National Conference on Weights and Measures
15245 Shady Grove Road, Suite 130 • Rockville, MD 20850

Certificate Number: 87-085A3

National Type Evaluation Program
Certificate of Conformance
for Weighing and Measuring Devices

For:
Load Cell
Bending Beam and Shear Beam
Model Family: SHB*
n_{max}: Single Cell, Class III: 3000
n_{max}: Single Cell, Class III L: 10 000
Capacity: 20 kg to 1000 kg

Submitted by:

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Standard Features and Options

The Model SHB Series is identified by the designation SHB-X_1 X_2 -Y_1 Y_2-Z_1 Z_2 Z_3 Z_4, where:

SHB	X_1	X_2	Y_1 Y_2	Z_1	Z_2	Z_3	Z_4
	A = Class III B = Class III L	n_{max} in thousands	Y_1 = capacity Y_2 = units, where kg = kilograms and t = 1000 kilograms	electrical cable length or connector		P = analog D = digital	wiring and private label variations

Load Cell Parameters:

Capacity (kg)	Class III v_{min} (kg)	Class III L v_{min} (kg)	Minimum Dead Load (kg)
20	0.002	0.0006	0
50	0.005	0.0016	0
100	0.010	0.0033	0
200	0.020	0.0066	0
500	0.050	0.016	0
1000	0.100	0.033	0

Temperature Range: -10 ˚C to 40 ˚C (14 ˚F to 104 ˚F)

This device was evaluated under the National Type Evaluation Program (NTEP) and was found to comply with the applicable technical requirements of Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: April 9, 1999

Louis E. Straub
Chairman, NCWM, Inc.

G. Weston Diggs
Chairman, National Type Evaluation Program Committee

Issue date: July 12, 1999

This is a reissuance by the NCWM of a Certificate of Conformance already issued by the National Institute of Standards and Technology.

Revere Transducers, Inc.
Bending Beam and Shear Beam Load Cell
Model Family: SHB

Application: The load cells may be used in Class III L scales for both single and multiple cell applications consistent with the model designations and parameters specified in this Certificate. Load cells of a given accuracy class may be used in applications with lower accuracy class requirements provided the number of scale divisions, the v_{min} values, and temperature range are suitable for the application. The manufacturer may market load cells with fewer scale divisions (n_{max}), and with larger v_{min} values than those listed on the certificate. However, the load cells must be marked with the appropriate n_{max} and v_{min} for which the load cell may be used.

Identification: A pressure sensitive identification badge containing the manufacturer, model designation, and serial number is located on the load cell. All other required information must be on an accompanying document including the serial number of the load cell.

Basic Design: The load cells with capacities of 20 kg through 200 kg have a bending beam design. The 500-kg and 1000-kg capacity cells have a shear beam design.

Test Conditions: This Certificate supersedes Certificate of Conformance Number 87-085A2 and is issued to include a digital output option. A representative sample of a load cell equipped with a digital output option was tested at NIST (Model SSB, Certificate of Conformance Number 86-041A3) using dead weights as the reference standard. The data were analyzed for single cell load cell applications. The load cell was tested over a temperature range of –10 ˚C to 40 ˚C. Three tests were run at each temperature. The temperature effect on zero was measured and a time dependence test (creep) was performed. The barometric pressure test was waived due to the insensitivity of the load cell to barometric pressure. Previous test conditions are listed below for reference.

Certificate of Conformance Number 87-085A2: This Certificate superseded Certificates of Conformance Number 87-057A1 and 87-051 and was issued to add Class III L load cells.

Data submitted in 1987 for two load cells, one 500-kg and one 1000-kg capacity, were originally analyzed for the classification of III, S, and 3000d. The original data was again analyzed for Class III L applications and found to comply with NTEP requirements.

Certificate of Conformance Number 87-051A1: This Certificate was in addition to Certificate of Conformance Number 87-085 dated March 10, 1988. This Certificate was issued to reflect new values for v_{min} based upon the change to Handbook 44 performance requirements for the temperature effect on zero, effective January 1, 1991. Certificate Number 87-085 remains in effect for those load cells manufactured under that Certificate.

Two load cells, one 50-kg and one 1000-kg capacity, were tested using dead weights as the reference standard. The data were analyzed for single load cell applications. The cells were tested over a temperature range of –10 ˚C to 40 ˚C. Three tests were run on each cell at each temperature. The temperature effect on zero was measured and a time dependence (creep) test was performed. The barometric pressure test was waived due to the insensitivity of the load cell design to changes in barometric pressure. The manufacturer's laboratory was used to collect the test data.

Representatives from the National Institute of Standards and Technology evaluated the manufacturer's test facility, witnessed repeat tests on the load cells, and analyzed the data. The results indicate that the load cells comply with the applicable requirements of NIST Handbook 44.

Type Evaluation Criteria Used: NIST Handbook 44, 1999 Edition

Tested By: NIST Force Group

Information Reviewed By: H. Oppermann, T. Grimes (NIST) 87-085A1; R. Whipple (NIST) 87-085A2; G. Newrock (NIST), L. Sebring (NIST) 87-085A3