TOKINARC®

BM3860 Mass Flow Meter

User Manual

Please be sure this instruction manual reaches the end user.

Tokin Corporation

SAFETY PRECAUTIONS

Before proceeding to any work (i.e. installation, operation, or maintenance and inspection), please always first read this manual and all other related documents thoroughly. After gaining a proficient understanding of all mechanical and safety precautions please operate appropriately.

DANGER If used improperly dangerous conditions which may result in severe injury or death are assumed.

CAUTION If used improperly a degree of possibility for minor injury to personnel, equipment or materials is assumed.

COMPULSORY Compulsory item or action.

PROHIBITED Prohibited item or action.

Please Note: Even though sections may be listed as “CAUTION”, depending on the situation serious injuries are possible. All of these symbols indicate important items that should always be observed.

⚠ Danger

❗ Please do not use this device for any purpose other than shielding gas flow measurement.

⚠ Precautions

❗ Please use this device only within the prescribed flow rate range.
❗ To prevent foreign objects from entering the device a filter is included. Please conduct periodic inspections and replace parts as needed.
⊘ This is a precise measurement devise. To avoid damage please do not allow it to be dropped, thrown, or otherwise impacted.
⊘ Please do not use this device outside of the gas pressure range. If used beyond the resistance capacity the device will be damaged.
⊘ Please avoid using or storing outdoors in direct contact with wind and rain, sunlight, et cetera. Also please avoid environments where water droplets, fine particles, dust, high humidity, or corrosive gas are in the atmosphere. In these conditions, electronic parts deteriorate and cable connections corrode resulting in defects.
⊘ Please avoid storing in areas subject to vibration or ambient temperatures exceeding 60℃. When actual gas is flowing during a measurement the temperature must be within 5℃～50℃. If used outside of that range the measurement performance will be impaired.

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1. Summary of Device

This device is a portable mass flow meter designed to measure gas flow from an arc welding torch. It is battery powered and capable of approximately 24 hours of continuous use.

2. Please Verify Contents

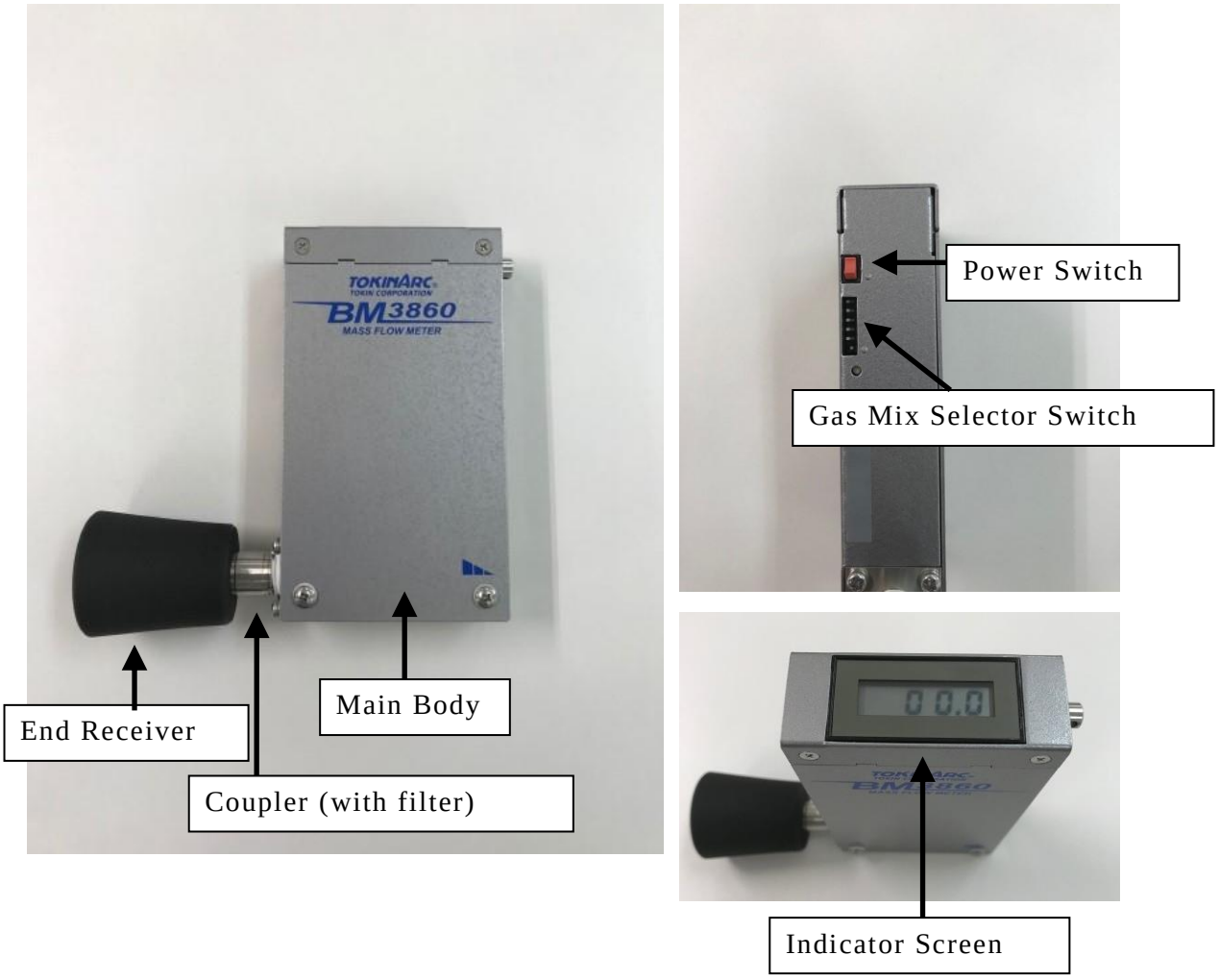
After the device is delivered please immediately verify the following.

