

Assembly Instructions

Imperial electrofusion products general installation guide





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INFORMATION

The information and installation instructions mentioned on the fitting or enclosed with the fitting shall be applied predominantly.

- 1. Technical Data Sheets 2. General Instructions
- 3. Inserted Instructions 4. Product Marking

For further information on the installation of Innogaz Electrofusion Fittings, please contact:



USA channel partner

Kerotest Manufacturing - (412)-521-4200 AF Hall, a division of KTI - (905)-335-5646 www.kerotest.com

Canada channel partner

www.afhall.ca

Page

1. Safety

The following warning symbols are used in these assembly instructions:

Symbol	Meaning		
A DANGER!	Danger to persons. Failing to observe this will cause death or serious injury.		
	Danger to persons. Failing to observe this can cause death or serious injury.		
	Danger to persons. Failing to observe this can cause low to medium severity injuries.		
NOTICE	Danger to objects. Failure to comply can result in objects damage.		
INFORMATION	Application tips and other useful information. Failing to observe this cannot cause injury.		

2. Areas of application

Innogaz Electrofusion Fittings are used for fusion joints of pressure pipes made of polyethylene for use in gas distribution. Innogaz Electrofusion Fittings must only be fused according to size and dimensions stated on the fitting. This includes but is not limited to the Standard Dimension Ratio (SDR)¹ 17 to SDR 11, given a minimum wall thickness of at least 0.090 inch (2.29mm).

NOTICE

Innogaz Electrofusion Fittings may be compatible with pipe SDR's outside of the stated range. Please contact your local authorized channel partner for further details and confirmation.

When operating with other media than natural gas, please contact your local authorized channel partner.

3. Pressure load-bearing capability

Innogaz Electrofusion Fittings are tested and approved according to ASTM F1055 and CSA B137.4.1 for a maximum operating pressure of up to 125 PSI. Innogaz Electrofusion Fittings can be subjected to a test pressure of up to 1.5 times maximum operating pressure under normal application and operating conditions².

² Normal operating temperature range of between -22°F to 140°F (-30°C to 60°C)



When subjecting pipe and fittings to high pressures, local rules and regulations and company safety practices must be respected.

The pressure load bearing capability of Innogaz Electrofusion Fittings made of PE 100 is determined by the SDR and a design factor (DF)³ of 0.4 at a reference temperature of 68°F (20° C).

SDR Fitting	Fitting Material	max operating pressure in PSI GAS (DF 0.4)		
11	PE4710/PE100	125		

Table 1

4. Regulations

For detailed and up-to-date information on Innogaz Electrofusion Fittings, please see the technical datasheets. Please contact your local channel partner.

Innogaz Electrofusion Fittings are manufactured and qualified to codes and standards in the United States (i.e., ASTM F1055, ASTM D2513) and Canada (i.e., CSA Z662, CSA B137.4.1) for use in a gas pressure pipe application. Innogaz Electrofusion Fittings also comply to the requirements of EN13244-2, ISO 4437 and ISO 4427.

This procedure has been qualified in accordance with the requirements of CFR 192.283 Plastic Pipe: Qualifying Joining procedures.

Innogaz Electrofusion Fittings are intended for use with pipe materials made of PE 100, PE 80, PE 2406/2708, PE 3408/4710 which meet applicable standards (i.e., ASTM D2513, CSA B137.4) including outside diameter tolerances and out of roundness requirements. Scratches and gouges which cannot be removed during the normal peeling process indicate that the jointing area is not suitable for electrofusion.

As a general note, PE materials having a fusion flow rate MFR 190/5 in the range of 0.007- 0.06 Oz/10 min. (0.2 - 1.7g/10 min) applies.

NOTICE

A proof of fusibility is required for pipe materials with MFR value outside of this stated range.

Innogaz injection molded fittings utilizing TUB 121 and TUB 121 N6000, resins are listed by PPI under TR4 as PE 4710 and PE 100 materials.

NOTICE

Innogaz Electrofusion Fittings are intended for use with PE materials in the stated MFR range. Installation on other pipe materials such as e.g. PP, PVC is prohibited.

During installation, pipes and fittings should have a similar temperature level in the permissible range of application between -22°F to 122°F (-30°C to 50°C).

