

USER MANUAL

VIC-K200 Series

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We appreciate this opportunity to service your flow measurement and control requirements with a VIC-D Series.

We recommend that you read this entire manual to the work to be performed before you install and operate this equipment.

Not following instructions may cause injury to people or damage to property.

NEVER DISCARD THIS MANUAL.

Safety precautions



Warning

- Please read and understand the manual before attempting to operate and install the product
- Please put the manual on the site that operating the device.
- Follow all directives and instructions on the manual, otherwise it may cause serious injuries or damage to the products.

Warning and Caution Boxes

The safety precautions described in this manual are indicated by symbols.

Please be sure you read and understand the symbols and their meaning described below before reading the rest of the manual.



Warning

Important information Ignoring this information could cause serious injuries to people or damage to the instrument or installation.



Caution

Ignoring this information could cause minor or moderate injuries to people or damage to the instrument or installation.



Caution

※ Storage

- ① Store the product in a safe place
(Make sure that product avoid direct sunlight, rain storm and unsafe environment)
- ② Do not keep the product in high temperature and humidity.
- ③ Prevent any corrosion.
- ④ Keep away from shock or impact.
- ⑤ Do not store the product in flooded districts.
- ⑥ MFC is shipped in contamination-free packages. Unpack MFC right before attempting to install or operate the product.



Warning

※ Handling

- ① These MFC are sophisticated technical products, Do not drop it nor subject it to shock. Doing so might damage the device.
- ② Do not remove the MFC cover.
-MFC warranties are void if the seal on the MFC is removed.
- ③ Do not hold the case at the time of carrying.
-Doing so might damage to the cover, or dropping the product due to slipping might result in getting hurt.



Warning


※ Product usage environment.

- ① Temperature between 5 °C and 50 °C
- Operate the MFC in the recommended temperature, Otherwise it could cause damage to property or Unstable flow.
- ② Ensure that product keep away from direct sunlight, rain and dust.
- ③ We recommend that you operate this equipment to the work to be performed at the indoor.
- ④ Prevent any electronic impact



Caution

※ Installation

- ① Before you install the MFC, ensure that you have the correct model for your system requirements.
 - ◆ Fitting
 - ◆ Direction of flow (Follow the mark  on the MFC)
 - ◆ Type of Gas (Check the label on the MFC)
 - ◆ Power supply / output signal (Check the label on the MFC)
 - ◆ Wiring (Check the pin-map on the MFC) [※See Page10])
- ② Prior to installation, ensure that all piping is clean and free from Obstructions.
- ③ Using screws mount the MFC. Ensure it is securely attached and will resist vibration from external sources.
- ④ After the device has been installed in the process, prevent any impact or electronic shock.
- ⑤ We recommend that you use a dedicated regulator on the MFC primary side.
 - Immoderate pressure may cause MFC failure and control error. Ensure that using stable pressure.
- ⑥ Recommends that in-line filter be installed upstream from the device to prevent the odds of any foreign substance entering the device.
- ⑦ It is recommended to install a separate shut-off valve in the line if so required.
- ⑧ The control valve in the MFC provides precision control and is not designed for positive shut-off. If positive shut-off is required, it is recommended that a separate shut-off valve be installed in-line
- ⑨ You must shut off the gas flow before installing the MFC



Warning

※ Operating

Discarding this information could cause damage to the instrument or personnel injury.

- ① Using gas that are not compatible with the MFC could result in damaging the product
- ② Prevent any foreign substance.
 - If the water, oil, rust or dust in the piping flows into the device, measurement error might occur and result in damaging the device.
- ③ Before operating the flow controller, ensure all pressure, gas have been properly set for working.

- ④ Complete purging is required to remove the MFC from the system.
 - If explosive or corrosive gases are used, purging with an inert gas is absolutely necessary.
- ⑤ Do not touch the device when power is being supplied.
- ⑥ Warm up the MFC for at least 30 minutes before supplying gas.



