

# MLT 2 Multi-Component Gas Analyzer

## FEATURES

- Up to 5 measuring channels:
  - 1- 2 NDIR/UV/VIS plus 1-2 TC or O<sub>2</sub>
  - 1- 3 TC or O<sub>2</sub>
  - 1- 5 NDIR/UV/VIS/TC/O<sub>2</sub> (optional)
- NDIR: Gas detector with microflow sensor or solid-state detector (IFC)
- NDUV/VIS: Semiconductor detector or vacuum diode
- Fast response paramagnetic or stable electrochemical oxygen sensor
- Flexible thermal conductivity cell
- NDIR/UV/VIS/TC & O<sub>2</sub> process cells
- Stainless steel tubing (optional)
- Wall-mountable field housings with IP 65 (NEMA 4/4X) industrial enclosures
- Thermostat controlled benches
- Autocalibration via digital I/O's, serial interface, network & time-programmed
- Solenoid valve block for autocal
- Zero and span stability by autozero and automatic gain control
- Pressure & flow rate measurement
- Impact tested intrinsically safe front panel
- Simplified pressurization for ATEX Zone 2 or Z Purge for CSA-C/US Ex Zone 2
- EExp option for ATEX Ex Zone 1

## APPLICATIONS

- Chemical process analysis & control
- Metallurgical process gas monitoring
- Furnace atmosphere in hardening gas
- Process monitoring in coal/wood gasification
- Ambient air monitoring in chemical plants
- Production of steel and non-ferrous metal

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## NEW: Foundation Fiedbus Communication

Rosemount Analytical's MLT series of NGA 2000 analyzers offer multi-component, multi-method analysis using infrared, ultraviolet, thermal conductivity, paramagnetic and electrochemical sensor technologies.

The MLT 2 gas analyzers measure up to five gas components depending on the configuration (space is determined by cell length) in a single or dual compartment IP 65 (NEMA 4/4X) wall-mount enclosure.

The MLT 2 can be configured as a stand-alone unit, as a "system control analyzer" with front panel display and keypad or as an analyzer module (AM). The AM is a blind analysis unit that measures concentrations and other relevant parameters and provides data to the NGA network. The AM must be combined with an MLT/TFID analyzer, an NGA 2000 platform or a customer-designed control unit.

For hazardous areas, the MLT 2 can be equipped with an impact tested, magnetically operated front panel and simplified pressurization (Z purge) for ex zone 2. An EExp approved "pressurization system" is available for ATEX ex zone 1 applications, either with leakage compensation or continuous purge - flammable & non-flammable gas.

For a complete overview of the NGA 2000 MLT series, please refer to brochure BRH-103-6658.A01.

  
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Process Management

Fig. 1 Mounting dimensions/drill drawing for standard versions. Dimensions in mm (Inches in parentheses).

