

Notes on Model Selection Before installation and use, please read the notes and precautions in the user's manual

- Do not use the product for gas that is within its explosive limits. Doing so may result in an explosion.
- If an abnormality in the controller is likely to result in damage, an appropriate redundant design should be used.
- If there is a possibility of foreign matter entering the device, install 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.
- When the device is used to control the air-to-fuel ratio of a burner, implement measures in the instrumentation to prevent backfires from occurring and to prevent a backfire from affecting the device if one does occur.
Increased pressure or flames in the piping due to a backfire from a burner can cause device failure.
- Do not connect a device with large turndown or pressure loss near the downstream side of the device. Doing so may cause hunting.
- If there is a possibility of a lightning surge, use a surge absorber (surge arrester). Otherwise, a fire may result or the device may fail.
- If the gas must be completely stopped, install a separate shutoff valve. This device's valve cannot completely shut off the gas.
- Do not install the device in places like those listed below.
 - Where the temperature and humidity exceed the specified limits
 - Where the temperature changes rapidly or where there is condensation
 - Places with sulfide or other corrosive gas
 - Places with flammable gas, liquid, or vapors
 - Where the atmosphere contains much dust, salt content, conductive matter (e.g., iron powder), waterdrops, oil mist, organic solvents, etc.
 - Places with mechanical vibration or impact that are outside of the specified ranges
 - Where the device is exposed to direct sunlight, wind, or rain
 - Where the device is splashed by oil or chemicals
 - Under a high-voltage cable or near a welding machine or other source that emits electrical noise
 - Places affected by an electromagnetic field
- Do not allow gas containing hydrogen to enter model F4Q0500. Doing so may cause device failure.
- To learn whether the device can be used for a gas other than the standard ones, please ask us in advance. Using a non-standard gas may cause the device to fail.



Digital Mass Flow Controller

Model F4Q



High-speed response, low pressure loss, high accuracy, and a wealth of functions



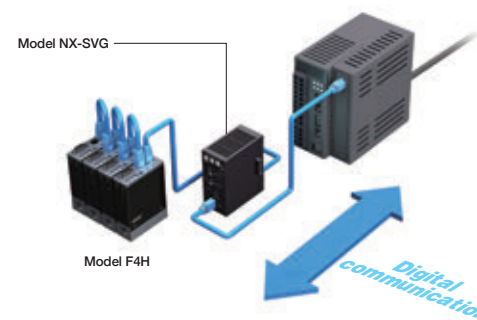
Related Products

Compact Digital Mass Flow Controller Model F4H

Compact size has been achieved by narrowing down the functions from model F4Q. This is the mass flow controller that contributes to the total cost reduction of equipment. Please see CP-PC-1590E for details.

Features

1. Compact design saves space.
2. High noise tolerance.
3. Wire-saving and programless communication.



※Programless communication is the feature when using Smart Device Gateway NX-SVG.

Please read "Terms and Conditions" from the following URL before ordering and use.
<https://www.azbil.com/products/factory/order.html>

"Swagelok" and "VCR" are registered trademarks of Swagelok Company.
Modbus™ is a trademark and the property of Schneider Electric SE, its subsidiaries and affiliated companies.
Other product names, model numbers and company names may be trademarks of the respective company.

[Notice] Specifications are subject to change without notice.
No part of this publication may be reproduced or duplicated without the prior written permission of Azbil Corporation.

Azbil Corporation
Advanced Automation Company
1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: <https://www.azbil.com>

1st Edition : Issued in Aug. 2021-SK
4th Edition : Issued in Aug. 2023-SK/AZ

GOOD DESIGN
AWARD 2021



Azbil Corporation

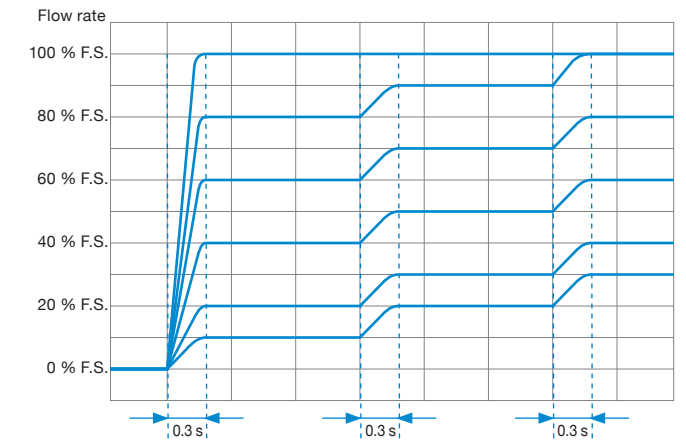
Advanced high-speed response, low pressure loss, and high-accuracy digital mass flow controllers

- Large LED and liquid crystal displays show control status at a glance
- Higher accuracy in a wide range of flow rates
- New functions to solve problems with flow rate control



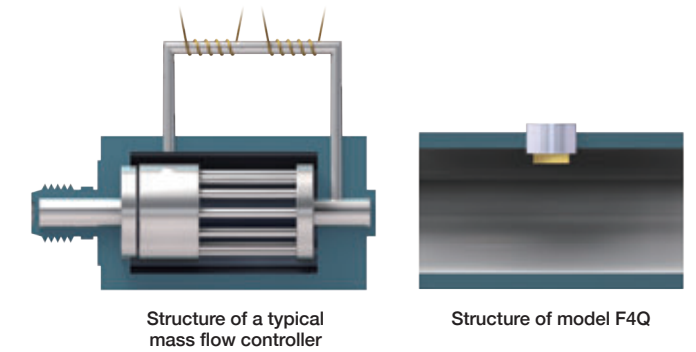
High-speed response of 0.3 seconds over a wide range of flow rates

Response is fast whether starting control with a fully closed valve or changing the settings. Even when the flow rates of multiple gases are changed at the same time, their ratio can be retained.



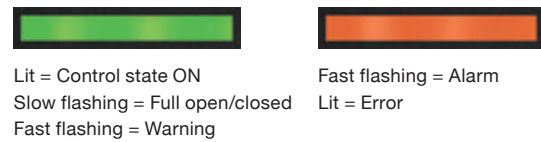
Low-differential pressure structure allows control of low-pressure gas

The pressure loss on a straight flow path is low, so this controller can control low-pressure gas (e.g., fuel gas).

