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.

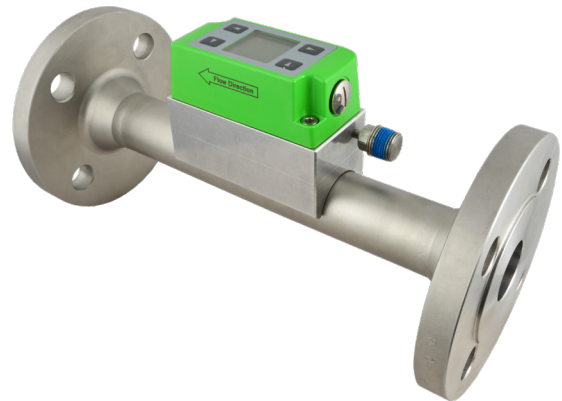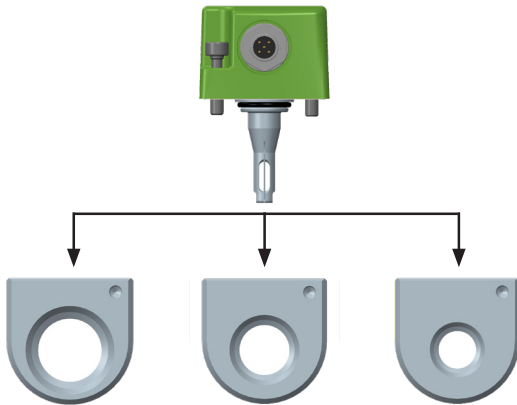### Easy installation and configuration

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

IO-Link

Modular Design

EE741-N50 with Gauge Mounting Block with Flanges

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

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

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

Measurands

» Standard volume flow [Nm³/h, Nm³/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

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
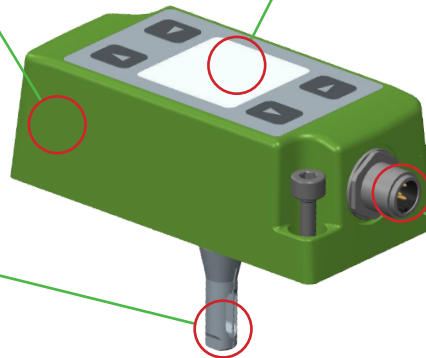
Gauge mounting block

» 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
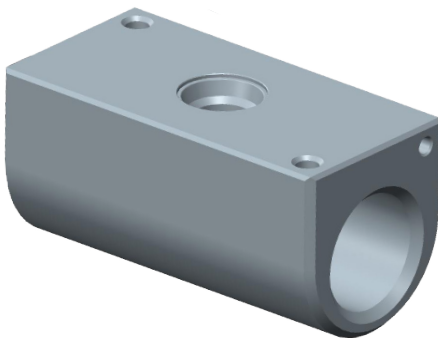
Available diameters
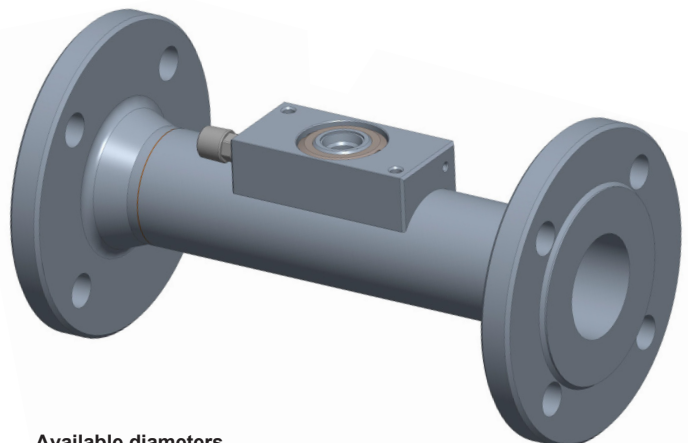» DN15 / DN20 / DN25
» DN32 / DN40 / DN50