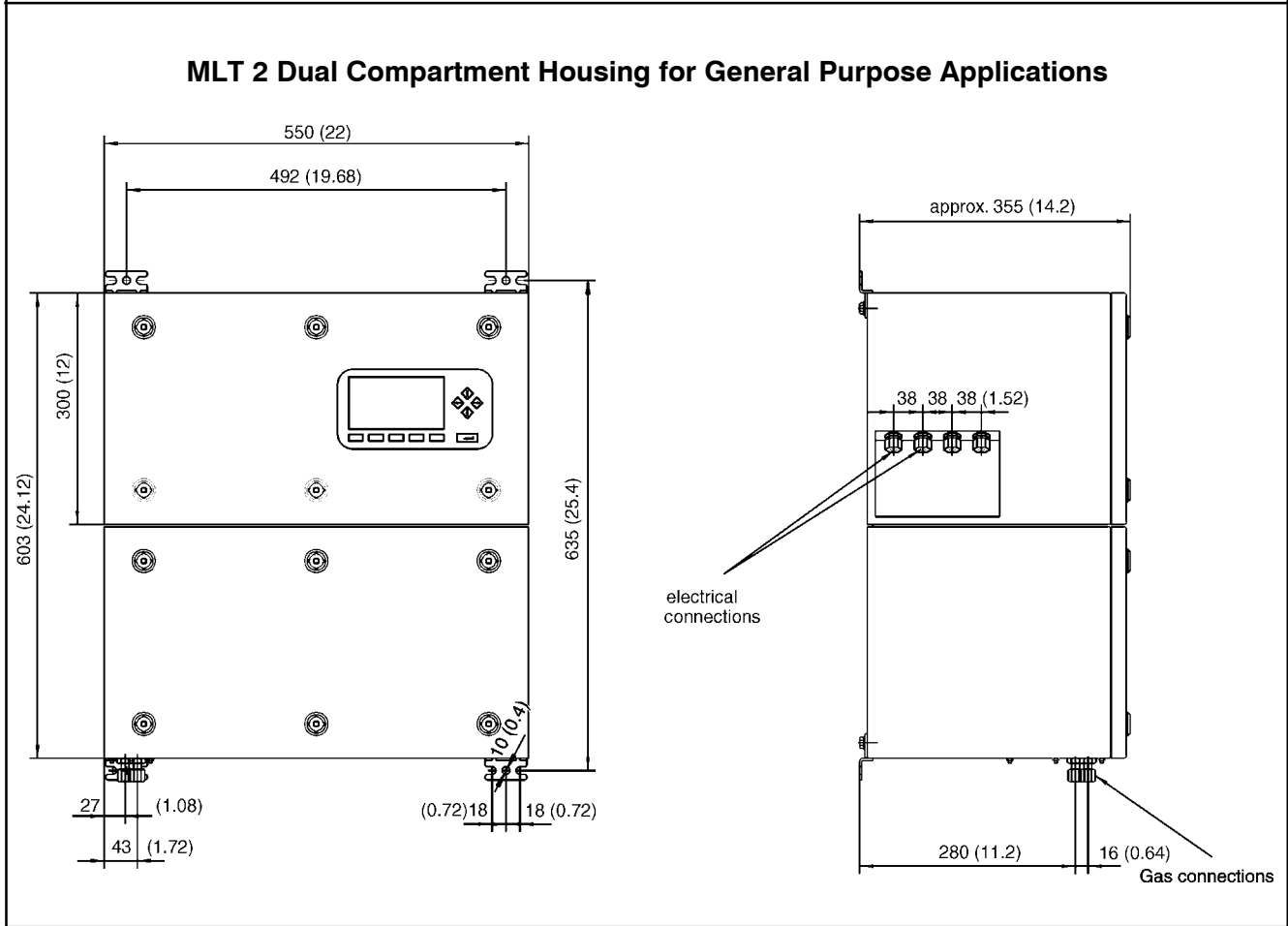
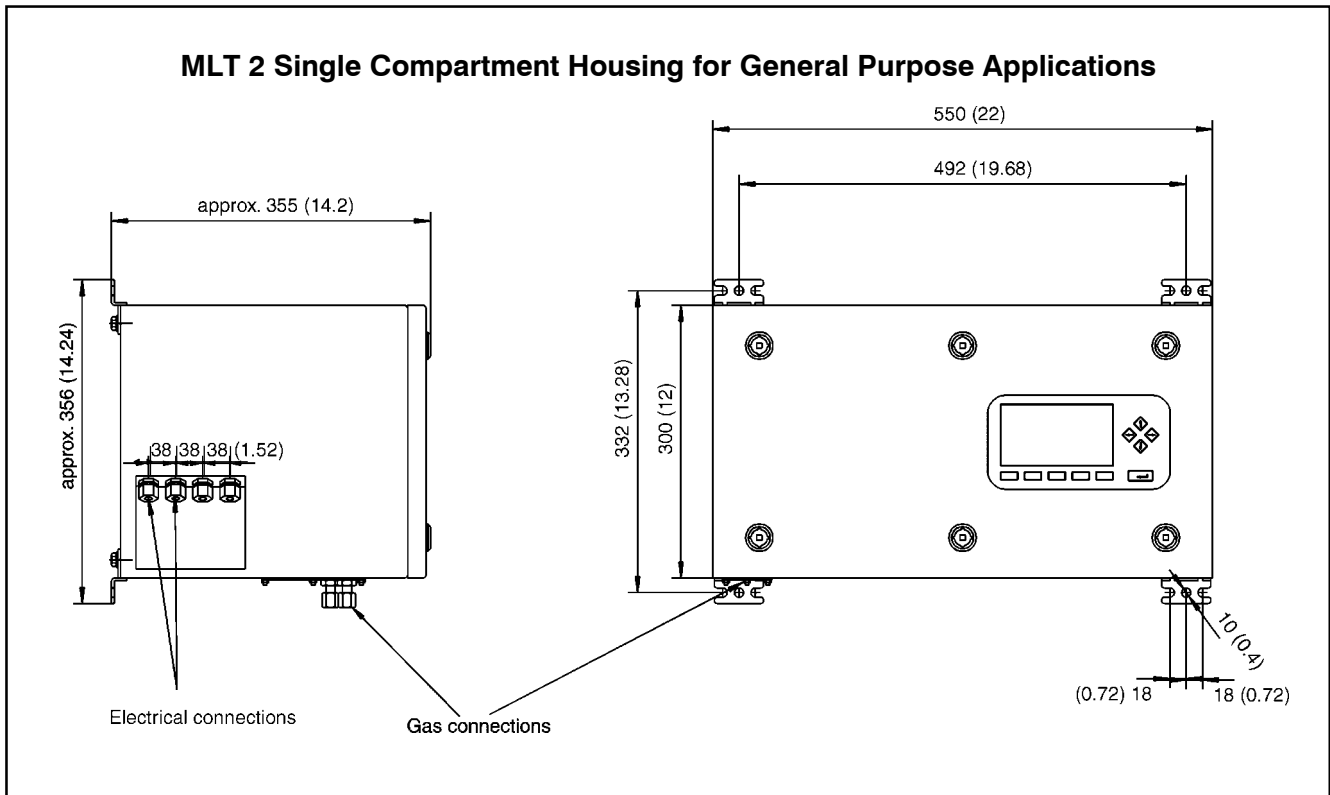