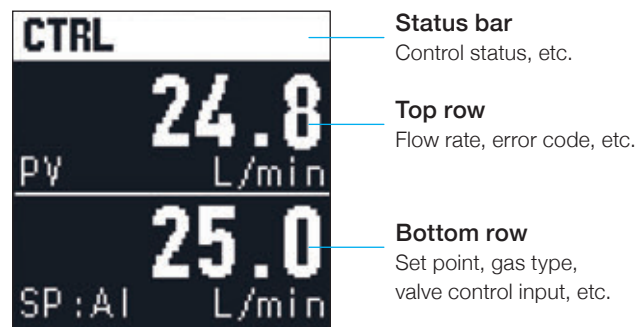


Understand the status of control at a glance

The color and state (e.g., flashing) of the LED indicator show the control status.



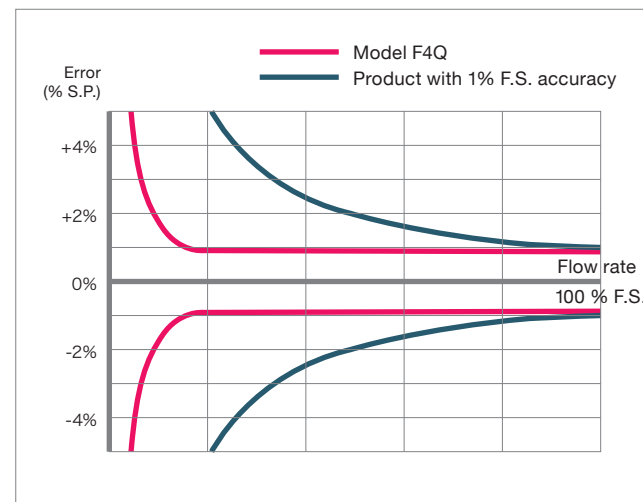
With the information-rich LCD, you understand the control status in detail.



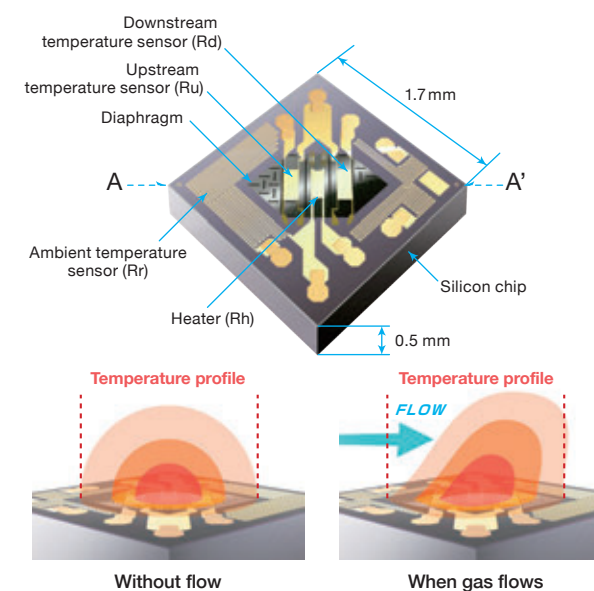
- Status bar**
Control status, etc.
- Top row**
Flow rate, error code, etc.
- Bottom row**
Set point, gas type, valve control input, etc.

Accuracy of 1 % S.P. in a wide range of flow rates

High-accuracy control for high and low flow rates. Great for applications where the flow rate set point changes significantly.



High-speed micro thermal flow sensor with low differential pressure



When there is no gas flow, the temperature distribution around the heater is symmetrical. When gas starts to flow the temperature upstream of the heater decreases and the temperature downstream of the heater increases, distorting the symmetry of the temperature distribution. The temperature sensor detects this temperature difference to calculate the speed of the flow.



The gas comes into direct contact with the micro thermal flow sensor which has an extremely small thermal capacity. This makes instantaneous detection of flow rate changes possible, even when the flow speed is very low. The result is high-speed response over a wide range of flow rates, with only low pressure loss in the straight flow path.

Easy-to-read display in any installation orientation

The display can be rotated to suit the installation orientation. The control key layout also changes based on the display orientation.



Greater resistance to environmental conditions

Strong metal connectors and a structure with no gaps give it margin when the controller is used in a dusty environment.



Fine adjustment of control

The PID settings make fine adjustment of control possible. You can adjust for control that prioritizes response or control that prioritizes stability, whichever suits the application.

※ Even without PID adjustment, the controller satisfies the response specified in the specifications.



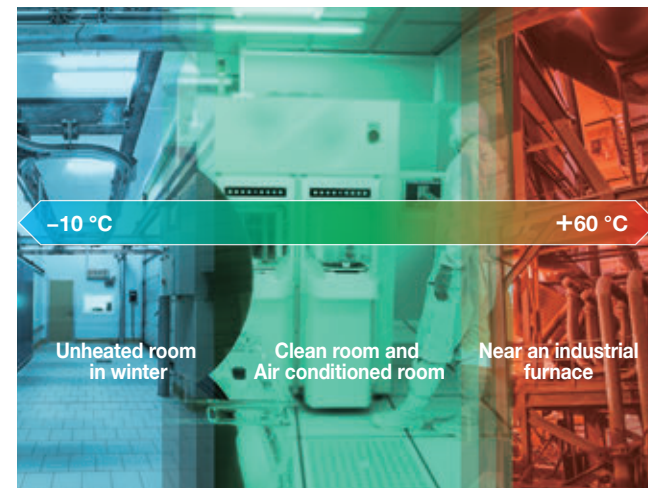
Separate display unit models for flexible installation layout

Models with a separate display unit can be installed in an easy-to-see location while the unit itself is in a place where pipe connections are easy. The separate display unit models can also be installed in any orientation.



Usable in a wide temperature range, from -10 to +60 °C

The controller can be used in a cold room in winter or near a hot industrial furnace. Even when the temperature changes greatly, its effect on the measured values is minimal.



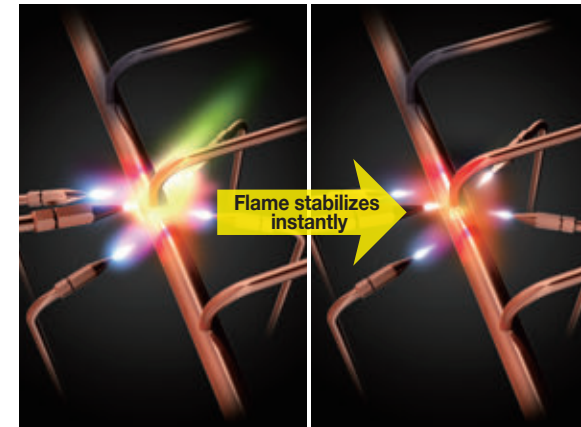
Even without external power, settings can be changed from the PC loader

Power for the controller can be supplied through the USB cable of the PC loader, so settings of the controller can be changed even when it is not otherwise powered.

