Operating Instructions

Type no. TGF.305.115

TGF11

Tracer Gas Filler

Order No.:
590-558 (TGF11)
590-559 (TGF11 LP)

Software version:
1.06

INFICON

Contents

1 Notes regarding instructions

This document belongs to the software version that is stated on the title page. Documents for other software versions are available from our sales department.

1.1 Target groups

This instruction manual is aimed at the user of the TGF11 tracer gas filling unit and also at technically qualified specialists with experience in the field of leak testing technology.

1.2 Applicable documents

- Instruction manual of your leak detector

1.3 Displaying information

1.3.1 Warning labels

⚠ DANGER

Imminent threat with death or serious injury as a result

⚠ WARNING

Hazardous situation with potential death or serious injury as a result

⚠ CAUTION

Hazardous situation with minor injury as a result

NOTICE

Hazardous situation with environmental or material damage as a result

2 Safety

2.1 Intended use

The TGF11 is used to evacuate and fill objects that are tested for leaks.

The TGF11 is an accessory to the Sentrac hydrogen leak detector. The TGF11 can also be used in conjunction with other INFICON leak detectors. Objects which require small to average quantities of gas for leak testing can be filled with the device.

If it is not possible to achieve the desired pressure in the test object, TGF11 interrupts the gas filling.

- ► The device must only be installed, operated, and maintained in accordance with this instruction manual.
- ► Adhere to the uses that are set out (*see chapter 4.3: "Technical data", page 15*).
- ► Only use the device in a dry environment.

Examples of misuse

- ► Never use the device for pumping liquids. Only use it for gases.

2.2 Requirements of the operator

The following notes are for entrepreneurs or those, bearing the responsiblilty for safe and effective use of the product by the user, the staff or third parties.

Safety-conscious work practices

- ► Only use the device when it is technically in perfect condition.
- ► Only use the device in accordance with this instruction manual in a safety-conscious manner whilst taking heed of all hazards.
- ► Adhere to the following regulations and ensure that they are being adhered to:
  - – Intended use
  - – Generally applicable safety and accident prevention regulations
  - – Internationally, nationally, and locally applicable norms and guidelines
  - – Additional device-related provisions and regulations
- ► Only use original spare parts or spare parts approved by the manufacturer.
- ► Store this instruction manual on site.

Personnel qualifications

- ► Only trained staff should be permitted to work with and on the device. Trained staff must be trained regarding use of the device.
- ► Personnel that are to be trained must only work with and on the device under the supervision of trained, specialist technical personnel.
- ► Ensure that the trained staff have read and understood this operation manual and all accompanying documents (*see chapter 1.2: "Applicable documents", page 5*) before starting work, with particular attention to safety, maintenance and servicing information.
- ► Arrange responsibilities, competences and the monitoring of personnel.

2.3 Requirements of the user

- ► Read, consider and follow this instruction manual as well as the work instructions draw up by the operator, especially the safety and warning notices.
- ► Carry out all work only in accordance with the full instruction manual.
- ► If you have any questions regarding operating or maintenance that is not explained in this manual, then please contact INFICON customer services.

2.4 Hazards

The device is built in accordance with the state-of-the-art and with recognized safety rules and regulations. Improper use may result in risk to life and limb on the part of the user or third parties, or damage to the device or other property may occur.

Hazards due to liquids and chemicals

- ► Do not use any flammable or explosive gases or gaseous mixtures as a tracer gas.
- ► Do not expose the device to open flames and avoid sparks, for example by smoking.

If the tracer gas seeps into the air, then there is a risk of asphyxiation. The tracer gas displaces oxygen.

- ► Ensure that the test system is leak-tight.
- ► Ensure that the workplace is well ventilated.

Liquids and chemicals could damage the device.

- ► Adhere to the uses that are set out (*see chapter 4.3: "Technical data", page 15*).
- ► Never attempt to use the device to evacuate or fill with toxic, acidic, micro-biological, explosive, radioactive or other hazardous materials.
- ► Only clean the device with mild household detergents.

Hazards due to compressed gases and compressed gas cylinders

Compressed gases contain great quantities of energy. Follow instructions regarding the handling of compressed gas and compressed gas cylinders.

Test objects loaded with pressure can burst. This can result in injuries to persons or objects being damaged.

- ► Only use on test objects who withstand the test pressure. Follow the local authorities requirements about gas pressurized objects. If in doubt, carry out a pressure test.

A test system loaded with pressure can burst. Hose connections can slip. This can result in injuries to persons or objects being damaged.

- ► Pay attention to the maximum permitted test gas pressure, *see chapter 4.3: "Technical data", page 15*.
- ► Ensure that the test system and hose connections can withstand the test pressure. If in doubt, carry out a pressure test.

Hazards due to electricity

The device is operated with electric currents up to 240 VDC. There is a risk of death if touching parts inside the housing which are fed with electrical current.

► Disconnect the device from the electricity supply before carrying out any installation or maintenance work. Ensure that the electricity supply cannot be switched back on unintentionally.

The device contains electric components that may be damaged due to high levels of electric current.

► Before connecting to the electricity supply, ensure that the mains voltage permitted for the device corresponds to the mains voltage available on site.

3 Scope of delivery, transport, storage

Scope of delivery

Table 1: Scope of delivery

Item	Quantity
Tracer gas filling unit	1
Mains cable	1
Communication cable	1
Instruction manual	1
USB stick with manuals in other languages	1
Plug 6 mm	1
Plug 10 mm	1

► Check the scope of delivery after receiving the product to ensure it is complete.

Transport

NOTICE

Damage caused by transport

The device can be damaged or contaminated if transported in unsuitable packaging.

► Keep the original packaging.

► Only transport the device in the original packaging.

Storage

Store the device while taking technical data into account,
see chapter 4.3: "Technical data", page 15.

4 Description

4.1 Function

TGF11 is intended to evacuate and fill test objects as described below:

The air in the test object is pumped out by the integrated Venturi nozzle before tracer gas fills it. This ensures that the test objects can be more completely filled with tracer gas. With long objects, such as pipelines or heat exchangers, pre-evacuation is particularly important (vacuum and pressure method).

As an alternative option, tracer gas can be used to fill during evacuation ("purge and pressure method"). This method becomes available if the test objects are particularly long or cannot withstand a vacuum.

The tracer gas is evacuated from the test objects and away from the measuring station in connection with the test. This results that the background concentration of the tracer gas remaining low, which enables greater precision during measuring.

4.2 Design

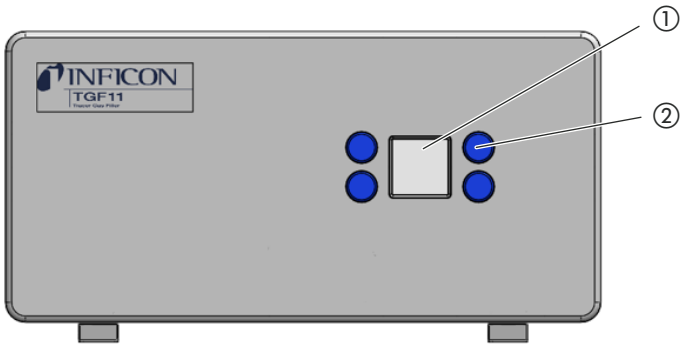


Fig. 1: Front view

① *Display*
② *Control and setting buttons*

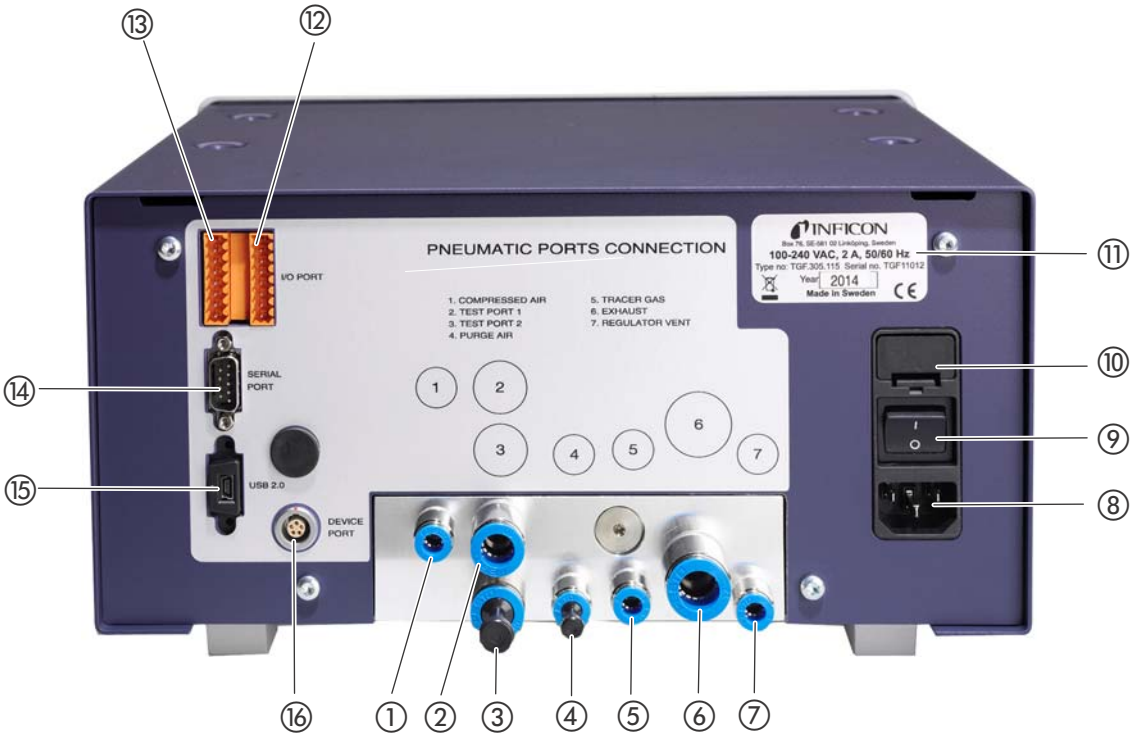


Fig. 2: Rear view

① *Compressed air, push-pull 6 mm*
② *Test port 1: Vacuum connection/tracer gas outlet 1, push-pull 10 mm*
③ *Test port 2: Tracer gas outlet 2, push-pull 10 mm, plug delivered separately in a bag*
④ *Purge air inlet, push-pull 6 mm, plug delivered separately in a bag*
⑤ *Tracer gas inlet, push-pull 6 mm*
⑥ *Exhaust, push-pull 12 mm*
⑦ *Regulator vent port 6 mm*
This is the drain from the pressure control valve when it decreases the pressure in the test object.
⑧ *Connection for mains cable*
⑨ *Mains switch*
⑩ *Fuse*
⑪ *Rating plate with information regarding supply voltage, serial number and production date*
⑫ *I/O port, pin 9-16 (top down)*
⑬ *I/O port, pin 1-8 (top down)*
⑭ *RS232 port, sub-D, 9-pin*
⑮ *USB 2.0 port*
⑯ *Device port (not used)*

4.3 Technical data

i	All pressure data is displayed in relative pressure.

Table 2: Technical data

Mechanical data	
Dimensions (B ×H ×D)	305 mm × 159 mm × 283 mm
Weight	~ 9.5 kg
Pneumatic connections	
Compressed air	Ø 6 mm, push-pull, outer diameter
Tracer gas outlets	Ø 10 mm, push-pull, outer diameter
Purge air inlet	Ø 6 mm, push-pull, outer diameter
Tracer gas inlet	Ø 6 mm, push-pull, outer diameter
Exhaust	Ø 12 mm, push-pull, outer diameter
Regulator vent	Ø 6 mm, push-pull, outer diameter
Environmental conditions	
Ambient temperature	5 °C . . . 45 °C
Humidity	95% at maximum operating temperature
Electrical data	
Power supply	100 to 240 VAC, 2 A, 50/60 Hz
Power consumption	
In standby	6.6 W
Maximum power consumption	12.5 W
IP code	IP 30
Physical data	
Tracer gas supply	Non-condensible gas as tracer gas. For example, helium or a mixture of hydrogen/nitrogen.
Tracer gas pressure	At least 1 bar (14.5 psi) higher than the fill pressure in the test object and within the following ranges TGF11: 1 ... 11 barg (14.5 ... 159 psig) TGF11 LP: 1 ... 4 barg (14.5 ... 58 psig)
Compressed air supply pressure	4 . . . 10 barg (58 ...145 psig) 4 . . . 3 barg (58 ... 43 pisg) without final vacuum performance 4 barg (58 psig) yields -0.85 barg (-12 psig) 3 barg yields -0.75 barg (-10 psig)
Purity	Filtered up to bis 40 µm (1.57 x 10^{-3} inch)
Output	
Fill pressure	TGF11: 0.3-10 barg (4.4 - 145 psig) TGF11 LP: 0.05-2 barg (0.7 - 29 psig)
Fill pressure resolution	TGF11: 5.4 mbar TGF11 LP: 1 mbar
Fill flow	
at 0.2 barg (2.9 psig)	100 l/min
at 1 barg (14,5 psig)	250 l/min
at 2 barg (29 psig)	375 l/min

Table 2: Technical data (Cont.)

at 3-10 barg (24-145 psig)	400 l/min
Evacuation flow	Max. 60 SLPM, free flow
Evacuation time	
up to -0.05 barg (-7.2 psig)	0.8 s/l
up to -0.07 barg (-10.2 psig)	1.6 s/l
up to -0.8 barg (-11.6 psig)	2.5 s/l
90 % of the final vacuum (type -0.77 barg, -11.2 psig)	1.0 s at a volume of 0.4 l 1.2 s at a volume of 0.75 l 11.9 s at a volume of 5 l
Final vacuum	-0.85 barg (-12 psig)
Purge air pressure	0 … 10 barg (0 ... 145 psig) external compressed air pressure
Purge air pressure in the test object with hose length of 2 m, hose diameter of 9 mm and compressed air supply of 3 ... 10 barg (43-145 psig)	0.1 barg (1.5 psig)
Purge air flow with hose length of 2 m, hose diameter of 9 mm and compressed air supply of 3 ... 10 barg (43-145 psig)	40 l/min
Pressure control	
Linearity	±0.5% FS
Hysteresis	± 0.2% FS
Repeatability	± 0.2% FS
Pressure reading	
Pressure transmitter resolution	TGF11 and TGF11 LP: 2.7 mbar (shown on the display)
Long-term drift	≤ 0.1 % FS (according to IEC 61298-3)

5 Installation

5.1 Setup

DANGER

Hazards due to moisture and electricity

Moisture that seeps into the device can lead to personal injury due to electric shocks and also to material damage due to short circuits.

