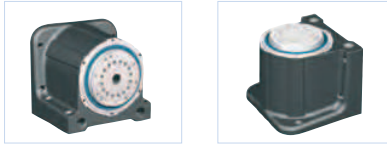


## Rotational units

## Overview

RDH-M Indexing table / Rotary unit

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RDH-S Indexing table / Rotary unit

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RDH-XS Indexing table / Rotary unit

2-100



DSH-S Rotary tilting unit

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RF 1 Indexing table

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## Rotational units

## Overview

MD 1 Miniature rotary unit

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ZD 30 Rotary unit

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ZR 20 Indexing table

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ZDS 2030

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Pin assignments

2-112

Transported loads

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Machining forces

Feed

## Indexing table / Rotary unit

## RDH-M



RDH-M as Indexing table  
(solid shaft design)

RDH-M as Rotary unit  
(hollow shaft design)



## Features

- With precision transmission
  - High load capacity, rigid drive bearing
  - Absence of play and high torsional rigidity
- Reduction 1:51 or 1:101
- Stepper or servomotor
- Protection class IP 65
- Stainless design
- Transfer accuracy < 1 minute of arc
- Repeatability <  $\pm 6$  seconds of arc
- Available in solid or hollow shaft design
- No maintenance

For pin assignment see page 2-112  
For transport loads see page 2-113

## Ordering key

2 6 6 2 X X 0 X 0 0

## Flanged shaft

- 0 = solid shaft
- 1 = hollow shaft

## Transmission reduction

- 0 = 101
- 1 = 51

## Motors

- 0 = Stepper motor MS 200 HAT with encoder (400 imp., 3-channel, RS422)
- 3 = brushless EC servomotor EC 60S
- 4 = brushed DC servomotor DC 100
- 5 = Stepper motor without encoder

## Accessories



## Chuck assembly

3-jaw chuck  $\varnothing$  125  
Part no.: **269063 2125**  
\* including flange



## Aluminium T-slot plate

$\varnothing$  240 mm/PT 25  
Part no.: **269050 0240**  
  
 $\varnothing$  365 mm/PT 25  
Part no.: **269050 0365**



## Tailstock unit RE M

Part no.: **269100 2100**  
(1000 mm)  
Part no.: **269100 2150**  
(1500 mm)  
Part no.: **269100 2200**  
(2000 mm)

## Indexing table / Rotary unit

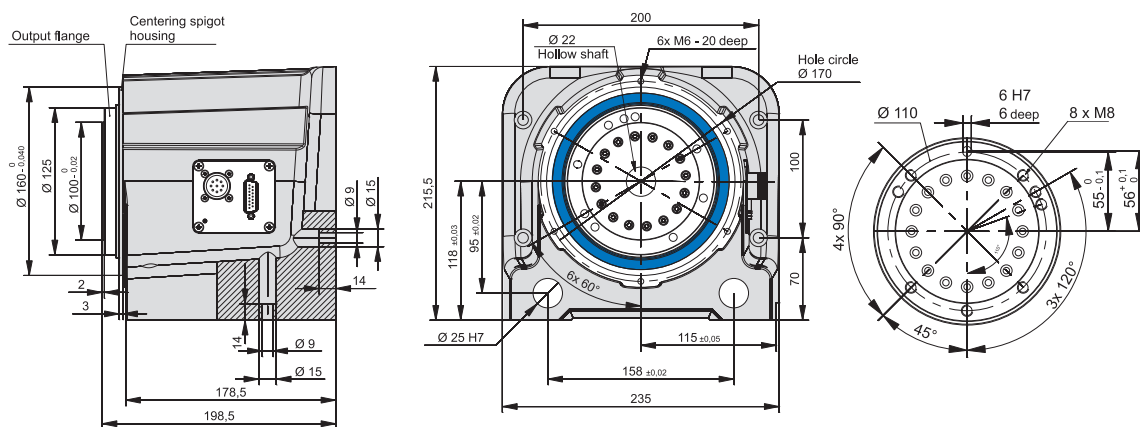
## RDH-M

## Technical specification

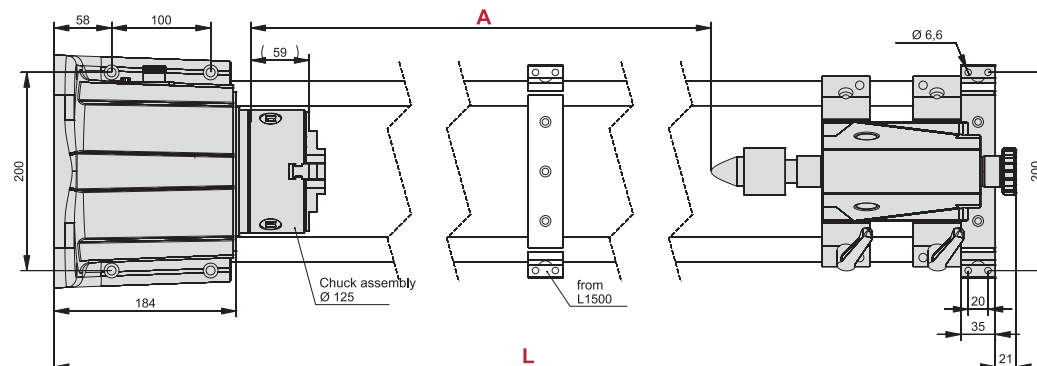
	stepper motor MS 200 HT *		EC servomotor EC 60S (brushless)		DC servo motor DC 100 (brushed)	
Reduction ratio	1:51	1:101	1:51	1:101	1:51	1:101
Nominal output speed [1/min]	4	2	22	11	22	11
	at 1500 Hz (225 1/min)		at 1100 1/min			
Max. output speed [1/min]	24	12	59	30	59	30
	at 8000 Hz		--			
Nominal torque [Nm]	24	46	9	17	7	14
	at 1500 Hz		--			
Max. torque (short term) [Nm]	--	--	42	80	39	73
Rated holding torque (static load) [Nm]	55	108	26	51	15	30
Max. transmission load [Nm]	98	157	98	157	98	157
	Limit for repeatable peak torque					
Dynamic load factor C [N]	21800					
Static load factor C <sub>0</sub> [N]	35800					
Weight [kg]	13.7					

\* Values for half-step operation

## Dimensioned drawings



Versions	Part no.	L	A
Tailstock unit RE-M 1000 mm	269100 2100	1110	624.5
Tailstock unit RE-M 1500 mm	269100 2150	1610	1124.5
Tailstock unit RE-M 2000 mm	269100 2200	2110	1624.5



## Indexing table / Rotary unit

## RDH-S



RDH-S as Indexing table  
(solid shaft design)

RDH-S as Rotary unit  
(hollow shaft design)



## Features

- With precision transmission
  - High load capacity, rigid drive bearing
  - Absence of play and high torsional rigidity
- Reduction 1:51 or 1:101
- Stepper or servomotor
- Protection class IP 65
- Stainless design
- Transfer accuracy < 1.5 minute of arc
- Repeatability <  $\pm 6$  seconds of arc
- Available in solid or hollow shaft design
- No maintenance

