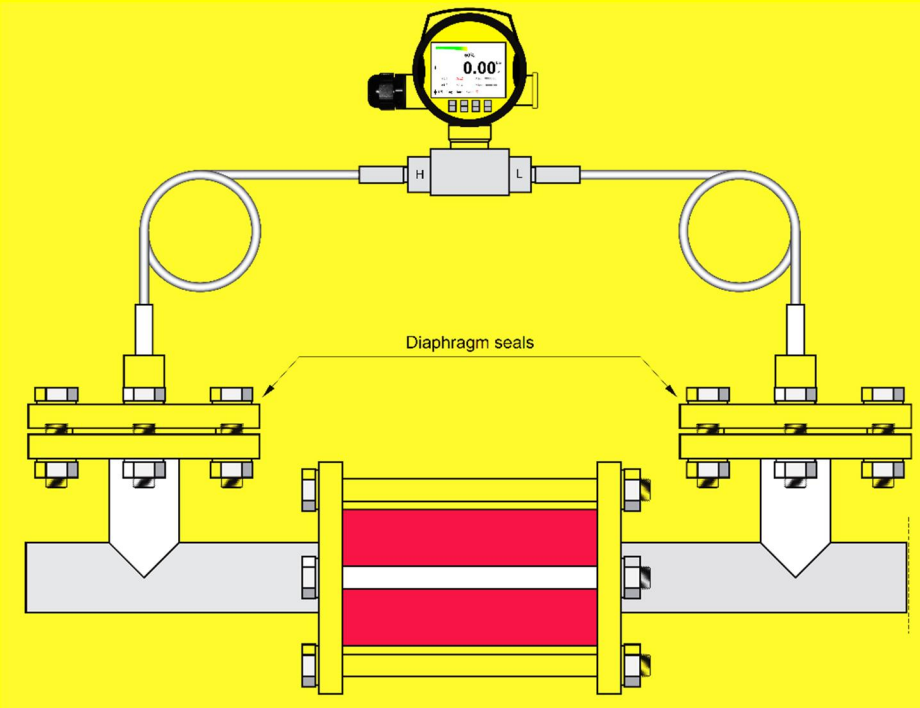


Differential Pressure Transmitter MODEL: SB-DP

SMART BIENE.



Example of filter loss measurement





Modbus-RTU Register Map

Format of the master message

Each message sent by the master obey the following format:

Device Address	Function code	n byte parameters (optional)	CRC16_L	CRC16_H
----------------	---------------	---------------------------------	---------	---------

Device Address: Address of the device.

Address 0 is reserved for broadcasting.

Addresses 1 to 247 can be used for this device

Function code: Function number

This function code use for read or write data.

Parameters: parameters different based on function

CRC16: 16-bit checksum to verify that data received correctly

Format of the slave message

A message transmitted by the slave obey the following format:

Device Address	Function code	n byte parameters (optional)	CRC16_L	CRC16_H
----------------	---------------	---------------------------------	---------	---------

• Device Address: **Address of the device.**

• Function code: **The function number is same to the function number sent by the master.**

• Data: **Any data requested via the function follow here. If error occued function code ORed with 0x80 and returned**

• CRC16

Exception errors

If message has been received correctly (no transmission error has occurred), but the transmitted function number and/or the parameters are invalid. **The slave responds an exception error**, unless the message has been received in broadcasting mode.

The message transmitted as a response by the slave has the following format:

Device Address	Function code	Exception code	CRC16_L	CRC16_H
----------------	---------------	----------------	---------	---------

Modbus RTU Frame Layout

> 3.5 char Delay time	8 bit address	8 bit Function code	n*(8 bit data)	CRC16	> 3.5 char Delay time
--------------------------	---------------	------------------------	----------------	-------	--------------------------

The entire message frame must be transmitted continuously. If a interval of more than 1.5 character times occurs between two characters, the message frame is declared incomplete and discarded by the receiver.

Description of MODBUS functions

F3: Read registers on MODBUS address space

F6: Write single register on MODBUS address space

F8: MODBUS Echo function

F16: Write multiple registers on MODBUS address space

Function 3: MODBUS Read Register



Read single or multiple registers in the MODBUS address space starting with Start Address. Note, that the data returned based on “MODBUS Register Map”.

Request:

Device Address	0x03	Start addr H	Start addr L	#Reg H	#Reg L	CRC16_L	CRC16_H
----------------	------	--------------	--------------	--------	--------	---------	---------

Response:

Device Address	0x03	# Bytes	Data H	Data L	...	CRC16_L	CRC16_H
----------------	------	---------	--------	--------	-----	---------	---------

Error:

Device Address	0x83	Error	CRC16_L	CRC16_H
----------------	------	-------	---------	---------

Function 6: MODBUS Write Single Register

This function is similar to F16, but writes only 1 register. Note, that the data will be written based on “MODBUS Register Map”.

Request:

Device Address	0x06	Start addr H	Start addr L	Data H	Data L	CRC16_L	CRC16_H
----------------	------	--------------	--------------	--------	--------	---------	---------

Response:

Device Address	0x06	Start addr H	Start addr L	Data H	Data L	CRC16_L	CRC16_H
----------------	------	--------------	--------------	--------	--------	---------	---------

Error:

Device Address	0x86	Error	CRC16_L	CRC16_H
----------------	------	-------	---------	---------

Function 8: MODBUS Echo Test

This function used to perform a quick line check. It returns the data that received.

Request:

Device Address	0x08	0	0	Data H	Data L	CRC16_L	CRC16_H
----------------	------	---	---	--------	--------	---------	---------

Response:

Device Address	0x08	0	0	Data H	Data L	CRC16_L	CRC16_H
----------------	------	---	---	--------	--------	---------	---------

Error:

Device Address	0x88	Error	CRC16_L	CRC16_H
----------------	------	-------	---------	---------

Function 16: MODBUS WRITE Register

Write multiple registers on the MODBUS address space starting with Start Address. Note, that the data will be written based on “MODBUS Register Map”.

Request:

Device Address	0x10	Start addr H	Start addr L	# Reg H	# Reg L	# Bytes	Data H	Data L	...	CRC16_L	CRC16_H
----------------	------	--------------	--------------	---------	---------	---------	--------	--------	-----	---------	---------

**Response:**

Device Address	0x10	Start addr H	Start addr L	# Reg H	#Reg L	CRC16_L	CRC16_H
----------------	------	--------------	--------------	---------	--------	---------	---------

Error:

Device Address	0x90	Error	CRC16_L	CRC16_H
----------------	------	-------	---------	---------

RTU character framing

Start bit	1	2	3	4	5	6	7	8	Even parity	Stop bit
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Note that this device only support baud rate 9600.

Register Map-SB-DP**SB-DP (0101)**

word	name	RW
0,1(Float IEEE754)	Min measuring range	R
2,3(Float IEEE754)	Max measuring range	R
4,5(Float IEEE754)	Pressure Value	R
6,7(Float IEEE754)	High Pressure	R
8,9(Float IEEE754)	Low Pressure	R
10(bit)	0-E1 1-E2 2-E3 3-E4 5-AI1On 6-AI2On 7-AI3On 8-AI4On	R
11-16(char)	Model ID	R
17-22(char)	Serial Number	R
23	Unit 0-mbar 1-bar 2-PSI 3-KPa 4-MPa 5-Kg/cm2 6-mmHg 7-mmH2O 8-inHg 9-inH2O	R
24-35(char)	Tag ID	RW

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