- ► Only use the device in a dry environment.
- ► Use the device away from sources of moisture or liquids.

- ► Set up the TGF11 on a level surface in a manner to avoid vibrations of the device. Vibrations can lead to incorrect measurement results.
- ► To facilitate the reading of the display, fold out the front feet to tilt the device.
- ► Place the device as close as possible to the test object.
- ► Place the device considering at least 350 mm of space between the back of the TGF11 and the next object so that cables are not kinked.
- ► Keep heat sources away from the device.
- ► Do not expose the device to direct sunlight.
- ► Pay attention to the technical data, *see page 15*.

5.2 Filling method and type of leak testing

Filling method

The test object can be filled with tracer gas using two different methods:

Mode A

- Vacuum and pressure method: The air is evacuated and then filled with tracer gas.

  This method is particular suitable for stable metal test objects. Test objects can be connected with hoses to the TGF11 via one or two ports. If you connect the test object via two ports with the TGF11 you can fill it quicker with tracer gas and this saves time.

Mode B

- Purge and pressure method: The air is evacuated at port 1 whilst tracer gas is simultaneously loaded via port 2. Tracer gas is subsequently filled via port 1 and 2.

  This method is particular suitable for test objects, which are long, narrow, tube-like or have thin walls such as plastic, which cannot withstand the strong vacuum.

Furthermore *see chapter 6.4.2.1: "Application example: Calculating concentration of tracer gas", page 35*.

Gross leak test

To avoid wasting tracer gas, there is a gross leak test when evacuating and filling a test object.

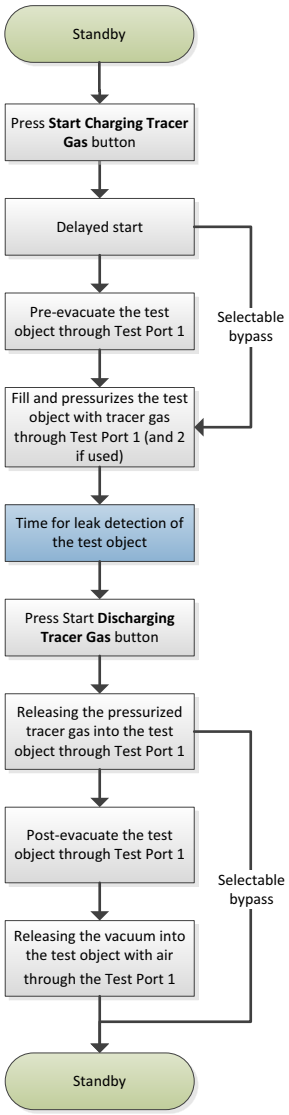
Sniffer test

Fill the test object with tracer gas. Then sniff the test object with a leak detector to detect leaks.

The TGF11 is configured for use with INFICON leak detectors.

Tracer gas charge overview process for TGF11

Operating Mode A: Tracer gas charging by using vacuum and pressure



Operating Mode B: Tracer gas charging by using flush and pressure

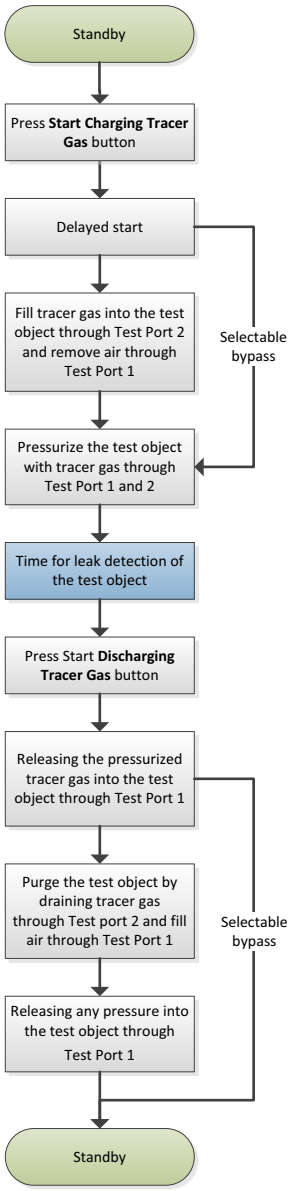


Fig. 3: Flowchart Mode A versus Mode B

Tracer gas charging process TGF11

Operating Mode A: Tracer gas charging by vacuum and pressure

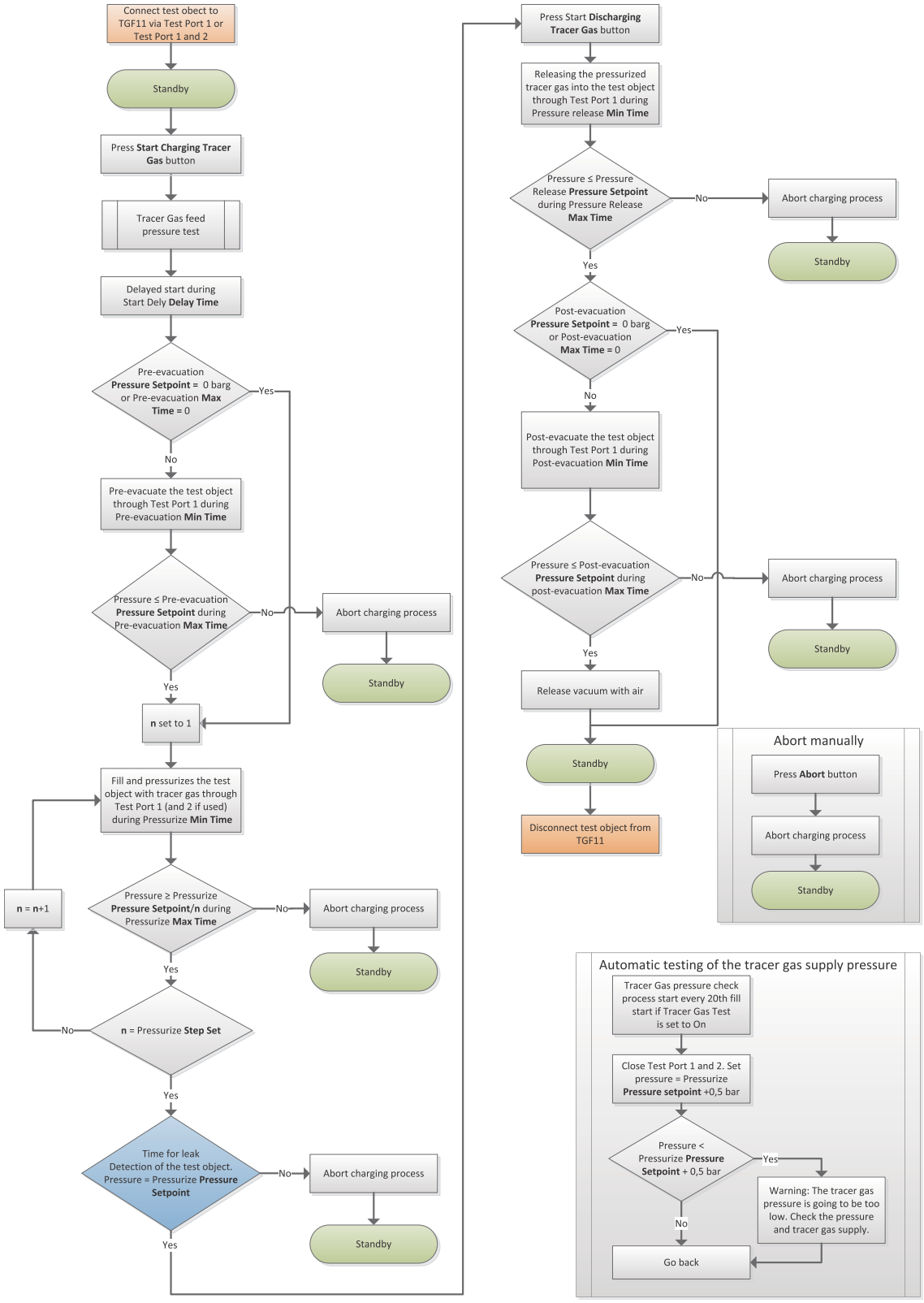


Fig. 4: Flowchart Mode A

Tracer gas charge process TGF11

Operating Mode B: Tracer gas charging by flush and pressure

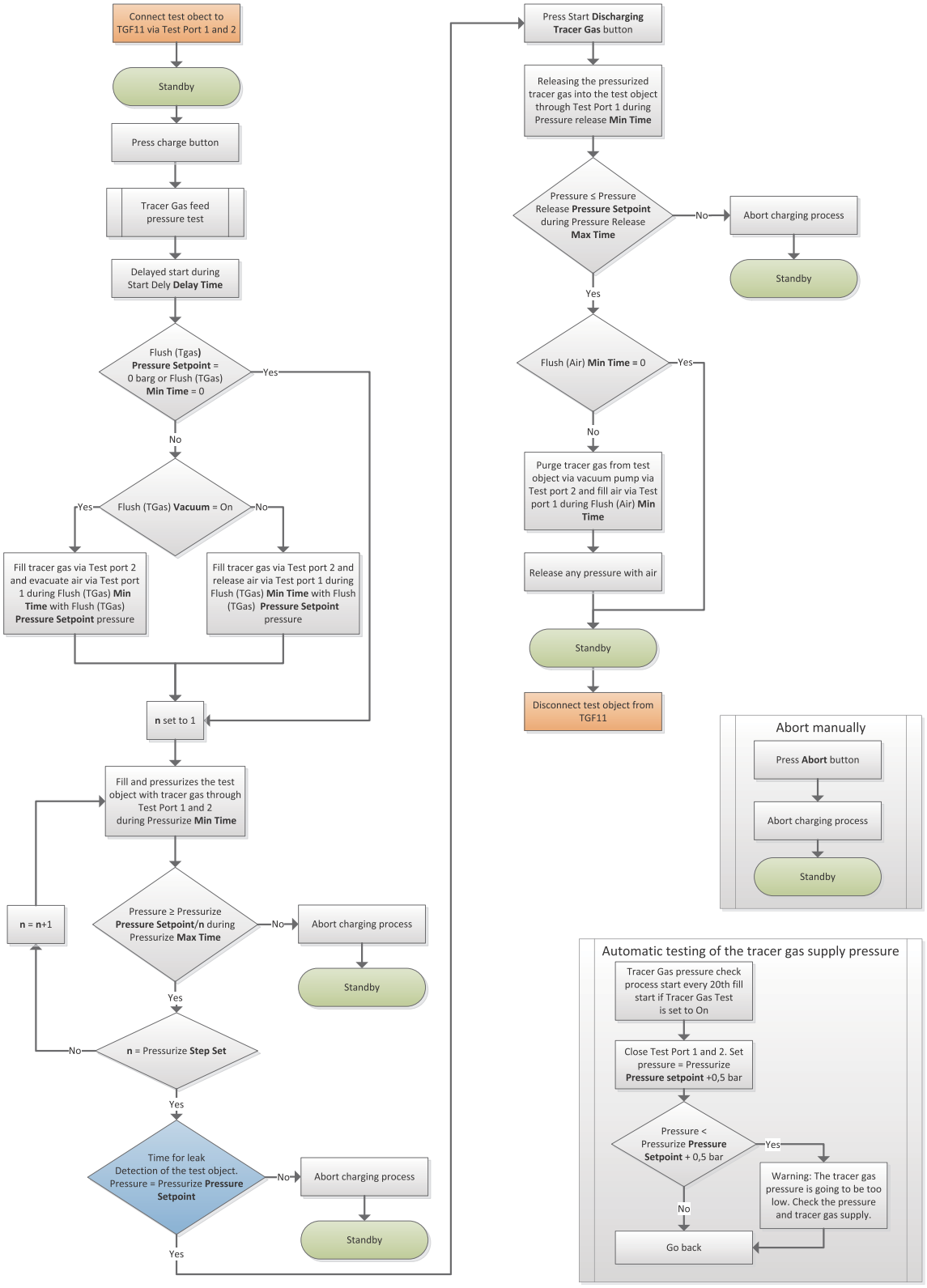


Fig. 5: Flowchart Mode B

5.3 Test setup

5.3.1 Connection set up

Operation Mode Sequence Description:

Mode A

Test object connected to Test port 1 or connected to Test Port 1 and 2

1. The test object is evacuated to the set vacuum pressure level or to the set min. time. This step can be deselected if the max. time is set to 0 or pressure setpoint is set to 0.
2. The test object is pressurized to set pressure level.
3. Test time (using for leak detection)
4. The test object releases the pressure to the set min. time or pressure level.
5. The test object evacuates the tracer gas until the set vacuum pressure level is reached or the set min. time runs out.
   This step can be deselected if the max. time is set to 0 or pressure setpoint is set to 0.
6. The test object will be filled with air.

