

Rotary units with Harmonic Drive[®]

**RDH-XS, RDH-S, RDH-M
RSH-S**

Assembly instruction with:

- Installation instructions
- Maintenance instructions
- Declaration of incorporation

for a drive system
(A partly completed machine as defined in the Machine Directive 2006/42/EC)

About these assembly instructions

Abbreviations





MD = MachineDirective 2006/42/EC
 RDH = Rotary Index Table with Harmonic Drive[®] Motor
 RSH = Rotary Swivel Unit with Harmonic Drive[®] Motor
 AC = Alternating Current, AC servo motor (always synchronous motor)
 BDC = Brushed DC, brush type Direct Current (DC) servo motor
 BLDC = Brushless DC, brushless type direct current (DC) servo motor
 PDF = Portable Document Format

Terminology

In these assembly instructions "product" always refers to a Rotary Unit with Harmonic Drive.

Symbols used

In these instructions you will find various symbols which are there to alert you to important information / facts and hazards:

Symbol	Warning	Meaning
	Danger	Warning of possible serious or fatal injuries to persons
	Caution ! Fatal Voltage !	The flash symbol is a clear warning of danger from electric current! Not heeding this warning can lead to personal injuries with fatal consequences.
	Warning, caution !	Warning of possible minor injuries to persons, of possible faults or destruction of the product or possible damage to property. Not heeding the facts following this symbol (text, picture or table) can result in serious damage to property.
	Important information or note	Important information or note on how the product works.

Reading the safety guidelines



Before commissioning the Rotary Units (as partly completed machines), working with them, or making any additions or modifications to the electrical installation, it is essential you read carefully:

- the safety guidelines in these assembly instructions
- the safety guidelines for electric drives and control systems in the instruction manual of the positioning module, drive controller, drive module or drive controls used.

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Although every care has been taken to avoid printing errors and mistakes, these cannot be ruled out. We would be grateful for any suggestions for improvements or information on possible mistakes or unclear formulation of facts and illustrations.

Note on CE compliance for partly completed machines:

isel/ rotary units comply with CE guidelines. They are classed as partly completed machines as defined in the Machinery Directive 2006/42/EC and therefore do not explicitly bear the CE mark.

Only after the compliance assessment procedures for the machine have been completed is the (complete) machine or system in which these linear units are installed awarded the CE mark by the manufacturer or distributor of the machine.

All other machine parts and/or machine components to which the CE safety guidelines apply must not be commissioned until all the relevant requirements of Machinery Directive 2006/42/EC are met.

isel/ Germany AG does not accept any responsibility for any modifications you make to the rotary unit.

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More documents from isel/ Germany AG:

'Nothing is so good it can't be improved upon.' In accordance with this motto, as the manufacturer, we are constantly improving all our manuals (including operating instructions and assembly instructions) at considerable cost to ourselves.

We are committed to doing so since this is of benefit to both you as our customers and us:

We want you to be able to work efficiently with the relevant manuals and find the information you are looking for quickly. Many details in the manuals are the result of information we have received from our customers.

To support you, all the manuals are available to download in PDF format on our homepage:

<http://www.isel-data.de/manuals>



In your own interest:

Please read these assembly instructions carefully and keep them in a safe place. These instructions form an integral part of the "Rotary Unit with Harmonic Drive" product, regardless of whether these instructions are supplied/available in the form of an electronic storage medium (as PDF file on a CD, DVD or memory stick) or as a printed version.

Please read and follow the safety guidelines in these assembly instructions.

Contents

1	General information.....	5
1.1	<i>Safety guidelines.....</i>	6
1.2	<i>Proper use.....</i>	8
1.3	<i>Deliverables.....</i>	8
2	Installation instructions and overview of functions	9
2.1	<i>Functions.....</i>	9
2.2	<i>Assembly / of the rotary units /drive elements.....</i>	10
2.3	<i>Connector pin assignment for rotary units.....</i>	27
3	Commissioning, general information.....	28
4	Assembly of the rotary unit.....	29
4.1	<i>Mounting and adjustment instructions.....</i>	29
4.2	<i>Mounting the tailstock unit.....</i>	30
5	Fault list.....	31
6	Technical specification.....	32
6.1	<i>Mechanical data.....</i>	32
6.2	<i>Electrical data.....</i>	35
7	Maintenance and cleaning	36
7.1	<i>Maintenance instructions.....</i>	36
7.2	<i>Cleaning.....</i>	36
8	Decommissioning / disposal	37
9	CE Conformity	38
10	Service	39
11	Warranty	40
12	Declaration of incorporation according to MD 2006/42/EC	41
13	Index.....	42
14	Appendix	43
14.1	<i>A1: Accessories.....</i>	43
14.2	<i>A2: Miscellaneous.....</i>	44

1 General information

This manual contains all important information about the assembly/installation, commissioning and maintenance of your rotary units. In addition, it provides information and important notes for your safety.

The isel-rotary units RDH - RSH are rotary modules with Harmonic Drive[®] Motors, which are ready to install. They are for use mainly in machining and positioning tasks in factory automation, handling technology and light machinery construction.

These rotary units are available in different standard sizes with various gear reductions.

The options for horizontal or vertical positioning of the rotary axis on the RDH series mean users can build a wide variety of constructions to suit their requirements.

Please note:

The product is classed as 'partly completed machine' and not a (complete) machine according to MD 2006/42/EC.

1.1 Safety guidelines



The following guidelines on safety and danger are intended to protect you, third parties and the product. It is essential that you follow them.

Operating environment

- The surrounding medium must not have a corrosive effect on aluminium alloys, stainless steels (1.4305) or ABS plastics.
- The product has achieved Protection Type IP65 if no corrosion has been caused on the surface of the radial shaft seal by the operating environment.
- When moving the product from cold to warm conditions, allow the product to adjust to the change in temperature for a few hours, to avoid possible damage from condensation.
- Do not install the product near devices which generate powerful magnetic fields. This could disturb some products main functions.
- Avoid environments exposed to direct solar radiation, considerable heat, cold, humidity or moisture.

Power supply (only applies to products with multiphase motors, brushed DC/brushless DC or AC servo motors and a suitable motor output stage/controller)

- Only connect the power supply of the multiphase motor/servo motor output stage iMD10/iMD20, the link to the servo motor output stage iMD40 (terminals L, N, PE) or the single-axis or multi-axis controller (e.g. iMC-P/iMC-S8, MC-1 series, iPU series...) to an earthed mains socket with a mains voltage of 230 V AC/50...60 Hz (1-phase AC power supply).
- It is preferable to use for the final stage of the multiphase motor or the final stage of the iMD10/iMD20 servomotor the original power supply recommended by isel Germany AG (primary power supply: 230V AC, secondary: 48V DC). Using a different, inappropriate power supply renders the warranty null and void. In addition, using an inappropriate power supply entails risks caused by electric current, such as electric shock, fire or short circuits!
- If you notice faults, activate the EMERGENCY STOP button on the (single axis) controller, the CNC operating panel/CNC console, the control panel/control cabinet or a handheld device. Activating the EMERGENCY STOP button interrupts the power supply to the motor output stage. If the power supply used is damaged you must not operate it. Have a qualified technician check and if necessary repair the product.

The rotary unit

- For safety reasons you must not convert and/or modify the rotary unit on your own.
- In operation, the rotary unit must not be concealed by supplies (electricity or compressed air), objects (e.g. tools) or tarpaulins, packaging or other materials etc. (e.g. clothing), because this can lead to mechanical damage or heat obstruction and sometimes fire.
- If using a single-axis/multi-axis controller to control a linear unit (equipped with an AC, brushed DC (BDC) or a brushless DC (BLDC) servo motor), you need to ensure that the controller or motor output stage used (in a control cabinet or on a mounting rack) is placed in a well ventilated environment.

Operation

(applies only to products supplied with a motor and a suitable motor output stage or a suitable controller, e.g. a single-axis controller)

Only if the product is assembled correctly and the motor, the tactile or inductive limit switches, the brake and the incremental measuring system (encoder) are correctly connected to the motor output stage/controller all further operations can be successful. Next operations are parameterisation, commissioning and operation/programming of the product as a fully-functioning drive system.

The technical details of special versions may differ from the following versions.

If the product malfunctions or you are unclear about its operational status, you should consult the relevant operating instructions/assembly instructions.

<http://www.isel-data.de/manuals>

Here you will find instructions and information on how to check the functions you require, remove the causes of a possible malfunction or have these removed.

You must always carry out the instructions you find completely and correctly in order to ensure the product functions correctly.

Never allow children or other persons who are vulnerable or at risk to operate the product unsupervised.

If you are still unclear about its operational status, it is highly recommended that you consult isel Germany, quoting the type and article number or serial number.

1.2 Proper use

The rotary units serve to rotate and position securely attached loads on the output flange in an environment where there is no danger of Exploded views and in accordance with the operational and environmental conditions specified for this product. The product can be installed as required (in a horizontal, vertical or diagonal position).



The rotary units are an partly completed machine (compare Article 2g in the MD 2006/42/EC). Here an partly completed machine is defined as follows (quote):

'A partly completed machine is a unit which almost forms a machine but which cannot fulfil any specific function on its own.

A drive system is a partly completed machine.

A partly completed machine is only intended to be installed into other machines or other partly completed machines or equipment, or joined together with these to form a machine as defined in this directive.'

The rotary units RDH - RSH are intended for installation into a machine or into other partly completed machines.

The product should not be used to transport people.

Any other use than those described above is not considered correct and can lead to personal injuries and damage to property.

1.3 Deliverables

The deliverables include:

- Assembly instructions and installation explanation according to MD 2006/42/EC
- Mounting materials
- Accessories if required

2 Installation instructions and overview of functions

Firstly, this section provides an overview of the mechanical structure, installation or assembly of the rotary units and a description of their functions.

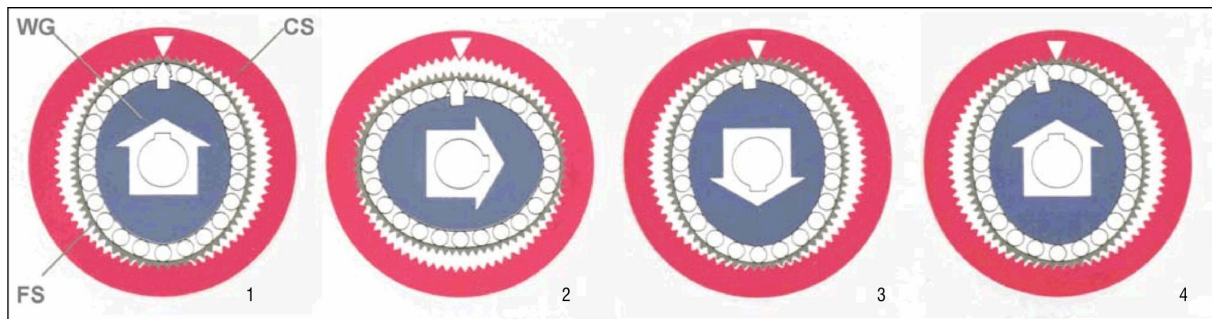
The instructions for commissioning/configuring the rotary unit and its programming by users depend on the motors used and the relevant controllers with output stages; they can be found in their documentation.

2.1 Functions

The rotary units in the series RDH and RSH have a modular design.

These rotary units are based on extremely durable Harmonic Drive® motors with their well-known high degree of precision.

These are housed in sealed aluminium moulded shell and linked to a drive directly (solid shaft) or via a drive belt (hollow shaft).



Operating principle of the Harmonic Drive-Transmission

Harmonic Drive motors are comprised of only three concentric components:

- The Circular Spline (CS), a rigid cylindrical ring with internal gearing
- The Flexspline (FS), a malleable cylindrical steel bushing with external gearing
- The Wave Generator (WG), an elliptical steel disk with a centric hub and thin section ball bearings

The powered elliptical Wave Generator (WG) deflects the Flexspline (FS), which is engaged with the internal gearing of the fixed Circular Spline (CS) across the ball bearings.

In turning, the WG shifts the major axis of the ellipse axis and hence the position of tooth engagement. The FS has two teeth less than the CS, so after half a WG rotary, a relative movement the size of one tooth occurs between FS and CS (after a complete rotary this is equal to two teeth).

Where the CS is fixed, the FS is the output element and rotates in the opposite direction.

The following advantages result from this operating principle:

- Reduction ratios of 30:1 to 320:1 with a minimal construction space
- Peak torque values of 0.5 to 15000 Nm
- Efficiencies of over 90% under rated operating conditions
- Total positioning accuracy to less than one minute of an angle
- Repeatability is only a few minutes of an angle
- Freedom of movement in the tooth system
- Very low tooth abrasion thanks to low sliding speed between the teeth

2.2 Assembly / of the rotary units /drive elements

The following illustrations, drawings and item lists illustrate the structure of the rotary units.

Options

Rotary units RDH – RSH are usually supplied ready for connection and with an integrated drive module. The RDH-S and RDH-M units are also available as hollow shafts.

Overview of the functions using RDH-M as an example

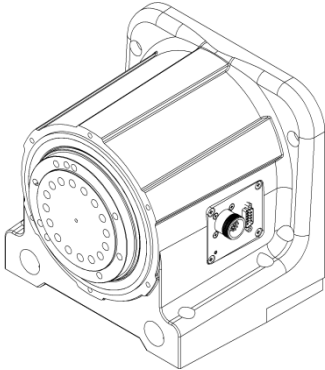
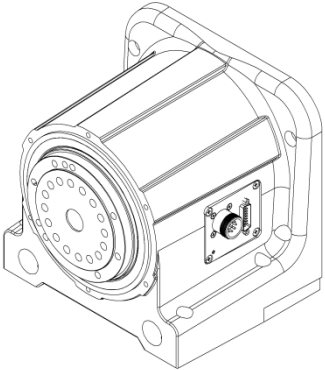
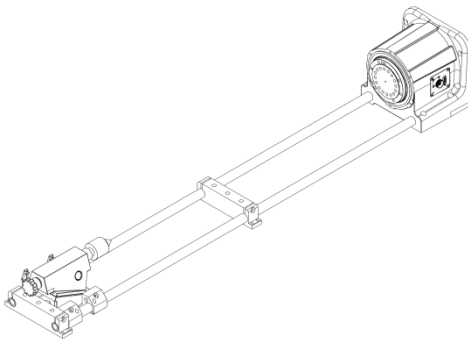
	<p>Solid shaft</p> <ul style="list-style-type: none"> (1) Harmonic Drive Motor (2) Aluminium moulding shell (3) Drive module (4) Output flange solid shaft (5) Cover (6) Connection panel (7) Rotary shaft seal
	<p>Hollow shaft</p> <ul style="list-style-type: none"> (1) Harmonic Drive Motor (2) Aluminium moulding shell (3) Drive module (4) Output flange hollow shaft with pipe penetration (5) Cover with penetration and shaft seal (6) Connection panel (7) Rotary shaft seal (8) Toothed belt stage