For pin assignment see page 2-112  
For transport loads, see page 2-113

## Ordering key

2 6 6 1 X X 0 X 0 0

## Flanged shaft

0 = solid shaft  
1 = hollow shaft

## Transmission reduction

0 = 101  
1 = 51

## Motors

0 = Stepper motor MS 045 HT with encoder (400 imp., 3-channel, RS422)  
2 = brushless DC servomotor RE 40  
3 = brushless EC servomotor EC 42  
5 = Stepper motor without encoder

## Accessories



## Chuck assembly

3-jaw chuck  $\varnothing$  65

Part no.: **269060 3065\***

3-jaw chuck  $\varnothing$  80

Part no.: **269063 2080\***

3-jaw chuck  $\varnothing$  100

Part no.: **269063 2100\***

\* including flange



## Circular plate

$\varnothing$  150

Part no.: **269 050 0150**



## Tailstock unit RE S

for RDH-S

Part no.: **269100 1020** (200 mm)

Part no.: **269100 1030** (300 mm)

Part no.: **269100 1040** (400 mm)

Part no.: **269100 1050** (500 mm)

## Indexing table / Rotary unit

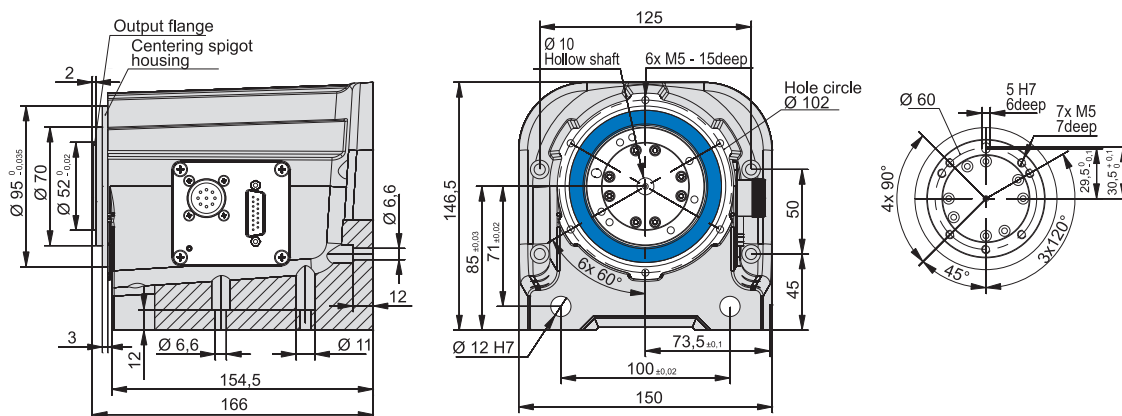
## RDH-S

## Technical specification

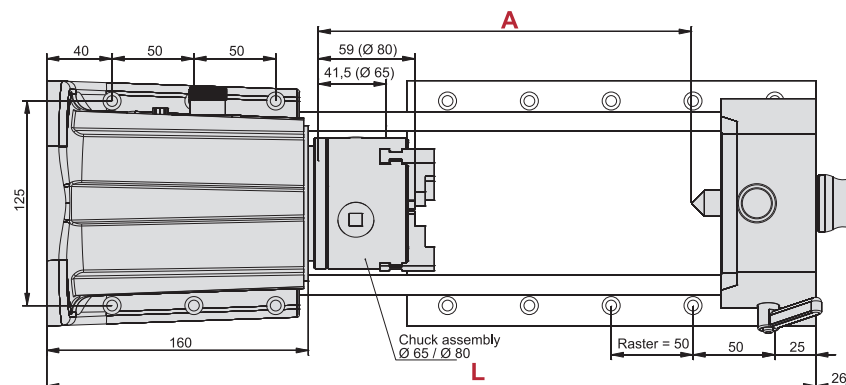
	stepper motor MS 045 HT *		EC servomotor EC 42 (brushless)		DC servo motor RE 40 (with brushes)	
	1:51	1:101	1:51	1:101	1:51	1:101
Reduction ratio	1:51	1:101	1:51	1:101	1:51	1:101
Nominal output speed [1/min]	4	2	22	11	22	11
	at 1500 Hz (225 1/min)		at 1100 1/min		at 1100 1/min	
Max. output speed [1/min]	24	12	59	30	69	35
	at 8000 Hz		--		--	
Nominal torque [Nm]	7	11	4.8	9.2	4.6	9
	at 1500 Hz		--		--	
Max. torque (short term) [Nm]	--	--	7	11	7	11
Rated holding torque (static load) [Nm]	7	11	7	11	7	11
Max. transmission load [Nm]	18	28	18	28	18	28
	Limit for repeatable peak torque					
Dynamic load factor C [N]	5800					
Static load factor C <sub>0</sub> [N]	8600					
Weight [kg]	4.6					

\* Values for half-step operation

## Dimensioned drawings



Versions	Part no.	L	A
Tailstock unit RE-S 200 mm	269100 1020	370	128
Tailstock unit RE-S 300 mm	269100 1030	470	228
Tailstock unit RE-S 400 mm	269100 1040	570	328
Tailstock unit RE-S 500 mm	269100 1050	670	428



## Indexing table/Rotary unit

## RDH-XS



RDH-XS as Rotary unit



RDH-XS as Indexing table

## Features

- With precision transmission
  - High load capacity, rigid drive bearing
  - Absence of play and high torsional rigidity
- Reduction 1:50 or 1:100
- Stepper or servomotor
- Protection class IP 65
- Stainless design
- Transfer accuracy < 2 minutes of arc
- Repeatability <  $\pm 1$  minute of arc
- No maintenance

For pin assignment see page 2-112  
For transport loads, see page 2-113

## Ordering key

2 6 6 0 0 X 0 X 0 0

## Transmission reduction

0 = 100

1 = 50

## Motors

0 = Stepper motor MS 045 HT with encoder (400 imp., 3-channel, RS422)

2 = brushed DC servomotor RE 40

3 = brushless EC servomotor EC 42

5 = Stepper motor without encoder

## Accessories



## Chuck assembly

3-jaw chuck  $\varnothing$  65

Part no.: 269060 4065\*

\* including flange



## Tailstock unit RE XS

for RDH-XS

Part no.: 269100 0020 (200 mm)

Part no.: 269100 0030 (300 mm)

Part no.: 269100 0040 (400 mm)

Part no.: 269100 0050 (500 mm)

