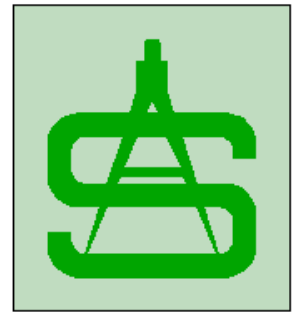
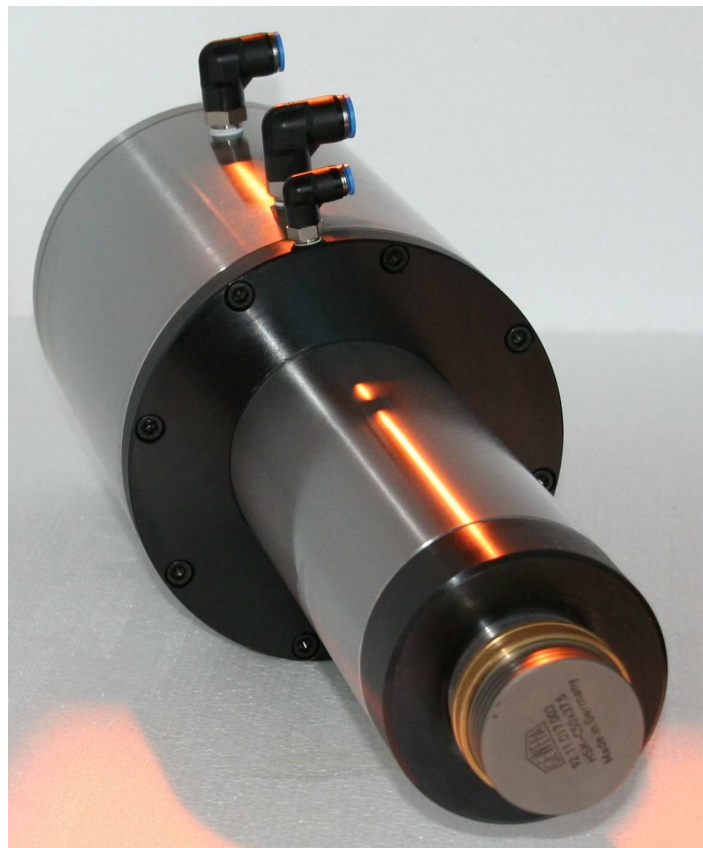


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Operating instructions for Motor grinding spindle **HMS90X220F-HSK-C50/006**



Specifications:

Grinding Spindel HMS90X220F-HSK-C50/006

Grease lubrication; Air purge connection p = 1,5 - 2 bar; 1/8"

Spindle outside Ø 90h5; Sleeve length 220; Motor Ø165x232,5

HSK-C50 Handclamping

Ceramicbearing: 4x spindle bearing HC7008C.TP4SUL <->

Axial stiffness: 59,2N/µm; Radial stiffness: 355,2N/µm

2x spindle bearing HC7008C.TP4SUL <>

Engine bearing: Spindle bearing 2xB7005C.TP4SUL<>

Motor: Alternating current synchronous motor DC127/80/4; Data -no.: 073 0053 100

winding design: 380V; 3 phase, 4 pole; 1 Piece KTY 84-130; 1 Piece PTC 130°

6000RPM bis n=18000RPM; Cooling Water 5-7l/min; with oil cooling reduces the Performance data by 20%;

1. General

1.1. Compliance with intended use

Motorspindles are suitable for grinding, milling and drilling. Installation and operation are to be done with suitable tools and appropriate materials. In order to guarantee proper use, only the original accessories are to be used. The maximum tool size as well as the maximum peripheral speed of the processing tool may not be exceeded and is to be followed.

The grinding and milling spindles are only being used properly if the given rotational speed is not exceeded. The spindle may not be operated without the appropriate protective cover.

For safety reasons, unauthorized enclosures and modifications to motorspindles and their original accessories are prohibited.

Electrical connection 8 pin:

- **8-pin mounting box CEDE271MR05000051000**
- **8-pin connector CSTA264 FR 48 45 0001 000 (with 12m cable)**
 - Pin Spindle side
 - cable
 - 1: U (brown) black 1; 10mm²
 - 2: V (blue) black 2; 10mm²
 - 3: W (black) black 3; 10mm²
 - A: PTC 130° (light blue) black 5; 1,0mm²
 - B: PTC 130° (light blue) black 6; 1,0mm²
 - C: KTY 84-130 (brown) black 7; 1,5mm²
 - D: KTY 84-130 (white) black 8; 1,5mm²
 - PE: protective conductor green/yellow; 10mm²
Shed to ground terminal

Operating Instructions for the HSK Clamping

Clean surface of taper with lint free cloth.

