

# Smart Flue Gas Analyser

## DC710

*to be used in conjunction with a Smart Phone/Tablet  
using the TPI View app.*



The Value Leader™

[www.tpieurope.com](http://www.tpieurope.com)

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## Download the TPI View App

Download the TPI View app from the Apple® app store or the Google® play store to begin using your DC710.



# Introduction

Thank you for purchasing TPI brand products. The TPI DC710 combustion analyser is state of the art and easy to use. Connect it to your smart device and you are ready to perform combustion analysis. The instrument is ruggedly constructed and comes with a 5 Year Warranty\*

\* Warranty subject to annual service/re-calibration by TPI Europe Ltd or an approved TPI Service Centre. Failure to ensure that annual service/re-certification is carried out will nullify the 5 Year Warranty and may lead to additional servicing costs when carried out.

## General Overview

The TPI DC710 combustion analyser uses state of the art electrochemical sensors. This sensor technology provides the longest lasting most accurate and reliable means for performing combustion tests. Your analyser will need to be serviced/re-certified annually.

The following guidelines will help prevent damage to your sensors and keep your analyser working and giving correct values:

- Always use the Mini Pump Protection Filter - see Page 11
- Always periodically check and replace the Mini Pump Protection Filter as needed if it becomes blocked or discoloured - see Appendix A
- Always make sure the in-line filter / water trap is installed properly - see Appendix A
- Always periodically check and replace the in-line filter as needed if this becomes saturated or discoloured- see Appendix A
- Always remove water or condensation from the inside of the in-line filter / water trap assembly prior to performing tests - see Appendix A
- Always use the optional oil filter (p/n A773) when performing tests on oil burning equipment

Failure to monitor and perform the above may result in SLOW and/or INCORRECT READINGS.

## General Overview (Continued)

This manual will guide you through the functions of the TPI DC710 which will give you many years of reliable service.

You should keep the battery of your DC710 charged so power is constantly being supplied to your sensors.

Your TPI DC710 Flue Gas Analyser comes complete with the following standard accessories:

- TPI DC710 Instrument
- Rubber Boot Ends
- Mini Pump Protection Filter Assembly c/w spare filters (A763)
- Instruction Manual

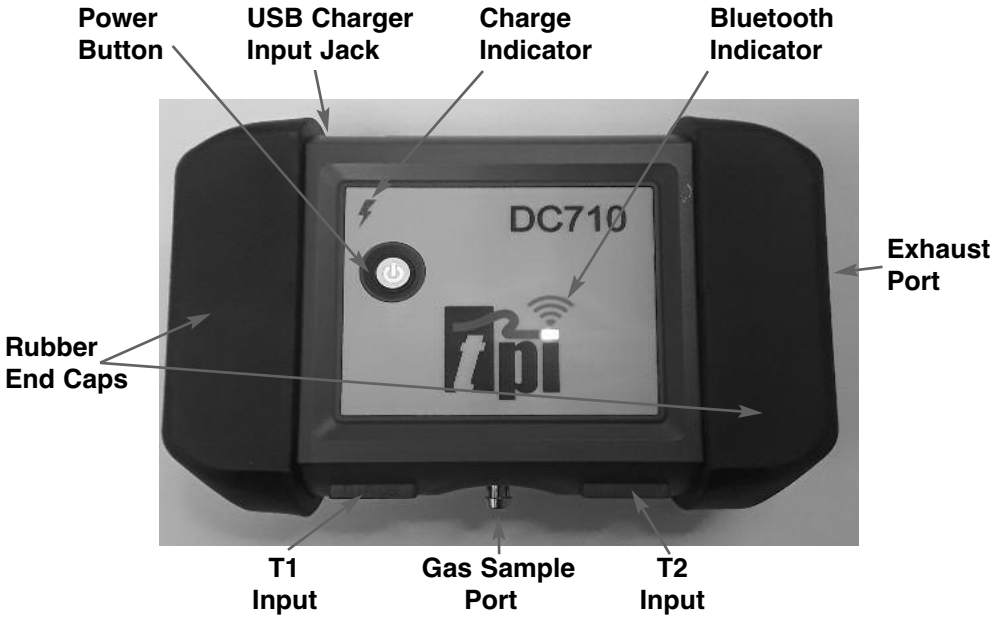
Your TPI DC710C1 Flue Gas Analyser comes complete with the following standard accessories:

