Product Data Sheet
PDS 43-6583.A01
September, 2001

MLT 3, MLT 4 Multi-Component Gas Analyzers

APPLICATIONS

- Internal combustion engine emissions and engine/catalyst development
- Suitability tested continuous emission monitoring systems
- Control of denitrification and desulphurization equipment
- Research and development institutes
- Trace monitoring in gas purity

FEATURES

- MLT 3/4 analyzers and analyzer modules
- Multi-channel:
  MLT 3 up to 4 channels,
  MLT 4 up to 5 channels with combinations of NDIR, NDUV, VIS, O_2 and TC
- NDIR: Microflow sensor or solid-state detector
- NDUV/VIS: Semiconductor detector or vacuum diode
- **O_2:** Fast response paramagnetic or long-term stable electrochemical oxygen sensor
- TC: Thermo-conductivity, corrosion-resistant
- 4 ranges per channel
- Dynamic autoranging ratio 1:10 or more (up to 1:250)
- AK protocol for automotive
- Autocalibration via internal or external valve block, controlled by digital I/O, serial interface, network, time-programmed
- Zero and span stability by autozero and automatic gain control without span gas
- Table-top or rack-mountable analyzer
- Thermostat controlled benches (option)
- Barometric or process pressure compensation
- Sample flow rate measurement
- Pump, filter and throttle (MLT 3)
- Analog, digital and serial I/Os (SIO/DIO)
- Suppressed ranges for O_2, H_2, CO_2, NO, N_2O and CO

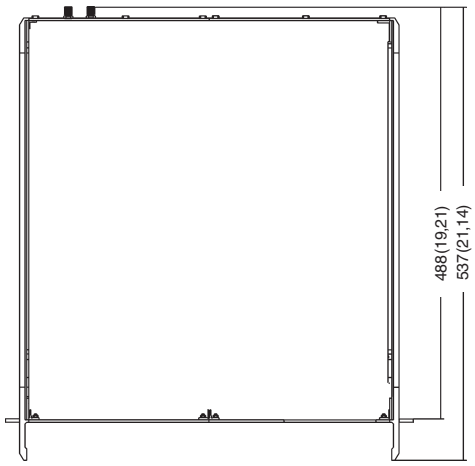
DESCRIPTION

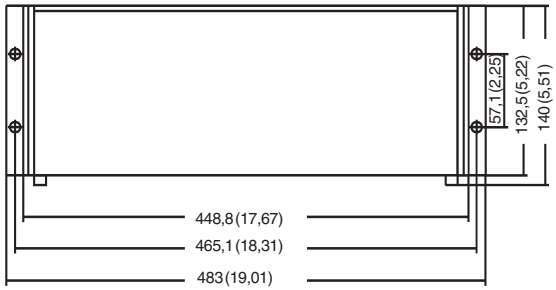
Rosemount Analytical's NGA 2000 MLT Series of gas analyzers offers multi-component, multi-method analysis using infrared, ultraviolet, thermal conductivity, paramagnetic and electrochemical sensor technologies. Housed in a total 19-inch enclosure (optionally thermostat controlled) the NGA 2000 MLT 3 Gas Analyzer can measure up to three gas components and the NGA 2000 MLT 4 can measure up to five gas components by combining the different technologies into one unit. The main difference between the MLT 3 and MLT 4 is the power supply, which is internal with the MLT 3.

The MLT 3 and MLT 4 can be configured as stand-alone units, as "system control analyzers" with front panel display and keypad or as analyzer modules. The AM is a blind analyzer which measures concentrations and other relevant parameters and provides data to the NGA network. The AM is designed for combination with an MLT analyzer or a platform in a system. Analyzers and AMs are configurable as rack-mountable or table-top versions. MLT AMs or stand-alone analyzers can be provided with local fast response I/Os (SIO and/or DIO) while system MLTs can use SIO and DIO as system I/Os supporting all AMs within the NGA 2000 analyzer system.

For a complete overview of the NGA 2000 MLT series, please refer to the general MLT capabilities brochure BRH 103-6658.A01. For a complete overview of process analytic solutions, refer to brochure BRH 100-7777.A01.

