



FEATURES

- Inductive conditioning technology
- High level output $\pm 10V$
- Low Moment of Inertia
- Speed and Angle Detection (Option)

APPLICATIONS

- Dynamic applications
- Process control equipment
- Robotics and effectors
- Laboratory and Research
- Test and Measurement

CD1140

Contactless Torquemeter

SPECIFICATIONS

- Range from ± 0.02 to $\pm 20,000$ Nm
(± 0.015 to $\pm 16,000$ lbf.ft)
- Keyed Shaft couplings
- Stainless Steel or Aluminum
- Linearity $\pm 0.1\%$

The **CD1140** family of torque sensors offers a contactless transmission for bridge supply voltage and measurement transmission. It eases continuous rotating operations with low wear even at high speed.

The **CD1140** is also available with optional speed or angle detection (but not both).

With a long standing experience as a designer and manufacturer of sensors, TE CONNECTIVITY often works with customers to design or customize sensors for specific uses and testing environments.

On request, Instruction documents can be provided to ease the selection and use of our sensors and provide helpful tips.

STANDARD RANGES (FS)

| Model | CD1140 | CD1140-1 | CD1140-1a | CD1140-1b | CD1140-2 | CD1140-3 | CD1140-6 | CD1140-7 | CD1140-8 |
|---------------------|--------|---------------------------------|-----------|-----------|----------|------------------------|--------------------|--------------------------|------------------|
| FS in Nm | 0.02 | 0.05 - 0.1 0.2 - 0.5 - 1 | 2 | 5 - 10 | 20 - 50 | 100 - 150 200 - 300 | 500 - 1000 1500 | 2k - 3k 4k - 5k | 10k - 15k 20k |
| FS in lbf.ft | 0.015 | 0.04 - 0.08 0.16 - 0.4 - 0.8 | 1.6 | 4 - 8 | 16 - 40 | 80 - 120 160 - 240 | 400 - 800 1200 | 1600 - 2400 3200 - 4k | 8k - 12k 16k |
| Weight in g | 200 | 170 | 170 | 340 | 600 | 1300 | 4500 | 11 500 | 33 000 |
| RPM Max | 20000 | 37000 | 37000 | 26000 | 19000 | 13500 | 7900 | 6300 | 4000 |

PERFORMANCE SPECIFICATIONS (typical values at temperature 23±3°C)

| Parameters | |
|-------------------------------------|--|
| Operating Temperature Range (OTR) | 0 to 60° C (32 to 140° F) |
| Compensated Temperature Range (CTR) | 5 to 45° C (41 to 113° F) |
| Zero Shift in CTR | 0.02% F.S. / °C (0.01% of F.S. / °F) |
| Sensitivity Shift in CTR | 0.01%/ ° C of reading (0.005% / °F of reading) |
| Over-Range | |
| Without Damage | 2 x F.S. |
| Accuracy | |
| Linearity | ±0.1% F.S. (<±0.15% for model 0.02N.m) |
| Hysteresis | ±0.1% F.S. (<±0.15% for model 0.02N.m) |

Electrical Characteristics

| Model | CD1140 |
|---------------------|------------------------|
| Supply Voltage | 12Vdc ±10% |
| Signal "FSO" | ±10V |
| Offset | ≤100 mV |
| Rise up time 10-90% | 2ms |
| Bandwidth at -3dB | 200 Hz (1kHz optional) |
| Consumption | Approx. 160mA |

Notes

1. Electrical Termination: connector output, mating plug need to be supplied separately
6 pin connector for standard version
12 pin connector for sensors with optional speed or angle detection
2. Protection Ingres IP 40 DIN400050

Speed and angle options characteristics

| Option | Speed (-N) | Angle (-W) |
|-------------------|------------------|--|
| Rotary speed max. | 10 000 rpm | 3 000 rpm |
| Internal Pull up | 10 kΩ (5V level) | |
| External Pull up | 24V max / 20 mA | |
| Pulses/revolution | 60 | 2x 360 (A & B channels) Phase shift Channel A 90° leading at right spin of propulsion side |