Overview of the functions of DSH-S

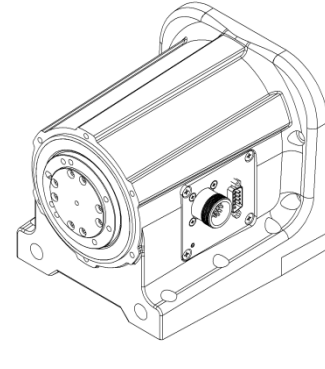
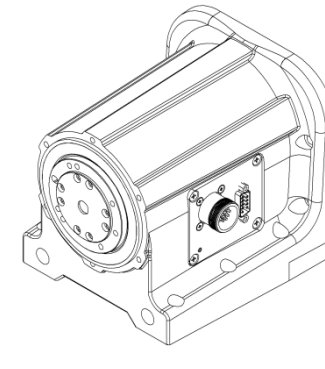
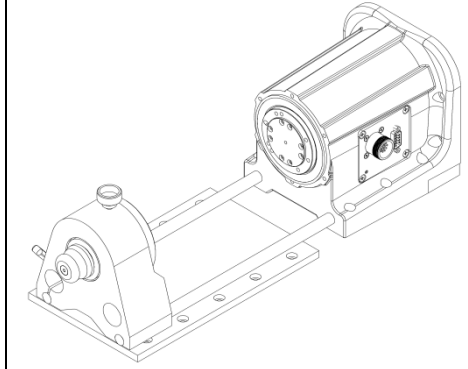
	<ul style="list-style-type: none"> (1) Swivel module (RDH-S) (2) Rotary axis (3) Base plate (4) Counterbearings <p>* Schwenkachse = swivelaxis / Drehachse = rotationaxis</p>
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Options

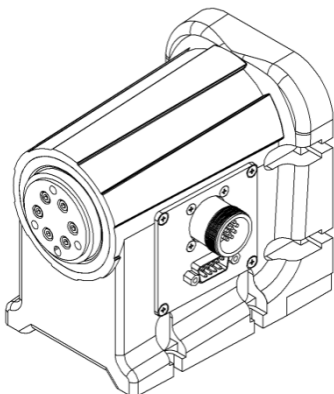
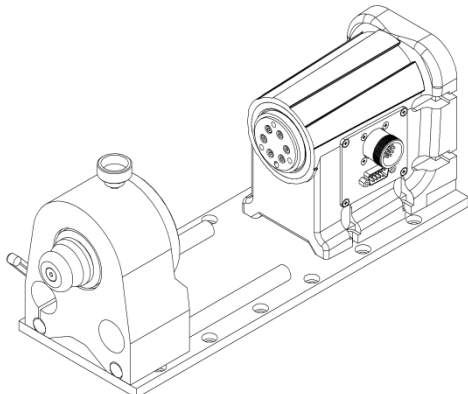
RDH-M

																	
<p>RDH-M (Solid shaft option)</p>	<p>RDH-M (Hollow shaft option)</p>	<p>RDH-M with tailstock unit RE M</p>															
<p>Ordering key</p> <p>2 6 6 2 X X 0 X 0 0</p> <table border="0"> <tr> <td>Flanged shaft</td> <td>Transmission reduction</td> <td>Motors</td> </tr> <tr> <td>0 = solid shaft</td> <td>0 = 101</td> <td>0 = Stepper motor MS 200 HAT with encoder (400 imp., 3-channel, RS422)</td> </tr> <tr> <td>1 = hollow shaft</td> <td>1 = 51</td> <td>3 = brushless EC servomotor EC 60S</td> </tr> <tr> <td></td> <td></td> <td>4 = brushed DC servomotor DC 100</td> </tr> <tr> <td></td> <td></td> <td>5 = Stepper motor without encoder</td> </tr> </table>		Flanged shaft	Transmission reduction	Motors	0 = solid shaft	0 = 101	0 = Stepper motor MS 200 HAT with encoder (400 imp., 3-channel, RS422)	1 = hollow shaft	1 = 51	3 = brushless EC servomotor EC 60S			4 = brushed DC servomotor DC 100			5 = Stepper motor without encoder	<p>Tailstock unit RE M</p> <p>Art. No.: 269100 2100 (1000 mm)</p> <p>Art. No.: 269100 2150 (1500 mm)</p> <p>Art. No.: 269100 2200 (2000 mm)</p>
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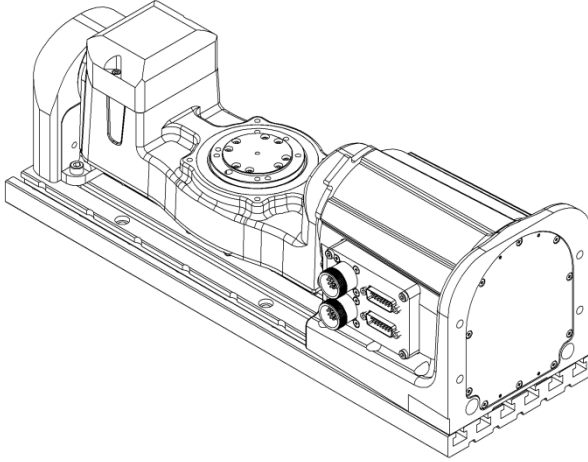
RDH-S

																	
<p>RDH-S (Solid shaft option)</p>	<p>RDH-S (Hollow shaft option)</p>	<p>RDH-S with tailstock unit RE S</p>															
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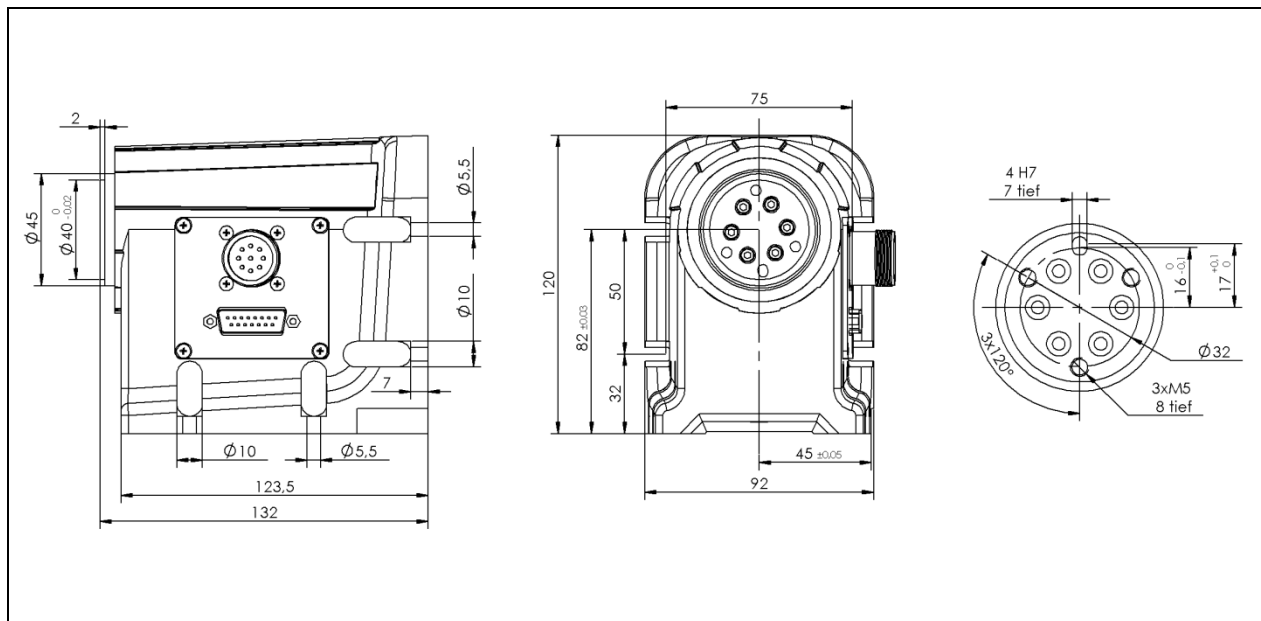
RDH-XS

			
RDH-XS (Solid shaft option)	RDH-XS with tailstock unit RE XS		
<p>Ordering key</p> <p>2 6 6 0 0 X 0 X 0 0</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Transmission reduction</p> <p>0 = 100</p> <p>1 = 50</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Motors</p> <p>0 = Stepper motor MS 045 HT with encoder (400 imp., 3-channel, RS422)</p> <p>2 = brushed DC servomotor RE 40</p> <p>3 = brushless EC servomotor EC 42</p> <p>5 = Stepper motor without encoder</p> </td> </tr> </table>	<p>Transmission reduction</p> <p>0 = 100</p> <p>1 = 50</p>	<p>Motors</p> <p>0 = Stepper motor MS 045 HT with encoder (400 imp., 3-channel, RS422)</p> <p>2 = brushed DC servomotor RE 40</p> <p>3 = brushless EC servomotor EC 42</p> <p>5 = Stepper motor without encoder</p>	<p>Tailstock unit RE S</p> <p>Art. No.: 269100 0020 (200 mm)</p> <p>Art. No.: 269100 0030 (300 mm)</p> <p>Art. No.: 269100 0040 (400 mm)</p> <p>Art. No.: 269100 0050 (500 mm)</p>
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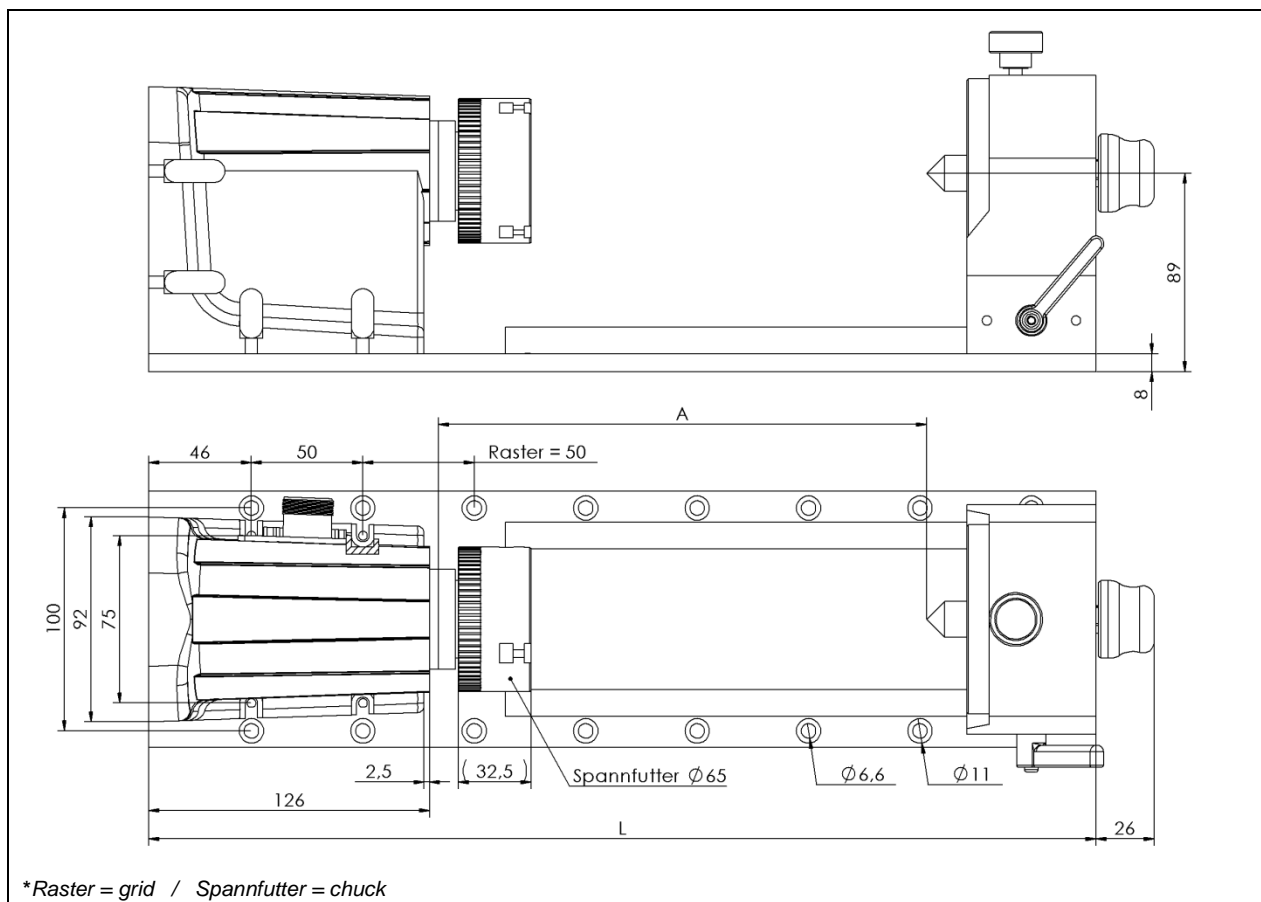
RSH-S

		
RDH-XS with tailstock unit RE XS		
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Dimension sheet for RDH-XS



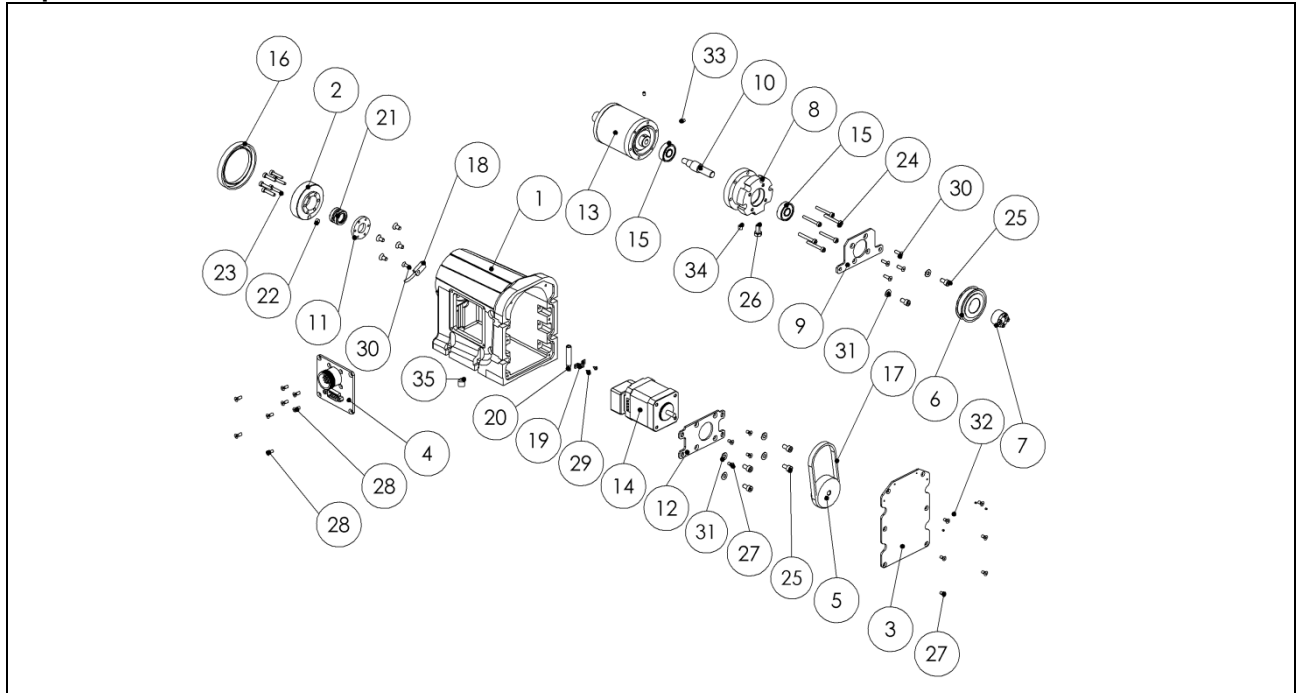
Dimension sheet for RDH-XS tailstock unit RE XS



