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> Mechanivis AMS2106 Thermal Mass Gas Flow Meter User Manual

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Mechanivis AMS2106 Thermal Mass Gas Flow Meter User Manual

Model: AMS2106 | Brand: Mechanivis

1. INTRODUCTION

This manual provides essential information for the safe and efficient operation, installation, and maintenance of the Mechanivis AMS2106 Thermal Mass Gas Flow Meter. Please read this manual thoroughly before using the device to ensure proper functionality and safety.

Key Features:

- **High Durability:** Designed for long service life in demanding industrial environments.
- **Strong Adaptability:** Can be used in various industrial applications for gas flow measurement.
- **Signal Output:** Provides standard electrical or digital signals, including RS485.
- **Wide Application:** Utilized in industrial production, environmental protection, and energy management fields.

2. PRODUCT OVERVIEW

The Mechanivis AMS2106 is a thermal mass gas flow meter engineered for precise measurement of various gases, including Air, N₂, O₂, CO₂, and Ar. It features a clear digital segment code screen for real-time display and RS485 communication for seamless integration into control systems.



Figure 1: Front view of the AMS2106 Flow Meter.

Components:

- Flow Meter Body (Constructed from 6061 Aluminium alloy)
- Digital Segment Code Display Screen
- Control Buttons (Up, Menu, Down) for navigation and settings
- Gas Inlet/Outlet Ports (Available in NPT 3/8 or NPT 1/2 depending on the specific variant)
- Type-C Port for power and data connection



Figure 2: Side view showing the Type-C port.

3. SETUP AND INSTALLATION

3.1 Unpacking and Inspection

Carefully unpack the flow meter and inspect it for any signs of damage during transit. Ensure all listed components are present. The package should contain one flow meter unit. If any damage or missing parts are found, contact your supplier immediately.

3.2 Mounting

The AMS2106 is designed for inline installation within your gas piping system. It is crucial to ensure the flow direction arrow, clearly marked on the meter body, aligns with the actual gas flow in your system. Mount the meter securely to a stable structure to prevent vibration, which could affect measurement accuracy.

3.3 Electrical Connection

The device can be powered by an external 9-24V DC source or internal batteries. Connect the appropriate power supply using the Type-C port. For digital communication with a control system, connect the RS485 interface according to your system's wiring diagram. Ensure all electrical connections are secure and comply with local electrical codes.

3.4 Gas Connection

Connect the gas lines to the inlet and outlet ports of the flow meter. Use appropriate sealing materials (e.g., PTFE tape) to ensure all connections are leak-free. The meter is calibrated for specific gases (Air, N₂, O₂, CO₂, Ar); ensure the gas being measured matches the meter's calibration to obtain accurate readings.

4. OPERATING INSTRUCTIONS

4.1 Power On/Off

To power on the device, ensure it is connected to a stable power source or has sufficiently charged internal batteries. The digital display will illuminate, indicating the device is active. To power off, disconnect the external power source or allow the internal batteries to deplete.

4.2 Display Readings

The segment code screen displays both the instantaneous gas flow rate and the cumulative total flow. Use the navigation buttons (Up, Menu, Down) located on the front panel to cycle through different display modes, view various parameters, or access the settings menu.

4.3 Basic Operation

Once powered on and gas flow is established through the system, the meter will automatically begin measuring. The instantaneous flow rate will be shown on the primary display, and the cumulative flow will continuously increment. For advanced configurations, such as selecting measurement units, setting alarms, or resetting cumulative values, refer to the detailed settings menu accessible via the 'Menu' button.

5. MAINTENANCE

5.1 Cleaning

Keep the exterior of the flow meter clean by wiping it with a soft, dry cloth. Do not use abrasive cleaners, solvents, or harsh chemicals, as these can damage the housing or display. Ensure the display screen remains free from dust and smudges for clear visibility of readings.

5.2 Sensor Care

The thermal mass sensor is a delicate component critical for accurate measurements. Avoid introducing contaminants, such as oil, moisture, or particulate matter, into the gas stream. Regular inspection of the gas lines and filters (if installed) for cleanliness is recommended to prevent sensor fouling.