When operating or installing Electrofusion fittings at extreme temperature ranges installers are advised to take additional precautions. Additional precautions may include but are not limited to the use of shelters and portable heating sources. A proper temperature compensation function requires that the fusion control unit is able to read an ambient temperature equal to pipe and fitting conditions at time of fusion.

5. Product storage

Innogaz Electrofusion Fittings can be stored and used for over ten years, provided the general storage specifications are adhered to.

Suitable storage conditions:

- Store in closed rooms or containers
- Store in original, undamaged packaging (plastic bag, cardboard box).
- Protect from UV radiation and other adverse conditions.
- Protect against the effects of weather such as moisture and frost.
- Storage temperature up to 122°F / 50°C.

Improperly stored fittings must not be installed because this could result in leaking fusion joints.

NOTICE

Confirm that fittings are in original packaging before installation. Damaged or improperly packaged fittings must not be installed.

6. Product identification

INFORMATION

Innogaz Electrofusion Fittings are traceable according to a batch identification embossed on the fitting surface as well as the barcode method.

HVTT and Coupling sizes \ge 3 IPS read from left to right:

Example:

- Production week (KW) (stamp 1+2)
- Production year (stamp 2 center)
- Material identification letter (stamp 3)



KW 14/19/E

Figure 1

LVTT, MVTT, and Coupling sizes \leq 2 IPS fitting batch identification system reads from left to right:

Example:

- Production week digits 1 and 2
- Production year digits 3 and 4

1419			
KW 14/19			
Figure 2			

Traceability

An automatic traceability record according to ASTM F2897 is possible when using traceability enabled Universal barcode fusion control units conforming to ISO 12176-2. Fittings are labeled with specific barcode (Figure 3) which contains fitting data according to ASTM F2897 e.g. manufacturer, dimension, material and batch. If the data is collected by the installer, the fitting traceability data is automatically stored in the fusion control unit.



Traceability code acc. ASTM F2897-11a

Figure 3

Printed information on the barcode label includes the following:

- 1. Upper barcode is fusion code and lower code is traceability.
 - Fusion barcode and corresponding 24-digit number.
 - Traceability barcode acc. to ASTM F2897 corresponding 16 characters (alphanumeric in Code 128 symbology).
- 2. Fitting type code (C-coupling, R-reducer, LV/LVTT/MV/MVTT/HV/HVTTtapping tee, BS-branch saddle, RS-repair saddle).
- 3. Minimum required cooling time in minutes until removal from clamp or rough handling is marked as CT=xx min where xx is the time in minutes.

7. Power source and fusion control unit

A power supply, i.e.: generator, with a continuous peak output of 5000 WATTS / 5 KVA or higher (measured at the output) will supply enough current to fuse Innogaz Electrofusion Fittings size range $\frac{1}{2}$ " CTS through 8" IPS.

For 2" Couplings and smaller as well as all LVTT and MVTT, a generator with a continuous output of 2400 WATTS / $2.4~\rm KVA$ is sufficient.

Generator requires a 30A female 3-Prong Twist Lock receptacle on the 110V/120V side for direct connection of the power cord of most commonly used universal fusion control units.

If the generator engine has an idle control switch or auto-Idle (throttle) switch, it must be in the OFF position prior to beginning the electrofusion process.

Allow a suitable warm-up time for the generator prior to turning on the electrofusion control unit and ALWAYS turn the electrofusion control unit off and remove the power cable from the generator before shutting the generator down.

INFORMATION

Fusion boxes are sensitive to input power parameters. The installer is advised to exercise caution when selecting suitable portable power products.

It is recommended to avoid operating other electric power tools on the same generator during the actual fusion cycle, as this has also been known to cause voltage and/or frequency changes which may result in a control unit shutdown.

Fusion control unit:

Best practice is to use fusion control units which conform to ISO 12176-2. All Innogaz fittings are equipped with a fusion barcode according to ISO 13950 which allows automatic reading of all required fusion parameters to the fusion control unit.

NOTICE

Manual electrofusion control units (without barcode reader), should be considered obsolete technology. Installation of Innogaz Electrofusion Fittings with these units is not recommended.

INFORMATION

If an extension cord is required, consult the fusion control unit manufacturer guidelines to ensure adequate conductor size. Power cords should be uncoiled during fusion.