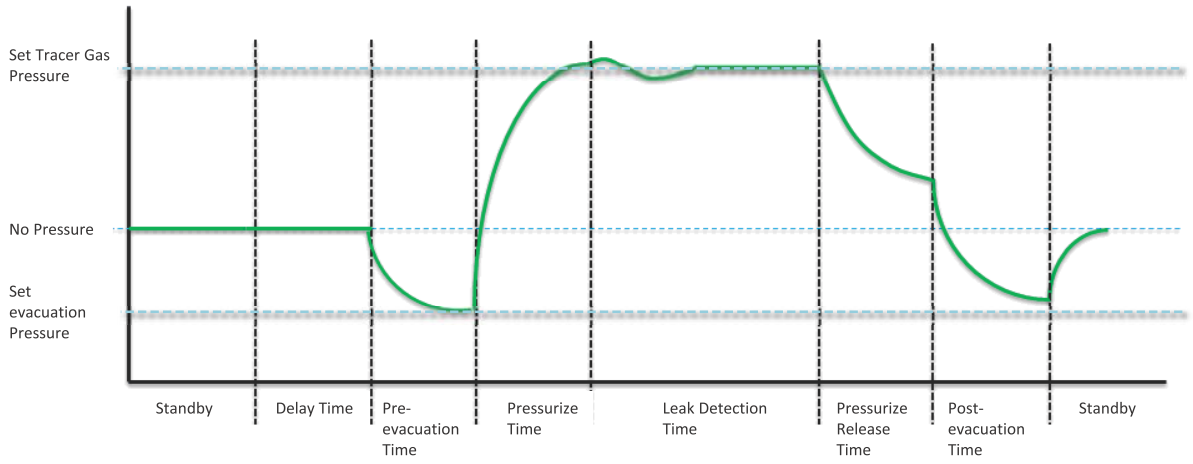


Fig. 6: Time pressure diagram Mode A

Mode B

Test object connected to Test Port 1 and 2

1. The test object is flushed with tracer gas to the set min. time.
   This step can be deselected if the min. time is set to 0.
2. The test object is pressurized to the set pressure level.
3. Test time (using for leak detection)
4. The test object releases the pressure to the set min. time or pressure level.
5. The test object is flushed with air during the set min. time.
   This step can be deselected if the min. time is set to 0.
6. The test object will be filled with air.

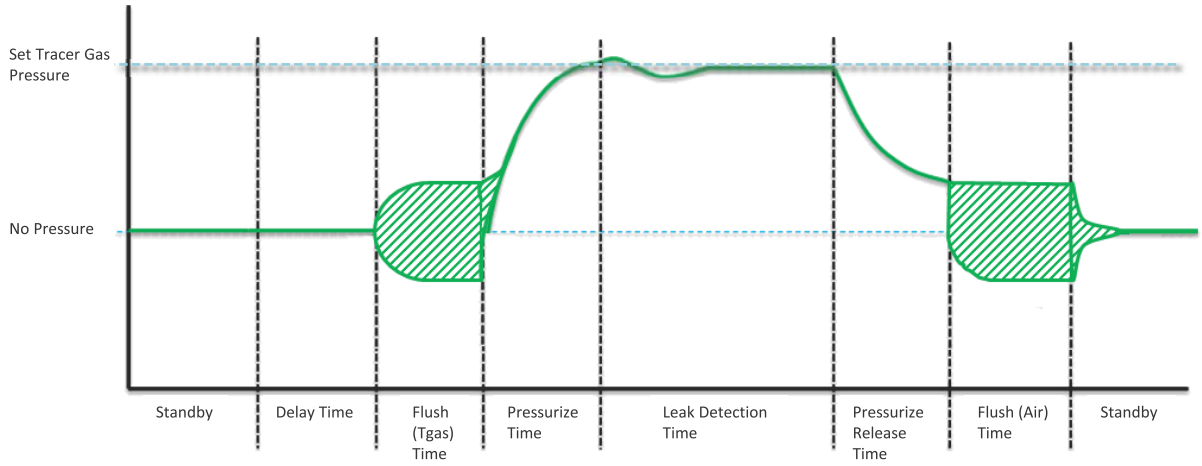


Fig. 7: Time pressure diagram Mode B

The hose dimensions, object size, tracer gas pressure and the pressurized purge air with compressed air will all affect the pressure of the shaded area. All of these circumstances must be considered and adopted correctly for each fill situation.

Port Connection Guide

Port	Mode A and test port 1	Mode A and test port 1, 2	Mode B and test port 1, 2
COMPRESSED AIR	Connected to compressed air	Connected to compressed air	Connected to compressed air
TEST PORT 1	Connect to test object	Connect to test object	Connect to test object
TEST PORT 2	Plugged	Connect to test object	Connect to test object
PURGE AIR	Plugged	Plugged	Open or connected to pressurized air
TRACER GAS	Connected to tracer gas	Connected to tracer gas	Connected to tracer gas
EXHAUST	Connected to exhaust ventilation	Connected to exhaust ventilation	Connected to exhaust ventilation
REGULATOR VENT	Connected to exhaust ventilation	Connected to exhaust ventilation	Connected to exhaust ventilation

Connection Rules

Port	Mode A and test port 1
COMPRESSED AIR	Do not use higher pressure than 10 barg (145 psig)
TEST PORT 1	Long and narrow tubes increases cycle time
TEST PORT 2	Long and narrow tubes increases cycle time
PURGE AIR	Normal not pressurized
TRACER GAS	Must be minimum 1 bar/100 kPa/ 14.5 psi above set tracer gas pressure into the test object
EXHAUST	Long and narrow tubes increases cycle time.
REGULATOR VENT	Connected to exhaust ventilation. Do not connect it direct to the Exhaust Port hose!

5.3.2 Vacuum and pressure method for filling the tracer gas via only one test port (Mode A)

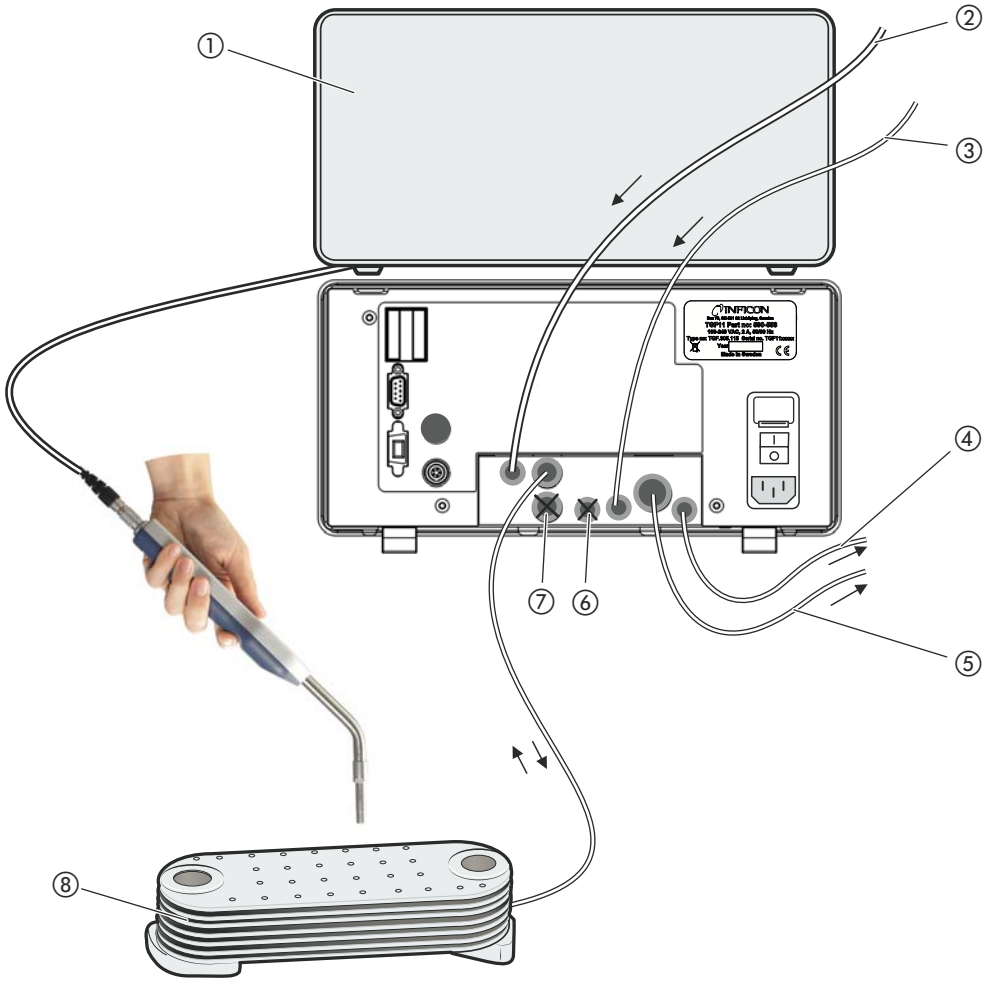


Fig. 8: Setup of the tracer gas filling unit if the test object is to be single feeded.

① *Leak detector*
② *Compressed air*
③ *Tracer gas inlet*
④ *Regulator vent port must be connected to exhaust ventilation*
⑤ *Exthaust port must be connected to exhaust ventilation*
⑥ *Purge air must be be plugged with the Blanking Plug 6 mm*
⑦ *Test port 2 must be plugged with the Blanking Plug 10 mm*
⑧ *Test object, connected to TGF11 via Test port 1*

⚠ WARNING

Risk of bursting

In case of malfunction the gas pressure can increase.

► To protect against too high gas pressure in the test object, install a pressure relief valve at the test port.

Test port 2 and Purge air inlet must be plugged.

1. Pushing ⏵ starts evacuating the test object via test port 1 first. Then the tracer gas is subsequently fed into the test object via the same line to the set pressure level.
2. Now is the time to leak detection ①.
3. Pushing ⏹ starts evacuating the test object from tracer gas. The test object will be released subsequently from tracer gas and filled with air.

5.3.3 Vacuum and pressure methode for filling the tracer gas via test port 1 and 2 (Mode A)

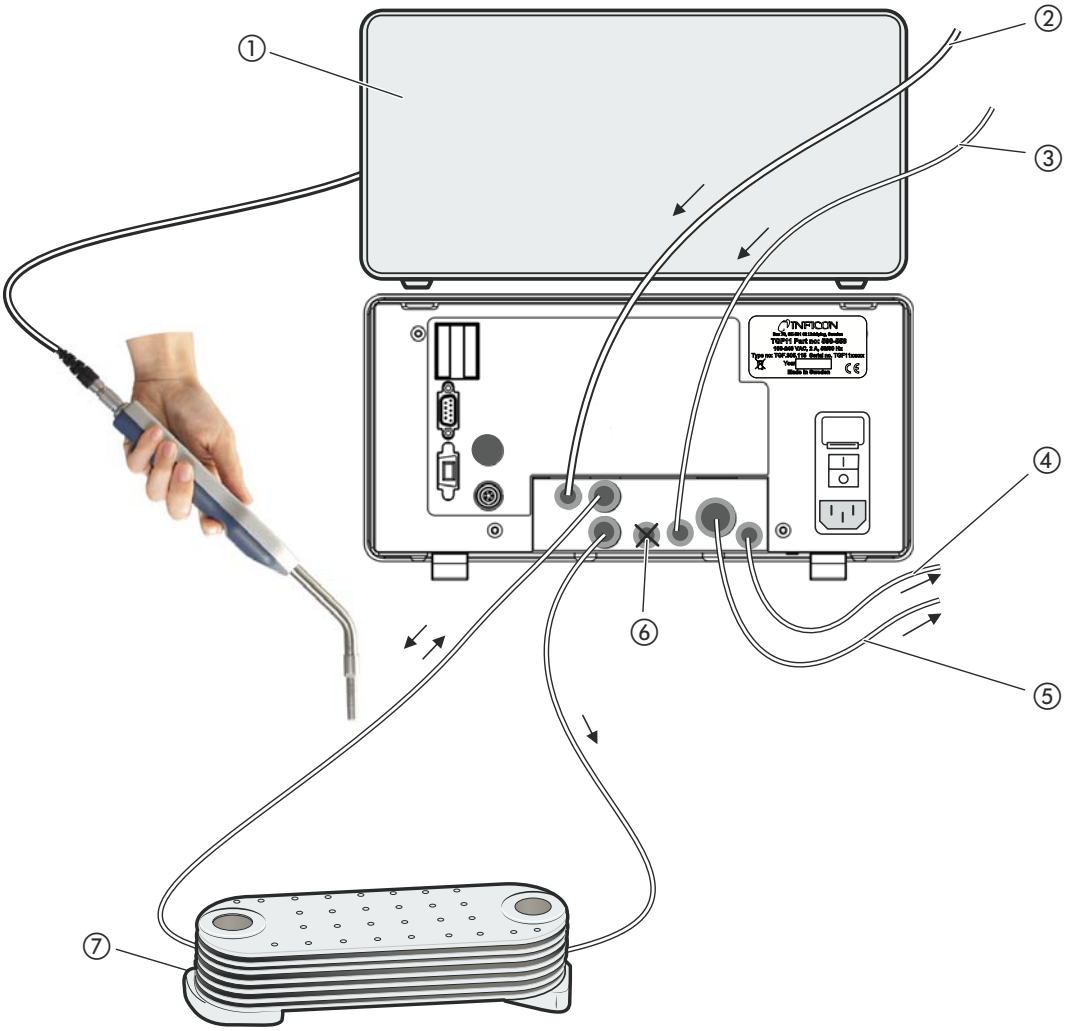


Fig. 9: Setup of the tracer gas filling the test object with gas via test port 1 and 2

① *Leak detector*
② *Compressed air*
③ *Tracer gas inlet*
④ *Regulator vent port must be connected to exhaust ventilation*
⑤ *Exthaust port must be connected to exhaust ventilation*
⑥ *Purge air must be be plugged with the Blanking Plug 6 mm*
⑦ *Test object, connected to TGF11 via Test port 1 and Test port 2.*

⚠ WARNING

Risk of bursting

In case of malfunction the gas pressure can increase.

