Warnings and Cautions for Model MQV_

MQV____ Flow Controllers

(For installation and use of this device, refer to the warnings and cautions in the user's manual.)

- Never allow gases that are within explosive limits to pass through this device. Doing so might result in an explosion accidents.
- Never use a device for oxygen gas if it is not a special oil-free oxygen gas model. Doing so could cause the gas to ignite.

Even if gas-contacting sections have been treated to be oil-free, they cannot be used for oxygen if they have previously been used for some other gas.

- If the device is used for burner air-fuel ratio control, take the necessary countermeasures with the equipment to prevent the occurrence of backfire and to avoid any influence to the device even if backfire occurs. Pressure increase or fire in the pipes caused by the backfire of the burner could damage the controller.
- Prevent foreign matter from entering the device. If rust, water droplet, oil mist, or dust in the pipes enters the device, measurement or control error or damage might occur.
- If there is a possibility of foreign matter entering the device, provide a filter, strainer or mist trap capable of eliminating foreign matter 0.1 $\mu \rm m$ or greater in diameter at the upstream. Be sure to inspect and replace the filter at regular intervals.
- Use the device within the operating differential pressure range. Also, do not subject it to pressure beyond the rated pressure resistance range. Doing so might damage it.
- Do not subject this device to pressure beyond its rated pressure resistance. Doing so might result in damage.
- Be sure to use within the flow rate range stated in the product specifications. To prevent excessive flow rate, design instrumentation that includes, as appropriate, supply pressure management, a throttle valve, etc. Exceeding the upper limit of the range may result in display and output values that are considerably lower than the actual flow rate.
- If a problem with this device could result in damage, include appropriate redundancy in the system design.
- The valve on this device cannot completely shut a flow off. If complete shutoff is required, provide a shutoff valve separately. When the external valve is closed, it is necessary also to fully close the valve of the device using either of the following methods:
- \cdot Set the flow rate setpoint to zero.
- \cdot Make the valve operation mode to fully closed.
- If this valve remains in normal control status when the external shutoff valve is closed (zero flow rate), there will be an excessively large flow as soon as the external shutoff valve is opened. For the model MQV0050(J,K)/0200(J,K)/0500(J,K), if the external shutoff valve is closed continuously for 5 minutes or more in control mode or with the valve forced fully open, the valve overheating limit (AL71) will be activated and the current to the valve will be forcibly limited.

- Before connecting pipes with Swagelok or VCR connections, check the precautions in the instruction provided by the connecting joint manufacturer. When separately purchasing a connecting joint, use the following made by Swagelok Co., Ltd:
 - 1/4" Swagelok: SS-400-1-6ST (standard)

SS-400-1-6STSC11 (oil-inhibited)

1/2" Swagelok: SS-810-1-8ST (standard) SS-810-1-8STSC11 (oil-inhibited)

1/4" VCR: SS-4-VCR-1-00032SC11

3/8" VCR: SS-8-VCR-1-8STSC11 or equivalent

- Observe the following when using the device (oil-free model) for oxygen gas:
 - Piping should be carried out by a specialist skilled in handling oxygen gas.
 - Use oil-free pipes and parts.
 - Be sure to remove foreign matter, burrs,
 - etc. from the pipes before connecting the device.
 - · Install a filter upstream of the device.
- Mount securely in order to prevent vibration. Otherwise, equipment failure could result
- Mount the device horizontally. Do not mount it with the display facing down. Doing so might cause measurement error or equipment failure.
- For the model MQV0050(J,K)/0200(J,K)/0500(J,K)/1000(J,K), to keep pressure loss in the piping as low as possible, use as large a diameter pipe as possible, If the pressure loss in the piping is high, the gas supply pressure to this device (operating differential pressure) may fluctuate greatly, resulting in unstable control.
- When using a relay for external contact input and/or external 3-way switching input, always use a relay designed for micro-current use (with gold contacts). Failure to do so could cause faulty contact, resulting in malfunction.
- If there is a risk of a power surge caused by lightning, use Azbil Corporation's SurgeNon to prevent possible fire or equipment failure.
- Gas type switching by external contact input, flow rate switching, and analog input/output voltage range switching by external 3-way input switching should be done only after setting the operation mode to fully closed. Switching while controlling could cause large fluctuations.
- Do not use a semi-standard gas model with gases other than those below. Doing so may degrade the O-ring seal.
- · Compatible gases: Nitrogen (N2), air, argon (Ar), carbon dioxide (CO2), ammonia (NH3), and acetylene (C2H2).
- If a semi-standard gas model is used for a gas with an ammonia component, be sure the gas is dry, with a dew point of -20°C or less. Otherwise the sensor may be damaged.

Please read "Terms and Conditions" from the following URL

https://www.azbil.com/products/factory/order.html

Other product names, model numbers and company names may be trademarks of the respective company.

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Azbil Corporation

Advanced Automation Company

1-12-2 Kawana, Fujisawa Kanagawa 251-8522 Japan URL: https://www.azbil.com

1st Edition : Mar. 2006-ST

9th Edition : Mar. 2023-SK/AZ (16) CP-PC-1453E



Digital Mass Flow Controller



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

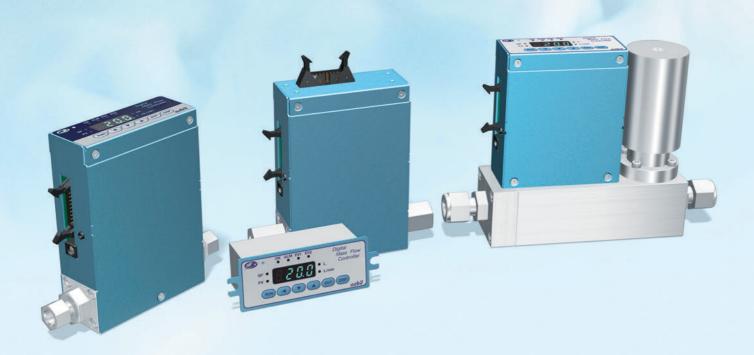


The Ultra Fast Micro Thermal Flow Sensor, Combined with Advanced **Actuator Control Technology**

300ms* high-speed control can be used for low differential pressure work. Selectable control range, power circuit isolation, and emphasis on usability

(* 500ms for the model MQV9005/9200/9050B and C, 700ms for the model MQV0050/0200/0500/1000J and K)

The model MQV features high performance digital mass flow controllers that incorporate the micro thermal flow sensor developed by Azbil Corporation, a pioneer in MEMS flow sensors. uses advanced PID control technology to drive a proportional actuator.