Fig. 2 Mounting dimensions: versions of Ex Zone 2. Dimensions in mm (Inches in parentheses).

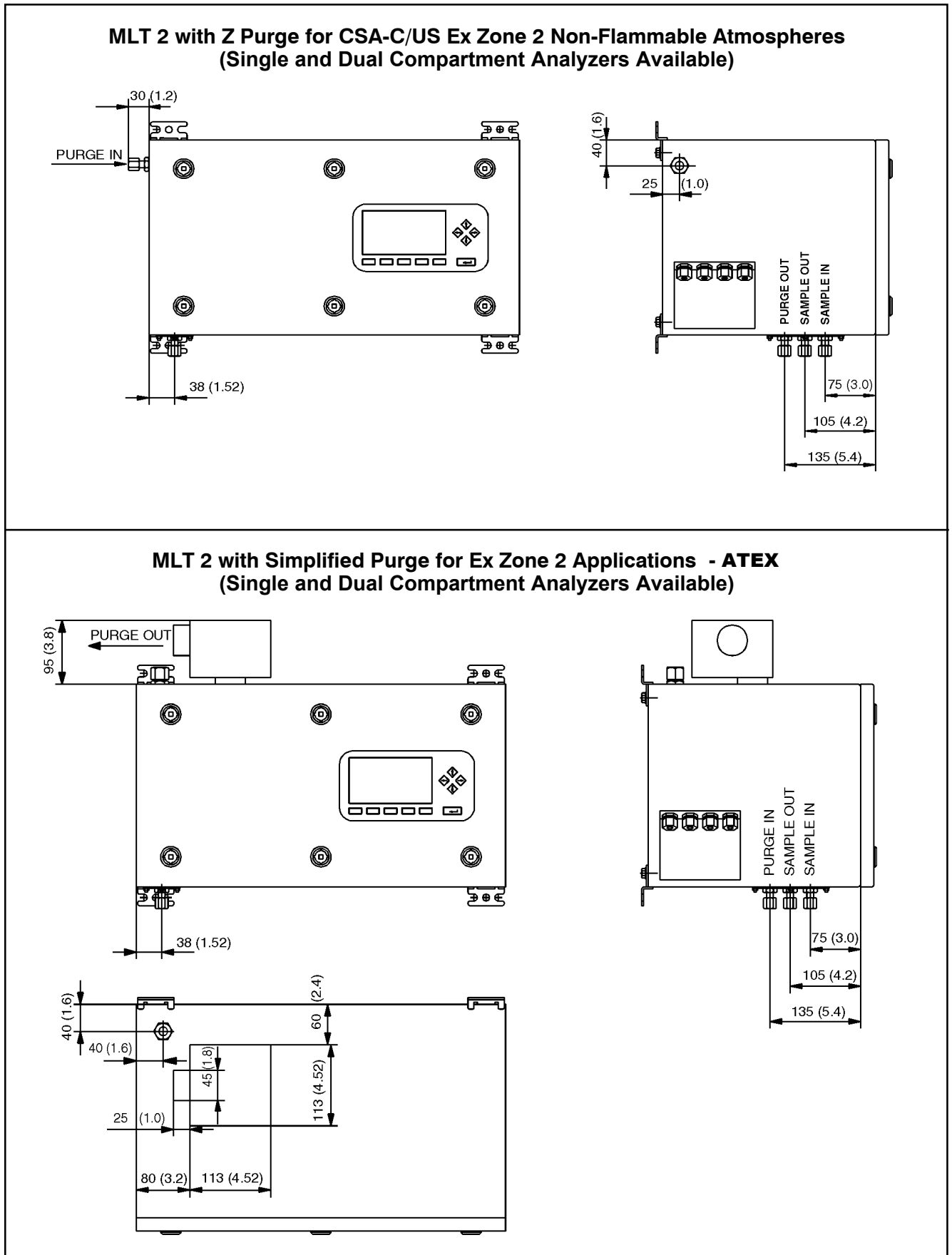
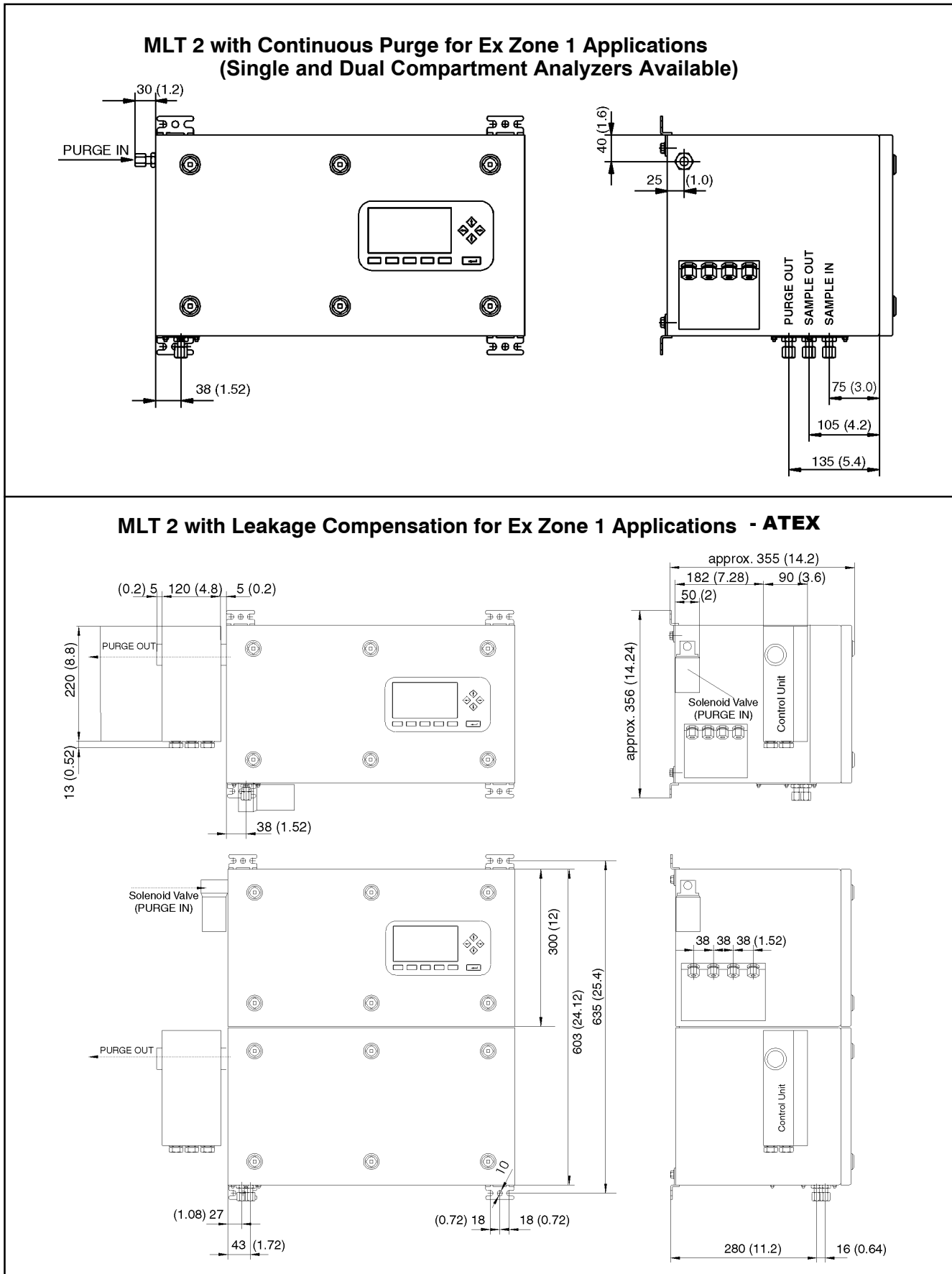


