Instromart
Sensors & Instrumentation

Datasheet EE741

Inline Flow Sensor for Compressed Air and Gases

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_2, N_2, Ar or CO_2 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.

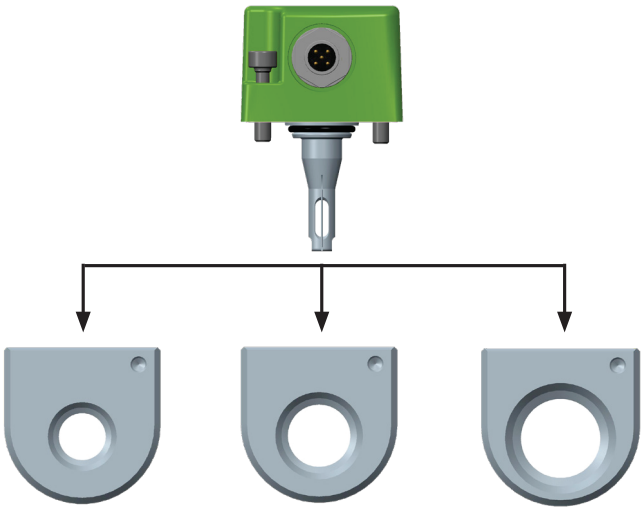
Easy installation and configuration

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 DN15 (1/2") and DN32 (1-1/4")

EE741 assembly on the gauge mounting block

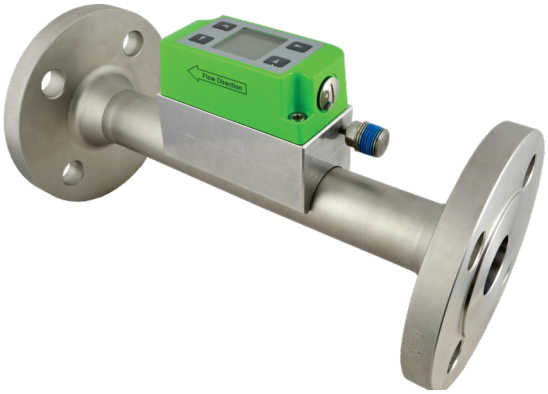
Modular Design



EE741 Sensor for three different pipe diameters

Pipe diameter

EE741	EE741-N50
DN15 (1/2")	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

