



Made in USA

Measurement & Control System

Pump Equipment Line

Mass Flow Meters & Controllers

Liquid Flow Meters & Controllers

Digital pressure and Vacuum Gauges & Controllers

Accessory & Software



REVODIX
레보딕스(주)

Mass Flow Meter and Controller



Product Series

- M-series** : Mass Flow Meter (질량유량계)
- MC-series** : Mass Flow Controller (질량 유량 컨트롤러)
- MB-series** : Portable Gas Mass Flow Meters (휴대용 유량계)

Features

- PC 및 PLC에 연결 없이 독립적으로 키패드 컨트롤 가능
- COMPOSER™ gas composition 펌웨어 포함
- 반응 속도 : 4ms
- 작동 준비 시간이 짧음 (<1 second)
- 다양한 기체혼합가스 측정 가능
- 한 화면에 모든 플로우 데이터 값 표기
- 압력 차 측정방식 : 습기 혹은 방향 변화에 영향 없음
- 정밀도 : 0.6%
- 작동 범위 : 0.01-100% of full scale
- 유량 범위 : 0.5-5000 SLPM (유량 범위에 따라 선정가능)
- 재질 : 304 stainless steel
(사용 조건에 따라 316L stainless steel 적용 가능 : MS, MCS series)

SENSOR PERFORMANCE

Mass Flow Accuracy (at Calibration Conditions)	low flow : $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale Mid flow : $\pm 0.6\%$ of reading or $\pm 0.1\%$ of full scale High Flow : $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale
High Accuracy Option	low flow : $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale Mid flow : $\pm 0.5\%$ of reading or $\pm 0.1\%$ of full scale High Flow : $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale
Repeatability	low flow : $\pm(0.2\%$ of reading + 0.02% of full scale) Mid flow : $\pm(0.1\%$ of reading + 0.02% of full scale) High Flow : $\pm(0.2\%$ of reading + 0.02% of full scale)
Flow Measurement Range	0.01-100% of full scale
Operating Temperature Range	-10~60°C
Temperature Accuracy	$\pm 0.75^\circ\text{C}$
Operating Pressure Full Scale	160 PSIA
Pressure Accuracy (above/below) 1atm	$\pm 0.5\%$ of reading / ± 0.07 PSIA
Sensor Response / Warm-Up Time	<10 ms, flow rate dependent / <1 s

COMMUNICATIONS

Analog I/O	4-20 mA, 0-5 VDC, 1-5 VDC, 0-10 VDC
Digital I/O	RS-232 Serial by default RS-485 Serial, Modbus RTU (over RS-232 or RS-485) Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, Profibus
Electrical Connection	6 pin locking, 8 pin mini-DIN, 8 pin M12, DB-9, DB-15 (contact Alicat for custom pinouts)
Power Requirements	9-24 VDC, 40 mA (12-24 VDC, 80 mA if equipped with 4-20 mA or 0-10 VDC output)
Digital Data Update Rate	40 Hz at 19200 baud
Analog Data Update Rate	1 kHz
Display Update Rate	10 Hz
Analog Signal Accuracy	$\pm 0.1\%$ of full scale additional uncertainty

Liquid Flow Meter and Controller



Product Series

L-series : Liquid Flow Meter (액체유량계)

LC-series : Liquid Flow Controller (액체 유량 컨트롤러)

LB-series : Portable Liquid Flow Meter (휴대용 액체 유량계)

Features

- PC 및 PLC에 연결 없이 독립적으로 키패드 컨트롤 가능
- 한 화면에 모든 플로우 데이터 값 표기
- 반응 속도 (측정시간 / 조절시간) : 20ms / 100ms
- 작동 준비 시간이 짧음 (<1 second)
- PID Valve tuning 방식을 통한 최고의 속도와 안정성 확보
- 정확도(Accuracy) : $\pm 2\%$ of full scale
- 작동 범위 : 2-100% of full scale
- 유량 범위 : 0-0.5 ccm to 0-10 lpm
- 재질 : 304 stainless steel
(사용 조건에 따라 316L stainless steel 적용 가능 : LS, LCS series)
- 방폭옵션 선택 가능 (CSA Class 1 Div 2 D16 Classification)

