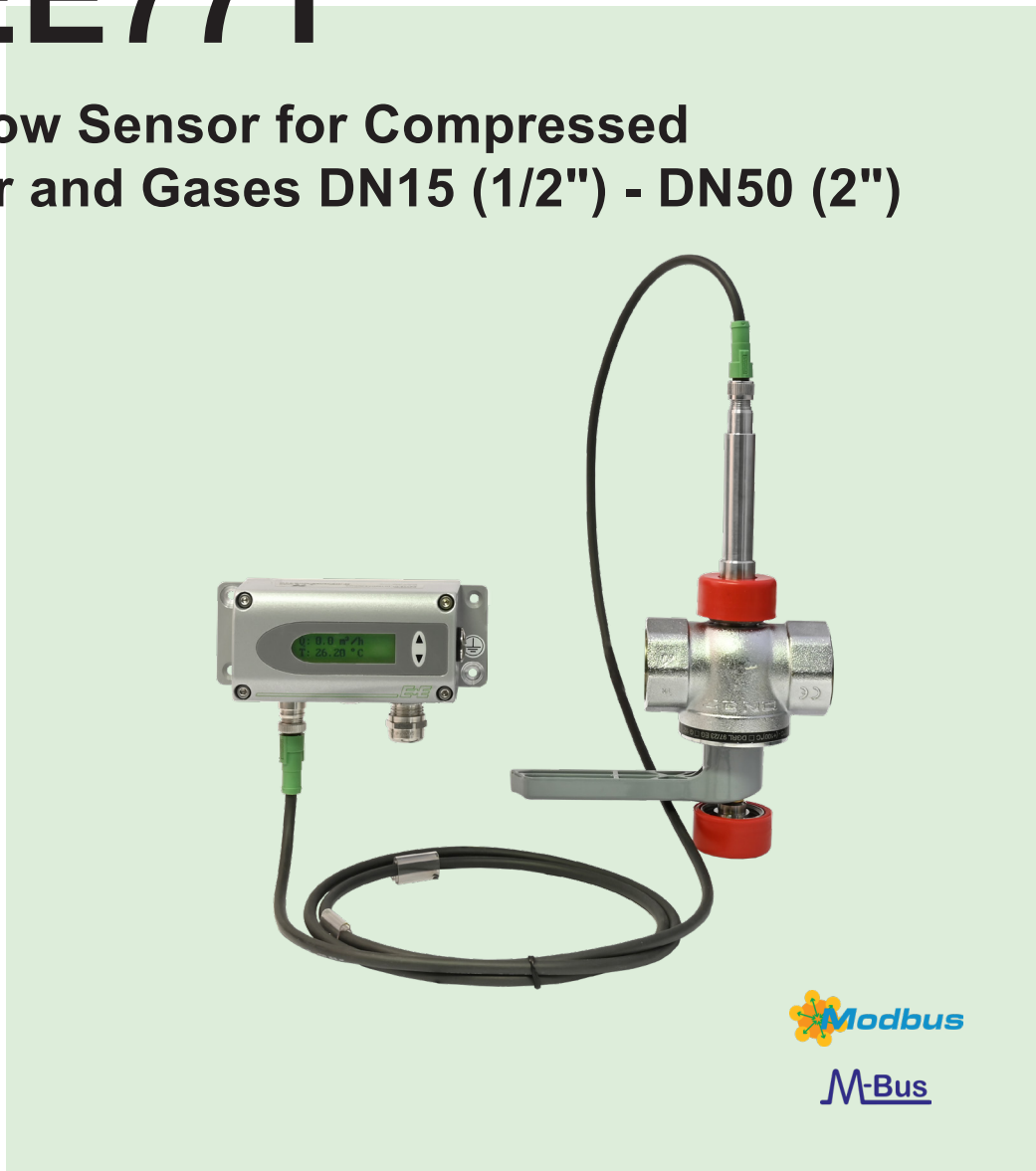




—
your partner
in sensor
technology.