※ Flow control is not possible when power is supplied from a USB cable.

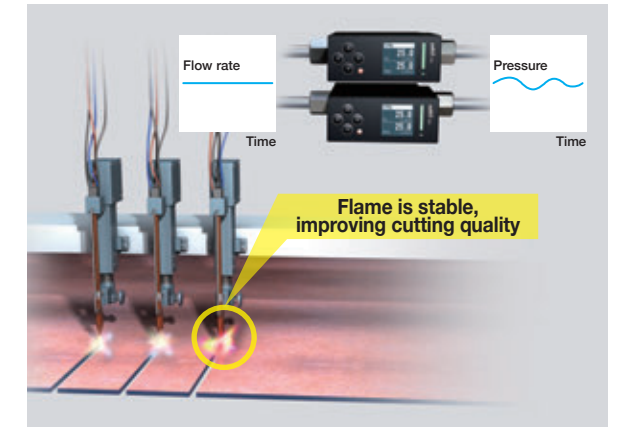


Sample applications



Brazing and burner work

Thanks to high-speed response, when the flame intensity is changed, the flame instantaneously stabilizes, contributing to stable product quality and reduced takt time.



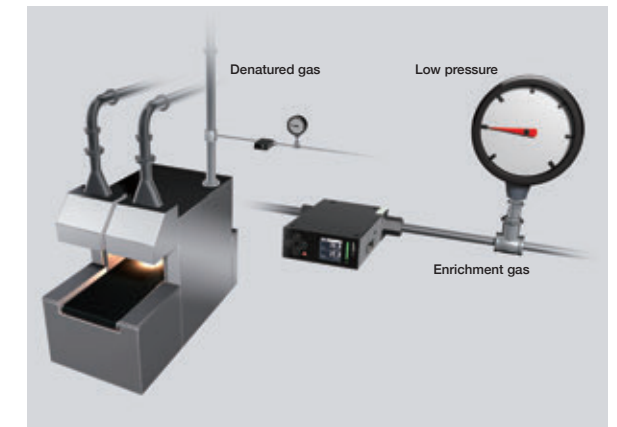
Gas cutting

Thanks to high-speed response, even when the source pressure changes, there is very little effect on the flow rate. The flame remains stable, which improves the cutting quality.



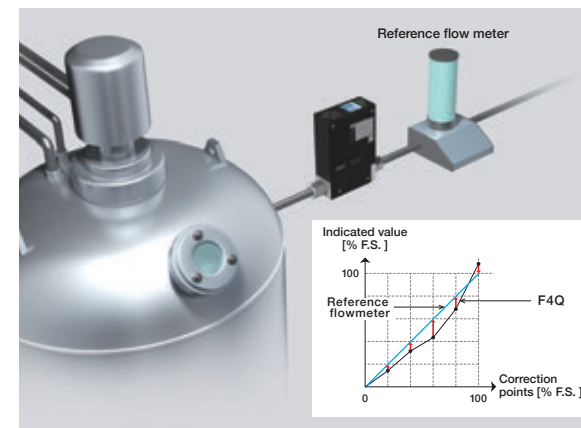
Baking furnace for MLCCs

The operating temperature range is a wide -10 to 60 °C and the effect of ambient temperature changes on flow rate control is small. A stable atmosphere in the furnace also helps to stabilize the quality of baking.



Gas carburizing furnace

Thanks to low pressure loss, model F4Q can control the flow rate of low-pressure enrichment gas, which is not possible with typical mass flow controllers. Better control of the atmosphere in the furnace can stabilize the quality of carburization.



Culture apparatus

The multiple-point flow rate correction function makes matching to a reference flowmeter possible during onsite calibration. It is not necessary to send the controller to the manufacturer for calibration, so costs can be cut and delivery schedules can be shortened.



Experiments

With an AC adapter, the controller can be powered from a wall socket, eliminating the need for troublesome wiring. Operation, monitoring, and data logging from a PC can be done using the PC loader. An experimental environment can be set up in a short period of time.

Control flow rate ranges according to gas type

● Models with fluororubber gasket

Models	F4Q9200	F4Q9500	F4Q0002	F4Q0005	F4Q0020	F4Q0050 (length: 90 mm)	F4Q0100	F4Q0050 (length: 150 mm)	F4Q0200	F4Q0500 (Available soon)
	Control flow rate ranges									
	mL/min									
	L/min									
Air, nitrogen	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	1 to 100	0.5 to 50	2 to 200	5 to 500
Oxygen	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	1 to 100	0.5 to 50	2 to 200	5 to 500
Argon	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	1 to 100	0.5 to 50	2 to 200	5 to 500
Carbon dioxide	1.2 to 120	0.003 to 0.3	0.012 to 1.2	0.03 to 3	0.12 to 12	0.3 to 30	0.8 to 80	0.3 to 30	1.2 to 120	4 to 400
City gas (45 MJ/m ³)	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	0.8 to 80	0.5 to 50	2 to 200	5 to 500
Methane (100 %)	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	0.9 to 90	0.5 to 50	2 to 200	5 to 500
Propane (100 %)	0.6 to 60	0.0016 to 0.16	0.006 to 0.6	0.016 to 1.6	0.06 to 6	0.16 to 16	0.32 to 32	0.16 to 16	0.6 to 60	2 to 200
Butane (100 %)	0.5 to 50	0.0012 to 0.12	0.004 to 0.4	0.012 to 1.2	0.04 to 4	0.1 to 10	0.2 to 20	0.1 to 12	0.4 to 40	2 to 150

● Models with EPDM gasket

Models	F4Q9200	F4Q9500	F4Q0002	F4Q0005	F4Q0020	F4Q0050 (length: 90 mm)	F4Q0200	F4Q0500 (Available soon)
	Control flow rate ranges							
	mL/min							
	L/min							
Acetylene (C ₂ H ₂)	2 to 120	0.005 to 0.3	0.02 to 1.2	0.05 to 3	0.2 to 12	0.5 to 30	1 to 120	4 to 360
Ammonia (NH ₃)	3 to 160	0.007 to 0.4	0.03 to 1.6	0.07 to 4	0.3 to 16	0.7 to 40	2 to 160	4 to 400
Air, nitrogen	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	2 to 200	5 to 500
Argon	2 to 200	0.005 to 0.5	0.02 to 2	0.05 to 5	0.2 to 20	0.5 to 50	2 to 200	5 to 500
Carbon dioxide	1.2 to 120	0.003 to 0.3	0.012 to 1.2	0.03 to 3	0.12 to 12	0.3 to 30	1.2 to 120	4 to 400

* The control flow rate ranges and display resolution can be changed. (E.g., for F4Q9200, depending on the decimal place setting, from 2 to 200 mL/min, or from 2.000 to 200.000 mL/min.)

