

# S4 SOLAR Gas Analyser



Flame Ionisation Detector (FID) analysers for gas purity, air separation plant, engine emissions, combustion studies and process plant VOC abatement monitoring.

## Flexible

- Fixed and portable versions
- 'Hot' and 'Cold' versions
- Optional touch screen colour front panel with logging facility

## Easy to Use

- Totally automatic operation
- Comes with Windows VB software for remote operation

## Accurate

- Precision monobloc FID
- Trace PPM measurements standard
- High range % available



**Non-screen Version**  
available for system  
integrators



# S4 SOLAR

## Signal Series 4 SOLAR flame ionisation detector (fid) gas analysers

### A new analyser platform for high-performance and ease-of-use

Flame Ionisation Detectors are the recognised method for measuring trace hydrocarbons. They are specified in many standards; for example EN ISO 25140:2010, EN BSI 12619:2013 and USEPA Method 25. These standards cover the measurement of hydrocarbons in municipal waste incinerators, solvent emissions from process plants and monitoring the effectiveness of VOC abatement equipment. Flame ionisation detectors are also used to measure trace hydrocarbons on air separation plants and trace impurities in other applications.

The Signal Group 'SOLAR' range of flame ionisation detectors are the latest 4th generation design; benefitting from knowledge and experience gained over 40 years. FID analysers generally come as either 'Hot FIDs' or 'Cold FIDs'. Hot FIDs are used especially when the VOCs (hydrocarbons) are in the gaseous phase at elevated temperatures.

Cold FIDs are used when the VOCs are in the gaseous phase at room temperature. Hot FIDs are used for emissions measurement from engines, especially diesel engines, and they are used in waste incineration plants and solvent based processes.

Cold FIDs are used for measurement in gas purity and air separation plants. Cold FIDs are also used in aerosol can

leak detection on the production line, and for detecting the LEL (lower explosion level) in coating process drying ovens.

The analyser has built-in relays which can be easily set by the user to operate calibration valves at the end of a heated line. This means that operators can choose to calibrate down the line as well as calibrate at the analyser, locally.

User selectable ranges can be programmed to allow each range to have a calibration value entered and a relay inside the analyser can be used to select that calibration gas and auto-calibrate each range separately.

The advanced intelligence of these analysers allows for ignition of the FID flame to be carried out automatically at any altitude or barometric pressure as the air/fuel ratio is adjusted in small amounts with the electronic flow controllers until ignition is detected. Following this the flows are reset to standard levels.

### A wide range of user-set alarms are available for conditions such as:

1. Concentration limit (user set)
2. Sample flow (outside limits)
3. Pump failure
4. Heater failure
5. Voltage outside limits
6. Thermocouple failure
7. EHT outside limits
8. Config. error
9. Options incorrectly set
10. Calculations bad (no calibration set)



## GASES

- Methane
- Non Methane
- Total Hydrocarbons

## APPLICATIONS

- CEMS
- Research
- Compliance
- Gas Purity
- Automotive
- Air Quality
- Process
- Combustion

## The SOLAR range of FID gas analysers is based on three different models:

1. a heated version with a single detector for total hydrocarbons.
2. a heated version with two detectors for continuously measuring total hydrocarbons with one detector, and methane-only with the other. An integral cutter with a special catalyst removes all hydrocarbons except for the methane. The efficiency of the cutter is 98% and the speed of response is T90 2.5 seconds. The instrument provides continuous hydrocarbon readings of 'Total', 'Methane' and (by subtraction), 'Non Methane.'
3. a 'cold' version with a single detector for the measurement of trace hydrocarbons in unheated gas streams.

All of these versions have Signal Group's unique precision machined monobloc detector which guarantees uniformity of production in a compact, leak free design and there is a 24VDC version for use on board a vehicle - Real-World Driving Emissions (RDE).

## There are many options available for these analysers:

- a colour touch-screen front panel with a built-in SD card and USB connector for data logging and uploading software upgrades
- sample pump, span/zero valves
- catalytic air purifier for providing detector flame combustion air and zero calibration air
- a wide range of communications options
- programmable contact closures
- bypass air pump (heated version)

## Specifications By Gas/Range

To receive a quotation for an analyser that precisely meets your needs, simply send Signal or your local distributor details of your monitoring requirements.

