



Model SRH300

Operating Instructions

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1.0 General Information

The SRH300 transmitter, available for wall or duct mounting as well as with remote probe, is designed for highly accurate measurement of humidity and temperature in demanding climate control applications.

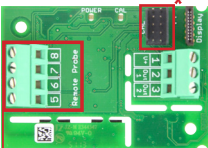
For use in special applications do not hesitate to contact Setra or a local distributor.

2.0 Caution

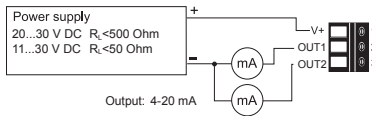
- For accurate measurement, it is essential that the temperature of the sensing probe and the sensing head is same as the temperature of the air to measure. Avoid mounting the SRH300 transmitter in a way which creates temperature gradients along the probe.
- The transmitter and the sensing head should not be exposed to extreme mechanical stress.
- The transmitter must be operated with the filter cap on at all times. DO NOT touch the sensors inside the sensing head.

3.0 Connection diagrams

SRH300 - Analog milliamps

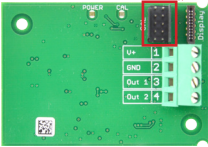


Only for remote probe!

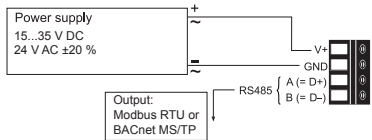


Important: The SRH300 (4-20 mA) with display operates correctly only if both outputs are connected. If no outputs are connected, then a jumper wire between the two outputs is required (in addition to negative power wire).

SRH300 - Analog volts



Only for remote probe!



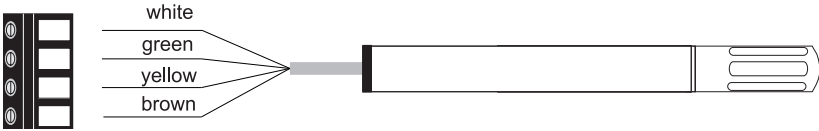
Bus termination resistor 120 Ω (jumper)

* configuration connector

SRP300

The SRH300 with remote probe are supplied as separate items. The probe is connected as shown below.

- First, install first the cable fitting (included in SRH300 scope of supply) onto the SRH300 enclosure.
- Before connecting the probe, disconnect the SRH300 power supply.
- Insert the probe cable through the cable fitting and connect it to the screw terminals according to the connection diagram below.



NOTE:

This is an intelligent probe with digital output and as such it is interchangeable. In case the probe or its cable gets destroyed or if a longer cable is needed, please order a replacement probe according to SRH300 accessory sheet. The replacement probe shall be installed as described above.

IMPORTANT:

Make sure that the cable fittings are closed tightly for both SRP300 probe cable and for the power supply and outputs cable. This is necessary for assuring the protection class (IP class) of the enclosure according to SRH300 specification, as well as for stress relief at the screw terminals on the SRH300 board.

4.0 LED indication (remove faceplate to view)

	Green LED	Blue LED
On	Everything okay	Setra Product Configuration Adapter (SETRAPCA1) is powered, no communication in progress
Flashing	Main board does not recognize the measurement electronics inside the sensing probe	PCA powered, communication in progress
Off	No power supply or main board failure	PCA not connected to the SRH300

5.0 Display

Factory Setup:

The display shows the two parameters selected for output 1 and output 2, RH and T.

User Setup:

The user can change the display layout to 1, 2 or 3 lines and select the parameters to be displayed by using Setra Product Configuration Software (free download from www.setra.com) and the optional SETRAPCA1 Product Configuration Adapter (not included in the scope of supply).



IMPORTANT:

The SRH300 (4 to 20 mA) with display operates correctly only if both outputs (RH and T) are connected. If you choose not to send output signals to a remote monitoring location, the two output connections must be joined using a jumper wire (not included). 4-20 mA units with no display do not require a jumper and do not require both outputs to be connected. Voltage output units also do not require both outputs to be connected.