- TPI DC710 Instrument
- Rubber Boot Ends
- Soft Carrying Case (A768)
- Flue Sampling Probe (A770)
- In-Line Filter assembly installed on Flue probe (A796)
- Temperature Probe (GK11M)
- Mini Pump Protection Filter Assembly c/w spare filters (A763)
- Instruction Manual

Your TPI DC710 Flue Gas Analyser has the following options available to complete your kit:

- Bluetooth Printer (A740BT)
- Smart Pressure Meter (SP620)
- Smart Ambient CO2 Meter (SP1000)
- Temperature Pipe Clamps (CK21M)
- CPA1 Probe Kit (CPK3)
- Pocket Combustible Gas Leak Detector (725L)

# Instrument Overview - Front View



## Power Button

Used to turn the DC710 on and off. Illuminates green when power is on.

## USB Charger Input Jack

Connection for included charger.

## Charge Indicator

Red = Charging. Green = Fully charged.

## Bluetooth Indicator

Blue = Connected to smart device.  
Red = Disconnected from device.  
Pink = Purging

## T1 Input Jack

Connection for the flue probe temperature lead - see page 6

## Gas Sampling Port

Connection for Mini Pump Protection Filter then Flue Probe - see Page 6

## T2 Input Jack

Connection for ambient temperature probe. If this probe isn't used the DC710 uses it's internal temperature sensor - see Page 6

## Rubber End Caps

Protects the instrument from accidental damage

# Instrument Overview - Back View

**Magnets**

**Hanging Hook**

**Magnets**



**Information Label**

**Magnets:**

Used to attach the DC710 to a metallic surface for hands free operation. Note: ensure to check that surface is not hot or the DC710 may be damaged.

**Hanging Hook:**

Used to hang the DC710 for hands free operation.

**Information Label:**

Contains the serial number and additional information regarding the DC710.

# BASIC ANALYSER FUNCTIONS

## Analyser Battery

Your combustion analyser is fitted with a Lithium Ion rechargeable battery. It is important to keep battery power to the sensors in your analyser even when it is not in use. Your analyser battery status is indicated at the top right corner of the TPI View App. and visible at all times when connected to the app.

## Turning The Analyser On & Connecting to the App

**Always: - Before turning on please ensure that nothing is connected to the Gas Sample Port**

Press and hold the power button until the power switch lights on.

Start the TPI View App and tap the center icon to begin scanning for TPI smart instruments.

A list of available devices will be seen.

Select the DC710 to connect to by tapping on the desired device on the TPI View app



Once connected the Bluetooth indicator on the DC710 will turn blue and the app will display measurement information.



## Connecting to the App (Continued)

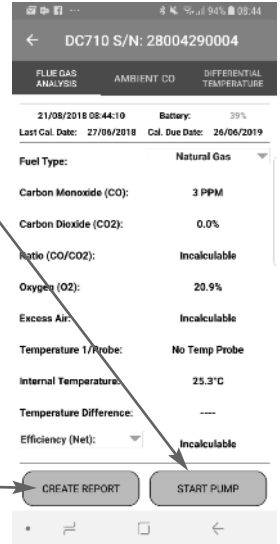
**Note:** It is recommended you perform routine general maintenance on your analyser to ensure proper function. Please refer to Appendix A for general maintenance schedule and function tests.

Make sure you are in a “clean air” environment and tap “Start Pump”.

