# COCCO Ctandard Ctandard

**SWISS** 

MADE



Têtes angulaires Winkelköpfe Angular heads



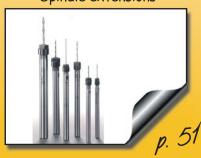
Têtes multibroches Mehrspindelköpfe Multispindle heads



Multiplicateurs de vitesse Schnellaufspindeln Spindle speeders



Rallonges de broches Spindelverlängerungen Spindle extensions



Têtes revolver Revolverköpfe Turret heads



Tête à broches alternées Köpfe mit abwechselnden Spindeln Multi heads with alternating spindles





#### LES AVANTAGES PIBOMULTI - DIE PIBOMULTI VORTEILE PIBOMULTI ADVANTAGES

internet : www.pibomulti.com mail : info@pibomulti.com (SA) internet : www.pibomulti-na.com mail : info@pibomulti-na.com

PIBOMULTI est reconnu pour vous offrir un choix incomparable de têtes angulaires adaptées à tout type de machines qui vous permettront de résoudre vos problèmes d'usinage et qui vous apporteront des solutions efficaces, afin de réduire vos temps de production.

En effet, les têtes angulaires PIBOMULTI vous offriront la possibilité de fraiser, percer ou tarauder dans tous les angles et dans toutes les grandeurs. Elles sont efficaces pour contrer les usinages difficiles jugés impossibles. Les têtes angulaires PIBOMULTI sont adaptées à toutes les opérations d'usinage requises à la configuration de la pièce.

- à l'intérieur d'alésages ou de poches
- lors d'encombrements réduits
- accès difficilement atteignables
- éviter les serrages multiples

Les têtes angulaires standard ou spéciales PIBOMULTI sont des produits haut de gamme, livrables en tout type de cône ISO, HSK ou flasquées, avec une ou plusieurs sorties de broches adaptées aux outils et à la configuration de la pièce.

Elles sont rigides, compactes, légères, fiables et de grande longévité. Les têtes angulaires PIBOMULTI sont construites avec soins et usinées avec une grande précision, parfois conçues aux limites de la faisabilité, montées avec :

- des roulements de broche à contact oblique ou à rouleaux côniques de précision, selon cas et utilisation
- des engrenages hélicoïdaux de précision en acier de haute résistance, cémentés, trempés et rectifiés ou rodés
- elles peuvent vous offrir un arrosage central à 50 bars --
- elles sont graissées à vie ou en option lubrifiées par air/huile vous permettant de plus grande vitesse de rotation ainsi qu'une grande longévité.

# De la conception à la réalisation! Vom Entwurf bis zur Verwirklichung! From design to realisation!

PIBOMULTI ist führend in der Produktion von Winkelköpfen und besonders bekannt durch seine grosse Produktpalette. Die PIBOMULTI-Winkelköpfe steigern erheblich den Automatisierungsgrad Produktionsmaschinen und reduzieren somit im gleichen Masse die Produktionszeiten. So z.B. wenn durch sie Mehrfachaufspannungen vermieden oder die Bearbeitungsprobleme erst lösbar werden.

Die Winkelköpfe sind universell einsetzbar. In unterschiedlichsten Grössen und in allen Winkellagen wird mit ihnen gebohrt, gefräst, ausgedreht, gewindegeschnitten usw. In Sonderausführungen können sie der Form des Werkstückes angepasst werden und können so Bearbeitungsoperationen erfüllen die zunächst als unmöglich erschienen. Solche Einsatzfälle sind :

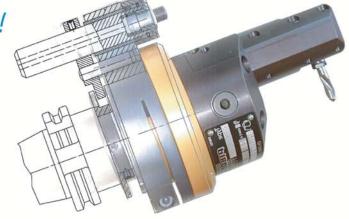
- in engen Bohrungen oder Taschen,
- schmalen Bearbeitungsfenstern
- kollisionsträchtigen Vorrichtungssituationen

Die PIBOMULTI - Winkelköpfe, in Standard- wie in Sonderausführung, sind Produkte höchster Qualität. Sie sind für alle Maschinenschnittstellen lieferbar : alle Steilkegelarten, Hohlschaftkegel oder Anflanschlösungen. Die Abtriebsspindeln können für alle gängigen Werkzeugaufnahmesysteme ausgelegt sein: Spannzangen, Weldon, Whistle Notch, HSK, ABS, Capto usw. bis hin zu Sonderaufnahmen nach Kundenzeichnung. Grundsätzlich können die Winkelköpfe mit einer oder mehreren Abtriebsspindeln versehen sein.

Allgemein zeichnen sich die PIBOMULTI - Winkelköpfe durch ihre Steifigkeit, Kompaktheit, Zuverlässigkeit und lange Lebensdauer aus. Ein kleiner Nebenaspekt ist das gefällige Design. Unsere Konstrukteure gehen in der Entwicklung bis an die Grenze des technisch machbaren, welches in der Produktion durch höchste Präzision und Sorgfalt realisiert wird. Einige technische Merkmale sind:

- Schrägschulter-Spindellager oder Schrägrollenlager höchster Qualität
- -> Helikoidal-Winkelgetriebe aus hochfestem Stahl, gehärtet, geschliffen, geläppt und oberflächenbeschichtet
- Schmierung als Dauerfettschmierung, Oelnebelschmierung oder Oel-Luft-Schmierung, entsprechend der Einsatzbestimmung
- Innere Kühlmittelzuführung bis zu 50 bar Druck (optional)

Anwender, rund um den Globus, vertrauen täglich PIBOMULTI-Winkelköpfen.



PIBOMULTI angle heads are recognized worldwide for bringing effective solutions to manufacturing problems, reducing production time, and for their adaptability to any type of machine.

The variety of choices among PIBOMULTI angle heads makes possible milling, drilling or tapping at every angle and in every size, effectively handling manufacturing situations often considered impossible. PIBOMULTI heads can be designed to

- Operate inside bores or pockets
- Reach areas with difficult access or small clearances
- Reduce multiple set-ups of parts

Whether standard or special, PIBOMULTI angle heads are available in any type of shank, ISO, HSK or flanged, with one or several spindle outputs adapted to tools and to the configuration of the work piece.

PIBOMULTI angle heads are rigid, compact, light, reliable and engineered for long life. PIBOMULTI designs and manufactures all its products with care and precision, often successfully pushing the limits of engineering feasibility. Angle

- Spindle bearings with angular contact or precision conical roller bearings, according to the application to be performed
- -> Precision, steel helical bevel gears are surface-treated, hardened and ground, providing high resistance to wear
- Thru-tool coolant up to 50 bar pressure is available
- Lubrication via permanent grease pack or air-oil mist for higher RPM capability and longer life.

#### SOMMAIRE - ZUSAMMENFASSUNG - SUMMARY





#### Cône ISO + HSK

Winkelkopf mit Zangen zum Bohren, Fräsen und Gewindeschneiden Angular head with collets for drilling, milling and tapping



CEP 08 L1 - CEP 08 L2	4
CEP 10 L1 - CEP 10 L2	4
CEP 13 L1 - CEP 13 L2	5
CEP 16 L1 - CEP 16 L2	6
CEP 20 L1 / L2 / etc	7
CEP 26 L1 - CEP 26 L2	8

Tête équerre à pince à multiplication pour percer fraiser et tarauder Winkelkopf mit Uebersetzung und Zangen zum Bohren, Fräsen und Gewindeschneiden

Angular head with collets with ratio for drilling, milling and tapping



CMP 10 L1 - CMP 10 L2	9
CMP 16 L1 - CMP 16 L2	9
CMP 10X5 L1 - CMP 10X5 L2	10
Tête équerre de sciage	

Winkelkopf zum Sägen Sawing angular head

CEF 16/22/27/32 ..... 10 Tête équerre à cône

Winkelkopf mit Steilkegel Angular head with shank



CEC 30 L1 / L2 / etc	11
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Tête équerre réglable à pince pour percer et fraiser Einstellbarer Winkelkopf mit Zangen zum Bohren und Fräsen Adjustable angular head with collets for drilling and milling



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CTAR 10	 15
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Tête angulaire réglable à cône Einstellbarer Winkelkopf mit Steilkegel Adjustable angular head with shank



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CTARH 50 - 20 / CTARH 50 - 20 - 2	21
FTARH 50 - 20 / FTARH 50 - 20 - 2	21
FTARH 50 - 14	22

#### Cône ISO + HSK

Tête pour usiner dans les alésages Kopf für die Bearbeitung in Bohrungen Head for machining inside of bores



CDP 02 L1 / L2 / etc	23
CDP 03 L1 / L2 / etc	24
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Tête pour tour Kopf für Drehmaschine Head for lathe



TTAR 07	31
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TDC 03 L1 / L2	32
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TECHNISCHE INFORMATIONEN

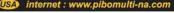


### CEP 08 L1 - CEP 08 L2

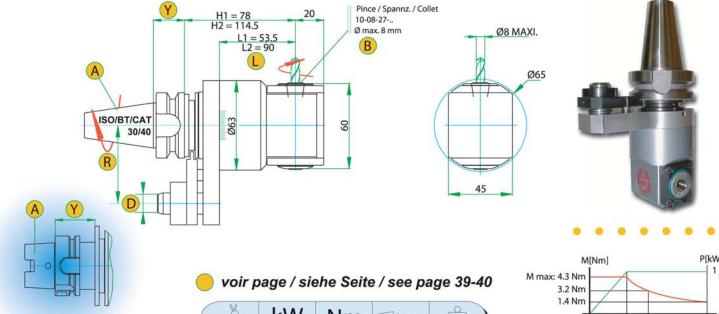


SPECIAL: 10 000 rpm



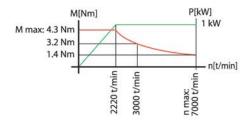






HSK 40/50/63

	kW	Nm	1:00	kg
7000 t/min u/min rpm	1.0 kW	4.3 Nm	1 à 1	≃ 1.5 à 3 kg





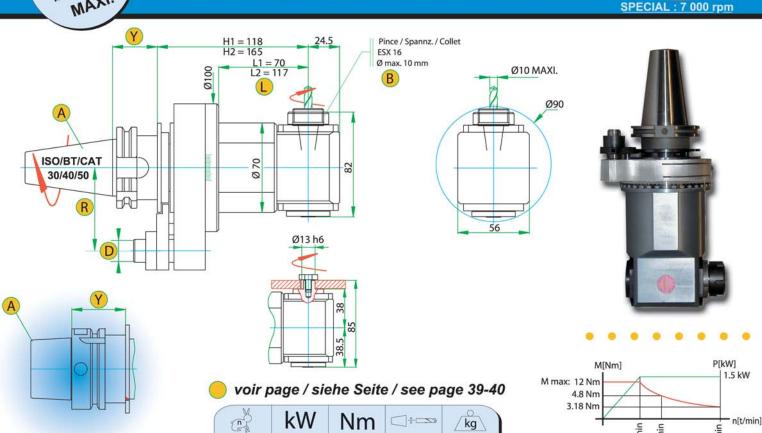
HSK 63/80

### CEP 10 L1 - CEP 10 L2



n max: 5000 t/min

1200 t/min



1 à 1

12 Nm

~ 5.5 à 9

kg

5000 t/min u/min

1.5 kW

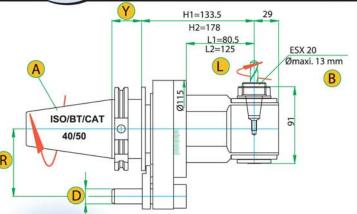


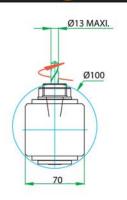


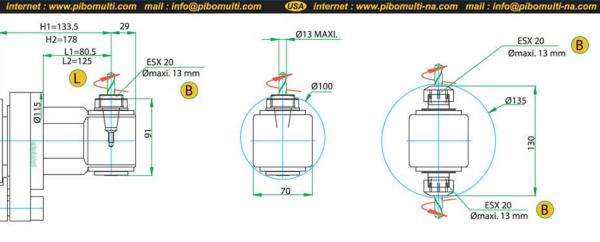
### CEP 13 L1 - CEP 13 L2



SPECIAL: 6 000 rpm



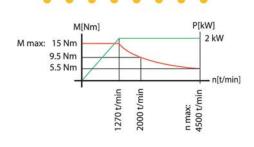




HSK 63/100

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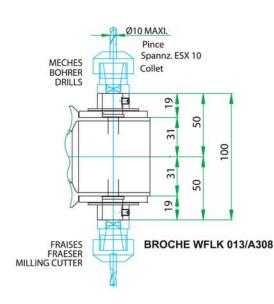
C. S.	kW	Nm		kg
4500 t/min u/min rpm	2.0 kW	15 Nm	1 à 1	≃ 6 à 10 kg



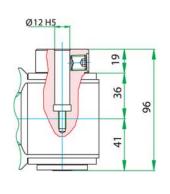
#### **BROCHE WFLK 013/A308**

M1 - M10 GEWINDEBOHRER TAPS 20 91 4

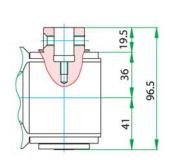
#### **BROCHE WFLK 013/A308**



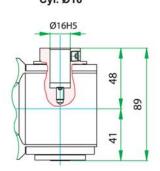
WHISTLE NOTCH DIN 1835-E



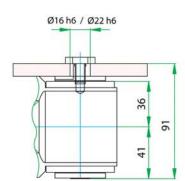
**ABS 32** 



Cyl. Ø16



Cyl. Ø16 OU Cyl. Ø22





6

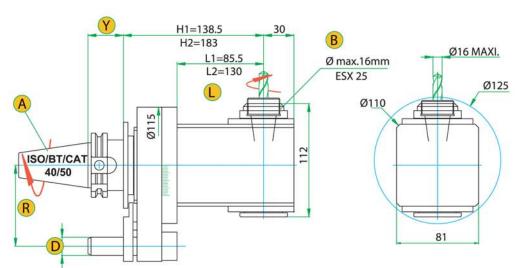
### CEP 16 L1 - CEP 16 L2

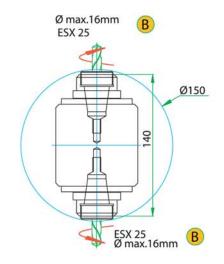


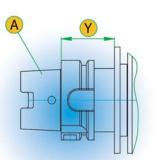
SPECIAL: 5 500 rpn

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G	kW	Nm		/kg
4500 t/min u/min rpm	3.0 kW	35 Nm	1 à 1	≃ 6.5 à 11 kg

