



APOLLO

SNOW MELT SENSOR

Outdoor dry-contact sensor for automatic APOLLO snow-melt triggering.

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1. SAFETY PRECAUTIONS

- ⚠ Before installing or operating the sensor, read this manual carefully to ensure safe and correct use.
- ⚠ Installation and wiring must be performed only by qualified personnel, in accordance with applicable local electrical codes and regulations.
- ⚠ Always disconnect power before wiring, servicing, or removing the sensor to prevent electric shock or equipment damage.
- ⚠ Do not disassemble or modify the sensor, as it contains no user-serviceable parts. Unauthorized modifications may result in malfunction or void the warranty.
- ⚠ Install the sensor only in suitable outdoor locations, avoiding exposure to corrosive chemicals, excessive vibration, or conditions beyond the specified operating limits.
- ⚠ Ensure the system is powered down and secured before performing any maintenance or inspection.
- ⚠ Dispose of electrical components and packaging materials in accordance with local environmental and recycling regulations.

2. INTRODUCTION

The APOLLO Snow Melt Sensor is designed for reliable detection of snow or rain presence in outdoor environments. It operates using a frequency-domain reflection principle combined with high-frequency electronic measurement and an embedded microprocessor. This allows fast response, high sensitivity, and stable operation in harsh winter conditions.

The sensor includes an integrated surface heating function to eliminate moisture accumulation and prevent false readings.

3. FEATURES

- Capacitive detection technology for rain and snow presence
- Aluminum housing

- Normally Open (NO) relay contact available for HVAC control logic
- Surface heating function
- High sealing level, IP67
- Strong resistance to electromagnetic interference
- Multiple output signal options
- Designed for long service life in outdoor installations

4. APPLICATIONS

This sensor is suitable for qualitative detection of rain or snow (presence / absence). Typical applications include:

- Hydronic snow-melt systems
- Driveway and walkway heating systems
- Roof and gutter ice prevention
- Building automation systems (BMS)
- Industrial and environmental monitoring

5. TECHNICAL SPECIFICATIONS

Measurement	Rain / Snow presence
Operating temperature	-30 °C to +70 °C
Operating humidity	0-99 % RH
Storage temperature	-40 °C to +80 °C
Power supply	12-24 V DC
Stability time	< 1 second
Response time	< 1 second
Protection rating	IP67
Housing material	Aluminum
Auxiliary function	Heating function

6. OUTPUT SIGNAL OPTIONS

The sensor supports multiple output configurations:

A. Relay output (Normally Open dry contact)

- AC 220 V / 1 A
- DC 24 V / 2 A

B. Voltage output: 0-2 V / 0-5 V / 0-10 V

C. Current output: 4-20 mA

D. RS485 (Modbus-RTU, default address 01)

E. NPN output

F. Combined outputs (Relay + Current + RS485)

G. SDI-12 protocol

Impedance requirement for the current signals:

Service voltage	9V	12V	20V	24V
Maximum Impedance	<250 Ω	<400 Ω	<500 Ω	<900 Ω

7. DIMENSIONS



Figure 1. Sensor dimensions

8. INSTALLATION

- Install the sensor outdoors in an open area exposed to snowfall.
- The sensor is supplied with a wall-mounting support, designed for secure installation on vertical surfaces.
- The mounting support includes a 12-inch pipe (arm length) to position the sensor away from the wall and ensure proper exposure to snowfall.
- The supplied support provides a fixed 15° inclination, ensuring the correct mounting angle to prevent snow accumulation on the sensing surface.
- Avoid installation near sources of chemical corrosion.
- Maintain adequate distance from high-voltage cables and strong heat sources.



Figure 2. Wall-mounting support



Figure 3. Sensor mounting angle

9. ELECTRICAL CONNECTIONS

The sensor may be connected to:

- Snow-melt controllers
- PLC or BMS digital inputs
- Data acquisition modules

The wiring description is shown below:

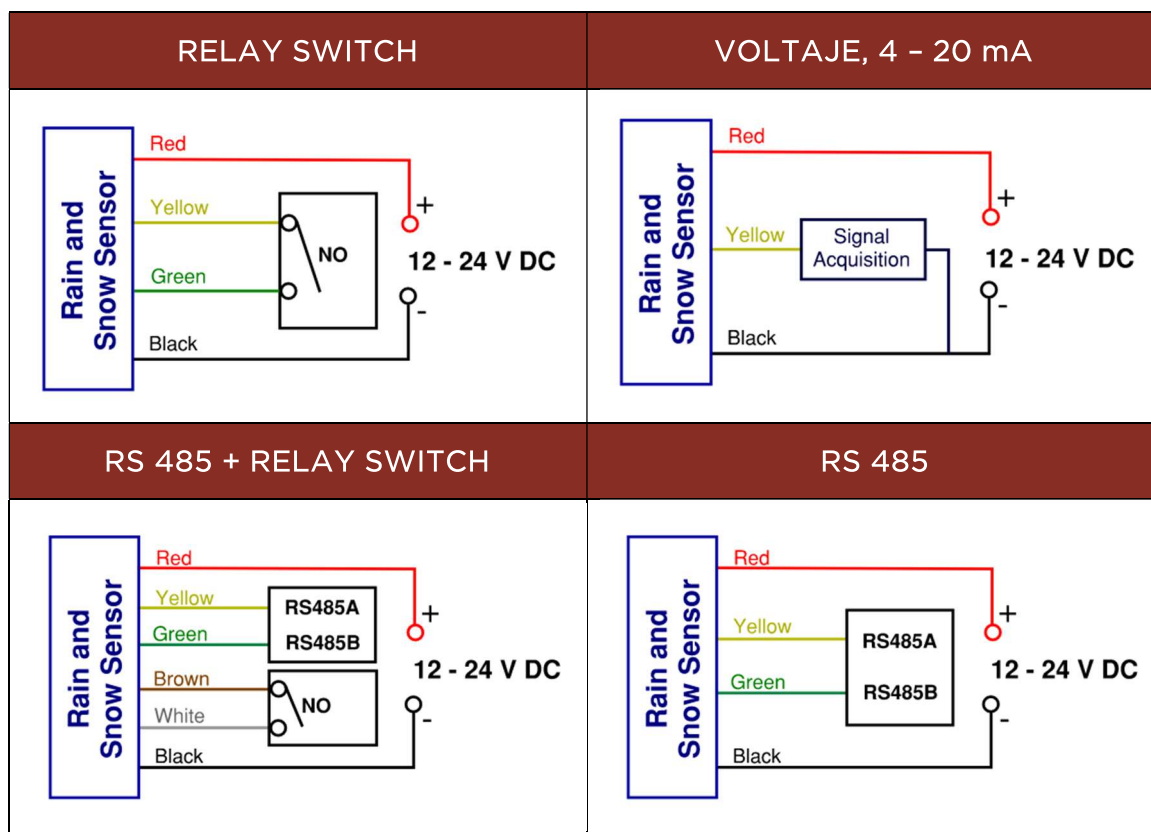


Figure 4. Electrical connections

10. DATA CONVERSION METHOD

OUTPUT SIGNAL	NO RAIN (SNOW)	THERE IS RAIN (SNOW)
Relay switch quantity (normally open)	break	actuation
0~2V DC	0.6V	1.6V
0~5V DC	1.5V	4V
0~10V DC	3V	8V
4~20mA	6mA	16mA
RS485	0X000A	0X000B

RS485 signal (default address 01): Standard Modbus-RTU protocol,
Baud rate: 9600;
Check bit: no;
Data bit: 8;
Stop bit: 1

10.1. MODIFICATION ADDRESS

For example, change the sensor with address 1 to address to 2, the host slave.

The Original Address	Function Code	High register Address	The register Address is low	The starting address is high	The starting address is low	CRC16 low	CRC16 high
0X01	0X06	0X00	0X30	0X00	0X02	0X08	0X04

If the sensor is received correctly, the data is returned in the original route.

Note: If you forget the original address of the sensor, you can use the broadcast address 0 XFE instead. When using 0 XFE, the host can only connect to one slave, and the returned address is still the original address, which can be used as the method of address query.

10.2. QUERY DATA

Query the data of the sensor (address 01) (rain or snow), the host slave.

Address	Function Code	Star register address is high	Star register address is low	The register length is high	The register length is low	CRC16 low	CRC16 high
0X01	0X03	0X00	0X00	0X00	0X01	0X84	0X0A

If the sensor receives correctly, return the following data to the slave host.

Address	Function Code	DL	Register 0 data is high	Register 0 data is low	CRC16 low	CRC16 high
0X01	0X03	0X02	0X00	0X0A	0X38	0X43
			No rain (snow): 0X000A Rain (snow): 0X000B			

10.3. SET UP ACTIVE REPORTING

When it needs to be set to active reporting mode, the host slave.

Address	Function Code	The reporting mode is high	Low reporting mode	High reporting time	Low reporting time	CRC16 low	CRC16 high
0X01	0X06	0X00	0X33	0X00	0X3C	0X79	0XD4
				0X0000 : Turn off automatic reporting. Automatic reporting time interval, in seconds. The upload speed is 60S / time. Invalid when turned off.			

If the data returned to the host is the same as the sent data, the setting is successful.

