ROTARY MOTION CONTROL

Technical Data Sheet

Mechanical Torque Limiter

The trend in industry is to design and incorporate more automation into production processes. Machines are becoming more accurate, requiring a higher degree of precision. They are becoming faster, using servo and DC drive technology, and they are more rigid to withstand the dynamic loads necessary to increase capacity and productivity.

Torque overloads caused by material jams, operator error, or a whole host of unforeseen reasons pose a significant threat to machine downtime.

Machine downtime in an automated production environment is very costly. Broken components, costly technicians, and long lead times for custom components can make the difference between operating profitably or not.

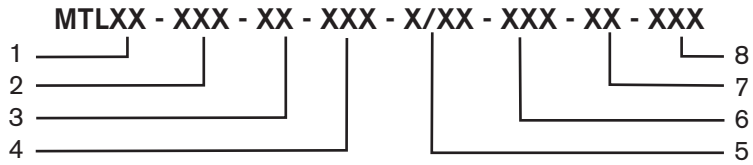
The use of a patented torque limiter will isolate the driving from the driven elements within a matter of milliseconds, once the torque reaches a preset overload value.

Features

- Precise overload protection
- Absolutely backlash-free and torsionally rigid
- Compact, simple design
- Disengagement detection is achieved through indexing ring movement
- Low residual friction following disengagement
- Low moment of inertia
- Disengagement within milliseconds
- Double bearing support of pulley/sprocket

Overview

Order using model descriptions only



FIELD 1: Specify MTL size 15, 30, 60, 150, 200, 300, 500, 800, 1500 or 2500

FIELD 2: Select the type of MTL mounting

PMT (Pilot Mount/ Tapered clamping hubs) lock the torque limiter to the shaft with a series of cap screws that are alternately and evenly tightened.

PMK (Pilot Mount/ Keyed bore) do not have set screws to retain the unit on the shaft. Use shaft collars to fix position of the MTL on the shaft. Setscrews are not an option with this design.

2CC: Coupling with two clamp collars and a integral, bellows coupling

2TC: Coupling with two Tapered clamping hubs and a integral, bellows coupling

PCC: Coupling with two clamp collars/and a conical, press-fit insert. The unit dis-mounts without loosening the collars

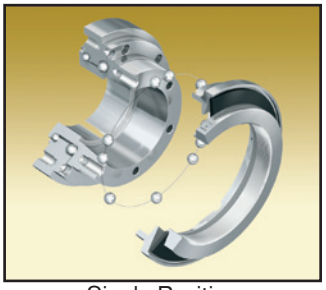
ECC: Coupling with two clamp collars with an elastomer (spider) coupling

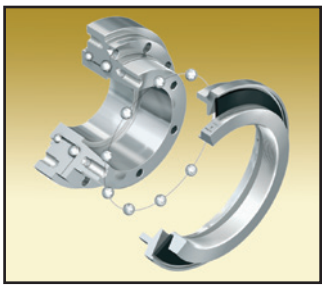
FIELD 3: Select the interface function

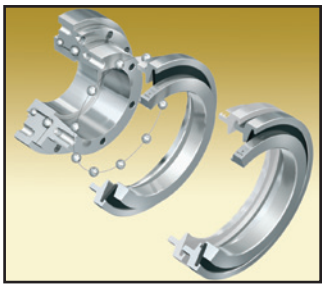
SP (Single Position) most commonly used, advantage is automatic re-engagement, resets at a single point every 360 degrees. Overloads are sensed with a proximity sensor.

MP (Multi-Position) applications include slow speed, single directional shafts like those used on conveyors or mixers. Overloads are sensed with a proximity sensor.

FD (Full Disengagement) interfaces are used where a proximity sensor is not an option. Low residual friction of the full disengagement version allows for multiple revolutions of the clutch to take place with minimal wear. Re-engagement is not automatic; the spring must be manually moved into position after an overload occurs. The Full Disengagement MTL re-engages manually every 60° (six positions). Other positions available on request.


Single Position


Multi-Position


Full Disengagement

FIELD 4: Specify the bore size; refer the maximum bores sizes in the selection chart. Specify a bore diameter for both ends of the coupling

FIELD 5: Specify the torque range; multiple torque ranges are shown for each model size. Select the torque range that provides the trip-torque in the middle of the range to allow for torque setting adjustment either up or down.

FIELD 6: Specify the trip-torque setting. This is the torque level where the MTL disengages to protect the components in the drive train.

FIELD 7: Specify the unit finish if non-standard. Standard material is black oxide steel. Optional material is stainless steel, designated as **SS** in this field. Note: Stainless steel MTL's are three times the cost of a standard unit.

FIELD 8: Specify the overall length for billows couplings (re: dimension "A" in the product catalog). The shortest overall length given in the catalog for billows type couplings provides the more lateral stiffness than the longest overall length. The longest overall length provides more angular misalignment than the shortest overall length.

Overview

Nexen Mechanical Torque Limiter Family

Torque Range in Newton Meters

MTL Size	15	30	60	150	200	300	500	800	1500	2500
Single or Multiposition In Nm	5-10[2, 3] 5-15 8-20[2] 12-25[1] 20-40 35-70	5-20 10-25[2, 3] 10-30 20-40[2, 3] 20-60[1] 50-100[1]	10-30 25-80 50-115[1]	20-70 30-90[2, 3] 45-150 80-180[2] 80-225[1] 80-200[3]	30-90 60-160 120-240[2] 140-280 250-400[1]	100-200 150-240 200-320[2] 220-400[1, 3]	80-200 200-350 300-500[2, 3] 320-650	400-650 500-800 650-850 600-900[3] 650-950[1]	600-800 650-850[3] 700-1200 1000-1800	1500-2000 2000-2500 2300-2800
Full Disengagement In Nm	7-15	8-20 16-30	10-30[1] 20-40 30-60	20-60 40-80 80-150	80-140 130-200	120-180 160-300	50-150 100-300 250-500	200-400 450-850	1000-1250 1250-1500	1400-2200 1800-2700

Maximum Bore in Millimeters

MTL Size	15	30	60	150	200	300	500	800	1500	2500
Tapered Bore	22	22	29	37	44	56	56	60	70	100
Clamp Collar Bore	26	30	32	42	45	60	60	75	80	--
Keyed Bore	19	25.4	30	38	44	50	58	60	73	95

Torque Range in Inch-Pounds

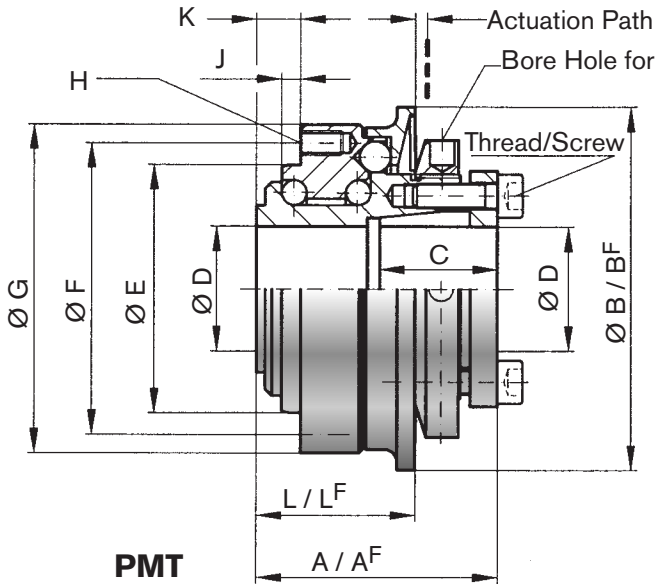
MTL Size	15		60	150	200	300	500	800	1500	2500
Single or Multiposition In-lbs	44-88[2, 3] 44-133 71-177[2] 106-221[1] 177-354 310-619	44-177 88-221[2, 3] 88-265 177-354[2, 3] 177-531[1] 442-885[1]	88-265 221-708 442-1018[1]	177-619 265-796[2, 3] 398-1327 708-1593[2] 708-1991[1] 708-1770[3]	265-795 530-1416 1062-2475[2] 1240-2478 2212-3540[1]	885-1770 1327-2125 1770-2832[2] 1945-3540[1]	705-1770 1770-3095 2655-4425[2] 2830-5750	3540-5750 4425-7080 5750-8405 5309-7964[3] 5752-8407[1]	5305–7080 5752-7522[3] 6194 -10620 8850 -15925	13275 -17700 17700 -22125 20350 –24775
Full Disengagement In Nm	60-130	70-175 140-265	85-265[1] 175-350 265-530	175-530 350-705 705-1325	705-240 1150-1770	1060-1590 1416-2655	440-1325 885-2650 2210-4425	1770-3540 3980-7079	8850-11060 11060-13275	12390-19470 15925-23890