ESX 25 Ø MAX 16 mm

M[Nm] P[kW] 3 kW

19 Nm
6.4 Nm

19 Nm
6.4 Nm

19 Nm

10 Nm

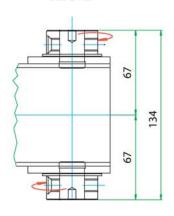
HSK 63/100

ABS 40





CEP 16 HSK



**ABS 40** 

**CEP 20 L1** 



#### CEP 20 L1/L2/L...

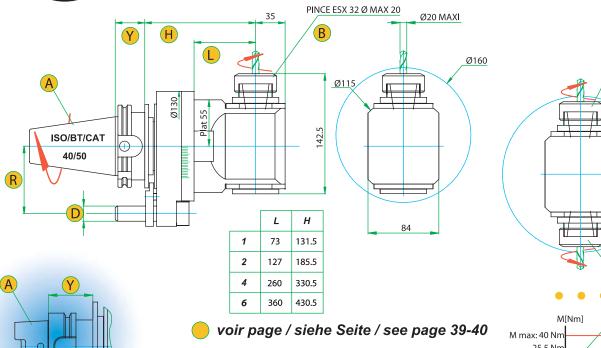


PINCE ESX 32 Ø MAX 20

Ø185

PINCE ESX 32 Ø MAX 20





kW

4.0 kW

Nm

40 Nm

1 à 1

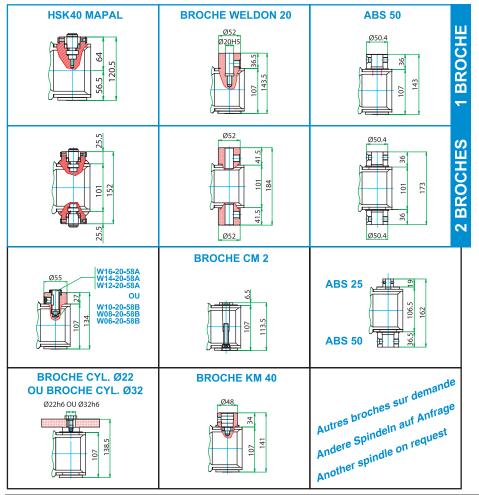
kg \ ~ 9 à 13

kg

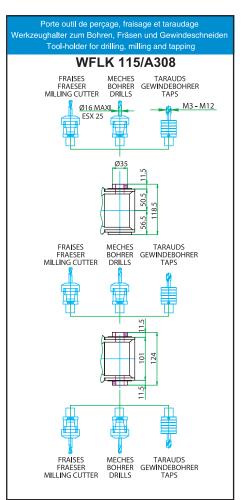
M M max: 40 Nm	[Nm]		P[	kW] 4 kW
25.5 Nm 10.3 Nm				— n[t/min]
	950 t/min	1500 t/min	n max: 3700 t/min	

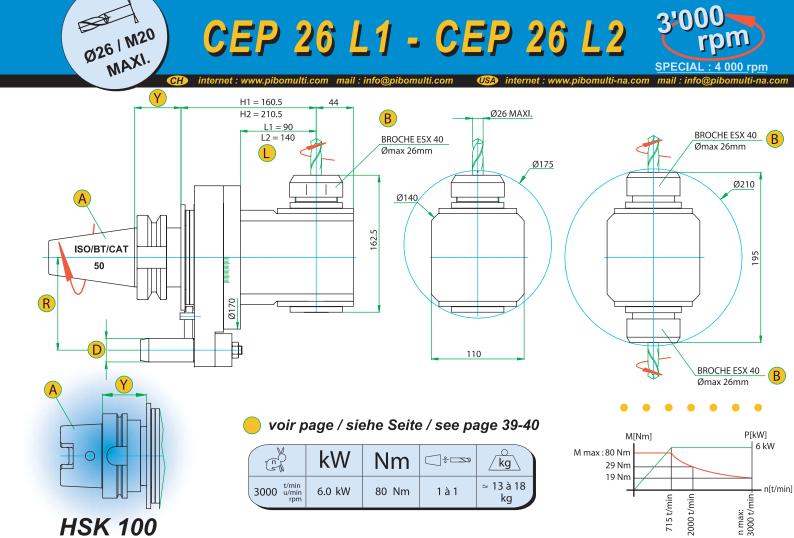
B

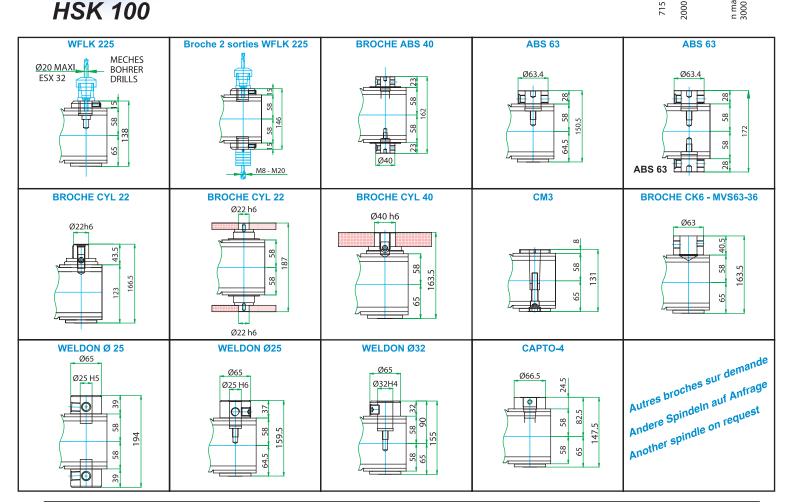
HSK 63/80/100



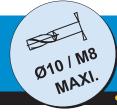
3700 t/min u/min rpm





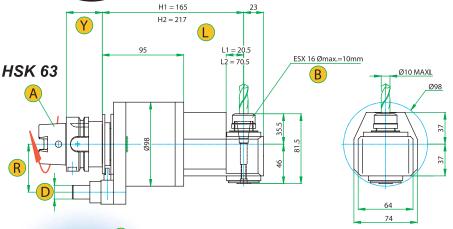


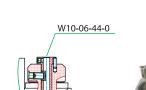




### CMP 10 L1 - CMP 10 L2

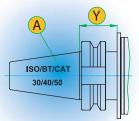
10'000 rpm





**BROCHE W 10** 

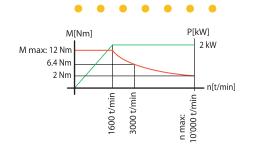




**AUTRE BROCHE SUR DEMANDE** ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

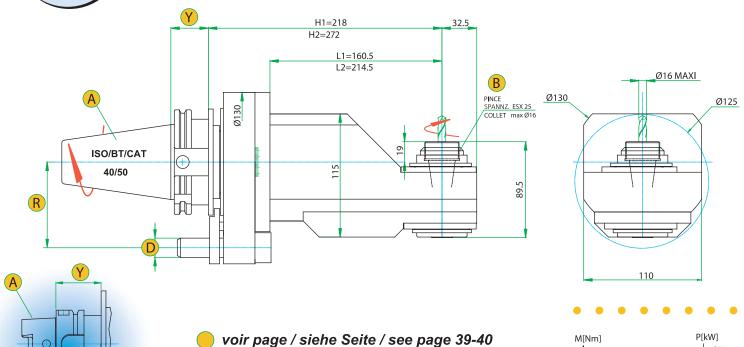
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BROCHE SPINDEL SPINDLE	kW	Nm		kg
10000 t/min u/min rpm	2.0 kW	12 Nm	1 à 2.22	≃ 5à6 kg



Ø16 | M12

### CMP 16 L1 - CMP 16 L2



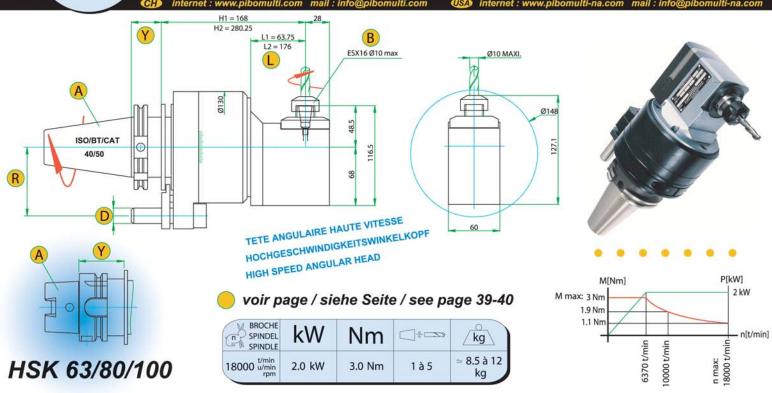
HSK 63/80/100

BROCHE SPINDEL  $\square$ kW Nm kg SPINDLE ≃ 15 à 17 7000 t/min u/min rpm 4.0 kW 20 Nm 1 à 2 kg



#### CMP 10X5 L1 - CMP 10X5 L2

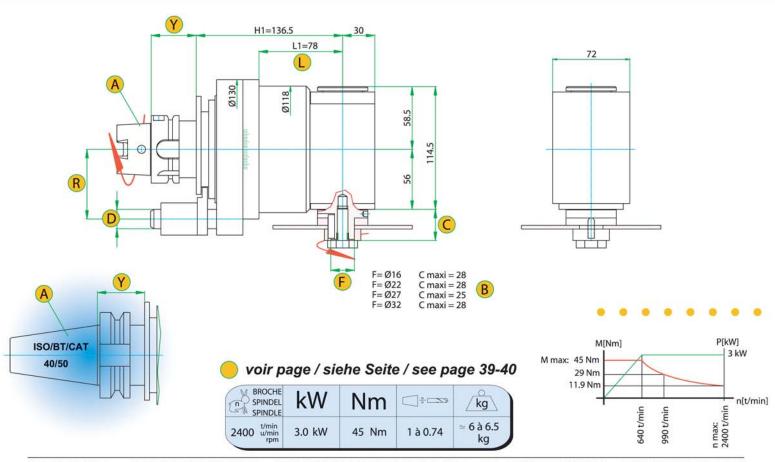
18'000 rpm



TETE DE SCIAGE SÄGEKOPF SAWING HEAD

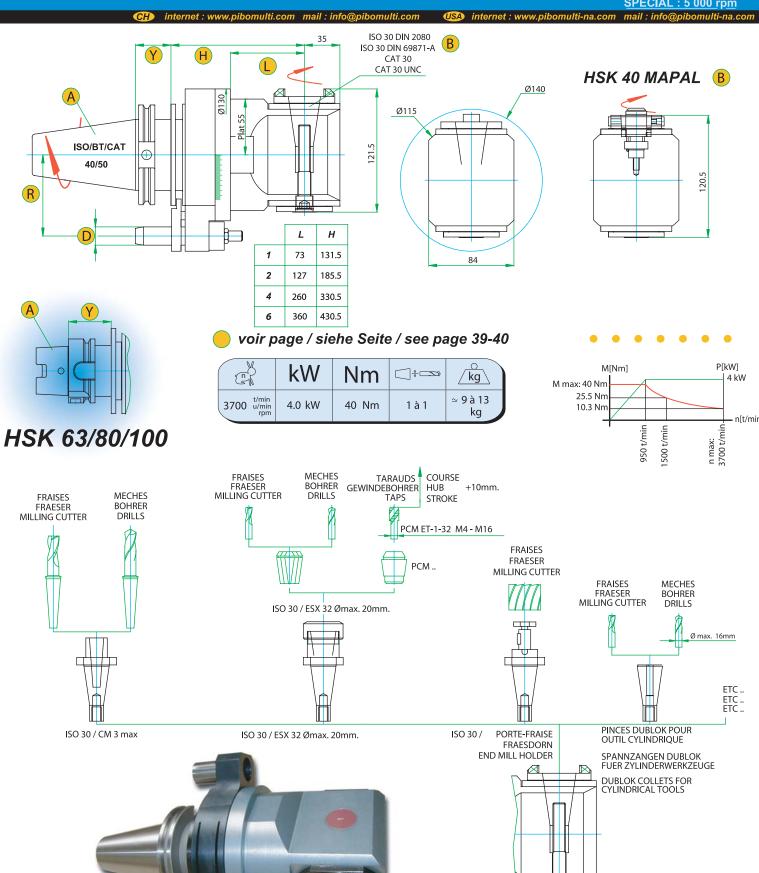
#### CEF 16/22/27/32





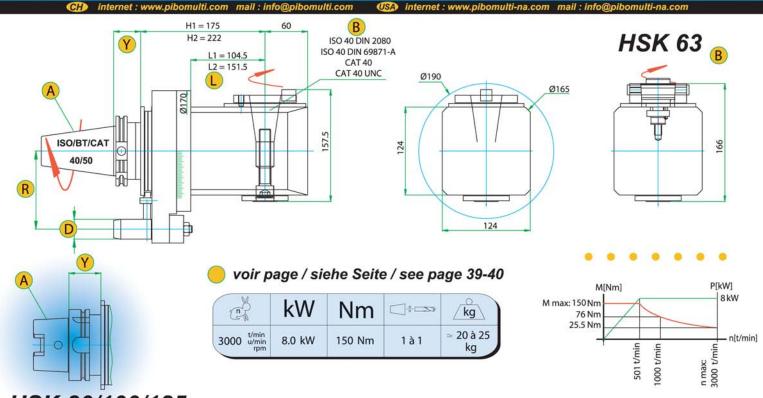
# CEC 30 L1/L2/L...



