

## CD1140

### Contactless Torquemeter

#### SPECIFICATIONS

- ◆ Range from  $\pm 0.02$  to  $\pm 20,000$  Nm  
( $\pm 0.015$  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.

#### 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

**STANDARD RANGES (FS)**

Model	CD1140	CD1140-1	CD1140-1a	CD1140-1b	CD1140-2	CD1140-3	CD1140-6	CD1140-7	CD1140-8
<b>FS in Nm</b>	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
<b>FS in lbf.ft</b>	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
<b>Weight in g</b>	200	170	170	340	600	1300	4500	11 500	33 000
<b>RPM Max</b>	20000	37000	37000	26000	19000	13500	7900	6300	4000

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

<b>Parameters</b>	
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)
<b>Over-Range</b>	
Without Damage	2 x F.S.
<b>Accuracy</b>	
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**

- 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
- 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

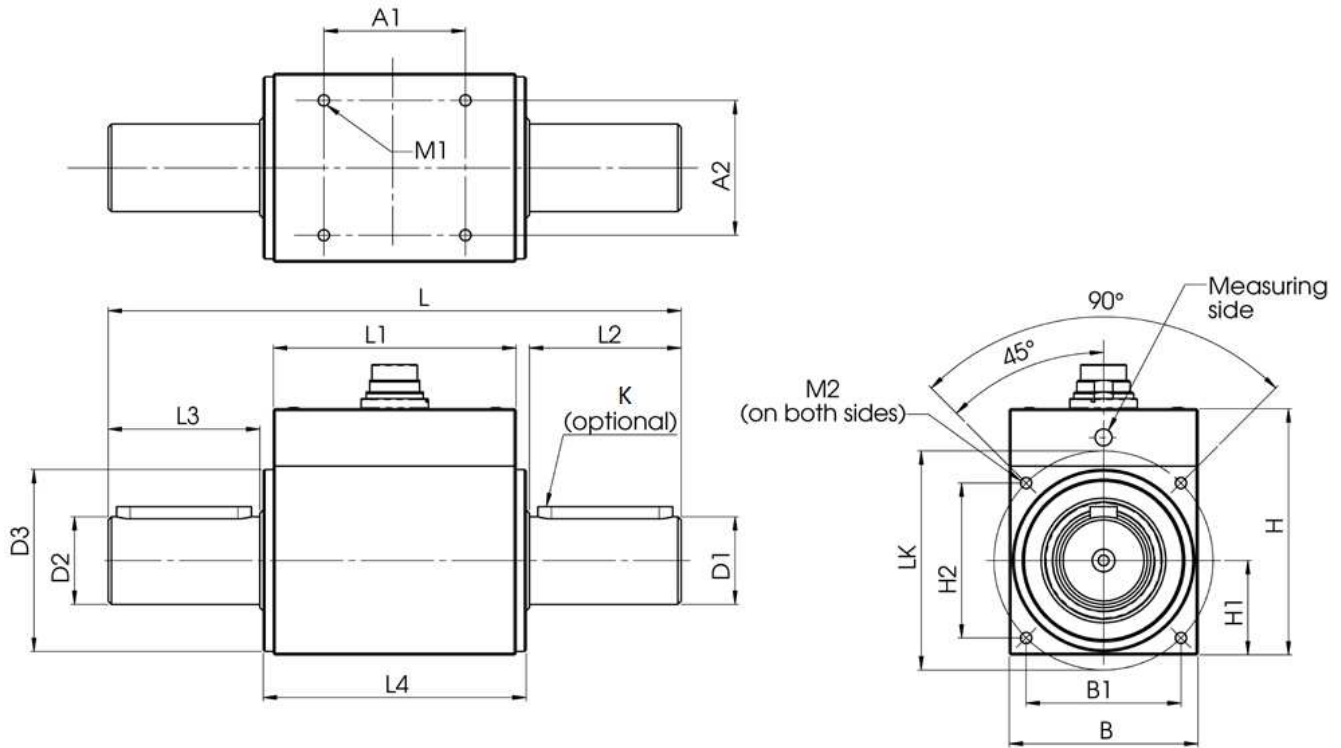
**Notes**

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

**REPOSE ET TENUES MECANIQUES**

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

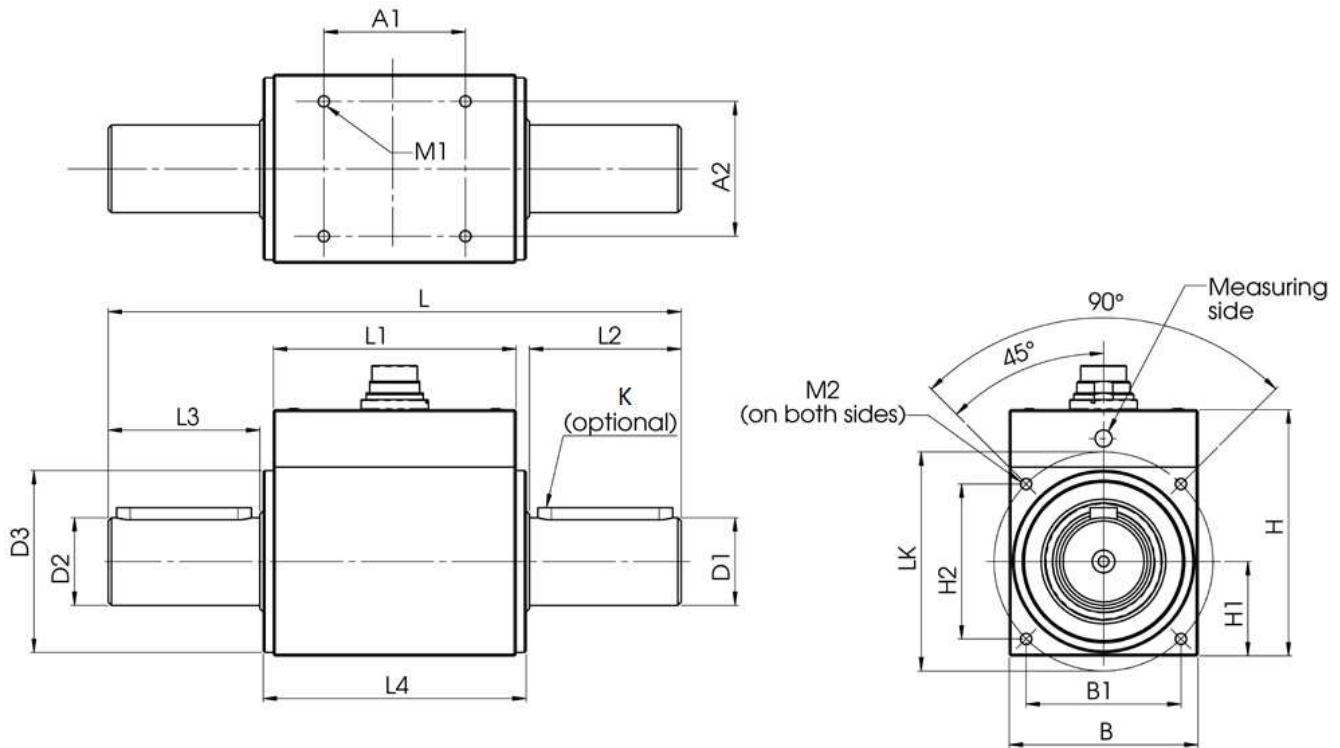
