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TDLAS — BM-H-3 BeamStack

Features

- Turnkey gas analyzer
- Absolute gas quantification
- Calibration-free gas analysis
- PPB-level sensitivity without cross-talks
- Digital and analog data interfaces
- IP68 grade mechanics
- Supply voltage: 15-32 VDC polarity protected

Description

The BM-H-3 BeamStack is a high-performance turnkey solution based on tunable diode laser absorption spectroscopy (TDLAS) for gas analysis.

The analyzer is designed with user- and integration-friendliness in mind, suitable for both industrial settings with PLC systems and research laboratories, where raw and/or processed data can easily be exported and visualized for post-processing in third-party tools.

The robust and established TDLAS technology provides fast (100 µs) and highly sensitive (PPB-level) gas analysis.

The TDLAS technology is also inherently self-referencing and calibration-free, requiring little to no maintenance.

The analyzer can measure many common gases found in the industry and laboratories, including greenhouse gases such as methane (CH_4). Other commonly analysed gases include O_2, CO_2, CO, N_2O, NH_3, NO_x, HF, H_2S and HCl, as well as hydrocarbons.

The highly energy-efficient design allows the BM-H-3 BeamStack to run for hours on batteries, making it well-suited for mobile analyzer solutions at locations where there is no access to external power.

The calibration-free gas analyzer system is highly durable for use in heavy industries and extremely robust in harsh environments.

Examples of gases

Gas	Analysis precision (ppm)[a)]
O_2	6
HF	0.01
CO	0.2
CO_2	0.5
CH_4	0.2
H_2S	0.3
NO	0.3
NH_3	0.2
N_2O	2
H_2O	0.2

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

Spectroscopy Characteristics

Parameter	Symbol	Min	Typical	Max
Data rate	f_R		1 Hz	10 kHz
Data sampling noise			0.1 µVrms*	
Low-light limit (10 s)	I_{LL}		1 nW	

**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	4 wire Full Duplex - protected	Yes	1
RS-485	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

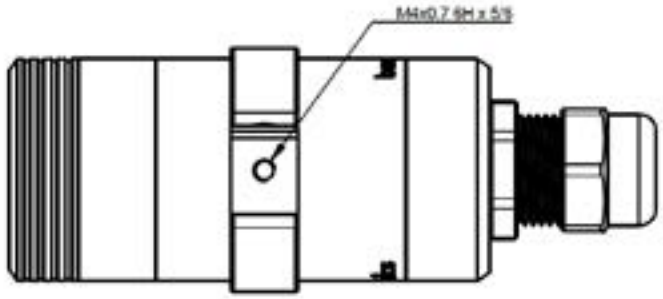
Parameter	Symbol	Min	Typical	Max
Supply voltage	V_{in}	15 VDC*	24 VDC	32 VDC
Power consumption			5 W**	
TEC driver power		0 W		3.56 W
Comm. link length				30 m
Comm. link speed				3 Mbit/s
Startup-time (ambient)	t_{su}		5 s	

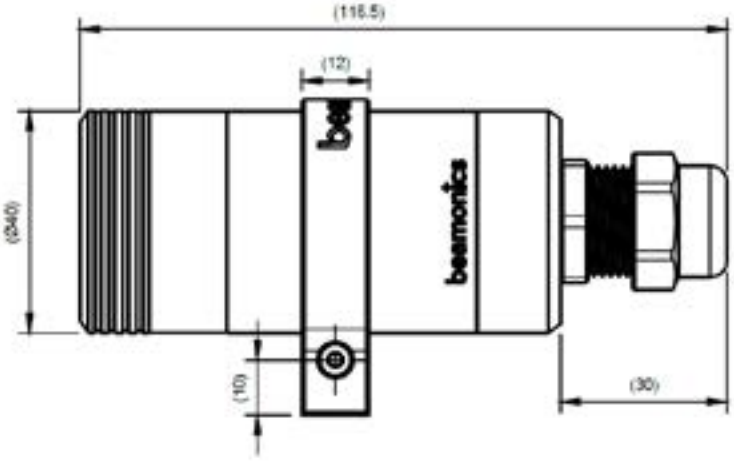
**Degraded noise performance if Vin < 15 V | ** 50 mA laser diode*

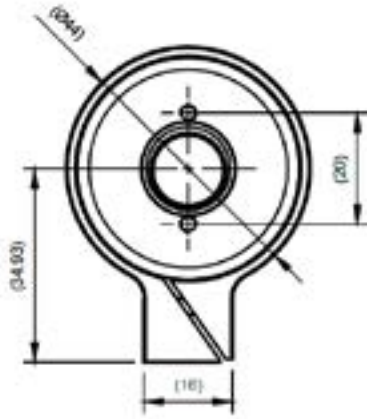
Other

Parameter	Symbol	Min	Typical	Max
Operating temperature	T_{op}	-10 °C		50 °C
Humidity (non-condensing)		40% @ 50 °C / 80% @ 30 °C		
IP classification		IP67		
Infrared laser		Laser Class I		
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		

Transmitter







Receiver