

Capable of measuring almost any combination of gases; hydrogen, helium, oxygen, carbon dioxide, methane, carbon monoxide, argon, nitrogen and many others.



Applications

Gas Mixing	Welding Gases	Heat Treatment Atmospheres
Hydrogen/Helium Purity	Food Packaging Gases	

Features & Benefits

- Programmable for different gases
- Built-in linearisation
- Fast response
- Excellent stability
- Built-in alarms and analogue outputs
- Diagnostics
- Insensitive to sample flow
- Computer communications
- Autoranging electronics
- Built-in auto-calibration

The 542 is a versatile, programmable gas analyser, based on the principles of thermal conductivity, capable of measuring almost any combination of gases. The instrument is especially suitable for measurements of mixtures containing hydrogen or helium.

With the use of sensitive floating circuits, the thermal conductivity analyser can detect gases down to parts per million levels and up to full concentration. The analyser is pre-programmed for a wide range of sample and reference gases, easily selectable from the simple front panel menu.

Calibration settings, for each combination of gases used, are stored in an internal memory and are recalled automatically every time a particular gas mix is required. This enables quick and easy switching between gas combinations.

Sophisticated microprocessor electronics enable the fastest possible response time, excellent stability and flexibility. Sample pressure and flow are internally controlled allowing connection to a wide range of pressurised samples. Automatic calibration is included as standard, when the instrument can be set to perform a zero and span calibration at timed intervals.

Principle of Operation

All gases conduct heat at a specific rate, known as the thermal conductivity of the gas. Matched pairs of heated filaments are installed in a large thermal mass detection block, one set in the stable reference gas and the other in the measured sample gas.

Each of these detectors form part of a Wheatstone Bridge powered by a constant current source.

When the measured gas concentration changes, the sample detector will detect a change in the thermal conductivity and will cause an imbalance in the Wheatstone Bridge, resulting in a signal output proportional to the change in gas concentration. The signal is processed by state of the art digital electronics and the results shown on a high resolution digital LED display.

Technical Specifications

Ranges	Dependent on selected gas mix. Adjustable, auto-ranging. Typical: 0-1000ppm (H ₂ in N ₂) 98-100% (O ₂ in Ar)
Resolution	0.5% or better
Accuracy	± 2% of scale*
Response Time	90% of reading in 20 seconds
Calibration Range	0-100% of selected measure gas. Automatic timed calibration as standard. Auto zero.
Measuring Cell Type	Thermal conductivity/katherometer, ultra stable
Alarms	Two adjustable alarms with volt-free, change-over contacts Fully configurable over complete range. Contact rating 10A at 240V ac/30V dc
Analogue Outputs	0-10V, 4-20mA (both isolated). Max loop resistance 500 Ohms
Serial Interface	Allows connection to a computer

Operating Conditions

Sample Inlet Pressure	1.0 to 7.0 Barg
Sample Flow Rate	Internally controlled (max 250ml/min)
Sample temperature	-10 to 40°C
Ambient Temperature	-5 to 50°C
Sample Connections	1/8" OD compression fittings (others on request)
Unsuitable gases	Corrosive gases (contact factory for alternatives)

Power Requirements

Power Supply	230/115V ± 10%, 50/60Hz at 40VA
Display Type	4 digit high visibility LED and 12 digit alphanumeric

Cabinetry and Mounting

Enclosure	Sheet steel
Installation	Bench or panel mounting
Dimensions	535W x 165H x 300D (mm) panel cutout 445W x 132.5D (mm)
Weight	12kg
Ingress Protection	IP40

Options

Sample Gas Pump	Externally mounted
IP55 Enclosure	
Sealed Reference Gas	Dependent on application and range (contact Systech for options)
Corrosive Gases	Contact Systech Illinois for information on alternative options.

***Note:** The 542 can be used to measure over 400 gas combinations. Some gas combinations can be measured in ppm but others can only be measured in percent levels therefore please contact the sales department for typical values. The accuracy of the instrument will be ± 2% of scale of the stated typical value.

Systech Illinois have over 25 years experience of providing analysis solutions for a wide range of industries. From our manufacturing plants in the UK and U.S we produce gas analysers for industrial process industries, headspace analysers for monitoring gas flushing of food products, and our range of permeation analysers.

Systech Instruments Ltd (UK)
17 Thame Park Business Centre,
Wenman Road,
Thame, Oxfordshire OX9 3XA
Tel: +44 (0)1844 216838
Fax: +44 (0)1844 217220
Email: sales.uk@systechillinois.com
www.systechillinois.com

Illinois Instruments, Inc (USA)
2401 Hiller Ridge Road
Johnsburg, Illinois 60051
USA
Tel: +1 815 344 6212
Fax: +1 815 344 6332
Email: sales.usa@systechillinois.com
www.systechillinois.com

Illinois Instruments (Thailand)
6th fl Nopnarong Bldg No7
Ladprao23, Jatujak, Bangkok 10900
Thailand
Tel: +66 (0)2938 0798
Fax: +66 (0)2938 1058
Email: mai@illinoisinstruments.com
www.systechillinois.com

Systech Illinois (China)
Room 519, No.3 FuCheng Building
No. 900 Quyang Rd, Hongkou district,
Shanghai, China 200434
Tel: +86 21 65533022
Fax: +86 21 65539651
Email: info@systechillinois.cn
www.systechillinois.cn