*Raster = grid / Spannfutter = chuck

Options	L	A
Tailstock unit RE-XS 200 mm	325	117
Tailstock unit RE-XS 300 mm	425	217
Tailstock unit RE-XS 400 mm	525	317
Tailstock unit RE-XS 500 mm	625	417

Explodedview RDH-XS



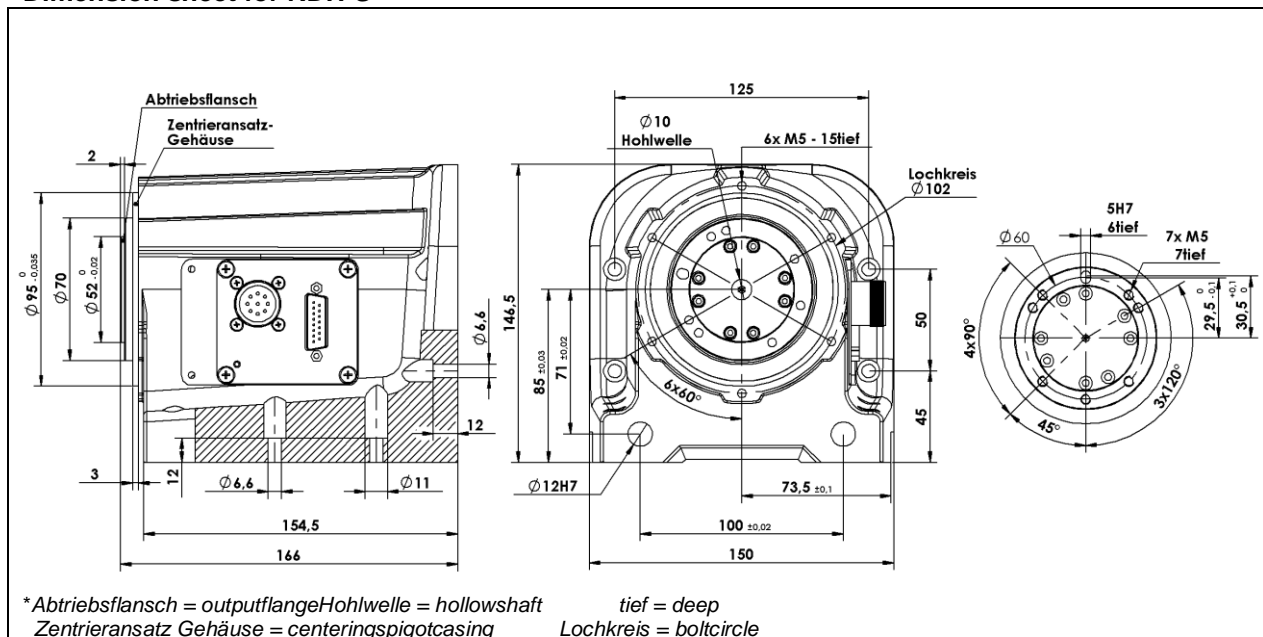
18	30	34	Servo motorstructure
19	20	22	multiphasemotorstructure

Item list RDH-XS

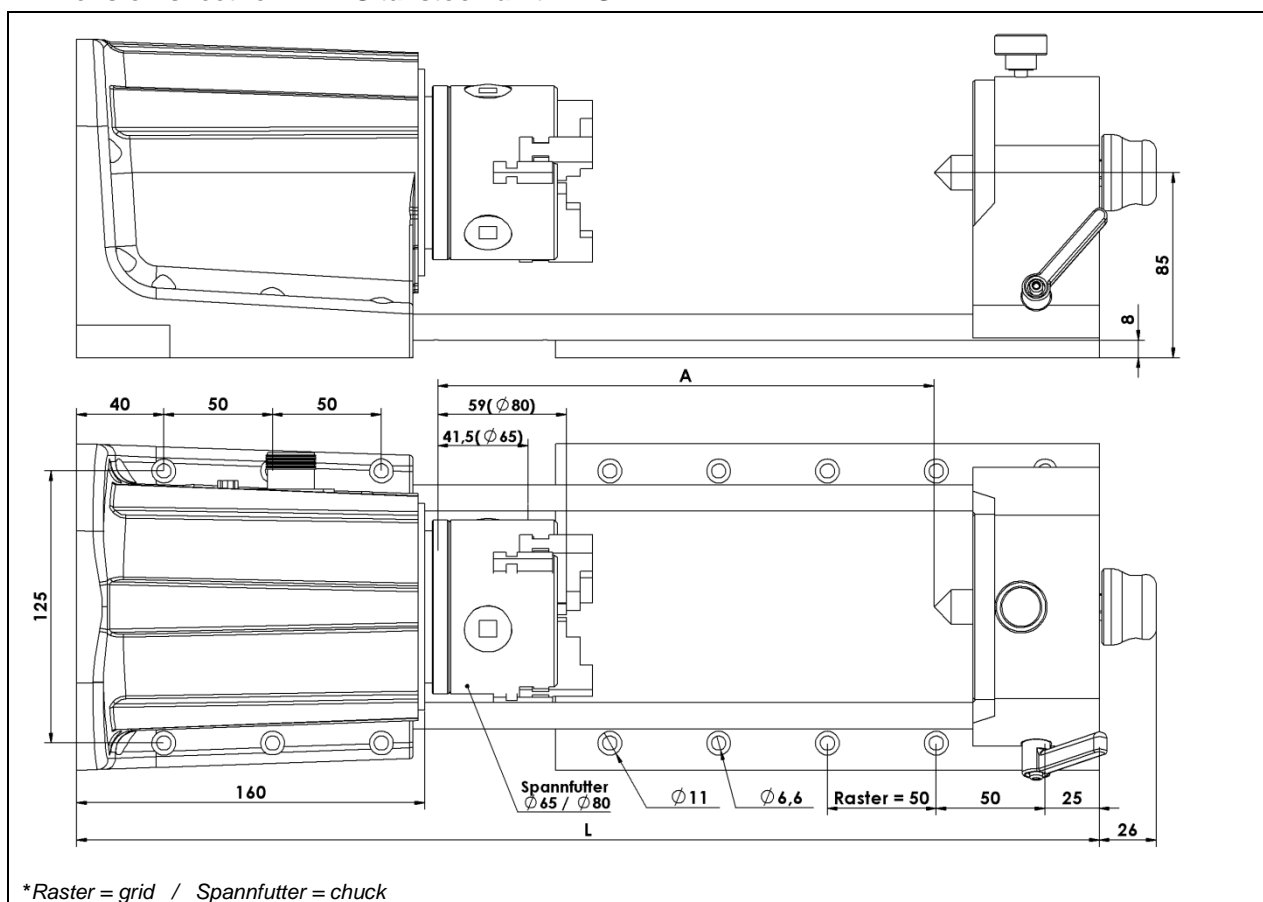
Pos No.	Item number	Quantity	Name	Drawing no.
1	660500 0000	1	EZ4150 - base body - XS - processed	EZ4150
2	660500 4152	1	EZ4152 – Adapter flange XS	EZ4152
3	660500 4156	1	EZ4156 – Cover at back	EZ4156
4	660500 28782 / 660500 28783	1	DZ2878 - Connector panel - RDH-XS	DZ2878
5	660500 41582 / 660500 41583	1	EZ4158 - toothed belt disk HTD3 - Z40	EZ4158
6	660500 39432	1	EZ4159 - toothed belt disk HTD3 - Z40 with flanged wheel	EZ4159
7	898081 8201	1	Clampingbushing 8-18-11(Mädler 615708 00)	
8	660500 4153	1	EZ4153 - Transmission attachment	EZ4153
9	660500 4154	1	EZ4154 - Transmission mounting	EZ4154
10	660500 4155	1	EZ4155 – Shaft Transmission entry	EZ4155
11	660500 4164	1	EZ4164 - Clamping ring	EZ4164
12	660500 41512 / 660500 41511	1	EZ4151 - Motor mounting	EZ4151
13	660500 1000 /650200 0010	1	Harmonic Drive Motor HDUC-14-xx-1U-CC (i=100 / i=50)	
14	XXXXXX XXXX *	1	Motor module	
15	896010 8224	2	Single-row groove ball bearings with sealing pads 608-2RS1	
16	843400 0030	1	Shaft seal BABSL 45-58-7 Simrit 72 NBR902	
17	616504 0722	1	Toothed belt HTD 3M CXP b=6 L216 (Z=72)	
18	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
19	582132	1	Magneticsensormounting	
20	563005	1	Magneticsensor	
21	898120 1218	1	Spieth pressure sleeve AK 12-18 L12	
22	632501 0002	1	Neodymium block magnet 3 mm	
23	891101 0161	6	Pan head screw DIN 912 8.8 VZ M3 x 16	
24	891101 0251	6	Pan head screw DIN 912 8.8 VZ M3 x 25	
25	891102 0081	6	Pan head screw DIN 912 8.8 VZ M4 x 8	
26	891053 0101	1	Allen screw DIN 933 M5x10	
27	891191 0065	10	Countersunk screw DIN 965 4.8 VA M 3 x 6	
28	891191 0085	8	Countersunk screw DIN 965 4.8 VA M 3 x 8	
29	891530 0051	2	Self-tapping screw DIN 7981 VZ 2,2 x 4,5	
30	891131 0101	5	Countersunk screw DIN 7991 M 3 x 10	
31	893051 0001	6	Disk DIN 125 ST 4,3	
32	891378 0025	4	Grubscrew DIN 913 VA M 2 x 2	
33	891371 0041	2	Grubscrew DIN 913 M 3 x 4	
34	891373 0051	1	Grubscrew DIN 913 M 5 x 5	
35	891375 0085	1	Grubscrew DIN 913 VA M 8 x 8	

* Item number see page 26

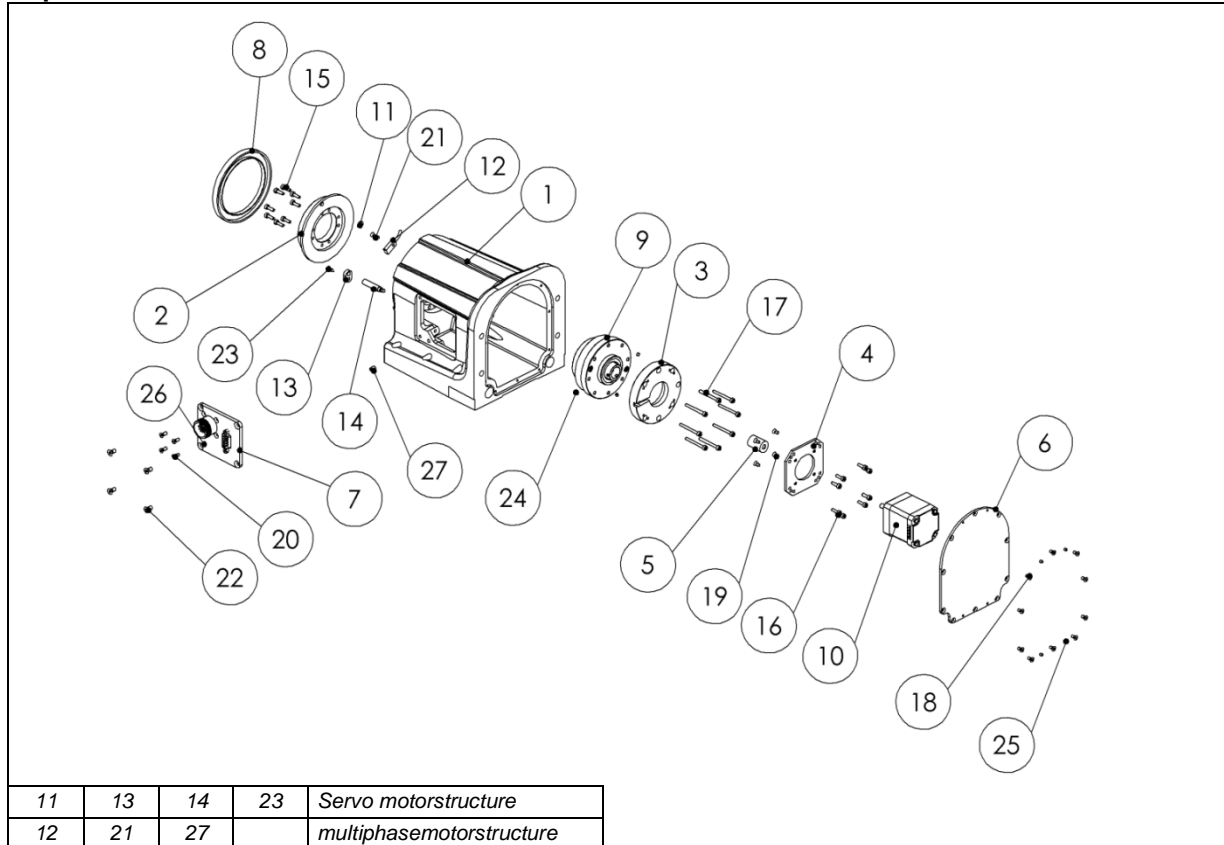
Dimension sheet for RDH-S



Dimension sheet for RDH-S tailstock unit RE S

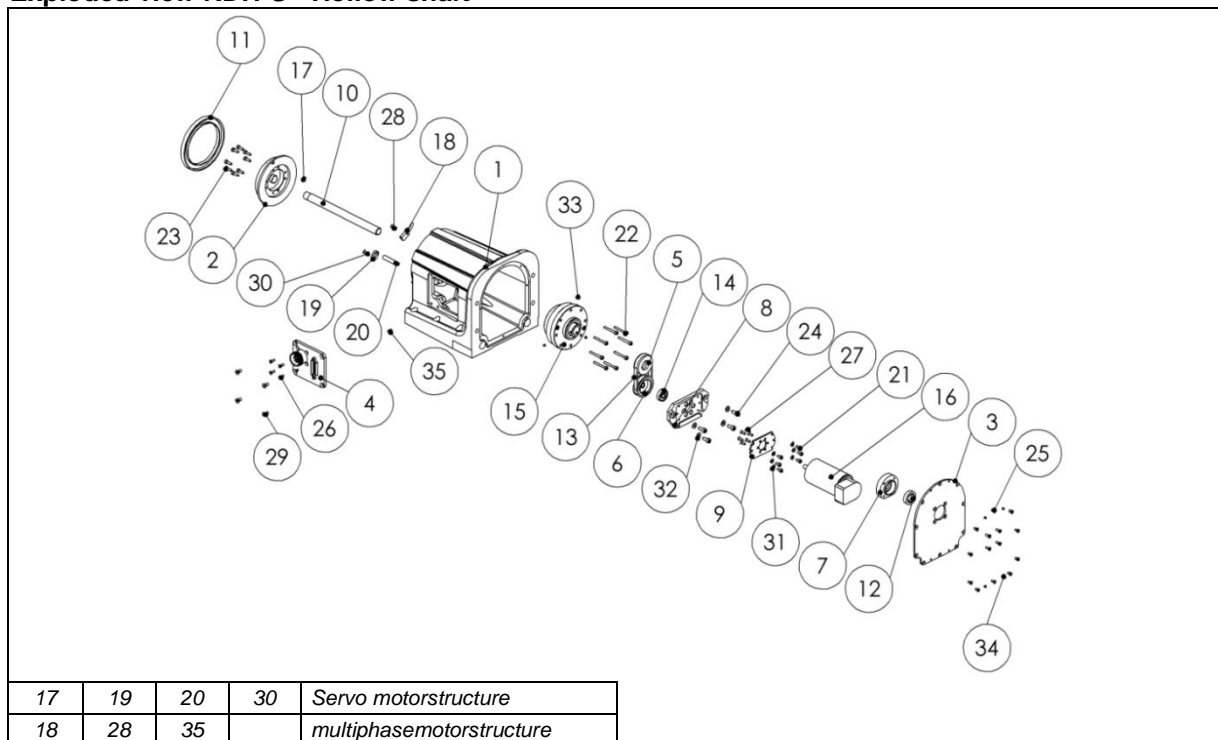


Options	L	A
Tailstock unit RE-S 200 mm	370	128
Tailstock unit RE-S 300 mm	470	228
Tailstock unit RE-S 400 mm	570	328
Tailstock unit RE-S 500 mm	670	428

