

T2 PRECISION ROTARY TORQUE TRANSDUCER (U.S. & METRIC)

FEATURES & BENEFITS

- Capacities from 0.1 to 20K Nm (0.88 to 177K lbf-in)
- Speed up to 15K RPM
- ±5 VDC output
- 12-28 VDC supply
- Contactless data transmission
- Digital electronics with on-shaft shunt
- 0.1% combined error
- 10 kHz sample rate
- 16-bit resolution
- Very short overall length

SPECIFICATIONS

| ACCURACY – (MAX ERROR) | | |
|----------------------------|---------------------|--|
| Combined Error – %FS | | ±0.1 |
| Nonrepeatability – %FS | | ±0.02 |
| Resolution – bit | | 16 |
| TEMPERATURE | | |
| Effect on Zero – %RO / deg | °C | ±0.02 |
| Effect on Output – % / deg | °C | ±0.01 |
| Compensated Range | °C | +5 to +45 |
| | °F | +41 to +113 |
| Operating Range | °C | 0 to +60 |
| | °F | +32 to +140 |
| Storage Range | °C | -10 to +70 |
| | °F | +14 to +158 |
| ELECTRICAL | | |
| Supply Voltage – VDC | | 12 - 28 |
| Supply Current – mA | | ≤ 60 |
| Output – VDC | | ±5 |
| Bandwidth, Hz (-3dB) | | 1,000 |
| Sample Rate – Hz | | 10,000 |
| Calibration Signal – %FS | | 100 |
| Electrical Connection | | 12-pin binder series 581 (Includes mate) |
| ENCODER OPTION | | |
| Capacities | 0.1 - 1K Nm | 360 pulse/rev, 2-track, +5V TTL, 90° offset, quadrature encoder |
| | 0.88 - 8.85K lbf-in | |
| | 2K - 20K Nm | 60 pulse/rev, 1-track, +5V TTL |
| | 17K - 177K lbf-in | |
| MECHANICAL | | |
| Safe Overload – %RO | | 200 |
| Max Speed – RPM | | Varies with Capacity (see table) |
| Shaft Material | | Alloy steel |
| Housing Material | | Aluminum |

STANDARD CONFIGURATION

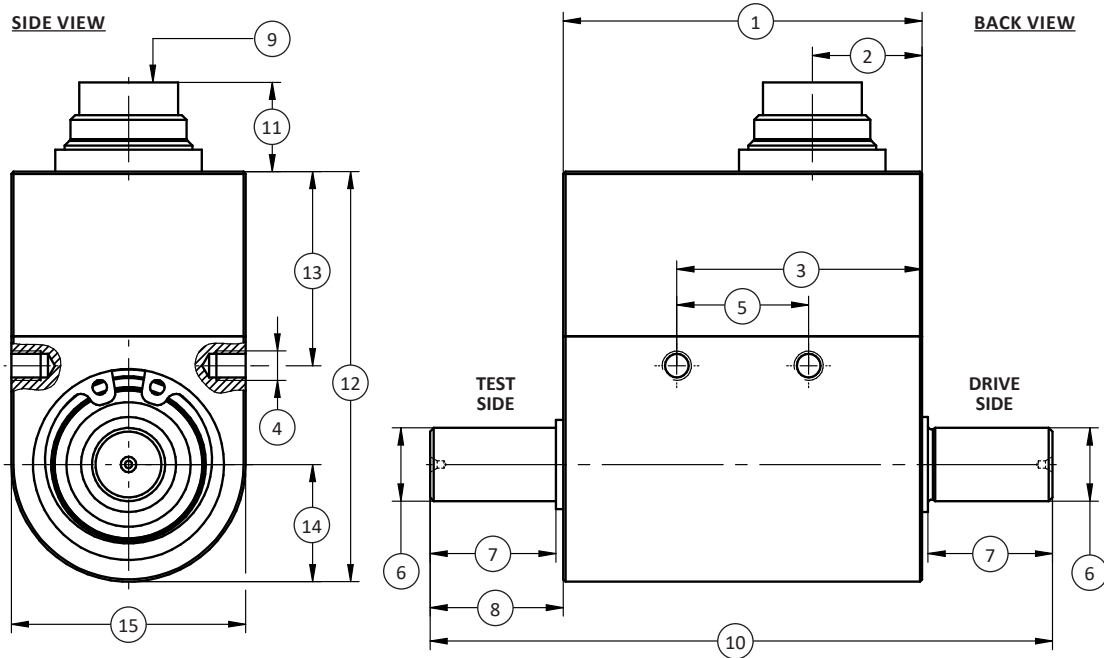


MODEL T2 (Shown)