+ Datasheet EE771

**Flow Sensor for Compressed
Air and Gases DN15 (1/2") - DN50 (2")**



EE771

Flow Sensor for Compressed Air and Gases DN15 (1/2") - DN50 (2")

The EE771 is ideal for flow measurement in pipelines with diameters of DN15 (1/2") up to DN50 (2"). Besides the temperature (T) the sensor provides the values for standardized volume 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, O₂, argon or other non-corrosive, non-flammable gases with a pressure of up to 16 bar (232 psi).

Precision and Reliability

The EE771 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 measurement valve with shut-off function permits rapid installation and removal of the device with only short flow interruption. It ensures high measurement accuracy through exact and reproducible sensing head positioning in the pipe.

Versatile Output Options

The EE771 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 EE771.



EE771 Compact



EE771 Remote

Features

Consumption metering

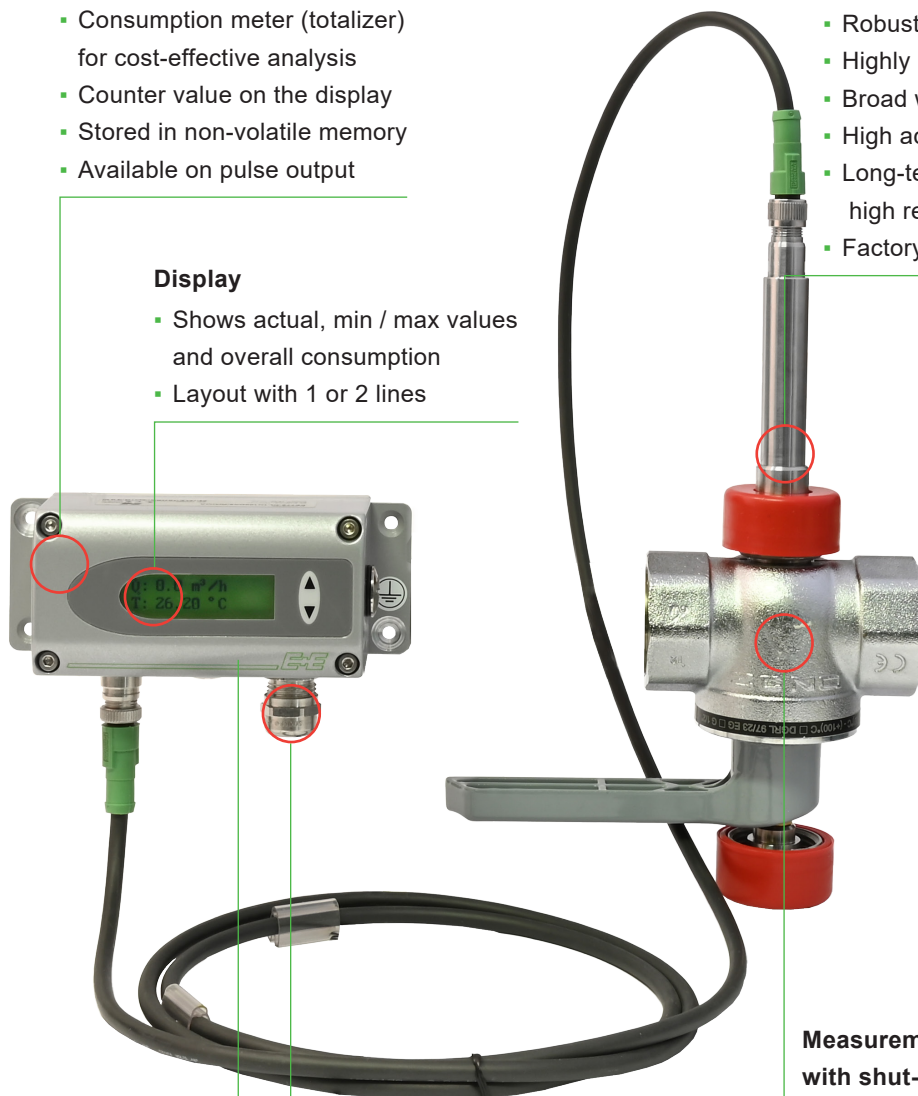
- Consumption meter (totalizer) for cost-effective analysis
- Counter value on the display
- Stored in non-volatile memory
- Available on pulse output