● Supported gas types

Best: recommended, OK: usable








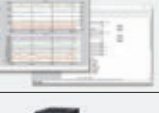

	O-ring material	Gas types					
		Air, nitrogen	Oxygen	Argon	Carbon dioxide	City gas	Methane (100 %)
F4Q with fluororubber gasket	Fluororubber	Best	Best	Best	Best	Best	Best
F4Q with EPDM rubber gasket	Ethylene propylene rubber	OK		OK	OK		

	O-ring material	Gas types			
		Propane (100 %)	Butane (100 %)	Acetylene (C ₂ H ₂)	Ammonia (NH ₃)
F4Q with fluororubber gasket	Fluororubber	Best	Best		
F4Q with EPDM rubber gasket	Ethylene propylene rubber			Best	Best

* For use with hydrogen and helium, please contact Azbil corporation.

* For gases other than the above, please contact Azbil Corporation.

Optional parts (sold separately)

Item	Model No.	Appearance	Application
Dedicated cable with half-pitch connector (2 m)	F9Y4QHP2		20-core cable assembly for controller power and signal connections *1
Dedicated cable with half-pitch connector (5 m)	F9Y4QHP5		
MQV-F4Q conversion harness	F9Y4QA1		Conversion harness for connecting a 20-core flat cable for model MQV to the F4Q *1
AC adapter made by UNIFIVE Co., Ltd.	UU318-2475		AC adapter for supplying power from a commercial power outlet to the controller. Use in combination with a harness (F9Y4QA2).
Conversion harness for AC adapter	F9Y4QA2		A conversion harness for supplying power to the controller using an optional AC adapter (UU318-2475).
Mounting bracket for 90 mm controller	F9Y4QB1		Bracket for installing a controller with a length of 90 mm
Mounting bracket for 150 mm controller	F9Y4QB2		Bracket for installing a controller with a length of 150 mm
PC loader	MLP-F4Q		This allows you to operate, monitor and datalog of model F4Q from your PC. It can be downloaded free of charge from the Azbil website. https://www.azbil.com/products/factory/factory-product/flowmeter/mass-flow-controller/f4q/software/index.html
Network Instrumentation Module Smart Device Gateway	NX-SVG		You can build communication between model F4Q and various devices without programming. Please see CP-PC-1597E for details. *2

*1 Depending on the customer's usage conditions, the cable should be renewed every 5 to 10 years, just like the main unit.

*2 A communication gateway that allows the interchange of information between various kind of control device without programming, enabling smarter development work.

Selection Guide

● 90 mm models with fluororubber gasket and EPDM gasket

Basic model No.	Standard flow rate range				Type	Flow path material	Piping method	Gas type	Comm. type	O-ring material	Option 1	Option 2	Option 3	Suffix	Description
	F	4	Q												
	9	2	0	0											2 to 200 mL/min (normal) *1
	9	5	0	0											0.005 to 0.5 L/min (normal) *1
	0	0	0	2											0.02 to 2 L/min (normal) *1
	0	0	0	5											0.05 to 5 L/min (normal) *1
	0	0	2	0											0.2 to 20 L/min (normal) *1
	0	0	5	0											0.5 to 50 L/min (normal) *1
	0	1	0	0											1 to 100 L/min (normal) *1 *2
					B										Integrated display
					C										Separate display
						6									SUS316
							T								Rc 1/4"
							S								1/4" Swagelok joint *3 (In use of 0100 change to 3/8" Swagelok joint)
							V								1/4" VCR joint *2 *3 (In use of 0100 change to 1/2" VCR joint)
							U								9/16-18 UNF *2
								N							Air, nitrogen *4
									1						RS-485 comm. (CPL/ModbusRTU selectable)
										0					Fluororubber
										E					EPDM *5
											0				None
												0			None
													0		With inspection certificate
														Y	With inspection certificate + traceability
														0	Product version

● 150 mm models with fluororubber gasket and EPDM gasket

Basic model No.	Standard flow rate range				Type	Flow path material	Piping method	Gas type	Comm. type	O-ring material	Option 1	Option 2	Option 3	Suffix	Description
	F	4	Q												
	0	0	5	0											0.5 to 50 L/min (normal) *1 *2 *6
	0	2	0	0											2 to 200 L/min (normal) *1
	0	5	0	0											4 to 500 L/min (normal) *1 *7 (Available soon)
					J										Integrated display
					K										Separate display
						6									SUS316
							T								Rc1/2"
							S								1/2" Swagelok joint *3
							V								1/2" VCR joint *2 *3
							U								3/4-16 UNF *2
								N							Air, nitrogen *4
									1						RS-485 comm. (CPL/ModbusRTU selectable)
										0					Fluororubber
										E					EPDM *5
											0				None
												0			None
													0		With inspection certificate
														Y	With inspection certificate + traceability
														0	Product version

*1. The control flow rate ranges are for air and nitrogen. "mL/min (normal)" and "L/min (normal)" indicate the volumetric flow rate (mL/min and L/min) converted to 0 °C and one atmosphere of pressure (101.3 kPa [abs]).

*2. For O-ring material, only option 0, "Fluororubber," can be selected. "EPDM" cannot be selected.

*3. Before connecting with Swagelok or VCR joints, read the precautions in the instructions from the joint manufacturer.

*4. The controller can be used for gases other than air and nitrogen by changing the setting. The controllable flow rate range varies depending on the gas type. For details, refer to "Control flow rate ranges according to gas type" on page 05.

*5. A controller with an EPDM gasket can only be used for the gases listed below. Otherwise, the sealing characteristics may be degraded. Supported gases: air, nitrogen, argon, carbon dioxide, ammonia, and acetylene

*6. Models F4Q0050J and F4Q0050K are for low differential pressure.

They can control up to a high flow rate at a lower differential pressure than models F4Q0050B and F4Q0050C.

*7. Do not allow gas containing hydrogen to enter model F4Q0500. Doing so may cause device failure.

