

# EE741

## Inline Flow Sensor for Compressed Air and Gases

### Versatility

The modular and compact EE741 is dedicated for accurate metering and monitoring of compressed air and technical gases such as O<sub>2</sub>, N<sub>2</sub>, Ar or CO<sub>2</sub> in DN15 to DN50 pipes.

### Measuring principle

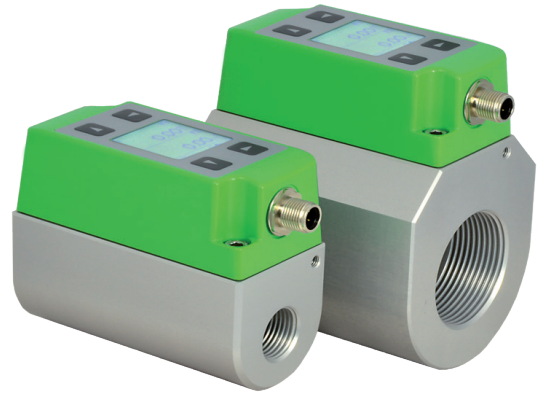
The thermal measuring principle and the well-proven E+E hot film sensing element lead to best long-term stability and fast response time.

### Measurement performance

Outstanding measuring accuracy even in the lower measuring range is achieved by an application-specific multi-point factory adjustment performed at 7 bar (102 psi) and allows for reliable leak detection.

### Easy installation and configuration

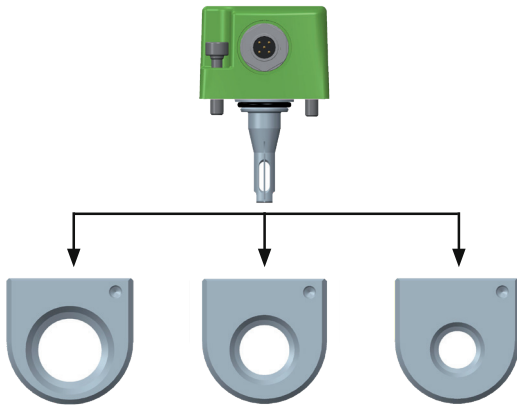
The EE741 is optimized for easy installation, configuration and maintenance. The setup can be performed using either display and push buttons or the free product configuration software EE-PCS.



EE741 with Gauge Mounting Block

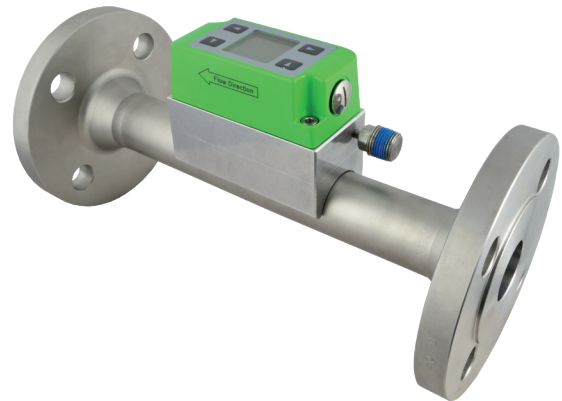


## Modular Design



The very same sensing unit can be used for three pipe diameters:

<b>EE741:</b> DN15 (1/2")	<b>EE741-N50:</b> DN32 (1-1/4")
DN20 (3/4")	DN40 (1-1/2")
DN25 (1")	DN50 (2")



EE741-N50 with Gauge Mounting Block with Flanges

Once the mounting block is built into the pipeline, the sensing unit can be installed and removed without disassembling the pipework. As a result, the EE741 is also ideal for temporary measurement with several mounting blocks.

## Features

### Sensing unit

#### Sensing Unit

- » One for each three pipe diameters
- » Installation and removal without disassembling the pipework facilitates regular calibration
- » Best accuracy due to application-specific adjustment under pressure

#### Display

- » Shows instantaneous values and overall consumption
- » Intuitive device setup with push-buttons
- » Rotation in 90° increments for convenient readability in any mounting position

#### Interfaces

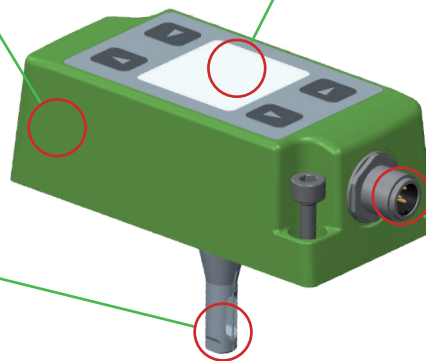
- » User configurable via display or PC
- » 0 - 20 / 4 - 20 mA output
- » Two switch outputs
- » Pulse output
- » Modbus RTU
- » M-Bus
- » IO-Link

