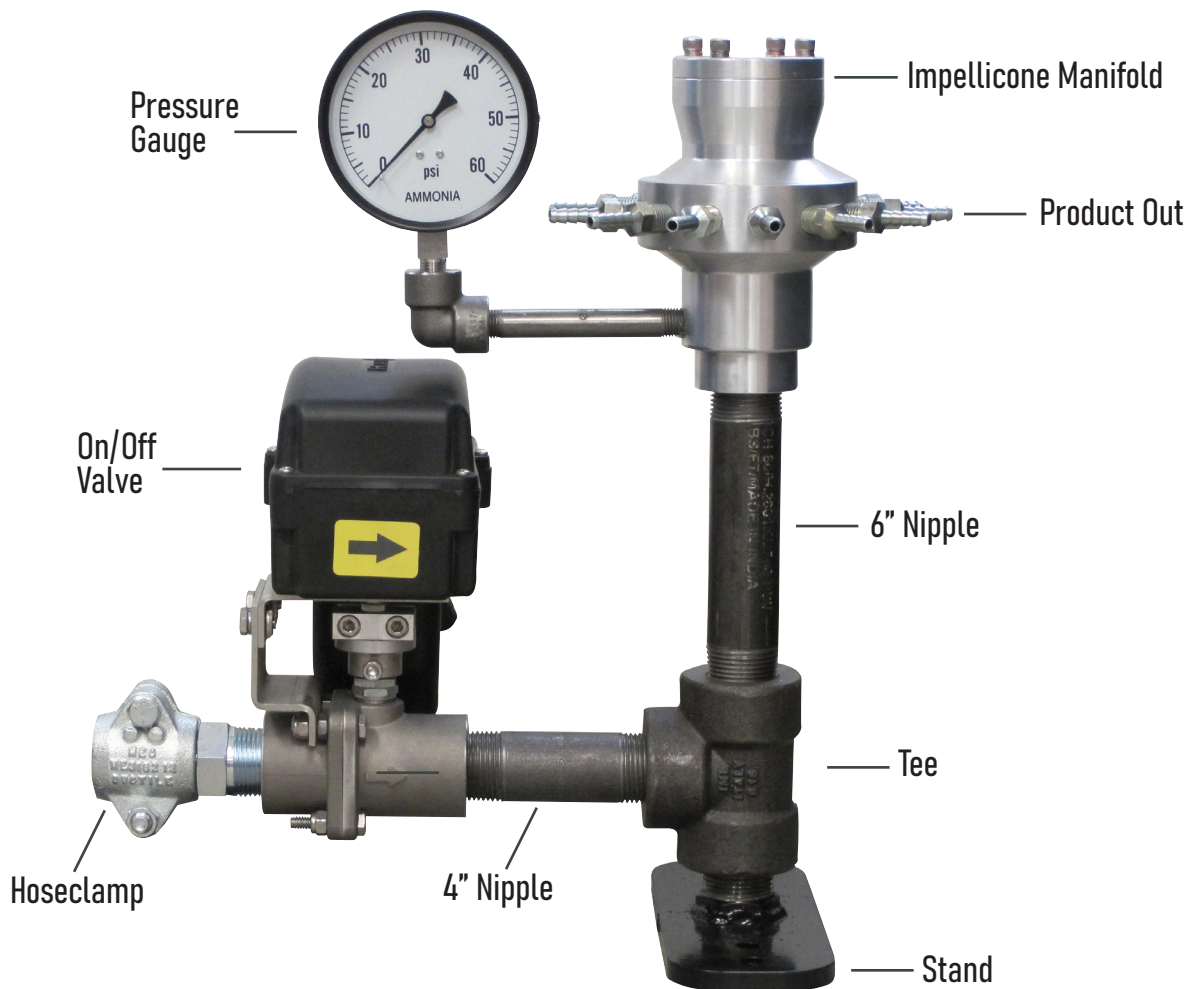


HELPFUL POINTERS

- . Use thread tape and thread sealant when installing connecting plumbing
- . Use thread sealant when installing $\frac{1}{4}$ " plumbing and hosebarbs



MVD MANIFOLD SECTION CONTROL



FAQ

Q. Where should I mount my section on/off valves? Why?

A. Mounting your section on/off valves at the manifold ensures a quicker on/off response time for each section. If you mount the on/off valves at the splitter, it will take longer for product in the lines to get to the ground when turning that section on, and will allow more product to flow to the ground when turning that section off.