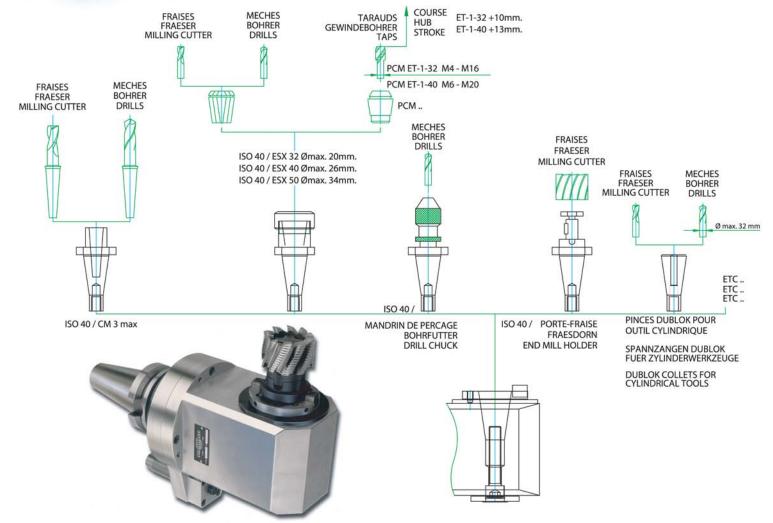


## CEC 40 L1 - CEC 40 L2





#### HSK 80/100/125



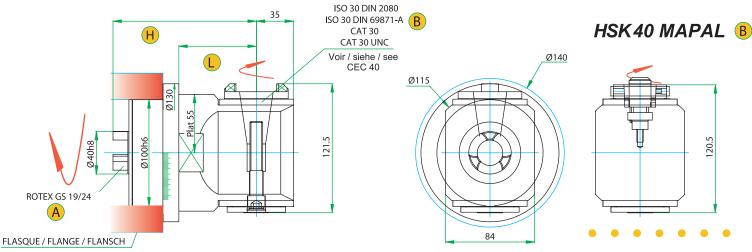
ASQUE

### FEC 30 L1/L2/L...





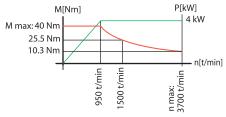
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L Н 73 135 2 127 189 260 322 360 422

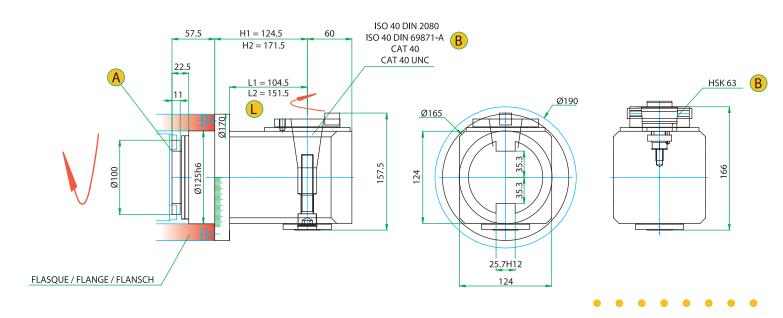
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	kW	Nm		kg
3700 t/min u/min rpm	4.0 kW	40 Nm	1 à 1	≃ 9 à 13 kg

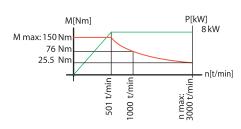


### FEC 40 L1 - FEC40 L2





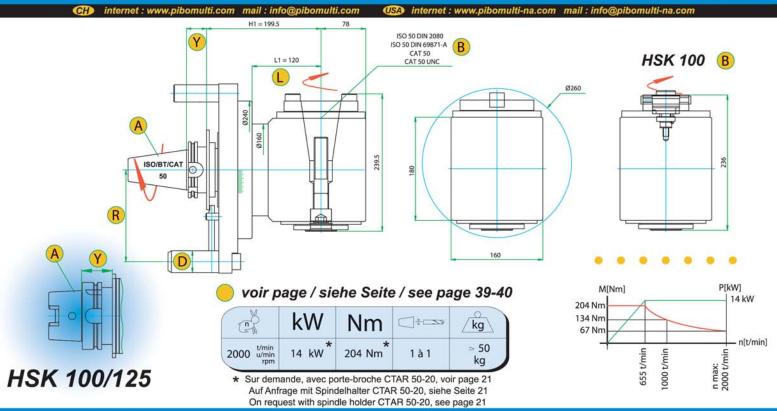
	kW	Nm	<u>°</u> □	kg
3000 t/min u/min rpm	8.0 kW	150 Nm	1 à 1	≃ 20 à 25 kg





### CEC 50

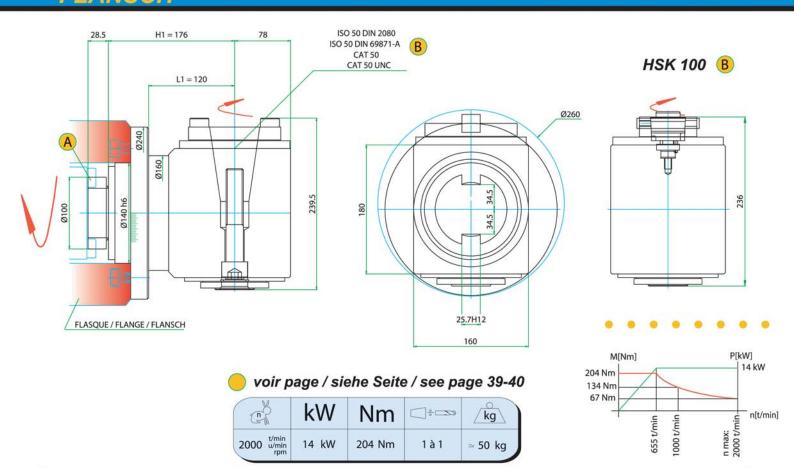




**FLASQUE** 

FEC 50



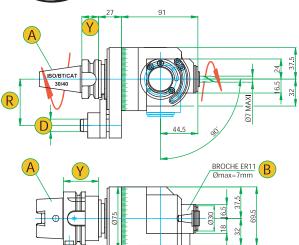


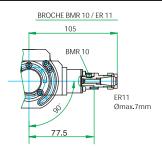




#### CTAR 07







A CHANGEMENT RAPIDE SCHNELLWECHSEL QUICK CHANGE

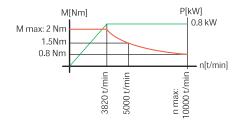


HSK 40/50/63

**AUTRE BROCHE SUR DEMANDE** ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

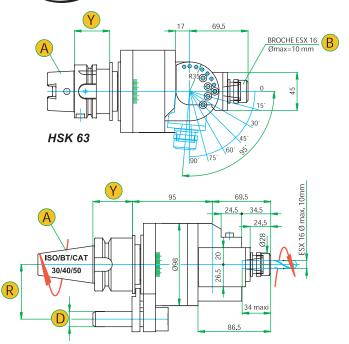
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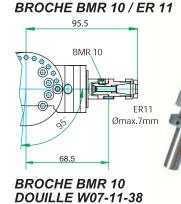
BROCHE SPINDEL SPINDLE	∣kW	Nm		kg
10000 t/min u/min rpm	0.8 kW	2 Nm	1 à 3.2	≃ 3 à 4 kg



Ø10 | M6 MAXI.

#### CTAR10





ďρ

A CHANGEMENT RAPIDE SCHNELLWECHSEL QUICK CHANGE

#### P[kW] M[Nm] 1 kW M max: 4.3 Nm 3.2 Nm n[t/min] n max: 7000 t/min -

#### voir page / siehe Seite / see page 39-40

**AUTRE BROCHE SUR DEMANDE** ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

BROCHE SPINDEL SPINDLE	kW	Nm		kg
7000 t/min u/min rpm	1.0 kW	4.3 Nm	1 à 2	≃ 6.5 à 7.5 kg



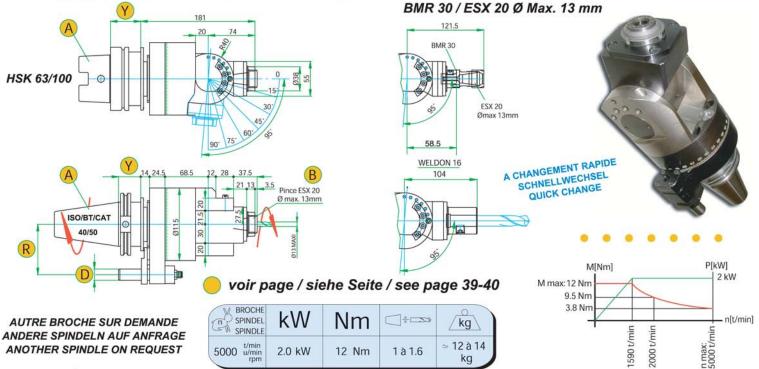
16

#### CTAR 13



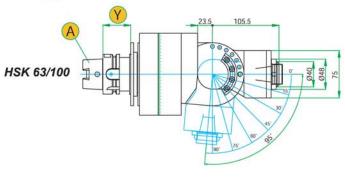


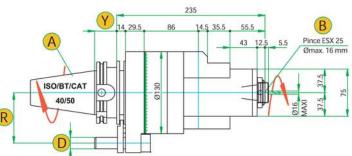
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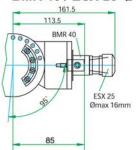
CTAR 16







#### BMR 40 / ESX 25 Ø Max. 16 mm

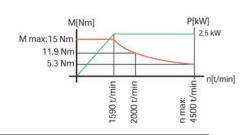


A CHANGEMENT RAPIDE SCHNELLWECHSEL QUICK CHANGE

#### voir page / siehe Seite / see page 39-40

AUTRE BROCHE SUR DEMANDE ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

	kW	Nm		kg
4500 t/min u/min rpm	2.5 kW	15 Nm	1 à 1.39	≥ 17 kg





#### FTAR 16



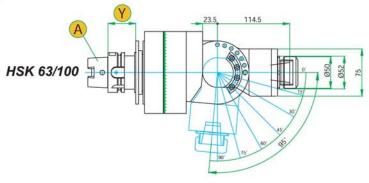
14.5 35.5 10.5

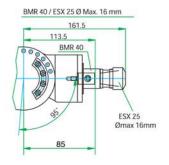
FLASQUE / FLANGE / FLANSCH Pince ESX 25 43

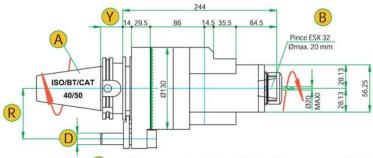
Ø20 | M16

#### CTAR 20











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P[kW] M[Nm] 2,5 kW M max: 15 Nm 11,9 Nm 5.3 Nm n[t/min] n max: 4500 t/min-

AUTRE BROCHE SUR DEMANDE ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

BROCHE SPINDEL SPINDLE	kW	Nm	□:\con	kg
4500 t/min u/min rpm	2.5 kW	15 Nm	1 à 1.39	≥ 17 kg



FTAR 20

SPECIAL: 5 500 rpm



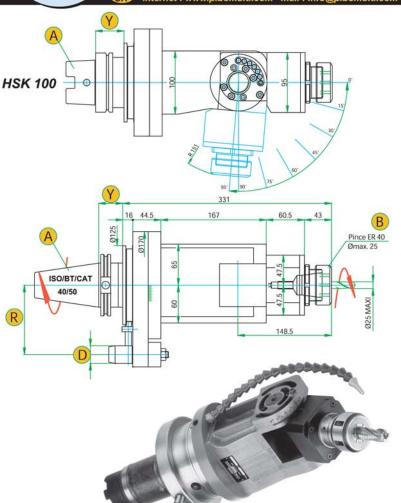


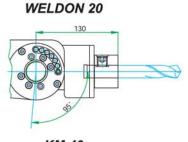
#### CTAR 25



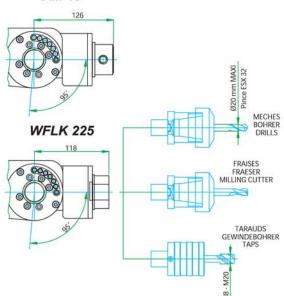
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USA internet : www.pibomulti-na.com mail : info@pibomulti-na.com





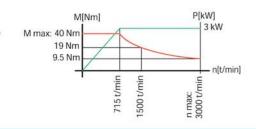
KM 40



oir page / siehe Seite / see page 39-40

AUTRE BROCHE SUR DEMANDE ANDERE SPINDELN AUF ANFRAGE ANOTHER SPINDLE ON REQUEST

BROCHE SPINDEL SPINDLE	kW	Nm		kg
3000 t/min u/min rpm	3.0 kW	40 Nm	1 à 1	≃ 30 à 33 kg