**DIMENSIONS & WIRING SCHEMATIC (IN METRIC AND IMPERIAL)**



**Dimensions in mm [inch]  
From 0.02N.m to 10N.m**

Model	CD1140	CD1140-1	CD1140-1a	CD1140-1b
<b>FS in Nm</b>	<b>0.02</b>	<b>0.05 -0.1 -0.2 - 0.5 - 1</b>	<b>2</b>	<b>5 - 10</b>
<b>FS in lbf.ft</b>	<b>0.015</b>	<b>0.04 - 0.08 - 0.16 - 0.4 - 0.8</b>	<b>1.6</b>	<b>4 - 8</b>
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

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



**Dimensions in mm [inch]**

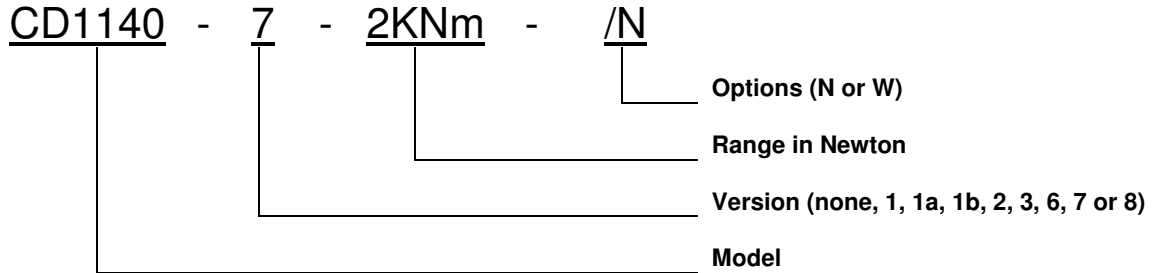
**From 20N.m to 20 000N.m**

Modèle	CD1140-2		CD1140-3		CD1140-6		CD1140-7		CD1140-8	
<b>FS in Nm</b>	<b>20 - 50</b>		<b>100 - 150 - 200 - 300</b>		<b>500 - 1000 - 1500</b>		<b>2k- 3k - 4k- 5k</b>		<b>10k - 15k - 20k</b>	
<b>FS in lbf.ft</b>	<b>16 - 40</b>		<b>80 - 120 - 160 - 240</b>		<b>400 - 800 - 1200</b>		<b>1600 - 2400 - 3200 - 4k</b>		<b>8k - 12k - 16k</b>	
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**

<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 INFORMATION**



**RECOMMENDED ACCESSORIES**

Description	Part Number
<b>KD6</b> : Mating 6 Pin for torque output only	NCETACC001KD6
<b>KD12</b> : Mating 12 Pin for torque with option speed or angle	NCETACC001KD12

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