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HRD



Technical Data

Overall accuracy	HRD2 +/- 2%RH HRD3 +/- 3%RH
Long term stability	Better than 2%RH p.a.
Humidity range	0...100%RH
Temperature range	0...+40°C (others on request)
Temp. accuracy	±0,3°C (standard)
Enclosure class	IP30 ABS Housing (flame retardant)
Dimensions	85 x 85 x 23mm
Ambient range	-10...+50°C
Power supply	
4-20 mA	20 - 35Vdc for 500ohm loop resistanc
0-10Vdc	17 - 34Vdc, 24 - 26Vac(4,7kohm min)
Connections	0,5-2,5mm ² cable
Output Signal	4-20mA or 0-10Vdc

Features

- Dewpoint -40 to +60C (optional)
- Outputs 4-20mA or 0-10Vdc link selectable
- Direct thermistor temperature output option
- High stability and reliability
- No loss of accuracy up to 100%RH
- Built-in circuitry diagnostics
- Enthalpy -20 to +269kJ/kg (optional)
- LCD display for RH & Temperature (optional)
- Three line fully configurable LCD

Design Features

The HRD space mounted humidity & temperature sensors offer the latest technology for high accuracy RH measurement.

Units can be ordered with an optional direct resistive temperature outpput (where this option is required, the type of temperature element MUST be specified at the time ordering.

The HRD is also available with additional outputs for enthalpy and dewpoint.

Non-standard temperature output ranges can be specified at the time of order.

Accuracy 3%

HRD3 142	4-20mA/0-10Vdc output RH&T
HRD3 142/T*	4-20mA/0-10Vdc output RH and direct output temp.element
HRD3 142/LCD	4-20mA/0-10Vdc output RH&T with display
HRD3 142/T*/LCD	4-20mA/0-10Vdc output RH and direct output temperature element with display

Accuracy 2%

HRD2 142	4-20mA/0-10Vdc output RH&T
HRD2 142/T*	4-20mA/0-10Vdc output RH and direct output temp.element
HRD2 142/LCD	4-20mA/0-10Vdc output RH&T with display
HRD2 142/T*/LCD	4-20mA/0-10Vdc output RH and direct output temperature element with display
HRD2 142/DEW	4-20mA/0-10Vdc output RH&T
HRD2 142/T*/DEW	4-20mA/0-10Vdc output RH and direct output temp.element
HRD2 142/DEW/LCD	4-20mA/0-10Vdc output RH&T with display
HRD2 142/T*/DEW/LCD	4-20mA/0-10Vdc output RH and direct output temperature element with display

T* = Direct output temperature element.

The Element type must be specified at the time of ordering, as this option cannot be changed on site

Compatible temperature element T* see page 3



Installation and Connection Details

All connections to BEMS controllers, data recorders etc. should be made using screened cable.

Normally the screen should be earthed at one end only (usually the controller end) to avoid earth hum loops which can create noise.

Low voltage signal and supply cables should be routed separately from high voltage or mains cabling.

Separate conduit or cable trays should be used.

Where possible, the controller's earth should be connected to a FUNCTIONAL EARTH, rather than the mains safety earth.

This will provide better immunity to high frequency noise. Most modern buildings have a separate earth from this purpose.

Caution: Anti-static precautions **must** be observed when handling these sensors.

The PCB contains circuitry that can be damaged by static discharge.

Transmitters should only be fitted to a system after airflow calibration has been carried out and preferably following full fan running of at least several days, in order that the main contaminants have been removed from the stagnant system.

1. Select a location on the wall, in a location that will give a representative sample of the prevailing room condition.
2. Remove lid from box and mark holes for screws on the wall, using the base plate as a template.

Take care not to contaminate the transmitter with dust, dirt or static.

3. Connect wiring to two part terminal block and fix transmitter to base plate.

Make electrical connections to transmitter only after all over electrical installation and test work has been completed.

4. It is recommended that screened cable be used and that the screen should be earthed at the controller.

Care should be taken not to lay control signal wiring in close proximity to power or other cables which may produce significant magnetic noise.

5. Allow 3 minutes before checking functionality.
6. Allow 30 minutes before carrying out pre-commissioning checks.

Room Transmitters

Care should be taken when siting the transmitters.

They should NOT be mounted where they will be exposed to direct sunlight.

Avoid mounting near sources of heat or steam, such as above an electric kettle.

The transmitters should be mounted in such a way as to allow adequate airflow, and to this end the unit must be mounted with the louvres at the top and bottom, NOT at the sides.

The transmitters should not be subjected to any application of proprietary cleaner, such as glass cleaning spray or furniture polish.

If any painting is to be carried out near the transmitters, remove the units until the paint has dried and any fumes have had a chance to disperse fully.

Installation Consideration

The HRD range of transmitter's output mode can be link configured to operate in either current (4-20 mA) or voltage (0-10 Vdc) outputs.

It should be noted that if the **RH output is set to current output 4-20mA when it normally supplied**, then the temperature must also be current output.

