**Please provide the following information to help us provide a system that exactly suits your requirements.**

**Please don’t hesitate to contact us if you have any questions or if you need help filling out this questionnaire.**

|  |  |  |
| --- | --- | --- |
| **CUSTOMER:**  **Company**  **Contact name**  **Address**  **City, State, Zip code** | Email: | **your email address** |
|  |
| Phone: | **your phone number** |
|  |
| Date: | **Date** |

|  |  |  |
| --- | --- | --- |
| **Industry:** |  | ***Others \*1*** |

**AMPRO 2000 Handheld Multigas Analyzer**

TUEV approved according to 1. BimSchV and EN 50379 / 1+2

For combustion control and industrial applications

SIMULTANEOUS measurement of up to 7 gas components!

The most powerful handheld multigas analyzer for stack emissions and combustion measurements.

**Measurement of: Combustion calculations:**

• O2 Oxygen (0….21%) • CO2 if no CO2 NDIR is installed

• CO Carbon monoxide (0….4,000ppm) • CO / CO2 ratio

• Combustion air temperature • Dew point

• Flue gas temperature • Excess air and air ratio (Lambda)

• Differential pressure • Combustion efficiency

• Differential temperature • Heat losses

|  |  |  |
| --- | --- | --- |
| **AMPRO 2000 - BASIC ANALYZER # 410082** | | |
| **• O2 Long Life sensor** (with 4 - 5 years life expectation) **\*1** | 0 … 21% | |
| **• CO** (H2 compensated) **\*2** | 0 … 4,000 ppm (short term overload 10,000ppm) | |
| **•** Calculated CO2 or optional NDIR measured CO2 (OPTION 63573) | |  |
| **•** Large fuel type list + user definable fuel types | |
| **•** CO protection using 2nd pump ***(protects the CO sensor against unwanted high CO concentrations)* \*3** | |
| **•** High energy Li-lon battery ***(for up 15 hours operation time)* \*4** | |
| **•** Analyzer and probe leak test ***(allows you to check analyzer and probe for leaks)*** | |
| **•** Combustion and Emission calculations | |
| **•** Flue Gas and Ambient Air Temperature measurement | |
| **•** Differential Temperature Measurement | |
| **•** Differential Pressure Measurement and Draft Measurement | |
| **•** Modern, slim line enclosure with fixing magnets | |
| **•** Super bright, color 3.5” TFT display with LED backlight ***(customizable and zoom function)*** | |
| **•** Mini-USB interface and USB cable, SD card reader and SD Card ***(export function to Excel)*** | |
| **•** IRDA interface for high speed infrared printer ***(printer not included)*** | |
| **•** Integrated, backlit condensate separator with PTFE filter and additional spare filter | |
| **•** Menu guided software and function keys | |
| **•** 100 - 240 Volt Battery charger | |  |
| **•** Robust, stainless steel gas connectors | |  |
| **\*1** *not all sensor configurations allow the LL sensor (in that case a +/- 2 year sensor will be installed)* | | |
| **\*2** *can be replaced by HIGH or VERY HIGH CO sensor but can also be in combination with HIGH or VERY HIGH CO sensor* | | |
| **\*3** *not possible in combination with NDIR CO2* | | |
| **\*4** *six to eight hours operation time with NDIR CO2* | | |

**Possible sensor combinations:**

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Most common configuration** | **Possible configuration with**  **CO sensor protection** | **Possible configuration with**  **CO2 NDIR** |

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **Long Life O2 sensor** | **B** | **O2 sensor (2 year sensor) is used when A is occupied** |
| **C** | **CO/H2 compensated sensor** | **F** | **NO sensor** |
| **D** | **CO sensor 2% (20,000ppm)** | **G** | **NO2 sensor** |
| **E** | **CO sensor 10% (100,000ppm)** | **H** | **SO2 sensor** |
| **I** | **CO2 NDIR** |

**Select the sensors you need (gases you want to measure):**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **SENSOR** | **REMARKS** | Range | | overload | **Part #** |
|  | **O2 LONG LIFE SENSOR** | **up to 5 year life span** | 0 – 21% |  | | **69365** |
|  | **O2 LONG (2 year sensor)** | **in case A is occupied** | 0 – 4,000 ppm | 10,000 ppm | | **63132** |
|  | **CO** (H2 compensated) |  | 0 – 4,000 ppm | 10,000 ppm | | **63132** |
|  | **NO** | **With calculated NOx** | 0 – 1,000 ppm | 5,000 ppm | | **63058** |
|  | **NO2** | **NO and NO2 needed for true NOx** | 0 – 200 ppm | 1,000 ppm | | **63059** |
|  | **SO2** |  | 0 – 2,000 ppm | 5,000 ppm | | **63060** |
|  | **CO High** | **Requires CO protection in comb. with CO/H2** | 0 – 4,000 ppm | 20,000 ppm | | **63057** |
|  | **CO Very High** | **Requires CO protection in comb. with CO/H2** | 0 – 4.0% | 100,000 ppm | | **63134** |
|  | **CO2 NDIR Measurement** | **#: 62727 CO protection can’t be installed** | 0 – 40% |  | | **63573** |

