

Moving



- Sliding
- Lifting
- Swinging
- Turning

Motion Drive Units



TUNKERS®
Ingenuity in series.

Motion Drive Units

Motion Devices in Body Automation

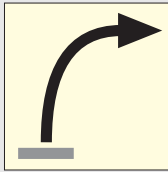
Sliding, Lifting, Swinging, Turning – these are typical movement actions required in body automation. The moved loads are considerably smaller than loads on cranes.

Automation actions consists of :

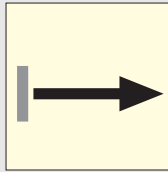
- Moving Welding Guns
- Lifting of pre-assemblies into assembly position
- Sliding of clamp assemblies to load/unload parts

Simple cylinders or slides do not do not fulfill the requirements for reproducing positioning accuracy. Normally complex and unique designs consisting of special drives, slides, shock absorbers, switches, etc. must be created at great cost to satisfy these requirements.

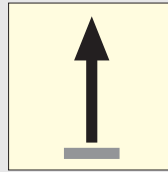
This catalog will provide you with an overview of standard field-proven devices to achieve the movement of tool and part assemblies you require.



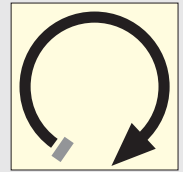
Swinging



Sliding



Lifting



Turning

It is our goal to offer to our customers ready-made, solutions, using robust, compact, complete and field-proven motion drive components, approved by the automotive industry. Keeping this in mind, all motion units offer the following advantages:

- Fully enclosed housings, protecting the mechanical components even in rough production environment, such as in welding
- Bearings and slides designed for high loads with roller, needle or graphite bearings are guaranteed for three million cycles.
- Drive integrated into housing, actuated by pneumatic cylinders.
- Defined end position with rigid stops, mechanical locking and position indication.

Should you be unable to find a standard product to your application, please contact us so that we may develop a special solution.



Swinging - Pivoting

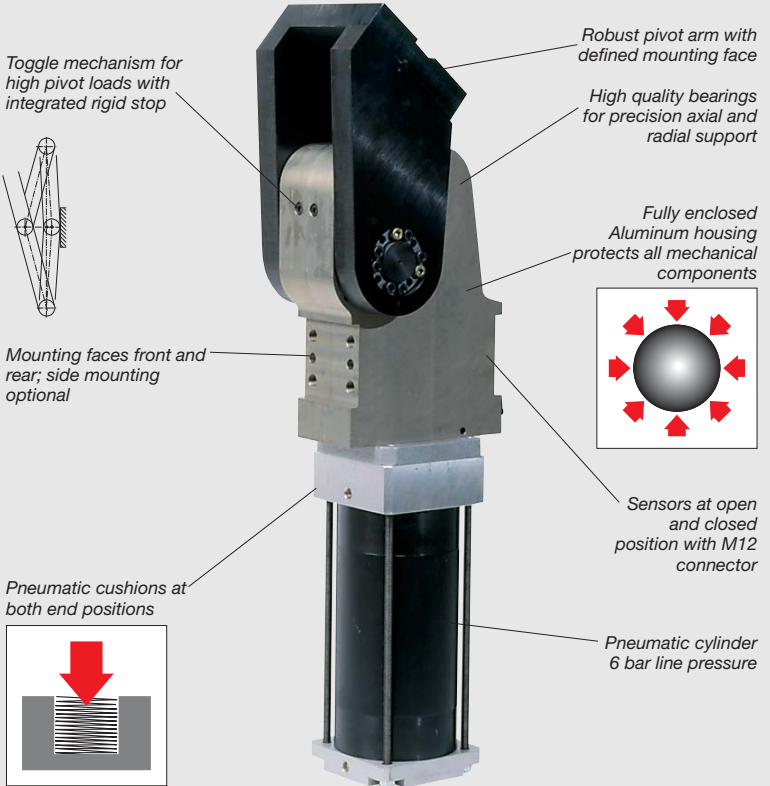


Swinging - Pivoting

Pivoting - Rotating

TUNKERS Pivot or Rotating Units are industry-wide proven driving elements to rotate parts up to 100 kg and up to 180° rotation. With pneumatic cylinders, integrated toggle mechanism, rigid stops and position sensing cartridges, the TUNKERS pivoting units are ready-to-install complete tools.

Design Principles

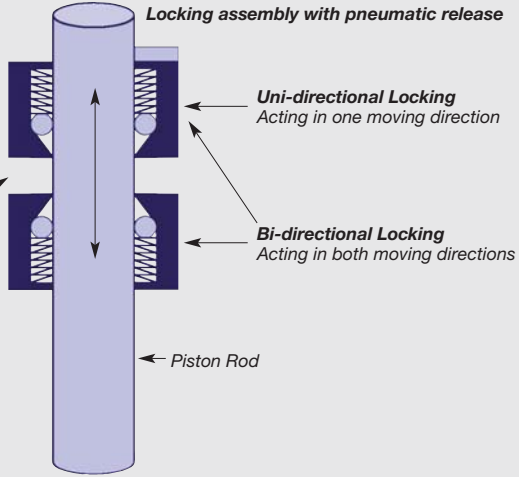
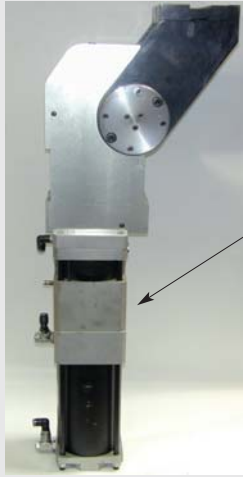


– Pivot arm mounted to drive shaft with RINGSPANN connector allowing step-less adjustment of pivot arm position

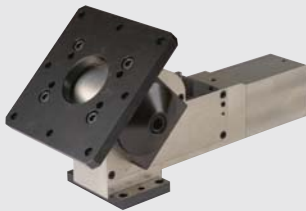


Optional Locking Feature

In emergency power loss and other stop situations, this optional internal attachment assures complete stopping of the pivot arm motion, preventing damage to equipment.



Product Line



KSW 63
for small pivot motion
< 45° and loads to 50 kg



KS...H
with hydraulically cushioned motion
for heavy pivot applications



EKS
with electric motor drive (3-phase),
compatible to the pneumatic units



KSB
Wide bearing spread for horizontal
pivot applications



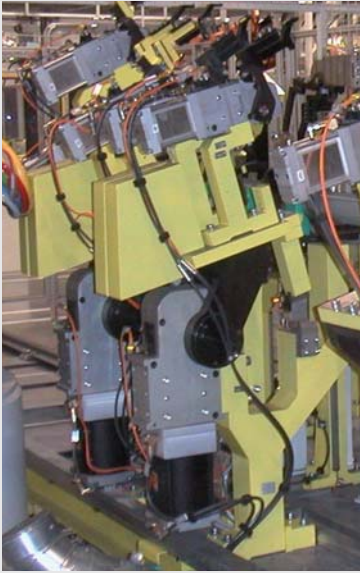
KSF
Flat cylinder and body for critical
room applications



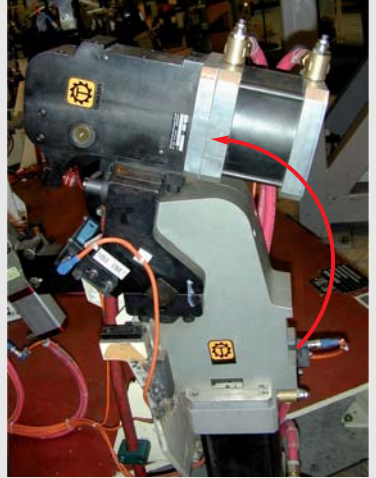
KSD
For 180° pivot applications

Swinging - Pivoting

Application Examples



Pivoting of complete clamping assembly into position



Pivoting of a piercing unit PFS 200 into position



Pivoting clamp assembly



Drive for assembly fixture



Basic Size Calculations

The load to be moved and the distance of the load from the pivot point determine the choice of a pivot unit. The product of load and arm length determines the required pivot force.

Example:

- Load: $F = 60 \text{ kg} = 600 \text{ N}$

- Arm length: $l = 0,2 \text{ m}$

(Distance of load center of gravity to pivot axis)

$$\text{Pivot Force: } F \times l = 600 \text{ N} \times 0,2 \text{ m} = 120 \text{ Nm} = M_s$$

The suggested product is the KS 100 Pivot Unit because the nominal force of 140 Nm is greater than the load force.

ATTENTION:

Because of the toggle action drive, the created force is not linear. At the end position more than 200% of the nominal force is generated while the force over 90° the force is reduced to less than 25%. Using the full pivot range this must be considered.

		Load Off-Set / Arm Length (mm)								
		100	150	200	250	300	350	400	450	500
load weight (kg)	10	KS 63	KS 63	KS 63	KS 80	KS 80	KS 80	KS 80	KS 80	KS 80
	20	KS 63	KS 63	KS 63	KS 80	KS 80	KS 80	KS 80	KS 80	KS 100
	30	KS 63	KS 63	KS 63/KS 80	KS 80	KS 80	KS 100	KS 100	KS 100	KS 125
	40	KS 63	KS 63/KS 80	KS 80	KS 100	KS 100	KS 100	KS 100	KS 125	KS 125
	50	KS 63	KS 80	KS 100	KS 100	KS 125	KS 125	KS 125	KS 125	KS 125
	60	KS 80	KS 80	KS 100	KS 125	KS 125	KS 125	KS 125	KS 125	KS 160
	70	KS 80	KS 100	KS 100	KS 125	KS 125	KS 125	KS 125	KS 160	KS 160
	80	KS 80	KS 100	KS 125	KS 125	KS 125	KS 160	KS 160	KS 160	KS 160
	90	KS 80	KS 100	KS 125	KS 125	KS 160	KS 160	KS 160	KS 160	KS 200
	100	KS 100	KS 125	KS 125	KS 125	KS 160	KS 160	KS 160	KS 200	KS 200



Swinging - Pivoting

Overview - Unit Selection

In the following table you will find all pivot units listed showing the most important parameters. Using the table showing load and offset a preliminary selection can be made.

