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Ref. No.:

324-06121454

## **Overview and Technical Data:**

**STARRAG HECKERT - CWK 400 D with palett changer +  
aluminium option**

**STARRAG HECKERT**



Starrag Group

Year of Build:  
May 1999

**Description:**

**Used STARRAG HECKERT FCWK 400D Dynamic 6-station pallet pool, 240 Tower magazine with aluminum finish**

- New spindle at 16 116 hours
- About. 33 568 operating hours
  
- CNC control Siemens 840 D
- Travel:
  - Column longitudinal travel X-axis 650 mm
  - Support vertical travel 650 mm Y-axis
  - Table traverse Z-axis 650 mm
  - B-axis 360 degrees x 0.001 indexing
  - Rapid traverse 40 m / min.
- Pallet size 400 x 400 mm
- Max Belastung 400 kp
- Drilling / tool spindle speed of 50 to max.15.000 r / min
- Drive power 31 KW
- Tool holder HSK 63
- Dynamic range change in 8 to 9 s by hydraulic rotary changer
- Coolant system
- Dimensions approximately 5.4 x 2.87 x 4.23 m

The motor spindles and speeds of 15 000 rev / min are creating the ideal conditions for the light metal processing, without compromising the high static and dynamic stiffness of the cast iron and steel processing.

The CWK 400 D Dynamic reach peak values??: Eilgangwerte to 100 m / min and accelerations up to 15 m/s<sup>2</sup>.

Innovative ideas also stuck in tool handling with the proven tower magazines with 240 tools. Attending dynamics is called for: in 1.5 s is provided the next tool, to 3.5 s to 4 s, the chip-to-chip time is reduced.

Compact in design, space-saving features of the circular memory 6 presets and 1 clamping space. It is powered by an AC servo motor.

For more details see PDFs

## **Technical Data:**

## **Technical Data:**

Control:

[SINUMERIK 840D](#)

Machine Hours:

33.568 hrs.

Spindle Hours:

16.116 hrs.

Spindle Speed:

15.000 rpm

Tool Capacity:

240 x

## **Travels:**

X-Axis:

650 mm

Y-Axis:

650mm

Z-Axis:

650 mm

## **Dimensions and Weight:**

Height:

2.870 mm

Width:

4.230 mm

Length:

5.400 mm

Weight:

12.800 kg

## **Buyer Information:**

Condition:

[Very good condition](#)

Availability:

[Sold](#)

Sold as:

[EXW \(Ex Works - Incoterm\)](#)

VAT:

[19 %](#)

Location:

Germany

## **Images:**



1



2



3



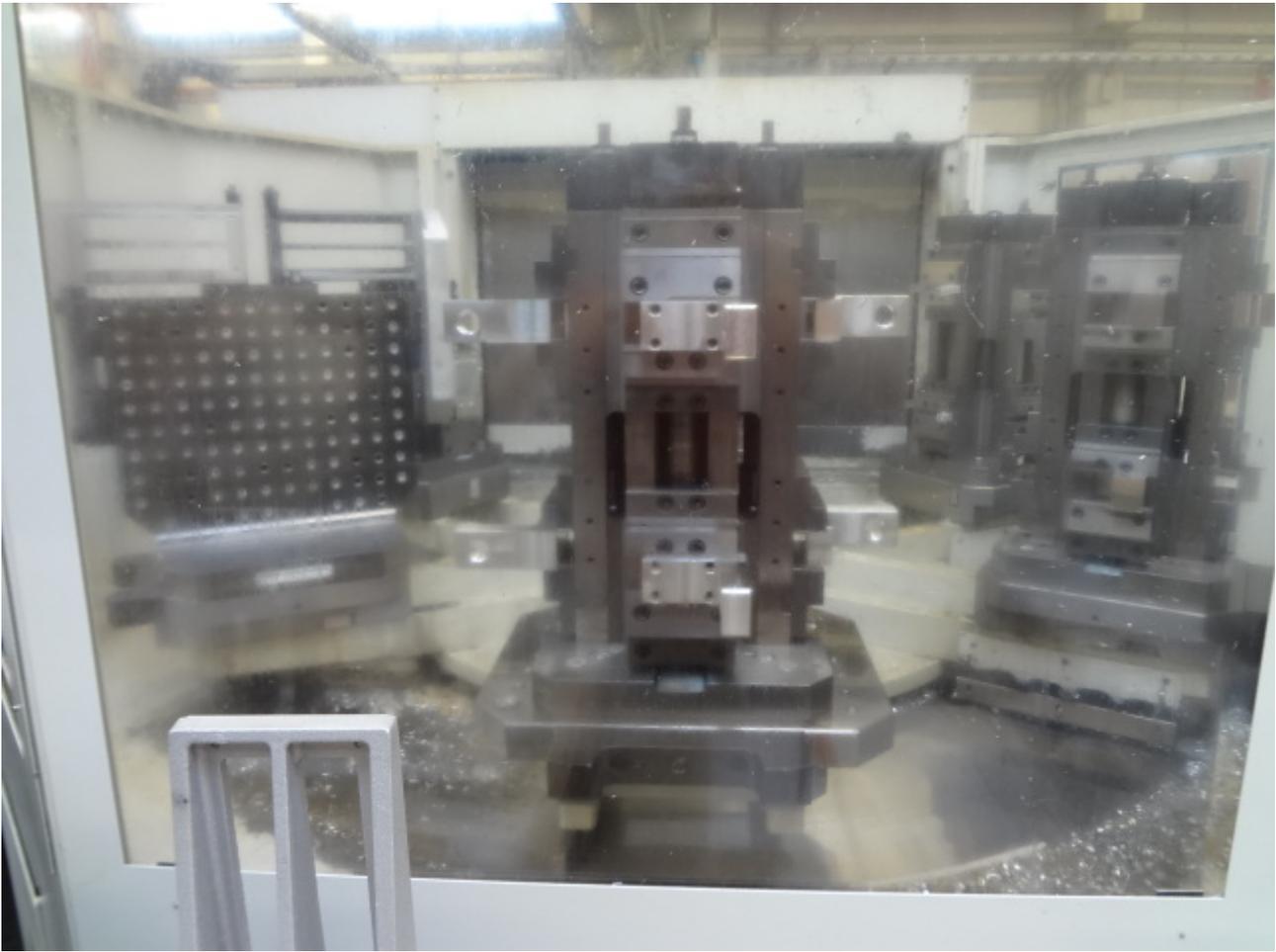
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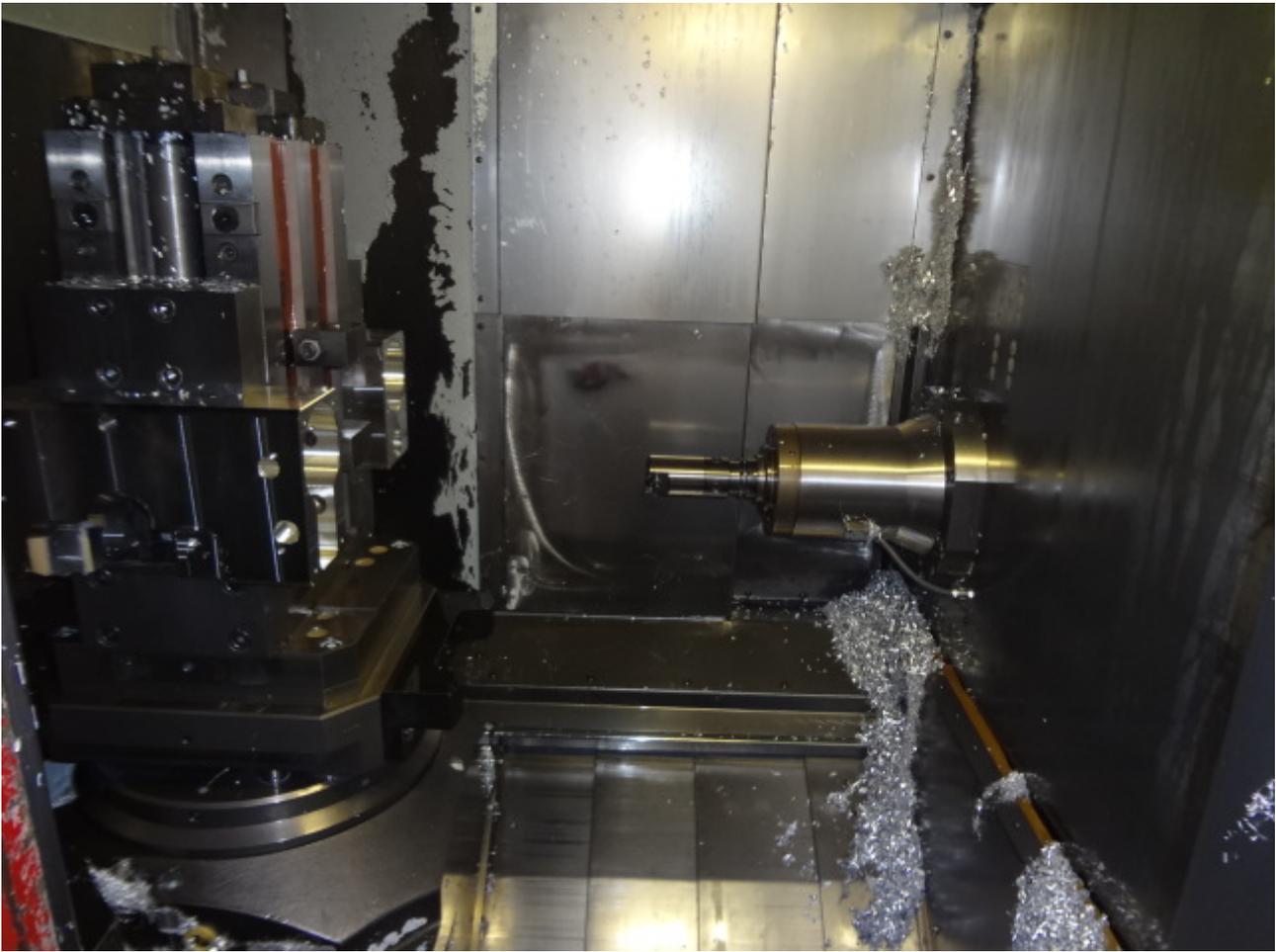
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8







11



12







15



16





**heckert**

*starrag-heckert group*

Heckert Werkzeugmaschinen GmbH  
D-09117 Chemnitz Otto-Schmerbach-Str. 15-17

Typ	CWK 400 D
Maschinen - Nr.	18272
Baujahr	1999
Temperaturbereich	+5...35 °C
Gesamtmasse	12,5 t



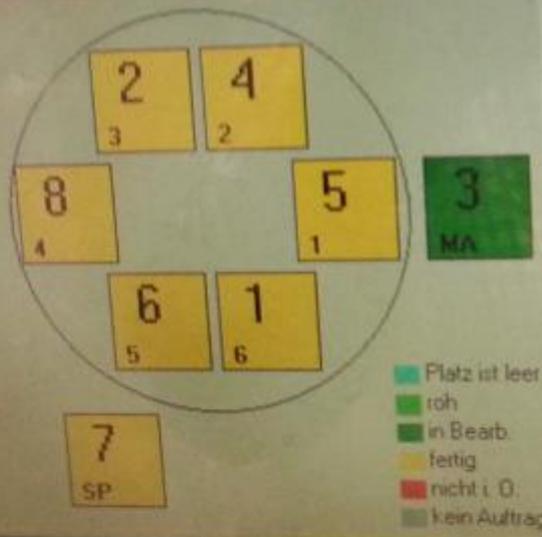
Made in Germany



SIEMENS

Platten  
speichert  
Kanal aktiv  
Programm läuft  
510220  
Einlesesperre bei Werkzeugwechsel  
AUTO  
WKS DIR 182/5 WPD  
6279 MFT  
RDV

### Speicherabbild



### AUTOMAT

Palettenfolge

Aktiv: Palette 3  
Folgebearbeitung = 0

Meldungen

Aufträge Palettenverwaltung Einstellung





Benennung	Einheit	Wert		Option	
		CWK 400D	CWK500D		
<b>Positionsgenauigkeiten in den Achsen X, Y, Z nach VDI / DGQ 3441</b>					
Normalausführung	Positionierunsicherheit	$P(T_p)$	$\mu\text{m}$	9	
	Positionsabweichung	$P_s$	$\mu\text{m}$	8	
	Positionsstreubreite	$P_{stmax}$	$\mu\text{m}$	7	
	max. Umkehrspanne	$U_{max}$	$\mu\text{m}$	6	
Hochgenauigkeitsausführung	Positionierunsicherheit	$P(T_p)$	$\mu\text{m}$	6	•
	Positionsabweichung	$P_s$	$\mu\text{m}$	5	•
	Positionsstreubreite	$P_{stmax}$	$\mu\text{m}$	4	•
	max. Umkehrspanne	$U_{max}$	$\mu\text{m}$	3	•

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Betrieberbedingungen</b>				
<b>Elektrotechnische Anschlußwerte</b>				
Werte sind ausrichtungsabhängig / detaillierte, maschinengebundene Angaben: Installationsplan (Teil Transport/Aufstellung/Inbetriebnahme)				
TN-C; 3 /PEN AC 400				
Netz	V	400 <sup>+1%</sup>		
Betriebsspannung	Hz	50 <sup>+1%</sup>		
Frequenz	kVA	75		
Anschlußwert	bei Normalausführung (Haupttriebs-Leistung 24 kW)	kVA	100	•
	bei Ausführung mit erhöhter Beschleunigung	kVA	100	
Dauerleistungsbedarf	bei Normalausführung (Haupttriebs-Leistung 24 kW)	kW	65	
	bei Ausführung mit erhöhter Beschleunigung	kW	87	•
Steuerspannung	DC/Gleichstrom	V	24	
<b>Umgebungsbedingungen</b>				
Temperaturbereiche	für Funktionsfähigkeit	° C	+10 bis +35	
	für Nenngenaugkeit (Normalausführung)	° C	+20 <sup>+2</sup>	
	für Nenngenaugkeit (HochgenauigkeitAusführung)	° C	+20 <sup>+1</sup>	
zulässige Temperaturänderung	bei Nenngenaugkeit	° C / Stunde	0,5	
zulässige relative Luftfeuchte	bei 20 ° C	%	max. 80	
zulässige Luftverunreinigung	es gelten die Werte der elektrotechnischen Ausrüstung			
	Niederschlag (30d)	g/m <sup>2</sup>	1	
	wasserlöslicher Staub	mg/m <sup>3</sup>	0,2	
<b>Druckluftanschluß / Pneumatik</b>				
Anschlußdruck	bar	6,1 bis 10		
Luftverbrauch	kurzzeitiger Spitzenverbrauch	m <sup>3</sup> / min	3,5	
	Mittelwert bei Normaldruck	m <sup>3</sup> / Stunde	9	
Restölgehalt		mg / m <sup>3</sup>	≤0,1	
Restfeuchte		g / m <sup>3</sup>	≤2,75	
Verunreinigung	Teilchengröße	µm	≤1	
	Massenkonzentration	mg / m <sup>3</sup>	≤5	

Benennung	Einheit	Wert		Option
		CWK400D	CWK500D	
Sinumerk 840 D				
<b>Steuerung</b>				
<b>Masse / Raumbedarf</b>				
Anhängemasse	Maschine	kg	ca. 12.800	ca. 15.000
Länge	Normalausführung ca.	mm	4.600	4.850
Breite	Normalausführung ca.	mm	3.920	4.000
Maschinenhöhe (bei Kettenmagazin)	über Unterkante Bett	mm	2.900	2.950
Maschinenhöhe (bei Turmmagazin)	über Unterkante Bett	mm	2.700	2.950
Montagehöhe	über Unterkante Bett	mm	3.150	3.300
Höhe Unterkante Bett über Fußboden	Normalausführung ca.	mm	125	
<b>Lärmemission</b>				
Lärmpegel		dBA	< 76	
			Prüfbedingungen: 1,6 m; Hauptgetriebe $n_{max}$ links und rechts; mittlerer Vorschub in allen Achsen nacheinander; Arbeitsschutz geschlossen, Messung vor dem Spannplatz und am Einlegeplatz; Meßgerät: Schallpegelmesser	

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Hydraulik</b>				
Pumpe	Druck	bar	85 bis 90	
	Förderstrom	l/min	22,5	
Ölbehälter	Ölmenge	l	40	
Antriebsmotor	Leistung	kW	4	
	Anzahl der Kreisläufe	-	1	
<b>Späneförderer</b>				
Nutzbreite		mm	450	
Abwurfhöhe	Standardausführung	mm	1050	
<b>Kühlaggregat</b>				
Kältemittel		-	R 134 A	
Wasserbehälter	Inhalt	l	ca. 30	
Zusatz gegen Korrosion		-	10% Anticorit	

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Prozessschmierung</b>				
Anzahl der Kreisläufe	-	2		
<b>durch Spindelmitte</b>				
manuell schaltbar	Fördermenge der Pumpe	l/min	30/27/24	•
	Druck am Begrenzungsventil	bar	30/40/50	•
schaltbar mit M-Befehl	Fördermenge der Pumpe	l/min	30/27/24	•
	Druck am Begrenzungsventil	bar	30/40/50	•
<b>über Düsen</b>				
	Fördermenge der Pumpe	l/min	50	
	Pumpendruck	bar	2	
<b>Schwalldusche</b>	Fördermenge der Pumpe	l/min	ca. 70	•
	Anzahl der Düsen am Dach	-	4	•
				•
<b>Spülpistole</b>	am Spannplatz			
<b>Filterart</b>	Rückspülfiter	l	900	
<b>mit</b>	Vliesfilter	l	1350	•
<b>Behälterinhalt</b>	Vakuumrotationsfilter	l	1250	•

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Werkzeug-Kettenmagazin</b>				
Span-zu-Span-Zeit <small>(gemessen nach VDI 2952)</small>	bei Elgang 40 m/min bei Elgang 82 m/min bei Elgang 100 m/min	s s s	5 ** 4 ** 3,5 **	6 ** 5 ** --
Anzahl der Werkzeugplätze		-	60	
max. Werkzeugdurchmesser	bei freien Nachbarplätzen	mm	∅ 160 *	
	bei belegten Nachbarplätzen	mm	∅ 85	
	bei freien Nachbarplätzen und Arbeitsspindel-Drehzahlerhöhung 24000 Upm	mm	∅ 125	
max. Werkzeugausraglänge		mm	350 *	400 *
max. Werkzeugmasse	bei Arbeitsspindel-Drehzahlerhöhung 24000 Upm	kg	10	
		kg	5	
max. Kippmoment	(an Griffstelle des Basisalters)	Nm	10	
Gesamtmasse	aller Werkzeuge im Speicher	kg	200	
max Unwucht	der Werkzeuge bei unsymmetrischer Bestückung	kg	80	
<b>Werkzeug-Turmmagazin</b>				
Span-zu-Span-Zeit	bei Elgang 40 m/min bei Elgang 82 m/min	s s	5 ** 4 **	6 ** 5 *
Anzahl der Werkzeugplätze		-	120/240	
max. Werkzeugdurchmesser	bei freien Nachbarplätzen	mm	∅ 160	
	bei belegten Nachbarplätzen	mm	∅ 80	
	bei freien Nachbarplätzen und Arbeitsspindel-Drehzahlerhöhung 24000 Upm	mm	∅ 125	
max. Werkzeugausraglänge		mm	350	
max. Werkzeugmasse	bei Arbeitsspindel-Drehzahlerhöhung 24000 Upm	kg	10	
		kg	5	
max. Kippmoment	(an Griffstelle des Basisalters)	Nm	10	
max. Geschwindigkeit Q-Achse	(Quen-/Horizontalbewegung)	m/min	100	
max. Geschwindigkeit V-Achse	(Vertikalbewegung)	m/min	70	

\* Einschränkungen bei max. Werkzeuglänge in Verbindung mit max. Werkzeugdurchmesser  
laut Skizze Pkt 11.2.9.1 beachten!