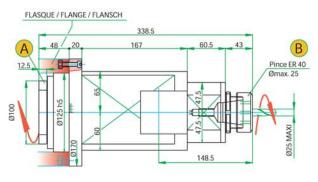


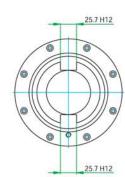


FLASQUE FLANGE FLANSCH

FTAR 25

3,000

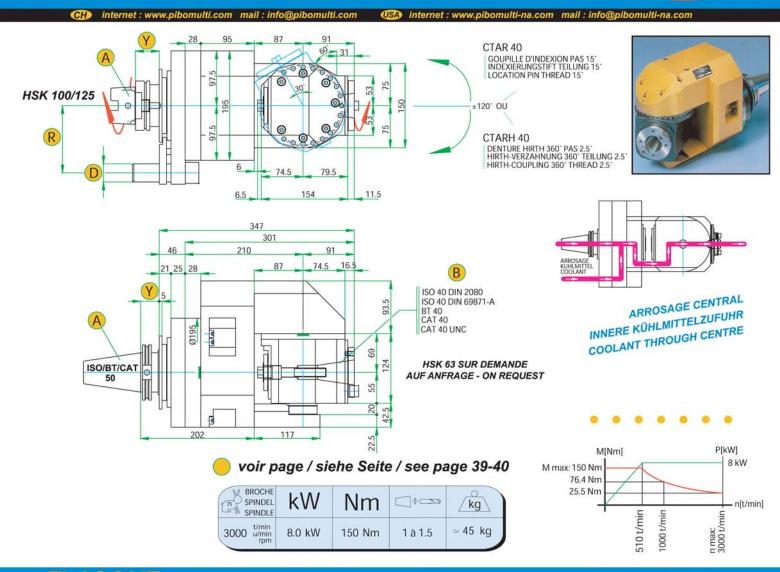






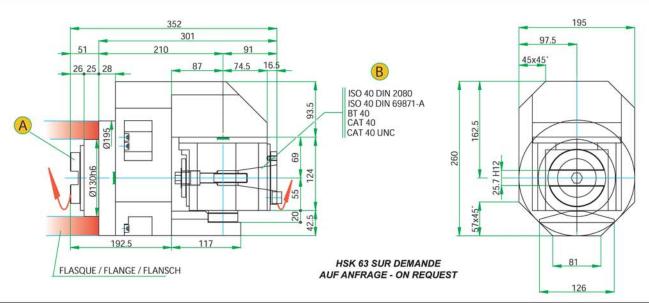
### CTAR 40 / CTARH 40





### FTAR 40 / FTARH 40





Ø140

FLASQUE / FLANGE / FLANSCH

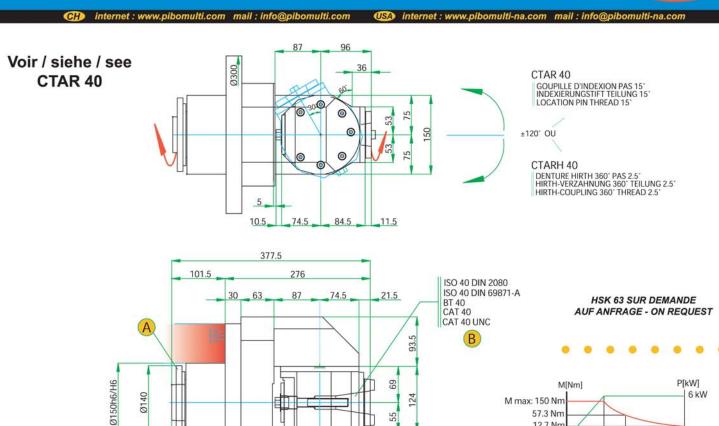
M max: 150 Nm 57.3 Nm 12.7 Nm

### FTAR 40 - 2.5 / FTARH 40 - 2.5



6 kW

n[t/min]



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24.75

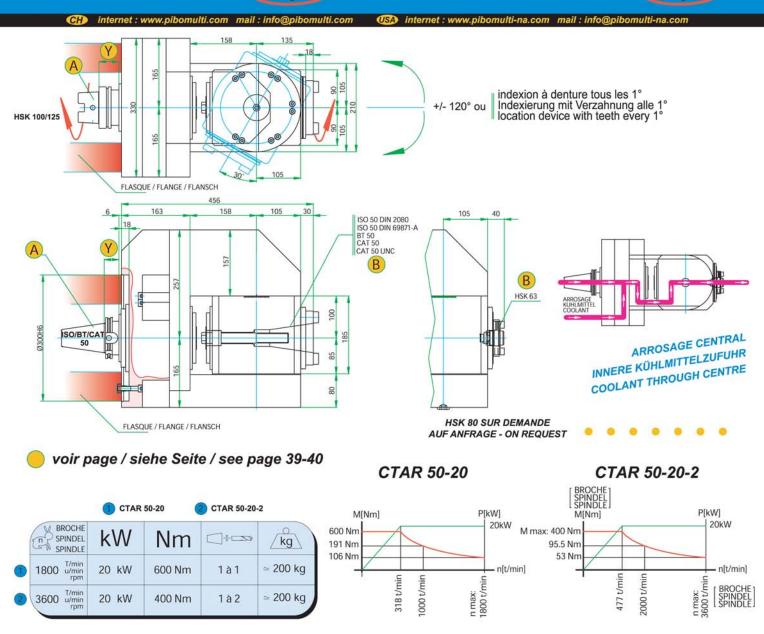
BROCHE SPINDEL SPINDLE	kW	Nm	0 0	kg
4500 t/min u/min rpm	6.0 kW	150 Nm	1 à 2.5	≃ 50 kg



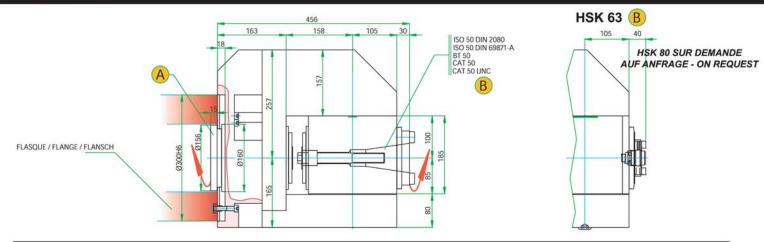
PIBOMULTI S.A. - JAMBE-DUCOMMUN 18 - CH-2400 LE LOCLE SWITZERLAND - TEL +41(0)32 933 06 33 - FAX +41(0)32 933 06 30

## CTARH 50-20 1'800 rpm

# CTARH 50-20-2 3'600 rpm



#### ASQUE FTARH 50-20 1'800 rpm FTARH 50-20-2 3'600

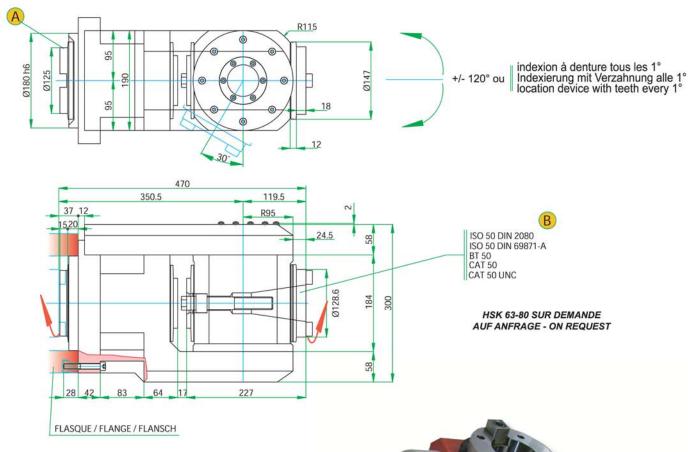


Tetes angulaires La solution

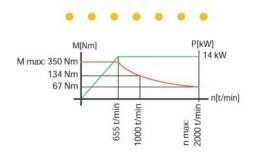
Winkelköpfe

### FTARH 50-14





BROCHE SPINDEL SPINDLE	kW	Nm	-÷	kg
2000 t/min u/min rpm	14 kW	350 Nm	1 à 1	≃ 140 kg





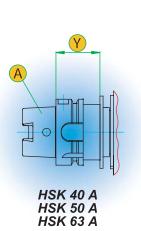
18.6



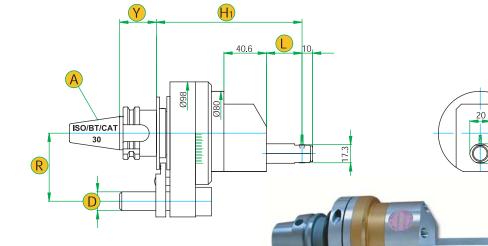


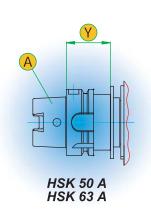
### CDP 02 L1/L2/L3/L...

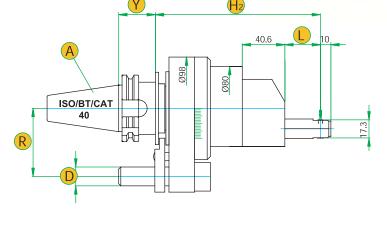


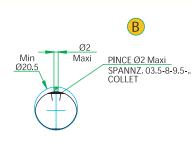


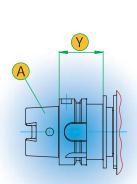
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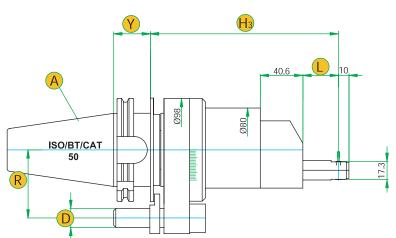






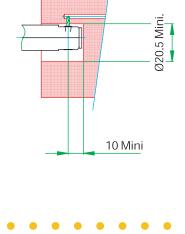
HSK 63 A HSK 80 A **HSK 100A** 

	L	H1	H2	Н3
L1	34	139.1	157.6	179.6
L2	49.5	154.6	173.1	195.6
L3	65	170.1	188.6	210.6
L4	80	185.1	203.6	225.6





BROCHE SPINDEL SPINDLE	kW	Nm		kg
8000 t/min u/min rpm	0.2 kW	1.6 Nm	1 à 2.5	≃ 3 à 4 kg

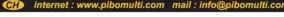


M 1 max:1.6 Nm 0.5 Nm 0.2 Nm	[Nm]		Pl	[kW]   0.2 kW
٦	1190 +/min	4000 t/min	n max:	├─ n[t/min]

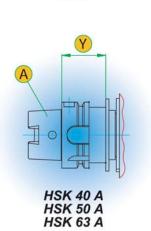


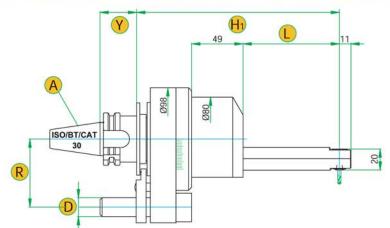
### CDP 03 L1/L2/L3/L...

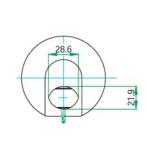


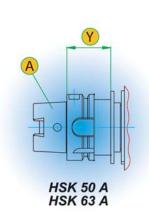


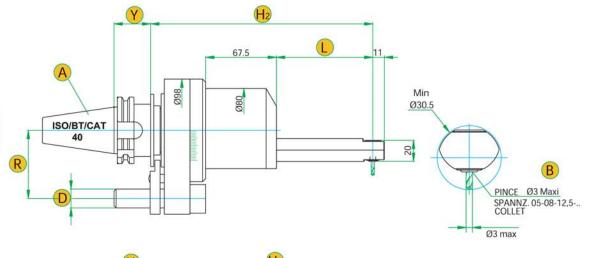
(USA) internet : www.pibomulti-na.com mail : info@pibomulti-na.com

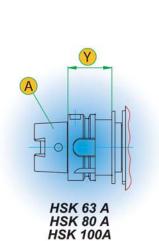










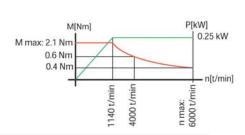


Y	) <del>[H</del> 3	
	89.5	L 11
ISO/BT/CAT 50	860 860	11 Mini:

	L	H1	H2	Н3
L1	50	151.5	170	192
L2	71	172.5	191	213
L3	79.5	181	199.5	221.5
L4	92	193.5	212	234
L5	112	214.5	233	255
L6	134	235.5	254	276

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7.0						

BROCHE SPINDEL SPINDLE	kW	Nm	0 0	kg
6000 t/min u/min rpm	0.25 kW	2.1 Nm	1 à 3	≃ 3 à 4 kg

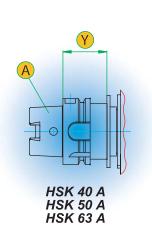


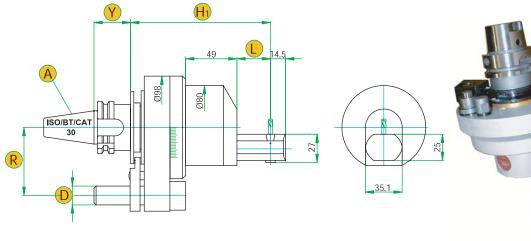


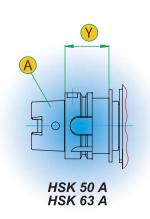


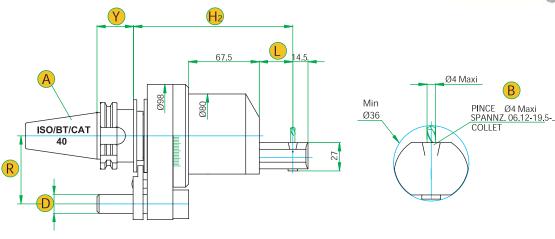
### CDP 04 L1/L2/L3/L...

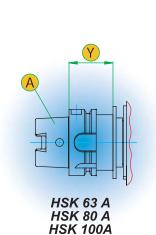


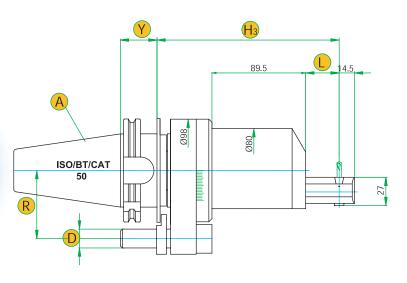








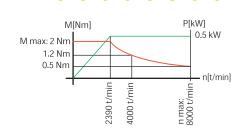




		Ø36 Mini.
	14.5 Mini	

	L	H1	H2	НЗ
L1	32	133.5	152	174
L2	56	157.5	176	198
L3	80	181.5	200	222
L4	104	205.5	224	246
L6	152	253.5	272	294

_	_		_	_
BROCHE SPINDEL SPINDLE	kW	Nm		kg
8000 t/min u/min rpm	0.5 kW	2.0 Nm	1 à 3	≃ 3.5 à 4.5 kg



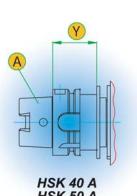




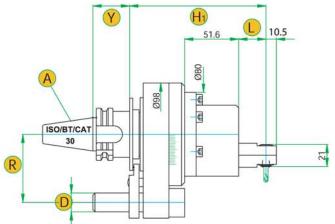
### CDP 041 L1/L2/L3/L...