		Standard Type					
		KSW 63	KS 80.2	KS 100.2	KS 125.2	KS 160.2	KS 200.2
Torque	Nm	60	90	140	250	410	650
Max. Load at 500 mm pivot arm	kg	-	18	28	50	82	130
Max. Load at 200 mm pivot arm	kg	12-40*	45	70	125	205	325
Pivot Angle	Grad	45	135	135	135	135	135
Cycle Time	Sec.	2	3	3	3	3	3
Weight	Kg	18	28	34	55	63	70
Dimensions	mm	370x180x190	600x175x100	600x175x100	725x200x235	740x206x235	745x206x235

		180° Version				Flat Cylinder	
		KSD 63	KSD 80	KSD 160	KSD 200	KSF 63	KSF 80
Torque	Nm	50	80	400	650	50	80
Max. Load at 500 mm pivot arm	kg	10	16	80	130	10	16
Max. Load at 200 mm pivot arm	kg	25	40	200	325	25	40
Pivot Angle	Grad	180	180	180	180	135	135
Cycle Time	Sec.	4	4	4	4	3	3
Weight	Kg	20	22	80	90	17	19
Dimensions	mm	730x92x180	730x102x180	1020x206x315	1025x206x315	544x92x120	620x102x150

*) horizontal installation



Standard Type



180° Version



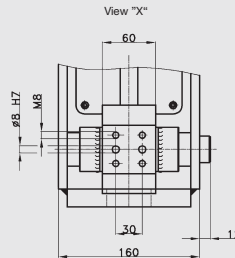
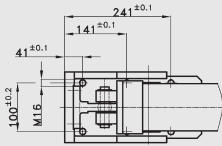
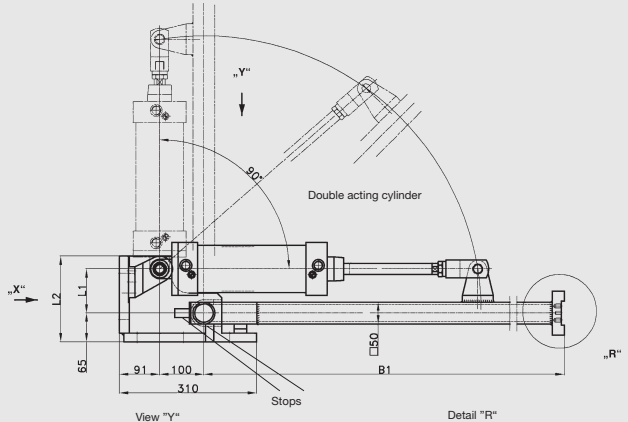
Flat-O flat Cylinder Type



Universal-Pivot Unit SE...



- Standard version, open type
- Direct drive by ISO-Pneumatic Cylinder
- Pneumatic cushioning
- Two mounting options to angle bracket
- Low space requirements because of parallel arrangement of pivot arm and cylinder



Technical Data:

Max. Off-Set: per request

Pivot angle: 90°

Double acting cylinder

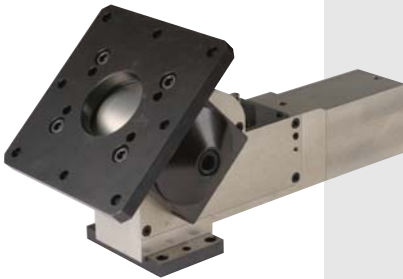
Position sensing: Optional

(Prox. switches for end positions)

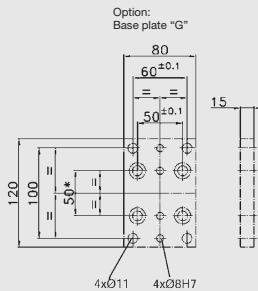
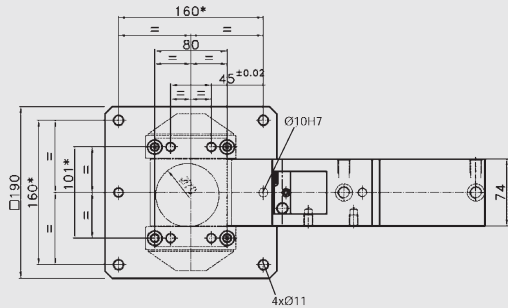
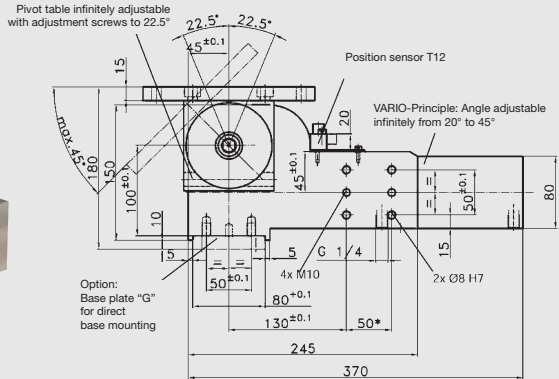
Control Pressure: min. 5 bar / max. 12 bar

Type	max. load weight	Air-connection	B1	L1	L2
SE 80	20 kg	G 3/8	min. 700	100	194
SE 100	25 kg	G 1/2	min. 700	100	194
SE 125	40 kg	G 1/2	min. 800	125	220

Pivot Unit KSW 63



- Compact style with fully enclosed high strength Aluminum body
- Drive: Ø 63 mm Pneumatic cylinder
- Energy transfer through toggle mechanism
- Locked end position
- Axial and radial needle bearings on drive shaft
- Infinite adjustment of pivot table
- Zero position
- Maximal pivot angle 45°
- Maximal pivot weight approx. 50 kg
- Optional integrated position sensors



Order Example:

KSW 63 G T12

↳ Type

↳ Option: with base

↳ Sensor type

Position Sensing:

...T00 without sensor
 ...T12 Inductive sensor 24 VDC with integrated LEDs, 1 12mm connector

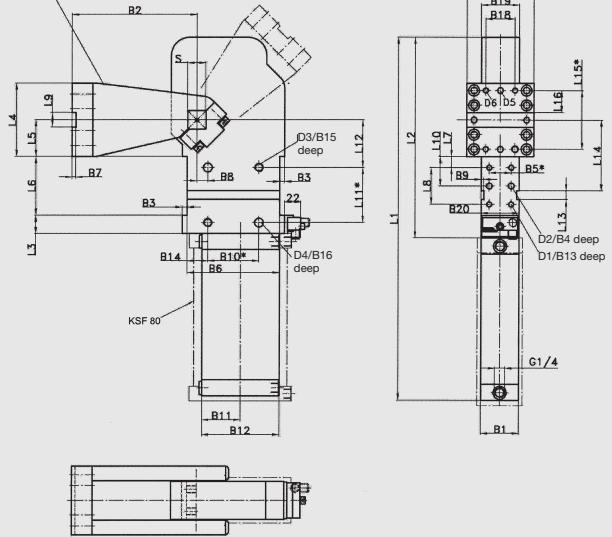
Weight: ~ 18 kg
 Torque through load weight: max. 60 Nm
 Max. load weight - Pivot table: 50 kg

Pivot Unit KSF...

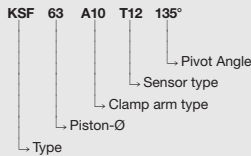


- Narrow form with flat cylinder
- Drive: Pneumatic Cylinder, equivalent to round 80 mm Dia.
- Energy transfer though toggle mechanism
- Locked end position
- Axial and needle bearings on drive shaft
- Maximal pivot angle 135°
- Optional integrated position sensors

Special pivot arms available upon request



Order Example:



Position Sensing:

- ...T00 without sensor
- ...T12 Inductive sensor 24 V, 1 connection with integrated LEDs isolated per DIN VDE 0100

Type	Torque at 6 bar	Equivalent Piston-Ø (mm)	Weight (kg)
KSF 63	100 Nm	63	approx. 17
KSF 80	160 Nm	80	approx. 19

Type	B1	B2	B3	B4	B5*	B6 ±0,1	B7	B8 ±0,05	B9	B10*	B11	B12	B13
KSF 63	52	170	7	12	30	126	5	15	3,5	70	53	106	15
KSF 80	62	170	7	12	30	126	5	15	3,5	70	70	140	15

Type	B14 ±0,1	B15	B16	B17	B18 ±0,1	B19*	B20	D1	D2 H7	D3	D4 H7	D5 H7	D6
KSF 63	28	12	12	92	40	52	54	M8	8	M12	12	8	M8
KSF 80	28	12	12	102	50	52	54	M8	8	M12	12	8	M8

Type	L1	L2	L3	L4	L5 ±0,05	L6 +0,1	L7 ±0,1	L8 ±0,2	L9 +0,1	L10 ±0,05	L11*	L12 ±0,05	L13 N9
KSF 63	544	267	30	100	50	80	15	50	20	40	75	65	12
KSF 80	614	267	30	100	50	80	15	50	20	40	75	65	12

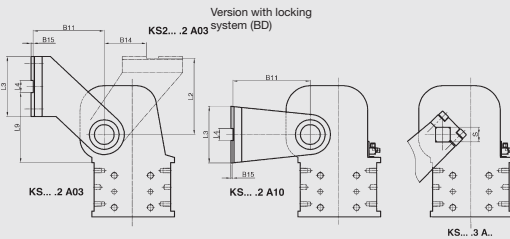
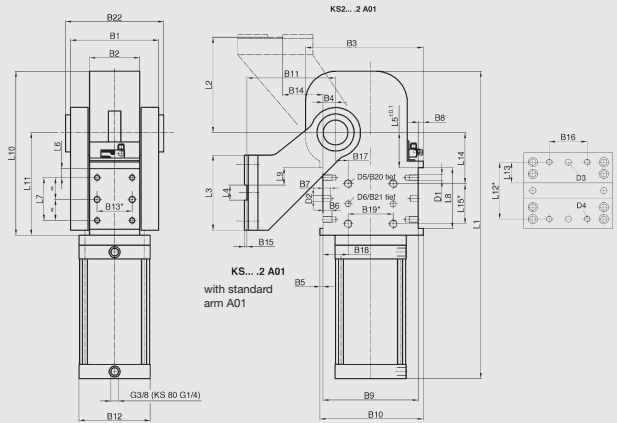
Type	L14	L15*	L16 ±0,1	S H9
KSF 63	96,5	80	30	27
KSF 80	96,5	80	30	27

