

# EE771 Series

## Flowmeter for compressed air and gases in Industrial Applications

The flowmeter of the series EE771, based on the measurement principle of thermal mass flow, is ideally suited for the measurement of flow of compressed air and gasses. Measurement of for instance the usage of compressed air, nitrogen, oxygen, CO2 or other non-corrosive gasses.

The EE771 is setting new standards in terms of measurement accuracy and reproducibility thanks to its application-specific adjustment during production. This flow meter is adjusted under a pressure of 7 bar. Adjusting the device specifically for its application has the advantage of keeping the actual flow speed in the pipeline low even with very large flow quantities. Thanks to the more stable flow profile, this low flow speed facilitates a much better degree of reproducibility and accuracy than if the device were adjusted conventionally under normal pressure, as flow speeds up to 200 m/s can often no longer be controlled under conventional adjustment pressures.

The core design of the flow meter is based on the E+E hot film sensor element, which is produced using the most modern thin film technology and has already proven itself time and time again in the automotive industry. This flow sensor features excellent long-term stability, a fast response time and an extremely high degree of reliability.

Two outputs are available, for further processing of the measurement data. Depending on the application, these outputs can be configured as analogue (current or voltage), switch output or as pulse output for the measurement of the consumption.



EE771 Compact



EE771 remote probe

### Customer Value

#### Reduce cost of compressed air

Accurate measurement of compressed air consumption and detection of leaks

#### Accountability of consumption per cost centre

Measuring the individual consumption per customer / cost centre

#### Early detection of machine failures

Compressed air consumption levels for individual machines or systems are tracked

#### Very low maintenance costs

Simple and fast installation and removal of the probe

#### Installation also in existing systems

Sturdy and easy to install

### Typical Applications

Measurement of consumption of compressed air

Compressed air counter

Mass flow measurement of industrial gases

### Features

high accuracy  $\pm 2.5\%$  of reading

exceptional reproducibility

quick sensor exchange at line pressure

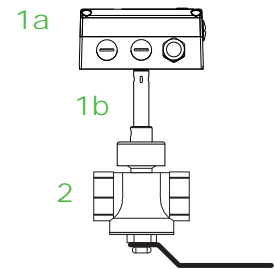
broad working range of 1 : 400

very service friendly

## Construction

The flow meter consists of the transmitter and the mounting valve. The transmitter is modular and consists of the probe and the signal conditioner. The measurement probe contains the sensor element and the measurement electronics, in which the data of the factory calibration is stored. The enclosure with the signal conditioning is mounted either on the measurement probe (compact) or is remote with a sensor cable up to 10 meters (33 feet). The mounting valve assembly allows for the easy and reliable installation within the pipeline. The high measurement accuracy is guaranteed by the accurate, reproducible positioning of the probe within the mounting valve.

- 1 **Transmitter**
  - 1a Enclosure with signal conditioning and optional display
  - 1b Measurement probe with sensor and measurement electronics
- 2 **Mounting ball valve**



## Assembly with ball valve

The ball valve assembly allows for the exact alignment of the sensing head within seconds during installation and removal, with only interrupting the process flow for a short moment.

The ball valve assembly is suitable for pressures up to 16 bar (PN16) and available for pipe diameters DN15 (1/2") to DN50 (2").

During installation in the pipeline, observe the required inlet and outlet paths as given in the operating instructions.



## Measurement of consumption (totalizer)

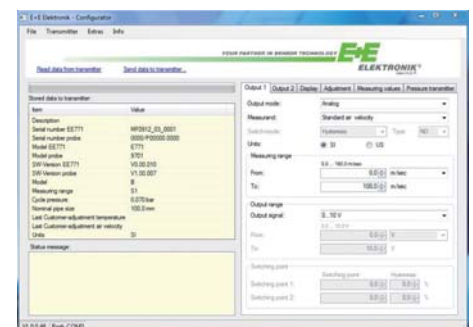
The EE771 holds an integrated counter for the usage. The amount is indicated in the display and stored; the data will not be lost due to a power outage. The availability of the consumption amount as a free configurable pulse output is another helpful feature.

## Configuration software

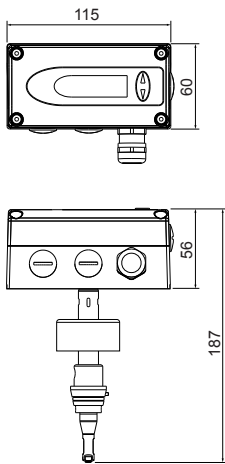
The EE771 flowmeter can be configured conveniently, to meet the requirements of the application with the standard configuration software and the integrated USB interface.

