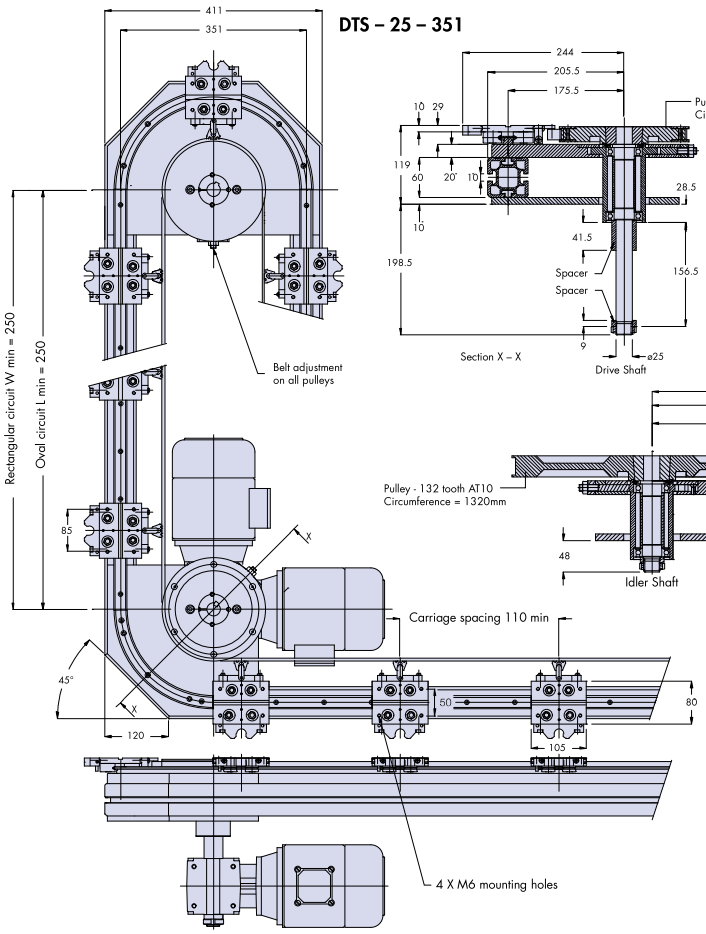
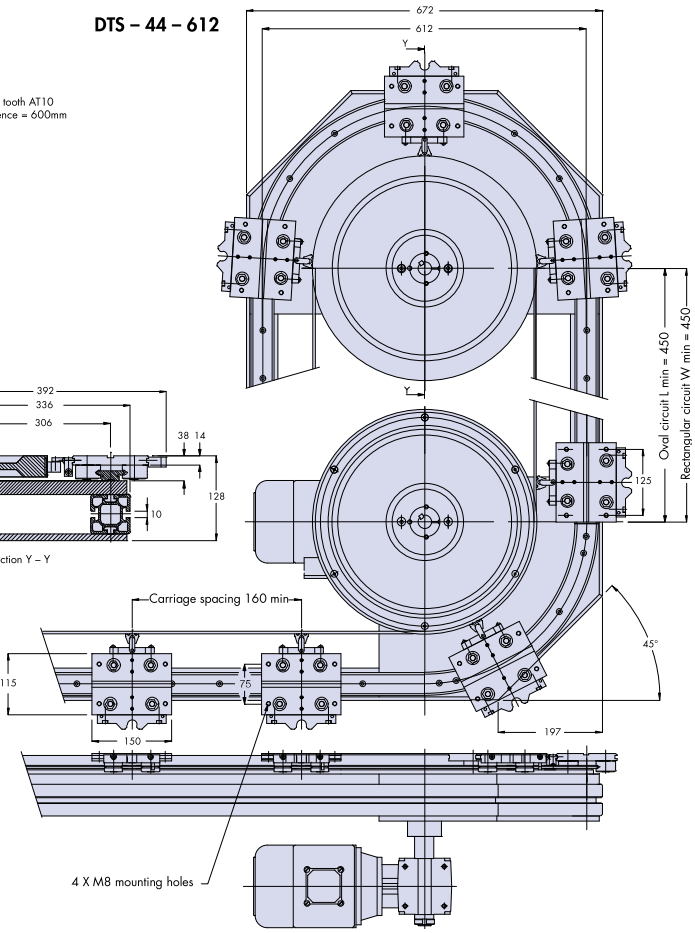
Data & Dimensions

DTS – 25 – 351



DTS – 44 – 612



For Carriage Locking System see page 9

Dynamic parameters

Excess speed combined with overloading of the carriages can result in disengagement of the trip latches at the bends where the carriages rapidly accelerate and decelerate. Maximum speed will also be affected if the centre of gravity of the carriage load overhangs externally, or if the system is configured in the vertical plane.

Some high-speed applications may benefit from the optional fixed method of connection from belt to carriage, in which case a torque limiter on the primary drive should be considered. Such overload protection may not be sufficiently sensitive to avoid damage. There is no fundamental limit to the number of carriages in a system, for instance 50 carriages each carrying a reasonable load may well be acceptable. Also, there is no fundamental limit to the length of track although support beams may need to be joined. In all cases it is important to inform Hepco of the complete dynamic and static data relating to your application including the effect of raising and lowering carriages if the track is to be configured vertically.

Specifying system parameters

1 Specify dynamic parameters

Carriage load.

External forces.

Full velocity profile including accelerations, dwells, speeds, duty cycle and required life.

2 Make an initial selection

Consider the physical size and weight of the component to be carried and make an initial selection of system size.

Parts mounted to the carriage can overhang the sides as the design allows clearance.

As a guide to weights a size 25 carriage would typically be used up to 20 kg with 40 kg being usual for size 44.

