Azbil

Технические характеристики

Реле контроля потока газа

CMG

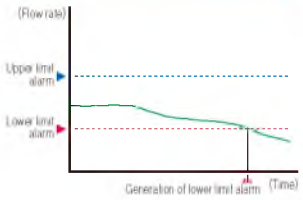
Реле контроля потока газа CMG

High-accuracy, high-speed response measurement

The gas flow monitor equipped withMicro Flow (μF) sensor realizes a compact body and high accuracy of ±4%RD. It also eliminates the need for correction of measured values generally affected by changes in temperature and pressure, due to its method of mass flow measurement.

Easy gas flow measurement and management

The gas flow monitor' digital indication of instantaneous / integrated flow rate is visible from a distance, and its measurement status can be indicated by Hi, Lo, OVER, ALARM LEDs.



Other functions, for example, setting the upper limit and lower limit alarms, and using contact and analog signals as external outputs, are effective for flow management, such as monitoring quantity of fuel used.

Most suitable for burner applications

Because of its structure to minimize pressure loss, The gas flow monitor is the most suitable for burner applications that are sensitive to pressure loss.

Free directions for mounting and indication in any direction

Unlike conventional controllers, gas flow monitor does not require straight piping at upstream and downstream sides.*

Indication direction can also be changed, allowing easy mounting in any direction.(* Refer to Precautions item 5)

Compact body with IP54 protective structure

With a compact mask of 83.9X83.9mm and protective structure of IP54(JIS C 0920), the CMG series can be installed without restrictions.

Self-diagnosis function

The self-diagnosis function is effective for troubleshooting.

Specifications

■ City gas 13A (LNG) and air models

Item		Contents						
Model No.		CMG150	CMG250	CMG400		CMG500		
Connection port	Thread	1/2 Rc	1 Rc	1 1/2 Rc		2 Rc		
Applicable gas		City gas (13A-46MJ), City gas (13A-45MJ) (Note 1), Air						
Measurement range m³/h (normal)		0.5 to 4.0	1.0 to 10.0	3.0 to 30.0	8.0 to 80.0	15.0 to 150.0	8.0 to 80.0	15.0 to 150.0
Indication range m³/h (normal)		0.0 to 7.0	0.0 to 16.0	0.0 to 35.0	0.0 to 100.0	0.0 to 170.0	0.0 to 100.0	0.0 to 170.0
Rated voltage		24V DC,100V AC, 200V AC						
Flow indication method		Flow quality at 0°C and 1 atmospheric pressure conversion						
Sampling cycle		100ms ±10%						
Ambient temperature		-10 to +60°C (no condensation allowed)						
Ambient humidity		90%RH at 40°C (no condensation allowed)						
Indication accuracy		Momentary flow indication accuracy: ±4%RD ± 1 digit (10 to 40°C) ±6%RD ± 1 digit (-10 to +60°C)						
Momentary flow output		1 to 5V DC output 4 to 20 mA output Output range: 0 to measurement range upper limit (changeable by parameter setting)						
Integral flow output		Measurement range: For decimal point 2-digit; Select either 0.001m³/h pulse or 0.01m³/h pulse For decimal point 1-digit; Select either 0.01m³/h pulse or 0.1m³/h pulse Output configuration: NPN open collector output						
Relay output		Contact (closes at an event generation) Contact rating: 250V AC, 30V DC, 5A (resistance load)						
Applicable pressure		Pressure code "0" model: 0 to 100 kPa (0 to 1bar) Pressure code "1" model: 0 to 1 MPa (0 to 10bar)						
Pressure resistance		Pressure code "0" model: 150 kPa max. (1.5bar max) Pressure code "1" model: 1.5 MPa max. (15bar max)						
Pressure loss (Note 2) (Upper limit value of air measurement range)	Thread	140 Pa	215 Pa	210 Pa	500 Pa	1300 Pa	285 Pa	550 Pa
	Flange	–	–	–	500 Pa	1300 Pa	285 Pa	550 Pa
Straight pipe length (cm)		–	–	15 min.	10 min.	40 min.	10 min.	40 min.
Protection		IP54 (JIS C 0920)						
Weight	Thread	850g	800g		2100g		2000g	