Fig. 3 Mounting dimensions: versions of Ex Zone 1. Dimensions in mm (Inches in parentheses).



## Standard Configuration Parameters \*)

Gas Components		Minimum Ranges	Maximum Ranges
Acetic acid****)	CH <sub>3</sub> COOH	0 - 2,000 ppm	0 - 5 %
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	0 - 500 ppm	0 - 12 %
Acrolein	C <sub>3</sub> H <sub>4</sub> O	0 - 2,000 ppm	0 - 2 %
Ammonia	NH <sub>3</sub>	0 - 100 ppm	0 - 100 %
Carbon monoxide	CO	0 - 10 ppm ***)	0 - 100 %
Carbon dioxide	CO <sub>2</sub>	0 - 5 ppm ***)	0 - 100 %
Chlorine****)	Cl <sub>2</sub>	0 - 1,000 ppm	0 - 100 %
Hexane	C <sub>6</sub> H <sub>14</sub>	0 - 300 ppm	0 - 9,000 ppm
Hydrogen cyanide****)	HCN	0 - 100 ppm	0 - 40 %
Mercury vapor****)	Hg	0 - 50 ppb	0 - 20 ppm
Methane	CH <sub>4</sub>	0 - 300 ppm	0 - 100 %
Methanol	CH <sub>3</sub> OH	0 - 1,000 ppm	0 - 5 %
Nitric dioxide	NO <sub>2</sub>	0 - 10 ppm ***)	0 - 5 %
Nitric oxide	NO	0 - 150 ppm	0 - 100 %
Nitrous oxide	N <sub>2</sub> O	0 - 200 ppm	0 - 100 %
Oxygen	O <sub>2</sub>	0 - 1 % ***)	0 - 100 %
Phosgene****)	COCl <sub>2</sub>	0 - 100 ppm	0 - 100 %
Sulphur dioxide	SO <sub>2</sub>	0 - 25 ppm	0 - 80 %
Sulphur hexafluoride	SF <sub>6</sub>	0 - 5 ppm	0 - 2 %
Water vapor **)	H <sub>2</sub> O	0 - 1,000 ppm	0 - 10 %

