

STACKER – AIR TOOL SINGLE SWATH CONFIGURATIONS – OPERATORS MANUAL

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Disclaimer

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ABOUT THIS MANUAL


This manual includes instructions for installation, operation, maintenance and troubleshooting of a Stacker Distribution System.


All dimensions shown in this manual are in millimetres.

SAFETY AND DAMAGE WARNINGS

The terms WARNING, CAUTION and NOTE are used throughout this manual to stress the importance of personal safety, potential machinery damage and useful operating information.

Term description and usage is shown below.

 **WARNING:** Indicates the strong possibility of severe personal injury or damage to machinery if instructions are not followed.

 **CAUTION:** Highlights hazards, unsafe or unwise practices which could cause personal injury, property damage, damage to your machinery or loss of potential crop yield if instructions are not followed.

 **NOTE:** Refers to important and useful information which should not be

IMPORTANT SAFETY INSTRUCTIONS

WARNING:

Always wear protective gloves, eyewear and clothing when dealing with liquid fertilizers and other liquid agricultural products.

Do not disconnect any hose lines while the pump is running.

Ensure power is switched off or disconnected when connecting or disconnecting any electrical components of the system.

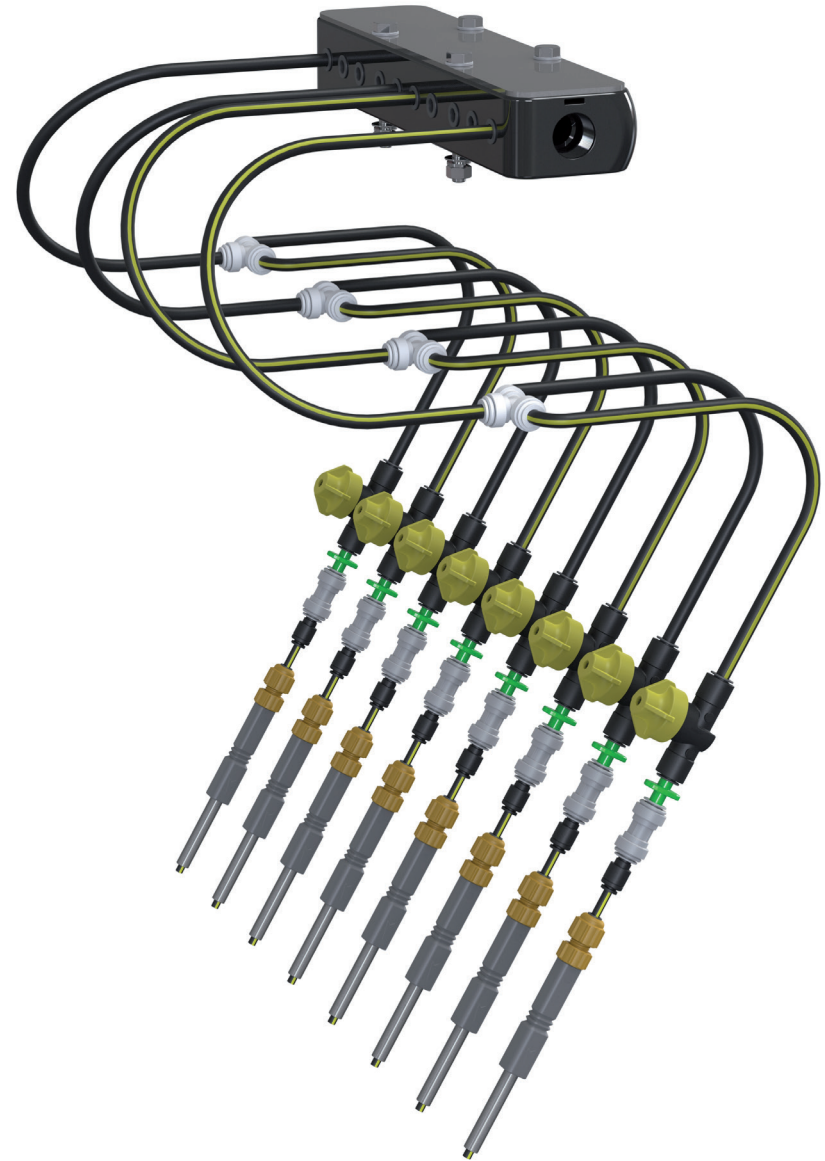
WARNING:

Use of phosphoric acid with this equipment will void the warranty.

ABOUT THE SYSTEM

Stacker Distribution Systems have been designed to provide accurate and even rate controlled application of clear liquid fertilizers and other high analysis agricultural liquids.

Distribution systems include all items necessary from induction to delivery to the opener tubes. Systems do not however include the stainless steel opener delivery tubes - (as many Air Tool shanks already feature these). Each system also includes support kit that includes spares, cutting & extraction tools etc.



SYSTEM COMPONENTS - Manifold Assembly Kit

Single Stacker Manifold



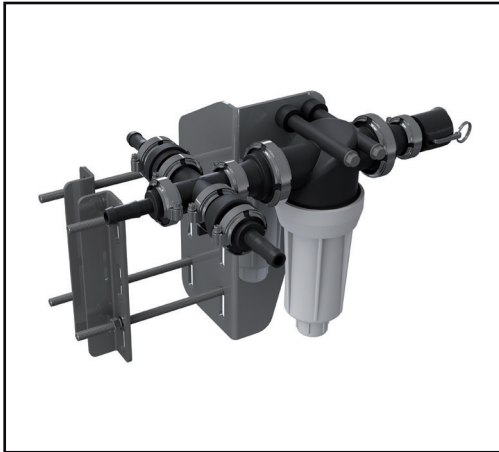
Dual Stacker Manifold




Universal Manifold Mounting Assembly



Induction Filter Assembly

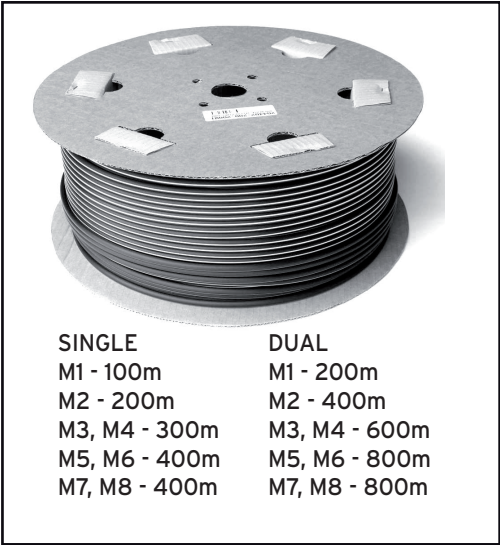


 **NOTE:** EACH MANIFOLD IS LABELLED WITH A CODE NUMBER - FOLLOW THE CODES ON PAGE 2.5 FOR SINGLE CONFIGURATION AND PAGE 2.7 FOR DUAL CONFIGURATION.

Stacker Pressure Gauge Assembly

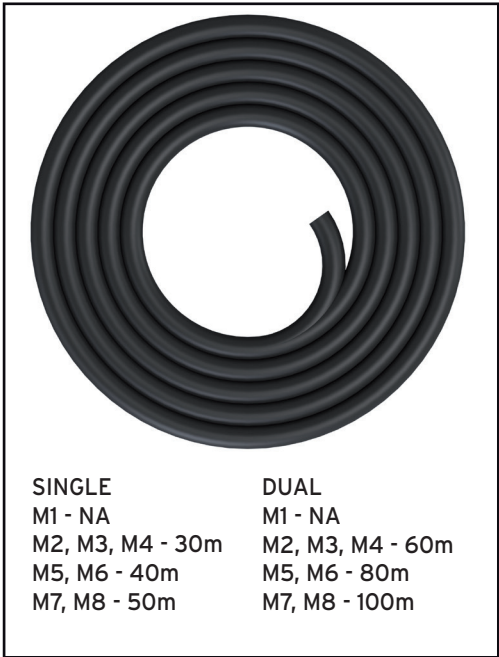


8mm OD Delivery Tube



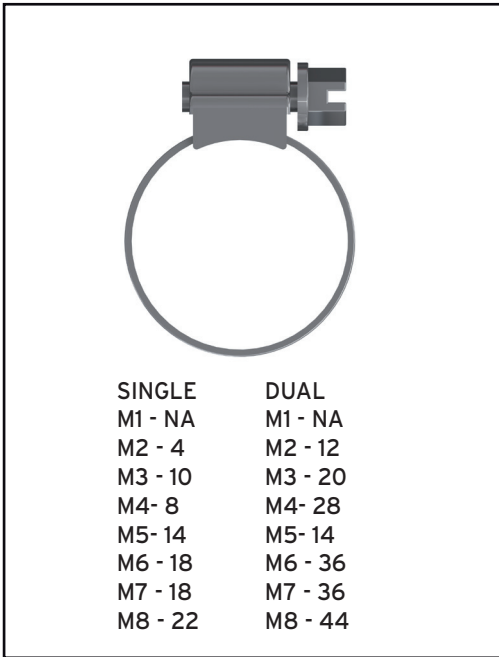
- | | |
|---------------|---------------|
| SINGLE | DUAL |
| M1 - 100m | M1 - 200m |
| M2 - 200m | M2 - 400m |
| M3, M4 - 300m | M3, M4 - 600m |
| M5, M6 - 400m | M5, M6 - 800m |
| M7, M8 - 400m | M7, M8 - 800m |

3/4" Pressure Hose



- | | |
|------------------|------------------|
| SINGLE | DUAL |
| M1 - NA | M1 - NA |
| M2, M3, M4 - 30m | M2, M3, M4 - 60m |
| M5, M6 - 40m | M5, M6 - 80m |
| M7, M8 - 50m | M7, M8 - 100m |

