OTT HydroMet

SUTRON

an OTT HydroMet brand

Accubar® SDI-12 Barometric Pressure Sensor

Operational Manual

8800-1223 | V1 (09-2024)

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1 Scope of supply

The following items are included with delivery:

- Accubar® SDI-12 Barometric Pressure Sensor
- Cable
- Mounting feet (optional)

2 Order numbers and variant code

2.1 Product variants

Variant	Order number
Accubar SDI-12 Barometric Pressure Sensor, 0.2 mB @ 20 °C	5600-0120-3A
Accubar SDI-12 Barometric Pressure Sensor, 0.3 mB @ 20 °C	5600-0120-3B
Accubar SDI-12 Barometric Pressure Sensor, 0.4 mB @ 20 °C	5600-0120-3C

2.2 Accessories and spare parts

Item	Order number
Barometer Pressure Port	5600-0121

3 About this manual

3.1 Other applicable documents

The following documents contain further information on installation, maintenance and calibration:

- Operations & Maintenance Manual Accubar® SDI-12 Barometric Pressure Sensor
- Data Sheet

3.2 General signs and symbols

The signs and symbols used in the operational manual have the following meaning:

Practical tip

i This symbol indicates important and useful information.

Action

✓ Prerequisite that must be met before performing an action.

▸ Step 1

⇨ Intermediate result of an action

▸ Step 2

⇨ Result of a completed action

List

- List item, 1st level
  - List item, 2nd level

3.3 Explanation of warnings

To avoid personal injury and material damage, you must observe the safety information and warnings in the operating manual. The warnings use the following danger levels:

WARNING

WARNING

This indicates a potentially hazardous situation. If the hazardous situation is not avoided, it may result in death or serious injuries.

CAUTION

CAUTION

This indicates a potentially hazardous situation. If the hazardous situation is not avoided, it may result in moderately serious or minor injuries.

NOTICE

NOTE

This indicates a situation from which damage may arise. If the situation is not avoided, products may be damaged.

4 General safety instructions

4.1 Intended use

The Accubar® Barometric Pressure Sensor is a solid-state pressure transducer used to measure atmospheric pressure.

4.2 Potential misuse

Any use of the product that does not comply with the intended use, be this intentional or negligent, is forbidden by the manufacturer.

- Use the product only as described in the operational manual.

4.3 Personnel qualification

The equipment described in this manual must be installed, operated, maintained and repaired by qualified personnel only.

- Obtain training from OTT HydroMet if necessary.

4.4 Operator obligations

The installer is responsible for observing the safety regulations. Unqualified personnel working on the product can cause risks that could lead to serious injury.

- Have all activities carried out by qualified personnel.
- Ensure that everybody who works on or with the product has read and understood the operational manual.
- Ensure that safety information is observed.
- File the operational manual together with the documentation of the entire system and ensure that it is accessible at all times.
- The operational manual is part of the product, forward the operational manual together with the product.

4.5 Personnel obligations

To avoid equipment damage and injury when handling the product, personnel are obliged to the following:

- Read the operational manual carefully before using the product for the first time.
- Pay attention to all safety information and warnings.
- If you do not understand the information and procedure explanations in this manual, stop the action and contact the service provider for assistance.
- Wear the necessary personal protective equipment.

4.6 Correct handling

If the product is not installed, used and maintained correctly, there is a risk of injury. The manufacturer does not accept any liability for personal injury or material damage resulting from incorrect handling.

- Install and operate the product under the technical conditions described in the operational manual.
- Do not change or convert the product in any way.
- Do not perform any repairs yourself.
- Get OTT HydroMet to examine and repair any defects.
- Ensure that the product is correctly disposed of. Do not dispose of it in household waste.

4.7 Risk of electrical shock

Live parts can cause electric shocks in the event of contact.

- Never take measurements on live electrical parts.
- Never touch live electrical parts.

4.8 Certification

CE (EU)

The equipment meets the essential requirements of EMC Directive 2014/30/EU.

