8866

Thermal Conductivity Analyser for measuring binary and quasi-binary mixtures in safe and hazardous area, ATEX classified (Zone 1 / 21).

8866

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Robust and top-reliable thermal conductivity analyser of application in harsh industrial environments

8866 is a thermal conductivity analyzer allowing very accurate and stable in line analysis of a gas in a binary (or almost binary) mixture, taking advantage of its own specific thermal conductivity, compared to the background gas..

The instrument is extremely accurate, stable and repeatable and it is not affect by pressure variations up to 10 bar absolute.

8866 is available in 2-ports standard versions or 4-ports version with reference flow in order to get the maximum accuracy in case of purity measurements close to 100%.

The weatherproof and explosion proof 8866 is designed for field installation in the most severe conditions, minimizing the sample conditioning requirements.

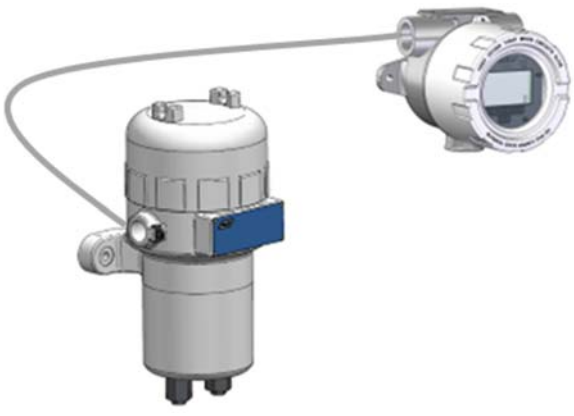
Easy access for maintenance, selected materials and modular design makes this analyser practically indestructible and the ideal solution for industrial applications.

8866 can be provided as 4-20 mA transmitter or combined with an ADEV control unit, that has the function to process the signal coming from the sensing unit, making the linearization and giving a 4-20 mA isolated analog output. In addition, the control unit offers many extra features like visualization, relays for alarm and diagnostics and possibility to adjust the range and the calibration in field, very easily.

8866 is designed for indoor and outdoor installation, in safe area and classified Zone 1 / Zone 21 (ATEX certified).

Binary Mixtures
Analyser

for Field Installation



Key Applications

- Nuclear plants and electric power industry
- Hydrogen cooled generators
- Electrolyzers
- Steel & Metal Processing
- Heat treatments
- Air separation plants
- Galvanizing furnaces
- Copper melting furnaces
- Hydrogen and Oxygen generators
- Synthesis gas & Fertilizers
- Gas production industry (purity monitoring of H2, Ar, N2, He, CO2, N2O)
- Measure of H2 in hydrocarbons in refinery industry
- Biogas & Landfill Gas

Main Features

High Accuracy

The 8866 is an high accuracy analyzer with temperature controlled sensing unit in order to be completely insensitive to ambient temperature variations.

There are no inner moving parts; installation position and eventual vibrations don't alter the accuracy and stability of the measure.

Very Easy Maintenance

Modular construction makes maintenance extremely easy. It's enough to unscrew the cap of the housing to have access to inner sensing unit that can be removed only by disconnecting 3 wires and unscrewing 2 screws.

Reference Ports

Available in standard 2-ports version and in 4-ports version with reference flow in order to get the maximum accuracy in case of suppressed ranges and purity measurements

Grease-Free Version

8866 can be provided with wet parts cleaned for pure Oxygen service.

Sampling System

The 8866 is an extractive analyser and so it needs an external sampling system able to deliver an almost clean sample gas to the analyser at the proper temperature, pressure and flow rate.