Wormscrew Clamp

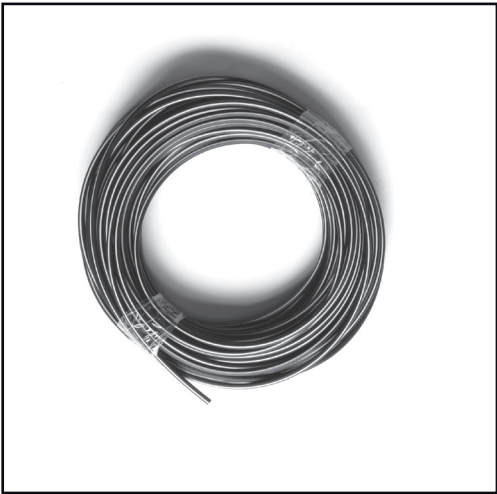


- | | |
|---------|---------|
| SINGLE | DUAL |
| M1 - NA | M1 - NA |
| M2 - 4 | M2 - 12 |
| M3 - 10 | M3 - 20 |
| M4 - 8 | M4 - 28 |
| M5 - 14 | M5 - 14 |
| M6 - 18 | M6 - 36 |
| M7 - 18 | M7 - 36 |
| M8 - 22 | M8 - 44 |


 **NOTE:** INSTALLATION TIPS ON PAGE 3.10

SYSTEM COMPONENTS - Terminal Assembly Kit

6, 5, or 4mm OD Terminal Tube

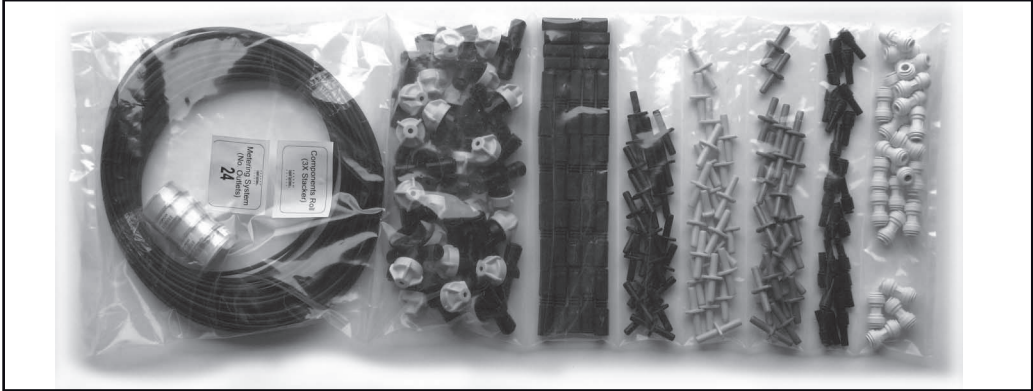


Cable Ties



SINGLE	DUAL
M1 - 1PK	M1 - 2PK
M2, M3, M4 - 2PK	M2, M3, M4 - 4PK
M5,M6 - 3PK	M5. M6 - 6PK
M7, M8 - 3PK	M7, M8 - 6PK

Components Pack


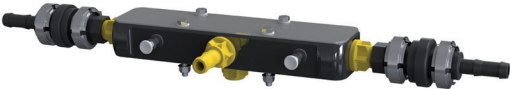

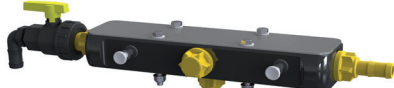



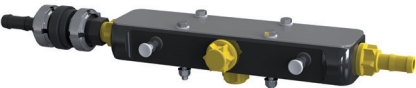
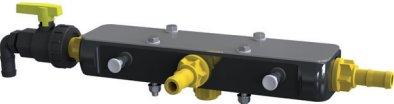



Customer Support Kit - contains spare components and tools

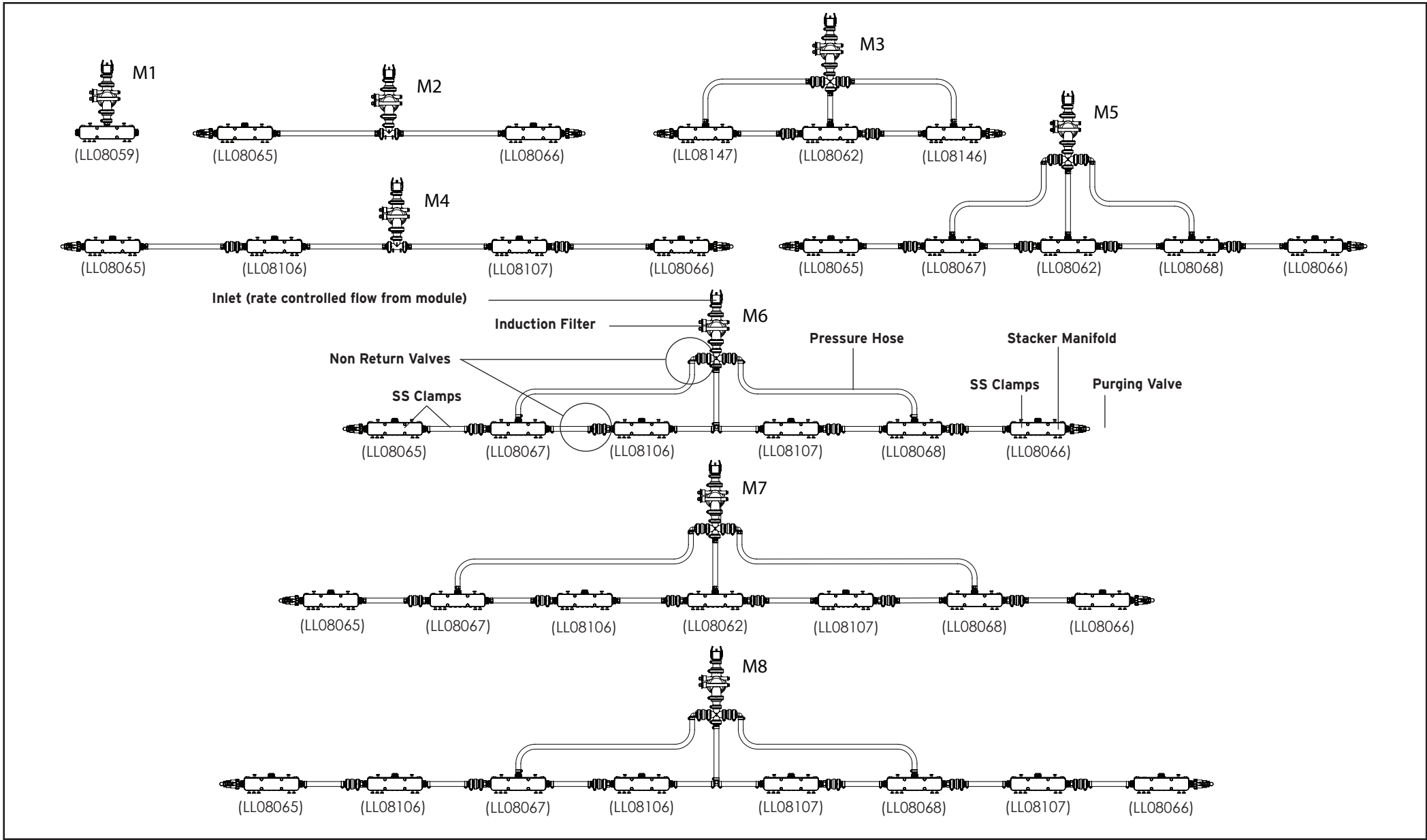


 **NOTE:** INSTALLATION TIPS ON PAGE 3.10

AIR TOOL STACKER MANIFOLD ASSEMBLIES - Single

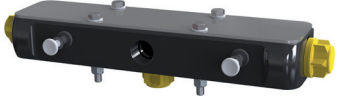



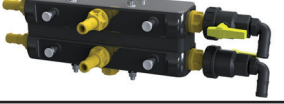
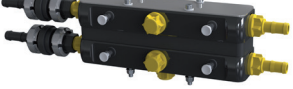
PART IMAGE	PART NO.	PART QUANTITY PER SYSTEM							
		M1	M2	M3	M4	M5	M6	M7	M8
	LL08059	1							
	LL08062			1		1		1	
	LL08065		1		1	1	1	1	1
	LL08066		1		1	1	1	1	1
	LL08067					1	1	1	1
	LL08068					1	1	1	1
	LL08106				1		1	1	2
	LL08107				1		1	1	2
	LL08146			1					
	LL08147			1					