OPTIONS

- Speed and angle output – 360 Pulse TTL, 2-Tracks 90° offset, available on capacities up to 5K Nm (44.25K lbf-in) only
- +10V Torque Output
- RS485
- Keyed shafts – per DIN 6885.1
- ±0.05% combined error
- Mating cable assembly
- Speed output - 60 Pulse TTL, 1-Track, available on capacities 10K Nm (88.5K lbf-in) and above

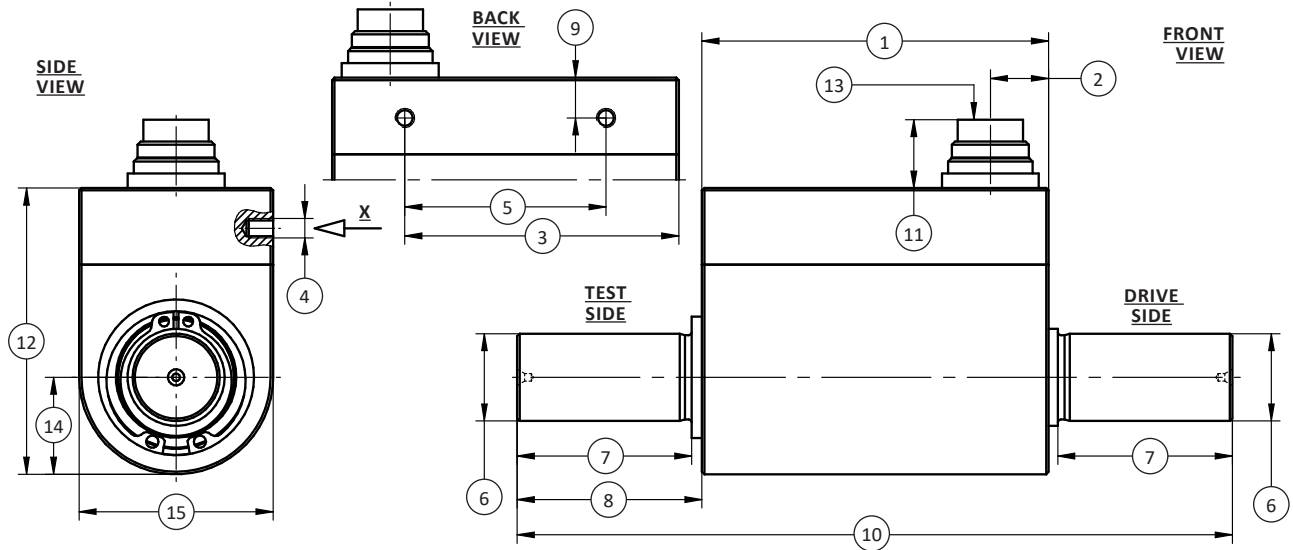
T2 PRECISION ROTARY TORQUE TRANSDUCER (U.S. & METRIC)



DIMENSIONS

| See Drawing | CAPACITIES | | | |
|-------------|------------------------|------------------------------------|------------------|------------------|
| | Metric (Nm) | U.S. (lbf-in) | Metric (Nm) | U.S. (lbf-in) |
| | 0.1, 0.2, 0.5, 1, 2, 5 | 0.88, 1.77, 4.43, 8.85, 17.7, 44.3 | 10 | 88.5 |
| | mm | in | mm | in |
| (1) | 49 | 1.9 | 49 | 1.9 |
| (2) | 15 | 0.6 | 15 | 0.6 |
| (3) | 33.5 | 1.32 | 33.5 | 1.32 |
| (4) | M4 ↓ 4 | M4 ↓ 0.2 | M4 ↓ 4 | M4 ↓ 0.2 |
| (5) | 18 | 0.7 | 18 | 0.7 |
| (6) | Ø8g6 | Ø0.3148 / 0.3144 | Ø10g6 | Ø0.3935 / 0.3931 |
| (7) | 17 | 0.67 | 17 | 0.67 |
| (8) | 18 | 0.7 | 18 | 0.7 |
| (9) | Connector 12-pin | | Connector 12-pin | |
| (10) | 85 | 3.35 | 85 | 3.35 |
| (11) | 12 | 0.5 | 12 | 0.5 |
| (12) | 56 | 2.2 | 56 | 2.2 |
| (13) | 26.5 | 1.04 | 26.5 | 1.04 |
| (14) | 16 | 0.6 | 16 | 0.6 |
| (15) | 32 | 1.3 | 32 | 1.3 |

