

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, CO₂, 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

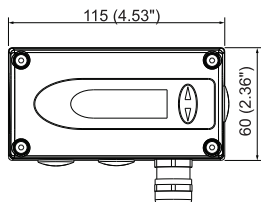
According to DIN EN 10204-3.1

Dimensions

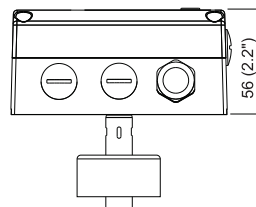
Values in mm (inch)

EE772 compact

Type T19, T20

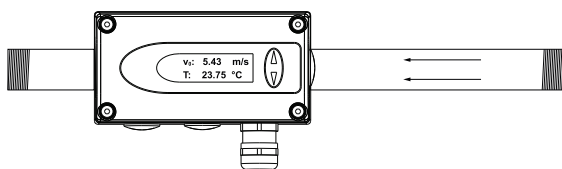


Type T19, T20

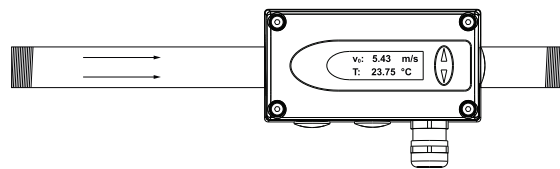


EE772 compact

Type T19: flow direction right to left

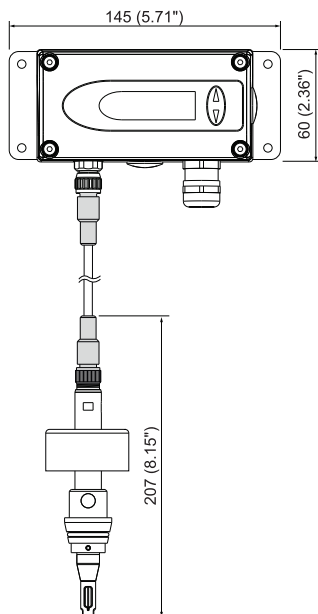


Type T20: flow direction left to right



EE772 remote

Type T3:

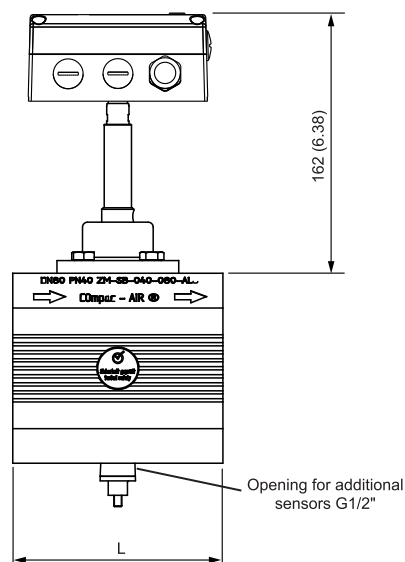
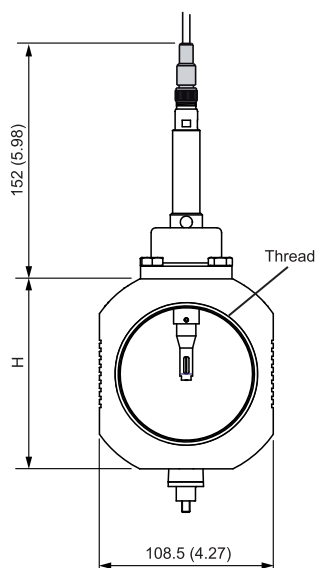


Dimensions

Values in mm (inch)

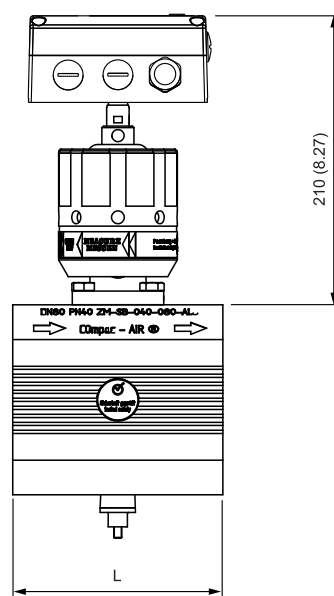
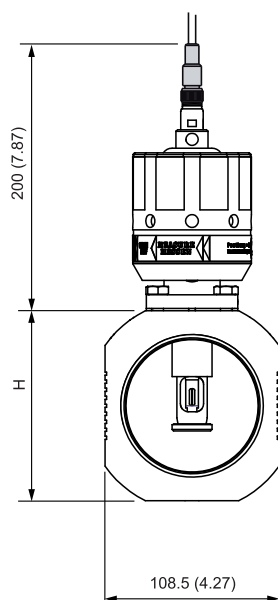
Gauge mounting block