PERFORMANCE

Product	L Meters	LC Controllers	LCR Controllers
Available Ranges	0.5 ccm to 10 lpm	0.5 ccm to 500 ccm	1 lpm to 5 lpm
Accuracy at calibration conditions after tare	$\pm 2\%$ Full Scale		
Repeatability	$\pm 2\%$ Full Scale		
Zero Shift and Span Shift	0.02% Full Scale / °Celsius / Atm		
Operating Range	2% to 100% Full Scale		
Turndown Ratio	50:1 Turndown		
Maximum Flow Rate	128% FS Measurable	102.4% FS Controllable	
Typical Response Time	20 ms (Adjustable)	100 ms (Adjustable)	
Warm-up Time	< 1 Second		

OPERATING CONDITION

Product	L Meters	LC Controllers	LCR Controllers
Operating Temperature	Non-Freezing -10° to +60 °Celsius		
Max. Internal Pressure	100 psig		
Proof Pressure	200 psig		
Ingress Protection	IP40		

COMMUNICATION / POWER

Product	L Meters	LC Controllers	LCR Controllers
Digital Output Signal	RS-232 Serial / RS-485 Serial / Modbus / PROFIBUS3		
Analog Output Signal	0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA		
Electrical Connection	8 Pin Mini-DIN / 9-pin D-sub (DB9) / 15-pin D-sub (DB15) / 6 pin locking		
Supply Voltage	7-30 Vdc	12-30 Vdc	24-30 Vdc
Supply Current	0.040 Amp	0.250 Amp	0.750 Amp

Pressure and Vacuum Gauge and Controller



P - Series

PC - Series

Product Series

P-series : Pressure Gauge (압력 게이지)

PC-series : Pressure Controller (진공, 압력 컨트롤러)

PCD-series : Dual Valve Differential Pressure Controllers
(이중밸브 압력 컨트롤러)

Features

- PC 및 PLC에 연결 없이 독립적으로 키패드 컨트롤 가능
- 한 화면에 모든 플로우 데이터값 표기
- 응답시간 : 50-100 ms
- PID Valve tubing방식을 통한 최고의 속도와 안정성 확보
- 정확도(Accuracy) : $\pm 0.25\%$ of full scale
- 재현성(Repeatability) : 0.08% of reading
- 작동범위 : PC and PCP : 0.01-100% full scale
PCR : 0.5%-100% Full Scale

PERFORMANCE

Product	P-Series Gauges	PC & PC3 Controllers	PCR & PCR3 Controllers
Standard Accuracy		$\pm 0.30\%$ Full Scale (2 inH ₂ O) $\pm 0.25\%$ (≥ 1 psi)	
High Accuracy Option		$\pm 0.125\%$ (≥ 1 psi)	
Repeatability		$\pm 0.08\%$ Full Scale	
Zero Shift and Span Shift		0.02% Full Scale / °C	
Operating Range		PC and PCP : 0.01-100% Full Scale, PCR : 0.5%-100% Full Scale	
Turndown Ratio		10000:1 (PC, PCP), 200:1 (PCR)	
Excess Pressure	128% Full Scale Measurable	102.4% Full Scale Controllable	
Burst Pressure	3 X Full Scale (1.5 X Full Scale for ranges >500 psi)		
Warm-up Time	< 1 Second		

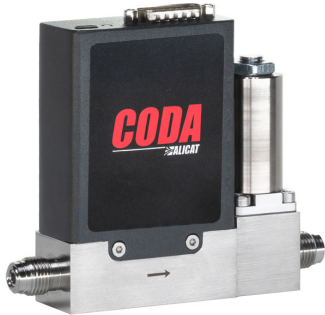
OPERATING CONDITION

Product	P-Series Gauges	PC & PC3 Controllers	PCR & PCR3 Controllers
Operating Temperature	Non-Freezing -10° to +60 °Celsius		
Ingress Protection	IP40		