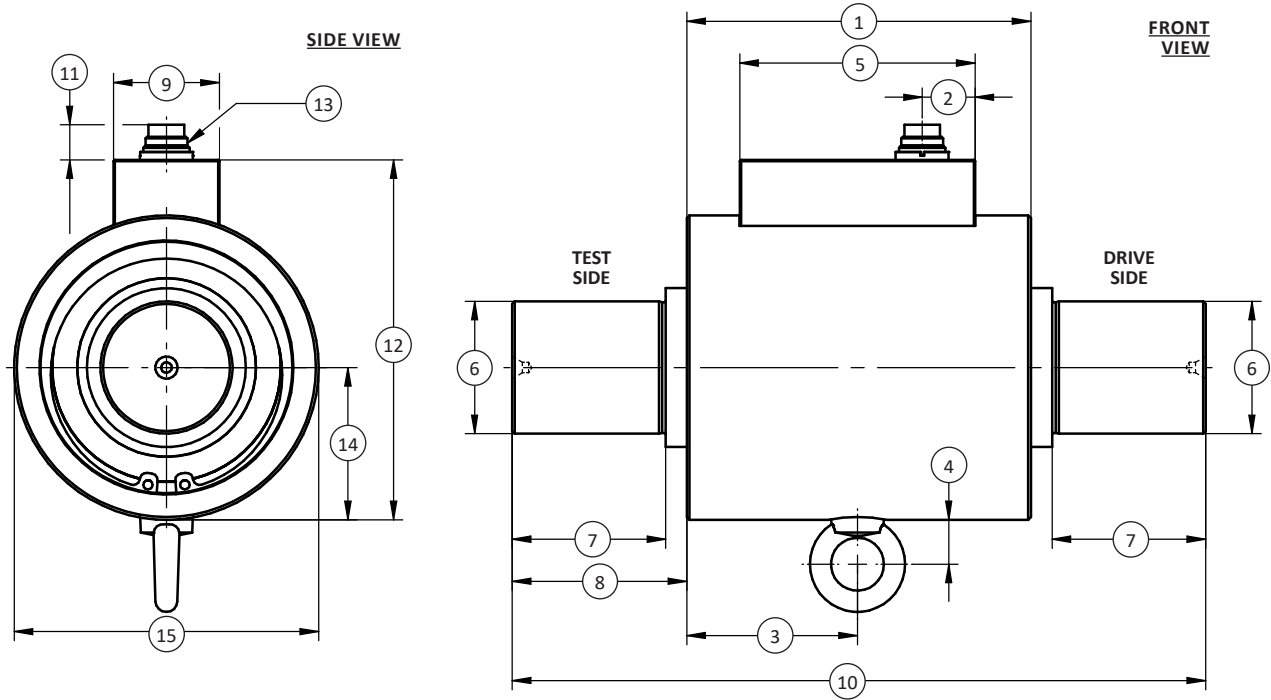
T2 PRECISION ROTARY TORQUE TRANSDUCER (U.S. & METRIC)



DIMENSIONS (CONTINUED)