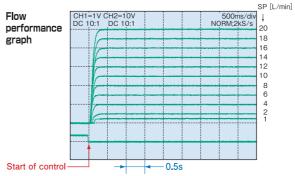
Structure and features of the micro thermal flow sensor Downstream temperature sensor (Rd Unstream temperature Section A-A Sensor in direct Principle of measurement When there is no gas flow, the temperature distribution around the heater is symmetric. When the gas starts to flow from Ru to Rd, the temperature at Ru upstream decreases and the temperature at Rd downstream increases, thus causing a distortion of the symmetry in temperature distribution. The temperature difference between Ru and Rd is used to calculate the mass flow rate (flow rate × density). No flow

12 advantages

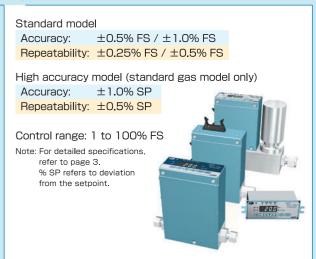
Advantage

Advanced 300ms high-speed controllability

Achieves 300ms high-speed control (700ms for the model MQV0050/0200/0500/1000J and K). The model MQV____ offers exceptionally fast response from no flow to the stable setpoint flow rate, and after setpoint changes. This high-speed response to changes in primary gas pressure can minimize the effects on secondary flow.



Advantage 2 Reliable control



Advantage 3 Broad lineup of models

The lineup includes models with or without integrated display, and models for standard gas, for hydrogen/helium, and for special gases. Select the optimum model for your application needs.



Operation at low differential pressure is a standard feature

The model MQV____ does not use capillaries that have large pressure loss. So the model MQV___ can control in the low pressure difference. Optimum for low pressure gas control application Ex. : Brazing, production of fluorescent lamps, etc. Structure of conventional massflow products Structure of the model MQV

Advantage 6 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. Easy connection using dedicated USB (PC side) communications cable (included with the MLP100)

Advantage 5 Wide range of standard functions

The model MQV____ comes with a multitude of standard functions such as flow rate indication and totalizing. Without the need to process software like a PLC, the model MQV____ handles a wide range of applications with ease.

Maior functions

- Flow rate indication Flow rate totalizing Valve open/close indication
- OK flow rate indication/output Indication of amperage to valve
 Flow rate unit and decimal point location change Up to 8 preset setpoints
- Valve forced open/closed
 Automatic valve shut-off
 Gas type changeover
 Gas type selection (freely change gas conversion factor)
 Selectable control range
- SP ramp setting
 Slow start option
 Control dead zone setting
 External switch input (for SP change, gas type changeover and range changeover)
- Event output (abnormal flow rate, operation mode)
 Alarm output

Six easy-to-operate buttons, superior indication function, and SP change even in control run mode.



(Control and display unit)

01 http://www.azbil.com 02

Sample applications

Advantage 7 A variety of available input and output signals



Voltage signal (0-5Vdc and 1-5Vdc) (Selectable by setting) Current signal (4-20mA and 0-20mA)

Switch between 3 inputs and between 2 event outputs RS-485 communications (optional) Dedicated port for connection to a PC

Advantage 9 Engineered for flexible installation

On models with an integrated display, the display direction can be changed 180 degrees.



Advantage 11 CE marking

03



Advantage 8 Can be connected to a regular 24Vdc power supply

The internal power supply circuit of this device is isolated from its analog circuits. When multiple model MQVs 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 240Vac) is also available by separate purchase.



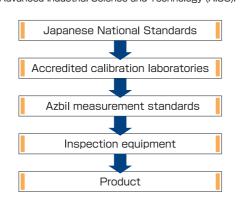
Advantage 10 Wide temperature range

As a product developed for general industrial markets, the model MQV___ can be used from -10 to +60°C (ambient temperature and gas temperature).



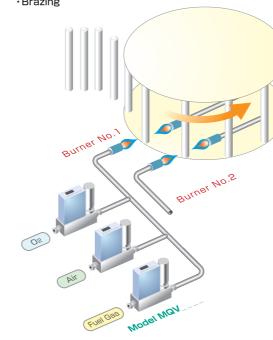
Advantage 12 JCSS traceability

The model MQV____ offers Japan Calibration Service System (JCSS) traceability, based on Japanese National Standards and Japanese measurement law, and in conjunction with Advanced Industrial Science and Technology (AISS).



