



DELTA-MIG[®]
Instruction Manual

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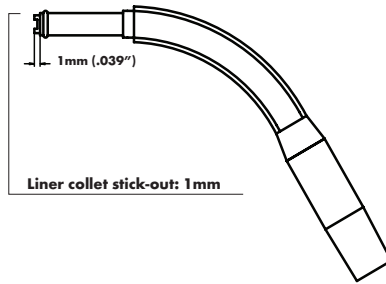
Installation of neckliners for slip-on and threaded nozzle swannecks.

Note: Neckliners are optional except on flex necks.

If replacing an existing neckliner:

1. Remove the swanneck.
2. Remove the old neckliner and measure its length.
3. Carefully cut the new neckliner to the same length as the old liner with a pair of sharp cutters.
4. Check to ensure that there are no burrs or obstructions to the inner diameter of the Liner.
5. Insert the cut liner into the swanneck. When cut and installed correctly, the neckliner should stick out approximately 1 mm (.039") without being held in. When pushed in, the neckliner should be flush with the end of the neck.
6. Replace the swanneck on the gun body in the preferred position and tighten the swanneck locking screw, which is located under a plastic plug on the right handle half.

Note: The factory torque setting is 64 inch lbs.



If installing a neckliner into a new swanneck or swanneck without old neckliner for measuring length:

1. Fit the consumables (diffuser/insulator, tip-holder, contact tip, nozzle) onto the swanneck.
2. Insert the neckliner into the swanneck as far as it will go.
3. Measure the length of liner sticking out from the back of the swanneck and subtract 1 mm (.039"). (When cut and installed correctly, the neckliner should stick out approximately 1 mm (.039") without tension).
4. Remove the liner and measure the length from step 3 back from the inserted end and mark carefully. With a pair of sharp cutters cut off excess liner.
5. Check to ensure that there are no burrs or obstructions to the inner diameter of the liner.
6. Insert the liner into the swanneck, fit the swanneck into the gun body in the desired position and tighten the swanneck locking screw, which is located under a plastic plug on the right handle half.

Note: The factory torque setting is 64 inch lbs.

Installation of insulated steel liners in Euro or direct mount guns without neckliners.



1. Lay the torch out straight and remove the nozzle and contact tip.
2. Remove the liner retaining nut at the wire feed end of the torch, remove the old liner if fitted.
3. Check that the new liner has no kinks in it.
4. Gently feed the liner through the cable assembly from the machine end of the torch, taking care not to kink it in the process.
5. With the liner collect fully seated in the rear connection, replace the liner retaining nut.
6. At the front end of the torch, the liner will now protrude from the tip holder.
7. Cut the liner flush with the tip holder.
8. Remove an additional two coils from the liner (approx. 2mm)
9. Check to ensure there are no burrs or obstructions in the inner diameter of the liner.
10. Reinstall the contact tip and nozzle
11. The torch is now ready to be fitted to the wire feeder.

Note: If using a pass through style liner you will need to trim the rear liner as close to the drive rollers as possible.

Installation of insulated steel liners in torches fitted with neckliners.



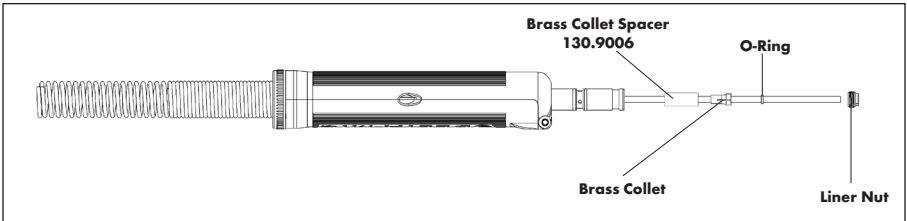
Cut off flush with handle.

Note: When using sizes 2.0mm - 2.4mm (.078" to .094"), no neckliner is available and the cable liner must be ran up to the contact tip. See instructions for installing liners in guns without neckliners.