MANIFOLD LAYOUT CONFIGURATIONS - OVERVIEW - Single

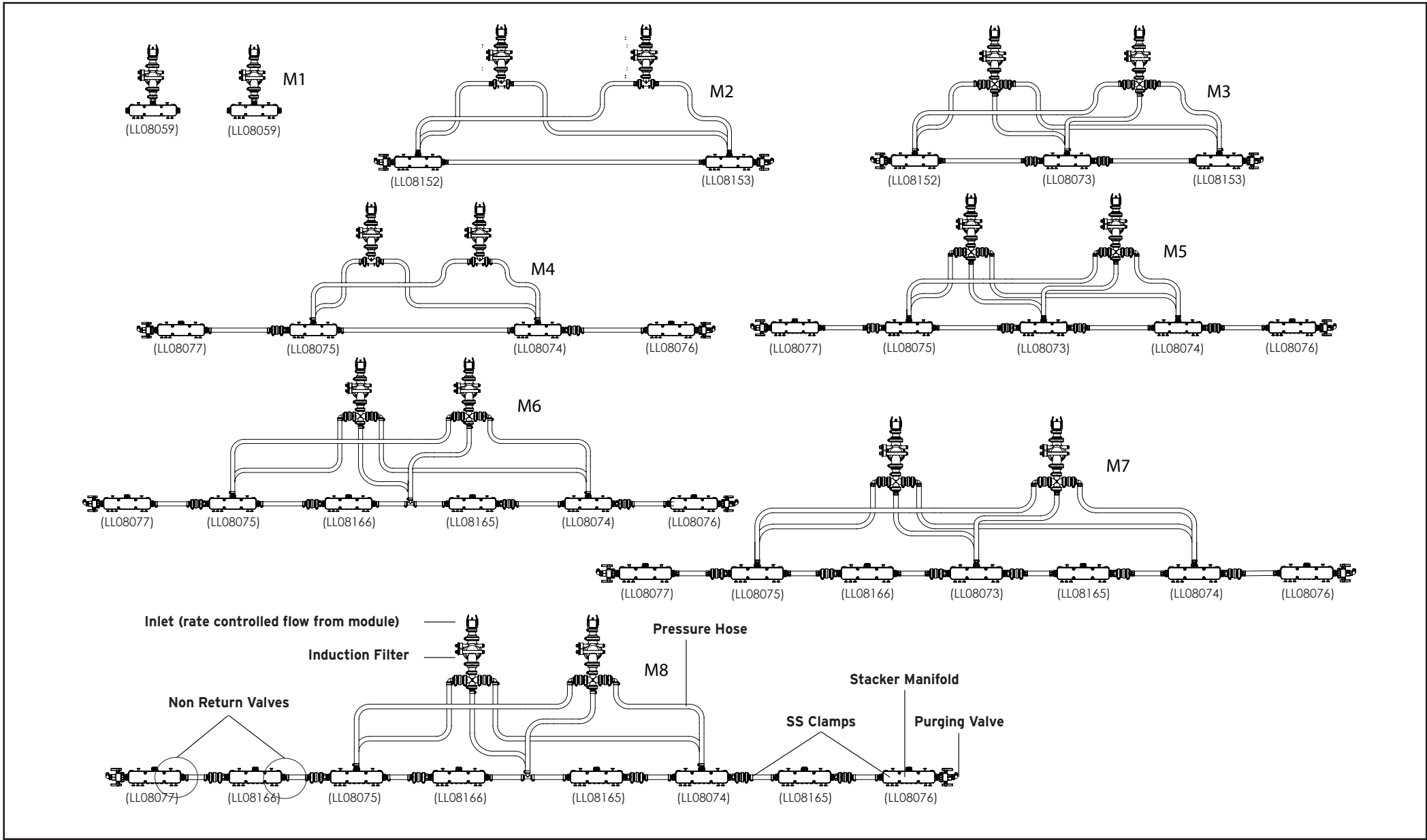


AIR TOOL STACKER MANIFOLD ASSEMBLIES - Dual

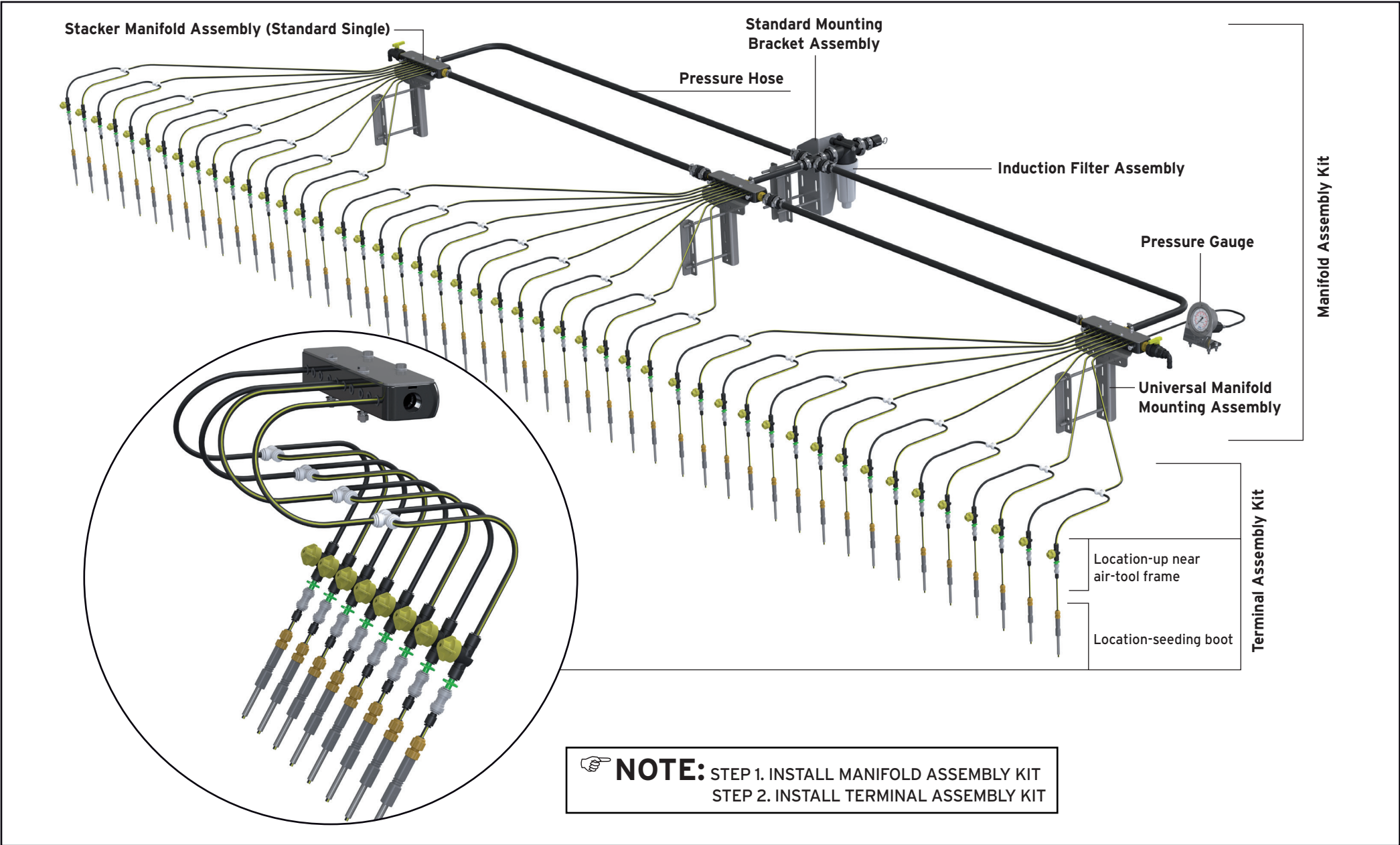
PART QUANTITY PER SYSTEM

PART IMAGE	PART NO.	M1	M2	M3	M4	M5	M6	M7	M8
	LL08059	2							
	LL08073			1		1		1	
	LL08074				1	1	1	1	1
	LL08075				1	1	1	1	1
	LL08076				1	1	1	1	1
	LL08077				1	1	1	1	1
	LL08152		1	1					
	LL08153		1	1					
	LL08165						1	1	2
	LL08166						1	1	2

MANIFOLD LAYOUT CONFIGURATIONS - OVERVIEW - Dual



COMPLETE SYSTEM LAYOUT – Example: M3 Single Swath Single System



MOUNT INDUCTION FILTER

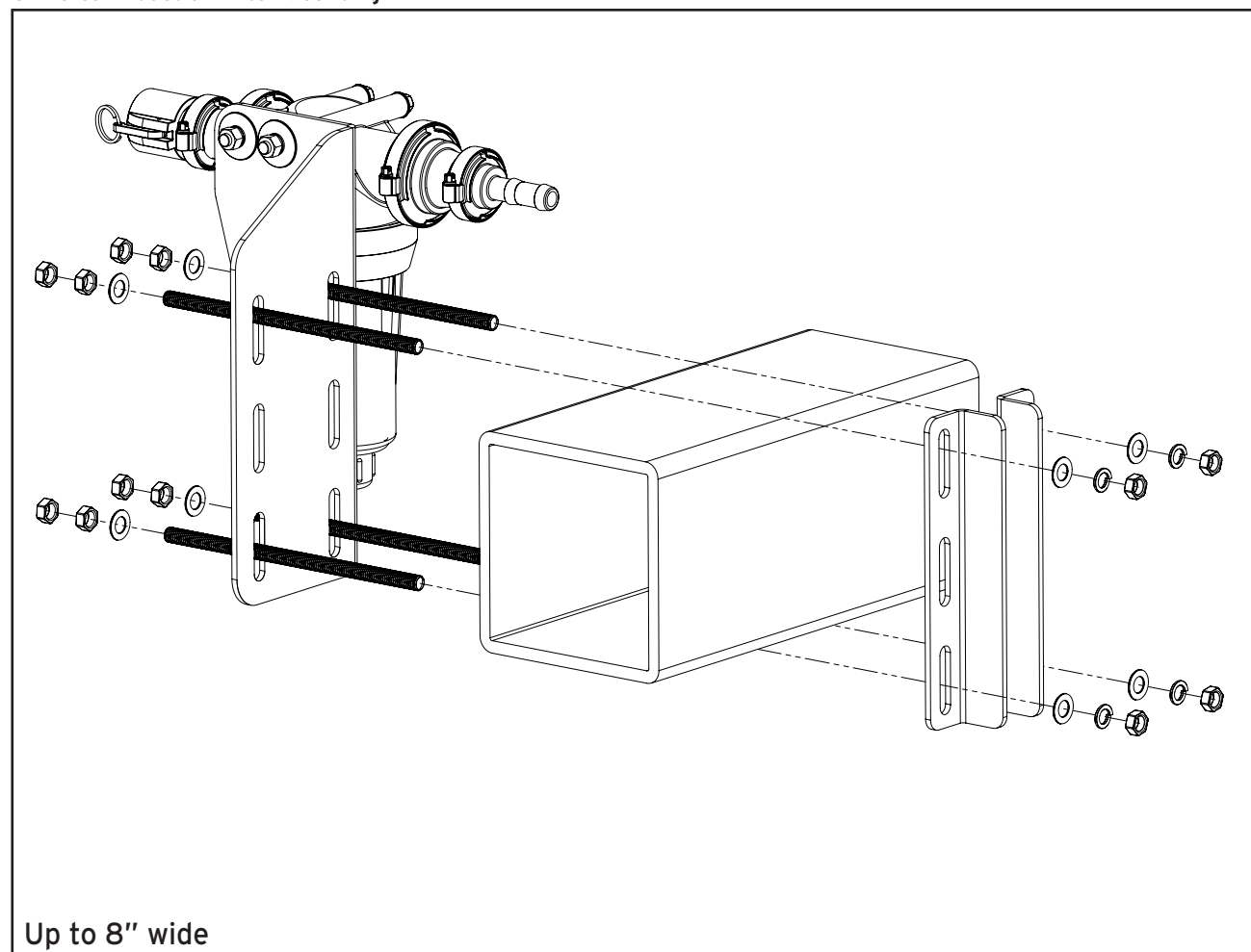
The Induction Filter needs to be mounted on an existing implement such as a tillage bar, Air Tool or Planter. The most suitable location for mounting the module will depend on the implement.

Factors to consider when selecting a mounting location.

- Ensure the location of the Induction Filter does not interfere with functionality of implement. E.g. folding sections, filling bin tanks
- Routing of umbilical line.

Use mounting assembly supplied for installation.

