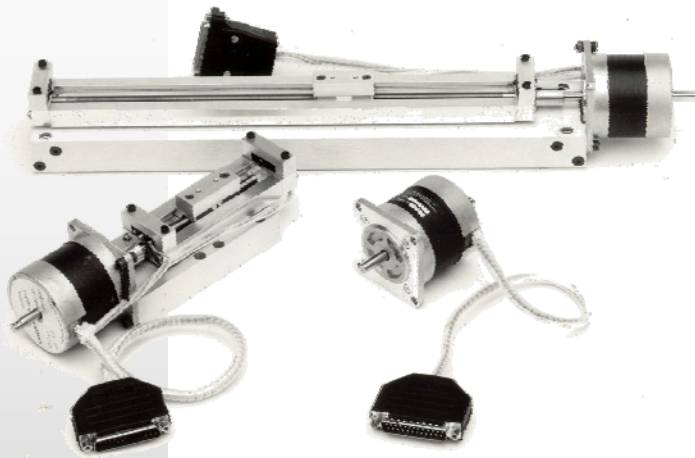




# Stepping Motor Systems



Bentham's stepping motor product range consists of a number of compatible units which are used for computerised control of rotation or position and generally for the automation of instruments in laboratory and industrial environments.

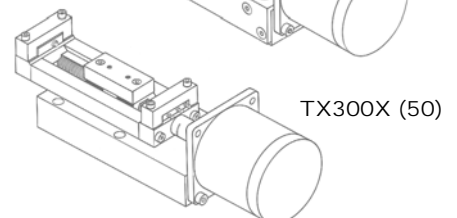
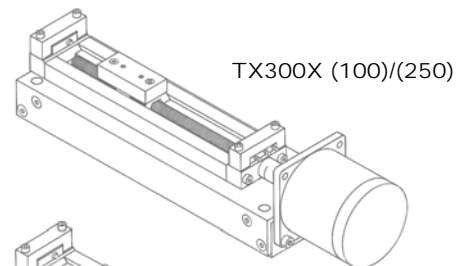
## Translation Stages

The T300 range uses a conventional, low expansion stainless steel screw and a plastic nut which is made of a special engineering material impregnated with a lubricant. Pads of the same materials are used as bearings between the dovetail shaped cartridge and the track into which it fits.

Model	Travel (mm)	Resolution (mm)	Max. translation speed (mm/sec)	Typical back-lash (mm)	Accuracy (mm/100 mm)	Max. balanced load	Wt. (kg)
T300X(50)	50	0.001	6	0.013	0.05	4	1.2
T300X(100)	100	0.002	3	0.025	0.05	4	1.6
T300X(250)	250	0.002	3	0.025	0.05	4	2.2
(when used with MAC controllers)							

## End-stop Microswitches

All T300 stages are protected by end-stop microswitches which also give a precise indication to the controller that the datum position has been reached. Accuracy is  $\pm 0.001\text{mm}$  for T300X(50) and  $\pm 0.002\text{mm}$  for the 100mm and 250mm devices.



# Stepping Motor Systems

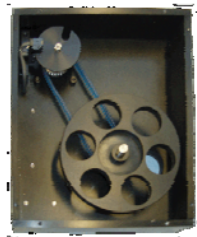
## Motor Gearbox Combinations

These units are useful in applications requiring greater torque or smaller step size that offered by the motors directly. Gearbox ratios are 2:1, 5:1 and 10:1. Torque multiplication is approximately 0.7 x ratio.

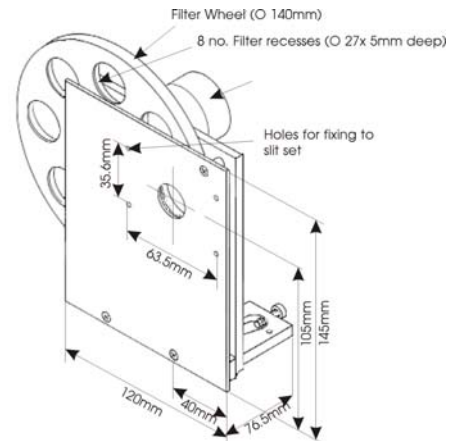


## Filter Wheels

Bentham manufacture a range of motorised filter wheels, open framed and fully-enclosed, that will hold six, eight, ten or twelve 25mm diameter optical filters. They can be controlled by any of our MAC or PMC units.



Maximum filter thickness is 4mm for standard filter wheels.



## Controllers



### MAC

The MACx is a programmable microstepping drive that can be configured with 2, 4, 6, 8 or 10 drive channels. The standard interface is USB, but IEEE-488 can be fitted as an option. These units are compatible with our wide range of motorised linear and rotary stages, filter wheels and all of our monochromators that do not have an internal drive.



### PMC-MAC

A compact 2-channel microstepping drive unit, the PMC-MAC is functionally equivalent to a MAC2 but cannot be expanded with additional channels.



### PMC3B-IEEE

This unit controls the grating and filter wheel in our M300, or any two size-23 motors. With built-in IEEE(GP-IB) interface and straightforward command set, the PMC3B provides an effective interface between computer and monochromator. The same unit is equally at home in other applications requiring stepping motor control. A PMC3B and two of our T300(x) translation stages can be assembled quickly and cost-effectively into a fully programmable x, y stage.

## Stepping Motors

Pull in torque is defined as the maximum torque against which a motor will start, at a constant stepping rate and reach a synchronism without losing a step.

Motor type	Step angle (°)	Step angle tolerance (minutes)	Voltage (V)	Current (A)	Resistance (Ω)	Weight (kg)
23	1.8	±5.4 non-cumulative	12	0.6	20	0.55