1. Lay the torch out straight and remove the swanneck.
2. Remove the liner retaining nut at the wire feed end of the torch and remove the old liner if fitted.
3. Check that the new liner has no kinks in it.
4. Gently feed the liner through the cable assembly from the machine end of the torch, taking care not to kink it in the process.
5. With the liner collect fully seated in the rear connection, replace the liner retaining nut, but hand tighten only.
6. At the front end of the torch, the liner will now protrude from the handle.
7. Cut the liner flush with the handle (see diagram above).
8. Remove the liner retaining nut and pull the liner back out of the torch.
9. At the front end of the liner, cut off an additional 38mm (1.5")
10. Check to ensure there are no burrs or obstructions in the inner diameter of the liner. Reinsert the liner into the rear of the torch and tighten the liner retaining nut with a wrench.
11. Reseat the swanneck into the torch body, adjust to the preferred position and tighten the locking screw in the side of the handle.
12. The torch is now ready to be fitted to the wire feeder.

Note: If using a pass through style liner you will need to trim the rear liner as close to the drive rolls as possible.

Installation of Combi liners for aluminum/stainless steel in direct mount guns without neckliners.



1. Lay the torch out straight and remove the liner retaining nut at the wire feed end of the torch cable. Remove the existing gun and swanneckliner if fitted.
2. With the neck installed, gently feed the Combi liner through the cable assembly until the liner bottoms out at the contact tip.
3. At the machine end of the torch, slide the brass collet spacer P/N 130.9006, brass collet and O-ring, over the liner until they are seated in the rear connection.
4. Install the proper liner nut which is supplied in the connector kit. This is the nut with the large hole for the liner to exit through. Do not over tighten the nut as this can result in wire feed problems.

DO NOT CUT EXCESS LINER YET!

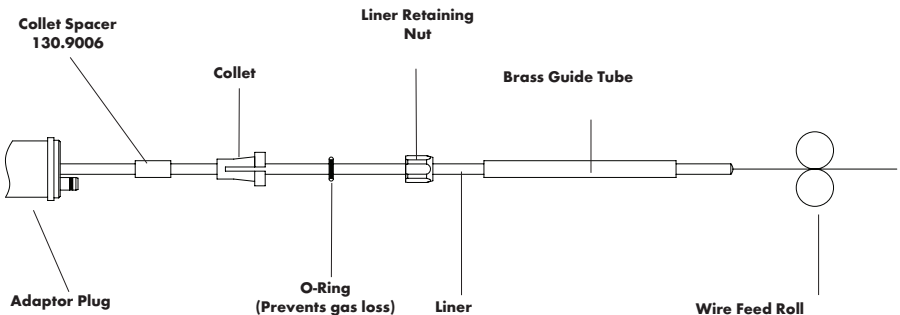
5. With the PTFE liner still protruding from the rear of the torch; feed the torch into the feeder mounting block. Using a sharp tool, cut the liner so that it butts up to the drive rolls. This will provide the needed support for the wire immediately after it exits the drive rolls. If the liner is trimmed correctly, and the wire hub tension is set properly, "bird-nesting" in the event of a wire jam will be reduced.
6. Secure torch rear end into the feeder's mounting block by the method used by the feeder manufacturer (normally a set screw).
7. After confirming that the feed rolls are the correct size and type for the wire being used, and that the wire is fed into the liner correctly, back off the wire feed roll pressure until the feed rolls no longer feed the wire, then retighten slightly. Be cautious as too much pressure will deform soft wire such as aluminum and cause the wire to jam in the contact tip. To help prevent wire deformation, a U-groove feed roll is better than a V-groove feed roll for soft wires.
8. Aluminum wire requires a contact tip with greater clearance than that used for steel. Binzel tips designed for aluminum wire start with P/N 141.xxxx.