HELPFUL POINTERS

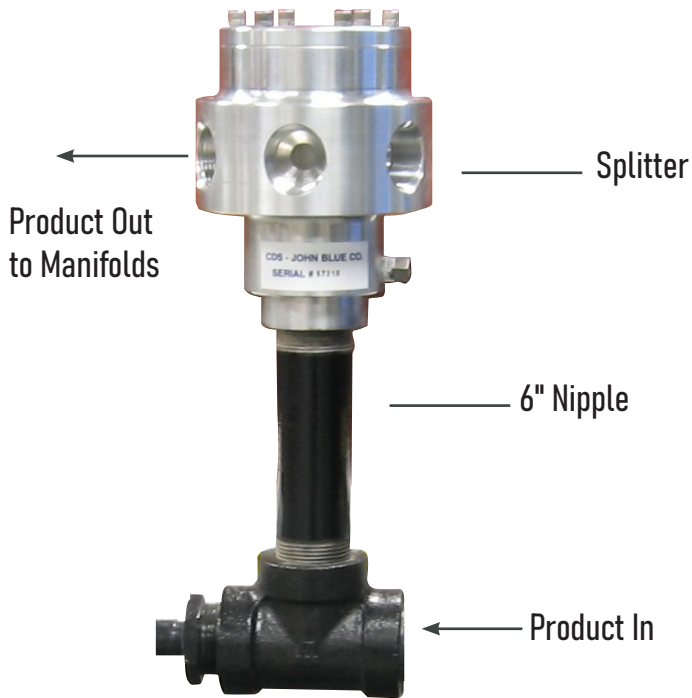
- . Use thread tape and thread sealant when installing connecting plumbing
- . Use thread sealant when installing 1/4" plumbing and hosebarbs



JOHN BLUE SPLITTER

COOLER MOUNT

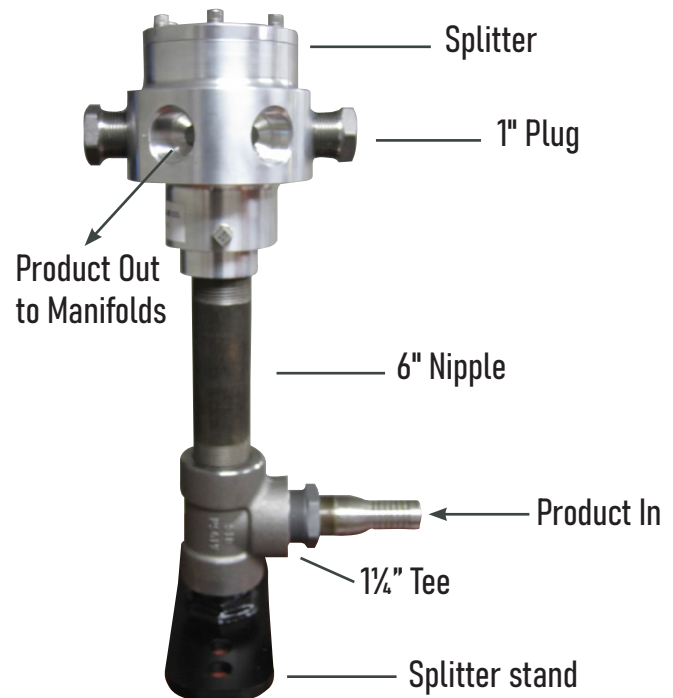
The splitter can be mounted directly on an NH3 cooler.



STAND MOUNT

A splitter stand kit is available if a cooler mount is not possible.