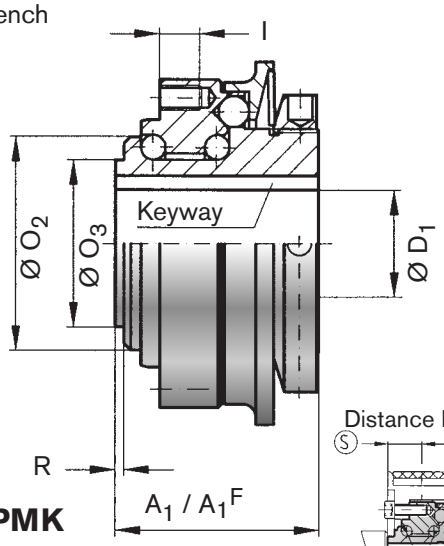
Maximum Bore in Inches

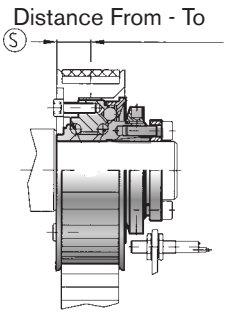
MTL Size	15	30	60	150	200	300	500	800	1500	2500
Tapered Bore	0.875	0.875	1.125	1.437	1.750	2.125	2.125	2.250	2.750	3.938
Clamp Collar Bore	1.000	1.187	1.250	1.625	1.750	2.312	2.250	2.937	3.125	--
Keyed Bore	0.750	1.000	1.187	1.500	1.750	1.937	2.250	2.312	2.875	3.750

[1] - PMT and PMK only. [2] - 2CC and ECC only. [3] - 2TC only.

Type PMT/PMK





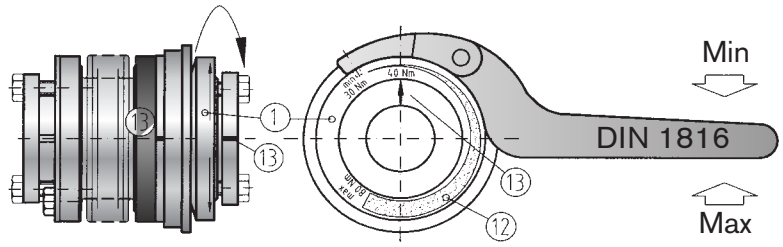


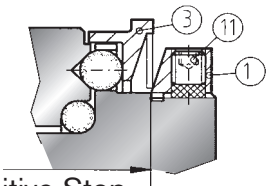
Radial Load Capacity

- Types PMT/PMK have integrated bearings for support of attached components. (Example: a pulley or timing belt sprocket)
- Do not exceed the maximum radial force (See page 7 for belt pull calculation).
- Center the load between dimension (S).

MTL Size	15	30	60	150	200	300	500	800	1500	2500
Maximum Radial Load Capacity N [lbs]	1400 [315]	1800 [405]	2300 [519]	3000 [674]	3500 [787]	4500 [1012]	5600 [1259]	8000 [1798]	12000 [2698]	20000 [4496]
(S) From - To mm [in]	7-14 [.28-.55]	8-18 [.31-.71]	8-18 [.31-.71]	12-20 [.47-.79]	12-22 [.47-.87]	12-23 [.47-.91]	12-25 [.47-.98]	14-34 [.55-1.34]	20-42 [.79-1.65]	32-60 [1.26-2.36]

Disengagement Torque Setting





1	Adjustment Nut	12	Adjustment Range
11	Fastening Screw	13	Marking
3	Steel Actuation Ring		

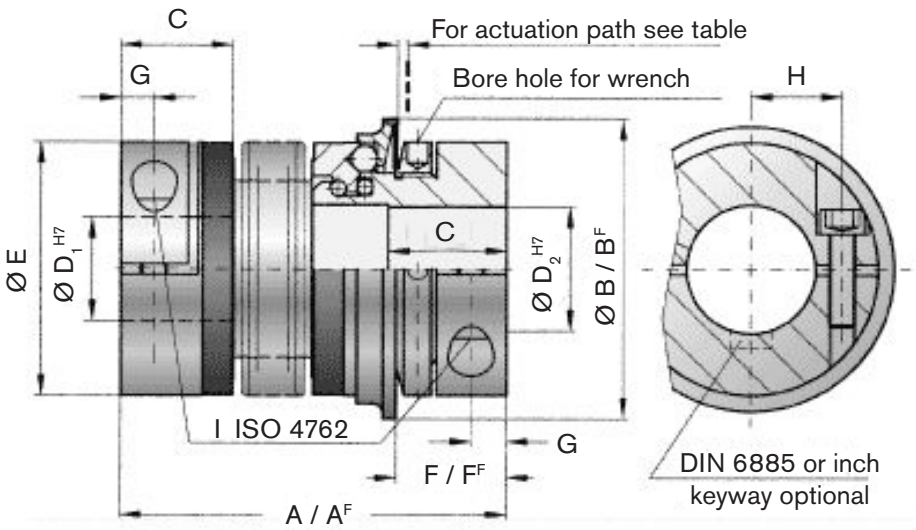
- Nexen mechanical torque limiters are factory set to the lowest disengagement torque, which is marked on the coupling. The adjustment range (min/max) is also marked on the adjustment nut (1).
- The customer can adjust the disengagement torque as long as it falls into the range (12) indicated on the adjustment nut.
- The adjustment range may not be altered during setting.
- To adjust the disengagement torque, loosen the locking screws (11) and rotate the adjustment ring using a spanner wrench to the desired new setting. Tighten the three locking screws (11) and test the torque limiter.

MTL Size	MTL Function Disengagement Speeds (RPM)	
	SP / MP	FD
15	4,000	14,700
30	2,800	13,400
60	3,500	12,100
150	3,200	10,900
200	3,000	9,500
300	2,500	8,250
500	2,200	7,000
800	2,000	5,700
1500	1,500	3,000
2500	1,200	3,000