Installation of Combi liners for aluminum/ stainless steel in Euro Quick-Connect guns:

1. Lay the torch out straight and remove the liner retaining nut at the wire feed end of the torch cable. Remove the existing gun and neckliner if fitted.
2. With the neck installed gently feed the PTFE liner through the cable assembly until the liner bottoms out at the contact tip.
3. Refer to the diagram below: At the adapter block end of the torch cable, slide the brass collet spacer 130.9006, brass collet and O-Ring, over the liner until they are located in the recess in the adapter block; replace the liner retaining nut.

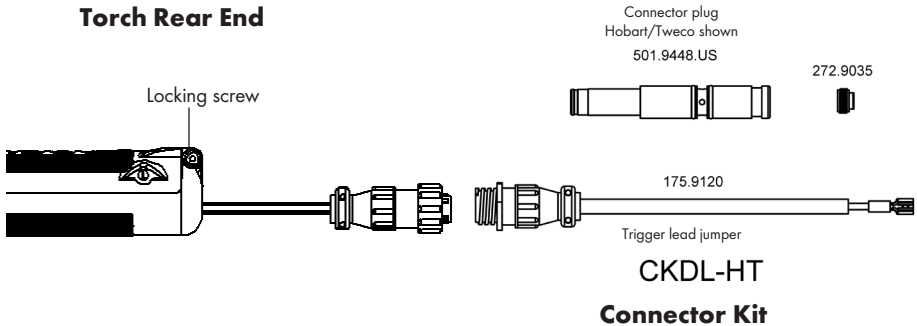
DO NOT CUT THE LINER YET!

4. If the wire feeder was previously set up for steel wire, it may be necessary to take a pair of long-nosed pliers and remove the steel inlet guide from the central adapter installed in the front face of the wire feed unit.
5. With plastic liner still protruding from the Euro adapter, feed the liner through the inlet of the central adapter kit until the adapter block on the torch is butted against the central adapter kit. Fasten into position with the plastic adapter nut. Cut the liner, using a sharp knife, so that it butts up to the drive rolls, thereby supplying support to the soft wire immediately after it exits the drive rolls. If this is done correctly, "bird-nesting" in the event of a wire jam will be reduced.
6. Remove the welding gun from the machine and ensure that the brass guide tube is 3mm (.118") shorter than the protruding plastic liner (if not, cut accordingly). Slide the guide tube over the liner and feed the liner (with the guide tube fitted) into the inlet in the central adapter. Continue to feed through until the adapter plug is butted against the central adapter, then tighten the plastic adapter nut.
Note: PTFE liners with a diameter of 4.7mm (.185") or larger do not require a guide tube. (See diagram below for correct location of parts).
7. After confirming that the feed rolls are the correct size and type for the wire being used, and that the wire is fed into the liner correctly, back off the wire feed roll pressure until the feed rolls no longer feed the wire, then retighten slightly. Be cautious as too much pressure will deform soft wire such as aluminum and cause the wire to jam in the contact tip.



Assembly instructions for feeder connector kits.

Torch Rear End




1. Insert the connector plug into the rear of the torch (the connector plug may differ from the one shown).
2. Tighten the locking screw in the side of the rear support with the Allen key provided.
Note: The factory torque setting is 64 inch lbs.
3. Connect the appropriate end of the trigger lead jumper supplied in the kit to the connector exiting the torch (the trigger lead may also differ from the one shown).
4. Install the gun liner supplied with the torch as per the liner installation instructions on pages 5-6.
5. The torch is now ready to be installed into the feeder. Finally, hook up the trigger connector, and gas hose (if equipped) on the feeder side.