#### Sensing head with hot film sensor

- » Robust design in stainless steel
- » Very short response time
- » Wide measuring range
- » Long-term stable and accurate
- » Negligible pressure drop
- » Highly insensitive to contamination
- » No additional pressure and temperature compensation required

#### Measurands

- » Standard volume flow [Nm<sup>3</sup>/h, Nm<sup>3</sup>/min, l/min, l/s, SCFM]
- » Mass flow [kg/h, kg/min ]
- » Standard flow [Nm/s, SFPM]
- » Temperature [°C, °F]
- » Integrated consumption meter (totalisator) for cost-effective consumption analysis without additional data logger

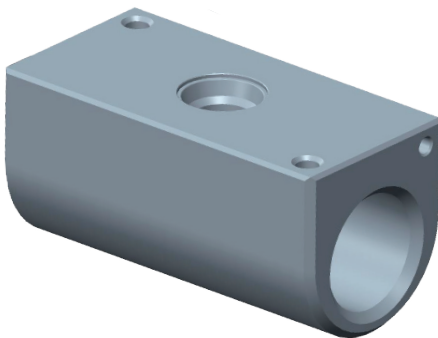


### Gauge mounting block

- » Best accuracy due to precise and reproducible positioning of the sensing head
- » Aluminum or stainless steel
- » Can be operated with sealing plug also without sensing unit

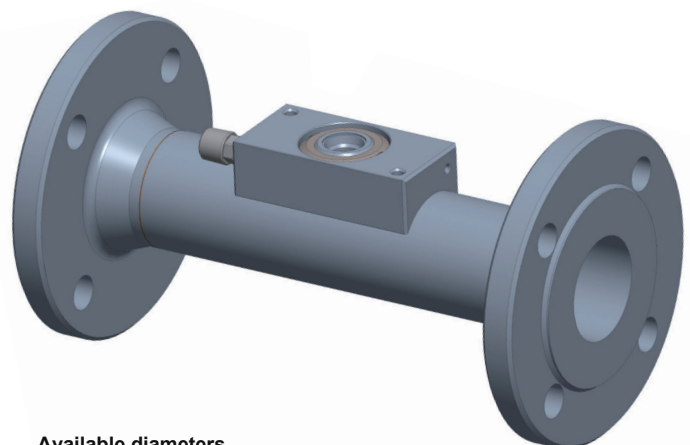
### Gauge mounting block with flanges

- » Robust design for demanding industrial application
- » Entire media-contacting surface in stainless steel 1.4404
- » Easy installation due to flange design
- » Precise and reproducible positioning of the sensing unit for best accuracy
- » Can be operated with sealing plug also without sensing unit



#### Available diameters

- » DN15 / DN20 / DN25
- » DN32 / DN40 / DN50



#### Available diameters

- » DN32 / DN40 / DN50

## Technical Data

### Measurands

#### Flow

Standard conditions (factory setting)	1 013.25 mbar (14.7 psi), 0 °C (32 °F) (configurable)
Measurement range <sup>1)</sup> in air	DN15 (1/2"): 0.2...76.3 Nm <sup>3</sup> /h (0.12...44.88 SCFM)
	DN20 (3/4"): 0.4...135.7 Nm <sup>3</sup> /h (0.24...79.77 SCFM)
	DN25 (1"): 0.6...212 Nm <sup>3</sup> /h (0.36...124.71 SCFM)
	DN32 (1-1/4"): 0.9...347.4 Nm <sup>3</sup> /h (0.52...202.06 SCFM)
	DN40 (1-1/2"): 1.4...542.8 Nm <sup>3</sup> /h (0.81...315.71 SCFM)
	DN50 (2"): 2.2...848.2 Nm <sup>3</sup> /h (1.22...493.35 SCFM)
Accuracy <sup>2)</sup> in air at 7 bar (102 psi) (abs) and 23 °C (73 °F)	± (3 % of measured value + 0.3 % of full scale)
Pressure dependency	Compensated by entering the system pressure using the EE-PCS <sup>3)</sup>
Response time t <sub>90</sub>	< 2 s
Measurement interval	0.1 s
<b>Temperature</b>	
Measurement range	-20...60 °C (-4...140 °F)
Accuracy at 20 °C (68 °F) and flow >0.5 Nm/s	± 0.7 °C (1.26 °F)

