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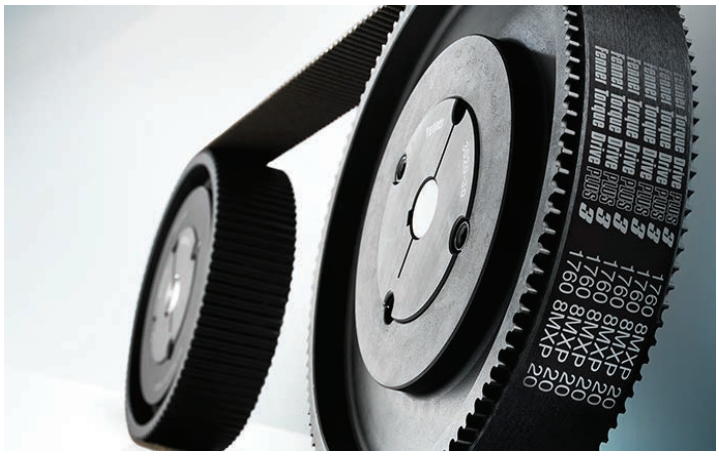
INSTALLATION GUIDE

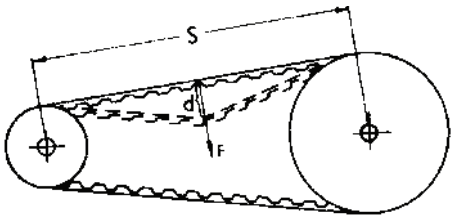
Synchronous Belt Drives



Synchronous belt drives operate by positive meshing and do not require high installed belt tensions. For optimum performance, however, belts should be installed with a pre-tension suitable for the envisaged drive duty, derived from the formulae below.

Where a range is indicated, the lower value will be suitable for lightly loaded, smooth running drives, whereas drives subject to high shock loads and/or frequent starts should be tensioned to the higher level. Belt pre-tension is usually achieved by drive centre distance extension and checked by applying a setting force F (N) at mid belt span sufficient to deflect the belt a distance d (mm) related to the length of the span S (metres).

It is necessary to ensure that the force is applied at right angles to the belt span, and evenly across the belt width. A Fenner Belt Tension Indicator may be used, in conjunction with a piece of rigid bar laid across the face of the belt at mid-span. An electronic, sonic tension indicator is also available.



TORQUE DRIVE PLUS 3 & HTD DRIVES

(Deflection – d 20mm/metre span length - S). Calculate the force F from the formulae

$$F(max) = \frac{kW \times 955{,}000}{d.n} \qquad F(min) = \frac{kW \times 477{,}500}{d.n} \quad (N)$$

where kW = Motor power, or absorbed power if known
d = Pitch diameter of either pulley (mm).
n = Rev/min of same pulley.

TIMING DRIVES

(Deflection – d 20 mm/metre span length - S). Use force F from the table below.

Belt	F (Newtons)
L050	2.7
L075	4.3
L100	6.1
H075	11.0
H100	15.6
H150	24.3
H200	33.4

NOTE: Excessive belt tension will reduce belt and bearing lives and may increase drive noise levels. For fixed centre applications tension may be applied by an idler pulley (see note on Idler Pulleys) or consult your local Authorised Distributor for precise fixed centre dimensions. Drive support frameworks must be rigid to avoid flexure resulting in centre distance reduction and consequent tooth jumping, particularly on high torque starts.

BELT CARE: Avoid 'crimping' belts. Folding belts such that they are tightly bent, e.g. for storage, damages the belt cords and will lead to premature failure.

BELT INSTALLATION

Provision should be made for adjustment of the drive centre distance to allow for installation of the belt around the pulleys without damage, and subsequent pre-tensioning. A belt should never be forced over pulley flanges as internal belt damage will result.

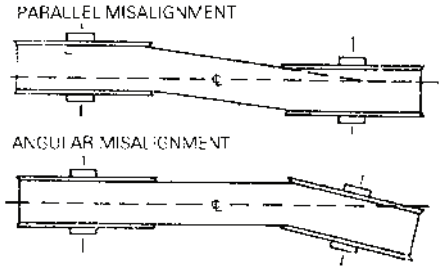
Centre Distance Allowance (installation on flangeless pulleys, tensioning) mm			Additional Centre Distance Allowance (installation over flanged pulleys) mm		
Belt Lenth (mm)	Installation	Tensioning Allowance (any drive)	Belt Pitch	One pulley flanged (mm)	Both pulleys flnaged (mm)
<1000	1.8	0.8	5mm	14	19
1001 - 1780	2.8	0.8	8mm	22	33
1781 - 2540	3.3	1.0	14mm	36	58
2541- 3300	4.1	1.0	L	25	35
>3300	5.3	1.3	H	32	48

PULLEY ALIGNMENT

Misalignment of drive pulleys results in unequal tension across the belt width and extreme edge wear. Pulley alignment should be proved using a straight-edge or laser device, and shafts checked for parallelism.

Misalignment on any synchronous drive should not exceed $1/4^0$ angular or 5mm/metre centre distance parallel. Drive support frameworks must be rigid to avoid flexure causing shaft misalignment under drive forces.

Flexure can result in tooth jumping during high torque starts, particularly if misalignment is present.



IDLER PULLEYS

Grooved idler pulleys can be used on the inside of all synchronous belts. Flat (not crowned) idlers can be used on the outer surface of Classical Timing, HTD and TDP3 belts. Wherever possible, idlers should operate on the slack span of a belt, and arc of contact should be kept to a minimum. Idler pulleys should be of equal or greater diameter than the smaller of the drive pulleys. Spring loaded idler pulleys are not normally recommended.

TAPER LOCK

Most of the synchronous pulleys/sprockets featured in this section use Taper Lock shaft fixing.

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