**CO and NO low are software options – this is not an additional sensor!!!**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **CO low** | **Requires Part #: 63132 CO Sensor** | 0 – 500 ppm | 0.1 ppm resolution | **63133** |
|  | **NO low** | **Requires Part #: 63058 NO Sensor** | 0 – 300 ppm | 0.1 ppm resolution | **63135** |
|  | **NO2 low** | **Requires Part #: 63059 NO2 Sensor** | 0 – 100 ppm | 0.1 ppm resolution | **65647** |

**Select your options:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | SD card, 4 GB card, software activating | **STANDARD** | **63137** |
|  | Ambient air temp probe | **STANDARD** | **61434** |
|  | CO protection using 2nd pump | **STANDARD \*3** | **62727** |
|  | Spare SD card, 2 Gb |  | **62994** |
|  | High accuracy differential pressure sensor and measurement +/– 100 hPa for continuous draft measurement | | **63316** |
|  | Combustion air temp probe – 2.5” (65 mm) |  | **62934** |
|  | Combustion air temp probe – 8” (200 mm) |  | **62928** |
|  | High speed IR printer. |  | **62693** |
|  | Standard ABS transport case |  | **63319** |
|  | Large ABS transport case with compartment for accessories |  | **63883** |
|  | Shoulder strap for analyzer |  | **63218** |
|  | AUX input |  | **63136** |
|  | Gas detector, HC Requires AUX input #: 63136 |  | **63086** |
|  | Gas flow velocity Requires Pitot tube and Option #: 63316 | | **63139** |

**\*3 not possible with CO2 NDIR**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **L-Type PITOT Tube** | | | | | |
|  | L-Type pitot tube | 11.81” x 0.24” | (300 mm x 6 mm) |  | **85120** |
|  | L-Type pitot tube | 19.68” x 0.24” | (500 mm x 6 mm) | **85130** |
|  | L-Type pitot tube | 31.48” x 0.24” | (800 mm x 6 mm) | **85132** |
|  | L-Type pitot tube | 39.35” x 0.31” | (1000 mm x 8 mm) | **85133** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **L-Type PITOT Tube with temperature measurement** | | | | | |
|  | L-Type pitot tube | 3.94” x 0.12” | (100 mm x 3 mm) | pitot_LTCK | **85125TE-K** |
|  | L-Type pitot tube | 7.87” x 0.12” | (200 mm x 3 mm) | **85127TE-K** |
|  | L-Type pitot tube | 11.81” x 0.24” | (300 mm x 6 mm) | **85120TE-K** |
|  | L-Type pitot tube | 19.68” x 0.24” | (500 mm x 6 mm) | **85130TE-K** |
|  | L-Type pitot tube | 31.48” x 0.24” | (800 mm x 6 mm) | **85132TE-K** |
|  | L-Type pitot tube | 39.35” x 0.31” | (1000 mm x 8 mm) | **85133TE-K** |

|  |  |  |  |
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|  | MRU Online View for transfer to PC |  | **15157** |
|  | Bluetooth module for wireless data transfer to a PC or MRU Smart Data APP |  | **63363** |

**Select your consumables:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ·   Service & cleaning set |  |  | **63140** |
|  | ·   Replaceable filter elements |  |  | **11165** |
|  | ·   Printer paper rolls (5 rolls) |  |  | **59465** |
|  | ·   Pre-Filter for high dust applications to be mounted after probe handle | | | **56356** |
|  | ·   Filter tablets for Pre-Filter 56356 50pcs per pack |  |  | **52798** |
|  | ·   Filter set for solid fuel measurements (Wood, Pellets, Coal) protects the unit against humidity and acid gases  **not suitable for NOx and SO2 measurements** | | | **11153** |



**Choose your Standard Probe:**

**NOT suitable for NO2 and / or SO2measurement (Suitable if you only measure O2 – CO – NO)**

|  |  |  |
| --- | --- | --- |
|  | **Standard Probe.** Low cost probe complete with fixed stainless steel tube **9.81” x 0.31”** (250 mm x 8 mm),  integrated NiCrNi thermocouple, Type “K” connector , **9’** (2.7 m) gas sampling hose and NBR draft hose | **64167** |
|  | **Standard Probe.** Low cost probe complete with fixed stainless steel tube **9.81” x 0.31”** (250 mm x 8 mm),  integrated NiCrNi thermocouple, Type “K” connector , **16’** (5.0 m) gas sampling hose and NBR draft hose | **64168** |