DELTA-MIG® 3 Threaded Nozzle: Consumable Combinations

Wire Size/ Type	Contact Tip P/N	Tip Holder P/N	Nozzle P/N	Neckliner P/N	Cable Liner P/N
.035/Steel	140.0214	H3T-8-C	N3T-R-62	*NLS-3545	SI4-3545-17PT
.040/Steel	140.0313	H3T-8-C	N3T-R-62	*NLS-3545	SI4-3545-17PT
.045/Steel	140.0442	H3T-8-C	N3T-R-62	*NLS-3545	SI4-3545-17PT
.052/Steel	140.0533	H3T-8-C	N3T-R-62	*NLS-5262	SI4-5262-17PT
.062/Steel	140.0587	H3T-8-C	N3T-R-62	*NLS-5262	SI4-5262-17PT
.035/Aluminum	141.0043	H3T-8-C	N3T-R-62	N/A	128.9047
.040/Aluminum	141.0008	H3T-8-C	N3T-R-62	N/A	128.9047
.045/Aluminum	141.0015	H3T-8-C	N3T-R-62	N/A	128.9047
.052/Aluminum	141.0055	H3T-8-C	N3T-R-62	N/A	128.9050

DELTA-MIG® 4 Threaded Standard: Consumable Combinations

Wire Size/ Type	Contact Tip P/N	Tip Holder P/N	Nozzle P/N	Neckliner P/N	Cable Liner P/N
.035/Steel	140.0214	H4T-8-C	N4T-62	*NLS-3545	SI4-3545-17PT
.040/Steel	140.0313	H4T-8-C	N4T-62	*NLS-3545	SI4-3545-17PT
.045/Steel	140.0442	H4T-8-C	N4T-62	*NLS-3545	SI4-3545-17PT
.052/Steel	140.0533	H4T-8-C	N4T-62	*NLS-5262	SI4-5262-17PT
.062/Steel	140.0587	H4T-8-C	N4T-62	*NLS-5262	SI4-5262-17PT
.078/Steel	140.0653	H4T-8-C	N4T-62	N/A	SI4-7894-17PT
.094/Steel	140.0677	H4T-8-C	N4T-62	N/A	SI4-7894-17PT

 - Factory standard set up for that wire size/type.

* Neckliners are optional and are not included from the factory.

TROUBLESHOOTING: POROSITY (SUMMARY)

Causes of Porosity	Possible Solutions
Base Metal Contamination	
Impurities on base metal	a. Remove contamination ; clean surfaces b. Use specific wire/gas mix for specific types of impurities
Filler Metal Contamination	
Impurities on filler metal (wire)	a. Replace wire b. Install wire-cleaning system c. Prevent industrial dust/dirt/grit from contaminating wire during storage or use d. Prevent build up of aluminum oxide on exposed aluminum wire surface by using quickly, or storing. e. Remove wire from wire drive unit and store in a sealed plastic bag when not in use for long periods.
Atmospheric Contamination	
Drafts, wind, fans, etc.	a. Protect weld from drafts (curtains/screens) b. Use tapered or bottleneck gas nozzles when drafts cannot be avoided.
Gas, Mixing Apparatus	
Too high gas flow, causing turbulence and/or sucking air at hose connections; creating venturi effect at end of gas nozzle.	a. Reduce gas flow b. Tighten all hose connection points
Too low gas flow, casing insufficient gas coverage	Increase gas flow
Damaged or kinked gas lines	Repair or replace
Too high oxygen content	Adjust mixer
Leaks in gas distribution system	Repair leaks
Other impurities in gas - moisture, etc.	Overhaul system; fit filters and/or dryers
Inconsistent gas flow (cfh) at the torch connection	Regulate pressure into flow meter for consistent cfh delivery of gas
Gas Turbulence	
Excessive spatter build-up in gas nozzle and contact tip	Clean nozzle and tip regularly; spray with anti-spatter fluid
Nozzle damage, causing uneven gas coverage	Replace nozzle
Torch gas ports clogged or deformed	Clean or replace
Super-heated nozzle, causing shielding gas to expand rapidly and create return effect at end of nozzle. Results in contamination of gas by atmosphere.	Check duty cycle rating of torch
Gas diffuser/nozzle insulator missing	Replace
Too high gas flow causing venturi effect	Reduce gas flow
Welding Parameters, Etc.	
Too long wire stick out; gas nozzle too far from weld puddle	Use longer nozzle or adjust stick-out (3/8" minimum or 15 times wire diameter)
Bad torch position - too sharp torch incline causing venturi effect at end of nozzle leading to atmospheric contamination	Correct torch angle
Excessively wide weld pool for nozzle I.D.	Width of the weld pool should be 1.3 times nozzle I.D.; use suitable wider gas nozzle
Arc voltage too high	Reduce voltage
Too high travel speed	Reduce speed