### Outputs

Analogue output (scalable)	0 - 20 mA / 4 - 20 mA     R <sub>i</sub> < 500 Ω
Switch output	DC PNP, max. 100 mA, V <sub>drop</sub> < 2.5 V, 10 kΩ pull-down Configurable: N/C or N/O, hysteresis, window
Pulse output	Consumption meter, pulse length 0.02...2 s
Digital output	
<b>RS485</b>	
Protocol	Modbus RTU (EE741 = 1 unit load)
Default settings	Baud rate 9600 <sup>4)</sup> , parity even, 1 stop bit, slave ID 240
<b>M-BUS</b>	
Default settings	Baud rate 2400 <sup>5)</sup> , parity even, 1 stop bit, slave ID 240
<b>IO-Link</b>	
Interface specification	IO-Link v1.1, IO-Link device, COM2 (38.4 kBaud)
Service interface	USB

### General

Supply voltage	18 - 30 V DC
Current consumption	with display     I <sub>max</sub> ≤ 120 mA     (P <sub>max</sub> ≤ 2,5 W)
	without display     I <sub>max</sub> ≤ 60 mA     (P <sub>max</sub> ≤ 1.6 W)
Operating pressure (max.)	16 bar (232 psi) / PN16
Ambient temperature range	with display     0...50 °C (32...122 °F)
	without display     -20...60 °C (-4...140 °F)
Medium and storage temperature range	-20...60 °C (-4...140 °F)
Humidity working range	0...100 % RH, non-condensing
Medium	Compressed air or none corrosive gases
Electrical connection	M12x1 plug, 4 poles
Electromagnetic compatibility	EN 61326-1   EN 61326-2-3 Industrial environment
<b>Material</b>	
Enclosure sensing unit	Polycarbonate
Sensing head / sensor element	Stainless steel 1.4404 / glass
Gauge mounting block	Aluminium anodised or stainless steel 1.4404
Gauge mounting block with flanges	Entire media contacting surface in stainless steel 1.4404
Enclosure protection rating	IP65



1) See operation manual for factory settings.

2) The tolerance specifications include the uncertainty of the factory calibration with a coverage factor k=2 (2 x standard deviation). The tolerance was calculated in accordance with EA-4/02 following the GUM (Guide to the Expression of Uncertainty in Measurement). Temperature coefficient: ± 0.25 % of measured value / °C deviating from 23 °C (73 °F).

3) The flow meter is factory adjusted at 7 bar (abs, 102 psi). Pressure compensation is valid for v = 10 ... 120 Nm / s. Without entering the system pressure into the EE741, the pressure dependency is +/- 0.5 % of the measured value / bar deviating from 7 bar.

4) Supported baud rates: 600, 1200, 2400, 4800, 9 600, 19 200, 38 400 and 57 600; find more details about communication setting in the User Manual and the Modbus Application Note at [www.epluse.com/ee741](http://www.epluse.com/ee741)

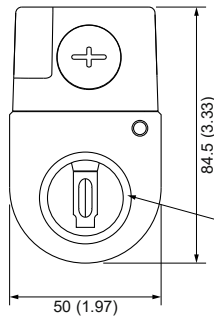
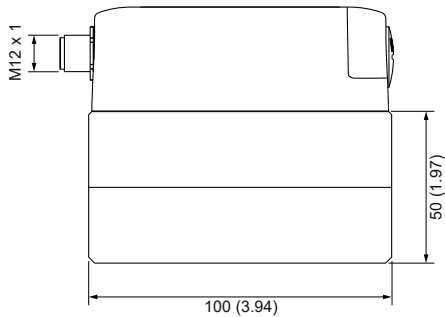
5) Supported baud rates: 600, 1200, 2400, 4800 and 9 600; find more details about communication setting in the User Manual

## Dimensions

Values in mm (inch)