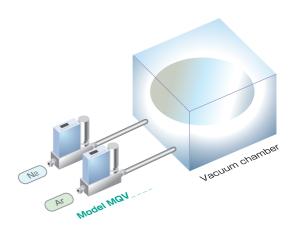
Air/fuel ratio control for burner

- · Manufacturing of backlights
- · Halogen lamps
- · Glass-forming
- Brazing



■ Gas flow rate control for vacuum

- ·Sputtering
- · Plasma cleaning

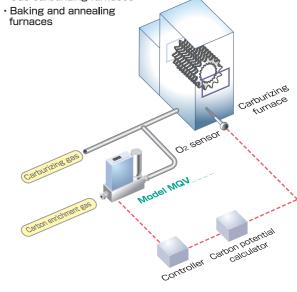


■ Various test equipment

- · Evaluation equipment
- · Gas analyzers
- Incubators

■ Control of furnace internal atmosphere

- · Baking furnaces for electronics parts
- · Gas carburizing furnaces



http://www.azbil.com 04

Standard gas model / Small-flow type

Standard ga	s model / Small-t	low type								
Model No.		MQV9005	MQV9020	MQV9200	MQV9500				MQV0050 (B,C)	MQV0100
Valve type						Proportiona				
Valve operation	on							rgized (N.C.)		
Standard full- flow rate [Note		5mL/min (standard)	20mL/min (standard)	200mL/min (standard)	0.500L/min (standard)	2.00L/min (standard)			50.0L/min (standard)	100L/min (standard)
Gas types), argon (Ar).	meth	city gas 13A (hane 100% (LNG: 45MJ/r CH4), propane	m ³), city gas e 100% (СзН	, carbon dioxid 13A (LNG: 461 8), butane 100	VIJ/m ³),)% (C4H10).	Air/nitrogen (N2), oxygen (O2), argon (Ar), carbon dioxide (CO2)
					sive compone				e clean, without dust	or oil mist. [Note 3]
Control	Response(at std.		2% FS (typ.)					2% FS (typ.)		
	differential pressure)	(When co	ntrol is star	ted from fu	lly closed co	ondition, and	d when the	setpoint is c	hanged while con	trol is performed.)
	Accuracy [Note 4] (at standard temperature and differential	+10	Standard model: ±0.5% FS (0% FS ≤Q ≤50% FS) ±1% FS (50% FS < Q ≤100% FS) ±1% FS (0% FS < Q ≤ 100% FS)							
	pressure; Q is flow rate)	±17	High accuracy model: $\pm 0.2\%$ FS (0% FS \leq Q \leq 20% FS) $\pm 1\%$ SP (20% FS \leq Q \leq 100% FS) [Note 5] $\pm 2\%$ FS (80% FS \leq Q \leq 100% FS \leq							
Pressure	Required differential pressure [Note 6]	5kPa	30kPa	50kPa	5kPa	50kPa	5kPa	50kPa	100kPa	250kPa
	Operating differential pressure range				30	OkPa max.				400kPa max.
	Max. inlet pressure					0.5MPa (gauge) [Not	e 7]		
Temp.	Operating temp.					-10	to +60°C	_		
Humidity	Operating humidity				10 to 9	90% RH (no	condensat	ion allowed)		
Analog output	Output range			0-5	Vdc / 1-5\	/dc / 0-20r	mAdc / 4-2	20mAdc (sele	ectable)	
Alarm/event output	Number of outputs					Alarm:	1. Event: 2			
External switching input	Input type, number of inputs					ernal 3-way contact inp		nputs: 1. switching): 3	3.	
Communications	System	(1) Dedicate	ed PC loade	r connectio	Note 9] (2) RS-485 c	ommunicatio	ns (3-wire system) [Note 10]
Power	Rating				24Vdc,	current cor	sumption	300mA max		
	Isolation	Power circuit is isolated from input/output circuit.								
Matl. of gas-co	ntacting parts	SUS316, Teflon, fluororubber, borosilicate glass, silicon								
Connection m	ethod	1/4" Swl,	1/4" VCR		Rc 1/4	1", 1/4" Swl	, 1/4" VCR	, 9/16-18 UN	NF	9/16-18 UNF, Rc 1/4", 3/8" Swl, 3/8" VCR
Mounting orie	ntation			Horiz	ontal Note	that the di		must not fa	ce down.	
Weight		Approx	1.1kg					ox. 1.2kg		
Certifications						CE	marking			

Standard gas model / Medium-flow type

Model No.		MQV0500 MQV0500 MQV0500								
Valve type			Proportional solenoid valve							
Valve operation	on	N	Normally closed when de-energized (N.C.	.)						
Standard full- flow rate [Note		50.0L/min (standard)	200L/min (standard)	500L/min (standard)						
Gas types		city gas methane 10	gen (N2), oxygen (O2), argon (Ar), carbon dioxid 13A (LNG: 45MJ/m³), city gas 13A (LNG: 46)O% (CH4), propane 100% (C3Ha), butane 10 omponents (chlorine, sulfur, acid), It must also	MJ/m ³), 0% (C4H10).						
Control	Response(at std.		0.7s for SP \pm 2% FS (typ.)							
	differential pressure)	(When control is started from fully clo	sed condition, and when the setpoint is	changed while control is performed.)						
	Accuracy [Note 4] (at standard temperature and	Sta	Standard model:±0,5% FS (0% FS ≤ Q ≤ 40% FS) ±1% FS (40% FS < Q ≤ 80% FS) ±1,5% FS (80% FS < Q ≤ 100% FS)							
	differential pressure; Q is flow rate)	(None)	High accuracy model: ±0.3% FS (0% FS≤Q<25% FS) ±1.2% SP(25% FS≤Q<80% FS) [Note 5] ±1.5% SP(80% FS≤Q≤100% FS)							
Pressure	Required differential pressure [Note 6]	10kPa	100kPa	150kPa						
	Operating differential pressure range	100kPa max,	300kPa max. (-10°C≤T≤40°C) 180kPa max. (40°C <t≤60°c)< td=""><td>300kPa max. (-10°C≤T≤35°C) 240kPa max. (35°C<t≤50°c)< td=""></t≤50°c)<></td></t≤60°c)<>	300kPa max. (-10°C≤T≤35°C) 240kPa max. (35°C <t≤50°c)< td=""></t≤50°c)<>						
	pressure range	(Condition: power supply voltage = 24,0V) [Note 8]								
	Max. inlet pressure	0.5MPa (gauge)								
Temp.	Operating temp.	-10 to	000+60℃	-10 to +50°C						
Humidity	Operating humidity	1	O to 90% RH (no condensation allowed	d)						
Analog output	Output range	0-5Vdc /	/ 1-5Vdc / 0-20mAdc / 4-20mAdc (se	electable)						
Alarm/event output	Number of outputs		Alarm: 1. Event: 2.							
External switching input	Input type, number of inputs	Ex	External 3-way switching inputs: 1. ternal contact inputs (2-way switching):	: 3.						
Communications	System	(1) Dedicated PC loader con	nection [Note 9] (2) RS-485 communicat	tions (3-wire system) [Note 10]						
Power	Rating		t consumption A max.	24Vdc, current consumption 500mA max,						
	Isolation	Power circuit is isolated from input/output circuit.								
Matl. of gas-cor		Standard gas model to SUS316. Teflon, fluororubber								
Connection m		Rc 1/2". 1/2" Swl. 3/8" VCR. 3/4-16 UNF								
Mounting orie		Horizontal. Note that the display panel must not face down.								
Weight		Approx. 3.5kg								
Certifications		CE marking								