Both systems can carry higher loads than this (see Hepco Ring Slides and Track System catalogue, page 24) and static loads of 200 and 400kg respectively are possible.

3 Calculate the carriage static and dynamic loadings

Use the Hepco Ring Slides and Track System catalogue pages 24-27 to determine if the initial choice of carriage is suitable for the application making reference to the 'lubricated condition'.

Laying out the track

4 Choose the track shape required

Oval (1 2) or Rectangular (1 2 / 3 4)

and specify the drive unit position(s) 1 to 4.

5 Choose the number of carriages you require

An even number of carriages will usually be selected in order to produce a symmetrical carriage layout.

6 Select the carriage spacing

The spacing must be in 10 mm increments. Carriages will usually be spaced equally apart.

Minimum spacing for a standard carriage

DTS25-351 = 110

DTS44-612 = 160

7 Calculate the overall dimensions of the system given:

N = number of carriages

S = carriage spacing (ignoring belt stretch)

L = System length (between centres of pulleys)

W = System width (between centres of pulleys)

Oval system

DTS 25-351 NS = 0.998 x (2L + 600)

DTS 44-612 NS = 0.998 x (2L + 1320)

Rectangular system

DTS 25-351 NS = 0.998 x (2L + 2W +600)

DTS 44-612 NS = 0.998 x (2L + 2W + 1320)

Note: The above equation yield approximate answers. Hepco will size systems exactly prior to manufacture.

If the calculated length is not in line with requirements, select an alternative number of carriages or carriage spacing and recalculate.

If a mechanical indexer is used as a drive source or the DTS is integrated into the customer's machine, drive ratios may have to be considered.

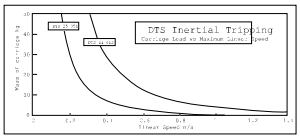
8 Check the trip load of each carriage

Using conventional mechanical calculations, allowing for friction, external load and acceleration (inertial force) ensure that at no time does the linear force on any single carriage exceed 60N. If this does occur then the trip latches will disengage and the carriages will become disconnected from the belt.

Inertial disengagement limits

The carriages on a DTS system travel faster on the curved section than on the straights. As each carriage moves between straight and curve, acceleration produces an inertial reaction force on the trip latch. This means that for any given mass on a carriage, there is a maximum speed (measured on the straights see graph below) beyond which carriages are liable to disengage.

The fixed carriage/belt connection may allow the 60N force to be exceeded. Please consult Hepco.



Specifying drive source & control

9 Select a suitable drive source

Hepco supply, as an optional extra, a comprehensive range of Geared AC Motors and drives and worm gearboxes for direct coupling to the DTS.

Some common selections together with performance data are shown in the table (above right).

Additional sizes and more detailed information can be found in Hepco's DLS (Driven Linear Transmission and Positioning System) catalogue Ref. DLS03.

Note that considerably higher linear forces can be achieved by incorporating more than one drive unit utilising geared motors of the WG7 design. This configuration gives the advantage of sharing the drive load between pulley bearing units. Alternatively, Hepco can supply the DTS drive unit shaft(s) prepared to receive the customer's drive source.

DTS 25 – 351 with AC Geared Motor

Nominal Linear Speed @ 50Hz m/s	Working Speed Range m/s	Nominal Linear Force N	Motor Power kW	Motor Type	Gearbox Ratio	Gearbox Rated Linear Force
0.19	0.02 - 0.3	726	0.25	71L/6	48	829
0.41	0.04 - 0.65	829	0.55	80S/4	34	889
0.73	0.07 - 1.15	754	0.75	80L/4	19	862
1.52	0.15 - 2.4	584	1.1	90L/6	6	877

DTS 44 – 612 with AC Geared Motor

Nominal Linear Speed @ 50Hz m/s	Working Speed Range m/s	Nominal Linear Force N	Motor Power kW	Motor Type	Gearbox Ratio	Gearbox Rated Linear Force
0.31	0.03 - 0.5	300	0.18	71S/6	63	321
0.42	0.04 - 0.68	330	0.25	71L/6	48	377
0.64	0.07 - 1.0	330	0.37	71L/4	48	377
1.06	0.11 - 1.7	381	0.55	80L/6	19	409
1.61	0.16 - 2.5	343	0.75	80L/4	19	392

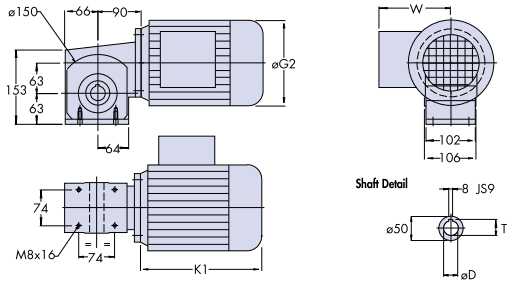
The DTS will produce the Nominal Linear force at speeds ranging from 50% to 100% of the Nominal Linear Speed.

The DTS will perform with a lower force and duty cycle over a much wider speed range from 10% to 160% of the Nominal Linear Speed.

The Gearbox Rated Linear Force is the force produced when the gearbox is on a service factor of 1.4. This is based upon a fast operation for 8 hours per day. Allowable forces can be increased if the application is less arduous than this.

Please contact Hepco's Technical Department for details.

Motor/Gearbox dimensions



Type of gear unit	Type of Motor	Motors G2	Motors K1	Motors W	Gearbox D H7	Gearbox T	Weight/kg of motor & gearbox
WG7	71S/L	138	212	125	25	28.3	13.5
	80S/L	156	233	137	25	28.3	16.9
	90L	176	275	147	30	33.3	22.3