Specifications

● 90 mm models with fluororubber gasket (for details, refer to CP-SP-1461E)

Model No.	F4Q9200	F4Q9500	F4Q0002	F4Q0005	F4Q0020	F4Q0050	F4Q0100
Valve type	Proportional solenoid valve, normally closed when de-energized (N.C.)						
Standard full-scale flow rate (air, nitrogen) *1	200 mL/min	0.5 L/min	2 L/min	5 L/min	20 L/min	50 L/min	100 L/min
Gas type	*2 Air, nitrogen, oxygen, argon, carbon dioxide, city gas (45 MJ/m ³), methane (100 %), propane (100 %), butane (100 %)						
Control	Control range	1 to 100 % F.S.					
	Response	*3 0.3 s for S.P. ± 2 % F.S. (typ.)					
	Accuracy (under reference conditions) (Q = flow rate)	*4 ±1 % S.P. (40≤Q≤100 %) ±0.4 % F.S. (1≤Q<40 %)	±1 % S.P. (15≤Q≤100 %) ±0.15 % F.S. (1≤Q<15 %)				±1.5%S.P. (60≤Q≤100%) ±0.9%F.S. (1≤Q<60%)
Pressure	Standard differential pressure	200 kPa (inlet pressure: 200 kPa [gauge], outlet pressure: 0 kPa [gauge])					
	Operating differential pressure range	*5 50 to 300 kPa	5 to 300 kPa	50 to 300 kPa	5 to 300 kPa	50 to 300 kPa	100 to 300 kPa
	Allowable inlet pressure	0.5 MPa (gauge)					
	Pressure resistance	1 MPa (gauge)					
Operating conditions	Ambient operating temperature	-10 to 60 °C					
External leakage	1 × 10 ⁻⁸ Pa·m ³ /s (He) (O-ring leakage is not included)						
Analog I/O	Input types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)					
	Output types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)					
Digital I/O	Digital inputs	3 (SP number selection, operation mode selection, flow rate zero correction execution, gas type setting selection, SP ramp control gradient selection, alarm reset, etc.)					
	Digital outputs	3 (Totalization pulse output, control state ON, full open ON, full closed ON, error ON, etc.)					
Communications	*6	(1) USB 2.0, (2) RS-485 comm. (3-wire system, CPL or ModbusRTU selectable by setting)					
Power	Rating	24 V DC, current consumption 300 mA max.					
	Isolation	The power circuit is isolated from the input/output circuits.					
Main material of gas-contacting parts	*7	SUS316, Fluororesin, Fluororubber					
Mounting orientation	*8	Horizontal (but top panel must not face downward) or vertical					
IP (protection) rating	*9	IP40					
Standards compliance	EN61326-1, EN61326-2-3						

● 90 mm models with EPDM rubber gasket (for details, refer to CP-SP-1461E)

Model No.	F4Q9200	F4Q9500	F4Q0002	F4Q0005	F4Q0020	F4Q0050
Valve type	Proportional solenoid valve, normally closed when de-energized (N.C.)					
Standard full-scale flow rate (air, nitrogen) *1	200 mL/min	0.5 L/min	2 L/min	5 L/min	20 L/min	50 L/min
Gas type	*2 Air, nitrogen, oxygen, argon, carbon dioxide, acetylene *10, ammonia *10					
Control	Control range	1 to 100 % F.S.				
	Response	*3 0.3 s for S.P. ± 2 % F.S. (typ.)				
	Accuracy (under reference conditions) (Q = flow rate)	*4 ±1 % S.P. (40≤Q≤100 %) ±0.4 % F.S. (1≤Q<40 %)	±1 % S.P. (15≤Q≤100 %) ±0.15 % F.S. (1≤Q<15 %)			
Pressure	Standard differential pressure	200 kPa (inlet pressure: 200 kPa [gauge], outlet pressure: 0 kPa [gauge])				
	Operating differential pressure range	*5 50 to 300kPa	5 to 300kPa	50 to 300kPa	5 to 300kPa	50 to 300kPa
	Allowable inlet pressure	0.5 MPa (gauge)				
	Pressure resistance	1 MPa (gauge)				
Operating conditions	Ambient operating temperature	-10 to 60 °C				
External leakage	1 × 10 ⁻⁸ Pa·m ³ /s (He) (O-ring leakage is not included)					
Analog I/O	Input types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)				
	Output types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)				
Digital I/O	Digital inputs	3 (SP number selection, operation mode selection, flow rate zero correction execution, gas type setting selection, SP ramp control gradient selection, alarm reset, etc.)				
	Digital outputs	3 (Totalization pulse output, control state ON, full open ON, full closed ON, error ON, etc.)				
Communications	*6	(1) USB 2.0, (2) RS-485 comm. (3-wire system, CPL or ModbusRTU selectable by setting)				
Power	Rating	24 V DC, current consumption 300 mA max.				
	Isolation	The power circuit is isolated from the input/output circuits.				
Main material of gas-contacting parts	*7	SUS316, Fluororesin, EPDM				
Mounting orientation	*8	Horizontal (but top panel must not face downward) or vertical				
IP (protection) rating	*9	IP40				
Standards compliance	EN61326-1, EN61326-2-3					

*1. "mL/min" and "L/min" indicate the volumetric flow rate per minute converted to 0 °C and 101.325 kPa (one atmosphere). The controllable flow rate range varies depending on the gas type. Refer to "Control flow rate ranges by gas type" on page 05. *2. Gas must be dry, without corrosive components like chlorine, sulfur, and acid. It also must be clean, without dust or oil mist. *3. Value at the standard differential pressure. *4. Instrument error compared with our equipment under reference conditions. Reference conditions: ● Fluid: air. ● Inlet pressure: standard differential pressure ± 15 kPa (gauge). ● Outlet pressure: atmospheric pressure. ● Ambient temperature: 23 ± 2 °C. ● Gas temperature: same as ambient temperature. ● Operation mode: control. ● Vibration/pulsation: none. ● Warm-up time: at least 2 hours at ambient temperature, plus at least 30 minutes after power-on. ● Installation orientation: horizontal with display facing upward. ● Upstream straight pipe length: any (excluding model F4Q0100), 25 mm (model F4Q0100). *5. The controller is operable even when the operating differential pressure is lower than the low limit, but the controllable flow rate range is smaller in that case. *6. USB 2.0 is used to connect Azbil's PC loader software. Micro USB Type-B (length 2 m max.) is supported. *7. The gas-contacting parts have been degreased. *8. When installed vertically, the measured values have an error which can be corrected by configuring the controller. Refer to the Digital Mass Flow Controller Model F4Q Detailed User's Manual (CP-SP-1461E) and the Digital Mass Flow Controller Model F4Q User's Manual for RS-485 Communication Functions (CP-SP-1458E). *9. Main unit: only when the connector is connected. Separate display unit: only the front of the display. *10. Cannot be selected in "Gas type selection." To use this gas, set a conversion factor in "User-set gas conversion factor."

