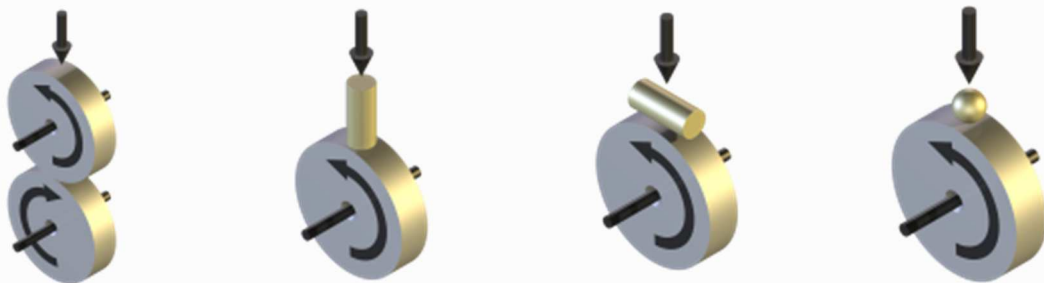
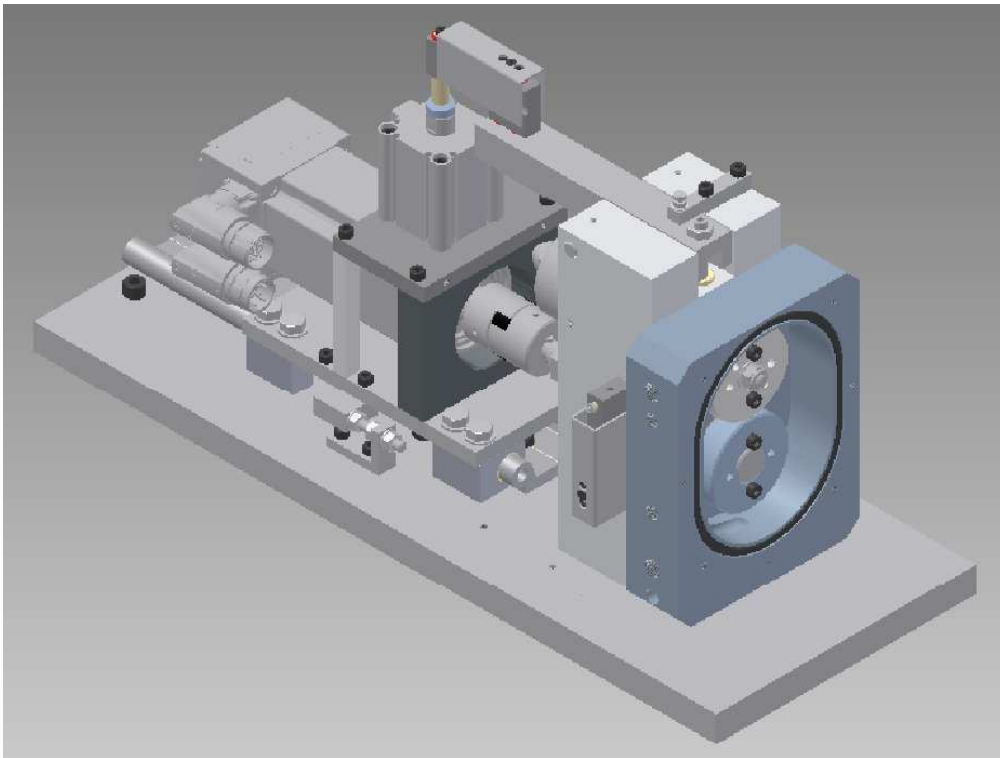