COMMUNICATION / POWER

Product	P-Series Gauges	PC & PC3 Controllers	PCR & PCR3 Controllers
Digital Output Signal	RS-232 Serial, RS-485 Serial, DeviceNet, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP/IP, PROFIBUS		
Analog Output Signal	0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA		
Electrical Connection	8 pin Mini-DIN, 9 pin D-sub (DB9), 15 pin D-sub (DB15), 6 pin locking, 8 pin M12		
Supply Voltage	7-30 Vdc	12-30 Vdc	24-30 Vdc
Supply Current	0.040 Amp	0.250 Amp	0.750 Amp

Coriolis Mass Flow Meter and Controller



CODA Series

KM/KC-Series : Standard Coriolis식 질량유량계

KMO/KCO-Series : Coriolis for OEM applications

Features

- 측정범위 : 0.2 g/h ~10 kg/h
- 정밀도 : 액체) $\pm 0.2\%$ of reading or $\pm 0.05\%$ (of full scale)
가스) $\pm 0.5\%$ of reading or $\pm 0.05\%$ (of full scale)
- 액체 및 기체의 화학적 특성을 모르는 경우에도 각각의 질량 및 유량을 정확하게 판독 가능
- 외부 진동에 영향 받지 않아 환경 간섭에도 높은 정확도를 유지
- 부식성 유체에 사용가능 : IP67등급
- 작동압력(max.) : 4000 PSIA

SENSOR AND CONTROL PERFORMANCE

Full Scale Flow Rate Options	100 g/h, 1000 g/h, 10,000 g/h
Flow Accuracy	Liquid: $\pm 0.2\%$ of reading or $\pm 0.05\%$ of full scale, whichever is greater Gas: $\pm 0.5\%$ of reading or $\pm 0.05\%$ of full scale, whichever is greater
Repeatability	$\pm 0.05\%$ of reading or $\pm 0.025\%$ of full scale, whichever is greater
Minimum Measurable Flow	0.2% of full scale
Density Accuracy	$\pm 5 \text{ kg/m}^3$
Viscosity Range	0–200 cP
Zero Stability	$\pm 0.05\%$ of full scale (included in the flow accuracy specification)
Temperature Sensitivity	Mass flow zero shift: $\pm 0.01\%$ of full scale per °C from tare temperature Mass flow span shift: $\pm 0.005\%$ of reading per °C from 25°C
Valve Function	Normally Closed
Typical Control Response Time	<500 ms (T98)
Typical Indication Response Time	<100 ms (T98)

MECHANICAL

Maximum Operating Pressure (Proof)	100–1000 g/h: 1500 PSIA / 10000 g/h: 1000 PSIA 4000 PSIA option is available for all ranges
Operating Temperature Range	Ambient: 0–60°C / Fluid : 30–105°C
Ingress Protection	IP40 (IP67 optional, M12 required)
Wetted Materials	FKM, 316L
Process Connections	1/4" VCR Male
Inlet Filter Recommended	Meter: 20 microns / Controller: 1 micron