## Indexing table/Rotary unit

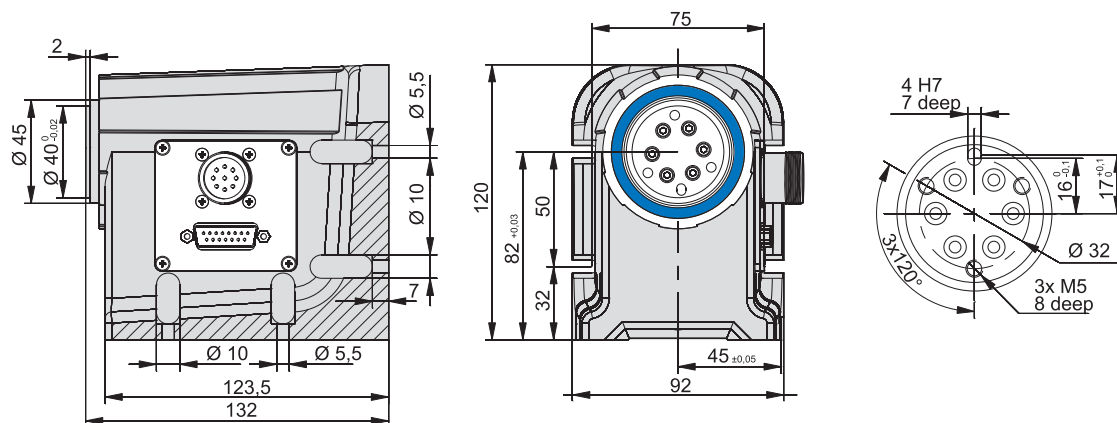
## RDH-XS

## Technical specification

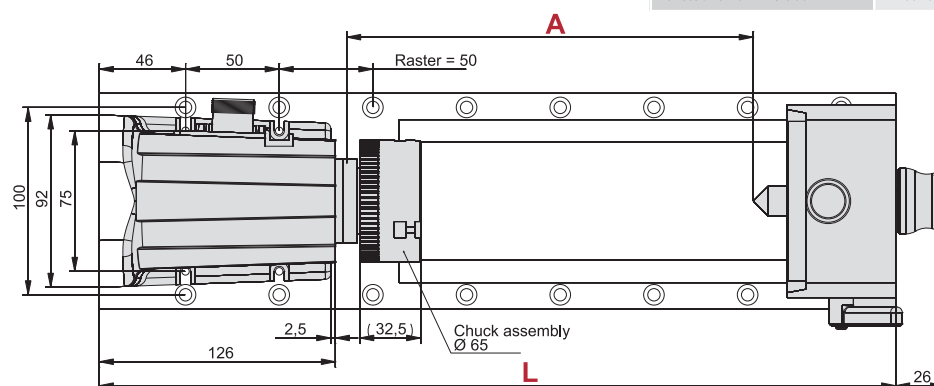
	stepper motor MS 045 HT *		EC servomotor EC 42		DC servo motor RE 40	
	1:50	1:100	1:50	1:100	1:50	1:100
Reduction ratio	1:50	1:100	1:50	1:100	1:50	1:100
Nominal output speed [1/min]	5	2	22	11	22	11
	at 1500 Hz (225 1/min)		at 1100 1/min		at 1100 1/min	
Max. output speed [1/min]	24	12	59	30	70	35
	at 8000 Hz (1200 rpm)		--			
Nominal torque [Nm]	5	7	5	7	5	7
	at 1500 Hz (225 1/min)		--			
Max. torque (short term) [Nm]	--	--	5	7	5	7
Rated holding torque (static load) [Nm]	5	7	5	7	5	7
Max. transmission load [Nm]	9	14	9	14	9	14
	Limit for repeatable peak torque					
Dynamic load factor C [N]	392					
Static load factor C <sub>0</sub> [N]	392					
Weight [kg]	2.3					

\* Values for half-step operation

## Dimensioned drawings



Versions	Part no.	L	A
Tailstock unit RE-XS 200 mm	269100 0020	325	117
Tailstock unit RE-XS 300 mm	269100 0030	425	217
Tailstock unit RE-XS 400 mm	269100 0040	525	317
Tailstock unit RE-XS 500 mm	269100 0050	625	417





# Rotary tilting unit

# DSH-S



## Features

- With precision transmission
  - High load capacity, rigid drive bearing
  - Absence of play and high torsional rigidity
- With rotary unit RDH-S
- Reduction 1:51 or 1:101
- Stepper or servomotor
- Protection class IP 65
- Stainless design
- Transfer accuracy < 1.5 minute of arc
- Repeatability <  $\pm 6$  seconds of arc
- No maintenance
- Swivel range continuously variable

For pin assignment see page 2-112

For transport loads, see page 2-113

## Ordering key

2 6 5 4 1 X X 0 0 0

### Motors

- 0 = Stepper motor MS 045 HT with encoder (400 imp., 3-channel, RS422)
- 2 = brushed DC servomotor RE 40
- 3 = brushless EC servomotor EC 42
- 5 = Stepper motor without encoder

### Transmission reduction

- 0 = 1 : 101
- 1 = 1 : 51

## Accessories



### Chuck assembly

3-jaw chuck  $\varnothing$  65

Part no.: **269060 3065\***

3-jaw chuck  $\varnothing$  80

Part no.: **269063 2080\***

3-jaw chuck  $\varnothing$  100

Part no.: **269063 2100\***

\* incl. Flange



### Circular plate

$\varnothing$  150

Part no.: **269 050 0150**

# Rotary tilting unit

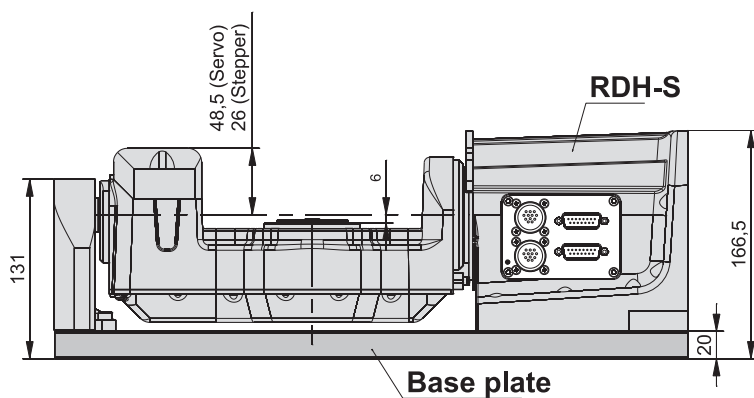
# DSH-S

## Technical specification

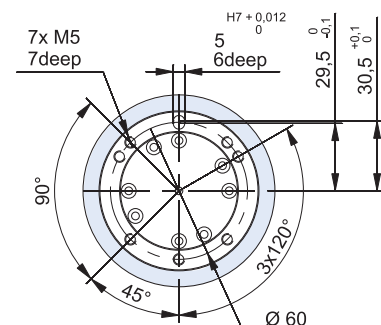
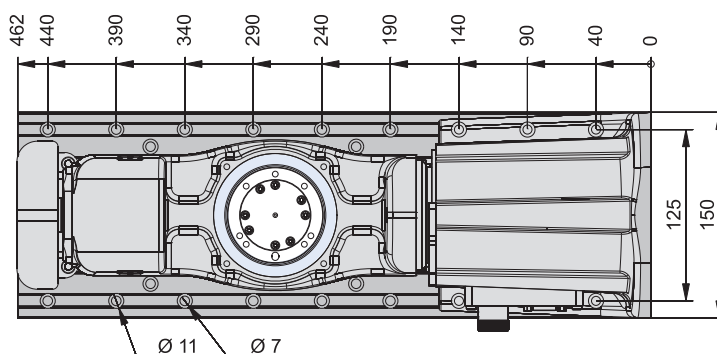
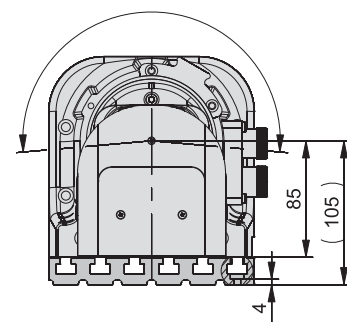
	stepper motor MS 045 HT *		EC servomotor EC 42		DC servo motor RE 40	
	1:51	1:101	1:51	1:101	1:51	1:101
Nominal output speed [1/min]	4	2	22	11	22	11
Max. output speed [1/min]	at 1500 Hz (225 1/min)		at 1100 1/min		at 1100 1/min	
	24	12	59	30	69	35
Nominal torque [Nm]	at 8000 Hz		--		--	
	7	11	4.8	9.2	4.6	9
Max. torque (short term) [Nm]	at 1500 Hz		--		--	
	--	--	7	11	7	11
Rated holding torque (static load) [Nm]	7	11	7	11	7	11
Max. transmission load [Nm]	18	28	18	28	18	28
Dynamic load factor C [N]	Limit for repeatable peak torque					
	5800					
Static load factor C <sub>0</sub> [N]	8600					
Weight [kg]	12 kg					