Insert HSK tool into holder. Check the slots are correctly aligned at the end of the taper. There is one deep slot and one shallower slot. It is only possible to assemble one way.

A slight resistance will be felt because of pretensioning of the orientation disc (i.e. the tool will positively engage).

Release the tool in order to apply the pretensioned orientation of the cutting edge.

Apply hexagon key 4 mm A/F (use long style key).

To clamp: Turn the key clockwise 90° to 130° with a torque.

achievable clamping force: 30 kN

To release: Turn the key anti-clockwise as far as the stop. Do not apply force against the stop!

The ejector on the HSK will be automatically activated when the clamping is released.

Motor: Alternating current synchronous motor DC127/80/4; Data -no.: 073 0053 100
winding design: 380V; 3 phase, 4 pole; 1 Piece KTY 84-130; 1 Piece PTC 130°
6000RPM bis n=18000RPM; Cooling Water 5-7l/min;
with oil cooling reduces the Performance data by 20%;
200Hz to 600Hz;
Power: 20KW

Cooling 5-7l/min	Water	Water	Water	Water
Current A	43	43	34	32
Frequ. Hz	200	400	517	600
Speed min-1	6000	12000	15500	18000
Power kW	10	20	20	20
Torque Nm	16	16	12	11
Operating mode	S1	S1	S1	S1
	100%	100%	100%	100%

The new spindle should be run in according to the following schedule before starting regular operation, not exceeding 18.000 min-1. It is advisable to fix a thermometer next to the front cover right at the case by use of plasticine or other plastic material.

1.2. Obligation of user

All motor spindles were tested once again before leaving the factory. The test run was carried out successfully, and the motor spindles are in technically proper condition. Technically correct assembly is one of the major factors determining the service life of a motor spindle.

Assembly may only be carried out by qualified technicians, as our spindles are highly sensitive precision tools.

Therefore the operator must ensure at all times, that any person entrusted with the assembly and operation of the motor spindles carefully reads and observes these operating instructions.

1.3. Liabilities & warranty

In case of unintended use of the dressing spindles and non-compliance with the instructions as set out below, Steinmetz Schleiftechnik will not assume liability for damages, regardless as to whether these are damages to persons or property.

1.4. Service & advice

We will be pleased to offer you information and advice. In case of questions and problems, please do not hesitate to contact us.

1.5. Repairs

Special tools are necessary for repairing grinding spindles. For this reason we recommend that you only allow our trained employees carry out possible repairs or set-up work. Please notice that any and all rights to compensation are lost via unauthorized tool disassembly.

1.6. Supplier



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D-63791 Karlstein
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1.7. Information

These Operating Instructions correspond with the technical standard at the time of delivery of the motor spindles.

1.8. Compliance

In case of non-compliance with the operating instructions and directions for use, STEINMETZ Schleiftechnik will not assume any liability whatsoever and refuses all responsibility.

2. Comments on Safety

2.1 Spindle dangers

All spindles are tested at the plant. The test run was successfully carried out so that the spindles are in technically perfect condition. However, certain risks still exist as a result of incorrect operation or misuse:

to the operator's life and limb
to the machine and other property belonging to the operator

2.2. Basic information on motor spindles

2.2.1 Spindles are suited for grinding, milling or drilling

2.2.2 Only the original accessories may be used.

2.2.3 Maximum tool size must not be exceeded.

2.2.4 Maximum rotation speed of the machining tool must be absolutely complied with (see manufacturer's information).

2.2.5 Grinding or milling spindles may only be operated with the given rotational speed(see enclosed production test document).

2.2.6 Spindles may never be operated without the corresponding protective tool cover.

2.2.7 Unauthorized enclosures and modifications to spindles and original accessories are prohibited for safety reasons.

2.2.8 Accident prevention measures as well as safety guidelines must absolutely be followed.

2.2.9 The device should be turned off and maintenance personnel notified when in doubt about changes in operation as compared to normal operation.

2.2.10 The tool must run perfectly round since vibrations can occur in the tool that could possibly lead to tool breakage.

2.3 Sources of danger

2.3.1 The spindle works with a spinning motion and can cause serious cuts and bruising if contact is made during spindle operation.

2.3.2 The spindle must be turned off and the drive motor secured against being turned on before maintenance and cleaning work.

2.3.3 Fragments could cause serious eye injuries when dressing the grinding wheels.

2.3.4 If changes as compared to normal operation should appear (unusual noises, vibrations, etc.) turn the device off immediately and notify the maintenance personnel.

The tool must run exactly round since vibrations could occur via a running tool that is noncircular which could possibly lead to tool breakage and thereby also endanger the operating personnel.

