

# CD1140 Contactless Torque Sensor



- Contactless transmission
- Keyed Shaft couplings
- Range from  $\pm 0.05$  to  $\pm 20,000$  Nm ( $\pm 0.04$  to  $\pm 16,000$  lbf.ft)
- Stainless Steel or Aluminum
- Built In Amplifier

## DESCRIPTION

The CD 1140 family of torque sensors offers a rugged but small package size as well as many mounting configurations so as to provide excellent measurements in both industrial and laboratory environments. The contactless transmission of supply voltage and measuring signal facilitates continuous operation with low wear and no slip ring service. The CD1140 is also available with optional speed or angle detection (but not both).

With many years of experience as a designer and manufacturer of sensors, Measurement Specialties, Inc. often works with customers to design or customize sensors for specific uses and testing environments.

To meet your needs we also offer complete turnkey systems. The matched components (sensor, power, amplifier and digital display) are formatted, calibrated and ready for immediate use.

## FEATURES

- High Accuracy
- Built-in Amplifier
- Low Moment of Inertia
- Small Outline
- Speed and Angle Detection (Option)

## APPLICATIONS

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

## STANDARD RANGES

| Model               | CD1140-1                        | CD1140-1a | CD1140-1b | CD1140-2 | CD1140-3               | CD1140-6           | CD1140-7                 | CD1140-8         |
|---------------------|---------------------------------|-----------|-----------|----------|------------------------|--------------------|--------------------------|------------------|
| <b>FS in Nm</b>     | 0.05 - 0.1<br>0.2 - 0.5 - 1     | 2         | 5 - 10    | 20 - 50  | 100 - 150<br>200 - 300 | 500 - 1000<br>1500 | 2k - 3k<br>4k - 5k       | 10k - 15k<br>20k |
| <b>FS in lbf.ft</b> | 0.04 - 0.08<br>0.16 - 0.4 - 0.8 | 1.6       | 4 - 8-    | 16 - 40  | 80 - 120<br>160 - 240  | 400 - 800<br>1.2k  | 1600 - 2400<br>3200 - 4k | 8k - 12k<br>16k  |
| <b>RPM max.</b>     | 37000                           | 37000     | 26000     | 19000    | 13500                  | 7900               | 6300                     | 4000             |

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## PERFORMANCE SPECIFICATIONS

All values are typical at temperature 20±1° 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)   |
| Range (F.S.)                        | ±0.05 Nm to ±20 kNm [±0.04 lbf.ft to ±16 klbf.ft] |
| Over-Range                          |   |
| Without Damage                      | 2 x F.S.  |
| Accuracy                            |   |
| Linearity                           | 0.1% F.S.   |
| Hysteresis                          | 0.1% F.S.   |