Semi-standard	gas model
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Seriii-Stariua	ra gas model										
Model No.		MQV9200	MQV9500	MQV0002	MQV0005		MQV0050 (B,C)	MQV0200	MQV0500		
Valve type						Proportiona	al solenoid valve				
Valve operation	on						hen de-energized (N	.C.)			
Standard full-s					5.00L/min		50.0L/min	200L/min	500L/min		
flow rate [Note	1]	(standard)	(standard)		(standard)		(standard)	(standard)	(standard)		
Gas types		lt n	Air/nitrogen (N2), argon (Ar), carbon dioxide (CO2), acetylene (C ₂ H ₂), ammonia (NH ₃) [Note 2] The gas must be dry, without corrosive components (chlorine, sulfur, acid). It must also be clean, without dust or oil mist. The dew point of the ammonia gas must be -20° or below. [Note 3]								
Control	Response(at std.				SP ±2% F9			0.7s for SP =			
	differential pressure)	(When cor	ntrol is star	ted from fu	lly closed co	ondition, and	d when the setpoint	is changed while co	ntrol is performed.)		
	Accuracy [Note 4] (at standard tempe- rature and differential pressure; Q is flow rate)	couracy [Note 4] t standard tempe- ture and differential $\pm 0.5\%$ FS $(0\%$ FS $\leq Q \leq 50\%$ FS) ture and differential $\pm 1\%$ FS $(50\%$ FS $< Q \leq 100\%$ FS)							≤Q≤40% FS) <q≤80% fs)<br="">S<q≤100% fs)<="" th=""></q≤100%></q≤80%>		
Pressure	Required differential pressure [Note 6]	50kPa	5kPa	50kPa	5kPa	50kPa	100kPa	100kPa	150kPa		
	Operating differential pressure range			30	300kPa max. (-10°C≤T≤40°C) 180kPa max. (40°C <t≤60°c) (Condition: power supply)</t≤60°c) 	300kPa max. $(-10^{\circ}C \le T \le 35^{\circ}C)$ 240kPa max. $(35^{\circ}C < T \le 50^{\circ}C)$ voltage = 24,0V)[Note 8]					
	Max. inlet pressure					0.5MPa (gauge) [Note 7]		,, ,,		
Temp.	Operating temp.						to +60°C		-10 to +50℃		
Humidity	Operating humidity				10 to 9	90% RH (no	condensation allow	red)			
Analog output	Output range			0-5	Vdc / 1-5\	/dc / 0-20r	mAdc / 4-20mAdc	(selectable)			
Alarm/event output	Number of outputs					Alarm:	1. Event: 2.				
External switching input	Input type, number of inputs						switching inputs: 1, uts (2-way switchin				
Communications	System	(1) Dedicate	ed PC loade	er connectio	n [Note 9] (2) RS-485 communio	cations (3-wire syste	m) [Note 10]		
Power	Rating	24Vdc, current consumption 300mA max.						24Vdc, current consumption 400mA max.	24Vdc, current consumption 500mA max.		
	Isolation				Power circu	uit is isolate	d from input/output	circuit.			
Matl. of gas-cor	ntacting parts				Standard	gas model t	o SUS316, Teflon,				
Connection m	ethod			Rc 1/4",	1/4" Swl, 1/	" Swl, 1/4" VCR 1/2" Swl,					
Mounting orie	ntation	Horizontal. Note that the display panel must not face down.									
Weight		Approx. 1.2kg Approx. 3.5kg									
		CE marking									

Hydrogen / Helium gas model

Model No.	Icliam Bas model	MQV9020	MQV9050	MQV9500	MQV0005	MQV0010	MQV0050	MQV0200			
Valve type					ortional solenoid						
Valve operation	on				sed when de-ene						
Standard full-s flow rate [Note		20.0mL/min (standard)	50.0mL/min (standard)	0.500L/min (standard)	5.00L/min (standard)	10.00L/min (standard)	50.0L/min (standard)	200L/min (standard)			
Gas types		Th	Hydrogen (H2), helium (He). The gas must be dry and not contain corrosive components(chlorine, sulfur, acid). It must also be clean, without dust or oil mist. [Note 3]								
Control	Response(at std.	500ms for SP				for SP ±2% FS					
	differential pressure)	(When contr	ol is started from	n fully closed cond	dition, and when	setting is change	ed while control is	s performed.)			
	Accuracy (at standard temperature and differential pressure; Q is flow rate)	±1.0%FS (50%FS <q≤100%fs) ±0.5%FS (0%FS≤Q≤50%FS)</q≤100%fs) 	±1,0%FS (0%FS≤Q≤100%FS)		±1.0% F	FS(0% FS≤Q≤4 FS(40% FS <q≤8 S(80% FS<q≤1< td=""><td>80% FS)</td><td></td></q≤1<></q≤8 	80% FS)				
Pressure	Required differential pressure [Note 6]	Hydrogen: 2,5kPa He l ium: 5kPa	Hydrogen:10kPa Helium:20kPa	Hydroger Helium		Hydrogen: 80kPa Helium: 150kPa	Hydrogen: 20kPa He l ium: 40kPa	Hydrogen:100kPa Helium:180kPa			
	Operating differential pressure range	300kPa max. (–10°C≤T≤60°C)									
	Max, inlet pressure			0,5	MPa (gauge) [Not	te 7]					
Temp.	Operating temp.				-10 to +60°C	-					
Humidity	Operating humidity			10 to 90% F	RH (no condensa	tion allowed)					
Analog output	Output range		0-5	5Vdc / 1-5Vdc /	0-20mAdc / 4-2	20mAdc (selecta	able)				
Alarm/event output	Number of outputs			Д	larm: 1. Event: 2	2.					
External switching input	Input type, number of inputs			External conta	3-way switching act inputs (2-way	switching): 3					
	System	(1) Dedica	ated PC loader co	onnection [Note 9]			wire system) [Note	e10]			
	Rating			,	ent consumption						
	Isolation										
Matl. of gas-cor	ntacting parts	SUS316, Teflon, fluororubber, borosilicate glass, silicon SUS316, Teflon, fluororubber									
Connection m		1/4" Swl,	1/4" VCR			Swl, 1/4" VCR,					
Mounting orie	ntation	Horizontal. Note that display panel must not face down.									
Weight		Approx. 1.1kg Approx. 1.2kg									
Certifications					CE marking						
■ Notes for pages 05-06											