Specifications

● 150 mm models with fluororubber gasket (for details, refer to CP-SP-1461E)

Model No.	F4Q0050	F4Q0200	F4Q0500 (Available soon)	
Valve type	Proportional solenoid valve, normally closed when de-energized (N.C.)			
Standard full-scale flow rate (air, nitrogen) *1	50 L/min	200 L/min	500 L/min	
Gas type	*2 Air, nitrogen, oxygen, argon, carbon dioxide, city gas (45 MJ/m ³), methane (100 %), propane (100 %), butane (100 %)			
Control	Control range	1 to 100 % F.S.		
	Response	*3 0.7 s for S.P. ± 2 % F.S. (typ.)		
	Accuracy (under reference conditions) (Q = flow rate)	*4 ±1.5 % S.P. (30 ≤ Q ≤ 100 %) ±0.45 % F.S. (1 ≤ Q < 30 %)	±1 % S.P. (30 ≤ Q ≤ 100 %) ±0.3 % F.S. (1 ≤ Q < 30 %)	±1.5 % S.P. (20 ≤ Q ≤ 100 %) ±0.3 % F.S. (1 ≤ Q < 20 %)
Pressure	Standard differential pressure	50 kPa (inlet pressure: 50 kPa [gauge], outlet pressure: 0 kPa [gauge])	200 kPa (inlet pressure: 200 kPa [gauge], outlet pressure: 0 kPa [gauge])	
	Operating differential pressure range	*5 10 to 100 kPa	100 to 300 kPa	150 to 300 kPa
	Allowable inlet pressure	0.5 MPa (gauge)		
	Pressure resistance	1 MPa (gauge)		
Operating conditions	Ambient operating temperature	-10 to 60 °C		
External leakage	1 × 10 ⁻⁸ Pa·m ³ /s (He) (O-ring leakage is not included)			
Analog I/O	Input types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)		
	Output types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)		
Digital I/O	Digital inputs	3 (SP number selection, operation mode selection, flow rate zero correction execution, gas type setting selection, SP ramp control gradient selection, alarm reset, etc.)		
	Digital outputs	3 (Totalization pulse output, control state ON, full open ON, full closed ON, error ON, etc.)		
Communications	*6	(1) USB 2.0, (2) RS-485 comm. (3-wire system, CPL or ModbusRTU selectable by setting)		
Power	Rating	24 V DC, current consumption 400 mA max.		
	Isolation	The power circuit is isolated from the input/output circuits.		
Main material of gas-contacting parts	*7	SUS316, Fluororesin, Fluororubber	SUS316, Fluororesin, Fluororubber, SUS630 equivalent	
Mounting orientation	*8	Horizontal (but top panel must not face downward) or vertical		
IP (protection) rating	*9	IP40		
Standards compliance	EN61326-1, EN61326-2-3			

● 150 mm models with EPDM rubber gasket (for details, refer to CP-SP-1461E)

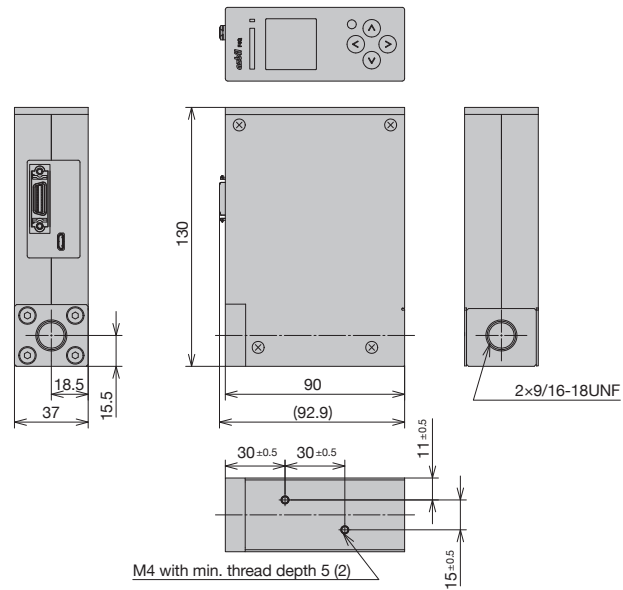
Model No.	F4Q0200	F4Q0500 (Available soon)	
Valve type	Proportional solenoid valve, normally closed when de-energized (N.C.)		
Standard full-scale flow rate (air, nitrogen) *1	200 L/min	500 L/min	
Gas type	*2 Air, nitrogen, oxygen, argon, carbon dioxide, acetylene *10, ammonia *10		
Control	Control range	1 to 100 % F.S.	
	Response	*3 0.7 s for S.P. ± 2 % F.S. (typ.)	
	Accuracy (under reference conditions) (Q = flow rate)	*4 ±1 % S.P. (30≤Q≤100%) ±0.3 % F.S. (1≤Q<30%)	±1.5 % S.P. (20≤Q≤100%) ±0.3 % F.S. (1≤Q<20%)
Pressure	Standard differential pressure	200 kPa (inlet pressure: 200 kPa [gauge], outlet pressure: 0 kPa [gauge])	
	Operating differential pressure range	*5 100 to 300 kPa	150 to 300 kPa
	Allowable inlet pressure	0.5 MPa (gauge)	
	Pressure resistance	1 MPa (gauge)	
Operating conditions	Ambient operating temperature	-10 to 60 °C	
External leakage	1 × 10 ⁻⁸ Pa·m ³ /s (He) (O-ring leakage is not included)		
Analog I/O	Input types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)	
	Output types	DC 0 to 5 V, 1 to 5 V, 4 to 20 mA (selectable)	
Digital I/O	Digital inputs	3 (SP number selection, operation mode selection, flow rate zero correction execution, gas type setting selection, SP ramp control gradient selection, alarm reset, etc.)	
	Digital outputs	3 (Totalization pulse output, control state ON, full open ON, full closed ON, error ON, etc.)	
Communications	*6	(1) USB 2.0, (2) RS-485 comm. (3-wire system, CPL or ModbusRTU selectable by setting)	
Power	Rating	24 V DC, current consumption 400 mA max.	
	Isolation	The power circuit is isolated from the input/output circuits.	
Main material of gas-contacting parts	*7	SUS316, Fluororesin, EPDM	SUS316, Fluororesin, EPDM, SUS630 equivalent
Mounting orientation	*8	Horizontal (but top panel must not face downward) or vertical	
IP (protection) rating	*9	IP40	
Standards compliance	EN61326-1, EN61326-2-3		

