

# + Datasheet EE772

**Multifunctional Flow Sensor for  
Compressed Air and Gases  
DN40 (1 1/2") - DN80 (3") / 40 bar (580 psi)**



# EE772

## Multifunctional Flow Sensor for Compressed Air and Gases DN40 (1 1/2") - DN80 (3") / 40 bar (580 psi)

The EE772 is ideal for flow measurement in pipelines with diameters of DN40 (1 1/2") up to DN80 (3"). Besides the temperature (T) the sensor provides the values for standardized volumetric flow ( $V'_n$ ), standardized flow ( $v_n$ ) and mass flow ( $m'$ ). The integrated totalizer records the consumption ( $Q_n$ ). The sensor is suitable for air, nitrogen, CO<sub>2</sub>, argon or other non-corrosive, non-flammable gases with a pressure of up to 40 bar (580 psi).

### Precision and Reliability

The EE772 sets new standards in terms of measurement accuracy and reproducibility thanks to its application-specific factory adjustment at 7 bar. A dynamic pressure compensation via a 2-wire 4 - 20 mA input is available. The E+E hot-film sensing element deploying the latest thin film technology features excellent long-term stability, fast response time and an outstanding reliability.

### Easy Mounting

The unique mounting concept including a gauge mounting block with hot tap valve permits rapid installation and removal of the device without flow interruption. It ensures high measurement accuracy through exact and reproducible sensing head positioning in the pipe.

### Versatile Output Options

The EE772 features two freely scalable outputs configurable as analogue current or voltage output, switch output or as pulse output for consumption measurement. Optionally, the measured data is available at the Modbus RTU or M-BUS (Meter-Bus) interface.

### User Configurable and Adjustable

The free EE-PCS Product Configuration Software and an optional configuration adapter facilitate the configuration and adjustment of the EE772.



EE772 Compact



EE772 Remote with gauge mounting block

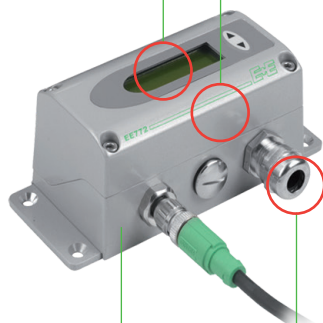
# Features

## Consumption metering

- Consumption meter (totalizer) for cost-effective analysis
- Counter value on the display
- Stored in non-volatile memory
- Available on pulse output

## Display

- Shows actual, min / max values and overall consumption
- Layout with 1 or 2 lines



## Measurands

- Standard volume flow ( $V'_n$ )
- Mass flow ( $m'$ )
- Standard flow ( $v_n$ )
- Temperature (T)
- Consumption ( $Q_n$ )

## Probe with hot-film sensing element

- Robust design in stainless steel
- Highly insensitive to contamination
- Broad working range of 1:400
- High accuracy  $\pm 1.5\%$  of reading
- Long-term stability and high reproducibility
- Factory adjustment under pressure

## Hot tap valve

- Mount and de-mount under pressure
- Pressure rating 40 bar (580 psi)



## Output

- User configurable via PC
- 0 - 10 V / 4 - 20 mA output
- Two switch outputs
- Pulse output
- Modbus RTU
- M-Bus

## Gauge mounting block

- Optional combination with p and Td sensors via quick coupling
- Fail-safe alignment of sensing unit
- Best accuracy due to precise and reproducible positioning of the sensing head

## Inspection certificate

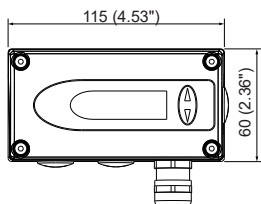
According to DIN EN 10204-3.1

# Dimensions

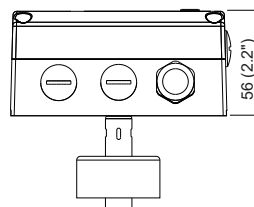
Values in mm (inch)