COMMUNICATIONS

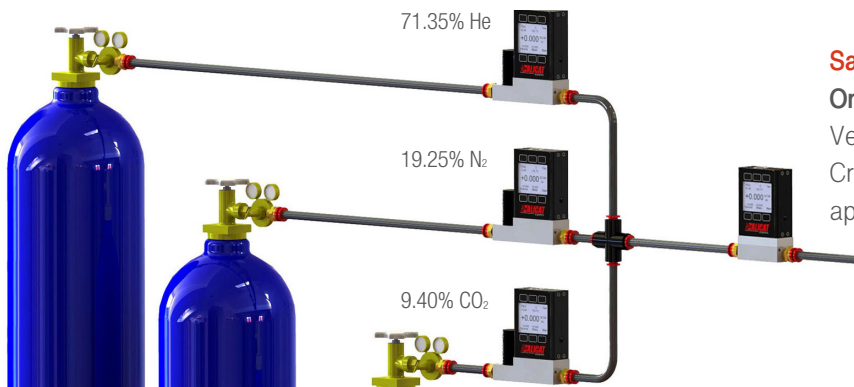
Analog I/O	0–5 Vdc, 0–10 Vdc, 4–20 mA
Digital I/O	Modbus RTU (over RS-232 or RS-485)
Electrical Connector Options	DB-15 with USB-C (default), M12 (IP67 only)
Power Requirements	Meter: 1.4 watts, 5–30 Vdc (58 mA at 24 Vdc) via USB-C or DB15/M12 Controller: 4 watts, 12–30 Vdc (167 mA at 24 Vdc) via DB15/M12 only
Digital Update Rate	50 Hz at 19200 baud
Analog Update Rate	50 Hz

Gas Select™ 5.0

하나의 Mass Flow Meter & Controller로 130가지 가스 및 20가지 혼합 가스의 측정과 컨트롤이 가능



- MFM, MFC에 등록된 130가지 가스 각각의 유량을 측정 및 컨트롤
- 130가지 가스 중 5가지 가스의 혼합물에 대한 측정 및 컨트롤
- 각 가스는 0.01%의 미세한 양까지 혼합 가능
- 원하는 혼합물의 Calibration data를 20개까지 저장 가능
- 가스 혼합물에 대한 측정 및 컨트롤을 실시간으로 확인 가능 (NIST ref.)
- RS-232를 통하여 원하는 가스 리스트 생성



Sample Application

On-Site Laser Gas Mixing

Verify flow rates for gases mixed on-site.
Create 20 mixes tailored to your exact application needs.

Alicat Gas Select™ 5.0 Preloaded Gases

Pure Gases

- Acetylene (C₂H₂)
- Air
- Argon (Ar)
- i-Butane (i-C₄H₁₀)
- n-Butane (n-C₄H₁₀)
- Carbon dioxide (CO₂)
- Carbon monoxide (CO)
- Deuterium (D₂)
- Ethane (C₂H₆)
- Ethylene/Ethene (C₂H₄)
- Helium (He)
- Hydrogen (H₂)
- Krypton (Kr)
- Methane (CH₄)
- Neon (Ne)
- Nitrogen (N₂)
- Nitrous Oxide (N₂O)
- Oxygen (O₂)
- Propane (C₃H₈)
- Sulfur Hexafluoride (SF₆)
- Xenon (Xe)

Stack/Flue Gases

- 2.5% O₂+10.8% CO₂+85.7% N₂+1% Ar
- 2.9% O₂+14% CO₂+82.1% N₂+1% Ar
- 3.7% O₂+15% CO₂+80.3% N₂+1% Ar
- 7% O₂+12% CO₂+80% N₂+1% Ar
- 10% O₂+9.5% CO₂+79.5% N₂+1% Ar
- 13% O₂+7% CO₂+79% N₂+1% Ar

Bioreactor Gases

- 5% CH₄ 95% CO₂
- 10% CH₄ 90% CO₂
- 15% CH₄ 85% CO₂
- 20% CH₄ 80% CO₂
- 25% CH₄ 75% CO₂
- 30% CH₄ 70% CO₂
- 35% CH₄ 65% CO₂
- 40% CH₄ 60% CO₂
- 45% CH₄ 55% CO₂
- 50% CH₄ 50% CO₂
- 55% CH₄ 45% CO₂
- 60% CH₄ 40% CO₂
- 65% CH₄ 35% CO₂
- 70% CH₄ 30% CO₂
- 75% CH₄ 25% CO₂
- 80% CH₄ 20% CO₂
- 85% CH₄ 15% CO₂
- 90% CH₄ 10% CO₂
- 95% CH₄ 5% CO₂

