

900⁺

The new series with direct drive

NEW



pl

DD series

All technical data tentative

7/2019 | EN

For millturn applications or for 5-axis simultaneous machining: **up to 5'450 rpm**

pl LEHMANN[®]

Innovative CUBE-design based on 10 years of experience with DD technology: fully sealed, super-fast, safe, versatile and service-friendly – for Industry 4.0

Transport and attachment holes

- + Screw holes for transport
- + may be used for fixtures, tool monitoring, measuring probes

Prepared for water cooling

At high speeds and long duty cycles or for dry machining, it may be necessary to connect a cooling unit in addition to good external cooling (cooling lubricant)

Universal spindle nose

- + Large mounting \varnothing 130 mm (outside)
- + Large through-bore \varnothing 64 mm

Innovative sealing system

- + Labyrinth seal front and back
- + Backed by lip seal front and back that contacts only at standstill or low speeds
- + This provides 100% leak tightness to IP67
- + Maximum possible efficiency
- + Lowest possible heat generation

Spindle bearing

- + high-quality, preloaded spindle bearings
- + designed for very high rpm values
- + lifetime-lubricated

Spindle clamping with fail-safe function

- + on large diameter
- + energyless clamping



Productivity and availability increase,
downtime and maintenance costs decrease



Bluetooth®, Ethernet,
web server

Rugged cast housing



Mobile base plate

- + Steel
- + 3 sides accessible for mounting at all times
- + Cable outlet direction selectable (also at a later date)

PL-iBox – for real Industry 4.0

Helps to increase productivity and availability, lower downtime and maintenance costs and permits quick troubleshooting and preventive maintenance.

Sensors for ...

- + Speed
- + Internal pressure
- + Temperature
- + Humidity
- + Shock / impact
- + Limit value exceeded with real-time stamp

New features with version 4.3

Components

- + Faster microprocessor
- + 3D acceleration sensor (previously 2D) – shock sensor

Monitoring

- + Duty cycle limit – overload protection, prevents motor damage

Interfaces

- + Bluetooth – set parameters and read out data via smartphone and app
- + Web server with Ethernet and RJ45 port – display state/error on CNC
- + Input for current sensor

Prepared for options

- + External WLAN- or GSM module
- + External, better vibration sensor with additional DSP
- + E-mail notification, e.g. of error messages

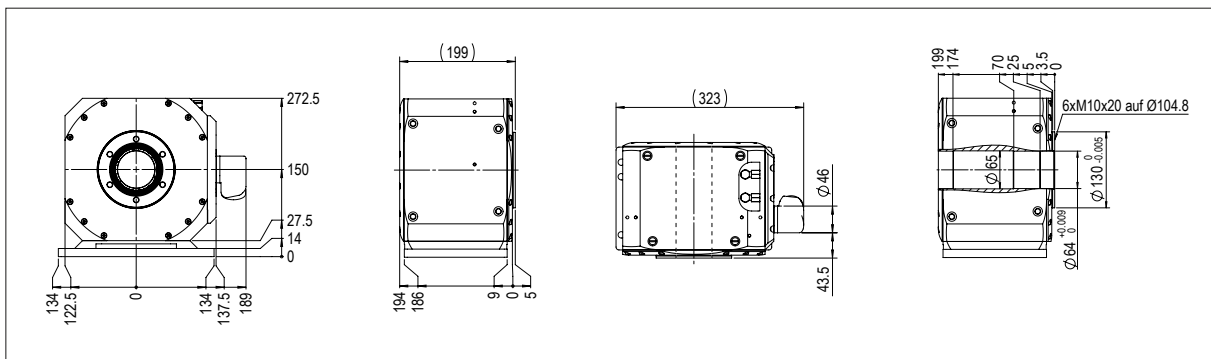
See main catalog for details

Highlights

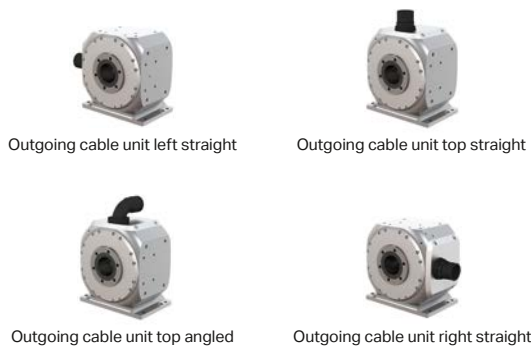
- + For millturn applications
(e.g. watch cases from bar stock)
- + Modular concept in Cube design
- + Very **compact**
- + DD up to **5'450 rpm** (without flux weakening function: max. 2'590 possible)
- + Interfaces **Fanuc, Siemens, Mitsubishi, Yaskawa, BISS**