FCC (US)

FCC Part 15, Class "A" Limits

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

IC (CA)

Canadian Radio Interference-Causing Equipment Regulation, ICES-003, "Class A"

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

5 Product description

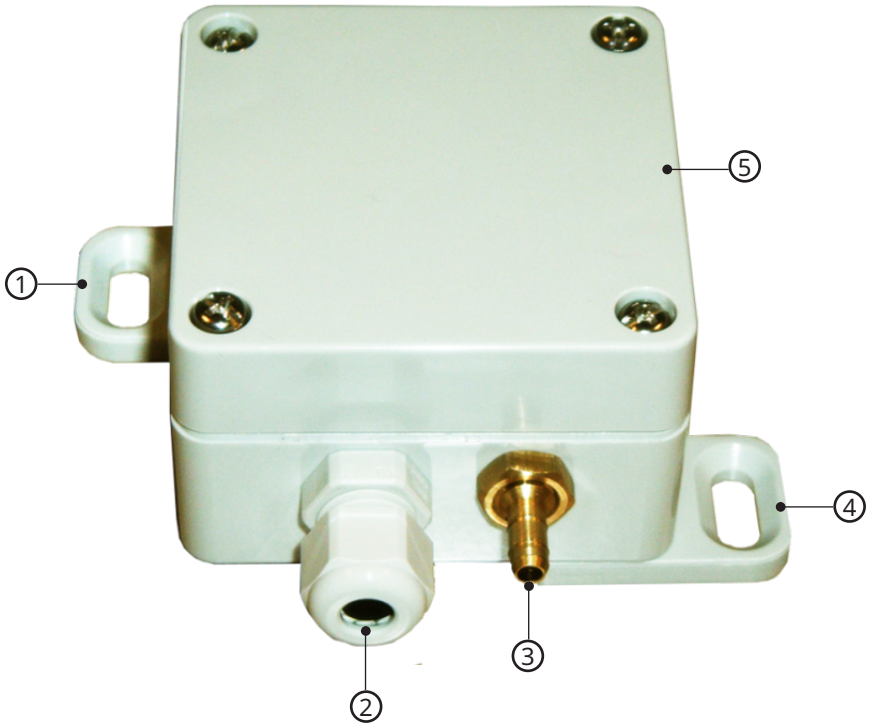
5.1 Design and function

The barometric pressure sensor is suitable for data collection and monitoring applications.

The sensor requires minimal energy, has high accuracy, and remains accurate even when a periodic calibration schedule is not maintained. Outfitted with SDI-12 outputs, the sensor is designed for datalogger compatibility.

The sensor retains its high standard of accuracy in temperatures ranging from -40°C to +60°C and at elevations between 700 meters below and 5600 meters above sea level. Coupled with low power consumption and minimal sensor drift, the sensor is designed for observation stations in remote or extreme settings.

5.2 Product overview



1	Mounting feet (optional)	4	Mounting feet (optional)
2	Cable gland	5	NEMA-4 enclosure
3	Hose connector		

6 Transport, storage, and unpacking

6.1 Transport

- Transport the product always in its original packaging.
- Ensure that the product is not mechanically stressed during transport.

6.2 Storage

- Store within specified temperature ranges.
- Store in dry area.
- Store in original box where possible.

6.3 Unpacking

- Carefully remove the product from the packaging.
- Check that the delivery is complete and undamaged.
- If you find any damage or if the delivery is incomplete, then immediately contact your supplier or manufacturer.
- Keep the original packaging for any further transportation.

7 Installation

7.1 Mechanical installation

7.1.1 Required tools and aids

The following tools and aids are required:

- Allen key, 4 mm
- wrench, 8 mm
- open-ended wrench, 16 mm or ⅝"

7.1.2 Installing device

The device can be mounted in any position. To prevent moisture from entering the device through the cable and tubing, it is recommended that the connections face downward.

- Position the device with the hose connector and cable gland pointing downward.
- Use the two holes under the sensor cover to mount the device to a panel or surface.
  Screw size: #4, #6, M3, or M3.5
- Alternatively, mount the device using the mounting feet. Screw size: #8, #10, #12, M4, or M5
- Connect a 3/16" ID tubing to the hose connector.

If the supplied cable is to be replaced with an installation specific one, note that the terminal block accommodates wire sizes from 30 AWG to 14 AWG or up to 1.5 mm^2. The recommended length of bare wire is 0.22" or 5.5 mm. The cable gland accepts cables with an outer diameter between 0.12” and 0.26” (3 to 6.5 mm).