6.0 Scope of supply

Model	SRH300 Wall mount (Type A)	SRH300 Duct mount (Type B)	SRH300 Remote version (Type C)	Remote probe* for Type C
SRH300 according to ordering guide	✓	✓	✓	✓
Cable gland	✓	✓	✓	
Mounting materials	✓	✓	✓	
Mounting flange		✓	✓	
Calibration & inspection certificate (EN10204-3.1)	✓	✓	✓	✓

7.0 BACnet or Modbus setup

7.1 Setting BACnet address using the address switch

Remove the units faceplate. You will see an address switch (pictured below). If you wish to set the address of the unit using this switch, you must first identify and make note of an available address found on your network.

Address Switch



Example: Slave address set to 11 (= 0000 1011 binary).

Before connecting the device to your network, set the address you wish to have on the switch following the above format and table below.

dec	binary	dec	binary	dec	binary	dec	binary
0	00000000	32	00100000	64	01000000	96	01100000
1	00000001	33	00100001	65	01000001	97	01100001
2	00000010	34	00100010	66	01000010	98	01100010
3	00000011	35	00100011	67	01000011	99	01100011
4	00000100	36	00100100	68	01000100	100	01100100
5	00000101	37	00100101	69	01000101	101	01100101
6	00000110	38	00100110	70	01000110	102	01100110
7	00000111	39	00100111	71	01000111	103	01100111
8	00001000	40	00101000	72	01001000	104	01101000
9	00001001	41	00101001	73	01001001	105	01101001
10	00001010	42	00101010	74	01001010	106	01101010
11	00001011	43	00101011	75	01001011	107	01101011
12	00001100	44	00101100	76	01001100	108	01101100
13	00001101	45	00101101	77	01001101	109	01101101
14	00001110	46	00101110	78	01001110	110	01101110
15	00001111	47	00101111	79	01001111	111	01101111
16	00010000	48	00110000	80	01010000	112	01110000
17	00010001	49	00110001	81	01010001	113	01110001
18	00010010	50	00110010	82	01010010	114	01110010
19	00010011	51	00110011	83	01010011	115	01110011
20	00010100	52	00110100	84	01010100	116	01110100
21	00010101	53	00110101	85	01010101	117	01110101
22	00010110	54	00110110	86	01010110	118	01110110
23	00010111	55	00110111	87	01010111	119	01110111
24	00011000	56	00111000	88	01011000	120	01111000
25	00011001	57	00111001	89	01011001	121	01111001
26	00011010	58	00111010	90	01011010	122	01111010
27	00011011	59	00111011	91	01011011	123	01111011
28	00011100	60	00111100	92	01011100	124	01111100
29	00011101	61	00111101	93	01011101	125	01111101
30	00011110	62	00111110	94	01011110	126	01111110
31	00011111	63	00111111	95	01011111	127	01111111

Note: You will see from the table there are 8 positions. For this device, the 8th position (or 8th bit) is ignored.

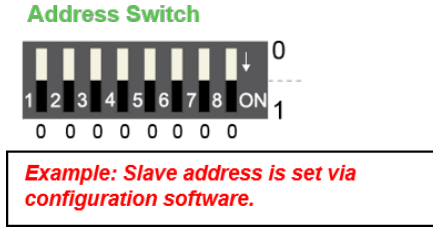
For example: ID127=0111111

BACnet PICS for this unit are available for download at www.setra.com. This unit's ID as well as many other properties are also read/writable from your BACnet console.

SRH200	Default=2	Permitted=0...127 (BACnet)
SRH300	Default=1	Permitted=0...127 (BACnet)

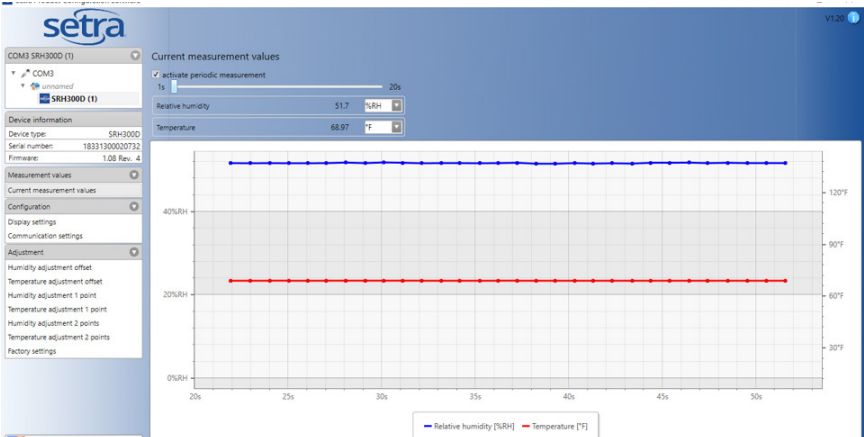
7.2 Setting BACnet address using the software

