



FLOWSIC550

HIGH PRESSURE GAS FLOW METER
FOR NATURAL GAS DISTRIBUTION

Gas flow meters

SICK
Sensor Intelligence.

READY FOR THE FUTURE: WITH CUTTING-EDGE TECHNOLOGY FOR NATURAL GAS MEASUREMENT

Benefit from the latest technology for the ultimate in measurement accuracy: In 2012 SICK introduced the first ultrasonic gas flow meter for natural gas distribution. Now, thousands of installations later, we present the FLOWSIC550 - the new ultrasonic gas meter dedicated to high-pressure applications in natural gas distribution and midstream measurement systems. With the FLOWSIC550, SICK now expands its portfolio of ultrasonic gas flow meters and offers a suitable solution for small nominal diameters in the high-pressure range.

FLWSIC550: Simple, cost-effective installation and integration

The FLOWSIC550 is easy to install, requiring only 3D straight upstream and 2D straight downstream piping.

The integrated and patented flow conditioner allows the use in most compact installations and fulfills accuracy requirements for Class 1, according to OIML R 137. Therefore, it can easily be integrated in existing measuring installations.

Gas flow measurement and volume correction have the same goal: providing a precise measurement of the quantity of gas supplied. The FLOWSIC550 combines all functions into one device, thereby helping to save on installation costs and reducing the number of interfaces. The integrated volume corrector supports all typical correction algorithms, such as SGERG88, AGA 8 options e.g. DC92 Gross 1 & Gross 2, and AGA NX-19.

Integrated volume correction

Battery powered

Only 3D upstream piping to achieve Class 1, acc. OIML R 137

High turn down ratio



REPLACING MECHANICAL FLOW METERS WITH MODERN ULTRASONIC TECHNOLOGY

To replace high pressure turbine meters with smart ultrasonic technology is now as easy as never before. Finally, the next step for the digitalization and modernization of the gas grid can be made. FLOWSIC550 adds digital connectivity, with RS485 Modbus and self-diagnostic capabilities, enabling remote access and condition-based maintenance. This saves operational efforts and increases measurement availability and reduces loss of unaccounted gas (LAUF).

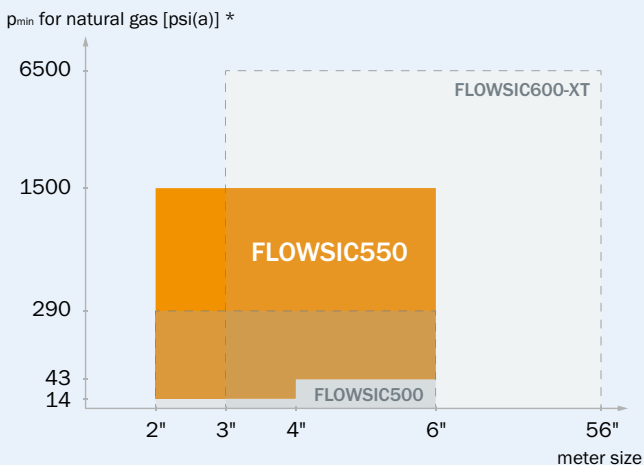
FLAWSIC550 makes a 1:1 replacement of mechanical high pressure gas flow meters in existing installations possible. The design of new metering stations can benefit by leveraging

the high turn down ratio of FLOWSIC550. Where before two meters had to be installed, now only one ultrasonic flow meter can do the job.

FLAWSIC550 with its integrated flow conditioners provides a solution for compact meter stations where other high pressure ultrasonic meters could not be installed up to now. Another key feature of the device is that it can be either battery powered to up to five years, or line-powered.

Four nominal diameters – all easy to operate

Thanks to the use of ultrasound technology and the absence of mechanical components, the FLOWSIC550 offers a competitive advantage over turbine and rotary displacement meters. The FLOWSIC550 operates either in an energy self-sufficient configuration or with external power supply. When utilized in transfer and measuring stations, FLOWSIC550 ensures a continuous and blockage-free gas supply.



* operation with air at ambient pressure possible



UNIQUE METER DESIGN

The design of FLOW SIC550 is unique

The core elements of the FLOW SIC550 is the patented flow conditioner in combination with a compact path layout, using reflective path technology.

The design leads to 40% less material usage for the meter and the metering package and additionally the pressure drop could be reduced up to 20% compared to the FLOW SIC500 design.

