## SERVOPRO MultiExact 4100

### A DIGITAL, NEXT-GENERATION MULTI-GAS ANALYZER DESIGNED TO PROVIDE A HIGHLY ADAPTABLE ANALYSIS SOLUTION FOR INDUSTRIAL AND MEDICAL GAS MANUFACTURERS

| GAS | MEASURES | APPLICATION |
|---|---|---|
| MULTIPLE | PERCENT | PROCESS CONTROL |
| | TRACE PPM | QUALITY |

### SENSING TECHNOLOGY

- GAS FILTER CORRELATION
- INFRARED
- PARAMAGNETIC
- ZIRCONIA
- ALUMINUM OXIDE
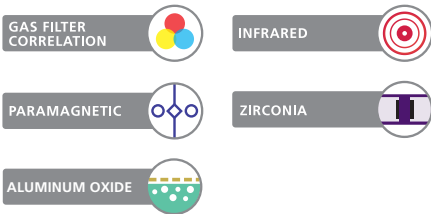
### KEY APPLICATIONS

- Product purity on air separation plant
- Process control on air separation plant
- Monitor trace $CO_2$ on scrubbed air inlet to air separation process
- Validation of medical $O_2$, $N_2$, air and He Mobile labs

### UNRIVALLED PERFORMANCE

- Uses industry-leading, ultra-sensitive and reliable Paramagnetic, GFx Infrared, SBDW Infrared, Zirconia and Aluminum Oxide sensing technologies
- Third generation platform building on more than 70 years of Servomex experience
- Restless innovating will have new sensors available soon

### FLEXIBLE

- Field upgradeable relay, alarm and communication protocols
- Measures up to four gas streams simultaneously
- Integrated support for the AquaXact 1688 Aluminum Oxide moisture transmitter
- Digital communications for remote access: RS232/RS485 Modbus, PROFIBUS, and Ethernet (Modbus TCP/IP)
- Up to 32 alarms and 32 relays with follow or freeze options
- Four analog outputs and four analog inputs

### EASY TO USE

- Intuitive icon-driven user interface with color touchscreen
- USB serial port for data logging and software upgrades
- Analyzer configurations can be easily transferred to other analyzers via USB thumb drive
- Download and email system files to leverage our remote service expertise

### LOW COST OF OWNERSHIP

- Uses ultra-stable, non-depleting digital sensing technologies that help extend maintenance intervals
- Auto-calibration function helps to reduce operational costs
- Plug and play sensor replacement
- Commonly integrated in to multiple stream switching systems

### BENCHMARK COMPLIANCE

- USP and European Pharmacopoeia compliant method for assay of medical oxygen and medical air
- In compliance with Low Voltage, CSA, EMC and applicable EU Directives

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## SERVOPRO MultiExact 4100

SAFE AREA

## HIGH RELIABILITY AND UNRIVALLED PERFORMANCE

With a strong combination of features and benefits, the MultiExact 4100 is a highly adaptable analysis solution that meets a range of needs. It uses a wide range of Servomex's proven, reliable and accurate sensing technologies to provide up to four simultaneous gas stream measurements, meeting the challenges faced by industrial and medical gas manufacturers. With flexible analysis solutions capable of meeting specific process monitoring needs, the MultiExact 4100 delivers precise, stable results at every point of the ASU process. The versatile MultiExact 4100 can be customized to meet your exact requirements, giving you the accuracy you need, without compromise.

## THE NEXT-GENERATION SOLUTION

The MultiExact 4100 shows how modern digital gas analyzers can be, constructed with so many features. Plug and Play support for the Servomex AquaXact 1688 moisture sensor, up to 32 relays/alarms and four analog inputs for integrating information from external sensors such as temperature, pressure or data from another gas sensor. In addition, analog and digital communications include the traditional 0-10V DC, 4-20mA, RS232 and RS485 outputs, while also providing optional advanced digital protocols, including Serial Modbus, PROFIBUS, and Ethernet (Modbus TCP/IP). In addition to its considerable monitoring capabilities, the MultiExact 4100 also provides engineer-friendly interaction through a high-brightness color touchscreen display and an intuitive, icon-driven user interface. It combines all the reliability of Servomex's familiar technology range with the flexibility, ease of use and range of intelligent digital options that the modern IG market demands.

