715 Product Page 715K3 Product Page

TPI 715

Gas Analyzer

1. Introduction

Thank you for purchasing TPI brand products. The TPI 715 Gas Analyser is a state of the art, easy to use analyser designed not only to display and calculate the required readings from a flue but also to cover most of the other desirable parameters associated with combustion. The instrument is ruggedly constructed and comes with a 3 Year Guarantee.

This manual will guide you through the functions of the TPI 715 which will give you many years of reliable service.

Your TPI 715 Gas Analyser comes complete with the following items as standard: -

- TPI 715 Instrument
- Rubber Boot
- Soft Carrying Case
- Sampling Probe (c/w Type “K” Thermocouple)
- In-Line Filter
- Exhaust Spigot (removable)
- Instruction Manual

Your TPI 715 Flue Gas Analyser has the following options available: -

- Various Temperature Probes (see Appendix B)
- Infrared Printer A740B

Contents

2. Instrument Overview

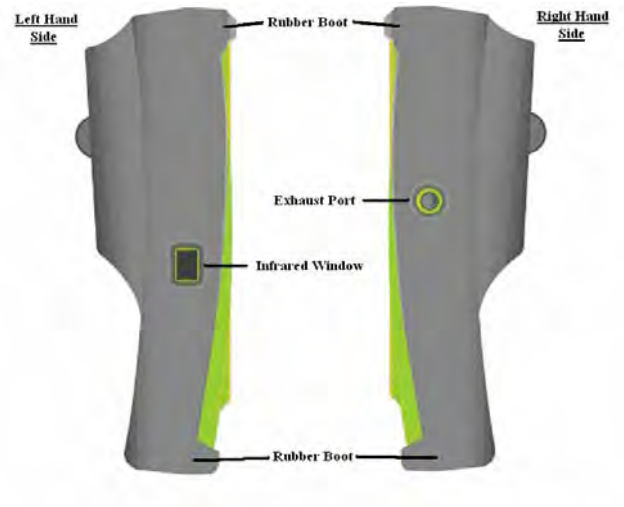
2.1 Front View

Rubber Boot	Protects the instrument from accidental damage
Display	Large 3 Parameter Backlit Display
Battery Indicator	Showing battery life
Up Arrow Key	Scrolls through selectable fuels (see 3.1) Switches between Gross and Nett Efficiency (see 4.1.2) Switches between °C and °F (see 4.2.1) Moves up through the Stored Data Addresses (see 5, 6 & 7)
Down Arrow Key	Zeroes pressure reading (see 4.3.1) Moves down through the Stored Data Addresses (see 5, 6 & 7) Decreases data logging time intervals (see 8)
Scroll/Enter Key	Scrolls through Gas Analysis Function Screens (see 4.1) Turns temperature differential calculation ON/OFF (see 4.2.1) Turns ch2 temperature ON/OFF (see 4.3.1) Allows you to change the Date and Time (see 4.5) Allows you to choose a Stored Data Address (see 5, 6, 7, & 8)
Print Key	Sends stored or real time data to a separate infrared printer (see 7)
Recall Key	Allows you to view stored data on the display (see 6)
Store/Logger Key	Stores readings to memory (see 8) Starts and Stops data logging (see 8)
Func/Backlight Key	Moves you through the 3 Functions (see 4) Turns Backlight ON and OFF (see 4)
Power Key	Turns the instrument ON and OFF (see 3.1 & 3.2)

2.2 Back View

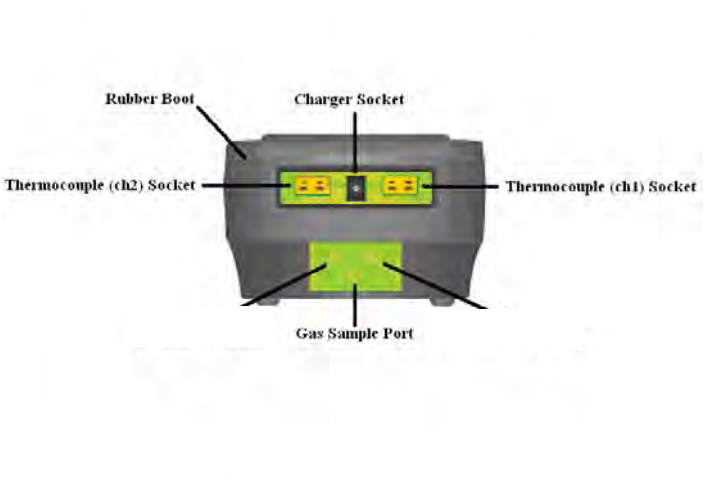
Sample Inlet Port	Connection for Gas Sampling Probe (see 2.4 & 4.1)
Calibration and Information Label	Displays calibration information Displays serial number
Battery Compartment	Holds 4 AA batteries
Rubber Boot	Protects the instrument from accidental damage

