

**FRI**

Prosperity through research

# Fire Research Institute

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

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Accreditation No. NABL C0066

## CALIBRATION CERTIFICATE OF FORCE MEASURING DEVICE

Date of calibration	: 28/08/2014	Certificate No. :	FRI/08/14/7117
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 - 500  
Sr. No. : 1586  
Resolution : 0.5 N

Date of receipt : 20/08/2014

Mode of Calibration : Compression

Machine used for calibration : Hydraulic Multiplication System (NPL-FIE-001)

Traceability : NPL,Cert.No.14070367/D5.05/C-254 valid up to 22/07/16

Read out setting : Nil

Temperature : 24°C

Note : 1) Compression test were made out by using self-aligning Compression pads 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)

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Identification : Load cell make : ADI Artech  
Sr. No. : 630932

Calibration method : The Load cell is calibrated in Compression 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
20	20.0	20.0	20.0	20.0
50	50.0	50.0	50.0	50.0
100	100.0	100.0	100.0	100.0
150	150.0	150.0	150.0	150.0
300	300.5	300.5	300.5	300.5
1000	1000.5	1000.5	1000.5	1000.5
1500	1501.0	1501.0	1501.0	1501.0
1875	1876.2	1876.2	1876.2	1876.2
2500	2502.0	2502.0	2502.0	2502.0
3000	3002.5	3002.5	3002.5	3002.5

Polynomial Used :  $Y = 0.0055102936 + 1.0005917489 * X + 0.000000131 * X * X + 0 * X * X * X$   
Where X = Force in N, Y = Average reading in N

Class	Mode	From	To	Uncertainty of measurement
Class 0	Compression	3000 N	1000 N	± 0.080%
Class 1	Compression	3000 N	1000 N	± 0.120%
Class 2	Compression	3000 N	20 N	± 0.240%

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