

**FRI**

Prosperity through research

Fie Research Institute

22/44, Ganganagar P. O., ICHALKARANJI - 416 116.
(Dist.Kolhapur) Maharashtra State, INDIA.

● Phone : (0230) 2441475 ● Fax : (0230) 2440191

● E-mail : fri@dataone.in ● Website : www.fieresearchinstitute.com

Accreditation No. NABL C0066

CALIBRATION CERTIFICATE OF FORCE MEASURING DEVICE

Date of calibration : 28/08/2014

Certificate No. : FRI/08/14/7118

Next calibration due on : 28/10/2016

Page No. : 1/2

Calibrated for : Krutam Techno Solutions Pvt.Ltd.
64/B, G.I.D.C, Makarpura Industrial Estate,
Behind Fire Brigade Station, Vadodara - 390 010

Customer Reference No. : Request Letter Dated 20/08/2014

Identification : Load cell make : ADI Artech
Model : 20210
Sr. No. : 630932
Capacity : 300 Kgf
Readout : ADI
Model : LI - 5000
Sr. No. : 1586
Resolution : 0.5 N

Date of receipt : 20/08/2014

Mode of Calibration : Tension

Machine used for calibration : Dead Weight Force Calibration Machine (FIE-DWP-002)

Traceability : NPL,Cert.No.14070367/D5.05/C-252 valid up to 22/07/16

Read out setting : Nil

Temperature : 24°C

Note : 1) Tension test were made out by using self-aligning Tension shackles provided with the force - measuring device.
2) Readout with load cell warmed up for 30 min. before calibration.
3) Calibration is done as per IS:4169-1988.
4) The reported uncertainty is at coverage factor $k=2$ which corresponds to a Coverage probability of approximately 95% for normal distribution, considering the relative error of different components such as zero, Resolution, Repeatability, Interpolation and combining the uncertainty of applied force.


U. V. Patil
(Sc. Assistant)


R. V. Tambad
(Sr. Engineer)


Dr. J. C. Padte
(Director)

**FRI**

Prosperity through research

Fie Research Institute

22/44, Ganganagar P. O., ICHALKARANJI - 416 116.

(Dist.Kolhapur) Maharashtra State, INDIA.

● Phone : (0230) 2441475 ● Fax : (0230) 2440191

● E-mail : fri@dataone.in ● Website : www.fieresearchinstitute.com

Accreditation No. NABL C0066

CALIBRATION CERTIFICATE OF FORCE MEASURING DEVICE

Date of calibration : 28/08/2014

Certificate No. : FRI/08/14/7118

Next calibration due on : 28/10/2016

Page No. : 2/2

Identification : Load cell make : ADI Artech
Sr. No. : 630932Calibration method : The Load cell is calibrated in Tension as per FRI Calibration procedure No.
FRICAL/CAL/02 based on IS:4169-1988

Results : The calibration results are valid for specific force steps/ interpolation

Applied force (N)	Deflection (N)			
	Series 1 at 0°	Series 2 at 180°	Series 3 at 360°	Average
100	100.0	100.0	100.0	100.0
300	300.0	300.0	300.0	300.0
500	500.0	500.0	500.0	500.0
1000	1001.0	1001.0	1001.0	1001.0
1200	1201.0	1201.0	1201.0	1201.0
1500	1501.0	1501.0	1501.0	1501.0
1800	1802.0	1802.0	1802.0	1802.0
2000	2002.0	2002.0	2002.0	2002.0
2500	2503.0	2503.0	2503.0	2503.0
3000	3004.0	3004.0	3004.0	3004.0

Polynomial Used : $Y = -0.1554104064 + 1.0005891686 \cdot X + 0.0000002744 \cdot X^2 + 0 \cdot X^3$

Where X = Force in N, Y = Average reading in N

Class	Mode	From	To	Uncertainty of measurement
Class 0	Tension	3000 N	1000 N	± 0.070%
Class 1	Tension	3000 N	500 N	± 0.120%
Class 2	Tension	3000 N	100 N	± 0.240%

U. V. Patil
(Sc. Assistant)R. V. Tambad
(Sr. Engineer)Dr. J. C. Padte
(Director)