Tolerance for dowel holes ±0,02, for threaded holes ±0,1

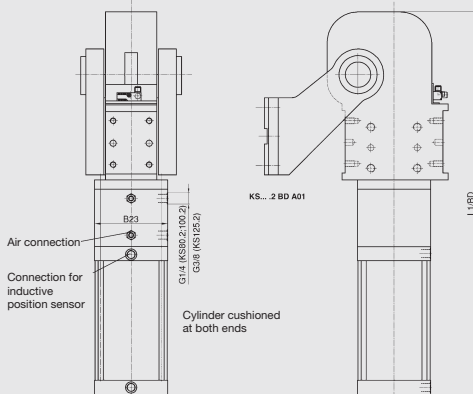
Pivot Unit KS... .2 / BD



- Compact style with fully enclosed high strength Aluminum body
- Drive: $\varnothing 80$, 200 mm Pneumatic cylinder
- Energy transfer though toggle mechanism
- Locked end position
- Axial and needle bearings on drive shaft
- Pneumatic cushions both ends
- Maximum Pivot Angle 135°
- Optional mechanical locking system (BD) for emergency stop
- Optional integrated position sensors



Version with locking system (BD)



Pivot Unit KS... .2 / BD



Position Sensing:

...T00 without sensor
 ...T12 Inductive Sensor 24 VDC,
 1 Connector, integrated LEDs

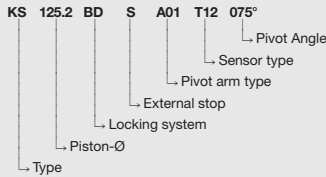
pivot angle:

Type KS... .2 A01: max. 120°
 Type KS2... .2 A01: max. 105°
 Type KS... .2 A03: max. 120°
 Type KS2... .2 A03: max. 60°

Bestellschlüssel Pivot arm typen:

...A00 without Pivot Arm
 ...A01 Standard Pivot Arm
 ...A03 Pivot Arm as Type A01 opposite
 ...A10 symmetrical Pivot Arm

Order Example:



Type	Torque** for Pivot-<90°	Torque by load weight	***Lateral Load Force max. (M)	Piston-Ø (mm)	Cylinder: R=round F=flat	Weight ~ (kg)
KS 80.2	180 Nm	90 Nm	360 Nm	80	F	28
KS 100.2	280 Nm	140 Nm	380 Nm	100	R	34
KS 125.2	500 Nm	250 Nm	1000 Nm	125	R	55
KS 160.2	830 Nm	410 Nm	1000 Nm	160	R	63
KS 200.2	1300 Nm	650 Nm	1000 Nm	200	R	70

Type	B1	B2 ±0,1	B3	B4	B5	B6	B7	B8	B9 ±0,1	B10	B11	B12	B13*
KS 80.2	145	80	180	20	8	18	12	8	140	156	155	140x62	50
KS 100.2	145	80	180	20	8	18	12	8	140	156	155	114	50
KS 125.2	176	100	235	25	10	16	12	10	190	210	190	142	70
KS 160.2	176	100	235	25	10	16	12	10	190	210	190	177	70
KS 200.2	176	100	235	25	10	16	12	10	190	210	190	218	70

Type	B14	B15	B16	B17 ±0,05	B18 ±0,1	B19*	B20	B21	B22	D1	D2 H7	D3 H7	D4
KS 80.2	55	5	60	10	30	85	16	10	175	M12	10	10	M12
KS 100.2	55	5	60	10	30	85	16	10	175	M12	10	10	M12
KS 125.2	80	5	80	20	45	100	16	12	206	M16	12	12	M16
KS 160.2	80	5	80	20	45	100	16	12	206	M16	12	12	M16
KS 200.2	80	5	80	20	45	100	16	12	206	M16	12	12	M16

Type	D5	D6 H7	L1 -	L1/BD -	L2	L3 ±0,1	L4 ±0,1	L5 ±0,1	L6 ±0,1	L7 ±0,1	L8	L9 -	L10 ±0,02
KS 80.2	M16	12	600	760	155	110	30	50	15	50	80	25	280
KS 100.2	M16	12	598	758	155	110	30	50	15	50	80	25	280
KS 125.2	M16	12	723	939	190	150	30	50	20	100	140	55	327
KS 160.2	M16	12	739	985	190	150	30	50	20	100	140	55	327
KS 200.2	M16	12	744	990	190	150	30	50	20	100	140	55	327

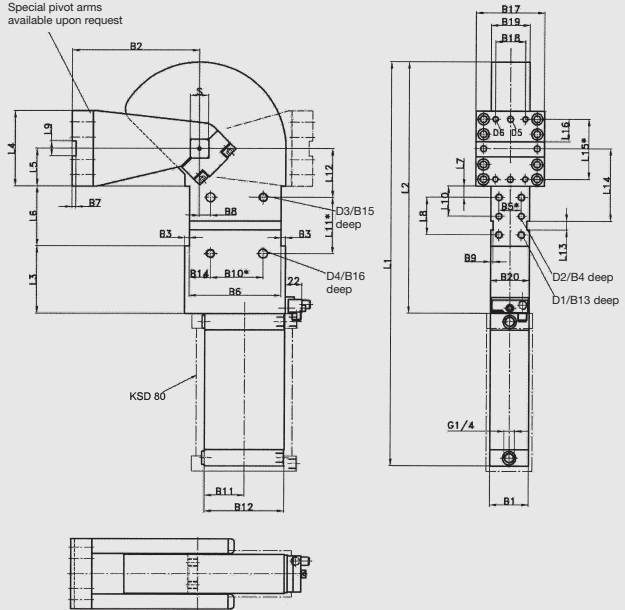
Type	L11	L12* ±0,1	L13 ±0,05	L14 *	L15
KS 80.2	178	90	30	85	60
KS 100.2	178	90	30	85	60
KS 125.2	205	90	30	85	60
KS 160.2	205	90	30	85	60
KS 200.2	205	90	30	85	60

Pivot Unit KSD... 180°



- Narrow form with 180° Pivot Angle
- Drive: Ø 63 and 80 mm pneumatic cylinder
- Energy transfer through toggle mechanism
- Locked end position
- Pneumatic cushions both ends
- Axial and needle bearings on drive shaft
- Maximum Pivot Angle 135°
- Optional integrated position sensors

Special pivot arms available upon request



Order Example:

KS 63 A10 T12 180°
 ↳ Type ↳ Piston-Ø ↳ Clamp arm type ↳ Pivot Angle

Position Sensing:

...T00 without sensor
 ...T12 Inductive sensor 24 VDC,
 1 Connector with integrated LEDs,
 insulated per DIN VDE 0100

Type	Torque at 6 bar	Equivalent Piston-Ø (mm)	Weight (kg)
KSD 63	100 Nm	63	approx. 20
KSD 80	160 Nm	80	approx. 22

Type	B1	B2	B3	B4	B5*	B6 ±0,1	B7	B8 ±0,05	B9	B10*	B11	B12	B13
KSD 63	62	170	7	12	30	126	5	15	3,5	70	53	106	12
KSD 80	62	170	7	12	30	126	5	15	3,5	70	70	140	12

Type	B14 ±0,1	B15	B16	B17	B18 ±0,1	B19*	B20	D1	D2 H7	D3	D4 H7	D5 H7	D6
KSD 63	28	12	12	92	40	52	54	M8	8	M12	12	8	M8
KSD 80	28	12	12	102	50	52	54	M8	8	M12	12	8	M8

Type	L1	L2	L3	L4	L5 ±0,05	L6 +0,1	L7 ±0,1	L8 ±0,2	L9 +0,1	L10 ±0,05	L11*	L12 ±0,05	L13 N9
KSD 63	730	340	90	100	50	80	15	50	20	40	75	65	12
KSD 80	730	340	90	100	50	80	15	50	20	40	75	65	12

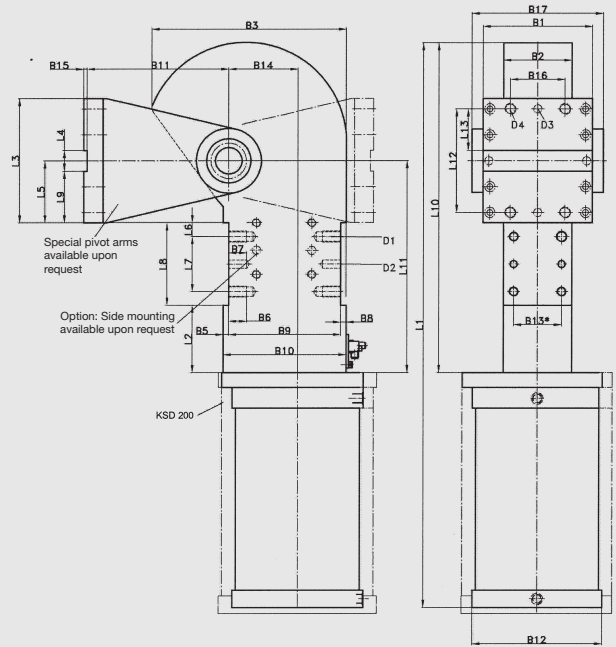
Type	L14	L15*	L16 ±0,1	S H9
KSD 63	96,5	80	30	27
KSD 80	96,5	80	30	27

Tolerance for dowel holes ±0,02, for threaded holes ±0,1

Pivot Unit KSD... 180°

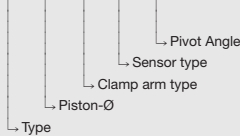


- 180° Series for heavy duty pivot applications
- Drive: Ø 200 mm Pneumatic cylinder
- Energy transfer through toggle mechanism
- Locked end position
- Pneumatic cushions both ends
- Axial and radial needle bearings on drive shaft
- Maximum Pivot Angle 135°
- Optional integrated position sensors



Order Example:

KSD 160 A10 T12 180°



Position Sensing:

- ...T00 without sensor
- ...T12 Inductive sensor 24 VDC, 1 Connector with integrated LEDs, insulated per DIN VDE 0100