8. Assembly best practices for cylindrical and saddle type fittings

NOTICE

Before commencing assembly process, it is imperative that the installer ensures equipment, site conditions and materials will allow the installation to continue without interruption. Interrupted installation could allow introduction of contaminants and/or have negative consequences to fusion quality.

8.1 Pre-cleaning

Clean pipe of rough contaminations. Using a clean lint-free towel.



Figure 4

8.2 Cutting pipe to length

NOTICE

Ensure pipe to be fused is within SDR range 17 – 11 (other SDR range on request) and is the correct size for the fitting to be fused!

It may be necessary to cut pipe ends before joining in order to remove "toe-in"⁴ or to ensure squareness of pipe ends. If a pipe cut is required, then cut the pipe at a right angle to the pipe axis (see Figure 5). A suitable tool is a PE pipe cutter or a saw with blade suitable for plastics which achieves as close to square cut as is practical.





Prior to cutting pipe, it is recommended that a pipe wrap is used for marking pipe to ensure squareness of cut (see Figure 6).



Figure 6

Failure to achieve square cut of pipe ends may cause the heating coil to not be fully covered by the pipe which may result in overheating, uncontrolled melt formation or self-ignition (see Figure 7).







Fusion with escaping molten PE material is not acceptable. Please refer to the joint acceptance criteria (see chapter 8.13).

8.3 Measure and marking

Insertion depth:

The insertion depth, i.e. the distance between the coupling edge and the internal stop or the area of the fusion saddle includes the fusion zone and the cooling zone. The installer should take care to extend marking beyond total area to allow 1/2 inch (12mm) of visibly peeled area for inspection purposes following joint completion.

Figure 8: Marking the insertion depth for couplings. Figure 9: Marking the fusion zone for saddle fittings.



Figure 8

Figure 9

8.4 Peeling of pipe surface

An oxidized layer forms on all PE pipes and spigot surfaces during storage. This outer layer cannot be fused and must be removed. First remove contamination from the pipe and/or spigot surfaces. When marking peeling area, note that an additional allowance length or perimeter of the fitting of + 1/2 inch (12mm) is required as evidence that the peeling operation has been respected. Use the FWSG peeler tool in the appropriate size or an approved equivalent which respects the desired peel thickness values listed in table 3 to remove a continuous peel from the pipe or spigot surface. See figures 10 and 11.

Figure 10: Peeler tool FWSG for pipe ends and fitting spigots. Figure 11: Peeler tool FWSG SE for pipe ends and saddle areas.



Figure 10

Figure 11

Pipe spigots, e.g. fittings LVTT, MVTT & HVTT or transition fittings are to be prepared in the same manner as the installation specifications for pipes.

Rotational peeler tools must conform to tolerances prescribed in Table 3. An equal and seamless peeling is achieved by using FWSG and FWSG SE peeler tools (see Table 2).

Peeler tool	Feature	Pipe dimension	
FWSG 63	Cross-dimensionally	d ½" − 2"	
FWSG 225	Cross-dimensionally	d 3" – 8"	
FWSG 400	Cross-dimensionally	d 3" – 14"	
FWSG 710S (half length of coupling)	Cross-dimensionally	d 10" – 28"	
FWSG 710L	Cross-dimensionally	d 10" – 28"	
FWSG 900L	Cross-dimensionally	d 25" – 36"	
FWSG SE	Dimension-bound	d 2", 3", 4", 6", 8" and 12"	

Table 2

NOTICE

Incomplete or improper removal of the oxide layer could compromise the fusion integrity.

A one-time, complete removal is sufficient (min. 0.006 inch (min. 0.15mm)). If following the peeling process, damages to the pipe surface, axial grooves or scratches are observed, the section is not suitable for electrofusion. Such visual indications suggest damages are in excess of the peel thickness and may contain embedded contaminations.

NOTICE

Worn peeler blades may lead to an excessive peel thickness, which may result in an excessively large annular gap in the fusion zone.

Please check condition and wear of the blade in the peeler tool regularly. Worn blades must be replaced.