HA071xxx



Gauge mounting block with hot tap valve

HA072xxx

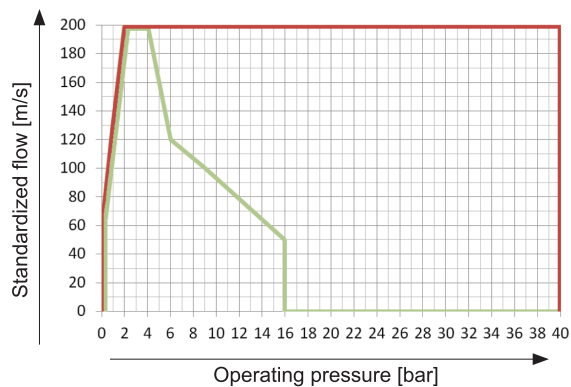


Valve	Thread ¹⁾	L in mm (inch)	H in mm (inch)
DN40	R _p	110 (4.3)	108.5 (4.27)
DN50	R _p	131 (5.2)	108.5 (4.27)
DN65	R _p	131 (5.2)	108.5 (4.27)
DN80	R _p	131 (5.2)	118.5 (4.67)

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

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

V'_n ... Standardized volumetric flow [m³/h]

v_n ... Standardized flow [m/s]

id ... Inner pipe diameter [m]

π ... 3.1415927

— Air, nitrogen, O₂, argon

— CO₂

Formula for standardized volumetric flow

Technical Data

Measurands

Volume Flow (V'n)

Standard conditions	Factory setting according to DIN 1343 $p_0 = 1013.25 \text{ mbar (14.7 psi)}$, $T_0 = 0 \text{ °C (32 °F)}$	
Measuring range Standardized volumetric flow in air	Pipe-diameter	HV33 (high)
	DN40 (1 1/2")	2.26...904 m³/h (1.33...531.8 SCFM)
	DN50 (2")	3.50...1400 m³/h (2.06...823.6 SCFM)
	DN65 (2 1/2")	5.97...1400 m³/h (3.51...823.6 SCFM)
	DN80 (3")	9.04...1400 m³/h (5.32...823.6 SCFM)
Measuring range Standardized flow in air, CO ₂ , nitrogen, argon, O ₂	Pipe-diameter	HV33 (high)
	≤DN50 (2")	0.5...200 m/s (100...39370 SFPM)
	DN65 (2 1/2")	0.5...117 m/s (100...23031 SFPM)
	DN80 (3")	0.5...77 m/s (100...15157 SFPM)
Accuracy ¹⁾ in air @ 7 bar (101.5 psi) (abs) and 23 °C (73 °F)	±(1.5 % of measured value + 0.5 % of full scale)	
Temperature dependency	±(0.1 % of measured value/°C)	
Response time t₉₀ , typ.	<1 s	
Sampling interval	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)

Measuring range	-20...+80 °C (-4...+176 °F)
Accuracy @ 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 _L < 1 mA R _L < 500 Ω R _L < 500 Ω	I _L = load current R _L = load resistance
---	--	--	---

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 ¹⁾ Factory settings Supported Baud rates Measured data types	Modbus RTU 9 600 Baud, parity even, 1 stop bit, Modbus address 1 9 600, 19 200, 38 400 and 57 600 FLOAT32
Protocol ²⁾ Factory settings Supported Baud rates	M-Bus 2 400 Baud, parity even, 1 stop bit, M-Bus address 1 600, 1 200, 2 400, 4 800 and 9 600



- 1) Find more details about communication setting in the User Manual and the Modbus Application Note at 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)
-------------------------------------	---

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 mm2 (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
Hardware Configuration		EE772-
	Type	Compact ri-le (flow direction right to left) Compact le-ri (flow direction left to right) Remote
		T19 T20 T3
	Measuring range	High
		HV33
	Measurement valve for pipe diameter	DN40 (1 1/2") DN50 (2") DN65 (2 1/2") DN80 (3")
		N40 N50 N65 N80
	Display	Without display Display with backlight
		No code D2
	Mounting	Gauge mounting block Gauge mounting block with hot tap valve
		TG2 TG3
Software Setup ¹⁾ Analogue Outputs	Electrical connection	Cable gland and screw terminals 1x plug for power supply and outputs
		No code E4
	Digital interface	Without digital output RS485 (with Modbus RTU) M-Bus (Meter-Bus)
		No code J3 J5
	Output 1 measurand	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]
		MA1 MA2 MA83 MA87 MA80 MA22 MA23
	Output 1 signal	Analogue output 0 - 5 V 0 - 10 V 0 - 20 mA 4 - 20 mA Switch output
		GA2 GA3 GA5 GA6 GA9
	Output 2 measurand	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 ²⁾] Consumption Q_n [ft³]
		MB1 MB2 MB83 MB87 MB80 MB22 MB23 MB91 MB93
	Output 2 signal	Switch output Pulse output
		GB9 GB10
	Medium	Air Nitrogen CO ₂ Argon
		No code FU2 FU3 FU7

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		BSP Thread
	Gauge Mounting Block	DN40
		DN50
		DN65
		DN80
	Gauge mounting block with hot tap valve	DN40
		DN50
		DN65
		DN80

Position 3 - Probe cable (Model T3 only)

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

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 [m³/h]
Output 1 signal	GA6	4 - 20 mA
Output 2 measurand	MB91	Consumption Q_n [m³]
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 (www.epluse.com/ee371)
Sampling cell for dew point sensor	HA050102
Quick coupling G1/2" for gauge mounting block	HA070202