Breathing Gases

- EAN-32 (32% O₂+68% N₂)
- EAN-36 (36% O₂+64% N₂)
- EAN-40 (40% O₂+60% N₂)
- EA-40 (40% O₂+60% Air)
- EA-60 (60% O₂+40% Air)
- EA-80 (80% O₂+20% Air)
- Heliox-20 (20% O₂+80% He)
- Heliox-21 (21% O₂+79% He)
- Heliox-30 (30% O₂+70% He)
- Heliox-40 (40% O₂+60% He)
- Heliox-50 (50% O₂+50% He)
- Heliox-60 (60% O₂+40% He)
- Heliox-80 (80% O₂+20% He)
- Heliox-99 (99% O₂+1% He)
- Metabolic Exhalant
(16% O₂+78.04% N₂+5% CO₂+0.96% Ar)

Fuel Gases

- Coal Gas 50% H₂+35% CH₄+10% CO+5% C₂H₄
- Endothermic Gas 75% H₂+25% N₂
- HHO 66.67% H₂+33.33% O₂
- LPG HD-5 96.1% C₃H₈+1.5% C₂H₆+0.4% C₃H₆+1.9% n-C₄H₁₀
- LPG HD-10 85% C₃H₈+10% C₂H₆+ 5% n-C₄H₁₀
- Nat Gas 1 93% CH₄+3% C₂H₆+1% C₃H₈+2% N₂+1% CO₂
- Nat Gas 2 95% CH₄+3% C₂H₆+1% N₂+ 1% CO₂
- Nat Gas 3 95.2% CH₄+2.5% C₂H₆+0.2% C₃H₈+0.1% C₄H₁₀+1.3% N₂+0.7% CO₂
- Syn Gas 1 40% H₂+29% CO+20% CO₂+11% CH₄
- Syn Gas 2 64% H₂+28% CO+1% CO₂+7% CH₄
- Syn Gas 3 70% H₂+4% CO+25% CO₂+1% CH₄
- Syn Gas 4 83% H₂+14% CO+3% CH₄

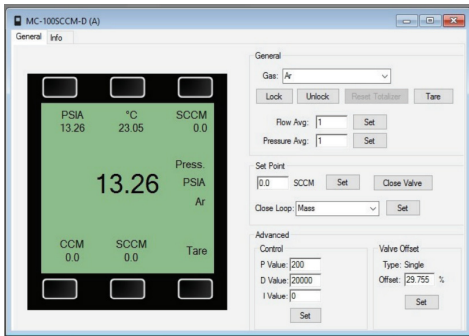
Laser Gases

- 4.5% CO₂+13.5% N₂+82% He
- 6% CO₂+14% N₂+80% He
- 7% CO₂+14% N₂+79% He
- 9% CO₂+15% N₂+76% He
- 9.4% CO₂+19.25% N₂+71.35% He
- 9% Ne+91% He

O₂ Concentrator Gases

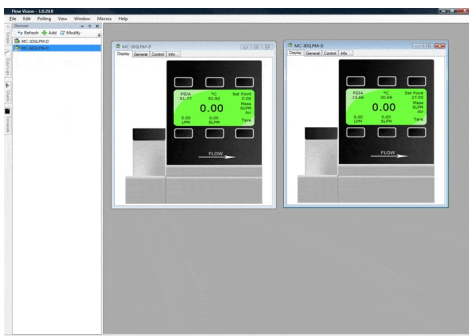
- 89% O₂+7% N₂+4% Ar
- 93% O₂+3% N₂+4% Ar
- 95% O₂+1% N₂+4% Ar