With RFX 600 on Robodrill. Fits perfectly on an L-machine



Outgoing cable unit variants



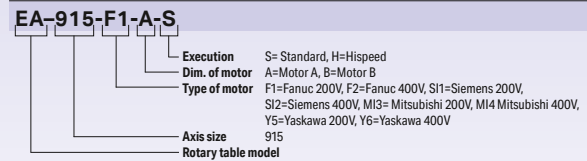
General technical data

		EA-915 DD	
Weight		kg	79
Spindle through-bore		mm	64
Clamping torque		Nm	820
Spindle load (max. permissible)	without support	kg	100
	with support	kg	200
Axial force (max. permissible)		kN	40
Pull-out torque		Nm	500
Moment of inertia (max. permissible)		kgm ²	1
Positioning accuracy +/-		arc sec	3
Repeat accuracy +/-		arc sec	1
Cycle time 90° (approx. value)		sec	0.1

Features

- + Angular encoder direct **+/- 3 arc sec.**
- + Fail-safe clamping integrated
- + Fully sealed **IP 67**
- + Workpiece clamping system can be retrofitted with **clamping cartridges**

Item no.



Motor data 915 also applies to dividing axis on T-type rotary tables, p. 6–8

Calculated, theoretical values; subject to change.

Motor A (water-cooled, internally or externally)

	Manufacturer	peak current servo [A]	max speed with flux w. [min ⁻¹]	max speed without flux w.	peak torque without flux w. [Nm]	intermittent torque with flux w. at 2'000 min ⁻¹ [Nm]	continuous torque without flux w. at max speed [Nm]			
								ED5%	ED40%	ED100%
200 V	Standard Type	Fanuc	40	-	2'010	64	21	21		
		Fanuc	80	-	2'010	68	36	34		
		Siemens	36			not available				
		Siemens	56			not available				
		Mitsubishi				on request				
		Mitsubishi				on request				
	High speed Type	Yaskawa				on request				
		Yaskawa				on request				
		Fanuc				on request				
		Fanuc				on request				
		Siemens	36			not available				
		Siemens	56			not available				
		Mitsubishi				on request				
		Mitsubishi				on request				
400 V	Standard Type	Fanuc	40	3,000	3,000	64	18	18		
		Fanuc	80	3,000	3,000	68	36	34		
		Siemens	36	3,370	3,370	58	29	29		
		Siemens	56	3,370	3,370	68	48	34		
		Mitsubishi								
		Mitsubishi								
	High speed Type	Yaskawa				on request				
		Yaskawa				on request				
		Fanuc				on request				
		Fanuc				on request				
		Siemens	36			on request				
		Siemens	56			on request				
		Mitsubishi				on request				
		Mitsubishi				on request				

Motor B (water-cooled, internally or externally)

	Manufacturer	peak current servo [A]	max speed with flux w. * [rpm]	max speed without flux w.	peak torque without flux w. [Nm]	intermittent torque with flux w. * at 2'000 rpm [Nm]	continuous torque without flux w. at max speed [Nm]			
								ED5%	ED40%	ED100%
200 V	Standard Type	Fanuc	40	2,150	1,200	107	35	35		
		Fanuc	80	2,150	1,200	118	60	60		
		Siemens	36			not available				
		Siemens	56			not available				
		Mitsubishi				on request				
		Mitsubishi				on request				
	High speed Type	Yaskawa				on request				
		Yaskawa				on request				
		Fanuc	40	3,000	818	121	50	50		
		Fanuc	80	3,000	818	121	87	81		
		Siemens	36			not available				
		Siemens	56			not available				
		Mitsubishi				on request				
		Mitsubishi				on request				
400 V	Standard Type	Fanuc	40	2,770	2,590	107	31	31		
		Fanuc	80	2,770	2,590	118	60	60		
		Siemens	36	2,770	2,590	96	48	48		
		Siemens	56	2,770	2,590	118	80	62		
		Mitsubishi				on request				
		Mitsubishi				on request				
	High speed Type	Yaskawa				on request				
		Yaskawa				on request				
		Fanuc	40	3,000	1,760	121	44	44		
		Fanuc	80	3,000	1,760	121	87	81		
		Siemens	36	5,450	1,760	121	69	69		
		Siemens	56	5,450	1,760	121	105	81		
		Mitsubishi				on request				
		Mitsubishi				on request				