## EE772 compact

Type T19, T20

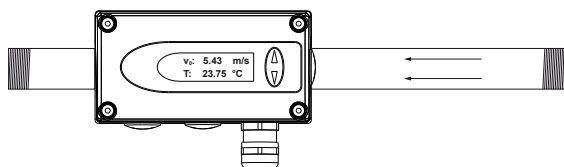


Type T19, T20

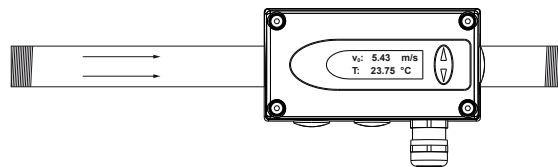


## EE772 compact

Type T19: flow direction right to left

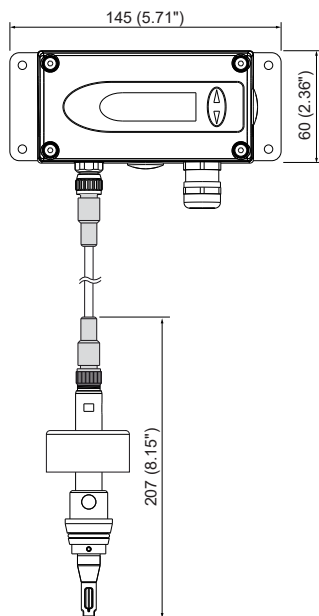


Type T20: flow direction left to right



## EE772 remote

Type T3:

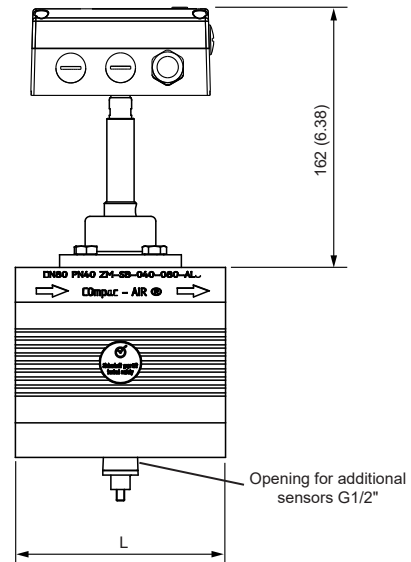
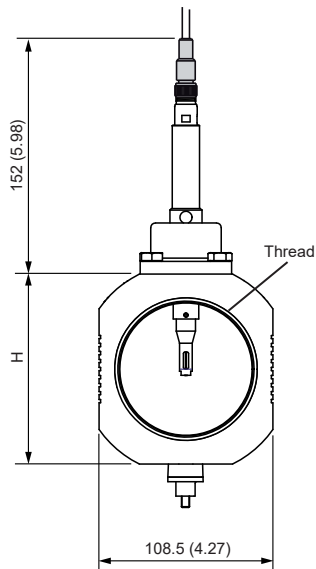


# Dimensions

Values in mm (inch)

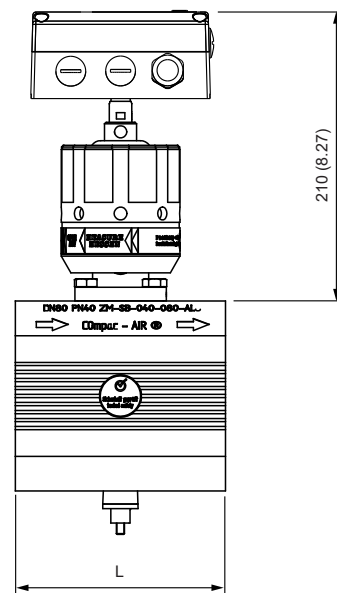
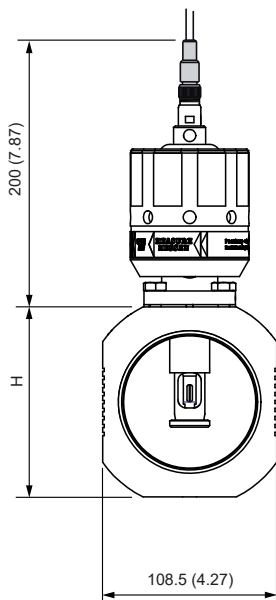
## Gauge mounting block

HA071xxx



## Gauge mounting block with hot tap valve

HA072xxx

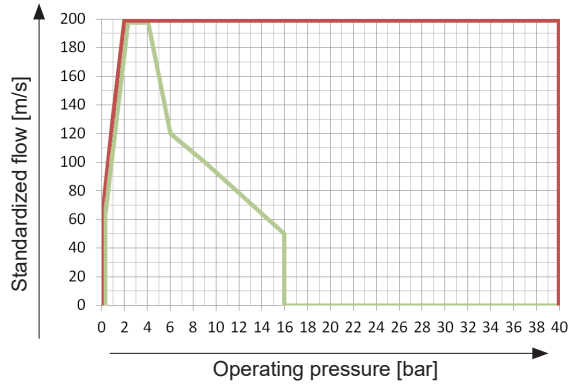


Valve	Thread <sup>1)</sup>	L in mm (inch)	H in mm (inch)
DN40	R <sub>p</sub>	110 (4.3)	108.5 (4.27)
DN50	R <sub>p</sub>	131 (5.2)	108.5 (4.27)
DN65	R <sub>p</sub>	131 (5.2)	108.5 (4.27)
DN80	R <sub>p</sub>	131 (5.2)	118.5 (4.67)

1) Female thread: Whitworth acc. to EN 10226 (old DIN 2999).

