Standard Flow Heated SHED-FID Solutions

555-S Data Sheet

Updated 19"/5PU rack mount and/or table top heated total hydrocarbon FID analyzer for large size SHED applications. High accuracy, sensitivity and stability. Economical, time-proven, very reliable and rugged. The model 555-S is designed for applications with sample flow rates of 2,5 l/min

Adjustable heated sample back pressure regulator allows both, sample flow through as well as closed loop applications to return the sample back into the SHED chamber.

Low cost of ownership. Choice of three types of fuel gas. Low fuel gas consumption. The combustion air supply for the FID detector is built in. No external cylinder for synthetic burner air is needed.

General:

Various versions available: Standard analyzer 555-S extracts at a 2,5 l/min sample flow. Lower or higher sample trough flows down to 400 ml/min (Mod. 555-L) and up to 9 l/min (Mod. 555H) are available optional. Designed for sample extraction applications as well as for closed loop applications back into the evaporation chamber. Our Proprietary design using a heated high precision sample pressure regulator allows long term stability and precise repeatability.

All sample gas contacting parts and components are discretely integrated into the heated oven to be serviced fast, easily and economically. The model 555 uses our low maintenance, 40 years time proven hydrogen Flame Ionization Detector (FID) in the constantly heated oven to prevent the loss of high molecular weight hydrocarbons. Thus provides very reliable performance in the analysis of trace level of volatile organic contaminants in air and other gases, typically being extracted from a large SHED.

The disposable heated sample filter is easily accessible from the rear panel. No special tools are required for filter change.

Low cost of ownership. Low fuel gas consumption. The combustion air supply for the FID detector is built in. No external source or cylinder for synthetic burner air is needed.

Complete rear view shown; sample in, sample bypass, zero and span gas inlets including optional internal heated line temperature controller

Features

1. Made in Germany
2. Adjustable sample pressure for most accurately operation
3. Low investment cost, low cost of ownership
4. All components in contact with sample fully heated and controlled at 180°C to prevent hydrocarbon hang up and cracking
5. Built-In sample pump in heated oven
6. Built-in combustion air supply, no extra air bottle needed
7. Easy to change sample filter accessible on the rear panel. No special tools required for quick filter changes
8. Separate solenoid valves for zero- and span calibration, manual and remote operation
9. Automatic flame out alarm
10. Optional automatic flame ignition and re-ignition
11. Choice of 1 out off 3 fuel gases: 40/60% H2/He, 40/60% H2/N2 and 100% H2
12. Low fuel consumption
13. Manual and remote calibration operation

Applications

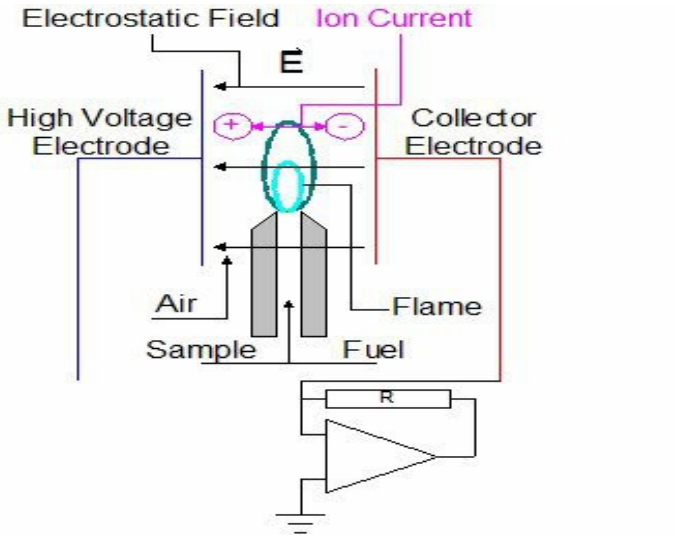
1. Standard SHED applications for large size and drive in chambers
2. Any other evaporation emission chamber application requiring flow through and/or closed loop sampling

For SHED-Chamber volumes of below 2.5 cubic meters of volume (Mini and Micro SHED) we recommend to use one of our different SHED FID analyzers of the 155 or 135 line of analyzers. Low flow analyzers down to 400 ml/min or ultra low flow analyzers of 30 ml/min down to 10 ml/min available.