Type PMT/PMK

Type PMT/PMK			Size									
			15	30	60	150	200	300	500	800	1500	2500
Overall Length	mm [in]	A	40 [1.57]	50 [1.97]	54 [2.13]	58 [2.28]	63 [2.48]	70 [2.76]	84 [3.31]	95 [3.74]	109 [4.29]	146 [5.75]
Overall Length A **(Full Disengagement)**	mm [in]	A^F	40 [1.57]	50 [1.97]	54 [2.13]	58 [2.28]	66 [2.6]	73 [2.88]	88 [3.47]	95 [3.74]	117 [4.61]	152 [5.99]
Overall Length A1	mm [in]	A_1	34 [1.34]	43 [1.69]	46 [1.81]	48,5 [1.91]	54 [2.13]	57 [2.24]	71,5 [2.81]	80 [3.15]	93 [3.66]	135 [5.31]
Overall Length A1 **(Full Disengagement)**	mm [in]	A_1^F	34 [1.34]	43 [1.69]	46 [1.81]	49 [1.93]	57 [2.25]	60 [2.36]	75 [2.96]	91 [3.59]	110 [4.33]	141 [5.56]
Actuation Ring Ø	mm [in]	B	55 [2.16]	65 [2.56]	73 [2.87]	92 [3.62]	99 [3.90]	120 [4.72]	135 [5.31]	152 [5.98]	174 [6.85]	242 [9.53]
Actuation Ring Ø **(Full Disengagement)**	mm [in]	B^F	62 [2.44]	70 [2.76]	83 [3.27]	98 [3.86]	117 [4.61]	132 [5.20]	155 [6.11]	177 [6.97]	187 [7.37]	258 [10.16]
Clamping Fit Length	mm [in]	C	19 [0.75]	22 [0.87]	27,5 [1.08]	32 [1.26]	32 [1.26]	41 [1.61]	41 [1.61]	49 [1.93]	61 [2.40]	80 [3.15]
Max. Bores (Type PMT)	mm [in]	D	22 [0.87]	22 [0.87]	29 [1.14]	37 [1.46]	44 [1.73]	56 [2.20]	56 [2.20]	60 [2.36]	70 [2.76]	100 [3.94]
Max. Bores (Type PMK)	in	D_1	19 0.750	25.4 1.000	30 1.187	38 1.500	44 1.732	50 1.969	58 2.283	60 2.362	73 2.875	95 3.740
Pilot Diameter h7	mm [in]	E	40 [1.57]	47 [1.85]	55 [2.16]	68 [2.68]	75 [2.95]	82 [3.23]	90 [3.54]	100 [3.94]	125 [4.92]	168 [6.61]
Bolt Circle Diameter ±0.2	mm [in]	F	47 [1.85]	54 [2.13]	63 [2.48]	78 [3.07]	85 [3.35]	98 [3.86]	110 [4.33]	120 [4.72]	148 [5.83]	202 [7.95]
Flange Diameter - 0.2	mm [in]	G	53 [2.09]	63 [2.48]	72 [2.83]	87 [3.43]	98 [3.86]	112 [4.41]	128 [5.04]	140 [5.51]	165 [6.50]	240 [9.45]
Thread		H	6 x M4	6 x M5	6 x M5	6 x M6	6 x M6	6 x M8	6 x M8	6 x M10	6 x M12	6 x M16
Thread Length	mm [in]	I	6 [0.24]	8 [0.31]	9 [0.35]	10 [0.39]	10 [0.39]	10 [0.39]	12 [0.47]	15 [0.59]	16 [0.63]	24 [0.94]
Pilot Length -0.2	mm [in]	J	3 [0.12]	5 [0.20]	5 [0.20]	5 [0.20	5 [0.20]	6 [0.24]	9 [0.35]	10 [0.39]	13,5 [0.53]	20 [0.79]
Distance	mm [in]	K	8 [.031]	11 [0.43]	11 [0.43]	12 [0.72	12 [0.72]	15 [0.59]	21 [0.83]	19 [0.75]	25 [0.98]	34 [1.34]
Distance	mm [in]	L	27 [1.06]	35 [1.38]	37 [1.38]	39 [1.54]	44 [1.73]	47 [1.85]	59 [2.32]	67 [2.64]	82 [3.23]	108 [4.25]
Distance **(Full Disengagement)**	mm [in]	L^F	27 [1.06]	37 [1.38]	39 [1.54]	41.5 [1.63]	47 [1.85]	51,5 [2.03]	62 [2.44]	75 [2.95]	94 [3.70]	120 [4.72]
Screw ISO 4762			M4	M5	M5	M6	M6	M8	M8	M10	M12	M16
Tightening Torque	[Nm]	N	4 [1.0]	4 [1.0]	7 [2.0]	12 [2.5]	14 [3.0]	18 [4.0]	25 [7.0]	36 [8.0]	70 [16.0]	120 [27.0]
Diameter	mm [in]	O_2	35 [1.38]	42 [1.65]	49 [1.93]	62 [2.44]	67 [2.64]	75 [2.95]	84 [3.31]	91 [3.58]	112 [4.41]	154 [6.06]
Diameter h7	mm [in]	O_3	27 [1.06]	32 [1.26]	39 [1.54]	50 [1.97]	55 [2.16]	65 [2.56]	72 [2.83]	75 [2.95]	92 [3.62]	128 [5.04]
Distance	mm [in]	R	2,5 [0.10]	2,5 [0.10]	2,5 [0.10]	2,5 [.010]	3 [0.12]	3 [0.12]	4 [0.16]	4 [0.16]	4,5 [0.18]	6 [0.24]
Moment of Inertia	10^{-3} kgm^2 [$lb\text{-}in^2$ $x10^{-3}$]	J_{ges}	0,15 [0.04]	0,25 [0.07]	0,50 [0.14]	1,60 [0.50]	2,70 [0.80]	5,20 [1.50]	8,80 [2.60]	20 [5.85]	31,5 [9.20]	210 [61.4]
Approx. Weight	kg [lbs]		0,4 [1.0]	0,7 [1.5]	1,0 [2.2]	1,3 [2.9]	2,0 [4.4]	3,0 [6.6]	4,0 [8.8]	5,5 [12.0]	10 [22.0]	28 [63.0]
Actuation Path	mm [in]		1,5 [0.06]	1,5 [0.06]	1,7 [0.07]	1,9 [0.07]	2,2 [0.09]	2,2 [0.09]	2,2 [0.09]	2,2 [0.09]	3,0 [0.12]	3,0 [0.12]

Type 2CC



MTL-2CC
with clamping hub

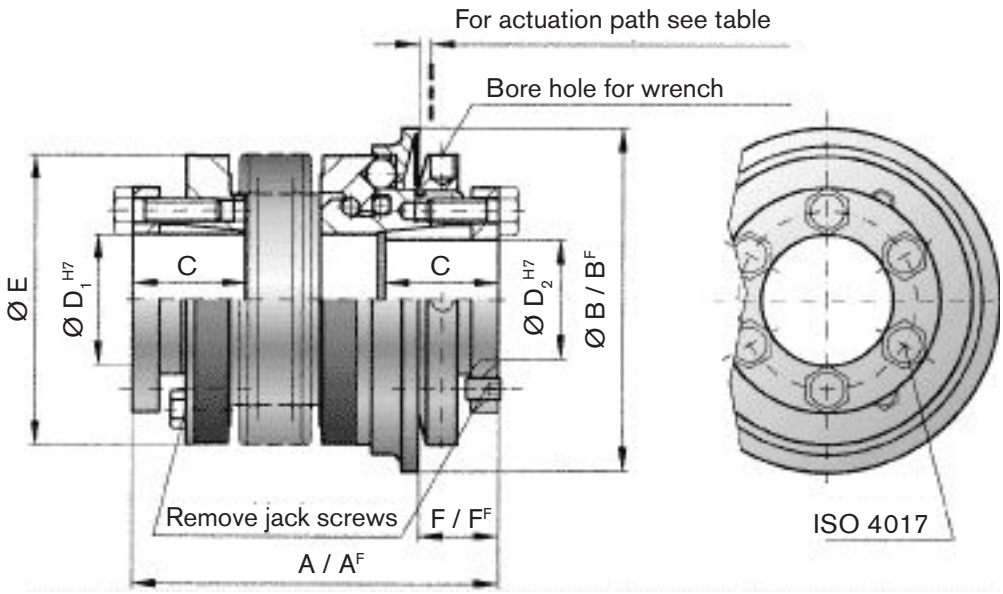
Materials:
Bellows: Stainless Steel
Interface: Hardened Steel
Hub: Sizes 15-60, Aluminum
Size 150 & larger, Steel

