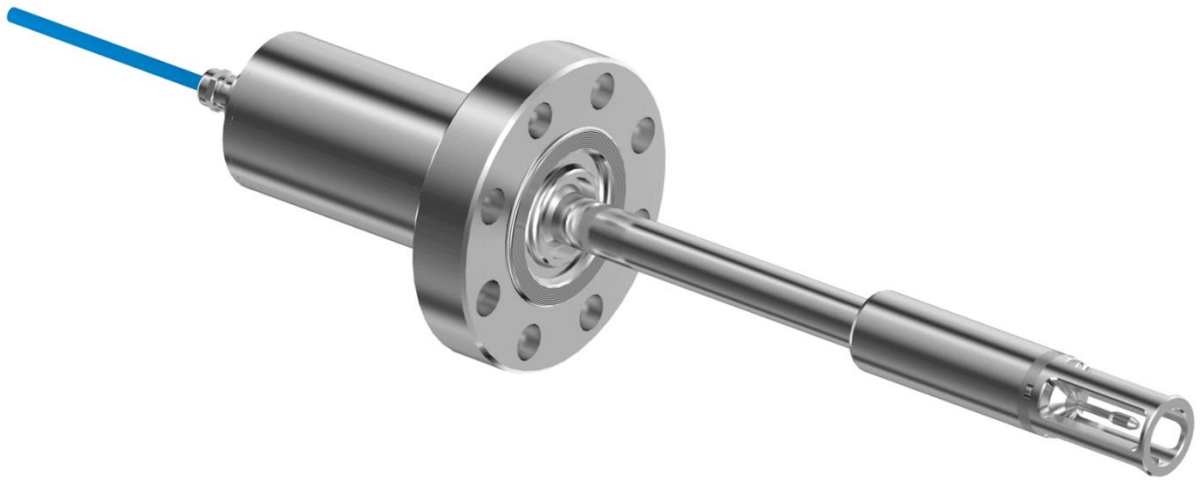
Rheonics Inline Process Sensors

SDP Integrator Manual

Rheonics Sand Detector Probe Sensor

DOC. ID: SDP-IM-27683A



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GLOBAL SUPPORT

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1 Before you begin

1.1 About the manual

This manual provides information on integrating the Rheonics SDP sensor to local systems using different communication protocols available.
This manual refers to external articles from Rheonics knowledge base, if any article link is not working, the user should refer to the main web page or contact Rheonics Support Team.

1.2 Contact

Contact the Rheonics team with any inquiry. For sales and delivery-related questions, contact the Sales Team at info@rheonics.com. For installation, integration, and troubleshooting, contact the Support Team at support@rheonics.com.

1.3 Warning Messages



ATTENTION
This word indicates useful information for the operator but without risk for the operation of Rheonics product.



CAUTION
This word indicates a medium or highly recommended action to ensure the proper function of Rheonics product.



WARNING
This word indicates a hazard or mandatory action to ensure the proper function and safety of Rheonics product.

1.4 Related Documentation

You can find all product documentation on the USB storage device that was shipped with the sensors. You can also find them on the website: https://rheonics.com/resources

For more information on the sensor, refer to the following documents on Rheonics website: https://rheonics.com/resources/manuals/. Contact Rheonics Support Team if you cannot find a document online.

Title	Code	Description
SDP Integrator Manual	**SDP-IM**	**Sand Detector Sensor Integration Manual**
SDP Operator Manual	SDP-OP	Sand Detector Sensor Operator Manual
SRV Operator Manual	SRV-OP	SRV Sensor Operator Manual
RCP Software Manual	RCP-OM	Rheonics Software Installation and User Manual
SME Operator Manual	SME-OP	Rheonics SME Sensor Module Electronics Manual

Table 1: Related documentation

1.5 Nomenclature

Abbreviation	Full-term	Description
SDP	Sand detector probe	Switch level sensor for sand detection
SRV	Symmetric Resonator Viscometer	Viscosity Sensor
SME	Sensor module electronics	Sensor electronics

Table 2: Nomenclature

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2 Technical Specifications

Rheonics Sand Detector Sensor, SDP sensor, is a switch-level sensor used to detect the accumulation or presence of sand in a desander vessel or pipelines, used in the oil and gas industry. Rheonics SDP is designed for high-pressure environments such as those found in desanders. The Rheonics Control Panel (RCP) that comes with the sensor makes real-time monitoring possible and recognition of phases in the fluid, such as oil, water, sand, or a mix of them.

Specifications of the sensor vary depending on the sensor configuration ordered through the SDP - Request for Quotation[1] by the user. General specifications of the SDP are given in Table 4.

Specification	Value
Operating temperature	Specified in order. Max. 150°C (302°F)
Operating pressure	Specified in order. Max. 1500 bar (20000 psi)
Probe surface material	Stainless Steel 316L
O-Ring material	NBR 90 ±5 Shore A
Power supply	24 V DC
Certificates available	Ex, ATEX, JPEx: Intrinsically safe

Table 3: SDP technical specifications

For complete information on sensor specifications and assembly instructions, refer to SDP-OP manual available at https://rheonics.com/resources/manuals/

[1] https://rheonics.com/request-for-quotation/sdp/

3 Sensor integration

The sand level detection algorithm provides two outputs: Sand Detection and Media Type. These indicate both the presence of sand and the type of medium in contact with the sensor. Both outputs are available simultaneously through multiple interfaces for monitoring and integration.