Notes

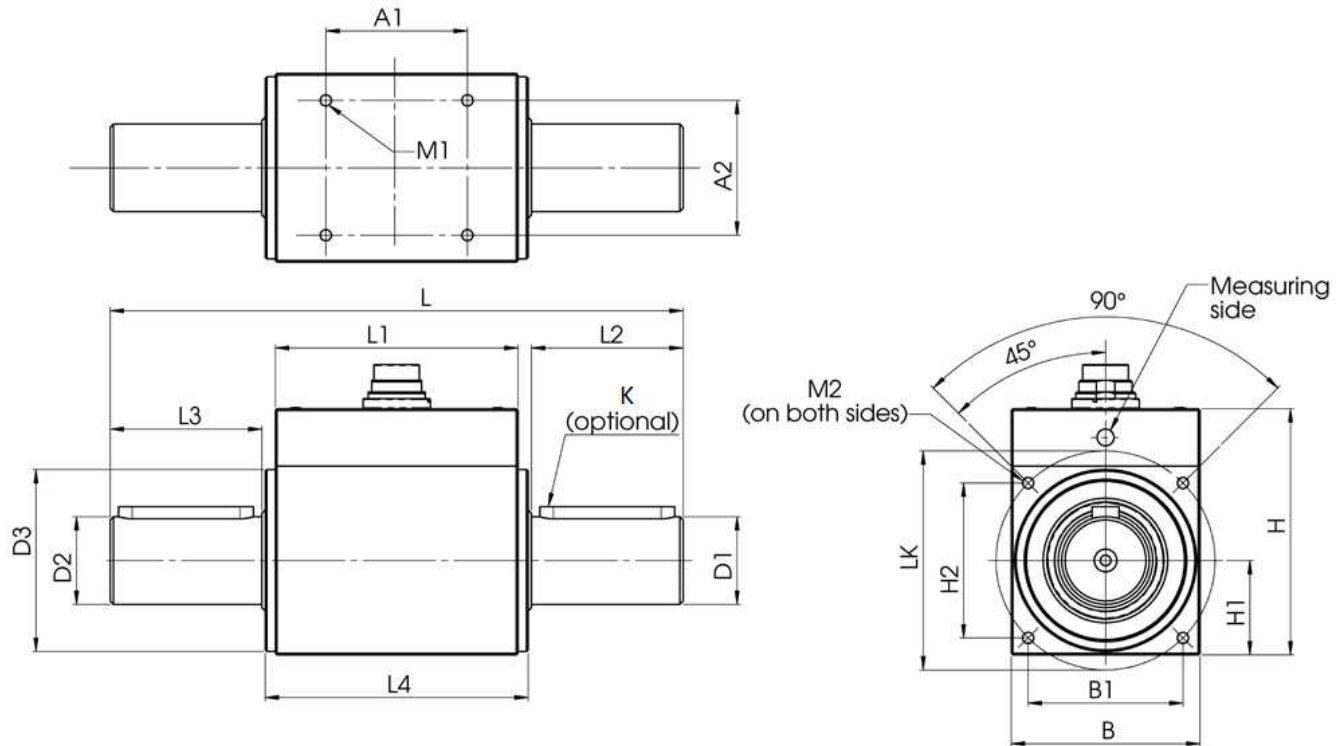
1. Electrical Termination: connector output, mating plug need to be supplied separately
 6 pin connector for standard version
 12 pin connector for sensors with optional speed or angle detection