* on Fanuc, a special servo and an additional module are needed for operation with «with flux weakening» (does not have space in Robodrill cabinet); check with Fanuc

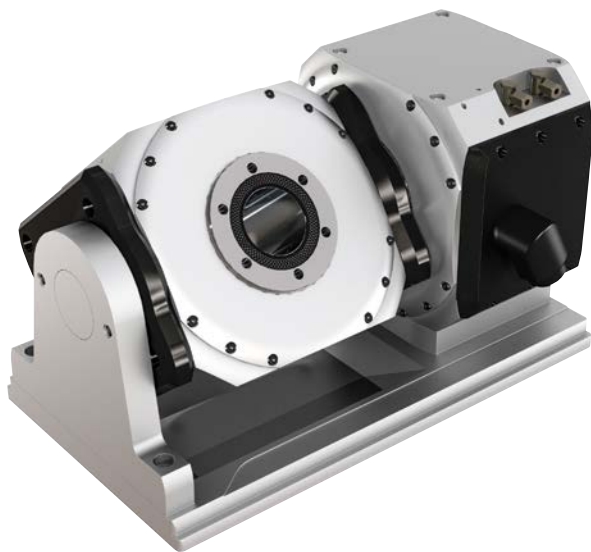
Highlights

- + 5-axis simultaneous machining (e.g. impellers)
- + Both axes use DD technology (dividing axis as on EA-915 DD, tilting axis reduced)

Item no.

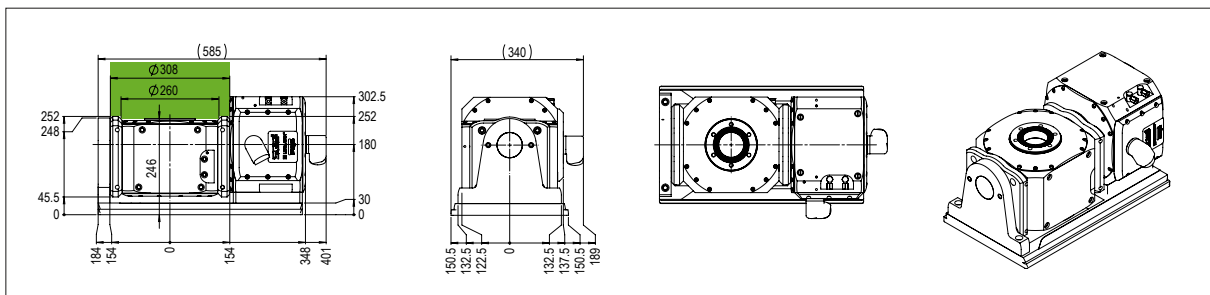
T1-915915-F1-A-S

Execution	S= Standard, H=Higspeed
Dim. of motor	A=Motor A, B=Motor B (see page 5)
Type of motor	F1=Fanuc 200V, F2=Fanuc 400V, S1=Siemens 200V, S12=Siemens 400V, M13= Mitsubishi 200V, M14 Mitsubishi 400V, Y5=Yaskawa 200V, Y6=Yaskawa 400V
Swiveling axis size	915
Dividing axis size	915
Rotary table model	



Both axes with direct drive

- + Maximum workpiece \varnothing 308 mm
- + Minimum length 585 mm
- + Vertical spindle height 246 mm or 216 mm (without base plate)



General technical data

Drive data rotary axis see page 5

			T1-915915 TAP9	
Weight (aluminum base plate)			kg	182 (166)
Spindle through-bore			mm	64 (42*)
Clamping torque	4 th axis		Nm	820
	5 th axis		Nm	820
Spindle load (max. permissible)			kg	30
Axial force (max. permissible)			kN	40
Pull-out torque			Nm	500
Moment of inertia (max. permissible)			kgm ²	1
Positioning accuracy +/-			arc sec	3
Repeat accuracy +/-			arc sec	1
Cycle time 90°	4 th axis		sec	0.1
	5 th axis		sec	not yet available

* with motor type B

Mounting on Robodrill

With elegant support (on request)