Exploded view RDH-S - Solid shaft

Item list RDH-S - Solid shaft

Pos No.	Item number	Quantity	Name	Drawing no.
1	660500 0001	1	EZ3937 - basebody - 14	EZ3937
2	660500 3930	1	EZ3930 - Adapter flange - 14	EZ3930
3	660500 3932	1	EZ3932 - Motor adapter_14	EZ3932
4	660500 39331 / 660500 39332	1	EZ3933 - Motor adapter 14	EZ3933
5	660500 39454 / 660500 39452	1	EZ3945 - Couplingpart	EZ3945
6	660500 39382	1	EZ3938 - Cover - below	EZ3938
7	660510 3919 / 660510 39191	1	EZ3919 - Cover	EZ3919
8	893400 0027	1	Shaft seal BABSL 90-70-7 Simrit 72 NBR902	
9	665330 1000 / 650200 0002	1	HarmDrive Motor HFUS-14-xx-2UH (i=101 / i=51)	
10	XXXXXX XXXX *		Motor module	
11	632501 0002	1	Neodymium block magnet 3 mm	
12	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
13	660510 3934	1	EZ3934 - Magnetic switch mounting	
14	563005	1	Magnetic sensor	
15	891101 0105	8	Pan head screw DIN 912 8.8 VA M3 x 10	
16	891101 0101	8	Pan head screw DIN 912 8.8 VZ M3 x 10	
17	891101 0301	8	Pan head screw DIN 912 8.8 VZ M3 x 30	
18	891191 0065	10	Countersunk screw DIN 965 4.8 VA M 3 x 6	
19	891191 0061	4	Countersunk screw DIN 965 4.8 VZ M 3 x 6	
20	891191 0085	4	Countersunk screw DIN 965 4.8 VA M 3 x 8	
21	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
22	891192 0085	4	Countersunk screw DIN 965 4.8 VA M 4 x 8	
23	891541 0095	1	Self-tapping screw DIN 7982 VA 2,9 x 9,5	
24	891371 0031	3	Grubscrew DIN 913 M 3 x 3	
25	891371 0035	4	Grubscrew DIN 913 VA M 3 x 3	
26	891372 0045	1	Grubscrew DIN 913 VA M 4 x 4	
27	891373 0061	1	Grubscrew DIN 913 M 5 x 6	

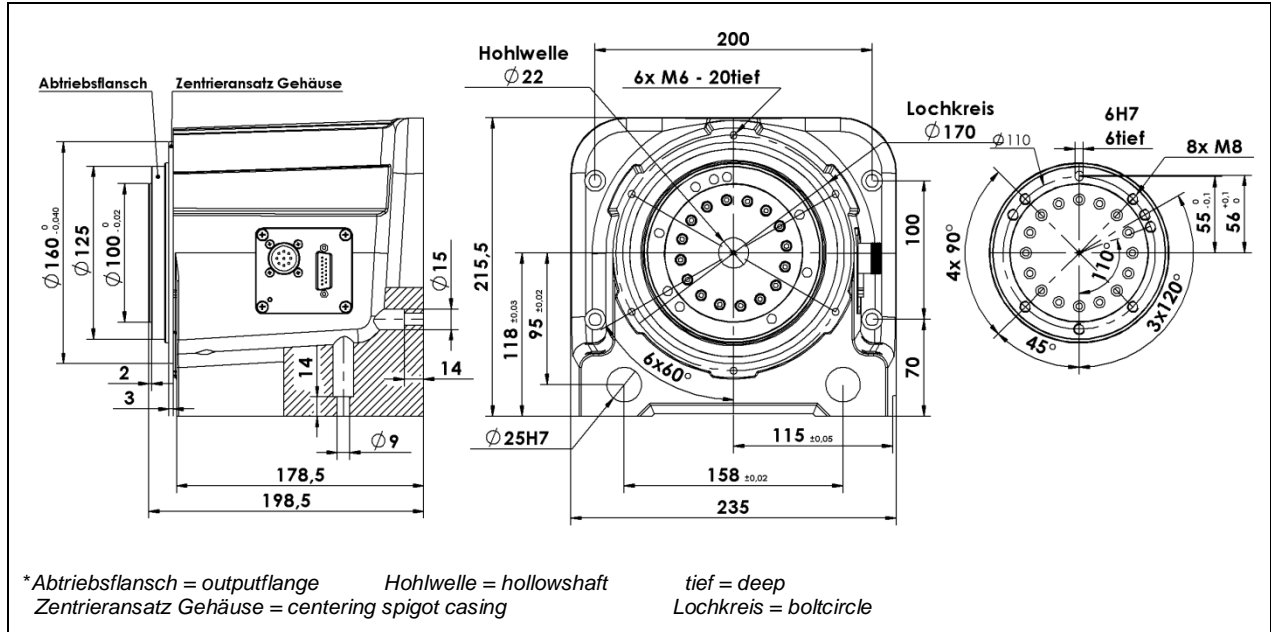
* Item number see page 26

Exploded view RDH-S - Hollow shaft

Item list RDH-S - Hollow shaft

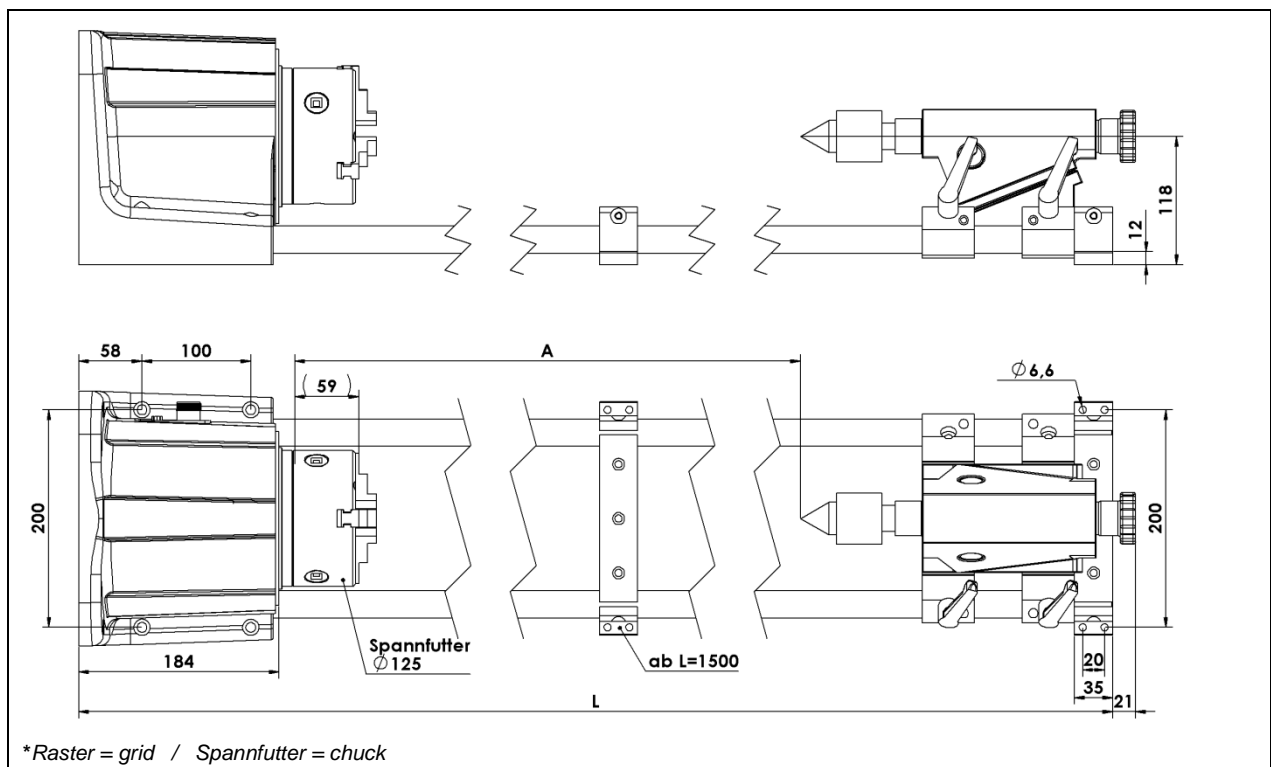
Pos No.	Item number	Quantity	Name	Drawing no.
1	660500 0001	1	EZ3937 basebody - 14	EZ3937
2	660500 3931	1	EZ3931 Adapter flange - 14 Hollow shaft	EZ3930
3	660500 39381	1	EZ3938 Cover - below hollow shaft structure	EZ3938
4	660510 3919	1	EZ3919-3 Cover - Connector - Option Sub-D 15	EZ3919
5	660500 3944	1	EZ3944 Toothed belt disk HTD3 - Z34	EZ3944
6	660510 3957 / 660510 39431	1	Toothed belt disk HTD3 - Z34 with flanged wheel	
7	660500 3941	1	EZ3941 Flange - Pipe seal_ 14	EZ3941
8	660500 3956	1	EZ3956 Bearing for RE40 Maxon Motor - 14	EZ3956
9	660500 3958 / 660500 3942	1	Motor mounting	EZ3942
10	660500 3940	1	EZ3940 Internal pipe	EZ3940
11	893400 0027	1	Shaft seal BABSL 90-70-7 Simrit 72 NBR902	
12	893400 0028	1	Shaft seal BABSL 12-22-6 Simrit 72 NBR902	
13	616504 0660	1	Toothed belt CXP HTD 180 -3M - 6 (Z60)	
14	896010 6194	1	Single-row groove ball bearings with sealing pads 626-2RS1	
15	665330 1000 / 650200 0002	1	HarmDrive Motor HFUS-14-xx-2UH (i=101 / i=51)	
16	XXXXXX XXXX *	1	Motor module	
17	632501 0002	1	Neodymium block magnet 3 mm	
18	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
19	660510 3934	1	EZ3934 Magneticswitchmounting	EZ3934
20	563005	1	Magneticsensor	
21	891101 0061	6	Pan head screw DIN 912 8.8 VZ M3 x 6	
22	891101 0251	8	Pan head screw DIN 912 8.8 VZ M3 x 25	
23	891101 0105	8	Pan head screw DIN 912 8.8 VA M3 x 10	
24	891102 0101	4	Pan head screw DIN 912 8.8 VZ M4 x 10	
25	891191 0065	10	Countersunk screw DIN 965 4.8 VA M 3 x 6	
26	891191 0085	8	Countersunk screw DIN 965 4.8 VA M 3 x 8	
27	891191 0081	6	Countersunk screw DIN 965 4.8 VZ M 3 x 8	
28	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
29	891192 0085	4	Countersunk screw DIN 965 4.8 VA M 4 x 8	
30	891541 0095	1	Self-tapping screw DIN 7982 VA 2.9 x 9.5	
31	893050 0001	6	Disk DIN 125 ST 3.2	
32	893051 0001	4	Disk DIN 125 ST 4.3	
33	891371 0031	3	Grubscrew DIN 913 M 3 x 3	
34	891371 0035	4	Grubscrew DIN 913 VA M 3 x 3	
35	891373 0061	1	Grubscrew DIN 913 M 5 x 6	