\*\* Bei Einsatz eines Winkelbohrkopfes und / oder Werkzeugaufnahme SK 40 erhöht sich die  
Span-zu-Span-Zeit um ca. 0,5 sec.

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Arbeitsspindel / Hauptmotor</b>				
Durchmesser im vorderen Lager	mm	∅75		
Werkzeugaufnahme		HSK-A63 DIN 69893		•
		SK 40-AD DIN 69871		
		Anzugsbolzen DIN 69872-19		
<b>Variante Motorspindel Starrag und HSK - A63</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 15 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Motorspindel Starrag und SK 40</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Motorspindel Starrag und HSK - A63</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Hohlwellenmotor und SK 40</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	37	24	
Drehmoment	Nm	350	230	

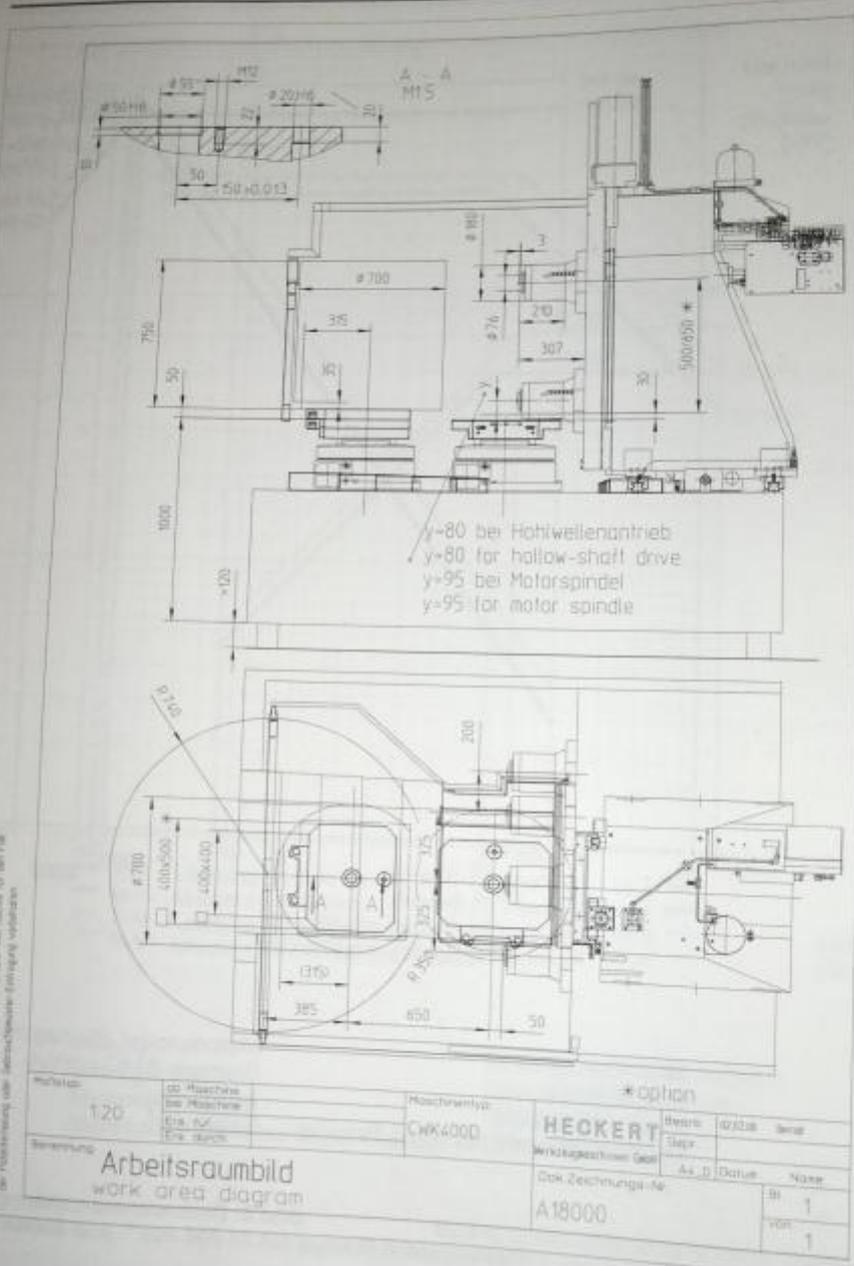
Benennung	Einheit	Wert		Option
		400D	500D	
<b>Verstellwege</b>				
X - Achse (Ständerverstellung)	mm	650	750	
Y - Achse (Support-Senkrechtverstellung)	mm	650	750	
Z - Achse (Tisch-Querverstellung)	mm	650	700	
<b>Verfahrbereich</b>				
min. Abstand Spindelvorderkante - Mitte Werkstückträger	mm	50	100	
min. Abstand Spindelmitte - Oberkante Werkstückträger	mm	30	80	
<b>lineare Vorschubachsen X / Y / Z</b>				
Vorschub	mm/min	0 ... 40 000 0 ... 82 000 0 ... 100 000		• •
Eilgang	m/min	40		•
	m/min	82		•
	m/min	100		•
technologisch verwertbare Vorschubkraft 60% ED	kN	12*		
100% ED	kN	10*		
Meßsysteme				
linear, optisch-inkremental, abstandscodiert				
Genauigkeitsklasse	µm	±5		
Teilungsperiode der Strichgitterteilung	µm	20		
Eingabe- und Anzeigefinheit	µm	1		
Beschleunigung X/Y/Z bei Eilgang 40m/min	m/s <sup>2</sup>	7		
Eilgang 82m/min bei Hohlwellenantrieb	m/s <sup>2</sup>	9,3 / 9,6 / 10		•
bei Motorspindel	m/s <sup>2</sup>	4 / 5,5 / 4,5		•
Eilgang 100m/min	m/s <sup>2</sup>	15/15/12		•

\* Beachten Sie die Einschränkung der Vorschubkraft  
(siehe Bild 1: Diagramm Zulässige Vorschubkraft im oberen Y-Bereich)

Benennung	Einheit	Wert		Option
		400D	500D	
<b>NC-Drehtisch / Drehachse B</b>				
max. Drehzahl	min <sup>-1</sup>		25	
Eingabe- und Anzeigeinheit	Grad		0,001	
zul. Tangentialmoment (Tisch geklemmt)	Nm		3000	
zul. Tangentialmoment bei Dreharbeiten	Nm		530 bei 100% ED 1000 bei 60% ED	
max. Kippmoment ab Oberkante Palette	Nm		5000	
Positionierzeiten	45°	s	0,8	
	90°	s	1,2	
	180°	s	2,0	
Normalausführung	Positionsunsicherheit P (T <sub>p</sub> )		12"	
	max. Positionsstreuung P <sub>stmax</sub>		10"	
	max. Umkehrspanne U <sub>max</sub>		6"	
Hochgenauigkeitsausführung	Positionsunsicherheit P (T <sub>p</sub> )		6"	•
	max. Positionsstreuung P <sub>stmax</sub>		5"	•
	max. Umkehrspanne U <sub>max</sub>		3"	•

11.5 Technische Daten

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Palette</b> (am Spannplatz drehbar)				
Aufspannfläche	mm x mm	400 x 400	-	•
	mm x mm	400 x 500	-	
max. Belademasse pro Palette (mittig)	kg	400	500	•
	bei Eilgang 82 m/min	kg	300	
bei Eilgang 100 m/min	kg	200		•
zul. Moment bei außermittiger Last	Nm	200		
Höhe der Werkstück-Aufspannfläche über Unterkante Bett (Spannplatz)	mm	1000		
Richtbohrung - Durchmesser	mm	∅ 20 H 6		
Abstand zur Tischmitte	mm	150	200	
		∅ 0,013	∅ 0,013	
Aufnahmebohrung ohne Spannhdraulik in Verbindung mit Spannhdraulik	mm	∅ 50 H 6		
	mm	∅ 20 H 6		
Befestigungsgewinde (Normalausführung)		43 x M12	23 x M12	
T-Nut (ähnlich DIN 650)	mm	14		•
Werkstück-Durchlaßhöhe	mm	750	900	
max. Störkreis	mm	∅ 700	∅ 800	
Spannhdraulik für Werkstückspannung		3 Anschlüsse		•
<b>Automatischer Palettenwechsel</b>				
Anzahl der wechselbaren Paletten	-	2		
max. Palettenwechselzeit bei Normalausführung	s	8	9	
bei Ausführung mit Spannhdraulik mindestens	s	10		

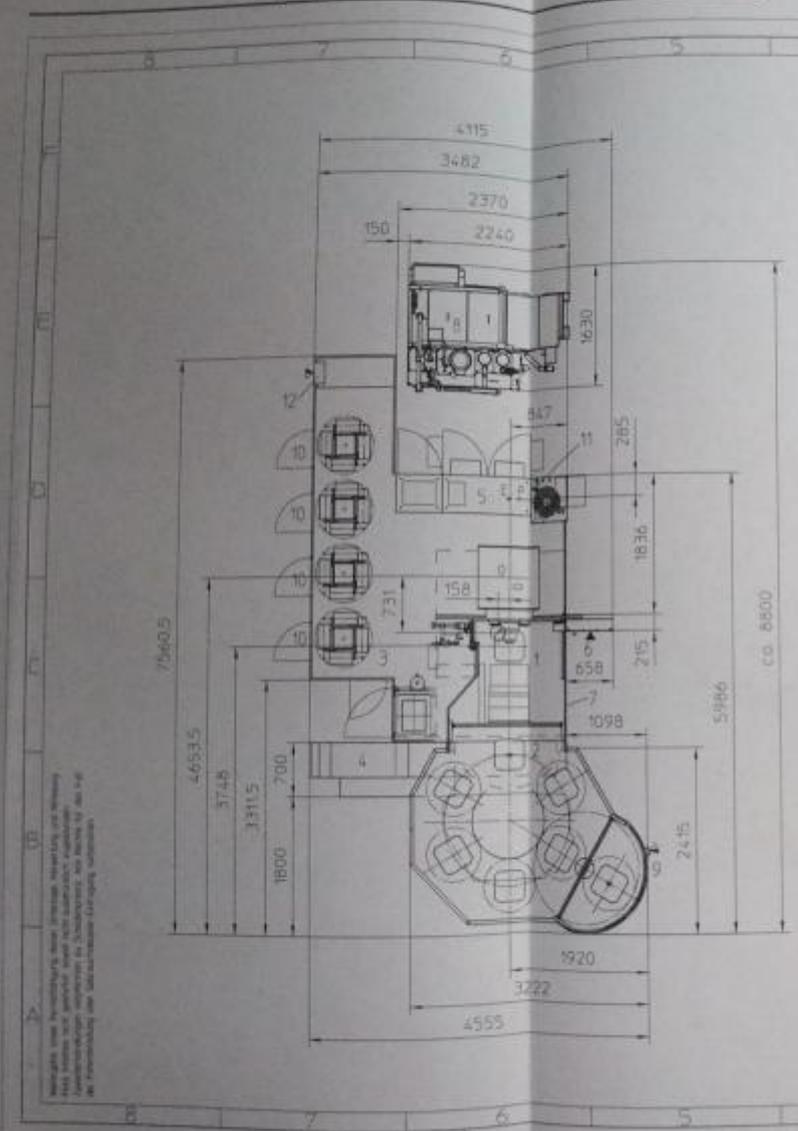


Alle Angaben sind ohne Gewährleistung. Die Hecker-Produkte sind ausschließlich für den Einsatz in der Industrie vorgesehen. Die Hecker-Produkte sind ausschließlich für den Einsatz in der Industrie vorgesehen.

Bild 6: Arbeitsraumbild

Bedienung  
Abschnitt 2

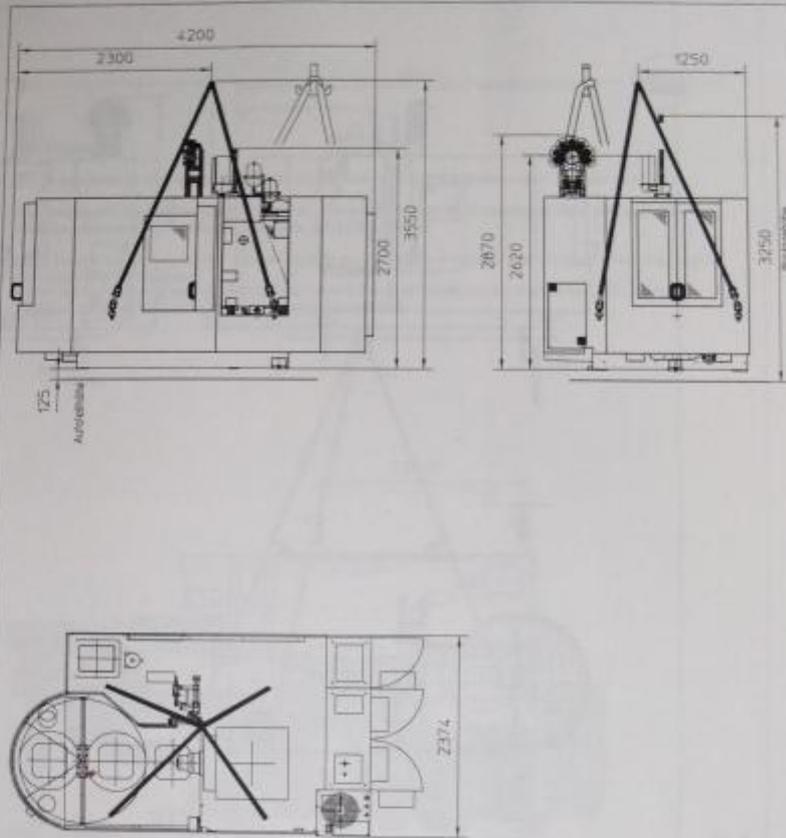
HECKERT  
CWK400D /500D



- 1 Arbeitsraum
  - 2 Werkstückwechsler
  - 3 Werkzeugspeicher/Werkzeugwechsler mit Verkleidung
  - 4 Späneförderer mit Schaufelbehälter
  - 5 Elektroschrank
  - 6 CNC-Steuerung mit Bedienfeld
  - 7 Arbeitsraumschutz
  - 8 Kühlmittelbehälter
  - 9 Sicherheitsrichtung Spornplatz
  - 10 Handrührplatz für Werkzeuge
  - 11 Hauptschalter
  - 12 2 NK-Bedientafel
- E Elektroanschluss (Netzanschluss)  
P Luftanschluss  
S Hauptbedientafel  
▶ Bedientafel

- 1 Work area
  - 2 Workpiece changer
  - 3 Tool Magazin/tool change with covering
  - 4 Chip conveyor with dry coolant tank
  - 5 Switch cabinets
  - 6 CNC-control with operator control
  - 7 Work area enclosure
  - 8 Coolant tank
  - 9 Safety device for clamping station
  - 10 Manual loading station for tools
  - 11 Main switch
  - 12 2 NK-operator panel
- E Power supply (mains connection)  
P Compressed-air supply  
S Main operator control  
▶ Secondary operator's stand

Auftrags-Nr. 150	an Maschine	mit	Maschinen-Nr. CWK400D
	an Maschine	mit	
	an Maschine	mit	
Bezeichnung RAUMBEDARFSPLAN			



Wichtiges zum Vorwärtigung dieser Unterlagen: Anwendung und Wartung  
des Erzeugnis nicht gestört, sowie nicht unautorisiert kopieren.  
Zusammenhänge aufpassen bei Schweißarbeiten. Alle Rechte für den Fall  
der Patentierung oder Gebrauchsmuster-Eintragung vorbehalten.

