mechanics

Rotary and Lifting Units

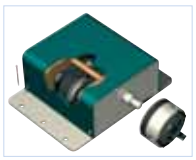
Overview

RDH-M Indexing Table/Rotary Axis B 210

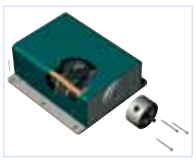

RDH-S Indexing Table/Rotary Axis B 212


RF 1 Indexing Table B 214


D 1 Indexing Table B 216




D 2 Indexing Table B 218



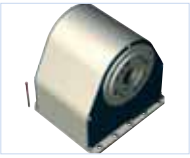

MD 1 Midget Rotary Axis B 220


ZR 20 Indexing Table B 222

Rotary and Lifting Units

Overview

ZD 30 Rotary Axis B 224



MHD 1 Midget Lifting
MHD 2 and Rotary Unit B 226

MH 1 Midget Lifting Unit B 228

Transport Loads, Processing Forces,Feed B 230

Application Samples B 232

Permissible Moment of Inertia J_Z B 233

mechanics

Indexing Table/Rotary Axis RDH-M

RDH-M as rotary axis
(hollow shaft)

RDH-M as indexing table
(solid shaft)

Features

- with HarmonicDrive® gear
  - extremely loadable and stiff drive bearing
  - zero backlash and high torsion stiffness
- reduction 1:51 or 1:101
- drive motors selectable
  - stepping motor (with encoder) or
  - DC servo motor (without brushes)
- protection type IP 65
- rust-proof design
- transmission accuracy < 1 arcmin
- repeatability < ± 6 arcsec
- optionally, in solid or hollow shaft design
- maintenance-free

- Options:
  - other drive motors
  - own motor adaptation
  - upon request, different gear reductions available

Order key

2 6 6 2 X X X X X X

Stub shaft
0 = Solid shaft
1 = Hollow shaft

Gear reduction
0 = 101
1 = 51

0 = Standard

Motors
0 = Stepping motor
1 = DC servo motor (without brushes)

0 = Standard

Accessory

Chuck
3-jaw chuck Ø 125
Item no.: **269060 0125**

Aluminium T-groove plate
Ø240 mm / PT 25
Item no.: **269050 0240**

Ø365 mm / PT 25
Item no.: **269050 0365**

Aluminium rotary plate
Ø 490 mm, customer-specific
Fixing holes are possible at extra charge
Item no.: **269051 0500**

Tailstock unit RE M
Item no.: **269100 2100** (1,000 mm)
Item no.: **269100 2150** (1,500 mm)
Item no.: **269100 2200** (2,000 mm)

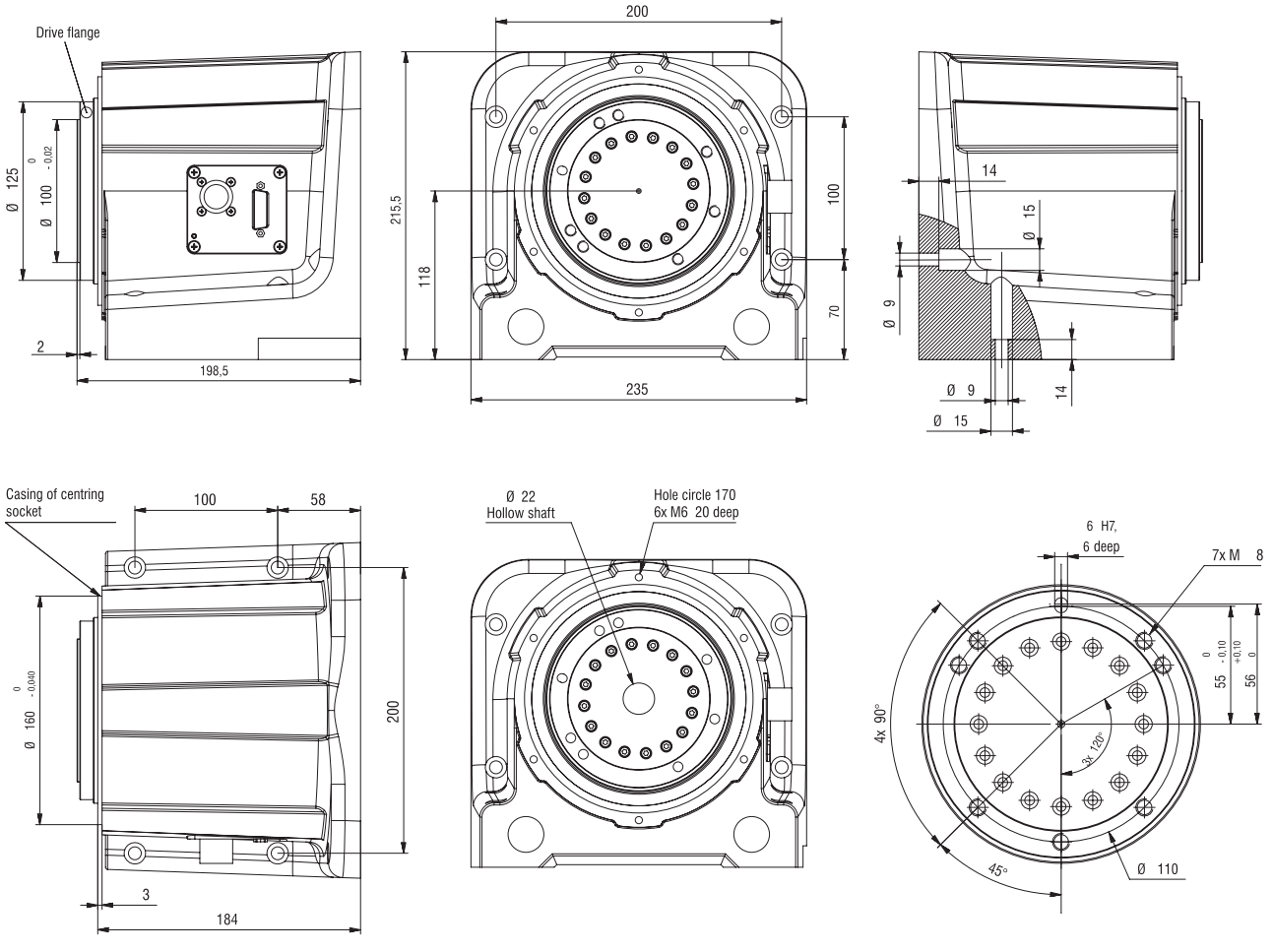
Indexing Table/Rotary Axis RDH-M

Technical data

		Stepping motor Ms 200 HT *		DC-servo motor MUMS 02	
Reduction ratio		1:51	1:101	1:51	1:101
Nominal drive revolution	[1/min]	4	2	22	11
		at 1500 Hz (225 1/min)		at 1100 1/min	
Max. drive revolution	[1/min]	24	12	59	30
		at 8000 Hz			
Nominal torque	[Nm]	24	46	15	29
		at 1500 Hz			
Max. torque (temporary)	[Nm]	--	--	46	88
Nominal holding torque (static load)	[Nm]	55	108	33	65
Max. load capacity of the gear	[Nm]	98	157	98	157
		Limit for repeatable peak torque			
Dynamic load rate C	[N]	21800			
Static load rate C0	[N]	35800			

* Values at half-step operation

Scale Drawings



mechanics

Indexing Table/Rotary Axis RDH-S

RDH-S as rotary axis
(hollow shaft)

RDH-S as indexing table
(solid shaft)

Features

- with HarmonicDrive® gear
  - extremely loadable and stiff drive bearing
  - zero backlash and high torsion stiffness
- reduction 1:51 or 1:101
- drive motors selectable
  - stepping motor (with encoder) or
  - DC servo motor (without brushes) or
  - DC servo motor (with brushes)
- protection type IP 65
- rust-proof design
- transmission accuracy < 1,5 arcmin
- repeatability < 6 arcsec
- optionally, in solid shaft or quill design
- maintenance-free

- Options:
  - other drive motors
  - own motor adaptation
  - upon request, different gear reductions available

Order key

2 6 6 1 X X X X X X

Stub shaft
0 = Solid shaft
1 = Hollow shaft

Gear reduction
0 = 101
1 = 51

0 = Standard

Motors
0 = Stepping motor
1 = DC servo motor (without brushes)
2 = DC servo motor (with brushes)

0 = Standard

Accessory

Clamping chuck
3-jaw chuck Ø 65
Item no.: 269060 3065

Tailstock unit RE S
for RDH-S
Item no.: 269100 1020 (200 mm)
Item no.: 269100 1030 (300 mm)
Item no.: 269100 1040 (400 mm)
Item no.: 269100 1050 (500 mm)