REPONSE ET TENUES MECANIQUES

| Model | Range (N.m) | Spring constant (Nm/rad) | Mass moment of inertia (g x cm ²) | Rated axial load (N) | Rated radial load (N) |
|------------------|--------------------------------|--|--|---------------------------------|------------------------------|
| CD1140 | 0,02 | 16 | 7 | 35 | 30 |
| CD1140-1 | 0,05 0,1 0,2 0,5 1 | 20 35 35 45 90 | 10 10 10 10 10 | 105 140 140 160 210 | 2 3 3 4 7 |
| CD1140-1a | 2 | 135 | 10 | 210 | 13 |
| CD1140-1b | 5 10 | 715 1320 | 30 30 | 725 725 | 25 50 |
| CD1140-2 | 20 50 | 3955 6700 | 100 105 | 1300 1300 | 60 155 |
| CD1140-3 | 100 150 200 300 | 30 . 10 ³ 45 . 10 ³ 54 . 10 ³ 67 . 10 ³ | 785 800 810 840 | 1800 1800 1800 1800 | 215 340 450 650 |
| CD1140-6 | 500 1000 1500 | 260 . 10 ³ 387 . 10 ³ 449 . 10 ³ | 9 935 10 140 10 380 | 4150 4150 4150 | 650 1275 1700 |
| CD1140-7 | 2k 3k 4k 5k | 1,45 . 10 ⁶ 1,85 . 10 ⁶ 2,10 . 10 ⁶ 2,30 . 10 ⁶ | 63 . 10 ³ 64 . 10 ³ 64 . 10 ³ 65 . 10 ³ | 4800 4800 4800 4800 | 1950 2930 3880 4000 |
| CD1140-8 | 10k 15k 20k | 8,20 . 10 ⁶ 10,45 . 10 ⁶ 11,80 . 10 ⁶ | 440 . 10 ³ 448 . 10 ³ 546 . 10 ³ | 11 800 11 800 11 800 | 8895 9830 9830 |

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DIMENSIONS & WIRING SCHEMATIC (IN METRIC AND IMPERIAL)

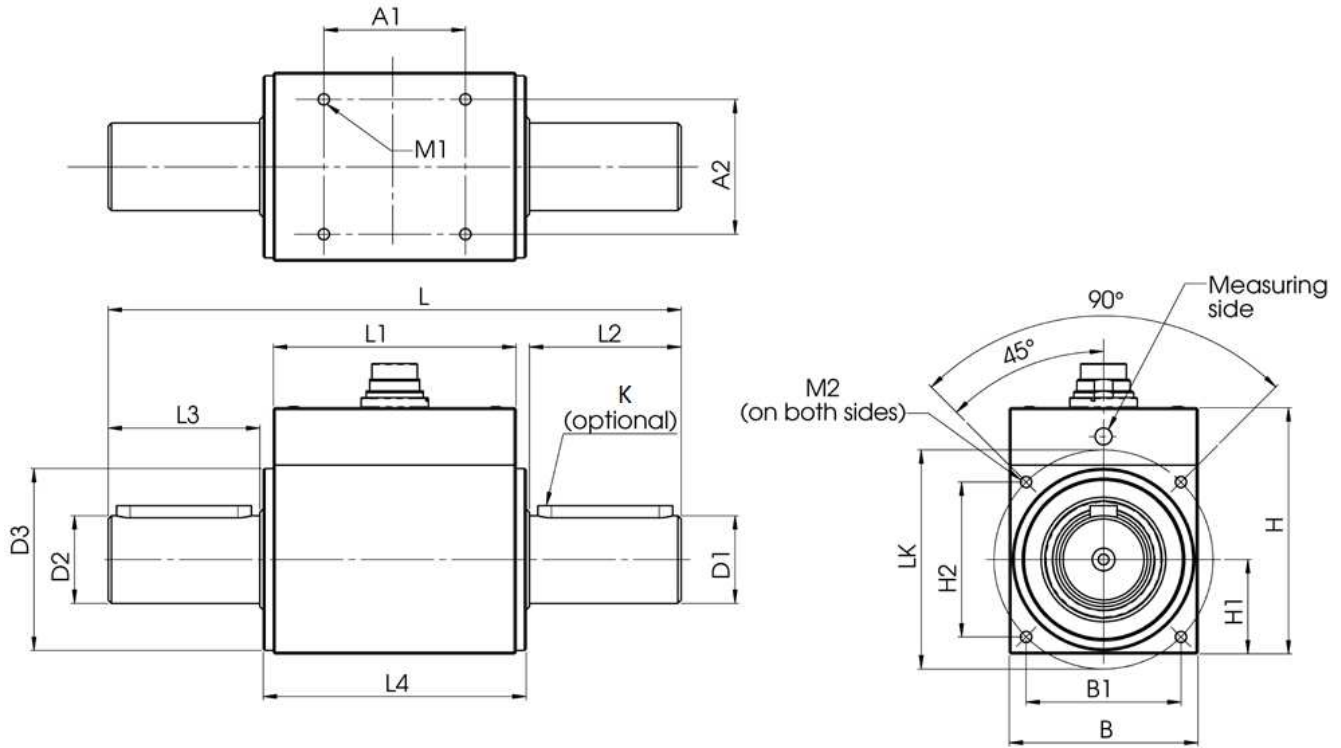
Dimensions in mm [inch]