Type	Torque at 6 bar	Equivalent Piston-Ø (mm)
KSD 160	800 Nm	160
KSD 200	1250 Nm	200

Type	B1	B2 ±0,1	B3	B5*	B6	B7	B8	B9	B10 ±0,1	B11	B12	B13*	B14
KSD 160	176	100	315	8	26	26	8	162	178	205	177	70	85
KSD 200	176	100	315	8	26	26	8	162	178	205	218	70	85

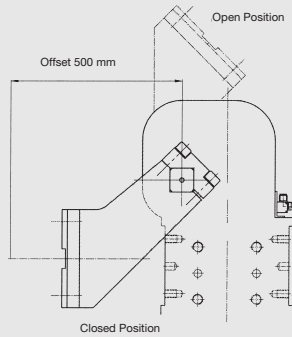
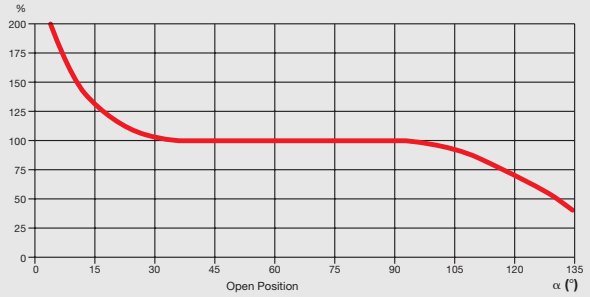
Type	B15	B16	B17	D1	D2 H7	D3 H7	D4	L1 -	L2	L3	L4 +0,1	L5 ±0,1	L6 ±0,1
KSD 160	5	80	206	M16	12	12	M16	1021	108	178	30	89	20
KSD 200	5	80	206	M16	1026	12	M16	1026	108	178	30	89	20

Type	L7 ±0,1	L8 +0,1	L9	L10 -	L11 ±0,02	L12*	L13
KSD 160	80	120	74	488	318	150	60
KSD 200	80	120	74	488	318	150	60

General Technical Data



Pivot Force related to Pivot Angle



Size	Medium Torque
80	180 Nm
100	280 Nm
125	500 Nm
160	830 Nm
200	1300 Nm

General Technical Data



Opening and closing time in relation to pivot angle

Area of Application / Explanations:

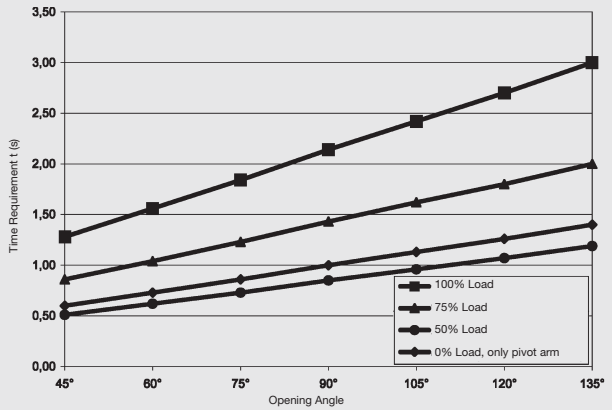
Line Pressure: 6 bar

Zero Position Pivot Arm:
Standard (see illustration)

Installation Position:
Vertical (see illustration)

All time shown:
Maximal required processing
time to open or close

Load Conditions (%):
Utilization of the max. allowable
torque at drive shaft, based on
weight load



Air consumption

for one complete open/close
cycle as related to the pivot angle

Type	Pivot Angle								
	15°	30°	45°	60°	75°	90°	105°	120°	135°
KS 80	0,17	0,24	0,30	0,35	0,41	0,47	0,53	0,59	0,62
	0,20	0,28	0,35	0,42	0,49	0,56	0,63	0,69	0,74
	0,37	0,52	0,65	0,77	0,90	1,03	1,16	1,28	1,36
KS 100	0,32	0,44	0,55	0,65	0,76	0,87	0,98	1,08	1,15
	0,35	0,48	0,60	0,72	0,83	0,95	1,08	1,19	1,27
	0,67	0,92	1,15	1,37	1,59	1,82	2,06	2,27	2,42
KS 125	0,57	0,79	0,98	1,17	1,36	1,56	1,76	1,94	2,07
	0,63	0,88	1,10	1,30	1,51	1,74	1,96	2,16	2,31
	1,20	1,68	2,08	2,48	2,87	3,30	3,72	4,10	4,38
KS 160	0,97	1,35	1,68	2,00	2,32	2,67	3,01	3,32	3,55
	1,03	1,44	1,79	2,14	2,48	2,85	3,21	3,54	3,78
	2,00	2,79	3,47	4,14	4,80	5,52	6,22	6,86	7,33
KS 200	1,54	2,16	2,69	3,20	3,74	4,27	4,84	5,31	5,67
	1,61	2,25	2,80	3,33	3,87	4,45	5,01	5,53	5,91
	3,15	4,41	5,49	6,53	7,58	8,72	9,82	10,84	11,58

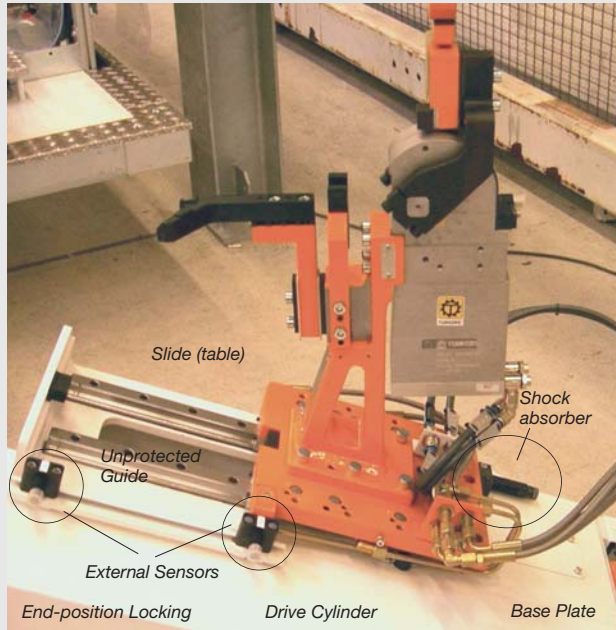
Sliding



- Linear Cylinder
- Slides
- Lifters

Sliding

Sliding of parts, clamping units, contour nests and complex assembly devices is normally accomplished in body assembly operations and other installations by pneumatic cylinders. The cylinder is only an element, which in conjunction with guides, stops, shock absorbers, connecting and mounting brackets, etc. becomes a complete unit; these are always unique and connected with considerable additional design cost.



Example of a individually designed linear actuator

Contrast this with a TÜNKERS ready to install Linear Actuator, which combines all required elements “Black-Box” style in one fully enclosed housing. This could be a linear cylinder, slide, lifter or lift table as a stand-alone unit, tailored to specific customer requirements based on TÜNKERS extensive “Body-in-White” experience.

Linear cylinder

Special pneumatic cylinder for guide applications to 100 mm stroke

Slides (Slide Units)

Units to slide loads up to approx. 50 kg with strokes of 200 to 500 mm

Lifters

Unit lift loads up to 100 mm stroke



Example TüNKERS Linear Unit SZKD 63



Linear Cylinder

The Tunkers linear cylinder combines in one compact housing the pneumatic drive cylinder, a very precise single or double bearing supported rod and an electronic position sensor. Additionally the V series units are equipped with a mechanical end position lock.

Design Features

Standard Version

High precision:

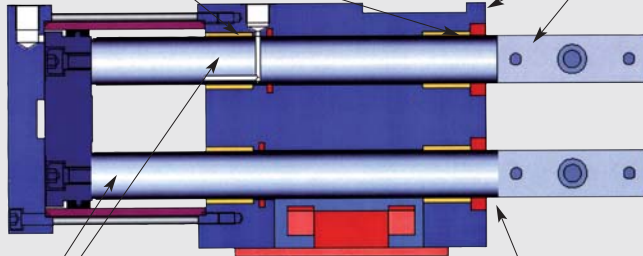
Wide positioning of the bearings provide the cylinder rod with solid guiding

No-play bronze-graphite bushings, manually fitted, provide precise guiding

One-piece guide/piston rod design keep the unit compact

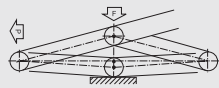
Inductive position sensor cartridge

Metal scraper protects piston rod for welding spatter

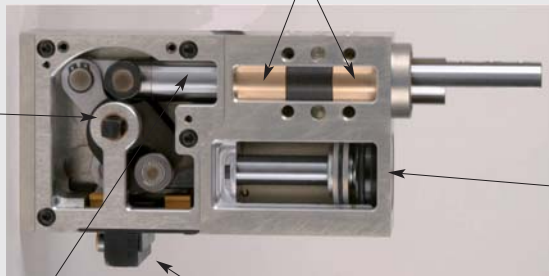


Mechanically End-Position Locked Version

Double bearing supported rod with bronze-graphite Bushings



rigid toggle locking mechanism with needle bearing support



Pneumatic-cylinder Ø 40 mm

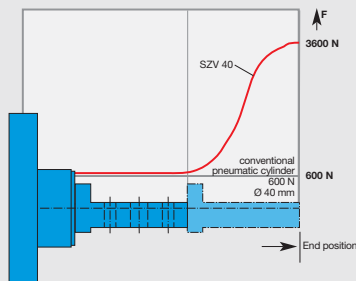


mechanical rotation prevention

Position sensing cartridge

Force curve with toggle mechanism

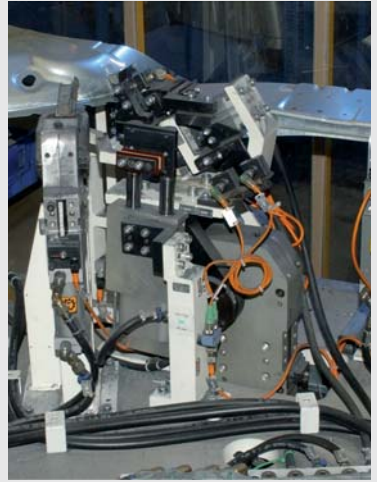
Higher push/pull force in the critical end position



Application Examples



as movable centering device



as lift unit for compact part transfer



Product Range



SZKD 40



SZKD 63



SZV 40.1



SZV 60



SZVD 50

Type	SZKD 40	SZKD 63	SZV 40.1	SZV 60	SZVD 50
Push/Pull Force in end position kN	0,6	1,4	4,0	8,0	4,6
Pre-stroke force kN	0,5	1,4	0,8	1,5	0,8
Stroke	40	40	40	60	40
Locking	Nein	Nein	Ja	Ja	Ja
Weight kg	1,4	5	3,5	9,2	7
Size mm	192x69x43	369x120x45	240x115x45	365x175x80	290x160x64



Slide Unit

Slide is applied as a cart or sled to accurately move loads up to max. 50 kg. Tankers slide units offer an extremely compact solution because the length is only 3 times the stroke; the piston rod acts a guide rod.