1. Check the exterior for any damage.
2. Check if all the contents are included.

Contents

Description	Quantity
BM3860 Mass Flow Meter	1
User Manual	1

3. All Part Names



4. How to Use

⃠ Please do not use this device outside of the gas pressure range. If used beyond the pressure resistance the device will be damaged.

Regarding Batteries

This device does not include batteries. Please purchase yourself based on the recommendation below.

Recommended Battery: AA size alkali dry cell, 4 batteries

●Installing the Batteries

There is a battery case inside the main body. Please install batteries according to the below instructions.

① Using a screwdriver please remove both screws from the front cover. Detach the cover by pulling from the bottom. While removing be careful not to lose the screws or plastic washers.

Fastening Screw with Plastic Washer

② Be careful of the positive and negative ends when setting the batteries. If using rechargeable batteries all 4 must be the same identical brand and specification.

③ Please be sure to install the screws in both locations on the front cover with plastic washers.

● Gas Mix Measurement Configuration

Please select the gas mix before you begin measuring.

There are 6 types of possible gas mix configurations.

The switch lever facing to the right indicates the corresponding gas configuration.
The side with the bubble mark is SW1.

SW1: CO2 100%
SW2: Ar 100%
SW3: Ar 80% + CO2 20%
SW4: Ar 70% + CO2 30%
SW5: Ar 90% + CO2 10%
SW6: Ar 60% + CO2 40%

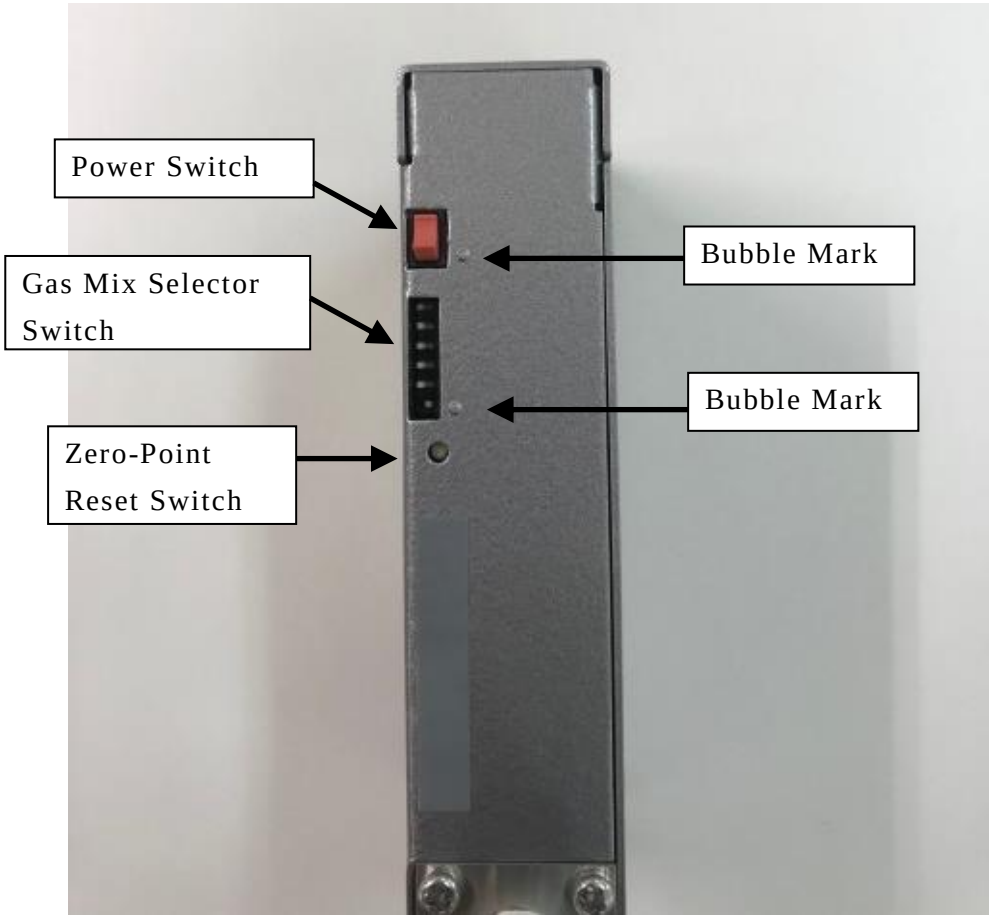
●Power-Up

To power-up this device press the switch on the left hand side.

To prevent battery consumption please keep the switch OFF when not in use. Press the switch towards the bubble mark to turn the device ON.

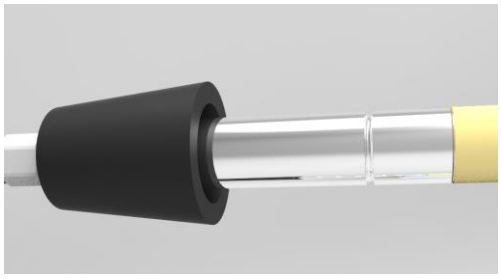
●Zero-Point Reset

If the display value exceeds ±0.1 when no gas is flowing, please use the zero-point reset switch.



●Flow Rate Measurement

Please press the end receiver to the nozzle where the gas flows out. While the gas is flowing the flow rate will display on the indicator screen. The flow rate takes approximately 10 seconds to display. The conversion is based on 20℃, SI units 101.325kPa (one atmospheric pressure).