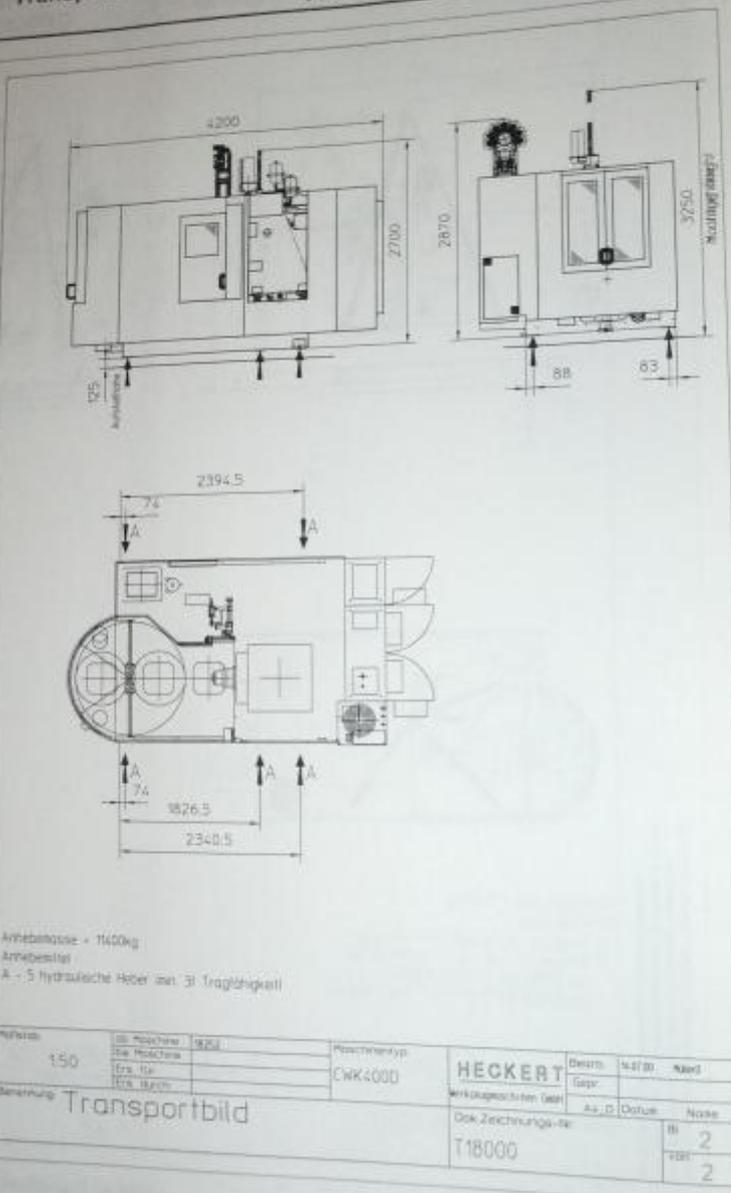
- Anhängerlaste = 11000kg  
Anhängersattel  
- 2 Rundschlingen WLL6000mm 6t lang  
- 6 Schakel A6 (links je 1x, rechts je 2x)  
  DN 8201 (mit 5t Tragfähigkeit)  
- 4 Anschlagwirbel M30 (mit 5t Tragfähigkeit)

Müllst. 150	ab Maschine	322	Maschinentyp CWK400D	HECKERT	Bestr.	1/17/0	Wert
	bei Maschine				Geor.		
Benennung Transportbild	Dr. Nr.		Werkzeugschlüssel	Datei	AL D	Datum	Namen
	Dr. Durch.				Dr. Zeichnungs-Nr.	Bl.	1
							von
							2

Bild 6: Transport Maschine Bl. 1

Transport/Aufstellung/Inbetriebnahme  
Abschnitt 5

HECKERT  
CWK400D /500D



Alle Angaben sind unverbindlich. Änderungen vorbehalten. Die Heckeert Maschinen sind nur für den Einsatz im Bereich der Baubranche geeignet. Die Heckeert Maschinen sind nicht für den Einsatz im Bereich der Landwirtschaft geeignet.

Anhebebasis = 11400kg  
Anhebezeit  
A - 5 Hydraulische Heber (mit 31 Traglastkraft)

Merkmal	Gr. Maschine	9,50	Maschinen Typ	HECKERT	Bestr.	1/4/20	Stiel
	Gr. Maschine				CWK400D	Gepr.	
150	Erk. Nr.				As. C	Datum	Notiz
Bezeichnung	Transportbild			Dok. Zeichnungs-Nr.	Bl. 2		
				T18000	von 2		

Bild 7: Transport Maschine Bl. 2

18409 16.08.2001

Betriebsanleitung

D 28 von 30

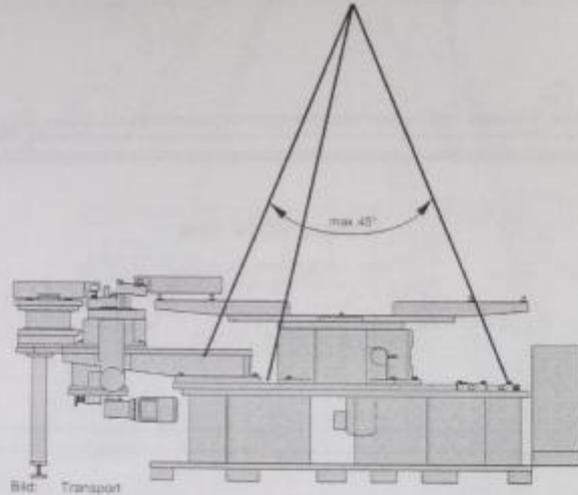


## 2 Transport

Der Palettenpool ist eine kompakte Baugruppe die nach der Inbetriebnahme in dem Zustand verbleibt.

Das Anhängen des Palettenpool darf nur an den mitgelieferten M20 Anschlagwirbel erfolgen. Das Einschrauben anderer Anhängeschrauben ist nicht zulässig!

Die 6 Spärrschrauben zwischen Verschiebepatte und Grundkörper müssen beim Transport fest angezogen sein (siehe 8.90 Grundgestell).  
Halten Sie die einschlägigen Unfallverhütungsvorschriften beim Transport des Palettenpool ein, die unter anderem den Aufenthalt unter schwebenden Lasten verbietet.

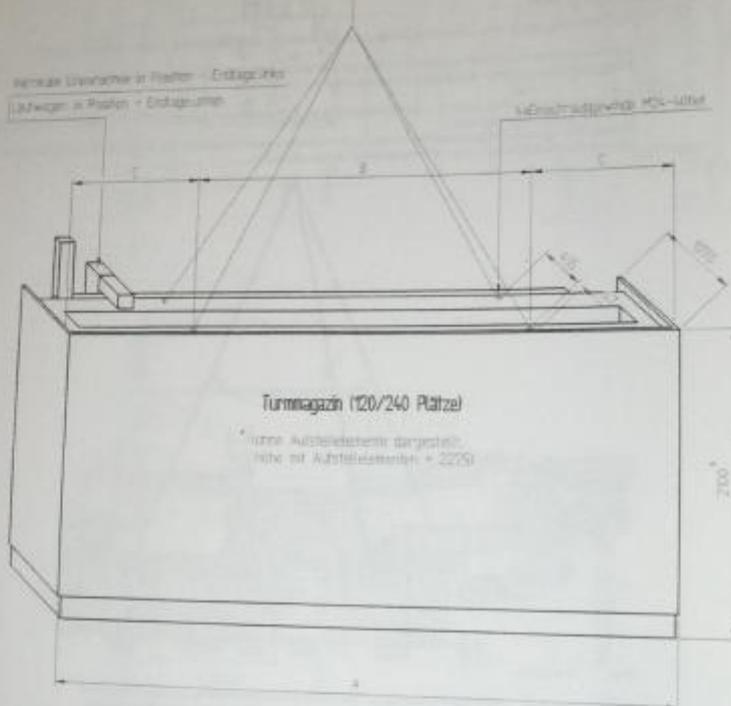


Anhängemasse: 3800 kg (Palettenpool komplett mit elektromechanischem Wurfwerk)  
Anhängemittel: 3 Anschlagwirbel M 20 (pro Anschlagwirbel sind 2 Tonnen zulässig)

©HECKERT 1999

Bild 8: Transport Palettenpool

Anhängebild-Krantransport



Turmagaz. - Typ	A (mm)	B (mm)	C (mm)	Masse (kg)
240 Plätze	4250	2905	570	3260
120 Plätze	2570	1665	300	2110

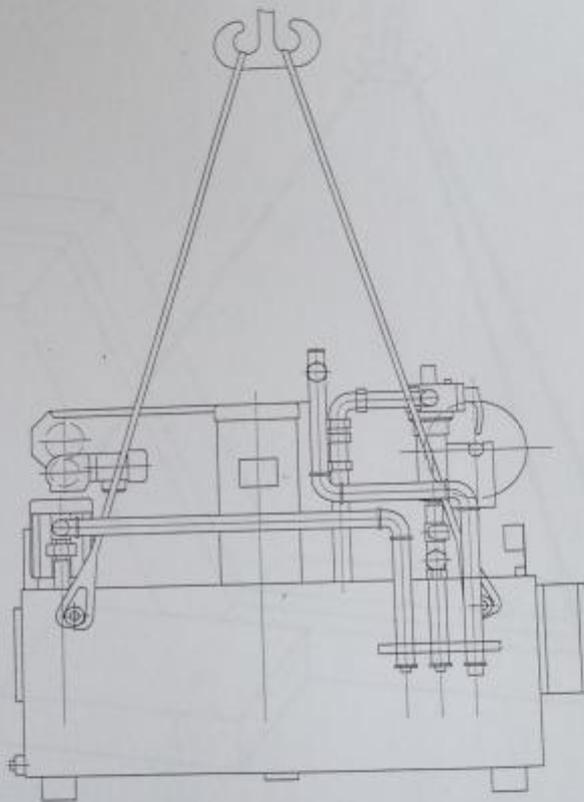
Bild 9: Transport Turmmagazin

18409 16.08.2001

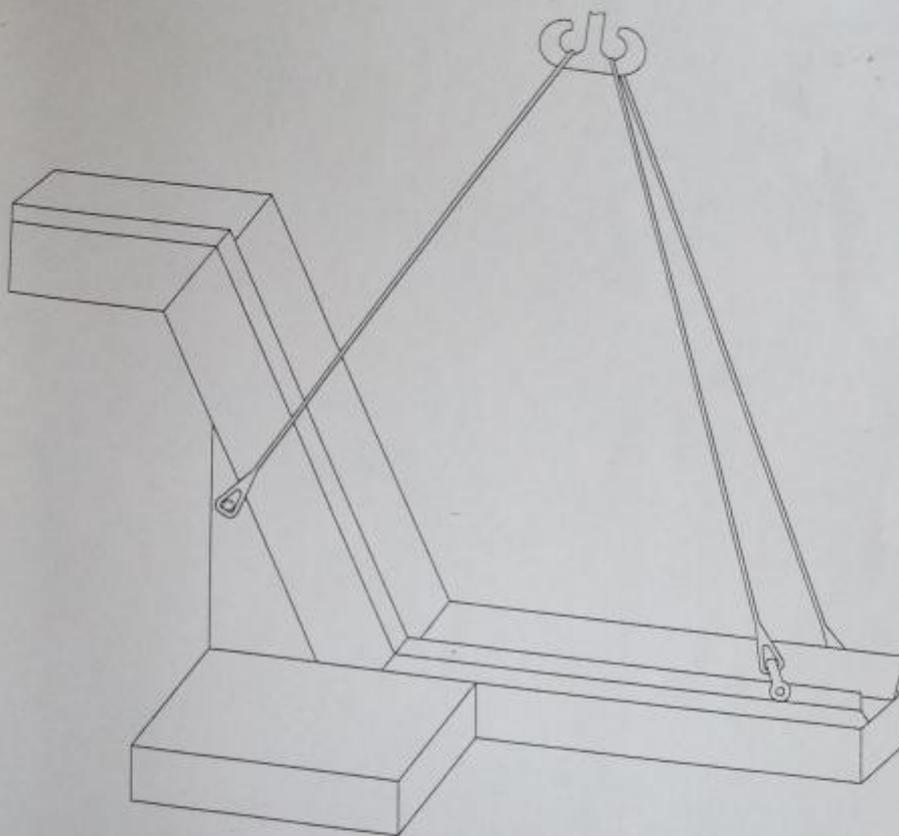
Betriebsanleitung

D

30 von 30



Масштаб 1:20	по чертежу	2007	Масштаб CWK 1000	<b>HECKERT</b> ОДЕЛЕНИЕ МАШИНОСТРОЕНИЯ ЦАЭП	Вариант	20/07/0001
	по фотографии				Стор.	1/1
	для кат.				Дата	
	для арх.				Имя	
Содержание TRANSPORTBILD, KÜHLMITTELBEHÄLTER				Счетчик	Стр.	7
					Итого	9



Maßstab 1:20	40 Maschine	2001	Maschinenyp EWK 1000	<b>HECKERT</b> Damen Werkzeugmaschinen GmbH	Rechts	20/10/100
	60 Maschine				Links	1/1
Benennung TRANSPORTBILD, SPÄNEFÖRDERER	Erz. für		Sachnummer T20000		Gesam	Neu
	Erz. durch				Stk	8
						9



**With Ever More  
To The New Mill**

The new HECKERT  
CWK 500 D  
Centres have 5  
the demands of  
more reliable,  
effective.  
Using motor  
speed ranges of  
15,000 rpm, o  
conditions have  
metal machin  
high static an  
machining cap  
the customers  
could be reduc  
extent. The CW  
highest dynam  
achieving top  
rates of up to  
rates of up to  
centres are n  
values with 82  
Innovative ide  
mented in too  
the well-prove  
with max. 240  
developed a n  
with 60 pocket  
between mag  
This also sub  
sequential too  
1.5 sec. and  
reduced to 3.5

## All Around A Direct Hit

### 1 Installation without any need for foundation

Thanks to compact design with 7 type bed and columns with reduced mass

### 2 Safe and extremely fast swarf removal

from the working zone thanks to chain bed design, swarf conveyor work and swarf conveyor as precondition for dry machining

### 3 Highest positioning accuracies

$P \pm 0.006$  mm and  $P_{max} \pm 0.004$  mm in all linear axes by means of linear motion guideways

### 4 Highest rapid traverse rates and short controller acting times

thanks to digital AC servo drives with pre-loaded ball lead screws

### 5 Dynamic package 1 g (optional) with rapid traverse rate of 32 m/min, acceleration rate of 10 m/s<sup>2</sup> and motor-driven spindle of 15,000 rpm

### 6 Dynamic package 1.5 g (optional for CWK 400 D)

with rapid traverse rate of 100 m/min, acceleration rate of 15 m/s<sup>2</sup> and motor-driven spindle of 15,000 rpm

### 7 Main drive

in variants with motor-driven spindle  
- driving power ratings of up to 21 kW, speed range of up to 10,000 rpm, steep-taper tool receptor AD 40 or hollow-chuck taper HSK 63  
- driving power ratings of up to 21 kW, speed range of up to 15,000 rpm, HSK 63 tool receptor  
- driving power ratings of up to 60 kW, speed range of up to 24,000 rpm, HSK 63 tool receptor  
or with hollow shaft-type motor  
- driving power ratings of up to 25 kW, torque up to 335 Nm, speed range of up to 10,000 rpm, steep-taper tool receptor AD 40

### 8 Pallet changeover time 8 to 9 sec. thanks to hydraulic rotary changer

### 9 Rotatable clamping station with 4 - 80° indexing facility for operator-friendly workpiece setting whilst the machining cycle is running

### 10 NC rotary table

for multiaxial and complete machining to satisfy highest accuracy demands ( $P \pm 0''$ ,  $P_{max} \pm 0''$ ) with coupling and for hydraulic workholding fixtures

### 11 High-performance in-process control and monitoring facilities

use of Sinumerik 840 D CNC continuous-path controller in 32-bit technology or, as an option, Fanuc 16i including comprehensive control and monitoring facilities

### 12 Tool handling with chain-type magazine, chip-to-chip times 3.5 to 4 sec., parallel tool location between magazine and main spindle, drive by means of AC servo motor to reduce the availability times for sequential tool and the chip-to-chip times

### 13 Tool handling with tool tower magazine

space-saving option with regard to chain-type magazine for increased tool demands of up to 240 pockets with smallest installation area and tool changeover in parallel to production time

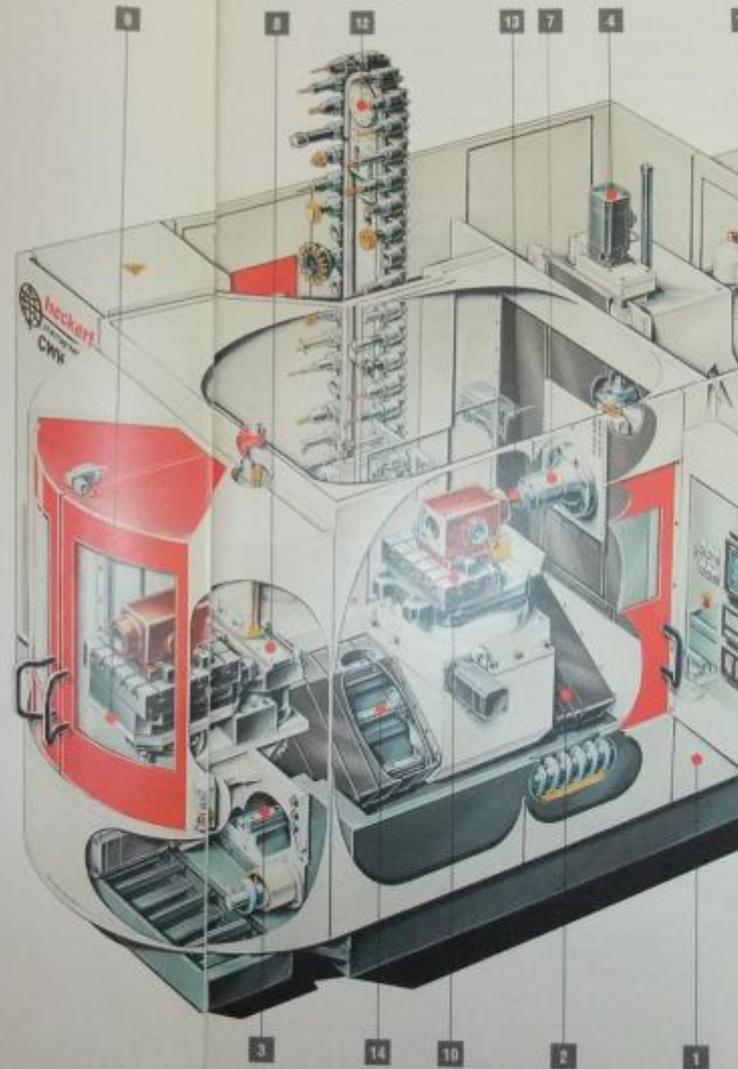
### 14 Coolant system

wet machining with coolant supply through nozzles or through spindle centre with a delivery pressure rating of up to 50 bar or dry machining with minimum-quantity lubrication

### 15 Low-maintenance grease lubrication

for motor-driven spindle, ball lead screws and linear motion guideways

### Conversion into manufacturing cells and flexible manufacturing systems with circular and linear magazines for workpiece pallets



## Economy And Ecology Form An Optimal Entity

- The compact design of HECKERT CWK 400 D and CWK 500 D centres with a T-type bed, carrying all major machine elements in the condition for transporting the machine as a single complete entity for installation without any need for foundations and instant readiness for use. This saves foundation, transportation, and assembly costs and makes sure that full production can be started even earlier.