Application example

manually actuated slide to move clamp groups.



Example of Linear Unit

Design Features

Slide table is a complete building element with actuator, cylinder, linear guide, locking mechanism and base plate for applied tooling

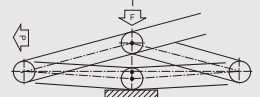
Linear guide with two precision rods, backlash free with custom fit Bronze / Graphite Bushings

End position sensor, front and rear

Screw and dowel constructed Aluminum plates base structure

Option: ACE shock absorber at end of stroke

Locking mechanism to assure end position



Application Examples

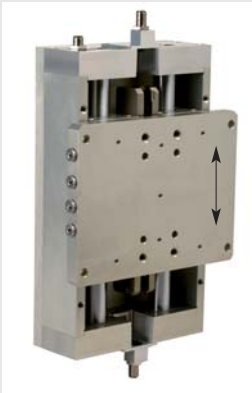


Optional:
Mechanism
R cover

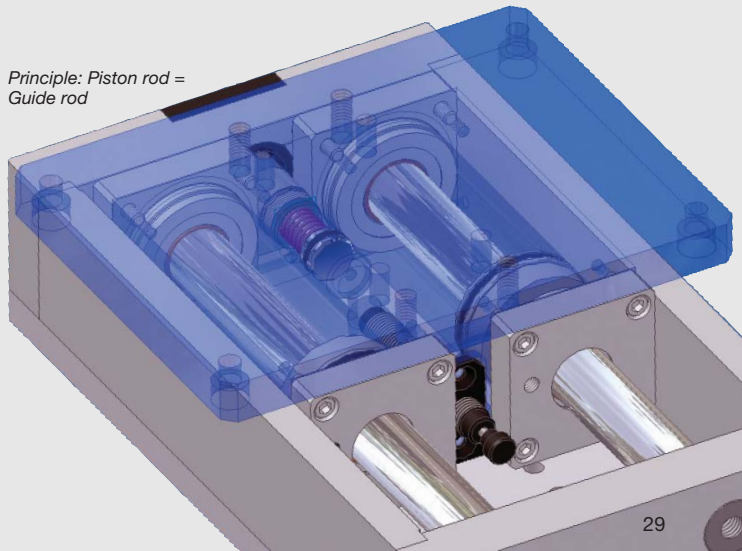
Standard Horizontal
Base housing below,
Slide top



Overhead Horizontal
Slide below, Base housing
top, acts as cover for the
mechanism

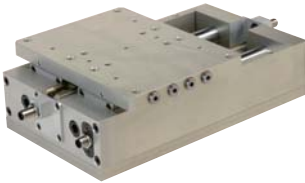


Vertical
Lift unit



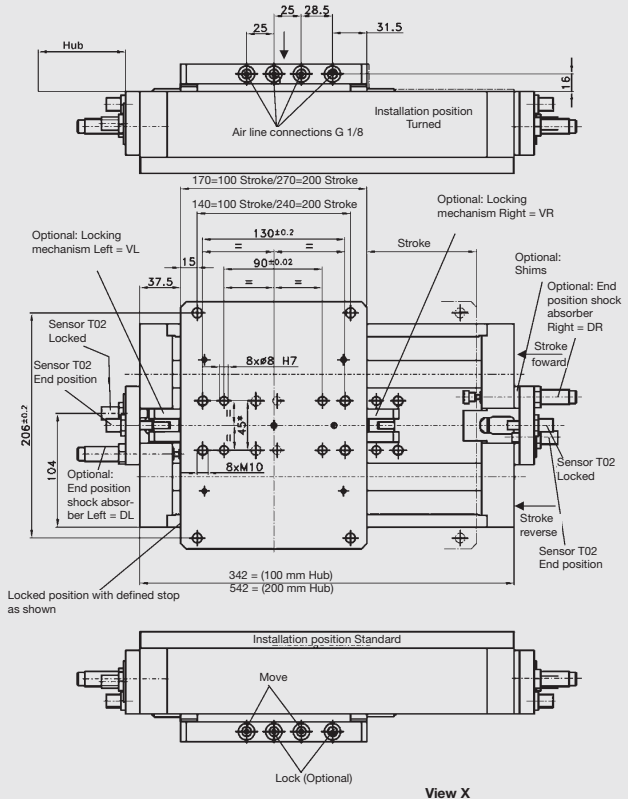
Principle: Piston rod =
Guide rod

Slide Unit LE 60



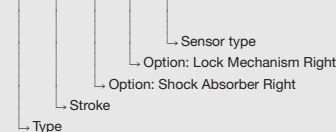
- Rigid housing, Aluminum plates with screw and dowel construction
- Slide guide 2 precision rods, 4 Bronze / Graphite Bushings for strokes to max. 200 mm
- 2 Pneumatic cylinders Ø 60 mm integrated in slide table providing a sliding force to 1700 N
- Position sensing both ends
- Optional damping of motion at end position with integrated industrial shock absorbers
- Optional mechanical end position locking through toggle lock arrangement

Electrically driven unit information available upon request



Order Example:

LE60 100 DR VR T02



Position Sensing:

...T00 without sensor
 ...T12 inductive Sensor 24 VDC
 2 Connectors without LED indicators

Weight: 100 mm Stroke = approx. 13,5 kg
 200 mm Stroke = approx. 16,8 kg

G max.: 30 kg
 M max.: 60 Nm
 Force at 5 bar = 1750 N

Position Sensing:

100 mm; 200 mm
 Reduced Strokes for LE 100 (50-100 mm) and for LE 200 (110-200 mm) upon request

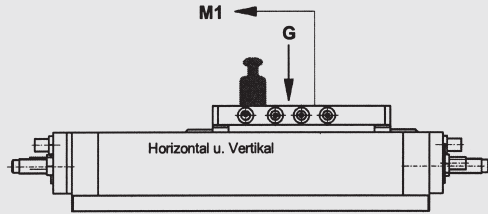
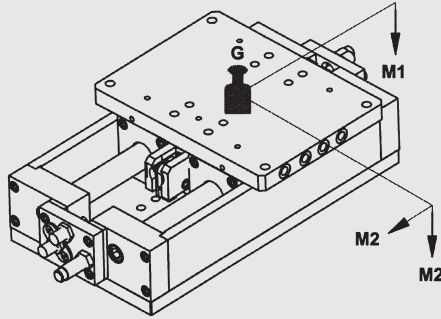
Option:

DR: Shock Absorber Right
DL: Shock Absorber Left
DR/L: Shock Absorber Right and Left
VR: Lock Mechanism Right
VL: Lock Mechanism Left
VR/L: Lock Mechanism Right and Left

Slide Unit LE 60

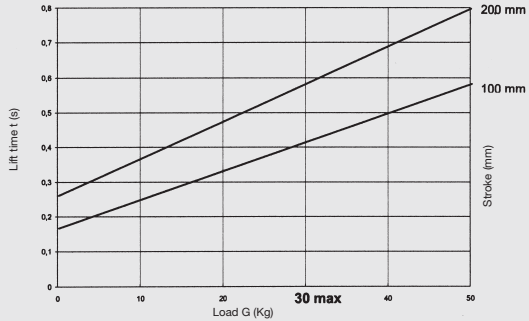


Cycle Time and Load Forces



Load:

- G = 30 kg
- M1 max. = 60 Nm
- M2 = 30 Nm

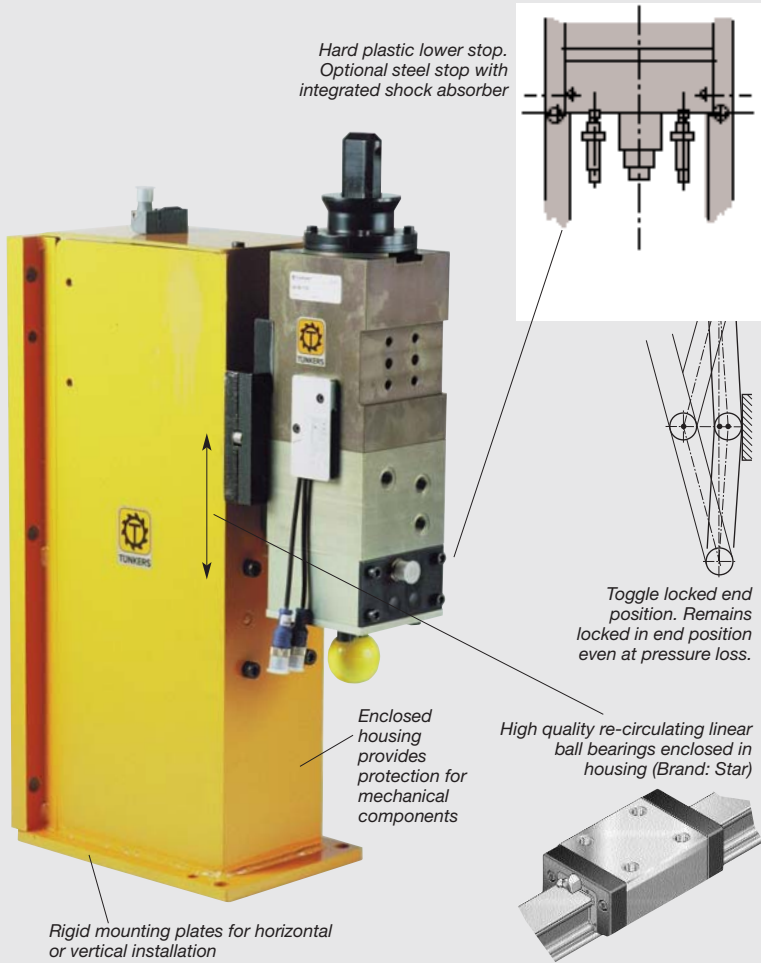


Cycle time given is guide only without valve switching time and without pressure build-up delay time at 5 bar. Control pressure (min. 4,5 bar; max. 8 bar)
For additional Information see the Data Sheet LE 60.