Display

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

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



Measurands

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

Output

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

Measurement valve with shut-off function

- Fail-safe alignment of sensing unit
- Service friendly due to <15 s flow interruption for sensor unit installation
- Best accuracy due to precise and reproducible positioning of the sensing head
- Pressure rating 16 bar (232 psi)
- Sealing plug allows for running the process also without sensor

Inspection certificate

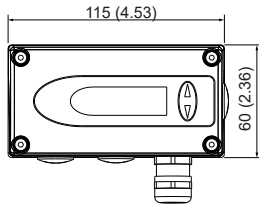
According to DIN EN 10204-3.1

Dimensions

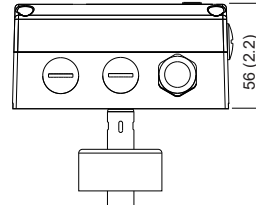
Values in mm (inch)

EE771 compact

Type T19, T20

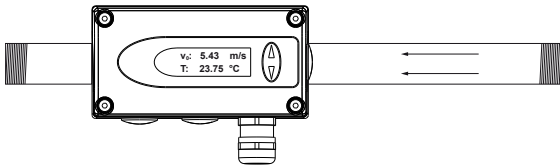


Type T19, T20

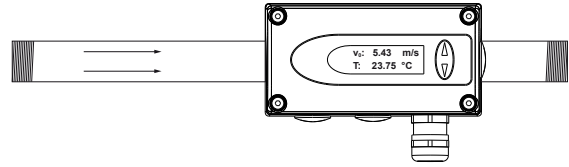


EE771 compact

Type T19: flow direction right to left

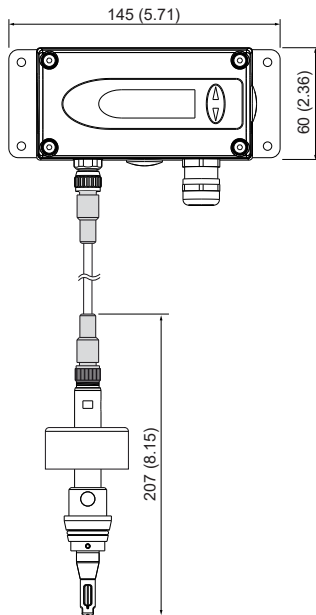


Type T20: flow direction left to right



EE771 remote

Type T3:

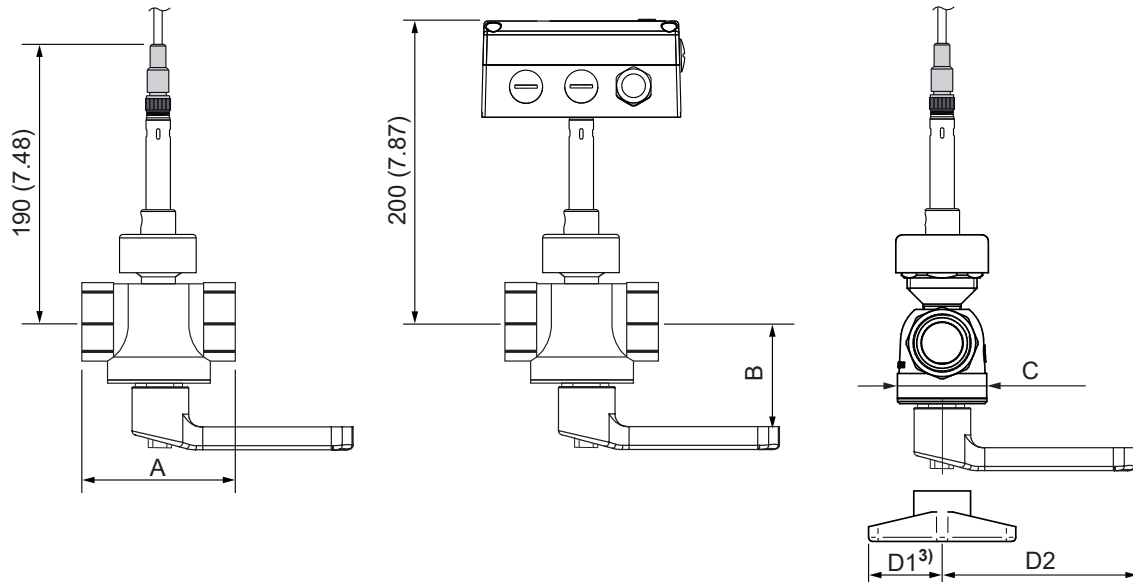


Dimensions

Values in mm (inch)

