Dwyer AQ-RHPLC Series RHPLC Humidity Temperature Transmitter Instruction Manual

Series RHPLC Humidity Temperature Transmitter
Bulletin AQ-RHPLC
Instruction Manual

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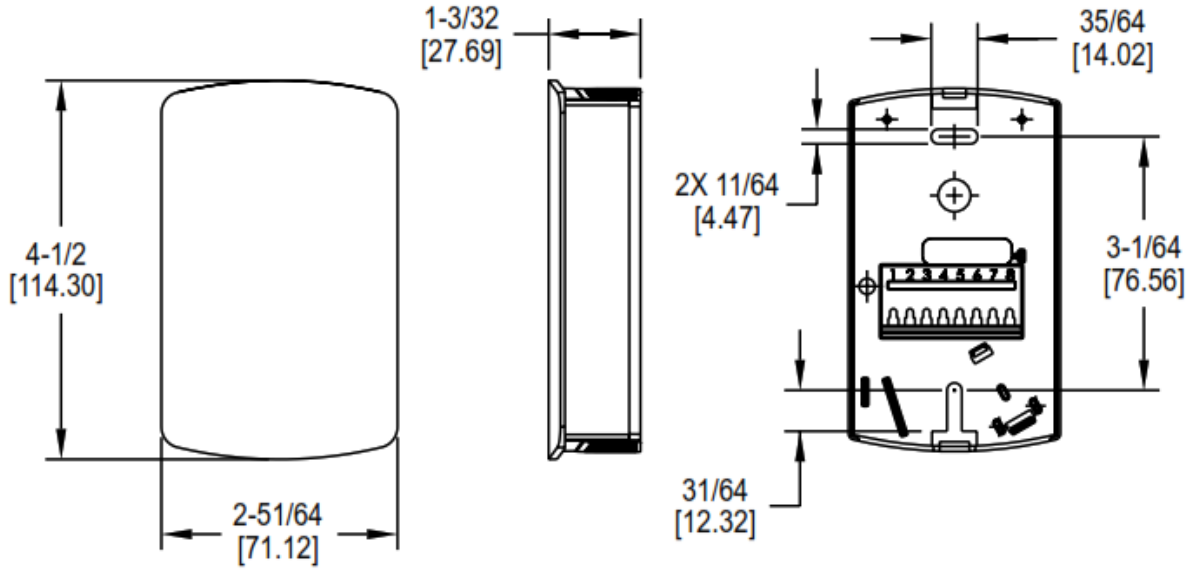
Specifications – Installation and Operating Instructions



The Series RHPLC Wall Mount Humidity/Temperature Transmitter is a compact economical sensor for the building automation market space. The stylish housing is well vented to provide airflow across the sensor to improve measurement accuracy.
Each unit utilizes a capacitive polymer sensing element to deliver a proportional analog output. A combination humidity and temperature model can be configured with current, voltage, RTD, or thermistor output. A wide selection of passive RTD or thermistor temperature sensors is available in this series.

BENEFITS/FEATURES

- Reduced installation cost with combined humidity and temperature sensing
- Wide application environments from a large selection of temperature sensors and 2% to 3% accuracies

APPLICATIONS

- Air economizers
- Room comfort monitoring

MODEL CHART							
Example	**HPLC**	**-3**	**N**	**2**	**A**	**-FC**	**HPLC-3N2A-FC**
Series	HPLC						Humidity/temperature transmitter
Accuracy		2 3					2% accuracy 3% accuracy
Housing			N				North American style wall mount
Humidity Output				1 2 3			Current 4-20 mA Voltage 0-10 VDC Voltage 0-5 VDC
Temperature Output					0 1 2 3 A B C D E F		None Current 4-20 mA Voltage 0-10 VDC Voltage 0 to 5 VDC 10K Ω @ 25ºC thermistor type III 10K Ω @ 25ºC thermistor type II 3K Ω @ 25ºC thermistor 100 Ω RTD DIN 385 1K Ω RTD DIN 385 20K Ω @ 25ºC thermistor
Options						FC	Factory calibration certificate (3% accuracy units)