## SIMPLE MAINTENANCE AND REDUCED ONGOING COSTS

The efficient, next-generation design of the MultiExact 4100 keeps maintenance requirements at a minimum. Servomex's non-depleting, low-drift technologies are easy to set up and install, especially with the new touchscreen display and easy to use interface. With ongoing costs for sensor replacement eliminated, and recalibration only needed at extended intervals – plus independent auto calibration – the cost of ownership across the product lifetime is kept extremely low. If you do require service assistance our self-diagnostic programing has you covered and the system files can be quickly emailed to our local service experts.

### USEFUL LINKS



SERVOMEX **SERVICE** N E T W O R K
**servomex.com/service**

SERVOMEX **SYSTEMS** INTEGRATED SOLUTIONS
**servomex.com/systems**

SERVOMEX **EXPERT** UNRIVALLED KNOWLEDGE AND VISION
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# TECHNICAL DATA SHEET

## SERVOPRO MultiExact 4100

## SPECIFICATIONS

| GAS MEASURED | MULTIPLE - see below |
|---|---|

| TECHNOLOGY | Paramagnetic and Zirconia for $O_2$, SBDW IR, and Infrared (Gfx) for other gases |
|---|---|

### PERFORMANCE

| Gas | $O_2$ purity | $O_2$ control | $O_2$ trace | $CO_2$ (trace) | $CO_2$ (trace)[†] | $N_2O$ (trace)[†] |
|---|---|---|---|---|---|---|
| Technology | Paramagnetic | Paramagnetic | Zirconia | Infrared (Gfx) | Infrared (Gfx) | Infrared (Gfx) |
| Range | 0-100% | | 0-210,000ppm | 0-5/100ppm | 0-50/500 ppm | |
| Accuracy (intrinsic error) | ±0.01% $O_2$ | ±0.10% $O_2$ | ±0.1ppm** | 1% of reading or <0.1ppm* | 1% of reading or <0.5ppm* | |
| Zero drift/week | <0.01% $O_2$ | <0.05% $O_2$ | ±0.25ppm | ±0.2ppm | ±1ppm | |
| $T_{90}$ in secs | <10s@200ml/min | | <10s@400ml/min‡ | <20s@2000ml/min | | |

### PERFORMANCE CONT

| Gas | CO (trace) | $CH_4$ (trace) | $CH_4$ (%) | $CO_2$ (%) | CO (%) |
|---|---|---|---|---|---|
| Technology | Infrared (Gfx) | Infrared (Gfx) | SBDW IR | SBDW IR | SBDW IR |
| Range | 0-50/500ppm 0-10/50ppm[†] | 0-50/500ppm | 0.5/1% | 0.2/0.5/1/5/10/ 20/30/50/100% | 0.2/0.5/1/2/5/10% |
| Accuracy (intrinsic error) | 1% of reading or <0.5ppm* | | <1% FS | | |
| Zero drift/week | ±1ppm | | <2% FS | | |
| $T_{90}$ in secs | <20s@2000ml/min | | <20s@200ml/min | <20s@700ml/min | |

### SIGNAL OUTPUTS/ INPUTS

| Analog output | Per measurement: 1 x 4-20mA (standard), 2 x 4-20 mA per transducer optional with addition of extra option board for 2 transducers, 1 x 0-10V (optional) |
|---|---|
| Analog input | Up to 4 x 4-20mA inputs |
| Digital input | Up to 8 digital inputs (2 per transducer) |
| Relays | 4 relays as standard (8 with autocal), up to 32 relays, 30V (dc or ac) /1A |
| Alarms | 2 alarms as standard, up to 32 alarms |
| Digital communications | RS232/RS485 Modbus, PROFIBUS, Ethernet (Modbus TCP/IP) (all optional) |