* Item number see page 26

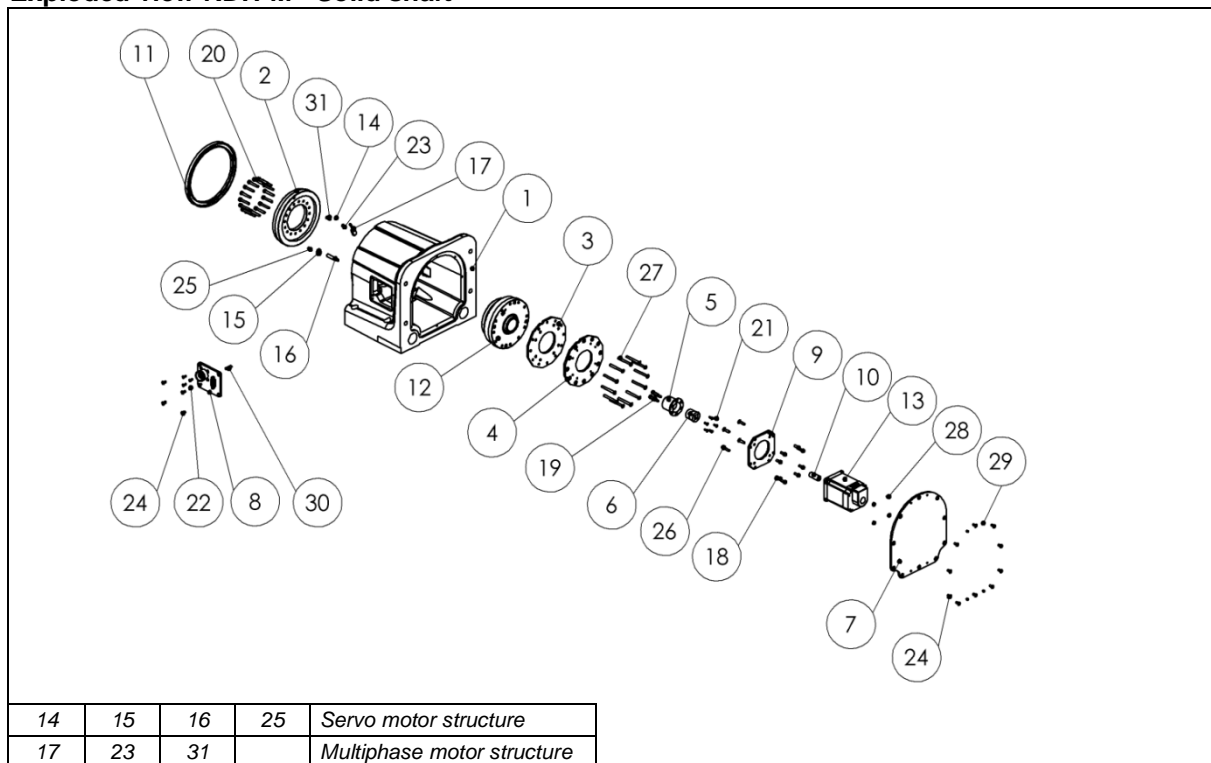
Dimension sheet for RDH-M



Dimension sheet for RDH-M tailstock unit RE M



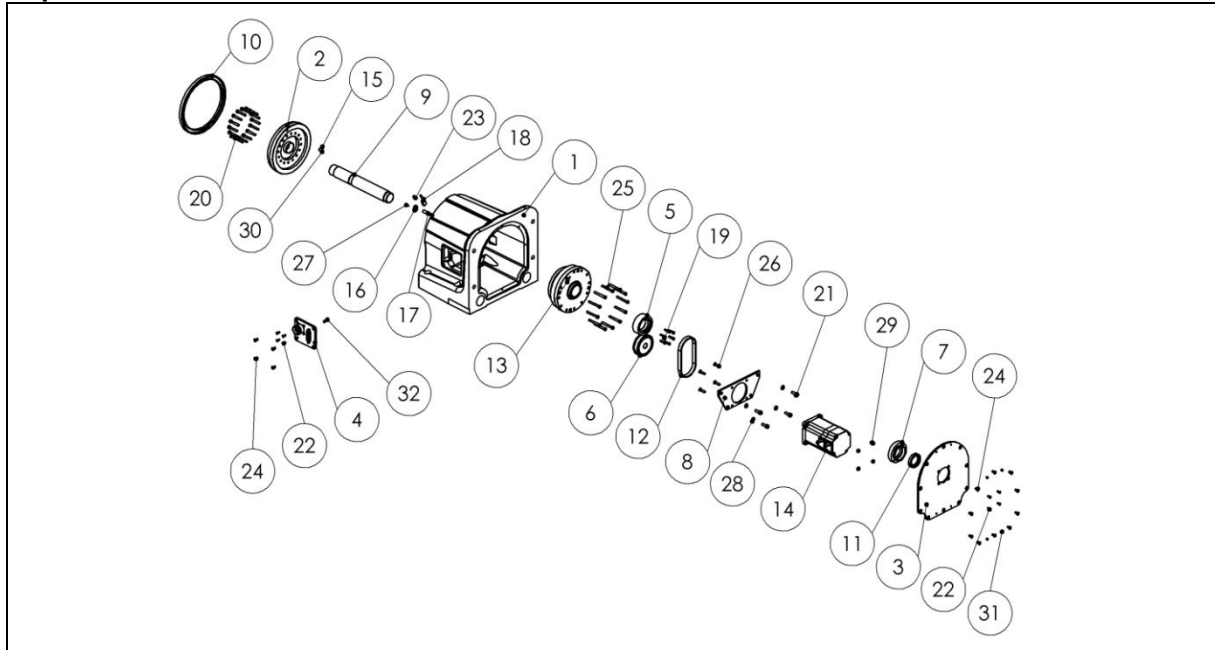
Options	L	A
Tailstock unit RE-M 1000 mmm	1110	624.5
Tailstock unit RE-M 1500 mmm	1610	1124.5
Tailstock unit RE-M 2000 mmm	2110	1624.5

Exploded view RDH-M - Solid shaft

Item list RDH-M - Solid shaft

Pos No.	Item number	Quantity	Name	Drawing no.
1	660510 0001	1	EZ3917 - basebody - 25	EZ3917
2	660510 3909	1	EZ3909 - Adapter flange 25	EZ3909
3	660510 3905	1	EZ3905 - Motor mounting 1	EZ3905
4	660510 3906	1	EZ3906 - Motor mounting 2	EZ3906
5	660510 1158	1	EZ1158 - Coupling part for HD motor - Male collet	EZ1158
6	635003 1101 / 635003 1200	1	EZ1160 - Collet Type S	EZ1160
7	660510 39182	1	EZ3918 - Cover - below option Standard	EZ3918
8	660510 3919 / 660510 39191	1	EZ3919 - Cover - Connector	EZ3919
9	660510 39072 / 660510 39074 / 660510 39075	1	EZ3907 - Motor adapter	EZ3907
10	66051039253 / 660510	1	EZ3925 - Adapter - Motor shaft	EZ3925
11	893400 0025	1	Shaft seal BABSL 130-150-7.5 Simrit 72 NBR902	
12	660510 1000 / 660510 1001	1	HarmDrive Motor HFSU-14-xx-2UH (i=101 / i=51)	
13	XXXXXX XXXX *	1	Motor module	
14	632501 0002	1	Neodymium block magnet 3 mm	
15	660510 3934	1	EZ3934 - Magneticswitch mounting	EZ3934
16	563005	1	Magneticsensor	
17	562015 4000	1	Inductiveproximityswitch	
18	891102 0101	8	Pan head screw DIN 912 8.8 VZ M4 x 10	
19	891102 0141	4	Pan head screw DIN 912 8.8 VZ M4 x 14	
20	891102 0255	16	Pan head screw DIN 912 8.8 VA M4 x 25	
21	891191 0081	6	Countersunk screw DIN 965 4.8 VZ M 3 x 8	
22	891191 0085	4	Countersunk screw DIN 965 4.8 VA M 3 x 8	
23	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
24	891192 0085	14	Countersunk screw DIN 965 4.8 VA M 4 x 8	
25	891541 0095	1	Self-tapping screw DIN 7982 VA 2.9 x 9	
26	891132 0161	4	Countersunk screw DIN 7991 M4 x 16	
27	891132 0401	12	Countersunk screw DIN 7991 M4 x 40	
28	892023 0002	4	Hexagonal flangenut DIN 934 8 M 4	
29	891372 0045	5	Grubscrew DIN 913 VA M 4 x 4	
30	891373 0161	1	Grubscrew DIN 913 M 5 x 16	
31	895025 0126	1	Grubscrew DIN 6325 d6x 12	

* Item numbersee page 26

Exploded view RDH-M - Hollow shaft



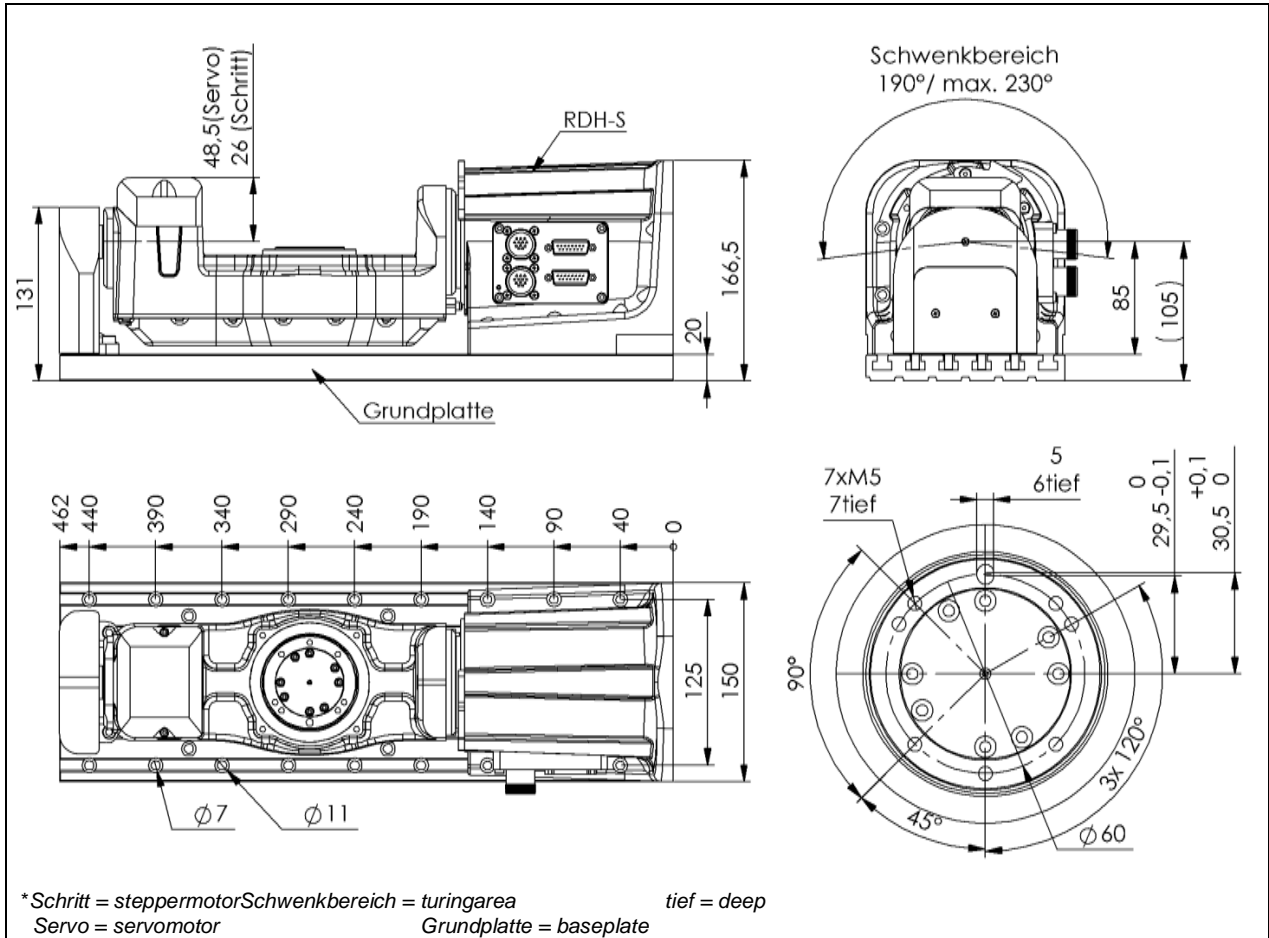
15	16	17	27	Servo motor structure
18	23	30		Multiphase motor structure

Item list RDH-M - Hollow shaft

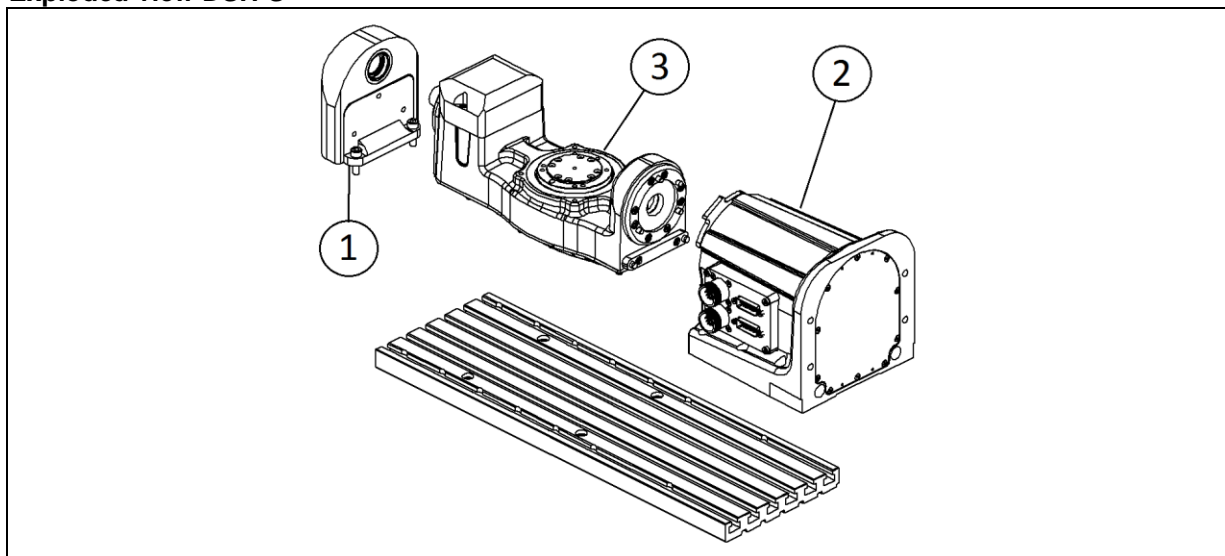
Pos No.	Item number	Quantity	Name	Drawing no.
1	660510 0001	1	EZ3917 - basebody - 25	EZ3917
2	660510 3915	1	EZ3915 - Adapter flange 25	EZ3915
3	660510 39181	1	EZ3918 - Cover - below option hollow shaft	EZ3918
4	660510 3919 / 660510 39191	1	EZ3919 - Cover Connector	EZ3919
5	660510 3924	1	EZ3924 - Toothed belt disk HTD3 - Z52	EZ3924
6	660510 39233 / 660510 39231 660510 39234	1	EZ3923 - Toothed belt disk HTD3 - Z52 with flanged wheel	EZ3923
7	660510 3921	1	EZ3921 - Flange - Pipe seal	EZ3921
8	660510 39223 / 66051 39222	1	EZ3922 - Motor mountingplate	EZ3922
9	660510 3920	1	EZ3920 - Internal pipe	EZ3920
10	893400 0025	1	Shaft seal BABSL 130-150-7.5 Simrit 72 NBR902	
11	893400 0026	1	Shaft seal BABSL 25-35-6 Simrit 72 NBR902	
12	616510 0267	1	Toothed belt CXP HTD 267 -3M - 9 (Z89)	
13	660510 1001 / 660510 1000	1	HarmDrive Motor HFSU-14-xx-2UH (i=101 / i=51)	
14	XXXXXX XXXX *	1	Motor module	
15	632501 0002	1	Neodymium block magnet 3 mm	
16	660510 3934	1	EZ3934 - Magneticswitchmounting	EZ3934
17	563005	1	Magneticsensor	
18	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
19	891101 0141	6	Pan head screw DIN 912 8.8 VZ M3 x 14	
20	891102 0255	16	Pan head screw DIN 912 8.8 VA M4 x 25	
21	891103 0145	4	Pan head screw DIN 912 8.8 VZ M5 x 14	
22	891191 0085	8	Countersunk screw DIN 965 4.8 VA M 3 x 8	
23	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
24	891192 0085	14	Countersunk screw DIN 965 4.8 VA M 4 x 8	
25	891122 0351	12	Pan head screw DIN 6912 8.8 M 4 x 35	
26	891132 0161	4	Countersunk screw DIN 7991 M 4 x 16	
27	891541 0095	1	Self-tapping screw DIN 7982 VA 2.9 x 9.5	
28	893053 0001	4	Disk DIN 125 ST 5.3	
29	892023 0002	4	Hexagonal flangenut DIN 934 8 M 4	
30	895025 0126	1	Grubscrew DIN 6325 d6x 12	
31	891372 0045	5	Grubscrew DIN 913 VA M 4 x 4	
32	891373 0161	1	Grubscrew DIN 913 M 5 x 16	