Temperature Range:
-30° C to 120° C
[-22° F to 248° F]

Type 2CC		Series																	
		15		30		60		150		200		300		500		800	1500
Overall Length mm [in]	A	75 [2.95]	82 [3.32]	87 [3.43]	95 [3.74]	102 [4.01]	112 [4.41]	116 [4.57]	128 [5.04]	128 [5.04]	140 [5.51]	139 [5.47]	153 [6.02]	163 [6.41]	177 [6.97]	190 [7.48]	223 8.78]
Overall Length (Full Disengagement) mm [in]	A^F	75 2.95]	82 [3.32]	87 [3.43]	95 [3.74]	102 [4.01]	112 [4.41]	118 [4.64]	130 [5.12]	131 [5.16]	143 [5.63]	142 [5.59]	156 [6.14]	167 [6.57]	181 [7.12]	201 [7.91]	232 [9.13]
Actuation Ring Ø mm [in]	B	55 [2.16]		65 [2.56]		73 [2.87]		92 [3.62]		99 [3.90]		120 [4.72]		135 [5.31]		152 [5.98]	174 [6.85]
Actuation Ring Ø (Full Disengagement) mm [in]	B^F	62 [2.44]		70 [2.75]		83 [3.27]		98 3.86]		117 [4.60]		132 [5.19]		155 [6.10]		177 [6.97]	187 [7.36]
Fit Length mm [in]	C	22 [0.87]		27 [1.06]		31 [1.22]		35 [1.38]		40 [1.57]		42 [1.65]		51 [2.01]		45 [1.77]	67 [2.64]
Bore Diameter from Ø to Ø H7 mm [in]	D_1/D_2	10-26 [.39-1.02]		12-30 [.47-1.18]		15-32 .59-1.26]		19-42 [.75-1.65]		24-45 [.94-1.77]		30-60 [1.18-2.36]		35-60 [1.38-2.36]		40-75 1.57-2.95]	50-80 [1.97-3.15]
Outer Diameter of Coupling mm [in]	E	49 [1.93]		55 [2.16]		66 [2.60]		81 [3.19]		90 [3.54]		110 [4.33]		123 [4.84]		134 [5.27]	157 [6.18]
Distance mm [in]	F	19 [0.75]		24 [0.94]		30 [1.18]		31 [1.22]		35 [1.38]		35 [1.38]		45 [1.77]		50 [1.97]	65 [2.56]
Distance (Full Disengagement) mm [in]	F^F	19 [0.75]		22 [0.87]		29 [1.14]		30 [1.18]		33 [1.30]		35 [1.38]		43 [1.69]		54 [2.13]	61 [2.40]
Distance mm [in]	G	6.5 [0.26]		7.5 [0.30]		9.5 [0.37]		11 [0.43]		12.5 [0.49]		13 [0.51]		17 [0.67]		18 [0.71]	22.5 [0.86]
Distance Between Centers mm [in]	H	17 [0.67]		19 [0.75]		23 [0.91]		27 [1.06]		31 [1.22]		39 [1.53]		41 [1.61]		2x 48 [2x 1.89]	2x 55 [2x 2.16]
ISO 4762 Screws	I	M5		M6		M8		M10		M12		M12		M16		2x M16	2x M20
Tightening Torque Nm [in-lbs]	I	8 [2]		15 [3]		40 [9]		70 [16]		120 [27]		130 [29]		200 [45]		250 [56]	470 [106]
Approx. Weight kg lbs		0.4 [.9]		0.6 [1.3]		1.0 [2.2]		2.4 [5.3]		4.0 [8.8]		5.9 [13.0]		9.6 [21.1]		14 [30.8]	21 [46.3]
Moment of Inertia 10^{-3} kgm^2	J_{ges}	0.10	0.15	0.27	0.32	0.75	0.80	2.50	2.80	5.10	5.30	11.5	11.8	22.8	23.0	42.0	83.0
Torsional Stiffness 10^3 Nm/Rad	C_T	20	15	39	28	76	55	175	110	191	140	420	350	510	500	780	1304
Lateral Misalignment mm [in]		0.15 [.006]	0.20 [.008]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.25 [.010]	0.30 [.012]	0.25 [.010]	0.30 [.012]	0.30 [.012]	0.35 [.014]	0.35 [.014]	0.35 [.014]
Angular Misalignment Degrees		1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	2	2.5	2.5	2.5
Lateral Spring Stiffness N/mm [ft-lbs/in]		475 [18.7]	137 [5.4]	900 [35.4]	270 [10.4]	1200 [47.2]	380 [15.0]	1550 [59.0]	435 [17.1]	2040 [80.3]	610 [24.0]	3750 [147.6]	1050 [41.3]	2500 [98.4]	840 [33.1]	2000 [78.7]	3600 [141.7]
Actuation Path mm [in]		1.5 [.059]		1.5 [.059]		1.7 [.067]		1.9 [.075]		2.2 .087]		2.2 [.087]		2.2 [.087]		2.2 [.087]	3.0 [.118]

A^F, B^F & F^F - Full Disengagement Version

Type 2TC



MTL-2TC
with tapered clamp connection

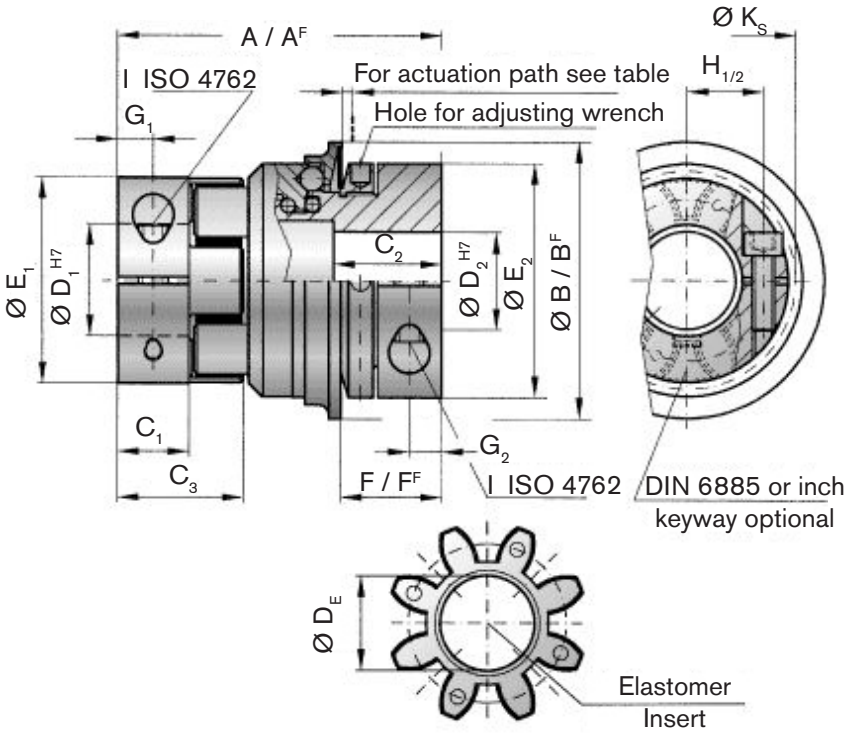
Materials:
Bellows: Stainless Steel
Interface: Hardened Steel
Hub: Sizes 15-60, Aluminum
Size 150 & larger, Steel

Temperature Range:
-30° C to 120° C
[-22° F to 248° F]