2.3 Side Views



Exhaust Port	Port for connection of Exhaust Adaptor
Infrared Window	Window for sending stored data to IR Printer or PC (see 7 & 9)
Rubber Boot	Protects the instrument from accidental damage

2.4 Top View



Power Socket	Connection for 12V Car Adapter (see 3.3)
Thermocouple (ch1) Socket	Connection for thermocouple plug on probe (see 4.1) Connection for any 'K' type thermocouple probe (see 4.2)
Thermocouple (ch2) Socket	Connection for any 'K' type thermocouple probe (see 4.2)
Gas Sampling Port	Connection for Gas Sampling Probe (see 4.1) Connection for In-Line Filter for Gas Leak Detection (see 4.4)

3. Turning On &Off

3.1 Turning On

Always: - Before turning on please ensure that the Temperature Sampling Probe complete with In-Line Filter is not connected to the Gas Sample Port (see 2.2 or 2.4)

Press the **Power Key** and the TPI 715 will start its 30 second countdown purge 'PURGING' will be displayed: - The instrument should be turned on in a clean air environment as the 30 second purge will set the Carbon Monoxide level to Zero and the Oxygen to 20.9%.
Ensure that the filters are clean and dry as dirty or wet filters will result in a loss of flow rate and 'Lo Flo' will be displayed to inform you that filters should be changed

During the last 20 seconds of the 30 second purge time the user can scroll through the following Fuels: - Natural Gas, LPG, Light Oil, Heavy Oil, Bituminous Coal, Anthracite Coal, Coke, Butane, Wood (Dry), and Bagasse by pressing the **Up Arrow Key** to select the Fuel they are working with. When desired fuel is displayed release the key, displayed fuel is now selected.

Fuel	LCD Display	Print Display
Natural Gas	Natural Gas	Natural Gas
Light Oil	Light Oil	Light Oil
Heavy Oil	Heavy Oil	Heavy Oil
LPG	LPG	LPG
Bituminous Coal	Fuel , OPT 1	Bituminous Coal
Anthracite Coal	Fuel , OPT 2	Anthracite Coal
Coke	Fuel , OPT 3	Coke
Butane	Fuel , OPT 4	Butane
Wood (Dry)	Fuel , OPT 5	Wood (Dry)
Bagasse	Fuel , OPT 6	Bagasse

NOTE: When selecting oil as fuel be sure to use the optional oil filter to prolong the life of the sensors.

After the 30 second countdown the instrument is ready to take Flue, Temperature readings and will Display Screen 1 from Function 1 as described in The 3 Functions Section (see 4.1.1)

3.2 Turning Off

Always: - Before turning off return the instrument to a clean air environment and allow the Carbon Monoxide level to return to below 15ppm and the Oxygen level to return to 20.9% (± 0.3%)

Press the **Power Key** to turn the instrument off:- **NOTE** Should you attempt to turn the instrument Off and the CO reading is above 0.003% then the instrument will remain On and a short Beep will be heard. The Instrument can only be switched off if the CO is below 0.003%

The instrument has an auto shut off after 10mins should no keys have been pressed for this period and as mentioned above that the CO is below 0.003%. Should the CO be above 0.003%then the 10 minute auto shut off countdown will not begin till the CO has gone below 0.003%

4. THE FUNCTIONS

You can move through the following functions by pressing the **Func/Backlight Key**

At any time you can activate the Backlight by holding down the **Func/Backlight Key** for 2 seconds.

