

TSC-245

User's Manual



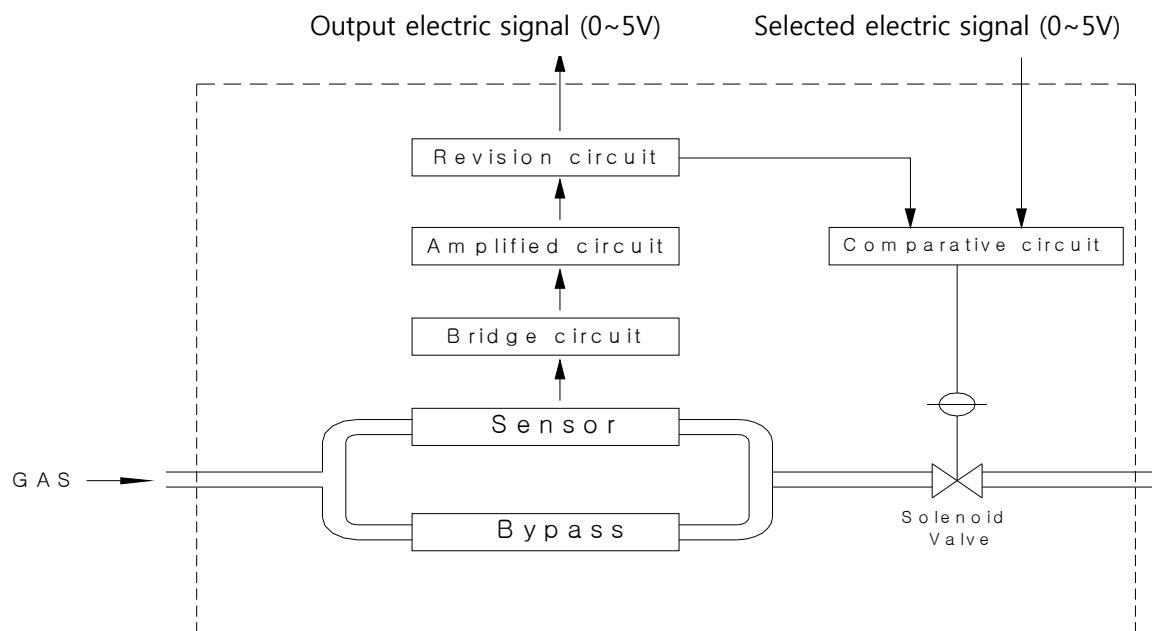
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1. Overview

1.1 Features

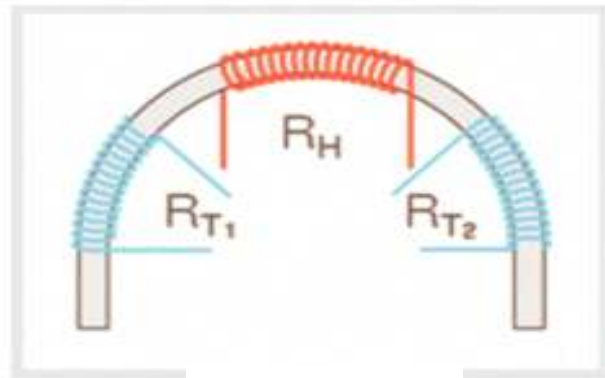
TSC-200 Series are independently developed (possess various patents) MFC by Original Korean Technology. Depending the model, it can be applied up to 100 bar in pressure, it has characteristic to directly measure and control gas mass flow almost having no problem or no bearing to the pressure and the temperature changes with the sensor principle. TSC Series can practically use from the applied flow ranges of small flow (5sccm) to large flow (2500lpm), and for the special model, it is possible to manufacture MFC that can function in a very small pressure gauges. Nearly 10 years of R&D and production experiences, TSC Series is acknowledged for its product quality that supplies major domestic user companies such as Samsung Electronics, Hynix, and other public enterprises and exporting globally.