## Electrical Characteristics

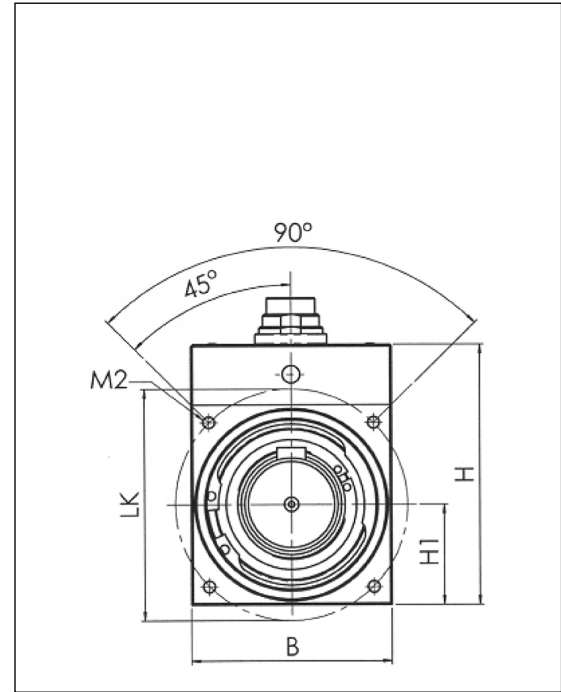
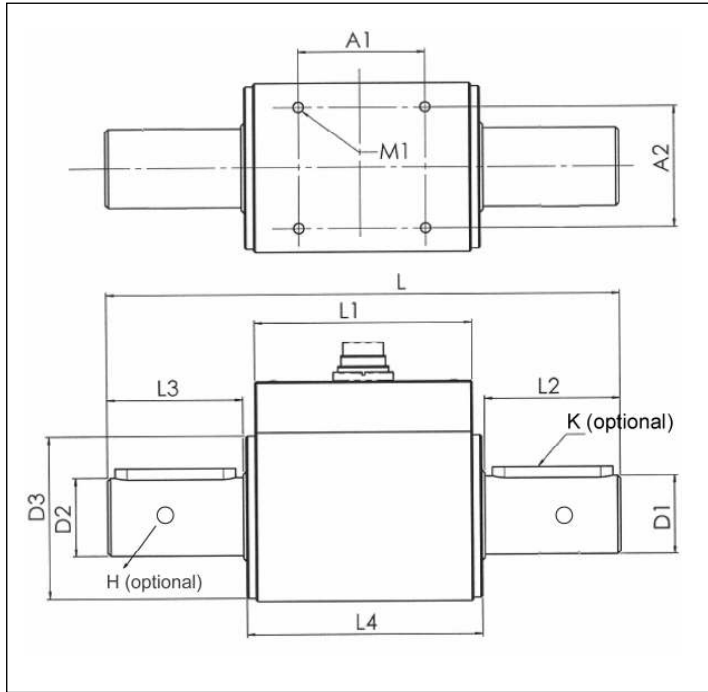
| Model          | CD1140    |
|----------------|-----------|
| Supply Voltage | 12Vdc±10% |
| Signal at F.S  | ±10V      |
| Consumption    | <200mA    |

## Notes

1. Electrical Termination: 6 pin connector (12 pin connector with optional speed or angle detection)

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## DIMENSIONS & WIRING SCHEMATIC (IN METRIC AND IMPERIAL)



Dimensions in mm [inch]