► To protect against too high gas pressure in the test object, install a pressure relief valve at the test port.

Purge air must be be plugged .

1. Pushing ⏵ starts evacuating the test object via test port 1 first. Then the tracer gas is subsequently fed into the test object via test port 1 to the set pressure level.
2. Now is the time to leak detection ①.
3. Pushing ⏹ starts evacuating the test object from tracer gas. The test object will be released subsequently from tracer gas and filled with air.

5.3.4 Purge and pressure method for filling the tracer gas (Mode B)

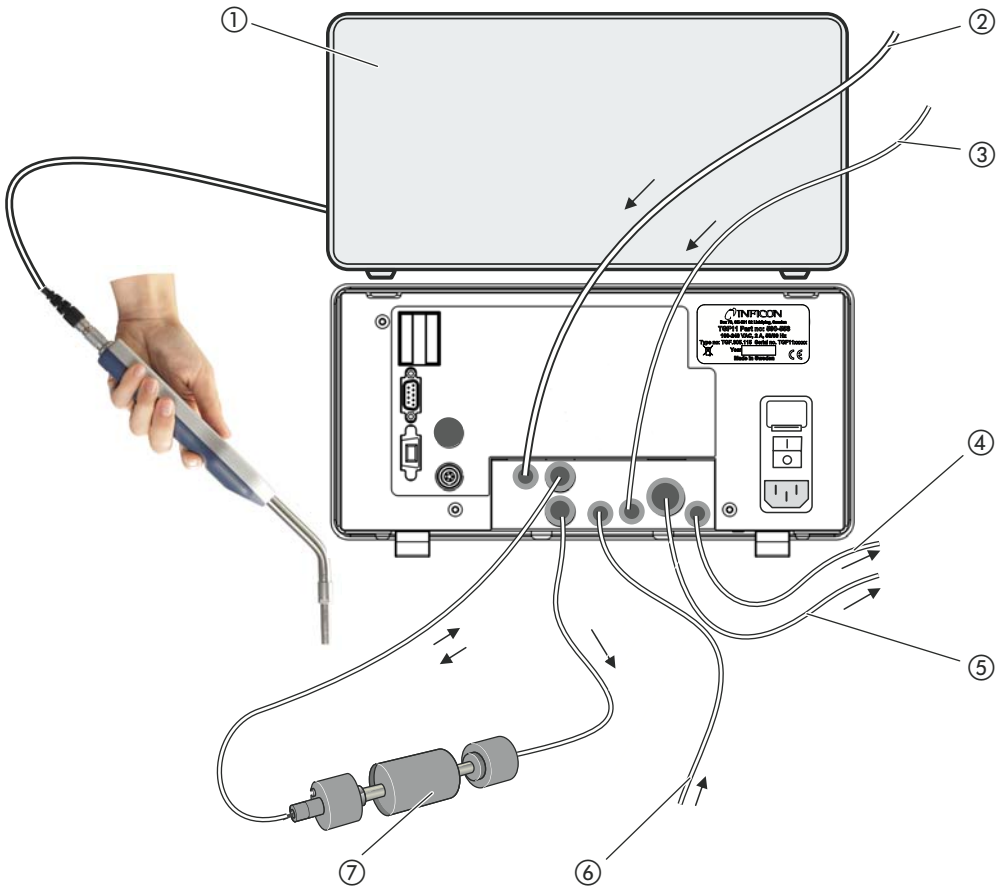


Fig. 10: Example of a test setup with an elongated test object

① *Leak detector*
② *Compressed air*
③ *Tracer gas*
④ *Regulator vent port must be connected to exhaust ventilation*
⑤ *Exthaus port must be connected to exhaust ventilation*
⑥ *Purge air inlet*
⑦ *Test object*

⚠ WARNING

Risk of bursting

In case of malfunction the gas pressure can increase.

► To protect against too high gas pressure in the test object, install a pressure relief valve at the test port.

The test object in the illustrated test setup is connected to the TGF11 via two lines.

1 After pressing ⏵ the air is evacuated via test port 1, and tracer gas is loaded via test port 2. Tracer gas is subsequently loaded via line 1.

2 Now there is time to leak detection ①.

3 Pressing ◉ the air used for purging is sucked in via test port 2 and out via test port 1, away from the measuring station. The air evacuated from the test object is led away from the measuring station.

5.4 Hoses

5.4.1 Prerequisites for gross leak alarm functions

If there is a gross leak and the TGF11 cannot exceed the set pressure limit, TGF11 interrupts the tracer gas charge process.

To enable this reaction, the hoses must not be too long. Otherwise a back pressure can give the impression that it is no gross leak.

Note the recommended max hose lengths and hose inside diameters:

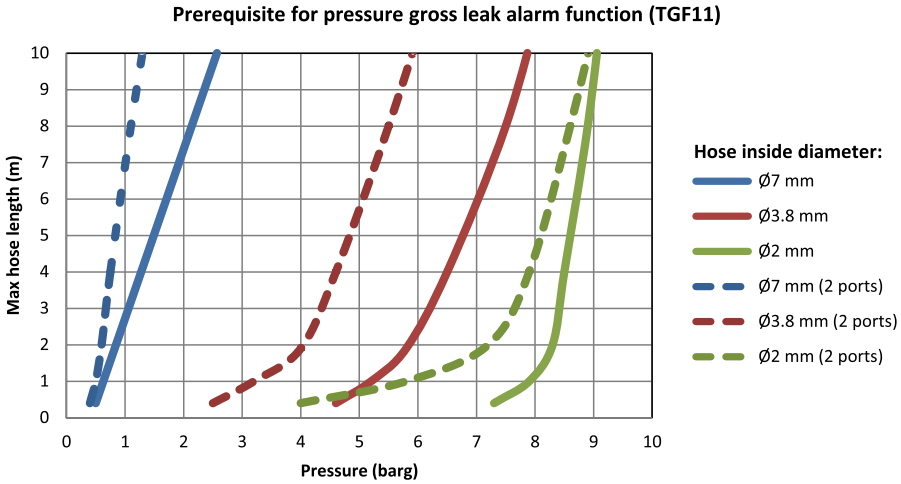


Fig. 11: Prerequisite TGF11

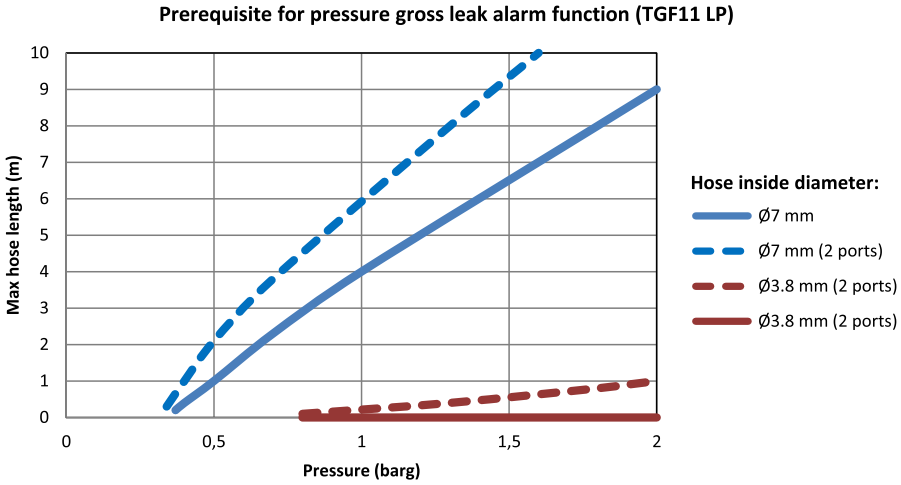


Fig. 12: Prerequisite TGF11 LP

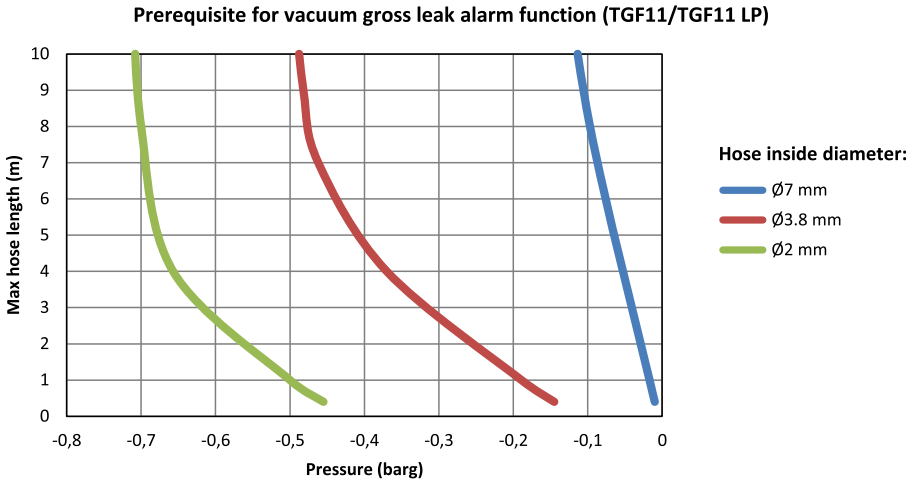


Fig. 13: Prerequisite TGF11/TGF11 LP

5.4.2 Connecting hoses

Several of the hose connections are closed off with plugs. Remove the plugs before connecting the lines. Save the plugs so that the connections can be sealed off again if necessary.

The length of the exhaust hose with a diameter of 12 mm must be 10 m as a maximum. If a longer hose is required, then select one with a larger diameter. This means that the resistance in the exhaust hose remains within the intended range.

► Push the hoses into the ports until they lock into position.

► To release the hoses, press the release ring and pull the line.

Location of the ports: *see chapter 4.2: "Design", page 13*.

1. Connect the compressed air supply to the TGF11.
2. Connect the tracer gas supply with the TGF11.
3. Connect the exhaust hose with the TGF11. Set up the exhaust hose in such a manner that the exhaust air is transported away as far as possible from the test area to prevent tracer gas contamination. Connect the hose to a ventilation exhaust system or pull it out to the outside of the building.
4. Connect the purge air hose with the TGF11. Set up the purge air hose in such a manner that clean air is sucked in.
5. Connect the test object with one or two lines, depending on the desired filling method. Use filters to protect the valve into the TGF11, *see chapter 10.1: "Accessories List", page 51*.

5.5 Electrical connections

If you would like to control the TGF externally then make the desired connection via the I/O port or the RS232 port (*see chapter 10.7.1: "PLC I/O Configuration", page 56*).

The USB port is required for software updates, *see chapter 6.8: "Updating software", page 39*.

5.6 Connecting to the mains

The TGF11 can be operated with various mains voltages, *see page 15*.

⚠ CAUTION

Hazards due to incorrect mains voltage

Incorrect mains voltage can destroy the device and injure people.

► Check that the mains voltage permitted for the TGF11 is the same as that which is available on site.

► Connect the device to the electricity supply using the mains cable delivered.

⚠ DANGER

Hazards due to electric shocks

Improperly earthed or secured products may cause death if a malfunction occurs. Use of a device without a protective conductor connected is not permitted.

► Only use the 3-wire mains cable provided.

5.7 Usage of an In-line Air Filter

You can use an in-line Air Filter (TGF11 Vacuum filter) to protect the Venturi pump and the Gas valves against pollution, *see chapter 10.1: "Accessories List", page 51*.