# Dimensions

## Flow measuring range as function of operating pressure



Graph for standardized volumetric flow

$$V'_n = v_n * id^2 * \pi/4 * 3600$$

$V'_n$  ... Standardized volumetric flow [m<sup>3</sup>/h]

$v_n$  ... Standardized flow [m/s]

$id$  ... Inner pipe diameter [m]

$\pi$  ... 3.1415927

— Air, nitrogen, O<sub>2</sub>, argon

— CO<sub>2</sub>

Formula for standardized volumetric flow

# Technical Data

## Measurands

### Volume Flow (V'n)

<b>Standard conditions</b>	Factory setting according to DIN 1343 $p_0 = 1013.25 \text{ mbar (14.7 psi)}$ , $T_0 = 0 \text{ °C (32 °F)}$	
<b>Measuring range</b> Standardized volumetric flow in air	<b>Pipe-diameter</b>	<b>HV33 (high)</b>
	<b>DN40 (1 1/2")</b>	2.26...904 m <sup>3</sup> /h (1.33...531.8 SCFM)
	<b>DN50 (2")</b>	3.50...1400 m <sup>3</sup> /h (2.06...823.6 SCFM)
	<b>DN65 (2 1/2")</b>	5.97...1400 m <sup>3</sup> /h (3.51...823.6 SCFM)
	<b>DN80 (3")</b>	9.04...1400 m <sup>3</sup> /h (5.32...823.6 SCFM)
<b>Measuring range</b> Standardized flow in air, CO <sub>2</sub> , nitrogen, argon, O <sub>2</sub>	<b>Pipe-diameter</b>	<b>HV33 (high)</b>
	<b>≤DN50 (2")</b>	0.5...200 m/s (100...39370 SFPM)
	<b>DN65 (2 1/2")</b>	0.5...117 m/s (100...23031 SFPM)
	<b>DN80 (3")</b>	0.5...77 m/s (100...15157 SFPM)
<b>Accuracy</b> <sup>1)</sup> in air @ 7 bar (101.5 psi) (abs) and 23 °C (73 °F)	±(1.5 % of measured value + 0.5 % of full scale)	
<b>Temperature dependency</b>	±(0.1 % of measured value/°C)	
<b>Response time t<sub>90</sub></b> , typ.	<1 s	
<b>Sampling interval</b>	0.1 s	

1) The accuracy statement includes the uncertainty of the factory calibration with an enhancement factor k=2 (2-times standard deviation).  
The accuracy was calculated in accordance with EA-4/02 and with regard to GUM (Guide to the Expression of Uncertainty in Measurement).  
The accuracy specifications apply when using inlet and outlet sections of suitable length, see accessories and User Manual.

### Temperature (T)

<b>Measuring range</b>	-20...+80 °C (-4...+176 °F)
<b>Accuracy</b> @ 20 °C (68 °F)	±0.7 °C (±1.26 °F)

# Technical Data

## Outputs

### Analogue

Signal range and measurands are freely configurable	0 - 10 V 4 - 20 mA 3-wire 0 - 20 mA 3-wire	0 mA < I <sub>L</sub> < 1 mA R <sub>L</sub> < 500 Ω R <sub>L</sub> < 500 Ω	I <sub>L</sub> = load current R <sub>L</sub> = load resistance
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Switch output	Potential free, max. 44 V DC, 500 mA switching capacity
Pulse output	Totalizer, pulse length: 0.02...2 s

### Digital (optional)

Digital interface	RS485 (EE772 = 1 unit load)
Protocol <sup>1)</sup> Factory settings Supported Baud rates Measured data types	Modbus RTU 9600 Baud, parity even, 1 stop bit, Modbus address 1 9600, 19200, 38400 and 57600 FLOAT32
Protocol <sup>2)</sup> Factory settings Supported Baud rates	M-Bus 2400 Baud, parity even, 1 stop bit, M-Bus address 1 600, 1200, 2400, 4800 and 9600



- 1) Find more details about communication setting in the User Manual and the Modbus Application Note at [www.epluse.com/ee772](http://www.epluse.com/ee772).  
2) Find more details about communication setting in the User Manual.

