Modbus TCP

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_2 analyser.

One specific advantage of the analyser is the modularity. This also allows for easily upgrading measuring cells. The user is then able to adapt his equipment to changing measuring requirements inexpensively.

The analyser comes standard with touch screen. Along with a clear menu structure this ensures intuitive, particularly user-friendly equipment operation.

Of course the user is provided the digital status-, limit- and alarm messages required for effective monitoring in analog form, in form of a 4 – 20 mA signal, or as a digital interface. The process control can access the process and diagnostic data via the Modbus TCP communication protocol as well as configure the device settings. 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_2 measurement paramagnetic, electro-chemical and/or ZrO_2
- Modular, maintenance-friendly layout
- User-friendly touch screen
- Signal output 4 - 20 mA or Modbus TCP
- All relevant limit- and status alarms
- Optional: Graphic flow display via screen
- Optional: Up to three float flow meters
- Optional: Up to three built-in pumps

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen
Tel. +49 (0) 21 02 / 49 89-0, Fax: +49 (0) 21 02 / 49 89-20
E-Mail: analyse@buehler-technologies.com
Internet: www.buehler-technologies.com

Technical Data

General

Housing	Dimensions:	19" rack mount housing, 3 HE
	H x W x D, style 1:	132 x 440 x 425 mm
	H x W x D, style 2:	132 x 440 x 335 mm
	Protection class:	IP 20
	Weight:	max. 7 kg
	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:	50/60Hz
	Max. Power input:	69 W
Ambient parameters	Ambient temperature:	10 °C ... 45 °C
	Relative humidity:	< 75 %
	Ambient pressure:	875 mbar to 1200 mbar
	Transport and storage temperature:	5 °C - 65 °C
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:	5 °C to 50 °C
	Sample gas pressure (absolute):	875 mbar to max. 1800 mbar, reduced to max. 1200 mbar with internal pump
	Sample gas conditioning:	purified/ filtered (<15 µ filtration) sample gas with dew point < 10 °C (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, ZrOx ceramic	1.4401 Borosilicate glass Platinum-iridium alloy	ABS

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 0-10vpm	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 H2, CO, CH4)

** 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 O2 cell can be used for measuring in the %-range.
A simple access to the cell via maintenance flap at the front of the housing allows for low cost, easy maintenance. In addition, extra durable and ultra-precise paramagnetic cells may be used for measuring in the %-range. A zirconium dioxide (ZrO2) cell may be selected for accurate oxygen trace measurement. This is also available in a catalytic inactive version.

Options for integration

Options currently available:

- Built-in pump(s)
- Gas analysis filter
- Float flow meter and/or
- Graphic flow display via screen

Gas connections

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

Equipment overview