This procedure saves time concerning maintenance, *see chapter 8.1: "Maintenance plan", page 45*.

► Connect filter on the hose. Ensure that the arrow on the filter housing is pointing to the test port of TGF11.

At a later point in time you can see how much particulate filter has captured.

Operating Instructions TGF11, nins69en1-05.fm, 1601

6 Usage

6.1 Switching on

► Switch on the device using the mains switch.

6.2 Operation

6.2.1 Display

The display

- uses process symbols to indicate the current stage of the measuring sequence,
- shows operating symbols for operation with buttons,
- shows a menu where settings can be altered,
- shows values via bars and numbers, e.g. pressure level or times.

Fig. 14: Example for information on the display

TGF11 has no function to display compressed air pressures.

6.2.1.1 Process symbols

With the following process symbols you are kept informed regarding the current stage of the measuring sequence or if an error occurs.

Table 3: Process and error symbols

Symbol	Meaning	Symbol	Meaning
	Standby		Leak testing
	Tracer gas test		Reduce pressure
	Start delay		Purge with air
	Evacuate		Aborted by operator

Table 3: Process and error symbols

Symbol	Meaning	Symbol	Meaning
	Purge with tracer gas		Aborted due to error
	Purge and evacuate with tracer gas		The tracer gas pressure is going to be too low. Check the pressure and tracer gas supply.
	Increase pressure		

6.2.1.2 Control icons

The control icons are in the corner of the display. The 4 buttons are assigned to these. Other control icons may be displayed depending on the stage within the operating sequence. The symbols can appear in two different colors:

- Gray: Function is locked.
- Blue: Function can be activated.

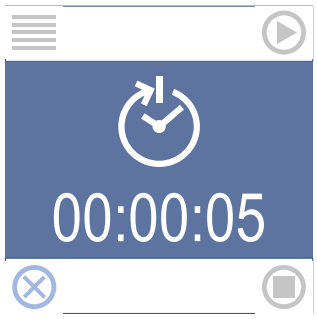
After switching on, the following functions are available with their symbols:

Table 4: Control icons in the start display

		Settings symbol
		Operation symbol
		Information symbol
		Diagnostics symbol

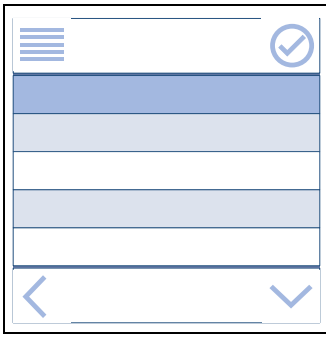
The following symbols and their functions are available before and during the measurement process:

Table 5: Control icons for measurement process

		Return to the start screen or main menu
		Start charging tracer gas
		Start discharging tracer gas
		Abort ongoing function

The following symbols with their functions are available in the settings menu:

Table 6: Control icons for settings menu

	Return to the start display
	Back
	Scroll downwards
	Confirm entry or selection
	Selects the number that can be changed.
	Count up the digits of a numerical entry. Normally 0-9, in some cases limited to lower maximum value.

6.3 Basic settings

6.3.1 Enter password and issue new password

Enter password

Access to the settings menu is protected by a password. The factory setting is "0000".

If you wish to open the settings menu with the ⚙ button, then you first have to enter the password. If the password is still at factory settings then you can immediately press the ⊘ button. Otherwise set the password and then press ⊘.

Issue new password

To issue a new password, select:

► Select "⚙ > (old) Password > General > Set Password".

► Set the new password.

► Select the < button.

6.3.2 Setting the language

The following languages can be chosen to be shown on the display:

- English (factory setting)
- Swedish
- German
- French
- Spanish
- Italian

► Select "⚙ > Password > General > Language".

6.3.3 Setting the pressure unit

i	All pressure data is displayed in relative pressure, even if the character "g" is missing!

You can select one of the following pressure units:

- bar (g) (factory setting)
- mbar (g)

- kPA (g)
- PSI (g)

► Select "⚙ > Password > General > Pressure Unit".

6.3.4 Setting the screensaver timer

You can set a time after which the screensaver is displayed to save energy. If the display is switched off then it can be switched back on by pressing a button.

- Format: hh.mm.ss

► Select "⚙ > Password > General > Screensaver timer".

6.3.5 Tracer Gas Test

If tracer gas pressure is going to be too low, a tracer gas pressure test warning is displayed.

Then you can e.g. change the gas bottle to a new one.

You can turn off the tracer gas pressure test function if you want.

► Select "⚙ > Password > General > Tracer Gas Test".

6.4 Settings for measurements

6.4.1 Select filling method

There is a choice between two filling methods, *see chapter 5.2: "Filling method and type of leak testing", page 17*.

► Select "⚙ > Password > Operation Mode > Mode A/Mode B".

Mode A: Vacuum and pressure method
Mode B: Purge and pressure method

In addition *see chapter 10.3: "Menu tree (Mode A)", page 52* and *see chapter 10.4: "Menu tree (Mode B)", page 53*.

► **To save the selected mode and settings permanently, select "Save Settings"** ***see chapter 6.5: "Save settings and call up again", page 38*****.**

6.4.2 Setting times and pressures

The settings are practically identical for both filling methods. The only difference in the settings can be found in evacuation of the test object, see below. The major difference between the filling methods is due to the different test setup and the internal switching of the valves.

6.4.2.1 Application example: Calculating concentration of tracer gas

There is always some residual air in the test object, which means it is not possible to achieve a 100% concentration of tracer gas.

If the test object has been evacuated before filling or if the tracer gas is purged into the test object then higher concentrations can be achieved.

Without pre-evacuation

Without pre-evacuation the concentration can be calculated as follows:

Fill pressure A: 0.5 barg (0.5 bar above atmospheric pressure)
The air in test object B: 1 bar (the atmospheric pressure)

Tracer gas fill factor C:

A/(A + B) = C 0.5 barg /(0.5 barg + 1 barg) = 0.33

The average tracer gas concentration is only one-third of the expected concentration in this example.

With a 5% tracer gas mixture: 0.33 × 5% = 1.7%

With pre-evacuation

With pre-evacuation, the concentration can be calculated as follows:

Fill pressure A: 0.5 barg (0.5 bar above atmospheric pressure)
The air in test object B: 1 bar (the atmospheric pressure)
Pre-evacuatin pressure D: -0.7 barg (0.7 bar below atmospheric pressure) => D=0.7 bar

Tracer gas fill factor C:

(A + D)/(A + B)=C (0.5 + 0.7)/(0.5 + 1) = 0.8

The average tracer gas concentration is therefore 80% of the initial concentration in this example.

With a 5% tracer gas mixture: 0.8 × 5% = 4%

6.4.2.2 Start delay

The start delay is a buffer period which runs after the overall process has been started with the ⏵ button. Using a start delay is a possibility to consider time for accumulation or bombing, for example.

► Select "⚙ > Password > Parameters > Start Delay > Delay time".

6.4.2.3 Pre-evacuation/Flush (TGas) limit and times

Pre-evacuation (Mode A)

Set the vacuum level that should be achieved in the test object.

► Select "⚙ > Password > Parameters > Pre-evacuation > Pressure Setpoint".
Setting range: 0.00 down to -0.85 barg

Set the time period during which this vacuum level should be achieved. If the vacuum level is not reached within the time set, then either the test object is too large, or the test object has a large leak. The whole process is then aborted.

► Select "⚙ > Password > Parameters > Pre-evacuation > Max Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

In addition it is also possible to set a minimum period of time used to create the vacuum. This means that a stable vacuum can be achieved.

► Select "⚙ > Password > Parameters > Pre-evacuation > Min Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

(For test there is no need to create a vacuum or if the test object cannot withstand vacuum it is possible to deselect this step by setting the pressure to 0 or max. time to 0.)

Flush (TGas) (Mode B)

Set the intended level of the tracer gas pressure at test port 2, which pushs the air out from the test object into Test Port 1.

► Select "⚙ > Password > Parameters > Flush (Tgas) > Pressure Setpoint".
Setting range: 0.3 up to 10.00 barg (0.05 up to 2.00 barg TGF11 LP)

Set the time period for which the pressure driven flush should be applied.

► Select "⚙ > Password > Parameters > Flush (Tgas) > Min Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

Set whether air should be evacuated from the test object at test port 1 via vacuum.

► Select "⚙ > Password > Parameters > Flush (Tgas) > Vacuum".
Setting range: On/Off

(For test there is no need to flush tracer gas it is possible to deselect this step by setting the min. time to 0.)

6.4.2.4 Tracer gas pressure limit, filling times and steps

Pressurize (Mode A and B)

Set the intended level of tracer gas pressure in the test object and the period of time within which this pressure should be achieved. If the pressure is not achieved within the set time, then the test object is either too large, or it has a large leak. The whole process is then aborted.

► Select "⚙ > Password > Parameters > Pressurize > Pressure Setpoint".
Setting range: 0.3 up to 10.00 barg (0.05 up to 2.00 barg TGF11 LP)

► Select " > Password > Parameters > Pressurize > Max Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

In addition, a time can be set that is used as a minimum period of time to build up the pressure. This means that stable pressure can be achieved.

► Select " > Password > Parameters > Pressurize > Min Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

It is also possible to determine that the pressure is built up in steps and not continuously.

► Select " > Password > Parameters > Pressurize > Steps".
Setting range: 0 to 10 steps. With settings "0" and "1" the pressure is continuously increased.

6.4.2.5 Releasing pressure and vent time

Pressure Release (Mode A and B)

These settings ensure that the test object is free of pressure before disconnect the test object or evacuating/flushing the test object free from tracer gas. Set how high the pressure must be at most in the test object.

In an ideal scenario the pressure should have fallen to 0.5 - 1 barg before the vacuum pump starts at Mode A.

It is also possible to set the minimum length of time the releasing of pressure should last and also how long it must last at most.

If the pressure has not fallen to the value set within the longest time period set, then there is a fault in the device. The whole process is then aborted.

► Select " > Password > Parameters > Pressure Release > Pressure Setpoint".
Setting range: 0.3 up to 10.00 barg (0.05 up to 2.00 barg TGF11 LP)

► Select " > Password > Parameters > Pressure Release > Min Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

► Select " > Password > Parameters > Pressure Release > Max Time".
Setting range: 00:00:00 … 99:59:59 (hh.mm.ss)

6.4.2.6 Tracer gas vacuum pressure limit and evacuation time

Post-evacuation (Mode A)

Set how much off the tracer gas as will be removed from the test object by vacuum for a certain period of time.

► Select " > Password > Parameters > Pressure Release > Pressure Setpoint".
Setting range: 0.00 down to -0.85 barg

► Select " > Password > Parameters > Pressure Release > Min Time".
Setting range: 00:00:00 … 99:59:59 sec.

► Select " > Password > Parameters > Pressure Release > Max Time".
Setting range: 00:00:00 … 99:59:59 sec.

6.4.2.7 Tracer gas flush time

Flush (Air) (Mode B)

Set the min. time when vacuum at test port 1 is evacuating air from test port 2 through the test object, which purges the test object free from tracer gas.

► Select " > Password > Parameters > Flush (Air) > Min Time". · Setting range: 00:00:00 … 99:59:59 (hh.mm.ss).

6.5 Save settings and call up again

If you have changed the settings but not saved, then these settings are lost when the device is switched off or the mode is changed. To prevent this from happening, the settings that have been changed can be saved:

- 4 sets for the vacuum and pressure method, mode A
- 4 sets for the purge and pressure method, mode B

If you are saving settings for the first time, you can move to the settings menu and select "Save Settings" there. If you have already saved settings that you do not wish to overwrite, then continue as follows:

1 Select " > Password > Operation Mode > Mode A/Mode B".

2 Select one of the four sets (A-1, A-2, A-3, A-4 or B-1, B-2, B-3, B-4).

3 Configure all settings.

4 Return to the settings menu and select "Save Settings".

A saved set can be called up via the following path:

1 Select " > Password > Operation Mode > Mode A/Mode B".

2 Select the required set.

If you have changed the settings but do not want to keep the changes, then you can quickly call back the settings you last saved:

► Select " > Password > Restore Settings".

6.6 Tracer Gas filling and leak testing process - summary

During leak testing there are no major differences between the vacuum and pressure method and the purge and pressure method regarding operation of the TG11.
The difference lies in the test setup, *see chapter 5.3: "Test setup", page 21* .

During the measuring sequence the display informs regarding times, pressures and the current step in the measuring sequence, *see chapter 6.2.1: "Display", page 31*.

During the measuring sequence the process can be aborted with the ⊗ button.
The device then goes into standby.

1 Create all pneumatic and electrical connections.

2 Switch on the TGF11.

3 Set the filling method and all parameters.

4 Ensure your leak detector is ready to use.

5 Switch over into operating with the ◎ button.

6 **⚠ WARNING**

Risk of bursting
Ensure that the facility, hose connections, and test object can withstand the test pressure. If in doubt, carry out a pressure test.

7 Start the filling and leak testing process sequence with the ⊛ button.

8 Follow filling progress on the display.

9 As soon as  is displayed then the leak testing can be carried out. If a pressure fall test is carried out, observe the pressure display.

10 To release the pressure, press the ◉ button.

When the times are set up for this, then the test object is subsequently evacuated (Mode A) or purged (Mode B).