### SAMPLE GAS

| Temperature | 5°C to 40°C (41°F to 104°F) |
|---|---|
| Dew Point | 5°C / 9°F below minimum ambient |
| Condition | Oil free, non-condensing and non-flammable |
| Particulates | 2µm |
| Vent | Each gas outlet should be connected to a separate atmospheric vent, free from any back pressure |
| Sample flow range | 0.2 – 2.5 l/min depending on the type of transducers installed |
| Connection | Sample inlet is 1/8" NPT male Sample outlet is 1/4" NPT female |

\*   Whichever is the greater
\*\*   For the range 0-10ppm $O_2$
†   Background $N_2$ or $O_2$, calibrate in chosen background gas
‡   For a change 2-10ppm $O_2$

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## PHYSICAL

| | |
|---|---|
| Size | Bench top: 432 (17) x 141.2 (5.6) x 543.6 (21.4), mm (inches), Width x Height x Depth<br>With expansion chassis: 432 (17) x 274.2 (10.8) x 543.6 (21.4) mm (inches)<br>Rack Mount: 482.6 (19) x 132.5 (5.2) x 543.6 (21.4) mm (inches)<br>With expansion chassis: 482.6 (19) x 265.5 (10.5) x 543.6 (21.4) mm (inches) |
| Weight | Main unit: approx 14kg (30.9lb)<br>Expansion chassis: approx 13.7kg (30.2lb) (dependent on number and type of sensors used) |

## OPERATING ENVIRONMENT

| | |
|---|---|
| Operating temperature | 5°C to 40°C (41°F to 104°F) |
| Storage temperature | 0°C to 50°C (32°F to 122°F) |
| Ambient pressure range | 101.3 kPa ± 20% (1.013 bar ± 20%) |
| Relative humidity | 10-90% RH, non-condensing |
| Altitude | -500m (below sea level) to 2000m (above sea level) |
| Warm-up time | Warm up time is typically <20 minutes from cold start at 20°C (68°F), may be longer for the higher sensitivity measurements with heaters |

## UTILITIES

| | |
|---|---|
| Power | 100-240V ac, 50-60 Hz (± 10% maximum fluctuation) |
| Max power consumption | 500VA |

## SAMPLE WETTED MATERIALS

| | PARAMAGNETIC | | ZIRCONIA | 1210 SERIES GFX NDIR TRANSDUCER | MB1520 SERIES SBDW NDIR |
|---|---|---|---|---|---|
| | CONTROL | PURITY | | | |
| 303 stainless steel | ● | ● | ● | ● | |
| 316 stainless steel | ● | ● | ● | ● | ● |
| Aluminium alloy 6063 | | | | | ● |
| Viton® | ● | ● | ● | ● | ● |
| Nitrile Rubber | | | | | ● |
| Borosilicate glass | ● | ● | | | ● |
| Polypropylene | | ● | | | |
| Platinum | ● | ● | | | |
| Platinum/iridium alloy | ● | ● | | | |
| Electroless nickel | ● | ● | | | |
| Stainless steel 310 | | | ● | | |
| Polyphenylene sulphide (PPS) carbon / PTFE filler | | | | | ● |
| Alumina | | | ● | | ● |
| Yttria stabilised zirconia | | | ● | | |
| Nickel iron | | | ● | | |
| Sealing glass | | | ● | | |
| Gold | | | ● | ● | ● |
| Calcium fluoride | | | | ● | |
| Nickel | | | | ● | ● |
| Sapphire | | | | | ● |
| Epoxy resin | | | | | ● |

| FEATURE | ADDITIONAL MATERIALS |
|---|---|
| Flow driven options | Polypropylene |
| Pressure driven options | Polysulphone, polypropylene |
| Flowmeters | Borosilicate glass, duralumin |
| Flow alarm | Glass, nylon, silicon rubber, aluminum |
| Internal filter | Polycarbonate, glass fibre |
| External filter | 316 stainless steel |

