beamonics

Made to measure

TDLAS — BM-H-3 BeamCell

Features

- Extractive in-line gas analyzer
- Absolute gas quantification
- No need for calibration gas
- Flow-chamber resistant to corrosive compounds
- IP67 housings
- Not affected by other gases (no cross-interference)
- Low maintenance requirements

Description

BM-H-3 BeamCell: High-performance in-line extractive gas analyzer

The BM-H-3 BeamCell is a state-of-the-art in-line solution utilizing Tunable Diode Laser Absorption Spectroscopy (TDLAS) for precise analysis of extracted/sampled gas. The equipped push-in gas connectors (G1/8”), adapted for 6-mm or 8-mm gas tubing, ensures seamless integration with most processes.

Effortless integration: Extracting gas into the controlled BM-H-3 BeamCell environment enables high-accuracy analysis, and the analyzer is easily integrated in industrial sites through standard PLC communication interfaces.

Unique compact form factor: The compact design of the BM-H-3 BeamCell makes it suitable for both new installations and retrofits into existing infrastructure, offering flexibility and ease of integration.

High-speed sampling: The fast response time of the BM-H-3 BeamCell provides true real-time analysis data. The speed of the analyzer also allows for sampling of multiple points in sequence within a few seconds.

Advanced TDLAS technology: The proven TDLAS technology delivers rapid (ms-rate) and highly sensitive (ppb-level) gas analysis. The technology is inherently self-referencing and calibration-free, ensuring minimal maintenance.

Versatile gas analysis: The analyzer is capable of detecting a wide range of gases commonly found in industrial and laboratory settings, such as O_2, CO_2, CO, C_2H_2, N_2O, NH_3, HF, H_2S, H_2O and HCl.

Energy efficient design: The highly energy-efficient design allows the BM-H-3 BeamCell to be integrated in portable systems capable of running on battery power for hours in mobile analysis applications.

Durable design: The analyzer is designed for heavy industrial use and is constructed to withstand harsh and corrosive gases. The flow chamber in the BM-H-3 BeamCell is capable of withstanding aggresive chemicals such as sulfuric acid, hydrofloric acid, and hydrogen fluoride ensuring long-term reliability in demanding applications.

Examples of gases

Gas	Analyzer precision (ppm)[a)]
O_2	100
HF	0.05
CO	1
CO_2	2.5
CH_4	1
C_2H_2	0.4
N_2O	0.1
NH_3	1
HCl	0.3
H_2S	1.5
H_2O	1

[a)]Under standard test conditions: L = 0.2 m, t = 1 s, P = 1 atm, T = 300 K, largest of 1% relative and specified precision

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Spectroscopy Characteristics

Parameter	Symbol	Min	Typical	Max
Analysis rate	f_R		1 Hz	10 kHz
Data sampling noise			0.1 µVrms*	
Low-light limit (10 s)	I_{LL}		1 nW	
Gas connector threading			G1/8	
Gas tube dimension			6 mm / 8 mm	

**1 s sampling time*

Interfaces

Interface	Model	Mounted	Quantity
USB	53398-0471 Communication, Data	Yes	2
USB	Mini USB, Firmware upgrade	Yes	2
RS-485/422	4 wire Full Duplex - protected	Yes	1
RS-485/422	4 wire Full Duplex - service data	Yes	1
RS-485	Half Duplex	Yes	1
Trig In	4-30 V	Yes	2
IO	0-12 V	Yes	2
IO Supply	12 V	Yes	1
Relay Output	G6K-2F-5DC, NC/NO	Yes	2
4-20 mA	Passive / Active	Expansion	2
Expansion connector	I^2C, SPI, GPIO, ADC, Loop Relay, Sync, GND, PWM, UART, Relay, IO, 5 V, 2.5 V, 12 V, PWR_IN, 4-20 mA, 0-10 V	Yes	3
Sync signals	Daisy chain configuration	Yes	2
Master clk in / out	73412-0110	Yes	2