2.4 Personal protective equipment

2.4.1 Protective glasses must be worn while dressing grinding wheels

2.4.2 Suitable tools must be used for dressing.

2.5 Unpacking, transport and storage

2.5.1 When unpacking, first be aware of transportation damage and, if need be, report the type and extent to the manufacturer immediately.

2.5.3 The manufacturer decides whether the spindle will be put into operation or whether it should be sent back to the plant for testing.

2.5.3 The spindle may not be “hung” on both shaft ends for transport (see figure).

2.5.4 Use the transport drill holes provided for this purpose or another appropriate flat lifting sling (according to sketch).

2.5.5 The spindle should be lightly oiled for storing, wrapped with oil-impregnated paper and provided with a “plastic hose” to protect against mechanical damage.

2.5.6 Spindles may not be exposed to any great temperature fluctuations in order to avoid condensed water buildup and therefore the danger of rusting.

3. Commissioning

3.1. Protection against shock

When handling the motor spindles, especially the storage position must not be exposed to impact shock. Impact of shocks on the storage position may cause damages that affect the service life of the dressing spindle.

3.2 Correct mounting

Each motor spindle must be clamped into a form-fit reception device. The borehole of the reception device must not exceed a maximum defect of form of 5µm. In addition, avoid any pressure of clamping screws onto the spindle housing.

3.3 Lubrication

The motor spindles are mounted with permanent grease lubrication and are therefore maintenance-free. The service life of the bearing depends on the operating conditions and can vary to a substantial extent. In case of manufacturing problems or a radial run-out of > 4-6µm, we recommend the return of the dressing spindle to us for repair.

3.4. Drive of the dressing spindle

Before commissioning the dressing spindle, ensure that add-on parts such as belt disks and diamond roller are correctly mounted and fastened.

3.5 Grinding spindle drive

Before start up be sure that any attached components such as belt wheels, grinding wheel flanges as well as internal grinding element loading are properly fastened to the taper holes.

Only endless flat belts should be used for driving belt-driven spindles.

3.6 Grinding spindle heating

The grinding spindle was put through a test run (warm-up phase) in accordance with regulations. Slightly raised temperatures during first operation are not damaging to the spindle. However, a temperature of 50(should not be exceeded.

3.7 Repairs

Special tools are necessary for repairing motor grinding spindles. Because of this, we recommend that any possible repairs or set-up only be carried out by trained Steinmetz Schleiftechnik employees.

3.8 Accessories

Only original accessories from Steinmetz Schleiftechnik should be used in order to guarantee perfect precision and function.

The taper holes must be well cleaned before attaching the grinding wheel flange.

All rotating accessory parts are to be balanced after the tools are attached since strong oscillation and vibration could appear during running which reduce lifetime and work quality.

4. Direction of rotation / Speed

4.1. Direction of rotation of the dressing spindle

The notes on connecting the three-phase current motors we use can be found in this Operating instructions.

4.2 Operating Instructions for the HSK Clamping

Clean surface of taper with lint free cloth.

Insert HSK tool into holder. Check the slots are correctly aligned at the end of the taper. There is one deep slot and one shallower slot. It is only possible to assemble one way.

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Release the tool in order to apply the pretensioned orientation of the cutting edge.

Apply hexagon key 4 mm A/F (use long style key).

To clamp: Turn the key clockwise 90° to 130° with a torque.

achievable clamping force: 30 kN

To release: Turn the key anti-clockwise as far as the stop. Do not apply force against the stop!

The ejector on the HSK will be automatically activated when the clamping is released.

5. Running diagram



FAG Aircraft/Super Precision Bearings GmbH

Empfehlungen zum Fettverteilungslauf von offenen und gefetteten Spindellagern B..., HS... und HC... Recommendations for the grease distribution run of greased non sealed spindle bearings B..., HS..., and HC....

