

### Features

- Turnkey cross-stack gas analyzer
- Absolute gas quantification
- Calibration-free gas analysis
- Analyze trace gases
- Digital and analog data interfaces
- IP67 grade mechanics
- Not disturbed by other gases (no cross-talk)

### Description

#### BM-H-3 BeamStack: High-performance turnkey gas analyzer

The BM-H-3 BeamStack is a state-of-the-art turnkey solution utilizing Tunable Diode Laser Absorption Spectroscopy (TDLAS) for precise gas analysis.

**Effortless integration:** Engineered for seamless integration, the analyzer is ideal for both industrial environments with PLC systems as well as research laboratories. It facilitates easy export and visualization of raw and processed data for post-processing in third-party tools.

**Advanced TDLAS technology:** By leveraging the robust and proven TDLAS technology, the BM-H-3 BeamStack delivers rapid (100  $\mu$ s) and highly sensitive (ppb-level) trace gas analysis. This 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, including greenhouse gases such as methane ( $\text{CH}_4$ ). Other commonly analyzed gases include  $\text{O}_2$ ,  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{N}_2\text{O}$ ,  $\text{NH}_3$ ,  $\text{HF}$ ,  $\text{H}_2\text{S}$ ,  $\text{H}_2\text{O}$  and  $\text{HCl}$ .

**Energy efficient design:** The highly energy-efficient design allows the BM-H-3 BeamStack to operate for hours on batteries, making it possible to deploy for mobile analysis applications without external power sources.

**Durability and robustness:** Designed for heavy industrial use, the calibration-free gas analyzer system is exceptionally durable and robust, capable of withstanding harsh environments.



### Examples of gases

Gas	Analysis precision (ppm) <sup>a)</sup>
$\text{O}_2$	6
$\text{HF}$	0.01
$\text{CO}$	0.2
$\text{CO}_2$	0.5
$\text{CH}_4$	0.2
$\text{H}_2\text{S}$	0.3
$\text{NH}_3$	0.2
$\text{H}_2\text{O}$	0.2

<sup>a)</sup>Under standard test conditions:  $L = 1 \text{ m}$ ,  $t = 1 \text{ s}$ ,  $P = 1 \text{ atm}$ ,  $T = 300 \text{ K}$ , largest of 1% relative and specified precision



## Spectroscopy Characteristics

Parameter	Symbol	Min	Typical	Max
Analysis rate	$f_R$		1 Hz	10 kHz
Data sampling noise			0.1 $\mu$ Vrms*	
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-485/422	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 <sup>2</sup> C, 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  $V_{in} < 15$  V | \*\* 50 mA laser diode

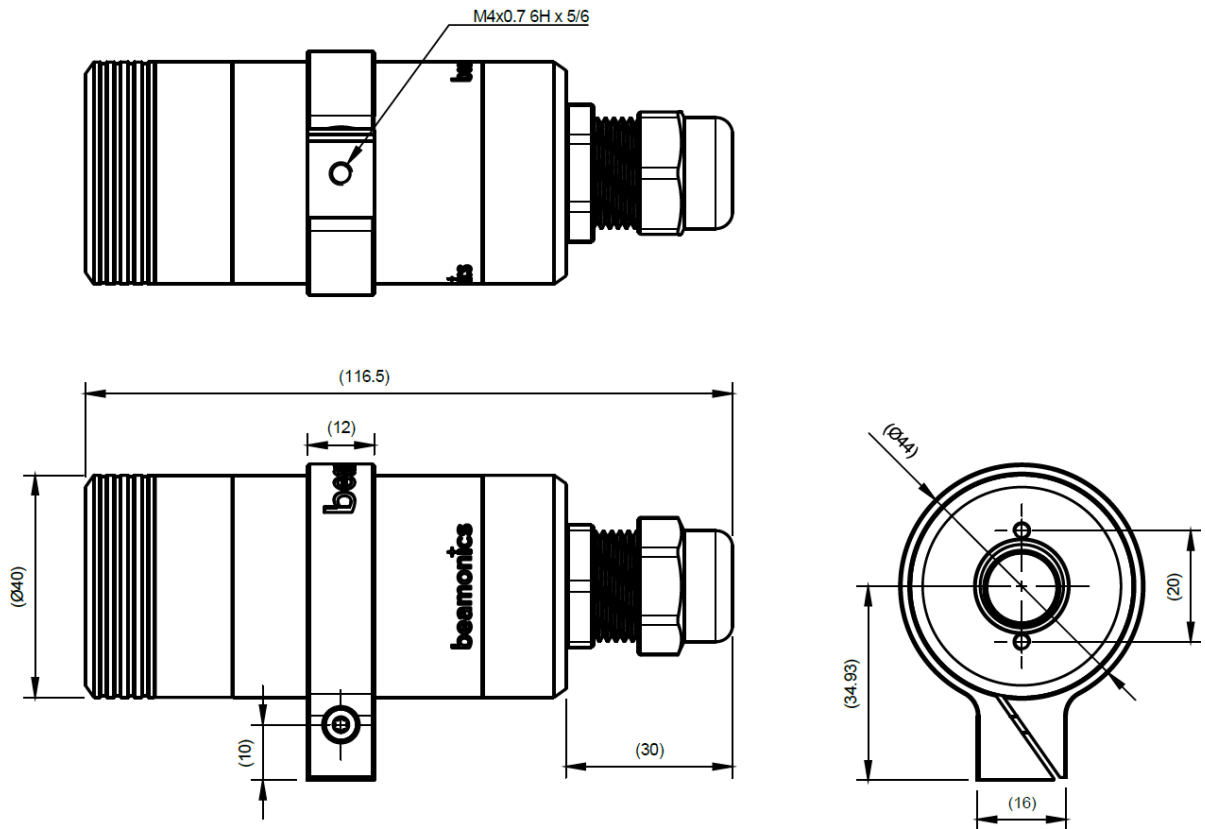
## Other

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		





## Transmitter



## Receiver