Increasing efficiency in gas distribution

- Gas measurement of low volume applications at high pressures
- Custody transfer: gas distribution and transmission systems
- Town border stations and city gate stations
- Compressor fuel gas measurement
- High pressure industrial gas measurement
- Applications where a continuous gas supply must be ensured

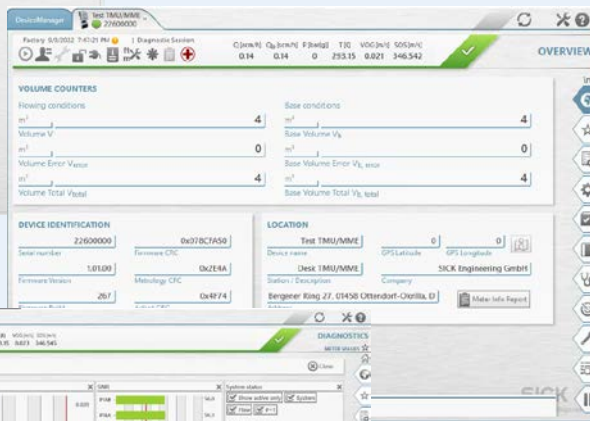


FLOWGATE™ OPERATING SOFTWARE

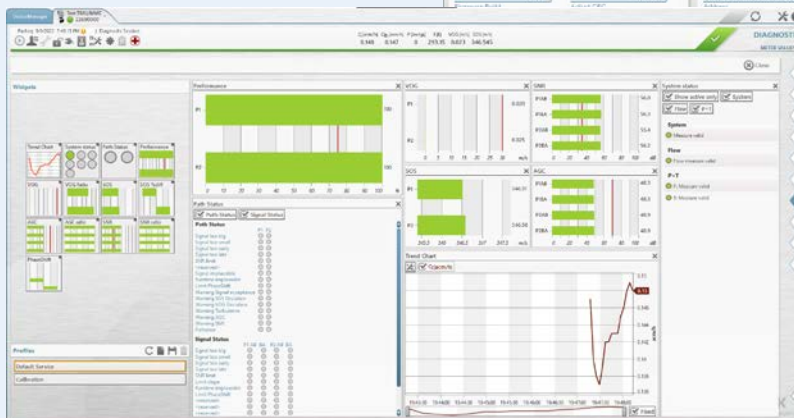
- The FLOWgate™ user software offers a user-friendly and results-oriented solution for all life cycle management tasks of the FLOWSIC550.
- FLOWgate™, with its wizards for calibration, commissioning and device diagnostics, supports the almost maintenance-free operation of the gas flow meter and can also be used to remotely monitor the gas flow meter.
- The Device Manager shows all registered devices, and offers device grouping and a convenient data backup function. Thanks to the integrated database you can access the stored data anytime offline or online.
- The intuitive operation and multi-language support of FLOWgate™ makes the FLOWSIC550 gas flow meter easy to use.



Device Manager



Meter values



Overview

HIGH PRESSURE GAS FLOW METER FOR NATURAL GAS DISTRIBUTION



Product description

The cutting-edge technology for natural gas measurement: The new FLOW-SIC550 ultrasonic compact gas meter from SICK ensures highly accurate metering for low volumes at high pressures in gas distribution - a perfect addition to FLOWSIC500. In absence of mechanical moving parts, the FLOWSIC550 is a robust, fail-safe, and low-maintenance device – allowing for a significant reduction in operating costs. It is over-

load-proof, accurate, and is monitored by an intelligent diagnostics system. FLOWSIC550 can easily be integrated into existing measuring stations. The FLOWSIC550 operates either in an energy self-sufficient configuration or in network operation. When utilized in transfer and measuring stations, FLOWSIC550 ensures a continuous and blockage free gas supply.