Type 2TC		Series																	
		15		30		60		150		200		300		500		800	1500	2500
Overall Length mm [in]	A	62 [2.44]	69 [2.72]	72 [2.84]	80 [2.15]	84 [3.31]	94 [3.70]	93 [3.66]	105 [4.13]	99 [3.90]	111 [4.37]	114 [4.49]	128 [5.04]	123 [4.84]	136 [5.36]	151 [5.95]	175 [6.89]	246 [9.69]
Overall Length (Full Disengagement) mm [in]	A^F	62 [2.44]	69 [2.72]	72 [2.84]	80 [3.15]	84 [3.31]	94 [3.70]	93 3.66]	105 [4.13]	102 [4.02]	114 [4.49]	117 [4.61]	131 [5.16]	127 [5.00]	140 [5.51]	151 [5.95]	184 [7.25]	252 [9.92]
Actuation Ring Ø mm [in]	B	55 [2.16]		65 [2.56]		73 [2.87]		92 [3.62]		99 [3.90]		120 [4.73]		135 [5.32]		152 [5.99]	174 [6.85]	243 [9.57]
Actuation Ring Ø (Full Disengagement) mm [in]	B^F	62 [2.44]		70 [2.76]		83 [3.27]		98 [3.86]		117 [4.61]		132 [5.20]		155 [6.10]		177 [6.97]	187 [7.36]	258 [10.16]
Fit Length mm [in]	C	19 [0.75]		22 [0.87]		27 [1.06]		32 [1.26]		32 [1.26]		41 [1.61]		41 [1.61]		49 [1.93]	61 [2.40]	80 [3.15]
Bore Diameter from Ø to Ø H7 mm [in]	D_1/D_2	10-22 [.39-.87]		12-23 [.47-.90]		12-29 [.47-1.14]		15-37 [.59-1.46]		20-44 [.78-1.73]		25-56 [.98-2.20]		25-60 [.98-2.36]		30-60 [1.18-2.36]	35-70 [1.38-2.75]	50-100 [1.97-3.94]
Outer Diameter of Coupling mm [in]	E	49 [1.93]		55 [2.16]		66 [2.60]		81 [3.19]		90 [3.54]		110 [4.33]		123 [4.84]		133 [5.23]	157 [6.18]	200 [7.87]
Distance mm [in]	F	13 [0.51]		16 [0.63]		18 [0.71]		19 [0.75]		19 [0.75]		23 [0.91]		25 [0.98]		31 [1.22]	30 [1.18]	37 [1.46]
Distance (Full Disengagement) mm [in]	F^F	13 [0.51]		14 [0.55]		17 [0.66]		18 [0.71]		17 [0.66]		20 [0.79]		22 [0.87]		20 [0.79]	26 [1.02]	31 [1.22]
6x ISO 4017	I	M4		M5		M5		M6		M6		M8		M8		M10	M12	M16
Tightening Torque Nm [in-lbs]	I	4 [1.0]		6 [1.0]		8 [2.0]		12 [3.0]		14 [3.0]		18 [4.0]		25 [6.0]		40 [9.0]	70 16.0]	120 [27.0]
Approx. Weight kg lbs		0.3 [.7]		0.4 [.9]		1.2 [2.6]		2.3 [5.1]		3.0 [6.6]		5.0 [11.0]		6.5 [14.3]		9.0 [19.8]	16.3 [35.9]	35 [77.2]
Moment of Inertia 10^{-3} kgm²	J_{ges}	0.10	0.15	0.28	0.30	0.75	0.80	1.90	2.00	2.80	3.00	5.50	6.00	11.0	12.8	20.0	42.0	257
Torsional Stiffness 10^3 Nm/Rad	C_T	20	15	39	28	76	55	175	110	191	140	420	350	510	500	780	1304	3400
Lateral Misalignment mm [in]		0.15 [.006]	0.20 [.008]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.25 [.010]	0.30 [.012]	0.25 [.010]	0.30 [.012]	0.30 [.012]	0.35 [.014]	0.35 [.014]	0.35 [.014]	0.35 [.014]
Angular Misalignment Degrees		1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	1.5	2	2	2.5	2.5	2.5	2.5
Lateral Spring Stiffness N/mm [ft-lbs/in]		475 [18.7]	137 [5.4]	900 [35.4]	270 [10.4]	1200 [47.2]	380 [15.0]	1550 [59.0]	435 [17.1]	2040 [80.3]	610 [24.0]	3750 [147.6]	1050 [41.3]	2500 [98.4]	840 [33.1]	2000 [78.7]	3600 [141.7]	6070 [238.9]
Actuation Path mm [in]		1.5 [.059]		1.5 [.059]		1.7 [.067]		1.9 [.075]		2.2 .087]		2.2 [.087]		2.2 [.087]		2.2 [.087]	3.0 [.118]	3.0 [.118]

A^F, B^F & F^F - Full Disengagement Version

Type ECC



MTL-ECC Elastomer insert coupling with clamping hubs

Materials:

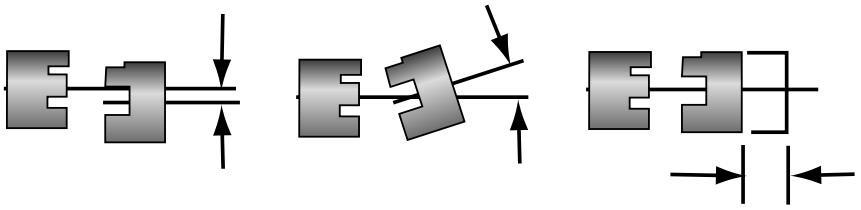
Elastomer Insert: Molded, wear resistant, thermally stable polymer
Interface: Hardened Steel
Hub: Sizes 15-60, Aluminum
Size 150 & larger, Steel

Temperature Range:

-30° C to 120° C
[-22° F to 248° F]

Coupling Properties

- Vibration Dampening
- Electrically Isolating
- Backlash Free
- Press Fit Design
- Compensated for Lateral, Angular and Axial Misalignment

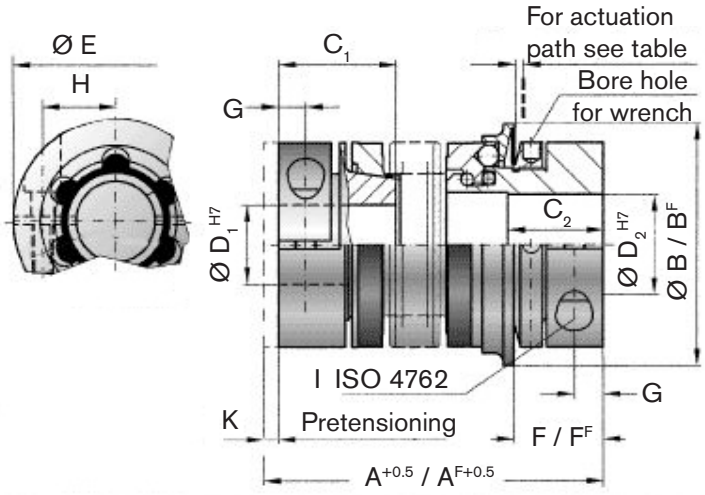


Lateral Misalignment | Angular Misalignment | Axial Misalignment

Type ECC			60	150	300	800
Static Torsional Stiffness	Nm/Rad	C_T	9750	10600	18100	66080
Dynamic Torsional Stiffness	Nm/Rad	C_{TDYN}	11900	29300	40400	180150
Lateral Misalignment	mm [in]	Max Values	0.10 [0.004]	0.12 [0.005]	0.14 [0.005]	0.20 0.008]
Angular Misalignment	Degrees		0.8	0.8	0.8	0.8
Axial Misalignment	mm [in]		± 2 [± 0.079]	± 2 [± 0.079]	± 2 [± 0.079]	± 2 [± 0.079]