SPECIFICATIONS

Sensor: Capacitive polymer.
Relative Humidity Range: 0-100% RH.
RH Accuracy: ±2% 10 to 90% RH @ 25°C for 2% accuracy units; ±3% 20 to 80% RH @ 25°C for 3% accuracy units.
RH Hysteresis: ±0.8%.
RH Repeatability: ±0.1% typical.
Temperature Output Range: -40 to 140°F (-40 to 60°C).
Passive Thermistor Temperature Sensor Accuracy: ±0.36ºF @ 77°F (±0.2°C @ 25°C).
Accuracy RTD Temp Sensor: DIN Class B; ±0.3°C @ 0°C (±0.54°F @ 77°F).
Accuracy Current/Voltage Temperature Output: ±0.9°F @ 72°F (±0.3°C @ 25°C).
Temperature Limits: Operating: -40 to 140°F (-40 to 60°C); Storage: -40 to 176°F (-40 to 80°C).
Power Requirements: 10-35 VDC for 4-20 mA or 0-5 VDC output; 15-35 VDC for 0-10 VDC output; 10-29 VAC for 0-5 VDC output; 15-29 VAC for 0-10 VDC output.
Response Time: 8 s (t63).
Electrical Connections: Screw terminal block.
Drift: <0.25% RH/year.
Enclosure Material: **Polycarbonate.**
Weight: 4.4 oz (125 g).
Agency Approvals: CE.

INSTALLATION

⚠ **WARNING** Disconnect power supply before installation to prevent electrical shock and equipment damage Make sure all connections are in accordance with the job wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.

⚠ **CAUTION** Use electrostatic discharge precautions (e.g., use of wrist straps) during installation and wiring to prevent equipment damage.

⚠ **CAUTION** Do not exceed the ratings of this device, permanent damage not covered by warranty may result. The 4-20 mA models are not designed for AC voltage operation.
NOTICE Avoid locations where severe shock or vibration, excessive moisture or corrosive fumes are present.

MOUNTING

1. Push the tab on the top and bottom of the cover and lift the cover from the back plate (See Figure 1).
2. Select the mounting location, away from diffusers, lights, or any external influences.
3. Mount the transmitter on a vertical surface to a standard electrical box using the two #6
4. M2C type screws provided.
5. Pull wires through the sub-base hole and make necessary connections.
6. Reattach the cover to the base plate

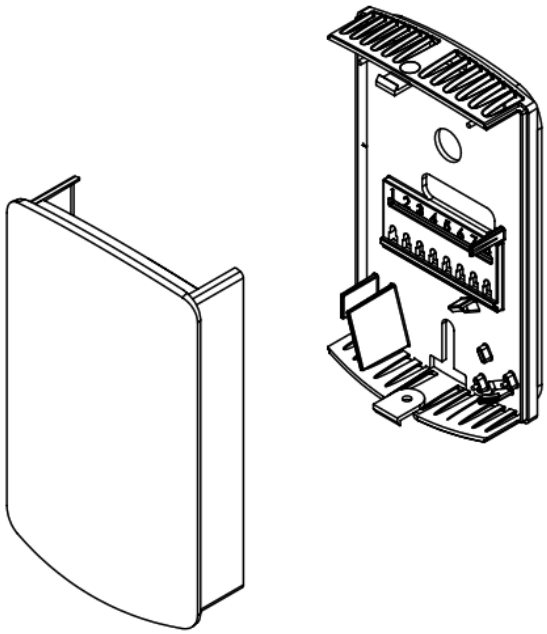


Figure 1: Removal of cover from back plate

Wiring

Use a minimum of 22 AWG to a maximum of 18 AWG wire for wiring to terminals. Refer to Figures 2 and 3 for wiring information.
Current Output Models: Wire as shown in Figure 2. Current outputs must be powered with 10-35 VDC. If the RH output is not required, wire the negative terminal of the
power supply to terminal 1 of the transmitter. If the unit has a passive temperature sensor, wire to terminals 3 and 4.