Measurement valve with shut-off function

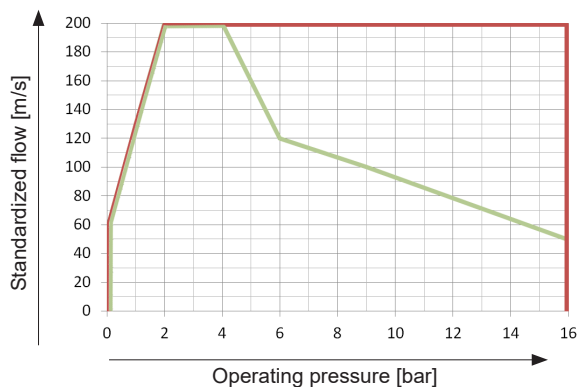
HA075xxx:



Valve	Thread ¹⁾	A	B	C	D1 ³⁾	D2	ISO	NPT
DN15	R _p 1/2"	100±8 (3.94±0.32) ²⁾	55 (2.28)	43 (1.69)	36 (1.46)	92 (3.62)	HA075015	Not available
DN20	R _p or NPT 3/4"	73 (2.83)	55 (2.28)	43 (1.69)	36 (1.46)	92 (3.62)	HA075020	HA175020
DN25	R _p or NPT 1"	88 (3.27)	67 (2.28)	52 (2.00)	48 (1.73)	125 (4.92)	HA075025	HA175025
DN32	R _p 1 1/4"	100 (3.94)	77 (2.64)	62 (2.44)	–	125 (4.92)	HA075032	Not available
DN40	R _p or NPT 1 1/2"	110 (4.33)	83 (3.27)	74 (2.91)	–	147 (5.79)	HA075040	HA175040
DN50	R _p or NPT 2"	131 (5.16)	88 (3.46)	90 (3.54)	–	147 (5.79)	HA075050	HA175050

- 1) Female thread: BSP thread acc. to EN 10226 (old DIN 2999) or NPT.
- 2) Including reduction 3/4" - 1/2"
- 3) Phasing out, mixed deliveries are possible in the transition phase.

Flow measuring range as function of operating pressure



Graph for standardized volume flow

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

V'_n ... Standardized volume 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 volume flow

Technical Data

Measurands

Volume Flow (V'n)

