



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



TRUE COPY

ULR No.: CC294725000000103F

SRF: PCL/2025/059

Issue Date : 12/03/2025

Certificate No.	Date of Calibration	Next date of Calibration	Page	No. of page
PCL/2025/059-1	12/03/2025	11/03/2026	1	3

Customer Name & Address :-	Customer Reference:-
M/s NCQC LABORATORY LLP 4, Abhishree Corporate Park, Near Swagat Bungalow BRTS,ISKCON-Ambli Road, Ambli, Ahmedabad, Gujarat 380058	Ref No/Id No:- NCQC-M/022 Date :- 07/03/2025 Condition on receipt:- Satisfactory

Location : In Lab

Details Of Device under calibration

Torque Sensor with Indicator

Mode: Clockwise & Counter Clockwise

Type : Torque Sensor Make : Sushma Model : TS-103F Sr. No. : TS13-0089 Capacity : 5 Nm	Type : Indicator Make : Sushma Model : TDU-RB-103 Sr. No. : DU13-0032 L.C. : 0.001 Nm	Parameter : Torque Unit : Nm
---	--	---

Reference Equipment and Method used for Calibration :

Dead weight Torque Test Rig with calibrated lever arm and Stainless Steel force weights

Serial No. :- PCL-02 DWTCS

Range :- 0.01 - 20 Nm

Lever Arm length, ± 100 mm used for 0.01-20 Nm range, Vide certificate/ULR No.: CC256424000004379F dated 06-05-2024, due on 05-05-2026.

Standards used for Calibration

Sr. No.	Nomenclature	Certificate No.	Validity
1	Dead Weights	TSC/24-25/4774-9	13/06/2029

CMC for Torque Calibration is 0.06% with coverage factor $k=2$ to give confidence level of 95%

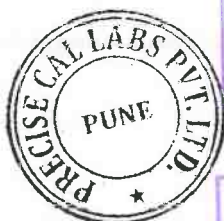
Calibration Procedure :- Done as per PCL Document No: CM -01 (based on BS 7882:2017)

Environmental Condition :- Temperature:- $23 \pm 1^\circ \text{C}$ Relative Humidity:- $50 \pm 10\%$ RH

- The calibration results reported corresponds to the particular item(s) mentioned above.
- This Certificate shall not be reproduced, except in full, unless written approval of PCL, Pune
- All Reference standards used are traceable to **National/International** Standards As Per ISO/IEC 17025-2017 through unbroken Chain of calibration through Accredited laboratory.
- All Calibration done in SI units and are traceable to **National/International** standards as required in ISO/IEC/17025
- Report Reported are without any adjustments or repair
- Calibration Procedure as per BS 7882:2017 and calibration point as per customer request .



Calibrated By
Mahadev
[Calibration Engg.]



NCQC LABORATORY LLP
Valid up to 11/03/2026
Reviewed *[Signature]*

Authorised By
Prajay P. Kasture

NCQC System Certificate No. 152

[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-1	12/03/2025	CC294725000000103F	2	3

Range : 0 - 5

Unit : Nm

L.C. : 0.001

Mode : Clockwise

Indicator Readings

Before After

Temp.: 23.4 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0	0	0	0	0	0
2	0.5	0.500	0.500	0.500	0.500	0.500	0.501
3	1.0	1.000	1.000	1.000	0.998	0.999	1.000
4	1.5	1.500	1.500	1.500	1.499	1.498	1.501
5	2.0	2.001	2.000	2.000	1.999	1.998	2.003
6	2.5	2.501	2.501	2.500	2.500	2.500	2.503
7	3.0	2.999	2.998	2.998	2.997	2.996	3.002
8	3.5	3.498	3.498	3.498	3.496	3.495	3.501
9	4.0	3.996	3.997	3.997	3.996	3.995	3.999
10	4.5	4.494	4.495	4.497	4.495	4.495	4.496
11	5.0	4.996	4.996	4.997	4.994	4.992	4.992