You will see that on this screen you can view: -

- Serial Number of Device Connected
- Battery Level
- Calibration Information
- Fuel Type (which can be changed from the dropdown)
- Flue Gas Readings
- Efficiency (which can be changed from the dropdown)

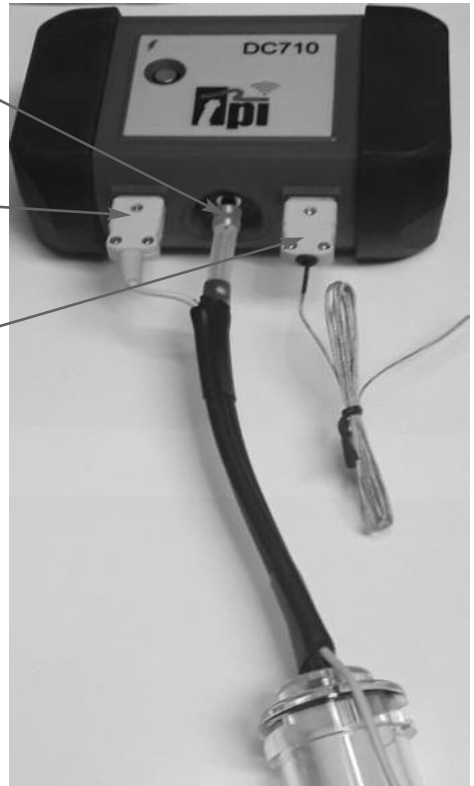
You can also select Ambient CO Testing or Differential Temperature Feature as well as Creating a Report from the Readings on the Screen



Connect the Mini Pump Protection Filter assembly and Flue Probe Tubing complete with In-Line Filter to the Gas Sample Port and the 'K' Type Thermocouple Plug from the Flue Probe into Thermocouple (T1) Socket.

The GK11M ambient air temperature probe is connected to the (T2) socket. If this probe is not used the analyser will use it's internal temperature sensor for ambient air (T2) reference.

**WARNING:** - Ensure the 'K' type thermocouple probes are inserted into the sockets correctly. The plugs are polarity marked and forcing the plug into the socket the wrong way may result in damage to the instrument.





# Turning The Analyser Off

***Always:*** - Before turning OFF, return the instrument to a clean air environment and allow the Carbon Monoxide level to return to below 10ppm and the Oxygen level to return to 20.9%

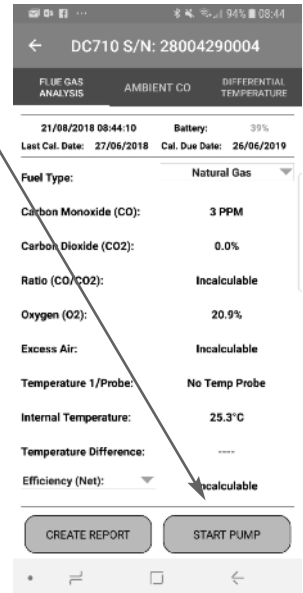
If the pump is running tap “Stop Pump” to turn the pump off.

If the CO is above 10ppm or the O2 is below 19% the Stop Pump icon will be greyed out.

Once the O2 and CO levels are within necessary limits the Stop Pump icon will be active.

Once the pump is off close the app or disconnect from the DC710.

Press and hold the power key on the DC710 to turn the analyser off.



## **NOTE:**

If the app is disconnected before the CO is below 10ppm or the O2 is above 19% and the power key is held down to turn the analyser off, the pump will continue to run until the CO and O2 are within limits.

The Bluetooth Indicator Light, on the DC710, will Flash Pink whilst the Purge Period is running. This purge period is necessary to remove any Gas that is present before allowing the Pump to Stop and the DC710 turning off leaving CO or depleted Oxygen inside the DC710 which may cause issues the next time the DC710 is turned ON.

Once the Purge Period has completed and within limits the DC710 will auto power down.