\*) Other components and configurations on request

\*\*) Dew point must not exceed ambient temperature

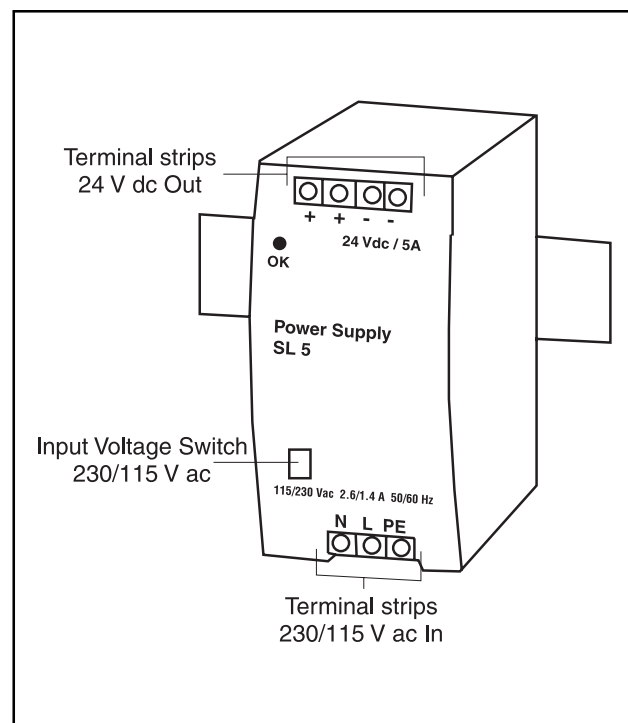
\*\*\*) Non-standard specifications - Consult Factory (CO/CO<sub>2</sub> see ADS43-411.A01)

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

## MLT 2 ELECTRICAL SPECIFICATIONS

<b>Input</b>	Glands, Plug jackets
<b>Nominal voltage</b>	120 / 230 V ac, 50/60 Hz
<b>Input voltage</b>	93 - 132 V ac and 196 - 264 V ac, with manual switch, 47 - 63 Hz
<b>Internal power supply</b>	One SL 5 or SL 10
<b>Installation</b>	Mounted on DIN supporting rails TS 35
<b>Input power</b> SL 5 / SL 10	Max. 240 VA / Max. 690 VA
<b>Output</b>	Terminal strips
<b>Output voltage</b> SL 5 / SL 10	24 V dc Max. 5.0 A / Max. 10.0 A
<b>Available power</b> SL 5 SL 10	Max. 120 W Max. 240 W
<b>Dimensions</b> SL 5 (H x W x D) SL 10 (H x W x D)	125 x 65 x 103 mm 125 x 120 x 103 mm

Fig. 4 Power Supply SL 5 (without cables)



## General Specifications

	NDIR/UV/VIS	Oxygen Sensor (PO <sub>2</sub> and EO <sub>2</sub> )	Thermal Conductivity
<b>Detection limit</b>	≤ 1 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>	≤ 2 % <sup>1) 4)</sup>
<b>Linearity</b>	≤ 1 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>
<b>Zero-point drift</b>	≤ 2 % per week <sup>1) 4)</sup>	≤ 2 % per week <sup>1) 4)</sup>	≤ 2 % per week <sup>1) 4)</sup>
<b>Span (sensitivity) drift</b>	≤ 0.5 % per week <sup>1) 4)</sup>	≤ 1 % per week <sup>1)</sup>	≤ 1 % per week <sup>1) 4)</sup>
<b>Repeatability</b>	≤ 1 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>
<b>Response time (t<sub>90</sub>)</b>	3 s ≤ t <sub>90</sub> ≤ 7 s <sup>3) 5)</sup>	< 3 s (increasing) <sup>3) 6)</sup> < 4 s (decreasing) <sup>3) 6)</sup> Approx. 12 s <sup>3) 9)</sup>	3 s ≤ t <sub>90</sub> ≤ 20 s <sup>3) 7)</sup>
<b>Permissible gas flow</b>	0.2 - 1.5 l/min	0.2 - 1.0 l/min <sup>6)</sup> / 0.2 - 1.5 l/min <sup>9)</sup>	0.2 - 1.5 l/min (constant)
<b>Influence of gas flow</b>		≤ 2 % <sup>1) 4)</sup>	≤ 1 % <sup>1) 4)</sup>
<b>Max. pressure</b>	≤ 1,500 hPa abs.	Atm. pressure <sup>6)</sup> / ≤ 1,500 hPa abs. <sup>9)</sup>	≤ 1,500 hPa abs.
<b>Influence of pressure</b>			
- At constant temperature	≤ 0.10 % per hPa <sup>2)</sup>	≤ 0.10 % per hPa <sup>2)</sup>	≤ 0.10 % per hPa <sup>2)</sup>
- With pressure compensation <sup>8)</sup>	≤ 0.01 % per hPa <sup>2)</sup>	≤ 0.01 % per hPa <sup>2)</sup>	≤ 0.01 % per hPa <sup>2)</sup>
<b>Permissible ambient temperature</b>	+ 5 °C to + 40 °C <sup>10)</sup>	+ 5 °C to + 40 °C <sup>10)</sup>	+ 5 °C to + 40 °C <sup>10)</sup>
<b>Influence of temperature (at constant pressure)</b>			
- On zero point	≤ 1 % per 10 K <sup>1)</sup>	≤ 1 % per 10 K <sup>1)</sup>	≤ 1 % per 10 K in 1 h <sup>1)</sup>
- On span (sensitivity)	≤ 5 % (+ 5 to + 40 °C) <sup>1) 11)</sup>	≤ 1 % per 10 K <sup>1)</sup>	≤ 2 % per 10 K in 1 h <sup>1)</sup>
<b>Thermostat control</b>	Approx. 55 °C	Approx. 55 °C <sup>6)</sup> / None <sup>9)</sup>	Approx. 75 °C <sup>12)</sup>
<b>Heating-up time</b>	Approx. 50 minutes <sup>5)</sup>	Approx. 50 minutes	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) Paramagnetic oxygen measurement (PO<sub>2</sub>)

