

Gas Analyzers

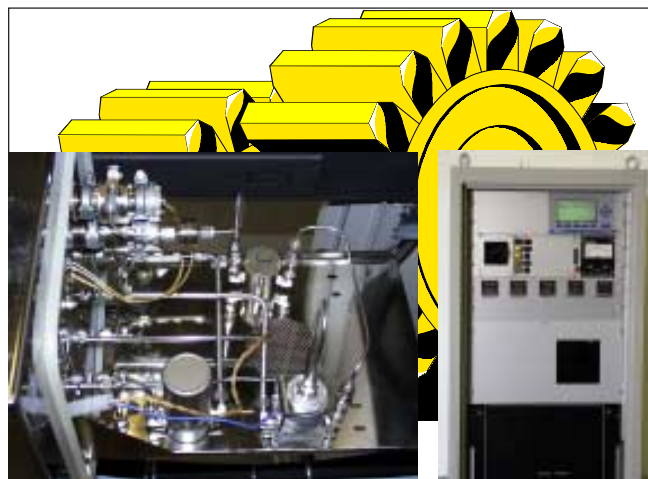
MLT 5

Features

- High Temperature: up to 150 or 180 °C
- Up to 5 measuring channels:
1- 4 NDIR/UV/VIS plus TC
- NDIR: Gas detector with microflow sensor or solid-state detector (IFC)
- NDUV/VIS: Semiconductor detector or vacuum diode
- Flexible thermal conductivity cell
- NDIR/UV/VIS & TC process cells
- Stainless steel tubing
- Table-top housings for containers
- IP 54 (NEMA 3) industrial enclosures
- Thermostat controlled physics
- Autocalibration via digital I/O's, serial interface, network & time-programmed
- Heated solenoid valve for autocal and safety switch (purge or calibration gas)
- Mass flow control in heated chamber
- Heated throttle for flow rate control
- Heated fine dust filter
- Heated bypass throttle
- Stand-alone analyzer or system control unit

Applications

- Chemical process analysis & control
- Furnace atmosphere in nitriding gas
- Furnace atmosphere in carbonitriding gas
- Process monitoring in urea production
- Process monitoring in fertilizer production
- Production of steel and non-ferrous metal



NGA 2000 series MLT 5 analyzers offers multi-component, multi-method analysis using infrared, ultraviolet and thermal conductivity sensor technologies as high temperature (HT) solution. MLT 5 gas analyzers are designed to measure up to five gas components.