Notes for pages 05-06

[Note 1] L/min (standard) indicates the volumetric flow rate (L/min) converted to 20°C, one atmosphere (1 atm). The reference temperature can be changed to 0°C, 25°C, or 35°C. The controllable flow rate range varies according to the gas type. See Table 1. [Note 2] When used with ammonia, or acetylene, select a Semi-standard gas model (with EPDM seal). For ammonia, be sure to use under dry conditions with a dewpoint of -20°C or less. In addition, do not use a Semi-standard gas model with gases other than the above gases. Doing so may degrade the 0-ring sealing characteristics. The Semi-standard gas model is set for air/nitrogen use before factory shipment. Before using the model, set the gas type conversion factor (C.F.). [Note 3] Prevent foreign matter from entering the device. If rust, water droplets, oil mist, or dust in the piping enters the device, measurement error or damage to the device might result. If there is a possibility of foreign matter entering the device, provide an upstream filter, strainer or mist trap capable of eliminating foreign matter 0.1 µm or greater in diameter, and be sure to periodically inspect and replace the filter. [Note 4] Accuracy information applies to air/nitrogen or oxygen (oxygen gas models). [Note 5] ±xx% SP indicates how accurately the controlled flow rate matches the flow rate setpoint. [Note 6] Differential pressure required to control the full-scale flow rate. (Conditions: outlet pressure = 0kPa (gauge)). Operation is possible even below the required differential pressure, but the controllable flow rate range is narrower. For details on the relationship between differential pressure and flow rate when the valve is fully open, refer to the user's manual, CP-SP-1204E (standard gas model) or CP-SP-1205E (hydrogen/helium gas model). [Note 7] For use at inlet pressures higher than 0.5 MPa (gauge), contact Azbil Corporation. [Note 8] Maximum operating differential varies according to power supply voltage. [Note 9] A dedicated PC loader package (sold se

05 http://www.azbil.com 06

Specifications

Table 1.

Sta	tandard gas model. Control flow rate range and setting/display resolutions (factory setting								(Units: mL/min (standard) for 9005,9020,9200, L/min (standard) for other models)					
		MQV	9005	MQV	V9020 MQV		9200 MQV		9500	MQV	0002	MQV	0005	
		Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	
ູດ	Air, nitrogen	0.10 to 5.00	0.02	0.2 to 20.0	0.1	2 to 200	1	0.004 to 0.500	0.002	0.02 to 2.00	0.01	0.04 to 5.00	0.02	
S	Oxygen	0.10 to 5.00	0.02	0.2 to 20.0	0.1	2 to 200	1	0.004 to 0.500	0.002	0.02 to 2.00	0.01	0.04 to 5.00	0.02	
\$	Argon	0.10 to 5.00	0.02	0.2 to 20.0	0.1	2 to 200	1	0.004 to 0.500	0.002	0.02 to 2.00	0.01	0.04 to 5.00	0.02	
ā	Carbon dioxide	_	_	_	_	1.0 to 120.0	0.5	0.003 to 0.300	0.001	0.010 to 1.200	0.005	0.03 to 3.00	0.01	
	City gas 13A (LNG: 45MJ/m ³)	_	_	_	_	2 to 200	1	0.004 to 0.500	0.002	0.02 to 2.00	0.01	0.04 to 5.00	0.02	
	City gas 13A (LNG: 46MJ/m ³)	-	_	_	-	2 to 200	1	0.004 to 0.500	0.002	0.02 to 1.60	0.01	0.04 to 5.00	0.02	
	Methane 100%	_	_	_	_	2 to 200	1	0.004 to 0.500	0.002	0.02 to 2.00	0.01	0.04 to 5.00	0.02	
	Propane 100%	_	_	_	_	0.6 to 60.0	0.2	0.002 to 0.160	0.001	0.006 to 0.600	0.002	0.02 to 1.60	0.01	
	Butane 100%	_	_	_	_	0.4 to 50.0	0.2	1.0 to 120.0 [Note 1]	0.5 [Note 1]	0.004 to 0.400	0.002	0.010 to 1.200	0.005	