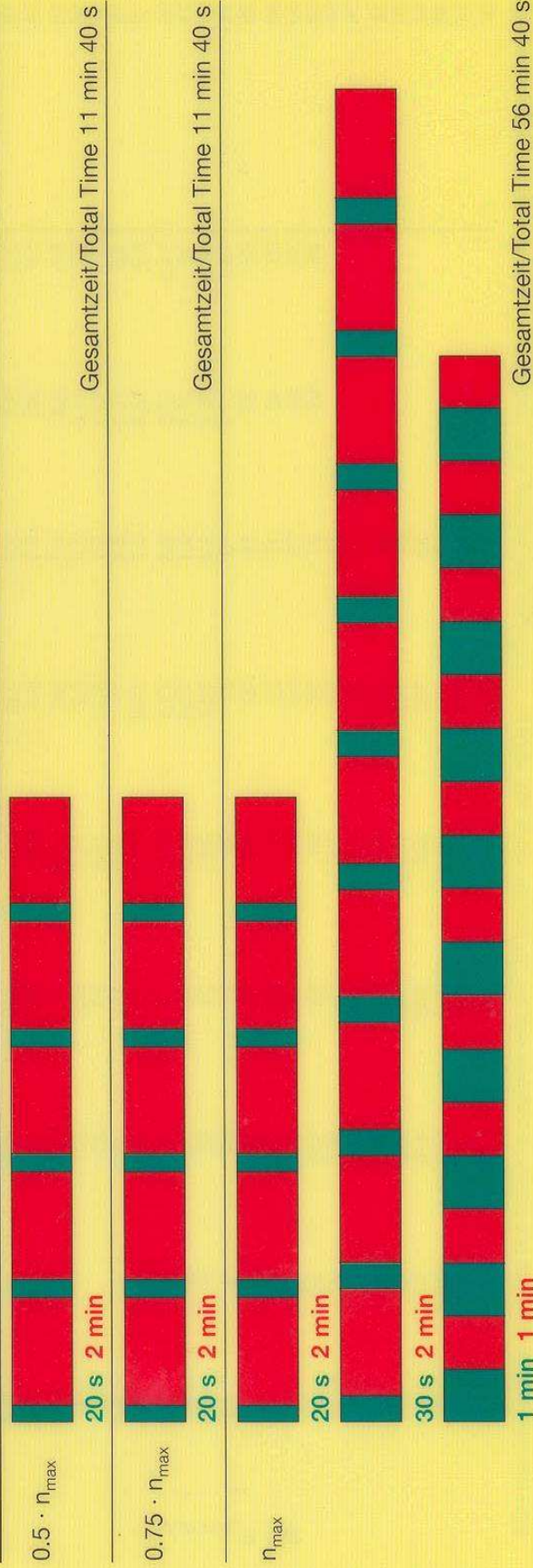
Der Einlaufvorgang besteht aus mehreren Zyklen eines Start-Stop-Betriebes mit unterschiedlichen Drehzahlen und Laufzeiten und Laufzeiten, wobei die Stillstandszeiten nach jedem Lauf sehr wichtig sind. Die notwendige Anzahl der Zyklen kann je nach Lagergröße, Lageranzahl, Höchststrehzahl und Lagerumgebung unterschiedlich sein.

The run is procedure includes several cycles of a stop and go run with different speeds and running times in which the still-stand times after each run is of great importance.

The necessary number of cycles can differ depending on bearing size, bearing number, max. speed and bearing enviroment.

Drehzahl Speed **Lauf- und Stillstandszeiten Running Time and Stand-still**

■ Laufzeit Running Time ■ Stillstandszeit Stand-still Time



1 min 10 s
 Weitere Zyklen mit verlängerter Laufzeit und kürzerer Stillstandszeit durchführen bis die Beharrungstemperatur erreicht ist.
 Additional cycles with extended running time and shorter stops should be carried out until steady-state temperature is reached.

Specification DC – Partial Motor preliminary



No. 073 0053 100

DC 127 / 80 / 4

Steinmetz

Stator

Rotating direction
 ccw
 cw

	L _{FE} [mm]	WK1 _{max} [mm]	WK2 _{max} [mm]	D1 [mm]	D2 [mm]		
Delivery Dimension	80	39	36	126,7	88		
Final Dimension ¹⁾	-	-	-	-	-		

	L _k [mm]	U [mm ²]	V [mm ²]	W [mm ²]			
Power Cables	300	4 brown	4 blue	4 black			

Cable outside-diameter max. 3,3 [mm]

Rotor

d5 [mm]	d6 [mm]	h [mm]	L _{FE} [mm]		
87	76	10	90		
-	-	-	-		

¹⁾ to be finished by Customer
 Magnetsystem directly mounted onto shaft by ATE
 Softmagnetic shaft material
 Max. circumference speed: 82,0 m/s

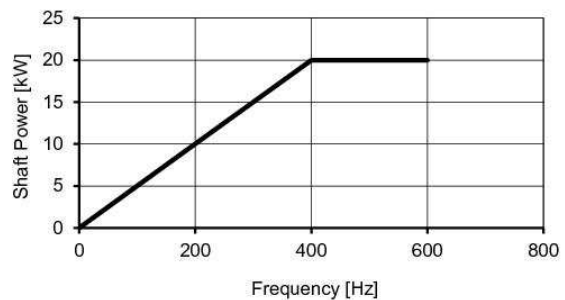
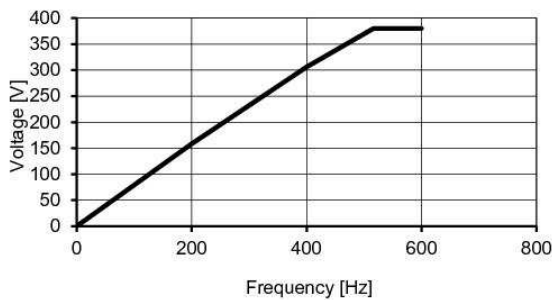
- Cooling**
- Water Cooling
 - Oil Cooling
 - Pressed Air Cooling
 - Fan Cooling
 - No Cooling
- Winding Protection**
- 1 PTC 130°
 - 2 KTY 84 -130
 - Thermoswitch 130°C
 - NTC K227
 - PT3C-51F-F1

