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## HUMIDITY TECHNOLOGIES

*earliest*

*chronological*

*most recent*

- |   |  |
|---|--|
| 1 | cellulose crystallite/strain           |
| 2 | elongated fiber, mechanical/inductance |
| 3 | conductivity in surface chemical films |
| 4 | conductivity eliminated cyclically     |
| 5 | capacitance change                     |
| 6 | impedence change                       |
| 7 | evaporation (wet/dry bulb)             |
| 8 | condensation on mirror surface         |
| 9 | polymer coated MEMS silicon bridge     |

*Fundamental physics and chemistry technologies which have been used to measure relative humidity.*

## Measuring Water as a Gas

### Bear Facts -- #95

**Relative humidity and dew point and bound water and absolute humidity are all related ways to observe and define water in its gaseous phase, where it is tasteless and invisible.**

**All sensors are transducers of some physical phenomena, compared here, into a mechanical or electronic analog which can be observed.**



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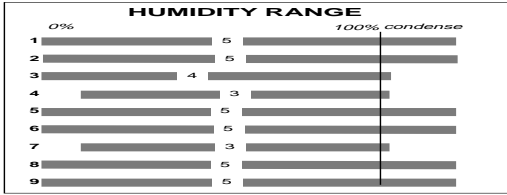


the DataBear

Bear Facts are published to provide useful insights into the operation and applications for the DataBear™ Measurer and associated complete instruments.

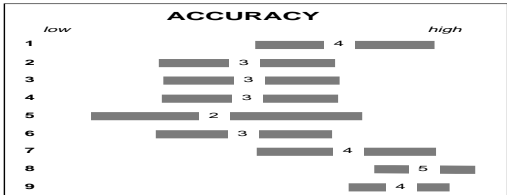
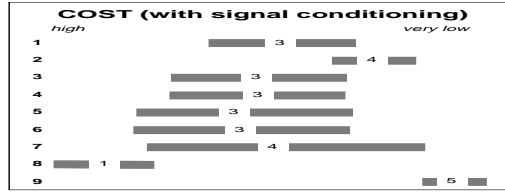
Keeping  
in  
Touch!

## Characteristics of Humidity Sensor Technologies



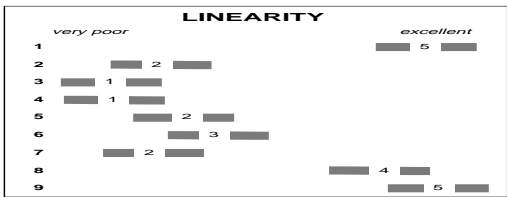
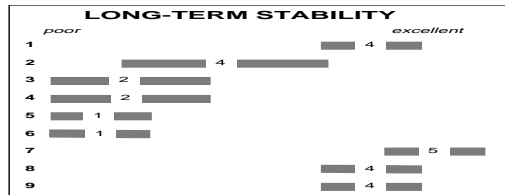
sensor dynamic range

relative cost inclusive of electronics needed to provide recordable signal



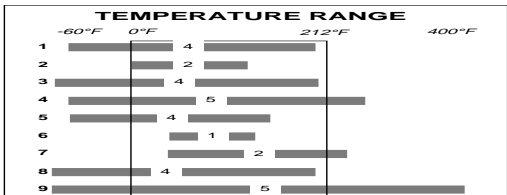
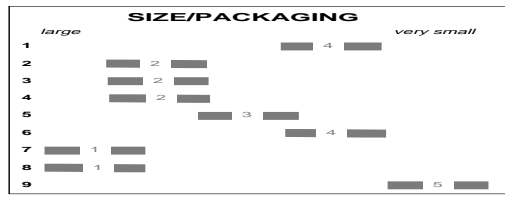
repeatability as compared to a reference standard

suitability for lasting over time without changing specifications



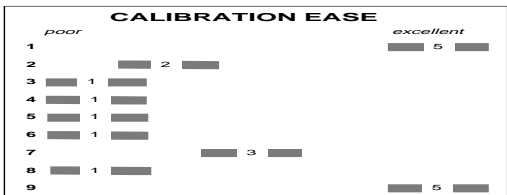
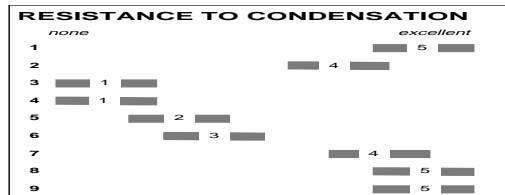
response of methodology over useful range compared to straight-line plot

relative physical size of sensor and associate signal electronics



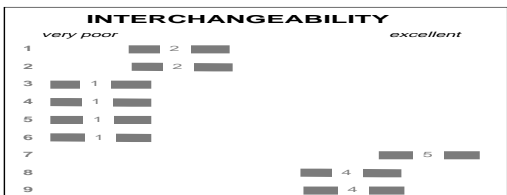
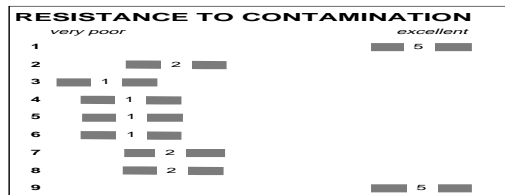
operating thermal range, even if necessary to compensate

ability to continue to measure when water vapor converts to liquid



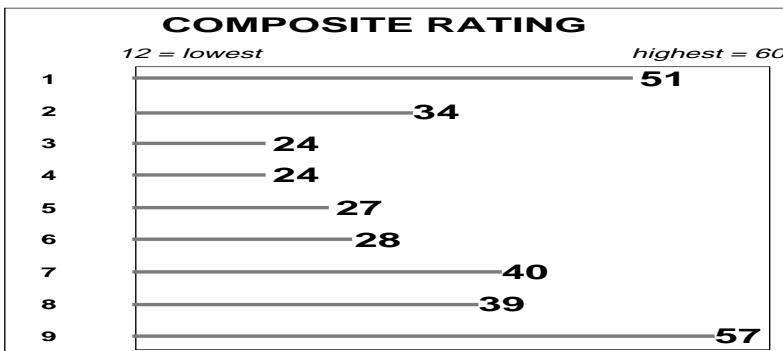
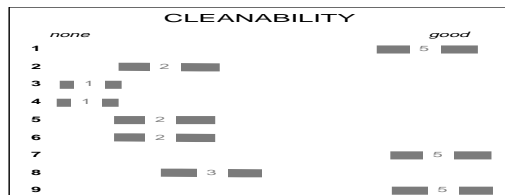
relative complexity in comparing methodology to reference standard

relative susceptibility to influence of adverse chemical damage



ability to exchange sensors created at different times and get repeatable data

relative ability to be clean after continuous exposure



These charts are based upon independent research summarized in a text table published in Sensors, May 1995. The original work was reported by Dr. William Clayton, while director of humidity products at Hycal, Inc. (Hycal has been purchased.) The rating numbers were applied by Leon Langan by visual observation of the resultant charts; the summation is an accumulation of all of the individual ratings.

Summation of ratings (1 to 5) given above. Higher score is better.

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**These are the main ways humidity is measured.**  
**Ostensibly the higher the composite sum the better the technology should be in measuring relative humidity.**  
**Of course, some technologies may be selected for their specific characteristics for a given application.**  
**Some methodologies are age old; #9 is just announced. It shows promise.**  
**That is why we have selected it for our new instruments!**  
 Visit our web site: <[www.langan.net/lpi](http://www.langan.net/lpi)>