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+ Datasheet EE741

**Inline Flow Sensor
for Compressed Air and Gases**



M-Bus



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 O₂, N₂, Ar or CO₂ 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

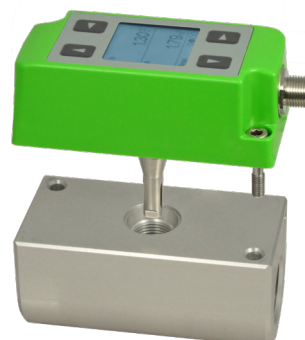
Outstanding measuring accuracy even in the lower measuring range is achieved by an application-specific multi-point factory adjustment performed at 7 bar (102 psi) and allows for reliable leak detection.

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.

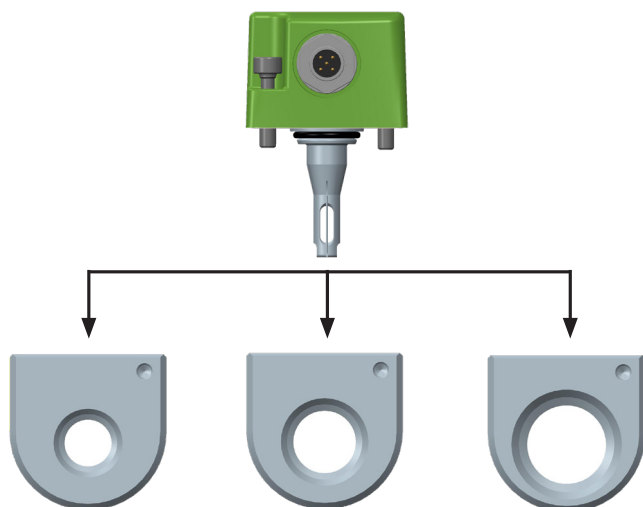


EE741 with gauge mounting block DN15 (1/2") and DN32 (1-1/4")



EE741 assembly on the gauge mounting block

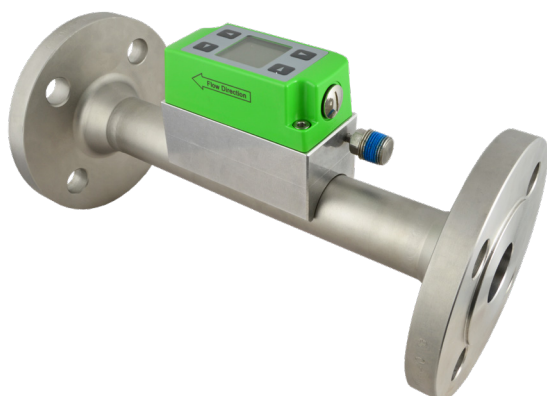
Modular Design



Pipe diameter

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

EE741 Sensor for three different pipe diameters



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

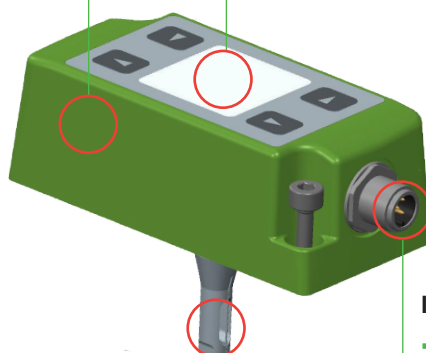
Sensing unit

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 pushbuttons
- Rotation in 90° increments for convenient readability in any mounting position



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

Interfaces

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

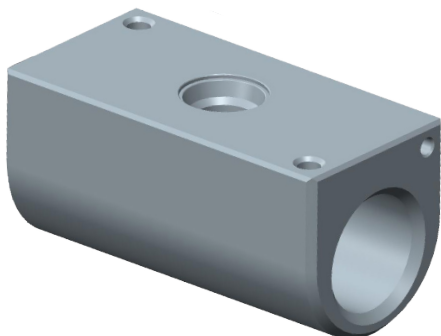
Measurands

- Standard volume flow [m³/h, m³/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