- All major machine elements feature excellent shock absorbing qualities and a very limited heat expansion to ensure vibration-free machining with high performance.

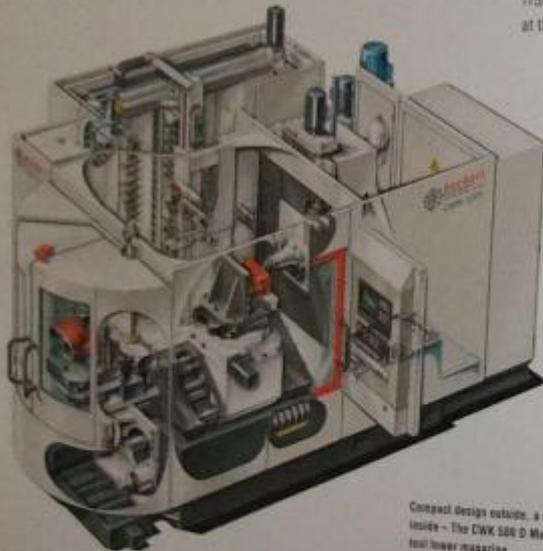
- To ensure fast and safe swarf removal from the working zone, the machine bed has been configured in slant-bed design. The consequential prevention of heat accumulation will create ideal conditions for dry machining.

- Extremely high running, positioning and permanent accuracies are ensured by optimally dimensioned linear motion guideways in all linear axes.

- Incremental, direct linear encoder systems with distance coding have been encapsulated in aluminium casings and

are pressurized with compressed air. So, the encoder systems are protected from swarf, coolant and contaminations. An incremental encapsulated angular position encoder system is used for the NC rotary axis.

- Manufacturing tolerance deviations and temperature fluctuations can be compensated for in conjunction with the CNC controller. In the stage of extension featuring enhanced machining accuracy, a positioning deviation of  $P \leq 0.006$  mm and a positioning variation of  $P_{smax} \leq 0.004$  mm in all linear axes and  $P_{smax} \leq 5''$  in the rotary axis can be achieved. So, accuracies in the IT5/IT6 tolerance class can be obtained at the workpiece.



Compact design outside, a variety of innovations inside – The CWK 500 D Machining Centre with tool lower magazine

- The technical concept of the HECKERT CWK 400 D and CWK 500 D consistently applies all necessary considerations for strict adherence to ecological requirements. Total-loss oil lubrication has become a thing of the past. Thanks to grease lubrication for main spindle, ball lead screws and linear motion guideways, maintenance requirements have been reduced quite considerably.

- With the machine being sealed off the shop floor, any ingress of coolant and hydraulic oil is avoided. This has been achieved by a machine bed which carries all functional machine elements and is hermetically sealed.

- Pieceless coolant purification with vacuum edge strainer and return flow filter for the high-pressure circuit does away with cost-intensive special refuse disposal requirements.

- In accordance with environment and operator-friendliness, a splash shower in the working zone with a coolant volume rate of 70 l/min, an air-blast gun at the clamping station for cleaning of workpiece and fixture and an emission extraction can be incorporated in the machining centres.

- A clear view of the working zone is always assured by a pneumatically operated, rotating inspection window in the working-zone safety door.

Construction principle  
with slant bed

## How A Reduction In Idle Times Can Be All Important



HECKERT CWK 400 D and CWK 500 D Machining Centres offer best conditions for high-speed machining of engine components

Optimal cutting conditions with coolant supply through spindle nozzle and through external nozzle



### ■ Main drive

A characteristic of the new HECKERT CWK 400 D and CWK 500 D Machining Centres is the highly dynamic behaviour of the main drive. With a mass-reduced and grease-lubricated motor-driven spindle, speeds of up to 10,000 rpm, 15,000 rpm and 24,000 rpm at power ratings of 31 kW can be reached optionally.

Even for heavy-duty cutting work, HECKERT offers another solution. A hollow-shaft-type motor ensures power ratings of 35 kW at torques of 335 Nm.

Optimal conditions are obtained for wet machining. Coolant supply is optionally possible through external, adjustable ball nozzles or through spindle and tool centre. Absolute swarf removal is guaranteed during core drilling with a delivery pressure rate of up to 50 bar.

Ideal machining results are achieved in dry machining thanks to the minimum-quantity lubrication. Clamping and unclamping of tools with steep-taper receptor 40 or hollow-shaft taper HSK 63 function quickly and safely by means of Belleville spring pack and hydraulic cylinder. Blasting of spindle taper and internal coolant supply of tools with compressed air during the automatic tool changeover cycle avoids contaminations and prevents negative influences on the machining quality.

### ■ Feed drive

Digital AC servo motors in combination with preloaded ball lead screws ensure short positioning times, minimized controller acting times, maximum rapid traverse rates, and a high stability over the whole range of feed rates. They feature the cost-saving option to the linear drives and reduce idle times above average with rapid traverse rates optionally from 40 m/min up to 100 m/min and acceleration rates of up to 15 m/s<sup>2</sup>. Such problems of linear drives as mastering of magnetic forces, expensive cooling and mass-dependent power capacity are excluded when using the rotary HECKERT drives.

Ever more dynamics can be achieved by the optional:

#### Dynamic package 1 g

(CWK 400 D and CWK 500 D)

- rapid traverse rate 82 m/min
- acceleration rate 10 m/s<sup>2</sup> in all linear axes
- motor-driven spindle with max. 15,000 rpm
- hollow-shank taper HSK-A63
- chip-to-chip time 4 sec.

#### Dynamic package 1.5 g (CWK 400 D)

- rapid traverse rate 100 m/min
- acceleration rate of up to 15 m/s<sup>2</sup>
- motor-driven spindle with max. 15,000 rpm
- hollow-shank taper HSK-A63
- chip-to-chip time 3.5 sec.

### ■ Pallet changeover

Pallet changeover too is safe, comfortable and ultra-fast. A hydraulically operated rotary pallet changer ensures exchange

of pallets with a t...  
Workpieces are clamp...  
unclamped at the clamp...  
machining takes place...  
standard design of...  
with its 4 × 90° indexing...  
operator comfort cons...  
An NC rotary table is off...  
machining operations...  
fitted with a high-prec...  
ensure a positioning d...  
and a position variatio...  
satisfy highest quality...  
The NC rotary table is...  
table with a coupling...  
pressure stages to su...  
holding fixtures.



## Highest Innovation During Tool Changeover

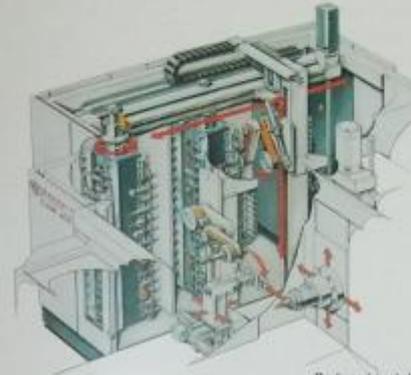
The tool handling is optimally matched with the machining job. Whether equipped with chain-type magazine for 80 tools or with tool tower magazine for 120 or 240 tools, the chip-to-chip time with dynamic package is only 3.5 to 4 sec. for tools of 10 kg in weight, 160 mm in diameter and up to 400 mm in length. The tool gripper is located outside the machining area and therefore not subject to coolant and swarf ingress. The enhanced peripheral speed of chain-type magazine will reduce the availability time of sequential tool to 1.5 sec. This is of particular importance for light-metal machining.

The tool tower magazine featuring highest tool density at minimum space requirements reduces setup times, optimizes sequences of operation and enhances operator comfort.



Arrangement of tools in chain-type magazine is optimal to the main spindle, ensures a chip-to-chip time of 3.5 sec.

## Advantages of tool tower magazine as against chain-type



Dynamic tool changeover between main spindle and tool tower magazine

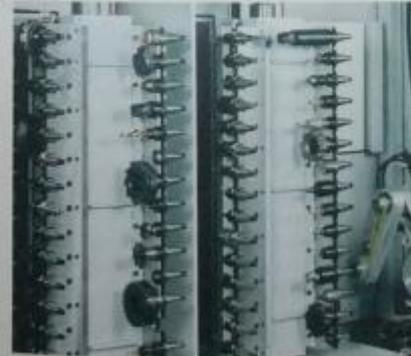
### Reduced installation

- Highest tool density
- 0.25 m<sup>3</sup> installation
- Full occupancy without vacant space

### Reduced setup

- Manual tool changeover during magazine changeover
- Magazine changeover within the automatic cycle
- Each tool can be located in any position
- Full occupancy without adjacent tools

Tool tower magazine for max. 120 or 240 tools with highest tool density at minimum space requirements



## Flexible Manufacture Can Be Extended

### ■ Linear magazine

A track-bound workpiece pallet transporter, clamping station for setup work, storage locations in linear arrangement for intermediate storage of workpiece pallets and a cell controller are included in the linear magazine.

The transporter featuring a traverse speed of 60 m/min as well as short acceleration and deceleration times guarantees short setup times.

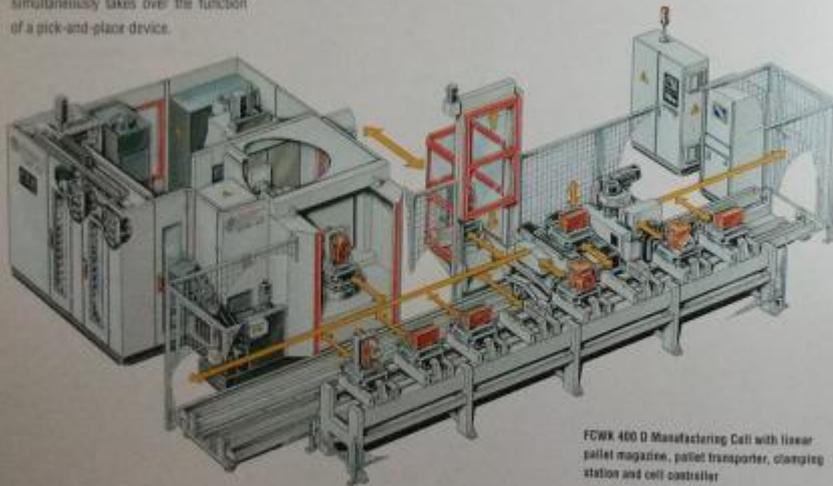
The independent NC controller of transporter increases operator comfort and reduces setup expenditure. The transverse conveyor at the transporter ensures double-sided loading and unloading of workpiece pallets and thus a high flexibility in cell structure.

When the storage locations are arranged in 2 or 3 tiers, the transporter simultaneously takes over the function of a pick-and-place device.

Setup work at the clamping station is carried out quickly, safely and under good ergonomic conditions. For clamping, positioning and unclamping of workpieces, for resetting the fixtures and for simple measuring operations, the clamping station can be rotated and indexed  $4 \times 90^\circ$ .

A protection device designed as lifting cage with electric drive and locking functions will increase labour safety and ease of operation.

The storage locations guarantee limited operator attendance for intermediate and buffer storage and can be arranged in one tier or in 2 or 3 tiers to save space.



CWK 400 D Manufacturing Cell with linear pallet magazine, pallet transporter, clamping station and cell controller

### ■ Circular magazine

The circular magazine in compact and, thus, space-saving design has got 6 storage locations and 1 clamping location and is driven by means of an AC servo motor.

To ease operation, the incorporated clamping station can be rotated and indexed for workpiece setup work.

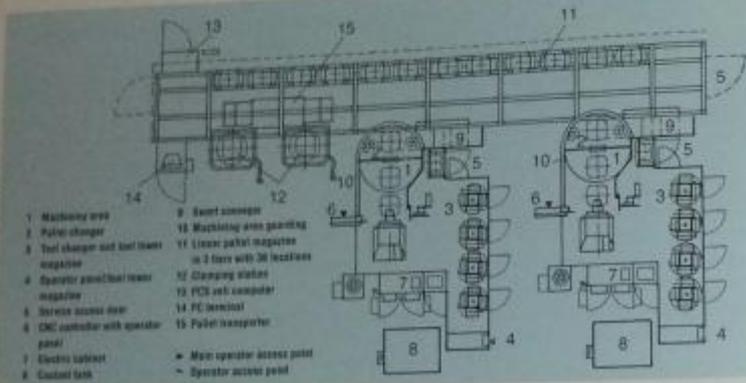
The workpiece pallets are quickly and safely transported from the clamping station to the circular magazine according to the rotary changer principle.

Following the same principle, the pallets

are introduced  
Zinc into the  
CWK 400 D  
Centres. The  
controls th  
takes over p



Layout of an HECKERT FWL 500 D Flexible Manufacturing System



Control and monitoring facilities

Comprehensive control and monitoring facilities are at choice for the HECKERT CWK 400 D and CWK 500 D Machining Centres as a precondition for semi-attended manufacture and for reducing manual inspection work. The target value and remaining life expectancy per tool are indicated on the CNC monitor screen for monitoring of

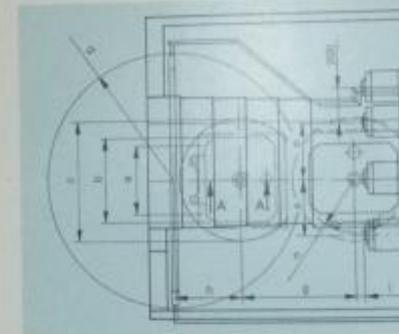
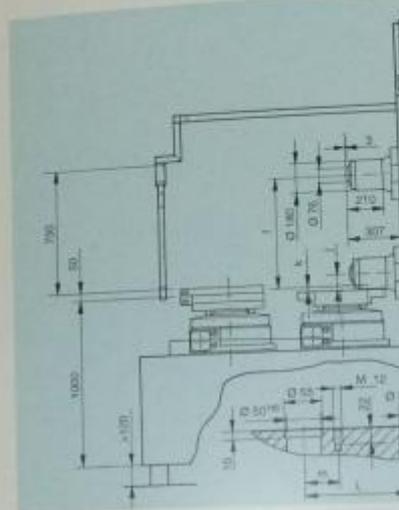
tool lifetime and consequential steps are automatically initiated upon any excess thereof. The main drive power rating is monitored for wear detection at the cutting edges of tool. The speed given in the tool list for each tool is permanently monitored to avoid any overspeeding. Direct tool break monitoring is ensured by means of break detector with pneumatic cylinder.

A 3D measuring probe monitors machining quality and allows for safe and fast zeroing of workpieces, allowance measurements and cut segmentation.

Direct tool break monitoring at break detector



Machining Area



	CWK 400 D
a	mm 400 - 400
b (optional)	mm (500 - 400)
c	mm 700
d	mm R 740
e/ longitudinal travel	mm ± 325
f/ vertical travel	mm 500 (650)
g/ transverse travel	mm 650
h	mm 385
i	mm 50
j	mm 95 for motor-driven spindle (80 for hollow-shaft motor)
k	mm 30
l	mm 150 ± 0.013
m	mm 50
e	mm R 310

Values in brackets = special execution



# Technical Data

		CWK 400 D	CWK 400 D with dynamic package 1g	CWK 400 D with dynamic package 1.5g	CWK 500 D	CWK 500 D with dynamic package 1g
<b>NC rotary table</b>						
Clamping surface/grip pattern (table DIN 55207)	mm	400 - 400 (300 - 400)	400 - 400 (300 - 400)	400 - 400 (500 - 400)	500 - 500 (430 - 500)	500 - 500 (500 - 500)
Input and display resolution	degrees	0.001	0.001	0.001	0.001	0.001
Max. load	kgf	400	300	200	500	300
Max. speed	rpm	25	25	25	35	25
Workpiece swing diameter	mm	700	700	700	800	800
<b>Automatic pallet changer</b>						
Number of changeable pallets		2	2	2	2	2
Max. pallet changeover time	sec.	8	8	8	8	8
<b>Traverse ranges</b>						
Column, transverse axis	mm	650	650	650	750	750
Spindle head, vertical axis	mm	500 (650)	600	600	850 (750)	600 (750)
Table, transverse axis	mm	650	650	650	700	700
<b>Main spindle Motor-driven spindle</b>						
Power rating at 100 % duty cycle	kW	19	19	19	19	18
Power rating at 40 % duty cycle	kW	31	31	31	31	31
Torque at 100 % duty cycle	Nm	165	165	155	165	165
Torque at 40 % duty cycle	Nm	200	200	180	200	200
Tool holder		SK 40 DIN 69871	HSK 63	HSK 63	SK 40 DIN 69871	HSK 63
Speed range	rpm	50...10000 (10000)	50...15000	50...15000	50...10000 (15000)	50...15000
Diameter of front bearing	mm	70	70	70	70	70
Increased power (600g ball-bearing motor optional)						
Power rating at 100 % duty cycle	kW	24	24		24	24
Power rating at 40 % duty cycle	kW	35	35		35	35
Torque at 100 % duty cycle	Nm	230	230		230	230
Torque at 40 % duty cycle	Nm	335	335		335	335
High speed package (optional)						
Max. speed/motor-driven spindle	rpm		24000			24000
<b>Automatic tool changer</b>						
Cham-type magazine						
Magazine pockets		60	60	60	60	60
Max. tool diameter	mm	160	160	160	160	160
Max. tool length	mm	350	350	350	400	390
Max. tool weight	kg	10	10	10	10	10
Max. 50 torque	Nm	10	10	10	10	10
Max. chip-to-chip time	sec.	5	4	3.5	6	4
Tool tower magazine (optional)						
Magazine pockets		120/240	120/240		120/240	120/240
Other data same as cham-type magazine						
<b>Traverse rates</b>						
Feed rate range, infinitely variable	mm/min	0...40	0...82	0...100	0...40	0...82
Rapid traverse rate	mm/min	40	82	100	40	82
Acceleration rate	mm/s <sup>2</sup>	7	10	15-12 for Z axis	7	10
<b>Coolant system</b>						
Supply through spindle centre						
Volume	l/min	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)
Pressure	bar	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)
Supply via nozzle						
Volume	l/min	30	30	50	50	50
Pressure	bar	2	2	2	2	2
Container capacity	l	350 (900)	350 (900)	500 (900)	550 (900)	320 (900)
<b>Machine accuracy according to VDI/DGQ 3441</b>						
Linear axes X, Y and Z						
Positioning deviation P	mm	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)
Positioning variation Pmax	mm	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)
NC rotary table						
Positioning deviation P	sec.	± 12 (6)	± 12 (6)	± 12 (6)	± 12 (6)	± 12 (6)
Positioning variation Pmax	sec.	± 10 (5)	± 10 (5)	± 10 (5)	± 10 (5)	± 10 (5)
<b>Net weight</b>						
kg		12000	12000	12000	15000	15000
<b>CNC controller type</b>						
		Sinuterk 840 D (Series 16.4)	Sinuterk 840 D	Sinuterk 840 D	Sinuterk 840 D (Series 16.5)	Sinuterk 840 D
<b>Tooler magazine (optional)</b>						
Number of storage locations		8	6	6	8	8
Design of clamping station				rotatable and indexable 4 x 90°		
Number of pallets in total system, max.		8	8	8	8	8
<b>Linear magazine (optional)</b>						
NC transceiver						
Traverse speed, approx.	mm/sec	60	60	60	60	60
Clamping station						
Storage locations, optional design		1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays
Number, optional		12/24/36	12/24/36	12/24/36	12/24/36	12/24/36
Number of pallets in total system, max.		14/26/38	14/26/38	14/26/38	14/26/38	14/26/38

Values in brackets = special execution



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Ref. No.:

324-06121454

**Overview and Technical Data:**

# **STARRAG HECKERT - CWK 400 D with palett changer + aluminium option**

**STARRAG HECKERT**



Starrag Group

Year of Build:  
May 1999

## Description:

# Used STARRAG HECKERT FCWK 400D Dynamic 6-station pallet pool, 240 Tower magazine with aluminum finish

- New spindle at 16 116 hours
- About. 33 568 operating hours
  
- CNC control Siemens 840 D
- Travel:
  - Column longitudinal travel X-axis 650 mm
  - Support vertical travel 650 mm Y-axis
  - Table traverse Z-axis 650 mm
  - B-axis 360 degrees x 0.001 indexing
  - Rapid traverse 40 m / min.
- Pallet size 400 x 400 mm
- Max Belstung 400 kp
- Drilling / tool spindle speed of 50 to max.15.000 r / min
- Drive power 31 KW
- Tool holder HSK 63
- Dynamic range change in 8 to 9 s by hydraulic rotary changer
- Coolant system
- Dimensions approximately 5.4 x 2.87 x 4.23 m

The motor spindles and speeds of 15 000 rev / min are creating the ideal conditions for the light metal processing, without compromising the high static and dynamic stiffness of the cast iron and steel processing.