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## SERVOMEX ANALYZERS
HIGH-PERFORMANCE GAS ANALYSIS
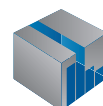
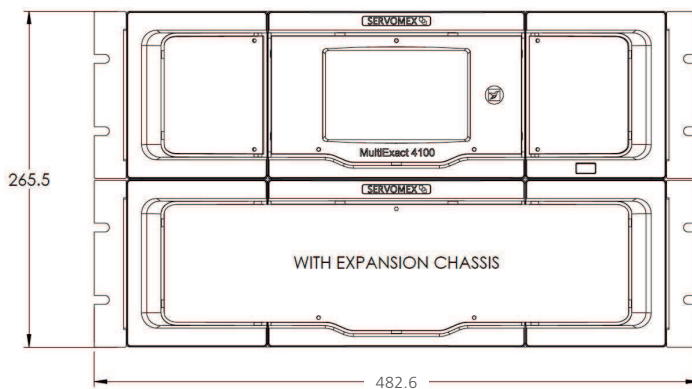## COMPLIANCE

| EC DIRECTIVES | This product complies with the EMC Directive, the Low Voltage Directive, and all other applicable directives. |
|---|---|
| ELECTRICAL SAFETY | Electrical safety to IEC 61010-1, CSA Electrical Certification<br>Rated for "Overvoltage Category II" and "Pollution Degree 2" |

## DIMENSIONAL DRAWINGS
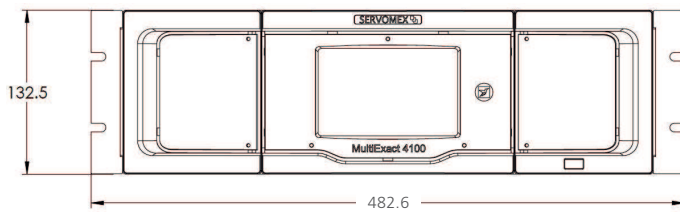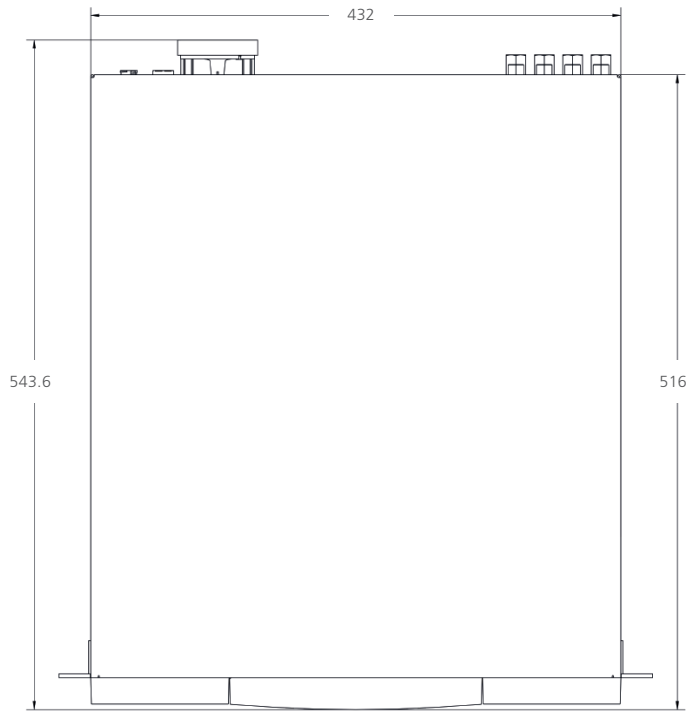


**Standard chassis with mounting ears**



**Extended chassis with mounting ears**

Dimensions shown in millimetres

# OPTIONS

| ANALYZER | | |
|---|---|---|
| **Background gas** | Standard $N_2$ background | ☐ |
| | $O_2$ background | ☐ |
| **Sample system** | Flow driven | ☐ |
| | Pressure driven | ☐ |

