



ModbusTCP

## Multi Component Gas Analyser BA 3 select

The BA 3 select is a gas analyser for 19" rack mounting with a modular design which can be expanded from 1-channel all the way to 3-channel O<sub>2</sub> analyser.

One specific advantage of the analyser is its modularity. This also allows measuring cells to be easily upgraded. The user is then able to adapt his equipment to changing measuring requirements at low cost.

The analyser comes with touch screen as standard. Together with a clearly structured menu, this ensures intuitive and particularly user-friendly operation of the device.

All status, limit value and alarm messages required for effective monitoring are, of course, available to the user in analogue form, as a 4–20 mA signal, and optionally also via a digital interface. Process control can access process and diagnostic data via the Modbus TCP communication protocol and can also adjust settings in the device configuration. Extensive analysis functions (e.g. interfering gas correction and graphic display of response characteristics) complete the ease of use.

Up to three separate gas paths

O<sub>2</sub> measurement paramagnetic, electro-chemical and/or ZrO<sub>2</sub>

Modular, maintenance-friendly layout

User-friendly touchscreen

4–20 mA signal output and optional Modbus TCP

All relevant limit value and status alarms

Optional: Graphic flow display via screen

Optional: Up to three float flow meters

Optional: Up to three built-in pumps



## Technical Data

## General

Housing	Dimensions:	19" rack mount housing, 3 HE
	H x W x D, style 1:	5.2 x 17.3 x 16.7 in
	H x W x D, style 2:	5.2 x 17.3 x 13.2 in
	Protection class:	IP 20
	Weight:	max. 15 lb
	Display and control:	4.7" touchscreen display
Electric supply	Voltage:	230 V AC or 115 V AC (note type plate on the unit)
	Mains frequency:	50/60 Hz
	Max. Power input:	69 W
Ambient parameters	Ambient temperature:	50 °F ... 113 °F
	Relative humidity:	< 75 %
	Ambient pressure:	12.7 PSI to 17.4 PSI
	Transport and storage temperature:	41 °F - 149 °F
Internal solenoid valves for auto calibration Function	Optional for each measuring channel (zero gas + span gas)	
Warm up time	Minimum 30 min (up to 2 h recommended for high-precision measurements)	

## Sample gas connections

Gas paths	Max. three separate gas paths (with auto cal. function)	
	Screw-in connection:	6 mm PVDF for 4/6 tube
Inlet parameters	Gas inlet temperature:	41 °F to 122 °F
	Sample gas pressure (absolute):	12.7 PSI to max. 26.1 PSI, reduced to max. 17.4 PSI with internal pump
	Sample gas conditioning:	purified/ filtered (<15 µ filtration) sample gas with dew point < 50 °F (always 5 K below ambient temperature).

## Signal inputs and outputs

Analog output:	0-20 mA / 4-20 mA / 0-10 V / 2-10 V inside unit variable by channel		
Limit relay:	2x per measuring channel (125 V AC, 0.5 A / 30 V DC, 1 A)		
Status relay:	Error, service, calibration, measuring range (125 V AC, 0.5 A / 30 V DC, 1 A)		
Binary inlets:	1x per channel + 2x per device designed for 24 V, potential-free		
24 Volt output:	1x per channel (to supply binary inputs), with T250 mA fuse		
Digital interface:	Modbus TCP (optional)		

## Parts in contact with sample gas

Component	Materials in contact with media		
Pump	PET, PPS		
Flow regulator	PTFE, stainless steel (1.4571)		
Gas lines	FPM (Viton), stainless steel (1.4571)		
Solenoid valves	PVDF or stainless steel (1.4571)		
Gas ducts	PVDF or stainless steel (1.4571)		
Flow meter	PVDF, borosilicate glass		
Measuring cell	ZrOx cell	Paramagnetic cell	EC cell
	1.4571,	1.4401	ABS
	ZrOx ceramic	Borosilicate glass Platinum-iridium alloy	

## Measuring cells

Measuring cell	ZrOx cell*	Paramagnetic cell	EC cell
Largest measuring range (MR)	0-10000 vpm (0-21 Vol.%)**	0-100 %	0-25 %
Smallest measuring range	0-10 vpm	0-1 %	0-10 %
Response time t90***	< 4 sec	< 5 sec	< 15 sec
Linearity deviation	< 1 % FS (< 2 % FS within the smallest MR)	< 0.2 Vol. %	< 1 % FS
Zero drift	< 1 % FS /week	< 0.2 Vol. % /week	< 2 % FS /week
Measurement value drift	< 0.3 % FS / week	< 0.2 % MW /week	< 2 % FS /week
Repeatability	1 % FS (2 % within the smallest MR)	1 % FS	1 % FS
Detection limit	0.1 vpm within MR 0-10 vpm	0.1 %	0.2 %
Pressure compensation	optional	yes	yes
Thermal stabilisation	yes	yes	-

\* Two cell types available: (A) catalytically active cell (CAC) => not for flammable carrier gases. (B) catalytically inactive cell => suitable if traces of flammable gases are present (< 10 vpm H<sub>2</sub>, CO, CH<sub>4</sub>)

\*\* Optional for unit with modified calibration routine

\*\*\* Signal damping adjustable fr. 1 sec to 20 sec

### Abbreviations:

FS ...from span

MW ...from measurement

r.F. ...relative error

## Oxygen measurement

There are three different cells available for measuring oxygen. The most cost-efficient electrochemical O<sub>2</sub> cell can be used for measuring in the %-range.