- Impregnation**
- moulded directly into cooling sleeve
- Insulation Class**
- F Winding
 - H Cable
- Stator Housing**
- Steel
 - Aluminium

Maximum current / phase: A

Choke: mH / phase

Kind of Connection	Y			
Mode of Operation	S1/100%			
Inverter Voltage [V]	158	306	380	380
Motor Voltage [V]	158	306	380	380
Current [A]	43	43	34	32
Frequency [Hz]	200	400	517	600
Shaft Speed [rpm]	6.000	12.000	15.500	18.000
Shaft Power [kW]	10	20	20	20
Torque [Nm]	16	16	12	11
Magn. Current I _D [A]	0	0	0	14
Losses [W]	900	1.050	850	900



The specified values are true for sinusoidal supply motor voltage and sinusoidal motor current.
 In case of frequency converter operation the first harmonic voltage (RMS value) must correspond to the declared motor voltage.
 Additional the motor current can be more than the declared data because of current harmonics.

ATE partial motors are components manufacturing of synchronous motors. After finishing of the motor (mounting), tests, due to IEC 34/1 and the corresponding regular technical standards, must be done.

The spindle manufacturer is responsible to check the operation of the motor with the inverter in advance.

Remarks: _____

Adjustment Parameter Siemens 611 Siemens Sinamics



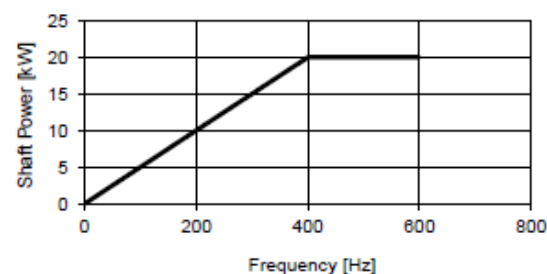
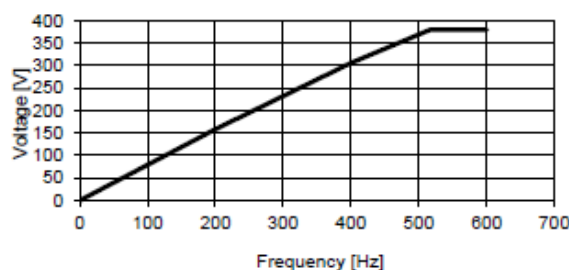
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DC 127 / 80 / 4