### Functionality:

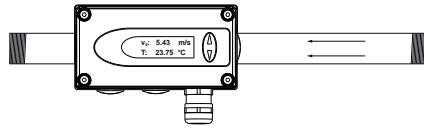
- Configuration of the output (scale / set point)
- 2-point user calibration for flow and temperature
- Readout of the counter values
- Reset of min / max values and counter
- Indication of the measurement value



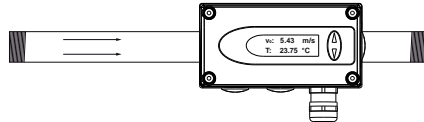
Dimensions (mm)



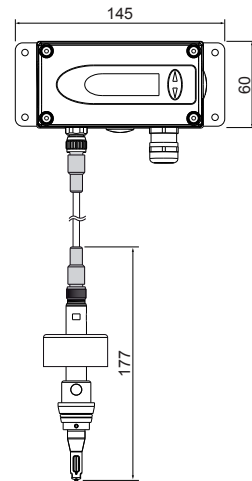
**EE771-A and EE771-B**  
**Compact**



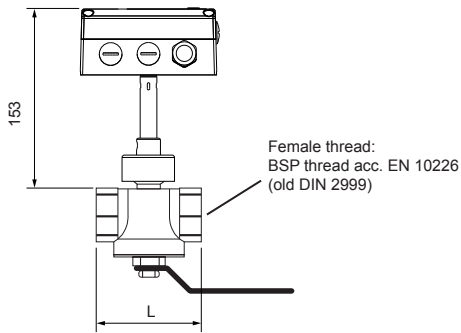
**EE771-A** direction of flow is right to left



**EE771-B** direction of flow is left to right



**EE771-C**  
**Remote probe**

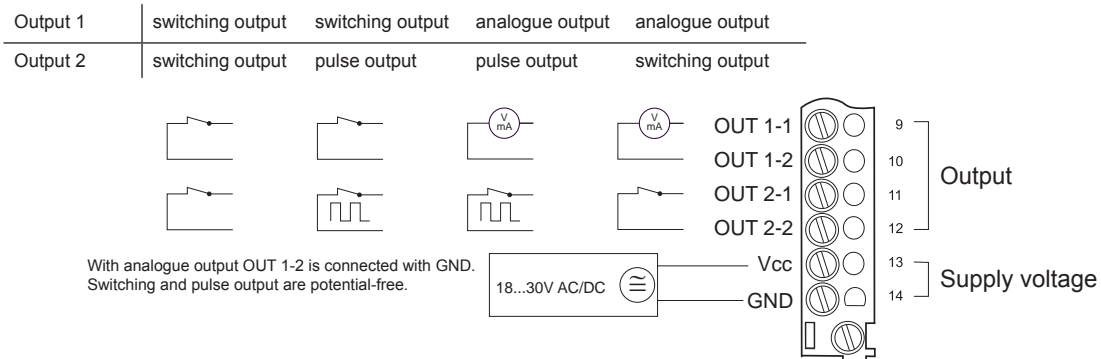


**HA075xxx**  
**Ball valve**

Ball valve	Thread	L
DN15	R1/2"	83,7
DN20	R3/4"	72,7
DN25	R1"	88
DN32	R1 1/4"	100
DN40	R1 1/2"	110
DN50	R2"	131

Dimensions in mm

Connection Diagram



## Technical Data

### Measuring value

#### Flow

Measurand

Volumetric flow at standard conditions acc. DIN 1343

$P_0 = 1013,25 \text{ mbar}$ ;  $t_0 = 0 \text{ °C}$  (273,15 K)

Measuring range		low (L1)		high (H1)	
standardized	DN15:	0,32...63 Nm <sup>3</sup> /h	0.19...37.1 SCFM	0,32...126 Nm <sup>3</sup> /h	0.19...74.1 SCFM
volumetric flow	DN20:	0,57...113 Nm <sup>3</sup> /h	0.34...66.5 SCFM	0,57...226 Nm <sup>3</sup> /h	0.34...133 SCFM
	DN25:	0,90...176 Nm <sup>3</sup> /h	0.53...103.5 SCFM	0,90...352 Nm <sup>3</sup> /h	0.53...207.1 SCFM
	DN32:	1,45...289 Nm <sup>3</sup> /h	0.85...170.0 SCFM	1,45...578 Nm <sup>3</sup> /h	0.85...340 SCFM
	DN40:	2,26...452 Nm <sup>3</sup> /h	1.33...265.9 SCFM	2,26...904 Nm <sup>3</sup> /h	1.33...531.8 SCFM
	DN50:	3,50...700 Nm <sup>3</sup> /h	2.06...411.8 SCFM	3,50...1400 Nm <sup>3</sup> /h	2.06...823.6 SCFM
standardized flow	≤DN50:	0,5...100 Nm/s	100...19685 SFCM	0,5...200 Nm/s	100...39370 SFCM

Accuracy in air at 7bar (abs) and 23°C (73°F)<sup>1)</sup> ± (2,5% of measuring value + 0,15% of full scale)

Accuracy of temperature compensation ± (0,1% of measuring value/°C)

Response time  $t_{90}$  typ. 1 sec.