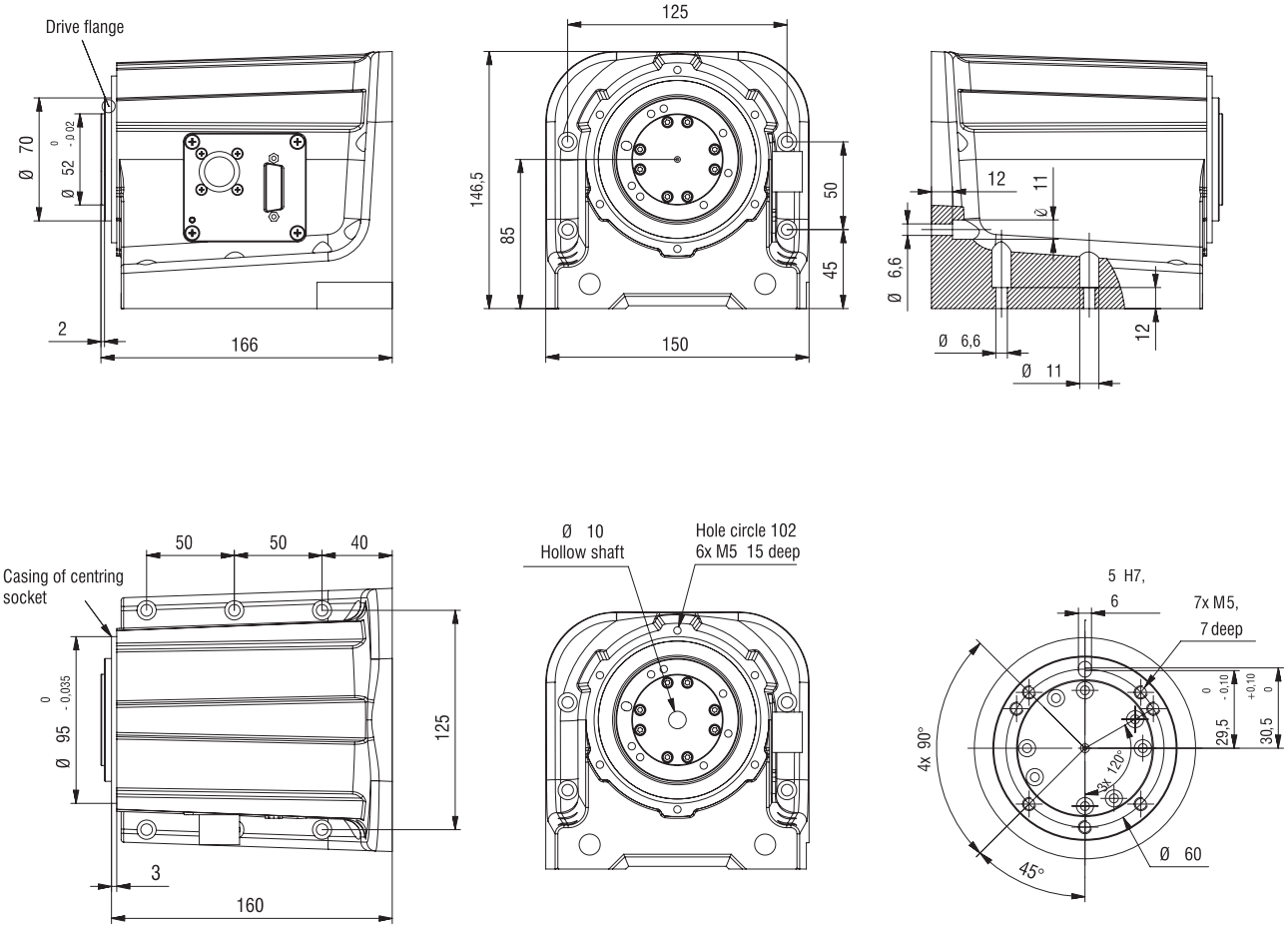
Indexing Table/Rotary Axis RDH-S

Technical data

		Stepping motor MS 045 HT *		DC-servo motor MD 100		DC-servo motor RE 40	
Reduction ratio		1:51	1:101	1:51	1:101	1:51	1:101
Nominal drive revolution	[1/min]	4	2	22	11	22	11
		at 1500 Hz (225 1/min)		at 1100 1/min		at 1100 1/min	
Max. drive revolution	[1/min]	24	12	59	30	69	35
		at 8000 Hz		--			
Nominal torque	[Nm]	7	11	7	11	4,6	9
		at 1500 Hz		--			
Max. torque (temporary)	[Nm]	--	--	7	11	7	11
Nominal holding torque (static load)	[Nm]	7	11	7	11	7	11
Max. load capacity of the gear	[Nm]	18	28	18	28	18	28
		Limit for repeatable peak torque					
Dynamic load rate C	[N]	5800					
Static load rate C_0	[N]	8600					

* Values at half-step operation

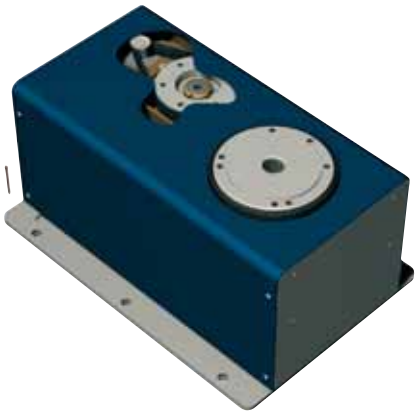
Scale Drawings



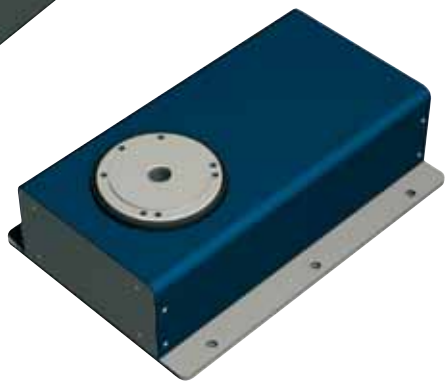
mechanics

Indexing Table

RF 1



RF 1 with servo motor drive



RF 1 with stepping motor drive

Features

- reduction assembly kit 1:52 and/or 1:100
- reduction 1:24 (standard)
- weight: 14.6 kg

Options:

- reduction assembly kit 1:52 and/or 1:100
- electromagnetic brake [60 Nm]
- stepping motor drive with encoder
- CNC control via amphenol

Order key

26024X X000

Motors
1 = Stepping motor
2 = DC servo motor
3 = AC servo motor

Brake
0 = without brake
1 = magnetic brake

Accessory

Assembly kit

For reduction 1:52

Item no.: **269077 0001**

For reduction 1:100

Item no.: **269077 0002**

Aluminium T-groove plate

Ø240 mm / PT 25

Item no.: **269050 0240**

Ø365 mm / PT 25

Item no.: **269050 0365**

Aluminium rotary plate

Ø490 mm, customer-specific
Fixing holes are possible at extra charge

Item no.: **269051 0500**

Chuck

3-jaw chuck Ø 125

Item no.: **269060 1125**

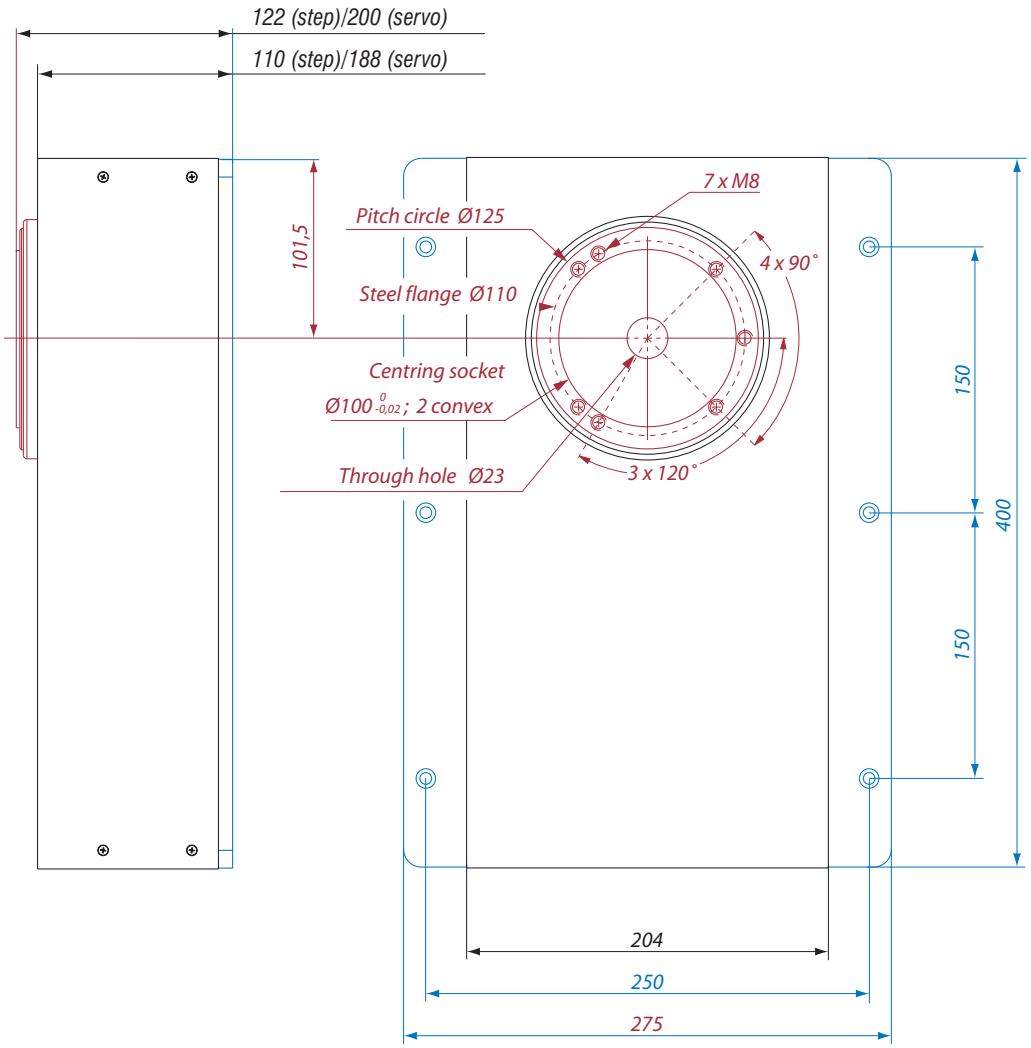
Indexing Table RF 1

Technical data

		Stepping motor MS 200 HT *			DC-servo motor MV 120			AC-servo motor MY 051		
Reduction ratio		1:24	1:52	1:100	1:24	1:52	1:100	1:24	1:52	1:100
Drive revolution	[1/min]	0 - 50	0 - 23	0 - 12	0 - 100	0 - 46	0 - 24	0 - 250	0 - 115	0 - 60
Operating moment (0 to 500 Hz)	[Nm]	20	42	75	--			--		
Operating moment (500 to 1000 Hz)	[Nm]	18	38	75	--			--		
Nominal torque	[Nm]	--			8	17	32	7	14	27
Nominal holding torque (static load)	[Nm]	37	75	75	10	23	44	9	19	37
Min. increment (positioning accuracy)	[arcmin]	2.5	2	2	2	2	2	2	2	2

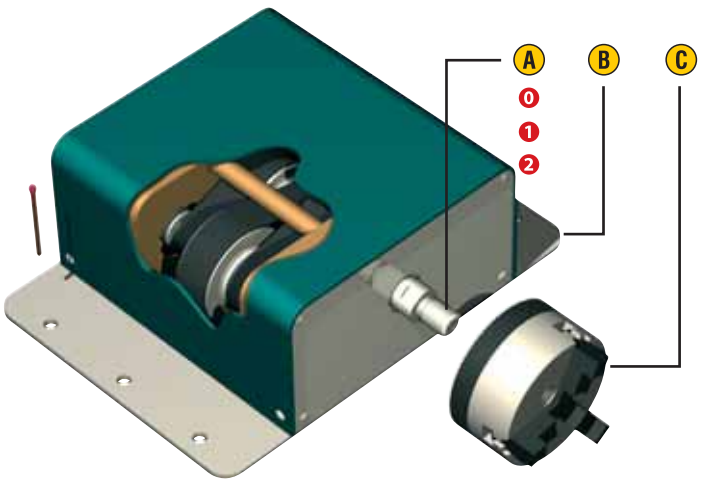
* Values at half-step operation

Scale Drawings



mechanics

Rotary Axis D 1



Features

- play-less timing belt drive with stepping, or DC servo motor
- reduction 1:16 and/or 1:50
- weight: 2.6 kg
- 3 different shaft designs