\* Values for half-step operation

## Dimensioned drawings

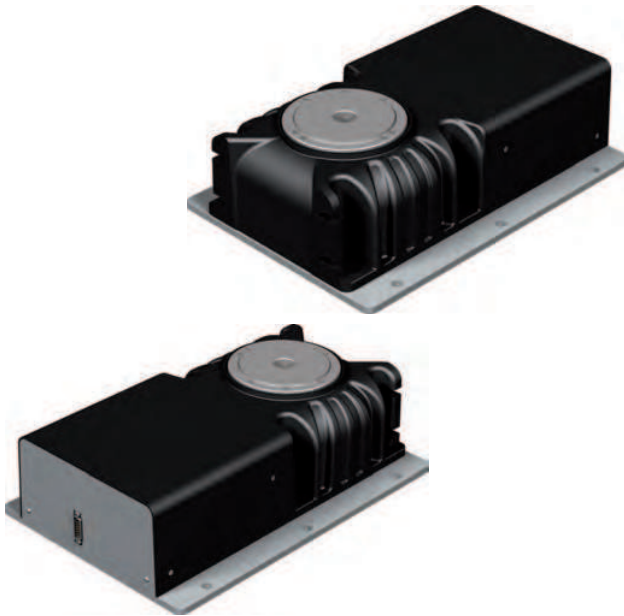


Swivel range  
190° / max. 230°



# Indexing table

## RF 1



### Features

- Low play toothed belt drive with stepper or DC servo motor
- Reduction 1: 24 (standard)
- Weight: 14.6 kg

For pin assignment see page 2-112

For transport loads, see page 2-113

### Options:

- Reduction installation set  
1 : 52 or 1 : 100
- Electromagnetic brake [60 Nm]
- Step motor drive with encoder
- CNC controller

### Ordering key

2 6 0 2 4 X X X 0 0

#### Motors

- 1 = Stepper motor MS 200 HT without encoder
- 4 = brushed DC servomotor DC 100
- 5 = brushless EC servomotor EC 60S

#### Brake

- 0 = without brake
- 1 = magnetic brake

#### Plug

- 1 = servomotor: M23 + SubD15
- 2 = Stepper motor: SubD9

### Accessories



#### Installation set

for reduction 1:52

Part no.: **269077 0001**

for reduction 1:100

Part no.: **269077 0002**



#### Aluminium T-slot plate

Ø 240 mm / PT 25

Part no.: **269050 0240**

Ø 365 mm / PT 25

Part no.: **269050 0365**



#### Chuck assembly

3-jaw chuck Ø 125

Part no.: **269063 2125**

## Indexing table

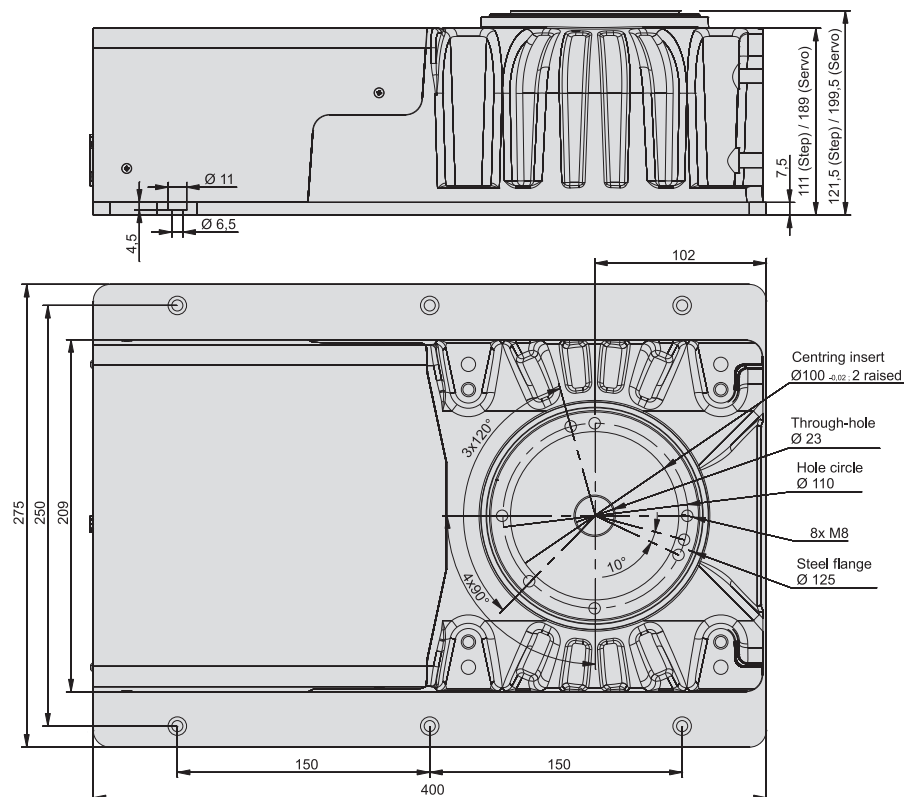
## RF 1

## Technical specification

	stepper motor MS 200 HT *			Servomotor DC 100/EC 60S		
Reduction ratio	1:24	1:52	1:100	1:24	1:52	1:100
Output speed [1/min]	0 - 50	0 - 23	0 - 12	0 - 125	0 - 58	0 - 30
Operating torque (0 - 500 Hz) [Nm]	20	42	75	--		
Operating torque (500 - 1000 Hz) [Nm]	18	38	75	--		
Rated torque [Nm]	--			41070	13 / 22	25 / 42
Rated holding torque (static load) [Nm]	37	75	75	41102	16 / 26	30 / 50
Angle accuracy [°]	0.16					
Weight [kg]	14.6					