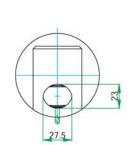


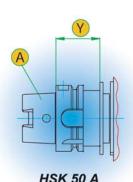




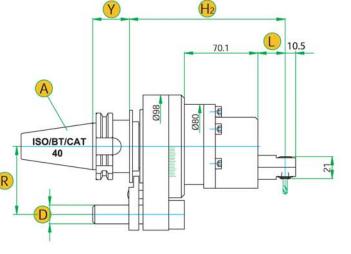
HSK 40 A HSK 50 A HSK 63 A

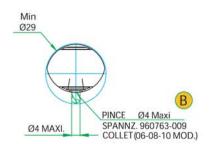


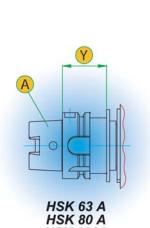




HSK 50 A HSK 63 A



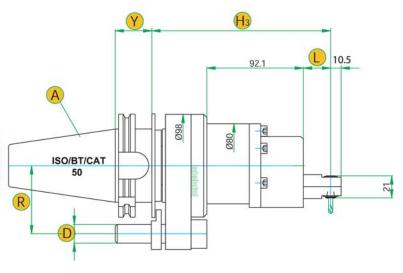




HSK 100A

	L	H1	H2	НЗ
L1	26	130.1	148.6	170.6
L2	50	154.1	172.6	194.6
L3	74	178.1	196.6	218.6

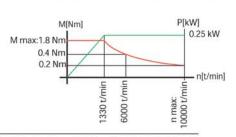
219.1



_	}	Ø29 Mini.
		021
	10.5 Mini	

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_	75 197				75 STEE	

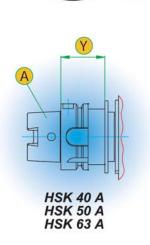
BROCHE SPINDEL SPINDLE	kW	Nm	1:00	kg
10000 t/min u/min rpm	0.25 kW	1.8 Nm	1 à 2.5	≃ 3.5 à 4.5 kg

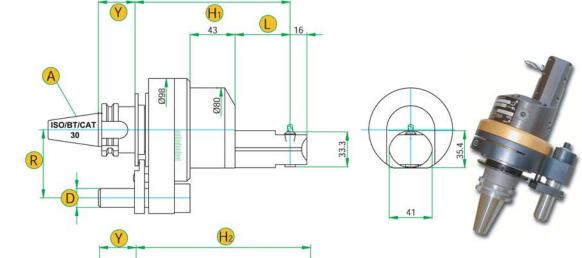


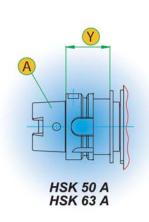


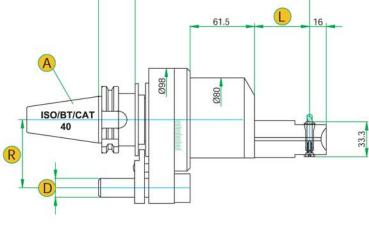
### CDP 05 L1/L2/L3/L...

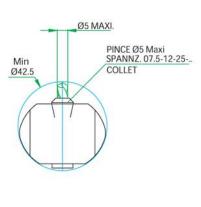


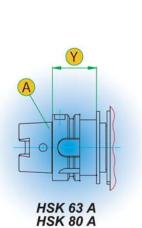




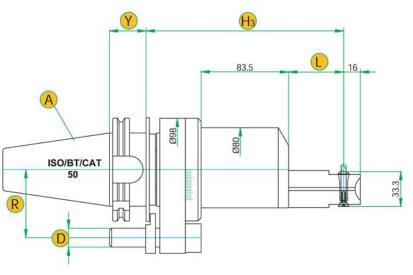








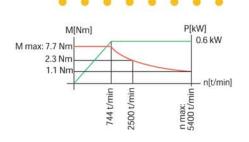
**HSK 100A** 



i.	
A CANINI	245.5
16 Mini	
10111111	

	L	H1	H2	НЗ
L1	52.5	148	166.5	188.5
L2	82.5	178	196.5	218.5
L3	112.5	208	226.5	248.5
L4	142.5	238	256.5	278.5
L5	172	267.5	286	308

BROCHE SPINDEL SPINDLE	kW	Nm		kg
5400 t/min u/min rpm	0.6 kW	7.7 Nm	1 à 1.6	≃ 4à7 kg

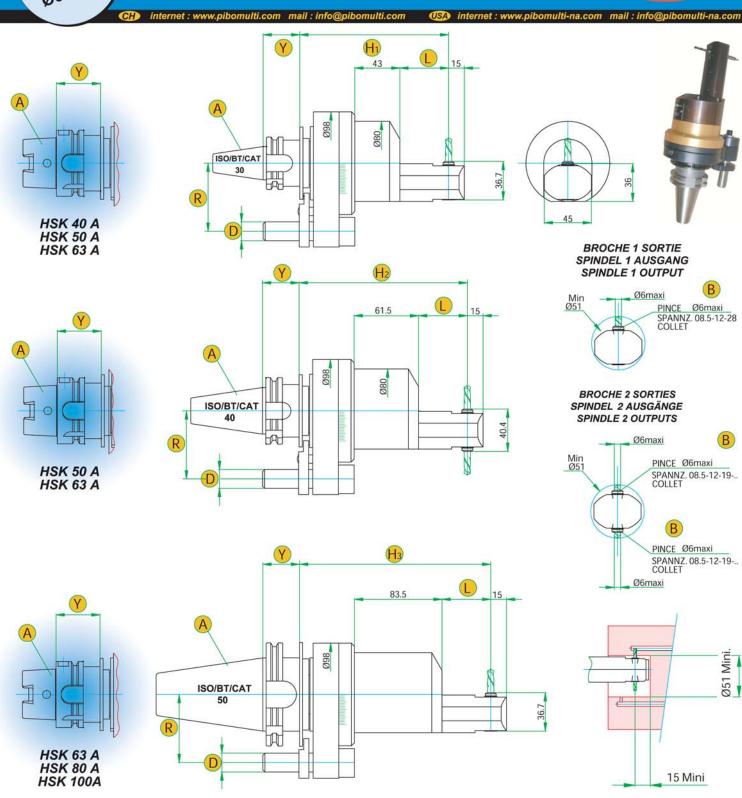




28

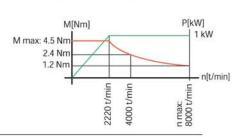
## CDP 06 L1/L2/L3/L...





	L	H1	H2	НЗ
L1	46.5	142	160.5	182.5
L2	74.5	170	188.5	210.5
L3	102.5	198	216.5	238.5

─ voir page / siehe Seite / see page 39-40						
BROCHE SPINDEL SPINDLE	kW	Nm		kg		
8000 t/min u/min rpm	1.0 kW	4.5 Nm	1 à 2.5	≃ 4 à 7 kg		

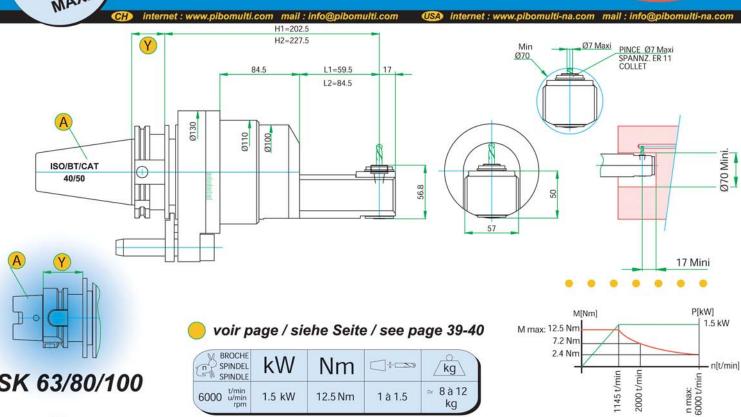






### CDP 07 L1/L2/L...





HSK 63/80/100

#### CDP 08 L1/L2/L3/L...

1 à 1.5

12.5 Nm

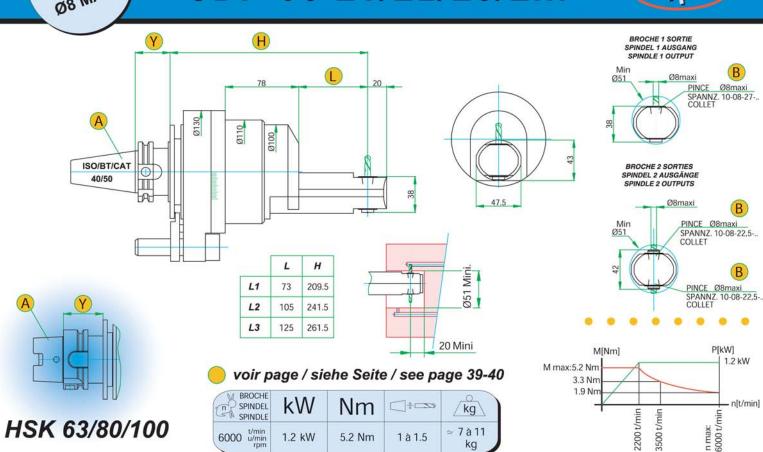
≈ 8à12

kg

6000 t/min u/min rpm

1.5 kW

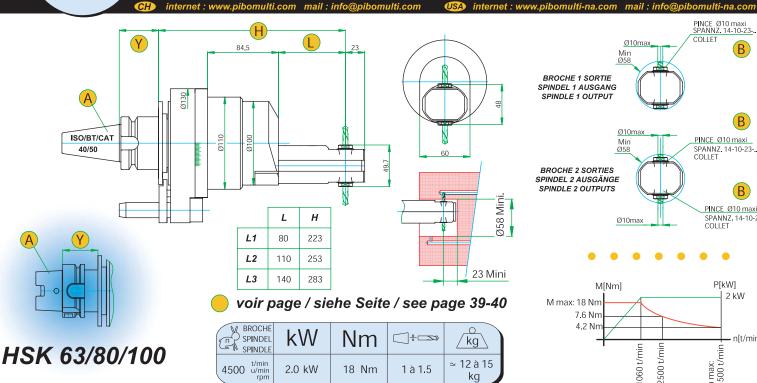






### CDP 10 L1/L2/L3/L...





2.0 kW

4500 t/min u/mir rpm

COLLET Ø10max B Ø10max PINCE Ø10 maxi SPANNZ. 14-10-23-.. COLLET B PINCE Ø10 maxi SPANNZ. 14-10-23-.. COLLET Ø10ma P[kW] 2 kW

#### CDP 13 L1/L2/L...

1 à 1.5

18 Nm

≃ 12 à 15

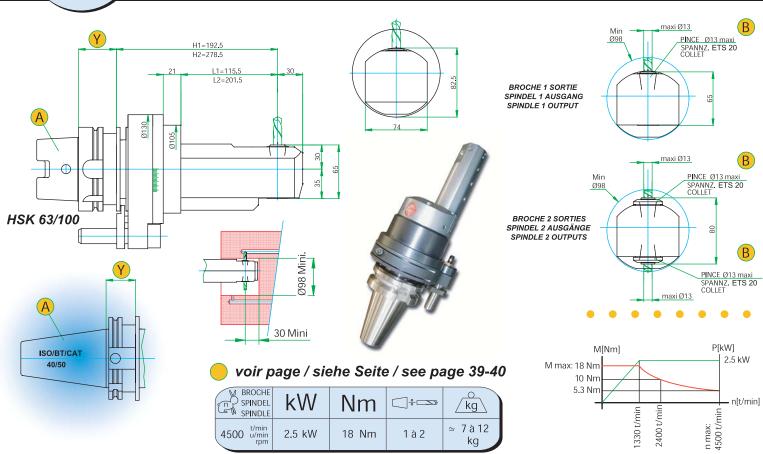
kg



2500 t/min

n[t/min]

n max: 4500 t/min -







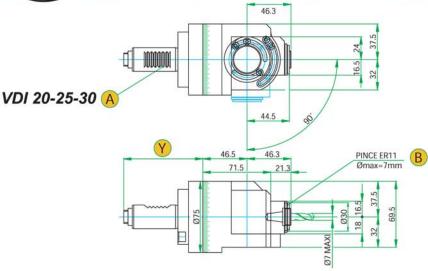
TETE POUR TOUR KOPF FUR DREHMASCHINE HEAD FOR TURNING MACHINE

TTAR 07

10'000 rom

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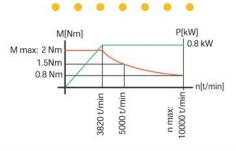


Voir / siehe / see CTAR 07

voir page / siehe Seite / see page 39-40

BROCHE SPINDEL SPINDLE	kW	Nm	<b>□</b> ÷□>>	kg
10000 t/min u/min rpm	0.8 kW	2.0 Nm	1 à 3.2	≃ 3 kg



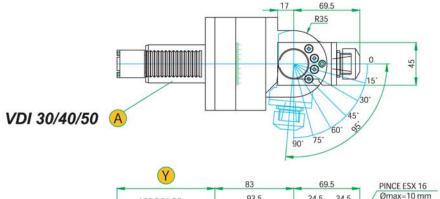


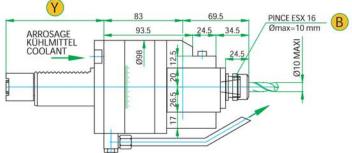
Ø10 | M6 MAXI.

TETE POUR TOUR KOPF FUR DREHMASCHINE HEAD FOR TURNING MACHINE

TTAR 10



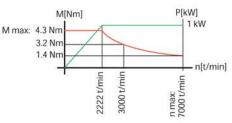




Voir / siehe / see CTAR 10

BROCHE SPINDEL SPINDLE	kW	Nm	□+□	kg
7000 t/min u/min rpm	1.0 kW	4.3 Nm	1 à 2	≃ 7 kg





Ø13 | M8 MAXI.