### Gauge mouting block

#### EE741:

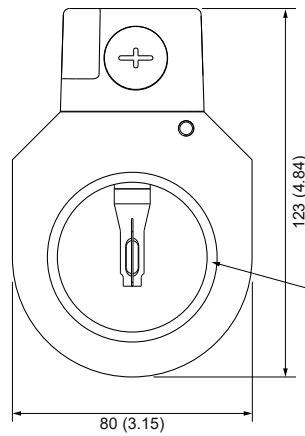
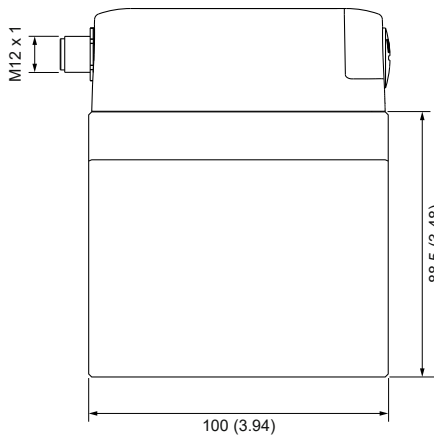


Internal thread:  
Whitworth thread  
according to EN 10226  
(old DIN 2999) or NPT

Mounting block	Thread R <sub>p</sub> or NPT
DN15	1/2"
DN20	3/4"
DN25	1"
DN32 <sup>1)</sup>	1-1/4"
DN40	1-1/2"
DN50	2"

1) R<sub>p</sub> thread only

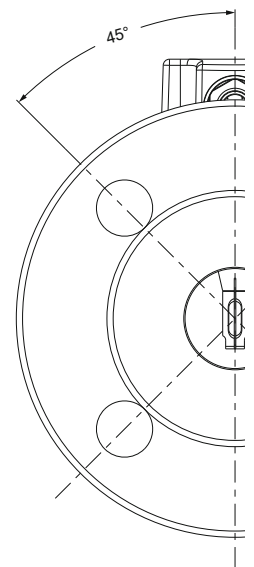
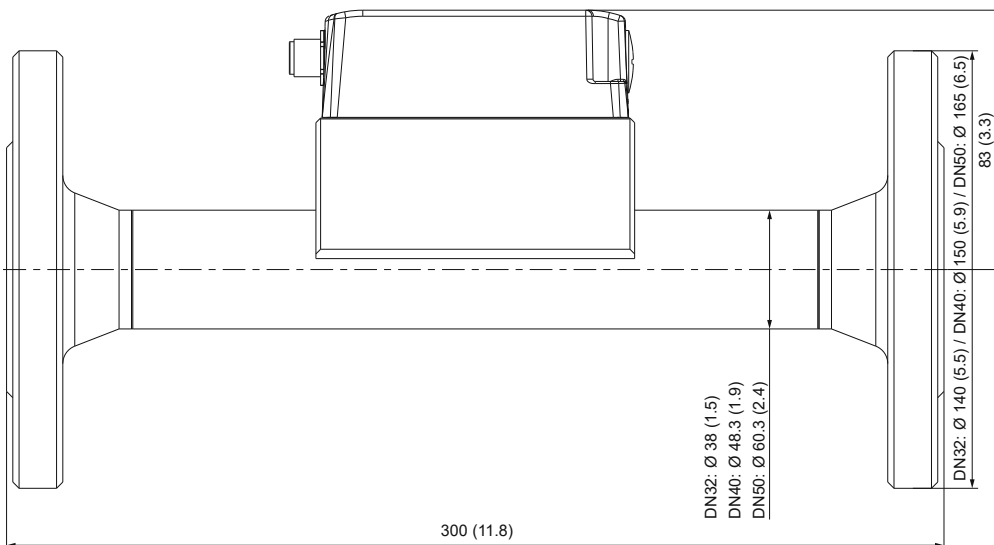
#### EE741-N50:



Internal thread:  
Whitworth thread  
according to EN 10226  
(old DIN 2999) or NPT

### Gauge mouting block with flanges

#### EE741-N50:



## Ordering Information

The EE741 flow sensor consists of a sensing unit (Item 1) and a gauge mounting block (Item 2).