Mean value in Nm.	Error of Indication in %	uncertainty in % k = 2	uncertainty U' (incl. error of indi.) in %
0.500	0.00	0.20	0.20
0.999	-0.07	0.19	0.26
1.499	-0.05	0.19	0.24
2.000	-0.02	0.19	0.21
2.500	0.00	0.14	0.14
2.998	-0.08	0.14	0.22
3.497	-0.09	0.12	0.21
3.996	-0.10	0.07	0.17
4.495	-0.11	0.07	0.18
4.995	-0.11	0.07	0.18

Classification :

Class	Range in Nm	
	From	To
0.5	5	0.5

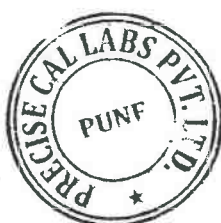
Scale Value : 2D48C2

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30 seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

N. Jetho

Calibrated By
Mahadev

[Calibration Engg.]



P. Kasture

Authorised By
Prajay P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-1	12/03/2025	CC294725000000103F	3	3

Range : 0 - 5

Unit : Nm

L.C. : 0.001

Mode : C. Clockwise

Indicator Readings

Before 23.4
After 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.5	-0.500	-0.499	-0.500	-0.500	-0.500	-0.501
3	1.0	-1.000	-1.000	-0.999	-1.000	-1.000	-1.003
4	1.5	-1.501	-1.500	-1.498	-1.502	-1.502	-1.503
5	2.0	-2.001	-2.001	-1.998	-2.001	-2.003	-2.004
6	2.5	-2.501	-2.501	-2.498	-2.501	-2.502	-2.503
7	3.0	-3.001	-3.001	-2.998	-3.001	-3.002	-3.004
8	3.5	-3.501	-3.499	-3.499	-3.501	-3.501	-3.504
9	4.0	-3.998	-3.998	-3.999	-4.001	-3.998	-4.003
10	4.5	-4.497	-4.498	-4.498	-4.501	-4.497	-4.501
11	5.0	-4.996	-4.997	-4.998	-5.002	-4.996	-4.996

Mean value in Nm.	Error of Indication in %	uncertainty in % k=2	uncertainty U* (incl. error of indi.) in %
-0.500	0.00	0.23	0.23
-1.000	-0.02	0.20	0.23
-1.501	0.05	0.20	0.25
-2.001	0.04	0.18	0.22
-2.501	0.02	0.12	0.14
-3.001	0.02	0.11	0.12
-3.501	0.01	0.09	0.11
-3.999	-0.02	0.09	0.12
-4.498	-0.04	0.09	0.13
-4.998	-0.04	0.09	0.13

Classification :

Class	Range in Nm	
	From	To
0.5	5	0.5

Scale Value : 2D48C2

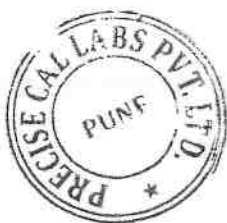
- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30 seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

N. Jetho

Calibrated By

Mahadev

[Calibration Engg.]



Prajyoti P. Kasture

Authorised By

Prajyoti P. Kasture

[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

TRUE COPY

ULR No.: CC294725000000104F

SRF: PCL/2025/059

Issue Date : 12/03/2025

Certificate No.	Date of Calibration	Next date of Calibration	Page	No. of page
PCL/2025/059-2	12/03/2025	11/03/2026	1	3

Customer Name & Address :-	Customer Reference:-
M/s NCQC LABORATORY LLP 4, Abhishree Corporate Park, Near Swagat Bungalow BRTS, ISKCON-Ambli Road, Ambli, Ahmedabad, Gujarat 380058	Ref No/Id No:- NCQC-M/022 Date :- 07/03/2025 Condition on receipt:- Satisfactory

Location : In Lab

Details Of Device under calibration

Torque Sensor with Indicator

Mode: Clockwise & Counter Clockwise

Type : Torque Sensor Make : Sushma Model : TS-103F Sr. No. : TS13-0091 Capacity : 100 Nm	Type : Indicator Make : Sushma Model : TDU-RB-103 Sr. No. : DU13-0032 L.C. : 0.01 Nm	Parameter : Torque Unit : Nm
---	---	---

Reference Equipment and Method used for Calibration :

Dead weight Torque Test Rig with calibrated lever arm and Stainless Steel force weights

Serial No. :- PCL-01 DWTCS**Range :-** 20 - 2000 NmLever Arm length, ± 1 m for used for 20-2000 Nm range, Vide certificate/ULR No.: TSC/24-25/18514-1 dated 21-01-2025 due on 20-01-2027.