Standard conditions	Factory setting according to DIN 1343 pn = 1013.25 mbar (14.7 psi); Tn = 0 °C (32 °F), configurable			
Measuring range Standardized volume flow in	Medium	Pipe-diameter	HV31	HV33
	Air	DN15 (1/2")	0.32...63 m³/h (0.19...37.1 SCFM)	0.32...126 m³/h (0.19...74.1 SCFM)
		DN20 (3/4")	0.57...113 m³/h (0.34...66.5 SCFM)	0.57...226 m³/h (0.34...133 SCFM)
		DN25 (1")	0.90...176 m³/h (0.53...103.5 SCFM)	0.90...352 m³/h (0.53...207.1 SCFM)
		DN32 (1 1/4")	1.45...289 m³/h (0.85...170.0 SCFM)	1.45...578 m³/h (0.85...340 SCFM)
		DN40 (1 1/2")	2.26...452 m³/h (1.33...265.9 SCFM)	2.26...904 m³/h (1.33...531.8 SCFM)
		DN50 (2")	3.50...700 m³/h (2.06...411.8 SCFM)	3.50...1 400 m³/h (2.06...823.6 SCFM)
Measuring range Standardized flow in	Medium	Pipe-diameter	HV31	HV33
	Air, CO₂, Nitrogen, Argon	≤DN50 (2")	0.5...100 m/s (100...19685 SFPM)	0.5...200 m/s (100...39370 SFPM)
	O₂	≤DN25 (1")	0.5...77 m/s (100...15157 SFPM)	0.5...200 m/s (100...39370 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 t ₉₀ , 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
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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 (EE771 = 1 unit load)
Protocol ¹⁾ 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 ²⁾ 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/ee771.
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 ² (AWG 16), optional with connector M12x1, 8 poles
Nominal pressure	16 bar (232 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 Measurement valve AlSi9Cu3 (Metal) Stainless steel Stainless steel / glass Brass
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 EE771 consists of the sensor (pos. 1) and the measurement valve with shut-off function (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		
		EE771-		
Hardware Configuration	Type	Compact ri-le (flow direction right to left) Compact le-ri (flow direction left to right) Remote	T19 T20 T3	
	Measuring range	0.5...100 m/s (100...19685 SFPM) 0.5...200 m/s (100...39370 SFPM)	HV31 HV33	
	Measurement valve for pipe diameter	DN15 (1/2") DN20 (3/4") DN25 (1") DN32 (1 1/4") DN40 (1 1/2") DN50 (2")	N15 N20 N25 N32 N40 N50	
	Display	Without display Display with backlight	No code D2	
	Mounting	Measurement valve with shut-off function	No code	
	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	
	Cleaning	Without Degreased for oxygen measurement	No code AF2	
	Software Setup¹⁾ Analogue Outputs	Output 1 measurand	Temperature T [°C] Temperature T [°F] Standardized volume flow V _n [m ³ /h] Standardized volume flow V _n [ft ³ /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 volume flow V _n [m ³ /h] Standardized volume flow V _n [ft ³ /min] Mass flow m' [kg/h] Standardized flow v _n [m/s] Standardized flow v _n [ft/min] Consumption Q _n [m ³ /h ²] Consumption Q _n [ft ³]	MB1 MB2 MB83 MB87 MB80 MB22 MB23 MB91 MB93
		Output 2 signal	Switch output Pulse output	GB9 GB10
Medium		Air Nitrogen CO ₂ O ₂ ³⁾ Argon	No code FU2 FU3 FU4 FU7	

1) Can be changed by the user.

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

3) Medium O₂ only for mounting valve DN15 up to DN25. Upon delivery, the mounting valve and the probe are free of oil and grease.

Ordering Guide

Position 2 - Measurement valve with shut-off function

Feature	Description	Code	Code	
Hardware	Measurement valve	BSP Thread	NPT Thread	
		DN15	HA075015	Not available
		DN20	HA075020	HA175020
		DN25	HA075025	HA175025
		DN32	HA075032	Not available
		DN40	HA075040	HA175040
		DN50	HA075050	HA175050
	Measurement valve O ₂	DN15	HA076015	Not available
		DN20	HA076020	HA176020
		DN25	HA076025	HA176025

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

EE771-T19HV31N25MA83GA6MB91GB10

Feature	Code	Description
Type	T19	Compact ri-le (flow direction right to left)
Measuring range	HV31	0.5...100 m/s (100...19685 SFPM)
Measurement valve for pipe diameter	N25	DN25 (1")
Display	No code	Without display
Mounting	No code	Measurement valve with shut-off function
Electrical connection	No code	Cable gland and screw terminals
Digital interface	No code	Without digital output
Output 1 measurand	MA83	Standardized volume flow V'_n [m ³ /h]
Output 1 signal	GA6	4 - 20 mA
Output 2 measurand	MB91	Consumption Q_n [m ³]
Output 2 signal	GB10	Pulse output
Medium	No code	Air

Order Examples

Position 1 - Sensor

EE771-T3HV31N15D2J3AF2MA1GA2MB1GB9

Feature	Code	Description
Type	T3	Remote
Measuring range	HV31	0.5...100 m/s (100...19 685 SFPM)
Measurement valve for pipe diameter	N15	DN15 (1/2")
Display	D2	Display with backlight
Mounting	No code	Measurement valve with shut-off function
Electrical connection	E1	1x M16x1.5 cable gland
Digital interface	J3	RS485 (with Modbus RTU)
Cleaning	AF2	Degreased for oxygen measurement
Output 1 measurand	MA1	Temperature T [°C]
Output 1 signal	GA2	0 - 5 V
Output 2 measurand	MB1	Temperature T [°C]
Output 2 signal	GB9	Switch output
Medium	No code	Air