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

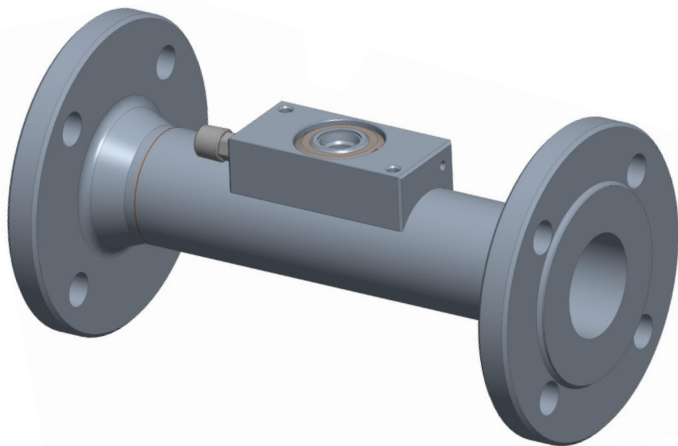


Available diameters

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

Gauge 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

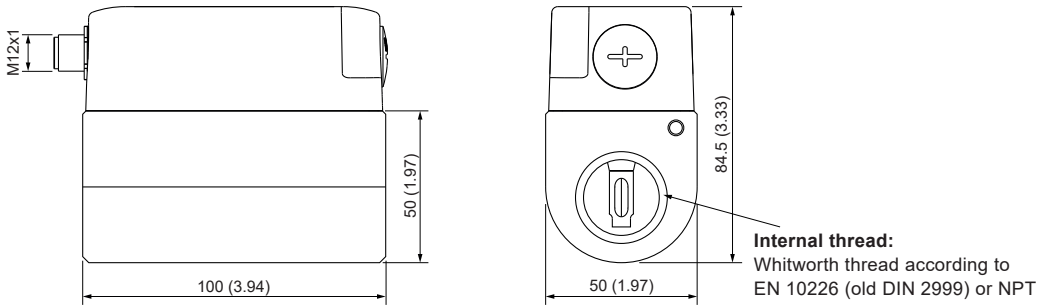
- DN32 / DN40 / DN50

Dimensions

Values in mm (inch)