Remove the units faceplate. You will see an address switch (pictured below). If you wish to set the address of the unit using Setra product configuration software, verify all these switches are set to "0".



Prior to adding unit to your network, power up the unit according to connection diagram on page 3. Now connect the Setra PCA adapter to the unit and to your laptop.

Start the Setra product configuration software. The software should automatically identify your unit after a few seconds and begin graphing and displaying sensor data.



Click on the communication settings found on left menu. The screen below will be displayed. Here you can set baud rate, data, parity, and stop bits. In the Bus address cell, you can enter the following ranges.

SRH200	Default=2	Permitted=0...127 (BACnet)
SRH300	Default=1	Permitted=0...127 (BACnet)

Note: Regardless of whether you are setting the address in the software or by using the address switch the following settings are recommended.

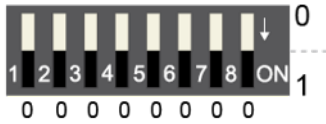
38400/8/NONE/1



7.3 Setting Modbus address using the software

Remove the units faceplate. You will see an address switch (pictured below). If you wish to set the address of the unit using Setra product configuration software, verify all these switches are set to "0".

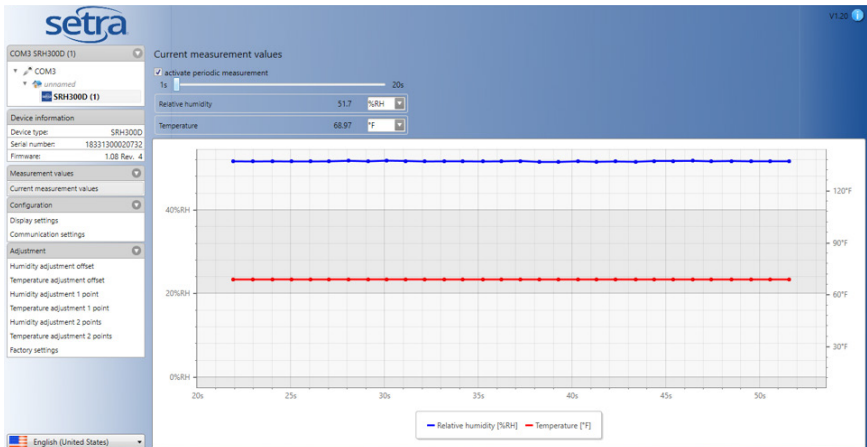
Address Switch



Example: Slave address is set via configuration software.

Prior to adding unit to your network, power up the unit according to connection diagram on page 3. Now connect the Setra PCA adapter to the unit and to your laptop.

Start the Setra product configuration software. The software should automatically identify your unit after a few seconds and begin graphing and displaying sensor data.



Click on the communication settings found on left menu. The screen below will be displayed. Here you can set baud rate, data, parity, and stop bits. In the Bus address cell, you can enter the following ranges.

SRH200	Default=245	Permitted=0...247 (Modbus)
SRH300	Default=242	Permitted=0...247 (Modbus)



7.3 Setting Modbus address using the address switch

Remove the units faceplate. You will see an address switch (pictured below). If you wish to set the address of the unit using this switch, you must first identify and make note of an available address found on your network.

Address Switch



Example: Slave address set to 11 (= 0000 1011 binary).