## Input

### External Dynamic Pressure Compensation

Requirements to the pressure sensor	4 - 20 mA (2-wire, 15 V) (relevant for gases other than air and nitrogen)
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## General

Power supply class III  USA & Canada: Class 2 supply necessary, max. voltage 30 V DC	18 - 30 V AC/DC
Current consumption, max.	200 mA (with display)
Electrical connection	Cable gland M16 and screw terminals max. 1.5 mm <sup>2</sup> (AWG 16), optional with connector M12x1, 8 poles
Nominal pressure	40 bar (580 psi)
Humidity range	0...100 %RH, non-condensing
Temperature range	Ambient, Storage Medium -20...+60 °C (-4...140 °F) -20...+80 °C (-4...+176 °F)
Material	Enclosure Probe Probe head Gauge mounting block AlSi9Cu3 (Metal) Stainless steel Stainless steel / glass Aluminium
Protection rating	Enclosure IP65/NEMA 4X
Electromagnetic compatibility	EN 61326-1 FCC Part15 Class B EN 61326-2-3 ICES-003 Class B Industrial environment
Conformity	



# Ordering Guide

The EE772 consists of the sensor (pos. 1) and the gauge mounting block (pos. 2). Both have to be ordered together!  
The probe cable (pos. 3) is only necessary for model T3.

## Position 1 - Sensor

Feature	Description	Code
		<b>EE772-</b>
<b>Hardware Configuration</b>	<b>Type</b>	Compact ri-le (flow direction right to left) Compact le-ri (flow direction left to right) Remote
		<b>T19</b> <b>T20</b> <b>T3</b>
	<b>Measuring range</b>	High
		<b>HV33</b>
	<b>Measurement valve for pipe diameter</b>	DN40 (1 1/2") DN50 (2") DN65 (2 1/2") DN80 (3")
		<b>N40</b> <b>N50</b> <b>N65</b> <b>N80</b>
	<b>Display</b>	Without display Display with backlight
		<b>No code</b> <b>D2</b>
	<b>Mounting</b>	Gauge mounting block Gauge mounting block with hot tap valve
		<b>TG2</b> <b>TG3</b>
<b>Electrical connection</b>	Cable gland and screw terminals 1x plug for power supply and outputs	
	<b>No code</b> <b>E4</b>	
<b>Digital interface</b>	Without digital output RS485 (with Modbus RTU) M-Bus (Meter-Bus)	
	<b>No code</b> <b>J3</b> <b>J5</b>	
<b>Software Setup<sup>1)</sup> Analogue Outputs</b>	<b>Output 1 measurand</b>	Temperature T [°C] Temperature T [°F] Standardized volumetric flow $V'_n$ [m³/h] Standardized volumetric flow $V'_n$ [ft³/min] Mass flow $m'$ [kg/h] Standardized flow $v_n$ [m/s] Standardized flow $v_n$ [ft/min]
		<b>MA1</b> <b>MA2</b> <b>MA83</b> <b>MA87</b> <b>MA80</b> <b>MA22</b> <b>MA23</b>
	<b>Output 1 signal</b>	Analogue output 0 - 5 V 0 - 10 V 0 - 20 mA 4 - 20 mA Switch output
		<b>GA2</b> <b>GA3</b> <b>GA5</b> <b>GA6</b> <b>GA9</b>
	<b>Output 2 measurand</b>	Temperature T [°C] Temperature T [°F] Standardized volumetric flow $V'_n$ [m³/h] Standardized volumetric flow $V'_n$ [ft³/min] Mass flow $m'$ [kg/h] Standardized flow $v_n$ [m/s] Standardized flow $v_n$ [ft/min] Consumption $Q_n$ [m³] <sup>2)</sup> Consumption $Q_n$ [ft³]
		<b>MB1</b> <b>MB2</b> <b>MB83</b> <b>MB87</b> <b>MB80</b> <b>MB22</b> <b>MB23</b> <b>MB91</b> <b>MB93</b>
	<b>Output 2 signal</b>	Switch output Pulse output
		<b>GB9</b> <b>GB10</b>
	<b>Medium</b>	Air Nitrogen CO <sub>2</sub> Argon
		<b>No code</b> <b>FU2</b> <b>FU3</b> <b>FU7</b>

1) Can be changed by the user.

2) Consumption measurement is only possible with pulse output (output 2 = GB10).