TETE POUR TOUR
KOPF FUR DREHMASCHINE
HEAD FOR TURNING MACHINE

TTAR 13



JECIAL . 0 000 Ipili

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Mail: internet: www.pibomulti-na.com mail: info@pibomulti-na.com



Voir / siehe / see CTAR 13

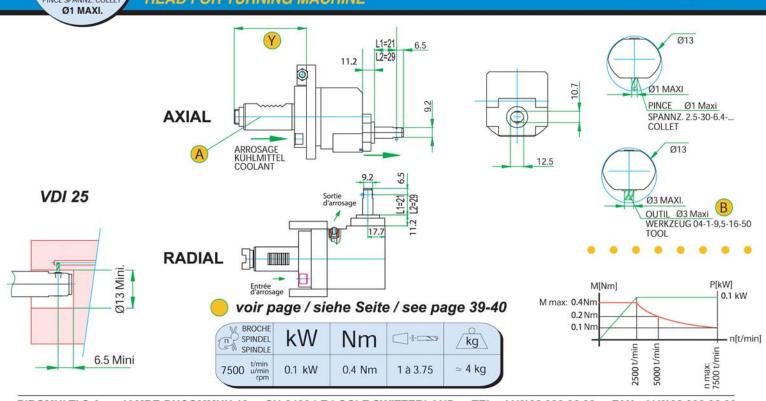
BROCHE SPINDEL SPINDLE	kW	Nm		kg
5000 t/min u/min rpm	2.0 kW	12 Nm	1 à 1.6	≃ 11 kg

9.5 Nm 4.8 Nm umax: 12 Nm 9.5 Nm 4.8 Nm umax: 12 Nm 128000 t/min]

OUTIL WERKZEUG TOOL
Ø3 MAXI.
PINCE SPANNZ. COLLET
Ø1 MAXI.

TETE POUR TOUR
KOPF FUR DREHMASCHINE
HEAD FOR TURNING MACHINE

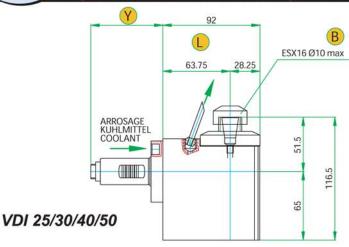
# TDC 03 L1/L2 7'500 rpm

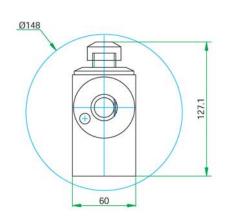


TETE POUR TOUR KOPF FUR DREHMASCHINE HEAD FOR TURNING MACHINE

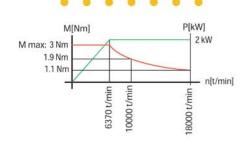
#### TTE 10X5

18'000 rpm





BROCHE SPINDEL SPINDLE	kW	Nm		kg
18000 t/min u/min rpm	2.0 kW	3.0 Nm	1 à 5	≃ 4 à 6 kg



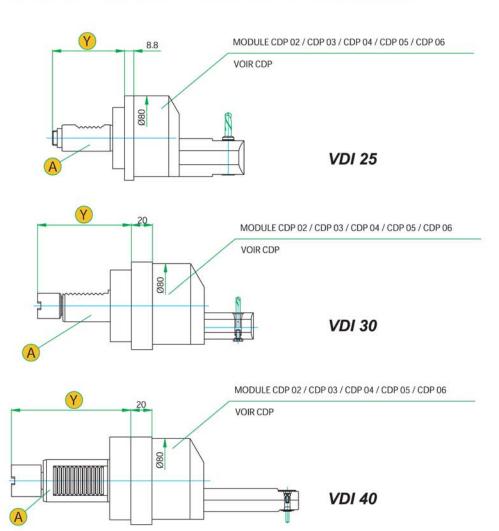




TETE POUR TOUR KOPF FUR DREHMASCHINE HEAD FOR TURNING MACHINE

#### TDP 02/03/04/05/06

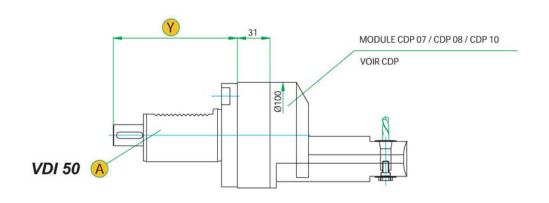




voir page / siehe Seite / see page 39-40

TETE POUR TOUR KOPF FUR DREHMASCHINE HEAD FOR TURNING MACHINE

#### TDP 07/08/10

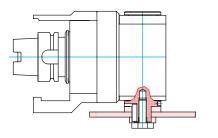




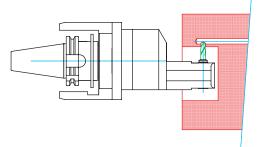
#### PROGRAMME - PROGRAMM - PROGRAM CHIRON



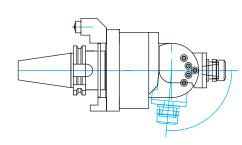
#### POUR - FÜR - FOR CHIRON FZ 08 / FZ 15 / FZ 18 / DZ 18 / FZ 12 / DZ 12 / FZ 22 / DZ 22 / FZ 28 / DZ 28



TETE DE SCIAGE SÄGEKOPF SAWING HEAD



TETES PERCAGE FRAISAGE TARAUDAGE KÖPFE ZUM BOHREN, FRÄSEN, GEWINDESCHNEIDEN HEADS FOR DRILLING, MILLING AND TAPPING



TETES ANGULAIRES REGLABLES EINSTELLBARE WINKEKÖPFE ADJUSTABLE ANGULAR HEADS SUR DEMANDE / AUF ANFRAGE / ON REQUEST

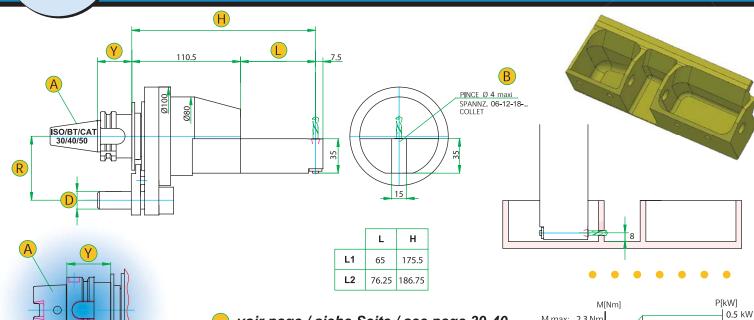






M max: 2.3 Nm 1.3 Nm 0.8 Nn

#### PROGRAMME - PROGRAMM - PROGRAM AEROSPACE CDP 042 L1/L2/L...



BROCHE SPINDEL SPINDLE	kW	Nm		kg	
6000 t/min u/min rpm	0.5 kW	2.3 Nm	1 à 3	≃3.5 à 4.5 kg	

## ARROSAGE - KÜHLMITTEL - COOLANT

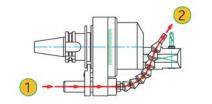


ARRIVEE D'ARROSAGE KÜHLMITTEL EINGANG COOLANT INPUT



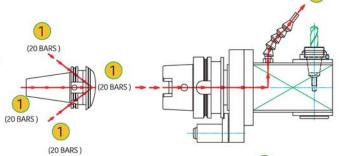
SORTIE D'ARROSAGE KÜHLMITTEL AUSGANG COOLING OUTPUT

Arrosage par l'indexion Kühlung durch die Indexierung Coolant through locating



POUR / FÜR / FOR: **TOUS LES MODELES** ALLE MODELLE ALL THE MODELS

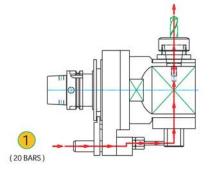
Entrée par le centre, sortie extérieur Eingang durch Zentrum, Ausgang aussen Inlet thru the centre, outlet outside



POUR / FÜR / FOR : **CEP 16** CEP 20 / CEC 30

... SUR DEMANDE AUF ANFRAGE / ON REQUEST

Entrée par l'indexion, sortie centre broche Eingang über Indexierung, Ausgang durch Spindelzentrum Inlet thru location device, outlet thru spindle centre



POUR / FÜR / FOR:

CEP 20

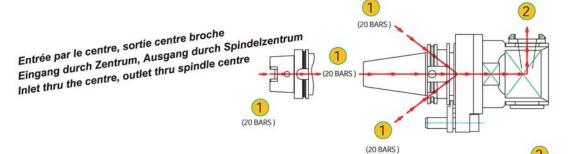
**CEP 16** 

CEP 13

CEP 10

**CMP 10** 

SUR DEMANDE AUF ANFRAGE / ON REQUEST

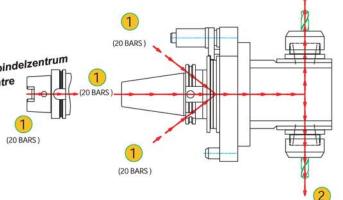


POUR / FÜR / FOR : **CEC 30** 

**CEC 40** 

SUR DEMANDE AUF ANFRAGE / ON REQUEST

Entrée par le centre, sortie centre broche Eingang durch Zentrum, Ausgang durch Spindelzentrum Inlet thru the centre, outlet thru spindle centre



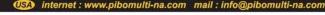
POUR / FÜR / FOR: CEP 26

... SUR DEMANDE AUF ANFRAGE / ON REQUEST



# TETES SPECIALES - SONDER-WINKELKOEPFE - SPECIAL HEADS





### Miniature - Miniatur - Small ...





















Têtes angulaires La solution Winkelköpfe

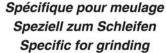
# OUTILS TOURNANTS - ANGETRIEBENE WERKZEUGE - DRIVEN TOOLS

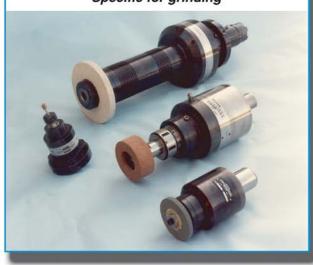




📵 internet : www.pibomulti.com mail : info@pibomulti.com 😘 internet : www.pibomulti-na.com mail : info@pibomulti-na.com









### Têtes angulaires avec multiplicateur intégré Winkelköpfe mit integrierten Schnellaufspindeln Angular Heads with integrated Spindle speeders







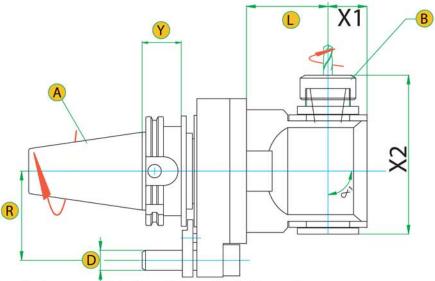


# INFORMATIONS TECHNIQUES TECHNISCHE INFORMATIONEN TECHNICAL INFORMATION A / B / D / L / R / Y

### HORS STANDARD SUR DEMANDE NICHT STANDARD AUF ANFRAGE NOT STANDARD ON REQUEST

X1 ET X2 A PRECISER IMPERATIVEMENT X1 UND X2 UNBEDINGT ANGEBEN X1 AND X2 TO BE INDICATED

Y SELON TYPE DE CONE ET DE MACHINE Y NACH STEIKEGEL UND MASCHINE TYPE Y ACCORDING TO SHANK AND MACHINE TYPE

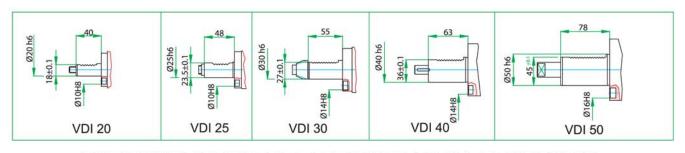


Toutes modifications réservées - Änderungen vorbehalten - Reserve the right to modify

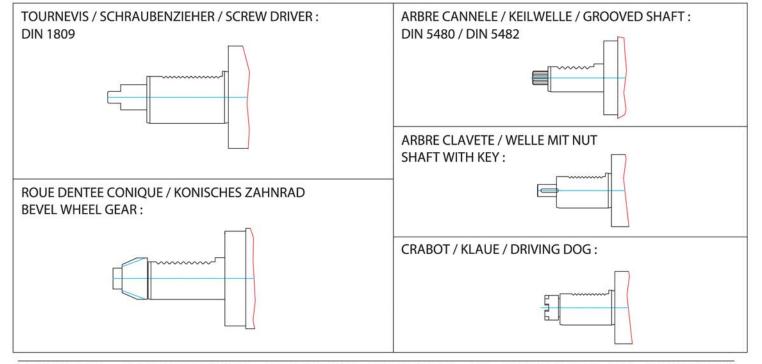


Exemples de machines équipées / Beispiele von ausgerüsteten Maschinen Examples of equipped machines:

Traub - Index - Mori Seiki - Nakamura - Okuma - Gildemeister - Mazak Cincinnati - Biglia - Citizen - Tornos - Star - Emag - Hardinge ...