* Item numberseepage 26

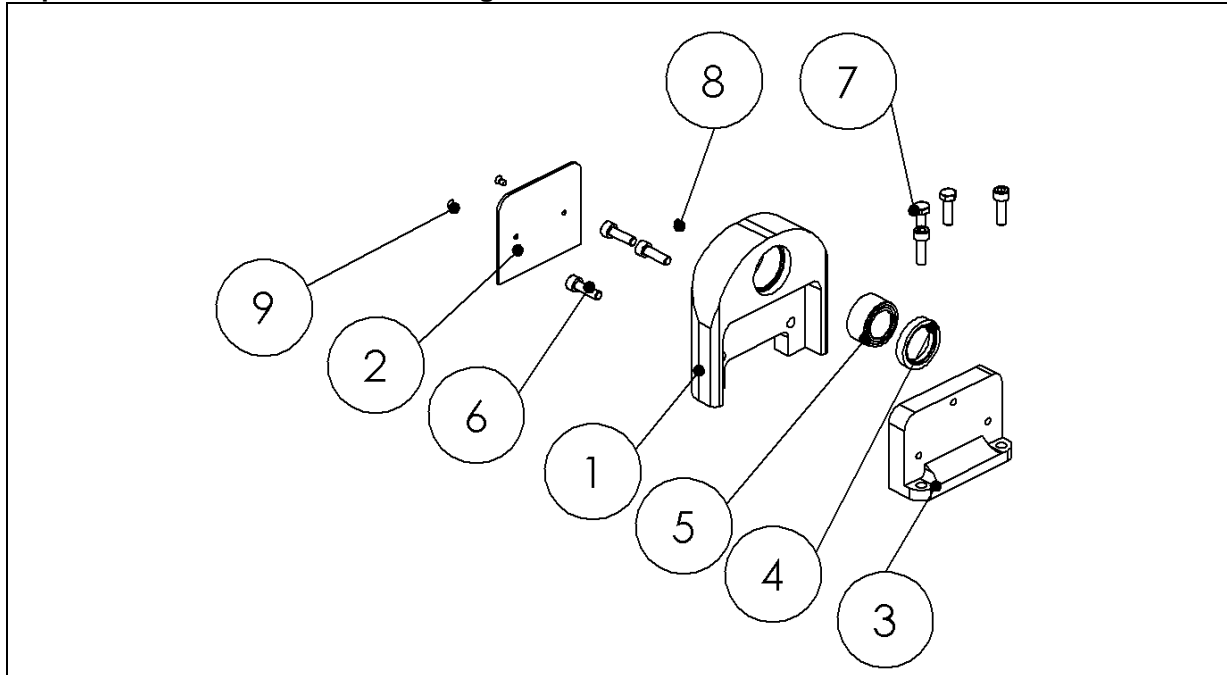
Dimension sheet for RSH-S



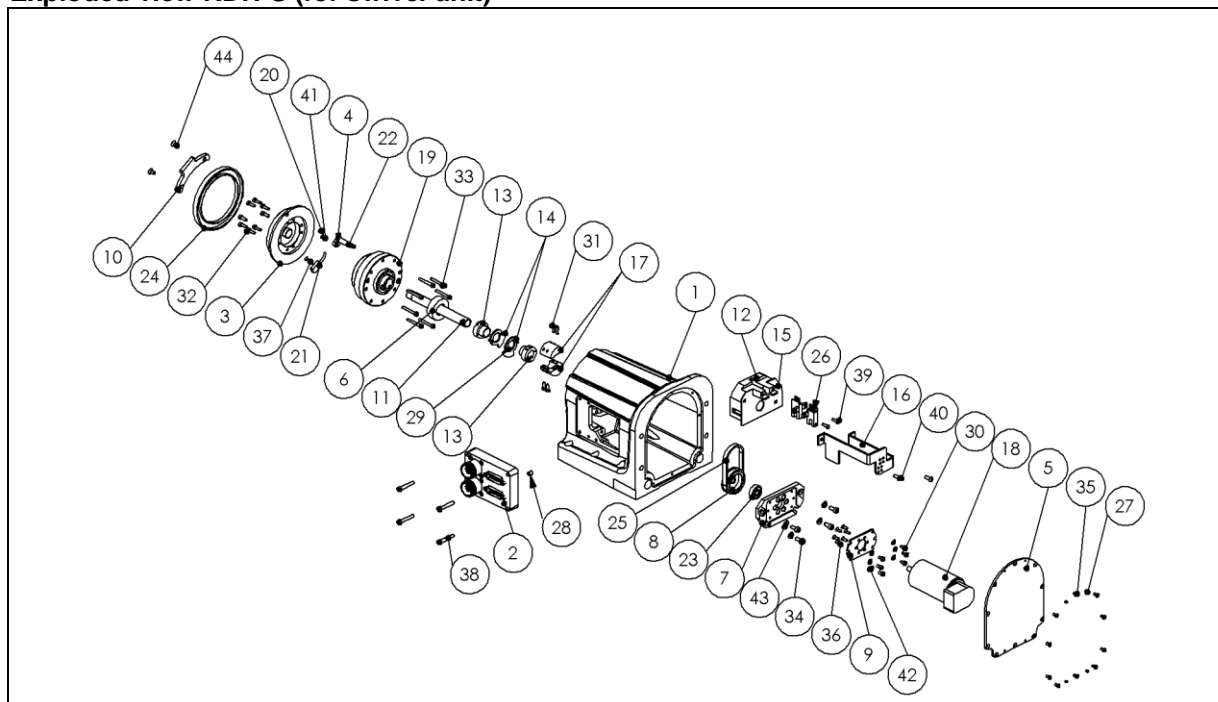
Exploded view DSH-S



Item list RDH-S - Hollow shaft				
Pos No.	Item number	Quantity	Name	Drawing no.
1	/	1	R5H-S Counter bearing	/
2	/	1	R5H-S Swivel unit	/
3	/	1	Rotary indexing table RDH-S (for RSH-S)	/

Exploded view R5H-S Counter bearing

Item list R5H-S Counter bearing

Pos No.	Item number	Quantity	Name	Drawing no.
1	665320 4331	1	EZ4331 Counter bearing block - S	EZ4331
2	665320 4385	1	EZ4385 Cover Counter bearing - S	EZ4385
3	665320 4369	1	EZ4369 Mount for counter bearing block - S	EZ4369
4	893400 0026	1	Shaft seal BABSL 25-35-6 Simrit 72 NBR902	
5		1	Needle bearings NKI 20-16	
6	891104 0205	5	Pan head screw DIN 912 8.8 VA M6 x 20	
7	891054 0201	2	Allen screw DIN 933 M6x20	
8	891190 0045	1	Countersunk screw DIN 965 4.8 VA M 2.5 x 4	
9	891191 0065	2	Countersunk screw DIN 965 4.8 VA M 3 x 6	

Exploded view RDH-S (for swivel unit)


4	20	22	41	Servo motor structure
21	37			Multiphase motor structure

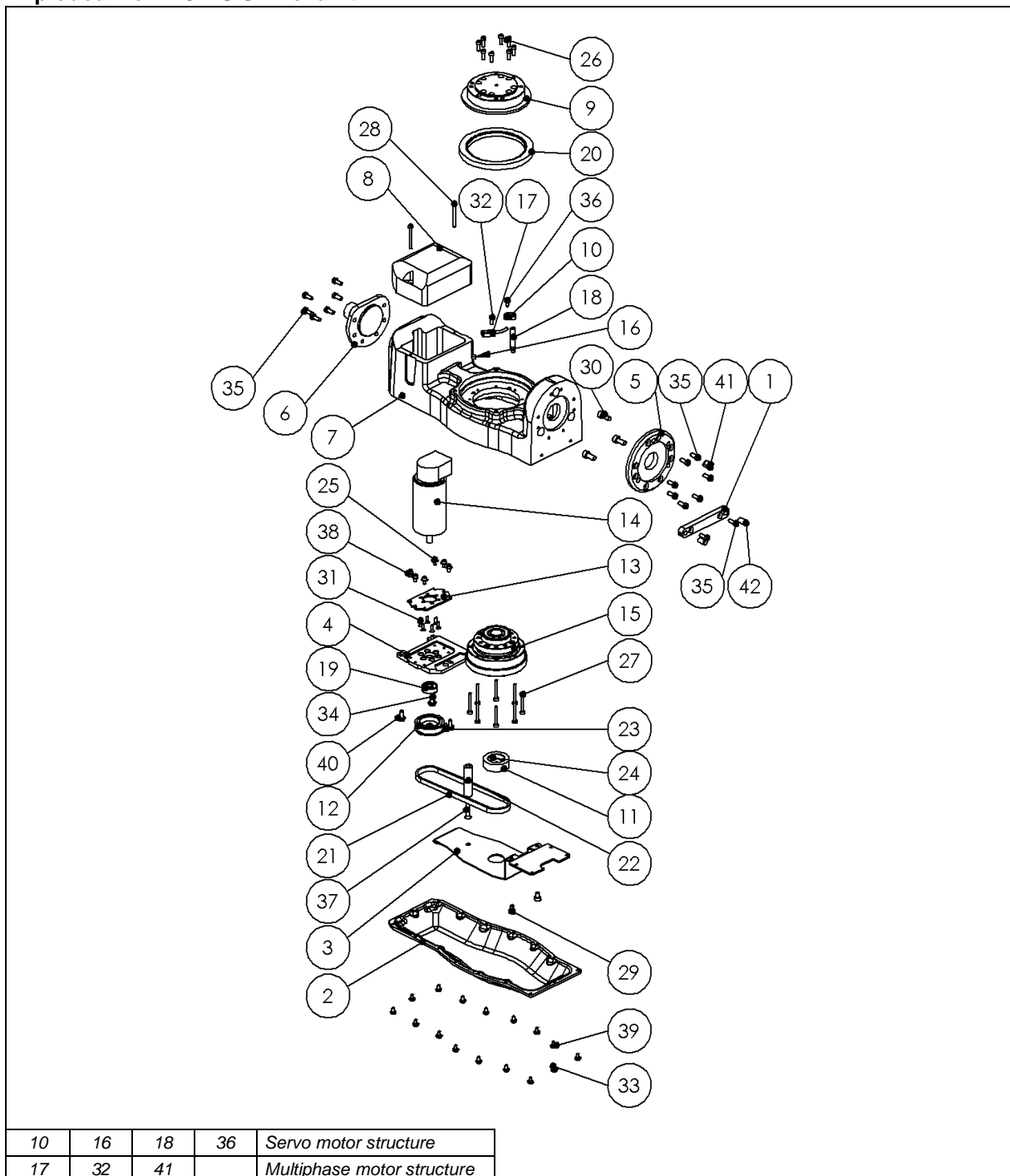
Item list RDH-S (for Swivel unit RSH-S)

Pos No.	Item number	Quantity	Name	Drawing no.
1	660500 0012	1	DZ2869 - Processing RSH-S - Servo	DZ2869
2	665320 28681	1	DZ2868 - Connector - RSH-S	DZ2868
3	660500 3931	1	EZ3931 Adapter flange - 14 Hollow shaft	EZ3930
4	660510 3934	1	EZ3934 Magnetic switch mounting	EZ3934
5	660500 39382	1	EZ3938 Cover - below Standard option	EZ3938
6	660500 3944	1	EZ3944 Toothed belt disk HTD3 - Z34	EZ3944
7	660500 3956	1	Bearing for motor module	
8	660500 3957 / 660500 39431	1	Toothed belt disk HTD3 - Z34 with flanged wheel for motor module	EZ3957
9	660500 3958 / 660500 3942	1	EZ3958 Motor adapter hollow shaft motor module	EZ3958
10	665320 42511	1	EZ4251-4 Stopcollar - right	EZ4251
11	See table	1	EZ4252 Internal pipe_14 Axis combinationL=112.5	EZ4252
12	665320 4256	1	EZ4256 Limit switch module ring LS	EZ4256
13	665320 4257	2	EZ4257 Adjustment ring LS with control disk	EZ4257
14	665320 4258	2	EZ4258 Control disk	EZ4258
15	665320 4259	1	EZ4259 Divider plate	EZ5249
16	/	1	EZ4262 Cable fastening	
17	/	2	EZ4263 Cable fastening - Pipe	
18	XXXXXX XXXX *	1	Motor module	
19	665330 1000 / 650200 0002	1	HarmDrive Motor HFSU-14-xx-2UH (i=101 / i=51)	
20	632501 0002	1	Neodymium block magnet 3 mm	
21	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
22	563005	1	Magnetic sensor	
23	896010 6194	1	Single-row groove ball bearings with sealing pads 626-2RS1	
24	893400 0027	1	Shaft seal BABSL 90-70-7 Simrit 72 NBR902	
25	616504 0660	1	Toothed belt CXP HTD 180 -3M - 6 (Z60)	
26	665320 0001	2	Fork light barrier PM-T54P	
27	891371 0035	4	Grub screw DIN 913 VA M 3 x 3	
28	891373 0061	1	Grub screw DIN 913 M 5 x 6	
29	89114x 0061	4	Pan head screw DIN 84 4.8 VG M 2 x 6	
30	891101 0061	6	Pan head screw DIN 912 8.8 VZ M3 x 6	
31	891101 0081	4	Pan head screw DIN 912 8.8 VZ M3 x 8	
32	891101 0105	8	Pan head screw DIN 912 8.8 VA M3 x 10	

33	891101 0251	8	Pan head screw DIN 912 8.8 VZ M3 x 25	
34	891102 0101	4	Pan head screw DIN 912 8.8 VZ M4 x 10	
35	891191 0065	10	Countersunk screw DIN 965 4.8 VA M 3 x 6	
36	891191 0081	6	Countersunk screw DIN 965 4.8 VZ M 3 x 8	
37	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
38	891122 0251	4	Pan head screw DIN 6912 A2 M 4 x 25	
39	891591 0101	2	Roundhead screw DIN 7380 M 3 x 10	
40	891592 0101	2	Roundhead screw DIN 7380 M 4 x 10	
41	891541 0095	1	Self-tapping screw DIN 7982 VA 2.9 x 9.5	
42	893050 0001	6	Disk DIN 125 ST 3.2	
43	893051 0001	4	Disk DIN 125 ST 4.3	
44	891132 0085	2	Countersunk screw DIN 7991 VA, M 4 x 8	