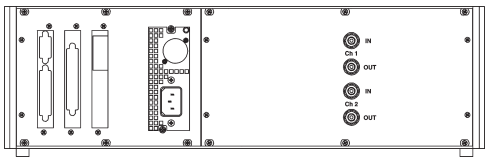
MLT 3 and MLT 4: Rack-Mounting/Table-Top Housing



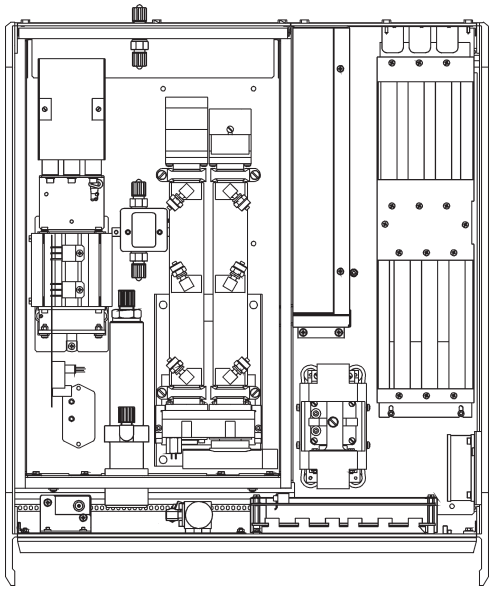


Top view

MLT 3 (Table-Top Housing)

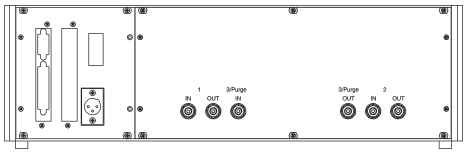


Rear view

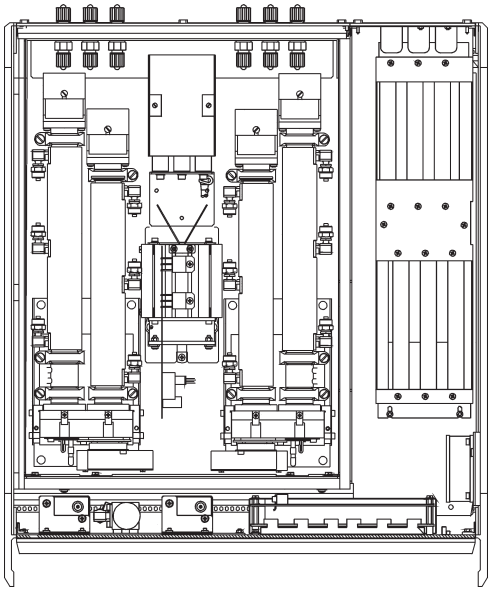


Inside view (including options)

MLT 4 (Table-Top Housing)



Rear view



Inside view

All dimensions in mm
(inches in parentheses)

STANDARD CONFIGURATION PARAMETERS *)

Gas Components		Minimum Ranges	Maximum Ranges
Ammonia	NH_3	0 - 100 ppm	0 - 100%
Carbon dioxide	CO_2	0 - 5 ppm ***)	0 - 100%
Carbon monoxide	CO	0 - 10 ppm ***)	0 -100%
Hexane	C_6H_{14}	0 - 300 ppm	0 - 9,000 ppm
Methane	CH_4	0 - 300 ppm	0 - 100%
Nitric dioxide	NO_2	0 - 10 ppm ***)	0 - 1,000 ppm
Nitric oxide	NO	0 - 150 ppm	0 - 100%
Nitrous oxide	N_2O	0 - 200 ppm	0 - 2,000 ppm
Oxygen	O_2	0 - 1% ***)	0 - 100% ****)
Sulphur dioxide	SO_2	0 - 25 ppm	0 - 80%
Sulphur hexafluoride	SF_6	0 - 5 ppm	0 - 2%
Water vapor **)	H_2O	0 - 1,000 ppm	0 - 10%

*) Other components and configurations on request
**) Dew point must not exceed ambient temperature
***) Non-standard specifications (CO/CO_2 see ADS43-411.A01)
****) PO_2 only; EO_2 up to 25%, higher concentrations reduce sensor lifetime

ELECTRICAL SPECIFICATIONS, MLT 3

Internal power supply UPS. Specifications see below.