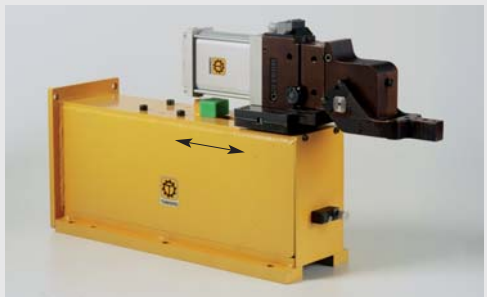
Lift Unit

Fully enclosed with drive and guide ways to lift weight up to 90 kg.

Design Features



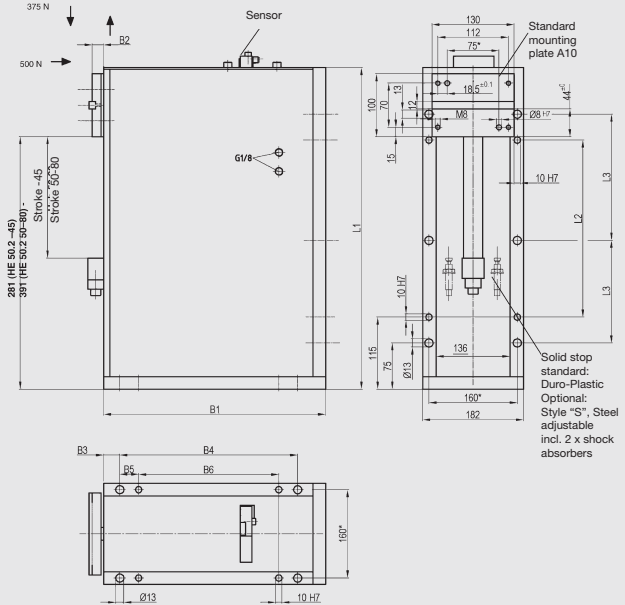
Lift F V
(375 shown above)
Lift Stroke 0-160 mm



Lift Unit HE 50.2 ... A..



- Solid, fully enclosed housing
- High quality re-circulating linear ball bearings enclosed in housing
- Driven by pneumatic cylinder Ø 50 mm
- End position locking by toggle-lock mechanism
- Position indicators at both ends
- Horizontal or vertical mounting



Order Example:

HE 50.2 S A10 T12



Position Sensing:

- ...T00 without sensor
- ...T12 Inductive sensor 24 VDC,
1 Connector with integrated LEDs

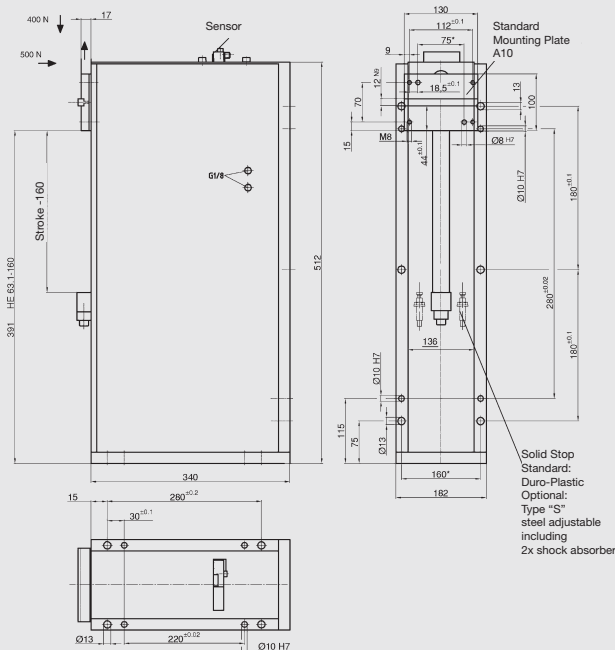
Type	Power Stroke	Piston-Ø (mm)	Lift Force N	Weight ~ (kg)
HE 50.2	0-45	50	375	32
HE 50.2	50-80	50	375	34

Type	B1	B2	B3	B4 ±0,1	B5 ±0,1	B6 ±0,02	L1	L2 ±0,02	L3 ±0,1
HE 50.2 0-45	220	17	15	170	20	125	405	220	150
HE 50.2 50-80	220	17	15	170	20	125	515	320	200

Lift Unit HE 63.2 ... A..



- Solid, fully enclosed housing
- High quality re-circulating linear ball bearings (Brand: Star) enclosed in housing
- Driven by pneumatic cylinder Ø 63 mm Diameter
- End position locking by toggle-lock mechanism
- Position indicators at both ends
- Horizontal or vertical mounting



Order Example:

HE 63.2 S A10 T12



Position Sensing:

- ...T00 without sensor
- ...T12 Inductive sensor 24 VDC, 1 Connector with integrated LEDs

Type	Power Stroke	Piston-Ø (mm)	Lift Force N	Weight ~ (kg)
HE 63.2	80-160	63	400	38

Lift Table HT 80

Lift Unit with Crank Arm Drive to lift loads to max. 100 kg, locking in both end positions

Design Features

Retracted Position



Four guide posts with maintenance free Sankyo-Bushings assure reproducible lifting motion

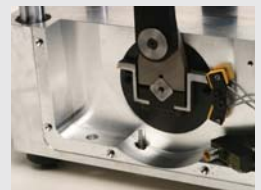
Extended Position



End position locking by crank moving past Zero in both directions

Rigid Aluminum housing with pneumatic drive for the 180° crank

Crank action provides linear lifting motion in a harmonic, sine-form motion and assure soft movement in the end positions

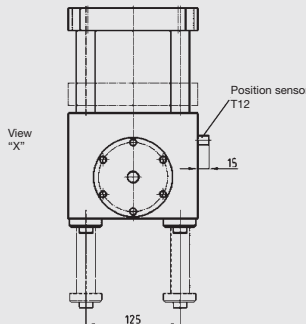
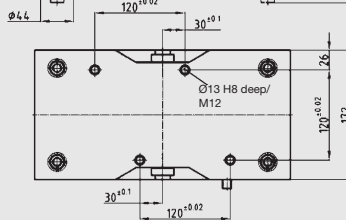
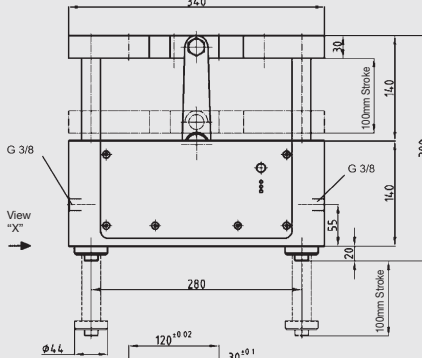
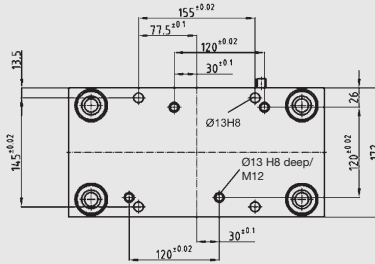


Position sensor on drive shaft

Lift Table HT 80...



- Solid, fully enclosed housing
- High quality re-circulating linear ball bearings (Brand: Star) enclosed in housing
- Driven by two pneumatic cylinders Ø 80 mm
- Four rigid guide posts with Bronze-Graphite Bushings
- Top plate hole pattern optional
- Position indicators at both positions



Available with electrical drive upon request



Order Example:

HT 80 100 T12
 ↳ Type ↳ Stroke ↳ Sensor type

Position Sensing:

...T00 without sensor
 ...T12 Inductive sensor 24 VDC,
 1 Connector with integrated LEDs

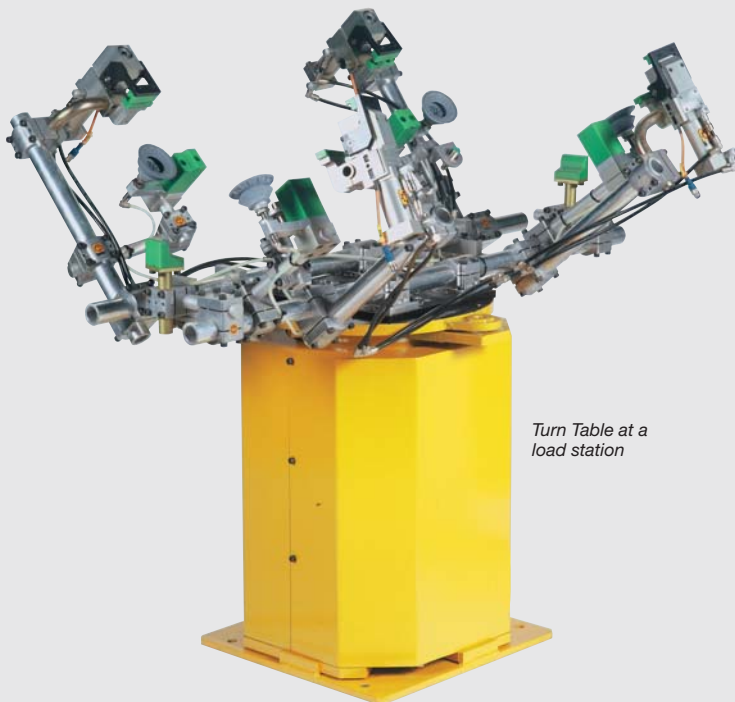
Stroke: 100 mm
 Weight: - 30 kg
 Lift Force at 5 bar: 1000 N

Turning

Turning

Turning

Movement of complex parts, fixtures and containers weighting up to tons within a defined workstation is the primary function on TUNKERS Turn- and Tip tables. Typical applications are load stations where the part is loaded manually onto the unit and then rotated 180° into the work position. An additional example is the movement of parts to two defined positions in part transfer stations.