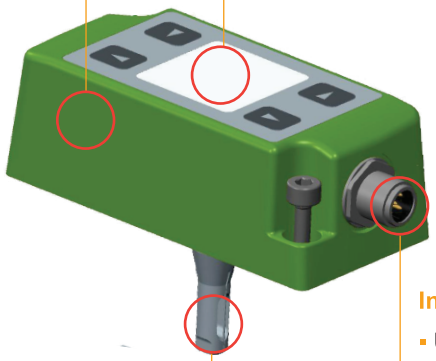
Sensing unit

Display

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

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



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

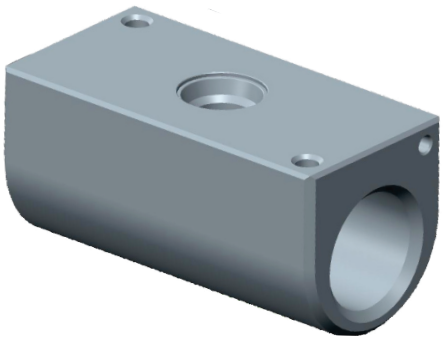
Inspection certificate

According to DIN EN 10204-3.1

Features / Dimensions

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

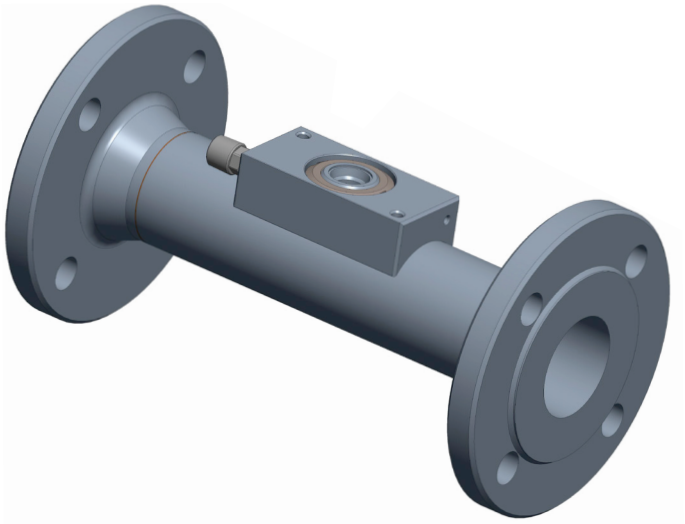


Available diameters

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

Gauge mouting 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

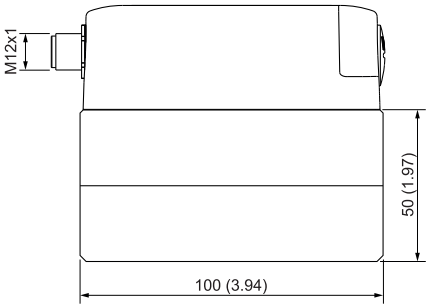
- DN32 / DN40 / DN50

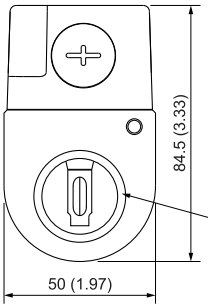
Dimensions

Values in mm (inch)

Gauge mounting block

EE741





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

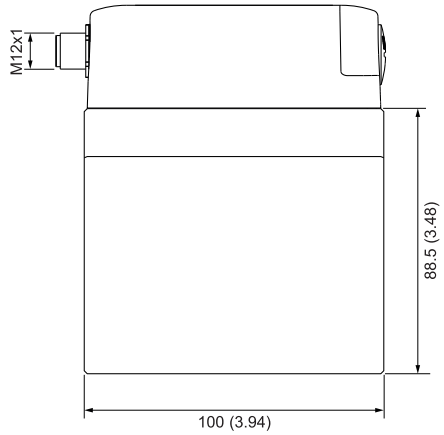
Pipe diameter

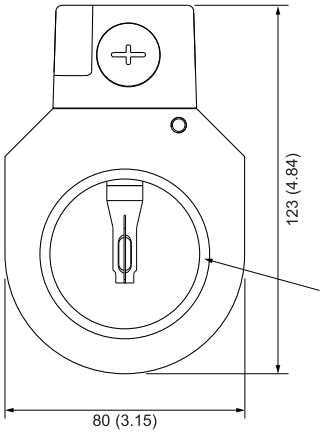
Mounting block	Thread Rp or NPT
DN15	1/2"
DN20	3/4"
DN25	1"
DN32[1)]	1-1/4"
DN40	1-1/2"
DN50	2"

1) Rp thread only

Gauge mounting block

EE741-N50

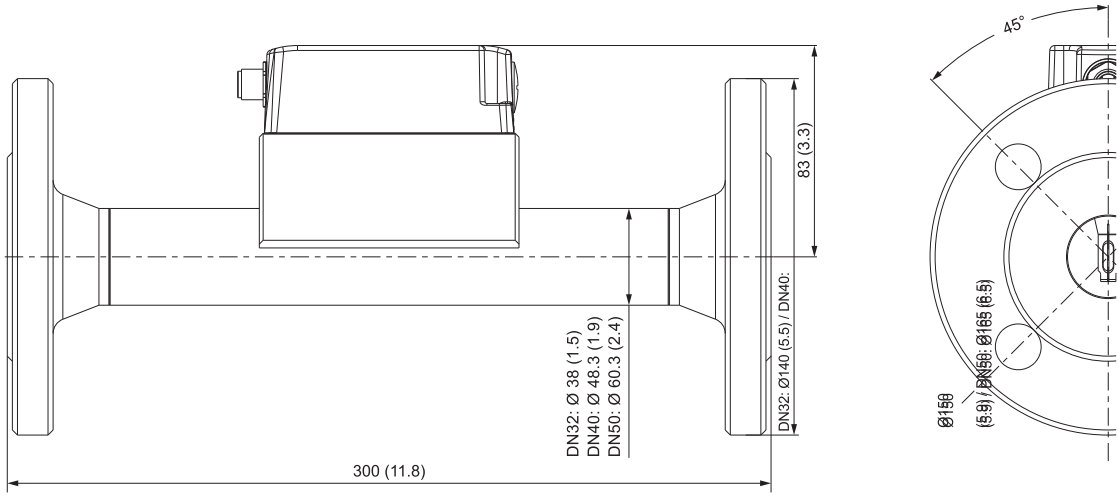




Internal thread:
Whitworth thread according to
EN 10226 (old DIN 2999) or NPT

Gauge mouting block with flanges

EE741-N50



Technical Data

Measurands

Volume Flow (V'n)