| See Drawing | CAPACITIES | | | | | |
|-------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Metric (Nm) | U.S. (lbf-in) | Metric (Nm) | U.S. (lbf-in) | Metric (Nm) | U.S. (lbf-in) |
| | 20, 30 | 177, 265 | 50, 100 | 443, 885 | 200, 500 | 1.77K, 4.43K |
| | mm | in | mm | in | mm | in |
| (1) | 71.5 | 2.81 | 71.5 | 2.81 | 72.5 | 2.85 |
| (2) | 12 | 0.5 | 12 | 0.5 | 15 | 0.6 |
| (3) | 56.5 | 2.2 | 56.5 | 2.2 | 51.5 | 2.03 |
| (4) | M4 ↓ 5 | M4 ↓ 0.2 | M4 ↓ 5 | M4 ↓ 0.2 | M4 ↓ 6 | M4 ↓ 0.2 |
| (5) | 41.5 | 1.63 | 41.5 | 1.63 | 29.5 | 1.16 |
| (6) | ∅18g6 | ∅0.7087 / 0.7082 | ∅18g6 | ∅0.7087 / 0.7082 | ∅32g6 | ∅1.2595 / 1.2589 |
| (7) | 18 | 0.71 | 36 | 1.42 | 38 | 1.50 |
| (8) | 20 | 0.79 | 38 | 1.50 | 43.5 | 1.71 |
| (9) | 8.3 | 0.33 | 8.3 | 0.33 | 8.3 | 0.33 |
| (10) | 111.5 | 4.39 | 147.5 | 5.81 | 159.5 | 6.28 |
| (11) | 14 | 0.6 | 14 | 0.6 | 14 | 0.6 |
| (12) | 59 | 2.32 | 59 | 2.32 | 76 | 2.99 |
| (13) | Connector 12-pin | | Connector 12-pin | | Connector 12-pin | |
| (14) | 20 | 0.79 | 20 | 0.79 | 29 | 1.14 |
| (15) | 40 | 1.57 | 40 | 1.57 | 58 | 2.28 |

T2 PRECISION ROTARY TORQUE TRANSDUCER (U.S. & METRIC)



DIMENSIONS (CONTINUED)

| See Drawing | CAPACITIES | | | | | |
|-------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | Metric (Nm) | U.S. (lbf-in) | Metric (Nm) | U.S. (lbf-in) | Metric (Nm) | U.S. (lbf-in) |
| | mm | in | mm | in | mm | in |
| (1) | 130 | 5.12 | 135 | 5.31 | 190 | 6.70 |
| (2) | 20 | 0.8 | 20 | 0.8 | 20 | 0.8 |
| (3) | 64.5 | 2.54 | 67.5 | 2.66 | 95 | 3.7 |
| (4) | 17 | 0.7 | 17 | 0.7 | 17 | 0.7 |
| (5) | 89 | 3.5 | 89 | 3.5 | 89 | 3.5 |
| (6) | Ø50g6 | Ø1.9685 / 1.9675 | Ø70g6 | Ø2.7559 / 2.7547 | Ø110g6 | Ø4.3307 / 4.3293 |
| (7) | 58 | 2.28 | 110 | 4.33 | 120 | 4.72 |
| (8) | 66 | 2.60 | 121 | 4.76 | 140 | 5.51 |
| (9) | 40 | 1.6 | 40 | 1.6 | 40 | 1.6 |
| (10) | 262 | 10.3 | 377 | 14.8 | 470 | 18.5 |
| (11) | 13 | 0.5 | 13 | 0.5 | 13 | 0.5 |
| (12) | 136 | 5.4 | 161 | 6.3 | 233 | 9.2 |
| (13) | Connector 12-pin | | Connector 12-pin | | Connector 12-pin | |
| (14) | 57.5 | 2.26 | 69.5 | 2.74 | 105 | 4.1 |
| (15) | Ø115 | Ø4.5 | Ø139 | Ø5.5 | Ø210 | Ø8.3 |

T2 PRECISION ROTARY TORQUE TRANSDUCER (U.S. & METRIC)

