

**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.fiegroupindia.com

Accreditation No. NABL C0066

CALIBRATION CERTIFICATE OF FORCE MEASURING DEVICE

Date of Calibration : 11/01/2014
Next Calibration due on : 11/03/2016Certificate No: FRI/01/14/6607
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.

D.C. No. 01 Dated on 10/01/2014

Details of Instrument Under Calibration

Instrument	Proving Ring
Id.No.	A WON 100kN 97506 (KTPL/F/005)
Capacity	100 kN
Type	Integral
Dial Gauge Make	Baker
1 Div	0.002 mm
Dial Gauge No.	SLC 236

Date of Receipt

11/01/2014

Mode of Calibration

Compression

Machine Used for Calibration

1) Hydraulic Multiplication System (NPL-FIE-001)
2) Dead Weight Force Machine (FIE-DWP-003)

Traceability

1) NPL, Cert.No. 12031657/D5.05/C-085 valid upto 07/07/14
2) NPL, Cert.No. 12031657/D5.05/C-084 valid upto 07/07/14

Dial Gauge setting

Large pointer at 12 O'clock position
Small pointer at 5 revolutions

Temperature



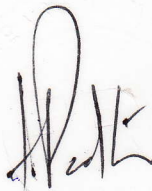
24°C

Correction of temperature variation

Apply $\pm 0.027\%$ correction to each reading for each °C
rise or fall of temperature.

Note

- 1) Compression test were made out by using self-aligning Compression pads provided with the force-measuring device.
- 2) Prior to each reading, the dial gauge was lightly tapped on the center of the dial cover.
- 3) The reported uncertainty is at coverage factor $k=2$ which corresponds to a coverage probability of approximately 95% for a normal distribution, considering the relative error of different components such as Zero, Resolution, Repeatability, Interpolation and combining the uncertainty of applied force.


Scientific Asst
(D.D.Magdum)
Sr. Engineer
(R.V.Tambad)
Director
(Dr.J.C.Padte)

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Details of instrument under calibration Id No. A WON 100 kN 97506 (KTPL/F/005)

Calibration Method

The Proving Ring is calibrated in Compression mode as per FRI calibration procedure No.FRICAL/CAL/01 based on IS:4169 -1988 and the results are tabulated below

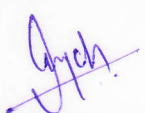
Results


The calibration results are valid for specific force steps.

Applied Force in kN	Dial Gauge Reading (Divisions)			
	Series1 at 0°	Series2 at 180°	Series3 at 360°	Average
10	93.6	93.6	93.6	93.6
20	188.4	188.4	188.4	188.4
30	284.8	284.8	284.8	284.8
40	382.6	382.4	382.4	382.5
50	479.6	479.6	479.4	479.5
60	579.8	579.8	580.0	579.9
70	678.6	678.6	678.4	678.5
80	778.4	778.6	778.6	778.5
90	877.4	877.4	877.6	877.5
100	978.2	978.2	978.0	978.1

Classification: The classification of force proving instrument is as follows:

Class	Mode	From	To	Uncertainty of measurement
Class 0	Compression	100 kN	30 kN	± 0.08%
Class 1	Compression	100 kN	20 kN	± 0.12%
Class 2	Compression	100 kN	10 kN	± 0.24%


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