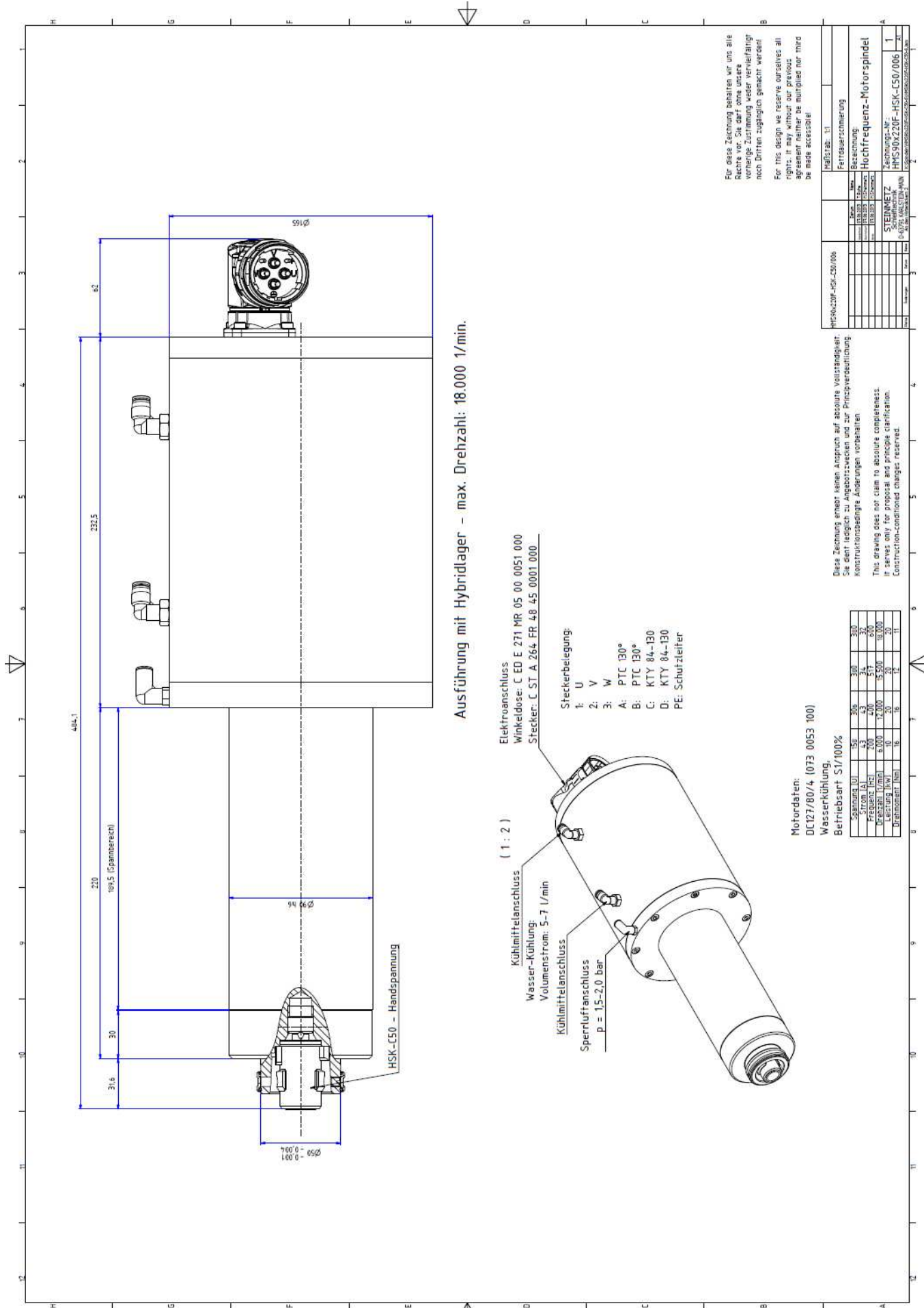
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Equivalent Circuit Data					
Parameter	Y	Unit	611 Nr.	Sinamics Nr.	Remarks
Rated current (continuous)	43	A _{eff}	1103	p305	
Maximum current (like P1122)	80	A _{eff}	1104	p323	
Number of pole pairs	2	-	1112	p314	
Torque constant	0,372	Nm/A _{eff}	1113	p316	referred to rated torque
Voltage constant / phase to phase	22,75	V _{eff} /1.000rpm	1114	p317	
Winding resistance / phase (20°C)	0,11	Ohm	1115	p350	
Rotor inductance / phase (Lq)	0,615	mH	1116	-	including choke
Rotor inductance / phase (Lq)	0,615	mH	-	p356	excluding choke
Rotor inertia	-	kgm ²	1117	p341	
Standstill current	43,0	A _{eff}	1118	p318	
Standstill torque	16	Nm	-	p319	
Motor limitation current (like P1104)	80	A _{eff}	1122	p338	
Optimum load angle (from FW3.3)	90	Grad	1128	p327	
Rated power	20.000	W	1130	p307	
Rated voltage	306	V	1132	-	
No-load current	101,97	A _{eff}	1136	p320	
Speed for field attenuation	0	rpm	1142	p348	no-load at U _b = 0 V
Maximum Speed	18.000	rpm	1146	p322	
Reluctance torque constant (from FW3.3)	-	mH	1149	p328	
Lower current limit adaption	0	%	1180	p391	
Upper current limit adaption	100	%	1181	p392	
Factor current control data	100	%	1182	p393	
Torque limitation	140	%	1230	-	
Power limitation	140	%	1235	-	
Rated speed	12.000	rpm	1400	p311	
Rated torque	16	Nm	-	p312	
Choke / phase	0	mH	-	p353	

Inverter Voltage [V]	158	306	380	380															
Motor Voltage [V]	158	306	380	380															
Current [A]	43	43	34	32															
Frequency [Hz]	200	400	517	600															
Shaft Speed [rpm]	6.000	12.000	15.500	18.000															
Shaft Power [kW]	10	20	20	20															
Torque [Nm]	15,9	15,9	12,3	10,6															
Magn. Current I _D [A]	0	0	0	14															



Bem.: _____



For this drawing remain for our all rights. Sie darf ohne unsere vorherige Zustimmung weder vervielfältigt noch Dritten zugänglich gemacht werden.
For this design we reserve ourselves all rights. It may without our previous agreement neither be multiplied nor third be made accessible.