Standard conditions		Factory setting according to DIN 1343 pn = 1013.25 mbar (14.7 psi); Tn = 0 °C (32 °F), freely configurable via EE-PCS	
Measuring range[1)] in air at standard conditions	**DN15 (1/2")**	0.2...76.3 m^3/h	(0.12...44.88 SCFM)
	DN20 (3/4")	0.4...135.7 m^3/h	(0.24...79.77 SCFM)
	DN25 (1")	0.6...212 m^3/h	(0.36...124.71 SCFM)
	DN32 (1-1/4")	0.9...347.4 m^3/h	(0.52...202.06 SCFM)
	DN40 (1-1/2")	1.4...542.8 m^3/h	(0.81...315.71 SCFM)
	DN50 (2")	2.2...848.2 m^3/h	(1.22...493.35 SCFM)
Accuracy[2)] in air @ 7 bar (102 psi) (abs) and 23 °C (73 °F)		±(3 % of measured value + 0.3 % of full scale)	
Temperature dependency		±(0.25 % of measured value / °C deviating from 23 °C (73 °F))	
Pressure dependency		Compensation by entering the system pressure using EE-PCS[3)]	
Response time t_{90}		<2 s	
Sampling interval		0.1 s	

1) For factory setting, see User Manual.
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).
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.

Temperature (T)

Measuring range	-20...+60 °C (-4...+140 °F)
Accuracy @ 24 V DC, 20 °C (68 °F)	±0.7 °C (±1.26 °F)

Technical Data

Outputs

Analogue

Analogue output (scalable)	0 - 20 mA / 4 - 20 mA	R_L < 500 Ω	R_L = load resistance

Switching output	DC PNP, max. 100 mA, V_{drop} < 2.5 V, 10 kΩ pull-down Configurable: N/C or N/O, hysteresis, window
Pulse output	Totalizer (Consumption meter)
Pulse length	0.02...2 s

Digital

Digital interface	RS485 (EE741 = 1 unit load)
Protocol **Factory settings** **Supported Baud rates**[1)] **Measured data types**	Modbus RTU 9600 Baud, parity even, 1 stop bit, Modbus address 240 600, 1200, 2400, 4800, 9600, 19200, 38400 and 57600 FLOAT32 and DOUBLE64
Protocol **Factory settings** **Supported Baud rates**[2)] **Measured data types**	M-Bus 2400 Baud, parity even, 1 stop bit, M-Bus address 240 600, 1200, 2400, 4800 and 9600 FLOAT32 or INT32
Protocol **Interface specification** **Measured data types** **Service interface**	IO-Link IO-Link v1.1, IO-Link device, COM2 (38.4 kBaud) FLOAT32 or INT32 USB

1) For further details on the communication setting: See User Manual and Modbus Application Note at www.epluse.com/ee741.
2) For further details on the communication setting: See User Manual.

General

Power supply class III ⧫ USA & Canada: Class 2 supply necessary	18 - 30 V DC
Current consumption, max. **with display** **without display**	 ≤120 mA (P_{max} ≤ 2.5 W) ≤60 mA (P_{max} ≤ 1.6 W)
Electrical connection	M12x1 plug, 4 pole
Operating pressure, max.	16 bar (232 psi) / PN16
Humidity working range	0…100 %RH, non-condensing
Ambient temperature range **With display** **Without display**	 0...+50 °C -20...+60 °C
Medium and storage temperature range	-20...+60 °C
Medium	Compressed air or non-corrosive gases
Material **Enclosure sensing unit** **Sensing head / sensor element** **Gauge mounting block** **Gauge mounting block with flanges**	 Polycarbonate (PC) Stainless steel 1.4404 / glass Aluminium anodised or stainless steel 1.4404 Entire media contacting surface in stainless steel 1.4404
Enclosure protection rating	IP65
Electromagnetic compatibility	EN 61326-1 EN 61326-2-3 Industrial environment FCC Part15 Class A ICES-003 Class A
Conformity	CE UKCA