| MODULE 1 | | | MODULE 2 | | |
|---|---|---|---|---|---|
| **Measurement** | $O_2$ Purity | ☐ | **Measurement** | $O_2$ Purity | ☐ |
| | $O_2$ Purity 3DP | ☐ | | $O_2$ Purity 3DP | ☐ |
| | $O_2$ Control | ☐ | | $O_2$ Control | ☐ |
| | $O_2$ Trace | ☐ | | $O_2$ Trace | ☐ |
| | 100% $CO_2$ | ☐ | | 100% $CO_2$ | ☐ |
| | 50% $CO_2$ | ☐ | | 50% $CO_2$ | ☐ |
| | 30% $CO_2$ | ☐ | | 30% $CO_2$ | ☐ |
| | 20% $CO_2$ | ☐ | | 20% $CO_2$ | ☐ |
| | 10% $CO_2$ | ☐ | | 10% $CO_2$ | ☐ |
| | 5% $CO_2$ | ☐ | | 5% $CO_2$ | ☐ |
| | 1% $CO_2$ | ☐ | | 1% $CO_2$ | ☐ |
| | 5,000vpm $CO_2$ | ☐ | | 5,000vpm $CO_2$ | ☐ |
| | 2,000vpm $CO_2$ | ☐ | | 2,000vpm $CO_2$ | ☐ |
| | 10% CO | ☐ | | 10% CO | ☐ |
| | 5% CO | ☐ | | 5% CO | ☐ |
| | 2% CO | ☐ | | 2% CO | ☐ |
| | 1% CO | ☐ | | 1% CO | ☐ |
| | 1% $CH_4$ | ☐ | | 1% $CH_4$ | ☐ |
| | 0.5% $CH_4$ | ☐ | | 0.5% $CH_4$ | ☐ |
| | 5,000vpm CO | ☐ | | 5,000vpm CO | ☐ |
| | 2,000vpm CO | ☐ | | 2,000vpm CO | ☐ |
| | 0-50/500vpm CO | ☐ | | 0-50/500vpm CO | ☐ |
| | 0-10/50vpm CO | ☐ | | 0-10/50vpm CO | ☐ |
| | 0-5/100vpm $CO_2$ | ☐ | | 0-5/100vpm $CO_2$ | ☐ |
| | 0-50/500vpm $CO_2$ | ☐ | | 0-50/500vpm $CO_2$ | ☐ |
| | 0-50/500vpm $N_2O$ | ☐ | | 0-50/500vpm $N_2O$ | ☐ |
| | 0-50/500vpm $CH_4$ | ☐ | | 0-50/500vpm $CH_4$ | ☐ |
| **Flowmeter** | Not required | ☐ | **Flowmeter** | Not required | ☐ |
| | 500ml/min (sample) | ☐ | | 500ml/min (sample) | ☐ |
| | 2,500ml/min (sample) | ☐ | | 2,500ml/min (sample) | ☐ |
| | 5,000ml/min (by-pass) | ☐ | | 5,000ml/min (by-pass) | ☐ |
| **Back pressure valve, $O_2$ purity** | Not required | ☐ | **Back pressure valve, $O_2$ purity** | Not required | ☐ |
| | Required | ☐ | | Required | ☐ |
| **External SS filter** | Not required | ☐ | **External SS filter** | Not required | ☐ |
| | Required w/ standard filter | ☐ | | Required w/ standard filter | ☐ |
| **Configurable alarms** | Two alarms (standard) | ☐ | **Configurable alarms** | Two alarms (standard) | ☐ |
| | Four alarms | ☐ | | Four alarms | ☐ |
| | Eight alarms | ☐ | | Eight alarms | ☐ |
| **Isolated analog output** | Isolated 4-20mA (standard) | ☐ | **Isolated analog output** | Isolated 4-20mA (standard) | ☐ |
| **0-10 V dc output** | Not required | ☐ | **0-10 V dc output** | Not required | ☐ |
| | 0-10 V dc | ☐ | | 0-10 V dc | ☐ |
| **Digital input** | Not required | ☐ | **Digital input** | Not required | ☐ |
| | 2 digital | ☐ | | 2 digital | ☐ |
| **Isolated analog input** | Not required | ☐ | **Isolated analog input** | Not required | ☐ |
| | Isolated 4-20mA | ☐ | | Isolated 4-20mA | ☐ |