Note: Most POROSITY is caused by gas problems, followed by base metal contamination

TROUBLESHOOTING: GENERAL GUIDE

Problems/Causes	Possible Solutions
Erratic Wire Feed	
Slipping feed rolls	Check that the feed roll size is correct for the wire size being used. Increase the drive roll pressure until the wire feed is even. Do not apply excessive pressure as this can damage the wire surface, causing copper coating to loosen from steel wires or metal shavings to be formed from soft wires like aluminum. These metal fragments or shavings can be drawn into the wire feed conduit and will rapidly clog the gun liner. When welding with flux-cored wires, excessive drive roll pressure may open the wire seam and allow flux or metal powders to escape.
Clogged or worn gun liner	Dust, particles of copper, drawing lubricants, metal or flux and other forms of contamination can all clog the gun liner so that the wire feed is slowed or impeded. A liner that has been in use for an extended period of time becomes worn and filled with dirt and must be replaced.
	When changing the welding wire, remove the swanneck from the front end of the gun and blow out the gun liner with clean, dry compressed air from the back of the gun. Repeat with the neckliner. <i>Note: Wear safety goggles when using compressed air to clean the liners. Make sure proper safety procedures are followed in order to avoid possible serious eye injury.</i>
Liner too long or too short	Check the lengths of the neck and gun liners and trim or replace if too long or too short. The efficient feeding of the welding wire is dependent on the liners fitting correctly. Consult the liner installation instructions on pages 4-7 or contact your local Authorized ABICOR Binzel Distributor for additional help.
Spatter on wire	An unprotected coil of wire quickly collects dust and other airborne contamination. If grinding is being performed in the vicinity, particles can become attached to the wire, severely interfering with the wire feed. Replace with clean wire and keep it protected with a cover. Make sure spare wire rolls are stored in a clean, dry place.
Coil brake incorrectly adjusted	Set the brake so that the coil immediately stops rotating as soon as welding is interrupted. If the brake is applied too hard it will cause the feed rolls to slip, resulting in uneven wire feed. If it is too loose, overrun of the wire will occur, causing wire tangles, inconsistent tension on the feed mechanism and irregular arc characteristics.
Unstable Arc	
Incorrect setting of voltage and/or current	Set the wire feed in relation to the arc voltage in such a way that the arc is stable and burns evenly. In spray arc welding, set the wire feed so that there are no short circuits and the filler metal is transferred in a spray across the arc.
Problems in wire feeding	Find the cause of the interference and correct it. (See above)
Worn contact tip	When the internal diameter of the contact tip becomes worn from the passage of wire through it, the wire may no longer stay in continuous electrical contact with the tip. This results in an unstable arc and an increase in spatter.
Impurities on the base metal	Paint, mill scale, silicon scale, rust or flux deposits from previous weld runs may form an insulating layer causing an unstable arc. Clean the surfaces to be welded.
Poor contact between ground cable and work-piece	Securely attach the ground cable as close to the point of welding as possible on the work-piece. Clean the surfaces thoroughly to ensure good contact.
Loose power connection	Check to insure the welding power connection on the power source is tight, the connection on the wire feeder is tight, the connection to the adaptor block is tight, and the connection of the gun to the adaptor block is tight.
Stick-out too long	Adjust the contact tip to work distance to a minimum of 9.5mm (3/8") for short arc welding. A more precise distance is 15 times the wire diameter.