At a glance

- Rugged and time-proven ultrasound technology
- Diagnostics and permanent operational self-monitoring
- Durable and reliable without moving parts
- Compact meter installations
- Integrated volume correction
- Battery or intrinsically safe power supply
- Bluetooth Low Energy (BLE)

Your benefits

- Ultimate measurement certainty and safety of continuous gas supply
- Simple installation, compatible with turbine gas meters
- Reduction of installation costs due to integrated volume correction
- Easy Commissioning and data reading via FLOWgate™ (PC and App)
- Minimal operating costs due to being nearly maintenance-free
- Reliable even when the gas flow fluctuates (on/off applications)
- Self-sufficient operation

Fields of application

- Gas Measurement of low volume applications at high pressures
- Custody transfer: gas distribution, uni-directional storage, and transmission systems
- Town border stations and city gate stations
- High pressure industrial gas measurement
- Compressor fuel gas measurement
- Critical applications where continuous gas supply must be ensured

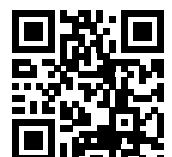


More information

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→ www.sick.com/FLOWSIC550

For more information, simply visit the above link to obtain direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications. Please contact your local SICK representative for information about the performance of the FLOWSIC550 for your application.

System

Measured values	Volume a.c., volume flow a.c., gas velocity In addition, for integrated volume correction: volume s.c., volume flow s.c.
Measurement principle	Ultrasonic transit time difference measurement
Measuring medium	Natural gas (dry, odorized), air
Measuring ranges	DN50 2" 88 cf/h ... 5650 cf/h at p_{\min} 12 psi(a) DN80 3" 141 cf/h ... 14125 cf/h at p_{\min} 12 psi(a) DN100 4" 777 cf/h ... 22955 cf/h at p_{\min} 44 psi(a) 229 cf/h ... 22955 cf/h at p_{\min} 145 psi(a) DN150 6" 1872 cf/h ... 56503 cf/h at p_{\min} 44 psi(a) 565 cf/h ... 56503 cf/h at p_{\min} 145 psi(a) Pressure ranges valid for natural gas, meter operation possible at ambient pressure for air
Repeatability	≤ 0.1%
Accuracy	Accuracy class 1; typical error limits Q_{\min} up to $0.1 Q_{\max}$ ≤ ± 1% $0.1 Q_{\max}$ up to Q_{\max} ≤ ± 1% Accuracy class 1; maximum allowed error limits Q_{\min} up to $0.1 Q_{\max}$ ≤ ± 2% $0.1 Q_{\max}$ up to Q_{\max} ≤ ± 1% After high pressure flow calibration: ± 0.2% at test pressure, otherwise ± 0.5%
Diagnostic functions	Permanent monitoring of measured values
Gas temperature	-40 °F ... +158 °F
Operating pressure	ANSI300 (ASME B16.5) up to 706 psi(g) for -40 °F ... +158 °F ANSI600 (ASME B16.5) up to 1410 psi(g) for -40 °F... +158 °F PN40 (EN 1092-1) up to 580 psi(g) for -40 °F ... +158 °F PN63 (EN 1092-1) up to 914 psi(g) for -40 °F ... +158 °F
Ambient temperature	-40 °F ... +158 °F
Conformities	MID: 2014/32/EU (DN100/4" and DN150/6" MID approval pending) OIML R 137-1&2:2012 EN 12405: 2010 (for integrated volume correction) AGA 9, 2022
Ex approvals	ATEX II 2 (1)G Ex ia [ia Ga] T4 IIB Gb IECEX Ex ia [ia Ga] T4 IIB Gb NEC/CEC (US/CA) Class I Division 1, Groups C, D T4 Ex ia [ia Ga] IIB T4 Gb Class I, Zone 1 AEx ia [ia Ga] IIB T4 Gb
Enclosure rating	IP66
Digital outputs	2x Pulse and Status (HF with f_{\max} = 2 kHz, LF with f_{\max} = 10 Hz) 2x RS485, external powered Encoder
RS485 protocol	Modbus RTU Modbus ASCII ISO 17089-1
Interface	Wired M12/USB Adapter or wireless adapter
Material in contact with media	Low Temperature Carbon Steel

Mounting	Horizontal or vertical installation Min. piping requirements depending on predisturbance: Mild: 3D straight inlet/2D straight outlet Severe: 5D straight inlet/2D straight outlet	
Electrical connection	Intrinsically safe supply 8 V DC ... 16 V DC, max. 50 mA Battery powered, life time 5 years (optional)	
Dimensions	see dimensional drawings	
Weight	DN50/2" DN80/3" DN100/4" DN150/6"	57 lbs 101 lbs 192 lbs 456 lbs