Type ECC			60	150	300	800
Overall Length	mm [in]	A	96 [3.78]	106 [[4.17]	140 [5.51]	179 [7.04]
Overall Length (Full Disengagement)	mm [in]	A^F	96 [3.78]	108 [4.25]	143 [5.63]	190 [7.48]
Actuation Ring Ø	mm [in]	B	73 [2.87]	92 [3.62]	120 [4.72]	152 [5.98]
Actuation Ring Ø (Full Disengagement)	mm [in]	B^F	83 [3.27]	98 [3.86]	132 [5.19]	177 [6.97]
Fit Length	mm [in]	C_1	20 [0.79]	21 [0.83]	31 [1.22]	46 [1.81]
Fit Length	mm [in]	C_2	31 [1.22]	35 [1.38]	42 [1.65]	45 [1.77]
Length of Hub	mm [in]	C_3	36 [1.42]	39 [1.53]	52 [2.05]	74 [2.91]
Hub Diameter from Ø to Ø H7	mm [in]	D_1	12-32 [0.47-1.26	19-35 [0.75-1.38]	20-45 [0.78-1.77]	35-80 [1.38-3.15]
Hub Diameter from Ø to Ø H7	mm [in]	D_2	15-32 [0.59-1.26]	19-42 [0.75-1.65]	30-60 [1.18-2.36]	40-75 [1.57-2.95]
Diameter of the Hub	mm [in]	E_1	56 [2.20]	66.5 [2.62]	82 [3.23]	136.5 [5.37]
Diameter of the Hub	mm [in]	E_2	66 [2.60]	81 [3.19]	110 [4.33]	132 [5.19]
Distance	mm [in]	F	30 [1.18]	31 [1.22]	35 [1.38]	50 [1.97]
Distance (Full Disengagement)	mm [in]	F^F	29 [1.14]	30 [1.18]	35 [1.38]	54 [2.13]
Distance	mm [in]	G_1	10 [039]	11 [0.43]	15 [0.59]	23 [0.91]
Distance	mm [in]	G_2	9.5 [0.37]	11 [0.43]	13 [0.51]	18 [0.71]
Distance Between Centers	mm [in]	H_1	21 [0.83]	24 [0.94]	29 [1.14]	50.5 [1.99]
Screws ISO 4762/12.9		I_1	M6	M8	M10	M16
Tightening Torque	Nm [in-lbs]		15 [3]	35 [8]	70 [16]	290 [65]
Distance Between Centers MTL side	mm [in]	H_2	23 [0.91]	27 [1.06]	39 [1.53]	48 [1.89]
Screws ISO 4762/12.9		I_1	M8	M10	M12	2x M16
Tightening Torque	Nm [in-lbs]		40 [9]	70 [16]	130 [29]	250 [56]
Screw G head Diameter	mm [in]	K_S	57 [2.24]	68 [2.68]	85 [3.35]	139 [5.47]
Approx. Weight	kg lbs		1.0 [2.2]	2.4 [5.3]	5.8 [12.8]	14.3 31.5]
Moment of Inertia	10^{-3} kgm²	J_{ges}	0.7	2.3	11	33.5
Actuation Path	mm [in]		1.7 [.067]	1.9 [.075]	2.2 [.087]	2.2 [.087]
Type (Elastomer Insert)			A B	A B	A B	A B
Inner diameter (elastomer Insert)	mm [in]		2.72 [0.107]	30.2 [1.189]	38.2 [1.503]	60.5 [2.381]

Type PCC



MTL-PCC Press-fit version with clamping hubs

Materials:
Bellows: Stainless Steel
Interface: Hardened Steel
Hub: Sizes 15-60, Aluminum
Size 150 & larger, Steel

Temperature Range:
-30° C to 120° C [-22° F to 248° F]

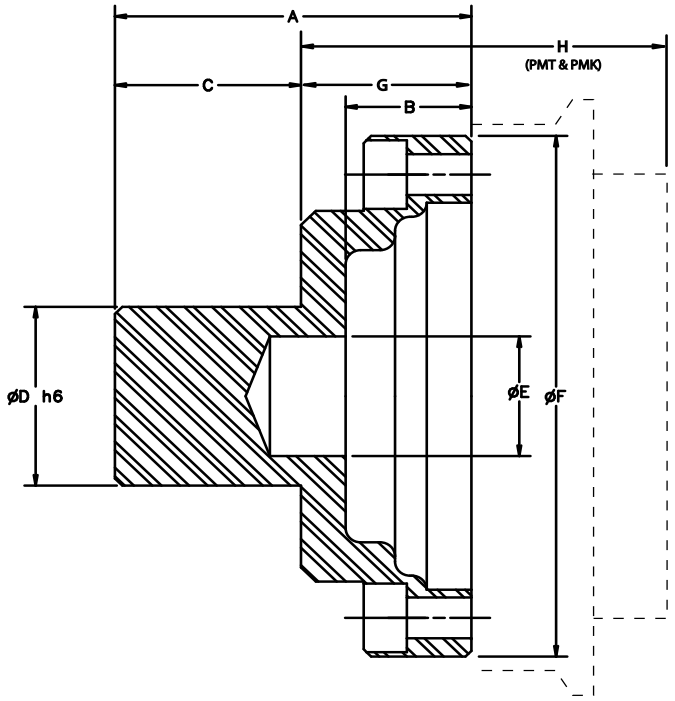
Six self-centered, tapered drive projection form a conical element that is molded into an aluminum hub. The mating piece is a metal bellow with a female tapered bore.

The MTL-PCC is used for applications with limited accessibility.

Model PCC			Series												
			15		30		60		150		300		500		800
Overall Length	mm [in]	A	76 [2.99]	83 [3.27]	89 [3.50]	97 [3.82]	105 [4.13]	115 [4.53]	116 [4.57]	128 [5.04]	143 [5.63]	157 [6.18]	166 [6.53]	180 [7.08]	201 [7.91]
Overall Length (Full Disengagement)	mm [in]	A^F	76 [2.99]	83 [3.27]	89 [2.50]	97 [3.82]	105 [4.13]	115 [4.53]	118 [4.64]	130 [5.12]	146 [5.75]	160 [6.30]	170 [6.69]	184 [7.24]	212 [8.34]
Actuation Ring Ø	mm [in]	B	55 [2.16]		65 [2.56]		73 [2.87]		92 [3.62]		120 [4.73]		135 [5.32]		152 [5.99]
Actuation Ring Ø (Full Disengagement)	mm [in]	B^F	62 [2.44]		70 [2.76]		83 [3.27]		98 [3.86]		132 [5.20]		155 [6.10]		177 [6.97]
Fit Length	mm [in]	C_1/C_2	28/22 [1.10/0.87]		33/27 [1.30/1.06]		39/31 [1.53/1.22]		43/35 [1.69/1.38]		52/42 [2.04/1.65]		61/52 [2.40/2.05]		45/48 [1.77/1.89]
Bore Diameter from Ø to Ø H7	mm [in]	D_1	8-22 [0.31-0.87]		10-25 [0.39-0.98]		12-32 [0.47-1.26]		14-38 [0.55-1.50]		30-56 [1.18-2.20]		35-60 [1.38-2.36]		40-75 [1.57-2.95]
Bore Diameter from Ø to Ø H7	mm [in]	D_2	8-26 [0.31-1.02]		10-30 [0.39-1.18]		12-32 [0.47-1.26]		14-42 [0.55-1.65]		30-60 [1.18-2.36]		35-60 [1.38-2.36]		40-75 [1.57-2.95]
Outer Diameter of Coupling	mm [in]	E	49 [1.93]		55 [2.16]		66 [2.60]		81 [3.19]		110 [4.33]		123 [4.84]		134 [5.27]
Distance	mm [in]	F	19 [0.75]		24 [0.94]		30 [1.18]		31 [1.22]		35 [1.38]		45 [1.77]		50 [1.97]
Distance (Full Disengagement)	mm [in]	F^F	19 [0.75]		22 [0.87]		29 [1.14]		30 [1.18]		36 [1.42]		43 [1.69]		54 [2.13]
	mm [in]	G	6.5 [0.26]		7.5 [0.30]		9.5 [0.37]		11 [0.43]		13 [0.51]		17 [0.67]		18 [0.71]
Distance Between Centers	mm [in]	H	17 [0.67]		19 [0.75]		23 [0.91]		27 [1.06]		39 [1.53]		41 [1.61]		48 [1.89]
6x ISO 4017		I	M5		M6		M8		M10		M12		M16		2x M16
Tightening Torque	Nm [in-lbs]	I	8 [2]		15 [3]		40 [9]		70 [16]		130 [29]		200 [45]		250 [56]
Approx. Weight	kg lbs		0.4 [.09]		0.6 [1.3]		1.4 [3.1]		2.4 [5.3]		5.9 [13]		9.6 [21.2]		15 [33.1]
Moment of Inertia	10^{-3} kgm²	J_{ges}	0.10	0.15	0.27	0.32	0.75	0.80	2.50	2.80	6.50	7.00	13.0	17.0	50
Torsional Stiffness	10^3 Nm/Rad	C_T	12	10	18	16	40	31	90	60	220	190	260	250	390
Lateral Misalignment	mm [in]		0.15 [.006]	0.20 [.008]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.20 [.008]	0.25 [.010]	0.25 [.010]	0.30 [.012]	0.30 [.012]	0.35 [.014]	0.35 [.014]
Angular Misalignment	Degrees		1	1.5	1	1.5	1	1.5	1	1.5	1.5	2	2	2.5	2.5
Lateral Spring Stiffness	N/mm [ft-lbs/in]		475 [18.7]	137 [5.4]	900 [35.4]	270 [10.4]	1200 [47.2]	380 [15.0]	1550 [59.0]	435 [17.1]	3750 [147.6]	1050 [41.3]	2500 [98.4]	840 [33.1]	2000 [78.7]
Actuation Path	mm [in]		1.5 [.059]		1.5 [.059]		1.7 [.067]		1.9 [.075]		2.2 [.087]		2.2 [.087]		2.2 [.087]