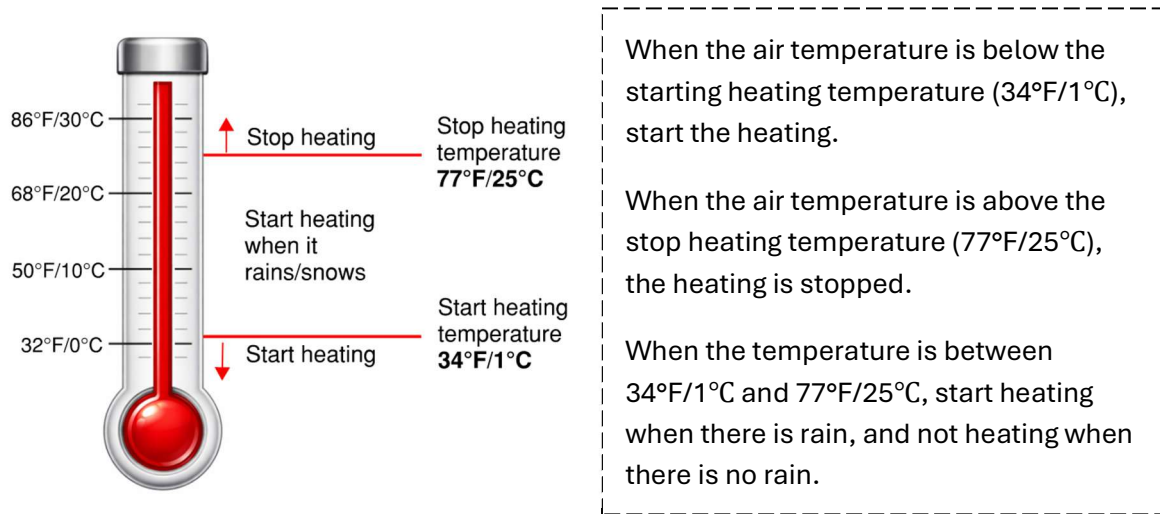


Figure 5. Sensor mounting angle

10.4. SET OR QUERY THE START AND END TEMPERATURE OF AUTOMATIC HEATING

10.4.1. SET THE HEATING START TEMPERATURE

Hosting oneself from the machine

Address	Function Code	Star register address is high	Star register address is low	Enable that the temperature data is high	Enable that the temperature data is low	CRC16 low	CRC16 high
0X01	0X06	0X00	0X5A	0X00	0X0A	0X29	0XDE
				34°F/1°C			

The data returned from the machine to the host is the same as the sent data, and the same description is set successfully.

10.4.2. SET THE HEATING STOP TEMPERATURE

Hosting oneself from the machine.

Address	Function Code	Star register address is high	Star register address is low	Stop temperature data is high	Stop temperature data is low	CRC16 low	CRC16 high
0X01	0X06	0X00	0X5B	0X00	0XFA	0X78	0X5A
				77°F/25°C			

If the data returned to the host is the same as the sent data, the setting is successful.

11. MAINTENANCE

The APOLLO Snow Melt Sensor is designed for reliable, maintenance-free operation under normal environmental conditions. Periodic inspection is recommended to ensure optimal performance. Inspect the sensing surface regularly and remove any accumulated dirt, debris, or residue that may affect detection accuracy. Verify that all electrical connections are secure and that the cable insulation is intact.

Do not use abrasive materials, solvents, or high-pressure water when cleaning the sensor. If cleaning is required, use a soft cloth and clean water only. Any maintenance or inspection must be performed with the power supply disconnected. The sensor contains no user-serviceable internal components; disassembly or modification is not permitted.

12. COMMISSIONING PARAMETERS

All control parameters are adjustable at the controller level:

- Outdoor temperature threshold
- Slab temperature setpoint
- Temperature differential
- Maximum operating time

13. SAFETY & COMPLIANCE

The sensor must be installed by qualified personnel. All wiring shall comply with local electrical codes. Relay outputs must not exceed rated load limits.

14. TROUBLESHOOTING

No.	Issue	Possible Cause	Solution
1	Sensor does not power on	No power supply or incorrect voltage	Verify 12–24 VDC power supply and wiring polarity
2	No output signal when snow is present	Incorrect wiring or output type selected	Check wiring connections and confirm correct output configuration
3	Relay output does not close	Relay load exceeds rating or wiring error	Verify relay load limits and NO contact wiring
4	False snow detection	Sensor surface contaminated or improperly installed	Clean sensing surface and confirm 15° installation angle
5	No snow detection during snowfall	Heating function disabled or sensor shielded	Enable heating function and ensure sensor is exposed to snowfall
6	Communication failure (RS485)	Incorrect address, baud rate, or wiring	Verify Modbus address, communication settings, and A/B polarity
7	Unstable or intermittent signal	Electrical interference or loose connections	Check grounding, cable routing, and tighten all terminals

15. SUPPORT

For technical assistance, contact:

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