Dividing axis positioned exactly in middle table slot

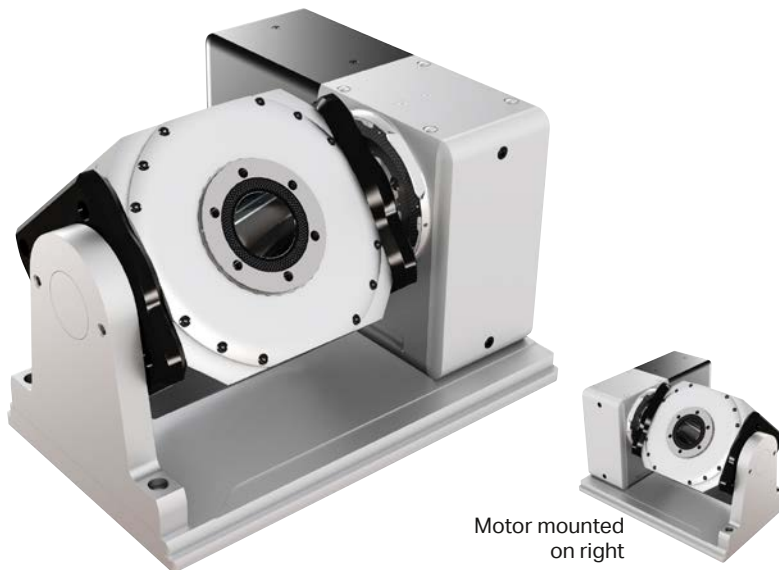
Highlights (for tilting axis)

- + Strong gear unit
- + Spindle clamping 2000 Nm
- + No controller adjustment when load changes
- + Backlash free thank to PGD

Item no.

T1-915520-F1-A-S

Execution	S= Standard, H=Hisppeed
Dim. of motor	A=Motor A, B=Motor B (see page 5)
Type of motor	F1=Fanuc 200V, F2=Fanuc 400V, S1=Siemens 200V, S12=Siemens 400V, M13= Mitsubishi 200V, M14 Mitsubishi 400V, Y5=Yaskawa 200V, Y6=Yaskawa 400V
Swiveling axis size	520
Dividing axis size	915
Rotary table model	

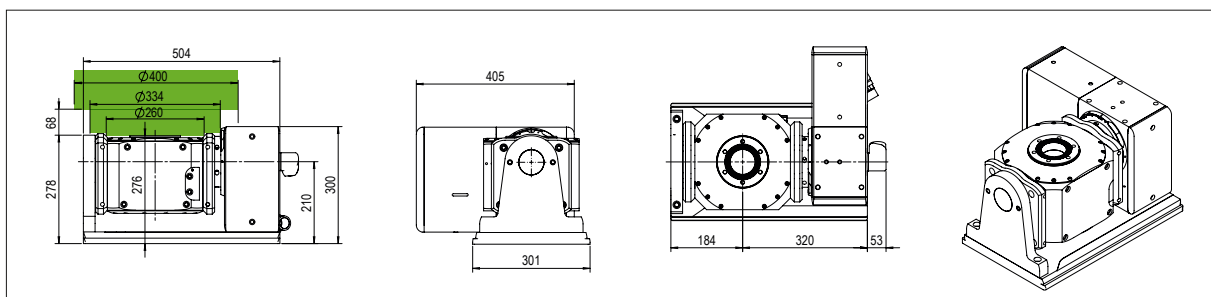


Motor mounted on right

Dividing axis with direct drive

Tilting axis with rugged gear unit (asymmetric; motor at right also possible)

- + Maximum workpiece Ø 400 mm
- + Minimum length 504 mm
- + Vertical spindle height 276 mm or 246 mm (without base plate)



General technical data

Drive data rotary axis see page 5, tilting axis see page 9

			T1-915520 TAP5	
Weight (aluminum base plate)			kg	173 (155)
Spindle through-bore			mm	64 (42*)
Clamping torque	4 th axis		Nm	820
	5 th axis		Nm	2'000
Spindle load (max. permissible)			kg	90
Axial force (max. permissible)			kN	40
Pull-out torque			Nm	500
Moment of inertia (max. permissible)			kgm ²	1
Positioning accuracy +/-			arc sec	3
Repeat accuracy +/-			arc sec	1
Cycle time 90°	4 th axis		sec	0.1
	5 th axis		sec	not yet available