7) Depending on sensor positioning

8) Pressure sensor is required





9) Electrochemical oxygen measurement (EO<sub>2</sub>), not for use with sample gas containing FCHC's

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

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

12) Sensor / cell only

## Specific Data

<b>Compliances</b>	EN 50081-1, EN 50082-2, EN 61010-1, NAMUR, GOSST    
<b>Suitability tests</b>	TÜV Rheinland: CO / SO <sub>2</sub> / NO / NO <sub>2</sub> / O <sub>2</sub> measurement acc. to TI Air, 13 <sup>th</sup> and 17 <sup>th</sup> BlmSchV
<b>Measuring components</b>	Approx. 60 gases are detectable, e.g.: NO, NO <sub>2</sub> , SO <sub>2</sub> , CO, CO <sub>2</sub> , CH <sub>4</sub> , C <sub>6</sub> H <sub>14</sub> , CH <sub>3</sub> OH, Cl <sub>2</sub> , H <sub>2</sub> O, N <sub>2</sub> O, C <sub>3</sub> H <sub>4</sub> O, NH <sub>3</sub> , HCN, COCl <sub>2</sub> , Hg etc.
<b>Measuring ranges</b>	Depend on the measured gas
Photometer channels	0 - 5 ... 100 % O <sub>2</sub> or 0 - 2 ... 25 % O <sub>2</sub> ;
Paramagnetic sensor	0 - 1 ... 10 % O <sub>2</sub> (non-standard specifications)
- Option	0 - 5 ... 25 % O <sub>2</sub> (higher measuring ranges reduce sensor lifetime)
Electrochemical sensor <sup>9)</sup>	
Thermal conductivity sensor	0 - 10 ... 100 % He 0 - 50 ... 100 % Ar 0 - 30 ... 100 % CO <sub>2</sub> 0 - 5 ... 100 % H <sub>2</sub> 0 - 2 % H <sub>2</sub> (non-standard specifications)
- Option	
<b>Data line &amp; main line glands</b>	EEx e II KEMA; cable diameter 7 to 12 mm
<b>Gas connections</b>	6/4 mm ss, 1/4" ss; add. fittings on request
<b>Protection class</b>	IP 65 according to DIN 40050 (NEMA 4-4X)
<b>Weight</b>	Approx. 30 - 35 kg depending on configuration
<b>Options</b>	Integrated flow sensor and pressure sensor, ss tubing, process cells, solenoid valve block, intrinsic safe I/O's, ex interface relays

## 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<sub>B</sub> ≤ 500 Ω), or
- 2 - 10 V and 4 - 20 mA (R<sub>B</sub> ≤ 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 / 485 and FF

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

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