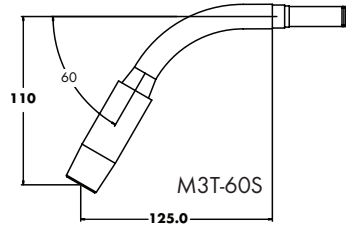
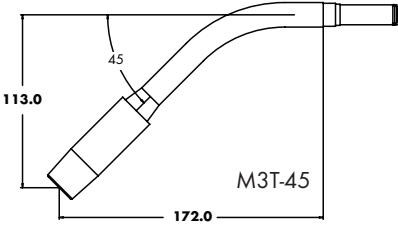
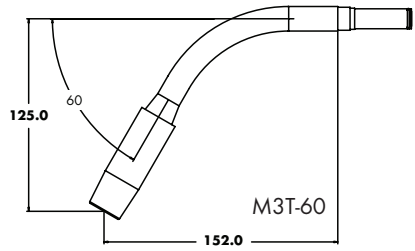
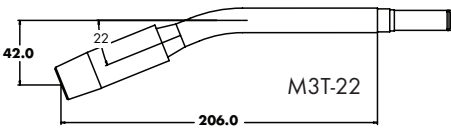
TROUBLESHOOTING: GENERAL GUIDE

Problems/Causes	Possible Solutions
Spatter	
Too fast or too slow wire feed for the arc voltage	Set the wire feed rate and voltage in accordance with good welding practices as recommended by a qualified welding engineer.
Arc too long	Adjust the wire feed and voltage so that the arc is in accordance with good welding practice for the joint to be welded. The distance from the contact tip to the work-piece should be 15 times the welding wire diameter. If the arc is too long there will be spatter, usually in the direction of the weld.
Damaged contact tip	If the contact tip becomes worn, the welding wire will not be in constant contact with the tip and the arc will become unstable. A contact tip contaminated with spatter will cause uneven wire feed resulting in further spatter.
Inclination of welding gun too great	The angle of the gas nozzle relative to the work-piece should be between 45 to 90 degrees. If the angle is too small, the wire runs parallel to the weld pool, resulting in spatter in the direction of welding.
Faulty power source	Have the power source checked for faulty conditions such as broken wires and faulty contacts.
Incorrect start	A great deal of spatter occurs if the stick-out is too great and if the welding gun is held too far from the work-piece when striking the arc. Try to start with as short a stick-out as possible and with the welding gun as close to the starting point as possible. If a large ball end is formed on the end of the welding wire, remove it by cutting the wire with sharp wire cutters. It is helpful if the wire is cut to a point. Always remove the ball end before striking an aluminum arc. Check the welding ground connection.
Incorrect pulse parameters	Check the user manual for your power supply or consult a qualified welding engineer.
Uneven wire feed	Uneven wire feed gives rise to heavy spatter. Find the cause of the disturbance and correct the condition before proceeding.
Impurities on the base metal	Uneven wire feed gives rise to heavy spatter. Find the cause of the disturbance and correct the condition before proceeding.
Poor ground contact	Inspect ground cable for loose connections, fraying and cuts. Correct any problem areas found and attach the ground cable directly to the work-piece after having cleaned the contact surface first. POOR GROUND CONTACT IS THE MOST COMMON CAUSE OF UNSTABLE MIG WELDING CONDITIONS.
Stick-out too long (short-arc welding)	The stick-out should be 15 times the diameter of the wire electrode being used. With increasing stick-out, the current is reduced and the arc voltage rises, giving a longer unstable arc and increased spatter.
Incorrect polarity	Check for correct polarity. Follow the electrode manufacturer's recommendations.