* with motor type B

Mounting on Robodrill

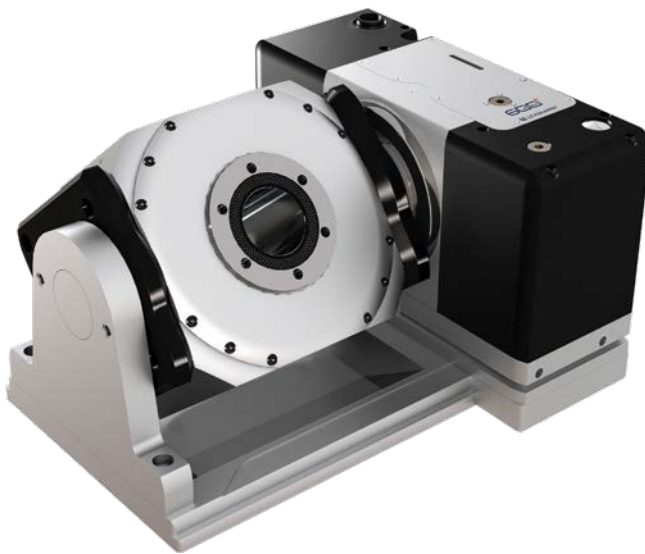
With elegant support (on request)



Dividing axis positioned exactly in middle table slot

Highlights (for tilting axis)

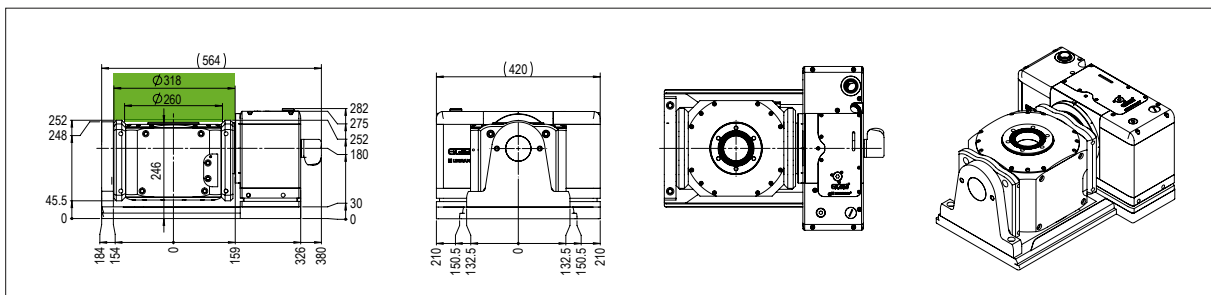
- + Identical to TDD, but with stronger gear unit
- + This provides extremely high torque
- + No controller adjustment when load changes
- + Large workpieces possible
- + Mounting at left or right thanks to symmetrical design
- + Highly accurate angular position measuring system possible (option)



Dividing axis with direct drive

Tilting axis with rugged gear unit (symmetrical)

- + Maximum workpiece \varnothing **318 mm**
- + Minimum length **564 mm**
- + Vertical spindle height **246 mm** or **216 mm** (without base plate)



General technical data

Drive data rotary axis see page 5, tilting axis see page 9

			T1-915618 TAP6	T2-915618 TAP6.2
Weight (aluminum base plate)		kg	175 (155)	250 (220)
Spindle through-bore		mm	64 (42*)	64 (42*)
Clamping torque	4 th axis	Nm	820	820
	5 th axis	Nm	2'000	2'000
Spindle load (max. permissible)		kg	90	2 x 40
Axial force (max. permissible)		kN	40	40
Pull-out torque		Nm	500	500
Moment of inertia (max. permissible)		kgm ²	1	1
Positioning accuracy +/-		arc sec	3	3
Repeat accuracy +/-		arc sec	1	1
Cycle time 90°	4 th axis	sec	0.1	0.1
	5 th axis	sec	not yet available	

* with motor type B

Mounting on Robodrill

With elegant support (on request)



Dividing axis positioned exactly in middle table slot

EA-618 or EA-619 from modular system as a robuste tilting axis

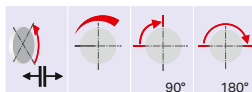
Item no.