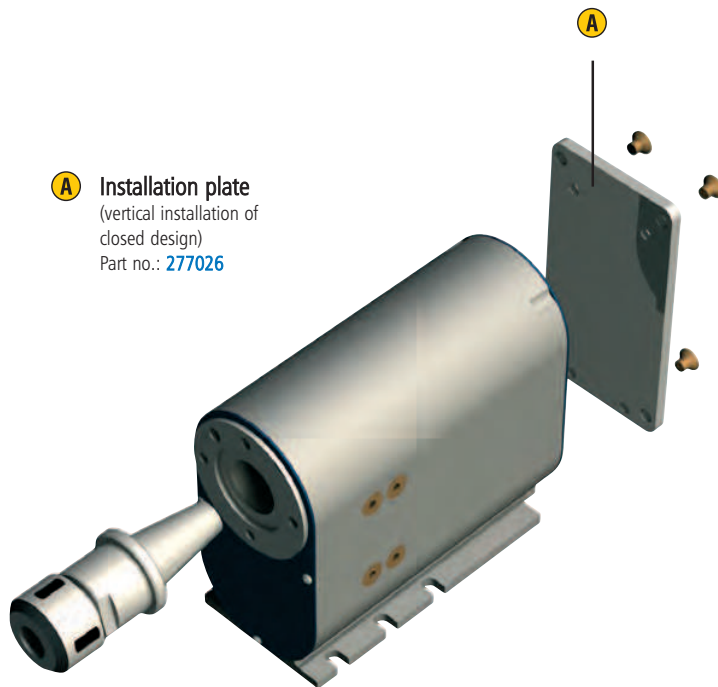
\* Values for half-step operation

## Dimensioned drawings



# Mini rotary unit

# MD 1



**A** **Installation plate**  
(vertical installation of closed design)  
Part no.: **277026**

## Features

- Low play toothed belt drive with stepper or DC servo motor
- Reduction 1 : 20
- Shaft  $\varnothing 9$  mm with boring
- Housing flange with inner cone SK 20
- Weight:  
depending on design, from 1.35 kg

For pin assignment see page 2-112  
For transport loads, see page 2-113

### Options:

- Additional installation plate (vertical installation possible)
- CNC controller

## Ordering key

**261010 0X10**

### Motors

- 0** = MS 045 HT stepper motor
- 2** = DC servomotor RE 40, with brushes
- 3** = brushless EC servomotor EC 42

## Accessories



**Chuck assembly**  
3-jaw chuck  $\varnothing 65$   
Part no.: **269060 2065\***

\* incl. Flange



**Collet holder**  
Collet holder SK 20  
for tools  $\varnothing 3 - 13$  mm, with installation ring  
Part no.: **239172 0020**

Collets are on page 5-32.

## Mini rotary unit

## MD 1

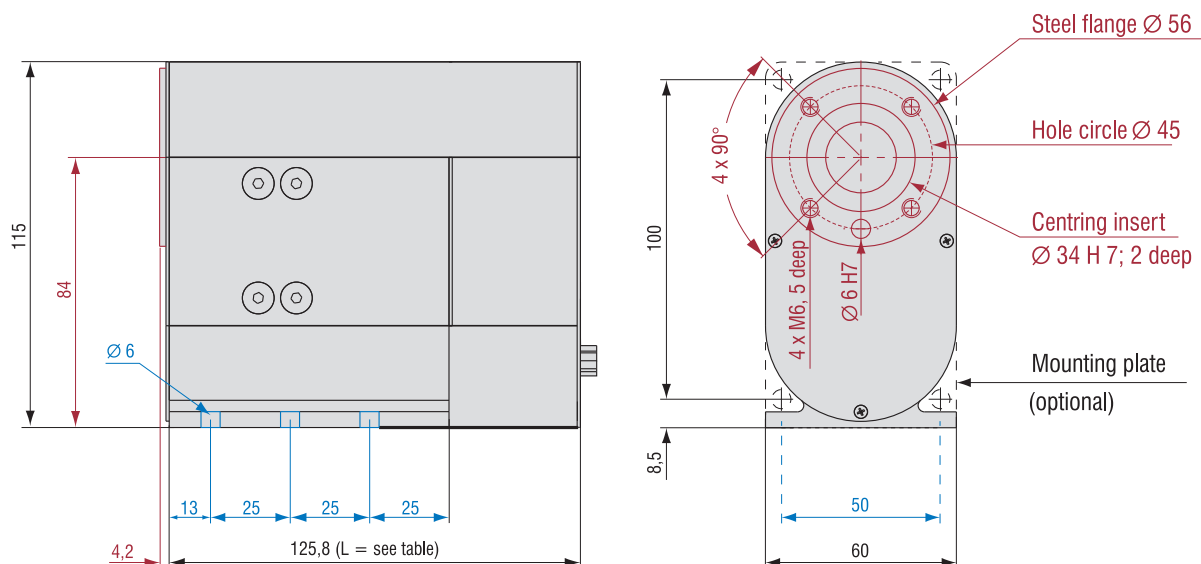
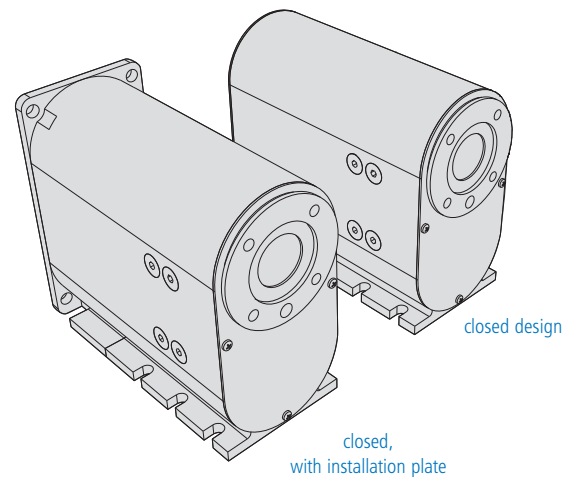
## Technical specification

	MS 045 HT stepper motor *	DC servomotor RE 40	EC servomotor EC 42
Reduction ratio	1:20	1:20	1:20
Output speed [1/min]	0 - 60	0 - 175	0 - 150
Operating torque (0 - 1600 Hz) [Nm]	8	--	--
Rated torque [Nm]	--	3	3.2
Rated holding torque (static load) [Nm]	14	3.9	4
Min. step (positional accuracy) [arcmin]	3.5	2	2
Gewicht [kg]		1.35	

\* Values for half-step operation

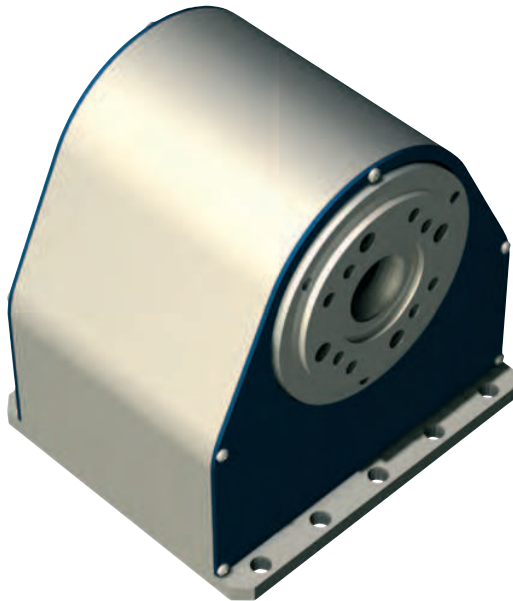
## Dimensioned drawings

	Length L per step	Length L for DC servo
closed design	129 mm	180 mm
closed with installation plate	133 mm	184 mm