VOLUME CORRECTION

Accuracy	Conversion factor C	Accuracy class 0.5 Maximum permitted error limits of $\leq \pm 0.5\%$ (at reference conditions)
Correction method		PTZ
Compressibility		SGERG88 AGA 8 Gross method 1 AGA 8 Gross method 2 AGA 8 DC92 AGA NX-19 AGA NX-19 mod. GERG91 Fixed value
Data archives		Measurement period archive (6,000 entries) Daily archive (600 entries) Monthly archive (25 entries) Diagnostic archive (6,000 entries)
Log books		Event log book (1,000 entries) Parameter log book (250 entries) Metrology log book (100 entries) Gas parameter log book (150 entries)
Pressure sensor	Absolute pressure Gauge pressure	12 psi(a) ... 290 psi(a) 102 psi(a) ... 508 psi(a) 203 psi(a) ... 1015 psi(a) 363 psi(a) ... 1886 psi(a) 0 psi(g) ... 1015 psi(g) 0 psi(g) ... 1500 psi(g)
Temperature sensor		-40 °F ... +158 °F (PT1000 class A)

SIZING CHART

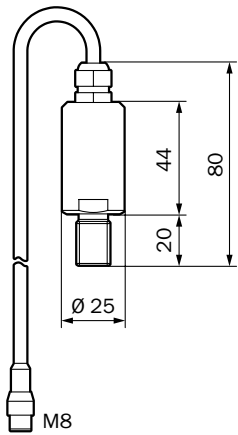
Corrected Capacity at Metering Pressure in MSCFH at Various Operating Pressures [psi(g)]					
Operating Pressure [psi(g)]	Meter Size	2"	3"	4"	6"
	Model	5.5 M	14 M	23 M	35 M
	Rating (ACFH)	5600	14000	23000	35000
	1	6	14.9	-	-
5	7.5	18.7	-	-	
10	9.4	23.4	-	-	
15	11.3	28.2	-	-	
20	13.2	32.9	-	-	
25	15.0	37.6	-	-	
50	24.5	61.2	100.6	244.8	
75	33.9	84.7	139.2	338.8	
100	43.2	108.1	177.6	432.5	
125	52.6	131.4	215.9	525.7	
150	61.9	154.7	254.1	618.7	
175	71.1	177.8	292.1	711.3	
200	80.3	200.9	330.0	803.5	
275	107.8	269.5	442.7	1078.0	
285	111.4	278.6	457.7	1114.3	
300	116.9	292.2	480.0	1168.7	
400	152.8	382.0	627.5	1527.9	
500	188.1	470.2	772.5	1880.8	
600	222.7	556.8	914.7	2227.2	
700	256.7	641.7	1054.2	2566.9	
800	290.0	724.9	1190.9	2899.6	
900	322.5	806.3	1324.7	3225.3	
1000	354.3	885.3	1455.3	3543.4	
1100	385.4	963.6	1583.1	3854.5	
1200	415.9	1039.8	1708.2	4159.1	
1300	445.6	1114.0	1830.1	4456.0	
1400	474.6	1186.5	1949.3	4746.1	

Ordering information

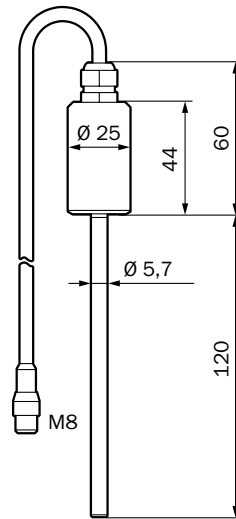
Our regional sales organization would be happy to advise you on what device configuration is best for you.

Dimensional drawing (Dimensions in mm)