Before connecting the device to your network, set the address you wish to have on the switch following the above format and table below.

dec	binary	dec	binary	dec	binary	dec	binary	dec	binary	dec	binary	dec	binary	dec	binary	dec	binary
0	00000000	32	00100000	64	01000000	96	01100000	128	10000000	160	10100000	192	11000000	224	11100000		
1	00000001	33	00100001	65	01000001	97	01100001	129	10000001	161	10100001	193	11000001	225	11100001		
2	00000010	34	00100010	66	01000010	98	01100010	130	10000010	162	10100010	194	11000010	226	11100010		
3	00000011	35	00100011	67	01000011	99	01100011	131	10000011	163	10100011	195	11000011	227	11100011		
4	00000100	36	00100100	68	01000100	100	01100100	132	10000100	164	10100100	196	11000100	228	11100100		
5	00000101	37	00100101	69	01000101	101	01100101	133	10000101	165	10100101	197	11000101	229	11100101		
6	00000110	38	00100110	70	01000110	102	01100110	134	10000110	166	10100110	198	11000110	230	11100110		
7	00000111	39	00100111	71	01000111	103	01100111	135	10000111	167	10100111	199	11000111	231	11100111		
8	00001000	40	00101000	72	01001000	104	01101000	136	10001000	168	10101000	200	11001000	232	11101000		
9	00001001	41	00101001	73	01001001	105	01101001	137	10001001	169	10101001	201	11001001	233	11101001		
10	00001010	42	00101010	74	01001010	106	01101010	138	10001010	170	10101010	202	11001010	234	11101010		
11	00001011	43	00101011	75	01001011	107	01101011	139	10001011	171	10101011	203	11001011	235	11101011		
12	00001100	44	00101100	76	01001100	108	01101100	140	10001100	172	10101100	204	11001100	236	11101100		
13	00001101	45	00101101	77	01001101	109	01101101	141	10001101	173	10101101	205	11001101	237	11101101		
14	00001110	46	00101110	78	01001110	110	01101110	142	10001110	174	10101110	206	11001110	238	11101110		
15	00001111	47	00101111	79	01001111	111	01101111	143	10001111	175	10101111	207	11001111	239	11101111		
16	00010000	48	00110000	80	01010000	112	01110000	144	10010000	176	10110000	208	11010000	240	11110000		
17	00010001	49	00110001	81	01010001	113	01110001	145	10010001	177	10110001	209	11010001	241	11110001		
18	00010010	50	00110010	82	01010010	114	01110010	146	10010010	178	10110010	210	11010010	242	11110010		
19	00010011	51	00110011	83	01010011	115	01110011	147	10010011	179	10110011	211	11010011	243	11110011		
20	00010100	52	00110100	84	01010100	116	01110100	148	10010100	180	10110100	212	11010100	244	11110100		
21	00010101	53	00110101	85	01010101	117	01110101	149	10010101	181	10110101	213	11010101	245	11110101		
22	00010110	54	00110110	86	01010110	118	01110110	150	10010110	182	10110110	214	11010110	246	11110110		
23	00010111	55	00110111	87	01010111	119	01110111	151	10001111	183	10101111	215	11010111	247	11101111		
24	00011000	56	00111000	88	01011000	120	01111000	152	10011000	184	10111000	216	11011000				
25	00011001	57	00111001	89	01011001	121	01111001	153	10011001	185	10111001	217	11011001				
26	00011010	58	00111010	90	01011010	122	01111010	154	10011010	186	10111010	218	11011010				
27	00011011	59	00111011	91	01011011	123	01111011	155	10011011	187	10111011	219	11011011				
28	00011100	60	00111100	92	01011100	124	01111100	156	10011100	188	10111100	220	11011100				
29	00011101	61	00111101	93	01011101	125	01111101	157	10011101	189	10111101	221	11011101				
30	00011110	62	00111110	94	01011110	126	01111110	158	10011110	190	10111110	222	11011110				
31	00011111	63	00111111	95	01011111	127	01111111	159	10011111	191	10111111	223	11011111				

SRH200	Default=245	Permitted=1...247 (Modbus)
SRH300	Default=242	Permitted=1...247 (Modbus)

7.5 Modbus setup

The measured values are saved as a 32 Bit float value from 0x19 to 0x1F and from 0x23 to 0x29. Additionally the measured values are available as 16 Bit signed integer from 0x12C to 0x12F and from 0x131 to 0x134.