* User's manual No. : CP-SP-1113E

■ Butane and propane models

Item		Contents						
Model No.		CMG150	CMG250	CMG400		CMG500		
Connection port		1/2 Rc	1 Rc	1 1/2 Rc		2 Rc		
Applicable gas		Butane gas (butane 75% + propane 25%), Propane gas (butane 98% + propane 2%)						
Measurement range m³/h (normal)	Propane	0.20 to 2.00	0.40 to 4.00	1.00 to 10.00	2.5 to 25.00	5.0 to 50.00	2.5 to 25.00	5.0 to 50.00
	Butane	0.10 to 1.00	0.30 to 3.00	0.80 to 8.00	2.0 to 20.00	4.0 to 40.00	2.0 to 20.00	4.0 to 40.00
Indication range m³/h (normal)	Propane	0.00 to 3.00	0.00 to 6.00	0.00 to 12.00	0.0 to 30.00	0.0 to 55.00	0.0 to 30.00	0.0 to 55.00
	Butane	0.00 to 1.50	0.00 to 4.50	0.00 to 10.00	0.0 to 25.00	0.0 to 45.00	0.0 to 25.00	0.0 to 45.00
Rated voltage		24V DC,100V AC, 200V AC						
Flow indication method		Flow quality at 0°C and 1 atmospheric pressure conversion						
Sampling cycle		100ms ±10%						
Ambient temperature		-10 to +60°C (no condensation allowed)						
Ambient humidity		90%RH at 40°C (no condensation allowed)						
Indication accuracy		Momentary flow indication accuracy: ± 6%RD ± 1 digit at 10 to 40°C						
Momentary flow output		1 to 5V DC output 4 to 20 mA output Output range: 0 to measurement range upper limit (changeable by parameter setting)						
Integral flow output		Measurement range: For decimal point 2-digit; Select either 0.001m³/h pulse or 0.01m³/h pulse For decimal point 1-digit; Select either 0.01m³/h pulse or 0.1m³/h pulse Output configuration: NPN open collector output						
Relay output		Contact (closes at an event generation) Contact rating: 250V AC, 30V DC, 5A (resistance load)						
Applicable pressure		0 to 100 kPa (0 to 1bar)						
Pressure resistance		150 kPa max. (1.5bar max)						
Straight pipe length (cm)		–	–	15 min.	10 min.	40 min.	10 min.	40 min.
Protection		IP54 (JIS C 0920)						
Weight		850g	800g	2100g		2000g		

* User's manual No. : CP-SP-1113E

Note 1: City gas 13A is based on the gases shown below, which are produced from LNG. If the composition of your 13A is different, contact Azbil Corporation.

Gas type name	Calorific value (MJ)	Methane (%)	Ethane (%)	Propane (%)	Batane (%)
City gas 13A-46MJ	46.04655	88	5.8	4.5	1.7
City gas 13A-45MJ	45.007	88.9	6.8	3.1	1.2

Note 2: Pressure loss of 13A city gas is calculated by multiplying 0.64 specific gravity. (in the case of 13A city gas for the CMG150 model, the pressure loss is approx. 90 Pa. (140 Pa x 0.64 where 140 Pa is the pressure loss by air)

Selection Guide

■ City gas 13A (LNG) and air models

Example: CMG150A0041A0000

Table	Selection								Description
I	Basic Model No.	CMG	↓	↓	↓	↓	↓	↓	Gas flow monitor
II	Piping size	15	O	–	–	–	–	–	15A (1/2B)
		25	–	O	–	–	O	–	25A (1B)
		40	–	–	O	O	–	O	40A (1.5B)
		50	–	–	O	O	–	O	50A (2B)
III	Piping type	0	O	O	O	–	O	O	Rc thread
		1	–	–	–	O	–	–	JIS 10K flange
IV	Gas type	A	O	O	O	O	O	O	Air
		N	O	O	O	O	–	–	City gas 13A 46MJ (LNG)
		G	O	O	O	O	–	–	City gas 13A 45MJ (LNG)
V	Flow range	004	O	–	–	–	–	–	4 m^3/h (normal)
		010	–	O	–	–	–	–	10 m^3/h (normal)
		030	–	O	–	–	O	–	30 m^3/h (normal)
		080	–	–	O	O	–	O	80 m^3/h (normal)
		150	–	–	O	O	–	O	150 m^3/h (normal)
VI	Output	0	O	O	–	–	–	–	1 to 5V DC
		1	O	O	O	O	O	O	4 to 20 mA + event
VII	Pressure	0	O	O	O	–	–	–	Low (0 to 100 kPa)
		1	–	–	–	O	O	O	Medium (0 to 1 MPa)
VIII	Communication	0	O	O	O	O	O	O	None
IX	Power	0	O	O	O	O	–	–	24V DC
		1	O	O	O	O	O	O	100V AC (50/60Hz)
		2	O	O	O	O	O	O	200V AC (50/60Hz)
X	Option	00	O	O	O	O	O	O	None
		D0	O	O	O	O	O	O	Inspection certificate provided
		Y0	O	O	O	O	O	O	Traceability certificate provided