Options:
- mounting plate
- tailstock unit
- stepping motor drive with encoder
- CNC control via Sub D

A 3 different shafts! 0 1 2
See scale drawing

B Mounting plate
(including fastening)
Item no.: 277023

C 3-jaw chuck Ø 65 (see accessory)

Order key

263XXX 0001

Stub shaft
0 = Standard shaft
1 = Shaft 2
2 = Shaft 3

Motors
0 = Stepping motor
1 = DC servo motor

Gear reduction
2 = 50
3 = 16

Accessory

0 = for standard shaft

1 = for shaft 2

2 = for shaft 3

Shaft coupling
Shaft coupling WK 40/60 for a clearance-free power transmission/in order to compensate a small shaft offset
Item no.: 218003 9999

Adjusting aid D 1
to exactly bring the rotary axis D 1 into line with machines
Item no.: 280110 9005

Tailstock unit RE 1
Length 350 mm; further designs up to a length of 650 mm upon request
Item no.: 269071

Quick-change chuck
for tools Ø 1.5-13 mm
Item no.: 269073

Tangential knife
to cut any contours (sharp angles) out of foils (up to 4 mm thick)
Item no.: 259010

Lathe plate
Lathe plate Ø 60 mm to clamp wood and plastics
Item no.: 269075

Clamping nut
Clamping nut SK 11
Item no.: 239111
Matching collets for tools Ø 1-6.35 mm
Item no.: 239110 XXXX

Chuck
3-jaw chuck Ø 65
Item no.: 269060 1065

Rotary Axis D 1

Technical data

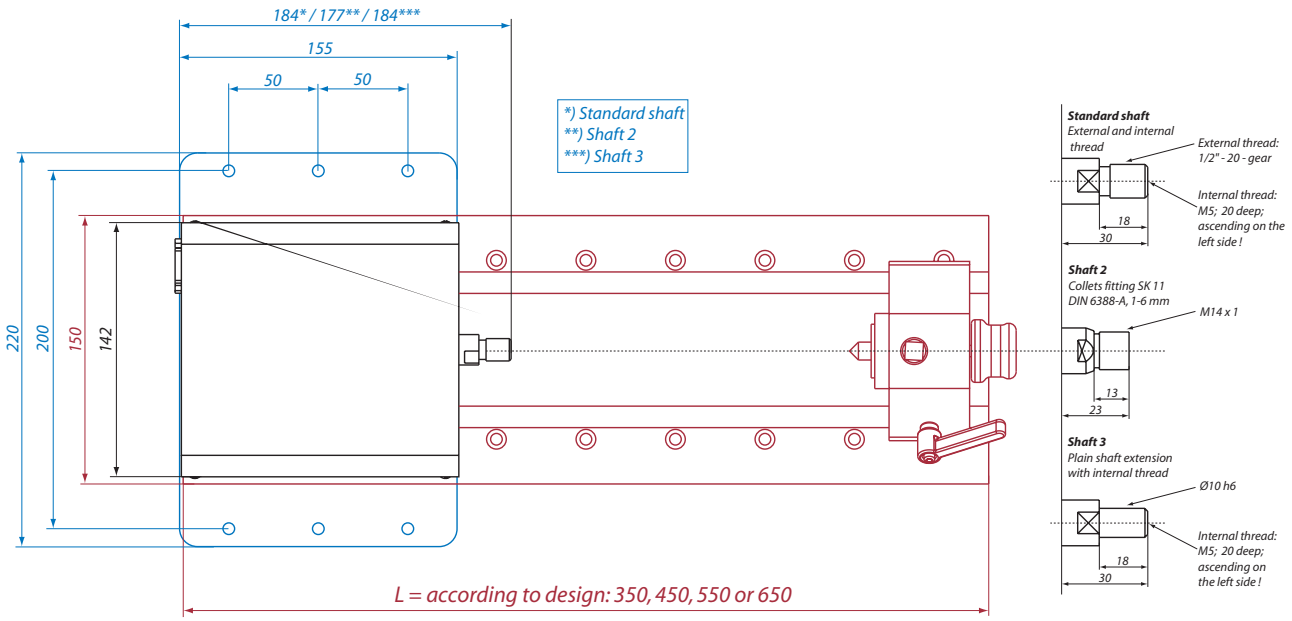
		Stepping motor MS 045 HT *		DC-servo motor MV 030	
Reduction ratio		1:16**	1:50**	1:16**	1:50**
Drive revolution	[1/min]	0 - 75	0 - 24	0 - 150	0 - 48
Operating moment (0 - 1600 Hz)	[Nm]	6	16	--	--
Nominal torque	[Nm]	--	--	1,5	4
Nominal holding torque (static load)	[Nm]	12	38	1,8	6
Min. increment (positioning accuracy)	[arcmin]	3,5	2	2	2

* Values at half-step operation

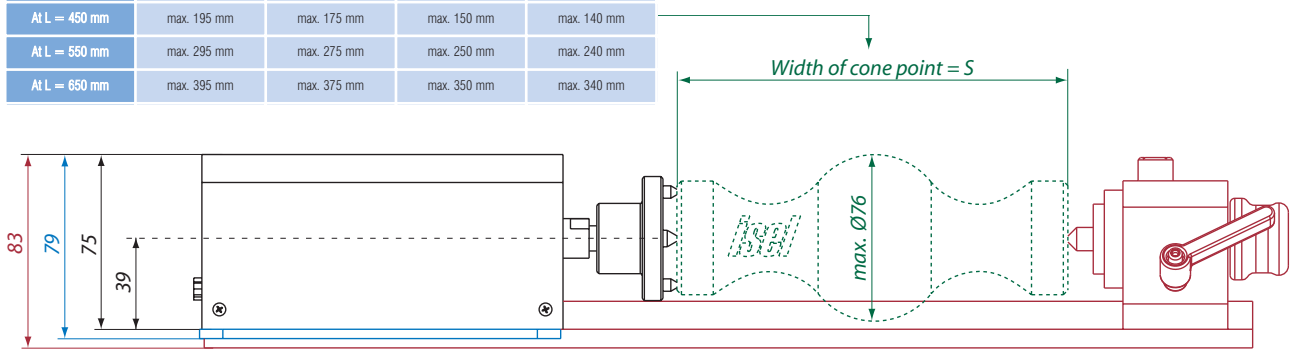
**) exact value: $16\frac{3}{7} \approx 16{,}429$

$49\frac{113}{315} \approx 49{,}359$

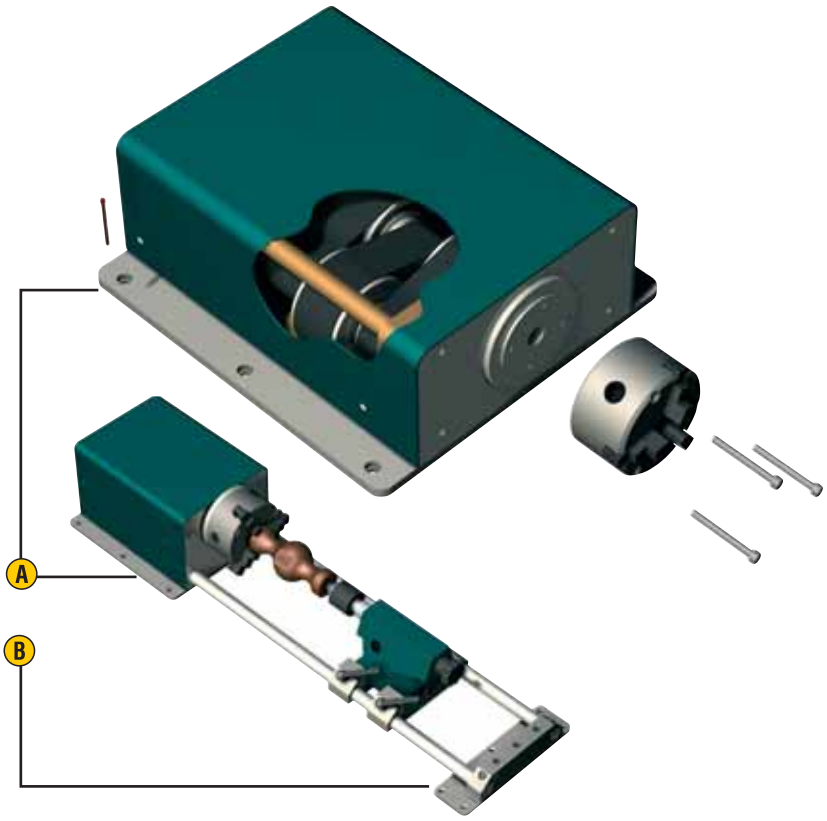
Scale Drawings



Width of cone point = S	with collets SK 11	with lathe plate	with quick-change chuck	with chuck Ø 65
At L = 350 mm	max. 95 mm	max. 75 mm	max. 50 mm	max. 40 mm
At L = 450 mm	max. 195 mm	max. 175 mm	max. 150 mm	max. 140 mm
At L = 550 mm	max. 295 mm	max. 275 mm	max. 250 mm	max. 240 mm
At L = 650 mm	max. 395 mm	max. 375 mm	max. 350 mm	max. 340 mm



Rotary Axis D 2



Features

- play-less timing belt drive with stepping, DC or AC servo motor
- reduction 1:40
- steel flange Ø 86 mm, 56 ± 3 HRC
- weight: 10.6 kg

Options:
- mounting plate, set 1 or set 2
- tailstock unit
- permanent magnetic brake 24 V [10 Nm] (locked in zero-current state)
- electromagnetic brake 24 V [15 Nm] (locked at impressed voltage)
- stepping motor drive with encoder
- CNC control via amphenol

A Mounting plate, set 1
(including fastening)
Item no.: 277024

B Mounting plate, set 2
(including fastening)
Item no.: 277024 1000

Order key

2640X0 X0X1

Motors
0 = stepping motor
1 = DC servo motor
2 = AC servo motor

Brake
0 = without brake
1 = permanent magnet
2 = electromagnet

Tailstock
0 = without tailstock
1 = RE 2, L=1000 mm
2 = RE 2, L=1500 mm
3 = RE 2, L=2000 mm