The factory setting for the Slave-ID (Modbus address) is 242 as an integer 16Bit value. This ID can be changed by the user in the register 60001 (0x00), permitted values are 1 - 247 permitted.

The serial number as ASCII-code is located at register address 30001-30008 (16 Bit per address). The Firmware version is located at register address 30009 (Bit 15...8 = major release; Bit 7...0 = minor release). The choice of measurement units (metric or not metric) must be done in the ordering guide, see SRH300 data sheet. For Modbus units, switching from non-metric to metric or vice versa by using the product configuration software is not possible.

FLOAT (read register):

Register address	Comm. address	Parameter name
30026	0x19	Temperature [°C],[°F]
30028	0x1B	Relative humidity [%]
30030	0x1D	water vapour partial pressure [mbar], [psi]
30032	0x1F	dew point temperature [°C], [°F]
30036	0x23	absolute humidity [g/m³], [g/ft³]
30038	0x25	mixing ratio [g/kg], [gr/lb]
30040	0x27	specific enthalpy [kJ/kg], [BTU/lb]
30042	0x29	frost point temperature [°C], [°F]

INFO (read register)*:

Register address	Comm. address	Parameter name
30301	0x12C	temperature [°C], [°F]
30302	0x12D	relative humidity [%]
30303	0x12E	water vapour partial pressure [mbar], [psi]
30304	0x12F	dew point temperature [°C], [°F]
30306	0x131	absolute humidity [g/m³], [g/ft³]
30307	0x132	mixing ratio [g/kg], [gr/lb]
30308	0x133	specific enthalpy [kJ/kg], [BTU/lb]
30309	0x134	frost point temperature [°C], [°F]

* Values are stored with a scaling of 1:100 (e.g.: 2550 is equivalent to 25.5°C)

INTEGER (read register):

Register address	Comm. address	Parameter name
30001	0x00	Serial number (as ASCII)
30009	0x08	Firmware version

INTEGER (write register)*:

Register address	Comm. address	Parameter name
60001	0x00	Slave-ID (Modbus address)
60002	0x01	Modbus protocol settings

Protocol setting:

Address, baud rate, parity and stop bits can be set via the product configuration software (available on www.setra.com).

8.0 Technical data

General

Power supply

<i>for 4-20 mA, 2-wire:</i>	10 V + R _L x 20 mA < V+ < 30 VDC
<i>0-5 V, 0-10 V, RS485:</i>	15-35 VDC or 24 VAC ±20%

Current consumption at 24 V

<i>Voltage output:</i>	DC supply max: 12 mA; w/display max: 23 mA AC supply max: 34 mA _{rms} / display max: 49 mA _{rms}
<i>Current output (2-wire):</i>	DC supply max: 40 mA; w/display max: 40 mA
<i>Digital interface:</i>	DC supply typ: 5 mA; w/display max: 20 mA AC supply typ: 15 mA _{rms} / display max: 35 mA _{rms}

Display 1, 2 or 3 lines, user configurable

Connection Screw terminals, max. 1.5 mm²

Housing material Polycarbonate, UL94V-0
(with Display UL94HB) approved

Protection class IP65/ NEMA 4

Cable fitting (PG9) M16 x 1.5

Probe cable (type C) PVC, Ø 4.3mm, 4 x 0.25 mm²;
Length: 1.5 or 3 m (4.9 or 9.8 ft.)

Electromagnetic compatibility EN61326-1 EN61326-2-3 Industrial Environment

Temperature ranges Operating: -40 to 60°C (-40 to 140°F)
Storage: -40 to 60°C (-40 to 140°F)

Temperature ranges w/ display Operating: -20 to 50°C (-4 to 122°F)
Storage: -20 to 60°C (-4 to 140°F)

Measured values

Relative humidity (RH) Sensor

Working range 0-100%

RH accuracy (incl. hysteresis, non-linearity and repeatability)