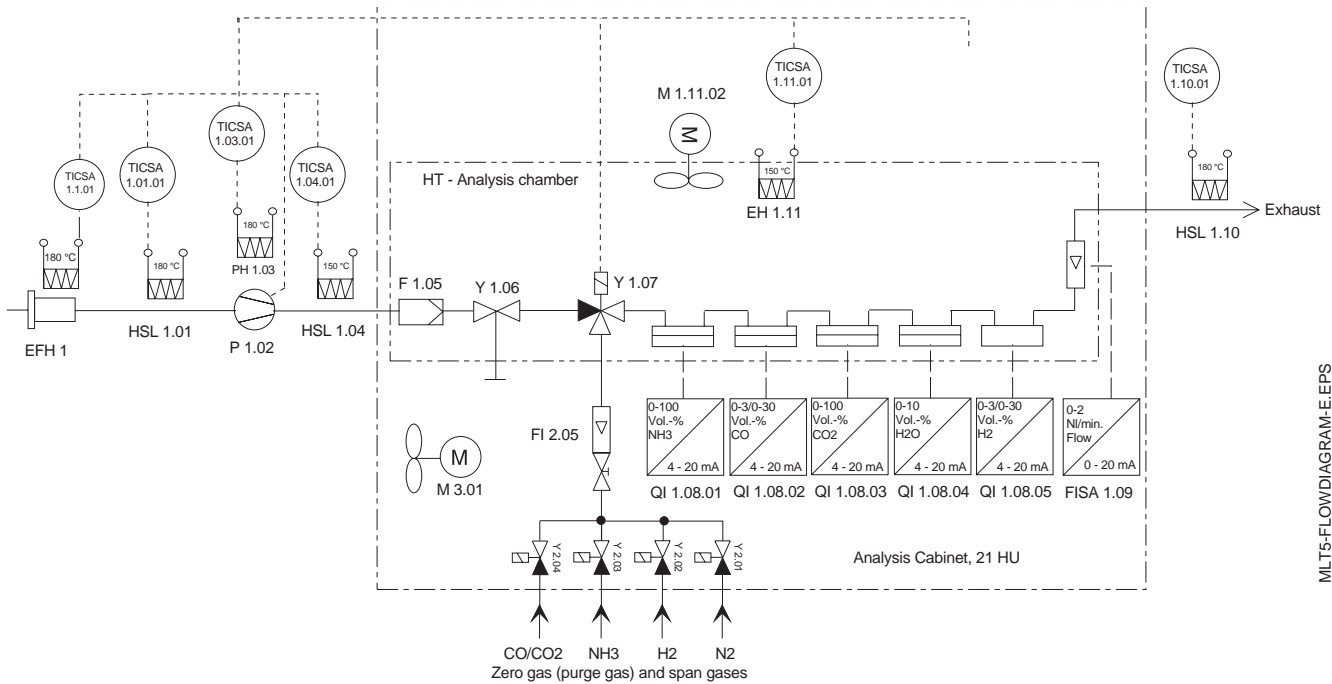
The MLT 5 can be equipped with a single or dual photometer bench (one bench with up to two channels) and one thermal conductivity sensor. Oxygen sensors for installation in a heated chamber at 150 or 180 °C are in progress.

MLT 5 may be configured as stand-alone unit or as "system control analyzer" with front panel display and keypad. Other analyzer modules (AM's) can be added to create NGA systems in combination with an HFID, TFID, CLD, WCLD, WNO_x or other AM's. The advantage of a high temperature analyzer together with a high temperature sample handling system is to avoid any condensation and losses of soluble measuring components. If alkaline and acid components are present salt formation may occur which can be suppressed by HT measurement depending on gas composition.

For a complete overview of the NGA 2000 MLT series, please refer to brochure BRH43-600.A01.

ROSEMOUNT ANALYTICAL

MLT 5: Gas Flow Diagram (including all options)



MLT5-FLOW/DIAGRAM-LEEPS

Standard assembly:

F	1.05	fine dust filter
Y	1.06	needle valve
Y	1.07	3/2-way-solenoid valve (sample gas, purge / test/ cal gases)
QI	1.08.01	analysis (depending on customer)
QI	1.08.02	analysis (depending on customer)
QI	1.08.03	analysis (depending on customer)
QI	1.08.04	analysis (depending on customer)
QI	1.08.05	analysis (depending on customer)
EH	1.11	heater HT - analysis chamber
TICSA	1.11.01	temperature regulation analysis chamber
M	1.11.02	fan HT - analysis chamber

Options:

EFH	1.1	heated gas sampling probe
TICSA	1.1.01	temperature controller sampling probe
HSL	1.01	heated gas sampling line
TICSA	1.01.01	temperature controller sampling line
P	1.02	sample gas pump
PH	1.03	heater for sample gas pump
TICSA	1.03.01	temperature controller sample gas pump
HSL	1.04	heated gas sampling line
TICSA	1.04.01	temperature controller sampling line
FISA	1.09	DFA (thermal mass flow indicator)
HSL	1.10	heated gas sampling line (exhaust)
TICSA	1.10.01	temperature controller sampling line
Y2.01-2.04		2/2 - way - solenoid valve "purge gas/ zero gas/ span gases"
FI	2.05	flow meter "purge gas/zero gas/span gas"
M	3.01	fan (cabinet)

Standard Configuration Parameters *)

