



Assembly Instructions

Low Volume Tapping Tees - LVTT (metric size)

INNOGAZ



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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 | 3. Inserted Instructions |
| 2. General Instructions | 4. Product Marking |

1. Safety

The following warning symbols are used in these assembly instructions:


Symbol	Meaning
 DANGER!	Danger to persons. Failing to observe this will cause death or serious injury.
 WARNING!	Danger to persons. Failing to observe this can cause death or serious injury.
 CAUTION	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. 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.

 CAUTION
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.

3. Product identification

INFORMATION

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



LVTT read from left to right:

Example:

KW 14/19/E

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

Top barcode (fusing barcode according to ISO 13950):

The fusing parameters are included in the main barcode. The parameters are entered into the fusion unit by utilising a reading wand or mini scanner or via smartphone using the WorkFlow procedure. The 24-digit number sequence can be entered manually into the fusion unit via the emergency input mode. The fusion unit always automatically monitors the fusion process and thereby regulates the introduced energy in specified limiting values.

Lower barcode (traceability barcode according to ISO 12176-4):

Data relating to the fitting, e.g. manufacturer, dimension, material, batch are contained in this barcode and therefore enable traceability (component traceability).

This data can be electronically archived together with the fusion parameters. Suitable fusion units are always required for this purpose. The 26-digit number sequence can be entered manually into the fusion unit via the emergency input mode.

4. Assembly best practices for LVTT saddles

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.

4.1 Pre-cleaning

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



Figure 1

4.2 Measure and marking

Marking the fusion zone for saddle fittings.

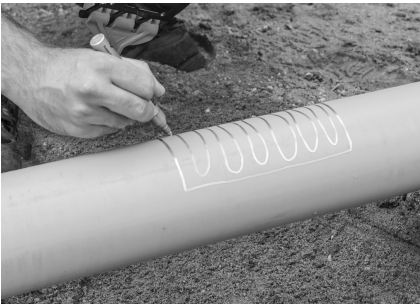


Figure 2

4.3 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 + 12mm is required as evidence that the peeling operation has been respected. Use the FWSG SE peeler tool in the appropriate size or an approved equivalent which respects the desired peel thickness values to remove a continuous peel from the pipe.

Figure 3: Peeler tool FWSG SE for pipe ends and saddle areas.

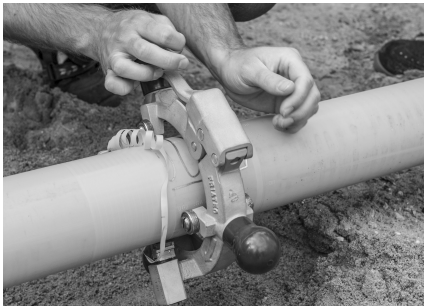


Figure 3

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

An equal and seamless peeling is achieved by using FWSG and FWSG SE peeler tools.

Peeler tool	Feature	Pipe dimension
FWSG 63	Cross-dimensionally	d 32 - d 63
FWSG SE	Dimension-bound	d 63 - d 160

NOTICE

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

A one-time, complete removal is sufficient (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.

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. 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.

INFORMATION

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

4.4 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 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 4).

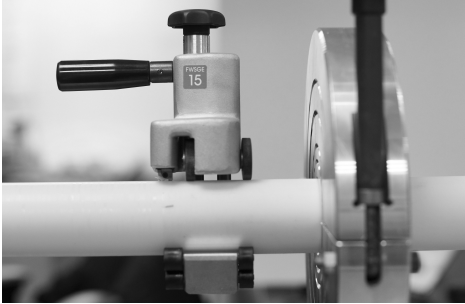


Figure 4

4.5 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 5

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 its 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.

4.6 Assembly of the Low Volume (LVTT) Tapping Tee

The assembly of the Innogaz Low Volume (LVTT) Tapping Tee can take place with a supplied permanent plastic underclamp (see Figure 6) or a supplied permanent belt strap underclamp (see Figure 7).



Figure 6



Figure 7

Plastic underclamp: Position the Low Volume and Medium Volume Pressure Tapping Tee on the peeled and cleaned pipe surface.

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 8a and 8b).

NOTICE

Ensure underclamp is inserted in correct direction.

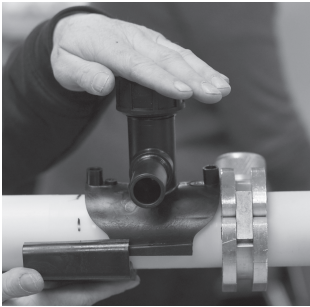


Figure 8a



Figure 8b

Belt strap underclamp: Position the Low Volume Pressure Tapping Tee on the peeled and cleaned pipe surface.

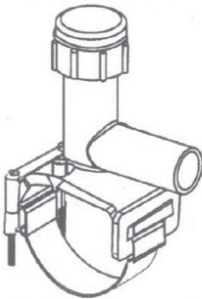


Figure 9

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 9).



Figure 10

NOTICE

Tighten the screws uniformly until the upper and lower sections of the underclamp have fully contacted (see Figure 10).



WARNING!

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

- Failure because of installation errors can cause injuries!

4.7 Reading fusion parameters and start fusion process

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

INFORMATION

Innogaz fitting connector pins are 4.0mm.

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 -10 bis +45 °C. The stated fusion time on the fitting barcode is the fusion time at 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).

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.

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.

NOTICE

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 11).



Figure 11

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 and in the inserted instruction documents.

NOTICE

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

4.8 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)!



CAUTION

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.

4.9 Tapping the Low Volume (LVTT) 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 12).



Figure 12

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.

Afterwards turn the tool anti-clockwise up to the upper stop. Continue an additional $\frac{1}{4}$ turn.

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.

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 13).

NOTICE

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



Figure 13

4.10 Joint acceptance criteria

NOTICE

The described sequence of the processes must be adhered to.

1. Ensure the pipe was peeled properly.
2. Coupling and Reducer: Ensure the pipe ends were fully inserted to the markings.
Saddle fittings: 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 14.

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 19).

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.


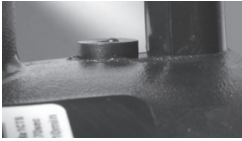






Acceptance criteria for pop-up indicators	
Limited or no movement 	
Normal movement 	
Above normal movement 	
Melt outflow 	

Figure 14

NOTICE

Any fusion not meeting the joint acceptance criteria above must be cut out and replaced accordingly.

5. 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.

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