A^F, B^F & F^F - Full Disengagement Version

Coupling Adapters for Inch-bored, Elastomer (Spider) Couplings



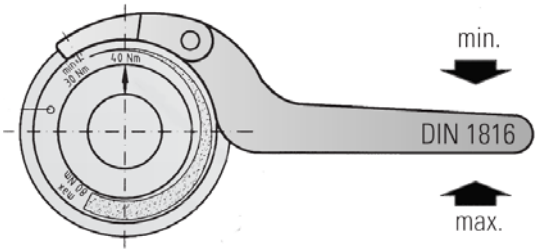
MTL Size	Product Number	A	B	C	D	E	F	PMT/PMK	PMT		PMK		Fastener	Tightening Torque
								G	H_1	H_2	H_1	H_2		
15	976880	37.20 [1.465]	20.00 [0.787]	13.20 [0.520]	19.05 [0.750]	12.20 [0.480]	56.00 [2.205]	24.0 [0.945]	32.0 [1.260]	32.0 [1.260]	26.0 [1.024]	26.0 [1.024]	M4	4.60 Nm [3 ft/lbs]
30	976881	44.2 [1.740]	22 [0.866]	17.7 [0.697]	19.05 [0.750]	12.2 [0.480]	64 [2.520]	26.5 [1.044]	39.0 [1.536]	39.0 [1.563]	32.0 [1.250]	32.0 [1.250]	M5	9.5 Nm [7 ft/lbs]
60	976882	47.900 [1.886]	25.000 [0.984]	16.900 [0.665]	25.40 [1.000]	17 [0.669]	74 [2.913]	31.0 [1.221]	43.0 [1.693]	43.0 [1.693]	35.0 [1.378]	35.0 [1.378]	M5	9.5 Nm [7 ft/lbs]
150	976883	52.4 [2.063]	25 [0.984]	20.4 [0.803]	25.40 [1.000]	17 [0.669]	90 [3.543]	32.0 [1.260]	46.0 [1.811]	46.0 1.811]	36.5 [1.437]	37.0 [1.457]	M6	16 Nm [12 ft/lbs]
200	976884	68 [2.677]	40 [1.575]	21.5 [0.846]	38.10 [1.500]	17 [0.669]	98 [3.858]	46.5 [1.831]	51.0 [2.008]	54.0 [2.127]	42.0 [1.654]	45.0 [1.772]	M6	16 Nm [12 ft/lbs]
300	976885	72.5 [2.854]	40 [1.575]	25 [0.984]	38.10 [1.500]	17 [0.669]	114 [4.488]	47.5 [1.871]	55.0 [2.166]	58.0 [2.284]	42.0 [1.654]	45.0 1.772]	M8	39 Nm [29 ft/lbs]
500	976886	81.5 [3.209]	40 [1.575]	33 [1.299]	38.10 [1.500]	26 [1.024]	128 [5.039]	48.5 [19.10]	63.0 [2.481]	67.0 [2.638]	50.5 [1.989]	54.0 [2.126]	M8	39 Nm [29 ft/lbs]
800	976887	92.2 [3.630]	50 [1.969]	31.2 [1.228]	50.80 [2.000]	31.02 [1.221]	140 [5.512]	61.0 [2.402]	76.0 [2.993]	76.0 [2.993]	61.0 [2.402]	72.0 [2.835]	M10	77 Nm [57 ft/lbs]
1500	976888	98.9 [3.894]	50 [1.969]	38.9 [1.532]	50.80 [2.000]	31.02 [1.221]	170 [6.693]	60.0 [2.363]	84.0 [3.308]	92.0 [3.623]	68.0 2.678]	85.0 [3.347]	M12	135 Nm [100 ft/lbs]
2500	976889	143.2 [5.638]	80 [3.150]	51.2 [2.016]	76.20 [3.000]	50.92 [2.005]	240 [9.449]	92 [3.623]	112.0 [4.411]	118.0 [4.647]	101 [3.977]	107.0 [4.214]	M16	330 Nm [242 ft/lbs]

Notes: H_1 Coupling Engaged
H_2 Coupling Disengaged
To determine the total effective length of the coupling, add dimensions G to H_1 or H_2.

Coupling adapters are designed to fit a variety of inch-sized bore, zero backlash, torsionally stiff high misalignment couplings.

Accessories

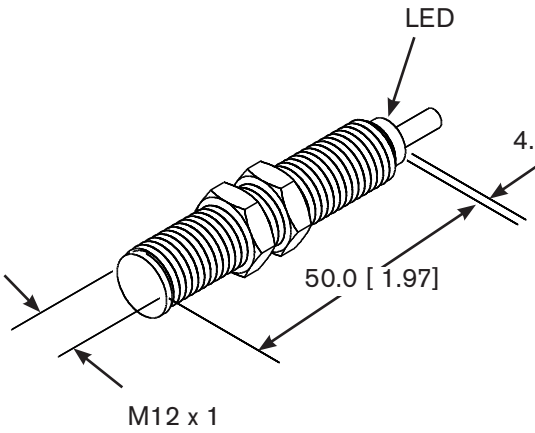
Torque Adjusting Wrench DIN 1816

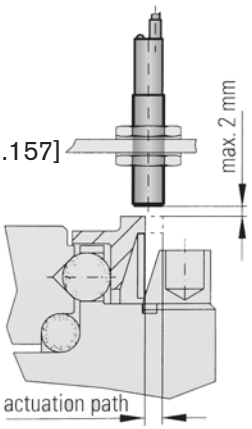


MTL Size	Adjustable Spanner Wrenches			
	Ring Dia. Range	Pin Dia.	Nexen #	J.W. Winco
15 ALL	49 mm	4 mm	170660	
30 ALL	55 mm	4 mm	170661	
60 ALL	66 mm	5 mm	171469	
150 ALL	82 mm	5 mm	171470	
200 ALL EXCEPT FD	90 mm	6 mm	170662	
200 FD	98 mm	5 mm	171471	
300 ALL	114 mm	6 mm	170663	
500 ALL	126 mm	8 mm		A55012
800 ALL EXCEPT FD	134 mm	8 mm		A55020
800 FD	144 mm	8 mm		A55020
1500 ALL	163 mm	8 mm		A55038
2500 ALL EXCEPT FD	210 mm	10 mm		A55053
2500 FD	226 mm	10 mm		A55053

Note: The recommended spanner wrenches for MTL Sizes 500, 800, 1500 & 2500 are available from J.W. Winco, Inc. www.jwwinco.com.