The CWK 400 D Dynamic reach peak values??: Eilgangwerte to 100 m / min and accelerations up to 15 m/s<sup>2</sup>.

Innovative ideas also stuck in tool handling with the proven tower magazines with 240 tools. Attending dynamics is called for: in 1.5 s is provided the next tool, to 3.5 s to 4 s, the chip-to-chip time is reduced.

Compact in design, space-saving features of the circular memory 6 presets and 1 clamping space. It is powered by an AC servo motor.

For more details see PDFs

## Technical Data:

## Technical Data:

Control:

[SINUMERIK 840D](#)

Machine Hours:

33.568 hrs.

Spindle Hours:  
16.116 hrs.  
Spindle Speed:  
15.000 rpm  
Tool Capacity:  
240 x

### **Travels:**

X-Axis:  
650 mm  
Y-Axis:  
650mm  
Z-Axis:  
650 mm

### **Dimensions and Weight:**

Height:  
2.870 mm  
Width:  
4.230 mm  
Length:  
5.400 mm  
Weight:  
12.800 kg

### **Buyer Information:**

Condition:  
[Very good condition](#)  
Availability:  
[Sold](#)  
Sold as:  
[EXW \(Ex Works - Incoterm\)](#)  
VAT:  
[19 %](#)  
Location:  
Germany

### **Images:**



1



2



3



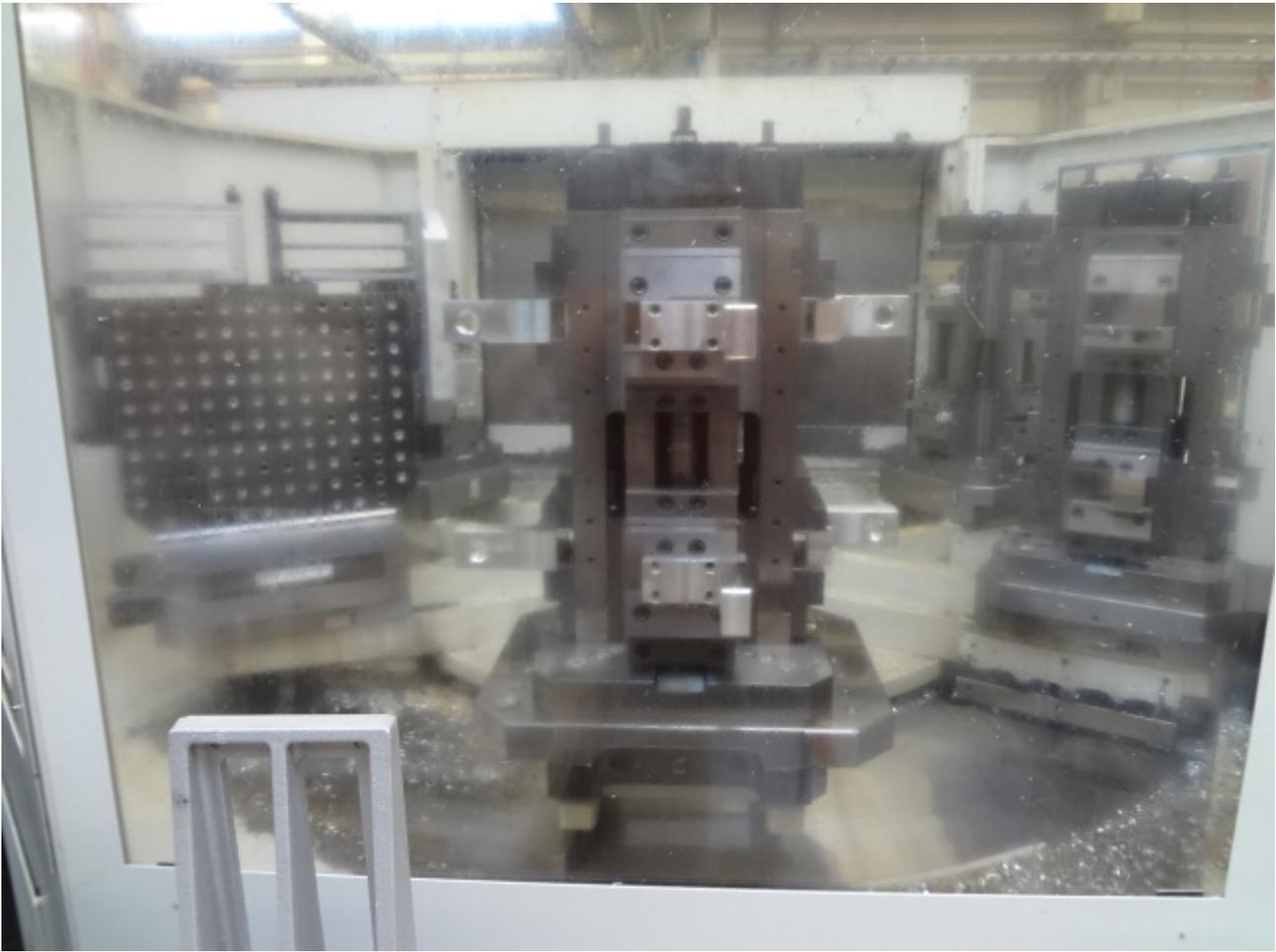
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5



6



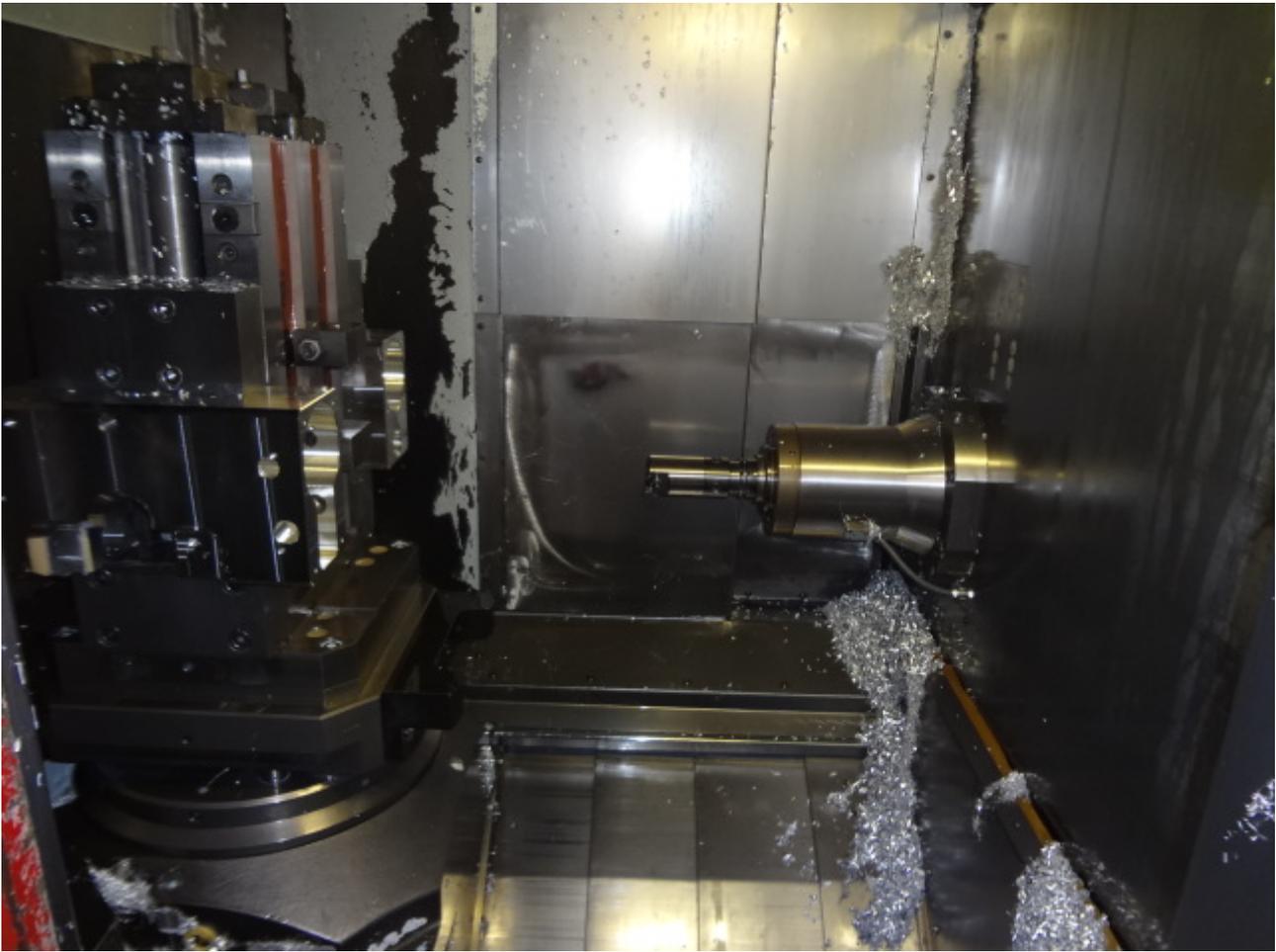
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8







11



12



13





15



16





**heckert**

*starrag-heckert group*

Heckert Werkzeugmaschinen GmbH  
D-09117 Chemnitz Otto-Schmerbach-Str. 15-17

Typ	CWK 400 D
Maschinen - Nr.	18272
Baujahr	1999
Temperaturbereich	+5...35 °C
Gesamtmasse	12,5 t



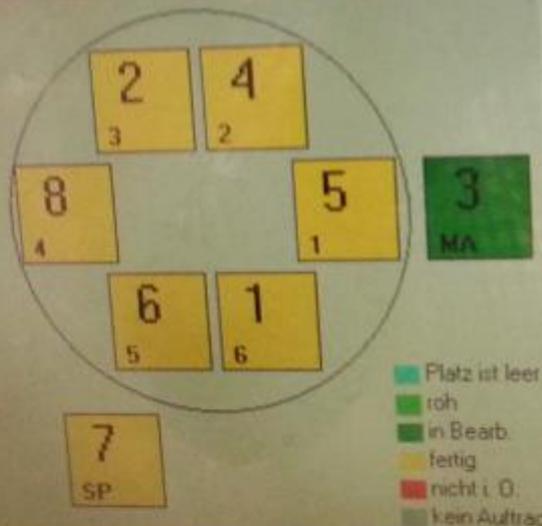
Made in Germany



SIEMENS

Platten  
speichert  
Kanal aktiv  
Programm läuft  
510220  
Einlesesperre bei Werkzeugwechsel  
AUTO  
WKS DIR 182/5 WPD  
6279 MFT  
RDV

### Speicherabbild



### AUTOMAT

Palettenfolge

Aktiv: Palette 3  
Folgebearbeitung = 0

Meldungen

Aufträge Palettenverwaltung Einstellung





Benennung	Einheit	Wert		Option	
		CWK 400D	CWK500D		
<b>Positionsgenauigkeiten in den Achsen X, Y, Z nach VDI / DGQ 3441</b>					
Normalausführung	Positionierunsicherheit	$P(T_p)$	$\mu\text{m}$	9	
	Positionsabweichung	$P_s$	$\mu\text{m}$	8	
	Positionsstreubreite	$P_{stmax}$	$\mu\text{m}$	7	
	max. Umkehrspanne	$U_{max}$	$\mu\text{m}$	6	
Hochgenauigkeitsausführung	Positionierunsicherheit	$P(T_p)$	$\mu\text{m}$	6	•
	Positionsabweichung	$P_s$	$\mu\text{m}$	5	•
	Positionsstreubreite	$P_{stmax}$	$\mu\text{m}$	4	•
	max. Umkehrspanne	$U_{max}$	$\mu\text{m}$	3	•

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Betrieberbedingungen</b>				
<b>Elektrotechnische Anschlußwerte</b>				
Werte sind ausrichtungsabhängig / detaillierte, maschinengebundene Angaben: Installationsplan (Teil Transport/Aufstellung/Inbetriebnahme)				
TN-C; 3 /PEN AC 400				
Netz	V	400 <sup>+1%</sup>		
Betriebsspannung	Hz	50 <sup>+1%</sup>		
Frequenz	kVA	75		
Anschlußwert	bei Normalausführung (Haupttriebs-Leistung 24 kW)	kVA	100	•
	bei Ausführung mit erhöhter Beschleunigung	kVA	100	
Dauerleistungsbedarf	bei Normalausführung (Haupttriebs-Leistung 24 kW)	kW	65	
	bei Ausführung mit erhöhter Beschleunigung	kW	87	•
Steuerspannung	DC/Gleichstrom	V	24	
<b>Umgebungsbedingungen</b>				
Temperaturbereiche	für Funktionsfähigkeit	° C	+10 bis +35	
	für Nenngenaugkeit (Normalausführung)	° C	+20 <sup>+2</sup>	
	für Nenngenaugkeit (HochgenauigkeitAusführung)	° C	+20 <sup>+1</sup>	
zulässige Temperaturänderung	bei Nenngenaugkeit	° C / Stunde	0,5	
zulässige relative Luftfeuchte	bei 20 ° C	%	max. 80	
zulässige Luftverunreinigung	es gelten die Werte der elektrotechnischen Ausrüstung			
	Niederschlag (30d)	g/m <sup>2</sup>	1	
	wasserlöslicher Staub	mg/m <sup>3</sup>	0,2	
<b>Druckluftanschluß / Pneumatik</b>				
Anschlußdruck	bar	6,1 bis 10		
Luftverbrauch	kurzzeitiger Spitzenverbrauch	m <sup>3</sup> / min	3,5	
	Mittelwert bei Normaldruck	m <sup>3</sup> / Stunde	9	
Restölgehalt		mg / m <sup>3</sup>	≤0,1	
Restfeuchte		g / m <sup>3</sup>	≤2,75	
Verunreinigung	Teilchengröße	µm	≤1	
	Massenkonzentration	mg / m <sup>3</sup>	≤5	

Benennung	Einheit	Wert		Option
		CWK400D	CWK500D	
Sinumerk 840 D				
<b>Steuerung</b>				
<b>Masse / Raumbedarf</b>				
Anhängemasse	Maschine	kg	ca. 12.800	ca. 15.000
Länge	Normalausführung ca.	mm	4.600	4.850
Breite	Normalausführung ca.	mm	3.920	4.000
Maschinenhöhe (bei Kettenmagazin)	über Unterkante Bett	mm	2.900	2.950
Maschinenhöhe (bei Turmmagazin)	über Unterkante Bett	mm	2.700	2.950
Montagehöhe	über Unterkante Bett	mm	3.150	3.300
Höhe Unterkante Bett über Fußboden	Normalausführung ca.	mm	125	
<b>Lärmemission</b>				
Lärmpegel		dBA	< 76	
			Prüfbedingungen: 1,6 m; Hauptgetriebe $n_{max}$ links und rechts; mittlerer Vorschub in allen Achsen nacheinander; Arbeitsschutz geschlossen, Messung vor dem Spannplatz und am Einlegeplatz; Meßgerät: Schallpegelmesser	

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Hydraulik</b>				
Pumpe	Druck	bar	85 bis 90	
	Förderstrom	l/min	22,5	
Ölbehälter	Ölmenge	l	40	
Antriebsmotor	Leistung	kW	4	
	Anzahl der Kreisläufe	-	1	
<b>Späneförderer</b>				
Nutzbreite		mm	450	
Abwurfhöhe	Standardausführung	mm	1050	
<b>Kühlaggregat</b>				
Kältemittel		-	R 134 A	
Wasserbehälter	Inhalt	l	ca. 30	
Zusatz gegen Korrosion		-	10% Anticorit	