Principle of Operation

The Heated Flame Ionization Detection (HFID) method is used to determine the presence of total hydrocarbon concentrations in gaseous samples. Burning hydrocarbon-free hydrogen in hydrocarbon-free air produces a negligible number of ions in the detector. Once a sample which contains hydrocarbons is introduced into this flame a very complex ionization process is started. This process creates a large number ions. A high polarizing voltage is applied between the two electrodes around the burner nozzle and produces an electrostatic field. Now negative ions migrate to the collector electrode and positive ions migrate to the high voltage electrode. The so generated ionization current between the two electrodes is directly proportional to the hydrocarbon concentration in the sample that is burned by the flame. This signal is measured and amplified by our electrometer amplifier.

Our proprietary heated heated sample back pressure regulator provides a controlled sample pressure and flow which gives admittance of a constant sample flow rate to the FID burner. This technique of using the air controlled sample pressure controlling technique is time proven by J.U.M. Engineering since over 38 years to provide the highest possible sample flow rate stability and lowest maintenance for ultra-low flow self extracting (pumping) systems. Our compactly designed flow control module for controlling the fuel and combustion air flow rates via needle valves and stabilizing capillaries use high precision pressure regulators. The low mass needle valves are factory adjusted and sealed to ensure the long lasting optimization of the burner.



FID Principle using the diffusion flame

Technical Specifications 555-S

Method of analysis	Heated Flame Ionization Detector (HFID)
Sensitivity	Max. 1 ppm CH_4 full scale
Response time	0.3 seconds at sample inlet. <1.2 seconds for t_{90} response time
Warm up time	30 Minutes. Typically 60 minutes to meet specifications
Zero drift	<1.5% full scale / 24 h
Span drift	<1.5% full scale / 24 h
Linearity	Up to 10.000 ppm within 1% FSD
Repeatability	± 1% of reading
Oxygen synergism	<2.5% FSD
Measuring ranges (ppm)	0-10,100, 1.000, 10.000, 100.000, others on request. Turn switch activated. Automatic select optional
Signal outputs	0-10 VDC, 4-20 mA
Data output	RS 232 data output, standard ASCII
splay	6- digit direct reading ppm units capability to measure 3 overlapping ranges without range change
Total sample flow through	2.5 l/min. Lower and higher sample flows available optional
Sample filter	2 micron disposable change filter (heated). 1 micron optional
Zero and Span gas	Switch selectable, gas inlets on rear panel
Zero and span adjust	Manual on front panel
Fuel gas choice	**Standard:** 40%H2/60%He, consumption approx. 90 ml/min **Optional:** 40%H2/60%N2, consumption approx. 90 ml/min **Optional:** 100% H2, consumption approx. 20 ml/min
Burner air consumption	Built in burner air supply, consumption approx. 130 ml/min
Oven temperature	190°C
Temperature control	micro-processor PID controller
Power requirements	230VAC/50Hz, 950W /(without heated sample line)
Ambient temperature	5-43°C (41-110°F)
Dimensions (W x D x)	19" (483 mm) x 460 mm x 221 mm
Weight	approx. 22 kg (50 lbs)

Available Options 555-S	
AZM 555	Automatic flame ignition and re-ignition
FOAS 555	Flame out alarm with automatic fuel gas shut off
LTO 555	Measurement of low trace concentrations of 1 to 10 ppm and up. Requires external, zero grade combustion air supply!
BLVX 555	Internal pressure regulators with purifier to use analyzer with external combustion air, for example zero grade synthetic air from cylinder
RC14 555	Galvanic isolated 4-20 mA analog signal output in stead of standard ma output
TPR 555	Internal temperature controller for a heated sample line
FGP 555	100% pure Hydrogen fuel gas. ***Note: 40/60% H_2/He is standard***
FGM 555	Mixed fuel gas 40%H_2 / 60% N_2. ***Note: 40/60% H2/He is standard***
SFL 555	Lower sample flows 300 ml/min up to 1000 ml/min. ***Specify request***
SFH 555	Higher sample flows above 2.5 up to 9 l/min. ***Specify request***
Availability of options may not be complete! Changes will not be made announced! Please contact us before specifying your purchase order!.	

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