Accessory

Chuck
3-jaw chuck Ø 80
Item no.: 269060 0080

Chuck
3-jaw chuck Ø 125
(only for D 2 + tailstock RE 2)
Item no.: 269060 1125

no image

Adjusting aid D 2
to exactly bring the rotary axis D 2 into line with machines
- setting of parallelism/workpiece zero points (reproducible alignment by demountable fittings)
Item no.: 269076 0002

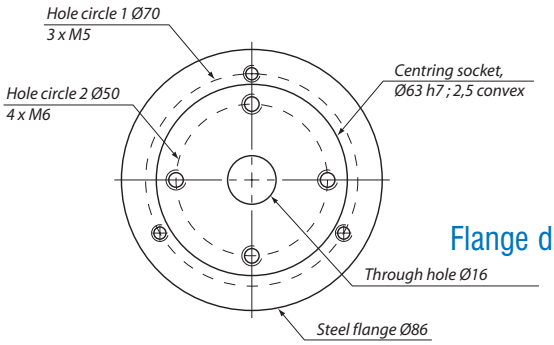
Rotary Axis D 2

Technical data

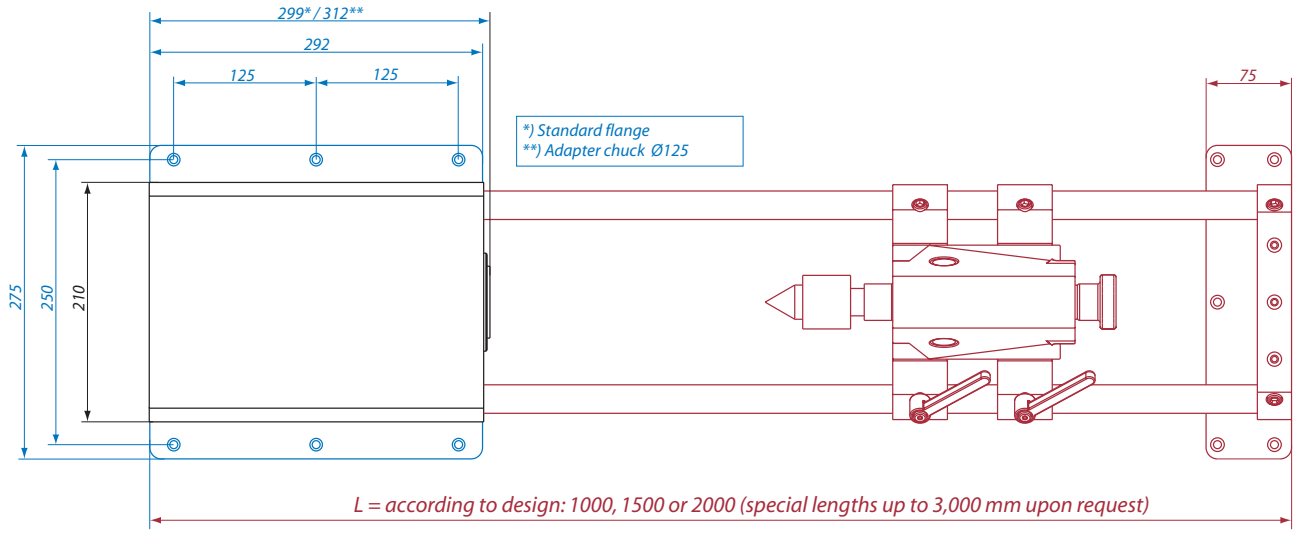
		Stepping motor MS 200 HT *	DC servo motor MV 120	AC servo motor MY 054
Reduction ratio		1:40	1:40	1:40
Drive revolution [1/min]	[1/min]	0 - 30	0 - 60	0 - 150
Operating moment (0 to 500/500 to 1,000 Hz)	[Nm]	35 / 30	--	--
Nominal torque	[Nm]	--	12	25
Nominal holding torque (static load)	[Nm]	55	18	40
Min. increment (positioning accuracy)	[arcmin]	2	2	2

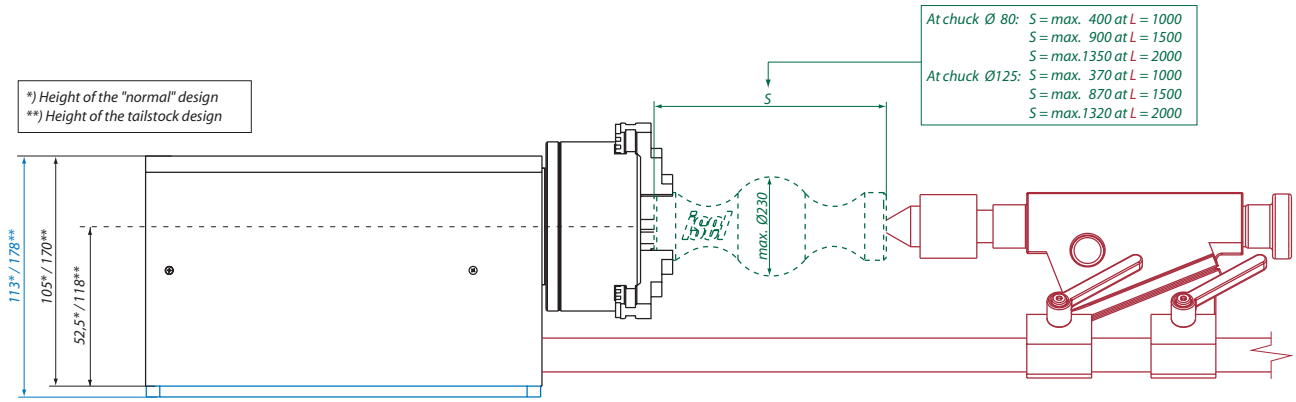
* Values at half-step operation

Scale Drawings

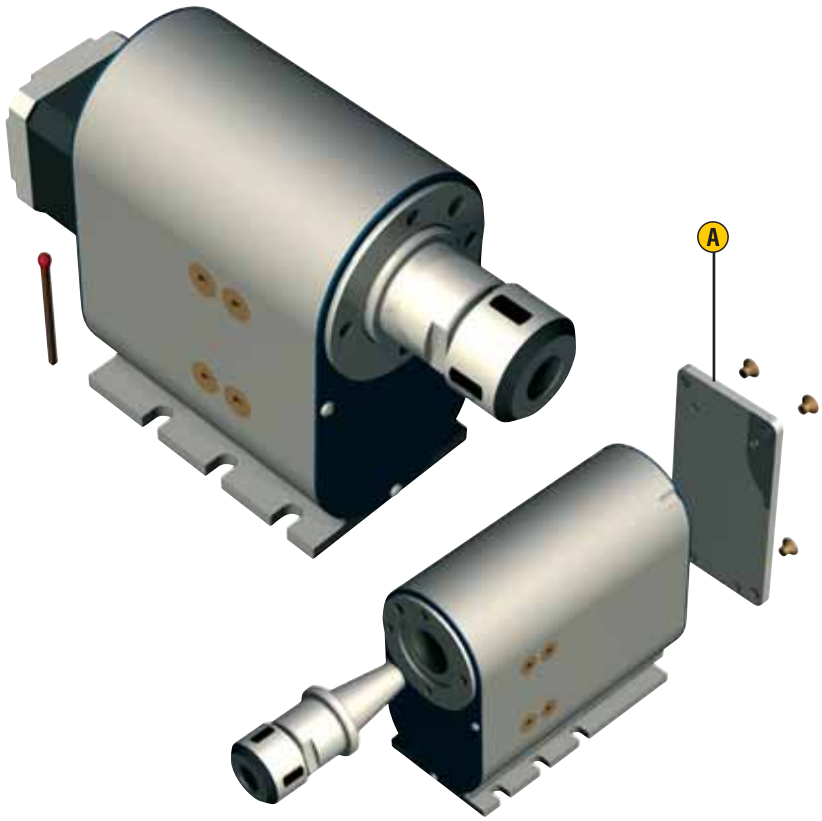


Flange dimensions





Midget Rotary Axis MD 1



Features

- play-less timing belt drive with stepping, or DC servo motor
- reduction 1:20
- shaft with through hole Ø 9
- reception flange with internal cone SK 20
- weight: according to design from 1.35 kg upwards

Options:
- "closed" design
- additional mounting plate (vertical mounting possible)
- CNC control via Sub D

A **Mounting plate**
(vertical mounting of the closed design)
Item no.: 277 026

Order key

261010 0XX0

Motors
0 = stepping motor
1 = DC servo motor
(only in closed design)

Design
0 = „open“ design
1 = „closed“ design

Accessory

Chuck
3-jaw chuck Ø 65
Item no.: 269060 2065

Collets fitting
Collets SK 20
for tools Ø 3-10 mm,
with mounting ring
Item no.: 239122 0001