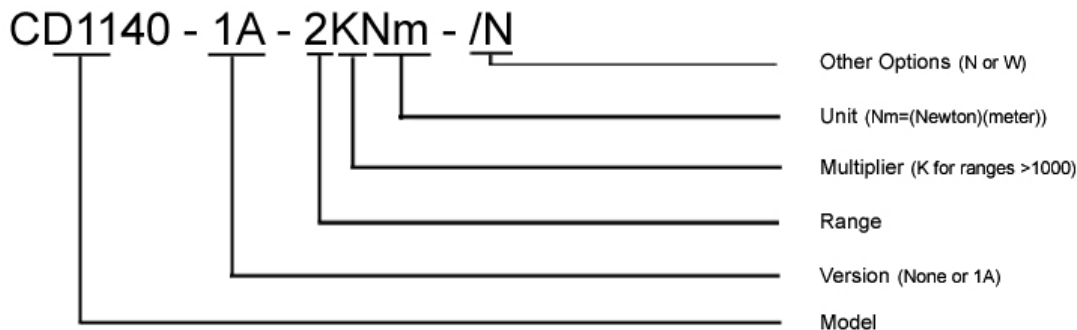
| Model        | CD1140-1                     | CD1140-1a   | CD1140-1b  | CD1140-2   | CD1140-3              | CD1140-6          | CD1140-7                | CD1140-8        |
|--------------|------------------------------|-------------|------------|------------|-----------------------|-------------------|-------------------------|-----------------|
| FS in Nm     | 0.05 -0.1 -0.2<br>0.5 - 1    | 2           | 5 - 10     | 20 - 50    | 100 -150<br>200 - 300 | 500 -1000<br>1500 | 2k- 3k<br>4k- 5k        | 10k- 15k<br>20k |
| FS in lbf.ft | 0.04 -0.08-0.16<br>0.4 - 0.8 | 1.6         | 4 - 8      | 16 - 40    | 80 -120<br>160 - 240  | 400 -800<br>1200  | 1600 -2400<br>3200 - 4k | 8k -12k<br>16k  |
| L            | 89 [3.5]                     | 95 [3.74]   | 110 [4.33] | 145 [5.71] | 170 [6.69]            | 270 [10.63]       | 320 [12.6]              | 355 [13.98]     |
| B            | 28 [1.1]                     | 28 [1.1]    | 36 [1.42]  | 42 [1.65]  | 56 [2.2]              | 88 [3.46]         | 105 [4.13]              | 160 [6.3]       |
| H            | 48,5 [1.91]                  | 48,5 [1.91] | 54 [2.13]  | 58 [2.28]  | 73 [2.87]             | 104 [4.09]        | 121 [4.76]              | 176 [6.93]      |
| H1           | 14 [0.55]                    | 14 [0.55]   | 18 [0.71]  | 21 [0.83]  | 28 [1.1]              | 44 [1.73]         | 52.5 [2.07]             | 80 [3.15]       |
| Ø D1         | 8 [0.31]                     | 8 [0.31]    | 10 [0.39]  | 15 [0.59]  | 26 [1.02]             | 45 [1.77]         | 70 [2.76]               | 110 [4.33]      |
| Ø D2         | 5 [0.2]                      | 6 [0.24]    | 10 [0.39]  | 15 [0.59]  | 26 [1.02]             | 45 [1.77]         | 70 [2.76]               | 110 [4.33]      |
| Ø D3         | 27 [1.06]                    | 27 [1.06]   | 32 [1.26]  | 38 [1.5]   | 54 [2.13]             | 80 [3.15]         | -                       | -               |
| H (optional) | Ø2 H7                        | Ø2.5 H7     | -          | -          | -                     | -                 | -                       | -               |
| Ø LK         | 32 [1.26]                    | 32 [1.26]   | 38 [1.5]   | 46 [1.81]  | 65 [2.56]             | 98 [3.86]         | -                       | -               |
| L1           | 62 [2.44]                    | 62 [2.44]   | 68 [2.68]  | 79 [3.11]  | 72 [2.83]             | 84 [3.31]         | 95 [3.74]               | 115 [4.53]      |
| L2           | 10 [0.39]                    | 14 [0.55]   | 18 [0.71]  | 30 [1.18]  | 45 [1.77]             | 85 [3.35]         | 110 [4.33]              | 115 [4.53]      |
| L3           | 11 [0.43]                    | 14 [0.55]   | 18 [0.71]  | 30 [1.18]  | 45 [1.77]             | 85 [3.35]         | 110 [4.33]              | 115 [4.53]      |
| L4           | 66 [2.6]                     | 66 [2.6]    | 72 [2.83]  | 83 [3.27]  | 78 [3.07]             | 90 [3.54]         | -                       | -               |
| A1           | 40 [1.57]                    | 40 [1.57]   | 56 [2.2]   | 60 [2.36]  | 42 [1.65]             | 46 [1.81]         | 75 [2.95]               | 85 [3.35]       |
| A2           | 22 [0.87]                    | 22 [0.87]   | 24 [0.94]  | 32 [1.26]  | 40 [1.57]             | 70 [2.76]         | 85 [3.35]               | 130 [5.12]      |
| M1           | M3x5                         | M3x5        | M3x6       | M3x6       | M4x8                  | M6x12             | M8x16                   | M10x20          |
| M2           | M3x6                         | M3x6        | M3x6       | M3x6       | M4x8                  | M6x12             | -                       | -               |
| K (optional) | -                            | -           | 2xA3x3x14  | 2xA5x5x25  | 2xA8x7x40             | 4xA14x9x80        | -                       | -               |
| Weight [g]   | 170                          | 170         | 340        | 600        | 1,300                 | 4,500             | 11,500                  | 31,000          |
| Rpm max      | 37,000                       | 37,000      | 26,000     | 19,000     | 13,500                | 7,900             | 6,300                   | 4,000           |

# CD1140 Contactless Torque Sensor

## OPTIONS

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

## ORDERING INFO



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