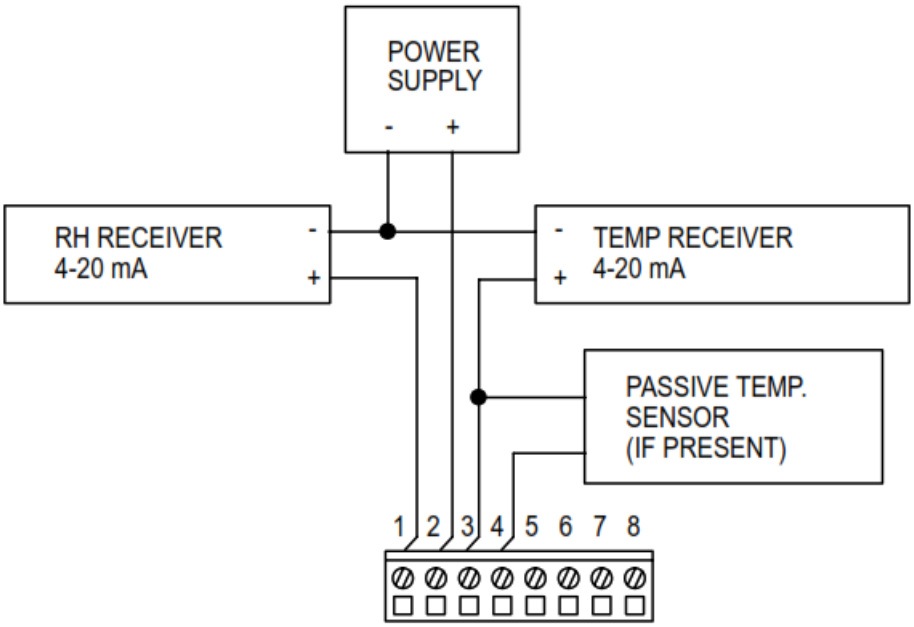


Figure 2: Current output wiring

Voltage Output Models: Voltage outputs may be powered with 10-35 VDC (0-5 V models), 15-35 VDC (0-10 V models) or 10-29 VAC (0-5 V modes), 15-29 VAC (0-10 V models). Note polarity when using DC power. Wire the RH voltage output as shown in Figure 3. If the unit has a voltage temperature output, wire the temperature receiver between terminal 4 and the negative terminal of the power supply. If the temperature or RH voltage output is not used it may be left disconnected. If the unit has a passive temperature sensor, wire to terminals 4 and 5.

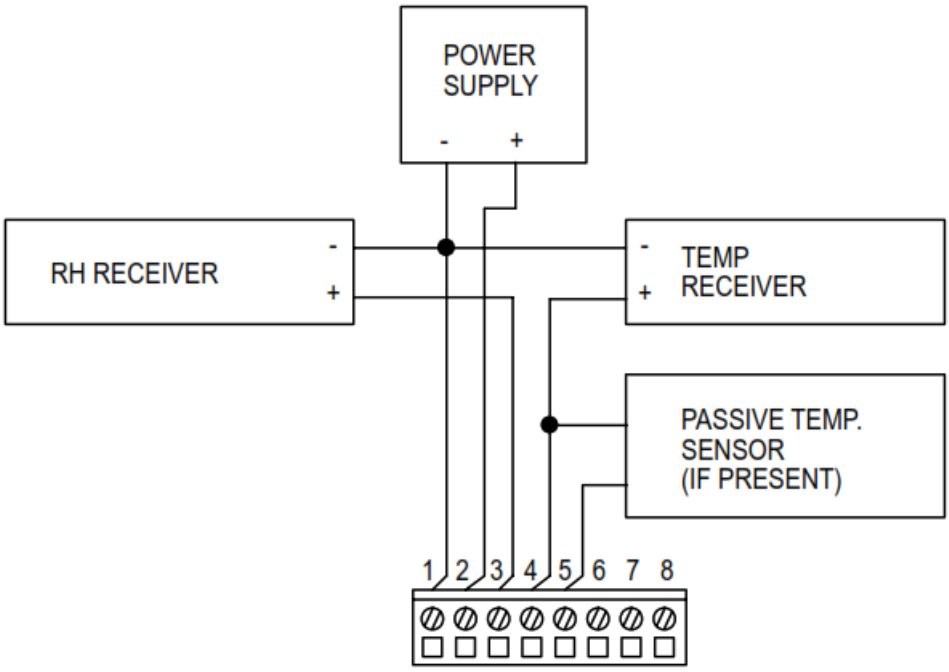


Figure 3: Voltage output wiring

TROUBLESHOOTING

1. Verify that the unit is mounted in the correct position.
2. 4-20 mA Models: Verify appropriate supply voltage. The transmitter requires a minimum of 10 and a maximum of 35 VDC at its connections for proper operation. Choose a power supply with a voltage and current rating

which meets this requirement under all operating conditions. If the power supply is unregulated, make sure voltage remains within these limits under all power line conditions. Ripple on the supply should not exceed 100mV.

Loop Resistance – The maximum allowable loop resistance depends on the power supply voltage. Maximum loop voltage drop must not reduce the transmitter voltage below the 10 VDC minimum. Maximum loop resistance can be calculated with the following equation. VPS is the power supply voltage.

$$Rmax = \frac{V_{ps} - 10.0}{20\ mA}$$

Some receivers, particularly loop-powered indicators, may maintain a fixed loop voltage to power the device. This voltage drop must also be subtracted from the power supply voltage when calculating the voltage margin for the transmitter. The following equation takes this into account. Vic is the receiver's fixed voltage.

$$Rmax = \frac{V_{ps} - 10.0 - V_{rec}}{20\ mA}$$

Voltage Output Models:
Verify appropriate supply voltage. The voltage output models require a 10-35 VDC (0-5 V models), 15-35 VDC (0-10 V models) or 10-29 VAC (0-5 V modes), 15-29 VAC (0-10
V models) for proper operation maximum. The maximum output load is 5 mA.