From 0.02N.m to 10N.m

| Model | CD1140 | CD1140-1 | CD1140-1a | CD1140-1b |
|-----------------|------------|--------------------------------|-------------|------------|
| FS in Nm | 0.02 | 0.05 - 0.1 - 0.2 - 0.5 - 1 | 2 | 5 - 10 |
| FS in lbf.ft | 0.015 | 0.04 - 0.08 - 0.16 - 0.4 - 0.8 | 1.6 | 4 - 8 |
| L | 82 [3.23] | 89 [3.5] | 95 [3.74] | 110 [4.33] |
| B | 32 [1.26] | 28 [1.1] | 28 [1.1] | 36 [1.42] |
| B1 | 24 [0.94] | | | |
| H | 47 [1.85] | 48,5 [1.91] | 48,5 [1.91] | 54 [2.13] |
| H1 | 14 [0.55] | 14 [0.55] | 14 [0.55] | 18 [0.71] |
| H2 | 22 [0.87] | - | - | - |
| Ø D1 g6 | 3 [0.12] | 8 [0.31] | 8 [0.31] | 10 [0.39] |
| Ø D2 g6 | 3 [0.12] | 5 [0.2] | 6 [0.24] | 10 [0.39] |
| Ø D3 (0/-0.1mm) | 15 [0.59] | 27 [1.06] | 27 [1.06] | 32 [1.26] |
| H (option) | - | Ø2 H7 | Ø2.5 H7 | - |
| Ø LK (±0.1mm) | - | 32 [1.26] | 32 [1.26] | 38 [1.5] |
| L1 | 63 [2.48] | 62 [2.44] | 62 [2.44] | 68 [2.68] |
| L2 | 7.5 [0.29] | 10 [0.39] | 14 [0.55] | 18 [0.71] |
| L3 | 7.5 [0.29] | 11 [0.43] | 14 [0.55] | 18 [0.71] |
| L4 | 67 [2.64] | 66 [2.6] | 66 [2.6] | 72 [2.83] |
| A1 | 50 [1.97] | 40 [1.57] | 40 [1.57] | 56 [2.2] |
| A2 | 24 [0.94] | 22 [0.87] | 22 [0.87] | 24 [0.94] |
| M1 | M2.5x5 | M3x5 | M3x5 | M3x6 |
| M2 | M2.5x6 | M3x6 | M3x6 | M3x6 |
| K (DIN 6885) | - | - | - | 2xA3x3x14 |
| Weight [g] | 200 | 170 | 170 | 340 |
| RPM max | 20,000 | 37,000 | 37,000 | 26,000 |

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DIMENSIONS & WIRING SCHEMATIC (IN METRIC AND IMPERIAL)

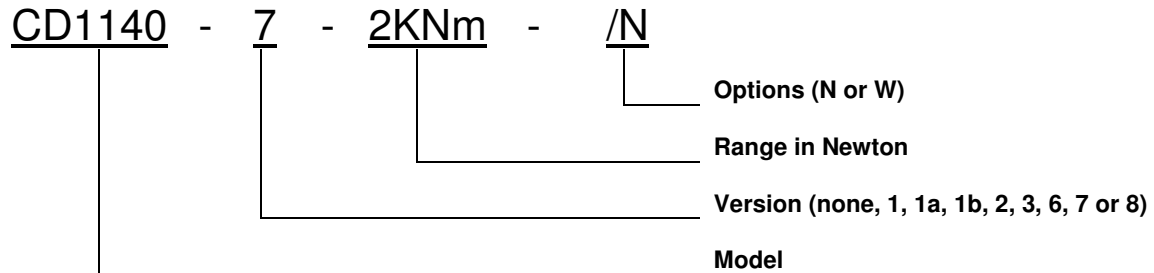
Dimensions in mm [inch]