5.3 Battery Replacement

If operating the device using internal batteries, replace them promptly when the low battery indicator appears on the display. Refer to the battery compartment cover for the correct battery type and ensure proper polarity during installation. Always dispose of used batteries according to local regulations.

6. TROUBLESHOOTING

6.1 No Display

- **Check Power Supply:** Verify that the external power supply is connected correctly and providing the specified voltage (9-24V DC).
- **Check Batteries:** If using internal batteries, ensure they are correctly installed and sufficiently charged. Replace if necessary.

6.2 Inaccurate Readings

- **Verify Gas Type:** Confirm that the gas being measured matches the meter's calibration. Using the wrong gas type will result in incorrect readings.
- **Check for Leaks:** Inspect all gas connections for leaks, which can affect flow measurement.
- **Flow Direction:** Ensure the meter is installed with the flow direction arrow aligned with the actual gas flow.
- **Environmental Conditions:** Confirm that the operating temperature and pressure are within the specified limits (-10°C to +60°C, ≤0.8 MPa).

6.3 No Flow Detected

- **Gas Supply:** Ensure that gas is actively flowing through your system.
- **Blockages:** Check for any blockages or obstructions in the gas lines leading to or from the flow meter.
- **Installation:** Verify that the meter is correctly installed in the flow path and that valves are open.

7. SPECIFICATIONS






Series	AMS1000 Series		AMS3 Series			AMS2000 Series		AFM07 Series	AMS2106 Series			
Picture for reference												
	AliExpress link		AliExpress link			AliExpress link		AliExpress link	AliExpress link			
Medium	Air, N2, O2, CO2(contact us), Ar(contact us)											
Principle	Thermal											
Range (L/min)	0~2,20,100	0~200,500	10~1000	20~2000	30~3000	60~6000	0~50,100	0~200,300,500	0~2,10,25,50,100	0.5~50,5~500, 0.02~2,0.1~10, 0.25~25	0.5~50,1~100	2~200,3~300
Connection piping specification	★ G1/4	G1/2	2-RC 1/2	2-RC 3/4	2-RC1	2-RC1 1/2	★ Rc 3/8	★ Rc 1/2	★ φ6	★ NPT 1/4	★ NPT 3/8	★ NPT 1/2
Pipe material	6061 Aluminium alloy								PBT	6061 Aluminium alloy		
Calibration gas	Air (25°C, 1Standard atmosphere)											
Max pressure	≤0.8MPa		0.1-1.5MPa			≤0.8MPa						
Power	External power supply 9~24VDC		External power supply 9~28VDC			External power supply 9~24VDC			3* AA Battery/External power supply			
Power dissipation	0.85W(type)											
Accuracy	±2%RD、±4%RD		±1%FS						±3%FS			
Repeatability	±1%FS											
Response time	50m		1S			50m			≤2s			
Display	LCD		TFT display			LCD			Segment code screen			
Communication	★ RS485											
Protocol	★ MODBUS-RTU											
NPN	NPN (Flow alarm)					/		NPN (Flow alarm)		/		
Analog output	1~5V / 4~20mA		1~5V			/		1~5V		/		
Operating temperature	-10~60°C		0~50°C			-10~60°C						
Size(mm)	91.4*37*70.1	98.6*50*83.2	130*40*78	130*45*83	170*60*98	80*32*52.5		68*18*44	89*42*124.2	92*42*124.2	98*42*124.2	

Figure 3: General Specifications Table for AMS Series.