Nominal Pipe Size (NPS)	Peeler tool	Desired peel thick- ness (mm)	Wear limit (mm)	Desired peel thickness (inch)	Wear limit (inch)
1/2 CTS - 2 IPS	FWSG 63 FWSG SE	0.15 – 0.225	> 0.229	0.006" - 0.008"	> 0.009"
3 IPS - 8 IPS	FWSG 225 FWSG SE	0.25 – 0.35	> 0.4	0.010" - 0.0137"	> 0.0157"
3 IPS - 14 IPS	FWSG 400 FWSG SE	0.15 - 0.25	0.229 / 0.3	0.006" - 0.010"	0.006" / 0.011"
24 IPS - 36 IPS	FWSG 900	0.25 - 0.35	0.4	0.010" - 0.0137"	0.0157"

Table 3

File, rasp, plainer, emery cloth and/or sandpaper are not permitted tools for removal of contamination or oxidation because they may insufficiently prepare the surface, introduce flat spots and/or introduce contamination.

To control the complete surface removal, we recommend applying marking (control) lines (see Figure 12). If during peeling of the surface un-peeled areas occur at some points (e.g. in case of bundled coils or oval pipes), these areas can be corrected using a manual scraping tool. The processed zone is to be protected against dirt, soap, grease, subsequently flowing water and unfavorable effects of weather (e.g. moisture, frost formation). Do not touch the fusion zone again after peeling.

NOTICE

The rework of un-peeled areas are to touch up scraping to remove skipped areas.

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Figure 12

INFORMATION

Innogaz Electrofusion Fittings utilize embedded and exposed heating coils and should not be peeled on the inside of the fitting.

8.5 External and internal pipe end preparation

It is recommended best practice to break the edge inside and outside of the cut end of the pipe (see Figure 13) prior to insertion into the coupling. For this operation, a manual scraper is a suitable tool. The purpose of this step is to remove any sharp edges which may damage the coupling when sliding into place. Deburring the inside edge of the pipe end eliminates the possibility that burrs are present in pipeline flow and/or contaminate the fusion joint.



Figure 13

8.6 Restoration of irregular/oval pipe

Plastic pipe, in particular bundled coils and reels, may become oval during storage. Pipe out of roundness in the fusion zone which exceeds 1.5% of the outer diameter or is > 0.11 inch (3mm), means re-rounding of the pipe is mandatory. Please use re-rounding clamps for this purpose which are installed at the end of the fusion zone (see Figure 14).



Figure 14

8.7 Cleaning

The surfaces of the pipes to be fused and the interior surfaces of the Innogaz Electrofusion Fitting must be clean, dry and free from any grease. These areas are to be cleaned with a suitable cleaning agent and lint-free towel.

For ideal cleaning result, use lint-free and non-dyed paper.



Figure 15

The amount of the PE cleaning agent is to be chosen such that the lint-free towel is slightly wet. Skin contact is to be avoided. Please observe the safety notes from the manufacturer of the PE cleaning agent.

When cleaning, ensure that no contaminations from the un-peeled pipe surface are introduced into the fusion zone.

NOTICE

When using isopropyl alcohol cleaning agents, the alcohol percentage must be at least 94%, an alcohol content of 98.9% is preferred.

Positive results can be achieved using acetone as a cleaning agent however regional environmental restrictions may prohibit it's use. It is therefore not a recommended cleaning solution unless expressly approved by appropriate local authorities. The cleaning agent must be completely evaporated before starting the fusion process.

Cleaning agent should be applied to lint-free towel and not directly onto the pipe or fitting surface.

Installer should exercise caution with tapping tee position when cleaning to prevent collection of cleaning agent inside tapping tee stack.

While exercising caution to avoid re-introducing contamination to the cleaned and prepared fusion zone, re-application of marking line for the fusion zone width with a marker may be necessary. The line may have been removed during peeling and cleaning. The joint surfaces must be clean and dry before installing the fitting. The cleaned fusion zone should not be touched with bare hands. Moisture in the area of the joint, e.g. because of dew or frost, is to be removed using suitable aids.

INFORMATION

The fusion fitting is to be removed from the packaging directly before the planned installation only. The packaging protects the fittings against external influences during transport, storage and handling on site.

8.8 Insertion of pipe ends into the fitting

When connecting Innogaz Electrofusion Fittings and pipes, it is to be ensured that the contact terminals are accessible for installing fusion control unit leads (see Figure 16). Innogaz Electrofusion Fittings should be slipped on without using force. The prepared insertion end must be inserted into the fitting up to the mark. If needed, rounding clamps (see Chapter 8.6) are to be used.