Caution

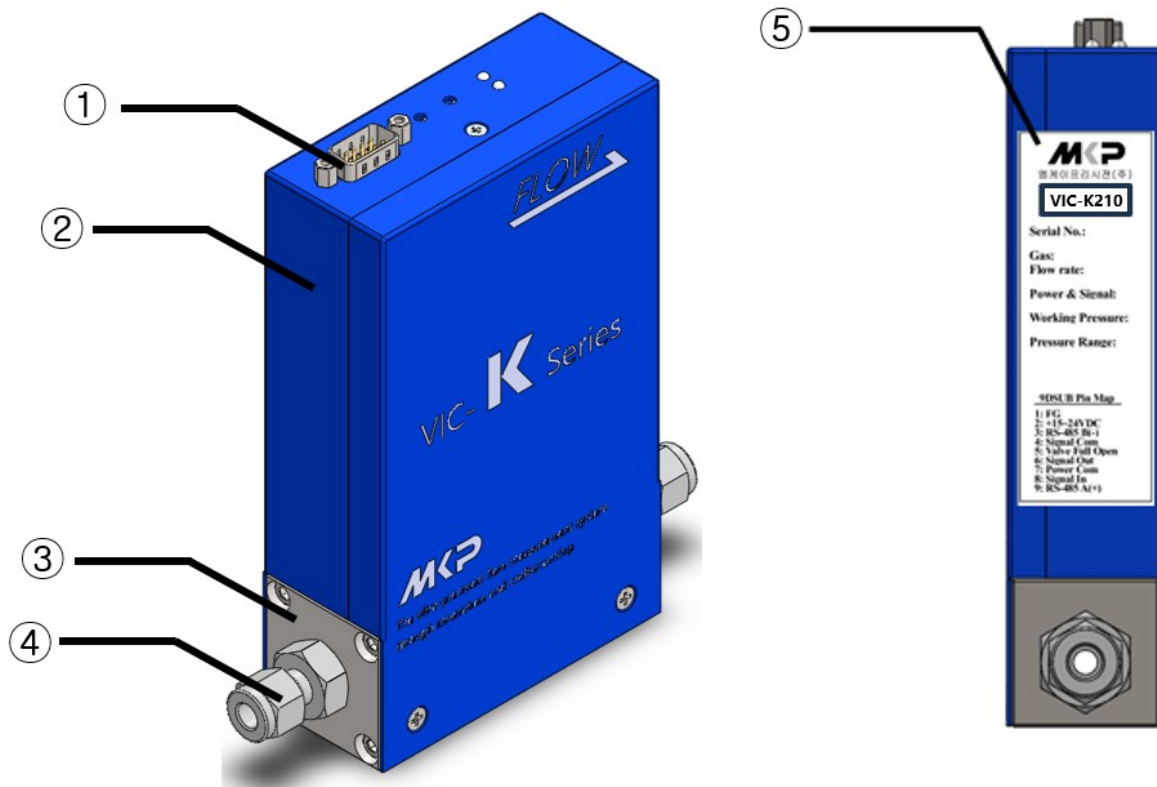
※ Electrical connections

- ① When removing and installing cables from and to your device, make sure the power is turned off.
- ② MKP MFC are powered with +14.5V to +24.5V / 0.5A
- ③ Recommends that using standard connector pins.
- ④ Make sure that all pin connections of the mating cable have the same pin out connections.