# Ordering Guide

## Position 2 - Gauge Mounting Block

Feature	Description	Code	
Hardware	Gauge Mounting Block	DN40	BSP Thread
		DN50	HA071040
		DN65	HA071050
		DN80	HA071065
	Gauge mounting block with hot tap valve	DN40	HA071080
		DN50	HA072040
		DN65	HA072050
		DN80	HA072065
			HA072080

## Position 3 - Probe cable (Model T3 only)

Feature	Description	Code	
Hard.	Cable length	2 m (6.56 ft)	HA010816
		5 m (16.4 ft)	HA010817
		10 m (32.8 ft)	HA010818

# Order Examples

## Position 1 - Sensor

### EE772-T19HV33N80TG3MA83GA6MB91GB10

Feature	Code	Description
Type	T19	Compact ri-le (flow direction right to left)
Measuring range	HV33	High
Measurement valve for pipe diameter	N80	DN80 (3")
Display	No code	Without display
Mounting	TG3	Gauge mounting block with hot tap valve
Electrical connection	No code	Cable gland
Digital interface	No code	Without digital output
Output 1 measurand	MA83	Standardized volumetric flow $V'_n$ [m <sup>3</sup> /h]
Output 1 signal	GA6	4 - 20 mA
Output 2 measurand	MB91	Consumption $Q_n$ [m <sup>3</sup> ]
Output 2 signal	GB10	Pulse output
Medium	No code	Air

# Order Examples

## Position 2 - Gauge mounting block

**HA072080**

DN80 - Gauge mounting block with hot tap valve

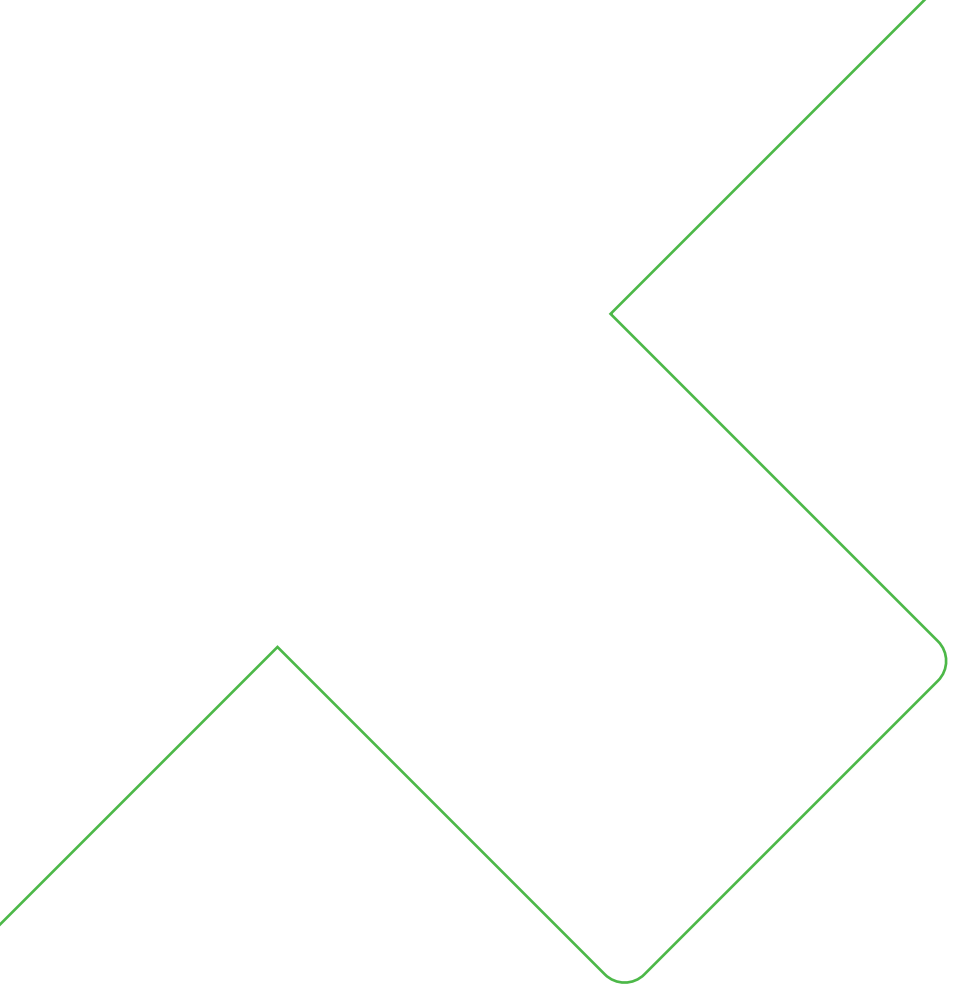
## Position 3 - Probe Cable

Necessary for model T3 only.

# Accessories

For further information see datasheet [Accessories](#).

Description	Code
Dew point sensor	See datasheet EE371 ( <a href="http://www.epluse.com/ee371">www.epluse.com/ee371</a> )
Sampling cell for dew point sensor	HA050102
Quick coupling G1/2" for gauge mounting block	HA070202



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