### **ENTRAINEMENT PAR / ANTRIEB DURCH / DRIVEN BY:**





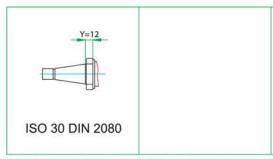


# INFORMATIONS TECHNIQUES TECHNISCHE INFORMATIONEN TECHNICAL INFORMATION

USA internet : www.pibomulti-na.com mail : info@pibomulti-na.com

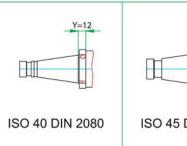
A / Y: TYPE DE CONE A / Y : STEILKEGEL A / Y: SHANK

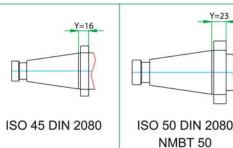
CHANGEMENT MANUEL MANUELLER WECHSEL MANUAL TOOL CHANGE



A / Y : STEILKEGEL

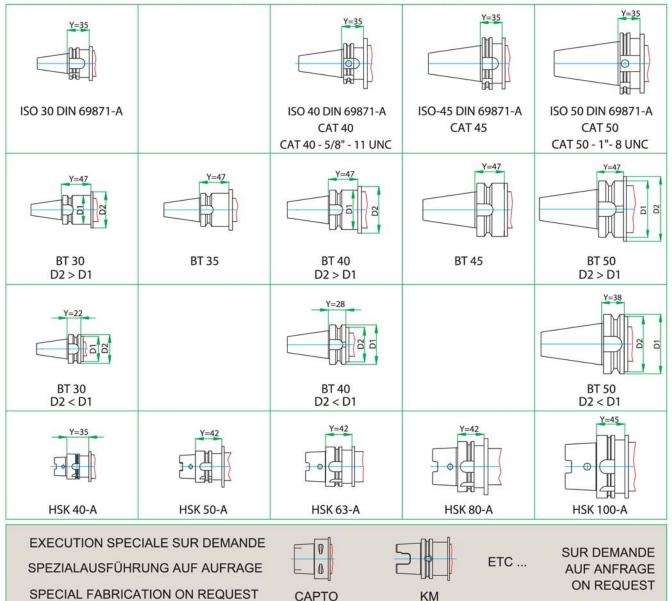
A / Y : SHANK





A / Y: TYPE DE CONE CHANGEMENT AUTOMATIQUE AUTOMATISCHER WECHSEL AUTOMATIC TOOL CHANGE

EXECUTION STANDARD / STANDARDAUSFÜHRUNG / STANDARD FABRICATION

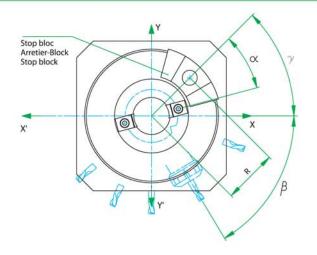




# INDEXION - INDEXIERUNG - LOCATION DEVICE

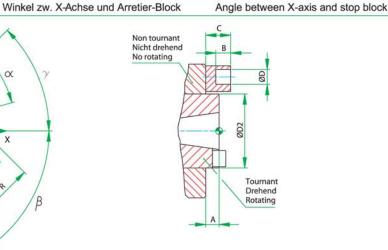
Conditions requises Benötigte Details für Location device pour une indexion eine Indexierung requirements ØD Ø du doigt d'indexion Ø des Positionierungsstiftes Ø of the location pin D2 Ø du nez de broche (partie tournante) Ø der Spindelnase (drehend) Ø of the spindle nose (rotating) R Rayon du doigt d'indexion Radius des Positionierungsstiftes Radius of the location pin A Distance 5 - face d'appui Distanz 9 - Auflagefläche Distance 9 - Orientation location face В Extrémité du doigt d'indexion Stirnseite des Positionierungsstiftes Front of location pin C Epaisseur du stop bloc Höhe des Arretier-Blocks Thickness of stop block  $\alpha$ Angle entre taquets et indexion Winkel zw. Mitnehmer und Indexierung Angle between drivers and location device В

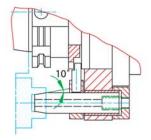
Winkel zw. X-Achse und Spindelausgang

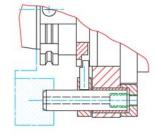


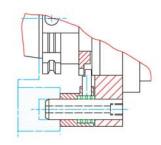
Angle entre axe X et sortie de broche

Angle entre l'axe X et le stop bloc









Angle between X-axis and spindle output

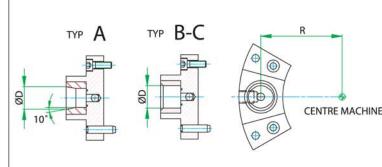
**TYPE** TYP TYPE

g

Goupille cônique 10° mobile 10° Kon. Beweglicher Stift 10° Conical moving pin **TYPE** TYP **TYPE**  Goupille cylindrique mobile Zyl. Beweglicher Stift Cylindrical moving pin

TYPE TYP TYPE Goupille cylindrique fixe Fester Stift, Zyl. Cylindrical fixed pin

### STOP BLOC / ARRETIER-BLOCK / STOP BLOCK

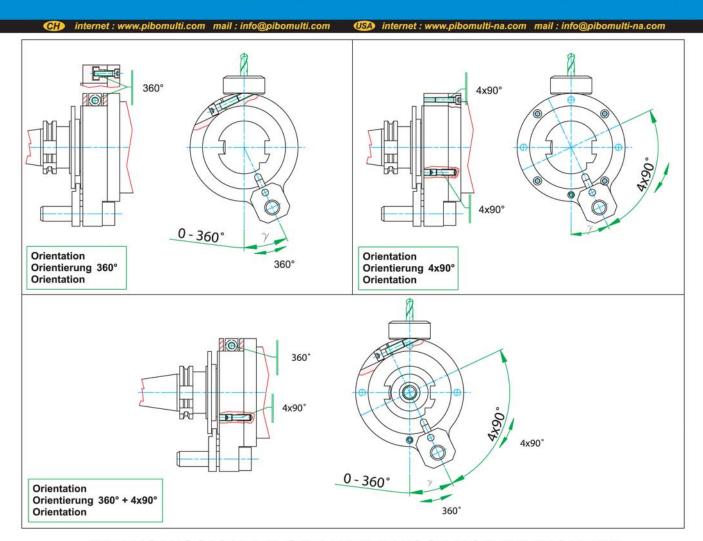


ISO HSK	R	ØD	REF.
30 / HSK 40-50	55	Ø 15 G6	076-05-206-20 (Typ C)
40 / HSK 63	65 ou 80	Ø 18 G6 Ø 18 G6	076-05-206-10 (Typ C) 076-05-206-30 (Typ A) 076-05-206-10 (Typ B-C)
50 / HSK 80-100	80 ou 100	Ø 18 G6 ou	076-05-206-30 (Typ A) 076-05-206-10 (Typ B-C)
	ou 110	Ø 28	175-265-35-00 (Typ A )

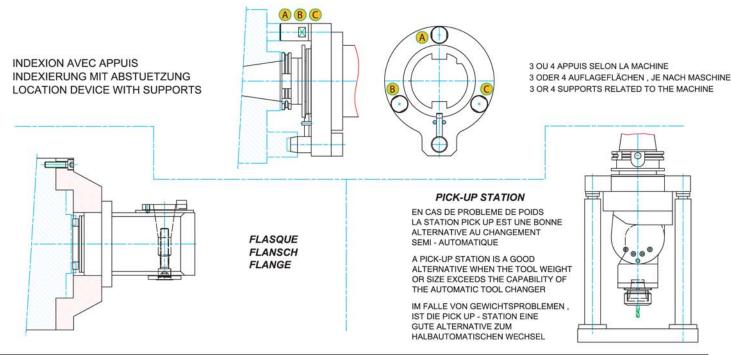




# ORIENTATION - ORIENTIERUNG - ORIENTATION



### TRANSMISSION DE GRANDE PUISSANCE ET RIGIDITE STABILITÄT UND UEBERTRAGUNG GROSSER KRÄFTE HIGH POWER TRANSMISSION AND RIGIDITY





# SOMMAIRE - ZUSAMMENFASSUNG - SUMMARY



Multiplicateurs de vitesse pour centre d'usinage ...... 44 Schnellaufspindeln für Bearbeitungszentren Spindle speeders for machining centre Schnellaufspindeln für hohe Produktivität und grosser Leistung Speeders for high productivity and big power Schnellaufspindeln für Drehmaschinen Spindle speeders for turning machines 

Technische Informationen

Technical information



**FX 300** 



XM1506

X1905

1÷6

1÷5

10'000

12'000

8'000 10'000

8 24

10 130

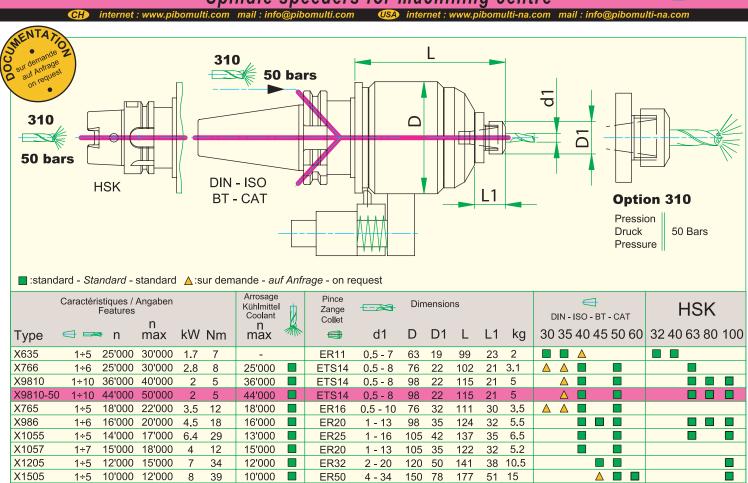




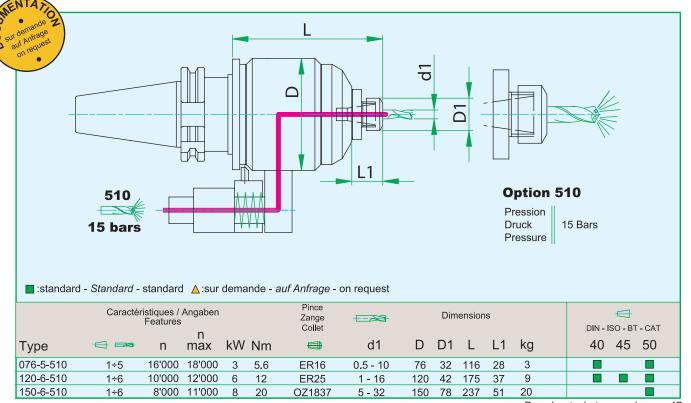
La solution Schnellauf
Spindeln
centre d'usinage
itungszentren

## Multiplicateur de vitesse pour centre d'usinage Schnellaufspindeln für Bearbeitungszentren Spindle speeders for machining centre





Données techniques voir page 47



Weldon 25

OZ1838

10 - 40

10 - 40

150 60

190

264

225

35

29

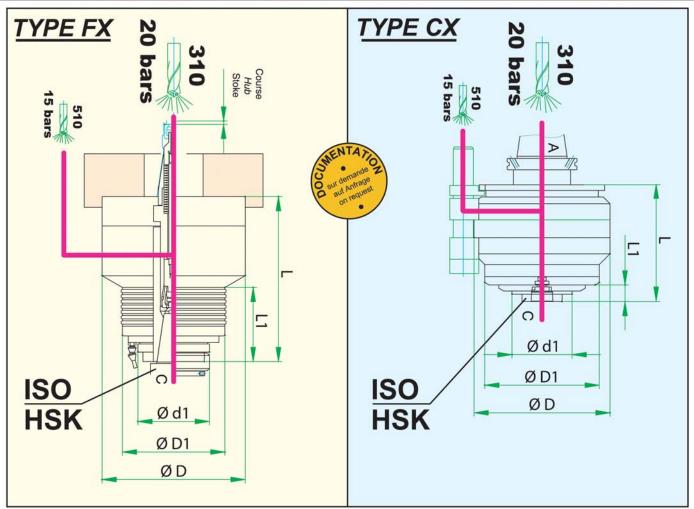
Données techniques voir page 47





Multiplicateur à grand rendement et de grande puissance Schnellaufspindeln für hohe Produktivität und grosser Leistung Speeders for high productivity and big power

30 kW



C		tiques /	Angaber	Dimensions								
Туре		n	n max.	kW	Nm	С	d1	D	D1	L	L1	kg
FX190-05	1÷5	10'000	12'000	10	130	ISO30/HSK50	121	190	150	210	130	30
FX210-04	1÷4	8'000	10'000	12	260	ISO40/HSK63	142	210	185	240	138	45
FX300-04	1÷4	6'000	8'000	20	405	ISO50/HSK100	150	300	220	346	156	110
FX375-06	1÷6	4'000	5'000	30	830	ISO50/HSK100	180	375	250	385	129	190

Données techniques voir page 47

standard - Standard - standard A:sur demande - auf Anfrage - on request

	Caractérist F	tiques / eatures		Dimensions										
Туре	0	n	n max.	kW	Nm	С	d1	D	D1	L	L1	kg	50	60
CX1905	1÷5	8'000	10'000	10	190	ISO30/HSK50	121	190	160	230	60	29		
CX2104	1÷4	8'000	10'000	12	260	ISO40/HSK63	150	210	186	240	80	38		
CX3504	1÷4	4'000	5'000	30	1000	ISO50/HSK100	190	350	290	400	197	185		

Données techniques voir page 47

# Ecrou de serrage rapide Pibomulti

### Pibomulti quick change nut

Schnellwechselmutter Pibomulti

Туре	Cône outils	d1	L	L1	L2
SER4001-000	ISO 40 DIN 2080	110	43.5	33	28.5
SER4002-000	ISO 40 DIN 69871-A ou CAT 40	110	43.5	33	28.5
SER4004-000	BT 40	110	47	37	32
SER5001-000	ISO 50 DIN 2080	150	48	37.5	30
SER5002-000	ISO 50 DIN 69871-A ou CAT 50	150	48	37.5	30
SER5004-000	BT 50	150	56.5	46	38.5

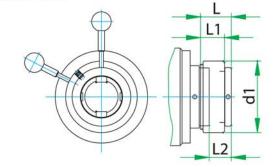
### Option 310

Pression / Druck / Pressure 20 bars Arrosage central avec entrée centrale. Innere Kühlmittelzufuhr mit Eintritt durch das Zentrum

Thru coolant with center input.

### Option 510

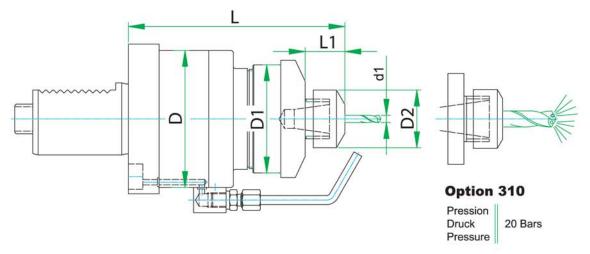
Pression / Druck / Pressure 15 bars Arrosage central avec entrée latérale. Innere Kühlmittelzufuhr mit seitlichem Eintritt. Thru coolant with side input.