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[1] in air		
DN15 (1/2"):	0.2...76.3 Nm³/h	(0.12...44.88 SCFM)
DN20 (3/4"):	0.4...135.7 Nm³/h	(0.24...79.77 SCFM)
DN25 (1"):	0.6...212 Nm³/h	(0.36...124.71 SCFM)
DN32 (1-1/4"):	0.9...347.4 Nm³/h	(0.52...202.06 SCFM)
DN40 (1-1/2"):	1.4...542.8 Nm³/h	(0.81...315.71 SCFM)
DN50 (2"):	2.2...848.2 Nm³/h	(1.22...493.35 SCFM)

Accuracy[2] 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[3]
Response time t_{90}	< 2 s
Measurement interval	0.1 s

Temperature

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_L < 500 Ω
Switch 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	Consumption meter, pulse length 0.02...2 s
Digital output	
RS485	
Protocol	Modbus RTU (EE741 = 1 unit load)
Default settings	Baud rate 9 600[4], parity even, 1 stop bit, slave ID 240
M-BUS	
Default settings	Baud rate 2 400[5], parity even, 1 stop bit, slave ID 240
IO-Link	
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_{max} ≤ 120 mA (P_{max} ≤ 2,5 W)
without display	I_{max} ≤ 60 mA (P_{max} ≤ 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
	FCC Part 15 ICES-003 Class B UKCA CE
Material	
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
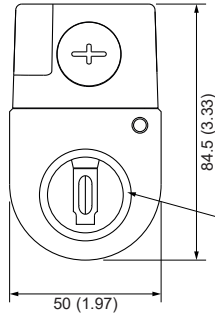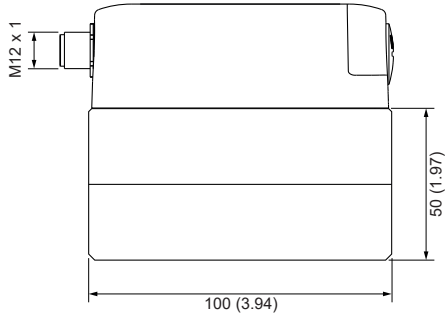5) Supported baud rates: 600, 1200, 2400, 4800 and 9 600; find more details about communication setting in the User Manual

Dimensions
Values in mm (inch)

Gauge mouting block

EE741:

M12 x 1
50 (1.97)
100 (3.94)
84.5 (3.33)
50 (1.97)

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

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

1) R_p thread only

EE741-N50:

M12 x 1
88.5 (3.48)
100 (3.94)
123 (4.84)
80 (3.15)
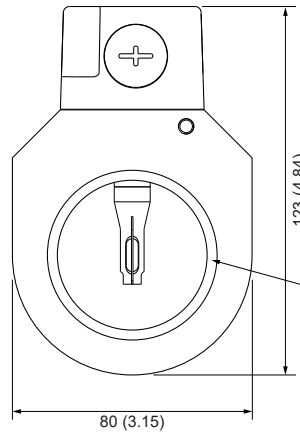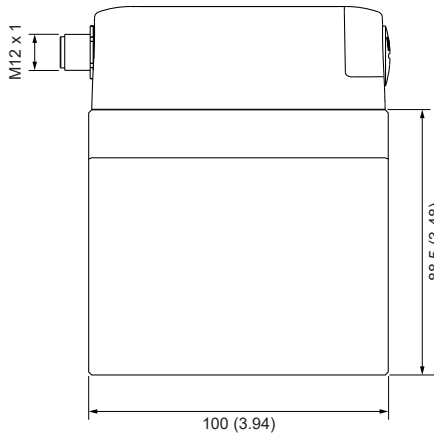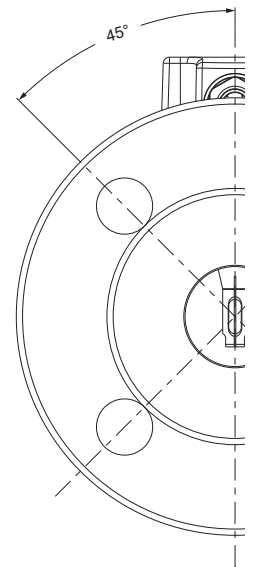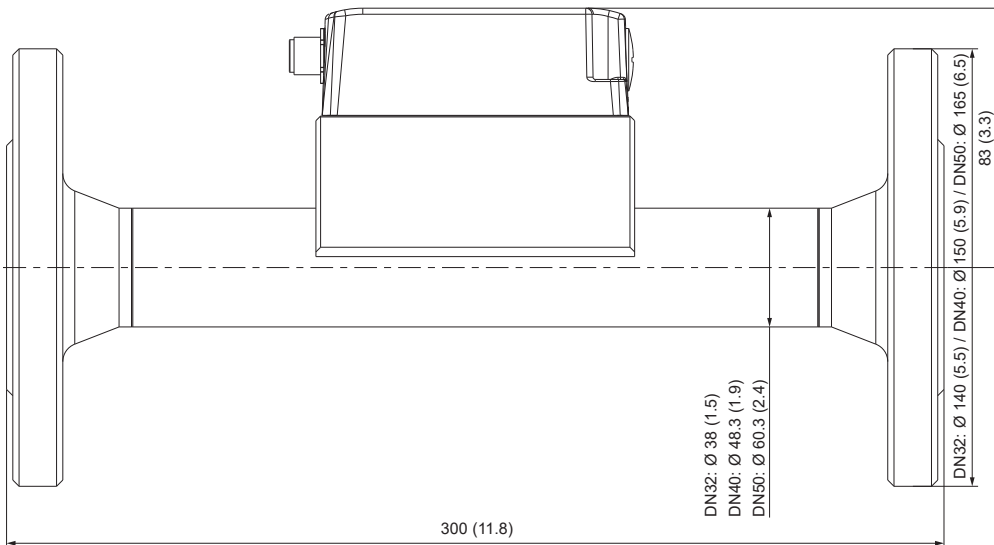
Internal thread:
Whitworth thread
according to EN 10226
(old DIN 2999) or NPT