1. Specification

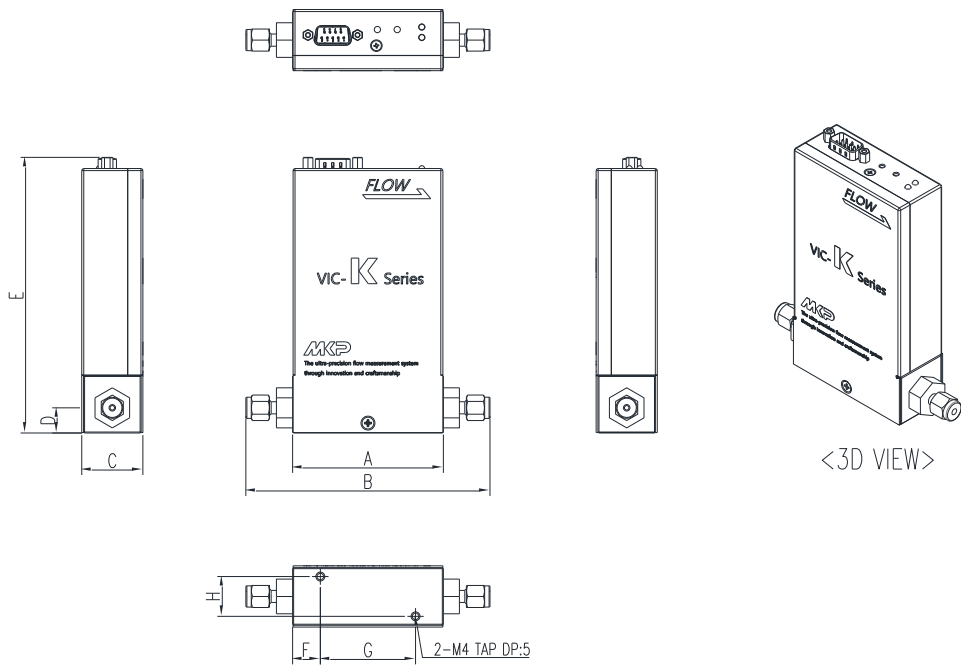
Model	VIC-K210	VIC-K220	VIC-K240
Flow Range (N2 Equivalent)	5 sccm ~ 1.5 slm	1.5 slm~50 slm	50 slm~200 slm
Flow control range	Of Full scale 2 ~ 100%		
Accuracy	Of Full scale $\leq \pm 1\%$		
Response time	≤ 1 sec (10 ~ 100%)		
Linearity	Of Full scale $\leq \pm 0.2\%$		
Repeatability	Of Full scale $\leq \pm 0.2\%$		
Control valve type	Normally Closed Solenoid		
Type of seal	Elastomer (Viton, Viton-ETP, Kalrez, etc)		
In/Outlet signal	Analog: 0~5VDC or 4~20mA Digita : RS485(Optional : D-Net)		
Power supply	+24VDC		
recommended Operating temperature	15 ~ 35 °C		
Warm-Up Time	30 min		
Connector	D-SUB 9P MALE (D-NET: M12 5P MALE)		
Weight (STS)	0.95 kg	0.97 kg	1.87 kg
Weight (AL)	0.67 kg	0.69 kg	1.35 kg

2. MFC COMPONENTS



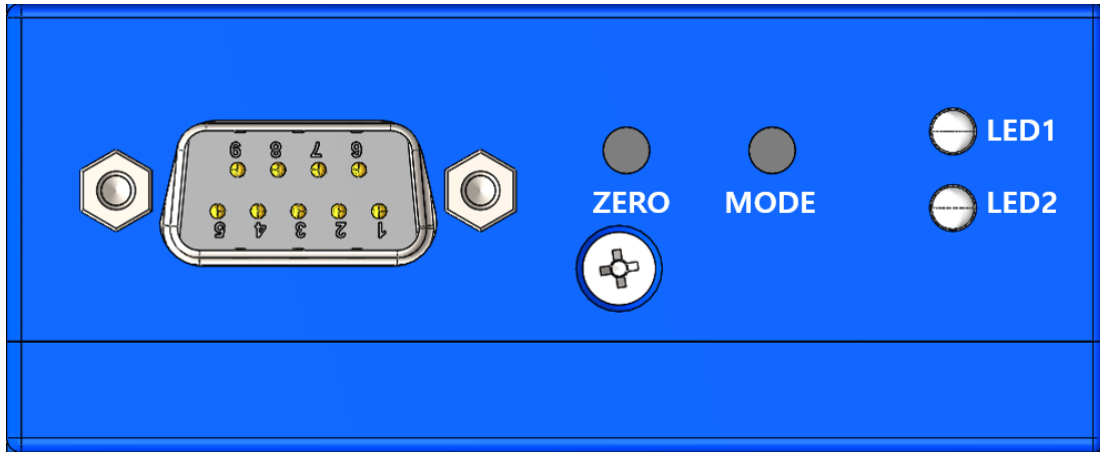
No	ITEM
①	D-SUB 9PIN CONNECTOR(MALE)
②	CASE
③	BODY
④	FITTING
⑤	PRODUCT INFORMATION