Part Number: KTJBSSM



FAQ

Q. Do hoses from the manifolds to the ground have to be uniform in length?

A. Yes. Failing to do so will distribute NH3 unevenly to each run, which will result in streaking.

Q. Can I plug my splitter ports?

A. Yes. If you have a John Blue Impellicone splitter you can plug unused outlets.

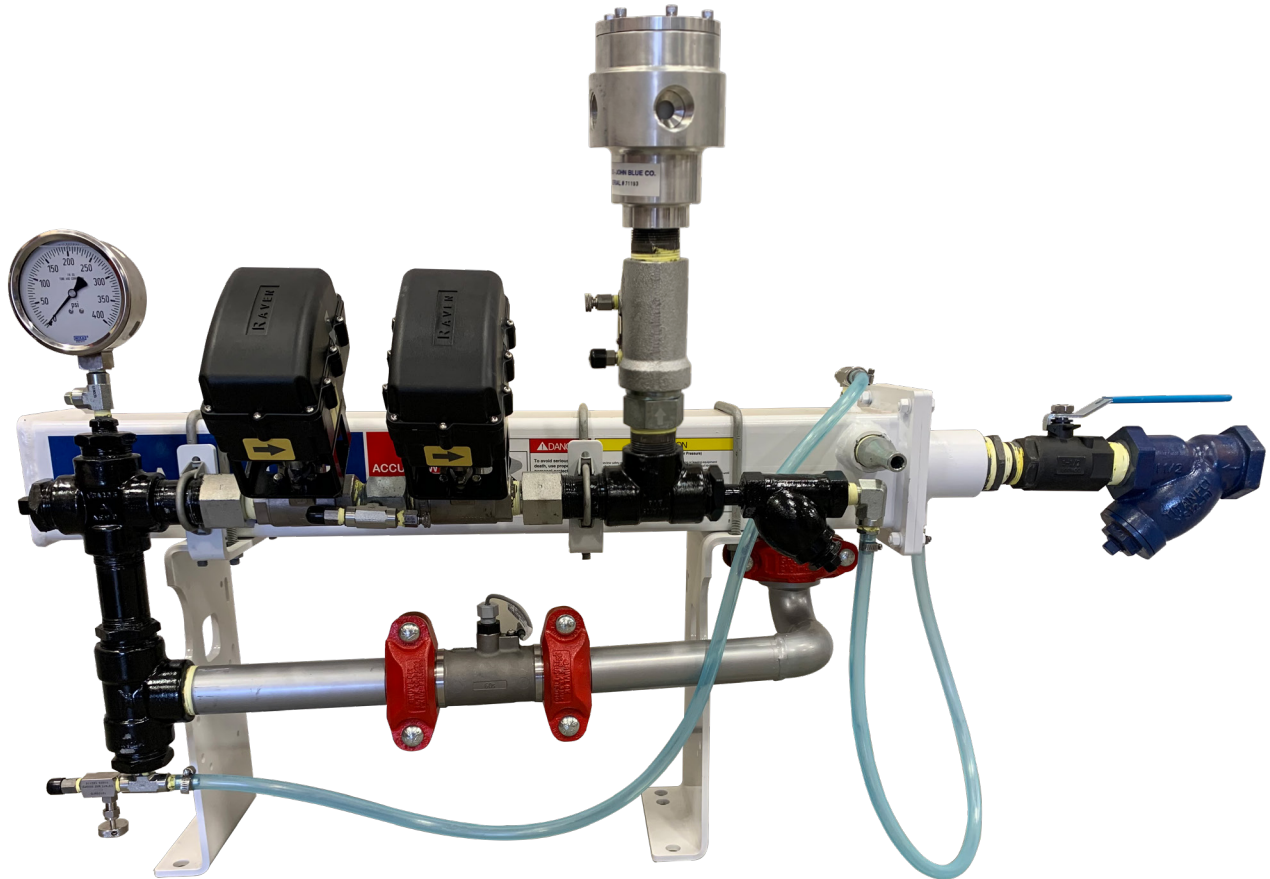


HELPFUL POINTERS

- . Splitter must be mounted upright
- . Splitter goes directly after the cooler
- . Outlets can be plugged
- . Use teflon tape and pipe sealant to assemble plumbing