# SPECIFICATIONS

## Instrument

Operating Temperature Range	-10°C to 50°C (-14°F to 122°F)
Battery Type	Rechargeable Li-ion (3.7V/2600mA)
Battery Life	>6 hours typical
Charger Port	USB Connection
Fuel Option (within View app)	Natural Gas, Light Oil, Heavy Oil, LPG, Bituminous Coal, Anthracite Coal, Coke, Butane, Wood (Dry), Bagasse, Wood Pellet
Dimensions	150mm x 100mm x 58mm
Weight	490g
Gas Sensor Type	Electrochemical smart sensors (O <sub>2</sub> and CO)

## Flue Temperature Probe

Construction	Pistol Grip with Stainless Steel Shaft
Hose Length	2500mm
Insertion Length	200mm
'K' Type Thermocouple Accuracy	+/- 0.3%, +/- 2°F (1°C)
Maximum Temperature	1472°F (800°C)

## Gases

	Range	Resolution	Accuracy
Oxygen	0-25%	0.1%	+/- 0.3%
Carbon Monoxide	0-10,000 ppm	1 ppm	+/- 5 ppm or 5% Whichever is greater
Carbon Dioxide	0-25%	0.1%	Calculated
CO/CO <sub>2</sub> Ratio	0-0.999	0.001	Calculated
Combustion Efficiency	0-100%	0.1%	Calculated

# SPECIFICATIONS (Continued)


## Temperature Measurement

Input Type	K-Type thermocouple
Range	-50°C to 1000°C (-58°F to 1832°F)*
Resolution	1°C (1°F)
Accuracy	+/- (0.3% of rdg + 1°C) or +/- (0.3% of rdg + 2°F)

\* The thermocouple supplied (GK11M) has the ability to measure temperatures in the -45°C to 510°C (-50°F to 950°F) range. The DC710 accepts industry standard K-type thermocouple probes with sub-mini connectors.

## Bluetooth Communication

Bluetooth Version: 4.2  
FCC ID: QOQBGM111  
IC: 5123A-BGM111

 : 209-J00192



# CALIBRATION & SERVICE

It is a requirement that your analyser be calibrated every 12 months. Please consult TPI Europe Ltd for further details or call our service department on the following number : -

**01293 530196 Opt. 2**

Alternatively visit : -

<https://www.tpieurope.com/annual-service-warranty-procedure/>

to electronically book in your return with our Service Department

The following are consumable parts or spares for the instrument:

In-Line Filter Element (pkg of 10)	User Replaceable	A796-F
Whatman Disc Lid Filter	User Replaceable	A796-D
Complete Water Trap	User Replaceable	A796
Mini Pump Protection Filter	User Replaceable	A763
Soft Carry Case	User Replaceable	A787
Temperature Sampling Probe	User Replaceable	A770
Oil Filter	User Replaceable	A773
Smoke Pump	User Replaceable	A788
CPA1 Probe Kit	User Replaceable	CPK3

## WARRANTY

Your TPI DC710 Flue Gas Analyser is guaranteed free from defects in materials and workmanship for 5 Years\* from the date of purchase. This guarantee does not affect your statutory rights.

For additional information please visit : -

<https://www.tpieurope.com/customer-support/returns-cancellations/>

To register your product(s) visit : -

<https://www.tpieurope.com/united-kingdom-warranty-registration/>

\* Warranty subject to annual service/re-calibration by TPI Europe Ltd or an approved TPI Service Centre. Failure to ensure that annual service/re-certification is carried out will nullify the 5 Year Warranty and may lead to additional servicing costs when carried out.

# Appendix A: General Maintenance

All combustion analysers use consumable items such filters and probes. These items are user serviceable and can be taken care of by the operator.

The consumable items that will require operator attention are the water trap / filter assembly, flue probe, pump protection filter, and ambient temperature probe.

The recommended maintenance schedule for your analyzer is as follows:

## Water Trap Check

Visually check the water trap for:

1. Cracks in the bowl.
2. Broken ears on the bowl where the lid locks on.
3. Broken ears on the lid.
4. Worn out o-ring on the lid.
5. Loose connection to the flue probe tubing.