HMS 90/220F-HSK-C50/006		HMS 90/220F-HSK-C50/006	
Rev.	Änderung	Rev.	Änderung
1		1	

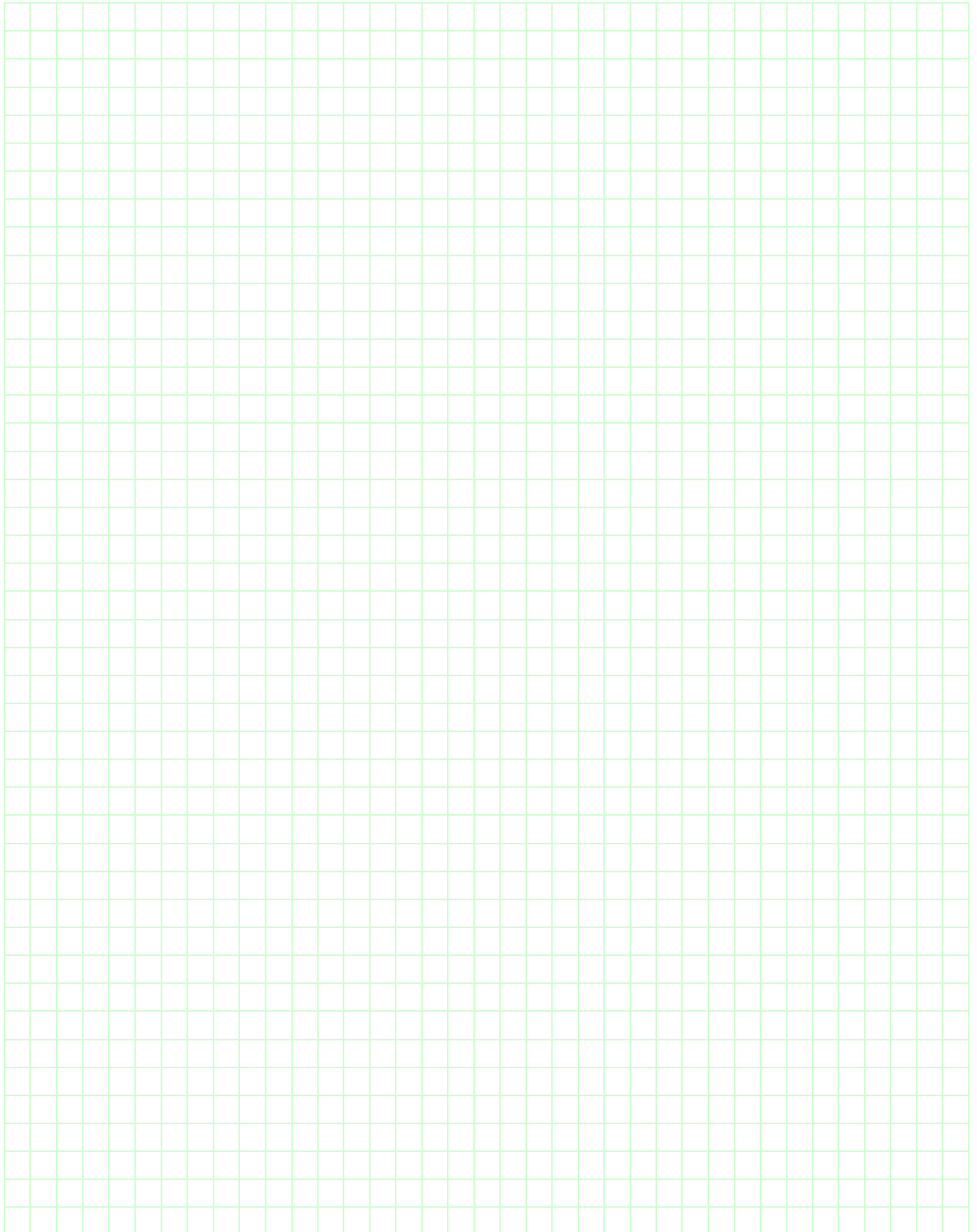
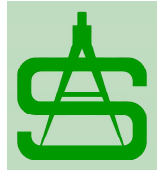
Bezeichnung: Hochfrequenz-Motorspindel
Zeichnungs-Nr.: HMS 90/220F-HSK-C50/006

Diese Zeichnung erhebt keinen Anspruch auf absolute Vollständigkeit. Sie dient lediglich zu Angebotszwecken und zur Prinzipveranschaulichung. Konstruktionsbedingte Änderungen vorbehalten.
This drawing does not claim to absolute completeness. It serves only for proposal and principle clarification. Construction-conditioned changes reserved.