From 20N.m to 20 000N.m

| Modèle | CD1140-2 | | CD1140-3 | | CD1140-6 | | CD1140-7 | | CD1140-8 | |
|--------------|-----------|--------|-----------------------|--------|-------------------|---------|-------------------------|--------|-----------------|---------|
| FS in Nm | 20 - 50 | | 100 - 150 - 200 - 300 | | 500 - 1000 - 1500 | | 2k- 3k - 4k- 5k | | 10k - 15k - 20k | |
| FS in lbf.ft | 16 - 40 | | 80 - 120 - 160 - 240 | | 400 - 800 - 1200 | | 1600 - 2400 - 3200 - 4k | | 8k - 12k - 16k | |
| L | 145 | [5.71] | 170 | [6.69] | 270 | [10.63] | 320 | [12.6] | 355 | [13.98] |
| B | 42 | [1.65] | 56 | [2.2] | 88 | [3.46] | 105 | [4.13] | 168 | [6.61] |
| H | 58 | [2.28] | 73 | [2.87] | 104 | [4.09] | 121 | [4.76] | 185 | [7.28] |
| H1 | 21 | [0.83] | 28 | [1.1] | 44 | [1.73] | 52.5 | [2.07] | 84 | [3.30] |
| Ø D1 | 15 | [0.59] | 26 | [1.02] | 45 | [1.77] | 70 | [2.76] | 110 | [4.33] |
| Ø D2 | 15 | [0.59] | 26 | [1.02] | 45 | [1.77] | 70 | [2.76] | 110 | [4.33] |
| Ø D3 | 38 | [1.5] | 54 | [2.13] | 80 | [3.15] | - | - | - | - |
| H (option) | - | - | - | - | - | - | - | - | - | - |
| Ø LK | 46 | [1.81] | 65 | [2.56] | 98 | [3.86] | - | - | - | - |
| L1 | 79 | [3.11] | 72 | [2.83] | 84 | [3.31] | 95 | [3.74] | 121 | [4.76] |
| L2 | 30 | [1.18] | 45 | [1.77] | 85 | [3.35] | 110 | [4.33] | 115 | [4.53] |
| L3 | 30 | [1.18] | 45 | [1.77] | 85 | [3.35] | 110 | [4.33] | 115 | [4.53] |
| L4 | 83 | [3.27] | 78 | [3.07] | 90 | [3.54] | - | - | - | - |
| A1 | 60 | [2.36] | 42 | [1.65] | 46 | [1.81] | 75 | [2.95] | 91 | [3.58] |
| A2 | 32 | [1.26] | 40 | [1.57] | 70 | [2.76] | 85 | [3.35] | 138 | [5.43] |
| M1 | M3x6 | | M4x8 | | M6x12 | | M8x16 | | M10x16 | |
| M2 | M3x6 | | M4x8 | | M6x12 | | - | | - | |
| K (DIN 6885) | 2xA5x5x25 | | 2xA8x7x40 | | 4xA14x9x80 | | 4xA20x12x100 | | - | |
| Weight [g] | 600 | | 1,300 | | 4,500 | | 11,500 | | 33,000 | |
| RPM max | 19,000 | | 13,500 | | 7,900 | | 6,300 | | 4,000 | |

OPTIONS

| |
|---|
| H : Cross Holes on Shaft Ends (see table on page 3/4) |
| K : Torque meter with Keyed Shafts (see table on page 3/4) |
| N : Speed Detection (Notes: Rev. Max: 10,000rpm; Pulses/Rev.: 60) |
| W : Angle Detection (Notes: Rev. Max: 3000rpm; Pulses/Rev.: 360; Resolution: 1°; Phase shift: 90°) |

ORDERING INFORMATION**RECOMMENDED ACCESSORIES**

| Description | Part Number |
|---|----------------|
| KD6 : Mating 6 Pin for torque output only | NCETACC001KD6 |
| KD12 : Mating 12 Pin for torque with option speed or angle | NCETACC001KD12 |

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