ADEV has a wide experience in process and can provide the 8866 analyser combined with a sample and condition system designed for the specific application requirements. Contact ADEV for details

European Directive Compliance

Low Voltage: Directive 2014/35/EU

EMC: Directive 2014/30/EU

ATEX: Directive 2014/34/EU (only for Ex-Proof version)

ATEX Marking

ATEX certification for Zone 1 / Zone 21 with protection mode::

II 2 G D Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
IP65

ATEX Certificate Number **CESI 03 ATEX 130**

Technical Specification

Thermal Conductivity Analyser 8866

Performance Specification

Model	8866
Accuracy	± 1% of FS
Repeatability	± 0.3% of FS (short term)
Reproducibility	24 hours: ± 1% of FS
Linearity	< 1% of FS (transmitter version); < ± 0.5% of FS (with control unit)
Drift	Zero: < 1% of FS / week; Span: < 1% of FS / week (without autocalibration)
Response Time (with 2000 cc/min. flow rate)	H2: Initial < 1 sec.; 60%: 13 sec.; 90%: 23 sec.; 99%: 40 sec. CO2: Initial < 2 sec.; 60%: 24 sec.; 90%: 45 sec.; 99%: 80 sec. Ultra-fast response version available: T90 : < 5 sec.
Ambient Temp. Influence	Typically < 1% of FS over the entire temperature range (-10°C ÷ +50°C)
Pressure Influence	none for pressure variations between 0.1 and 10 bars (a)
Flow Rate Influence	< 0.5% of FS over flow range from 250 to 1000 cc/min.
Line Voltage Influence	< 0.02% of FS per 1% change of power voltage

Operative Specification

Model	8866
Sample Flow Rate	250 ÷ 1000 cc/min. (2000 cc/min. max)
Range	Refer to Ordering
Output	Standard: non-normalized output that functions as input of the selected ADEV control unit; Transmitter version: 4-20 mA output proportional to the ordered range
Sample Pressure	0.03 ÷ 1 bar(g) **[note 1]**
Relative Humidity	0...90% RH non condensing
Temperature Control	Sensing unit temperature controlled at 50°C
Operative Temperature	-10°C....+50°C
Storage Temperature	Max. +70°C
Power Supply	24....30 VDC, 45 VA
Pneumatic Connections	Compression fittings for ¼" or 6 mm OD tube
Electrical Connection	General purpose: N°2 threaded holes 3/8" BSPP (for PG 13 cable gland) Ex-Proof: N°2 threaded holes 1/2" NPT-F (cable gland or conduit).

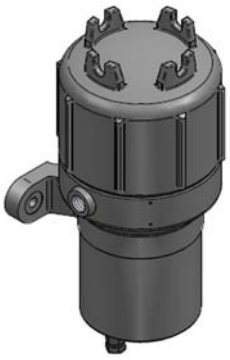
Physical Specification

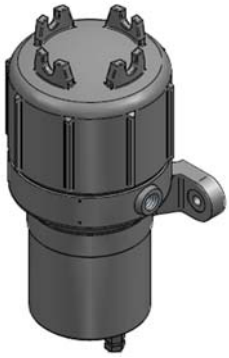
Model	8866
Housing Material	Painted Aluminum (epoxy textured enamel finish)
Wet Parts Materials	SS 316, Glass, Viton (or others depending on application)
Mounting	Wall / plate mounting
Protection	IP65
Dimensions	Refer to dimensional layout
Weight	7 kg (with general purpose housing) ; 8,5 Kg. (with explosion proof housing)

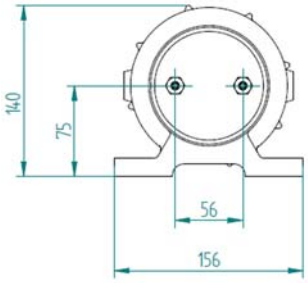
[Note 1]
The specification of max. and min. sample pressure is related to operative parameters for letting the gas circulate into the analyser. What is really important is having a perfectly stabilized and constant flow rate, not exceeding the specified limits.