Turn Table at a load station

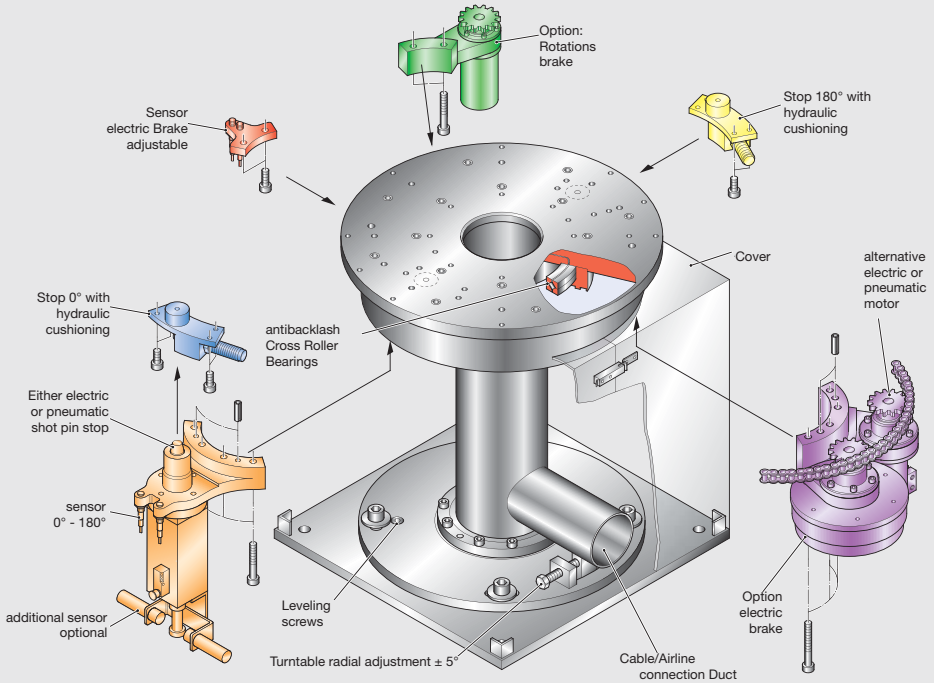
Solid construction, using rigid components assure that the TUNKERS Turn- and Tip Tables are designed to have a product life of up to 1 Million cycles. High quality Cross Roller Bearings assure precise motion and backlash free positioning. The modular construction allow modular setup of the unit from a simple manual turntable to electrically or pneumatically units for continuous, unidirectional or back and forth motion.



Design Features

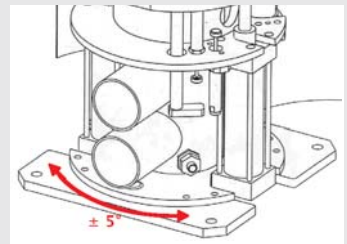
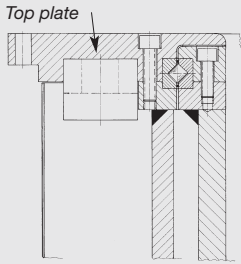
Turntable TD-Series

Alternatively available for either manual, electric or pneumatic operation.



Simple Adjustment

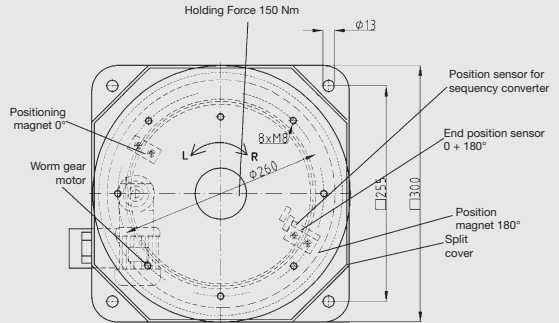
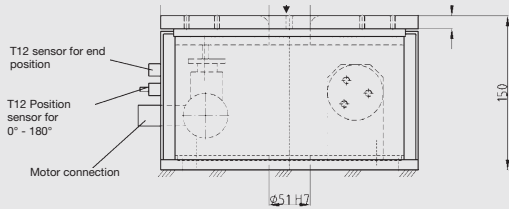
The complete turntable is mounted centrally on the base plate. Special adjustment screws permit turntable to be adjusted to the base plate $\pm 5^\circ$ at installation



Turntable TD 05..



- Base/Housing:
Heavy duty welded steel construction
- Designed for reversing or continuous motion operation
- Ball bearing mounted top plate
- Max. load 5 kN
- Three-phase Gear Motor with integrated brake, actuating the turning plate via a radial gear rack.
- Mechanical end position locking



Order Example:

DT 05 T12
 ↳ Type ↳ Sensor type

Technical Data:

Three-phase gear motor with integrated brake
 400/230 V; 2680 RPM; Output 87,6 W ; 50 Hz ; IP 54

Positioning magnets for 0° and 180°:
 Output 9 W; 100% ED ; 24 V DC ; IP 65
 Holding Force 150 Nm

Position sensors 1; 1 each for end position 0° and 180°
 T12 Inductive sensor 24 VDC, one connector with integrated LED's, insulated per DIN VDE 0100
 Switch position adjustable

Position sensors 2; for control of gear motor with frequency converter (Optional)
 T12 Inductive sensor 24 VDC, one connector with integrated LED's, insulated per DIN VDE 0100
 Switch position adjustable

The turntable is maintenance free, mountable in any position
 Split, side mounted cover for access of control of internal components

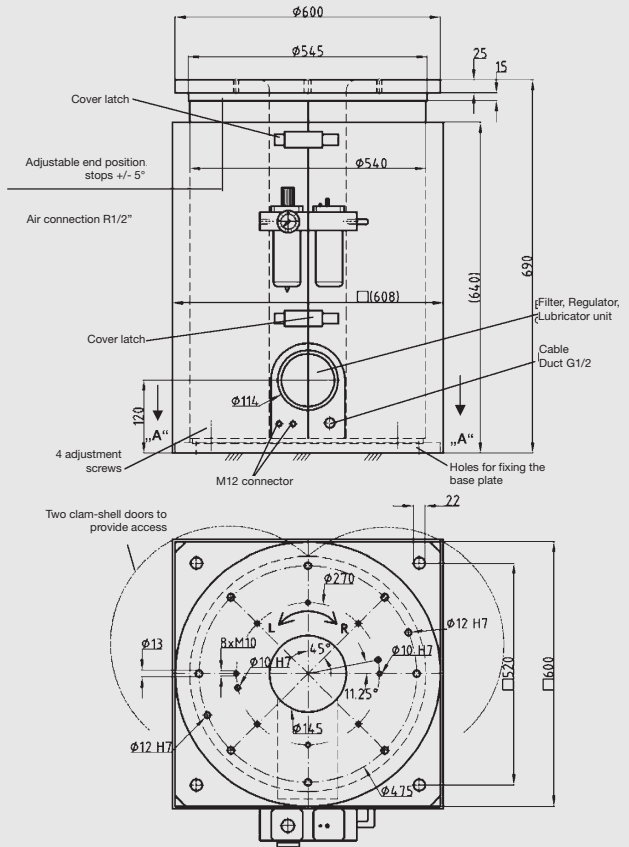
Turntable weight: ~31Kg

Cycle Time: 0° - 180° in 6 sec.

Turntable TD 20



- Base/Housing:
Heavy duty welded steel construction
- Heavy duty Cross Roller Bearing on turning plate
- Either Electric or Pneumatic operation
- Continuous or reversing ($\pm 180^\circ$) motion
- Central duct for cables, air lines and suction
- Industrial shock absorbers at both end positions
- Max. load 20 kN
- End position pneumatic or electric shot pin



Order Example:

TD 20 T12
 ↳ Sensor type
 ↳ Type

See separate Data Sheet for pneumatic layout

See separate Data Sheet for electrical schematic

Mass moment of inertia: ~0,22 Kg/m²
 (for all turning parts)

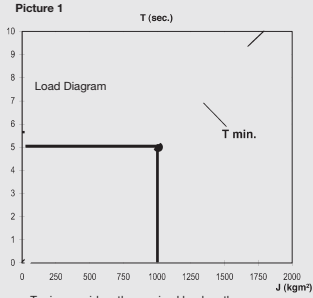
Position Sensor

...T12 Inductive sensor 24 VDC, one connector with integrated LED's, insulated per DIN VDE 0100

Technical Data Turntable

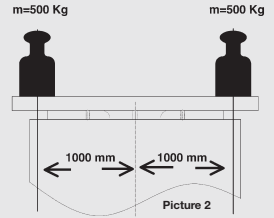


Cycle timing diagram
for 180° turning



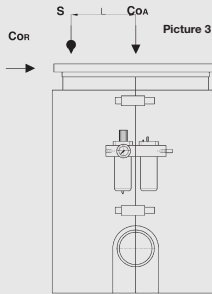
T min. considers the maximal load on the driving mechanism as well as a brake time at optional emergency brake of <1sec

Determination of the minimum cycle time

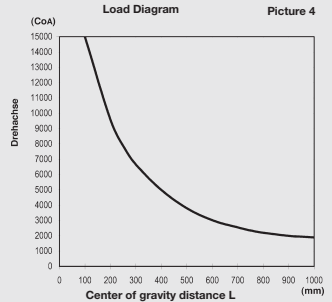


Example:
 $2 \times 500 \text{ Kg} \times 1000 \text{ mm} = 1000 \text{ Kg/m}^2$ from diagram = $1000 \text{ J} = T \text{ min.} = 5.8 \text{ seconds}$

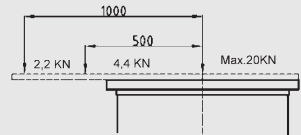
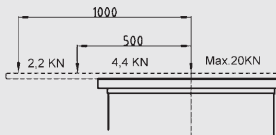
Static load number of the turntable bearings



CoA = 15000 N
COR = 3500 N
Higher loads possible upon request.