Standards used for Calibration

Sr. No.	Nomenclature	Certificate No.	Validity
1	Dead Weights	TSC/24-25/4774-10	13/06/2029

CMC for Torque Calibration is 0.06% with coverage factor $k=2$ to give confidence level of 95%**Calibration Procedure :-** Done as per PCL Document No: CM -01 (based on BS 7882:2017)**Environmental Condition :-** Temperature:- $23 \pm 1^\circ \text{C}$ Relative Humidity:- $50 \pm 10\%$ RH

- The calibration results reported corresponds to the particular item(s) mentioned above.
- This Certificate shall not be reproduced, except in full, unless written approval of PCL, Pune
- All Reference standards used are traceable to **National/International** Standards As Per ISO/IEC 17025-2017 through unbroken Chain of calibration through Accredited laboratory.
- All Calibration done in SI units and are traceable to **National/International** standards as required in ISO/IEC/17025
- Report Reported are without any adjustments or repair
- Calibration Procedure as per BS 7882:2017 and calibration point as per customer request .



Calibrated By
Mahadev
[Calibration Engg.]



NCQC LABORATORY LLP
Valid up to 11/03/2026
Reviewed

Authorised By
Prajalya P. Kasture
[QM]

NCQC System Certificate No. 152/2



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-2	12/03/2025	CC294725000000104F	2	3

Range : 0 - 100

Unit : Nm

L.C. : 0.01

Mode : Clockwise

Indicator Readings

Before After

Temp.: 23.4 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0	0	0	0	0	0
2	5	5.00	4.99	5.00	5.00	5.00	5.00
3	10	10.01	10.01	9.99	10.01	10.01	10.02
4	20	20.02	20.01	19.98	20.01	20.02	20.02
5	30	30.04	30.02	29.98	30.02	30.02	30.03
6	40	40.04	40.03	39.97	40.02	40.03	40.02
7	50	50.06	50.03	49.98	50.02	50.03	50.01
8	60	60.04	60.03	59.98	60.02	60.02	60.03
9	70	70.01	70.02	69.97	70.03	70.02	70.03
10	80	80.02	80.03	79.97	80.02	80.02	80.05
11	90	90.00	90.03	89.97	90.02	90.02	90.03
12	100	99.99	100.01	99.98	100.01	100.03	100.03

Mean value in Nm.	Error of Indication in %	uncertainty in % k=2	uncertainty U' (incl. error of indi.) in %
5.000	0.00	0.20	0.20
10.005	0.05	0.17	0.22
20.008	0.04	0.15	0.19
30.015	0.05	0.15	0.20
40.015	0.04	0.13	0.16
50.023	0.05	0.12	0.17
60.015	0.03	0.07	0.10
70.008	0.01	0.06	0.07
80.008	0.01	0.06	0.07
90.003	0.00	0.06	0.06
100.003	0.00	0.06	0.06

Classification :

Class	Range in Nm	
	From	To
0.2	100	10
0.5	100	5

Scale Value : 21FF15

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 correspondes to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

Mahadev
Calibrated By
Mahadev
[Calibration Engg.]



Prajyala P. Kasture
Authorised By
Prajyala P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-2	12/03/2025	CC294725000000104F	3	3

Range : 0 - 100

Unit : Nm

L.C. : 0.01

Mode : C. Clockwise

Indicator Readings

Before After

Temp.: 23.4 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0.0	0.0	0.0	0.0	0.0	0.0
2	5	-5.00	-5.01	-5.00	-5.00	-5.00	-5.01
3	10	-10.01	-10.02	-10.01	-10.01	-10.01	-10.01
4	20	-20.02	-20.02	-20.02	-20.02	-20.02	-20.02
5	30	-30.02	-30.03	-30.05	-30.03	-30.03	-29.98
6	40	-40.03	-40.04	-40.05	-40.05	-40.03	-39.95
7	50	-50.05	-50.06	-50.05	-50.04	-50.04	-49.91
8	60	-60.06	-60.07	-60.06	-60.05	-60.09	-59.93
9	70	-70.06	-70.07	-70.06	-70.06	-70.08	-69.93
10	80	-80.04	-80.06	-80.05	-80.06	-80.07	-79.95
11	90	-90.03	-90.03	-90.06	-90.06	-90.06	-89.86
12	100	-100.03	-100.02	-100.06	-100.05	-100.04	-100.04