TEILELISTE			
OBJEKT	ANZAHL	BAUTEILNUMMER	BESCHREIBUNG
1	1	1 006 326	Motorhülse
2	1	1 006 327	Kühlhülse
3	1	2 006 324	Welle
4	1	2 006 325	Hülse
5	1	2 006 329	Flansch
6	1	2 006 330	Motordeckel
7	1	3 005 022	Labyrinthring
8	1	3 006 322	Motor Hülse
9	1	3 006 328	Labyrinthring
10	1	3 006 331	Zwischenring
11	2	4 005 024	Distanzringe
12	2	4 006 332	Passfeder
13	1	0730053100_DC127/80/4_Rot	Rotor
14	1	0730053100_DC127/80/4_Stat	Stator
15	2	B7005C.T.P4S.UL	Spindellager
16	6	B7008C.T.P4S.UM	Spindellager
17	1	CED_0020_6-polig	Elektro-Anschluss
18	2	533294 QBL-1/4-3/16-U	QBL - Steckverschraubung
19	1	QSL-1/8-4	Steckverschraubung
20	1	HSK-C50	Aufnahme
21	1	für HSK C 50	Messingverschlussring
22	1	RS 25x1,5	Nutmutter
23	1	RS 35x1,5	Nutmutter
24	1	RS40x1,5	Nutmutter
25	4	DIN 912 - M4 x 10	Zylinderkopfschraube
26	7	DIN 912 - M5 x 25	Zylinderkopfschraube
27	16	DIN 912 - M6 x 16	Zylinderkopfschraube
28	2	Ø90x2	O-Ring
29	2	O-R_120x3	O-Ring
30	3	O-R_133x3	O-Ring
31	2	O-R_139x3	O-Ring

Notizen

Notes



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Schleiftechnik

**Präzisions
Abrichttechnik**

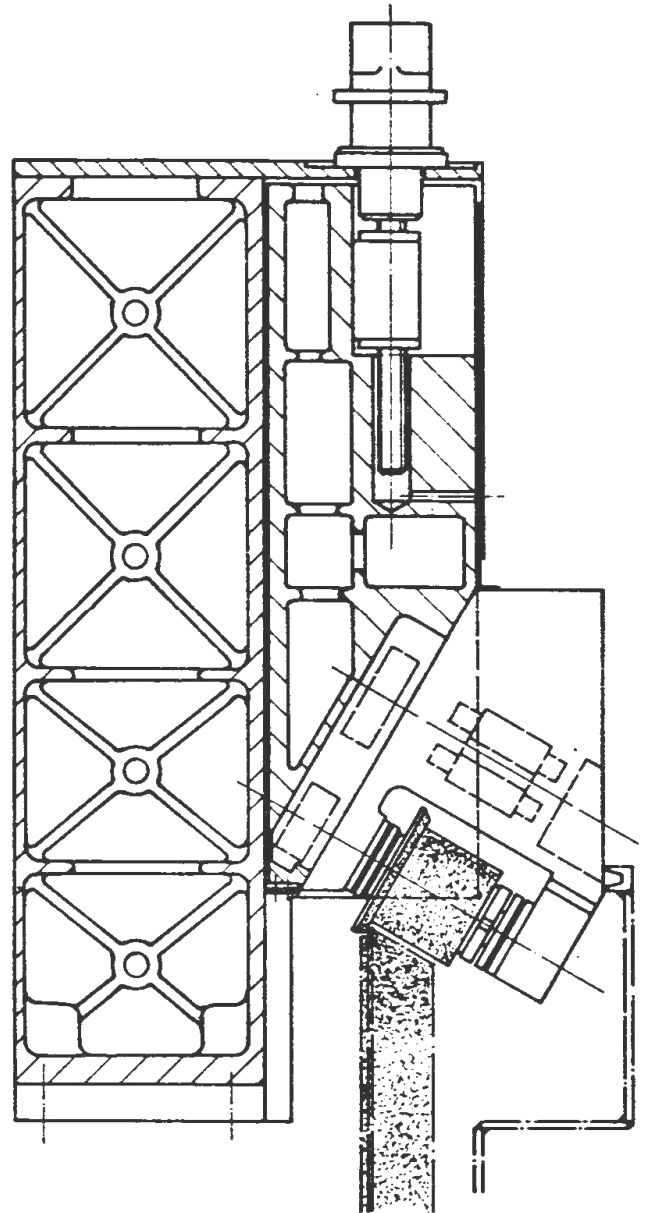
Nutzen Sie unser Know-how!

**Precision
Dressing Technology**

Make use off our Know-how!

Technische Änderungen vorbehalten

Subject to technical alterations



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