Sample rate 0,1 sec.

#### Temperature

Measuring range -20...80 °C (-4...176 °F)

Accuracy at 20°C (68°F) ± 0,7 °C (1.26 °F)

### Outputs

Output signal and display ranges are freely scalable

Analogue output voltage 0 - 10 V max. 1 mA  
current (3-wire) 0 - 20 mA and 4 - 20 mA  $R_i < 500 \text{ Ohm}$

Switching output potential-free max. 44 VDC, 500 mA switching capacity

Pulse output Totalizator, pulse length: 0,02...2 sec.

Digital interface USB (for configuration)

### Input

Optional pressure compensation 4 - 20 mA (2-wire; 12 V) for pressure sensor

### General

Supply voltage 18 - 30 V AC/DC

Current consumption max. 200 mA (with display)

Temperature range ambient temperature: -20...60 °C (-4...140 °F)

medium temperature: -20...80 °C (-4...176 °F)

storage temperature: -20...60 °C (-4...140 °F)

Nominal pressure up to 16 bar (232 Psi)

Humidity no condensation

Medium compressed air or none corrosive gases

Connection cable gland M16x1,5 (optional connector M12x1 8pol.)

Electromagnetic compatibility EN61326-1 EN61326-2-3

Industrial Environment

Material housing metal (AlSi3Cu)

probe stainless steel

sensor head plastic (PBT)

ball valve brass

Housing protection class IP65 / Nema 4



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).

## Ordering Guide

The complete Flow meter consists of the Transmitter (pos. 1) and the mounting valve (pos. 2). Both have to be ordered together! The probe cable (pos. 3) is only necessary for model C.

Position 1 - Transmitter			EE771-
<b>Hardware Configuration</b>			
<b>Model</b>	Compact ri-le Compact le-ri remote probe	direction od flow right to left direction od flow left to right	A B C
<b>Working range</b>	low high		L1 H1
<b>Mounting valve for pipe diameter</b>	DN15 DN20 DN25 DN32 DN40 DN50		N015 N020 N025 N032 N040 N050
<b>Display</b>	without display with display		D
<b>Mounting</b>	ball valve		K
<b>Plug</b>	cable gland 1 plug for power supply and outputs		C12
<b>Software Configuration</b>			
<b>Physical parameters of output 1</b>			
	Temperature	T [°C] [°F]	B
	standardized volumetric flow	V <sub>0</sub> [Nm <sup>3</sup> /h] [SCFM]	R
	mass flow	m <sup>1</sup> [kg/h]	S
	standardized flow	v <sub>0</sub> [Nm/s] [ft <sup>3</sup> /min]	T
<b>Physical parameters of output 2</b>			
	Temperature	T [°C] [°F]	B
	standardized volumetric flow	V <sub>0</sub> [Nm <sup>3</sup> /h] [SCFM]	R
	mass flow	m <sup>1</sup> [kg/h]	S
	standardized flow	v <sub>0</sub> [Nm/s] [ft <sup>3</sup> /min]	T
	consumption <sup>1)</sup>	Q <sub>0</sub> [Nm <sup>3</sup> ] [ft <sup>3</sup> ]	I
<b>Output 1</b>	0-5 V analogue output 0-10 V 0-20 mA 4-20 mA		2 3 5 6
	switching output		S
<b>Output 2</b>	switching output pulse output <sup>2)</sup>		S I
<b>Measured value unit</b>	metric / SI none metric US / GB		E01
<b>Medium</b>	Air Nitrogen CO2 Oxygen other gases		B C D on request
<b>Position 2 - mounting valve</b>			
	DN15 - ball valve	HA075015	
	DN20 - ball valve	HA075020	
	DN25 - ball valve	HA075025	
	DN32 - ball valve	HA075032	
	DN40 - ball valve	HA075040	
	DN50 - ball valve	HA075050	
<b>Position 3 - Probe cable (only model C)</b>			
<b>cable length</b>	2 m	HA010816	
	5 m	HA010817	
	10 m	HA010818	

1) consumption measuring is possible only with pulse output (output 2 = I)

## Order Example

### Position 1 - Transmitter

#### EE771-AL1N025K/RI6I

Model: Compact ri-le  
 Working range: low 0.9 ... 176 Nm<sup>3</sup>/h  
 Measuring pipe-diameter: DN25  
 Display: no  
 Mounting: ball valve  
 Plug: cable gland  
 Phys. parameter output 1: standardized volumetric flow  
 Phys. parameter output 2: consumption  
 Output 1: 4-20mA  
 Output 2: pulse output  
 Measured value unit: metric SI

### Position 2 - mounting valve

#### HA070025

DN25 - ball valve