Control Software



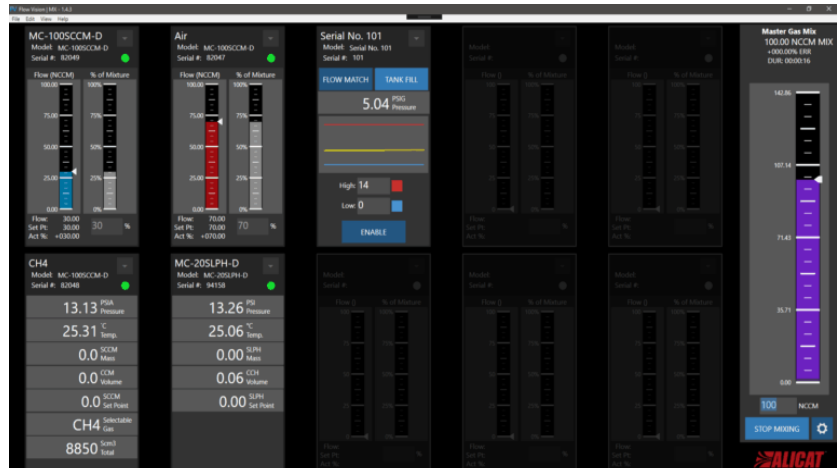
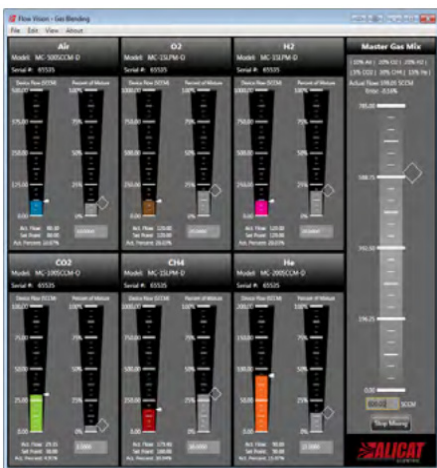
Flow Vision SC Software

- 최대 26개의 제품을 실시간으로 동시 모니터링 및 컨트롤
- 데이터 캡처 기능 및 로깅 기능 (그래프 표시 가능)
- 프로그램에서 손쉬운 Gas Calibration 가능
- 제품 연결 시 자동 구성 기능
- 자주 사용하는 설정 값 저장 및 불러내기 기능
- 제품이 멈추거나 설정 범위가 초과 될 경우 알람기능 탑재



Flow Vision MX™ Gas Mixing Software

- 최대 6개의 mass Flow controller를 이용하여 실시간 가스 혼합
- 데이터 캡처 기능 및 로깅 기능 (그래프 표시 가능)
- 프로그램에서 손쉬운 Gas Calibration 가능
- Graphical user interface (GUI)제공
- 제품 연결 시 자동 구성 기능
- 자주 사용하는 설정 값 저장 및 불러내기 기능
- 제품이 멈추거나 설정범위가 초과 될 경우 알람기능 탑재



Accessories



Multi-drop Breakout Boxes (BB9 series)

- Supply DC Cable
- 8-pin, 6-pin, D-Subend으로 구성
- RS-232, RS-485, USB 사용자가 원하는 사양 선택 가능
- 하나의 PC로 최대 9개의 MFC를 동시에 작동



Communications Cables

- Supply DC Cable
- 8-pin, 6-pin, D-Subend으로 구성
- RS-232, RS-485, USB 사용자가 원하는 사양 선택 가능
- 하나의 PC로 최대 9개의 MFC를 동시에 작동



Fittings and Adapters

- 사용 조건에 따라 원하는 Connection port선정 가능
- NPT ports (1.0", 1.5", 2.0")
- British Standard Pipe ports (1/8", 1/4", 3/8", 1/2", 3/4" etc.)
- Welded VCR ports (1/8", 1/4", 1/2", 3/4" etc.)



Display Option

- Remote Display
 - 사용자 장비 내 별도 장착 가능
 - 기존 장비와 같이 데이터를 실시간 모니터링가능
 - 칼라 옵션 적용가능



REMOTE ELECTRONICS (for high temperature)

- 측정 부와 모니터링부분을 분리하여 운용
- 고온의 가스 측정 시 적용 가능
(가스 온도 100°C에도 사용 가능)
- 소형장비에 장착하여 원격운용 가능