1.2 Function principle

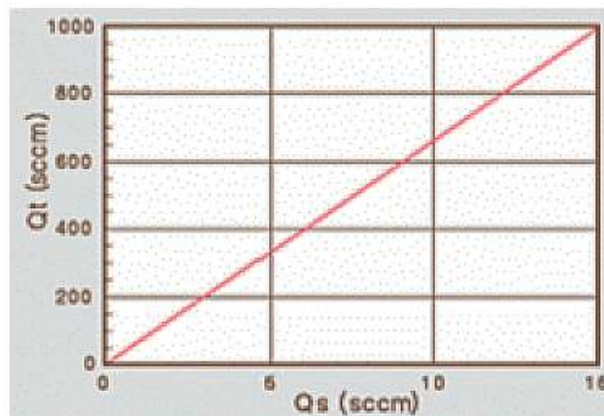
MFC(mass flow controller) is composed of sensor, actuator, and control circuit. When the flow passes through the MFC, there will be differences in the temperature on top and bottom part of the sensor area that works to decide generating power ratio of the flow, then by comparing with the external setting signal and the power output, MFC automatically opens the valve to control. These consecutive movements make the equal signal.

1.3 Major parts – Sensor



1. Utilizes tube structures that was made by the ultra-precision processing technology
2. Carries two installed precision sensors which help to perform the sensitive sensing.
3. Selected sensor structure that can make an absolute external balance.
4. Applied structure technology that perfectly harmonizes the tube and bypass.
5. Designed to make sure that its characteristics do not change in the long time usage.

1.4 Major parts – Bypass



Bypass parts has applied a manufacturing technology that applied the patent technology to give the perfect alignment with guarantee. Flow measurements are done by the sensor, yet

most of the flow flows by the bypass and is structured to have an alignment relationship where it can measure the entire flow.

2. Specifications

Flow range	0 ~400slm
Flow rate control range	2~100%
Accuracy	±1.0% of F.S.
Linearity	±0.2% of F.S.
Repeatability	±0.2% of F.S
Response time	less than 2 seconds
Warm up time	15min (precious measurement 30 min)
Circuit type	Analog
Power supply	+15VDC or +24VDC
Input/output signal	0~5V or 4~20mA Selectable
Connector	D-sub 9 pin
Control valve type	Solenoid valve (Normally Closed)
Standard fittings	SWL of VCR Selectable
Operating temperature	0~50°C (recommended temp. range 15 - 30°C)
Max. operating pressure	Vacuum ~ 100 bar(g) Selectable
Operating humidity	less than 85%RH
Material	SUS316L

※ NOTE

- a) Apply the conversion factors when applying for gases other than the nitrogen, and air.
For the detailed information, refer to the homepage. (www.mcmflow.co.kr)
- b) For the detailed specifications per model, refer to the homepage. (www.mcmflow.co.kr)

3. Dimensions

T8

MFC | Analog

질량유량제어기 (Mass Flow Controller)

TSC-245

0 ~ 400 slm

외형 » Appearance



활용분야 » Configuration

- 반도체, 화학 등 제조에 필요한 정밀유량제어 용도
- 연구소, 실습실 등 연구 및 학습 분야

주요특징 » Features

- 직통식 구조
- 항상된 안정성
- 높은 정확성 및 반복성
- 빠른 응답성
- 반응성 높거나 안정성이 낮은 가스에 최적의 구조를 실현
- Material : SUS 316L

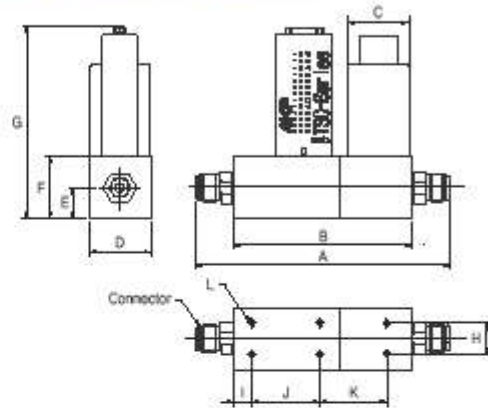
품질보증 » Warranty

- ISO 9001 인증
- Helium leak test
- CE, TUV, 자율안전

성능 » Performance Specification

항 목	내 용
Media	Multi-gas, nitrogen, hydrogen, oxygen, helium, LPG, LNG, argon etc. (any gases)
Flow Rate	0 ~ 400 slm
Flow control Range	2~100%
Accuracy	≤ ±1.0% of F.S.
Linearity	≤ ±0.2% of F.S.
Repeatability	≤ ±0.2% of F.S.
Response time	≤ 2sec
Warm-up time	≤ 15min (accuracy guaranteed : ≤30min)
Readout system	Analog
Power supply	+15VDC or +24VDC Selectable
In/out signal	0~5V or 4~20mA Selectable
Valve type	Solenoid valve(Normally Closed)
Temperature	0~50℃(accuracy guaranteed : 15~35℃)
Humidity	≤ 85%RH