		MQV	0020	MQV005	O (B, C)	MQV	0100	MQV005	0 (J' K)	MQV	0200	MQV	0500
		Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]
Gas	Air, nitrogen	0.2 to 20.0	0.1	0.4 to 50.0	0.2	1.0 to 100.0	0.5	0.4 to 50.0	0.2	2 to 200	1	4 to 500	2
	Oxygen	0.2 to 20.0	0.1	0.4 to 50.0	0.2	1.0 to 100.0	0.5	0.4 to 50.0	0.2	2 to 200	1	4 to 500	2
type	Argon	0.2 to 20.0	0.1	0.4 to 50.0	0.2	1.0 to 100.0	0.5	0.4 to 50.0	0.2	2 to 200	1	4 to 500	2
Ф	Carbon dioxide	0.10 to 12.00	0.05	0.3 to 30.0	0.1	1.0 to 80.0	0.5	0.3 to 30.0	0.1	1.0 to 120.0	0.5	4 to 400	2
	City gas 13A (LNG: 45MJ/m ³)	0.2 to 20.0	0.1	0.4 to 50.0	0.2	_	-	0.4 to 50.0	0.2	2 to 200	1	4 to 500	2
	City gas 13A (LNG: 46MJ/m ³)	0.2 to 20.0	0.1	0.4 to 50.0	0.2	_	-	0.4 to 50.0	0.2	2 to 200	1	4 to 400	2
	Methane 100%	0.2 to 20.0	0.1	0.4 to 50.0	0.2	-	-	0.4 to 50.0	0.2	2 to 200	1	4 to 500	2
	Propane 100%	0.06 to 6.00	0.02	0.2 to 16.0	0.1	-	-	0.2 to 16.0	0.1	0.6 to 60.0	0.2	2 to 200	1
	Butane 100%	0.04 to 4.00	0.02	0.10 to 10.00	0.05	_	_	0.10 to 12.00	0.05	0.4 to 40.0	0.2	2 to 160	1

■ Table 2.

Semi-standard model Control flow rate range and setting/display resolutions (factory settings)

(Units: mL/	min	(etandard)	for Q200	I /min	(etandard)	for other	modale)

Jei	Jeffini-Staffuld in How Tate Tarige and Setting/display Testifutions (Tactory Settings) (Onits: mL/min (standard) for 9200, L/min (standard) for other models)												
MQV9200			9200	MQV	MQV9500		MQV0002		MQV0005		0020	MQV0050 (B, C)	
		Control flow rate range	Setting/display resolution [Note 2]	Control flow rate range	Setting/display resolution [Note 2]								
ູດ	Acetylene (C2H2)	1.0~120.0	0.5	0.003~0.300	0.001	0.010~1.200	0.005	0.03~3.00	0.01	0.10~12.00	0.05	0.3~30.0	0.1
as t	Ammonia (NH ₃)	2~160	1	0,004~0,400	0,002	0,02~1,60	0,01	0,04~4,00	0,02	0,2~16,00	0.1	0,4~40,0	0.2
.ype	Air, nitrogen	2~200	1	0.004~0.500	0.002	0.02~2.00	0.01	0.04~5.00	0.02	0.2~20.0	0.1	0.4~50.0	0.2
U	Argon	2~200	1	0.004~0.500	0.002	0.02~2.00	0.01	0.04~5.00	0.02	0.2~20.0	0.1	0.4~50.0	0.2
	Carbon dioxide	1.0~120.0	0.5	0.003~0.300	0.001	0.010~1.200	0.005	0.03~3.00	0.01	0.10~12.00	0.05	0.3~30.0	0.1

		MQV	0200	MQV0500			
		Control flow rate range Setting/display		Control flow rate range	Setting/display resolution [Note 2]		
Gas	Acetylene (C2H2)	1.0~120.0	0,5	4~400	2		
	Ammonia (NH ₃)	2~160	1	4~400	2		
type	Air, nitrogen	2~200	1	4~500	2		
	Argon	2~200	1	4~500	2		
	Carbon dioxide	1.0~120.0	0.5	4~400	2		

Table 3.

07

Hydrogen gas model Control flow rate range and setting/display resolutions (factory settings) (Units: mL/min (standard) for MQV9020/9050, L/min (standard) for other models)

	MQV9020		9020	MQV9050		MQV9500		MQV0005		MQV0010		MQV0050	
		Control flow rate range	Setting/display resolution [Note 2]										
Gas	Hydrogen	0.2 to 20.0	0.1	0.4 to 50.0	0.2	0.004 to 0.500	0.002	0.04 to 5.00	0.02	0.10 to 10.00	0.05	0.4 to 50.0	0.2
type	Helium	0.2 to 20.0	0.1	0.4 to 50.0	0.2	0.004 to 0.500	0.002	0.04 to 5.00	0.02	0.10 to 10.00	0.05	0.4 to 50.0	0.2

		MQV0200				
		Control flow rate range	Setting/display resolution [Note 2]			
Gas	Hydrogen	2 to 200	1			
type	Helium	2 to 200	1			

[Note 1] When the gas type of model MQV9500 is set to butane 100%, the flow rate display unit is mL/min.

[Note 2] If an analog signal is applied to the setting input and the flow rate output, the resolution will increase greatly. Contact Azbil Corporation for more information.

Compatible gases for each model

○: recommended, ○: usable

				Gas type										
	O-ring material	Sensor	Air, Nitrogen	Oxygen	Argon	Carbon dioxide	City gas 13A	Methane 100%	Propane 100%					
Standard gas model	Fluororubber	Standard	0	0	0	0	0	0	0					
Special gas model	Ethylene-propylene	Standard	0		0	0								
Hydrogen/helium gas model	Fluororubber	Dedicated hydrogen/ helium use												

			Gas type										
	O-ring material	Sensor	Butane 100%	Ammonia	Acetylene	Ethylene, oxide gas	Hydrogen	Helium					
Standard gas model	Fluororubber	Standard	0										
Special gas model	Ethylene-propylene	Standard		0	0	0							
Hydrogen/helium gas model	Fluororubber	Dedicated hydrogen/ helium use					0	0					

Note: For use with gases other than the above, contact Azbil Corporation.