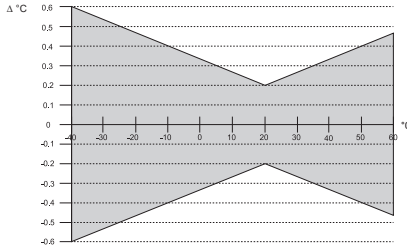
	-15 to 40 °C (5 to 104 °F) ≤90 % RH ±(1.3 + 0.003*measured value) % RH
<i>Wall & duct version:</i>	-15 to 40 °C (5 to 104 °F) >90 % RH ±2.3 % RH
	-40 to 60 °C (-40 to 140 °F) ±(1.5 + 0.015*measured value) % RH
<i>Remote probe version:</i>	at 20 °C (68 °F) ±2.5 % RH

8.0 Technical data (continued)

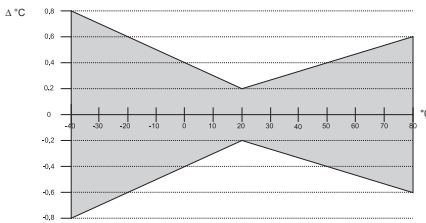
Measured values (continued)

Temperature (T) sensor

(tolerance class B, DIN EN 60751) integrated in humidity probe tip.



T-accuracy



Output

0-10 V :

-1 mA < I_c < 1 mA

4-20 mA (2-wire) :

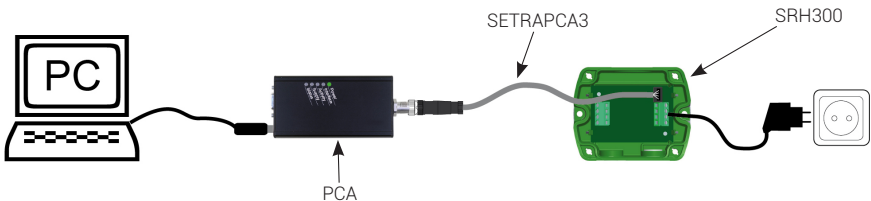
R_L < 500 Ω

Digital output

RS485 (BACnet MS/TP or Modbus RTU),
max. 32 SRH300 units in one bus

9.0 Setup and adjustment

The SRH300 transmitter is ready to use and does not require any configuration by the user. The factory setup of SRH300 corresponds to the type number ordered. For ordering guide please see data sheet at www.setra.com. If needed, the user can change the factory setup by using the optional Setra Configuration Adapter and the Setra Product Configuration Software.



One can assign other physical quantities to the analogue outputs, change the scaling of the outputs and perform one or two point adjustment for humidity and temperature.

The Setra Product Configuration Software is free and can be downloaded from www.setra.com.

10.0 Maintenance

10.1 Humidity calibration and adjustment:

Depending on the application and the requirements of certain industries, there might arise the need for periodical humidity calibration (comparison with a reference) or adjustment (bringing the device in line with a reference).

Calibration and adjustment at Setra

Calibration and/or adjustment can be performed by the Setra calibration laboratory. For information on the Setra capabilities in ISO or accredited calibration please visit www.setra.com.

Calibration and adjustment by the user

Depending on the level of accuracy required, the humidity reference can be:

- Humidity Calibrator- Purchased separately (not currently sold by Setra)
- Handheld device- Purchased separately (not currently sold by Setra)
- Calibrated salt solutions- Most economical

10.2 Temperature calibration and adjustment:

Due to the outstanding protection of the temperature sensing element integrated in the Setra sensor, a drift of the T measurement is rather unlikely. If adjustment seems necessary, although the user can perform a one or two point T adjustment with PCA and PCS against a reference of choice, it is highly recommended to return the device to the manufacturer for this. The reasons rest on the difficulty of an accurate T calibration in the air. The calibration shall take into account the self-heating of SRH300 with closed enclosure, in its real mounting position and in continuous operation. The impact of the output current and of the probe orientation to the self-heating, as well as the cooling effect of the air circulation in the climate chamber used for calibration.

10.3 When employed in dusty, polluted environment:

The filter cap shall be replaced once in a while with a Setra original. A polluted filter cap causes longer response time of the device.

If needed, the sensing head can be cleaned. For cleaning instructions please see www.setra.com.