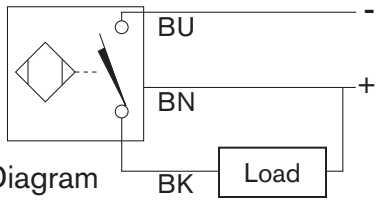
Proximity Switch for Emergency Cut-off





Product Number 170666

Technical Data	
Voltage	10 - 30 VDC
Output Current	200 mA
Switch Frequency	2,000 Hz
Protective System	IP 67
Switch Type	Normally Open
Max. Detection Gap	2 mm



Switch Diagram

Minimum Sprockets for PMT and PMK

MTL Size	Chain Size									
	35	40	50	60	80	100	120	140	160	180
MTL15	23T	19T								
MTL30	26T	21T	18T							
MTL60	29T	26T	20T							
MTL150		34T	27T	23T	20T					
MTL200		39T	26T	25T	18T	15T				
MTL300			34T	28T	24T	20T				
MTL500			37T	31T	27T	22T	18T			
MTL800				34T	29T	23T	19T			
MTL1500				33T	26T	22T	19T	17T		
MTL2500					25T	29T	25T	22T	20T	19T

Re-engagement of the Full Disengage Design

Put pressure on the disengagement detection ring with an installation tool (a screwdriver for example).

Approximate Engagement (Press-In) Force	
Model	Engagement Force, Approximate Full Disengagement Design
MTL15-xxx-FD	20-40 N [5-10 lbs]
MTL30-xxx-FD	25-50-N [6-12 lbs]
MTL60-xxx-FD	30-60 N [7-14 lbs]
MTL150-xxx-FD	35-70 N [8-16 lbs]
MTL200-xxx-FD	35-70 N [8-16 lbs]
MTL300-xxx-FD	50-100 N [11-22 lbs]
MTL500-xxx-FD	60-120 N [13-26 lbs]
MTL800-xxx-FD	500-1000 N [112-224 lbs]
MTL1500-xxx-FD	2000-3000 N [450-674 lbs]

Product Selection Based on Torque Requirements

As a rule, torque limiters are selected according to the required disengagement torque. This rating must be greater than the torque necessary for normal machine operation. The necessary disengagement torque is determined in accordance with the drive specifications. The following calculations have proven themselves as "rule of thumb" solutions.

Disengagement Torque

$$T_{KN} \geq 1.5 \cdot T_{AS}(Nm)$$

or

$$T_{KN} \geq 9550 \cdot \frac{P_{AN}}{n} \cdot 1.5(Nm)$$

T_{KN} = Rated Torque of the Torque Limiter (Nm)
T_{AS} = Peak Torque of Motor (Nm)

T_{KN} = Rated Torque of the Torque Limiter (Nm)
P_{AN} = Drive Power (kw)
N = Speed of Drive (RPM)

Start-up Torque Without a Load

$$T_{KN} \geq \alpha \cdot J_L \geq \frac{J_L}{J_A + J_L} \cdot T_{AS} \cdot S_A(Nm)$$

S_A = Load Factor
S_A = 1 (Uniform Load)
S_A = 2 (Non-Uniform Load)
S_A = 3 (Jerky Load)

Values for S_A = 2 - 3 are usual for servo drives on machine tools

T_{KN} = Rated Torque of the Torque Limiter (Nm)
α = Angular Acceleration

$$\alpha = \frac{\omega}{t} = \frac{\pi \cdot n}{t - 30} \quad \frac{1}{s^2}$$

t = Acceleration Time (s)
ω = Angular Speed In (s^{-1})
n = Speed of Drive (RPM)
J_L = Moment of Inertia on Load Side (kgm^2)
J_A = Moment of Inertia on Drive Side (kgm^2)
T_{AS} = Peak Torque of Motor (Nm)

Start-up Torque With a Load

$$T_{KN} \geq \alpha \cdot J_L + T_{AN} \geq \left[\frac{J_L}{J_A + J_L} \cdot (T_{AS} - T_{AN}) + T_{AN}\right] \cdot S_A(Nm)$$

S_A = Load Factor
S_A = 1 (Uniform Load)
S_A = 2 (Non-Uniform Load)
S_A = 3 (Jerky Load)

Values for S_A = 2 - 3 are usual for servo drives on machine tools.

T_{AN} = Rated Torque of the Torque Limiter (Nm)
α = Angular Acceleration

$$\alpha = \frac{\omega}{t} = \frac{\pi \cdot n}{t - 30} \quad \frac{1}{s^2}$$

t = Acceleration Time (s)
ω = Angular Speed In (s^{-1})
n = Speed of Drive (RPM)
J_L = Moment of Inertia on Load Side (kgm^2)
T_{AN} = Load Torque (Nm)
J_A = Moment of Inertia on Drive Side (kgm^2)
T_{AS} = Peak Torque of Motor (Nm)

Machine Tool - Feed Force Torque

Spindle Drive

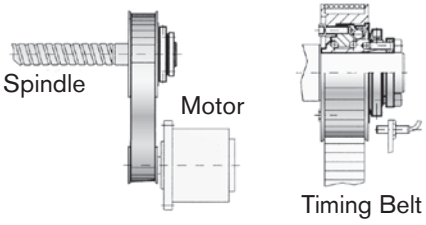
$$T_{AN} = \frac{s \cdot F_V}{2000 \cdot \pi \cdot \eta}(Nm)$$

T_{AN} = Load Torque (Nm)
S = Spindle Pitch (mm)
F_V = Feed Force (N)
η = Spindle Efficiency

Timing Belt Drive

$$T_{AN} = \frac{d_0 \cdot F_V}{2000}(Nm)$$

T_{AN} = Load Torque (Nm)
d_o = Sprocket Diameter (mm)
F_V = Feed Force (N)



Timing Belt Drive

Conversion Formulas

kW (kilowatt) = 0.7457 x hp
Nm (Newton-meter) = in-lbs / 8.849
Kgm^2 = 0.041 x $lb\text{-}ft^2$

Radial Belt Pull

$$R = \frac{P_{AN} \cdot 9545}{N \cdot d_P}$$

P_{AN} = Drive Power (kw)
N = Speed of Drive (RPM)
d_P = Sprocket or Pulley Pitch Radius (m)

THE NEXEN ADVANTAGE

The trend in industry is to design and incorporate more automation into production processes. Machines are becoming more accurate, requiring a higher degree of precision.

Machine downtime in an automated production environment is very costly. Broken components, expensive technicians, and long lead times for custom components.

The use of a Nexen Mechanical Torque Limiter isolates the driving from the driven elements within a matter of milliseconds.

This can be the difference between operating profitably or not.

Features

- Adjustment range engraved on the outer diameter
- Actual values marked rather than percentages
- Adjustable without removal from the application
- Patented preload for zero backlash
- Small, guided actuation ring for fast reaction
- Double bearing support fo pulley / sprocket
- Large bores possible

Areas of Application

- Machine Tools
- CNC Machining Centers
- Woodworking Machines
- Automation Equipment
- Textile Industry
- Industrial Robots
- Sheet Metal Processing Machines
- Servo + DC Motor Drives

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