11 Wait until the test object is without pressure and the TGF11 switches over into standby mode. Display: 

12 You can now disconnect the test object from the TGF11.

6.7 Read and write data

Data can be read and write via the RS232 interface and the USB port, *see chapter 10.7.2: "USB/R232", page 60*.

6.8 Updating software

The software can be updated via the USB connection. To do so, connect the USB port with a PC with a USB cable and start the corresponding installation program on the PC.

6.9 Switching off

You can turn off the TGF11 at any time using the mains switch. This means that overpressure or a vacuum in the test object is immediately relieved.

7 Warning and error messages

If you intend to input an entry which lies outside the possible range of values, then the TGF11 displays a corresponding message.

The following table describes other error messages.

Table 7: Error messages and cause

Error message or error	Possible cause
	• No tracer gas pressure • Tracer gas pressure < 1 bar above the tracer gas pressure set in the test object. • Tracer gas pressure beneath the value set for the test. • No compressed air supply, so the internal valves do not switch. Possible reasons: – Tracer gas test does not monitor trace gas pressure continuously, but the function is intended to alert the user that the tracer gas pressure starts to decrease and approach a pressure ensuring that you can no longer regulate the pressure to the test object as desired. – It is normally required about 0.5 - 1 bar higher pressure of the incoming tracer gas that feeds the instrument against the regulated pressure to the test object for it to work well. – Tracer gas test is carried out automatically between fill cycles with regular intervals. You can turn off this feature if desired.
	Aborted by the device • The vacuum set was not achieved within the chosen evacuation time. Possible reasons: – Gross leak or test object not connected. – Incorrect vacuum setting that does not work with the test object or connection hose size. – Loss of or too low compressed air pressure. – Malfunction of the vacuum pump. – Dirt in the filter that blocks the flow of gas. • The test pressure set was not achieved within the filling time. Possible reasons: – Gross leak or test object not connected . – Incorrect pressure setting that does not work with the test object or connection hose size. – Loss of or too low tracer gas feed pressure. – Dirt in the filter that blocks the flow of gas. • The pressure threshold on releasing the pressure was not reached within the set pressure release time. Possible reasons: – Incorrect pressure setting that does not work with the test object or connection hose size. – Dirt in the filter that blocks the flow of gas.
	Warning – Tracer gas pressure is going to be too low If the operator gets this warning, the symbol changes to orange. After pushing the diagnosis symbol a message will pop up.

7.1 Troubleshooting

Table 8: Troubleshooting

Error	Possible source of error	Eliminating errors
Unusually high leak rate	Exhaust gases are not transported far enough away from the measuring station.	Use longer hoses.
No picture on display	Screensaver active, *see chapter 6.3.4, page 34*.	Press a button.
	No power supply	Connect power supply.
	Device is off as the fuse is blown.	Replace the fuse.
	Main cable broken	Replace Main Cable.
	Main PCB broken	Contact INFICON customer services.
	Internal PCB power cable loose or broken	Contact INFICON customer services.
	Internal Display PCB cable loose or broken	Contact INFICON customer services.
	Display is faulty.	Contact INFICON customer services.
Abnormal picture on display or wrong picture	Main PCB broken	Contact INFICON customer services.
	Display PCB broken	Contact INFICON customer services.
Buttons do not work	Display PCB broken	Contact INFICON customer services.
Interfaces have no function	Internal defect.	Contact INFICON customer services.
Settings lost on restart	The Main PCB Memories broken (Flash Memories)	Contact INFICON customer services.
Not enough vacuum pressure	Test object is either not connected, or has a severe leak.	Check the test object and the connections.
	Value set too low for the vacuum (< -85 kPa).	Set a higher value instead.
	No compressed air pressure to power the vacuum pump.	Create a compressed air supply.
	Exhaust blocked or choked flow because of the narrow tube or too a long hose.	Check that the exhaust has sufficient throughflow.
	Dirty vacuum pump (Venturi pump)	Clean vacuum pump. Contact service for more information, if necessary.
	Calibration is wrong. Pressure transmitter reading is not calibrated.	Recalibration must take place. Contact INFICON customer services.
	Broken valve	Contact INFICON customer services.
	Broken pressure gauge	Contact INFICON customer services.
	Broken Main PCB	Contact INFICON customer services.
No vacuum into the test object even if vacuum pressure is displayed	Test port 1 pluged and test object connected to Test port 2. The Pressure Gauge is connetcted only to Test port 1.	Connect test object to Test Port 1 and plug Test Port 2, *see chapter 5.3: "Test setup", page 21*.
Too low tracer gas pressure	Gross leak or test object not connected	Check the test object and the connections.
	No tracer gas pressure or too low pressure	Check tracer gas supply, adjust the pressure. Should be 100 kPa higher pressure than sat pressure.
	No compressed air pressure to activate valve	Check the compressed air supply.
	Pressure calibration needs.	Recalibration must take place. Contact INFICON customer services.
	Broken valve	Contact INFICON customer services.
	Broken pressure gauge	Contact INFICON customer services.
	Broken Main PCB	Contact INFICON customer services.

Table 8: Troubleshooting

Error	Possible source of error	Eliminating errors
Too high tracer gas pressure (on display)	Pressure calibration needs.	Contact INFICON customer services.
	Broken pressure regulator valve	Contact INFICON customer services.
	Broken pressure gauge	Contact INFICON customer services.
	Broken Main PCB	Contact INFICON customer services.
No tracer gas purge flush (in operating mode B)	Test object not connected to test port 2.	Connect the test object properly, *see chapter 5.3: "Test setup", page 21*.
	Tracer gas is not connected, or connected at too low a pressure.	Check the tracer gas supply.
	No compressed air supply and valves are therefore without function.	Check the compressed air supply. Contact service for more information, if necessary.
	Broken pressure regulator valve	Recalibration must take place. Contact INFICON customer services.
	Broken valve	Contact INFICON customer services.
	Broken pressure gauge	Contact INFICON customer services.
	Broken Main PCB	Contact INFICON customer services.
No air purge flush (in operating mode B)	Test port 2 pluged	Remove the plug and connect the port to the test object, *see chapter 5.3: "Test setup", page 21*.
	Purge Air Port pluged or blocked.	Remove the plug or remove the blockage.
	No compressed air pressure to power the vacuum pump which sucks air through the test object.	Check compressed air supply.
	Dirty vacuum pump (Venturi pump) which sucks air through the test object	Clean vacuum pump. Contact service for more information, if necessary.
	No compressed air supply and the valves are therefore without function.	Check the compressed air supply.
	Broken Main PCB	Contact INFICON customer services.
No tracer gas into the test object during test even if the pressure level works	Compressed air contected to Tracer Gas Port	Connect tracer gas to Tracer Gas Port, *see chapter 5.3: "Test setup", page 21*.
	Purge Air (with pressure) connected to Tracer Gas Port	Connect tracer gas to Tracer Gas Port
Still tracer gas in the test object after test	It is normal to have a small amount of tracer remaining after the test, especially when emptying the test object via vacuum alone. To flush test objectet can be more efficient, depending on the test object's geometry.	Do nothing.
	Not optimized settings	Extension periods or pressure levels
Slow pressure release of test object even if the vacuum pump works	Test port 1 plugged and test object connected to Test port 2. The pressure gage is connected only to test port 1. The pressure release goes through the pressure regulator valve exhaust.	Connect test object to test port 1 and plug test port 2
Icon "Tracer gas low." shown	The tracer gas pressure soon empty	Check tracer gas supply pressure and amount of tracer gas remaining
Tracer gas leaking from the instrument	Leaky hose connection	Check whether the hoses are inserted properly.
	Broken valve	Contact INFICON customer services.
Tracer gas leaking out from test ports	Tracer Gas from pressure regulator valve exhaust port diffuses out through test ports	Connect Exhaust Port to slightly under pressed exhaust ventilation
	Broken pressure regulator valve	Contact INFICON customer services.
	Broken valve	Contact INFICON customer services.
	Too high tracer gas pressure supply	Lower trace gas pressure

8 Maintenance

8.1 Maintenance plan

There are two different parts that need regular maintenance:

- Venturi pump: If test port 1 and/or 2 are not protected by filter, the Venturi pump needs regular cleaning.
- Gas valves: If test port 1 and/or 2 are not protected by filter, gas valves need regular cleaning or have to be replaced.

Table 9: Maintenance plan

Part	Interval	Action
Venturi Pump	3 months	– Check Ultimate Vacuum by plugged test port 1 and set the vacuum pressure to -1 barg (-14.5 psig). – Clean Venturi nozzles when necessary.
Valves	3–6 months[1)]	– Check condition of valves. – Replace valves when necessary.

1. Depends on the amount of particulates in the objects tested. Metal burrs and other sharp particles will wear the valves down, requiring shorter maintenance intervals.

8.1.1 Maintenance work

Required tools:

- Allen keys (hexagonal 3 and 8 mm), (0,1" and 0,2")
- Torx key (T20)
- Protective eye wear and ear plugs

DANGER

Risk of death due to electric shock

There are high voltages in the interior of the device. Touching parts which are supplied with high voltage means there is a risk of death.

► Disconnect the device from the electricity supply before carrying out all maintenance work. Ensure that the electricity supply cannot be switched back on unintentionally.

8.1.2 Maintenance of Venturi pump

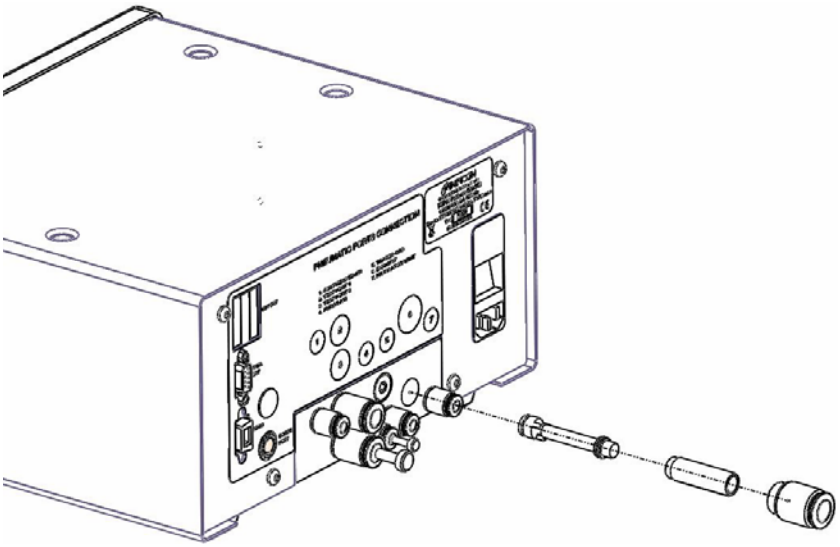


Fig. 15: Venturi pump

1. Turn off the instrument.
2. Remove the exhaust port quick hose connection using an 8 mm hex wrench.
3. Remove the vacuum pump support (brass cylinder). Remember which direction it is mounted.
4. Remove the vacuum pump (Yellow plastic cylinder). Remember which direction it is mounted.
   If the pump is still in the device, turn on the instrument and start vacuum pumping. Place something soft, like a cloth, to catch the pump when it is pushed out by compressed air.
5. Clean the pump by using compressed air.
6. Check the O-ring.
7. Reinstall the pump in the same direction as it was installed.
8. Reinstall the vacuum pump support (brass cylinder) in the same direction as it was installed.
9. Reinstall the test port quick hose connection.
10. Check vacuum level by plugged test port 1 and set the vacuum pressure to -1 barg (-14.5 psig).