Universal Induction Filter Mounting



MOUNT MANIFOLD ASSEMBLIES

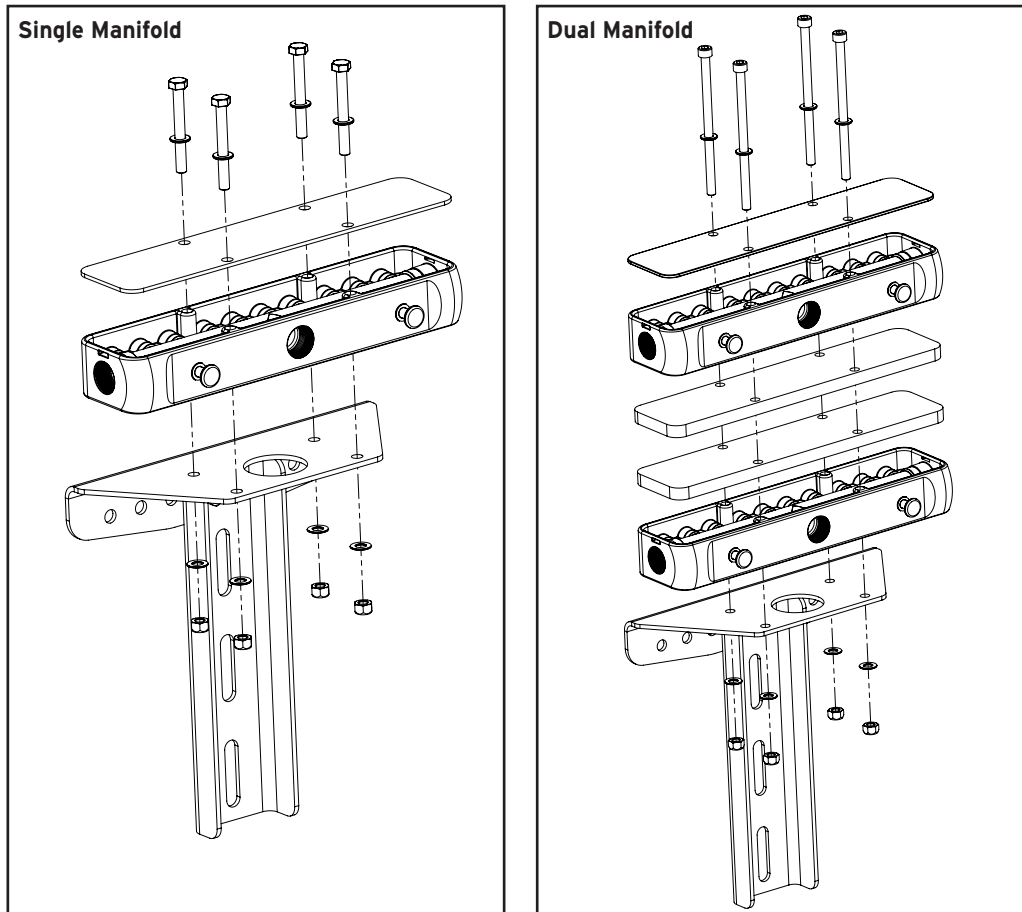
Mount manifold assemblies using brackets provided as shown below.

Refer to configuration layouts on pages 2.5 (single systems) and 2.7 (dual systems).

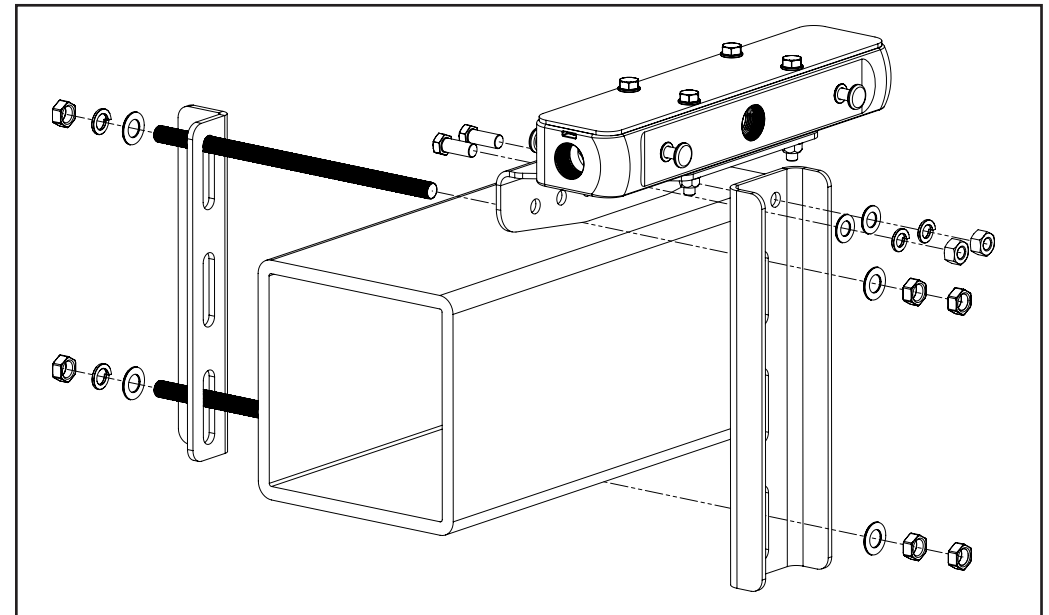
Mounting location Tips:

- Minimise routing distance to openers.
- Ensure folding of implement will not damage the manifold, pressure hose or delivery tube.
- Ensure manifolds and mounting brackets will not interfere with movement of tyne or disc openers.

1. Mount Stacker Manifold to mounting



2. Mount mounting bracket to implement bar.

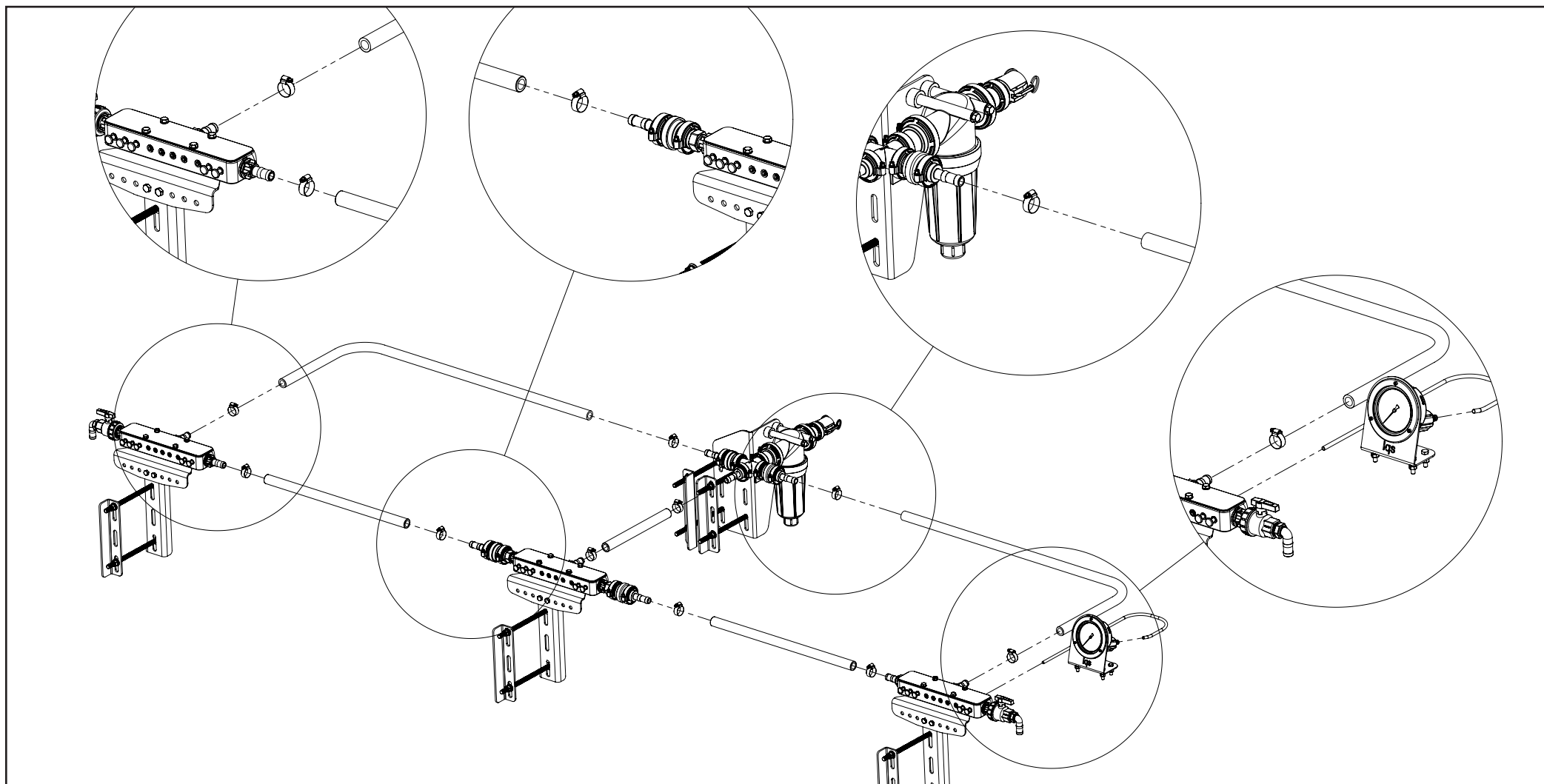


INSTALL PLUMBING

Connect Pressure Hose

1. Route 20mm (3/4") pressure hose from Induction Filter to manifolds and between manifolds as per layout diagram. Ensure hose will not be kinked or crushed when implement folds.
2. Use cable ties supplied to secure hose into place. Attach hose to Induction Filter and manifold hose barbs with hose clamps provided.

NOTE: WHEN CUTTING HOSE ENSURE A STRAIGHT CLEAN CUT.



INSTALL TERMINAL ASSEMBLIES - RESTRICTIVE DEVICE SELECTION

All terminal assemblies require either a Line Meter or a length of Friction Tube. These restrictive devices create a system back pressure that ensures equal application of liquid product at each outlet across the tool bar.

Line Meters are a fixed size orifice that can be used with 8mm push-in fittings. They come in a range of orifice sizes from 0.70 to 2.5 mm.

Friction Tube creates back pressure according to the length of tube used. Longer tube means higher operating pressure.

Friction tube is available in 4 sizes:
5mm OD x 1.2mm ID, 5mm OD x 1.5mm ID, 5mm OD x 1.8mm ID, and 3mm OD x 1.2mm ID.