# TE 53 MULTI-PURPOSE FRICTION & WEAR TESTER

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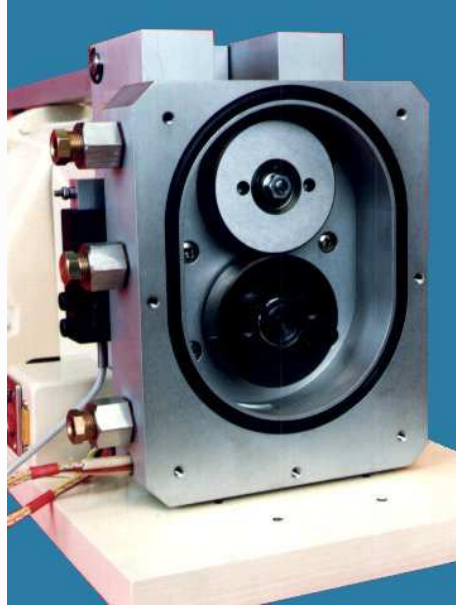


## Description

A bearing housing carries two parallel shafts. The lower shaft carries a flat profile ring or roller and is connected to an a.c. servo motor. The upper shaft is carried in a spherical bearing at one end that permits rotation about the gear contact line and has a floating bearing at the other end. This allows the shaft to pivot freely in the vertical and horizontal axes.

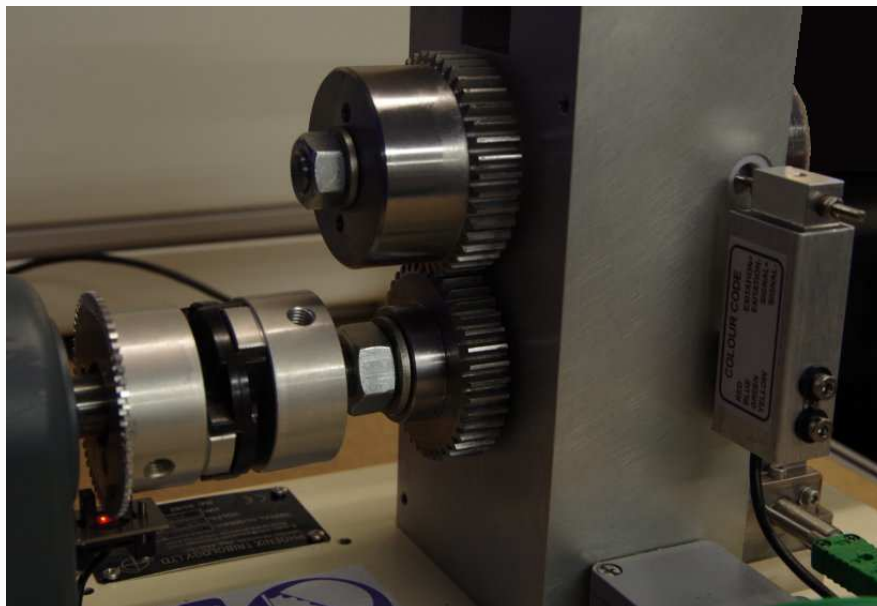
Horizontal movement in the direction perpendicular to the upper shaft axis and is resisted by a strain gauge transducer. This gives measurements of the tangential force in the contact, which is displayed as friction force on the control unit.

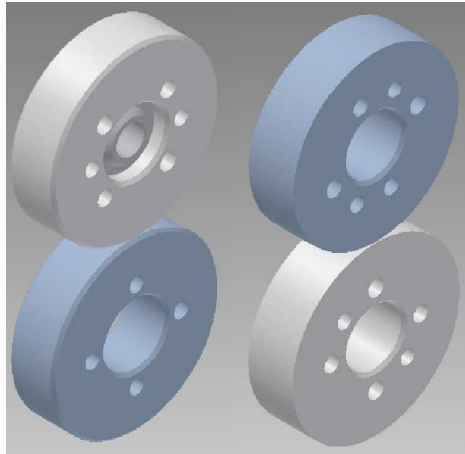
Load is applied through a lever acting in the vertical plane on the front end of the upper shaft, pressing on the outer race of the floating bearing. Load is applied to the other end of the lever by a low friction pneumatic cylinder, which is manually set using a precision regulator. A strain gauge beam force transducer is provided to sense the applied load.