8.1.3 Maintenance gas valve

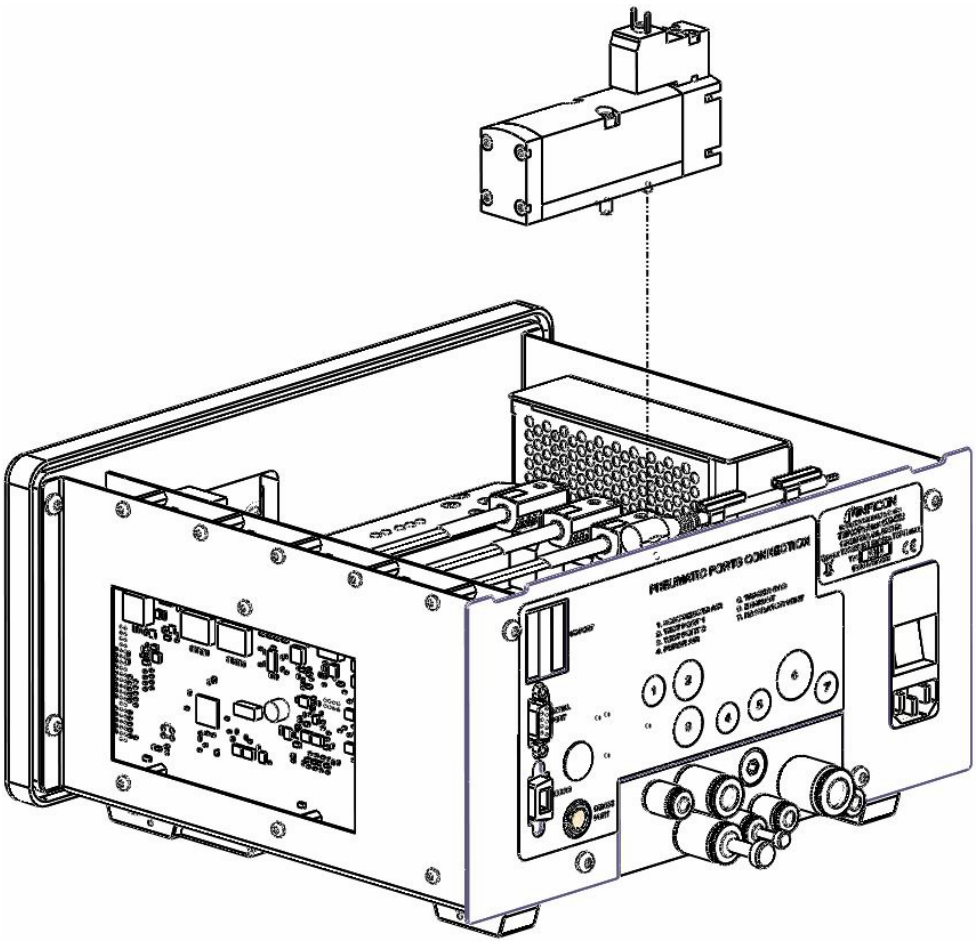


Fig. 16: Gas valve

1. Turn off the instrument.
2. Remove the power supply.
3. Remove the chassis by loosening the screws holding the chassis (4). Move the chassis back until it is loose.
4. Remove the cable from the valve.
5. Remove valve.
6. Install new valve.
7. Reinstall cable to valve.
8. Reinstall chassis.
9. Check function.

i	The pressure control valve which is located next to the valves has buttons that you can press. If you press them, nothing happens. The pressure control valve is controlled by the software in the instrument.

8.1.4 Maintenance external filter

Replace the filter element:

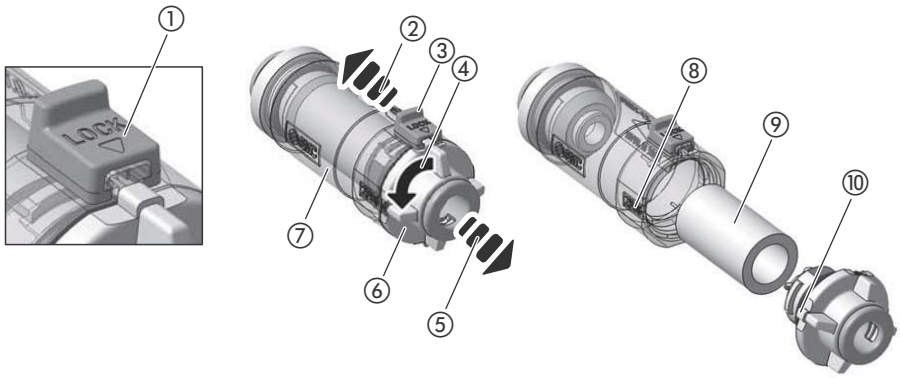


Fig. 17: Disassembling

① *Unlocked state*
② *Step 2*
③ *Rotating*
④ *Step 3*
⑤ *Step 4*
⑥ *Cover*
⑦ *Case*
⑧ *Product no. displayFilter element*
⑨ *Protrusion on the cover*
⑩ *Protrusion on the cover*

1 Stop operation and reduce the filter's internal pressure to atmospheric.

2 Slide the lock mechanism in the direction of the arrow to release the lock.

3 Rotate the cover counterclockwise at least 90 degrees.

4 Pull the cover out of the case to remove the element. Remove dust and other debris remaining inside the case by blowing it out with air, etc. (Also, confirm that the O-ring is not damaged.)

5 Install a new element on cover and insert it into the case.

Fig. 18: Assembling

⑪ *Step 5*
⑫ *Step 6*
⑬ *Step 7*
⑭ *Locked state*

6 Align the raised part of the cover with the model no. display of the body, and push the cover to the end of the body and rotate it clockwise until it stops.

7 Set the lock mechanism and check that the cover is locked completely.

9 Decommissioning

9.1 Disposing of the device

The device can either be disposed of by the operator or be sent to INFICON.

The device consists of materials that can be recycled. This option should be exercised to prevent waste and also to protect the environment.

► During disposal, observe the environmental and safety regulations of your country.

9.2 Sending in the device

Contact before dispatch

Speak with a member of our service team before sending back components of the INFICON device. You will either receive an RMA number for your device immediately or complete a declaration of contamination and then subsequently receive an RMA number.

If a package is sent in without an RMA number then we will contact you before opening the package. This leads to delays during maintenance of the device.

⚠ WARNING

Hazards due to harmful substances

Contaminated devices could endanger the health of INFICON employees.

► Completely fill in the declaration of contamination.

► Attach the declaration of contamination on the outside of the packaging.

Declaration of Contamination

The declaration of contamination is a legal requirement and serves to protect our employees. INFICON sends devices which are sent without a completed declaration of contamination back to the sender.

Declaration of Contamination: See below.

Declaration of Contamination

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay.
This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

1 Description of product

Type _____
Article Number _____
Serial Number _____

2 Reason for return

_____
_____
_____

3 Operating fluid(s) used (Must be drained before shipping.)

_____
_____

4 Process related contamination of product:

toxic	no ❑ 1)	yes ❑
caustic	no ❑ 1)	yes ❑
biological hazard	no ❑	yes ❑ 2)
explosive	no ❑	yes ❑ 2)
radioactive	no ❑	yes ❑ 2)
other harmful substances	no ❑ 1)	yes ❑

The product is free of any substances which are damaging to health yes ❑

1) or not containing any amount of hazardous residues that exceed the permissible exposure limits

2) Products thus contaminated will not be accepted without written evidence of decontamination!

5 Harmful substances, gases and/or by-products

Please list all substances, gases, and by-products which the product may have come into contact with:

Trade/product name	Chemical name (or symbol)	Precautions associated with substance	Action if human contact

6 Legally binding declaration:

I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.

Organization/company _____
Address _____ Post code, place _____
Phone _____ Fax _____
Email _____
Name _____

Date and legally binding signature _____

Company stamp

Copies:
Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender

10 Appendix

10.1 Accessories List

Name	Order no.	Amount	Note
Fuse 2A slow 6,3 x 32 mm	591-578	10	Accessories
Cover Screw Terminal BL.3.5 / 8	591-634	5	Accessories
Screw Terminal BL 3.5/8 SN SW	591-632	5	Accessories
Blanking Plug 6 mm	591-961	10	Accessories
Blanking Plug 10 mm	591-962	10	Accessories
In-line air filter 10 mm	592-032	10	Accessories
In-line air filter 6 mm	592-047	6	Accessories
USB 2.0 cable 1.0 m	592-002	1	Accessories
Power Cord eu	591-146	1	Accessories
Power Cord uk	591-147	1	Accessories
Power Cord US	591-853	1	Accessories

10.2 Parts List for Consumables

Name	Order no.	Amount	Note
In-line air filter Elements	592-033	2	Consumables
Valve 5/2	591-936	3	Consumables
TGF11 Venturi Kit	597-004	1	Consumables

10.3 Menu tree (Mode A)

			Mode A selected	
Start		**Menu level 1**	**Menu level 2**	**Menu level 3**
Settings	Password	Operation Mode	Mode A	A-1
				A-2
				A-3
				A-4
			Mode B	B-1
				B-2
				B-3
				B-4
		Parameters	Start Delay	Delay time
			Pre-evacuation	Pressure Setpoint
				Min Time
				Max time
			Pressurize	Pressure Setpoint
				Steps
				Min Time
				Max Time
			Pressure Release	Pressure Setpoint
				Min Time
				Max Time
			Post-evacuation	Pressure Setpoint
				Min time
				Max Time
		General	Pressure Unit	Bar
				mbar
				kPa
				Psi
			Language	English
				Swedish
				German
				French
				Spanish
				Italian
			Screensaver timer	
			Set Password	
			Tracer Gas Test	On
				Off
		Restore Settings	Save current configuration settings to memory	
		Save Settings	Restore current configuration settings	
Operating	Start Charging tracer gas			
	Start Discharging tracer gas			
	Abort			
	Start screen			
Info				
Diagnosis				

10.4 Menu tree (Mode B)

			Mode B selected	
Start		**Menu level 1**	**Menu level 2**	**Menu level 3**
Settings	Password	Operation Mode	Mode A	A-1
				A-2
				A-3
				A-4
			Mode B	B-1
				B-2
				B-3
				B-4
		Parameters	Start Delay	Delay time
			Flush (Tgas)	Pressure Setpoint
				Min Time
				Vacuum
			Pressurize	Pressure Setpoint
				Steps
				Min Time
				Max Time
			Pressure Release	Pressure Setpoint
				Min Time
				Max Time
			Flush (Air)	Min Time
		General	Pressure Unit	Bar
				mbar
				kPa
				Psi
			Language	English
				Swedish
				German
				French
				Spanish
				Italian
			Screensaver timer	
			Set Password	
			Tracer Gas Test	On
				Off
		Restore Settings	Save current configuration settings to memory	
		Save Settings	Restore current configuration settings	
Operating	Start Charging tracer gas			
	Start Discharging tracer gas			
	Abort			
	Start screen			
Info.				
Diagnosis				

10.5 CE declaration of conformity

Declaration of CE Conformity

Manufacturer

INFICON AB
Westmansgatan 49
SE-582 16 Linköping
Sweden

Object of the declaration (marketing identification):

Part no	Product name	Configuration ID
590-558	Tracer Gas Filler TGF11 (standard pressure)	TGF.305.115
590-559	Tracer Gas Filler TGF11 (low pressure)	TGF.305.115

The object of the declaration described above is in conformity with the relevant Community Directives, namely:

EMC Directive (2004/108/EC)
LVD, Low Voltage Directive* (2006/95/EC)
RoHS Directive (2011/65/EC)

Harmonized European standards which have been applied

No.	Ed	Subject
EN 61326-1:2006	2	Class B: Electrical equipment for measurement, control and laboratory use.
EN 61326-1:2006	2	Industrial Requirements Electrical equipment for measurement, control and laboratory use.

*Internal voltage range is not in scope of directive. AC/DC power supply of desktop model is CE-marked and installed correctly.

For INFICON AB, Linköping, Sweden, November 10, 2014

Fredrik Enquist
R&D Manager

INFICON AB

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10.6 Declaration of Incorporation

INFICON

DECLARATION BY THE MANUFACTURER

(Directive 2006/42/EC, Art. 4.2 and Annex II, sub B)

PROHIBIT TO PUT EQUIPMENT INTO SERVICE

Manufacturer

INFICON AB
Westmansgatan 49
SE-582 16 Linköping
Sweden

Hereby declares that

TGF11, Tracer Gas Filler
TGF11 L, Tracer Gas filler, low pressure model

(Type no for construction identification: TGF.305.115)

- is designed to allow it to be incorporated into machinery or to be assembled with other machinery to constitute machinery governed by Directive 2006/42/EC and/or Pressure Equipment governed by Directive 97/23/EC, as amended;

and furthermore declares that it is not allowed to put the equipment into service until any Machinery and/or Pressure Equipment into which it has been incorporated or of which it has become a component has been found and declared to be in conformity with the provisions of Directive 2006/42/EC and/or Directive 97/23/EC as applicable and with national implementing legislation, i.e. as a whole, including the equipment referred to in this declaration.