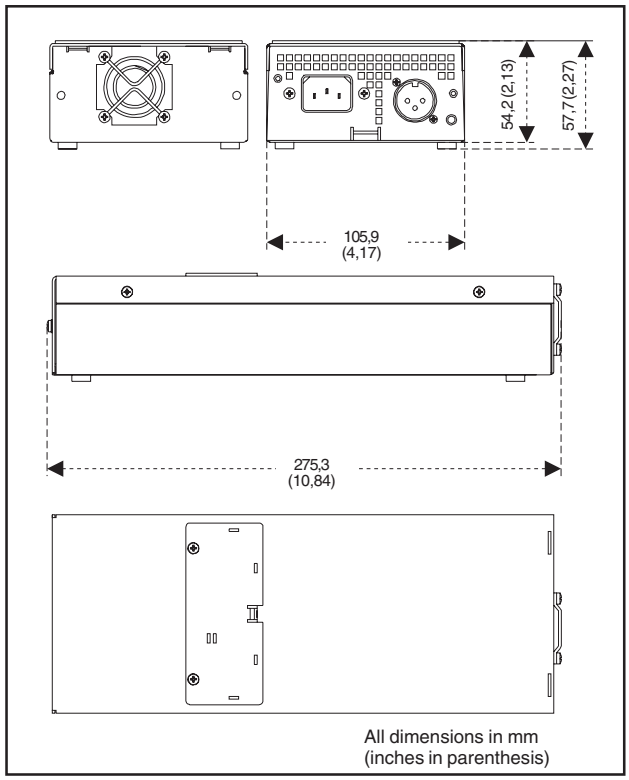
SPECIFICATIONS, UPS / SL 5, SL 10

Input UPS / SL 5, SL 10	IEC appliance inlet/terminals
Nominal voltage	120 / 230 VAC, 50/60 Hz
Input voltage UPS / SL 5, SL 10	93 - 132 VAC resp. 196 - 264 VAC, 47 - 63 Hz autoranging/manual switch
Input current UPS // SL 5 // SL 10	2,5 / 1,5 A // 2,6 / 1,4 A // 6,0 / 2,8 A
Output UPS SL 5, SL 10	3 pole XLR flange (female) internal version: dual pole connectors terminals
Output voltage UPS, SL 5 / SL 10	24 VDC max. 5,0 A / max. 10,0 A
Nominal power UPS, SL 5 SL 10	 max. 120 W max. 240 W
Dimensions UPS Rack Module SL 5 (SL 10)	 19", 3 HU, 21 DU 125 x 65 (122) x 103 mm (H x W x D)
Installation UPS Rack Module SL 5 / SL10	 Depth min. 400 mm (with plug/cable) Mountable on DIN supporting rails type TS 35

ELECTRICAL SPECIFICATIONS, MLT 4

Input	3-pole XLR flange (male), lockable
Voltage supply	24 VDC ± 5% / 5 A
For AC operation (120 / 230 V)	The DC supply must be provided by including one of the following options: UPS, SL 5 / SL 10 (cabinet only) or equivalent power supply.

Fig. 2
Mounting dimensions Universal Power Supply (UPS): Table-top version (without cables)