Item 1 - Sensing unit		EE741-	EE741-		
Hardware	Pipe diameter / Type	DN15, DN20, DN25 DN32, DN40, DN50	no code N50	no code N50	
	Output	Analogue/switch/pulse output RS485 Modbus RTU M-Bus IO-Link	A6	J3 J5 J10	
	Display	Without display With display	no code D2	no code D2	
	Cleaning	Without Degreased for oxygen measurement <sup>1)</sup>	no code AF2	no code AF2	
Software configuration	Factory setting pipe diameter (selectable)	DN15 (1/2") DN20 (3/4") DN25 (1") DN32 (1-1/4") only for N50 DN40 (1-1/2") only for N50 DN50 (2") only for N50	DN15 DN20 DN25 DN32 DN40 DN50	DN15 DN20 DN25 DN32 DN40 DN50	
	Output 1	Analogue output 4 - 20 mA Switch output 0 - 20 mA	no code GA5 GA9		
	Output 2	Pulse output (Only with output 2 = Consumption) Switch output	no code GB9		
	Measurand output 1	Standard volume flow	V'n [Nm <sup>3</sup> /h]	no code	
			V'n [Nm <sup>3</sup> /min]	MA84	
			V'n [l/min]	MA85	
			V'n [l/s]	MA86	
			V'n [SCFM]	MA87	
	Mass flow	m' [kg/h]	MA80		
		m' [kg/min]	MA81		
	Standard flow	vn [Nm/s]	MA22		
		vn [SFPM]	MA23		
	Temperature	T [°C]	MA1		
T [°F]		MA2			
Measurand output 2	Consumption	Qn [Nm <sup>3</sup> ] (Only for output 2 = Pulse output)	no code		
	Standard volume flow	V'n [Nm <sup>3</sup> /h]	MB83		
		V'n [Nm <sup>3</sup> /min]	MB84		
		V'n [l/min]	MB85		
		V'n [l/s]	MB86		
		V'n [SCFM]	MB87		
	Mass flow	m' [kg/h]	MB80		
		m' [kg/min]	MB81		
Standard flow	vn [Nm/s]	MB22			
	vn [SFPM]	MB23			
Temperature	T [°C]	MB1			
	T [°F]	MB2			
Unit for process parameters <sup>2)</sup>	SI units [mbar, °C] US units [psi, °F]	no code U2	no code U2		
Medium <sup>3)</sup>	Air	no code	no code		
	Nitrogen	FU2	FU2		
	CO <sub>2</sub>	FU3	FU3		
	Oxygen	FU4	FU4		
	Argon	FU7	FU7		

Item 2 - Gauge mounting block		BSP thread	NPT thread	Flange version
Aluminum gauge mounting block	DN15 (1/2")	HA079015	HA179015	
	DN20 (3/4")	HA079020	HA179020	
	DN25 (1")	HA079025	HA179025	
	DN32 (1-1/4")	HA079032		
	DN40 (1-1/2")	HA079040	HA179040	
	DN50 (2")	HA079050	HA179050	
Stainless steel gauge mounting block	DN15 (1/2")	HA078015	HA178015	
	DN20 (3/4")	HA078020	HA178020	
	DN25 (1")	HA078025	HA178025	
Stainless steel gauge mounting block for oxygen <sup>1)</sup>	DN15 (1/2")	HA081015	HA181015	
	DN20 (3/4")	HA081020	HA181020	
	DN25 (1")	HA081025	HA181025	
Stainless steel gauge mounting block with flanges	DN32 (1-1/4")			HA278032
	DN40 (1-1/2")			HA278040
	DN50 (2")			HA278050

1) The parts of the sensor/mounting block in contact with the medium are oil and grease-free. Only for DN15, DN20 and DN25.

2) For IO-Link: no code

3) Other gases upon request.

## Order Example

### Item 1 - Sensing unit

#### EE741-A6D2DN15

Pipe diameter/type	DN15, DN20, DN25
Output:	Analogue/switch/pulse output
Display:	With display
Pipe diameter (selectable):	DN15 (1/2")
Output 1:	4 - 20 mA
Measurand 1:	Standard volume flow [Nm <sup>3</sup> /h]
Output 2:	Pulse output
Measurand 2:	Consumption [Nm <sup>3</sup> ]
Unit for process parameters:	SI units [mbar, °C]
Medium:	Air

### Item 2 - Gauge mounting block

#### HA079015

Aluminum gauge mounting block	DN15 (1/2")
	BSP-thread

## Accessories

- Inlet and outlet path BSP thread, stainless steel, for mounting block	DN15 (1/2")	HA070215
	DN20 (3/4")	HA070220
	DN25 (1")	HA070225
	DN32 (1-1/4")	HA070232
	DN40 (1-1/2")	HA070240
- Gasket set for gauge mounting block with flanges	DN50 (2")	HA070250
	DN32 (1-1/4")	HA074532
	DN40 (1-1/2")	HA074540
- Cable M12x1 female, angled 90°, 4 poles	DN50 (2")	HA074550
	2 m	HA010824