형상/규격 » Configuration / Specification

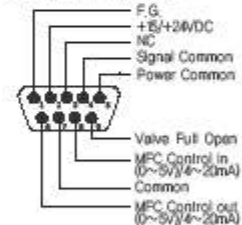


A	B	C	D	E	F	G	H
200	141	∅48	49	24.5	49	150.3	24
I	J	K	L				
14.5	54	52.5	M&0.7P DP6				

- Male connector
SUS316L SWL or VCR

피팅(인치)	A(mm)
1/2" SWL	205.5
3/4" SWL	208.2
1/2" VCR	200

- D SUB 9Pin Connector



※ NOTE

a) Special specification can be produced.

b) For the detailed specifications per model, refer to the homepage. (www.mcmflow.co.kr)

4. Wiring diagram

Pin Number.	Name
1	F.G
2	Power (+15VDC or +24VDC)
3	NC
4	Signal Common
5	Power Common
6	MFC Control out(0~5V or 4~20mA)
7	Common for PLC
8	MFC Control in(0~5V or 4~20mA)
9	Valve Full Open

※ NOTE

1. Power common pin must be directly connected by an independent line of the readout box or the common terminal of the electricity supply equipment.
2. FG pin must be connected to the sash ground.

3. Valve full open pin is the terminal used when spreading out the equipped line of MFC. In this case, valves are completely open by supplying 15V. Here, the flow will be a lot bigger than what MFC can control.
4. For the detailed specifications, please refer to the homepage. (www.mcmflow.co.kr)
5. When you use PLC application you have to join pin 5 and pin7.

5. Usage method

- 1) Keep attention to the flow and connect to MFC gas line.
- 2) Utilize power supply than can supply more than DC 200mA and exact power to MFC.
- 3) In general, it is okay to use the power supply directly. However, warm up for 15 minutes after supplying the power for the precision purpose.
- 4) Correctly establish the pressure.
- 5) Insert MFC control in.

$$\text{Setting Value(MFC Control in)} = \frac{\text{Needed flow}}{\text{mfc flow}} * 5.000V$$

6. Handling precautions

- 1) Within the valve there should never be liquids such as water, oil, vapors.
- Each valve must supply clean gas without containing the dust. Dust will deteriorate the accuracy and cause the block which makes the control impossible.
- 2) Valve should not leak and should be installed after completing the purge procedures.
- 3) When connecting the valve (fitting), one must use the spanner and a vice.
- 4) For the MFC be safely remain with the pressure in the front/rear part, one should make the system or the equipment.
- 5) In order to completely shut the flow, it is preferable to install a manual valve.
- 6) Do not reach over 5V for the MFC control in.
- 7) Be careful connecting the electric power.

- 8) In the condition where the power is on, do not draw out the cable or reconnect. This can cause the mal function.
- 9) Do not use other gas other than what is used.- Contact if it is necessary.
- 10) Do not shock.
- 11) Keep it fixed when using it.
- 12) Do not disassemble.
- 13) TSC-200 Series converts the flow amount at 20 °C, 1013hPa(1atm) or 0 °C, 1013hPa(1atm) to calibrate 0 value.

7. Product warranty

1) Warranty period

Free repair or exchange when the product breaks within 1 year of the purchase.

2) Warranty range

Warranty is limited to the main frame, and the company will not be responsible for damage problems other than the body.

3) Warranty for the repaired parts

90 days after the repair, separate from the warranty period.

4) Exemptions

Company will not be responsible within the warranty period in cases stated below.

1. Damages due to the natural disaster
2. Damage caused by mistreatment
3. Damages caused due to the operation in an inappropriate environment.
4. Damages caused by the excess ranged setting.
5. Damaged occurred by other products

- Korea Instruments T&S disassembles and inspects A/S products to find out if it will be charged or free of charge for the repair.