TRACTION DRIVE SPEED ACCELERATOR

Full-functions in a compact body.

POINT 1

Basic principle

①Power of the traction drive is transmitted by the rolling contact mechanism via oil film of traction grease characterized by high viscosity at high pressures.

②Contact pressure P is created at each contact surface on planetary rollers, a sun roller and a stationary housing, which are assembled with elastic deformation.
By this pressure, the oil films changes to high viscosity one (only when contact pressure P is imposed) so that the power can be transmitted at the roller contact area.

③The traction force T is formulated by Equation (1).

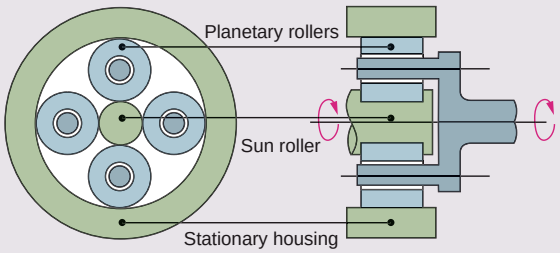
$$T=\mu P \cdots\cdots\cdots (1)$$

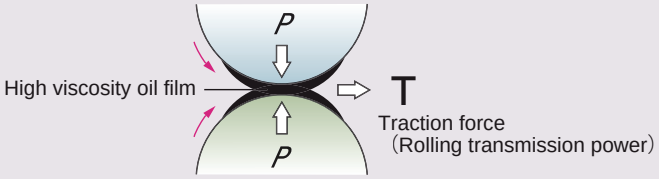
where, μ:Traction coefficient, P:Contact pressure

④This unit is a speed increasing device which the revolution of the planetary roller is used for input side and the rotation of the sun roller is output side.
The speed increasing ratio is formulated by Equation (2).

$$n=1+\frac{D}{d} \cdots\cdots\cdots (2)$$

where, D:Bore diameter of stationary housing
d:Outside diameter of sun roller





POINT 2

Features

Positioning Block

(Optional for use on M/C)
The positioning block and pin mechanism supplies coolant to the tool.

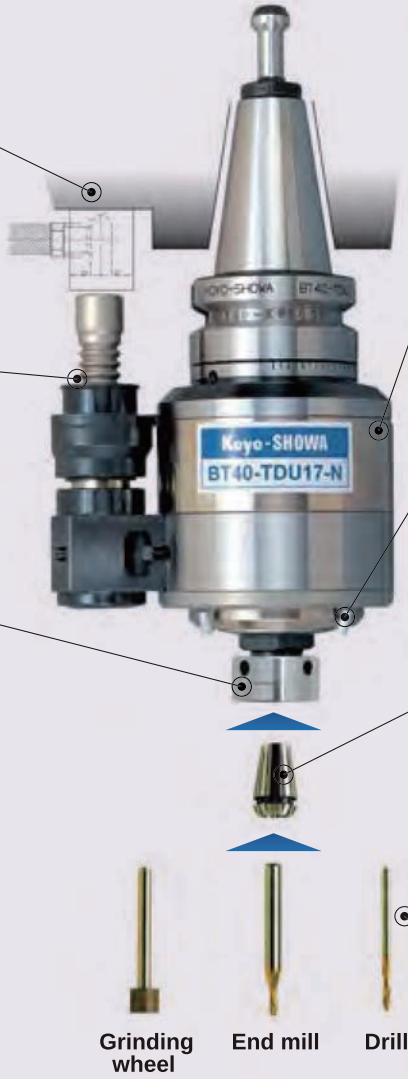
Positioning Pin

"One-touch" adjustment, with in a height range of 40mm.
PAT.P

Nut

The balance adjustment is already made in the factory.

More widely usable, due to its adaptability to a great variety of M/C spindles.



Grinding wheel | End mill | Drill

Orientation Ring

The fitting position of a positioning block differs among machining centers. The position can be adjusted by rotating the orientation ring within 360°.

Coolant Nozzle

The angle adjustment of the coolant nozzle can be made easily by hand.
The spray angle of the coolant is adjusted to match the inserted cutter length.

Collet

Only a under super precision collet, runout within 3 microns, should be used.
Various sizes can be supplied by mm unit.
Please order sizes to match the shanks of tools to be used.

Cutters

A drill, end mill and grinding wheel with a straight shank can be applied.

ATC-Ready

Compact and light, the TDU is ready for ATC… with no extra attachments necessary.

Low Vibration

The Traction Drive Unit is particularly smooth-running, and without noise vibration, it even makes grinding possible on your M/C.

Transmission Power

A stable torque transmission produced stable rpm, unlike air motor speed accelerators.

High Speed

Since the traction drive is run by a transmission mechanism based on rolling contact, high lubrication can be maintained even at high speed rotation.
The uses of ceramic bearings and through-body coolant are incorporated to ensure reliable, long-lasting high speed operation.

DIMENSIONS BT ▸ P.93,94

POINT 3

A complete series supports a full range of applications.