* Item number see page 26

Exploded view R5H-S Swivel unit



Item list for R5H-S Swivel unit				
Pos No.	Item number	Quantity	Name	Drawing no.
1	665320 4340	1	EZ4340 Pin fixing	EZ4340
2	665320 4343	1	EZ4343 Base body - Cover for Swivel unit - S	EZ4343
3	665320 4345	1	EZ4345 Divider plate - S	EZ4345
4	660500 3956	1	EZ4357 Bearing for motor module	EZ3956
5	665320 4366	1	EZ4366 Flange - S Drive side	EZ4366
6	665320 4367	1	EZ4367 Flange - S Counter bearing side	EZ4367
7	665320 4375	1	EZ4375 Base body Swivel unit - S Finishing	EZ4375
8		1	EZ4384 Cover Swivel unit - S	EZ4384
9	660500 3930	1	EZ3930 - Adapter flange - 14	EZ3930
10	660510 3934	1	EZ3934 Magnetic switch mounting	EZ3934
11	660500 3944	1	EZ3944 Toothed belt disk HTD3 - Z34	EZ3944
12	660500 3957	1	Toothed belt disk HTD3 - Z34 with flanged wheel for motor module	EZ3957
13	660500 3958	1	EZ3958 Motor adapter hollow shaft motor module	EZ3958
14	XXXXXX XXXX *	1	Motor module	
15	665330 1000 / 650200 0002	1	HarmDrive Motor HFSU-14-xx-2UH (i=101 / i=51)	
16	632501 0002	1	Neodymium block magnet 3 mm	
17	562015 4000	1	Inductive proximity switch Baumer IFFM08P37A6_L	
18	563005	1	Magnetic sensor	
19	896010 6194	1	Single-row groove ball bearings with sealing pads 626-2RS1	
20	893400 0027	1	Shaft seal BABSL 90-70-7 Simrit 72 NBR902	
21	616504 0660	1	Toothed belt CXP HTD 318 -3M - 6 (Z106)	
22		1	Pipe D10 d5 L=40	
23	890365 0101	1	TE2770-4 Grubscrew M8x0.75 with 60 point	TE2770
24	891371 0031	3	Grubscrew DIN 913 M 3 x 3	
25	891101 0061	6	Pan head screw DIN 912 8.8 VZ M3 x 6	
26	891101 0105	8	Pan head screw DIN 912 8.8 VA M3 x 10	
27	891101 0251	8	Pan head screw DIN 912 8.8 VZ M3 x 25	
28	891101 0305	2	Pan head screw DIN 912 8.8 VA M3 x 30	
29	891102 0061	2	Pan head screw DIN 912 8.8 VZ M4 x 6	
30	891103 0125	3	Pan head screw DIN 912 8.8 VA M5 x 12	
31	891191 0081	6	Countersunk screw DIN 965 4.8 VZ M 3 x 8	
32	891191 0101	1	Countersunk screw DIN 965 4.8 VZ M 3 x 10	
33		16	Pan head screw DIN 6912 A2 M 3 x 6	
34	891122 0101	3	Pan head screw DIN 6912 8.8 M 4 x 10	
35	891122 0101	16	Pan head screw DIN 6912 A2 M 4 x 10	
36	891541 0095	1	Self-tapping screw DIN 7982 VA 2.9 x 9.5	
37	891132 0451	1	Countersunk screw DIN 7991, M 4 x 45	
38	893050 0001	6	Disk DIN 125 ST 3.2	
39	893050 0005	16	Disk DIN 125 ST 3.2	
40	893051 0001	3	Disk DIN 125 ST 4.3	
41	895024 0126	1	Grubscrew DIN 6325 d5x 12	
42	895025 0126	2	Grubscrew DIN 6325 d6x 12	

* Item number see page 26

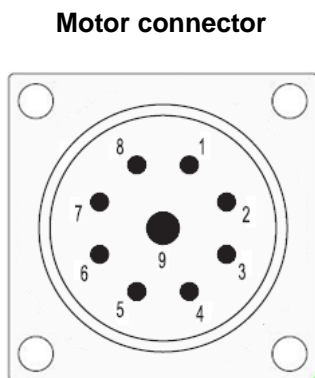
Drive module

Various drive modules with multiphase motors, brushed servo motors (BDC) and brushless servo motors (BLDC) are available for the rotary units RDH - RSH as standard.

	Drive module	RDH-XS	RDH-S	RDH-M	RSH-S	Item no.
multiphase motor	MS-045 HT	X	X		X	398702 0002
	MS-200 HT			X		398701 0002
EC ser- vomotor	EC 42 (brushless)	X	X		X	398703 0005
	EC 60S (brushless)			X		398703 0003
DC ser- vomotor	RE 40 (brushed)	X	X		X	398700 0001
	DC 100 (brushed)			X		398700 0012

2.3 Connector pin assignment for rotary units

Connector pin assignment for brushed DC servo motors (BDC)



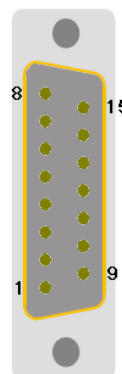
View of pin insertion on the plug-in side

M23 9-pol. (8+1) pin

- 1 Motor phase 1 (U+)
 - 2 Motor phase 2 (U-)
 - 3 Motor phase 1 (U+)*
 - 4 Motor phase 2 (U-)*
 - 5 +24V brake
 - 6 GND brake
 - 7 ---
 - 8 ---
 - 9 Protective conductor PE
- Casing – cable shield

* Motor phases are partly connected via two wires

Encoder connector

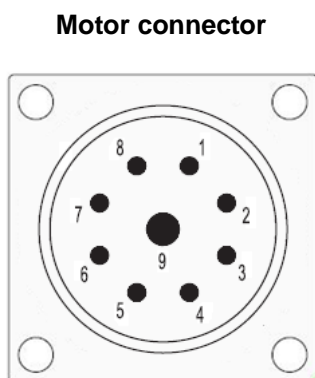


View of pin insertion on the plug-in side

Sub-D 15-pol. 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
- Casing – cablesshield

Connector pin assignment for brushless DC servo motors (BLDC) 48V

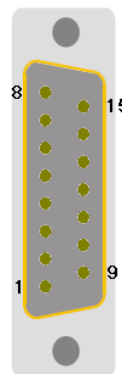


View of pin insertion on the plug-in side

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 Protectiveconductor PE
- Casing – cablesshield

Encoder connector



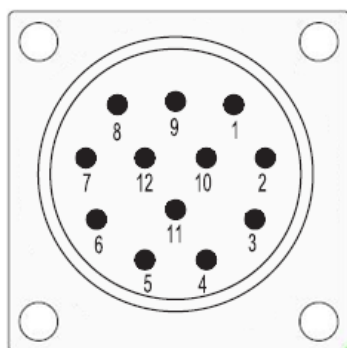
View of pin insertion on the plug-in side

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
- Casing – cablesshield

Connector pin assignment for M23 12 pin for multiphase motors

Motor connector



View of pin insertion on the plug-in side

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 ---
- Casing – cablesshield

3 Commissioning, general information

The rotary unit is commissioned after mounting the relevant drive modules and any necessary cables.

Follow the relevant instructions in the documentation of the motor modules, output stages or controls used.

Procedure:

- **Switch off the controls and ensure that they are secured.**
- Mount the rotary unit / rotary-swivel unit securely to a suitable work surface
- Connect the encoder cable.
- Connect the motor cable.
- Switch the controls on and check that the rotary unit / rotary-swivel unit is working correctly
- Conduct a test run
 - First with slow movement,
 - Then under operating conditions



Incorrect assembly (including loading on the axis system), cabling or commissioning increases the risks.



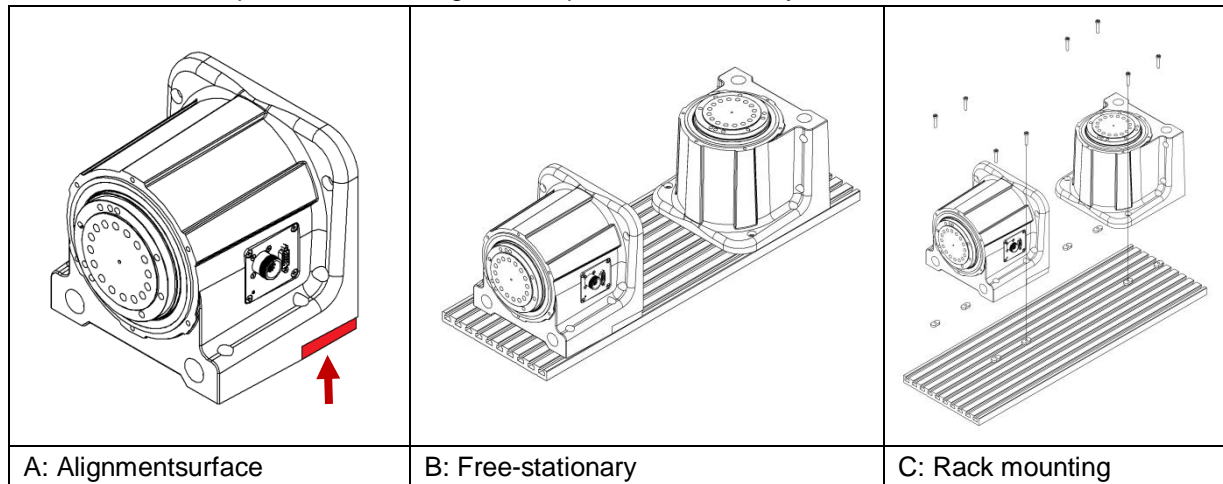
Unauthorised individuals should not be given access to the controls or the switch cabinet. There is a risk of electric current causing injuries. This is the responsibility of the individual who installed the machinery.

4 Assembly of the rotary unit

Before you can assemble your new rotary unit you must remove any securing devices used in transport.

4.1 Mounting and adjustment instructions

You have several options for mounting the components individually:



A) Alignment surface

The rotary units RDH / RSH have a stop face on the connector side of the casing with a clearly defined distance from the axis of rotary. (Distances are given in the respective dimensioned drawings).

In addition, the rotary units have two plane installation surfaces parallel to the axis of rotary, which allows the rotary unit to be used as a rotary axis as well as a rotary indexing table.

B) Free-stationary rotary unit

You can place the rotary unit on a rack, a work table or any other suitable, i.e. sturdy base.



Choose the location carefully so that the product cannot fall or be knocked over by any impact or tug on the cables.

C) Rack mounting (recommended)

Use the depression in the base body of the rotary unit to mount the rotary unit on your rack. Use appropriate Pan head screws and the matching T-nuts / threaded rails (accessories) to secure it.



Make sure the mounting surfaces are sufficiently clean.

The base bodies used in the rotary units are castings which can deviate in terms of their tolerance as a result of the manufacturing process.

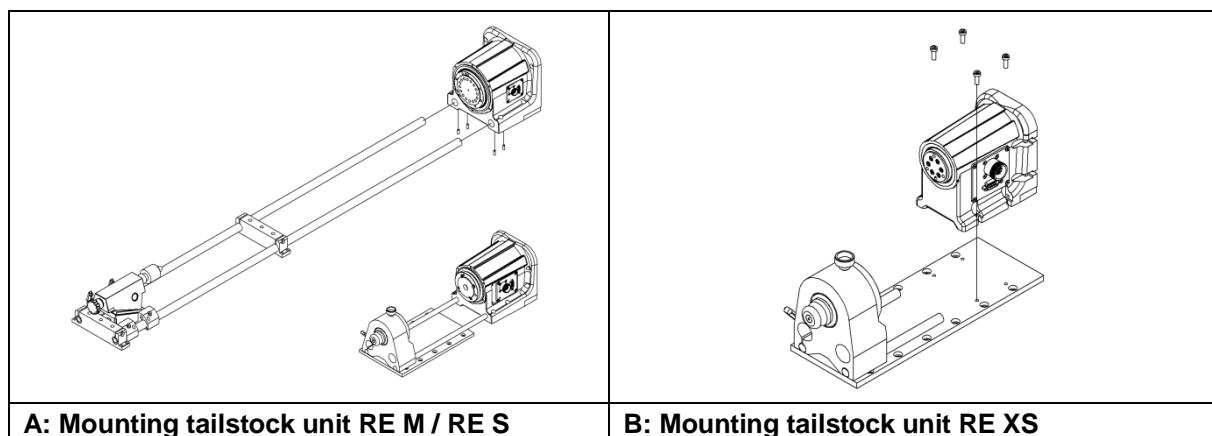
The surface areas of these base bodies are plane-milled to achieve a high degree of precision.

However, to achieve the desired guide accuracies and running performance, the rotary unit must either be laid out over an appropriately flat surface or arranged over levelling plates. This achieves round tolerances or axial run-out tolerances of maximum 0.03 mm in the Transmission flange.



Make sure the fixing surfaces are sufficiently clean and sufficiently level.

4.2 Mounting the tailstock unit



A) Position both guide shafts of the tailstock unit RE S / RE M in the two through bores of the rotary unit RDH-S / RDH-M so that these can be secured on the underside of the rotary unit with the appropriate grub screws.

For tailstock unit RE M, place the guide shafts (facing the rotary unit) in a middle position between the rotary unit and the pinole. Secure the two guide shafts to the work surface with suitable screws.

Secure the position of tailstock unit RE S by also screwing the base plate of the tailstock unit to the work surface.


B) First secure rotary unit RDH-XS to the base plate of the tailstock unit (4x M5). Leave the screws loose at this stage. Turn the rotary unit axial to the tailstock unit and tighten the screws securely.

Now secure the entire unit to your work surface (if you are using T-nut plates use T-nuts and the appropriate matching screws, see accessories). Leave the screws loose at this stage. Align the unit precisely with the existing axis system and secure the screws.

5 Fault list



Only allow qualified technicians to carry out repairs on the electric components of the product. Otherwise there is a risk of electric current causing fatal injuries.

Problem/fault	Possible cause(s)	Help
Louder running sounds	Dirt Lack of lubricating film	Clean the rotary unit in the area around the seals
Stiffness	Dirt Incorrect tension	Clean the rotary unit Alignment, adjustment
Impaired positioning accuracy or repeatability	Overload	Reduce load
 Important: In unfavourable electromagnetic conditions the effects of EMC can cause faults.		



Do not attempt to manipulate the controller or output stage of the rotary unit.

6 Technical specification

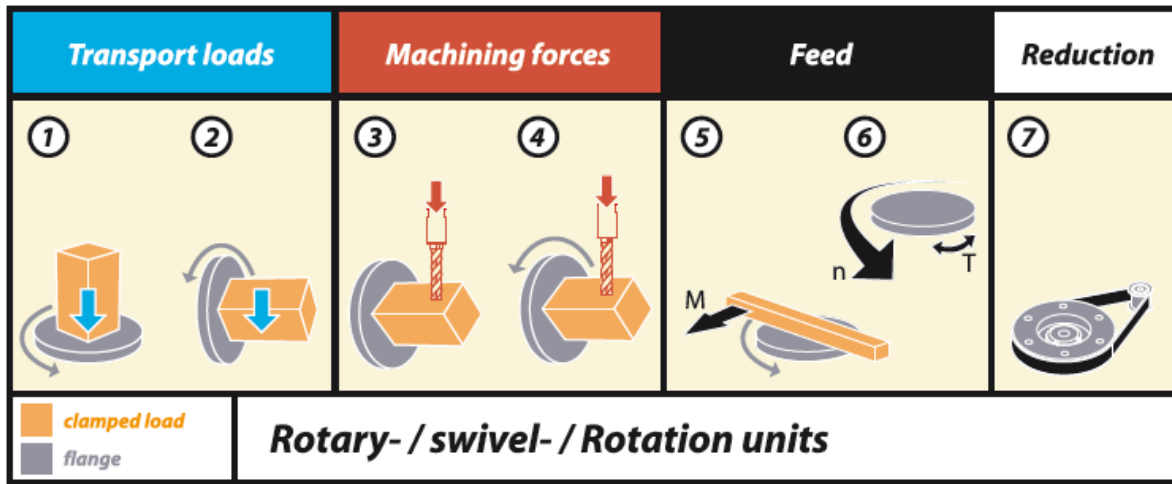
6.1 Mechanical data

Technical specification RDH-XS	Multiphase motor MS 045HT*		EC servomotor EC 42		DC servomotor RE 40	
	Reductionratio	1 : 50	1 : 100	1 : 50	1 : 100	1 : 50
Nominal outputspeed [rpm]	5	2	22	11	22	11
	at 1500 Hz (225 rpm)		at 1100 rpm		at 1100 rpm	
Max. outputspeed [rpm]	24	12	59	30	70	35
	at 8000 Hz (1200 rpm)		--			
Nominal torque [Nm]	5	7	5	7	5	7
	at 1500 Hz (225 rpm)		--			
Max. Torque(short) [Nm]	--	--	5	7	5	7
Nominal holding torque (static load) [Nm]	5	7	5	7	5	7
Max drive load [Nm]	9	14	9	14	9	14
	Limit for repeatable peak torque					
Dynamic loading capacity C [N]	392					
Static loading capacity C ₀ [N]	392					
Weight [Kg]	2.3					
* Values for half-stepping mode						