PERFORMANCE PARAMETERS

| CAPACITY | | MAX RPM | SPRING RATE | MOMENT OF INERTIA ¹ | | MAX THRUST LOAD ² | | MAX SHEAR LOAD ² | |
|----------|--------|---------|---------------------|--------------------------------|----------------------|------------------------------|-------|-----------------------------|-------|
| Nm | lbf-in | | | NM/rad | Drive Side | Test Side | N | lbf | N |
| 0.1 | 0.88 | 15,000 | 1.8x10 ¹ | 1.9x10 ⁻⁶ | 2.8x10 ⁻⁷ | 42 | 9.44 | 0.9 | 0.20 |
| 0.2 | 1.77 | 15,000 | 1.8x10 ¹ | 1.9x10 ⁻⁶ | 2.8x10 ⁻⁷ | 58 | 13.0 | 1.2 | 0.27 |
| 0.5 | 4.43 | 15,000 | 1.2x10 ² | 1.9x10 ⁻⁶ | 2.8x10 ⁻⁷ | 172 | 38.7 | 1.9 | 0.43 |
| 1 | 8.85 | 15,000 | 1.2x10 ² | 1.9x10 ⁻⁶ | 2.8x10 ⁻⁷ | 227 | 51.0 | 2.9 | 0.65 |
| 2 | 17.7 | 15,000 | 3.6x10 ² | 1.9x10 ⁻⁶ | 2.9x10 ⁻⁷ | 348 | 78.2 | 5.5 | 1.24 |
| 5 | 44.3 | 15,000 | 4.0x10 ² | 1.9x10 ⁻⁶ | 2.9x10 ⁻⁷ | 650 | 146 | 14 | 3.15 |
| 10 | 88.5 | 15,000 | 9.3x10 ² | 2.1x10 ⁻⁶ | 3.8x10 ⁻⁷ | 1K | 225 | 26 | 5.85 |
| 20 | 177 | 15,000 | 4.5x10 ³ | 1.2x10 ⁻⁵ | 9.9x10 ⁻⁶ | 1.68K | 378 | 43 | 9.67 |
| 30 | 265 | 15,000 | 4.5x10 ³ | 1.2x10 ⁻⁵ | 9.9x10 ⁻⁶ | 2.2K | 495 | 65 | 14.6 |
| 50 | 443 | 15,000 | 8.5x10 ³ | 1.3x10 ⁻⁵ | 1.2x10 ⁻⁵ | 3.1K | 697 | 80 | 18.0 |
| 100 | 885 | 12,000 | 8.5x10 ³ | 1.3x10 ⁻⁵ | 1.2x10 ⁻⁵ | 4.8K | 1.08K | 160 | 36.0 |
| 200 | 1.77K | 10,000 | 6.7x10 ⁴ | 1.0x10 ⁻⁴ | 9.0x10 ⁻⁵ | 8K | 1.80K | 290 | 65.2 |
| 500 | 4.43K | 10,000 | 7.1x10 ⁴ | 1.0x10 ⁻⁴ | 9.0x10 ⁻⁵ | 14K | 3.15K | 700 | 157 |
| 1K | 8.85K | 8,000 | 3.1x10 ⁵ | 1.6x10 ⁻³ | 1.1x10 ⁻³ | 23K | 5.17K | 900 | 202 |
| 2K | 17K | 5,500 | 7.2x10 ⁵ | 5.3x10 ⁻³ | 4.3x10 ⁻³ | 33K | 7.42K | 1.2K | 270 |
| 5K | 44.3K | 5,500 | 8.0x10 ⁵ | 5.4x10 ⁻³ | 4.3x10 ⁻³ | 57K | 12.8K | 2.8K | 629 |
| 10K | 85.5K | 5,000 | 3.1x10 ⁶ | 4.0x10 ⁻² | 3.7x10 ⁻² | 90K | 20.2K | 4.4K | 989 |
| 20K | 177K | 5,000 | 3.7x10 ⁶ | 4.0x10 ⁻² | 3.8x10 ⁻² | 130K | 29.2K | 8.2K | 1.84K |

Notes:
1 = Without encoder option
2 = Unsupported shaft

ELECTRICAL CONNECTION

| Pin | 12-PIN ELECTRICAL CONNECTION | | 12-PIN RS485 OPTION | |
|-----|------------------------------|-----------------------|---------------------|-------------|
| | Function | Description | Function | Description |
| A | NC | - | NC | - |
| B | Option Angle B | TTL | Option Angle B | TTL |
| C | Signal (+) | ±5 VDC (±10 VDC) | NC | - |
| D | Signal (GND) | 0 VDC | NC | - |
| E | Supply (GND) | 0 VDC, TTL | Supply (GND) | 0 VDC |
| F | Supply (+) | 12-28 V | Supply (+) | 12-28 VDC |
| G | Option Angle A | TTL | Option Angle A | TTL |
| H | NC | - | NC | - |
| J | NC | - | RS485 Option | RS485 (B) |
| K | Cal. Control | L < 2.0 V / H > 3.5 V | NC | - |
| L | NC | - | RS485 Option | RS485 (A) |
| M | Housing | - | Housing | - |