T1-915618-F1-A-S

- Execution S= Standard, H=Hjspeed
- Dim. of motor A=Motor A, B=Motor B (see page 5)
- Type of motor F1=Fanuc 200V, F2=Fanuc 400V, S1=Siemens 200V, S2=Siemens 400V, M13= Mitsubishi 200V, M14 Mitsubishi 400V, Y5=Yaskawa 200V, Y6=Yaskawa 400V
- Swiveling axis size 618
- Dividing axis size 915
- Rotary table model

Drive data tilting axis

Rotary axis see page 5; values based on standard load cube see **main catalogue**



		Motors	i_{tot}	Feed* [Nm]	Speed [min ⁻¹]	Cycle time*** [sec]
SIEMENS	EA-618	1FK7042-2AK1	72:1	200	100	
	EA-619		144:1	440	50	
			36:1	120	200	
FANUC	EA-618	$\alpha 2$ (HV)is	72:1	90	56	
			144:1	220	28	
			72:1	110	56	
	EA-619	$\alpha 4$ (HV)is	144:1	260	28	
			36:1	50	111	
			72:1	130	56	
YASKAWA SGM7J	EA-618	SGM7J 06	72:1			
			144:1			
			72:1			
	EA-619	SGM7J 08	36:1			
			72:1			
			72:1			
YASKAWA SGMJV	EA-618	SGMJV 08	72:1	150	67	
			144:1	350	33	
	EA-619		36:1	90	133	
			72:1	210	67	
MITSUBISHI 200V	EA-618	HG75	72:1	140	56	
			144:1	330	28	
			72:1			
	EA-619	HG105	36:1	90	111	
			72:1	200	56	
			72:1			
MITSUBISHI 400V	EA-618	HG-H75	72:1			
			144:1			
			72:1			
	EA-619	HG-H105	36:1			
			72:1			
			72:1			
SANYO	EA-618	R2AAB8100	72:1	290	67	
			144:1	440	33	
	EA-619		36:1	170	133	
			72:1	370	67	

* at 1 rpm; for more see **main catalogue**

** for Siemens / Heidenhain

*** without clamping; for times, see **main catalogue**

For calculation of load, forces and torques, see **main catalogue**

Important information

- The limit values as set out in the corresponding parameter list take precedence over the data and information provided in the main catalogue (due to motor, drive enhancement and the respective machine CNC)
- Motor-dependent data are optimum values at operating temperature
- Further details are available at www.lehmann-rotary-tables.com, under Download / Commissioning

Accessories

For motor, cable, angular position measuring system, pL CNC and accessories see **main catalogue**, suitable to type 520

Options

Item no.	Description
GET.6xx-GEN	Increased gear precision *
GEO.6xx-GEN	Incr. geometric precision, 1/2 standard tolerance

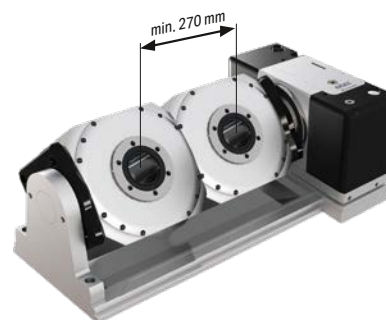
* incl. increased radial and axial run-out 0.003 mm

Suitable alignment elements

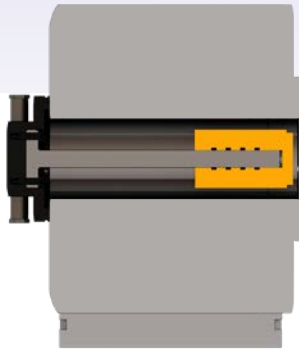
Item no.	Designation	Groove width
AUR.St-12	Alignment block, 1 pair	12h6
AUR.St-14		14h6
AUR.St-16		16h6
AUR.St-18		18h6

T2-915618 TAP6.2

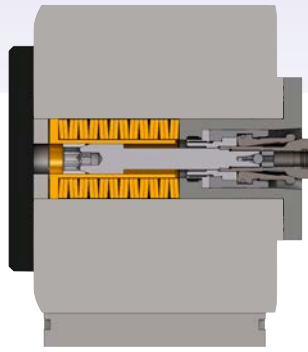
Tentative design, details on request



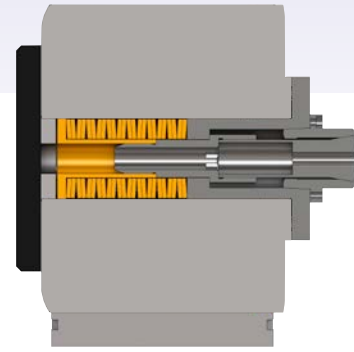
Spindle system MTS, prepared for many different clamping systems – as standard