**Please tick the box for required MODULE 1 options**     **Please tick the box for required MODULE 2 options**

# OPTIONS

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| MODULE 3 | | |
|---|---|---|
| **Measurement** | $O_2$ Purity | ☐ |
| | $O_2$ Purity 3DP | ☐ |
| | $O_2$ Control | ☐ |
| | $O_2$ Trace | ☐ |
| | 100% $CO_2$ | ☐ |
| | 50% $CO_2$ | ☐ |
| | 30% $CO_2$ | ☐ |
| | 20% $CO_2$ | ☐ |
| | 10% $CO_2$ | ☐ |
| | 5% $CO_2$ | ☐ |
| | 1% $CO_2$ | ☐ |
| | 5,000vpm $CO_2$ | ☐ |
| | 2,000vpm $CO_2$ | ☐ |
| | 10% CO | ☐ |
| | 5% CO | ☐ |
| | 2% CO | ☐ |
| | 1% CO | ☐ |
| | 1% $CH_4$ | ☐ |
| | 0.5% $CH_4$ | ☐ |
| | 5,000vpm CO | ☐ |
| | 2,000vpm CO | ☐ |
| | 0-50/500vpm CO | ☐ |
| | 0-10/50vpm CO | ☐ |
| | 0-5/100vpm $CO_2$ | ☐ |
| | 0-50/500vpm $CO_2$ | ☐ |
| | 0-50/500vpm $N_2O$ | ☐ |
| | 0-50/500vpm $CH_4$ | ☐ |
| **Flowmeter** | Not required | ☐ |
| | 500ml/min (sample) | ☐ |
| | 2,500ml/min (sample) | ☐ |
| | 5,000ml/min (by-pass) | ☐ |
| **Back pressure valve, $O_2$ purity** | Not required | ☐ |
| | Required | ☐ |
| **External SS filter** | Not required | ☐ |
| | Required w/ standard filter | ☐ |
| **Configurable alarms** | Two alarms (standard) | ☐ |
| | Four alarms | ☐ |
| | Eight alarms | ☐ |
| **Isolated analog output** | Isolated 4-20mA (standard) | ☐ |
| **0-10 V dc output** | Not required | ☐ |
| | 0-10 V dc | ☐ |
| **Digital input** | Not required | ☐ |
| | 2 digital | ☐ |
| **Isolated analog input** | Not required | ☐ |
| | Isolated 4-20mA | ☐ |