CHECK VALVE SECTION CONTROL ONLY



FAQ

Q. Why does my Raven Accuflow have 2 valves? Why is this advantageous?

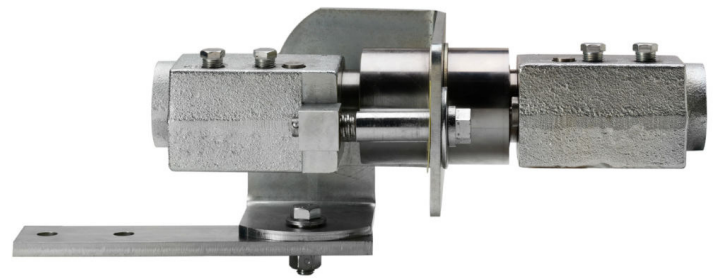
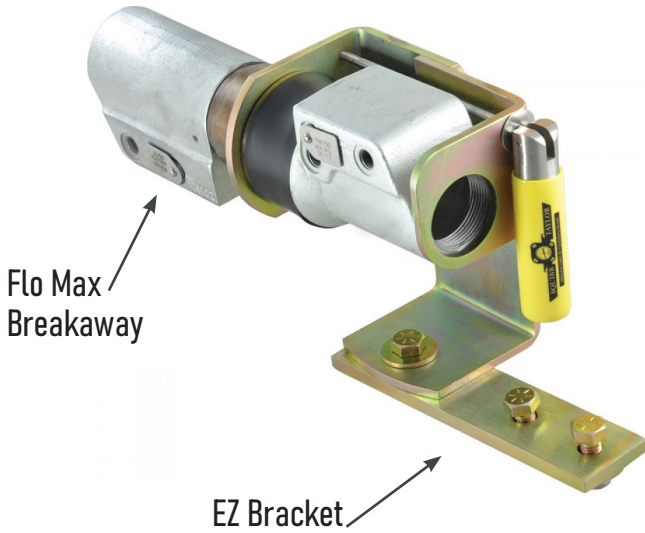
A. The first valve is a control valve which regulates what rate you are applying NH₃ at. The second valve is an on/off valve that allows you to quickly stop or start applying NH₃. The advantage of having two valves is that when you turn the system off or on, the valve that controls your rate does not move, and will not have to “search” for the desired rate you have programmed into your field computer.



HELPFUL POINTERS

. A check valve is required to keep hoses charged when all sections are shut off

HIGH FLOW BREAKAWAY



FLO MAX BREAKAWAY

1 1/4" FLO MAX
Part #STFM126K

1 1/4" EZ Bracket
Part #STFM126-1500

Repair Kit 1 1/4"
Part #STFM125-0022DY

Plunger Kit 1 1/4"
STFM125-0023

1 1/2" FLO MAX w/Bracket
Part #STFM150K

Repair Kit 1 1/2"
Part #STFM150-0022

Plunger Kit 1 1/2"
STFM150-0023

CONTINENTAL BREAKAWAY

1 1/4" CONTINENTAL
WITH BRACKET
Part #CTB-SWV-125-D

Repair Kit
Part #CTA-SWV125150-RK
(o-rings)

Rebuild
CTA-SWV125150-RBK

1 1/2" CONTINENTAL
WITH BRACKET
Part #CTB-SWV-150-D

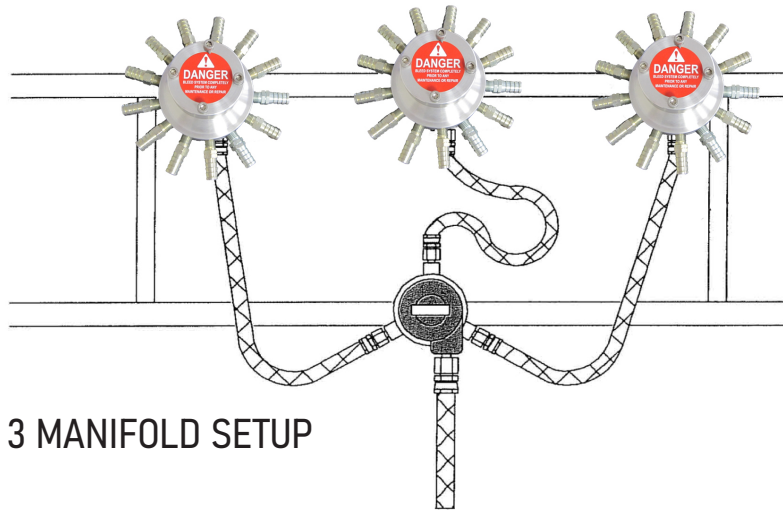
Repair Kit
Part #CTA-SWV125150-RK
(o-rings)