Rotary union up to approx. 2'000 rpm, max 4-fluted



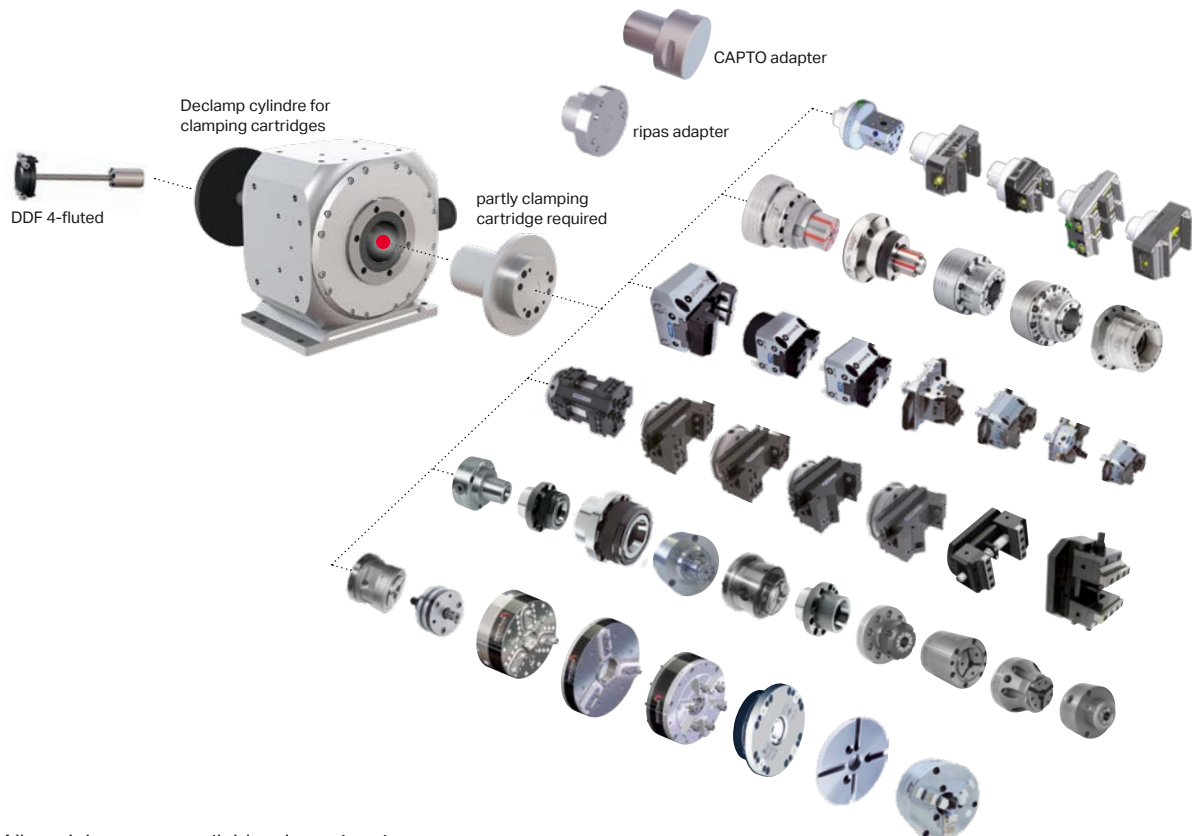
Automatic HSK clamping A63, suitable for up to 5'450 rpm (required release pressure: 16 bar)



Automatic collet clamping Bar opening max. 30 mm

Spindle accessories 4th axis EA-915

- + Rotary union **4-fluted, up to 10 bar air** (higher on request)
- + Declamp cylindre **30 kN at 16 bar compressed air**