❗Please use gas within 5℃～50℃ without any sudden change in temperature. If measured immediately after welding the gas temperature can fluctuate significantly causing the flow rate to display inaccurately.

5.Troubleshooting

●If Not Operating Properly

If the device is not operating properly, please reference the below chart.

Issue	Countermeasure
If the flow rate is not displaying on the indicator screen.	If the batteries are exhausted the flow rate will not display. Please replace with new batteries.
If the flow rate measurement is inaccurate.	Please verify that the flow rate does not drastically exceed the measurement range. If the problem persists, the device must be repaired by the manufacturer.

6. Specifications

Gas Mixture		100% CO2, 100% Ar Ar/CO2 Mixtures (Ratio: 8:2, 7:3, 9:1, 6:4)
Mass Flow Measurement Range		0～50L/min(20℃, 1atm)
Accuracy		CO2: ±3.0% F.S. Ar/CO2 Mixture:0~30L/min up to±3.0％F.S.
Temperature	Precise Warranty Temperature	15～35℃
	Operating Temperature	5～50℃
	Allowable Storage Temperate	-10～65℃
Allowable Operating Humidity		10~90% RH (Assuming no condensation)
Utilization Pressure		2kPa～480kPa
Pressure Resistance		980kPa
Required Electric Power		DC6V (AA alkali 1.5Vx4)
Current Consumption		60mA or less
Other		RoHS standard, CE standard compatible

7. Precautions

- Return Process

If this device has been exposed to toxic gases or hazardous materials from semiconductor equipment, please return according to the「SEMI E34-Safety Guideline for Mass Flow Device Removal and Shipment」instructions.

- Disposal Process

When disposing of this device, please do so according to the local regulations for industrial waste appropriate to your municipality. This device is composed of mainly FR-4 (printed wire board), electrical parts, iron (case, screws), SUS (gas connection parts), fluorine rubber (O-ring), CR rubber (receiver).

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Inquiries

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