Gauge mounting block

EE741



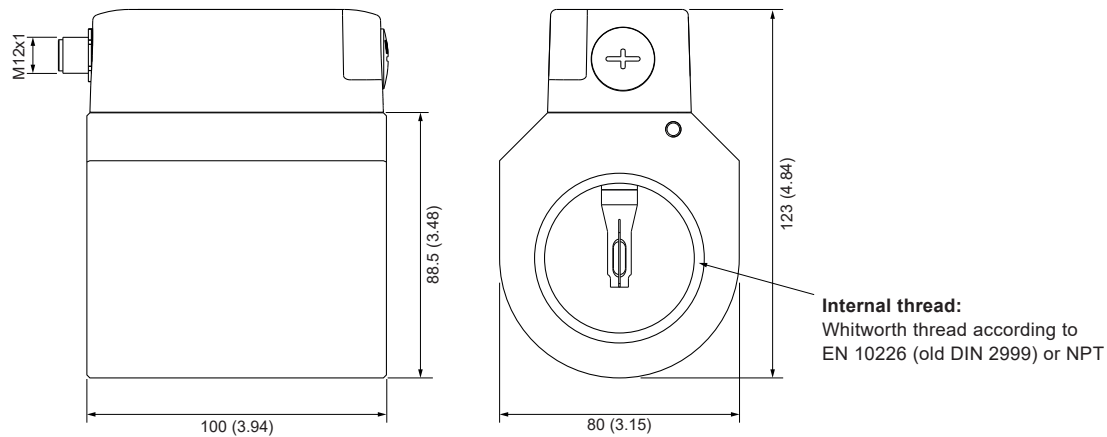
Pipe diameter

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

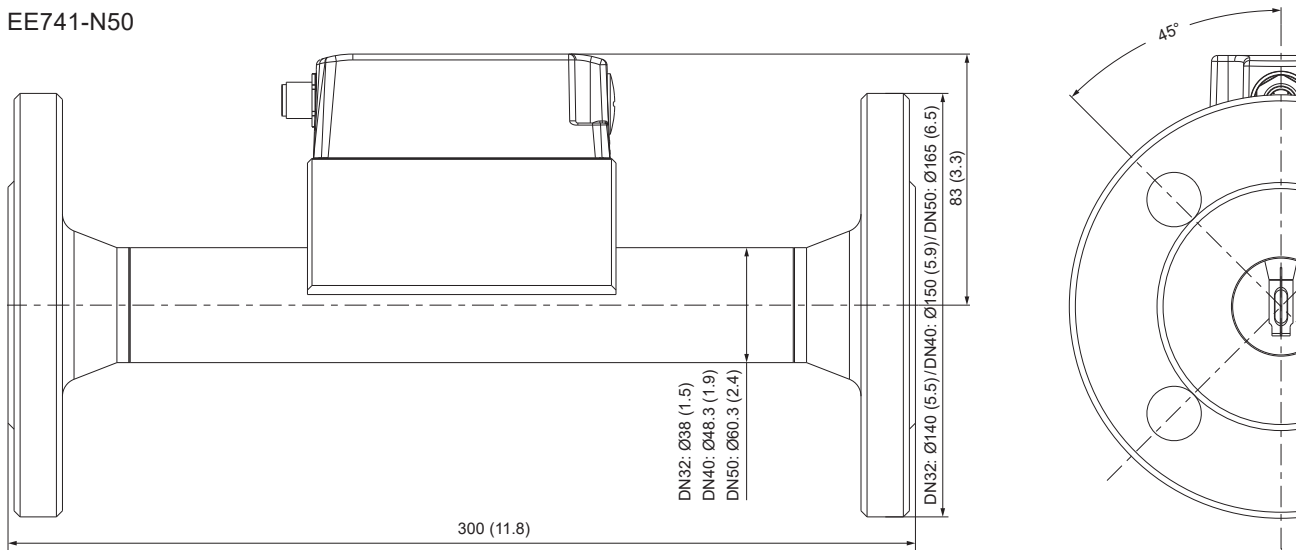
Gauge mounting block

EE741-N50



Gauge mounting block with flanges

EE741-N50



Technical Data

Measurands

Volume Flow (V'n)

Standard conditions	Factory setting according to DIN 1343 p _n = 1 013.25 mbar (14.7 psi); T _n = 0 °C (273.15 K), freely configurable via EE-PCS	
Measuring range¹⁾ in air at standard conditions	DN15 (1/2") DN20 (3/4") DN25 (1") DN32 (1-1/4") DN40 (1-1/2") DN50 (2")	0.2...76.3 m ³ /h (0.12...44.88 SCFM) 0.4...135.7 m ³ /h (0.24...79.77 SCFM) 0.6...212 m ³ /h (0.36...124.71 SCFM) 0.9...347.4 m ³ /h (0.52...202.06 SCFM) 1.4...542.8 m ³ /h (0.81...315.71 SCFM) 2.2...848.2 m ³ /h (1.22...493.35 SCFM)
Accuracy²⁾ 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 t₉₀	<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	$R_L < 500 \Omega$	$R_L =$ load resistance
Switching output	DC PNP, max. 100 mA, $V_{drop} < 2.5 V$, 10 k Ω 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, 1 200, 2400, 4 800, 9600, 19 200, 38 400 and 57 600 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, 1 200, 2400, 4 800 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	$\leq 120 \text{ mA}$ ($P_{max} \leq 2.5 \text{ W}$) $\leq 60 \text{ mA}$ ($P_{max} \leq 1.6 \text{ W}$)		
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 none 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 FCC Part15 Class A	EN 61326-2-3 ICES-003 Class A	Industrial environment
Conformity	 		