7.2 Electrical installation

7.2.1 Electrical connections

The device comes with a cable pre-wired to the internal terminal strip.

The wiring of the cable is as follows:

Color	Assignment	Comment
White	SDI-12 DATA	Connect to data recorder SDI-12 data line
Red	POWER	8 to 16 V DC
Black	GND	Connect to ground
Brown	B-OUT	RS-232 data out
Green	A-IN	RS-232 data in

Only the first three wires are needed to use the SDI-12 interface. The last wires can be used as part of an RS-232 interface to upgrade the firmware.

8 Commissioning

8.1 Starting the device

The device comes configured from the factory at SDI-12 address 0 and ready to make barometric pressure readings in mB (hPa).

- Connect the device cable to the SDI-12 data recorder.
- Issue the basic SDI-12 start measurement command *M* to address *0 (0M!).*
  - ⇨ The barometric pressure measurement starts.
- Get the data back with a *D0* command. Done automatically by most data recorders when they are measuring.
  - ⇨ The device returns the barometric pressure plus a units indicator number.
- If using with other SDI-12 sensors, set the device to a unique address.
- Issue the change address command *(aAb!)*: a = current address, b = new address.

> The device needs to be the only SDI-12 module on the bus at address *a* when this command is issued, or both devices will be changed to address *b*.

- For example, to change the address from the factory default of *0* to *2*, issue the command: *0A2!*
  - ⇨ All future commands will then need to be sent to address *2*.
- To query a module as to its address, ensure that it is the only SDI-12 module on the bus and then issue the address query command: *?!*
  - ⇨ The unit will respond with its address.
- To confirm the SDI-12 communication with a module, issue the SDI-12 send identification command (to address 0 in the example): *0I!*
  - ⇨ The device responds with its identification string.
    For example: 013 SUTRON BARO-12.120120002B1.01
    This shows a response from address 0, that the device supports SDI-12 specification 1.3 (and therefore 1.2, 1.1, and 1.0), that the manufacturer is SUTRON, and that the model is a BARO-1.

> Further information can be found in the Operations & Maintenance Manual Accubar® SDI-12 Barometric Pressure Sensor.

9 Maintenance

9.1 Maintenance schedule

WARNING

Risk of electrical shock!

Live parts can cause electric shocks in the event of contact.

- Never touch live electrical parts.
- Disconnect the device from the power supply before working on it.

The frequency of cleaning is dependent upon the local weather and environmental conditions.

The following maintenance intervals are recommended:

Interval	Activity	Performed by
Annually	▸ Check all cables for damage.	Operator
Annually	▸ Check the tubing for leaks.	Operator
Annually	▸ Check and set the elevation offset.	Operator
Annually	▸ Have a calibration check performed.	OTT HydroMet

10 Troubleshooting

10.1 Error elimination

Error	Possible cause	Corrective action
No data	Fault wiring	▸ Check all wiring and terminations.
No data	No power	▸ Check fuse in the data recorder and power at sensor. There is no fuse in the sensor itself.
No data	Wrong address requested	▸ Ensure that the data recorder is set up to request data at the proper address.
No data	Wrong address set in sensor	▸ Use the identify command to ensure that the sensor is responding to the proper address.
No data	Command or address is wrongly written	▸ Ensure that the address is proper case and that commands are written in upper case. All commands are capital letters.
No data	Reversed data	▸ With RS-232, ensure that transmit and receive data are not reversed.
Garbled data	Multiple sensors set to the same address	▸ Check address settings of all SDI sensors. ▸ Remove all other sensors from the recorder and add them one at a time.
Garbled data	Command issued to a wild card address (* or ?)	▸ Remove all other sensors from the recorder and try again.
Erroneous data	Wrong units selected	▸ Use the M command and look at the units field. ▸ Verify that the desired units are selected.
Erroneous data	Erroneous offset entered	▸ Use the M3 command to display and verify the elevation. ▸ Re-calibrate the offset.
Erroneous data	Erroneous user scale and offset entered	▸ Use the M3 command to display and verify the user scale and offset.