for tools Ø 3-12.7 mm,
with mounting ring
Item no.: 239122 9001

Midget Rotary Axis MD 1

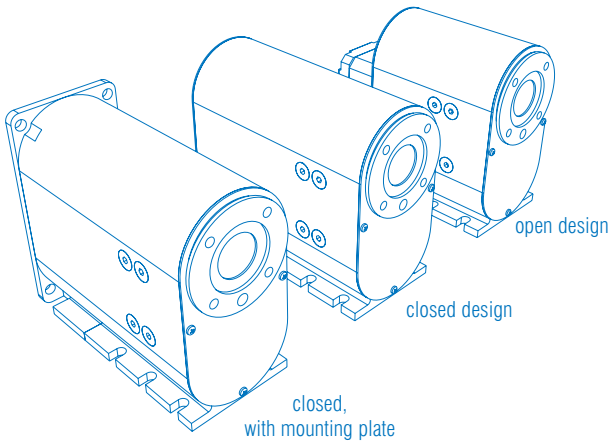
Technical data

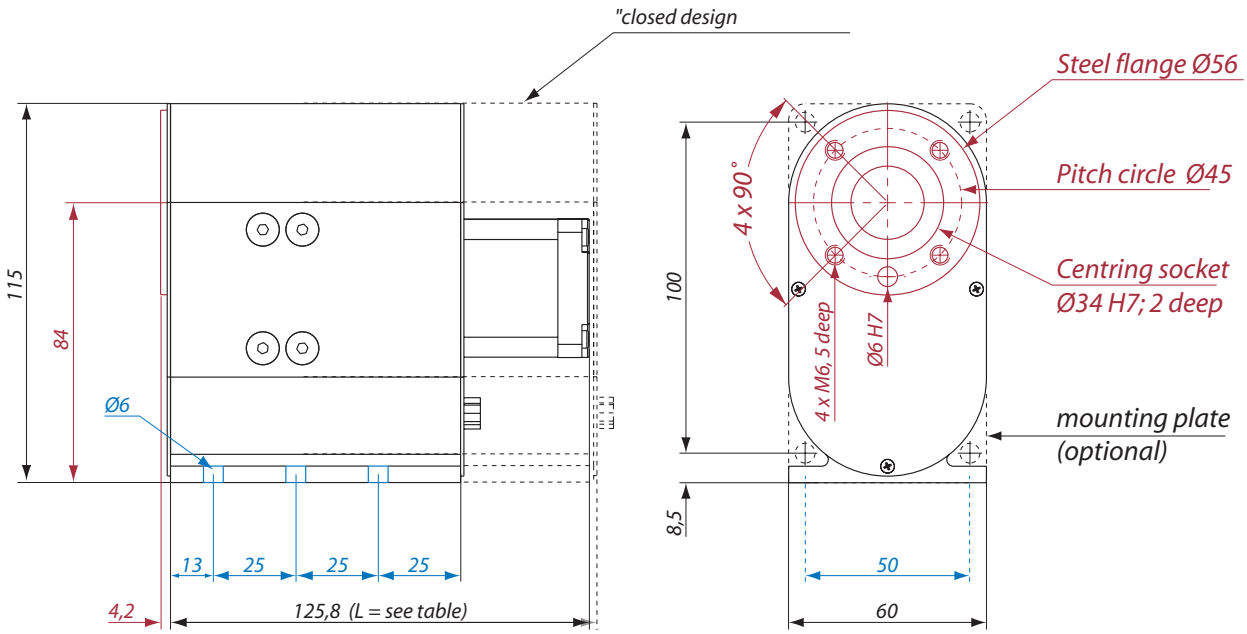
		Stepping motor MS 045 HT *	DC servo motor MV 030
Reduction ratio		1:20	1:20
Drive revolution	[1/min]	0 - 60	0 - 120
Operating moment (0 - 1600 Hz)	[Nm]	8	--
Nominal torque	[Nm]	--	2
Nominal holding torque (static load)	[Nm]	14	3
Min. increment (positioning accuracy)	[arcmin]	3,5	2

* Values at half-step operation

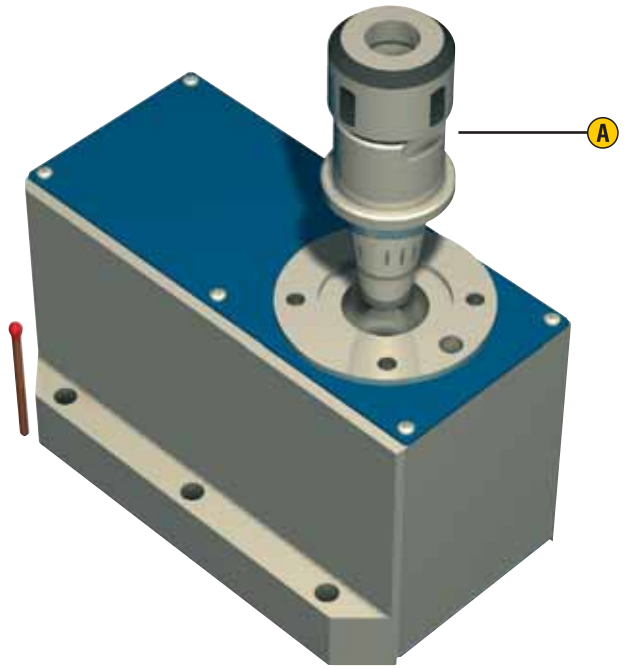
Scale Drawings

	Length L at step	Length L at DC servo
open design	125,8 mm	-
closed design	129 mm	180 mm
closed, with mounting plate	133 mm	184 mm





Indexing Table ZR 20



Features

- play-less timing belt drive with stepping motor
- reduction 1:20
- shaft with through hole Ø 15
- reception flange with internal cone SK 20
- weight: 2,1 kg

Options:
- CNC control via Sub D

Ⓐ Collets fitting SK 20
(accessory)

Ordering data

Indexing table ZR 20
Item no.: **260300 0000**

Accessory

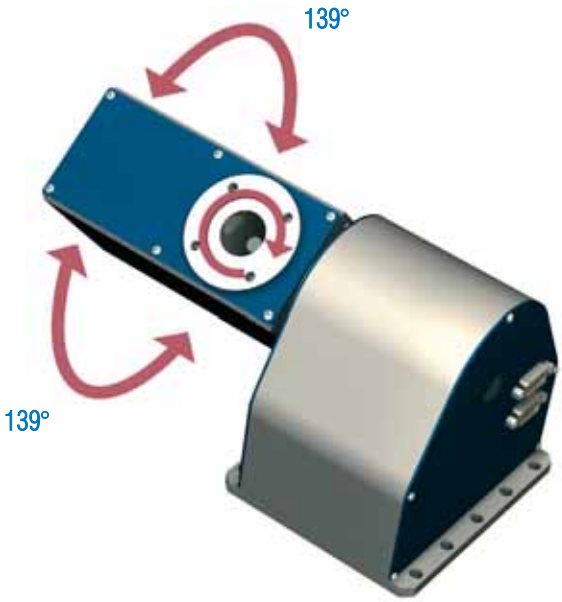
Chuck

3-jaw chuck Ø 65
Item no.: **269060 2065**

Collets fitting

Collets fitting SK 20
for tools Ø 3-10 mm,
with mounting ring
Item no.: **239122 0001**

for tools Ø 3-12.7 mm,
with mounting ring
Item no.: **239122 9001**



The rotary/swivelling unit ZDS 2030 can be used as fourth/fifth axis in CNC machines in the fields of precision engineering or handling. It is a combination of ZD 30 and the modified version of ZR 20.
The ZDS 2030 enables a conventional 3-axis plant to treat five sides and/orfree-form surfaces of easy to machine materials (e.g. plastics).
The pivoting angle is 139° in both directions.

Rotary/swivelling unit ZDS 2030
Item no.: **265 000 0000**

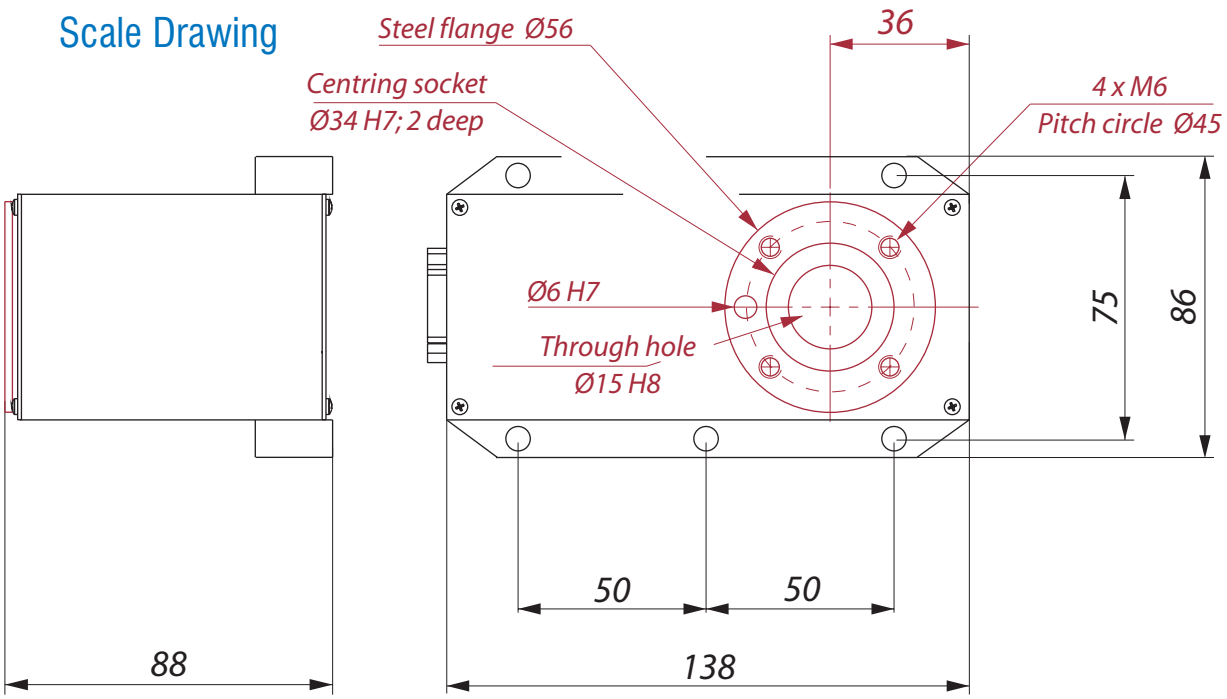
Indexing Table ZR 20

Technical data

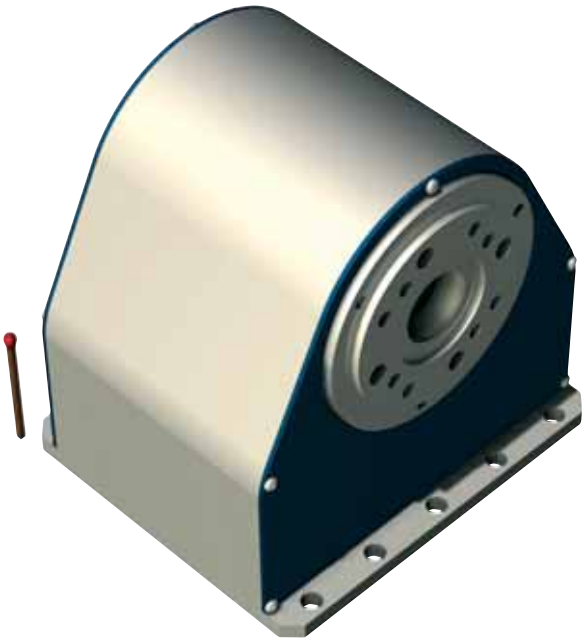
		Stepping motor MS 045 HT *
Reduction ratio		1:20
Drive revolution	[1/min]	0 - 60
Operating moment (0 - 1600 Hz)	[Nm]	8
Nominal holding torque (static load)	[Nm]	14
Min. increment (positioning accuracy)	[arcmin]	3,5

* Values at half-step operation

Scale Drawing



Rotary Axis ZD 30



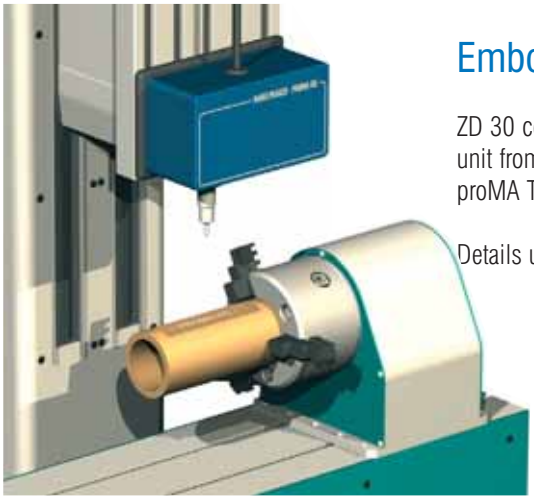
Features

- play-less timing belt drive with stepping motor
- reduction 1:30
- shaft with through hole Ø 15
- reception flange with internal cone SK 20
- weight: 2,9 kg

Options:
- CNC control via Sub D

Ordering data

Rotary axis ZD 30
Item no.: **261100 0000**



Embossing

ZD 30 combined with the pin marking unit from the company proMA Technologie GmbH.