Mean value in Nm.	Error of Indication in %	uncertainty in % k = 2	uncertainty U' (incl. error of indi.) in %
-5.000	0.00	0.23	0.23
-10.010	0.10	0.16	0.26
-20.020	0.10	0.16	0.26
-30.033	0.11	0.16	0.27
-40.040	0.10	0.16	0.26
-50.045	0.09	0.16	0.25
-60.065	0.11	0.16	0.27
-70.065	0.09	0.13	0.22
-80.055	0.07	0.13	0.20
-90.053	0.06	0.13	0.19
-100.045	0.05	0.06	0.11

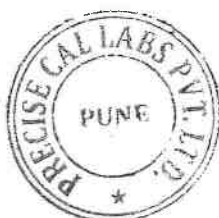
Classification :

Class	Range in Nm	
	From	To
0.5	100	5.0

Scale Value : 21FF15

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max.Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 correspondes to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

N. J. 70
Calibrated By
Mahadev
[Calibration Engg.]



Pasture
Authorised By
Prajalya P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



TRUE COPY

ULR No.: CC294725000000105F

SRF: PCL/2025/059

Issue Date : 12/03/2025

Certificate No.	Date of Calibration	Next date of Calibration	Page	No. of page
PCL/2025/059-3	12/03/2025	11/03/2026	1	3

Customer Name & Address :-	Customer Reference:-
M/s NCQC LABORATORY LLP 4, Abhishree Corporate Park, Near Swagat Bungalow BRTS,ISKCON-Ambli Road, Ambli, Ahmedabad, Gujarat 380058	Ref No/Id No:- NCQC-M/022 Date :- 07/03/2025 Condition on receipt:- Satisfactory

Location : In Lab

Details Of Device under calibration

Torque Sensor with Indicator

Mode: Clockwise & Counter Clockwise

Type : Torque Sensor Make : Sushma Model : TS-103F Sr. No. : TS13-0092 Capacity : 500 Nm	Type : Indicator Make : Sushma Model : TDU-RB-103 Sr. No. : DU13-0032 L.C. : 0.1 Nm	Parameter : Torque Unit : Nm
---	--	---

Reference Equipment and Method used for Calibration :

Dead weight Torque Test Rig with calibrated lever arm and Stainless Steel force weights

Serial No. :- PCL-01 DWTCS

Range :- 20 - 2000 Nm

Lever Arm length, ± 1 m for used for 20-2000 Nm range, Vide certificate/ULR No.: TSC/24-25/18514-1 dated 21-01-2025 due on 20-01-2027.

Standards used for Calibration

Sr. No.	Nomenclature	Certificate No.	Validity
1	Dead Weights	TSC/24-25/4774-12	13/06/2029

CMC for Torque Calibration is 0.06% with coverage factor $k=2$ to give confidence level of 95%

Calibration Procedure :- Done as per PCL Document No: CM -01 (based on BS 7882:2017)

Environmental Condition :- Temperature:- $23 \pm 1^\circ \text{C}$ Relative Humidity:- $50 \pm 10\% \text{ RH}$

- The calibration results reported corresponds to the particular item(s) mentioned above.
- This Certificate shall not be reproduced, except in full, unless written approval of PCL, Pune
- All Reference standards used are traceable to **National/International** Standards As Per ISO/IEC 17025-2017 through unbroken Chain of calibration through Accredited laboratory.
- All Calibration done in SI units and are traceable to **National/International** standards as required in ISO/IEC/17025
- Report Reported are without any adjustments or repair
- Calibration Procedure as per BS 7882:2017 and calibration point as per customer request .