Gauge mouting block with flanges

EE741-N50:

45°

83 (3.3)

DN32: Ø 140 (5.5) / DN40: Ø 150 (5.9) / DN50: Ø 165 (6.5)

DN32: Ø 38 (1.5)
DN40: Ø 48.3 (1.9)
DN50: Ø 60.3 (2.4)

300 (11.8)

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		no code	no code
	DN32, DN40, DN50		N50	N50
Output	Analogue/switch/pulse output		A6	
	RS485 Modbus RTU			J3
	M-Bus			J5
	IO-Link			J10
Display	Without display		no code	no code
	With display		D2	D2
Accessories	No accessories		AC0	AC0
	M12x1 cable socket, for self assembly		AC2	AC2
Cleaning	Without		no code	no code
	Degreased for oxygen measurement[1]		AF2	AF2
Software configuration				
Factory setting pipe diameter (selectable)	DN15 (1/2")		DN15	DN15
	DN20 (3/4")		DN20	DN20
	DN25 (1")		DN25	DN25
	DN32 (1-1/4") only for N50		DN32	DN32
	DN40 (1-1/2") only for N50		DN40	DN40
	DN50 (2") only for N50		DN50	DN50
Output 1	Analogue output	4 - 20 mA	no code	
		0 - 20 mA	GA5	
	Switch output		GA9	
Output 2	Pulse output	(Only with output 2 = Consumption)	no code	
	Switch output		GB9	
Measurand output 1	Standard volume flow	V'n [Nm³/h]	no code	
		V'n [Nm³/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 [Nm³] (Only for output 2 = Pulse output)	no code	
	Standard volume flow	V'n [Nm³/h]	MB83	
		V'n [Nm³/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[2]	SI units [mbar, °C]		no code	no code
	US units [psi, °F]		U2	U2
Medium[3]	Air		no code	no code
	Nitrogen		FU2	FU2
	CO₂		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[1]	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-A6D2DN15AC2

Pipe diameter/type	DN15, DN20, DN25
Output:	Analogue/switch/pulse output
Display:	With display
Accessories:	M12x1 cable socket, for self assembly
Pipe diameter (selectable):	DN15 (1/2")
Output 1:	4 - 20 mA
Measurand 1:	Standard volume flow [Nm³/h]
Output 2:	Pulse output
Measurand 2:	Consumption [Nm³]
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
	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	HA010824