Position 2 - Measurement Valve

HA075025

DN25 - measurement valve with shut-off function

Position 3 - Probe Cable

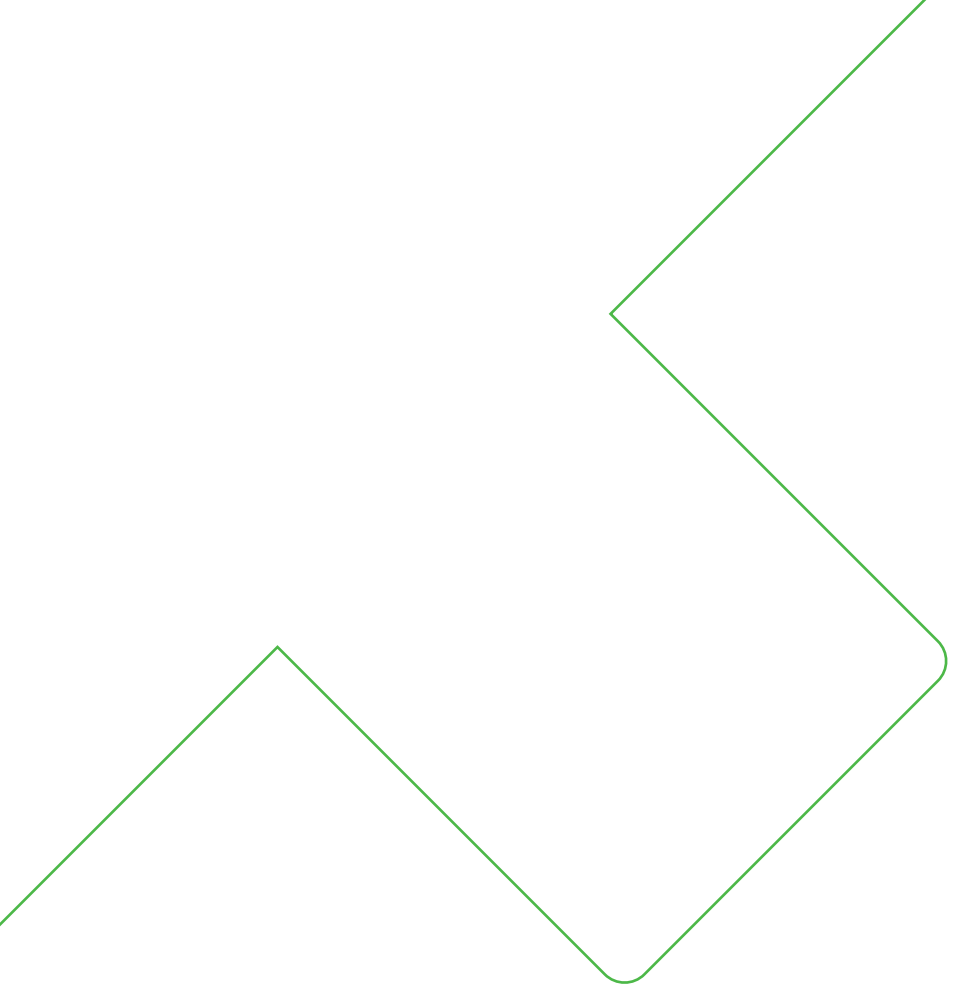
Necessary for model T3 only.

Accessories

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

Description	Code
Inlet and outlet section for Measurement valve with shut-off function	
DN15 ^{*)}	HA070215
DN20 ^{*)}	HA070220
DN25 ^{*)}	HA070225
DN32 ^{*)}	HA070232
DN40 ^{*)}	HA070240
DN50 ^{*)}	HA070250

^{*)} Inlet and outlet pipe section is available for measurement valve with shut-off function with BSP thread only.



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