**Or choose your Industrial Probe:**

**A must for NO2 and/or SO2 measurement!!**

(Not needed when you have chosen the Standard Probe + additional probe tube needed – see below)**:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Industrial Probe.** Industrial probe handle for exchangeable probe tubes; integrated NiCrNi thermocouple; type “K” connector,  9’ (2.7 m) gas sampling hose and draft hose; stainless steel connectors. With: | | | |  |
|  | ·  **9’** (2.7 m) Viton hose | **(probe tube must be selected below)** | **most selected probe handle** | **62741** |
|  | ·  **16’** (5.0 m) Viton hose | **(probe tube must be selected below)** |  | **62747** |



**Choose your Probe Tube for the Industrial Probe**

(Not needed when you have chosen the Standard Probe)**:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ·  Exchangeable probe tube 4” x 0.3” (100 mm x 8 mm) | **≤ 1200°F** (650°C) |  | **55583** |
|  | ·  Exchangeable probe tube 7” x 0.3” (180 mm x 8 mm) | **≤ 1200°F** (650°C) |  | **55583** |
|  | ·  Exchangeable probe tube 12” x 0.3” (300 mm x 8 mm) | **≤ 1200°F** (650°C) | **most selected probe tube** | **55583** |
|  | ·  Exchangeable probe tube 20” x 0.3” (500 mm x 8 mm) | **≤ 1200°F** (650°C) |  | **59292** |
|  | ·  Exchangeable probe tube 20” x 0.4” (500 mm x 10 mm) | **≤ 1200°F** (650°C) |  | **55806** |
|  | ·  Exchangeable probe tube 30” x 0.4” (750 mm x 10 mm) | **≤ 1200°F** (650°C) |  | **55672** |
|  | ·  Exchangeable probe tube 40” x 0.4” (1000 mm x 10 mm) | **≤ 1200°F** (650°C) |  | **55673** |
|  | ·  Exchangeable probe tube 60” x 0.4” (1500 mm x 10 mm) | **≤ 1200°F** (650°C) |  | **55674** |
|  | ·  Exchangeable probe tube 80” x 0.4” (2000 mm x 10 mm) | **≤ 1200°F** (650°C) |  | **55464** |
|  | ·  Exchangeable probe tube 30” x 0.4” (750 mm x 10 mm) | **≤ 2000°F** (1100°C) |  | **60626** |
|  | ·  Exchangeable probe tube 40” x 0.4” (1000 mm x 10 mm) | **≤ 2000°F** (1100°C) |  | **56737** |
|  | ·  Exchangeable probe tube 60” x 0.4” (1500 mm x 10 mm) | **≤ 2000°F** (1100°C) |  | **56738** |



**Choose a High Temperature Probe** (if needed)**:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | High Temperature probe, CERAMIC 40” x 0.4” (1000 mm x 10 mm)  **without temperature measurement and draft measurement** | **≤ 3000°F** (1700°C) | **63320** |

**Basic information about some sensor options and configuration**

The AMPRO 2000 can either have a measured or calculated **NOx**. - What's the difference?

NOx is the accumulation of measured NO and NO2.

In case of a calculated NOx we measure the NO and then add 5% to get an equivalent of NOx.

In case a true NOx is required the AMPRO 2000 will have two sensors – NO and NO2 – both measured values will be NOx.

***Calculated method is not suitable for gas engines and gas turbines.***

The AMPRO 2000 can either have a measured or calculated **CO2**. What’s the difference?

If you know what fuel type you are burning then CO2 calculated is fine.

The calculated CO2 uses the measured O2 and the fuel type depended CO2 max and some other parameters to calculate the CO2.

If you don't know the fuel type or you have a mixture of fuel types your option will be the measured CO2.

The AMPRO 2000 has an active **CO protection** (not possible with all options).

Why is that important and how does it work?

The active CO protection protect your CO sensor against unwanted high CO concentrations (user definable CO threshold).

For most applications and under normal conditions the CO concentration in a gas stream is fairly low.

Should the CO concentration however be higher than expected then the CO protection gives you the peace of mind not to damage the CO sensor. The life span of a CO sensor is defined by CO concentration and time. If you have low (normal) CO concentrations the CO sensor will have a longer life. If you overload the CO sensor occasionally or frequently the life span of the CO sensor will be much shorter.

H2 compensated CO sensor verses CO sensor without **H2 compensation**.

The AMPRO 2000 basic analyzer always has the H2 compensated CO sensor.

In every combustion you will have a certain amount of H2. When using a sensor without H2 compensation the displayed CO value is always higher than the actual CO concentration. The sensor reads CO and also reads H2 and displays that as CO. The H2 compensated CO sensor "eliminates" the H2 and only displays the actual CO concentration.

**Your comments:**

**Email this questionnaire to: info@mru-instruments.com**

We will be more than happy to send you a quotation for the above chosen Analyzer and Options.

If you have any questions regarding this Analyzer or any other of our Analyzers and Instruments,

please feel free to contact us at any time.