The same applies if the RH output is voltage; the temperature output then must also be voltage.

The ONLY time this is not true is if a DIRECT temperature output is specified AT THE TIME OF ORDERING.

The RH output may then be either current or voltage, while the temperature is a thermistor output.

It should also be noted that while the RH output can operate as stand alone, where the temperature output is NOT a thermistor the RH connections MUST be made for the temperature output to work.

It is important that the switches on the PCB are set for the appropriate output type BEFORE power is applied. Refer to page 3 which accompanies the product for these switches settings.

N.B.

Unless the sensor is ordered as having a direct thermistor temperature output, the jumpers are set by default to CURRENT output.

Where the temperature output has been ordered as direct thermistor, the PCB will have been specially modified for this purpose, **AND WILL NOT OPERATE AS A VOLTAGE OR CURRENT TEMPERATURE OUTPUT WITHOUT FURTHER MODIFICATION.**

Where the output type is set to current, **ONLY A 24 Vdc SUPPLY MUST BE CONNECTED.**

Where a voltage output is used, AC or DC may be used as a supply.

In all cases, the RH elements should not be exposed to condensation or physical shock, as damage to the element may occur.

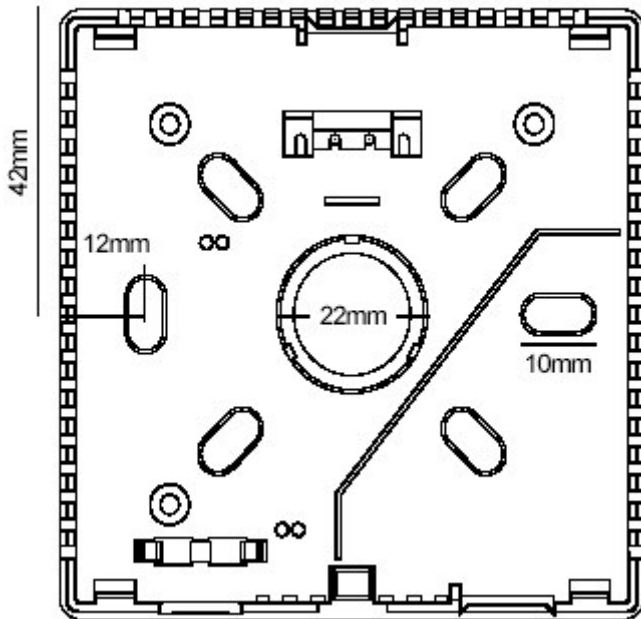
Commissioning

To perform an accurate comparison between a transmitter output and a portable reference, it is essential that the two probes are held adjacent for a minimum of 30 minutes in a stable RH environment.

Only this way can speed of response and temperature factors be eliminated.

It is not uncommon for test instruments and transmitters to disagree by 10%RH or more when site measurements are taken incorrectly.

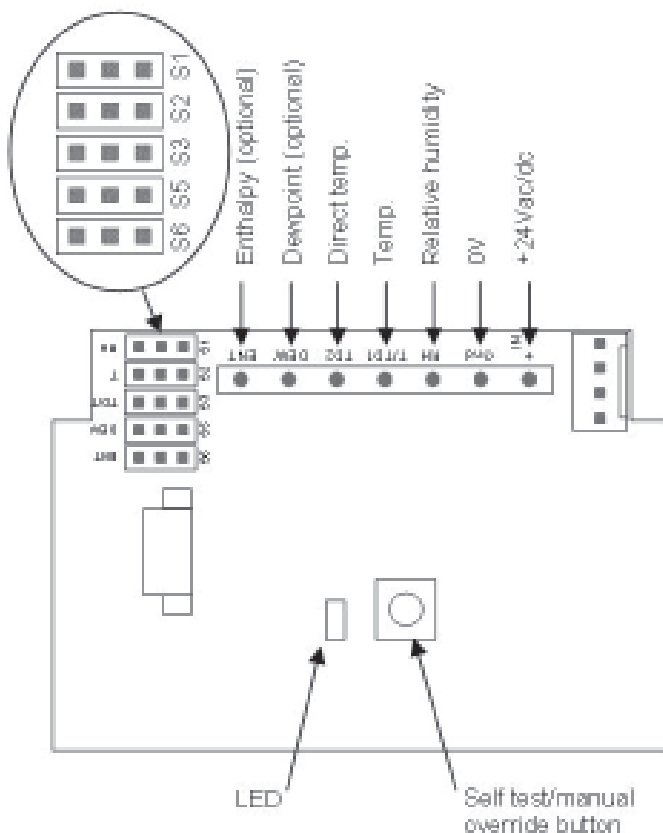
A sling or other mechanical hygrometer can be used for indication **only**, and should **NOT** be used as a reference