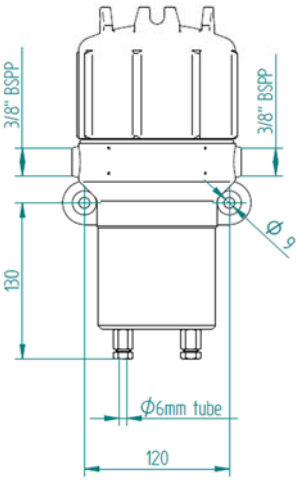
Dimensional Layout

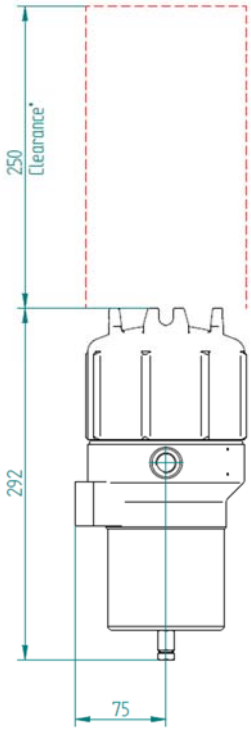
General Purpose Version for Safe Area





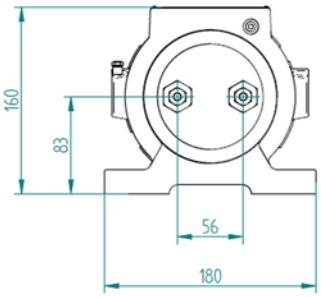


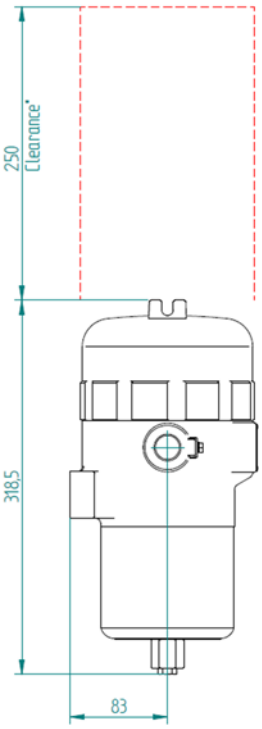


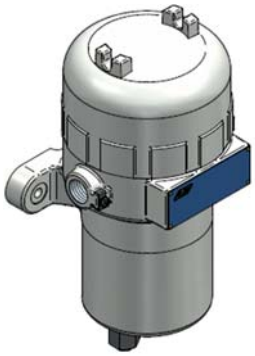


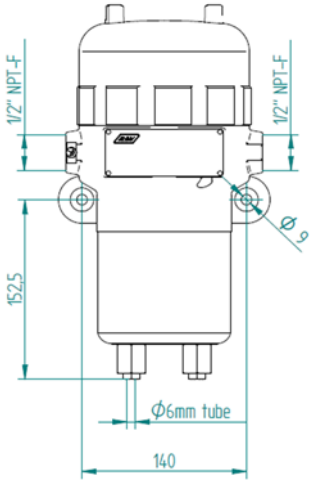
Quotes expressed in mm

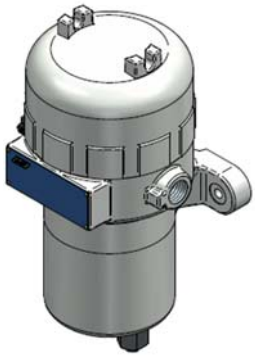
Ex-Proof Version for Hazardous Area









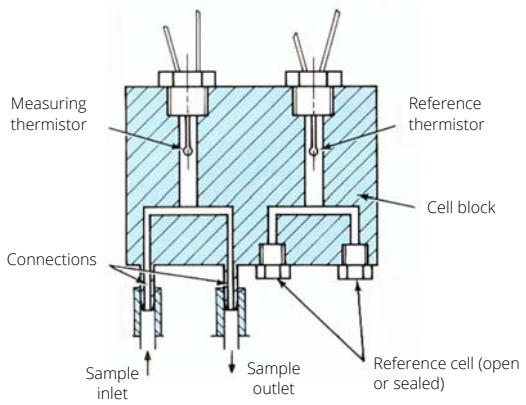


Measuring Principle

Thermal Conductivity Analyser 8866

The Cell Block assembly is made of stainless steel construction with two identical internal cells: the measuring cell and the reference cell. A highly stable thermistor is mounted in each cell.

These matched thermistors form the active arms of a bridge circuit: the unbalanced current of the bridge provides the means of measuring the relative ability of the sample and reference gases to conduct heat away from their respective thermistors to the cell wall, which is held at a constant temperature



The reference gas chamber, with inlet and outlet openings drilled into the chamber from the base, may be open or sealed.

The cells in which the thermistors are mounted are deadened so the sample gas enters only by diffusion, minimising the effect of sample flow variations.