# Rotary unit

# ZD 30



## Features

- Low play toothed belt drive with Stepper motor
- Reduction 1 : 30
- Shaft with Ø 15 mm boring
- Housing flange with inner cone SK 20
- Weight: 2,9 kg

For pin assignment see page 2-112

For transport loads, see page 2-113

### Options:

- CNC controller via Sub D

## Ordering data

ZD 30 rotary unit  
Part no.: **261100 0000**

## Accessories



**Chuck assembly**  
3-jaw chuck Ø 65  
Part no.: **269060 2065\***



**Chuck assembly**  
3-jaw chuck Ø 80  
Part no.: **269063 3080\***



**Collet holder**  
Clamping ring housing SK 20  
for tools Ø 3 - 13 mm, with  
installation ring  
Part no.: **239172 0020**

Clamping rings are on  
page 5-32.



**Tailstock unit RE-ZD30**  
200 mm Part no.: **269 100 1060** L 331  
300 mm Part no.: **269 100 1070** L 431  
400 mm Part no.: **269 100 1080** L 531  
500 mm Part no.: **269 100 1090** L 631

\* including flange

# Rotary unit

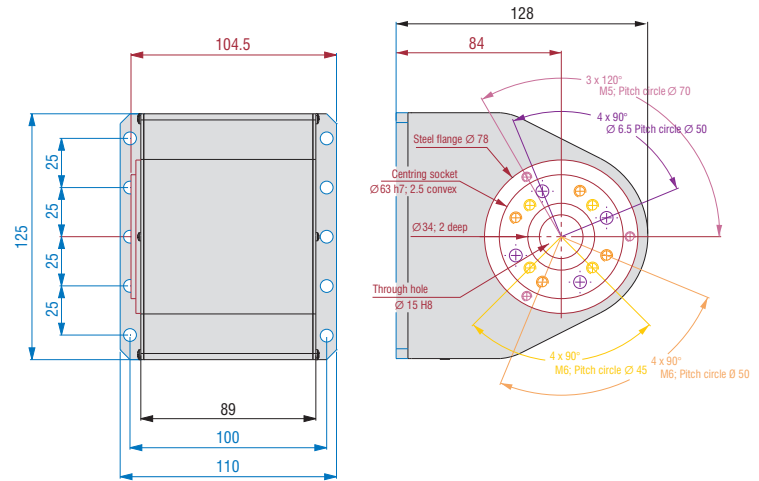
# ZD 30

## Technical specification

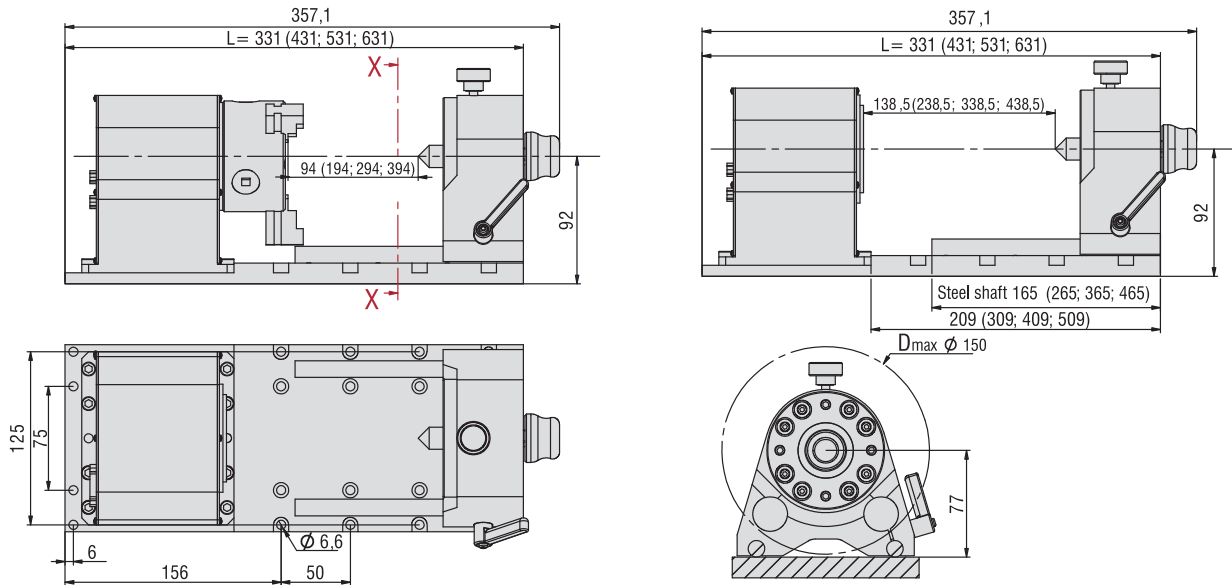
		stepper motor MS 045 HT *
Reduction ratio		0.0625
Output speed	[1/min]	0 - 40
Operating torque (0 - 1600 Hz)	[Nm]	12
Rated holding torque (static load)	[Nm]	20
Min. step (positional accuracy)	[arcmin]	2.5
Weight	[kg]	2.9

\* Values for half-step operation

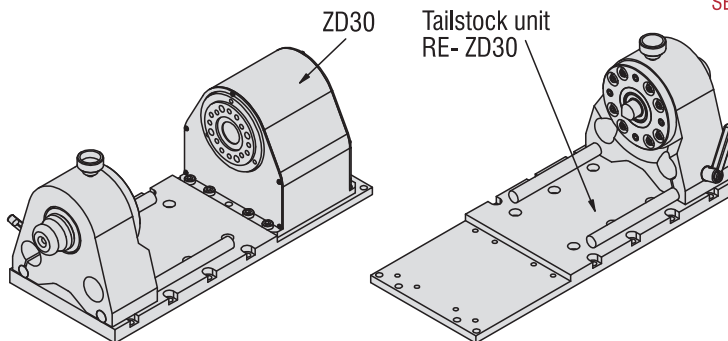
## Dimensioned drawings



## Tailstock unit RE-ZD30



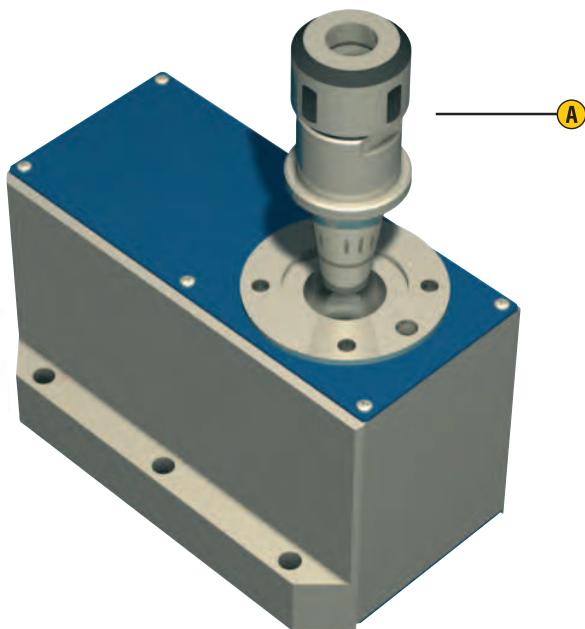
SECTIONAL DRAWING X-X





## Indexing table

## ZR 20



## Features

- Low play toothed belt drive with stepper motor
- Reduction 1 : 20
- Shaft with  $\varnothing$  15 mm boring
- Housing flange with inner cone SK 20•  
Weight: 2,1 kg