It is important to install restrictive devices that are suitable for the range of application rates and operating speeds for the intended cropping program to ensure the system is operating at a suitable pressure.

The system operates best at pressures between 1.5 to 4 bar (22 to 58 psi).

NOTE: ONCE RESTRICTIVE DEVICE IS DETERMINED IT MUST BE THE SAME SIZE ID AND LENGTH FOR EACH OUTLET.

Line Meters



Friction Tube



NOTE: Liquids with high viscosity may require a larger size line meter.

INSTALL TERMINAL ASSEMBLIES - RESTRICTIVE DEVICE SELECTION CONTINUED

Different liquid products can flow at very different pressures for the same restrictive device due to differences in viscosity and density.

Calculate range of flow required out of each outlet by using the following formulae. Calculate minimum flow using **lowest** target application rate and **slowest** ground speed required. Calculate maximum flow using **highest** target application rate and **fastest** ground speed required.

Metric

$$\frac{W \times R \times S}{600 \times N} \text{ L/min}$$

- Where:
- W is width of bar in metres
 - R is rate in L/Ha
 - S is operating ground speed in km/h
 - N is number of outlets

US

$$\frac{W \times R \times S \times 128}{495 \times N} \text{ fl-oz/min}$$

- Where:
- W is implement width in feet
 - R is rate in US Gal/Acre
 - S is operating ground speed in MPH
 - N is number of openers

Look up resistance charts to identify Line Meter size or Friction Tube length that is most suitable for the identified flow range and the intended product. Water added to liquid products will normally reduce the operating pressure.
It is better to overestimate friction tube length than cut lengths that are too short.



NOTE: DOWNLOAD OUR FLOW DATA FROM: www.liquidsystems.com.au/technical/flow-charts/

INSTALL TERMINAL ASSEMBLIES

Assemble & Install Terminal Assemblies Install liquid ready points or stainless steel terminal tubes prior to installing terminal assemblies. Whether using liquid ready points or attaching after market or custom stainless steel terminal tubes, consult with an agronomist to determine optimal point of delivery for the liquid products being applied.

Assemble and install terminal assemblies on openers as shown. Each terminal configuration is different. It is important to follow your required assembly closely. Use wrapping guide & cable ties provided to secure assemblies in place.



NOTE: IMPORTANT INSTALLATION TIPS ON PAGE 3.10

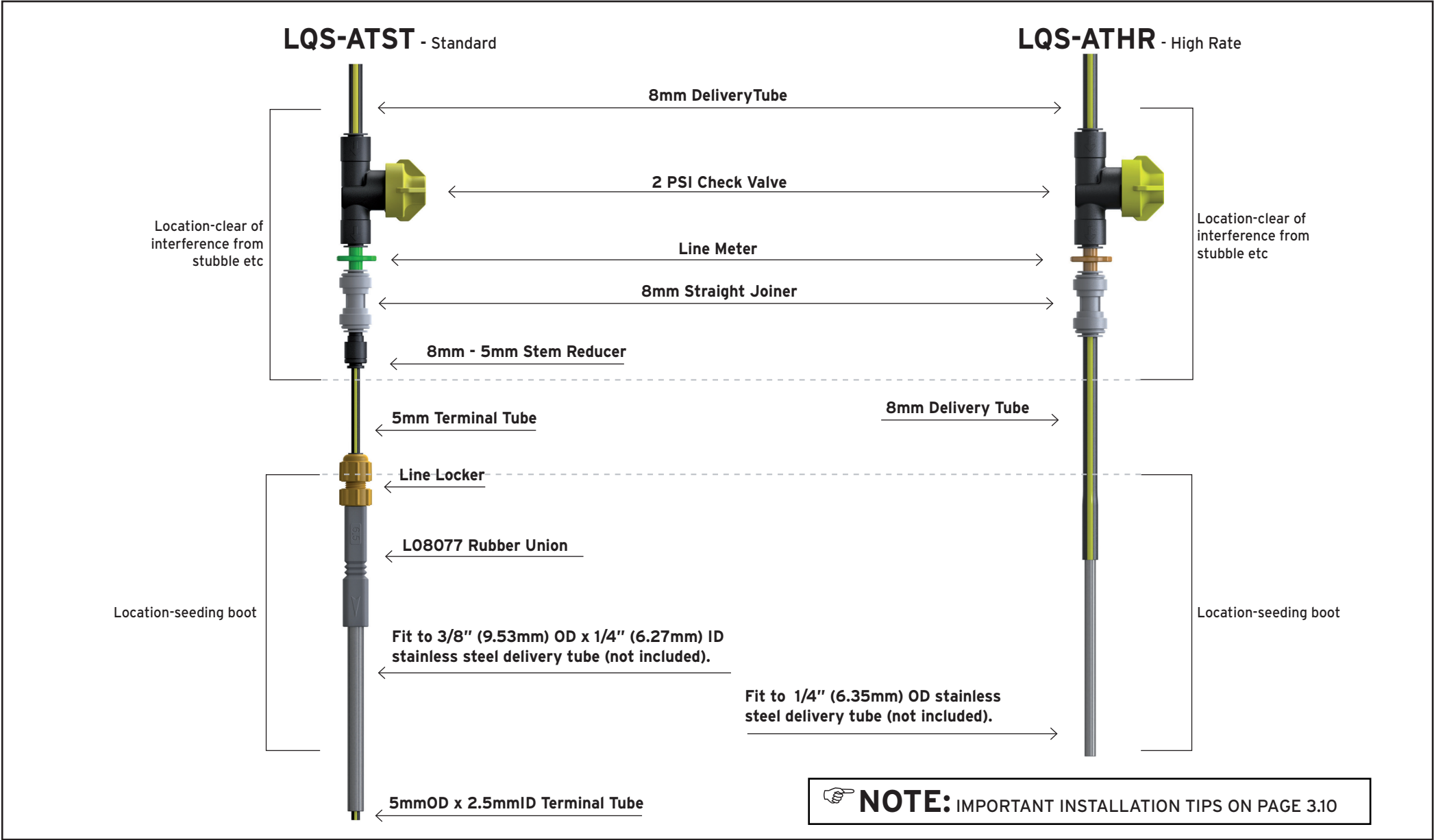


NOTE: DOWNLOAD FULL FLOW CHART GO TO: www.liquidsystems.com.au/technical/flow-charts/

INSTALL TERMINAL ASSEMBLIES

Air Tool Terminal Configurations

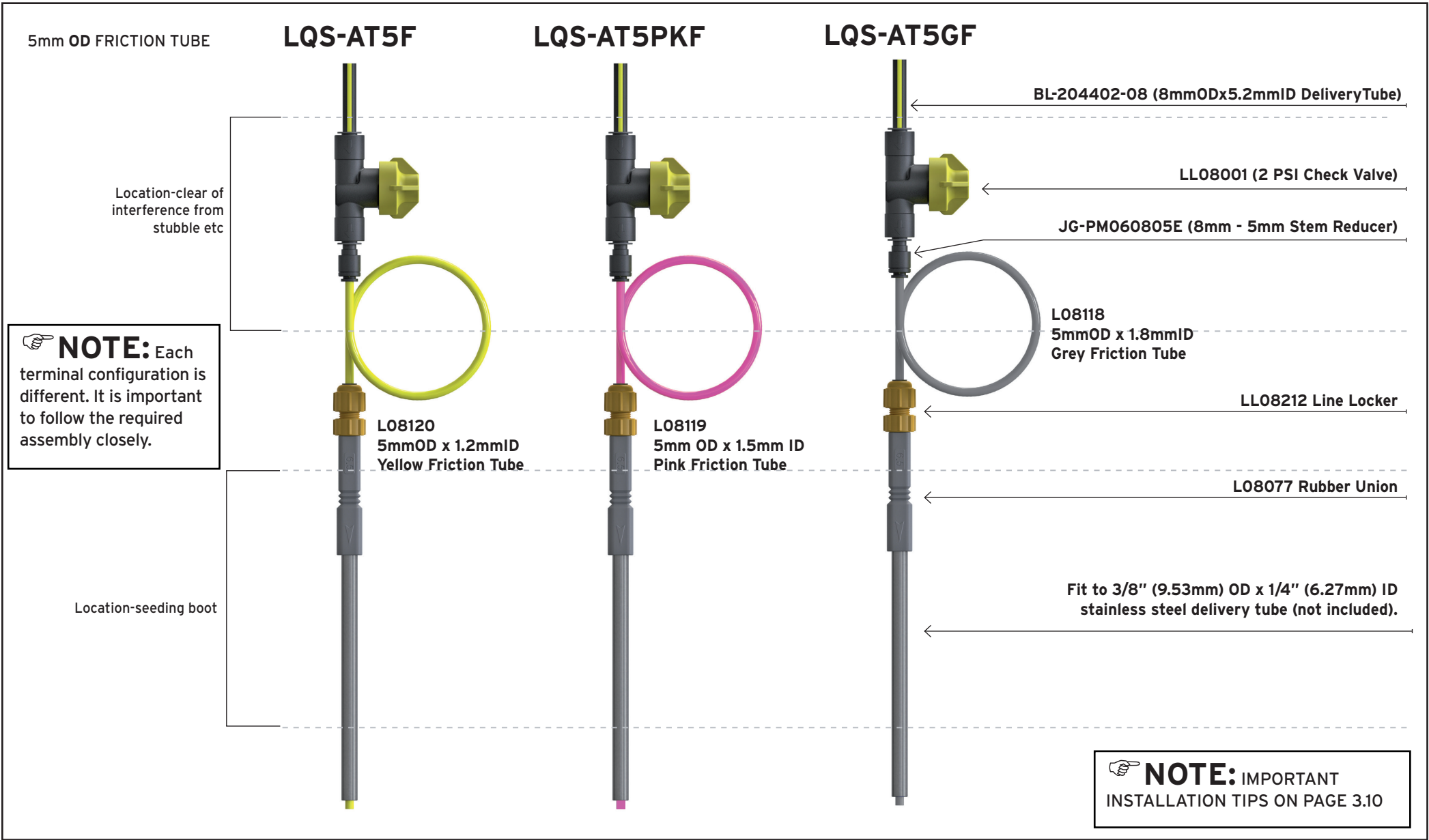
NOTE: Each terminal configuration is different. It is important to follow the required