Benennung	Einheit	Wert		Option
		CWK 400D	CWK500D	
<b>Prozessschmierung</b>				
Anzahl der Kreisläufe	-	2		
<b>durch Spindelmitte</b>				
manuell schaltbar	Fördermenge der Pumpe	l/min	30/27/24	•
	Druck am Begrenzungsventil	bar	30/40/50	•
schaltbar mit M-Befehl	Fördermenge der Pumpe	l/min	30/27/24	•
	Druck am Begrenzungsventil	bar	30/40/50	•
<b>über Düsen</b>				
	Fördermenge der Pumpe	l/min	50	
	Pumpendruck	bar	2	
<b>Schwalldusche</b>	Fördermenge der Pumpe	l/min	ca. 70	•
	Anzahl der Düsen am Dach	-	4	•
<b>Spülpistole</b>	am Spannplatz			•
<b>Filterart</b>	Rückspülfiter	l	900	
<b>mit</b>	Vliesfilter	l	1350	•
<b>Behälterinhalt</b>	Vakuumrotationsfilter	l	1250	•

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Werkzeug-Kettenmagazin</b>				
Span-zu-Span-Zeit <small>(gemessen nach VDI 2952)</small>	bei Elgang 40 m/min bei Elgang 82 m/min bei Elgang 100 m/min	s s s	5 ** 4 ** 3,5 **	6 ** 5 ** —
Anzahl der Werkzeugplätze		-	60	
max. Werkzeugdurchmesser	bei freien Nachbarplätzen	mm	∅ 160 *	
	bei belegten Nachbarplätzen	mm	∅ 85	
	bei freien Nachbarplätzen und Arbeitsspindel-Drehzahlerhöhung 24000 Upm	mm	∅ 125	
max. Werkzeugausraglänge		mm	350 *	400 *
max. Werkzeugmasse	bei Arbeitsspindel-Drehzahlerhöhung 24000 Upm	kg	10	
		kg	5	
max. Kippmoment	(an Griffstelle des Basisalters)	Nm	10	
Gesamtmasse	aller Werkzeuge im Speicher	kg	200	
max Unwucht	der Werkzeuge bei unsymmetrischer Bestückung	kg	80	
<b>Werkzeug-Turmmagazin</b>				
Span-zu-Span-Zeit	bei Elgang 40 m/min bei Elgang 82 m/min	s s	5 ** 4 **	6 ** 5 *
Anzahl der Werkzeugplätze		-	120/240	
max. Werkzeugdurchmesser	bei freien Nachbarplätzen	mm	∅ 160	
	bei belegten Nachbarplätzen	mm	∅ 80	
	bei freien Nachbarplätzen und Arbeitsspindel-Drehzahlerhöhung 24000 Upm	mm	∅ 125	
max. Werkzeugausraglänge		mm	350	
max. Werkzeugmasse	bei Arbeitsspindel-Drehzahlerhöhung 24000 Upm	kg	10	
		kg	5	
max. Kippmoment	(an Griffstelle des Basisalters)	Nm	10	
max. Geschwindigkeit Q-Achse	(Quen-/Horizontalbewegung)	m/min	100	
max. Geschwindigkeit V-Achse	(Vertikalbewegung)	m/min	70	

\* Einschränkungen bei max. Werkzeuglänge in Verbindung mit max. Werkzeugdurchmesser  
laut Skizze Pkt 11.2.9.1 beachten!

\*\* Bei Einsatz eines Winkelbohrkopfes und / oder Werkzeugaufnahme SK 40 erhöht sich die  
Span-zu-Span-Zeit um ca. 0,5 sec.

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Arbeitsspindel / Hauptmotor</b>				
Durchmesser im vorderen Lager	mm	∅75		
Werkzeugaufnahme		HSK-A63 DIN 69893		•
		SK 40-AD DIN 69871 Anzugsbolzen DIN 69872-19		
<b>Variante Motorspindel Starrag und HSK - A63</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 15 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Motorspindel Starrag und SK 40</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Motorspindel Starrag und HSK - A63</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	31	19	
Drehmoment	Nm	200	165	
<b>Variante Hohlwellenmotor und SK 40</b>				
Drehzahlbereich	min <sup>-1</sup>	50 ... 10 000		
		40% ED	100% ED	
Motorleistung	kW	37	24	
Drehmoment	Nm	350	230	

Benennung	Einheit	Wert		Option
		400D	500D	
<b>Verstellwege</b>				
X - Achse (Ständerverstellung)	mm	650	750	
Y - Achse (Support-Senkrechtverstellung)	mm	650	750	
Z - Achse (Tisch-Querverstellung)	mm	650	700	
<b>Verfahrbereich</b>				
min. Abstand Spindelvorderkante - Mitte Werkstückträger	mm	50	100	
min. Abstand Spindelmitte - Oberkante Werkstückträger	mm	30	80	
<b>lineare Vorschubachsen X / Y / Z</b>				
Vorschub	mm/min	0 ... 40 000 0 ... 82 000 0 ... 100 000		• •
Eilgang	m/min	40		•
	m/min	82		•
	m/min	100		•
technologisch verwertbare Vorschubkraft 60% ED	kN	12*		
100% ED	kN	10*		
Meßsysteme linear, optisch-inkremental, abstandscodiert				
Genauigkeitsklasse	µm	±5		
Teilungsperiode der Strichgitterteilung	µm	20		
Eingabe- und Anzeigefinheit	µm	1		
Beschleunigung X/Y/Z bei Eilgang 40m/min	m/s <sup>2</sup>	7		
Eilgang 82m/min bei Hohlwellenantrieb	m/s <sup>2</sup>	9,3 / 9,6 / 10		•
bei Motorspindel	m/s <sup>2</sup>	4 / 5,5 / 4,5		•
Eilgang 100m/min	m/s <sup>2</sup>	15/15/12		•

\* Beachten Sie die Einschränkung der Vorschubkraft  
(siehe Bild 1: Diagramm Zulässige Vorschubkraft im oberen Y-Bereich)

Benennung	Einheit	Wert		Option
		400D	500D	
<b>NC-Drehtisch / Drehachse B</b>				
max. Drehzahl	min <sup>-1</sup>		25	
Eingabe- und Anzeigeinheit	Grad		0,001	
zul. Tangentialmoment (Tisch geklemmt)	Nm		3000	
zul. Tangentialmoment bei Dreharbeiten	Nm		530 bei 100% ED 1000 bei 60% ED	
max. Kippmoment ab Oberkante Palette	Nm		5000	
Positionierzeiten	45°	s	0,8	
	90°	s	1,2	
	180°	s	2,0	
Normalausführung	Positionsunsicherheit P (T <sub>p</sub> )		12"	
	max. Positionsstreuung P <sub>stmax</sub>		10"	
	max. Umkehrspanne U <sub>max</sub>		6"	
Hochgenauigkeitsausführung	Positionsunsicherheit P (T <sub>p</sub> )		6"	•
	max. Positionsstreuung P <sub>stmax</sub>		5"	•
	max. Umkehrspanne U <sub>max</sub>		3"	•

11.5 Technische Daten

Benennung	Einheit	Wert		Option
		CWK 400D	500D	
<b>Palette</b> (am Spannplatz drehbar)				
Aufspannfläche	mm x mm	400 x 400	-	•
	mm x mm	400 x 500	-	
max. Belademasse pro Palette (mittig)	kg	400	500	•
	bei Eilgang 82 m/min	kg	300	
bei Eilgang 100 m/min	kg	200		•
zul. Moment bei außermittiger Last	Nm	200		
Höhe der Werkstück-Aufspannfläche über Unterkante Bett (Spannplatz)	mm	1000		
Richtbohrung - Durchmesser	mm	∅ 20 H 6		
Abstand zur Tischmitte	mm	150	200	
	mm	∅ 0,013	∅ 0,013	
Aufnahmebohrung ohne Spannhdraulik in Verbindung mit Spannhdraulik	mm	∅ 50 H 6		
	mm	∅ 20 H 6		
Befestigungsgewinde (Normalausführung)		43 x M12	23 x M12	
T-Nut (ähnlich DIN 650)	mm	14		•
Werkstück-Durchlaßhöhe	mm	750	900	
max. Störkreis	mm	∅ 700	∅ 800	
Spannhdraulik für Werkstückspannung		3 Anschlüsse		•
<b>Automatischer Palettenwechsel</b>				
Anzahl der wechselbaren Paletten	-	2		
max. Palettenwechselzeit bei Normalausführung	s	8	9	
bei Ausführung mit Spannhdraulik mindestens	s	10		

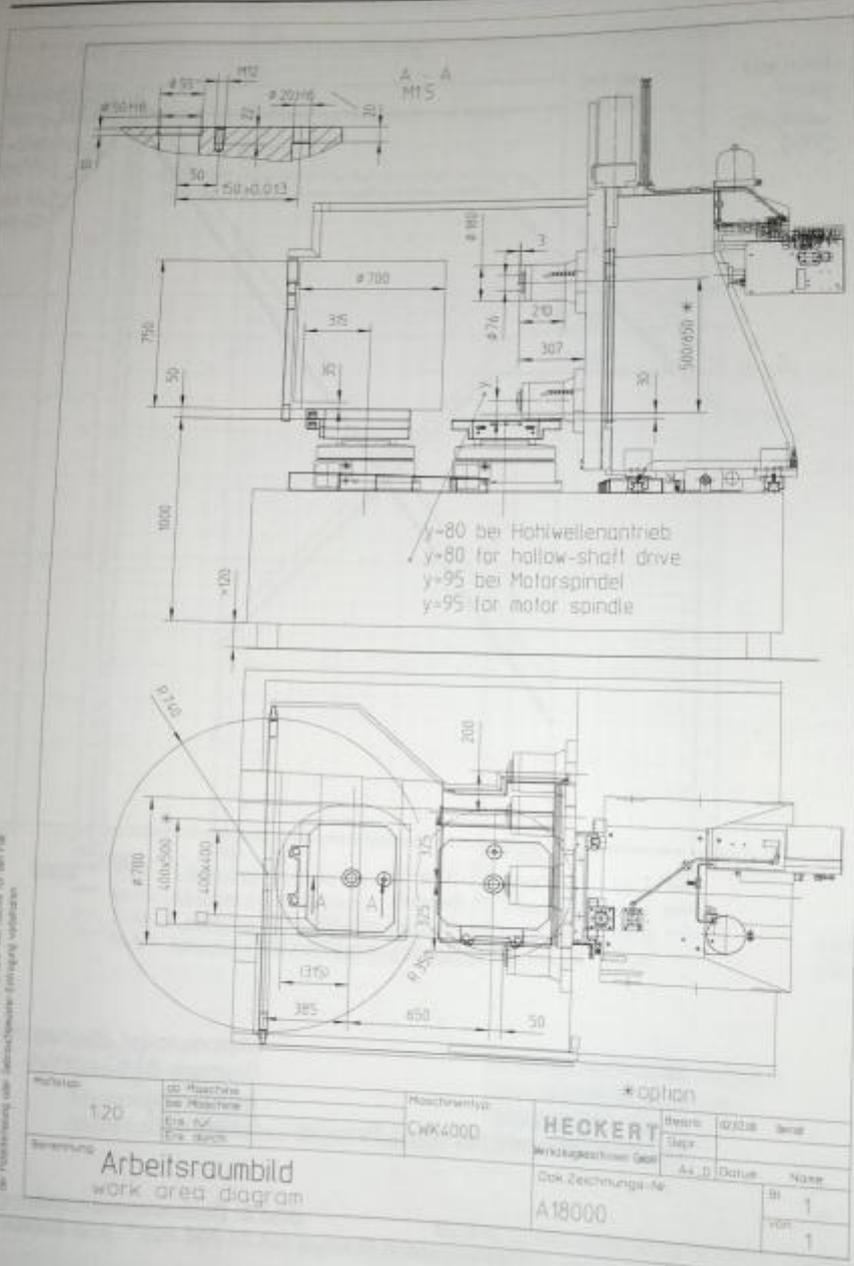
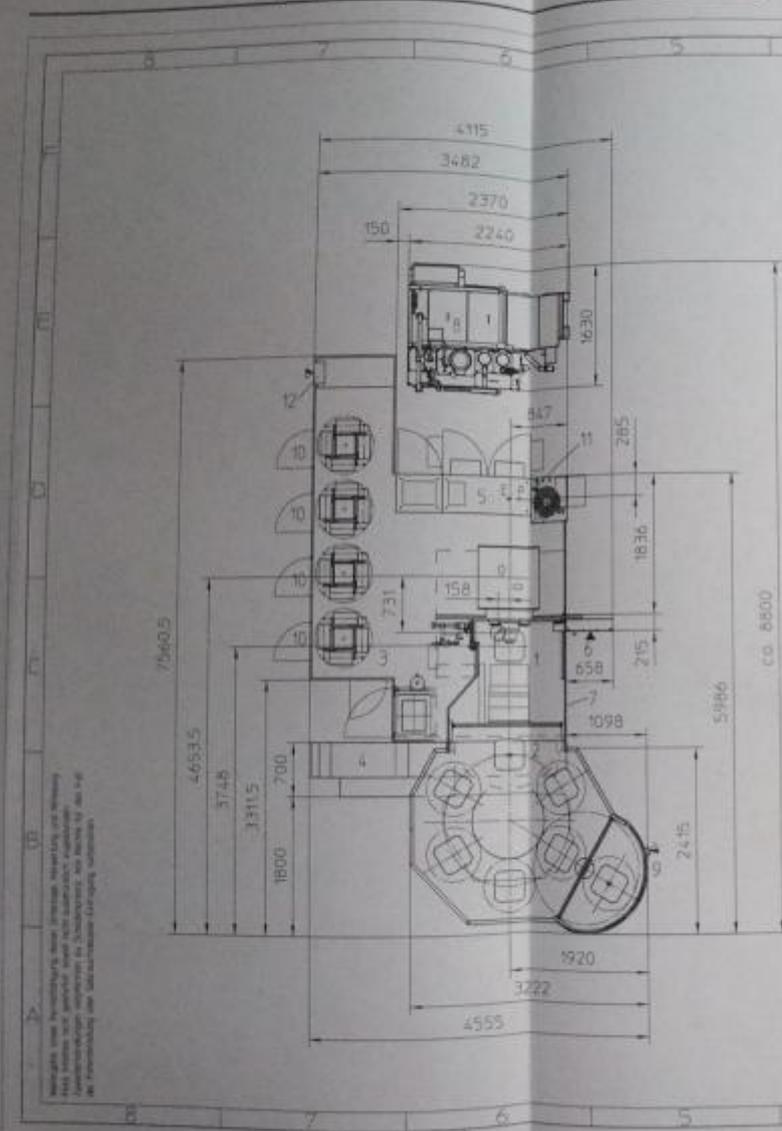


Bild 6: Arbeitsraumbild

Bedienung  
Abschnitt 2

HECKERT  
CWK400D /500D

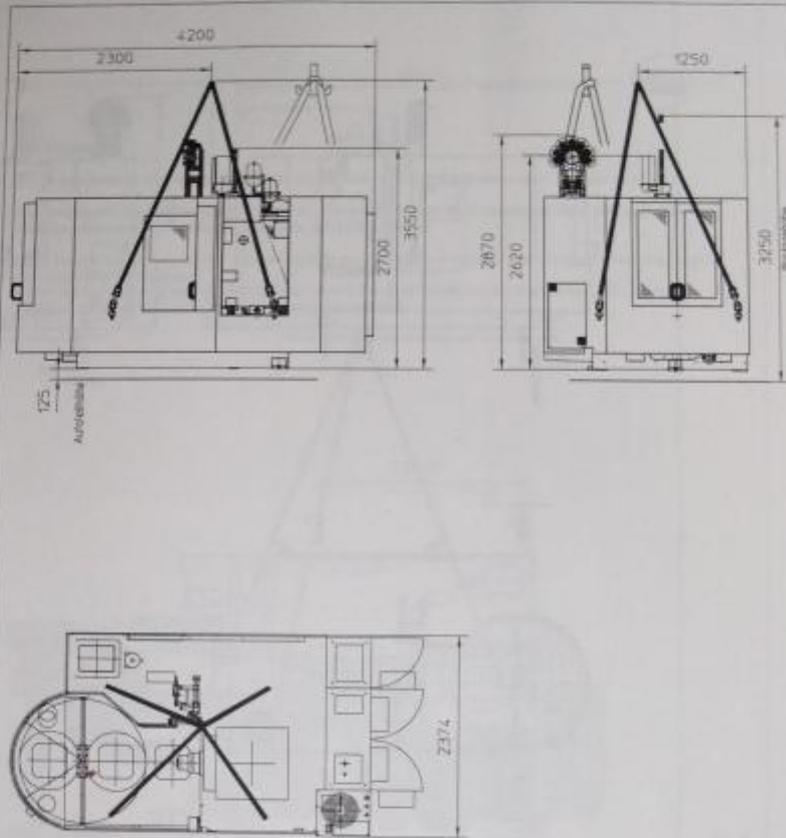


- 1 Arbeitsraum
  - 2 Werkstückwechsler
  - 3 Werkzeugspeicher/Werkzeugwechsler mit Verkleidung
  - 4 Späneförderer mit Schaufelbehälter
  - 5 Elektroschrank
  - 6 CNC-Steuerung mit Bedienfeld
  - 7 Arbeitsraumschutz
  - 8 Kühlmittelbehälter
  - 9 Sicherheitsrichtungssperre
  - 10 Handrührplatz für Werkzeuge
  - 11 Hauptschalter
  - 12 2 NK-Bedientafeln
- E Elektroanschluss (Netzanschluss)  
P Luftanschluss  
▶ Hauptbedienstelle  
▲ Bedienstelle

- 1 Work area
  - 2 Workpiece changer
  - 3 Tool Magazine/tool change with covering
  - 4 Chip conveyor with dry coolant tank
  - 5 Switch cabinets
  - 6 CNC-control with operator control
  - 7 Work area enclosure
  - 8 Coolant tank
  - 9 Safety device for clamping station
  - 10 Manual loading station for tools
  - 11 Main switch
  - 12 2 NK-operator panel
- E Power supply (mains connection)  
P Compressed-air supply  
▶ Main operator control  
▲ Secondary operator's stand

Alle Angaben sind unverbindlich. Diese Zeichnung ist eine Kopie der Originalzeichnung. Die Originalzeichnung ist Eigentum der Heckert Maschinenbau GmbH. Die Weitergabe oder Vervielfältigung dieser Zeichnung ist ohne schriftliche Genehmigung der Heckert Maschinenbau GmbH untersagt.