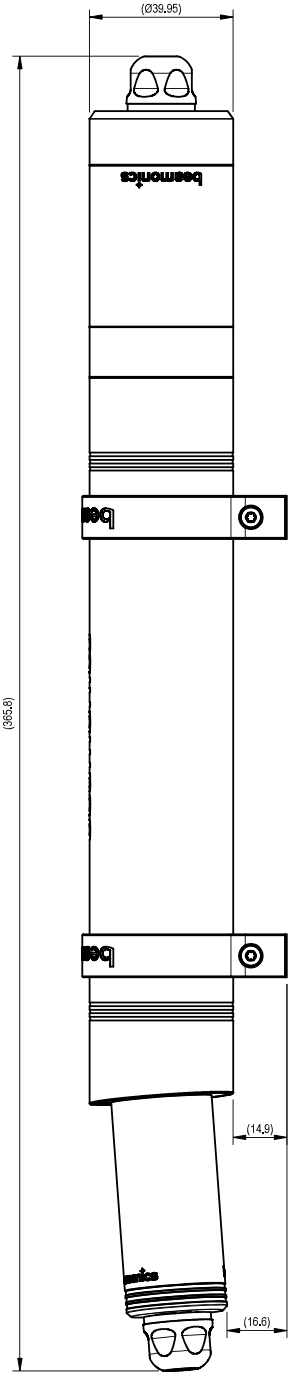
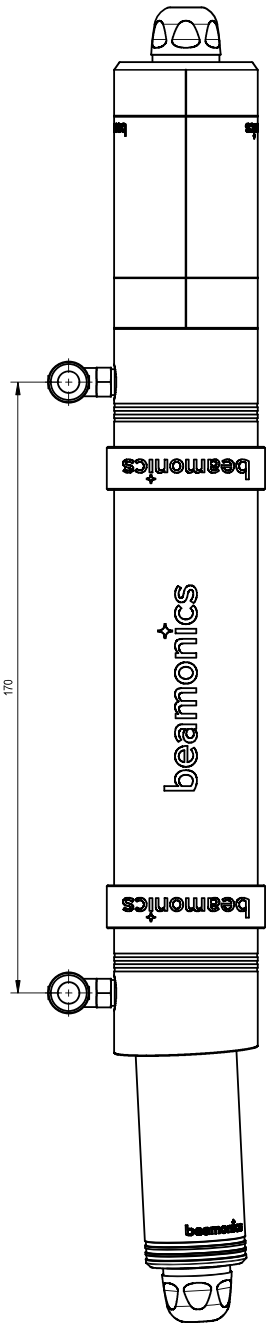
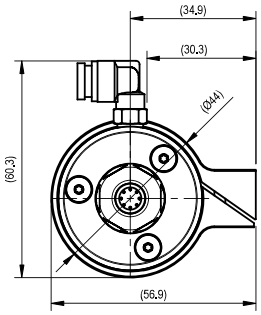
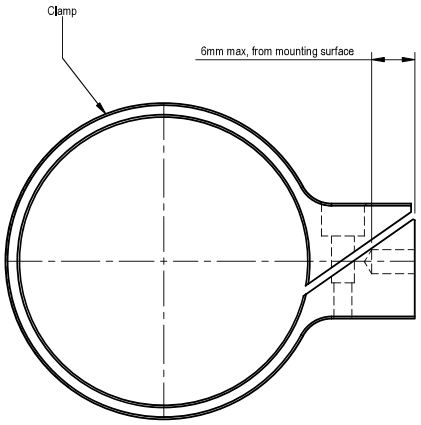
Electrical Characteristics

Parameter	Symbol	Min	Typical	Max
Supply voltage	V_{in}	15 VDC*	24 VDC	32 VDC
Power consumption			5 W**	
TEC driver power		0 W		3.56 W
Comm. link length				30 m
Startup-time (ambient)	t_{su}		5 s	

**Degraded noise performance if V_{in} < 15 V / **50mA laser diode*

Other

Parameter	Symbol	Min	Typical	Max
Operating temperature	T_{op}	-10 °C		55 °C
Humidity (non-condensing)		40% @ 50 °C / 80% @ 30 °C		
IP classification		IP67		
Infrared laser		Laser Class 1		
CE-marked EU directives		2014/35/EU, 2012/19/EU, 2011/65/EU, EN61000-6-2:2005, EN61000-6-2:2019, EN61000-6-4:2007, EN61000-6-4:2019		

TDLAS — BM-H-3 BeamCell

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