For pin assignment see page 2-112  
For transport loads, see page 2-113

## Options:

- CNC controller via Sub D

- **A** Collet holder SK 20  
(Accessories)

## Ordering data

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

## Technical specification

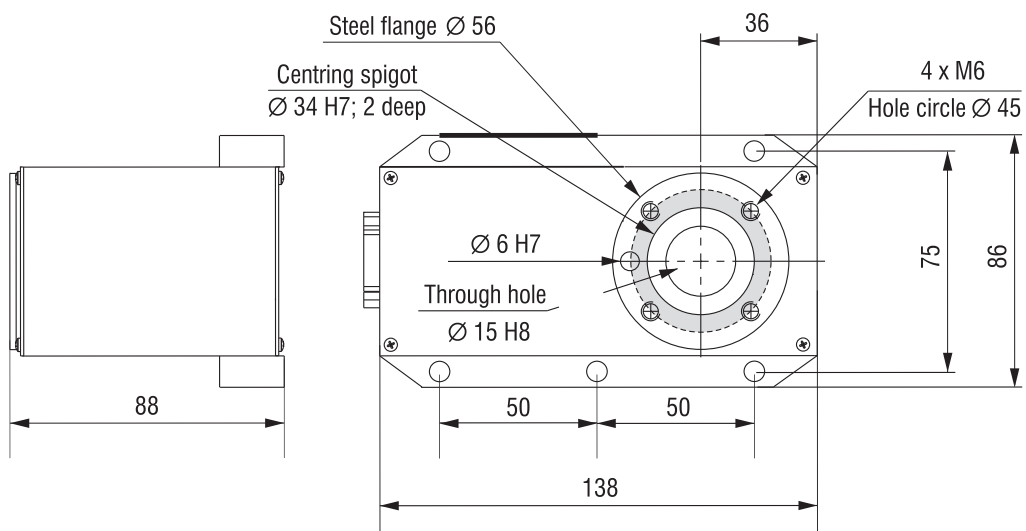
		stepper motor MS 045 HT *
Reduction ratio		1:20
Abtriebsdrehzahl	[1/min]	0 - 60
Operating torque (0 - 1600 Hz)	[Nm]	8
Rated holding torque (static load)	[Nm]	14
Min. step (positional accuracy)	[arcmin]	3.5
Weight	[kg]	2.1

\* Values for half-step operation

## Accessories

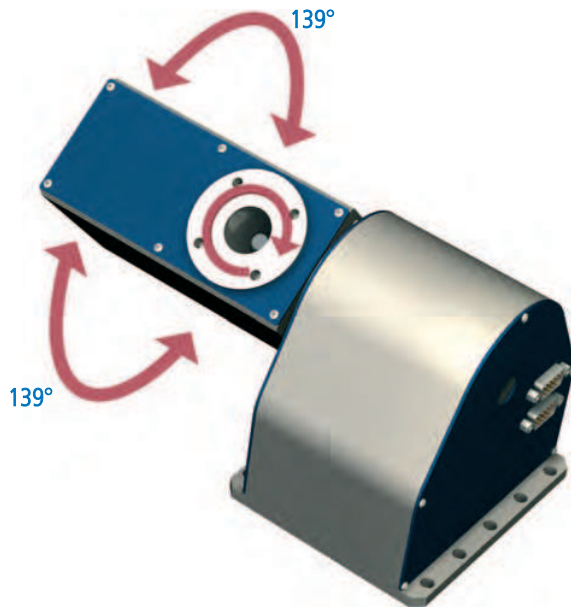
see rotary tilting unit ZDS 2030

## dimensioned drawing



# Rotary tilting unit

# ZDS 2030



## General

The **rotary tilting unit ZDS 2030** can be used as a 4th/5th axis in CNC machines for fine workshops or in the handling area.

It is a combination of ZD 30 and the modified version of ZR 20.

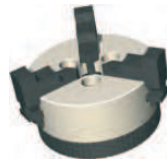
ZDS 2030 enables 5-side machining or free-form surface machining on a conventional 3-axis system of easily machinable materials (e.g. plastic).

The tilting angle is 139° in both directions.

## Ordering data

Rotary tilting unit ZDS 2030  
Part no.: **265000 0000**

## Accessories



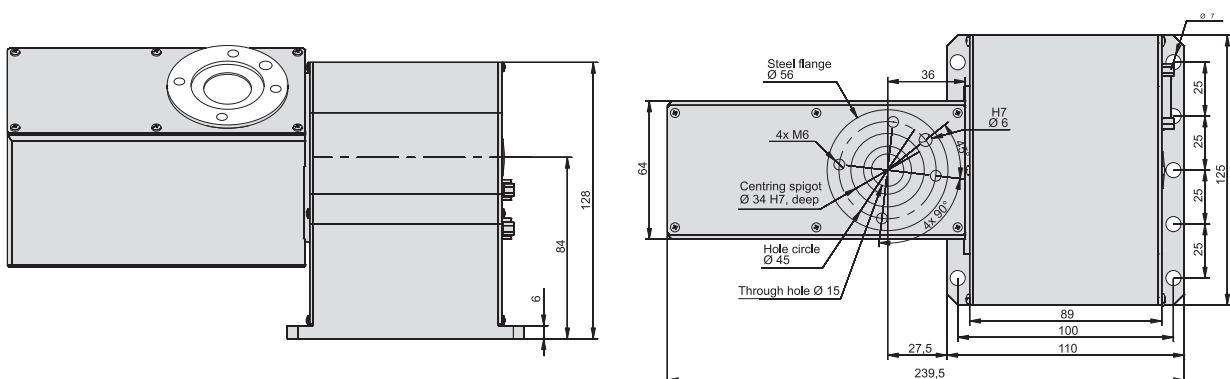
**Chuck assembly**  
3-jaw chuck Ø 65  
Part no.: **269060 2065\***

\* including flange



**Clamping ring housing**  
SK 20 clamping ring housing for tools Ø 3 - 13 mm, with installation ring  
Part no.: **239172 0020**  
Clamping rings are on page 5-32.