## Signal Series 4 SOLAR flame ionisation detector (fid) gas analysers

	Detector Temperature	Ranges
Fixed Cold FID (CFID-THC)	120°C single detector	0-1ppm up to 0-1000ppm User settable response time
Fixed Hot FID (HFID-THC)	200°C single detector	0-10 up to 0-10,000 or 0-100 up to 0-100,000 User settable response time
Fixed Methane and Non-Methane Hot FID (HFID-DNMHC)	200°C dual detector	0-10 up to 0-10,000 or 0-100 up to 0-100,000 User settable response time Cutter efficiency 98 %

## Signal Series 4 SOLAR analyser screens

### MAIN SCREEN



Shows up to 3 channels of information (error condition, measure state, gas type, concentration, range in use, unit in use). Has links to further detail for each channel. Buttons for menu and logging measure state (sample, zero, span, pause, standby and sleep), calibration, abandon calibration, whether to apply calibration to a single range or every range, alarm clearance and user logout. Also gives general analyser details (time/date/serial number/software versions/etc).

### MENU SCREEN



Has links to calibration gas setup, time set, error log, display restart, display refresh, local/remote mode selection and software upgrade. Exit returns to Main screen.

### CAL GAS SETUP



Use this page to set span gas concentrations. Users may set one concentration for each range on each measurement channel. Exit returns to Main screen.

### DATE/TIME SET SCREEN



Set current date/time. Exit returns to Main screen.

### DATALOGGING SCREEN



Set log rates and choose data location (USB or SD card), start and stop logging. Exit returns to Main screen.

### CHANNEL DETAIL SCREEN



This gives channel specific details such as controlled temperatures, pressures and flows, and allows individual selection of controls for this specific channel, i.e. measurement modes (sample/zero/span/pause), calibration, abandon calibration, errors and choice of range or autorange. Exit takes you to Main screen.

## SPECIFICATIONS

### MEASUREMENT TECHNIQUE

Flame Ionisation Detector

### MEASURING UNITS

PPM or mg/Cu.Mtr. user selectable

### MEASURING RANGES

Range A: 0-1000ppm. User settable to e.g. 0-1ppm, 0-5ppm, 0-10ppm, 0-50ppm, 0-100ppm, 0-500ppm, 0-1000ppm. Resolution: 0.01ppm  
Range B: 0-10000ppm. User settable to e.g. 0-10ppm, 0-50ppm, 0-100ppm, 0-500ppm, 0-1000ppm, 0-5000ppm, 0-10,000ppm. Resolution: 0.1ppm  
Range C: 0-100,000 ppm. User settable, with resolution of 1ppm

### RESPONSE TIME

THC <1.5 secs  
CH4 and NMHC <2.5 secs

### REPEATABILITY

<1% FSD

### OXYGEN EFFECT

0.3% from 0-10% O2 in sample (Heated versions only)

### LINEARITY

+/- 0.5% FSD or 2% of point  
EN14181 - dc rel : <0.5  
R2 : >0.99

### ZERO DRIFT

< 2% FS/24hrs

### TEMPERATURE EFFECT ON ZERO

<0.15% per °C

### TEMPERATURE EFFECT ON SPAN

<0.3% per °C

### SAMPLE INLET PRESSURE

With sample pump option:  
-0.5bar to +0.5bar.  
Without sample pump option:  
Max +0.5bar

### ZERO NOISE

EURO VI -  
THC <0.05%FSD  
CH4 - <0.05%FSD  
CFR40 part 1065 -  
THC - <2.5%FSD  
CH4 - <1%FSD  
EPA1065 - THC <2.5% FSD

### SPAN NOISE

<0.5% FSD

### ACCURACY

<0.2% FSD  
Precision  
EURO VI - <1%

### DETECTION LIMIT

0.05mgC/m3

### BYPASS FLOW SENSITIVITY

Less than 2% from 1 to 3 L/min

### SAMPLE FILTER

Removable 0.4 micron PTFE  
7um non removable stainless steel filter  
for CFID

### DISPLAY BLANK

panel or 7" colour display

### SAMPLE CONDITION

0-200°C (Heated version)  
0-80 non-condensing for CFID

### INLET PRESSURE

-0.5barg - 1barg

### FUEL CONSUMPTION

35ml/min for H2 single (Heated version)  
70ml/min H2, 360ml/min H2He for dual  
180ml/min for single detector

### AIR SUPPLY

1.1L/min minimum  
1.6L for dual FID

### OPERATING CONDITIONS

5-40°C ambient temperature

### OUTPUTS

0-10 Vdc  
RS232  
Ethernet  
TCP/IP  
Optional 4-20 mA

### POWER REQUIREMENTS

220-240 V AC  
110-12 V AC  
24 V DC  
600 W max.

### REMOTE CONTROL

AK protocol via RS232 port,  
Ethernet  
Comes with S4i remote software  
operating system.

### SIZE AND WEIGHT

19" (w) x 133.5 (h) x 530 mm (d)  
Apx. 30Kg



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