Rebuild
CTA-SWV125150-RBK

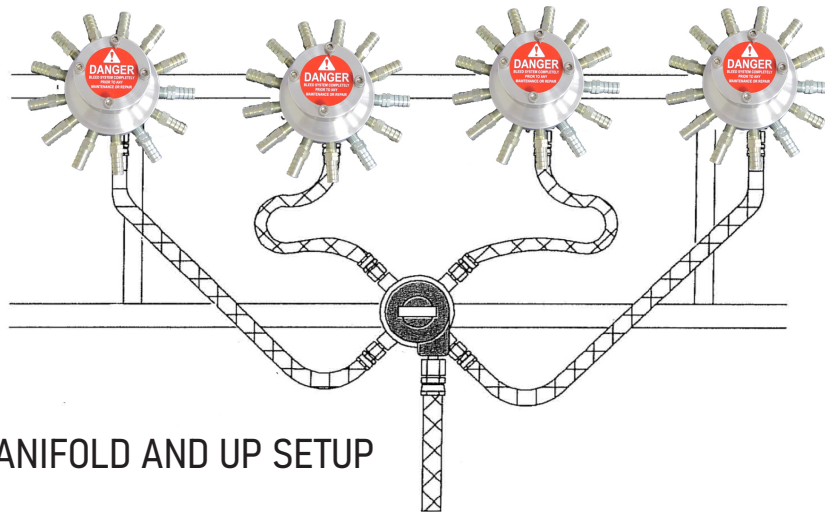


HOSE LENGTHS

FOR MAXIMUM ACCURACY, KEEP ALL HOSES BETWEEN SPLITTER & MANIFOLDS EQUAL LENGTH



3 MANIFOLD SETUP



4 MANIFOLD AND UP SETUP

NOTE: Hoses from the manifolds to the ground should also be the same length.

RAVEN 440 CONSOLE

QUICK SET-UP GUIDE

Note: A tutorial also available on DyTerra's YouTube Channel

When the console is powered up for the first time it will flash CAL and US VOLUME PER ACRE. This means the console must be programmed before operation.

1. To begin programming, **ENTER** to accept US VOLUME.
2. Display will now flash SP1-WHEEL DRIVE
 - a) Press the **CE button**, display will now show SP2-RADAR SPEED SENSOR. **ENTER** to accept SP2.
3. Display will now flash C-CD-STANDARD VALVE
 - a) If you have a 2 valve system (Tagged #2123 on the valve) then **ENTER** to accept standard valve
 - b) If you have a single FAST VALVE (Tagged #743 on the valve) then press **CE button** until you come to C-FC-FAST CLOSE VALVE and **ENTER** to accept.
4. Display will now flash CAL SELF TEST 0.0. Leave this as-is for now.

NOTE: FOR THE FOLLOWING CALIBRATION SETTINGS YOU WILL NEED TO **DEPRESS THE KEY** IN WHICH YOU WANT TO ENTER DATA, FOLLOWED BY **ENTER**, FOLLOWED BY THE **NUMBER YOU WISH TO ENTER**, FINALLY FOLLOWED BY **ENTER** AGAIN TO SAVE.
5. Next press **BOOM 1 CAL** button and then **ENTER** and then enter the width of your applicator in INCHES (i.e.: 720" for 60ft.). **ENTER** to save.
6. Boom 2 and 3 width should both be zero, if they are not, then enter 0 for both.
7. Press **SPEED CAL** button then **ENTER**, then enter a speed calibration number, then **ENTER**.

NOTE: For Raven Phoenix 10 GPS Sensor, use Cal #785 and for Raven Radar Gun use #586.