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		
Hardware Configuration			EE741-		
	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			
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 volumetric flow V'n [m ³ /h]	No code			
	Standardized volumetric flow V'n [m ³ /min]	MA84			
	Standardized volumetric flow V'n [l/min]	MA85			
	Standardized volumetric flow V'n [l/s]	MA86			
	Standardized volumetric flow V'n [ft ³ /min]	MA87			
	Mass flow m' [kg/h]	MA80			
	Mass flow m' [kg/min]	MA81			
	Standardized flow vn [m/s]	MA22			
	Standardized flow vn [SFCM]	MA23			
	Temperature T [°C]	MA1			
	Temperature T [°F]	MA2			
Output 2 measurand	Consumption Qn [m ³] (only for output 2 = Pulse output)	No code			
	Standardized volumetric flow V'n [m ³ /h]	MB83			
	Standardized volumetric flow V'n [m ³ /min]	MB84			
	Standardized volumetric flow V'n [l/min]	MB85			
	Standardized volumetric flow V'n [l/s]	MB86			
	Standardized volumetric flow V'n [SCFM]	MA87			
	Mass flow m' [kg/h]	MB80			
	Mass flow m' [kg/min]	MB81			
	Standardized flow vn [m/s]	MB22			
	Standardized flow vn [ft/min]	MB23			
	Temperature T [°C]	MB1			
	Temperature T [°F]	MB2			
	Units (for process parameters) ²⁾	SI units	No code		
US units		U2			
Medium ³⁾	Air	No code			
	Nitrogen	FU2			
	CO ₂	FU3			
	Oxygen (O ₂)	FU4			
	Argon	FU7			
Software-Setup (Analogue-) Outputs					

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.

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 volumetric 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

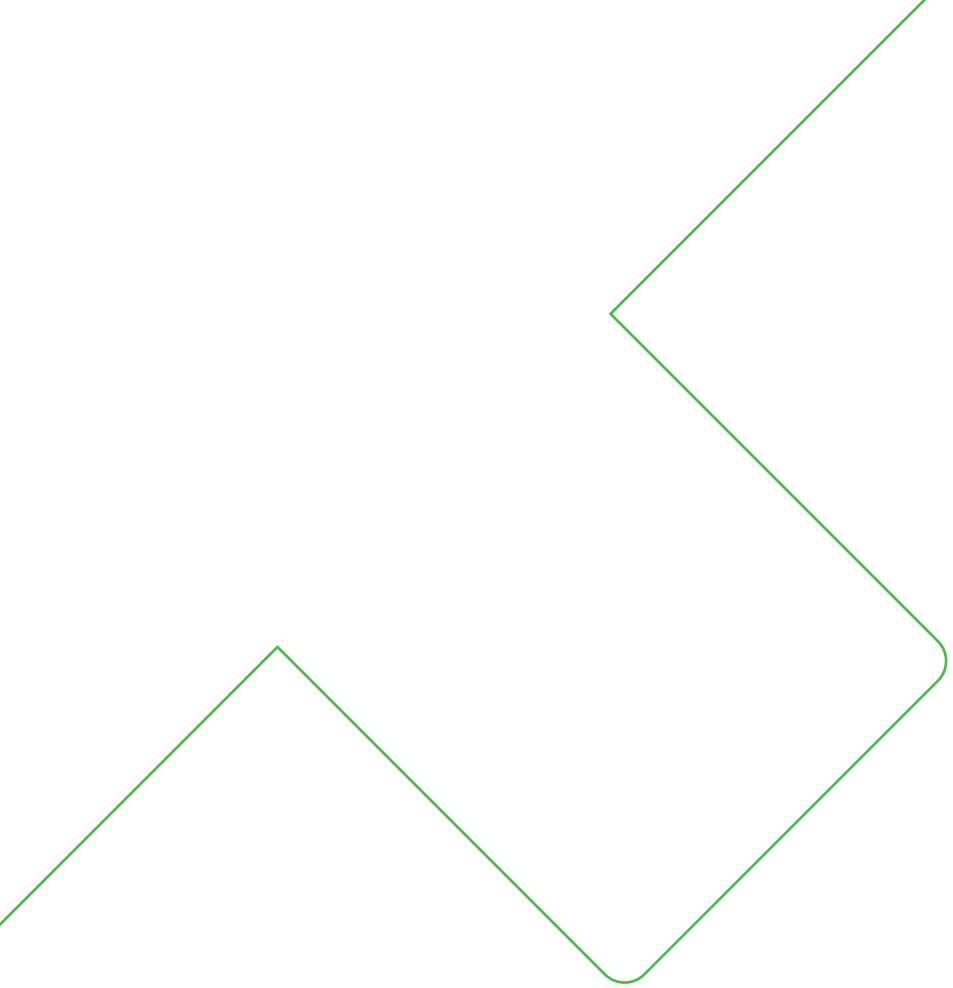
Position 2 - Gauge mounting block: HA079015

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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