Gas Components		Minimum Ranges	Maximum Ranges
Acetic Acid ^{***)}	CH ₃ COOH	0 - 1 %	0 - 5 %
Ammonia	NH ₃	0 - 300 ppm	0 - 100 %
Carbon monoxide	CO	0 - 200 ppm	0 - 100 %
Carbon dioxide	CO ₂	0 - 500 ppm ^{***)}	0 - 100 %
Chlorine ^{***)}	Cl ₂	0 - 5,000 ppm	0 - 100 %
Hexane	C ₆ H ₁₄	0 - 300 ppm	0 - 9,000 ppm
Hydrogen	H ₂	0 - 5 %	0 - 100 %
Hydrogen cyanide ^{***)}	HCN	0 - 500 ppm	0 - 40 %
Methane	CH ₄	0 - 500 ppm	0 - 100 %
Methanol	CH ₃ OH	0 - 1 %	0 - 5 %
Nitric oxide	NO	0 - 5,000 ppm	0 - 100 %
Nitric dioxide ^{***)}	NO ₂	0 - 50 ppm ^{***)}	0 - 50 %
Nitrous oxide	N ₂ O	0 - 1 %	0 - 100 %
Phosgene ^{***)}	COCl ₂	0 - 500 ppm	0 - 100 %
Sulphur dioxide	SO ₂	0 - 300 ppm	0 - 80 %
Water vapor ^{**)}	H ₂ O	0 - 2 %	0 - 100 %
Oxygen	O ₂	in progress in progress	

*) Other components and configurations on request

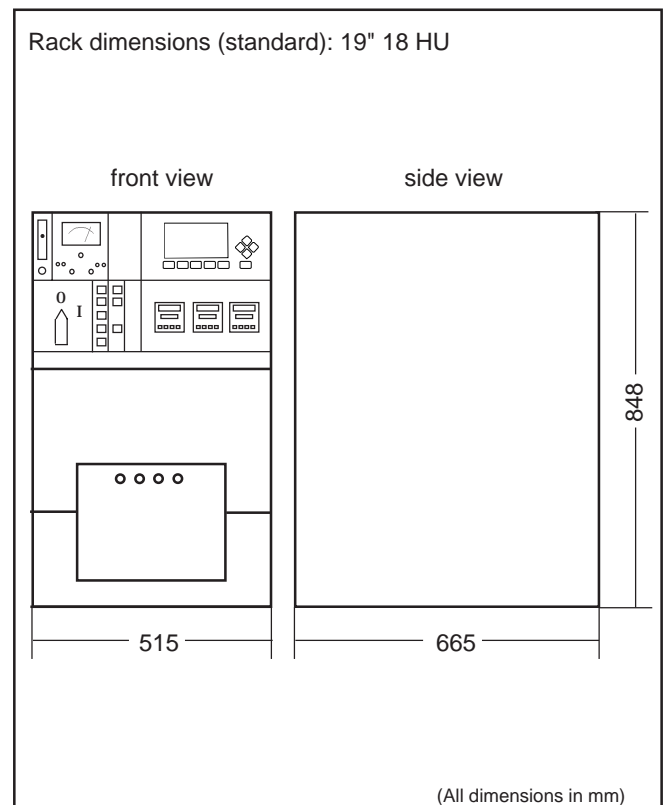
***) Thermostat control of complete sample handling system

****) Non-standard components require special calibration and linearization methods

Electrical Specifications, MLT 5

Input	Glands, Terminal strips
Nominal voltage	110–120 / 210–240 V ac, 50/60 Hz
Input voltage	93 - 132 V ac or 196 - 264 V ac, 47 - 63 Hz
Power consumption	approx. 1,3 kVA (standard assembly without options)