 - a) If your Raven console speed does not match up with your actual tractor speed or you are using a third party speed sensor, you can just increase or decrease the Cal number until they match.
8. Press **METER CAL** button then **ENTER**, then enter the calibration number from the flow meter, then **ENTER**.
 - a) The Meter Cal number is on a grey tag located on the flow meter under the Raven cooler. It will have a number (i.e.: 169/lbsN) on it. This is the number you use. **NOTE: DO NOT USE LIQUID OR LITRES** number.
 - b) This is also the number you can change if you find you are over applying or under applying. To do this, take your desired application rate divided by the rate you applied and multiply by the flow meter number (i.e.: $100\text{lbs} / 90\text{lbs} \times 169 = 187$ as new number).
9. Press **VALVE CAL** button then **ENTER** and enter your calibration number then **ENTER**.
 - a) Your Valve Cal number is on the valve motor. For a standard two-valve system the number is 2123 and for a single fast valve setup it's 743.
10. Press **RATE 1 CAL** button then **ENTER**, then enter desired lbs. of N to be applied (should be a rate you typically apply at, i.e. 100 lbs.) then **ENTER**.
11. Press **RATE 2 CAL** button then **ENTER** then enter Rate 2 desired lbs. of N to be applied then **ENTER**. This provides the ability to switch to a higher or lower application rate on the fly. **IMPORTANT NOTE:** You must enter a number in RATE 2 to complete calibration process.



12. It should now be displaying RATE 00 and programing is complete. If not, go back to STEP 5 and begin again.

13. If an error is made in steps 1 to 3 you can fix it two ways.

Option 1: Press and hold **SELF TEST** until it cycles through all the settings and stops. The screen will say 'UNITS US' (takes about 15-20 seconds).

ENTER to advance to the setting you want to change. Press **CE** to change the value. **ENTER** to finish. Repeat for any other changes needed. This method will save you from reprogramming all the calibration setting again.

Option 2: Factory Reset. (Caution: This which will also wipe out all the calibration settings you just entered.) This is done by turning the power switch OFF then depress and hold the CE button while turning the power switch back ON. Program all settings again.

14. Self-Test Feature

a) Self-test allows speed simulation for testing the system while the machine is not moving. This is done by pressing **SELF TEST** then **ENTER** then desired speed (5.0mph) then **ENTER**. The system will also clear itself when the tractor begins to move.

Additional: To learn about other settings like the SELF TEST and AUTOMATIC RATE +/- please see pages 18 and 19 in the 440 console manual.

Also NH3 Calibration setting for the Valve Cal, Meter Cal, Speed Cal, Boom Cal, are all found in the Installation and Operation Manual for the AccuFlow System.

RAVEN TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE & CORRECTIVE ACTION
<p>1. Rate display is inaccurate or unstable.</p>	<ol style="list-style-type: none"> 1. Check to see if your strainer is plugged. 2. Verify that there is product being discharged from each of the vapour tubes – If not, disassemble and clean out your supercooler with compressed air. 3. Unplug, Check and reconnect all wiring harnesses – Just one corroded pin or loose connection could cause the system to malfunction. 4. Test Your Flow Cable – (See Fig. 2 on next page) Ensure that power is actually getting to your flow meter by testing for the required voltages. If no power can be found, check connections or replace your flow cable. If there is power at your flow cable, replace your flow sensor. 5. Replace your flow sensor – The black wire connected to your flow meter is called the flow sensor. Remove the old sensor and thread in the new sensor, making sure to follow the installation instructions. No calibration changes are required. 6. Replace your flow meter – If you are still having issues after replacing the flow sensor, the turbine inside your Flow meter may have burnt out. Flow meter replacement parts are on page 10 of the DyTerra Catalogue.
<p>2. Rate does not change in either manual or automatic control modes.</p>	<ol style="list-style-type: none"> 1. Check the control valve cabling for wear or breaks. 2. Check and clean cable connections. 3. Check the voltage at the control valve: (see Fig. 1) 4. Power on the console. 5. Set the master switch on the console to “On”. 6. Set the console to “Manual” mode. 7. Hold the Increase/Decrease switch while testing voltage at the flow cable. 8. If voltage is found, plug the control valve back in. 9. If the valve will not turn while holding the Increase/Decrease Switch, replace the valve.
<p>3. Are you still having issues?</p>	<p>The flow of NH₃ through your metering system is solely controlled by tank pressure. When applying in colder temperatures, tank pressure will drop. If tank pressure drops too low, your cooler will be starved for product, which causes rates to fluctuate. Your options are to slow down or try the following:</p> <ol style="list-style-type: none"> 1. Increase plumbing size from tank. 2. Upgrade to a high flow breakaway. 3. Use a larger nurse tank with a high-flow withdrawal. 4. Upgrade to a higher capacity supercooler.