**Please tick the box for required MODULE 3 options**

| MODULE 4 | | |
|---|---|---|
| **Measurement** | $O_2$ Purity | ☐ |
| | $O_2$ Purity 3DP | ☐ |
| | $O_2$ Control | ☐ |
| | $O_2$ Trace | ☐ |
| | 100% $CO_2$ | ☐ |
| | 50% $CO_2$ | ☐ |
| | 30% $CO_2$ | ☐ |
| | 20% $CO_2$ | ☐ |
| | 10% $CO_2$ | ☐ |
| | 5% $CO_2$ | ☐ |
| | 1% $CO_2$ | ☐ |
| | 5,000vpm $CO_2$ | ☐ |
| | 2,000vpm $CO_2$ | ☐ |
| | 10% CO | ☐ |
| | 5% CO | ☐ |
| | 2% CO | ☐ |
| | 1% CO | ☐ |
| | 1% $CH_4$ | ☐ |
| | 0.5% $CH_4$ | ☐ |
| | 5,000vpm CO | ☐ |
| | 2,000vpm CO | ☐ |
| | 0-50/500vpm CO | ☐ |
| | 0-10/50vpm CO | ☐ |
| | 0-5/100vpm $CO_2$ | ☐ |
| | 0-50/500vpm $CO_2$ | ☐ |
| | 0-50/500vpm $N_2O$ | ☐ |
| | 0-50/500vpm $CH_4$ | ☐ |
| **Flowmeter** | Not required | ☐ |
| | 500ml/min (sample) | ☐ |
| | 2,500ml/min (sample) | ☐ |
| | 5,000ml/min (by-pass) | ☐ |
| **Back pressure valve, $O_2$ purity** | Not required | ☐ |
| | Required | ☐ |
| **External SS filter** | Not required | ☐ |
| | Required w/ standard filter | ☐ |
| **Configurable alarms** | Two alarms (standard) | ☐ |
| | Four alarms | ☐ |
| | Eight alarms | ☐ |
| **Isolated analog output** | Isolated 4-20mA (standard) | ☐ |
| **0-10 V dc output** | Not required | ☐ |
| | 0-10 V dc | ☐ |
| **Digital input** | Not required | ☐ |
| | 2 digital | ☐ |
| **Isolated analog input** | Not required | ☐ |
| | Isolated 4-20mA | ☐ |

**Please tick the box for required MODULE 4 options**

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HIGH-PERFORMANCE GAS ANALYSIS

# OPTIONS



## AQUAXACT

| | | |
|---|---|---|
| **AquaXact 1688 transducer** | None | ☐ |
| | Required | ☐ |
| **Gas** | Moisture | ■ |
| **Measurement range** | Universal | ■ |
| **Transducer type** | $Al_2O_3$ | ■ |
| **Options** | Not required | ☐ |
| | Sample block, NPT 1/4" Swagelok | ☐ |
| | Sample block, VCO fittings | ☐ |
| | Sample block, VCR fittings | ☐ |
| | Sample system #1 | ☐ |
| | Sample system #2 | ☐ |
| | Sample system #3 | ☐ |
| | Sample system #4 | ☐ |
| | Sample system #5 | ☐ |
| **Transducer cables** | 5 meter cable digital | ☐ |
| | 10 meter cable digital | ☐ |
| | 100 meter cable digital | ☐ |
| **Adapter 3/4" AquaXact** | Not required | ☐ |
| | Required | ☐ |
| **1688 transducer tip (extra)** | Not required | ☐ |
| | Required | ☐ |

## GENERAL CONFIGURATION

| | | |
|---|---|---|
| **Power cord** | Not required | ☐ |
| | USA | ☐ |
| | Europe | ☐ |
| | UK | ☐ |
| **Flow alarm** | Not required | ☐ |
| | Fitted to module 1 ($O_2$ purity only) **OR** | ☐ |
| | Fitted to module 2 ($O_2$ purity only) | ☐ |
| **Serial communications** | Not required | ☐ |
| | RS232 communication | ☐ |
| | RS485 communication w/Modbus | ☐ |
| | RS232 & RS485 comm combo | ☐ |
| | Profibus | ☐ |
| **Modbus** | Not required | ☐ |
| | Required | ☐ |
| **Mounting** | Bench top | ☐ |
| | Rack mount w/ears | ☐ |
| | Rack mount w/slides | ☐ |
| **Autocal** | Not required | ☐ |
| | Required | ☐ |
| **Relay contacts** | 4 relay contacts (standard) | ☐ |
| | 8 relay contacts w/connectors | ☐ |
| | 16 relay contacts w/connectors | ☐ |
| | 24 relay contacts w/connectors | ☐ |
| | 32 relay contacts w/connectors | ☐ |
| **Operator manual** | English | ☐ |

**Please tick the box for required options**



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> **WE'RE READY TO HELP**
WHATEVER YOUR GAS ANALYSIS REQUIREMENTS, WHEREVER YOU ARE

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