11 Repair

11.1 Customer support

- Have repairs carried out by OTT HydroMet service personnel.
- Only carry out repairs yourself, if you have first consulted OTT HydroMet.
- Contact your local representative: www.otthydromet.com/en/contact-us
- Include the following information:

– instrument model
– instrument serial number
– details of the fault or problem
– examples of data files
– readout device or data acquistion system
– interfaces and power supplies
– history of any previous repairs or modifications
– pictures of the installation
– overview of the local environment conditions

12 Notes on disposing of old devices

Member States of the European Union

In accordance with the German Electrical and Electronic Equipment Act (ElektroG; national implementation of EU Directive 2012/19/EU), OTT HydroMet takes back old devices in the Member States of the European Union and disposes of them in the proper manner. The devices that this concerns are labeled with the following symbol:

- For further information on the take-back procedure contact OTT HydroMet:

OTT Hydromet Corp.
Service & Technical Support
22400 Davis Drive, Suite #100
Sterling, VA 20164
USA
phone: +1 703 406-2800
email: NAtechsupport@otthydromet.com

All other countries

- Dispose of the product in the proper manner following decommissioning.
- Observe the country-specific regulations on disposing of electronic equipment.
- Do NOT dispose of the product in household waste.

13 Technical data

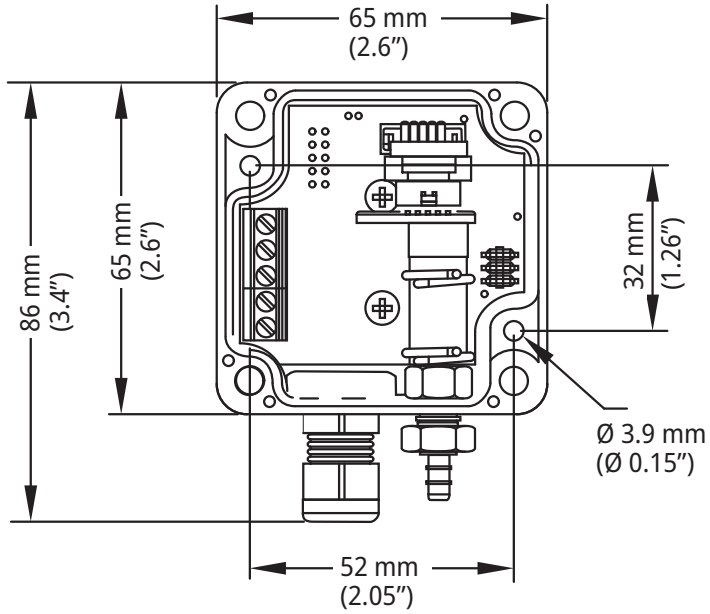
13.1 General technical data

Specification	Value
Operating and storage temperature	-50 °C to +70 °C (-58 °F to +158 °F)
Calibrated temperature range	-40 °C to +60 °C (-40 °F to +140 °F)
Humidity range	0 to 100 % (non-condensing)
Range	500 to 1100 mB (hPa) 14.8 to 32.5” Hg
Elevation	-700 to 5600 m (-2300 to 18 300 ft)
Accuracy	0.4, 0.3, 0.2 mB (hPa) @ 20 °C; depending on version An additional 0.1 mB over the temperature range
Resolution	Better than 0.01 mB
Averaging time	0 to 120 seconds (user selectable)
Pressure units	mB, hPa, kPa, ”Hg, mm Hg, ATM, psi
Pressure fitting	Hose barb for 3/16" ID hose
Cable fitting	Cable gland for 0.12” to 0.26” diameter cable to terminal block for 14- 30 AWG wire
Enclosure rating	NEMA-4X (IP66)
Enclosure material	corrosion cesistant UV stabilized polycarbonate