Calibrated By
Mahadev

[Calibration Engg.]



NCQC LABORATORY LLP
Valid up to 11/03/2026
Reviewed: [Signature]

Authorised By
Prajalya P. Kasture

[QM]

NCQC System Certificate No. 152/3



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-3	12/03/2025	CC294725000000105F	2	3

Range : 0 - 500

Unit : Nm

L.C. : 0.1

Mode : Clockwise

Indicator Readings

Temp.: Before 23.4 After 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0	0	0	0	0	0
2	50	50.0	50.1	50.0	50.0	50.0	50.0
3	100	100.1	100.2	100.1	100.0	100.1	100.1
4	150	150.1	150.2	150.2	150.2	150.1	150.1
5	200	200.2	200.3	200.4	200.3	200.1	200.2
6	250	250.3	250.3	250.3	250.4	250.2	250.3
7	300	300.3	300.2	300.2	300.3	300.1	300.3
8	350	350.3	350.3	350.3	350.4	350.7	350.3
9	400	400.4	400.4	400.1	400.3	400.2	400.3
10	450	450.4	450.2	450.3	450.5	450.3	450.3
11	500	500.4	500.2	500.2	500.5	500.3	500.3

Mean value in Nm.	Error of Indication in %	uncertainty in % k =2	uncertainty U' (incl. error of indi.) in %
50.000	0.00	0.20	0.20
100.075	0.07	0.12	0.20
150.150	0.10	0.12	0.22
200.250	0.13	0.12	0.25
250.300	0.12	0.11	0.23
300.225	0.08	0.11	0.18
350.425	0.12	0.11	0.23
400.250	0.06	0.06	0.12
450.375	0.08	0.06	0.14
500.350	0.07	0.06	0.13

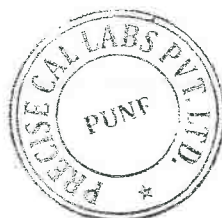
Classification :

Class	Range in Nm	
	From	To
0.5	500	50

Scale Value : 442792

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

Mahadev
Calibrated By
 Mahadev
 [Calibration Engg.]



Prajalya P. Kasture
Authorised By
 Prajalya P. Kasture
 [QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-3	12/03/2025	CC294725000000105F	3	3

Range : 0 - 500

Unit : Nm

L.C. : 0.1

Mode : C. Clockwise

Indicator Readings

Before 23.4
After 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0.0	0.0	0.0	0.0	0.0	0.0
2	50	-50.0	-49.9	-50.0	-50.0	-50.0	-50.1
3	100	-100.0	-100.0	-99.9	-100.0	-100.0	-100.3
4	150	-150.1	-150.0	-149.8	-150.2	-150.2	-150.3
5	200	-200.1	-200.1	-199.8	-200.1	-200.3	-200.4
6	250	-250.1	-250.1	-249.8	-250.1	-250.2	-250.3
7	300	-300.1	-300.1	-299.8	-300.1	-300.2	-300.4
8	350	-350.1	-349.9	-349.9	-350.1	-350.1	-350.4
9	400	-399.8	-399.8	-399.9	-400.1	-399.8	-400.3
10	450	-449.7	-449.8	-449.8	-450.1	-449.7	-450.1
11	500	-499.6	-499.7	-499.8	-500.2	-499.6	-499.6

Mean value in Nm.	Error of Indication in %	uncertainty in % k=2	uncertainty U' (incl. error of indi.) in %
-50.000	0.00	0.23	0.23
-99.975	-0.03	0.20	0.23
-150.075	0.05	0.20	0.25
-200.075	0.04	0.18	0.22
-250.050	0.02	0.12	0.14
-300.050	0.02	0.11	0.12
-350.050	0.01	0.09	0.11
-399.900	-0.02	0.09	0.12
-449.825	-0.04	0.09	0.13
-499.800	-0.04	0.09	0.13

Classification :

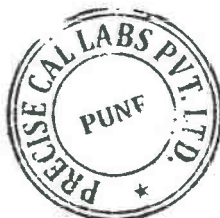
Class	Range in Nm	
	From	To
0.5	500	50

Scale Value : 442792

- Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30 seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

Mahadev

Calibrated By
Mahadev
[Calibration Engg.]