## Filter Check

Signs of dirty or water saturated filters are a slow pump, when the flue probe is connected, and measurements that take longer than normal.

TPI analyzers use three filters to protect the pump and sensors. The first filter to check is the A763 mini pump protection filter. (see picture below)



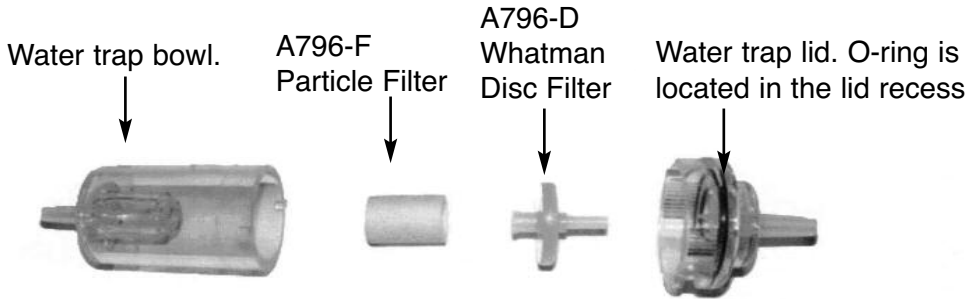
A763 Pump Protection Filter

Look in the inspection window to check the filter. When the filter material becomes dark, pull the black nose cone out of the tubing and replace the ball filter inside.

# Appendix A: General Maintenance (continued)

## Filter Check Continued

The other two filters are located in the water trap (p/n A796). The main filter is the A796-F particle filter. This filter stops debris and dust from traveling down to the analyzer. The secondary filter is the A796-D whatman lid disc filter. This filter stops flow in the event the water trap fills with condensate. Refer to the picture below.



Exploded View of A796 Water Trap

Visually inspect the A796-F particle filter. If the filter is discoloured on the inside or outside a replacement filter should be installed.

If the A796-F is clean but saturated with water a replacement should be installed to ensure proper flow. The saturated filter can be left to dry and reused later.

## Pump Operation Check

1. Turn the analyser on as outlined on page 5 and connect to the TPI View app. Do not connect anything to the inlet. Turn the pump on by tapping “Start Pump” prior to proceeding to step 2.
2. Cover the analyser inlet with your finger. The analyser pump should draw down and begin to slow.

If the analyser pump does not draw down and slow this may be an indication the pump is faulty, or there is an internal leak. The analyser should be returned for factory service.

# Appendix A: General Maintenance (continued)

## Flue Probe Integrity Check

NOTE: Perform this check after performing the Pump Operation Check outlined on the previous page.

1. Turn the analyser on as outlined on page 5 and connect to the TPI View app. Do not connect anything to the inlet. Turn the pump on by tapping “Start Pump” prior to proceeding to step 2.
2. Connect the A763 mini pump protection filter and flue probe assembly to the inlet of the analyser and the yellow thermocouple connector to input T1.
3. Look at the displayed temperature for T1 on the app. If the displayed temperature is approximately the ambient temperature the thermocouple is operating properly and you may proceed to the next step to continue the test. If the displayed temperature is “No Temp Probe” the thermocouple is open and the probe is in need of factory service.
4. Cover the end of the flue probe with a small piece of tube and pinch the end close. After a short period of time the analyser pump should draw down and begin to labour. If this happens the flue probe is operating properly and the integrity test is complete. If the analyser pump does not draw down and labour this is an indication of a possible leak somewhere in the flue probe and you may proceed to the next step for further tests.
5. Pinch the hose below the handle of the flue probe. If the analyser pump draws down and labours there is a leak in the handle assembly and the probe needs to be factory serviced. If the analyser pump does not draw down and labour proceed to the next step for further tests.
6. Pinch the hose between the analyser and the water trap. If the pump does not slow down and labour there may be an internal leak, pump problem, or other issue and the analyser needs to be factory serviced. If the pump does slow down and labour there is a leak in the water trap assembly and the water trap assembly should be checked as outlined on page 12.

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