Details upon request

Accessory

Chuck
3-jaw chuck Ø 65
Item no.: **269060 2065**

Chuck
3-jaw chuck Ø 80
Item no.: **269060 0080**

Collets fitting
Collets fitting SK 20
for tools Ø 3-10 mm,
with mounting ring
Item no.: **239122 0001**

for tools Ø 3-12.7 mm,
with mounting ring
Item no.: **239122 9001**

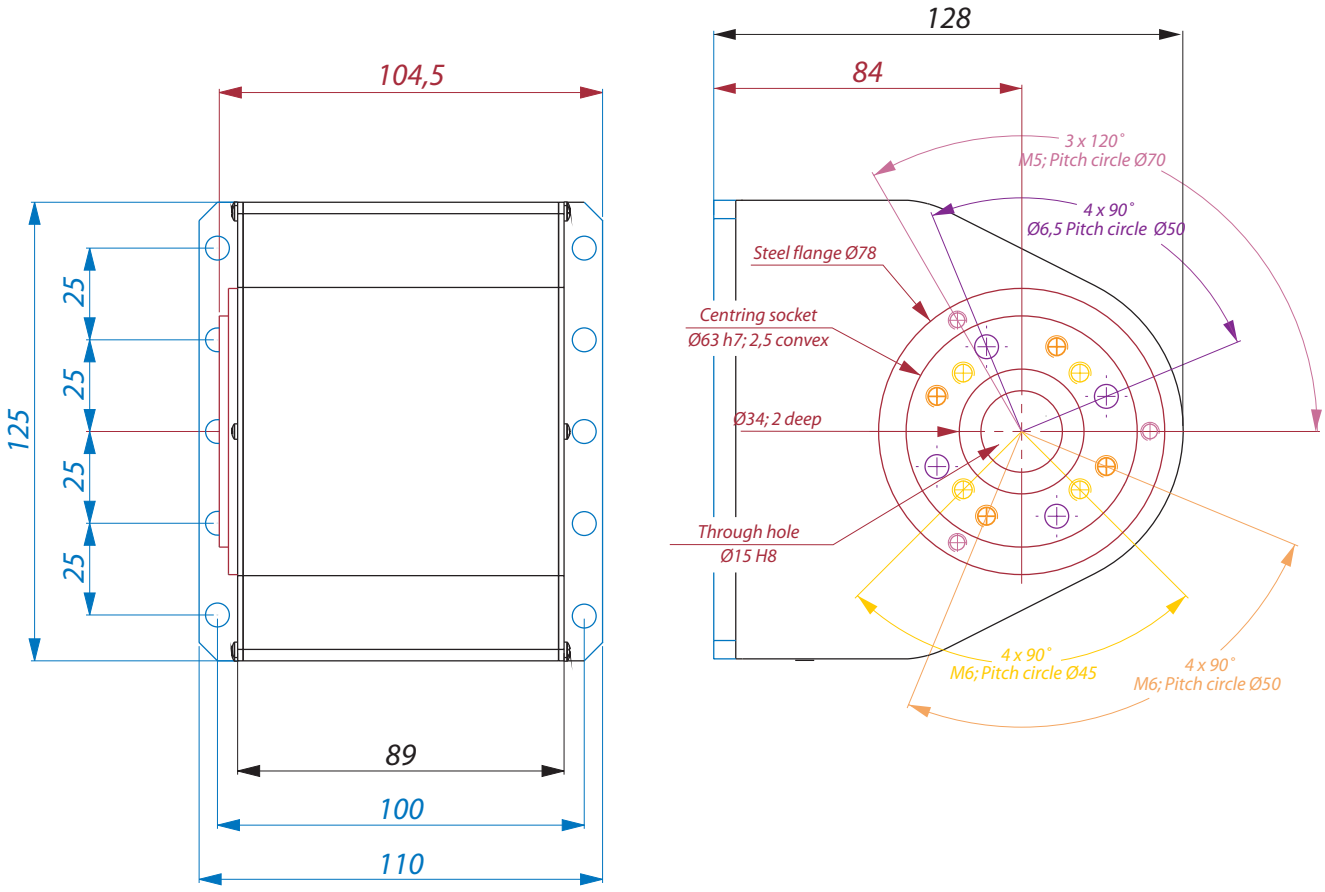
Rotary Axis ZD 30

Technical data

	Stepping motor MS 045 HT*
Reduction ratio	1:30
Drive revolution [1/min]	0 - 40
Operating moment (0 - 1600 Hz) [Nm]	12
Nominal holding torque (statische Belastung) [Nm]	20
Min. increment (positioning accuracy) [arcmin]	2,5

* Values at half-step operation

Scale Drawing



Midget Lifting and Rotary Unit MHD 1 / MHD 2

Features

- drive via two kinematically coupled stepping motors
- 50 mm stroke/100 mm stroke
- lift pivot with fastening screw set M 6
- weight: 1.3 kg/3.5 kg

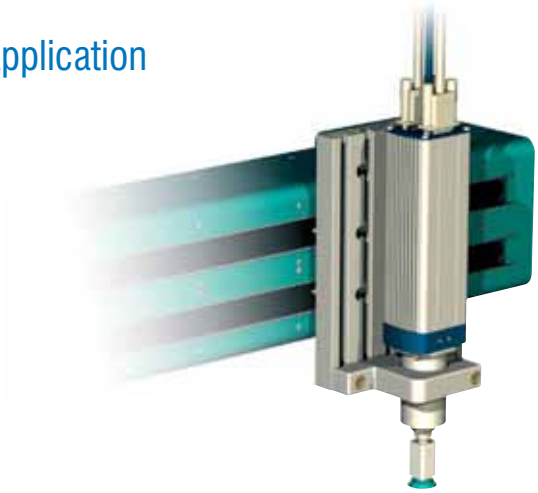
Options:
- pneumatic feed line
- CNC control via 2 x Sub D

Ordering data

MHD 1
Item no.: **230014 0005**

MHD 2
Item no.: **230014 0010**

Application

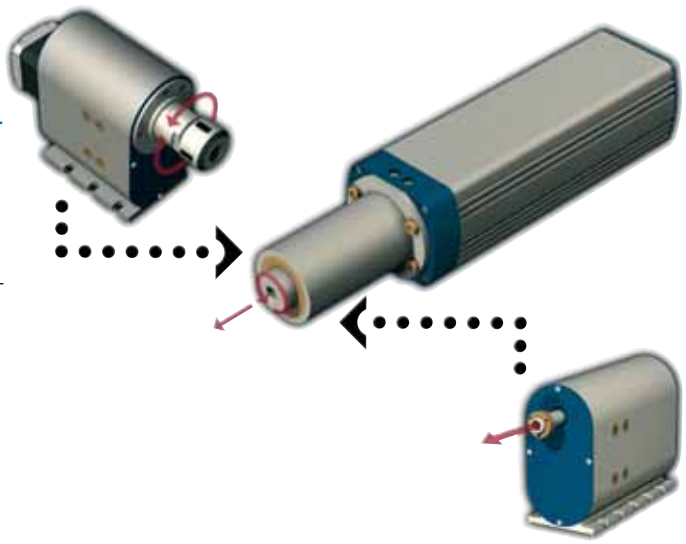


Information

**You can choose -
a lifting and/or rotary unit of a unit with combined lifting/rotary motion …**

Midget lifting and rotary unit MHD 1/MHD 2

The drive takes place via two kinematically coupled stepping motors According to the rotating direction and the revolution difference (between the motor), a combinable lifting/rotary motion results. For the lifting motion, a spindle with 20 mm/30 mm pitch is used; the rotary motion takes place via a radially active guiding element. The system is maintenance-free.



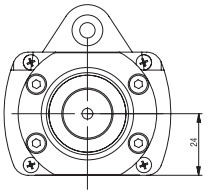
Midget Lifting and Rotary Unit MHD 1 / MHD 2

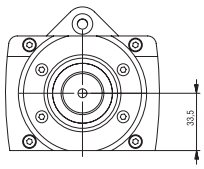
Technical data

	MHD 1	MHD2
Repeatability linear	≤ 0,1 mm	≤ 0,1 mm
Repeatability circular	≤ 0,25°	≤ 0,4°
Pick&Place-cycle speed linear	≤ 0,7 s / double stroke (50 mm)	≤ 0,9 s / double stroke (100 mm)
Pick&Place-cycle speed circular	≤ 0,4 s / double stroke (180°)	≤ 0,4 s / double stroke (180°)
Handling weight (max.)	100 g	400 g
Stroke (max.)	50 mm	100 mm
Weight	1,3 Kg	3,5 Kg
Dimensions (L/B/H)	237,5(+50)/65/66,5 mm	385(+100)/90/84 mm