MAINTENANCE/REPAIR
Upon final installation of the Series RHPLC, no routine maintenance is required. The Series CDWP is not fielded serviceable and is not possible to repair the unit. Field repair
should not be attempted and may void the warranty.

WARRANTY/RETURN
Refer to "Terms and Conditions of Sale" in our catalog and on our website. Contact customer service to receive a Return Goods Authorization number before shipping the
product back for repair. Be sure to include a brief description of the problem plus any additional application notes.

RESISTANCE VS TEMPERATURE TABLE

Temperature		**Resistance Curves (in Ohms)**					
°C	**°F**	**A**	**B**	**C**	**D**	**E**	**F**
-55	-67.0	607800.00	963849.00	289154.70	78.32	783.2	2394000.00
-50	-58.0	441200.00	670166.00	201049.80	80.31	803.1	1646200.00
-45	-49.0	323600.00	471985.00	141595.50	82.29	822.9	1145800.00

-40	-40.0	239700.00	336479.00	100943.70	84.27	842.7	806800.00
-35	-31.0	179200.00	242681.00	72804.30	86.25	862.5	574400.00
-30	-22.0	135200.00	176974.00	53092.20	88.22	882.2	413400.00
-25	-13.0	102900.00	130421.00	39126.30	90.19	901.9	300400.00
-20	-4.0	78910.00	97081.00	29124.30	92.16	921.6	220600.00
-15	5.0	61020.00	72957.00	21887.10	94.12	941.2	163500.00
-10	14.0	47540.00	55329.00	16598.70	96.09	960.9	122280.00
-5	23.0	37310.00	42327.00	12698.10	98.04	980.4	92240.00
0	32.0	29490.00	32650.00	9795.00	100.00	1000.0	70160.00
5	41.0	23460.00	25392.00	7617.60	101.95	1019.5	53780.00
10	50.0	18780.00	19901.00	5970.30	103.90	1039.0	41560.00
15	59.0	15130.00	15712.00	4713.60	105.85	1058.5	32340.00
20	68.0	12260.00	12493.00	3747.90	107.79	1077.9	25360.00
25	77.0	10000.00	10000.00	3000.00	109.74	1097.4	20000.00
30	86.0	8194.00	8057.00	2417.10	111.67	1116.7	15892.00

35	95.0	6752.00	6531.00	1959.30	113.61	1136.1	12704.00
40	104.0	5592.00	5326.00	1597.80	115.54	1155.4	10216.00
45	113.0	4655.00	4368.00	1310.40	117.47	1174.7	8264.00
50	122.0	3893.00	3602.00	1080.60	119.40	1194.0	6722.00
55	131.0	3271.00	2986.00	895.80	121.32	1213.2	5498.00
60	140.0	2760.00	2488.00	746.40	123.24	1232.4	4520.00
65	149.0	2339.00	2083.00	624.90	125.16	1251.6	3734.00
70	158.0	1990.00	1752.00	525.60	127.08	1270.8	3100.00
75	167.0	1700.00	1480.00	444.00	128.99	1289.9	2586.00
80	176.0	1458.00	1255.00	376.50	130.90	1309.0	2166.00
85	185.0	1255.00	1070.00	321.00	132.80	1328.0	1822.60
90	194.0	1084.00	915.50	274.65	134.71	1347.1	1540.00
95	203.0	939.30	786.60	235.98	136.61	1366.1	1306.40
100	212.0	816.80	678.60	203.58	138.51	1385.1	1112.60
105	221.0	712.60	587.60	176.28	140.40	1404.0	951.00

110	230.0	623.60	510.60	153.18	142.29	1422.9	815.80
115	239.0	547.30	445.30	133.59	144.18	1441.8	702.20
120	248.0	481.80	389.60	116.88	146.07	1460.7	606.40
125	257.0	425.30	341.90	102.57	147.95	1479.5	525.60
130	266.0	376.40	301.00	90.30	149.83	1498.3	N/A
135	275.0	334.00	265.80	79.74	151.71	1517.1	N/A
140	284.0	297.20	235.30	70.59	153.58	1535.8	N/A
145	293.0	265.10	208.90	62.67	155.46	1554.6	N/A
150	302.0	237.00	186.10	55.83	157.33	1573.3	N/A

NOTES

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Documents / Resources

	Dwyer AQ-RHPLC Series RHPLC Humidity Temperature Transmitter [pdf] Instruction Manual AQ-RHPLC, Series RHPLC Humidity Temperature Transmitter, AQ-RHPLC Series RHPLC Humidity Temperature Transmitter, RHPLC Humidity Temperature Transmitter, Humidity Temperature Transmitter, Temperature Transmitter, Transmitter

References

- Dwyer Home