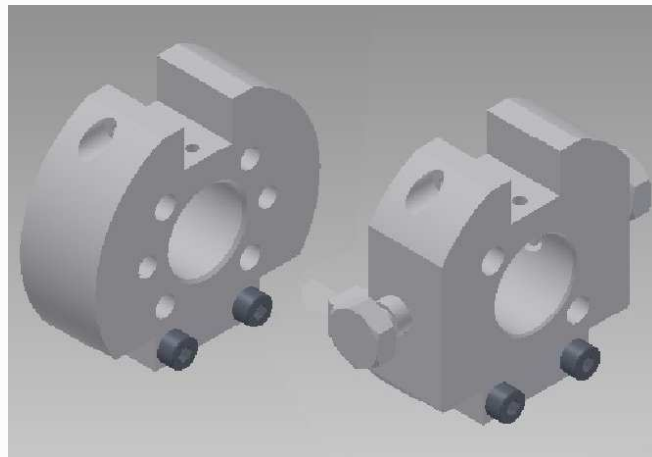
A sealed chamber surrounds the test specimens and incorporates a heater element to maintain the test fluid temperature.

In two roller configuration the upper shaft carries a roller and is driven from the lower shaft through a pair of gears. Seven fixed percentage slip ratios are provided.





For line contact tests, the upper roller is mounted on a self-aligning bearing to achieve full width contact between the specimens. For elliptical contact tests, the upper roller is crowned and rigidly mounted on the shaft



In block on ring configuration the upper shaft carries a holder for the fixed specimen and is restrained from rotating. For self-locating specimens such as a ball (ball on cylinder test) or a cylinder (crossed cylinder test), a rigid holder is used. For block specimens in line contact (block on ring test) a self-aligning holder is used.

Roller and block specimens can be manufactured easily from a variety of materials including metals, plastics, elastomers and ceramics.

## Control and Data Acquisition

Speed set-point control is manual, implemented via a PLC, with inputs via touch-screen. Data is recorded at 1 Hz sampling rate, stored by the PLC and exported on USB stick, for post-processing.

# TE 53 MULTI-PURPOSE FRICTION & WEAR TESTER

## Technical Specifications

Contact Geometry:	Crossed Cylinder Ball on Cylinder Block on Ring Two Roller
Speed Range:	50 to 1200 rpm
Equivalent Velocity:	up to 3.8 m/s
Slip Rate:	1.79, 5.13, 8.70, 10.53, 13.33, 18.18 and 22.22%
Slide-Roll Ratio:	1.77, 5.00, 8.33, 10.00, 12.50, 16.67 and 20.00%
Friction Range:	130 N
Wear Transducer:	+/- 2 mm (5 $\mu$ m resolution)
Load Range:	0 to 750 N
Load Actuator:	Pneumatic
Bath Temperature:	ambient to 150°C
Heater Power:	150 W
Temperature Sensor:	k-type thermocouple
Roller Size:	60 mm diameter
Sliding Specimen:	12.7 mm ball, roller or block
Interface:	PLC
Software:	
Motor:	0.4 kW a.c. servo motor

## Manually Controlled Parameters

Load (Precision Pneumatic Regulator)  
Rotational Speed (PLC)  
Reservoir Temperature (PLC)  
Test Duration (PLC)

## Measured Parameters

Load  
Rotational Speed  
Friction Force  
Temperature  
Number of Revolutions  
Test Duration

## Services

Electricity:

220/240V, single phase, 50 Hz, 1.2 kW  
110/120 V, single phase, 60 Hz, 1.2 kW

## Installation

Bench-mounting machine:

Packing Specification:

1,000 mm x 200 mm x 250 mm high, 40 kg  
0.48 m<sup>3</sup>, GW 145 kg, NW 97 kg