INSTALL TERMINAL ASSEMBLIES

Air Tool Terminal Configurations

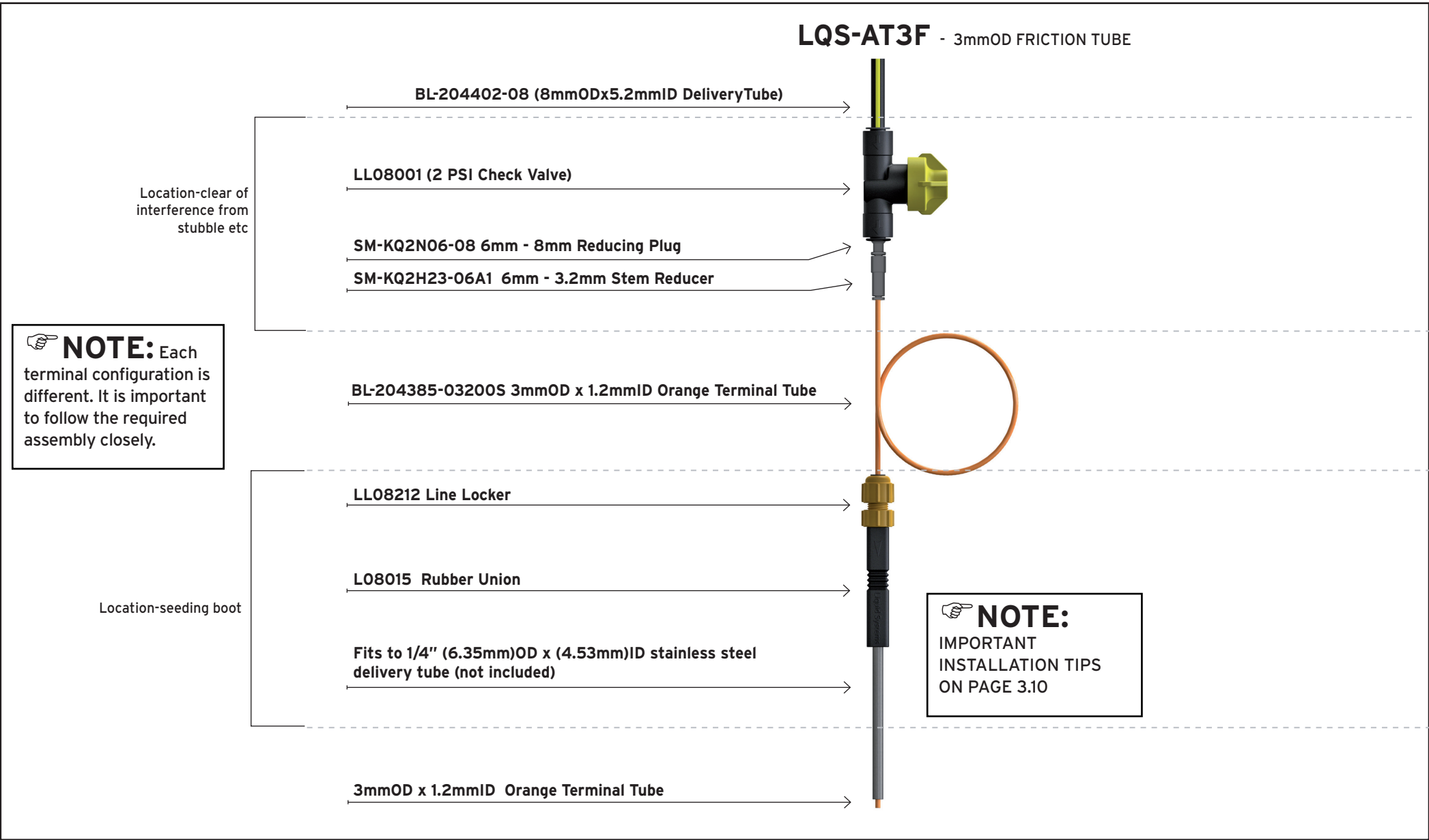
NOTE: TO FIND YOUR TUBE LENGTH DOWNLOAD OUR FLOW DATA FROM:
www.liquidsystems.com.au/technical/flow-charts/



INSTALL TERMINAL ASSEMBLIES

Air Tool Terminal Configurations

NOTE: TO FIND YOUR TUBE LENGTH DOWNLOAD OUR FLOW DATA FROM:
www.liquidsystems.com.au/technical/flow-charts/



INSTALLATION TIPS

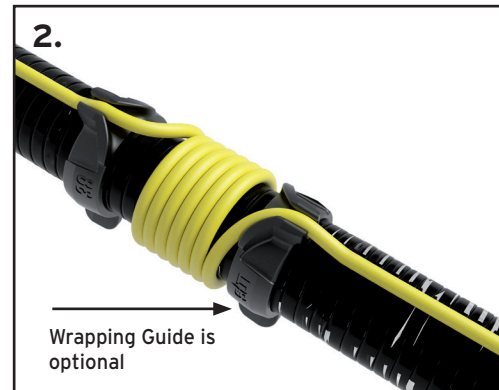
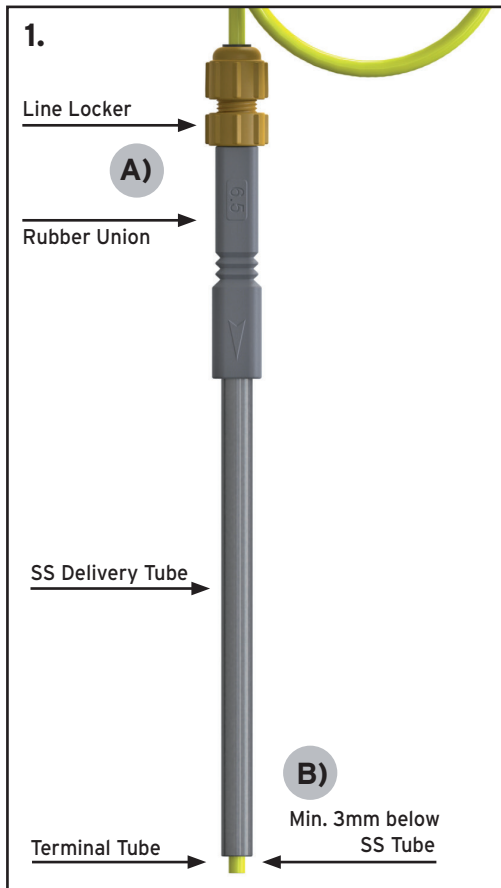
We recommend once you have mounted the manifolds onto bar, start the Terminal Assembly installation from the openers back to the manifolds.

Rubber Union and Line Locker

- **(Image 1.) A)** START with installing the Line Locker into the Rubber Union, next push the rubber union onto stainless steel tube on the opener.

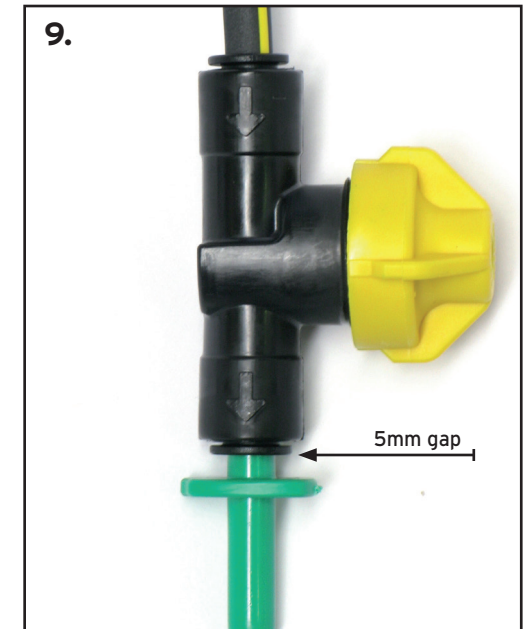
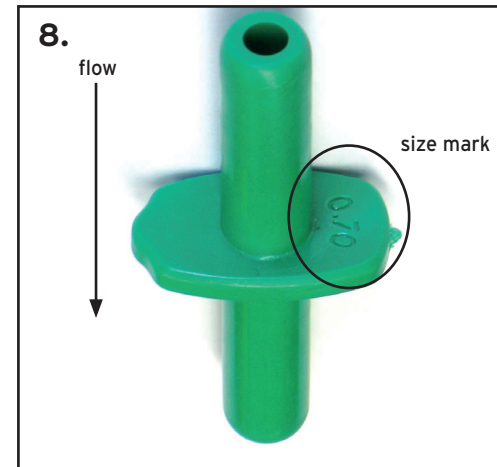
Terminal / Friction Tube

- **(Image 1.) B)** For optimal stream control thread friction tube all the way through line locker and steel delivery tube **3mm below SS Tube**.
- **(Image 2.)** Continue wrapping friction tube up air hose. Use wrapping guide to hold 5mm OD friction tube on air hose for quick tidy placement of friction tube. Wrap or straight placement.



Line Meter

- **(Image 4.)** Fit all line meters in the same direction. Line meter size marking should be on the upstream side of the central tab.
- **(Image 5.)** Leave 5mm gap between central tab and check valve. This makes it easier to use separator tool Type 2 to change line meters.



NOTE: Go to page 3.4 & 3.5 to determine restrictive device is required.

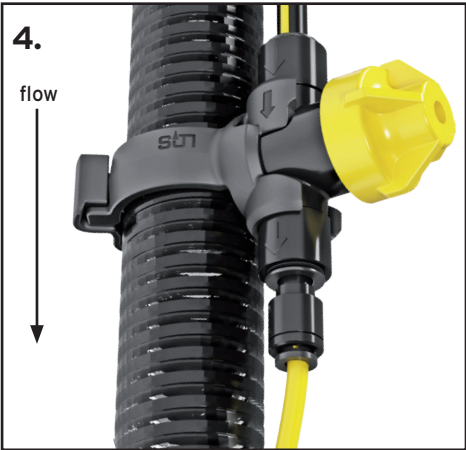
NOTE: ONCE RESTRICTIVE DEVICE IS DETERMINED IT MUST BE THE SAME SIZE ID AND LENGTH FOR EACH OUTLET.

