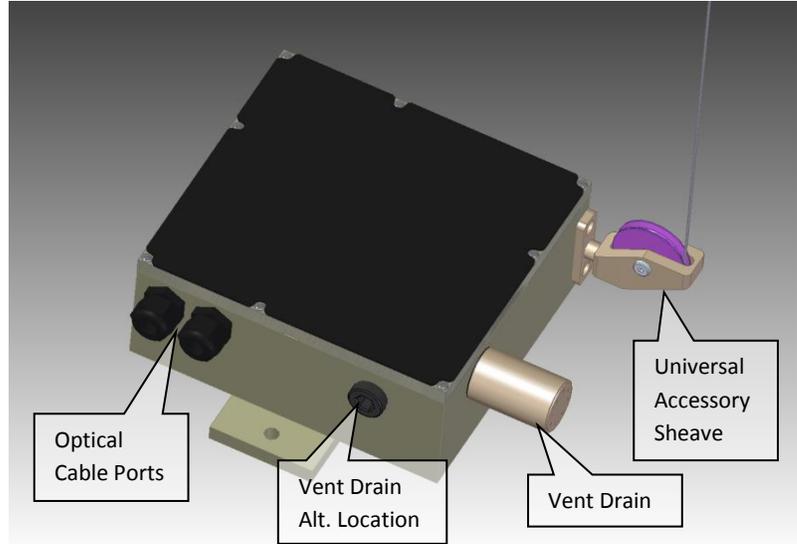




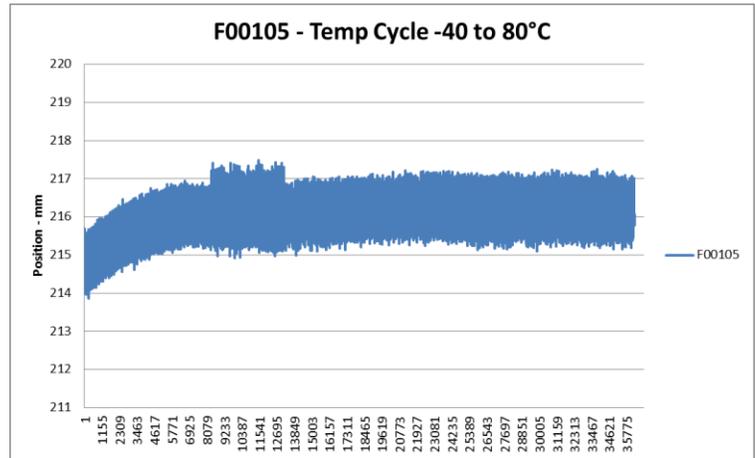
os5500 Displacement Gage Test Summary

The os5500 long range displacement gage provides the user with accurate and long term position measurements for monitoring movement for both static and dynamic applications. The gage is offered in three displacement ranges: 0 - 150mm, 0 - 300mm, and 0 – 450mm. To insure long term reliable measurements, this gage has been subjected to harsh environmental, fatigue, repeatability, and other testing. The following is a summary of the tests and results that insure the long term reliability of the gage.

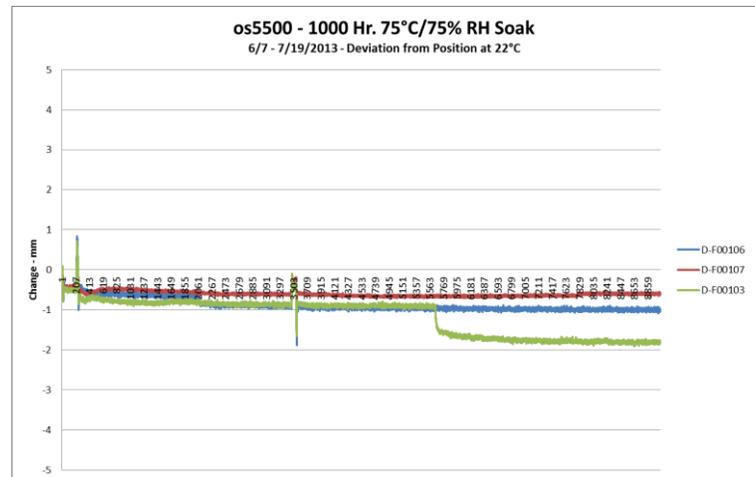


Environmental Tests:

Temperature cycle 3 gages: F00101, F00102a, F00105
 Temperature range: -40C to +80C
 Number of cycles: 500 cycles (400 shown)
 Instrument: Micron Optics sm125 serial number SIAB8T
 Chamber: ESPEC model PL-1FPH, serial number 12005885
 Displacement Error: 2mm for 450mm gage due to temperature
 Test start date: May 7, 2013
 Test end date: August 19, 2013



Humidity Soak 3 gages: F00103, F00106, F00107
 Time: 1000 hours
 Temperature: 75C
 Humidity: 75% RH
 Instrument: Micron Optics sm125, serial number SIA886
 Chamber ESPEC – Model LHU-113, serial number 1012000693
 Displacement Error: <2mm
 Test Start date: June 6, 2013
 Test end date: July 17, 2013





Long Term Outdoor Environmental Test 3 gages from left to right: F00110, F00108, F00109

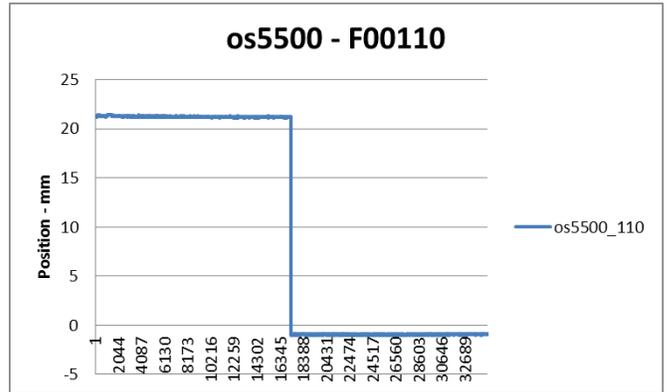
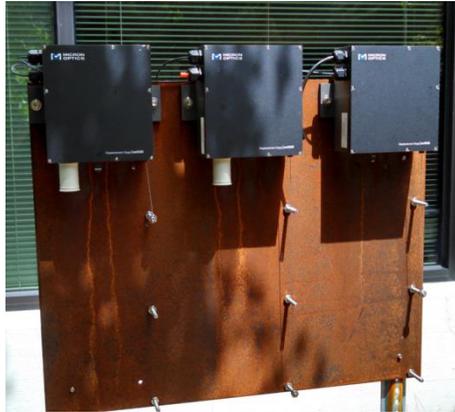
Test Start Date: 8/28/2013

Data thru: 6/25/14

Instrument: Micron Optics sm125 serial, number SIA43E

Location: Atlanta, GA

Step Change indicates change in cable position on Feb. 5, 2014



Fatigue Test

Gage: F00109

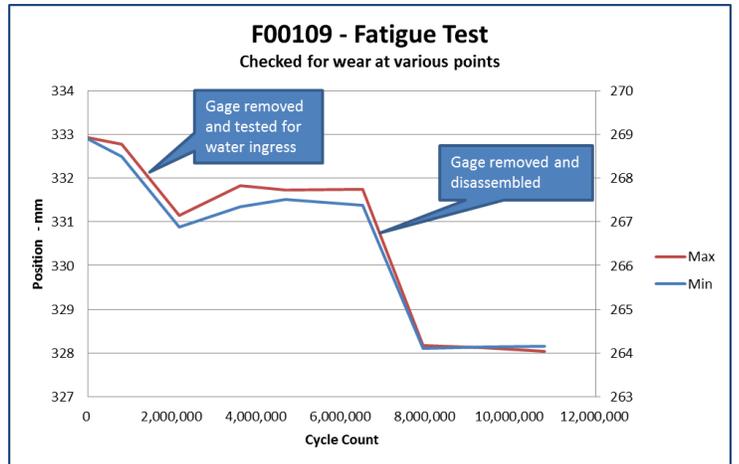
Fatigue Tester: Micron Optics designed (dwg #DQS101222), max stroke 50mm

Instrument: Micron Optics sm130, 1 kHz, serial number SIA9AY

Recorded 2 second data burst hourly. Data plotted at 3 day intervals

Test Start Date: 5/21/13

Test End Date: 6/24/13



Gage Repeatability

Gage F00108, 450mm range

Test Fixture: Micron Optics Calibration Test Set, Drawing #DQS130328

Micron Specification: .05% of full scale