GENERAL SPECIFICATIONS

	NDIR/UV/VIS	Oxygen (PO_2/EO_2 [9])	Thermal conductivity
Detection limit	≤ 1 % [1) 4)]	≤ 1 % [1) 4]	≤ 2 % [1) 4)]
Linearity	≤ 1 % [1) 4)]	≤ 1 % [1) 4)]	≤ 1 % [1) 4)]
Zero-point drift	≤ 2 % per week [1) 4)]	≤ 2 % per week [1) 4)]	≤ 2 % per week [1) 4)]
Span (sensitivity) drift	≤ 0.5 % per week [1) 4)]	≤ 1 % per week [1)]	≤ 1 % per week [1) 4)]
Repeatability	≤ 1 % [1) 4)]	≤ 1 % [1) 4)]	≤ 1 % [1) 4)]
Response time (t_{90})	3 s ≤ t_{90} ≤ 7 s [3) 5)]	< 5 s [3) 6)] / Approx. 12 s [3) 9)]	3 s ≤ t_{90} ≤ 20 s [3) 14)]
Permissible gas flow	0,2 - 1,5 l/min	0,2 - 1,0 / 0,2 - 1,5 [9)] l/min	0,2 - 1,0 l/min (± 0,1 l/min)
Influence of gas flow	-	≤ 2 % [1) 4)]	≤ 1 % [1) 4) 12)]
Max. pressure	≤ 1.500 hPa abs. [15)]	Atm. pressure / ≤ 1.500 hPa abs. [9) 15)]	≤ 1.500 hPa abs. [15)]
Influence of pressure			
- At constant temperature	≤ 0,1 % per hPa [2)]	≤ 0,1 % per hPa [2)]	≤ 0,1 % per hPa [2)]
- With pressure compensation [10)]	≤ 0,01 % per hPa [2)]	≤ 0,01 % per hPa [2)]	≤ 0,01 % per hPa [2)]
Permissible ambient temperature	+ 5°C to + 40°C [7)]	+ 5°C to + 40°C [7)]	+ 5°C to + 40°C [7)]
Influence of temperature (at constant pressure)			
- On zero point	≤ 1 % per 10 K [1)]	≤ 1 % per 10 K [1)]	≤ 1 % per 10 K in 1 h [1)]
- On span (sensitivity)	≤ 5 % (+ 5 to + 40°C) [1) 6)]	≤ 1 % per 10 K [1)]	≤ 2 % per 10 K in 1 h [1)]
Thermostat control [11) 13)]	None	Approx. 55°C [8)] / None [9)]	Approx. 75°C [11)]
Warm-up time [11) 13)]	Approx. 15 to 50 minutes [5)]	Approx. 50 minutes [9)]	Approx. 15 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/sensor
6) Starting from 20°C (to + 5°C or to + 40°C)
7) Higher ambient temperatures (45°C) on request
8) Thermoelectrically controlled PO cell
9) EC: Not for use with sample gas containing FCHC
10) Pressure sensor required
11) Measuring cell only
12) Gas flow constant within ± 0,1 l/min
13) Option thermostated box: 55 °C, warm-up time approx. 50 min. for all principles
14) Depending on measuring range
15) At normal atmospheric pressure (1013 hPa)

SPECIFIC DATA

Compliances	EN 61326, EN 61010-1, NAMUR, PAC, C-Tick, GOST: VNIIMS, Pattern (Belarussia)
Suitability tests	FDA test: 0 - 10 ppm CO and 0 - 5 ppm CO_2 TÜV Rheinland: CO / SO_2 / NO / NO_2 / O_2 measurement acc. to TI Air (Technical Instruction on Air Quality Control), 13th BImSchV (Large Furnaces order) and 17th BImSchV (Order on Incineration Plants for Waste and Similar Combustible Materials)
Measuring components	Approx. 60 gases are detectable, e.g.: NO, NO_2, SO_2, CO, CO_2, CH_4, C_6H_{14}, SF_6, Cl_2, H_2O, N_2O, O_2, NH_3, R13a, H_2 etc.
Gas connections for sample, reference or purge gas	MLT 3: 6 fittings, 6/4 mm PVDF MLT 4: 10 fittings, 6/4 mm PVDF Option: 6/4 mm ss, 1/4" ss; add. fittings on request
Protection class	IP 20 according to DIN 40050
Case classification	General purpose for installation in weather protected area
Permissible humidity	< 90% rel. humidity at 20°C < 70% rel. humidity at 40°C
Weight	Approx. 13 - 18 kg depending on configuration
Options	Integrated flow sensors and pressure sensors, vibration decoupling, thermostated box for physical components (standard 55° C, option 120° C) MLT 3 only sample handling: pump, fine dust filter, throttle

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 ($R_B \leq 500\ \Omega$), or
- 2 - 10 V and 4 - 20 mA ($R_B \leq 500\ \Omega$)

3 relay contacts (SIO, NAMUR):

- Contact rating: 1 A, 30 V

Serial interfaces (SIO, option):

- RS 232 C or RS 485

Digital I/Os (DIO, optically isolated, freely programmable from a list of commands)

- 8 digital inputs, 0 - 30 VDC / 2.2 mA (for remote functions)
- 24 digital outputs, 5 - 30 VDC / 500 mA

For full technical specifications for I/Os, please refer to Input/Output data sheet.

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