For INFICON AB, November 07, 2014

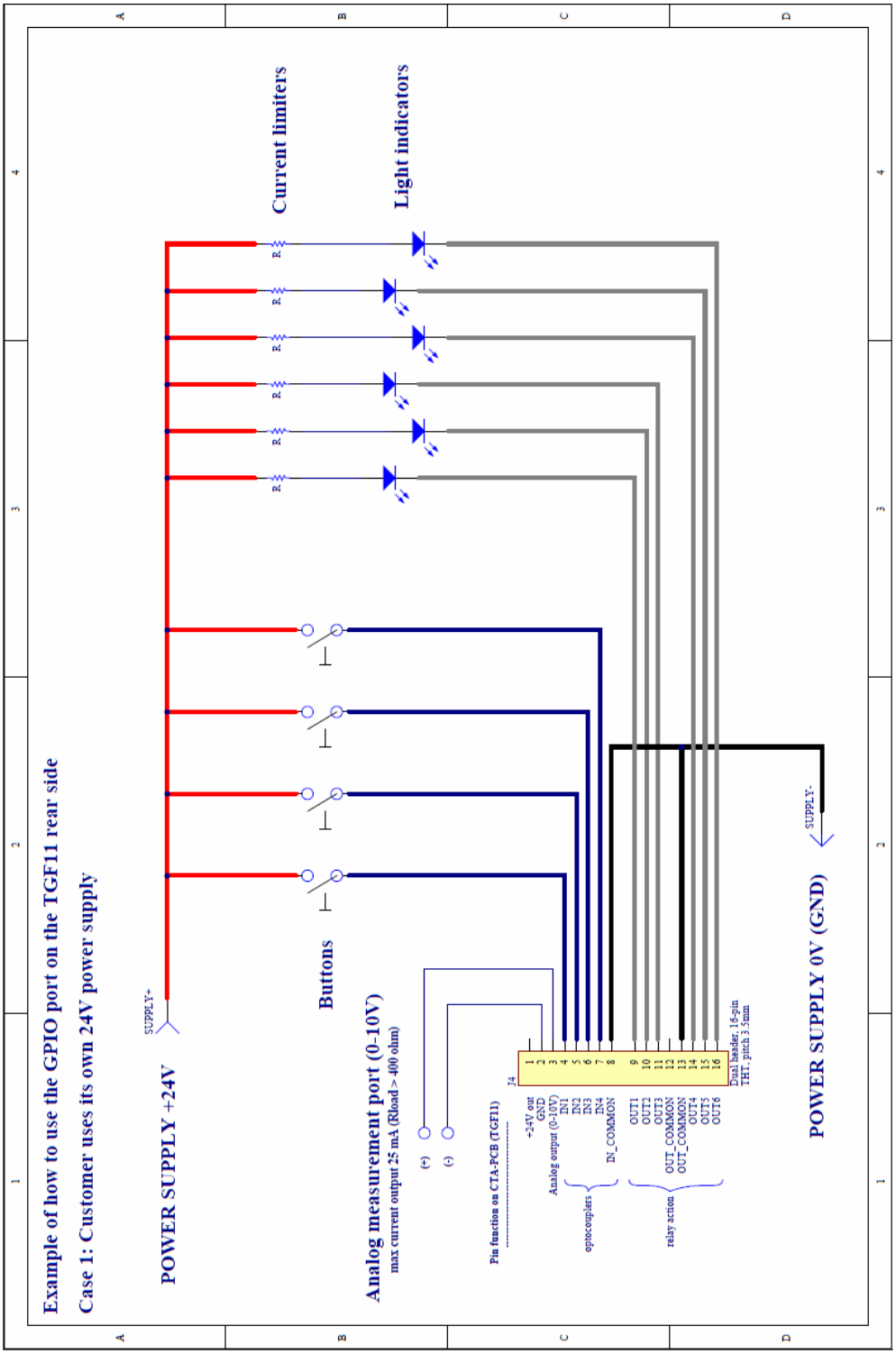
Fredrik Enquist

Fredrik Enquist, R&D Manager

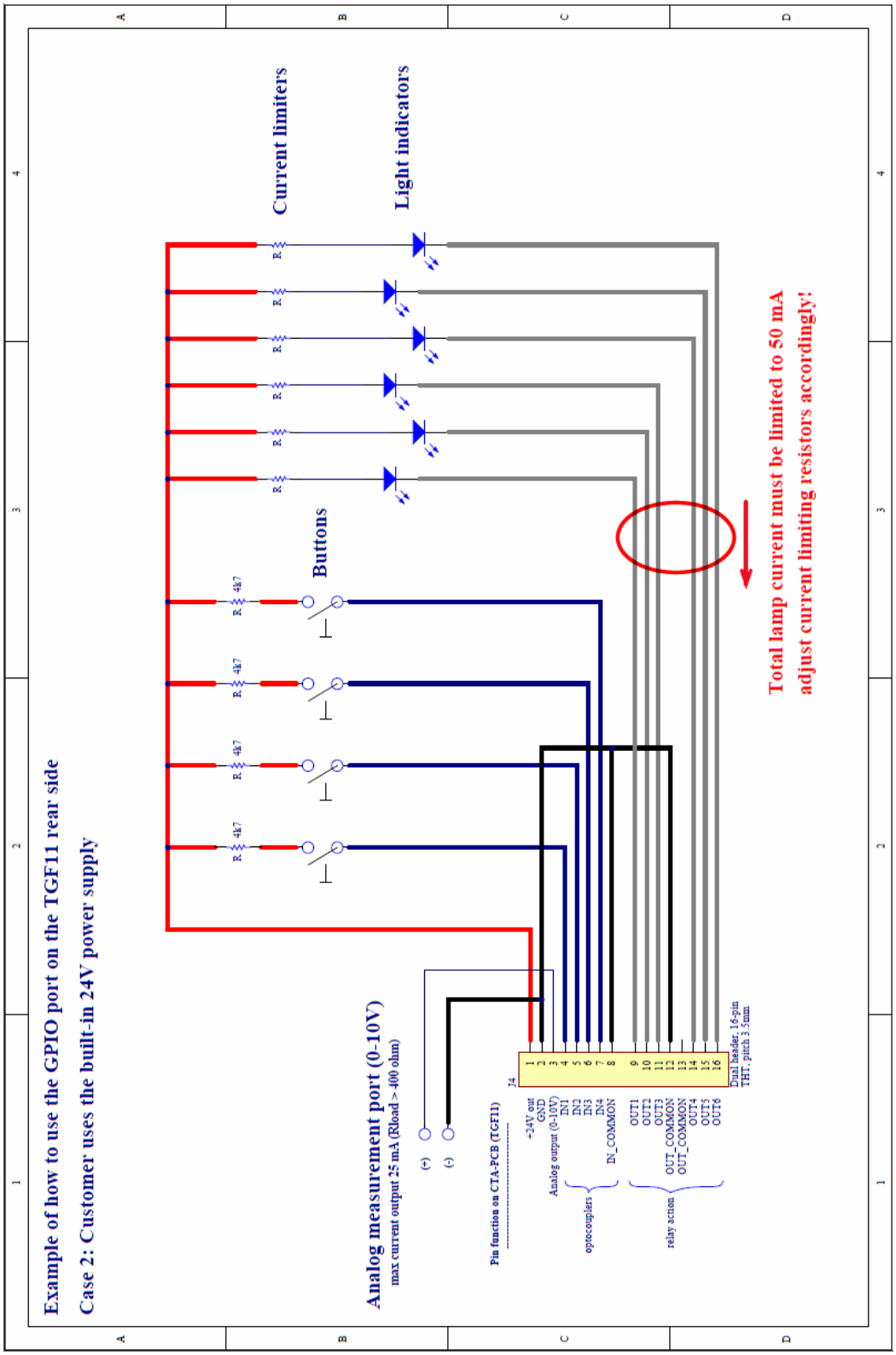
10.7 Pages for programmers and installers

10.7.1 PLC I/O Configuration

Example Case 1: Customer uses its own 24V power supply



Example Case 2: Customer uses the built-in 24V power supply



Pin.	I/O	Function	Note.	Specification
1	24VAC			Max 84mA output totaly from pin 1 and 3
2	GND			
3	Analog out	1.5 to 7.0 V = -1 to 10 barg (-14.5 to 145 psig)	Scale: 0.5 V/bar or 2 bar/V Resolution: 5 mV = 10 mbar Example: -1 barg = 1.5 V 0 barg = 2 V 2 barg = 3 V 10 barg = 7 V	Max 84mA output totaly from pin 1 and 3
4	IN1	Start charging	Hi=Start charging. Message on display.	Max 50VDC. Input impedance min 10 kohm. External source must drive atleast 1 mA @ 24V into input pin.
5	IN2	Start discharging	Hi=Start discharging (overiding IN1). Message on display.	Max 50VDC. Input impedance min 10 kohm. External source must drive atleast 1 mA @ 24V into input pin.
6	IN3	Abort/Reset	Hi=Stop charging/discharging and go to Standby (overiding IN1 and IN2). Message on display. The message can be rested by IN3 set to Hi a second time.	Max 50VDC. Input impedance min 10 kohm. External source must drive atleast 1 mA @ 24V into input pin.
7	IN4	Not used		Max 50VDC. Input impedance min 10 kohm. External source must drive atleast 1 mA @ 24V into input pin.
8	IN-COM	Common IN		
9	OUT1	Pressurized test object	Hi=Time for leak detection. Message on display.	Relay outputs: max 24VDV, max 1A per pin. Relays close between "OUTx" and "COM"
10	OUT2	Standby	Hi=Standby. Message on display.	Relay outputs: max 24VDV, max 1A per pin. Relays close between "OUTx" and "COM"
11	OUT3	Can not reach set level	Hi=wrong settings, rough Leak, defect vacuum pump, compressed air drop. Error message on display. Goes to Standby after Maximum Time out.	Relay outputs: max 24VDV, max 1A per pin. Relays close between "OUTx" and "COM"
12	OUT-COM	Common OUT		
13	OUT-COM	Common OUT		
14	OUT4	Not used		
15	OUT5	Not used		

16	OUT6	Low tracer gas level	Hi=Low TG pressure, time to change gas bottle. Only a warning, don't stop the TGF11. Message on display.	Relay outputs: max 24VDV, max 1A per pin. Relays close between "OUTx" and "COM"

10.7.2 USB/R232

Types of USB/RS232 commands

- **Read Parameter** Read parameters who has impact of the measurement
- **Read Status** Read the status
- **Read Device Setup** Read data about the instrument and device
- **Write Device Setup** Write data about the instrument and device
- **Command Execute** Function command

USB/RS232 interface

Setting	Data
Data rate	115200 baud
Data bits	8
Stop bits	1
Parity	None
Flow control	None

\n = cursor return

Read Parameters

Parameter	Read		
	Sequence of Data	Answer	Comments
Serial number	rDds\n	XXXXXXXX\n	Read serial number
SW version	rDdv\n	X.XX.XX\n	Read sw version
GetStatistic	rDgs\n	S-0+" "+X+\n S-1+" "+X+\n …	Returns run statistic, how many completed, manually aborted, aborted due to error. See "Get…answer/ GetStatistic"
GetConfig	rDgc\n	C-0+" "+X+\n C-1+" "+X+\n …	Returns sequence id, language settings etc.. See "Get…answer/ GetConfig"
GetParameters	rDgp\n	P-0+" "+X+\n P-1+" "+X+\n …	Returns parameters, charge pressure, min max time etc.. See "Get…answer/ GetParameters"
GetSettings	rDga\n	S-0+" "+X+\n S-1+" "+X+\n … S-0+" "+X+\n P-17+" "+X+\n	Returns all saved variables in the tgf11, statistic, config and parameters. See "Get…answer"
Test status	rDio\n	XXXXXXY\n	Where X is 0 or 1 in ascii. Y is checksum calculated by summing over all X (decimal representation) and \n. See Test status description
GetOperationMode	rDom	C-0+" "+X+\n	X = 0 to 7, See "Get…answer"

Get…answer:		Comments
GetStatistic		
S-0	Completed	
S-1	Manually aborted.	
S-2	Aborted due to error.	
S-3	TG low pressure.	
GetConfig		
C-0	Current operation mode. (0-7) = (A-1, A-2, A-3, A-4, B-1, B-2, B-3, B-4)	
C-1	Pressure unit. (0-3) = (bar, mbar, kpa, psi)	
C-2	Baud rate. (not used)	
C-3	Language. (0-5) = (English, German, French, Spanish, Swedish, Italian)	
C-4	Regulator type. (0-1) = (2 bar, 10 bar)	
C-5	Screensaver timer. (ms)	
C-6	Password.	Answer in figures: 0000 = 0, 0001 = 1, 0010 = 10, 1000 = 1000 etc.
C-7	Pressure transmitter calibration factor A. (Ax+B)	
C-8	Pressure transmitter calibration factor B.	
C-9	Pressure transmitter offset.	
C-10	Propvalve offster.	
C-11	Tracer gas test. (0-1) = (off, on)	
GetParameters		
P-0	Start delay. (ms)	
P-1	Pressurize setpoint. (mbar)	
P-2	Pressurize steps.	
P-3	Pressurize min time. (ms)	
P-4	Pressureize max time. (ms)	
P-5	Pressure release setpoint. (mbar)	
P-6	Pressure release min time. (ms)	
P-7	Pressure release max time. (ms)	
P-8	Pre: Venturi setpoint. (mbar)	
P-9	Pre: Venturi min time. (ms)	
P-10	Pre: Venturi max time. (ms)	
P-11	Post: Venturi setpoint. (mbar)	
P-12	Post: Venturi min time. (ms)	
P-13	Post: Venturi max time. (ms)	
P-14	Flush (Tracer Gas) setpoint. (mbar)	
P-15	Flush (Tracer Gas) min time. (ms)	
P-16	Flush (Tracer gas) ejector. (0-1) = (off, on)	
P-17	Flush (Air) min time. (ms)	

Digit (right to left)	Status (0 or 1)
Digit 1	1 = Pressurized test object
Digit 2	1 = Standby
Digit 3	1 = Cannot reach set level
Digit 4	Not used
Digit 5	Not used
Digit 6	1 = Low tracer gas level

Write Device Setup

Setup	Write		Answer	Comments
	Sequence of Data	value/text		
Set Operating Mode	wDom + " " + [value/text]+ \n	0 = A-1 1 = A-2 2 = A-3 3 = A-4 4 = B-1 5 = B-2 6 = B-3 7 = B-4	X\n	A = Mode A, vacuum and pressure B = Mode B, flush and pressure 1-4 different parameters setup. Total 8 different sets of parameters.

Execute Commands

Execute command	Sequence of Data	Answer
Start charging	cEst\n	cEst\n
Start discharging	cEsp\n	cEsp\n
Abort/Reset	cEab\n	cEab\n
On next test check tracer gas level.	cEtg\n	cEtg\n

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