■ Butane and propane models

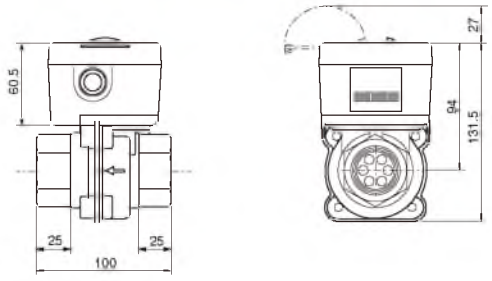
Example: CMG150P0021A0000

Table	Selection								Description
I	Basic Model No.	CMG	↓	↓	↓	↓	↓	↓	Gas flow monitor
II	Piping size	15	O	–	–	O	–	–	15A (1/2B)
		25	–	O	–	–	O	–	25A (1B)
		40	–	–	O	–	–	O	40A (1.5B)
		50	–	–	O	–	–	O	50A (2B)
III	Piping type	0	O	O	O	O	O	O	Rc thread
IV	Gas type	B	O	O	O	–	–	–	Butane
		P	–	–	–	O	O	O	Propane
V	Flow range	001	O	–	–	–	–	–	1 m^3/h (normal)
		002	–	–	–	O	–	–	2 m^3/h (normal)
		003	–	O	–	–	–	–	3 m^3/h (normal)
		004	–	–	–	–	O	–	4 m^3/h (normal)
		008	–	O	–	–	–	–	8 m^3/h (normal)
		010	–	–	–	–	O	–	10 m^3/h (normal)
		020	–	–	O	–	–	–	20 m^3/h (normal)
		025	–	–	–	–	–	O	25 m^3/h (normal)
		040	–	–	O	–	–	–	40 m^3/h (normal)
		050	–	–	–	–	–	O	50 m^3/h (normal)
VI	Output	0	O	O	–	O	O	–	1 to 5V DC
		1	O	O	O	O	O	O	4 to 20 mA + event
VII	Pressure	0	O	O	O	O	O	O	0 to 100 kPa (0 to 1bar)
VIII	Communication	0	O	O	O	O	O	O	None
IX	Power	0	O	O	O	O	O	O	24V DC
		1	O	O	O	O	O	O	100V AC (50/60Hz)
		2	O	O	O	O	O	O	200V AC(50/60Hz)
X	Option	00	O	O	O	O	O	O	None
		D0	O	O	O	O	O	O	Inspection certificate provided
		Y0	O	O	O	O	O	O	Traceability certificate provided

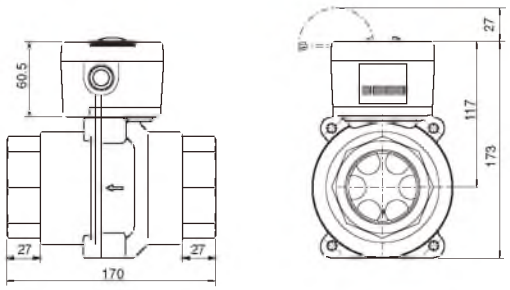
Dimensions

(unit:mm)

• **CMG150/250**



• **CMG400/500**



Датчик массового расхода воздуха MCS100

The air mass flow sensors in the MCS100 series are suitable for air flow rate measurement in various types of physical science equipment as well as confirmation of vacuum suction of minute electronic parts.