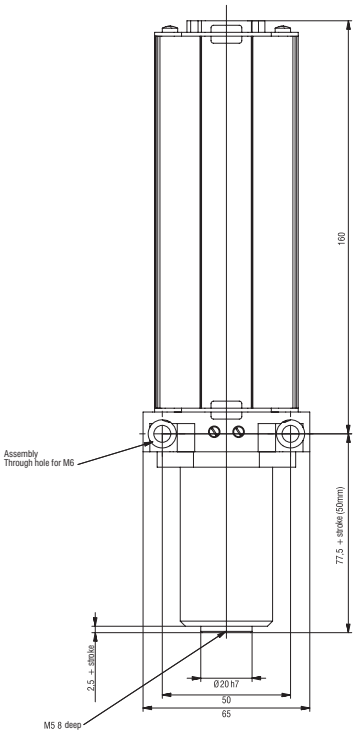
* Values at half-step operation

Scale Drawings

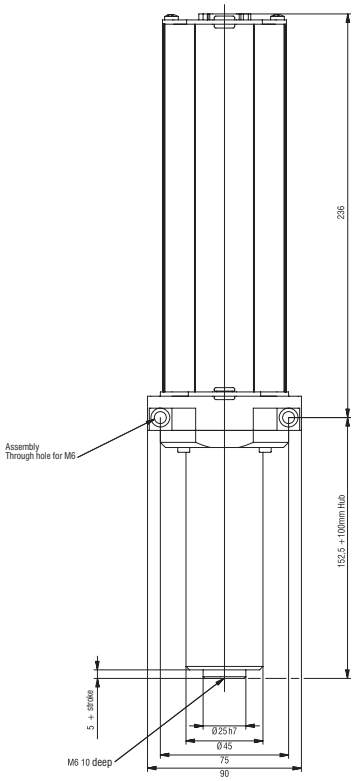


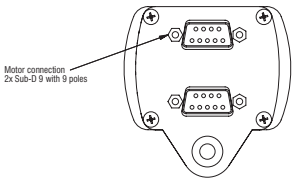


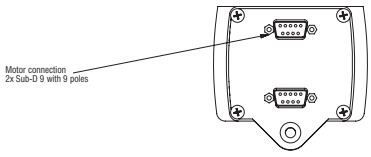
MHD 1



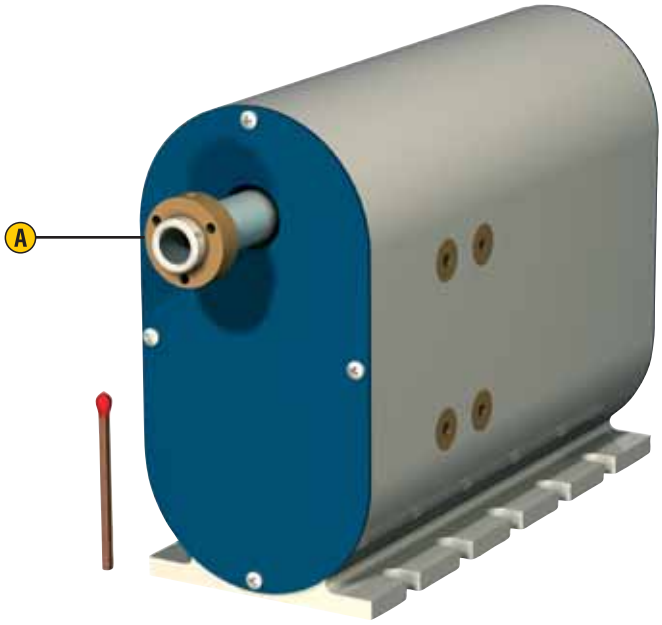
MHD 2







Midget Lifting Unit MH 1



Features

- play-less ball screw drive with stepping or DC servo motor
- spindle pitch: (pitch of 10 only with 90 mm stroke and stepping motor MS 050 HT)
- lift pivot with through hole Ø 8
- demountable reception flange
- weight: according to design from 1.9 kg upwards

Options:
- different stroke lengths, 30, 60 and 90 mm
- CNC control via Sub D

(A) **Demountable reception flange**
(see scale drawing)

Order key

230012 X1XX

Motors
0 = stepping motor
1 = DC servo motor

Spindle pitch
2 = 2,5 mm
5 = 5 mm
0 = 10 mm

Stroke length
0 = 30 mm
2 = 60 mm
4 = 90 mm

Midget Lifting Unit MH 1

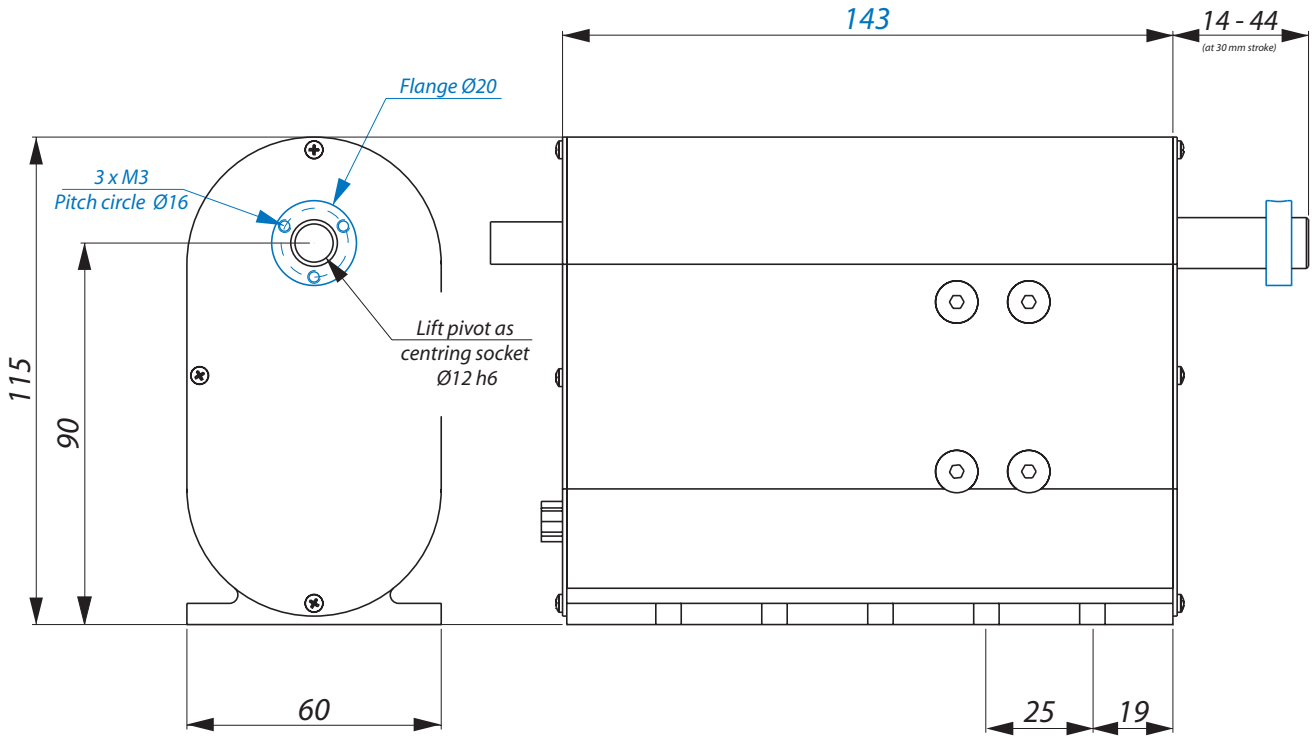
Technical data

Stepping motor MS 045 HT *				
Spindle pitch	[mm]	2,5	5	10 **
Pick & place cycle	[s]	1,4	0,8	0,5
Feed force (0 - 1600 Hz)	[N]	500	275	150
Positioning accuracy	[mm]	0,05	0,07	0,15
Repeatability	[mm]	0,025	0,05	0,1

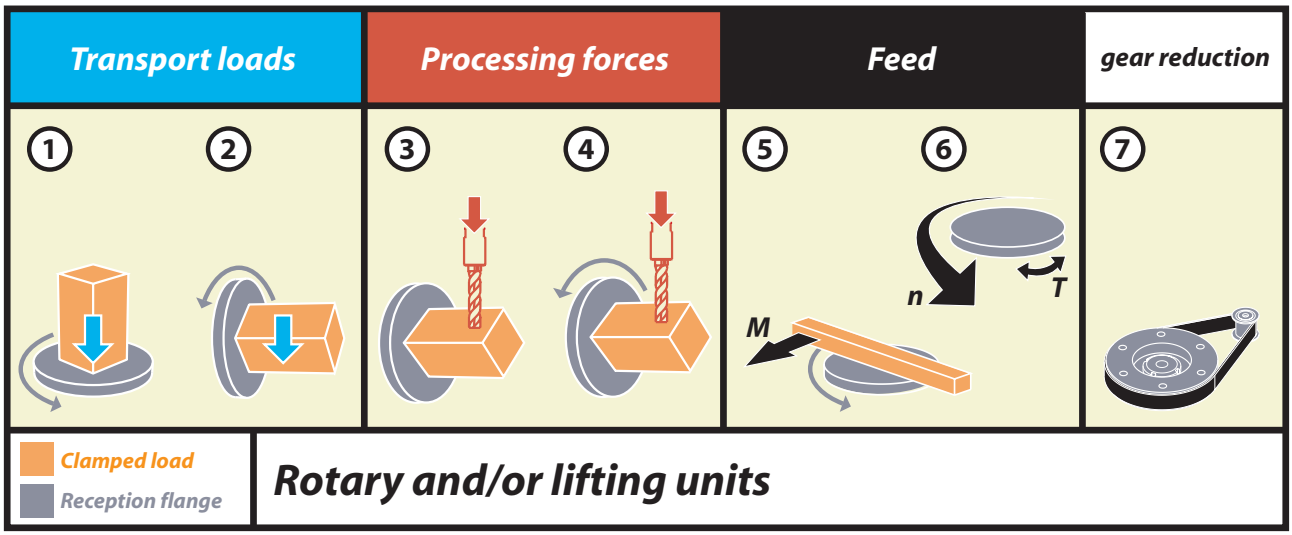
Servo motor MV 030			
Spindle pitch	[mm]	2,5	5
Pick & place cycle	[s]	0,8	0,6
Feed force	[N]	125	75
Positioning accuracy	[mm]	0,04	0,06
Repeatability	[mm]	0,02	0,03

* Values at half-step operation
** Please, pay attention to the information provided under "order key".