Prajalya P. Kasture

Authorised By
Prajalya P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



TRUE COPY

ULR No.: CC294725000000106F

SRF: PCL/2025/059

Issue Date : 12/03/2025

Certificate No.	Date of Calibration	Next date of Calibration	Page	No. of page
PCL/2025/059-4	12/03/2025	11/03/2026	1	3

Customer Name & Address :-

M/s NCQC LABORATORY LLP
4, Abhishree Corporate Park,
Near Swagat Bungalow BRTS, ISKCON-Ambli Road,
Ambli, Ahmedabad, Gujarat 380058

Customer Reference:-

Ref No/Id No:- NCQC-M/022
Date :- 07/03/2025
Condition on receipt:- Satisfactory

Location : In Lab

Details Of Device under calibration

Torque Sensor with Indicator

Mode: Clockwise & Counter Clockwise

Type : Torque Sensor	Type : Indicator	Parameter : Torque
Make : Sushma	Make : Sushma	Unit : Nm
Model : TS-103F	Model : TDU-RB-103	
Sr. No. : TS13-0093	Sr. No. : DU13-0032	
Capacity : 2000 Nm	L.C. : 0.1 Nm	

Reference Equipment and Method used for Calibration :

Dead weight Torque Test Rig with calibrated lever arm and Stainless Steel force weights

Serial No. :- PCL-01 DWTCs

Range :- 20 - 2000 Nm

Lever Arm length, ± 1 m for used for 20-2000 Nm range, Vide certificate/ULR No.: TSC/24-25/18514-1 dated 21-01-2025 due on 20-01-2027.

Standards used for Calibration

Sr. No.	Nomenclature	Certificate No.	Validity
1	Dead Weights	TSC/24-25/4774-14	13/06/2029

CMC for Torque Calibration is 0.06% with coverage factor $k=2$ to give confidence level of 95%

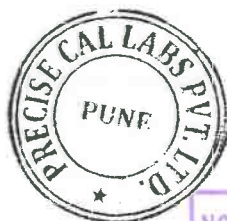
Calibration Procedure :- Done as per PCL Document No: CM -01 (based on BS 7882:2017)

Environmental Condition :- Temperature:- $23 \pm 1^\circ \text{C}$ Relative Humidity:- $50 \pm 10\% \text{ RH}$

- The calibration results reported corresponds to the particular item(s) mentioned above.
- This Certificate shall not be reproduced, except in full, unless written approval of PCL, Pune
- All Reference standards used are traceable to **National/International** Standards As Per ISO/IEC 17025-2017 through unbroken Chain of calibration through Accredited laboratory.
- All Calibration done in SI units and are traceable to **National/International** standards as required in ISO/IEC/17025
- Report Reported are without any adjustments or repair
- Calibration Procedure as per BS 7882:2017 and calibration point as per customer request .



Calibrated By
Mahadev
[Calibration Engg.]



NCQC LABORATORY LLP
Valid up to **11/03/2026**
Reviewed **Piger**

NCQC System Certificate No. 152/4

Authorised By
Prajalya P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-4	12/03/2025	CC294725000000106F	2	3

Range : 0 - 2000

Unit : Nm

L.C. : 0.1

Mode : Clockwise

Indicator Readings

Temp.: Before 23.4 After 23.5

Sr.No.	Applied Torque in Nm	0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending
1	0	0	0	0	0	0	0
2	200	200.2	200.4	200.3	200.3	200.2	200.4
3	400	400.3	400.5	400.6	400.4	400.3	400.6
4	600	600.5	600.6	600.7	600.6	600.5	600.6
5	800	800.3	800.5	800.7	800.6	800.5	800.5
6	1000	1000.4	1000.5	1000.6	1000.6	1001.2	1000.6
7	1200	1200.4	1200.6	1200.5	1200.5	1201.4	1200.5
8	1400	1400.8	1400.8	1400.7	1400.5	1401.8	1400.6
9	1600	1600.8	1600.8	1600.8	1600.5	1601.5	1600.6
10	1800	1800.7	1800.7	1800.7	1800.5	1801.2	1800.6
11	2000	2000.6	2000.6	2000.6	2000.5	2000.7	2000.7