Dimensions MLT 5



General Specifications

	NDIR/UV/VIS	Thermal Conductivity	
Detection limit	≤ 1 % ^{1) 4)}	≤ 2 % ^{1) 4)}	
Linearity	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}	
Zero-point drift	≤ 2 % per week ^{1) 4)}	≤ 2 % per week ^{1) 4)}	
Span (sensitivity) drift	≤ 0.5 % per week ^{1) 4)}	≤ 1 % per week ^{1) 4)}	
Repeatability	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}	
Response time (t₉₀)	3 s ≤ t ₉₀ ≤ 7 s ^{3) 5)}	3 s ≤ t ₉₀ ≤ 20 s ^{3) 6)}	
Permissible gas flow	0.2 - 1.5 l/min	0.2 - 1.5 l/min (constant)	
Influence of gas flow		≤ 1 % ^{1) 4)}	
Max. pressure	≤ 1,500 hPa abs.	≤ 1,500 hPa abs.	
Influence of pressure			
- At constant temperature	≤ 0.10 % per hPa ²⁾	≤ 0.10 % per hPa ²⁾	
- With pressure compensation ⁷⁾	≤ 0.01 % per hPa ²⁾	≤ 0.01 % per hPa ²⁾	
Permissible ambient temperature	+ 5 °C to + 40 °C ⁸⁾	+ 5 °C to + 40 °C ⁸⁾	
Influence of temperature (at constant pressure)			
- On zero point	≤ 1 % per 10 K ¹⁾	≤ 1 % per 10 K in 1 h ¹⁾	
- On span (sensitivity)	≤ 5 % (+ 5 to + 40 °C) ^{1) 9)}	≤ 2 % per 10 K in 1 h ¹⁾	
Thermostat control	Approx. 150 °C	Approx. 75 °C ¹⁰⁾	
Heating-up time	Approx. 50-120 minutes ⁵⁾	Approx. 50 minutes	

1) Related to full scale

2) Related to measuring value

3) From gas analyzer inlet at 1.0 l/min gas flow
(electr. = 2 s)

4) Constant pressure and temperature

5) Dependent on integrated photometer bench

6) Depending on sensor positioning


7) Pressure sensor is required

8) Higher ambient temperatures (45 °C) on request

9) Starting from 20 °C (to + 5 °C or to + 40 °C)

10) Sensor / cell only

Specific Data

Compliances	EN 50081-1, EN 50082-2, EN 61010-1, GOSST 
Measuring components	Approx. 60 gases are detectable, e.g.: NO, NO ₂ , SO ₂ , CO, CO ₂ , CH ₄ , C ₆ H ₁₄ , CH ₃ OH, Cl ₂ , H ₂ O, N ₂ O, C ₂ H ₄ , NH ₃ , HCN, COCl ₂ , Hg etc.
Measuring ranges	Depend on the measured gas
Photometer channels	0 - 5 ... 100 % O ₂ or 0 - 2 ... 25 % O ₂ (up to 150 °C)
Oxygen sensor (in progress)	0 - 5 ... 100 % H ₂
Thermal conductivity sensor	0 - 10 ... 100 % He 0 - 50 ... 100 % Ar 0 - 30 ... 100 % CO ₂
Gas connections	6/4 mm ss, 1/4" ss; add. fittings on request
Tubings	ss, Viton or PTFE as option
Protection class	IP 20 according to DIN 40050 (standard) IP 54 according to DIN 40050 as option
Weight	Approx. 45 - 50 kg depending on configuration
Options	Integrated mass flow sensor and temperature sensor, process cells, solenoid valve, fine dust filter, throttle valve, bypass valve heated gas sampling probe, heated gas sampling lines, heated gas sampling pump

Signal Outputs, Interfaces

SIO and DIO [Options]

2 - 8 analog signal outputs

(SIO, optically isolated, sub-modular structure):

- 0 - 10 V and 0 - 20 mA (R_B ≤ 500 Ω), or
- 2 - 10 V and 4 - 20 mA (R_B ≤ 500 Ω)

3 relay contacts (SIO, NAMUR):

- Contact rating: 1 A, 30 V
- Digital, parallel** (DIO, optically isolated, freely programmable from a list of commands):
- 8 digital inputs, 0 - 30 V dc / 2.2 mA (for remote functions)
 - 24 digital outputs, 5 - 30 V dc / 500 mA

Serial interfaces (SIO, option):

- RS 232 C or RS 485

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For full technical specifications for I/O's, please refer to data sheet PDS43-620.02.