Figure 16

NOTICE

Repeated peeling may not be performed to remedy installation problems due to out-of-roundness!

For larger couplings where out-of-roundness prevents insertion of pipe into fitting, a simple identification of high points is possible by placing the coupling against the leading edge of the prepared pipe end and evaluating the annular gap.

INFORMATION

Some Innogaz couplings may have center stops that will confirm the insertion depth. In cases when the coupling must be slid all the way onto the pipe (i.e., repair application), the tabs can be easily broken off by quickly sliding the coupling onto the pipe with a sudden jolt, forcing the pipe into the coupling. Make sure the coupling only slides within the clean area. Ensure any residual debris from center stop removal is cleared away from fusion zone.

NOTICE

For repair applications without gap between pipe sections it may be necessary to slide coupling completely onto pipe end, for this reason it is necessary to clean the full length of the coupling.

8.9 Ensure a tension-free assembly of components

8.9.1 Coupling and Reducer

All joints prepared for fusion must be tension-free. Pipes may not be positioned in the Innogaz Electrofusion Fitting under bending stress or self-load. After the installation of the pipe ends, it must still be possible to move coupling by hand.



Figure 17

NOTICE

A non-tension-free or shifted joint may result in an escaping melt flow and a defective joint during fusion (see Figure 17).



Escaping melt flow can cause burnings on skin!

Always keep a distance of 3 feet (1 meter) to the fusion site during the fusion process for general safety reasons.

If required, piping or fitting can be supported. A suitable clamping tool may be utilized to ensure movement of the joint during the fusion and cooling cycle does not occur (see Figure 18). The tension-free fixing of the joint is to be maintained until the "clamped" cooling time stated on the instruction document is reached.



Figure 18

Before starting the fusion process (see chapter 8.10), check again the markings on the pipe to determine whether the insertion depth of the pipe end in the Innogaz Electrofusion Fitting has moved (correct, if required).

8.9.2 Tapping Tees

8.9.2.1 Assembly of the High Volume Tapping Tee HVTT

The assembly of the Innogaz High Volume Tapping Tee can take place with the reusable chain clamp (see Figures 19 - 23) or with the belt strap (see Figures 24 and 25).

<u>Chain clamp</u>: Position the High Volume Pressure Tapping Tee on the peeled and cleaned pipe surface (see chapter 8.1 - 8.7 in this general installation guide), and hook both ends of the clamping device into the holes on the lip of the tapping tee (see Figure 19).



Figure 19

Close the clamping device by pulling the handle upwards until the stop pin is contacted. If the handle can't be closed, loosen the bolts on the side opposite to the handle until it can be closed fully (see Figure 20).



Figure 20

Alternately tighten each bolt on the side opposite the handle (see Figure 21).





Observe the gap between the washer and spacer and check if the spacer can spin under the washer, as you tighten the bolt (see Figure 22).



Figure 22

Continue to tighten the bolt until the gap between washer and spacer is closed, and the spacer can no longer spin under the washer (see Figure 23).



Figure 23

After the cables are attached to the fitting and just prior to fusion, check again to ensure the spacers cannot spin under the washers. It is common for the polyethylene to relax and the spacers may loosen. If loose, re-tighten the bolts until the spacers cannot turn, then immediately start the fusion process (see chapter 8.10).



Note that the clamping device is under a large amount of tension when fully closed.

- Failure because of installation errors can cause injuries!
- Exercise caution when opening the handle!

<u>Belt strap</u>: Position the High Volume Pressure Tapping Tee on the peeled and cleaned pipe surface (see chapter 8.1 - 8.7 in this general installation guide), and install the belt strap by attaching the end of the belt strap into the fitting saddle holes.

The bolts are then tightened in an equal and uniform sequence until the lower bars are tight against the fitting (see Figure 24).



Figure 24

NOTICE

The belt strap has a label with numbers 1 to 10 (see Figure 25). Remove the number off the label corresponding to the number of times the strap has been used.

Belt strap may only be used maximum 10 times!



Figure 25



Note that the belt strap is under a large amount of tension when mounted.

- Failure because of installation errors can cause injuries!
- Exercise caution when opening the belt!