Selection Guide

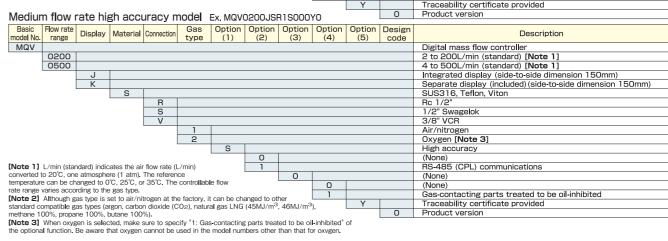
■ Standard gas model

Low flow rate Ex. MQV9200BSRN000000	ow flow rate	Ex. MQV9200BSRN000000
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	Flow rate	Display	Material	Connection	Gas						Design	Description
model No.	range				type	(1)	(2)	(3)	(4)	(5)	code	'
MMA	9005											Digital mass flow controller
-	9020											0.10 to 5.00mL/min (standard) [Note 1]
-	9200											0.2 to 20.0mL/min (standard) [Note 1]
-	9500											2 to 200mL/min (standard) [Note 1]
-	9500											0.004 to 0.500L/min (standard) [Note 1]
-	0002											0.02 to 2.00L/min (standard) [Note 1]
-												0.04 to 5.00L/min (standard) [Note 1]
-	0020											0.2 to 20.0L/min (standard) [Note 1]
-	0100											0.4 to 50.0L/min (standard) [Note 1]
l	0100											1.0~100.0L/min (standard)
		В										Integrated display (side-to-side dimension 90mm)
		С										Separate display (side-to-side dimension 90mm)
			S									SUS316, Teflon, Viton
				R								Rc 1/4"(except 9005, 9020)
				S								1/4" Swagelok (In use of 0100 change to 3/8" Swagelok)
				V								1/4" VCR(In use of 0100 change to 3/8" VCR)
				U								9/16-18 UNF(except 9005, 9020)
					N							Air/nitrogen (changeable to standard gases) [Note 2]
					S							Oxygen [Note 3]
						0						(None)
							0					(None)
							1					RS-485 (CPL) communications
								0				(None)
									0			(None)
									1			Gas-contacting parts treated to be oil-inhibited
										0		(None)
										D		Inspection certificate provided
										Υ		Traceability certificate provided
Mediun	n f l ow i	rate E	x. MQVO	050JSRN	00000	0					0	Product version

vicului												
Basic model No.	Flow rate range	Display	Material	Connection	Gas type	Option (1)	Option (2)	Option (3)	Option (4)	Option (5)	Design code	Description
MQV												Digital mass flow controller
	0050											0.4 to 50.0L/min (standard) [Note 1]
	0200											2 to 200L/min (standard) [Note 1]
	0500											4 to 500L/min (standard) [Note 1]
		J										Integrated display (side-to-side dimension 150mm)
	[K										Separate display (included) (side-to-side dimension 150mm)
			S									SUS316, Teflon, Viton
				R								Rc 1/2"
				S								1/2" Swagelok
				V								3/8" VCR
				U								3/4-16 UNF
					N							Air/nitrogen (changeable to standard gases) [Note 2]
				L	S							Oxygen [Note 3]
						0						(None)
							0					(None)
							1					RS-485 (CPL) communications
								0				(None)
									0			(None)
									1			Gas-contacting parts treated to be oil-inhibited
										0		(None)
										D		Inspection certificate provided
										Υ		Traceability certificate provided
ow flo	w rate	high a	ccurac	v mode	I Ev M	เดงเจอกด	nese i sc	nonvo			0	Product version

										1		Traceability certificate provided
I ow flo	ow rate	high a	accurac	cy mode	el Ex N	งดงครดด	nese i so	nnnyn			0	Product version
			acou, ac	Jy mode								
Basic	Flow rate	Display	Material	Connection	Gas		Option	Option		Option	Design	Description
model No.	range	Diopidy	wateria	Cominoction	type	(1)	(2)	(3)	(4)	(5)	code	Boscipton
MQV												Digital mass flow controller
	9200											2 to 200mL/min (standard) [Note 1]
	9500											0.004 to 0.500L/min (standard) [Note 1]
	0002											0.02 to 2.00L/min (standard) [Note 1]
	0005											0.04 to 5.00L/min (standard) [Note 1]
	0020											0.2 to 20.0L/min (standard) [Note 1]
	0050											0.4 to 50.0L/min (standard) [Note 1]
		В										Integrated display (side-to-side dimension 90mm)
		С										Separate display (side-to-side dimension 90mm)
			S									SUS316, Teflon, Viton
				R								Rc 1/4"
				S								1/4" Swagelok
				V								1/4" VCR
					1							Air/nitrogen
				[2							Oxygen [Note 3]
						S						High accuracy
							0					(None)
							1					RS-485 (CPL) communications
								0				(None)
									0			(None)
	1											Gas-contacting parts treated to be oil-inhibited
	Y											Traceability certificate provided
Mediur	n flow	rate hi	gh acc	uracv n	nodel	Ex MOV	1200JSF	315000	YΩ		0	Product version



Selection Guide

■ Semi-standard gas model

Low flow rate Ex. MQV9200BSSE000100

Basic model No.	Flow rate range	Display	Material	Connection	Gas type	Option (1)	Option (2)	Option (3)	Option (4)	Option (5)	Design code	Description
MQV												Digital mass flow controller
	9200											2 to 200mL/min (standard) [Note 1]
	9500											0.004 to 0.500L/min (standard) [Note 1]
	0002											0.02 to 2.00L/min (standard) [Note 1]
	0005											0.04 to 5.00L/min (standard) [Note 1]
	0020											0.2 to 20.0L/min (standard) [Note 1]
	0050											0.4 to 50.0L/min (standard) [Note 1]
		В										Integrated display model (body length 90mm)
		С										Separate display model (body length 90mm)
			S									SUS316
				R								Rc 1/4"
				S								1/4" Swagelok
				V								1/4" VCR
				[E							Semi-standard gas [Note 2]
						0						(None)
							0					(None)
							1					Model with RS-485 communications (CPL)function
								0				Without optional functions
									1			Oil-inhibiting treatment for gas-contacting parts
										0		(None)
										D		With inspection certificate
										Υ		With traceability certificate
											0	Product version