Fig. 1

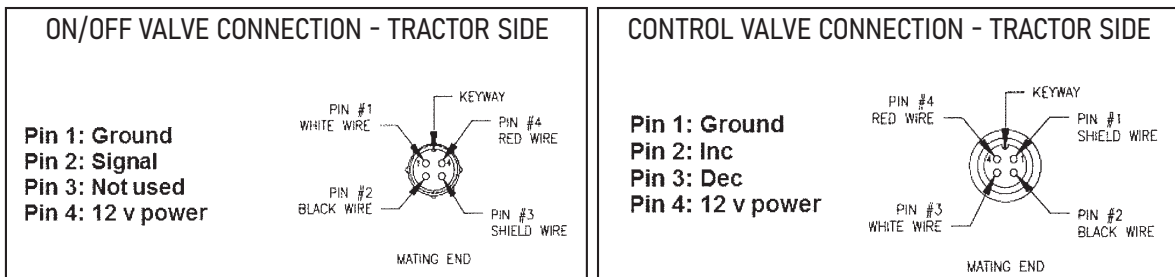
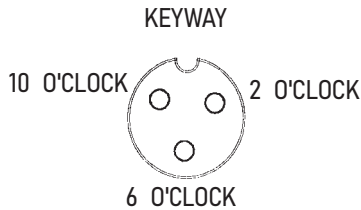


Fig. 2

PROCEDURE TO TEST FLOW METER CABLES:

1. Disconnect cable from flow sensor.
2. Hold flow sensor cable so that the keyway is pointing to the 12 o'clock position:



PIN DESIGNATIONS

- 2 o'clock socket location is ground.
- 10 o'clock socket location is power.
- 6 o'clock socket location is signal.

VOLTAGE READINGS

- a) 2 o'clock socket to 6 o'clock socket = +5 VDC
- b) 2 o'clock socket to 10 o'clock socket = +5 VDC

PROCEDURE TO TEST FLOW CABLE:

1. Enter a meter cal number of 1 in the key labelled METER CAL.
2. Depress key labelled TOTAL VOLUME.
3. Place boom switches to ON.
4. With a small jumper wire, short between the 2 o'clock and 6 o'clock sockets with a "Short, No Short" motion. Each time a contact is made, the TOTAL VOLUME should increase by increments of 1 or more counts.
5. If TOTAL VOLUME does not increase, remove the section of cable and repeat test at the connector next closest to the console. Replace defective cables as required.
6. Perform the above voltage checks.
7. If all cables test properly, replace the flow sensor.

NOTE: After testing is complete, re-enter correct METER CAL numbers before application.

DICKEY-JOHN TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE & CORRECTIVE ACTION
<p>1. Rate display is inaccurate or unstable.</p>	<p>This is a Dickey-John Flow Sensor. (Fig.1) Usually a faulty flow sensor is responsible for this issue, but before replacing the flow sensor, try the following:</p> <ol style="list-style-type: none"> 1. Check to see if your strainer is plugged. (Fig. 2) 2. Check the opening on your Continental cooler. There is a small 3/8" hose barb in the elbow after your control valve. Remove the barb and make sure it's not plugged. (Fig.3) 3. Verify that there is product being discharged from each of the vapour tubes – If not, disassemble and clean out your supercooler with compressed air. 4. Unplug, check and reconnect all wiring harnesses – just one corroded pin, or loose connection could cause the system to malfunction. 5. Check the voltage on the tractor side of the flow sensor connection. Voltage should read 12V across red and black 9V across black and green (Fig.4) <p>Power at flow sensor: Black + Red 12V Black + Green 9V</p> <ol style="list-style-type: none"> 6. If there is no voltage, you have a faulty cable or connection. Check or replace implement harness. 7. If there is voltage, remove the flow sensor and check to see that the paddle wheel inside the flow meter is spinning freely. If the paddle wheel spins freely inside the flow meter, replace the flow sensor.
<p>2. Control Valve will not operate in auto.</p>	<p>Does the Valve Operate in Flush? If it does, check your speed cable connections. If it doesn't, test the voltage on the tractor side of the control valve connection (Fig. 5)</p> <p>Power at Actuator Connection: Red + Black 12V Always Black + White 12V Flush Switch Off Black + Brown 12V Flush Switch On</p>
<p>3. Are you still having issues?</p>	<p>The flow of NH₃ through your metering system is solely controlled by tank pressure. When applying in colder temperatures, tank pressure will drop. If tank pressure drops too low, your cooler will be starved for product, which causes rates to fluctuate. Your options are to slow down or try the following:</p> <ol style="list-style-type: none"> 1. Increase plumbing size from tank. 2. Upgrade to a high flow breakaway. 3. Use a larger nurse tank with a high-flow withdrawal. 4. Upgrade to a higher capacity supercooler.