INSTALLATION TIPS



Check Valve

- (Image 3.) Whenever possible, position the Check Valve on the air hose. Install Check Valves at a height that avoids debris but is as close to the opener as possible. This keeps the line charged with liquid, optimizing startup response time. Build up of dirt on the check valve cap will prevent it from functioning correctly.
- (Image 4.) Arrows on Check Valve must point in direction of flow.
- (Image 4.) Use Check Valve Saddle to hold valve firmly in position on air hose.



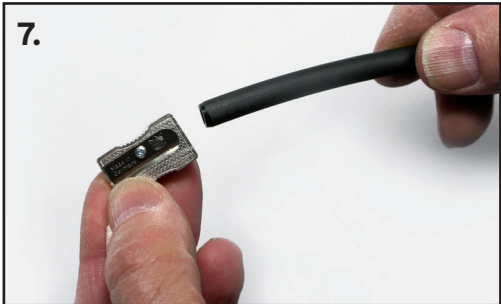
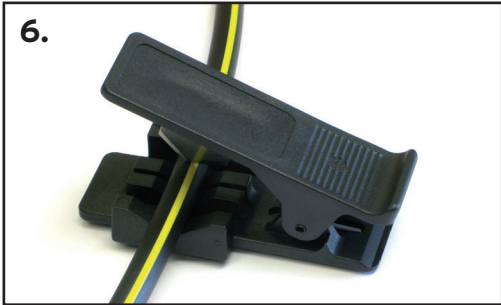
Check Valve Boot

- (Image 5.) Install Check Valve Boot by stretching over check valve cap. Ensure boot is fully expanded by pulling boot out sideways to ping it into shape.



Delivery Tube

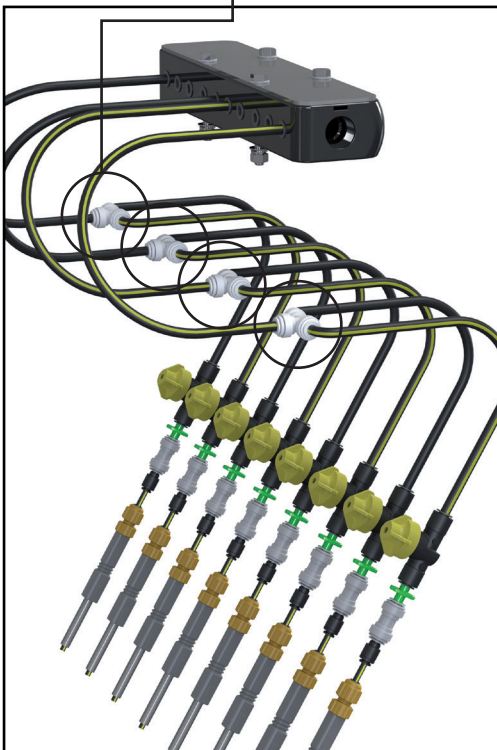
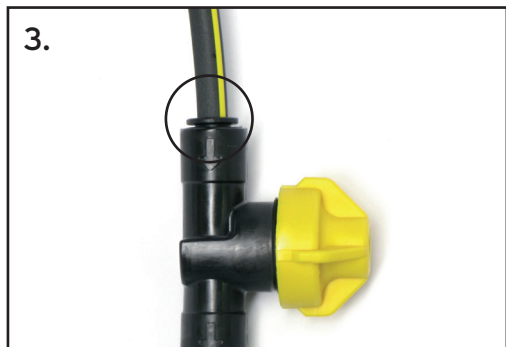
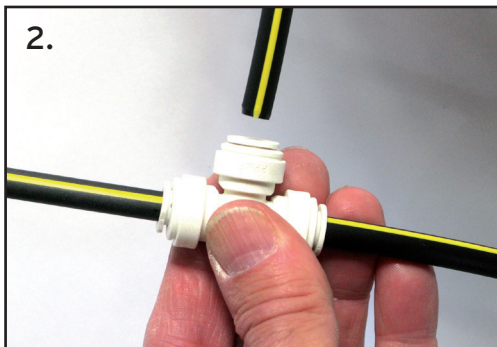
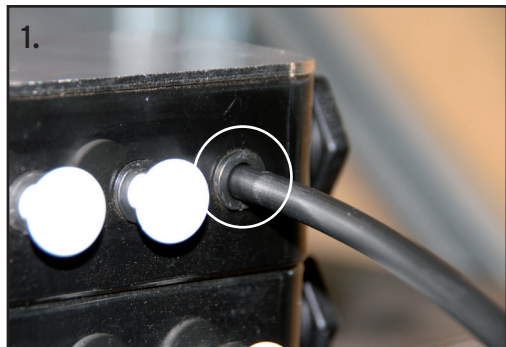
- (Image 6.) Always use tube cutter supplied in Support Kit to cut straight across **delivery tube & terminal tube**. It will ensure clean non distorted tube ends.
- (Image 7.) Chamfer the tube end after cutting using the pencil sharpener provided. (This allows easier fitment into push-in fittings of the Manifold and CheckValve.



NOTE: ALL TIPS ARE OF HIGH IMPORTANCE

ROUTE DELIVERY TUBE

Route 8mm delivery tube from Manifolds to Terminal Assemblies. Use 8mm push-in tees to split flow where required with Air Tool assemblies. (Image 1,2,3.)

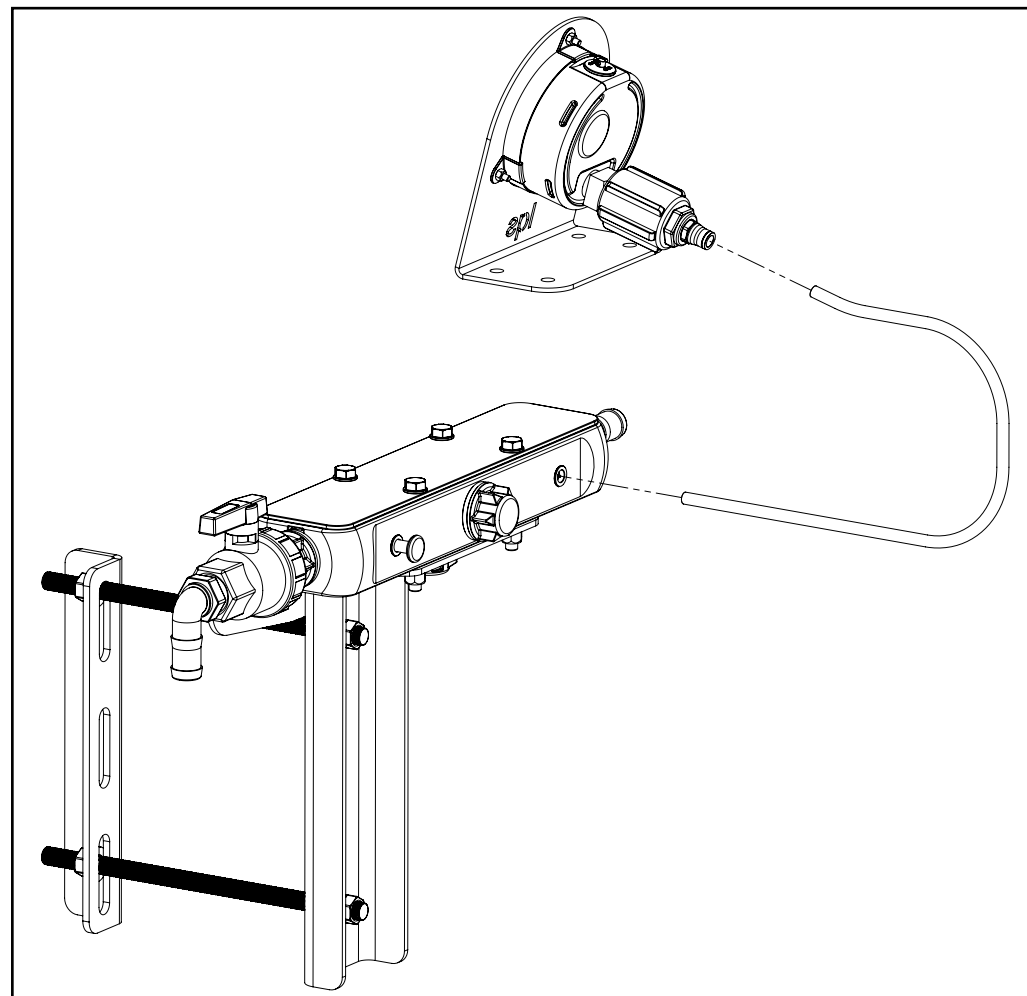


NOTE: Always use tube cutter supplied in Support Kit to cut terminal tube. It will ensure clean non distorted tube ends. Chamfer the tube end after cutting using the pencil sharpener provided. See Installation Tips on

INSTALL PRESSURE GAUGE

Select a suitable mounting location for the gauge so it is visible from the tractor cab.

Use fasteners and bracket provided to mount gauge in chosen location. Connect gauge via 8mm delivery tube to the gauge port on one of the Stacker Manifolds.



FLUSH SYSTEM & CHECK OUTLETS

- Frequency:
- Prior to initial use.
 - When in use, once daily.
 - When the system is to be shut down for an extended period.

More frequent flushing may be required depending on products being applied and operating conditions.

Use your Liquid Systems Rate Control Module to flush the system with clean water. Refer to your Rate Control Module manual for details. For optimal results flush system at a pressure of approx 6 bar. Alternatively flush system with clean water from an external water source.

Check all outlets are working and clear any blockages. (See how to extract line meters correctly on page 4.2)

HYGIENE IS IMPORTANT

- Flush your system daily at the end of use.
- Wash down your bar at the end of use.
- Clean tank prior to storage
- Flush and clean full system at the end of season and before new season use.

CHECK & CLEAN INDUCTION FILTER

Frequency - twice daily when system is in operation.

1. Unscrew filter bowl from body.
2. Inspect and clean/rinse screen. Replace screen if damaged.
4. Check seating of O ring.
5. Replace screen and screw bowl back into place.
6. Apply Vaseline to thread to improve seal and make task easier.

Refer to the spare parts section of this manual for replacement parts.



⚠ WARNING: Liquid will escape from the filter during this process. Ensure suitable protective gloves and clothing are worn when performing this task.