4.1 Function 1: - Gas Analysis

Ensure you have connected the Temperature **Flue Sampling Probe complete with In-Line Filter to the Gas Sample Port (see 2.2 or 2.4) and the 'K' Type Thermocouple Plug into Thermocouple (ch1) Socket (see 2.4). as well as the 'K' Type wire probe for measuring the combustion air temperature into ch2 socket (see 2.4).**

WARNING: - Ensure that the In-Line Filter hangs in a vertical position whilst readings are being taken, particularly if water is visible. Failure to comply may result in damage to the instrument.

WARNING: - There is ONLY one correct way to connect the 'K' type thermocouple plug into the socket (see 2.4). Forcing the plug into the socket the wrong way round may result in damage to the instrument.

You can move through the following Screens by pressing the **Scroll/Enter Key**: -

4.1.1 Screen 1 Displays Carbon Monoxide (CO) reading in percent (%)
Displays calculated Carbon Dioxide (CO_2) figure in percentage (%)
Displays calculated CO/CO_2 (Ratio) figure

4.1.2 Screen 2 Displays Oxygen (O_2) reading in percentage (%)
Displays calculated Excess Air (X Air) figure in percentage (%)
Displays calculated Efficiency (Eff.) figure in percentage (%)
Pressing the Up Arrow Key will toggle between Gross & Nett Efficiency

4.1.3 Screen 3 Displays Carbon Monoxide (CO) reading in parts per million (ppm)
Displays Oxygen (O_2) reading in percentage (%)
Displays NOx reading in parts per million (ppm)

4.1.4 Screen 4 Displays Temperature reading of Channel 1 (ch1) in degrees Centigrade (°C)
Displays Temperature reading of Channel 2 (ch2) in degrees Centigrade (°C)
Displays the Differential Temperature (Diff.) between ch1 and ch2 in °C
'oPEn' will be displayed if no 'K' type probe is connected to the thermocouple socket

4.1.5 Screen 5 Displays NO readings in parts per million (ppm)
Displays NOx readings in parts per million (ppm)

4.2 Function 2: - Temperature Reading

Ensure you have a 'K' type probe connected to one or both of the thermocouple sockets ch1 or ch2 (see 4.2)

WARNING: - There is ONLY one correct way around to connect the 'K' type thermocouple plug into the socket (see 4.2). Forcing the plug into the socket the wrong way round may result in damage to the instrument.

The pump will stop running when in this function

4.2.1 Screen 1

Pressing the Up Arrow Key will toggle between ºC and ºF
Displays Temperature reading of Channel 1 (ch1) in degrees Centigrade (ºC) or degrees Fahrenheit (ºF)
Displays Temperature reading of Channel 2 (ch2) in degrees Centigrade (ºC) or degrees Fahrenheit (ºF)

Pressing the Scroll/Enter Key will toggle the Differential Temperature ON and OFF
Displays the Differential Temperature (Diff.) between ch1 and ch2 in ºC or ºF

'oPEn' will be displayed if no 'K' type probe is connected to the thermocouple socket

4.5 Function 5: - Date/Time

The Time, Date and Year can be changed whilst in this function as below:-

4.5.1 Screen 1

Displays the current Time, Date and Year

Press the Scroll/Enter Key once to allow you to change the Time, Date and Year
Press the Up Arrow Key to Increase the Minutes
Press the Down Arrow Key to Decrease the Minutes
Press the Scroll/Enter Key to confirm the desired Minute and move onto the Hours
Repeat steps 2 to 4 to change the Hour, the Day, the Month and the Year
The unit will return to normal after the desired Year has been confirmed

5. SAVING DATA

Press the Store Key once
'Save' will be displayed on the top line along with 'Addr SA ' and a location number from 0 to 9 will be flashing on the screen.
Select the required address location that you wish to save the data to by pressing the Up and Down Arrow Keys

Press the Scroll/Enter Key once
The location number which you have chosen will stop flashing and after about 2 seconds the instrument will return to the screen/function you were previously on.