Fig. 1



Fig. 2



Fig. 3

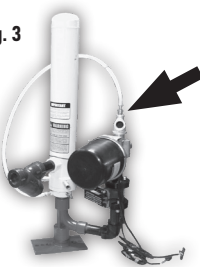


Fig. 4



Fig. 5



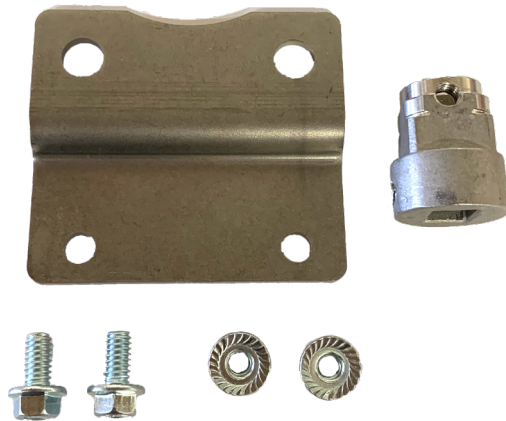
DICKEY-JOHN COMMON REPLACEMENT



DICKEY-john Actuator
Part Number: DJ467095060
required when upgrading to a CTA-BVT valve



Flow Sensor Module
Part Number: DJ457901570AS1



Part Number: DJ457904000

RAVEN VALVES AND ACTUATORS

QUICK REFERENCE GUIDE

OLD STYLE VALVE



NEW STYLE VALVE



DESCRIPTION	COMPLETE ASSEMBLY	MOTOR ONLY	VALVE ONLY	SEAL KIT
1" VALVES - NEW STYLE				
1" CONTROL VALVE	RV1-063-01732-877	RV1-063-0173-664	RV1-334-0001-071	N/A
1" ON/OFF VALVE	RV1-117-0173-876	RV1-063-0173-665	RV1-334-0001-071	N/A
1" FAST VALVE	RV1-063-0173-878	RV1-063-0173-666	RV1-334-0001-071	N/A
1" VALVES - Complete Assemblies No Longer Available - Please refer to NEW STYLE Chart				
1" CONTROL VALVE	N/A	RV1-063-0173-206	RV1-117-0171-686	RV1-117-0159-410
1" ON/OFF VALVE	N/A	RV1-063-0173-207	RV1-117-0171-686	RV1-117-0159-410
1" FAST VALVE	N/A	RV1-063-0172-982	RV1-117-0171-686	RV1-117-0159-410
1½" VALVES				
1½" CONTROL VALVE	N/A	RV1-063-0173-206	N/A	RV1-117-0171-355
1½" ON/OFF VALVE	N/A	RV1-063-0173-207	N/A	RV1-117-0171-355
1½" FAST VALVE	N/A	RV1-063-0173-982	N/A	RV1-117-0171-355
1½" VALVES				
1½" CONTROL VALVE	RV1-063-0173-667	RV1-063-0173-664	RV1-334-0001-066	N/A
1½" ON/OFF VALVE	RV1-063-0173-668	RV1-063-0173-665	RV1-334-0001-066	N/A
1½" FAST VALVE	RV1-063-0173-626	RV1-063-0173-666	RV1-334-0001-066	N/A
1" VALVES RETROFIT KIT w/ADAPTORS		COMPLETE ASSEMBLY		
1" CONTROL VALVE w/PIPE ADAPTORS		RV1-063-0173-667		
1" ON/OFF VALVE w/PIPE ADAPTORS		RV1-063-0173-668		
1" FAST VALVE w/PIPE ADAPTORS		RV1-063-0173-626		