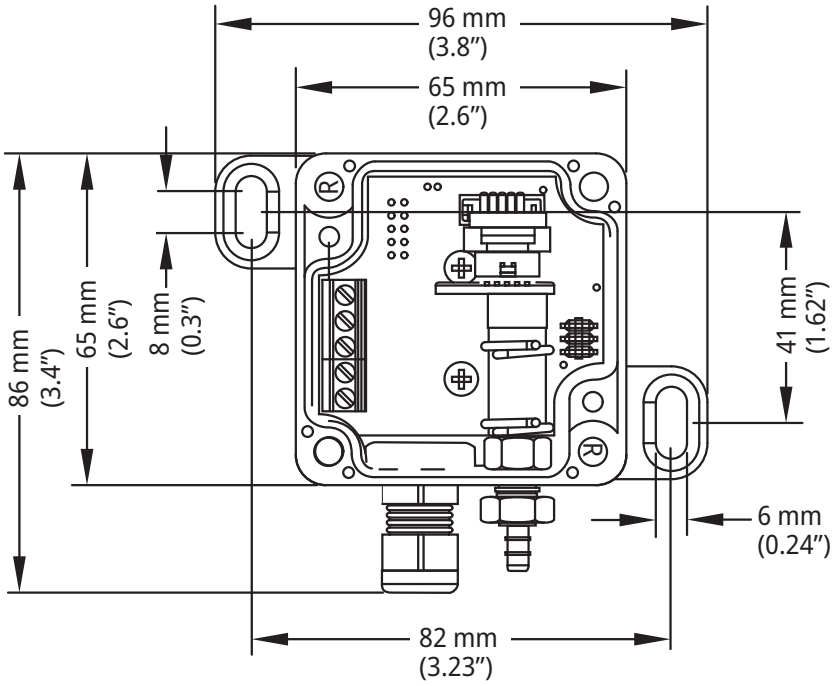
13.2 Electrical data

Specification	Value
Power supply	+8 to +16 V DC (reverse polarity protected)
Power consumption:	
SDI-12 (active)	3.5 mA typ., 4 mA max.
Standby	0.05 mA typ., 0.1 mA max.
RS-232 connected	Additional 3.2 mA
Communication rate	1200 baud

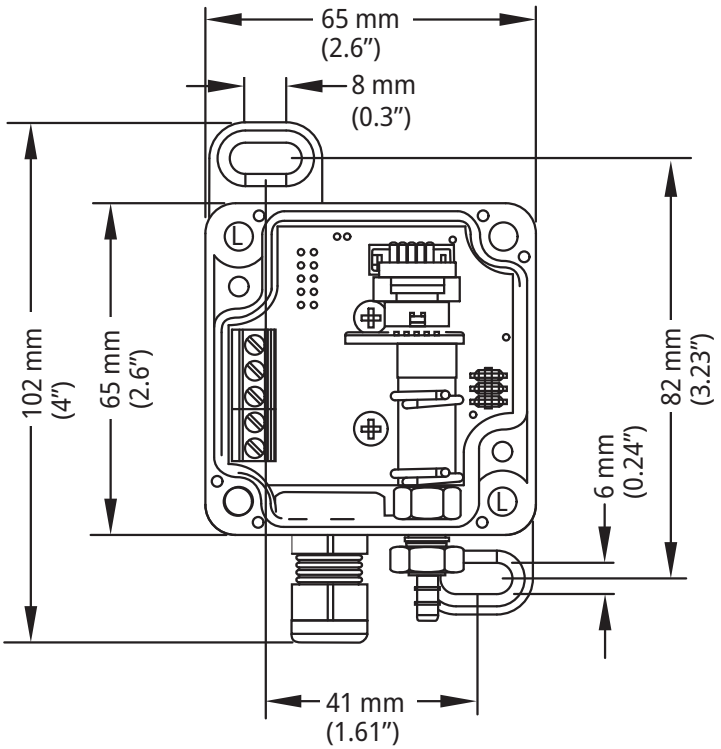
13.3 Dimensions and weight



Accubar with hidden mounting screws



Accubar with R mounting feet



Accubar with L mounting feet

Specification	Value
Dimensions packed (length x height x width)	127 x 127 x 77 mm (5 x 5 x 3 in)
Dimensions unpacked (length x height x width) Excluding cable gland, hose barb and mounting feet	67 x 67 x 41 mm (2.6 x 2.6 x 1.6 in)
Weight packed	0.7 kg (1.5 lbs.)
Weight unpacked	0.2 kg (0.44 lbs.)
Cable	0.9 m (3 ft)

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Contact Information