Features

- 5 ms high-speed response by a mass flow meter sensor of Azbil's original technology
- A larger output differential can be secured between pickup and non-pickup conditions when comparing with a standard pressure sensor
- Compact and lightweight allowing the flow sensor to be installed anywhere even just above the nozzle (direct mounting onto the air tube between nozzle and ejector), enabling the high response for detection of pickup
- Accurate detection is ensured by the MCS' unique flow rate measurement system which is not influenced by suction pressure fluctuations like pressure sensors are
- Single setup control is possible at controller side due to an analog output signal even if pickup nozzle is changed. Filter clogging or nozzle deformation can be detected with flow rate at non-pickup state
- Both pickup and bringing-back of chip in the mounting process can be detected because the flow in both positive and reverse directions can be detected

Расходомер массового расхода воздуха CMS

High performance and high range ability Gas Flow Meters.

Description

The CMS series of gas mass flow meters employs our proprietary thermal flow rate sensor as the sensing element. Through integration of this ultraminiature mass flow sensor, which is manufactured using micromachining technology and advanced ultrafine channel design, an unprecedented level of high accuracy and wide measurement range have been achieved at low cost. Boasting both ease of use and high reliability, these flowmeters will set the standard for the future.

Manufactured by silicon micro-machining and thin-film technologies, this thermal type flow sensor is a mere 1,7 mm² and 0,5 mm thick.

The use of ultra-precision machining technology minimizes variations in element layout and thermal capacity. High resolution of 1 mm/s in flow speed and high-speed response of approximately 2 ms are achieved at the sensor chip level.

When gas flow does not exist, the temperature distribution around the heater is symmetric. When the gas starts to flow from Ru to Rd, the temperature at Ru upstream begins to decrease, while the temperature at Rd downstream increases, thus causing a distortion in the symmetry in temperature distribution.
This temperature difference between Ru and Rd is used to calculate the mass velocity (velocity x density).

Features

- The gas mass flowmeter is equipped with a mass flow sensor to offer high accuracy of +/- 3% RD, repeatability of 0,5% FS and wide range ability of 100:1, all at low cost
- To obtain stable measurement, a conventional flowmeter requires a long straight piping area at the upstream side. The gas mass flowmeter, however, can assure stable measurement without a straight piping area, due to the superior performance of μF sensor and Azbil's rectification mechanism. It can even be connected to an elbow pipe, allowing for easy design of piping layout
- The gas mass flowmeter offers a variety of functions, such as instantaneous / integrated flow rate indication, analog output, integrated pulse output, event output (2 points) and analog output scaling function and RS-485 communications
- Only 500 Pa pressure loss, when the primary pressure is 49 kPa for the CMS200, due to a special measurement method on the flow path wall
- A broad selection of the gas mass flowmeter is available to meet any application and price range. Choose a suitable model according to flow rate range, gas passage material, types of gas measured, etc.

Панель контроллер массового расхода воздуха MPC

World's smallest (48 mm² x 73 mm deep) and lightest (300g) mass flow controller.

Description

Panel-mount mass flow controllers in the MPC series combine our proprietary ultra high-speed mass flow sensor with a compact proportioning solenoid valve, a new flow channel structure, and advanced actuator control technology. Controllers can be installed on the front of a panel.

Features

- Small and Light mass flow controller
  Compact (front panel: 48 x 48 mm, depth: 73,7 mm) and light (300g)
  panel mounting body contains a built-in miniature proportioning valve, enabling full-automated flow control
- Azbil's original mass flow sensor
  High speed (1 sec.), high accuracy (2% FS) flow control unaffected by pressure and temperature fluctuations
- Easy operation and easy mounting
  Easy operation and easy mounting even for the purge meter users. Once the flowrate set point is set, all the operations are automatically done by the MPC. External set point change (from PLC or host systems) is easy, using optional analog setting input function or communication function (RS-485).
- Pipe connections and electrical wiring terminals are arranged on the rear of the body, enabling easy mounting. Wiring is easy by connector type terminal

Компактный датчик массового расхода воздуха MCS200

The compact air mass flow sensors in the MCS200 series can be used with atmosphere analyzers to measure air flow rate or with gas analyzers to measure nitrogen flow rate, and can be used to confirm vacuum suction of minute electronic parts.
Compared to the MCS100 series, these sensors are smaller and lighter.
Connection to piping is made through manifolds.

Description

The MCS200 is a compact, fast-response air/nitrogen mass flow sensor equipped with Azbil's own mass flow meter sensor chip. The MCS200 outputs the flow rate converted to standard conditions (20 °C, 1 atm), without the need for temperature or pressure compensation.
The MCS200 offers wide rangeability and various flow rate ranges. It is ideal for flow measurements in numerous scientific and industrial applications.