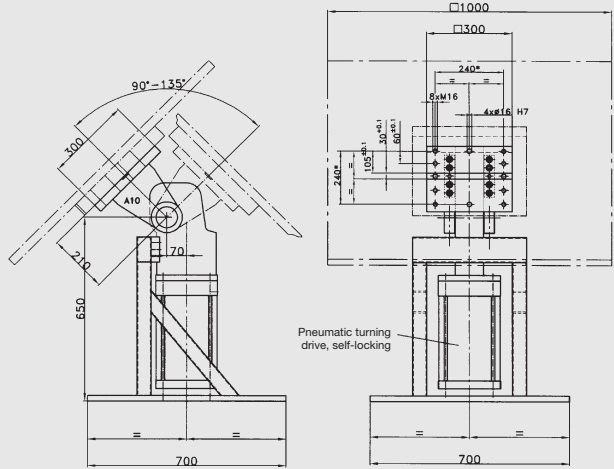
Turning Axis



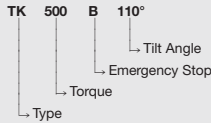
Tilt Table TK 180-1300



- Welded steel frame construction
- Actuated by compact KS Series Pivot Unit
- End position lock through toggle mechanism
- Defined, reproducible end position
- Mounting plate with standard hole pattern
- Maximal tilt angle 135°
- Applicable for loads from approximately 20 to 200 kg



Order Example:



Standard Tilt Angle:

60°; 90°; 135°

Option:

Emergency Stop Device „B“

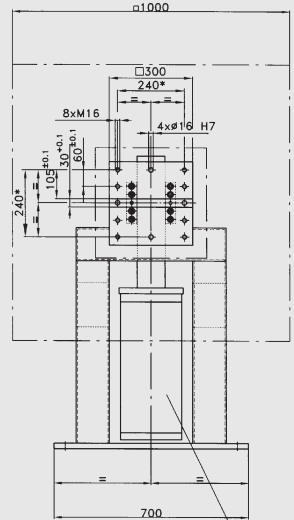
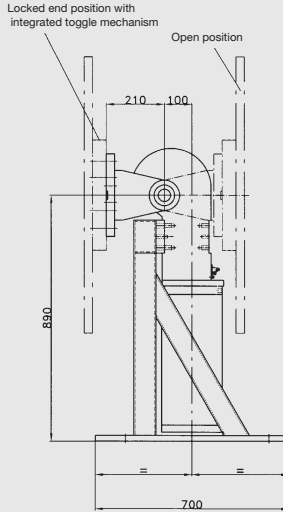
*Center of gravity (approximately 500 mm from tilt axis)

Type	Torque at max. 10 bar (8 bar TK 180)	max. load weight*
TK 180	180 Nm	90 Nm
TK 280	280 Nm	140 Nm
TK 500	500 Nm	250 Nm
TK 830	830 Nm	410 Nm
TK 1300	1300 Nm	650 Nm

Tilt Table TW 800-1250

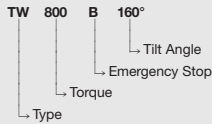


- Welded steel frame construction
- Actuated by compact KS Series Pivot Unit
- End position lock through toggle mechanism
- Defined, reproducible end position
- Mounting plate with standard hole pattern
- Maximal tilt angle 180°
- Applicable for loads from approximately 50 to 150 kg



Pneumatic turning drive, self-locking

Order Example:



Option:
Emergency Stop Device „B“

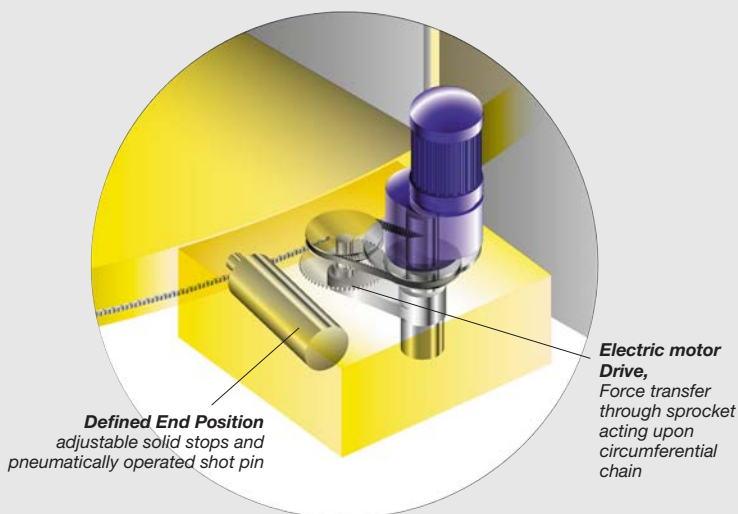
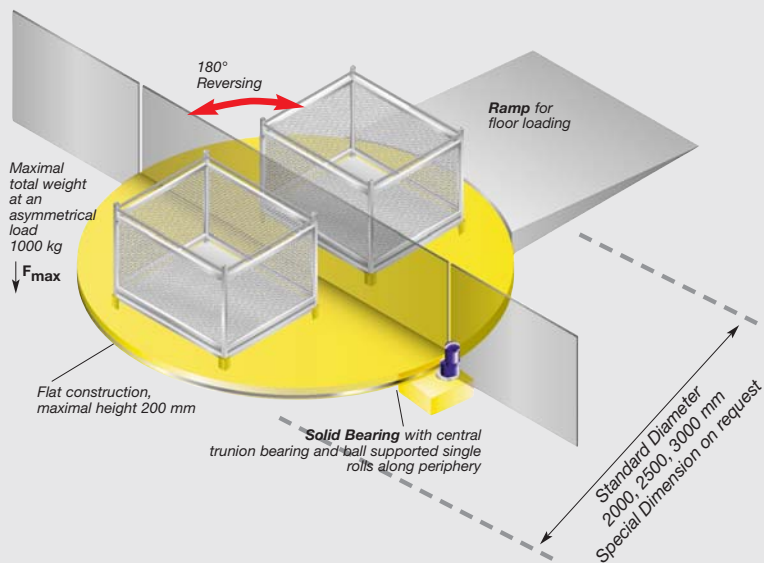
*Center of gravity (approximately 500 mm tilt axis)

Type	Torque at max. 10 bar	max. load weight*
TW 800	800 Nm	approx. 80 kg
TW 1250	1250 Nm	approx. 125 kg

Turning

Turning Plate

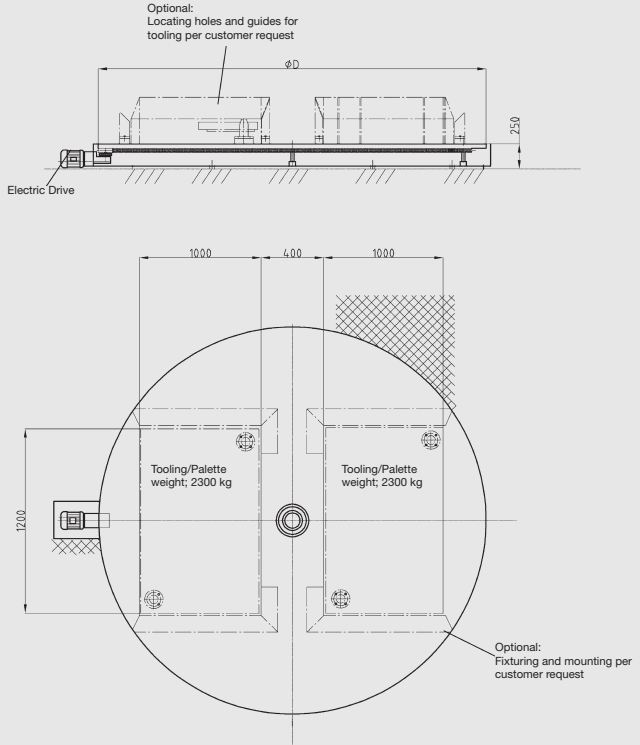
Electrically actuated turning device to move standard containers, parts or fixtures in an enclosed work area (Robotic cell)



Turning Plate DT ...



- Welded steel construction turning plate. A circumferentially mounted chain provides the motion through a sprocket.
- Central axial and radial bearings are designed for a maximum load of 1500 kg.
- Edge positioned support rollers are roller bearing mounted, lubricated for life, move on the base rail.
- Drive is a three-phase motor with a flanged reducer. A heavy duty sprocket transfers the motion to the circumferentially mounted chain.
- End positions locked by shot pin, SA50, with includes T12 position sensor.
- End position sensing with one sensor cartridge at each end.
- max. 180° turning for reversing operation
- Fixture Mounting
The standard turning plate is equipped with locating holes and gating guides to assure repeatable mechanical positioning of the holding fixtures. Layout of these locating devices can be individualized.



Order Example:

DT 3500
 ↳ Turning Plate Diameter D
 ↳ Type

Turning Angle:

Standard: 180°

Other turning angles upon request.

*All turning plates can be loaded by fork trucks. The maximum load can also be positioned on one side of the platform. In the end position the platform is locked and position can be sensed electrically.

Type	Turning Angle	Cycle Time for 180°	Max. added Load*	Voltage choice of	Total Weight	Diameter mm
DT 3000	180°	12 sec.	1000 K	220/380 V	1700 kg	3000
DT 3500	180°	12 sec.	1200 K	220/380 V	2000 kg	3500
DT 3800	180°	12 sec.	1500 K	220/380 V	2400 kg	3800



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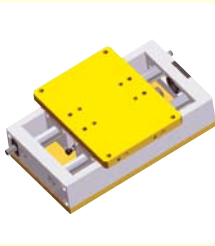
Automation Tooling Construction

Additionally to motion systems, TUNKERS offers you turnkey automation solutions for all functions in the construction and application of Body in White tooling.



Clamping Devices

Pneumatic and electrically actuated tooling to clamp, position, position clamp and position hold.



Motion Devices

Turnkey systems to slide, lift, tilt and turn tooling components.



Forming Devices

X- and C-frame units for punching, piercing, forming, pierce nut setting, marking and coining



Welding Devices

Toggle weld guns for spot welding as stationary, pedestal and manual units



Gripping Devices

Robotic grippers in modular design to handle body-in-white parts in moving and welding, as well as in complete geostation applications.