*1. "mL/min" and "L/min" indicate the volumetric flow rate per minute converted to 0 °C and 101.325 kPa (one atmosphere). The controllable flow rate range varies depending on the gas type. Refer to "Control flow rate ranges by gas type" on page 05. *2. Gas must be dry, without corrosive components like chlorine, sulfur, and acid. It also must be clean, without dust or oil mist. *3. Value at the standard differential pressure. *4. Instrument error compared with our equipment under reference conditions. Reference conditions: ● Fluid: air. ● Inlet pressure: standard differential pressure ± 15 kPa (gauge). ● Outlet pressure: atmospheric pressure. ● Ambient temperature: 23 ± 2 °C. ● Gas temperature: same as ambient temperature. ● Operation mode: control. ● Vibration/pulsation: none. ● Warm-up time: at least 2 hours at ambient temperature, plus at least 30 minutes after power-on. ● Installation orientation: horizontal with display facing upward. ● Upstream straight pipe length: any (model F4Q0050), 50 mm (model F4Q0200), 70 mm (model F4Q0500). *5. The controller is operable even when the operating differential pressure is lower than the low limit, but the controllable flow rate range is smaller in that case. *6. USB 2.0 is used to connect Azbil's PC loader software. Micro USB Type-B (length 2 m max.) is supported. *7. The gas-contacting parts have been degreased. *8. When installed vertically, the measured values have an error which can be corrected by configuring the controller. Refer to the Digital Mass Flow Controller Model F4Q Detailed User's Manual (CP-SP-1461E) and the Digital Mass Flow Controller Model F4Q User's Manual for RS-485 Communication Functions (CP-SP-1458E). *9. Main unit: only when the connector is connected. The location where the valve cable enters the unit is not included. Separate display unit: only the front of the display. *10. Cannot be selected in "Gas type selection." To use this gas, set a conversion factor in "User-set gas conversion factor."