Details PN	Measure range	Display unit	Thread Spec	Connector diameter
AMS2106R00	2 ~ 200L/min	Cumulative flow: SCC (cm ³ , standard case), SL (L, standard condition), NCM (m ³ , standard condition)	NPT 1/2	15mm
AMS2106R01	3 ~ 300L/min		NPT 3/8	11mm
AMS2106R02	1 ~ 100L/min			
AMS2106R03	0.5 ~ 50L/min	Instantaneous flow rate: SLPM (L/min, standard condition)	NPT 1/4	6mm
AMS2106R04	0.25 ~ 25L/min			
AMS2106R05	0.1 ~ 10L/min			
AMS2106R06	0.02 ~ 2L/min	Cumulative flow: SCC (mL, standard condition) Instantaneous flow rate: SCCM (mL/min, standard condition)	NPT 1/4	6mm
AMS2106R07	5 ~ 500mL/min			
AMS2106R08	0.5 ~ 50mL/min			
<p>1) Details PN: A subdivision of the AMS2106 series to distinguish between different models.</p> <p>2) Why doesn't the measuring range start at 0? The product uses the pressure difference principle to measure mass flow rate, which requires the gas to reach a certain flow rate in the flow channel. If the design of the minimum flow rate is not reached, the value measured by the equipment will be inaccurate. The minimum starting value is 10% of the corresponding range, such as R00 200L, the minimum range is 2L.</p> <p>3) What gases can AMS2106 measure? Can measure 3 standard gases: Air, N2, O2</p>				
Custom measurement gas version of AMS2106 (Ar & CO2)				
Specialty Gases and Customization:				
(Please contact us for customized ranges)				
AMS2106C02	0~100 L/min	RS485	CO2 Only	
AMS2106C03	0~50 L/min	RS485	CO2 Only	
AMS2106C04	0~25 L/min	RS485	CO2 Only	
AMS2106C05	0~10 L/min	RS485	CO2 Only	
AMS2106C06	0~2 L/min	RS485	CO2 Only	
AMS2106C07	0~500 L/min	RS485	CO2 Only	
AMS2106C08	0~50 L/min	RS485	CO2 Only	
AMS2106A02	0~100 L/min	RS485	AR Only	
AMS2106A03	0~50 L/min	RS485	AR Only	
AMS2106A04	0~25 L/min	RS485	AR Only	
AMS2106A05	0~10 L/min	RS485	AR Only	
AMS2106A06	0~2 L/min	RS485	AR Only	
AMS2106A07	0~500 L/min	RS485	AR Only	
AMS2106A08	0~50 L/min	RS485	AR Only	

Figure 4: Detailed AMS2106 Series Specifications.

Mechanivis AMS2106 Thermal Mass Gas Flow Meter Specifications

Parameter	Value
Model	AMS2106 (Air O2 N2 0.05-50L)
Measuring Principle	Thermal Mass Flow
Measuring Medium	Air, N2, O2, CO2, Ar
Range (Current Model)	0.05 - 50 L/min
Accuracy	±3% F.S.

Parameter	Value
Repeatability	0.5% F.S.
Response Time	≤2s
Max Pressure	≤0.8 MPa
Power Supply	Battery or External 9-24V DC
Power Dissipation	50mW (battery)
Display	Segment Code Screen
Communication Interface	RS485
Communication Protocol	MODBUS-RTU
Operating Temperature	-10°C to +60°C
Pipe Material	6061 Aluminium alloy
Connection Piping	NPT 3/8, NPT 1/2 (depending on specific variant)
Dimensions (L×W×H)	89 × 42 × 124.2 mm
Item Weight	6.61 pounds (approx. 3 kg)
Assembly Required	No

8. SAFETY INFORMATION

- Always ensure proper ventilation when working with gases, especially in enclosed spaces.
- Do not exceed the maximum pressure rating of 0.8 MPa to prevent damage to the device and potential hazards.
- Ensure all electrical connections are secure, properly insulated, and meet local safety standards to avoid electrical shock.
- Avoid exposing the device to extreme temperatures, high humidity, or corrosive environments outside its specified operating range (-10°C to +60°C).
- Only qualified and trained personnel should perform installation, maintenance, and troubleshooting procedures.
- Do not attempt to modify or repair the device yourself. Refer all servicing to authorized personnel.

9. WARRANTY AND SUPPORT

For detailed warranty information and technical support, please contact Mechanivis customer service or your authorized distributor. It is recommended to keep your purchase receipt as proof of purchase for any warranty claims. Specific warranty terms and conditions may vary by region and retailer. For further assistance, product updates, or to access additional resources, please visit the official Mechanivis website or contact your local support representative.

