



**Measures Wobbe Index,
Combustion Air Requirement
(CARI) and
Calorific Value of Natural Gas
and Fuel Gases**



- Fast response ($T_{90} < 5 \text{ sec}$)
- High accuracy and repeatability
- Automatic calibration
- Insensitive to ambient temperature fluctuations
- Suitable for outdoor installation
- Effective measuring range 0-100% FS
- Output in MJ/Nm³, kcal/Nm³ and BTU/SCF
- Minimal maintenance
- Suitable for corrosive and dirty applications
- Flameless analyser
- Residual oxygen content principle
- Epoxy coated stainless steel enclosure
- Rugged design
- Suitable for high sulphur applications
- Suitable for installation in EX environment
DEKRA 11ATEX0277X and
IECEx DEK 11.0057X
CSA Class 1, Div.2
- Zero emission option
- Optional remote operation by TCP/IP
- Optional MODBUS RTU (RS485)
- Optional specific gravity output



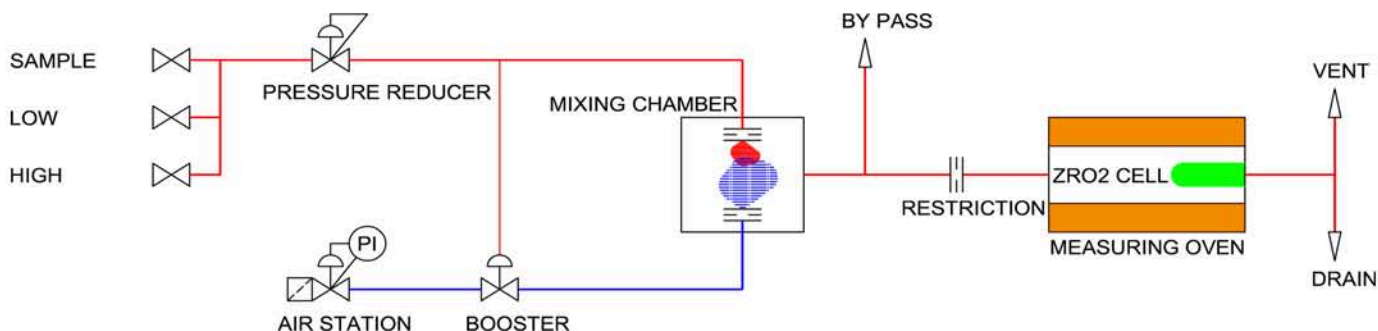


INTRODUCTION

The WIM COMPAS™ series is the latest addition to the Hobré Instruments portfolio of process analysers for Wobbe Index, Heating Value/BTU and Combustion Air Requirement Index. Designed and manufactured in our factory in The Netherlands the WIM COMPAS™ builds on more than 20 years of success of the WIROX, WIM 9600 and WIM 9900 series. Offering unmatched reliability, speed of response, accuracy and supported by profound application knowledge the WIM COMPAS™ is the best choice for measuring gas combustion parameters.

PRINCIPLE OF OPERATION

Sample gas is continuously mixed with combustion air under controlled conditions followed by catalytic combustion in an electrically heated furnace. The residual oxygen content in the flue gas is measured with an accurate and reliable zirconium oxide sensor. In the control unit following combustion parameters are calculated from the oxygen signal and the (optional) density signal: Wobbe Index, Combustion Air Requirement Index (CARI), Calorific Value (or BTU) and specific gravity.



TYPICAL APPLICATIONS

Natural gas blending and storage. The speed of response and the high accuracy and repeatability of the WIM COMPAS™ are providing many customers with a perfect signal for the feed forward control of gas blending operations as well as monitoring the quality of gas delivered to the grid including LNG regasification.

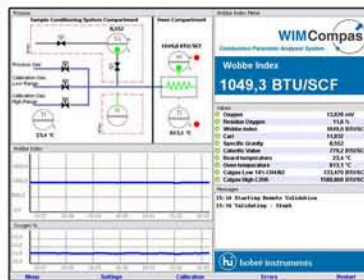
Fired heaters. Besides speed of response the availability of the CARI signal is a key benefit of the WIM series. Whereas the Wobbe Index is an excellent indication for the thermal load of a furnace, for air/fuel ratio control the CARI is a much better parameter. This is particularly the case when hydrogen, carbon monoxide and olefins are present in the fuel gas.

Gas turbine control. Gas turbines are sensitive to rapid changes in gas composition; besides poor fuel economy and a reduced lifetime, improper control also results in higher CO and NOx emissions. The WIM provides the Wobbe Index, Heating Value and Specific Gravity in seconds. Optionally also CO2, N2 and Heat Ratio are available.

Steel industry and biogas. Dirty and wet gases are common in steel and biogas monitoring applications.

The WIM COMPAS™ sample handling system is kept at elevated temperature to prevent condensation and the hot section is resistant to significant sulfur levels.

Flare gas and sour gas monitoring. A special version of the WIM measures flare gas in accordance with USA Rule 1118 and is capable of dealing with very high sulfur levels. The method closely follows ASTM-4891 and complies with expected new EPA Flare Emissions 40 CFR regulations.



The WIM COMPAS™ **F** has a full-color graphical user interface.

The **BASIC** version offers an ethernet connection to view the graphical user interface on a remote computer.

WIM COMPAS™ is available in **BASIC** and **F** version. Please consult factory for other applications and options including outputs for hydrogen and total sulfur in fuel gas, CO2 emission from fuel gas and the integrated gas chromatograph option.