Auftrags-Nr.	150	Maßstab	1:1	Rechenwert	
		Maßstab	1:1	Rechenwert	
		Maßstab	1:1	Rechenwert	
Bezeichnung		RAUMBEDARFSPLAN			



Wichtiges zum Vorwärtigen lesen: Unterwegs, Anhebung und Halten der Maschine nicht gestört, sowie nicht ausströmen lassen. Zusammenklappen verhindern zu Schäden. Alle Räder für den Fall der Notwendigkeit oder Gebrauchswartung vorbereiten.

- Anhängerlast = 11000kg  
Anhängemittel:  
- 2 Rundschlingen WLL6000mm 6m lang  
- 6 Schakel A6 (links je 1x, rechts je 2x)  
  DN 8201 (mit 5t Tragfähigkeit)  
- 4 Anschlagwirbel M30 (mit 5t Tragfähigkeit)

Müllst. 150	ab. Maschine	322	Maschinentyp	HECKERT	Bestr.	14700	Wert
	bei Maschine				CWK400D	Geor.	
Benennung	Dr. Nr.		Werkzeugschlüssel	Datei	AL-D	Datum	Namen
	Dr. Buch				Doc. Zeichnungs-Nr.	Bl.	1
							von
							2

Bild 6: Transport Maschine Bl. 1

Transport/Aufstellung/Inbetriebnahme  
Abschnitt 5

HECKERT  
CWK400D /500D

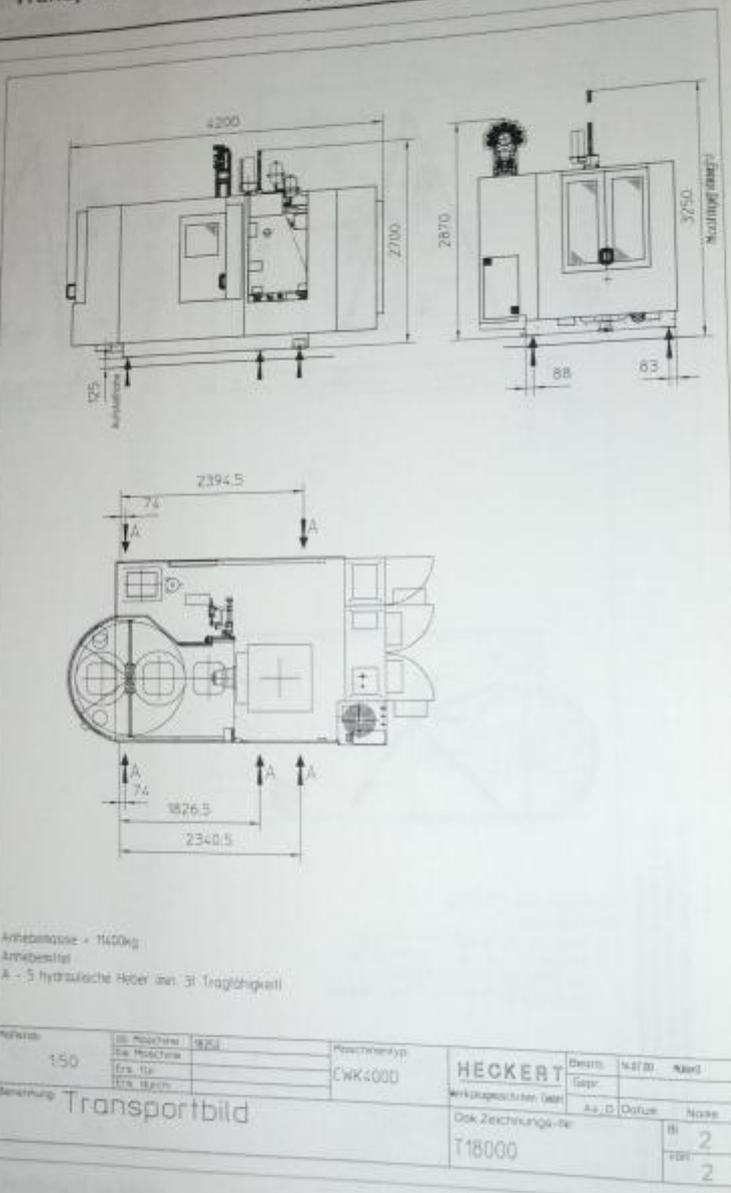


Bild 7: Transport Maschine Bl. 2

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Betriebsanleitung

D 28 von 30

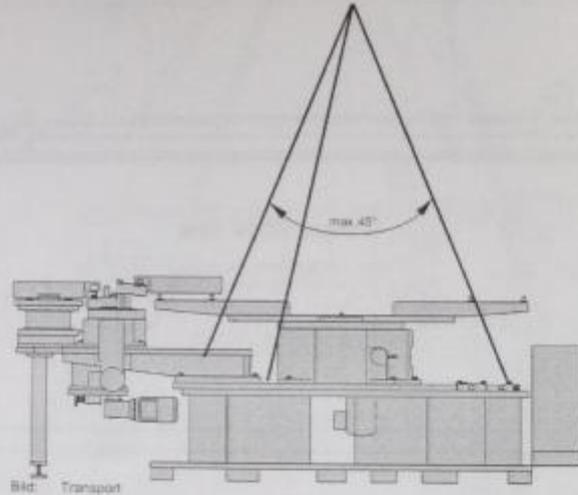


## 2 Transport

Der Palettenpool ist eine kompakte Baugruppe die nach der Inbetriebnahme in dem Zustand verbleibt.

Das Anhängen des Palettenpool darf nur an den mitgelieferten M20 Anschlagwirbel erfolgen. Das Einschrauben anderer Anhängeschrauben ist nicht zulässig!

Die 6 Spärrschrauben zwischen Verschiebeplatte und Grundkörper müssen beim Transport fest angezogen sein (siehe 8.90 Grundgestell).  
Halten Sie die einschlägigen Unfallverhütungsvorschriften beim Transport des Palettenpool ein, die unter anderem den Aufenthalt unter schwebenden Lasten verbietet.

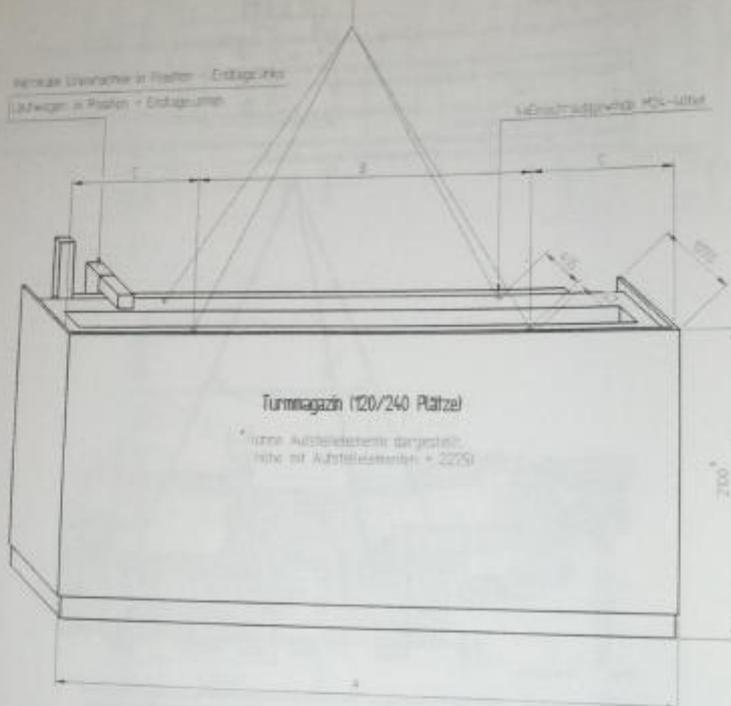


Anhängemasse: 3800 kg (Palettenpool komplett mit elektromechanischem Wurfwerk)  
Anhängemittel: 3 Anschlagwirbel M 20 (pro Anschlagwirbel sind 2 Tonnen zulässig)

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Bild 8: Transport Palettenpool

Anhängebild-Krantransport



Turmmag. - Typ	A (mm)	B (mm)	C (mm)	Masse (kg)
240 Plätze	4250	2905	570	3260
120 Plätze	2570	1665	300	2110

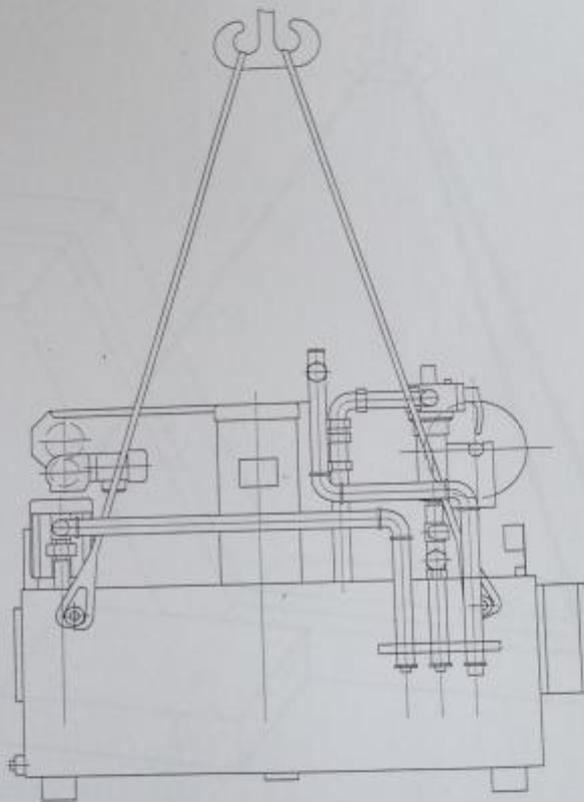
Bild 9: Transport Turmmagazin

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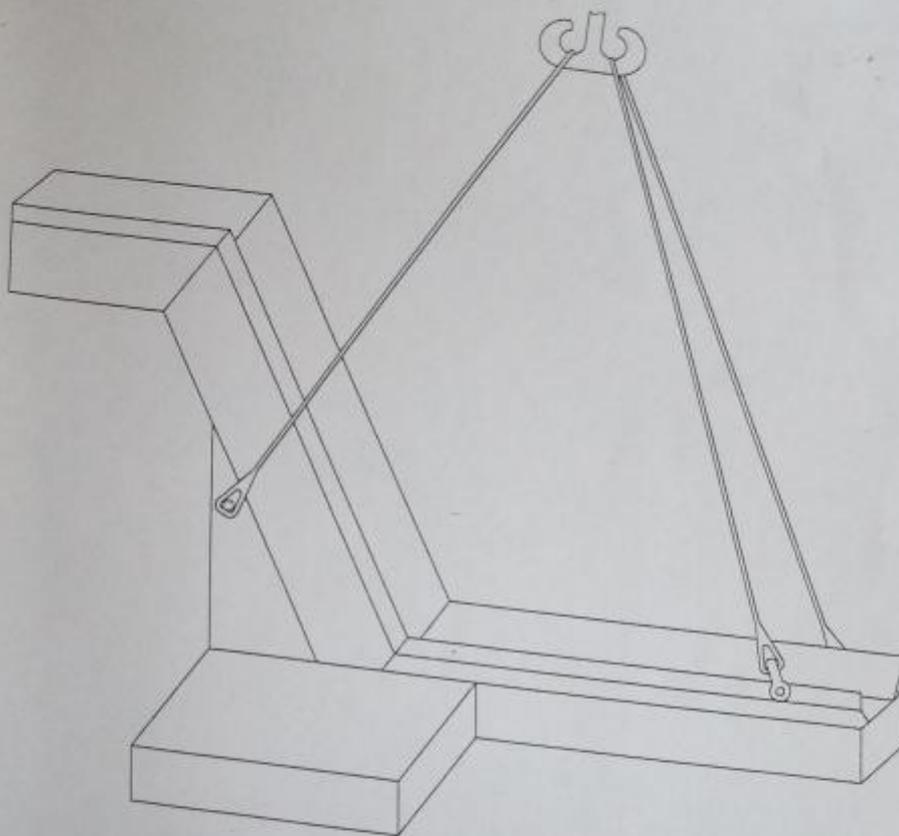
Betriebsanleitung

D

30 von 30



Масштаб 1:20	по чертежу	2007	Масштаб CWK 1000	<b>HECKERT</b> ОДЕЛЪТЪ ЗА ПРОЕКТИРАНЕ И ИК	Вариант	20/07/2007
	по спецификации				Год	11
	изготвено				Дата	11
	изготвено				Състав	7
Спецификация TRANSPORTBILD, KÜHLMITTELBEHÄLTER				Сериенummer	T20000	
					Състав	9



Maßstab 1:20	40 Maschine	2001	Maschinenart EWK 1000	<b>HECKERT</b> (damals Werkzeugmaschinen GmbH)	Rechts	20/10/1000
	60 Maschine				Links	1/1
Benennung TRANSPORTBILD, SPÄNEFÖRDERER	Ent. für		Sachnummer T20000		Gesam	Neu
	Ent. durch				Stk	8
						9



**With Ever More  
To The New Mill**

The new HECKERT  
CWK 500 D  
Centres have 5  
the demands of  
more reliable,  
effective.  
Using motor  
speed ranges of  
15,000 rpm, o  
conditions have  
metal machin  
high static an  
machining cap  
the customers  
could be reduc  
extent. The CW  
highest dynam  
achieving top  
rates of up to  
rates of up to  
centres are n  
values with 82  
innovative ide  
mented in too  
the well-prove  
with max. 240  
developed a n  
with 60 pocket  
between mag  
This also sub  
sequential too  
1.5 sec. and  
reduced to 3.5

## All Around A Direct Hit

### 1 Installation without any need for foundation

Thanks to compact design with 7 type bed and columns with reduced mass

### 2 Safe and extremely fast swarf removal

from the working zone thanks to chain bed design, swarf conveyor work and swarf conveyor as precondition for dry machining

### 3 Highest positioning accuracies

$P \pm 0.006$  mm and  $P_{max} \pm 0.004$  mm in all linear axes by means of linear motion guideways

### 4 Highest rapid traverse rates and short controller acting times

thanks to digital AC servo drives with pre-loaded ball lead screws

### 5 Dynamic package 1 g (optional) with rapid traverse rate of 32 m/min, acceleration rate of 10 m/s<sup>2</sup> and motor-driven spindle of 15,000 rpm

### 6 Dynamic package 1.5 g (optional for CWK 400 D)

with rapid traverse rate of 100 m/min, acceleration rate of 15 m/s<sup>2</sup> and motor-driven spindle of 15,000 rpm

### 7 Main drive

in variants with motor-driven spindle  
- driving power ratings of up to 21 kW, speed range of up to 10,000 rpm, steep-taper tool receptor AD 40 or hollow-shank taper HSK 63  
- driving power ratings of up to 21 kW, speed range of up to 15,000 rpm, HSK 63 tool receptor  
- driving power ratings of up to 60 kW, speed range of up to 24,000 rpm, HSK 63 tool receptor or with hollow shaft-type motor  
- driving power ratings of up to 25 kW, torque up to 335 Nm, speed range of up to 10,000 rpm, steep-taper tool receptor AD 40

### 8 Pallet changeover time 8 to 9 sec. thanks to hydraulic rotary changer

### 9 Rotatable clamping station with 4 - 80° indexing facility for operator-friendly workpiece setting whilst the machining cycle is running

### 10 NC rotary table for multiaxial and complete machining to satisfy highest accuracy demands ( $P \pm 0''$ , $P_{max} \pm 0''$ ) with coupling and for hydraulic workholding fixtures

### 11 High-performance in-process control and monitoring facilities use of Sinumerik 840 D CNC continuous-path controller in 32-bit technology or, as an option, Fanuc 16i including comprehensive control and monitoring facilities

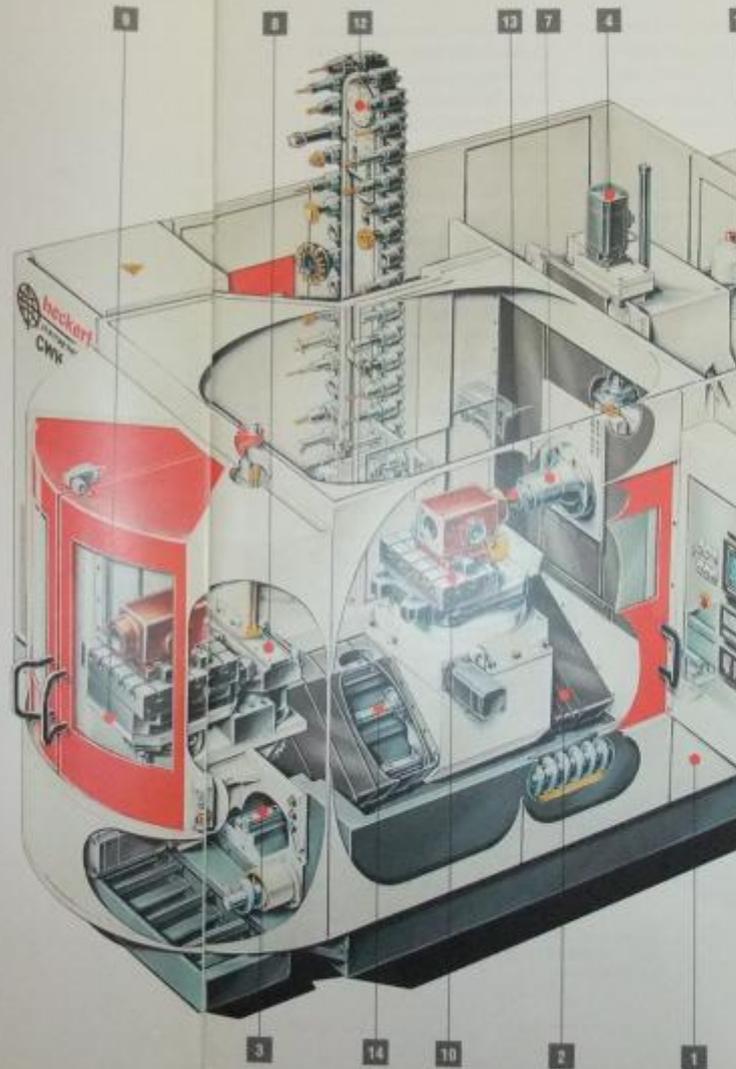
### 12 Tool handling with chain-type magazine, chip-to-chip times 3.5 to 4 sec., parallel tool location between magazine and main spindle, drive by means of AC servo motor to reduce the availability times for sequential tool and the chip-to-chip times

### 13 Tool handling with tool tower magazine space-saving option with regard to chain-type magazine for increased tool demands of up to 240 pockets with smallest installation area and tool changeover in parallel to production time

### 14 Coolant system wet machining with coolant supply through nozzles or through spindle centre with a delivery pressure rating of up to 50 bar or dry machining with minimum-quantity lubrication

### 15 Low-maintenance grease lubrication for motor-driven spindles, ball lead screws and linear motion guideways

### Conversion into manufacturing cells and flexible manufacturing systems with circular and linear magazines for workpiece pallets



## Economy And Ecology Form An Optimal Entity

- The compact design of HECKERT CWK 400 D and CWK 500 D centres with a T-type bed, carrying all major machine elements is the condition for transporting the machine as a single complete entity for installation without any need for foundations and instant readiness for use. This saves foundation, transportation, and assembly costs and makes sure that full production can be started even earlier.