Scale Drawing



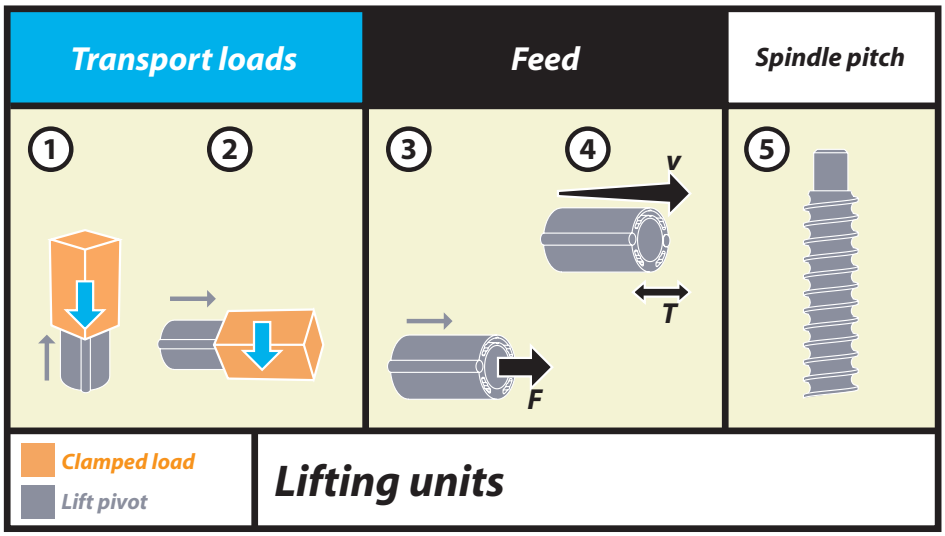
Rotary and Lifting Units:
Transport Loads, Processing Forces, Feed



Rotary and/or lifting units	1*	2*	3	4	5	6	7
RDH-M (step)	100 kg	45 kg	55 Nm	24 Nm	24 Nm	4 rpm	1:51
RDH-M (step)	160 kg	70 kg	108 Nm	45 Nm	45 Nm	2 rpm	1:101
RDH-M (DC servo without brushes)	110 kg	50 kg	32 Nm	15 Nm	15 Nm	22 rpm	1:51
RDH-M (DC servo without brushes)	180 kg	80 kg	64 Nm	29 Nm	29 Nm	11 rpm	1:101
RDH-S (step)	30 kg	15 kg	6,9 Nm	6,9 Nm	6,9 Nm	4 rpm	1:51
RDH-S (step)	48 kg	24 kg	11 Nm	11 Nm	11 Nm	2 rpm	1:101
RDH-S (DC servo without brushes)	30 kg	15 kg	6,9 Nm	6,9 Nm	6,9 Nm	22 rpm	1:51
RDH-S (DC servo without brushes)	48 kg	24 kg	11 Nm	11 Nm	11 Nm	11 rpm	1:101
RDH-S (DC servo)	25 kg	13 kg	6,9 Nm	4,6 Nm	4,6 Nm	22 rpm	1:51
RDH-S (DC-servo)	40 kg	20 kg	11 Nm	8,7 Nm	8,7 Nm	11 rpm	1:101
RF 1 (step)	60 kg	30 kg	37 Nm	17,5 Nm	17,5 Nm	50 rpm	1:24
RF 1 (step)	100 kg	50 kg	75 Nm	38 Nm	38 Nm	23 rpm	1:52
RF 1 (step)	150 kg	75 kg	75 Nm	75 Nm	75 Nm	12 rpm	1:100
RF 1 (DC-servo)	70 kg	35 kg	10 Nm	7,5 Nm	7,5 Nm	100 rpm	1:24
RF 1 (DC-servo)	110 kg	55 kg	23 Nm	17 Nm	17 Nm	46 rpm	1:52
RF 1 (DC-servo)	160 kg	80 kg	44 Nm	32 Nm	32 Nm	24 rpm	1:100
RF 1 (AC-servo)	90 kg	45 kg	9 Nm	6,5 Nm	6,5 Nm	250 rpm	1:24
RF 1 (AC-servo)	130 kg	65 kg	19 Nm	14 Nm	14 Nm	115 rpm	1:52
RF 1 (AC-servo)	180 kg	90 kg	37 Nm	27 Nm	27 Nm	60 rpm	1:100
D 1 (step)	8 kg	4 kg	12 Nm	6 Nm	6 Nm	75 rpm	1:16
D 1 (step)	10 kg	5 kg	38 Nm	16 Nm	16 Nm	24 rpm	1:50
D 1 (DC-servo)	8 kg	4 kg	1,8 Nm	1,5 Nm	1,5 Nm	150 rpm	1:16
D 1 (DC-servo)	10 kg	5 kg	6 Nm	4 Nm	4 Nm	48 rpm	1:50
D 2 (step)	40 kg	20 kg	55 Nm	30 Nm	30 Nm	30 rpm	1:40
D 2 (DC-servo)	60 kg	30 kg	18 Nm	12 Nm	12 Nm	60 rpm	1:40
D 2 (DC-servo)	80 kg	40 kg	40 Nm	25 Nm	25 Nm	150 rpm	1:40
MD 1 (step)	5 kg	2,5 kg	14 Nm	8 Nm	8 Nm	60 rpm	1:20
MD 1 (DC-servo)	6 kg	3 kg	2 Nm	3 Nm	3 Nm	120 rpm	1:20
ZR 20 (step)	10 kg	5 kg	14 Nm	8 Nm	8 Nm	60 rpm	1:20
ZD 30 (step)	14 kg	8 kg	20 Nm	12 Nm	12 Nm	40 rpm	1:30
MHD 1 (rotary)	0,1 kg	-	-	-	0,05 Nm	1 s** (1000 U/min.)	-
MHD 2 (rotary)	0,4 kg	-	-	-	0,01 Nm	1 s** (1000 U/min.)	-

*)Guide values that vary according to application!! **) Pick & place cycle

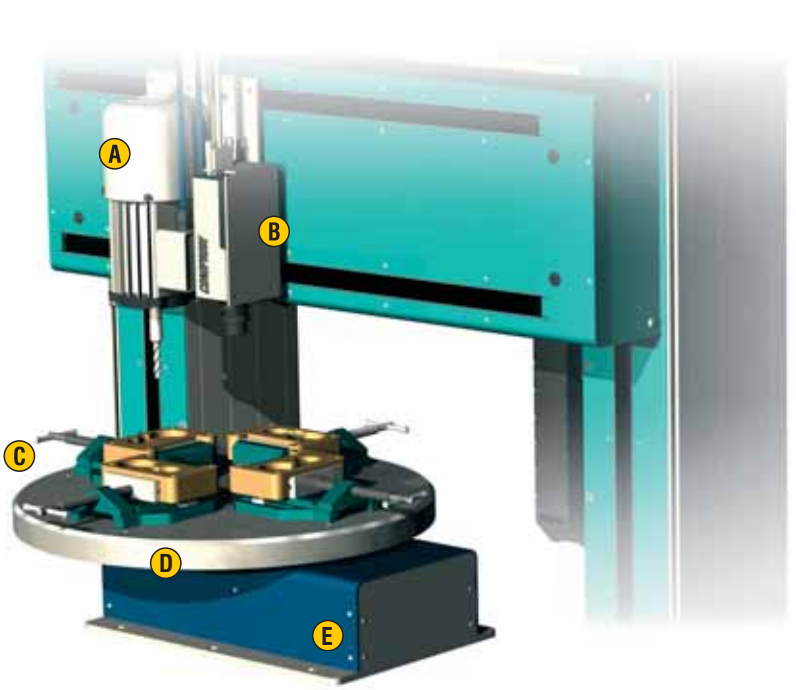
Lifting Units:
Transport Loads and Feed

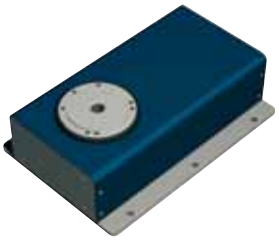


Lifting units	1*	2*	3	4	5
MHD 1 (lift)	0,1 kg	-	10 N	0,7 s**	20 mm
MHD 2 (servo)	0,4 kg	-	15 N	0,9 s**	30 mm
MH 1 (step)	7 kg	2 kg	500 N	1,4 s**	2,5 mm
MH 1 (step)	3,5 kg	2 kg	300 N	0,8 s**	5 mm
MH 1 (step)	2 kg	2 kg	150 N	0,5 s**	10 mm
MH 1 (servo)	8 kg	2 kg	125 N	0,8 s**	2,5 mm
MH 1 (servo)	4 kg	2 kg	75 N	0,6 s**	5 mm

*) Guide values that vary according to application !! **) Pick & place cycle

Application Samples





Try out a combination!

- **A** 500 W **spindle motor MAH 2.05-S from isel**
- **B** **Three-dimensional laser digitalisation system**
- **C** **Vice 1 from isel** (L152 x B130 x H45)
- **D** **Aluminium rotary plate** Ø 490 mm from isel
- **E** **Indexing table RF 1** from isel (step/servo)
- **F** **CNC basic units from isel**

Permissible Moment of Inertia J_z

Calculation

It is important to calculate the permissible moment of inertia Jz in order to ensure the desired values also at "external load" (rotary table and accessory) - e.g. the stepping motor should not lose steps.
In this connection, it is important the calculated moment of inertia of the "external load" [Je] does not exceed the permissible moment of inertia.

T-groove plate ø 240: 43.9 kgcm²

T-groove plate ø 365: 262.9 kgcm²

Aluminium rotary plate ø 490: 662.9 kgcm²

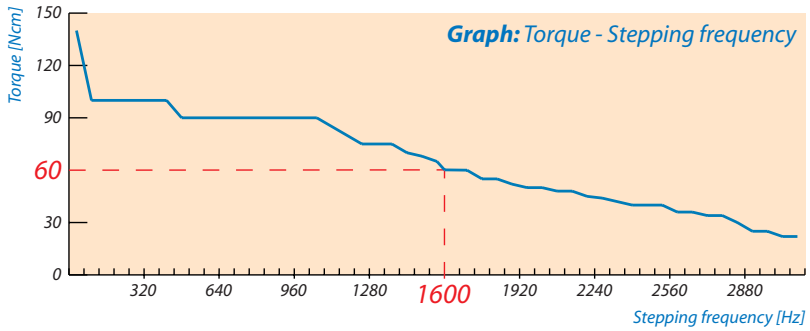
Moments of inertia of the plates

The calculation example refers to the indexing table RF 1 with stepping motor!

J_z [kgcm²]	Max. permissible moment of inertia
J_e [kgcm²]	Moment of inertia of the "external load"
t_b [s]	Acceleration and/or braking time
f [Hz]	Operating frequency
M [Ncm]	Torque
i	reduction factor
G_f	Specific gear factor: for RF 1 = 0.5

$$J_z \approx G_f \cdot M \cdot \frac{t_b}{f} \cdot 6366 \cdot i$$

Only for 2-phase stepping motors



Now, we calculate the permissible moment of inertia at a stepping frequency of **1,600** Hz. We learn the torque (**60** Ncm) from the line graph (see above) and set the acceleration time [tb] for 0.5 seconds.
The reduction ratio is 1: 24, and thus the reduction factor [i] is **24**.

Please keep in mind that the rotary plate is an "external load" and that its moment of inertia must be included in the calculation!

$$J_z \approx 0{,}5 \cdot 60 \cdot \frac{0{,}5}{1600} \cdot 6366 \cdot 24$$

$$J_z \approx 1432 \text{ kgcm}^2$$