TDU40

Super rigid Type

3.4×Spindle rev. Max.12,000rpm

Cutting Example [Groove Milling]

Material	:	Aluminum alloy
End mill	:	16mm dia. T/C, 2-blade
Speed	:	12,000rpm
Cut. depth	:	5mm
Feed	:	1000mm/min

TDU17-N

Standard Type

6×Spindle rev. Max.30,000rpm

Cutting Example [Groove Milling]

Material	:	Aluminum alloy
End mill	:	4mm dia. T/C, 2-blade
Speed	:	28,000rpm
Cut. depth	:	2mm
Feed	:	1,000mm/min

	Super rigid type	Standard type
Type	TDU40	TDU17-N
Speed increasing ratio	3.4×	6×
Speed (rpm) (min⁻¹)	MAX. 12,000	MAX. 30,000
Output torque (Nm)	7	1
Output power (kw)*1	8.8	3.1
Taper *2	BT50	BT40 / BT50
Tool grip diameter (mm)	φ1.5~20	φ0.5~10
Net weight (kgW)	11.5	5.4 / 7.9

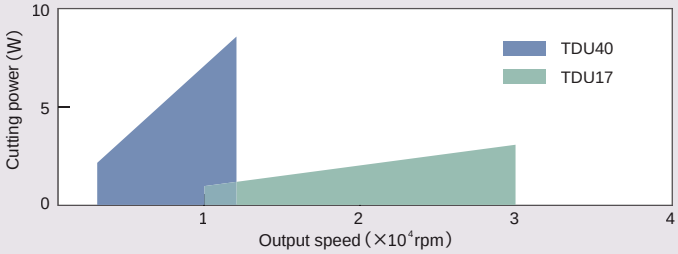
*1 Max. output for each max. speed.
*2 Other tapers are also available:
SK40,CV40,HSK63 equivalent to BT40.
SK50,CV50,HSK100 equivalent to BT50.

Warranted total running time : 2,000hrs
Period of warranted : One year

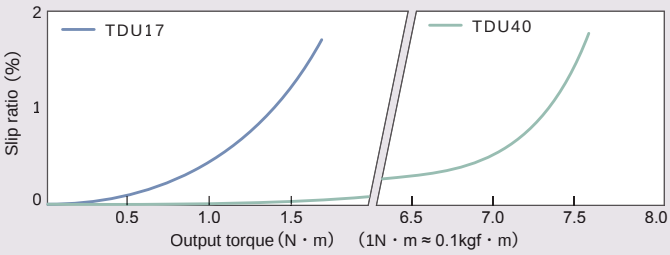
POINT 4

Covering a wide application range…

1 Application range



2 Torque transmission characteristics



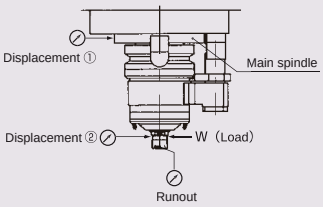
3 Runout and Bending rigidity

Type	Runout (μm) *1	Bending rigidity (N/μm) *2
TDU40	≦5	30≦
TDU17	≦5	10≦

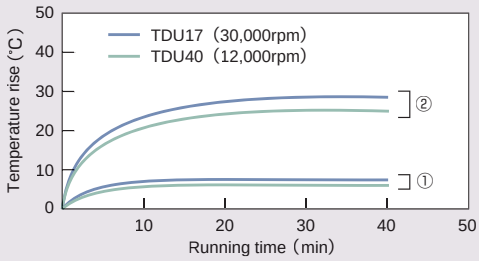
*1) : Runout of main spindle

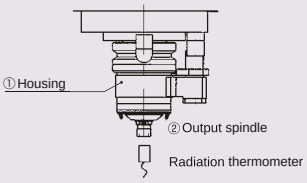
*2) : Bending rigidity = W / (Displacement② - Displacement①)

(1 N/μm ≈ 0.1kgf/μm)



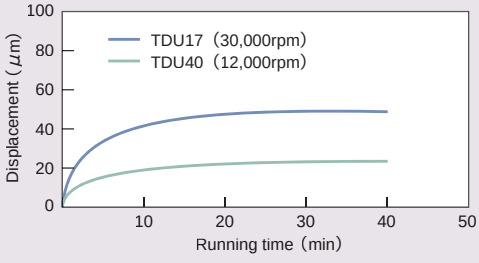
4 Temperature rise (Temperature-Coolant temperature)

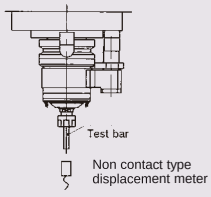




Coolant pressure : 200kPa (2kgf/F)
Coolant temperature : 20:
Room temperature : 20:
(Coolant amount : 15R/X)

5 Axial displacement





Coolant pressure : 200kPa (2kgf/F)
Coolant temperature : 20:
Room temperature : 20:
(Coolant amount : 15R/X)

6 Noise level