- All major machine elements feature excellent shock absorbing qualities and a very limited heat expansion to ensure vibration-free machining with high performance.

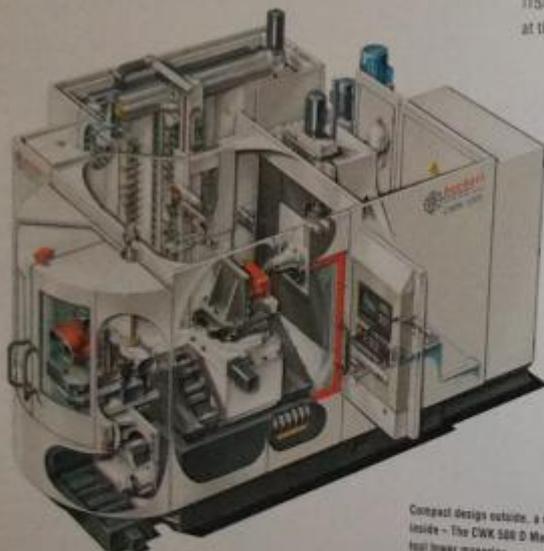
- To ensure fast and safe swarf removal from the working zone, the machine bed has been configured in slant-bed design. The consequential prevention of heat accumulation will create ideal conditions for dry machining.

- Extremely high running, positioning and permanent accuracies are ensured by optimally dimensioned linear motion guideways in all linear axes.

- Incremental, direct linear encoder systems with distance coding have been encapsulated in aluminium casings and

are pressurized with compressed air. So, the encoder systems are protected from swarf, coolant and contaminations. An incremental encapsulated angular position encoder system is used for the NC rotary axis.

- Manufacturing tolerance deviations and temperature fluctuations can be compensated for in conjunction with the CNC controller. In the stage of extension featuring enhanced machining accuracy, a positioning deviation of  $P \leq 0.006$  mm and a positioning variation of  $P_{smax} \leq 0.004$  mm in all linear axes and  $P_{smax} \leq 5''$  in the rotary axis can be achieved. So, accuracies in the IT5/IT6 tolerance class can be obtained at the workpiece.



Compact design outside, a variety of innovations inside – The CWK 500 D Machining Centre with tool lower magazine

- The technical concept of the HECKERT CWK 400 D and CWK 500 D consistently applies all necessary considerations for strict adherence to ecological requirements. Total-loss oil lubrication has become a thing of the past. Thanks to grease lubrication for main spindle, ball lead screws and linear motion guideways, maintenance requirements have been reduced quite considerably.

- With the machine being sealed off the shop floor, any ingress of coolant and hydraulic oil is avoided. This has been achieved by a machine bed which carries all functional machine elements and is hermetically sealed.

- Pieceless coolant purification with vacuum edge strainer and return flow filter for the high-pressure circuit does away with cost-intensive special refuse disposal requirements.

- In accordance with environment and operator-friendliness, a splash shower in the working zone with a coolant volume rate of 70 l/min, an air-blast gun at the clamping station for cleaning of workpiece and fixture and an emission extraction can be incorporated in the machining centres.

- A clear view of the working zone is always assured by a pneumatically operated, rotating inspection window in the working-zone safety door.

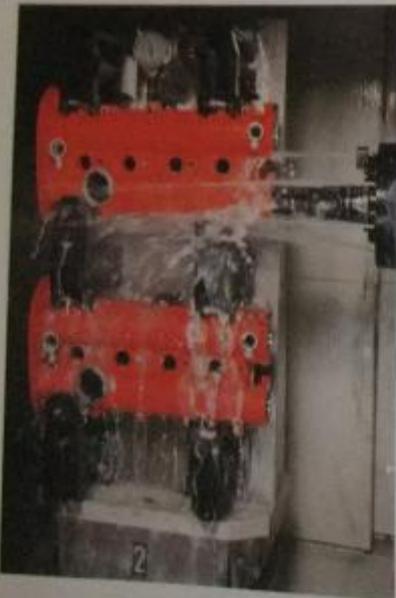
Construction principle with slant bed

## How A Reduction In Idle Times Can Be All Important



HECKERT CWK 400 D and CWK 500 D Machining Centres offer best conditions for high-speed machining of engine components

Optimal cutting conditions with coolant supply through spindle nozzle and through external nozzle



### ■ Main drive

A characteristic of the new HECKERT CWK 400 D and CWK 500 D Machining Centres is the highly dynamic behaviour of the main drive. With a mass-reduced and grease-lubricated motor-driven spindle, speeds of up to 10,000 rpm, 15,000 rpm and 24,000 rpm at power ratings of 31 kW can be reached optionally.

Even for heavy-duty cutting work, HECKERT offers another solution. A hollow shaft-type motor ensures power ratings of 35 kW at torques of 335 Nm.

Optimal conditions are obtained for wet machining. Coolant supply is optionally possible through external, adjustable ball nozzles or through spindle and tool centre. Absolute swarf removal is guaranteed during core drilling with a delivery pressure rate of up to 50 bar.

Ideal machining results are achieved in dry machining thanks to the minimum-quantity lubrication. Clamping and unclamping of tools with steep-taper receptor 40 or hollow-shaft taper HSK 63 function quickly and safely by means of Belleville spring pack and hydraulic cylinder. Blasting of spindle taper and internal coolant supply of tools with compressed air during the automatic tool changeover cycle avoids contaminations and prevents negative influences on the machining quality.

### ■ Feed drive

Digital AC servo motors in combination with preloaded ball lead screws ensure short positioning times, minimized controller acting times, maximum rapid traverse rates, and a high stability over the whole range of feed rates. They feature the cost-saving option to the linear drives and reduce idle times above average with rapid traverse rates optionally from 40 m/min up to 100 m/min and acceleration rates of up to 15 m/s<sup>2</sup>. Such problems of linear drives as mastering of magnetic forces, expensive cooling and mass-dependent power capacity are excluded when using the rotary HECKERT drives.

Ever more dynamics can be achieved by the optional:

#### Dynamic package 1 g

(CWK 400 D and CWK 500 D)

- rapid traverse rate 82 m/min
- acceleration rate 10 m/s<sup>2</sup> in all linear axes
- motor-driven spindle with max. 15,000 rpm
- hollow-shank taper HSK-A63
- chip-to-chip time 4 sec.

#### Dynamic package 1.5 g (CWK 400 D)

- rapid traverse rate 100 m/min
- acceleration rate of up to 15 m/s<sup>2</sup>
- motor-driven spindle with max. 15,000 rpm
- hollow-shank taper HSK-A63
- chip-to-chip time 3.5 sec.

### ■ Pallet changeover

Pallet changeover too is safe, comfortable and ultra-fast. A hydraulically operated rotary pallet changer ensures exchange

of pallets with a t...  
Workpieces are clamp...  
unclamped at the clamp...  
machining takes plac...  
standard design of...  
with its 4 × 90° index...  
operator comfort cons...  
An NC rotary table is of...  
machining operations...  
fitted with a high-prec...  
ensure a positioning d...  
and a position variatio...  
satisfy highest quality...  
The NC rotary table in...  
table with a coupling...  
pressure stages to su...  
holding fixtures.



## Highest Innovation During Tool Changeover

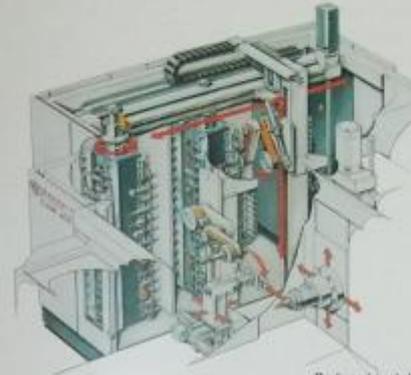
The tool handling is optimally matched with the machining job. Whether equipped with chain-type magazine for 80 tools or with tool tower magazine for 120 or 240 tools, the chip-to-chip time with dynamic package is only 3.5 to 4 sec. for tools of 10 kg in weight, 160 mm in diameter and up to 400 mm in length. The tool gripper is located outside the machining area and therefore not subject to coolant and swarf ingress. The enhanced peripheral speed of chain-type magazine will reduce the availability time of sequential tool to 1.5 sec. This is of particular importance for light-metal machining.

The tool tower magazine featuring highest tool density at minimum space requirements reduces setup times, optimizes sequences of operation and enhances operator comfort.



Arrangement of tools in chain-type magazine is optimal to the main spindle, ensures a chip-to-chip time of 3.5 sec.

## Advantages of tool tower magazine as against chain-type



Dynamic tool changeover between main spindle and tool tower magazine

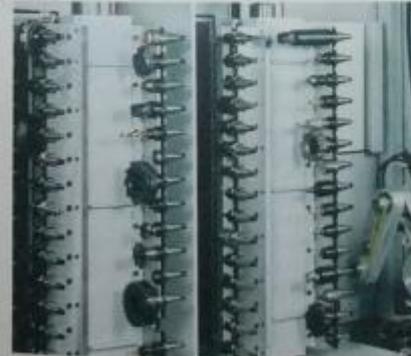
### Reduced installation

- Highest tool density
- 0.25 m<sup>3</sup> installation
- Full occupancy without vacant space

### Reduced setup

- Manual tool changeover during magazine during within the automatic cycle
- Each tool can be located
- Full occupancy without adjacent

Tool tower magazine for max. 120 or 240 tools with highest tool density at minimum space requirements



## Flexible Manufacture Can Be Extended

### ■ Linear magazine

A track-bound workpiece pallet transporter, clamping station for setup work, storage locations in linear arrangement for intermediate storage of workpiece pallets and a cell controller are included in the linear magazine.

The transporter featuring a traverse speed of 60 m/min as well as short acceleration and deceleration times guarantees short setup times.

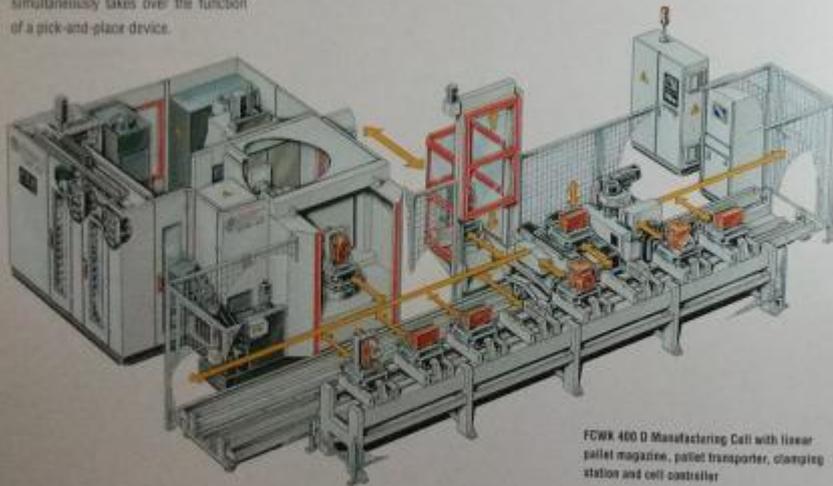
The independent NC controller of transporter increases operator comfort and reduces setup expenditure. The transverse conveyor at the transporter ensures double-sided loading and unloading of workpiece pallets and thus a high flexibility in cell structure.

When the storage locations are arranged in 2 or 3 tiers, the transporter simultaneously takes over the function of a pick-and-place device.

Setup work at the clamping station is carried out quickly, safely and under good ergonomic conditions. For clamping, positioning and unclamping of workpieces, for resetting the fixtures and for simple measuring operations, the clamping station can be rotated and indexed  $4 \times 90^\circ$ .

A protection device designed as lifting cage with electric drive and locking functions will increase labour safety and ease of operation.

The storage locations guarantee limited operator attendance for intermediate and buffer storage and can be arranged in one tier or in 2 or 3 tiers to save space.



CWK 400 D Manufacturing Cell with linear pallet magazine, pallet transporter, clamping station and cell controller

### ■ Circular magazine

The circular magazine in compact and, thus, space-saving design has got 6 storage locations and 1 clamping location and is driven by means of an AC servo motor.

To ease operation, the incorporated clamping station can be rotated and indexed for workpiece setup work.

The workpiece pallets are quickly and safely transported from the clamping station to the circular magazine according to the rotary changer principle.

Following the same principle, the pallets

are introduced  
Zinc into the  
CWK 400 D  
Centres. The  
controls th  
takes over p







# Technical Data

		CWK 400 D	CWK 400 D with dynamic package 1g	CWK 400 D with dynamic package 1.5g	CWK 500 D	CWK 500 D with dynamic package 1g
<b>NC rotary table</b>						
Clamping surface/grip pattern (table DIN 55207)	mm	400 - 400 (300 - 400)	400 - 400 (300 - 400)	400 - 400 (500 - 400)	500 - 500 (430 - 500)	500 - 500 (500 - 500)
Input and display resolution	degrees	0.001	0.001	0.001	0.001	0.001
Max. load	kgf	400	300	200	500	300
Max. speed	rpm	25	25	25	35	25
Workpiece swing diameter	mm	700	700	700	800	800
<b>Automatic pallet changer</b>						
Number of changeable pallets		2	2	2	2	2
Max. pallet changeover time	sec.	8	8	8	8	8
<b>Traverse ranges</b>						
Column, X-axis	mm	650	650	650	750	750
Spindle head, vertical Z-axis	mm	500 (650)	600	600	850 (750)	600 (750)
Table, horizontal Y-axis	mm	650	650	650	700	700
<b>Main spindle Motor-driven spindle</b>						
Power rating at 100 % duty cycle	kW	19	19	19	19	18
Power rating at 40 % duty cycle	kW	31	31	31	31	31
Torque at 100 % duty cycle	Nm	165	165	155	165	165
Torque at 40 % duty cycle	Nm	200	200	180	200	200
Tool holder		SK 40 DIN 69871	HSK 63	HSK 63	SK 40 DIN 69871	HSK 63
Speed range	rpm	50...10000 (10000)	50...15000	50...15000	50...10000 (15000)	50...15000
Diameter of front bearing	mm	70	70	70	70	70
Increased power (600g ball-bearing motor (optional))						
Power rating at 100 % duty cycle	kW	24	24		24	24
Power rating at 40 % duty cycle	kW	35	35		35	35
Torque at 100 % duty cycle	Nm	230	230		230	230
Torque at 40 % duty cycle	Nm	335	335		335	335
High speed package (optional)						
Max. speed/motor-driven spindle	rpm		24000			24000
<b>Automatic tool changer</b>						
Cham-type magazine						
Magazine pockets		60	60	60	60	60
Max. tool diameter	mm	160	160	160	160	160
Max. tool length	mm	350	350	350	400	390
Max. tool weight	kg	10	10	10	10	10
Max. 50 torque	Nm	10	10	10	10	10
Max. chip-to-chip time	sec.	5	4	3.5	6	4
Tool tower magazine (optional)						
Magazine pockets		120/240	120/240		120/240	120/240
Other data same as cham-type magazine						
<b>Traverse rates</b>						
Feed rate range, infinitely variable	mm/min	0...40	0...82	0...100	0...40	0...82
Rapid traverse rate	mm/min	40	82	100	40	82
Acceleration rate	mm/s <sup>2</sup>	7	10	15-12 for Z axis	7	10
<b>Coolant system</b>						
Supply through spindle centre						
Volume	l/min	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)	24 (30/27/24)
Pressure	bar	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)	10 (30/40/50)
Supply via nozzle						
Volume	l/min	30	30	50	50	50
Pressure	bar	2	2	2	2	2
Container capacity	l	350 (900)	350 (900)	500 (900)	550 (900)	320 (900)
<b>Machine accuracy according to VDI/DGQ 3441</b>						
Linear axes X, Y and Z						
Positioning deviation P	mm	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)	± 0.01 (0.006)
Positioning variation Pmax	mm	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)	± 0.007 (0.004)
NC rotary table						
Positioning deviation P	sec.	± 12 (6)	± 12 (6)	± 12 (6)	± 12 (6)	± 12 (6)
Positioning variation Pmax	sec.	± 10 (5)	± 10 (5)	± 10 (5)	± 10 (5)	± 10 (5)
<b>Net weight</b>						
kg		12 800	12 800	12 800	15 000	15 000
<b>CNC controller type</b>						
		Sinumerik 840 D (Series 16.1)	Sinumerik 840 D	Sinumerik 840 D	Sinumerik 840 D (Series 16.1)	Sinumerik 840 D
<b>Tooling magazine (optional)</b>						
Number of storage locations		8	6	6	8	8
Design of clamping station				rotatable and indexable 4 x 90°		
Number of pallets in total system, max.		8	8	8	8	8
<b>Linear magazine (optional)</b>						
NC controller						
Traverse speed, approx.	m/min	60	60	60	60	60
Clamping station				rotatable and indexable 4 x 90°		
Storage locations, optional design		1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays	1, 2 or 3 bays
Number, optional		12/24/36	12/24/36	12/24/36	12/24/36	12/24/36
Number of pallets in total system, max.		14/26/38	14/26/38	14/26/38	14/26/38	14/26/38

Values in brackets = optional equipment



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