## Multiplicateur de vitesse pour tour Schnellaufspindeln für Drehmaschinen Spindle speeders for turning machines





standard - Standard - standard △ :sur demande - auf Anfrage - on request

	Caract	éristiques / / Features	Angaben			Pince Zange Collet			Dimen	sions			adap	tation	VDI	
Туре	0	n	max.	kW	Nm	-	d1	D	D1	D2	L	L1	20 25	30 4	40	50
X635T	1÷5	25'000	30'000	2	7	ESX12	0.5 - 7	63	48	19	98	17			Δ	
X9810T	1÷10	36'000	40'000	2	5	ETS14	0.5 - 8	98	51	22	120	15.5				Δ
X765T	1÷5	18'000	22'000	4	12	ESX16	0.5 - 10	76	60	32	120	30				
X1055T	1÷5	8'000	12'000	6.4	29	ESX25	1 - 16	105	90	_	120	10.5				
X1205T	1÷5	12'000	15'000	7	34	ESX32	2 - 20	120	92	50	175	38		,	Δ	

Sur demande, exécution flasqué et/ou avec arrosage par le centre. Ausführung mit Flansch und/oder mit Innenkühlung auf Anfrage. Upon request, flange execution and/or with coolant thru.



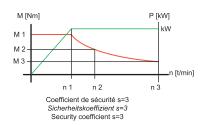


# INFORMATIONS TECHNIQUES TECHNISCHE INFORMATIONEN TECHNICAL INFORMATION

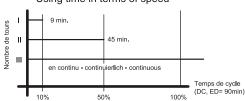


### Graphique de puissance-couple et " n " en continu Drehmoment und Dauerlaufdiagramm Power-torque and " n " in continuous diagram

Puissance et couple maxi Leistung und Drehmoment max Power and torque max



Temps d'utilisation en fonction de la vitesse Einsatzdauer in Bezug zur max. Drehzahl Using time in terms of speed



	Cou	ıple (Nm	1)	Nbr. d	e tours (	Puissance		
Туре	M1	M2	M3	n1	n2	n3	kW	
X635	7	1.6	0.54	2'320	10'000	30'000	1.7	
X766	8	2.7	0.9	3'340	10'000	30'000	2.8	
X9810	5	1	0.5	3'800	20'000	40'000	2	
X9810-50	5	1	0.4	3'800	20'000	50'000	2	
X765	12	3.3	1.5	2'800	10'000	22'000	3.5	
X986	18	4.3	2.1	3'390	10'000	20'000	4.5	
X1055	29	6.1	3.6	2'100	10'000	17'000	6.4	
X1057	12	3.8	2.1	3'180	10'000	18'000	4	
X1205	34	6.7	4.4	2'000	10'000	15'000	7	
X1505	39	15.3	6.3	2'000	5'000	12'000	8	
XM1506	24	15.3	6.4	3'180	5'000	12'000	8	
X1905	130	32	9.5	730	3'000	10'000	10	
FX190-05 / CX1905	130	32	8	730	3'000	12'000	10	
FX210-04 / CX2104	260	38	11.5	440	3'000	10'000	12	
FX300-04	405	87	24	471	2'200	8'000	20	
CX3504	1'000	280	125	300	1'000	2'300	30	
FX375-06	830	130	57	345	2'200	5'000	30	
X635T	7	1.9	0.6	2'700	10'000	30'000	2	
X9810T	5	0.9	0.5	3'800	20'000	40'000	2	
X765T	12	3.8	1.7	3'200	10'000	22'000	4	
X1055T	29	7.7	5.1	2'100	8'000	12'000	6.4	
X1205T	34	7.6	5	2'250	10'000	15'000	8	

	Nbr. de	e tours (	t/min)
Туре	ı	Ш	III
X635	30'000	25'000	20'000
X766	30'000	25'000	20'000
X9810	40'000	36'000	28'800
X9810-50	50'000	44'000	35'200
X765	22'000	18'000	14'400
X986	20'000	16'000	12'800
X1055	17'000	13'000	10'400
X1057	18'000	15'000	12'000
X1205	15'000	12'000	9'600
X1505	12'000	10'000	8'000
XM1506	12'000	10'000	8'000
X1905	10'000	8'000	6'400
FX190-05 / CX1905	12'000	10'000	8'000
FX210-04 / CX2104	10'000	8'000	6'400
FX300-04	8'000	6'000	4'800
CX3504	5'000	4'000	3'200
FX375-06	5'000	4'000	3'200
X635T	30'000	25'000	20'000
X9810T	40'000	36'000	28'800
X765T	22'000	18'000	14'400
X1055T	12'000	8'000	6'400
X1205T	15'000	12'000	9'600



: entrée - sortie

: t/min 50% DC

kW : puissance en kW (n) Nm : Couple Nm (n) kg : poids en kg DC,ED : durée du cycle 90 min



Technische Daten

: Eingang - Ausgang : U/Min 50% DC n max. : U/Min 10% DC

kW : Leitung kW (n) Nm: Drehmoment Nm (n) kg : Gewicht in kg DC,ED : Zyklusdauer 90 Min



Technical data

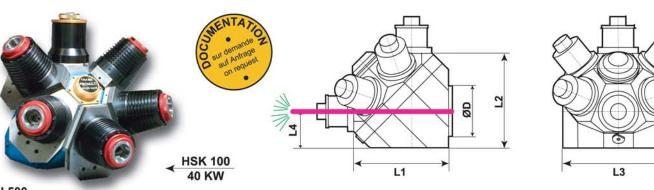
 : Input - output : rpm 50% DC n max. : rpm 80% DC DC,ED: duty cycle 90 Min

kW: power in kW (n) Nm: torque Nm (n) kg : weight in kg



# Données techniques Technische Daten Technical data

		TRI 150	TRI 200	TRI 300	TRI 400	TRH 300	TRH 400	TRH 500	TRH 800	TRA 200
NOMBRE DE POSITIONS ANZAHL STATIONEN NUMBER OF STATIONS		2-4-6	2-4-6-8	2-4-6	2-4-6	2-4-6-8	2-4-6-8-12	2-4-6-8	2-4-6-8	2-3-4
PUISSANCE TRANSMISSIBLE ÜBERTRAGBARE LEISTUNG TRANSMITTING POWER	kW max.	3.7	7	12	22	12	22	40	40	7
COUPLE TRANSMISSIBLE DREHMOMENT TRANSMITTING TORQUE	Nm	60	110	250	700	250	700	1700	3000	110
VITESSE DE ROTATION MAX. MAX SPINDELDREHZAHL MAX ROTATION SPEED	rpm	18'000	16'000	15'000	11'000	15'000	11'000	6'000	4'000	16'000
REPETABILITE DE LA POSITION WIEDERHOLBARKEIT DER SPINDELPOS. REPEAT OF SPINDLE POSITION		+/- 2" (0.0016 mm)	+/-2" (0.0020mm)	+/-2" (0.0025 mm)	+/-2" (0.003 mm)	+/- 2" (0.0025 mm)	+/-2" (0.003 mm)	+/- 2" (0.0035 mm)	+/-2" (0.004 mm)	0.01 mm
PRECISION DE POSITIONNEMENT POSITIONIERGENAUIGKEIT PRECISION OF POSITIONNING		+/-6" (0.005 mm)	+/- 6" (0.006 mm)	+/-6" (0.007 mm)	+/-6" (0.010 mm)	+/-6" (0.007 mm)	+/-6" (0.01 mm)	+/- 5" (0.01 mm)	+/-5" (0.0125 mm)	0.01 mm
TEMPS D'INDEXION 1/6 DE TOUR INDEXIERUNGSZEIT 1/6 DER DREHUNG INDEXING TIME 1/6 OF ROTATION	s.	0.6	0.8	1	1.5	1	1.5	2.5	2.5	0.8
ENCOMBREMENT PLATZBEDARF DIMENSION	L1 (mm) L2 (mm) L3 (mm) L4 (mm) ØD (mm)	160 160 170 75 85	210 210 220 100 100	270 270 290 125 135	390 390 420 180 200	280 280 340 105 135	375 375 440 145 200	505 505 570 220 270	740 740 820 320 300	240 290 370 64
POIDS SANS OUTILLAGE GEWICHT OHNE WERKZEUG WEIGHT WITHOUT TOOL	kg	30	55	100	350	100	350	600	2000	100
ENTREE D'ARROSAGE PAR LE CENTRE INNERE KÜHLMITTELZUFUHR COOLANT THROUGH	bars	50 (option 100)	50 (option 100)	50 (option 100)	50 (option 100)	50 (option 100)	50 (option 100)	50	50	50 (option 100)
PRESSION D'HUILE POUR INDEXION OELDRUCK FÜR REVOLVERINDEXIERUNG OIL PRESSURE FOR TURRET INDEX	bars	20 à 50	20 à 50	20 à 50	20 à 50	20 à 50	20 à 30	20 à 30	20 à 30	20 à 50



**TRH 500** 



Un partenaire complet Une solution globale

# Ein kompletter Partner Eine globale Lösung

A complete partner A global solution

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4 Multispindle Heads / 184 Spindles



Maîtrise global de l'usinage par l'apport d'accessoires PIBOMULTI Durch PIBOMULTI-Zubehör beherrschen Sie alle Bearbeitungsaufgaben PIBOMULTI accessories allow total control of the design and manufacture process



# Un savoir-faire incomparable

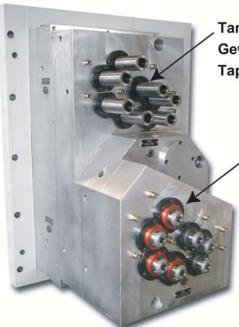
50

# Unvergleichbares know-how

# Matchless know-how

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Taraudage Gewindeschneiden Tapping

> Perçage Bohren Drilling



Fraisage, perçage et taraudage sans changer d'outil

Fräsen, Bohren und Gewindeschneiden ohne das Werkzeug zu wechseln

milling, drilling and tapping without changing the tool



Entraxes réduits (dès 4.5 mm) Vitesse de rotation jusqu'à 40.000 min-1

Geringer Achsabstand (ab 4.5 mm)
Drehzahlen bis 40.000 min-1

Small spindle axis distance (from 4.5 mm)
Revolution up to 40'000 min-1







De l'horlogerie au moteur de bateau

Von der Uhrenindustrie bis zum Schiffsmotor

From watchmaking to shipbuilding



# Une solution Zu jedem Problem eine Lösung

# A solution to each problem

### Tête de taraudage à patronne Gewindeschneidkopf mit Leitpatrone Tapping head with lead screw

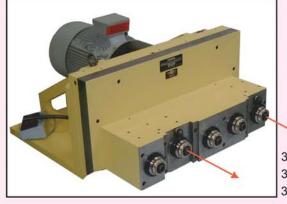


Différents pas dans la même opération Verschiedene Steigung in der gleichen Operation With different pitches in the same operation

Avec contrôle électrique Mit elektrischer Kontrolle With electrical control



### Têtes à broches alternées Köpfe mit abwechselnden Spindeln Multi heads with alternating spindles



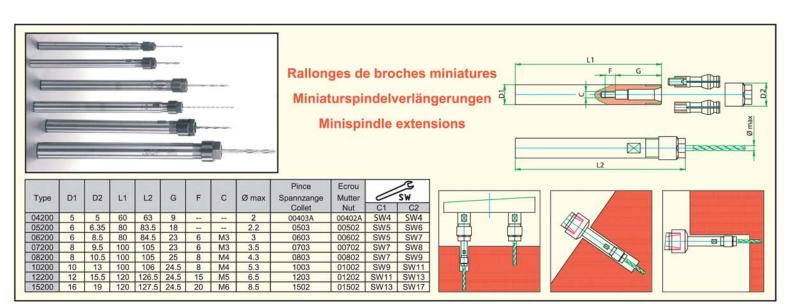


3 broches fixes / 2 mobiles

3 fixe Spindeln, 2 Vorschübe Spindeln

3 fixed spindles, 2 stroke spindles







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### Parc machines

### Centres d'usinage de haute précision :

- DIXI 200 à palettes, 4 axes, 120 outils 1000x800x1000 mm
- · OKUMA MA 40H A 6 palettes, *4 axes*,150 outils 560x610x560 mm
- . OKUMA MA 600 HB *6 palettes*, 150 outils, 1000x800x900 mm
- · 3 x MIKRON VCE, 3 axes 1250x508x675 mm

#### Fraisage CNC:

- · REIDEN BF23, *5 axes* 3000x1500x1200 mm
- · REIDEN BF2, 5 axes
- 1200x700x750 mm
- Fraisage conventionnel max. 1500x1000x750 mm
- · VERNIER ; HURON ; etc.

### Tournage CNC 2 - 3 axes:

15 tours avec outils motorisés passage ø 80
 710x2000 mm

### Centre de tournage fraisage :

- 3 tours CNC 5 axes, 72 outils 610x1500 mm

### Machines à pointer / Aléseuse :

- 5 SIP HYDROPTIC 6A 1000x700x800 mm
- . SIP HYDROPTIC 7A 1400x1000x1000 mm
- · 3 aléseuses DIXI 75 1000x1000x900 mm
- · 3 SIP MP3K 520x380x350 mm

### Rectifiage :

- 1 rectifieuse CNC STUDER ext. int. 3 broches 1600 x 450
- · 2 rectifieuses CNC, extérieur max. 350x1250 mm
- · 1 rectifieuse VOUMARD CNC 150, 3 broches
- · 5 rectifieuses VOUMARD 3A et 5A
- · Rectifiage filet REISHAUER
- · Rectifiage centre
- · 5 Planeuses max. 2000x500x400 mm

## Machine à tailler et rectifier les engrenages CNC, capacité module 3

· Machine à raboter les engrenages, module 2

#### **Electro-érosion AGIE**

#### Honage

· Machine à honer SUNNEN

### **Gravage laser**

· 1 machine de gravage laser

#### Contrôle 3D

· 2 machines à mesurer 3D DEA, 3.5+41/1000 1500x1000x900 mm

### internet / mail CH:

http:\\www.pibomulti.com info@pibomulti.com

### internet / mail USA:

http:\\www.pibomulti-na.com info@pibomulti-na.com

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