3. Dimensions for MFC Models



모델	A	B									C	D	E	F	G	
		LOK					VCR		mm							
		1/8"	1/4"	3/8"	1/2"	3/4"	1/4"	1/2"	6	8						
VIC-K210, 220	76	122.1	127.6	130.5	134.7	-	124	131.5	128.1	131	30.8	12.7	138.8	14	48	20
VIC-K240	95	-	147.8	150.8	156.8	166.4	145	150.5	148.7	151	40.8	19.5	162.6	23.5	48	20

4. “ZERO” Setting & MODE Changing



- (a) ZERO: Display output signal during not operate product. Use as changing setting button in MODE 1, 2.
- (b) MODE: Check MODE status display. (MODE 0 , 1 , 2)
- (c) LED 1: Display MODE status. (MODE 0, 1, 2) <Refer 1-1. Mode status display and Setting >
- (d) LED 2: Display setting status. <Refer 1-1. Mode status display and Setting >

1-1. ZERO Setting

- Before Zero Reset, close inlet valve and open MFC, outlet valve (Remove remain gas)
- Press “ZERO” button during 2 seconds.
- Red light flickering in once in LED2 when Zero setting completed



Warning

Please make sure remove remain gas inside of product before ZERO setting.
If gas remains inside of product, it might be cause inaccurate Zero Reset Value due to influence of leakage.

1-2. Mode status display and Setting

























- Press “MODE” button to change MFC mode.
- Choose ‘MODE 0’, ‘MODE 1’, ‘MODE 2’.
(In case of setting MODE 1, Press “MODE” twice: Digital(RS485) Mode
After completed setting MODE 1, Press “MODE” twice: “MODE 2”)
- MODE 0: General operation mode (Power status, Display flow condition)
- MODE 1: Use for select communication mode (Digital, Analog).

Use ZERO button for changing communication type.

- MODE 2: Digital Communication Speed Selecting Mode (9600, 14400, 19200, 38400bps)
Press "ZERO" button control communication speed.

Please refer to the appendix named "Mode Setting Process".