8.9.2.2 Assembly of the Low Volume (LVTT) and Medium Volume (MVTT) Tapping Tee

The assembly of the Innogaz Low Volume (LVTT) and Medium Volume (MVTT) Tapping Tee can take place with a supplied permanent plastic underclamp (see Figure 26) or a supplied permanent belt strap underclamp (see Figure 27).





Figure 27

<u>Plastic underclamp</u>: Position the Low Volume and Medium Volume Pressure Tapping Tee on the peeled and cleaned pipe surface (see chapter 8.1 - 8.7 in this general installation guide).

The plastic underclamp is tapered to allow it to slide onto the tapping tee flange. Slide the underclamp on the tapping tee flange and insert it (by gently hitting) with a small mallet until contact with stop (see Figures 28a and 28b).



Figure 28a

Figure 28b

<u>Belt strap underclamp</u>: Position the Low Volume and Medium Volume Pressure Tapping Tee on the peeled and cleaned pipe surface (see chapter 8.1 - 8.7 in this general installation guide).



Figure 29

Install the belt strap underclamp by inserting the end of the belt strap with screws onto the opposite flange of the tapping tee outlet (see Figure 29).



Figure 30

NOTICE

Tighten the screws uniformly until the upper and lower sections of the underclamp have fully contacted (see Figure 30).

Note that the belt strap is under a large amount of tension when mounted. • Failure because of installation errors can cause injuries!

8.10 Reading fusion parameters and start fusion process

Connect the electrofusion control box outlet cable to the Innogaz Electrofusion Fitting connector pins.



NOTICE

Best practice is to use ISO Universal barcode fusion control unit conforming to ISO 12176-2.

INFORMATION

The permitted installation ambient temperature range is between -22°F to 122°F (-30°C to 50°C). The stated fusion time on the fitting barcode is the fusion time at 68°F (20°C). An automatic temperature compensation feature is applied to increase or decrease fusion time based on actual ambient temperature conditions at time of fusion.

The fusion control units automatically monitor the fusion process and control the supplied energy in determined limits.

Fusion parameters are located on the reverse side of the inserted instruction document for installer's reference (see instructions packed with the fittings).



Figure 31

For Innogaz Electrofusion Fittings equipped with a fusion indicator, the latter only indicates the fusion process has been completed. The proper fusion process is, however, only indicated by the fusion control unit!

Reading the barcode with a wand or barcode scanner (see Figure 31).

After reading the barcode, the fitting data are to be compared with the data shown on the unit's display. If the values are consistent, **start fusion process**. Please observe the operating instruction of the fusion control unit.

The fusion control unit automatically monitors the fusion process and controls the supplied energy in determined limits.

Avoid stress or load caused by fusion cable connections.

Keep a distance of 3 feet (1 meter) to the fusion site during the fusion process for general safety reasons.

The obtained actual fusion time is to be compared with the target fusion time on the unit and to be noted on the pipe or the Innogaz Electrofusion Fitting (see Figure 32).



Figure 32

With this identification it is ensured that fusion joints are not overlooked. If required, a fusion can be repeated but the joint surfaces must be cooled to ambient temperature before restarting the fusion cycle. When the fitting is cool to touch, it is considered suitable for refusion.

NOTICE

Prior to repeating fusion a second time, please contact your local sales engineer by phone or authorized channel partner for technical support.

A repeated fusion is only allowed in the event that the power supply was interrupted during the fusion process. Any other error message or joint acceptance criteria failure cannot be corrected by a repeated fusion.

INFORMATION

Observe the joint acceptance criteria in this general installation guide (see chapter 8.13) and in the inserted instruction documents.

NOTICE

After fusion is complete, wait at least 15 seconds before carefully removing the cables from the fitting.

8.11 Cooling times

Movement of the fusion surfaces during the cooling cycle can result in failure. Cooling times are located on the reverse side of the inserted instruction document for installer's reference.

NOTICE

Observe the cooling time listed on the barcode label of the fitting (CT)!

8.12 Tapping

A pressure test is strongly recommended to ensure fusion integrity prior to tapping.

NOTICE

Observe cooling times before tapping!

NOTICE

Before tapping, fuse branch pipeline fitting according to this general installation guide. (see chapter 8.1 - 8.7)

8.12.1 Tapping the High Volume Tapping Tee HVTT

At the end of the fusion time, the fusion control unit can be switched off and the fusion cable removed. Remove the belt strap from the tapping tee by loosening the bolts and dismantling the strap or for the chain clamp by loosening the bolts and opening the handle after the end of the cooling time (CT).