11.0 Accessories

Category	Setra accessory P/N	Description
Filters	SRHMF	Membrane filter
Filters	SRHSS	Stainless steel sintered filter
Filters	SRHPG	Plastic grid filter
Filters	SRHPF	PTFE - filter Ø12mm
Filters	SRHMG	Metal grid filter
Filters	SRHHP	H2O2 - filter
Flanges	SRHWMC	Plastic mounting clip for probe Ø12mm
Flanges	SRHPMFB	Plastic mounting flange 12mm; black
Flanges	SRHPMFG	Plastic mounting flange 12mm; grey (RAL7035)
Part configuration adapter	SETRAPCA1	Configuration adapter transmitter to RS232 and USB
Part configuration adapter	SETRAPCA3	Configuration cable for SRH200 digital & SRH300
Calibration	SRH300SCAL	SRH300 (ISO)
Calibration	SRH300NCAL	SRH300 (NIST)
Probe & cable assembly for SRH300	SRH300HTMFPE	Remote probe extension cable - 1.5 meter (membrane filter)
Probe & cable assembly for SRH300	SRH300HTMFPT	Remote probe extension cable - 3 meter (membrane filter)

12.0 Returning products for repair or replacement

Please contact a Setra application engineer (800-257-3872, 978-263-1400) before returning unit for repair to review information relative to your application. Many times only minor field adjustments may be necessary. If a return is required please call 1-800-257-3872 or email orders@setra.com to obtain an RMA number before sending unit(s) back to us. Once an RMA number has been assigned to you, please send the package back to the below address.

Setra Systems, Inc.
159 Swanson Road
Boxborough, MA 01719-1304
Attn: RMA #

To download return form, please visit Setra's service page.

To assure prompt handling, please make sure the RMA number is on the outside of the box and a copy of the service request form is included in the shipment. If applicable, include a copy of the PO for return in the shipment.

NOTES:

Please remove any pressure fittings and plumbing that you have installed and enclose any required mating electrical connectors and wiring diagrams.

Allow approximately 3 weeks after receipt at Setra for the repair and return of the unit. Non-warranty repairs will not be made without customer approval and a purchase order to cover repair charges.

12.1 Calibration Services

Setra maintains a complete calibrations facility that is traceable to the National Institute of Standards and Technology (NIST). If you would like to recalibrate or recertify your Setra product, please call our Customer Service Department at 800-257-3872 (978-263-1400) for scheduling.

13.0 Limited warranty & limitation of repair

SETRA warrants its products to be free from defects in materials and workmanship, subject to the following terms and conditions: Without charge, SETRA will repair or replace products found to be defective in materials or workmanship within the warranty period; provided that:

- a) the product has not been subjected to abuse, neglect, accident, incorrect wiring not our own, improper installation or servicing, or use in violation of instructions furnished by SETRA;
- b) the product has not been repaired or altered by anyone except SETRA or its authorized service agencies;
- c) the serial number or date code has not been removed, defaced, or otherwise changed; and
- d) examination discloses, in the judgment of SETRA, the defect in materials or workmanship developed under normal installation, use and service;
- e) SETRA is notified in advance of and the product is returned to SETRA transportation prepaid.

Unless otherwise specified in a manual or warranty card, or agreed to in writing and signed by a SETRA officer, SETRA pressure, humidity, and acceleration products shall be warranted for one year from date of sale.

The foregoing warranty is in lieu of all warranties, express, implied or statutory, including but not limited to, any implied warranty of merchantability for a particular purpose.

SETRA's liability for breach of warranty is limited to repair or replacement, or if the goods cannot be repaired or replaced, to a refund of the purchase price. In no instance shall SETRA be liable for incidental or consequential damages arising from a breach of warranty, or from the use or installation of its products.

No representative or person is authorized to give any warranty other than as set out above or to assume for SETRA any other liability in connection with the sale of its products.

For all CE technical questions, contact Setra Systems, USA. EU customers may contact our EU representative Hengstler GmbH, Uhlandstr 49, 78554 Aldingen, Germany (Tel: +49-7424-890; Fax: +49-7424-89500).



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