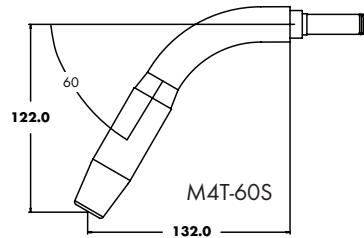
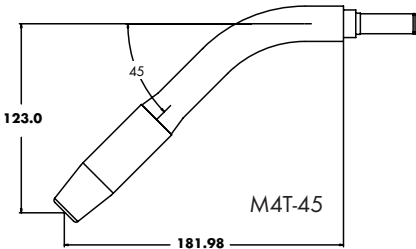
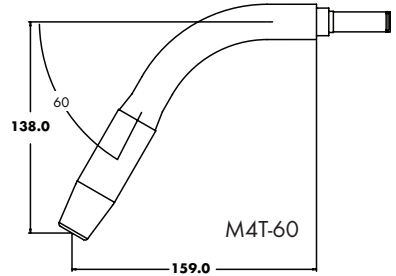
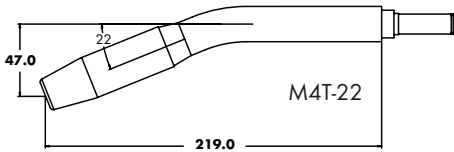
TROUBLESHOOTING: GENERAL GUIDE

Problems/Causes	Possible Solutions
Air-cooled Gun Running Too Hot	
Poor ground	Inspect ground cable for loose connections, fraying and cuts. Correct any problem areas found. Clean clamping area to insure good contact. Securely attach the ground cable to the work-piece as close as possible to the point of welding. Make sure there is a good connection to the welding power source.
Loose power connection	Check to make sure the power connection on the power source is tight, the connection on the wire feeder is tight, the connection to the adaptor block is tight, and the connection of the gun to the adaptor block is tight.
Loose Bikox connection	Remove handle assembly and adaptor support. Check to ensure the Bikox connection to the swanneck is tight and the Bikox connection to the adaptor block is tight.
Damaged Bikox assembly	Visually inspect the Bikox assembly for cuts and tears. Replace the Bikox assembly if necessary.
Consumable items loose or worn	Remove nozzle from gun and inspect contact tip and tip holder/gas diffuser for wear and tightness; replace or tighten as necessary.
Capacity of gun being exceeded	Note complete weld parameters and mode, including welding current (Amps), welding voltage, wire feed speed, type and size of wire, type of gas and flow rate of gas and consult your local Authorized ABICOR Binzel Distributor.
Dirty connection	Remove swanneck and inspect interface for dirt build-up. Periodic cleaning is necessary.

SWANNECK DIMENSIONS: DELTA-MIG® 3 THREADED



SWANNECK DIMENSIONS: DELTA-MIG® 4 THREADED



Approximate x and y measurements are in millimeters and are taken from the end of the contact tip with spray arc set-up.

! WARNING !

Read and follow the manufacturer's instructions, employer's safety practices, and Material Safety Data Sheets (MSDSs). Only qualified personnel should install, use, or service this material and/or equipment.



WELDING SPARKS can cause fire or explosion

- Do not weld near flammable material
- Do not weld on closed containers.
- Remove combustibles from the work area and/or provide a fire watch.
- Avoid oily or greasy clothing as a spark may ignite them.



ARC RAYS can injure eyes and burn skin

- Always wear correct eye, ear, and body protection
- Always wear a welding helmet with the proper grade filter lens. Protect yourself and others from spatter arc flash rays by using protective screens, barriers and welding curtains.
- Always wear protective gloves and clothing to cover exposed skin. This will aid in the prevention of arc and spatter burns.



ELECTRIC SHOCK can kill.

- Always wear dry installing gloves
- Do not touch live electrical parts.
- Always disconnect power source before hooking up or changing electrodes, nozzles and other parts.



FUMES AND GASES can be hazardous to your health.

- Keep your head out of the fumes
- Use enough ventilation or exhaust at the arc to keep fumes and gases from your breathing zone, and general area.
- Fumes from cutting and welding can deplete air quality, causing injury or death. Always wear an air supplied respirator in confined areas, or if breathing air is not safe.



LOUD NOISE can damage hearing.

- Always wear protective hearing devices to ensure protection when noise levels exceed OSHA standards.

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Read American National Standard Z49.1, "Safety in Welding, and Cutting, and Allied Processes," available from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126; OSHA Safety and Health Standards, available from U.S. Government Printing Office, Washington, DC 20402.



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