Remove cap and inspect for proper position of cap O-ring (see Figure 33).

INFORMATION

Re-apply grease if necessary.



Figure 33

Turn the cutter down to the lower stop using the hex wrench and then turn anti-clockwise to the upper stop, continue an additional 1/4 turn (see Figure 34).

NOTICE

Excessive force can damage upper stop!

INFORMATION

Some leakage from the upper stop after this operation is normal and does not affect the functionality of the tapping tee.



Figure 34

Install and tighten cap by using nylon belt wrench (see Figure 35). The tapping tee stack is sealed when the cap is properly installed.



Rotate clockwise to end of thread by using nylon belt wrench.



Figure 35

NOTICE

Do not use pliers or other mechanical devices to tighten!

8.12.2 Tapping the Low Volume (LVTT) and Medium Volume (MVTT) Tapping Tee

At the end of the fusion time, the fusion control unit can be switched off and the fusion cable removed.

NOTICE

Don't remove the plastic underclamp or the belt strap underclamp from the tapping tee. They are permanent and remain on the tapping tee.

NOTICE

Remove cap from the tapping tee. Tapping tees have fixed stops in both directions (forward-stop and backstop) for the cutter.

Insert the tapping tool (1/2" hex T-wrench, or similar) into the cutter at the top of the tapping tee (see Figure 36).



Figure 36

Turn the tool clockwise until it bottoms out on the forward-stop.

INFORMATION

Innogaz tapping tee tools have indicator marks (either cuts into the tool shank or changes in the shank diameter) showing the cutter at the forward-stop position when in line with the top of the tapping tee stack. Use the first depth indicator for an LVTT and the second depth indicator for an MVTT.

Afterwards turn the tool anti-clockwise up to the upper stop. Continue an additional 1/4 turn.

Excessive force can damage upper stop!

INFORMATION

Some leakage from the upper stop after this operation is normal and does not affect the functionality of the tapping tee.

Prior to reinstalling the tapping tee cap, visually inspect the inside area of the cap and the O-ring (located on the neck of the tapping tee) to ensure it is in the right position and not damaged. Also check to ensure there is silicone grease on the O-ring for proper pressure seal. Re-apply grease if necessary while exercising caution not to introduce contamination into the work area.

Screw the tapping tee cap onto the tapping tee and tighten only by hand until a positive stop occurs (see Figure 37).

NOTICE

Do not use a wrench or any other mechanical tools to tighten!



Figure 37

NOTICE

The described sequence of the processes must be adhered to.

- 1. Ensure the pipe was peeled properly.
- 2. <u>Coupling and Reducer</u>: Ensure the pipe ends were fully inserted to the markings.

<u>Saddle fittings:</u> Ensure fitting was installed within marked saddle area markings.

- 3. Ensure the pipe and coupling / saddle fitting were aligned and secured during the fusion and cooling cycles.
- 4. Ensure the correct fusion cycle was completed with no interruption or error code from the electrofusion control box.
- 5. Ensure the correct cooling time was followed.
- 6. Ensure there is no "outflow" anywhere around the base of the fitting. If there are visible signs of "outflow", the fitting must be replaced. Outflow is defined as any material visible beyond the fitting when viewed from a square cut angle.
- 7. Check the pop-up indicators according to the "joint acceptance criteria for pop-up indicators" in Figure 38.

NOTICE

On all Innogaz Electrofusion Fittings, movement of the fusion indicator is only a witness that a fusion cycle has been done. This indicator is under no circumstances the proof of a correct joint. Any movement of the fusion indicator(s) is just a visual verification that energy / heat during the fusion was in place (see Figure 38).

In case of no movement, confirm the following:

- All steps in the preparation of the joint (peeling, cleaning & clamping) have been respected
- · A visual check to ensure no melt outflow is present
- No errors are shown on the fusion unit display

NOTICE

Fusion with melt outflow is not acceptable!

Provided this criteria are met, the fusion joint may be accepted and subject to normal pressure test requirements.





9. Updates of assembly and operating instructions

These technical statements are regularly revised to be up to date. The date of the last revision is stated on the document.

For an updated version of the assembly and operating instructions, please contact your authorized local channel partner.