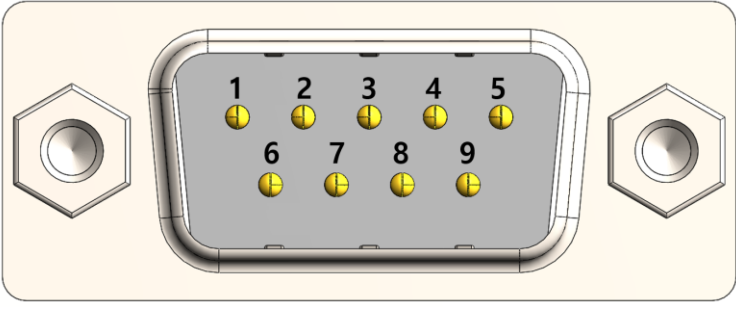
< 1-1. Mode Setting & Display >

	LED 1	LED 2	LED 1	LED 2	LED 1 Status	Setting Method
MODE 0			Green (Lighting continuous)		IDLE Status (Standby status)	X
			Green (Lighting continuous)	Green (Lighting continuous)	FLOW Status (Stable)	X
			Green (Lighting continuous)	Red (Lighting continuous)	FLOW Status (Unstable)	X
			Red 1 time flickering		Input power under 13V	X
			Red 2 times flickering		Not connected to the sensor	X
			Red 3 times flickering		Abnormality in sensor power supply (unrelated to sensor connection)	X
MODE 1 (Comm Mode)			Green 1 time	Green 1 time	Digital (RS-485) Mode	Ex. Initial Value
			Green 1 time	Green 2 times	Analog Mode	Press "ZERO" twice
MODE 2 (Comm Speed)			Green 2 times	Green 1 time	9600 bps	Ex. Initial Value
			Green 2 times	Green 2 times	14400 bps	Press "ZERO" twice
			Green 2 times	Green 3 times	19200 bps	Press "ZERO" twice
			Green 2 times	Green 4 times	38400 bps	Press "ZERO" twice

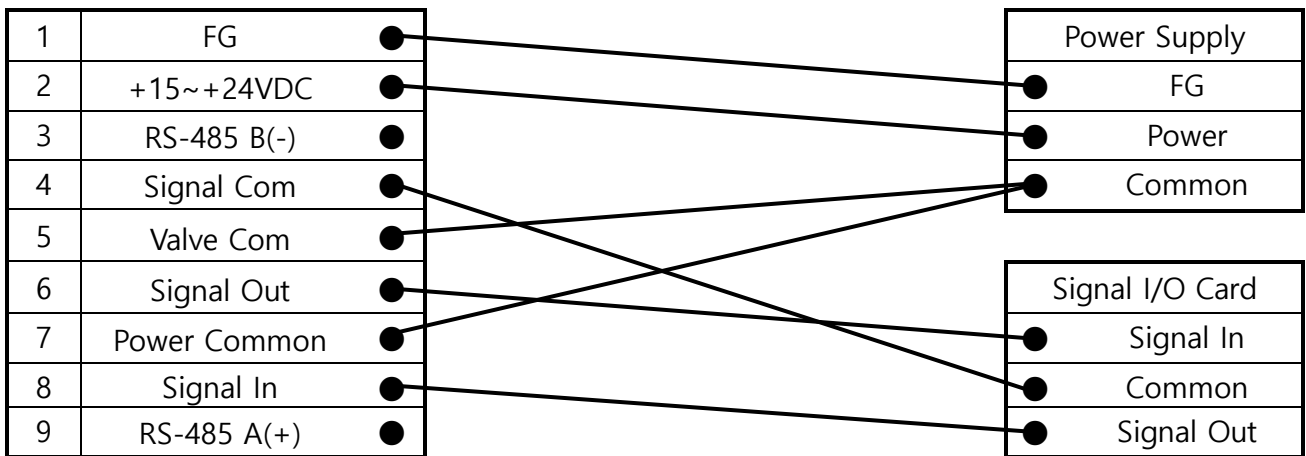


Product is not working checking during condition mode or setting mode.
Please make sure operate product during "Zero" mode.

5. D-SUB 9-PIN CONNECTOR

D-Sub 9 Pin	Pin No	Electrical Connection
	1	FG
	2	+24VDC
	3	RS-485 B(-)
	4	Signal Com
	5	Valve Com
	6	Signal Out
	7	Power Common
	8	Signal In
	9	RS-485 A(+)