You have just successfully stored a set of readings which can be either reviewed on screen (see 6) or sent to the IR printer (see 7)

6. REVIEWING DATA

Press the Recall Key once
'Stor' will be flashing on the display

Press the Scroll/Enter Key once
'Addr SA ' will be displayed and a location number from 0 to 9 will be flashing.
Select the required address location that you wish to review the saved data from by pressing the Up and Down Arrow Keys

Press the Scroll/Enter Key once
The Time & Date of the Saved Data from the selected address location will be displayed flashing on the screen.
The rest of the Saved Data at this address location can be reviewed by pressing the Up and Down Arrow Keys

Press the Scroll/Enter Key once 'End' will be displayed with 'YES' flashing

Press the Scroll/Enter Key once to EXIT
or
Press the Up or Down Arrow Keys 'End' will be displayed with 'no' flashing

Press the Scroll/Enter Key once to CHOOSE another address location to review and repeat steps 2 to 5

7. PRINTING DATA

1. Press the Print Key once
   'Print & IR' will be displayed on the top line along with 'Stor' flashing on the screen with "REAL" also on the display.

You can choose to print stored readings which have been already saved (Stor) or select "REAL" by pushing the up arrow button so that the "REAL" is flashing you can print the current realtime readins on the display.

Press the Scroll/Enter Key once
'Addr SA ' will be displayed and a location number from 0 to 9 will be flashing.
Select the required address location that you wish to print the saved data from by pressing the Up and Down Arrow Keys

Press the Scroll/Enter Key once
'Print, Wait, Send & IR' will be displayed on the top line along with 'out' on the screen

WARNING: - To operate correctly there must be a clear line of sight between the Infrared Window on the instrument (see 2.3) and the Infrared Window on the IR Printer (see Printer instructions)
After all the saved data has been sent to the printer 'End' will be displayed with 'YES' flashing

Press the Scroll/Enter Key once to EXIT
or
Press the Up or Down Arrow Keys
'End' will be displayed with 'no' flashing

Press the Scroll/Enter Key once to CHOOSE another address location to print and repeat steps 2 to 4

Appendix A : SPECIFICATIONS

Instrument

Operating Temperature Range	-10˚C to +50˚C
Battery	4 AA Alkaline Batteries
Battery Life	> 6 Hours
Fuels	Natural Gas, LPG, Light Oil, Heavy Oil & User Defined
Display	Backlit LCD
Data Storage	10 sets of readings
Time & Date	24 Hour Real Time Clock
Dimensions	200mm x 90mm x 60mm
Weight	500g
Casing	Rubber Boot as Standard
Switch Off	Failsafe
Exhaust	Safety Spigot
Conforms to	BS7927 (and the draft BS7967)

Flue Temperature Probe

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

Gases

	Range	Resolution	Accuracy
Oxygen	0-25%	0.1%	+/- 0.3%
Carbon Monoxide	0-10 %	+/-0.001 %	<20 ppm : +/- 3 ppm >100 ppm : +/- 5 %
Nitrogen Oxide	0-5,000 ppm	1 ppm	+/- 3 ppm
NOx	0-5,000 ppm	1 ppm	calculated
Carbon Dioxide (calculated)	0-25%	0.1%	+/- 0.3%
CO/CO_2 Ratio (calculated)	0-0.999	0.001	
Combustion Efficiency	0-100%	0.1%	

Appendix B : CALIBRATION & SERVICE

It is recommended that the instrument be calibrated every 12 months. Please consult Test Products International for further details.

Appendix C : GUARANTEE

Your TPI 715 Gas Analyser is guaranteed free from defects in materials and workmanship for 3 Years from the date of purchase.

Covered by TPI: - Repair parts and labour; or replacement of the product at the option of TPI. Normal transportation charges to the purchaser are also covered.

Not covered by TPI: - Damage to the product which are the result of abuse, improper use or maintenance are not covered. Any other expenses, consequential damages, incidental expenses including damages to property are not covered. Transportation expenses to the customer are not covered.

To obtain warranty performance: - Include with the product your name, address, phone number, written description of the problem and proof of purchase date. Carefully package and return to TPI.

This guarantee does not affect your statuary rights.

Appendix E : INDEX

Appendix E : INDEX continued

Trouble Shooting Guide

Problem	Solution
Unit will not turn on	Battery voltage is low, change batteries.
Unit will not turn off	The CO level is above 0.030% and the failsafe will not allow the unit to shut off, wait for CO levels to drop and then shut off.
Can not print saved readings	-Make sure the infrared eyes are aligned on the printer and the 715 -Make sure the lights on the printer are not flashing if so batteries need to be replaced
Wrong readings are on the printout	-Make sure you are selecting the correct location to print, if saved in “location 1” print “location 1” -Make sure you are not selecting REAL time print mode