In addition, the entire cell-block assembly is maintained at a constant optimum temperature through two heaters and a control thermistor which are located in the cell-block assembly.

The standard 2-ports version is used for zero-based ranges and has reference side sealed (air-filled).

For suppressed ranges from 95%, the use of the four port version, with specific flowing reference gas, increase the accuracy to the maximum level.

Triple Range Version for Hydrogen-Cooled Generators Application

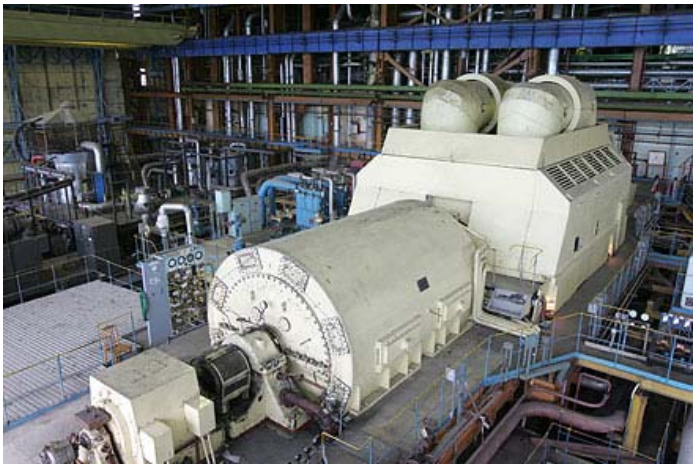
Model 8866 can be provided with calibration for Hydrogen-cooled generators and thus ideally suited to providing the highly sensitive and accurate analysis for the required measurement:

H_2 in Air H_2 in CO_2 Air in CO_2

with the great advantage that all measures can be made with a unique analyser, simply setting the wanted range in accordance to the phase.

The range modification can be done thanks to the control unit both manually (by menu) and remotely, sending contacts from DCS.

Example of typical triple ranges are:



1. 0-100% CO_2 in Air
2. 0-100% CO_2 in H_2
3. 100-75% H_2 in Air

Ordering

Thermal Conductivity Analyser 8866

TC Analyser	8866	...	...	...	...	...	...
Range							
0-1% **[Note 1]**		01					
0-2%		02					
0-5%		03					
0-10%		04					
0-15%		05					
0-20%		06					
0-30%		07					
0-75%		08					
0-100%		09					
80-100%		10					
95-100%		11					
98-100%		12					
Dissociated Ammonia		90					
On spec.		99					
Calibration							
Gas to Analyze		Background					
H2.....	[1]	H2.....	[1]	[...][...]			
CO2.....	[2]	CO2.....	[2]				
Air.....	[3]	Air.....	[3]				
He.....	[4]	He.....	[4]				
Ar.....	[5]	Ar.....	[5]				
SO2.....	[6]	O2.....	[6]				
CH4.....	[7]	CH4.....	[7]				
N2.....	[8]	N2.....	[8]				
N2O.....	[9]	N2O.....	[9]				
Calibration for Hydrogen Cooled Generator **[Note 2]**				TR			
On spec.				OS			
Housing							
General purpose - Two port, sealed reference					2G		
Ex-Proof (ATEX) - Two port, sealed reference					2X		
General purpose - Four port, flowing reference					4G		
Ex-Proof (ATEX) - Four port, flowing reference					4X		
Output Signal							
Non-normalized current output **[Note 3]**						1	
4-20 mA output **[Note 4]**						1	
Special						9	
Response Time							
Standard							S
Fast response time version							F
Special Packages							
Standard							ST
Nuclear application package (wet parts in EPDM & Vulcolan. No Teflon)							NU
On spec.							OS

Notes

[**Note 1**]
Range available only for H2

[**Note 2**]
The calibration for Hydrogen Cooled Generators requires the control unit, configured with Triple Range package.

[**Note 3**]
Sensing must be combined with an ADEV control unit

[**Note 4**]
Zero & Span calibration by trimmers. Only available for some ranges

Contacts

ADEV S.r.l.

Via S. Eurosia, 27/A

20811 Cesano Maderno (MB) - Italy

+39 (0)362 641684

info@adev.it