Medium flow rate Ex. MQV0200JSSE000100

Basic model No.	Flow rate range	Display	Material	Connection	Gas type	Option (1)	Option (2)	Option (3)	Option (4)	Option (5)	Design code	Description
MQV												Digital mass flow controller
	0200											2 to 200L/min (standard) [Note 1]
[0500											4 to 500L/min (standard) [Note 1]
		J										Integrated display model (body length 150mm)
		K										Separate display model (body length 150mm)
			S									SUS316
				S								1/2" Swagelok
					Е							Semi-standard gas
						0						(None)
							0					(None)
							1					Model with RS-485 communications(CPL)function
								0				(None)
				ow rate (L/m	in) conver	ted to 20°C			1			Oil-inhibiting treatment for gas-contacting parts
one atmosp				perature						0		(None)
can be cha				rding to the						D		With inspection certificate
					gas type.					Y		With traceability certificate
	Note 2] Applies only to ammonia, acetylene. Since the factory setting is air/nitrogen, be sure to set the gas type conversion factor (C.F.) before use.										0	Product version
	,	-	_ ,,				(-	,				

■ Hydrogen / Helium gas model

Low flow rate Ex. MQV9500BSRH0000100

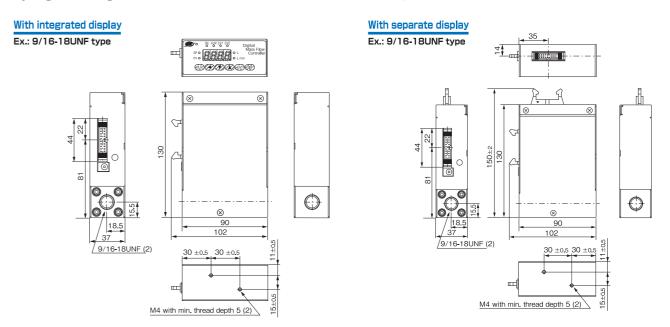
Basic model No.	Flow rate range	Display	Material	Connection	Gas type	Option (1)	Option (2)	Option (3)	Option (4)	Option (5)	Design code	Description
MQV												Digital mass flow controller
	9020											0.2 to 20.0mL/min (standard) [Note 1]
	9050											0.4 to 50.0mL/min (standard) [Note 1]
	9500											0.004 to 0.500L/min (standard) [Note 1]
	0005											0.04 to 5.00L/min (standard) [Note 1]
	0010											0.10 to 10.00L/min (standard) [Note 1]
	0050											0.4 to 50.0L/min (standard) [Note 1]
[0200											2 to 200L/min (standard) [Note 1]
		В										Integrated display
		С										Separate display
			S									SUS316, Teflon, Viton
				R								Rc 1/4"
				S								1/4" Swagelok
				V								1/4" VCR
				U								9/16-18 UNF
					Н							Hydrogen/helium [Note 2]
						0						(None)
							0					(None)
							1					RS-485 (CPL) communications
								0				(None)
									1			Gas-contacting parts treated to be oil-inhibited
				drogen flow						0		(None)
				tmosphere (to 0°C, 25°C						D		Inspection certificate provided
				rding to gas						Υ		Traceability certificate provided
				ydrogen at t		it can be c	hanged to	helium.			0	Product version

■ Table 3. Optional parts (sold separately)

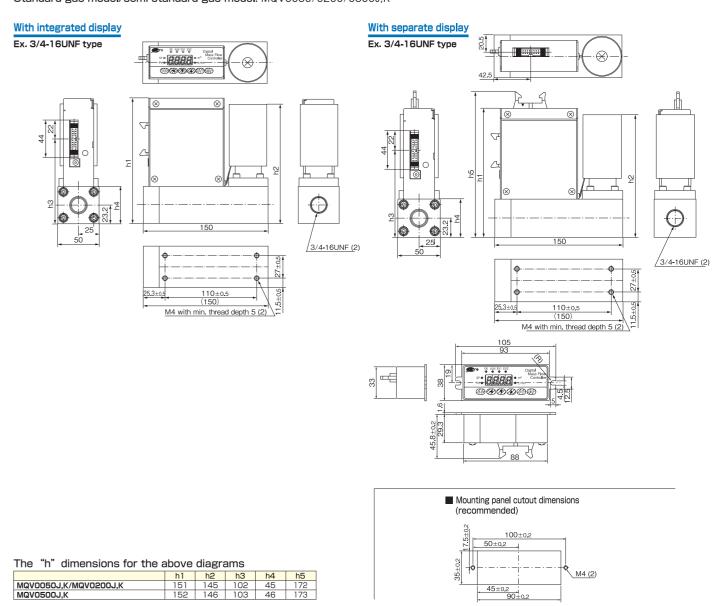
Name	Part No.	Description
Cable with dedicated connector	81446681-001	2m 20-core flat cable
Cable with dedicated connector	81446951-001	5m 20-core shielded cable
AC adapter made by UNIFIVE Co., Ltd.	UU318-2475	Rating: 24Vdc 750mA
Potentiometer for setting flow rate	81446683-002	Digital dial, 5kΩ, 10 turns
Front cover for separate display	81446858-001	Resin
PC loader package	MLP100A100	A dedicated software & cable

External Dimensions (Unit: mr

Standard gas model/semi-standard gas model: MQV9005/9020/9200/9500/0002/0005/0020/0050B,C Hydrogen/helium gas model: MQV9020/9050/9500/0005/0010/0050/0200B,C



Standard gas model/semi-standard gas model: MQV0050/0200/0500J,K



09