Mean value in Nm.	Error of Indication in %	uncertainty in % k = 2	uncertainty U' (incl. error of indi.) in %
200.250	0.13	0.10	0.22
400.400	0.10	0.08	0.18
600.575	0.10	0.08	0.18
800.525	0.07	0.08	0.15
1000.700	0.07	0.08	0.15
1200.700	0.06	0.08	0.14
1400.950	0.07	0.08	0.15
1600.900	0.06	0.06	0.12
1800.775	0.04	0.06	0.10
2000.600	0.03	0.06	0.09

Classification :

Class	Range in Nm	
	From	To
0.2	2000	600
0.5	2000	200

Scale Value : OF47B1

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

Mahadev
Calibrated By
Mahadev
[Calibration Engg.]



Prajalya P. Kasture
Authorised By
Prajalya P. Kasture
[QM]



PRECISE CAL LABS PVT. LTD.

CALIBRATION CERTIFICATE



CC-2947

Certificate No.	Date of Calibration	ULR No.:	Page	No. of page
PCL/2025/059-4	12/03/2025	CC294725000000106F	3	3

Range : 0 - 2000

Unit : NIT

L.C. : 0.1

Mode : C. Clockwise

Indicator Readings

Sr.No.	Applied Torque in Nm	Temp.: 23.4						After 23.5
		0° Series 1	0° Series 2	90° Series 3	180° Series 4	270° Series 5	270° Series 5'	
		Ascending	Ascending	Ascending	Ascending	Ascending	Descending	
1	0	0.0	0.0	0.0	0.0	0.0	0.0	
2	200	-200.3	-200.5	-200.3	-200.3	-200.4	-200.5	
3	400	-400.4	-400.6	-400.5	-400.4	-400.5	-400.6	
4	600	-600.8	-600.6	-600.5	-600.8	-600.6	-600.7	
5	800	-800.8	-800.5	-800.4	-800.5	-801.1	-800.9	
6	1000	-1000.8	-1000.6	-1000.2	-1000.7	-1001.1	-1001.4	
7	1200	-1200.8	-1200.8	-1200.8	-1200.8	-1201.1	-1201.1	
8	1400	-1400.7	-1400.7	-1400.7	-1400.5	-1400.8	-1400.2	
9	1600	-1600.6	-1600.8	-1600.6	-1600.6	-1600.8	-1600.8	
10	1800	-1800.6	-1800.7	-1800.6	-1800.5	-1800.7	-1800.7	
11	2000	-2000.6	-2000.7	-2000.5	-2000.5	-2000.8	-2000.8	

Mean value in Nm.	Error of Indication in %	uncertainty in % k=2	uncertainty U' (incl. error of indi.) in %
-200.325	0.16	0.08	0.25
-400.450	0.11	0.07	0.18
-600.675	0.11	0.07	0.18
-800.700	0.09	0.07	0.16
-1000.700	0.07	0.07	0.14
-1200.875	0.07	0.06	0.13
-1400.675	0.05	0.06	0.11
-1600.650	0.04	0.06	0.10
-1800.600	0.03	0.06	0.09
-2000.600	0.03	0.06	0.09

Classification :

Class	Range in Nm	
	From	To
0.2	2000	800
0.5	2000	200

Scale Value : OF47B1

- **Classification:** The instrument is Classified considering relative repeatability, reproducibility, residual deflection, reversibility, error of indication & minimum applied torque as per BS 7882:2017
- Pre-loaded for max. Torque thrice for a period of 1 min before taking readings at first fitted position and once after each the series. rotation before starting the series. Readings are noted after 30seconds between each step in all
- This Certificate refers to the value obtained at the time of calibration
- The uncertainty stated is the expanded uncertainty of measurement obtained by multiplying the standard uncertainty by the coverage factor k=2 corresponds to confidence level of 95.45% for normal distribution, considering the relative error of different components such as zero

Mahadev

Calibrated By
Mahadev

[Calibration Engg.]



Prajalya R. Kasture

Authorised By
Prajalya R. Kasture

[QM]