## dimensioned drawing

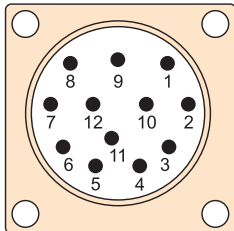


# Motor pin assignments

## Pin assignment for 12-pin stepper motors

(for RDH, DSH-S)

Motor connection



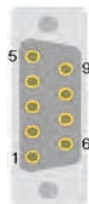
Plug side view of pin insert

M23 12-pin Pin	
1	Motor phase 1A
2	Motor phase 1B
3	Motor phase 2A
4	Motor phase 2B
5	+24V switch
6	+24V brake
7	GND switch
8	GND brake
9	Limit switch 1
10	Limit switch 2
11	---
12	---
Housing - cable shield	

## Pin assignment for 9-pin stepper motors

(for RF1, iZD 54, MD 1, ZD 30, ZR 20, ZDS 2030)

Motor connection



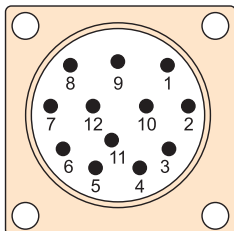
Plug side view of pin insert

Sub-D 9-pin Pin	
1	Motor phase 1A
2	Motor phase 1B
3	Motor phase 2A
4	Motor phase 2B
5	+24V switch
6	+24V brake
7	Limit switch 2
8	GND brake
9	Limit switch 1
Housing - cable shield	

## Pin assignment for stepper motors with encoder

(for RDH)

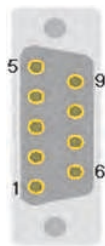
Motor connection



Plug side view of pin insert

M23 12-pin Pin	
1	Motor phase 1A
2	Motor phase 1B
3	Motor phase 2A
4	Motor phase 2B
5	+24V switch
6	+24V brake
7	GND switch
8	GND brake
9	Limit switch 1
10	Limit switch 2
11	---
12	---
Housing - cable shield	

Encoder connection

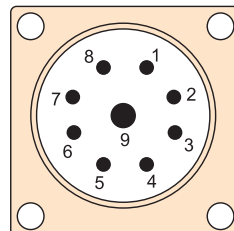


Plug side view of pin insert

Sub-D 9-pin Pin	
1	+5V encoder
2	Encoder track A
3	Encoder track B
4	Encoder track Z
5	---
6	GND encoder
7	Encoder track/A
8	Encoder track/B
9	Encoder track/Z
Housing - cable shield	

## Pin assignment for DC servo motors with brushes (BDC)

Motor connection



Plug side view of pin insert

M23 9-pol. (8+1) pin	
1	Motor phase 1 (V+)
2	Motor phase 1 (V-)
3	Motor phase 1 (V+)*
4	Motor phase 1 (V-)*
5	+24V brake
6	GND brake
7	---
8	---
9	Earthing lead
Housing - cable shield	

\* Part motor phase connection over 2 wires.

Encoder connection

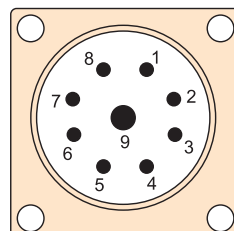


Plug side view of pin insert

Sub-D 15-pin Pin	
1	---
2	+5V encoder
3	Encoder track/Z
4	Encoder track/B
5	Encoder track/A
6	+24V switch
7	Limit switch 1
8	GND switch
9	---
10	GND encoder
11	Encoder track Z
12	Encoder track B
13	Encoder track A
14	Reference switch
15	Limit switch 2
Housing - cable shield	

## Pin assignment for brushless EC servomotors (BLDC) 48V

Motor connection



Plug side view of pin insert

M23 9-pol. (8+1) pin	
1	Motor phase U
2	Motor phase V
3	Motor phase W
4	---
5	+24V brake
6	GND brake
7	---
8	---
9	Earthing lead
Housing - cable shield	

Encoder connection

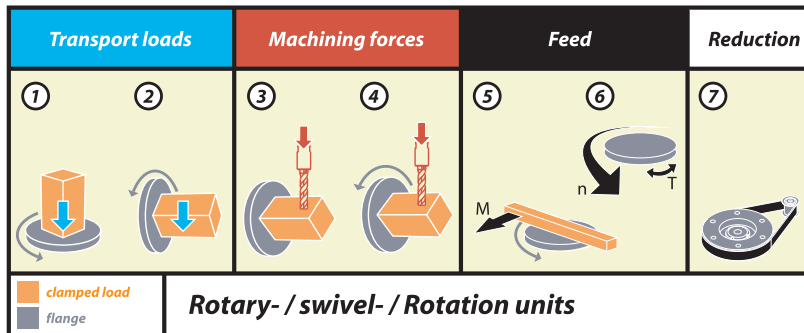


Plug side view of pin insert

Sub-D 15-pin Pin	
1	Hall signal A
2	+5V encoder/Hall
3	Encoder track/Z
4	Encoder track/B
5	Encoder track/A
6	+24V switch
7	Limit switch 1
8	GND switch
9	Hall signal B
10	GND encoder
11	Encoder track Z
12	Encoder track B
13	Encoder track A
14	Hall signal C
15	Limit switch 2
Housing - cable shield	

Turn/tilt/rotation units:

# Transport loads, machining forces, feed



Rotary or tilting 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 (EC-servo, brushless)	110 kg	50 kg	26 Nm	9 Nm	9 Nm	22 rpm	1:51
RDH-M (EC-servo, brushless)	180 kg	80 kg	51 Nm	17 Nm	17 Nm	11 rpm	1:101
RDH-S (step)	30 kg	15 kg	7 Nm	7 Nm	7 Nm	4 rpm	1:51
RDH-S (step)	48 kg	24 kg	11 Nm	11 Nm	11 Nm	2 rpm	1:101
RDH-S (EC-servo, brushless)	30 kg	15 kg	7 Nm	4.6 Nm	4.6 Nm	22 rpm	1:51
RDH-S (EC-servo, brushless)	48 kg	24 kg	11 Nm	4.6 Nm	9.2 Nm	11 rpm	1:101
RDH-S (DC-servo)	25 kg	13 kg	7 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
RDH-XS (step)	30 kg	10 kg	5 Nm	5 Nm	5 Nm	24 rpm	1:50
RDH-XS (step)	30 kg	10 kg	7 Nm	7 Nm	7 Nm	12 rpm	1:100
RDH-XS (EC-servo, brushless)	30 kg	10 kg	5 Nm	5 Nm	5 Nm	59 rpm	1:50
RDH-XS (EC-servo, brushless)	30 kg	10 kg	7 Nm	7 Nm	7 Nm	30 rpm	1:100
RDH-XS (DC-servo)	30 kg	10 kg	5 Nm	5 Nm	5 Nm	70 rpm	1:50
RDH-XS (DC-servo)	30 kg	10 kg	7 Nm	7 Nm	7 Nm	35 rpm	1:100
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/EC servo)	70 kg	35 kg	7 / 12 Nm	6 / 10 Nm	6 / 10 Nm	125 rpm	1:24
RF 1 (DC servo/EC servo)	110 kg	55 kg	16 / 26 Nm	13 / 22 Nm	13 / 22 Nm	58 rpm	1:52
RF 1 (DC servo/EC servo)	160 kg	80 kg	30 / 50 Nm	25 / 42 Nm	25 / 42 Nm	30 rpm	1:100
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	3.9 Nm	3 Nm	3 Nm	175 rpm	1:20
MD 1 (EC servo, brushless)	6 kg	3 kg	4 Nm	3.2 Nm	3.2 Nm	150 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

\*) Guideline values will vary according to application !!