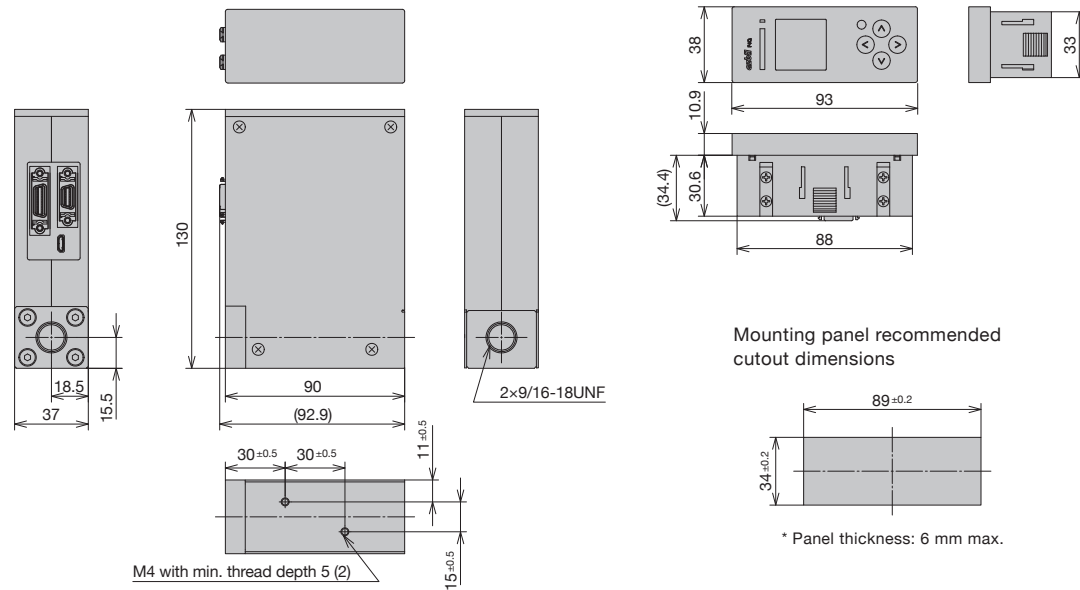
External Dimensions Unit: mm

● 90 mm models with fluororubber gasket or EPDM rubber gasket

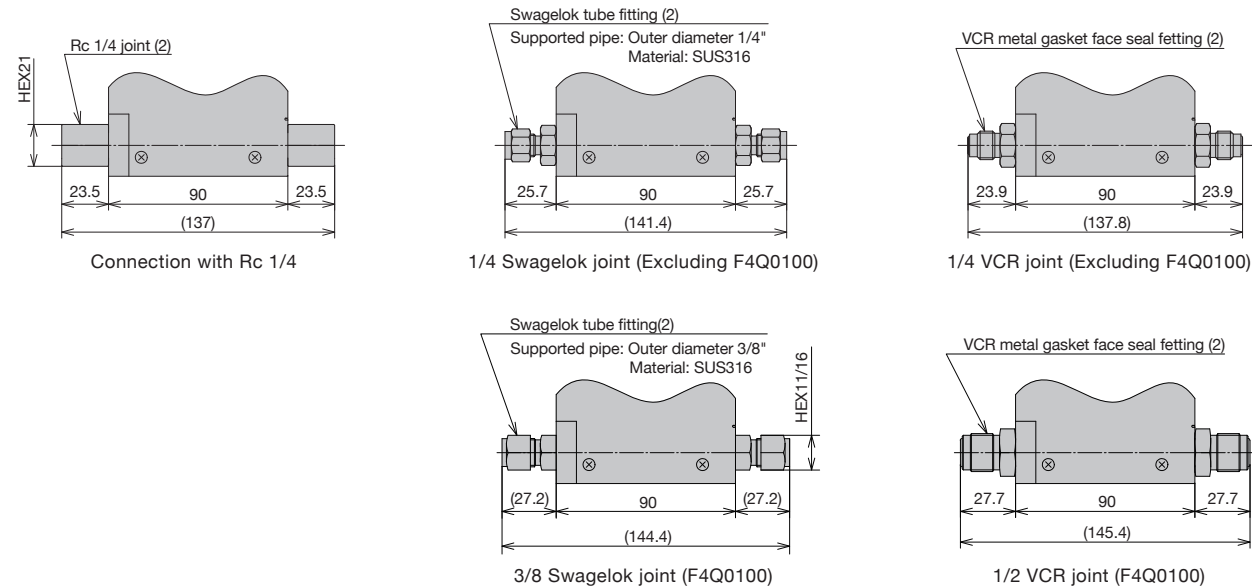
With integrated display



With separate display

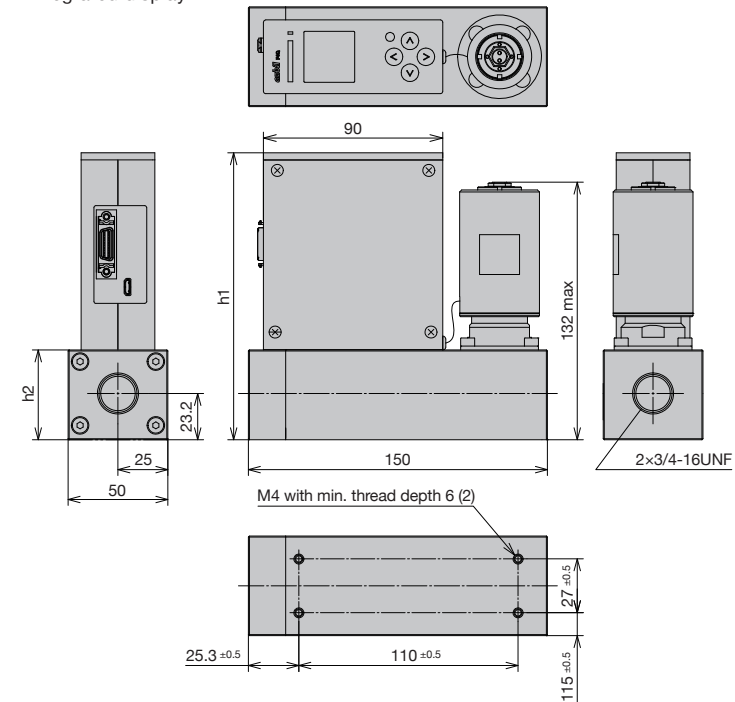


Common to the integrated display and separate display types

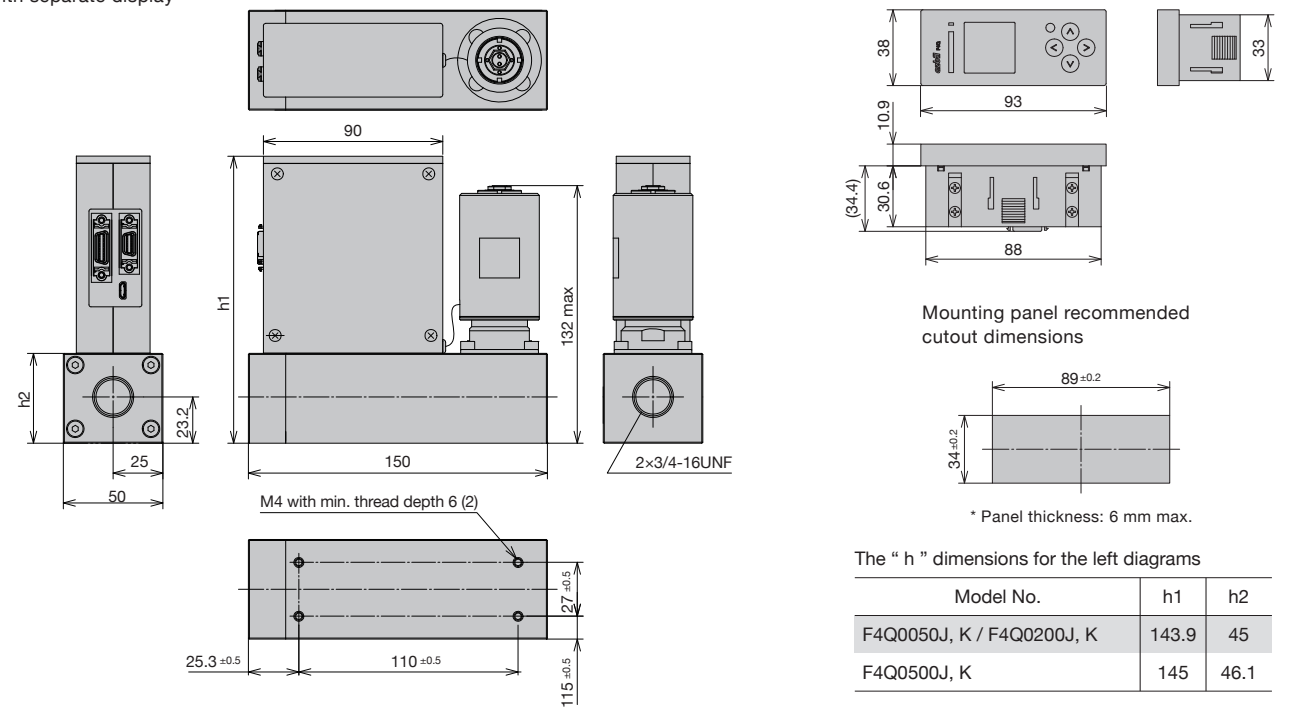


● 150 mm models with fluororubber gasket or EPDM rubber gasket

With integrated display



With separate display



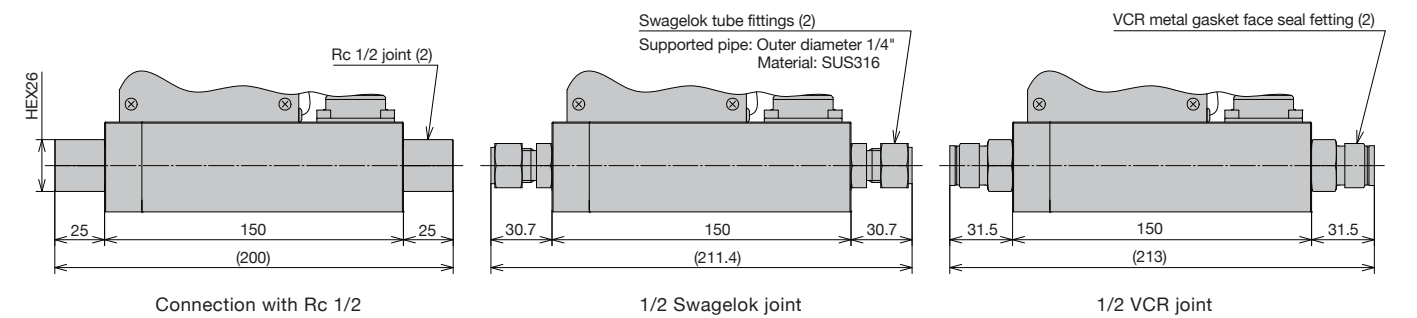
The "h" dimensions for the left diagrams

Model No.	h1	h2
F4Q0050J, K / F4Q0200J, K	143.9	45
F4Q0500J, K	145	46.1

The "h" dimensions for the left diagrams

Model No.	h1	h2
F4Q0050J, K / F4Q0200J, K	143.9	45
F4Q0500J, K	145	46.1

Common to the integrated display and separate display types



Tolerance unless otherwise specified: ±1