👉 NOTE: HYGIENE IS EXTREMELY IMPORTANT FOR PERFORMANCE

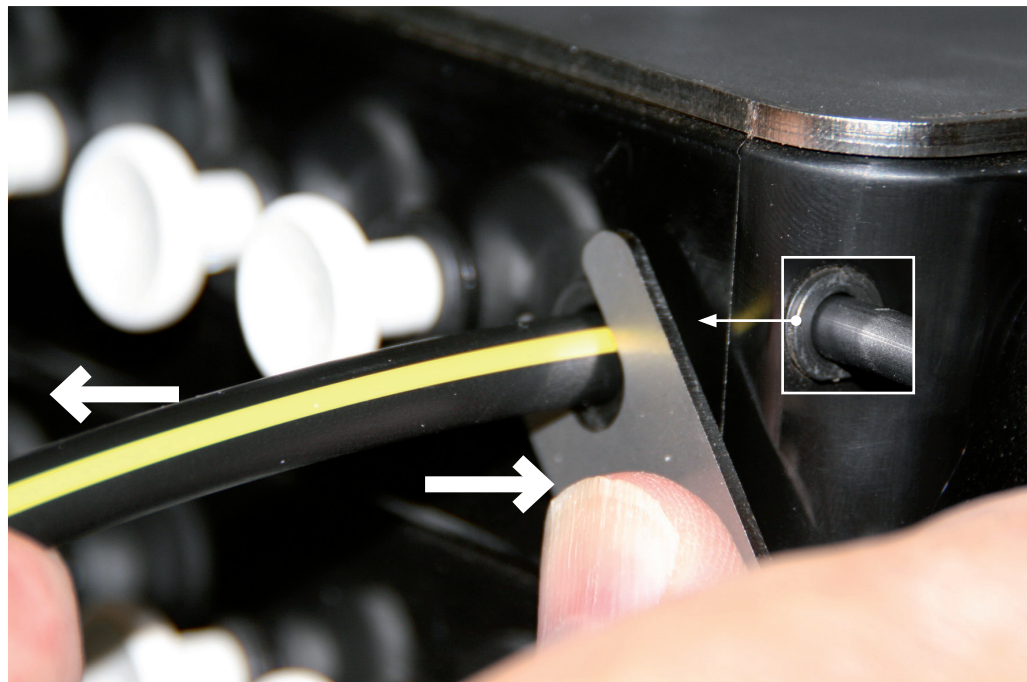
EXTRACTING TERMINAL AND DELIVERY TUBE

The best way to extract tubing from push-in fittings and check valves is to use the extraction tool (Type 1) provided in the support kit.



(Use the Compression Tool to depress the Locking Collets on the STACKER Manifold quick release insert cartridges when inserting or extracting the 8.0mm PE tubing.)

Use the above extraction tool to depress the collet by pushing forward. Pull the tube back while the collet is still depressed. See image below. Inset shows collet.

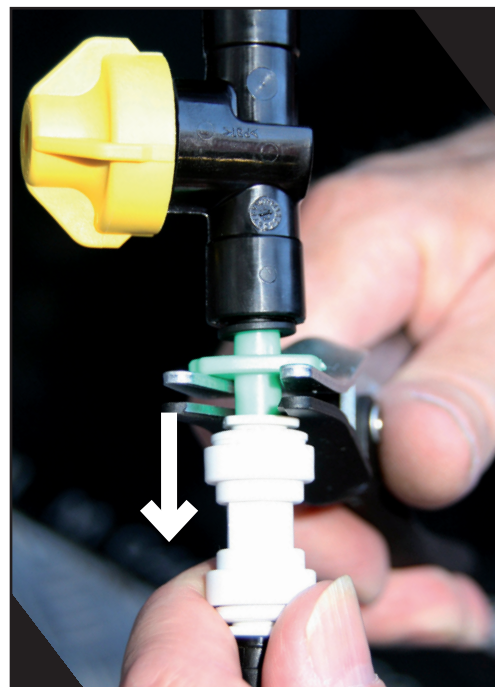


EXTRACTING LINE METERS

When checking line meters, the best way to extract them from push-in fittings and check valves is to use the extraction tool (Type 2) provided in the support kit.



Insert tool between line meter tab and push-in fitting or check valve. Squeeze handles to depress the collet of the push-in fitting and release line meter.



⚠ WARNING: Failing to depress collet when removing tube or line meter will damage the manifold or fitting.

PROBLEM	POSSIBLE CAUSE	RESOLUTION
System pressure is too low. i.e. < 0.5bar (< 7psi)	Output rate is too low to produce reasonable pressure with the line meters in use.	Replace line meters with a smaller size. Increase operating speed. Dilute liquid product and apply at a higher rate.
	Flow meter calibration may be incorrect.	Recalibrate flow meter of rate control system.
Sudden drop in system pressure.	Some part of the Stacker system has been damaged and is leaking	Stop product application immediately. Check for leaks while doing a system flush.
System pressure is too high.	Outlets have become blocked.	Perform system flush and check for blocked outlets.
	Line meter orifice size is too small for the rates being applied.	Replace installed line meters with line meters with a larger orifice size.
	Flow meter calibration may be incorrect.	Recalibrate flow meter of rate control system.
	Induction filter has become blocked and needs cleaning.	Unscrew body of induction filter, clean filter screen and replace.
Liquid continues to dribble out of some outlets when liquid application is switched off.	Check valves aren't functioning correctly.	Remove cap on check valve. Clean cap thoroughly to remove any dirt build up. Check valve diaphragm is intact and replace if damaged. If valve spring is not functioning correctly, replace cap.

PART	PART NO.	DESCRIPTION
	BJ-FC100	1" Flange Clamp
	BJ-M100G	1" EPDM Gasket ('O' ring)
	JG-PPM0208W	Equal Tee 8mm
	JG-PPM0408W	Equal Joiner 8mm
	JG-PPM0808W	Plug 8mm
	JG-PM060804E	Stem Reducer 8-4mmOD
	JG-PM060805E	Stem Reducer 8-5mm OD
	JG-PM060806E	Stem Reducer 8-6mm OD
	JG-PM0610080E	Stem Reducer 10-8mm OD
	BJ-M100075BRB	1" Flange x 3/4 " Hose Barb
	JG-5-16SCV	5/16" Single Check Valve





PART	PART NO.	DESCRIPTION
	JG-PM2308E	8mm Two Way Divider
	JG-PM2310E	10mm Two Way Divider
	JG-PM1210E	10mm Bulkhead Connector
	BJ-M100075FPT	1" Flange x 3/4" Female Thread
	BJ-MCV100	1" Flanged Check Valve
	JG-PPMSV040808W	8mm Shut-off Valve
	BJ-UV075FP	3/4" Single Union Ball Valve
	LL08001	In Line Check Valve
	L08050	Check Valve Elastomer Boot
	TJ-21950-2-NYB	TeeJet 2 PSI End Cap
	L08114	LQS CV Viton Diaphragm

PART	PART NO.	DESCRIPTION
	BJ-HB075-90	90° Elbow 3/4" Male Thread x 3/4" Hose Barb
	BJ-HBT075	3/4" Hose Barb Tee
	LQ-LM070GRN	0.70mm Green Line Meter
	LQ-LM085BLU	0.85mm Blue Line Meter
	LQ-LM100PUR	1.0mm Purple Line Meter
	LQ-LM110ORN	1.1mm Orange Line Meter
	LQ-LM120YEL	1.2mm Yellow Line Meter
	LQ-LM130WHI	1.3mm White Line Meter
	LQ-LM150PNK	1.5mm Pink Line Meter
	LQ-LM170BLK	1.7mm Black Line Meter
	LQ-LM210BRN	2.1mm Brown Line Meter
	LQ-LM250GRY	2.5mm Grey Line Meter
	LL08212	Line Locker

PART	PART NO.	DESCRIPTION
	L08077	6.5mm V5 Rubber Union to suit 9.53mm (3/8") SS Tube end 8.75 ID -- Linelocker end 8.9 ID
	L08015	6.35mm (1/4") V3 Rubber Union to suit 6.35mm (1/4") SS Tube end 6.2 ID -- Linelocker end 8.9 ID
	L08016	5mm V4 Rubber Union to suit 9.53mm (3/8") SS Tube end 8.75 ID -- Friction Tube end 5.2 ID
	JG-TSNIP	Tube Cutting Tool
	CF-70843	Line Meter Pliers
	LQ-COM-0013-SM	Separator (Compression) Tool
	TJ-AAB126ML-F75-80	F75-80 Flange Strainer BSPT 80 Mesh Filter Screen
	TJ-CP15941-3-SSPP	50 Mesh Filter Screen for AA126 Line Strainer
	TJ-CP15941-4-SSPP	80 Mesh Filter Screen for AA126 Line Strainer
	TJ-CP15941-5-SSPP	100 Mesh Filter Screen for AA126 Line Strainer

PART	PART NO.	DESCRIPTION
	LL08003	Manifold
	L08005	Stainless Steel Manifold Lid
	L08066	Manifold Spacer Plate 12mm
	L08071	Manifold Fitting Gasket Seal
	LL08201	3/4" Barb Fitting
	LL08202	3/4" Plug Fitting
	LL08203	3/4" Nipple Fitting
	LQ-LIQ21	3/4" BSP Plug
	L08023	Manifold Mounting Bracket
	L08025	Manifold Landing Plate
	L08029	Manifold Adaptor Bracket

PART	PART NO.	DESCRIPTION
	LL08080	Stacker Pressure Gauge Assembly
	BL-204402-08100	Delivery Tube 8mm OD x 100m Black/Yellow tube
	BL-204402-08200	Delivery Tube 8mm OD x 200m Black/Yellow tube
	BL-204390-200R	Terminal Tube 5mm x 2.5mm LLDPE Black/Yell
	L08120	Terminal Tube 5mm x 1.2mm LLDPE Yellow
	L08119	Terminal Tube 5mm x 1.5mm LLDPE Pink
	L08118	Terminal Tube 5mm x 1.8mm LLDPE Grey
	BL-204385-03200R	Terminal Tube 3mm x 1.2mm LLDPE Orange
	PR-T006.3BASA	6.35 x 0.91 SS Seamless Tube
	PR-T009.5DASA	9.53 x 1.63 SS Seamless Tube

PART	PART NO.	DESCRIPTION
	L08109	Air Hose 38-39mmOD wrapping guide - fit 5mmOD tube
	L08112	Adaptor Sleeve -fit Air Hose 31-32/39mmOD
	LL08311	Check Valve Saddle - fit Air Hose 38-39mmOD
	CF-M12X250 304 SS	M12X250 304 SS All Thread