Ordering Guide

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

Position 1: Sensing unit

	Feature	Description		Code	
				EE741-	
Hardware Configuration	Pipe diameter / type	DN15, DN20, DN25		No code	
		DN32, DN40, DN50		N50	
	Output	Analogue / switch / pulse output		A6	
		RS485 (with Modbus RTU)			J3
		M-Bus			J5
		IO-Link			J10
	Display	Without display		No code	
		Display with backlight		D2	
	Accessories	Without		AC0	
		M12x1 cable mount connector, socket, for self assembly		AC2	
	Cleaning	Without		No code	
		Degreased for oxygen measurement[1]		AF2	
Software-Setup (Analogue-) Outputs	Factory setting pipe diameter (selectable)	DN15 (1/2")		DN15	
		DN20 (3/4")		DN20	
		DN25 (1")		DN25	
		DN32 (1 1/4") for N50 only		DN32	
		DN40 (1 1/2") for N50 only		DN40	
		DN50 (2") for N50 only		DN50	
	Output signal 1	Analogue output	0 - 20 mA	GA5	
			4 - 20 mA	No code	
		Switch output		GA9	
	Output signal 2	Pulse output (only with output 2 = Consumption)		No code	
		Switch output		GB9	
	Output 1 measurand	Standardized volume flow V'n [m^3/h]		No code	
		Other measurands (*xx* see measurand code below)		MA*xx*	
	Output 2 measurand	Consumption Qn [m^3] (only for output 2 = Pulse output)		No code	
		Standardized volume flow V'n [m^3/h]		MB83	
		Other measurands (*xx* see measurand code below)		MB*xx*	
	Units (for process parameters)[2]	SI units		No code	
		US units		U2	
	Medium[3]	Air		No code	
		Other media (*xx* see media code below)		FU*xx*	

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.

Measurand Code

For Output 1 and 2 in the Ordering Guide

Measurand		Unit	Code
			MAxx / MBxx
Standardized volume flow	V'n	m^3/min l/min l/s ft^3/min	84 85 86 87
Mass flow	m'	kg/min	80 81
Standardized flow	vn	m/s	22 23
Temperature	T	°C °F	1 2

PLEASE NOTE

No mix of SI/US units allowed.

Media Code

Medium	Unit	Code
		FU*xx*
Nitrogen	-	FU2
CO_2	-	FU3
Oxygen	-	FU4
Argon	-	FU7
75 % N2 + 25 % CO_2	-	FU8
80 % Ar + 20 % CO_2	-	FU9
60 % CO_2 + 40 % N_2	-	FU10
40 % CO_2 + 60 % N_2	-	FU11
35 % CO_2 + 65 % N_2	-	FU12
82 % Ar + 18 % CO_2	-	FU13
N_2O (Nitrous oxide)	-	FU14

Ordering Guide

Position 2: Gauge mounting block

Feature	Description	BSP thread	NPT thread	Flange Version
		EE741-		
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	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

Order Example

Position 1 - Sensing unit: EE741-A6D2AC2DN15

Feature	Code	Description
Pipe diameter / type	No code	DN15, DN20, DN25
Output	A6	Analogue / switch / pulse output
Display	D2	Display with backlight
Accessories	AC2	Cable mount connector, socket, for self assembly
Cleaning	No code	Without
Pipe diameter (selectable)	DN15	DN15 (1/2")
Output signal 1	No code	Analogue output 4 - 20 mA
Output 1 measurand	No code	Standardized volume flow V'n [m^3/h]
Output signal 2	No code	Pulse output (only with output 2 = Consumption)
Output 2 measurand	No code	Consumption Qn [m^3] (only for output 2 = Pulse output)
Units (for process parameters)	No code	SI units
Medium	No code	Air

Position 2 - Gauge mounting block: HA079015

Feature	Code	Description
Aluminum gauge mounting block	HA079015	DN15 (1/2") BSP thread

Accessories

For further information see datasheet Accessories.

Accessories		Code
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
	DN50 (2")	HA070250
Gasket set for gauge mounting block with flanges		
	DN32 (1-1/4")	HA074532
	DN40 (1-1/2")	HA074540
	DN50 (2")	HA074550
Cable M12x1 female, angled 90°, 4 poles	2 m (6.6 ft)	HA010824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