Technical specification RDH-S	multiphasemotor MS 045HT*		EC servo motor EC 42 (brushless)		DC servo motor RE 40 (brushed)	
	Reduction ratio	1 : 51	1 : 101	1 : 51	1 : 101	1 : 51
Nominal output speed [rpm]	4	2	22	11	22	11
	at 1500 Hz (225 rpm)		at 1100 rpm		at 1100 rpm	
Max. output speed [rpm]	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
Nominal holding torque (static load) [Nm]	7	11	7	11	7	11
Max driveload [Nm]	18	28	18	28	18	28
	Limit for repeatable peak torque					
Dynamic loading capacity C [N]	5800					
Static loading capacity C ₀ [N]	8600					
Weight [Kg]	4.6					
* Values for half-stepping mode						

Technical specification RDH-M	Multiphase motor MS 200HT*		EC servo motor EC 60S (brushless)		DC servo motor DC 100 (brushed)	
	1 : 51	1 : 101	1 : 51	1 : 101	1 : 51	1 : 101
Reductionratio	4	2	22	11	22	11
Nominal output speed [rpm]	at 1500 Hz (225 rpm)		at 1100 rpm		at 1100 rpm	
Max. output speed [rpm]	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
Nominal holding torque (static load) [Nm]	55	108	26	51	15	30
Max drive load [Nm]	98	157	98	157	98	157
	Limit for repeatable peak torque					
Dynamic loading capacity C [N]	21800					
Static loading capacity C ₀ [N]	35800					
Weight [Kg]	13,7					
	* Values for half-stepping mode					

Technical specification RSH-S	Multiphase motor MS 045HT*		EC servomotor EC 42		DC servomotor RE 40	
	1 : 51	1 : 101	1 : 51	1 : 101	1 : 51	1 : 101
Reduction ratio	4	2	22	11	22	11
Nominal output speed [rpm]	at 1500 Hz (225 rpm)		at 1100 rpm		at 1100 rpm	
Max. output speed [rpm]	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
Nominal holding torque (static load) [Nm]	7	11	7	11	7	11
Max drive load [Nm]	18	28	18	28	18	28
	Limit for repeatable peak torque					
Dynamic loading capacity C [N]	5800					
Static loading capacity C ₀ [N]	8600					
Weight [Kg]	12					
	* Values for half-stepping mode					



Rotary unit	1*	2*	3	4	5	6	7
RDH-M (step)	100kg	45kg	55Nm	24Nm	24Nm	4 rpm	1 : 51
RDH-M (step)	160kg	70kg	108Nm	45Nm	45Nm	2 rpm	1 : 101
RDH-M (EC servo/brushless)	110kg	50kg	26Nm	9Nm	9Nm	22 rpm	1 : 51
RDH-M (EC servo/brushless)	180kg	80kg	51Nm	17Nm	17Nm	11 rpm	1 : 101
RDH-M (DC servo/brushed)	110kg	50kg	15Nm	7Nm	7Nm	22 rpm	1 : 51
RDH-M (DC servo/brushed)	180kg	80kg	30Nm	14Nm	14Nm	11 rpm	1 : 101
RDH-S (step)	30kg	15kg	7Nm	7Nm	7Nm	4 rpm	1 : 51
RDH-S (step)	48kg	24kg	11Nm	11Nm	11Nm	2 rpm	1 : 101
RDH-S (EC servo /brushless)	30kg	15kg	7Nm	4.6Nm	4.6Nm	22 rpm	1 : 51
RDH-S (EC servo/brushless)	48kg	24kg	11Nm	4.6Nm	9.2Nm	11 rpm	1 : 101
RDH-S (DC servo/brushed)	25kg	13kg	7Nm	4.6Nm	4.6Nm	22 rpm	1 : 51
RDH-S (DC servo/brushed)	40kg	20kg	11Nm	8.7Nm	8.7Nm	11 rpm	1 : 101
RDH-XS (step)	30kg	10kg	5Nm	5Nm	5Nm	24 rpm	1 : 50
RDH-XS (step)	30kg	10kg	7Nm	7Nm	7Nm	12 rpm	1 : 100
RDH-XS (EC servo/brushless)	30kg	10kg	5Nm	5Nm	5Nm	59 rpm	1 : 50
RDH-XS (EC servo/brushless)	30kg	10kg	7Nm	7Nm	7Nm	30 rpm	1 : 100
RDH-XS (DC servo/brushed)	30kg	10kg	5Nm	5Nm	5Nm	70 rpm	1 : 50
RDH-XS (DC servo/brushed)	30kg	10kg	7Nm	7Nm	7Nm	35 rpm	1 : 100

* Standard values may deviate depending on the application

Performance data for drive bearing Rotary units RDH		RDH-M	RDH-S / RSH-S	RDH-XS
Dynamic loading capacity	C [N]	21800	5800	-
Static loading capacity	C ₀ [N]	35800	8600	-
Added dynamic breakdown torque ¹	M [Nm]	258	74	5
Added static breakdown torque ²	M ₀ [Nm]	1070	144	5
Tilting rigidity	K _b [Nm/arcmin]	114	25	-
Added axial load ³	F _a [N]	11504	3044	392
Added radial load ³	F _r [N]	7708	2039	392

¹ applies to turning drives
² applies to stationary drives with static safeguard 1.5
³ is on the basis of a normal load, average rotational speed 15 rpm, working life 15000h

These data only apply for a load →
M, M₀ → F_a=F_r=0
F_a → F_r=0, M=0
F_r → F_a=0, M=0

working life is calculated similarly to the roller bearings through the dynamic equivalent load, load factors, the average output speed and the service factor to the load ratings

6.2 Electrical data

You can find the motor data, output stages mains values and connection values and controller data in the documentation

<http://www.isel-data.de/manuals>

7 Maintenance and cleaning

7.1 Maintenance instructions

The RDH - RSH rotary units function extremely accurately and reliably. Maintenance costs are therefore relatively low.

Maintenance of the rotary units is limited to cleaning them of coarse dirt particles and contaminants.

The Harmonic Drive Motors are ex works lubricated with special isel grease. No further basic lubrication is necessary before the axis system is started up.

Maintenance interval	Maintenance work
When necessary	Clean the rotary unit
300 – 700 operating hours	Visual check of seals, attachments
2 years	Replace toothed belts (when available) Replace shaft seal rings

7.2 Cleaning

Clean the surface of the rotary unit's cast housing and the output flange with a lint-free, dry/slightly damp cloth. Do not use harsh cleaning agents or abrasive cleaners.

8 Decommissioning / disposal



The symbol on the product or its packaging indicates that the product must not be disposed of with normal household waste. Users must deliver the products/used devices to a collection point for used electrical and electronic devices. The separate collection and proper disposal of your products/used devices helps to conserve natural resources and guarantees recycling, which in turn protects people's health and the environment. You can get information on where to find collection points for your used devices from your local borough council, local waste disposal companies or on the Internet.

9 CE Conformity



The *rotary units RDH - RSH* are classified as 'partly completed machines' according to MD 2006/42/EC and therefore comply with CE guidelines (see installation explanation of the manufacturer, isel Germany AG).

As a 'partly completed machine' the product does not carry the CE mark, although it still conforms to the relevant European guidelines.

isel Germany AG hereby confirms that the product complies with the following directives:

EC Directive 2006/42/EC 'Machinery Directive'

EC Directive 2006/95/EC 'Electrical Equipment Designed for Use within certain Voltage Limits'/Low Voltage Directive'



EC Directive 2004/108/EC 'Electromagnetic Compatibility (EMC)'

The installation explanation for the product *rotary unit RDH - RSH* is an integral part of these assembly instructions.



10 Service

If you need customer service or have any questions regarding parameterisation of the controllers/motor output stages (if they are included in the scope of the delivery), please consult:

Mr Frank Hecht (Dermbach - Thüringen plant):

 **Tel:** +49 (0)6659 981-763
 **Email:** support@isel.com

Mr Frank Jansen (Eichenzell – Hessen plant):

 **Tel:** +49 (0)6659 981-765
 **Email:** support@isel.com

11 Warranty

Warranty:

Over and above the seller's statutory liability for material defects and according to the following conditions, as the manufacturer we guarantee flawless working life of products from isel Germany AG if used properly.

This guarantee extends to the functioning of isel Germany AG products and includes any fault which can be proved to have been caused by the manufacturing process or material defects.

Warranty exclusions:

All replaceable individual components, e.g. screws, connecting pins etc. are excluded from this warranty. Furthermore, we accept no liability for damage caused by:

Inappropriate or improper use

Faulty or negligent handling

Failure to observe installation instructions and instructions on care, as well as modifications or repairs carried out by users themselves

The effects of chemical and physical influences and improper use on the surface of the materials, e.g. damage from sharp objects.

We do not accept any liability for consequential damage.

We do not accept any liability for damage to persons and property caused by improper handling or failure to observe the safety guidelines. In cases such as these no claim can be made against the warranty.

Warranty conditions:

Our warranty only covers at our discretion the repair or replacement of the product free of charge for first/end users within the warranty period.





Warranty period:

In accordance with our General Terms and Conditions (AGB of isel Germany AG, Section VI) our warranty lasts one year.

For claims please contact the seller or the manufacturer directly, quoting the number of your invoice/delivery note.

Manufacturer: *isel* Germany AG

Bürgermeister-Ebert-Straße 40
D-36124 Eichenzell, Germany

 Tel: +49 (0)6659 981-0
 Fax: +49 (0)6659 981-776
 Email: automation@isel.com
 Website: www.isel-germany.com

12 Declaration of incorporation according to MD 2006/42/EC**Declaration of incorporation according to EC Machinery Directive 2006/42/EC, Appendix II B**

The manufacturer isel Germany AG
Bürgermeister-Ebert-Straße 40
D-36124 Eichenzell, Germany

hereby declares that the **product (partly completed machine)**

Product description: **Rotary unit RDH-XS** Item number: 26600x 0x00
Rotary unit RDH-S Item number: 2661xx 0x00
Rotary unit RDH-M Item number: 2662xx 0x00
Rotary unit DSH-S Item number: 26541x x000

complies with the **fundamental health and safety requirements** of EC Machinery Directive 2006/42/EC Appendix I.

The following harmonised standards were applied:

EN ISO 12100-1:2003 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN ISO 12100-2:2003 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles
EN 349:2008-09 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN 14121-1:2007 Safety of machinery – Risk assessment – Part 1: Principles
EN 60204-1:2006 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

The following additional EC Directives relevant to this product were applied:

Low Voltage Directive 2006/95/EC

The **technical documentation** for this partly completed machine was produced according to Appendix VII Part B. The manufacturer undertakes to pass on these technical documents to national authorities in electronic form on request.

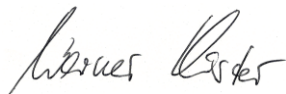
Member of staff responsible for producing the technical documents or assembly instructions/installation explanation is: Mr Helmut Danz

The product (partly completed machine) is intended for installation into a machine or combining with other partly completed machines to form a machine as defined in MD 2006/42/EC, Article 1, Section (1) a.

This partly completed machine (product) must not be commissioned until the machine in which this product is installed or which it forms a component meets the provisions of all the relevant directives (especially MD 2006/42/EC) and this (complete) machine carries a CE mark.

Place, date:

Dermbach, 15 November 2011



Werner Kister, CEO

13 Index

A

Abbreviations	2
Appendix with Accessories	43
Assembly.....	29

C

CE Conformity.....	38
Cleaning	36
Copyright.....	2

D

Decommissioning	37
Deliverables	8
drive elements.....	10

F

Fault list.....	31
Functions.....	9

I

Installation instructions	9
---------------------------------	---

O

Operating environment.....	6
----------------------------	---

P

Proper use.....	8
-----------------	---

S

Safety guidelines	6
Service.....	39
Symbols used.....	2

T

Technical specification	32
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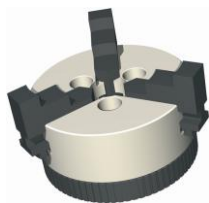
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Warranty.....	40
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14 Appendix

14.1 A1: Accessories

RDH-XS

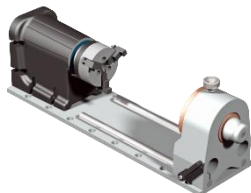


Chuck

- 3-jaw chuck Ø 65

Item no.: 269060 4065*

* including flange



Tailstockunit RE XS

- for RDH-SX

Item no.: 269100 0020 (200mm)

Item no.: 269100 0030 (300mm)

Item no.: 269100 0040 (400mm)

Item no.: 269100 0050 (500mm)

RDH-S



Chuck

- 3-jaw chuck Ø 65

Item no.: 269060 3065*

- 3-jaw chuck Ø 80

Item no.: 269063 2080*

- 3-jaw chuck Ø 100

Item no.: 269063 2100*

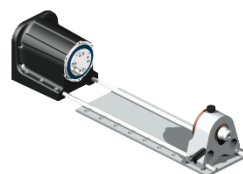


Chuck

- 4-jaw chuck Ø 100

Item no.: 269061 2100*

- * including flange



Tailstockunit RE S

- for RDH-SX

Item no.: 269100 1020 (200mm)

Item no.: 269100 1030 (300mm)

Item no.: 269100 1040 (400mm)

Item no.: 269100 1050 (500mm)

RDH-M



Chuck

- 3-jaw chuck Ø 125

Item no.: 269062 2125

- 4-jaw chuck Ø 125

Item no.: 269061 0125*

- * including flange



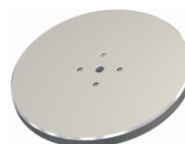
Aluminium T-nut disk

- Ø 240 mm / PT 25

Item no.: 269050 0240

- Ø 365 mm / PT 25

Item no.: 269050 0365



Aluminium rotary disk

- Ø 490 mm, anchor points drilled at extra charge on customer request

Item no.: 269051 0500



Tailstock unit RE S

- for RDH-SX

Item no.: 269100 2100 (1000mm)

Item no.: 269100 2150 (1500mm)

Item no.: 269100 2200 (2000mm)

RSH-S



Chuck

- 3-jaw chuck Ø 65

Item no.: 269060 3065*

- 3-jaw chuck Ø 80

Item no.: 269063 2080*

- 3-jaw chuck Ø 100

Item no.: 269063 2100*



Chuck

- 4-jaw chuck Ø 100

Item no.: 269061

2100*

- * including flange



Rotary table

- Ø 150 mm

Item no.: 269050 0150

Threadedinserts/slidingnut	Item number	Comments	
Threadedinsert M6 (Grid 50)	209011	VE 3 piece x 1m	
Slidingnut M6	209001 0005	VE 100 pieces	
Slidingnut 2x M6	209002 0004	VE 50 pieces	
Slidingnut M5	209006 0001	VE 20 pieces	
Angled sliding nut 2x M6	209021 0003	VE 25 pieces	
Special angled gliding nut 3x M6	209022 0003	VE 25 pieces	

14.2 A2: Miscellaneous

Assembly instructions [product] identification no.: 970261 BE 0001 / 11-2011