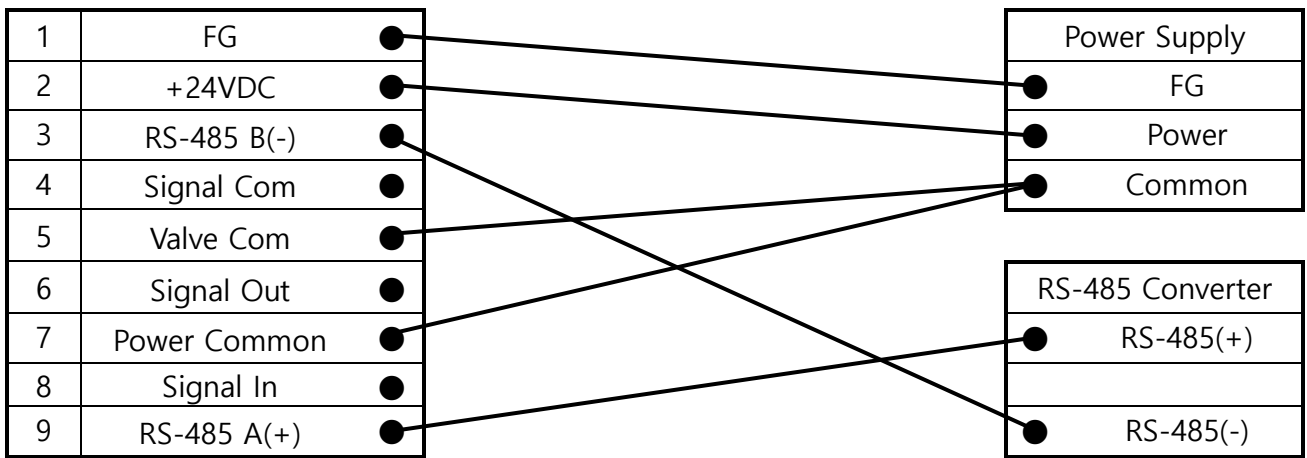
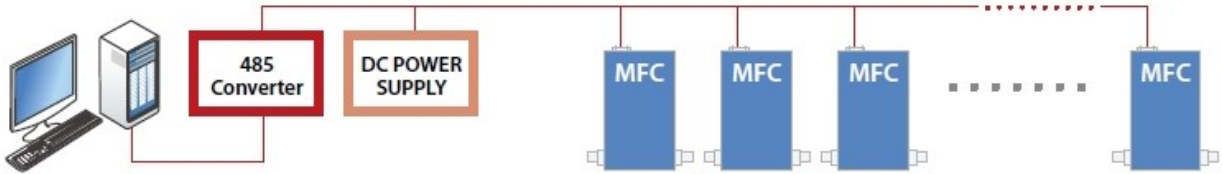
1) Analog Wiring



<Information on the Analog Wiring>

- ① Pins 5 and 7 must be connected at the Power supply common
- ② Pins 4 and 7 is connected to adjust the signal level and this pin should not be used jointly.
- ③ Pin2 that flow from Power supply must flow out through Pin 5 and 7.
- ④ Pin 6 and 8 that flow at Signal I/O Card must flow out through Pin4.

2) Digital Wiring



6. Troubleshooting MFC

1. Gas is not supplied

- ① Check power supply / Check cable connection (+24VDC)
(See “Analog wiring” on page 10)
 - ② Check for power failures in the 0~5VDC or 4~20mA)
 - ③ Check the outlet side of the MFC.
 - Release the gas through outlet of the MFC to check if gas is supplied.
 - Before attempting to test, Be sure the gas must have no hazardous (ex: corrosion, flammable, harmful)
 - ④ Prior to checking the pipe line, inspect the inlet mesh carefully.
If they have any contamination on the mesh that cause no gas is being supplied.
- ◆ If the gas contains foreign matter such as dust, rust, oil or water. If it seems that there is foreign matter in the flow meter, Contact MKP service center and ask for repair

2. Output signal much lower and/or higher than set point signal or desired flow

- ① Check power supply / Check cable connection (+15VDC or +24VDC)
- ② Check the output signal and the readout indicator.
 - Indicator may have failed or wrong calibrated.
- ③ Incorrect type of gas is used and/or different pressure is possible cause.
 - Check the conditions for which it was designed.
- ④ Check the piping for any gas leaks / Leaks from the piping may cause flow output and set point do not match.

3. Unstable flow or incorrect out exists

- ① Check for stable pressure on both the inlet and outlet sides of the MFC
- ② Check that the pressure differential between the inlet and outlet sides of the MFC is correct.
- ③ Check whether MFC is being used with correct gas.