Functionality	Values
Sand Detection	0: No sand 1: Sand
Media Type	0: Air 1: Water 2: Water + Sand 3: Sand

Table 4: Sand detection and media type behavior

3.1 LCD Display

The **LCD screen** provides a direct visual indication of the algorithm results for local observation. This interface allows quick field verification of the sensor readings without requiring external communication tools.

Line	Description
Line 1 – Sand Detection	Displays whether sand is detected by the sensor
Line 2 – Media Type	Displays the type of medium surrounding the sensor.

Table 5: LCD Display description

3.2 Analog Outputs (4–20 mA)

The algorithm outputs are also mapped to the **analog output channels** for integration with conventional control systems. Each channel outputs a current proportional to the corresponding algorithm result, enabling compatibility with analog monitoring or PLC analog input cards.

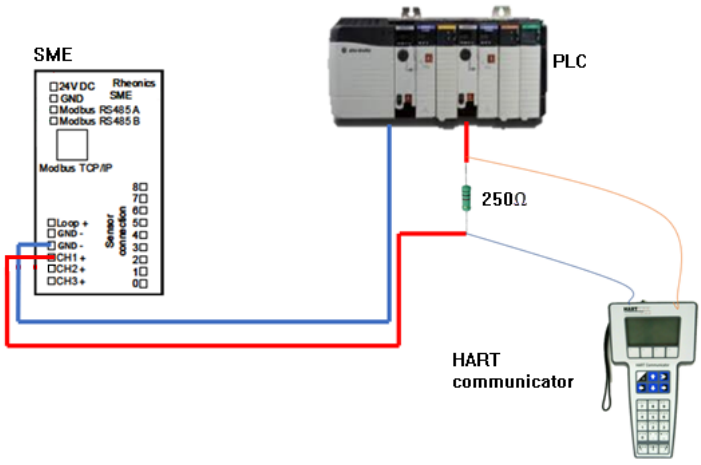
Functionality	Values
Channel 0 – Sand Detection	4 mA: No Sand 16 mA: Sand
Channel 1 – Media Type	4 mA: Air 8 mA: Water 12 mA: Water + Sand 16 mA: Sand

Table 1. Analog output Sand detector probe

3.3 HART Communication

The sand level detection probe (SDP) provides clients a HART interface to get digital data over the traditional 4-20 mA channel.

Figure 1: Sand detector probe installed in HART loop



Variable	Functionality	Value
Primary Variable (PV)	Sand detection	0: No sand 1: Sand
Secondary Variable (SV)	Media type	0: Air 1: Water 2: Water + Sand 3: Sand
Tertiary Variable (TV)	Temperature	-
Quaternary Variable(QV)	Sensor Status	-

Table 2. HART Communication Sand detector probe

3.4 Modbus Communication

The sand level detection probe (SDP) offers Modbus TCP protocol over the Ethernet interface and Modbus RTU over RS-485. This protocol gives the user access to multiple registers that contain the parameters read by the sensor. Using Modbus TCP, allows the user to connect the sensor to the Ethernet TCP/IP network through an Ethernet cable with Client-Server communication. These registers update continuously, allowing Modbus masters to read the live sand and media information.

Functionality	Values
Sand Detection	Register: 192 Size: 2 (Float) SME Parameter: 19
Media Type	Register: 200 Size: 2 (Float) SME Parameter: 20

Table 3. Modbus Communication Sand detector probe

3.5 Profinet Communication

The sand level detection probe (SDP) variants can be ordered with Profinet. Using Profinet, the Rheonics Sensors can transmit real-time data at 100 Mbps in full duplex communication through the SME Ethernet Port, resulting in improved operational performance, precision, and system integration.

Functionality	Values
Sand Detection	Index: 249 Size: 4 Bytes Type: Real SME Parameter: 19
Media Type	Index: 262 Size: 4 Bytes Type: Real

Table 4. Profinet Communication Sand detector probe

3.6 Ethernet/IP Communication

The sand level detection probe (SDP) variants can be ordered with Ethernet/IP. This communication protocol enables the fast delivery of extensive data from SDP sensors to external devices, like AllenBradley PLCs, through the SME Ethernet Port. Rheonics have extensive expertise with Ethernet/IP, hence comprehensive guidelines can be found on Rheonics Support Portal to ensure an easy and effective.

Functionality	Values
Sand Detection	Index: 249 Size: 4 Bytes Type: Real SME Parameter: 19
Media Type	Index: 262 Size: 4 Bytes Type: Real

Table 5. Profinet Communication Sand detector probe

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5 Notes/Errata

6 Revision and Approvals

Version	Nature of changes	Approvals	Date
1.0	Original version	CA	04.11.2025

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