Specifications

Service	Natural Gas, Fuel Gas, Flare Gas, Biogas, BFG, COG, etc.
Measuring principle	Residual Oxygen Method
Sample wetted parts	SS316, Inconel and Platinum
Installation options	<ul style="list-style-type: none"> - Non Ex - ⚠ II 3G Ex px [ib] IIC T3 Gb - ⚠ II 2G Ex px [ib] IIC T3 Gb - Class 1, Div. 2, Group B, C, D T3 - IECEx Ex px [ib] IIC T3 Gb

Measuring ranges

Wobbe Index	50 MJ/Nm ³ span in 0 – 100 MJ/Nm ³ range
Accuracy	± 0,4% of full scale for natural gas
Repeatability	± 0,05% of measured value or ± 30 kJ (which ever is higher)
Drift	< ± 0,05% or ± 30 kJ per day (which ever is higher)
Response time	T90 < 5 seconds (includes lag time and rise time)
CARI *	span of 15 in 0 – 25 range
Calorific Value (SG cell option) **	span of 50 MJ/Nm ³ in 0 – 120 MJ/Nm ³ range
Specific Gravity cell (SGU option)	Updated signal (every 10 seconds, Hobré SG cell)
SG range	0 – 3
SG accuracy	< ± 0,5% of Full scale
Response time CV signal	< 20 seconds to T90
Specific Gravity cell (SGC option)	Continuous measurement (oscillation principle SG cell)
SG range	0 – 3
SG accuracy	< ± 0,5% of reading
Response time CV signal	< 5 seconds to T90

* CARI = Combustion Air Requirement Index

** Response time CV signal depends on type SG cell

Outputs

Local HMI	8,4" full colour display with touchpad (all functions)
Analogue outputs	2 off isolated 0 / 4 – 20 mA (optionally up to 4)
Digital outputs	<ul style="list-style-type: none"> - 2 off relay SPST for malfunction, calibration status, etc. - 8 off 24 VDC / 1 A or potential free relays (optional)
Digital input	Start calibration, start validation, etc.
Communication options	<ul style="list-style-type: none"> - Remote control via TCP/IP or optical fiber incl. software for remote operation - MODBUS RTU via RS485, TCP/IP or optical fiber

Utilities

Power supply	115/230 VAC, 50/60 Hz
Power consumption	1.000-2.250 VA max; depending on configuration
Instrument air	<ul style="list-style-type: none"> - 15 NI/min at 4 barG minimum, 10 barG maximum - 50 NI/min for Ex purge option ATEX* - 80 NI/min for Ex purge option IECEx*
Sample pressure	Sample flow ± 1 NI/min 1,5 – 5 barG for standard version 0 – 1,5 barG requires pump option

* Pre-purge: total flush volume 500 litre, pre-purge flow 70 NI/min. (80 NI/min for IECEx)

Installation

Mounting	Wall mounting
Dimensions (HxWxD)	1000 x 800 x 400 mm (non-Ex version)
Weight	80 – 250 kg, depending on version
Enclosure protection	IP65 design (outdoor installation: protected against direct sunlight and rain)
Ambient temperature range	Non Ex and ⚠ II 3G: +5..+40°C (Optional -20..+55°C*) Cl.1 Div.2 : +5..+40°C (Optional -20..+55°C*) ⚠ II 2G and IECEx: +5..+40°C (Optional -20..+55°C*)

* Note: Instrument air temperature should not exceed max. ambient temperature.





Order Code	WIM Compas™ F
P	P version (sample pressure > 1,5 barg)
LP	LP version with one pump, incl. fast loop (sample pressure < 1,5 barg)
C	Continuous measurement principle
D	High sulphur version with continuous measurement and dilution system
I	High sulphur version with Injection system
115	Power supply 115 VAC, 50/60 Hz
230	Power supply 230 VAC, 50/60 Hz
0	No specific gravity meter
SGC	Oscillation type specific gravity cell
SGU	Hobré specific gravity cell
0	No sample pressure monitoring
SPM	Sample pressure monitoring
OFA	Oven flow alarm
FPM	Oven flow alarm + Sample pressure monitoring
0	Non Ex version
1	II 2G Ex px [ib] IIC T3 Gb version (Zone 1, excluding back-up purge)
2	II 2G Ex px [ib] IIC T3 Gb version (Zone 1, including back-up purge and freestanding frame)
3	II 3G Ex px [ib] IIC T3 Gb version (Zone 2) *
Z	Class 1, Div. 2, Group B, C, D T3 version
E1	Ex px [ib] IIC T3 Gb version (IEC Ex certified, excluding back-up purge)
E2	Ex px [ib] IIC T3 Gb version (IEC Ex certified, including back-up purge and freestanding frame)
2	2 analog outputs
4	4 analog outputs
0	No serial communication
R	Remote operation via TCP/IP (incl. software for communication)
RM	Modbus and/or remote operation via TCP/IP (incl. software for communication)
RO	Remote operation via optical fiber (incl. software for communication)
RMO	Modbus and/or remote operation via optical fiber (incl. software for communication)
M	Modbus RTU via RS485
MO	Modbus RTU via optical fiber
0	No extra isolated relais added
R	8 off extra isolated relais added (already included in II 2G version)
0	No additional fast loop inside the analyser
F	Fast loop installed inside analyser
FA	Fast loop with alarm installed inside analyser
0	Standard ambient temperature range +5 up to +40°C
H	Heated electronics for low ambient temperature (down to -20°C)
C	Cooling for high ambient temperature (up to +55°C)
HC	Version for ambient temperature range of -20 up to +55°C
1	No additional frame included
2	Analyser mounted on free standing frame (SS304)
3	Analyser mounted on free standing frame with sunroof
*	<i>In case of purge failure the analyser has to be switched off</i>