A maintenance flap at the front of the housing for easy access to the cell ensures low-cost, easy maintenance. In addition, extra durable and ultra-precise paramagnetic cells may be used for measuring in the %-range. A zirconium dioxide (ZrO<sub>2</sub>) cell may be selected for accurate oxygen trace measurement. This is also available in a catalytic inactive version.



## Options for integration

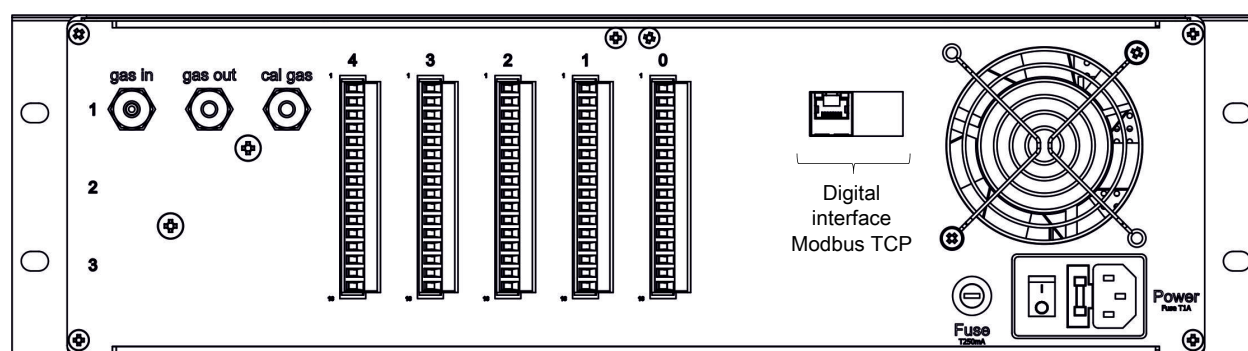
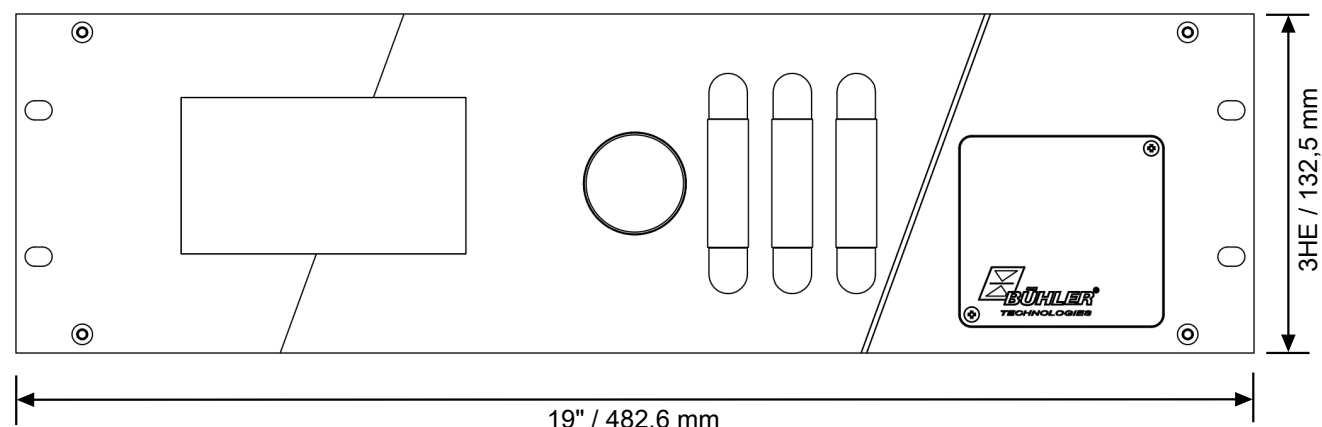
Options currently available are:

- Modbus TCP,
- integrated pump(s),
- gas analysis filter,
- Variable area flow meter and/or
- Graphical flow display on the screen.

## Gas connections

- up to 3x pipe fitting (Ø6 mm)
- up to 3x PVDF hose screw connections (Ø4/6 mm)

# Equipment overview



Analogue outputs  
(4 – 20 mA, Limit value + Status signals (Relay))