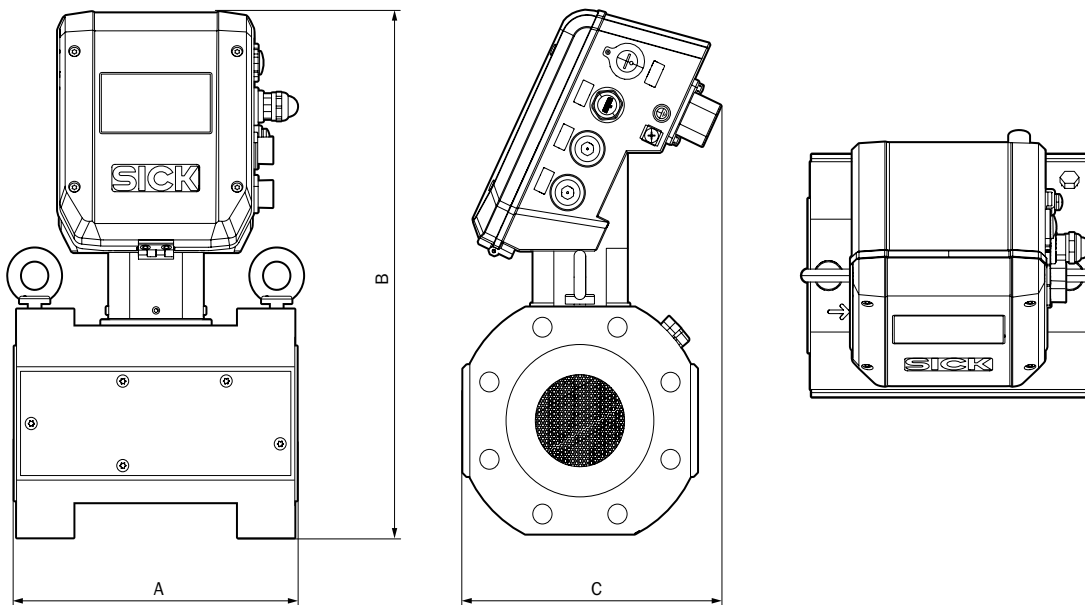
Temperature sensor



Temperature sensor



FLAWSIC550

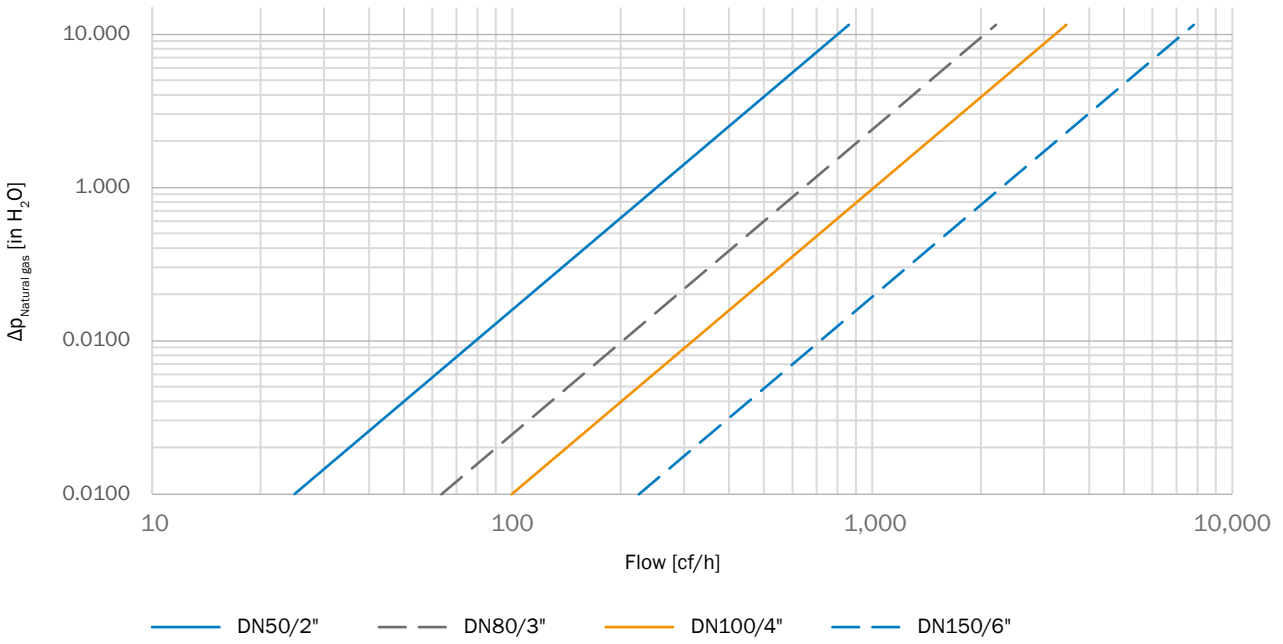


Nominal size	Dimensions [mm]		
	A	B	C
DN50/2"	150	425	220
DN80/3"	240	425	220
DN100/4"	300	500	250
DN150/6"	450	560	300

Application areas

Pressure loss

FLWSIC550 causes a typical pressure loss of:



Reference density natural gas: $\rho = 0.052 \text{ lb/cf}$

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 11,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

That is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com