Compatible temperature element T*

xxx/NTC	Cylon, Trend, Honeyell (Aquatrol), Thorn, Smart Kontrol, Siox, Elesta, AP, Ambiflex
xxx/PTC	EM, Satchwell, NCS
xxx/PT100	INU, ABB, Serck, Exomatic
xxx/PT1000	Cylon, Johnson, Honeywell, Elesta, Bastec, Diana, KTC, SAIA
xxx/Ni 1000	Sauter, Exomatic
xxx/TA	TAC
xxx/LGNI	Landis & Staefa (Siemens), Exomatic (QAA 23, QAD 21)
xxx/ALE	Alerton, Satchwell(DDU 1804), Honeywell(TE200AD-6)
xxx/AND	Andover, York<40C, Siebe(TSserie)
xxx/SAT1	Satchwell(DDT,DWT, DOS some)
xxx/SAT2	Satchwell(DD, DR, DW 1202, DWS1301)
xxx/SAT3	Satchwell(DW 1204, DW 1202)
xxx/SAT4	Satchwell(DWS 1202)
xxx/T1	Staefa(T1)
xxx/T30	Staefa(t30)
xxx/SIE	Siebe

Other temperature elements on request.



	RH = 4-20mA T = 4-20mA Dew = 4-20mA Ent = 4-20mA	RH = 0-10Vdc T = 0-10Vdc Dew = 0-10Vdc Ent = 0-10Vdc	RH = 4-20mA T = Direct Dew = 4-20mA Ent = 4-20mA	RH = 0-10Vdc T = Direct Dew = 0-10Vdc Ent = 0-10Vdc
SW1	Left	Right	Left	Right
SW2	Left	Right	Left	Right
SW3	Left	Left	Right	Right
SW5	Left	Right	Left	Right
SW6	Left	Right	Left	Right
+24V	24Vdc	24Vdc	24Vdc	24Vdc
0V	No connection	0V	No connection	0V
RH	RH output (mA)	RH output (Vdc)	RH output (mA)	RH output (Vdc)
T/TD1	T output (mA)	T output (Vdc)	T output (direct)	T output (direct)
TD2	No connection	No connection	T output (direct)	T output (direct)
DEW	Dew output (mA)	Dew output (Vdc)	Dew output (mA)	Dew output (Vdc)
ENT	Ent output (mA)	Ent output (Vdc)	Ent output (mA)	Ent output (Vdc)



Verification in the field

The most common difficulty that arises when commissioning or verifying correct operation in the field is that of RH measurement.

It is vital that a reliable reference is used against which the transmitter is to be measured.

Slings, though now less popular than in times gone by, are still widely used.

They should be used for indication only, and never as a reliable reference for calibration purposes.

PURE distilled water only should be used (NOT just de-ionised). Errors are especially large and readings unreliable at low levels of relative humidity.

When the action of whirling the device is stopped, the water being wicked up the sock evaporates very quickly, leading to a significant rise in wet-bulb temperature.

This, coupled with questionable water purity, the interpretation of Psychrometric charts and the inherent difficulties in producing a repeatable "read action" can lead to errors in excess of 10-15%RH.

Automatikprodukters policy at present is that we will NOT ACCEPT THE USE OF A SLING as a reference against which a AP transmitter is measured.

It is recommended that a RECENTLY CALIBRATED (preferably to N.A.M.A.S. standard), 2% or better accuracy, electrical impedance instrument be used as a measurement reference.

Rotronic, Vaisala and Humitec, among others, offer suitable instruments.

It should be noted that the instrument chosen should be capable of being left powered ON for several hours unattended.

Many instruments have a timed switch-off system, which while useful for conserving battery life, can lead to unstable and unreliable readings in the field, because the sensor under test AND the measuring instrument must stabilise over a period of time to allow accurate readings to be taken.

These stable test conditions are threatened by the need to switch the instrument on again.

Inaccuracies can be expected as the reference instrument must stabilise under power again.

It is therefore very important that the reference instrument can be left for long periods of time, unattended, WITHOUT SWITCHING ITSELF OFF.

A great deal of confusion can arise when taking readings from a transmitter(s) which has been installed for some time and comparing them against an instrument, however accurate, which has been brought on site from a different environment.

The reference will quite commonly APPEAR to read as much as 8-10%RH.

HIGH when compared to the installed sensor. This is especially noticeable during periods of LOW RH (40% or less).

This is caused primarily by the reference instrument coming from an environment with a HIGHER ambient RH.

It is vital that enough time be allowed for the reference device to acclimatise to the same ambient conditions as the in-situ sensor.

This can typically take up to 4 hours or longer, depending on the difference that exists between the two devices.

The reason for this is that the extra moisture on the sensing element of the reference needs time to be given off back into the atmosphere, enabling an accurate reading to be taken.

Output Ranges

The temperature range of the transmitter is 0°C to +40°C.

The range of the RH output is 0-100% RH in all instances. The only variation from this is where a direct thermistor output is used.

Sensor Maintenance

A filter for the RH element is included.

It is recommended that the filter be fitted only if the transmitter is likely to be exposed to dirty air.

If fitted, and the filter becomes clogged with grime or dust, the filter can be removed from the RH element and replaced (order RH/FIL).

The transmitters can also be gently washed in a Isopropanol alcohol.

Do not wash in water or on fluids.