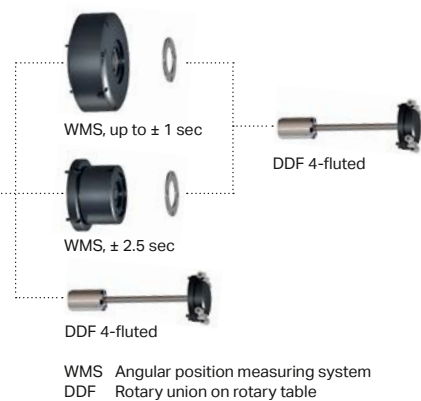
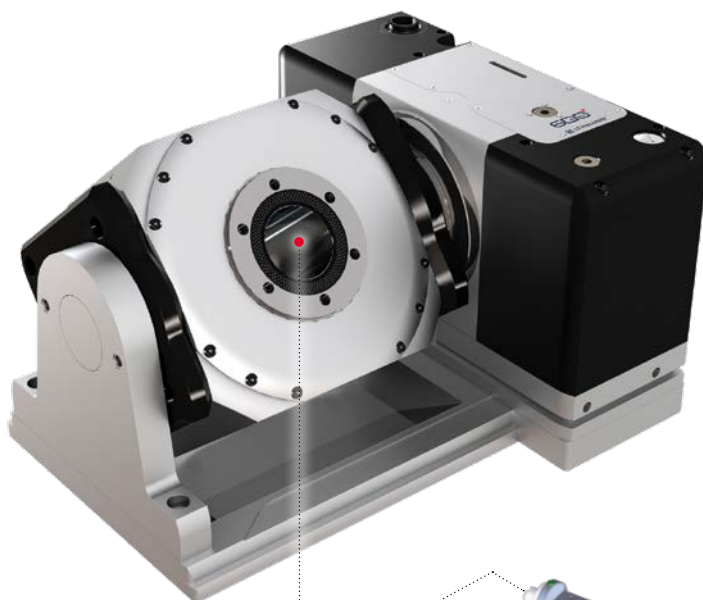
All models not yet available; please inquire

Highlights

- + Clamped without power (safety)
- + Bar machining: manually clamped up to $\varnothing 60$ mm, automatically clamped up to $\varnothing 30$ mm
- + Compact, low-wear construction
- + Simple, economical, can be refitted

Spindle accessories 4th/5th axis T1-915xxx

- + Rotary union (possible for rotary and tilting axis) **4-fluted, up to 10 bar air** (higher on request)
- + Declamp cylindre (only rotary axis) **30 kN at 16 bar compressed air**



All models not yet available; please inquire

valid for p. 10 & 11



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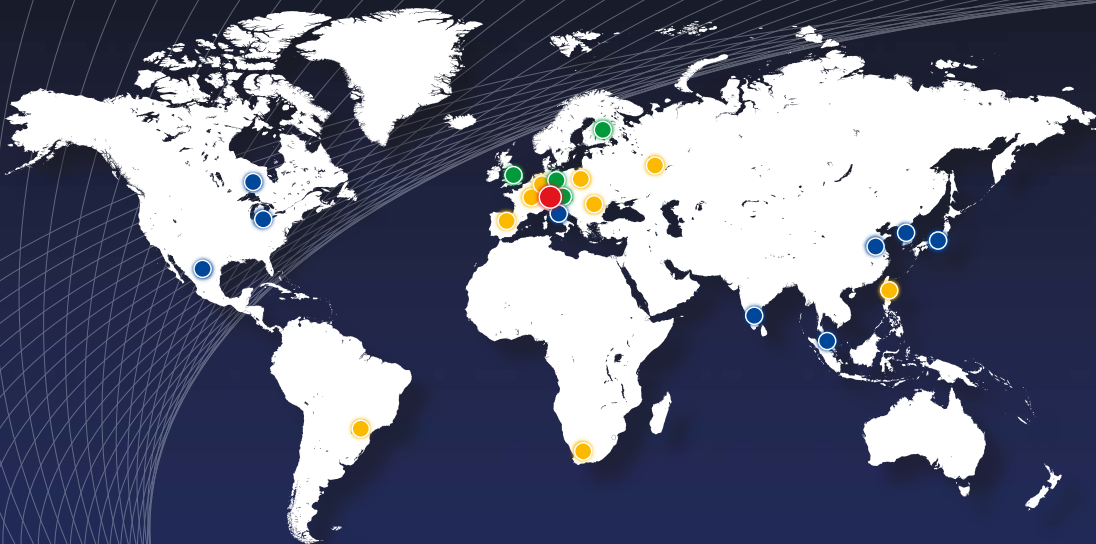
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● Headquarters ● direct sales/service partner ● pL SOLUTIONS® partner ● value added reseller & partner

More information (address, telephone number...) at www.lehmann-rotary-tables.com