Features

- Compact and lightweight
  - S and L types: 28,2 x 10,0 x 12,1 mm (including mounting tabs and connector socket), weighing just 5 g.
  - R type: 28,2 x 10,0 x 11,8 mm (including mounting tabs and connector socket), weighing just 5 g.
- Can be installed in extra small mounting space using manifold mounting
- Fast response time: 5 ms max.
- High accuracy
  - S and L types: +/- 3% FS
  - R type: +/- 5% FS
- Measures positive or negative flow (R type only)
- Low power consumption

Цифровой контроллер массового расхода воздуха MQV

New advances in finely honed control capability! Superior high-speed control (300 ms) with an enhanced variety of functions.

Description

The MQV series of advanced digital mass flow controllers employs our proprietary thermal flow rate sensor as the sensing element, combined with a proportioning solenoid valve and advanced actuator technology. The result is a high-performance next-generation controller.
Developed for general industrial use, the MQV series was designed with high-speed, wide rangeability flow control needs in mind. The MQV series uses μF sensor output and advanced PID control technology to drive a proportional actuator. Very low flow rate models of 5, 20, and 50 mL/min have been added to the line-up, expanding the available application ranges.

Features

- Achieves 300 ms high-speed control (700 ms for the MQV0050/0200/0500/1000J and K).
  The MQV series offers exceptionally fast response from no flow to the stable set point flow rate, and after set point changes. This high-speed response to changes in primary gas pressure can minimize the effects on secondary flow
- Reliable control
- The line-up includes models with or without integrated display, and models for standard gas, for hydrogen / helium, and for special gases
- Operation at low differential pressure is a standard feature
  The MQV series does not use capillaries that have large pressure loss. This way the MQV series can control at low pressure differences
- The MQV series comes with a multitude of standard functions such as flow rate indication and totalizing. Without the need to process software like a PLC, the MQV series handles a wide range of applications with ease
- PC loader communications functions
  A convenient personal computer loader function has been integrated as a standard feature. The MLP loader software, which is sold separately, allows not only configuration of various settings, but also monitoring of flow rate trends and other operating status information on the PC screen. Acquired data can also be saved as a CSV file
- A variety of available input and output signals
  Switch between 3 inputs and between 2 event outputs RS-485 communications (optional). Dedicated port for connection to a PC
- Can be connected to a regular 24 Vdc power supply
  The internal power supply circuit of this device is isolated from its analog circuits. When multiple MQV's are controlled by PLC analog input / output, even if the analog module of the PLC is not isolated between channels, a common power supply can be used. Even without individual power supplies, there is no negative effect from surrounding circuits. An AC adapter (100 to 240 Vac) is also available by separate purchase
- Engineered for flexible installation
  The display direction on models with an integrated display can be changed 180 degrees
- Wide temperature range
  As a product developed for general industrial markets, the MQV series can be used from -10 to +60 °C (ambient temperature and gas temperature)

Компактный контроллер массового расхода воздуха F4H

The standard for mass flow controllers has just been raised.

Description

Azbil Corporation has added a new series of compact, easy-to-use products to its lineup of digital mass flow controllers equipped with a mass flow sensor that achieves 0,3 s high-speed controllability.

Features

Compact design saves space

With a width of 28 mm, the F4H's slim design saves a great amount of space.

All models are IoT-ready

The large amount of data stored in the digital mass flow controller can be uploaded using the communication functions. This feature can be used not only to diagnose the mass flow controller, but also to diagnose the system that is using the mass flow controller.

High noise tolerance

By isolating the valve drive circuit from other circuits, power supply circuit and analog circuit isolation is achieved, even with a small-capacity isolated power supply. Thanks to this feature, noise from power wiring has no effect on signals.
All models have digital communication capability, eliminating the effect of noise on analog signals. Additionally, highly noise-resistant 4-20 mA signals can be used.

Reduction in overall cost

By switching from an analog to a digital connection with the PLC, the analog I/O module can be eliminated and since the F4H series run on 24 Vdc, a dedicated +/- 15 V power supply is not required. The isolation of the power supply from the signal circuits, supplying power from a single source to multiple F4H units will not create a cyclic circuit.