

WHN(Q) 13/15 CNC

**HORIZONTAL MILLING
AND BORING
MACHINES**



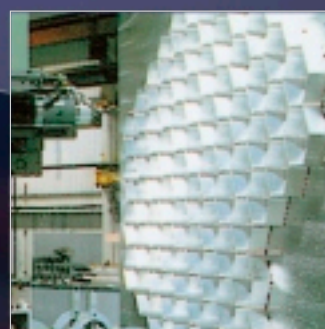
WHN 13/15 CNC



WHQ 13/15 CNC

WHN 13/15 MC

WHQ 13/15 MC



04/2013



TOS VARNSDORF a.s.

2013 PEOPLE AND MACHINES
TOS

New goals need new solutions

ABOUT COMPANY

www.tosvarnsdorf.com

Company TOS VARNSDORF a.s. situated in Varnsdorf, Czech Republic has a years-lasting tradition in machine tool production. The company was founded, under the name of Arno Plauert Machine Works, as early as 1903 and up to now it grew up into a big engineering company, known with its products all around the world.

The company's manufacturing program is based on the development, manufacture and sale of machine tools, integrated with a wide offer of services, such as:

- training for operators and maintenance workers
- technological studies
- installations of new machines
- warranty and after-warranty (extended) servicing
- spare parts sales
- overhauls and modernizations

In addition, the company provides for the services in the form of outwork offers (Metalworking, Measuring services, Chemical and Heat Treatment of Metals).

High engineering standards of TOS VARNSDORF a. s. products were recognized in 1996 when the company was awarded the ISO 9001 certificate.



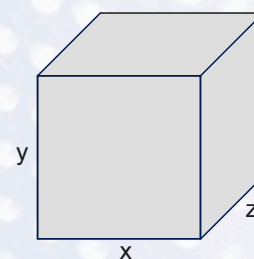
PRODUCTION PROGRAM

PRODUCTION OF MACHINE TOOLS

- HORIZONTAL MILLING AND BORING MACHINES
- FLOOR TYPE HORIZONTAL BORING MILLS
- MACHINING CENTRES
- PORTAL TYPE MACHINING CENTRES
- SPECIAL MACHINES
- ACCESSORIES

SERVICES

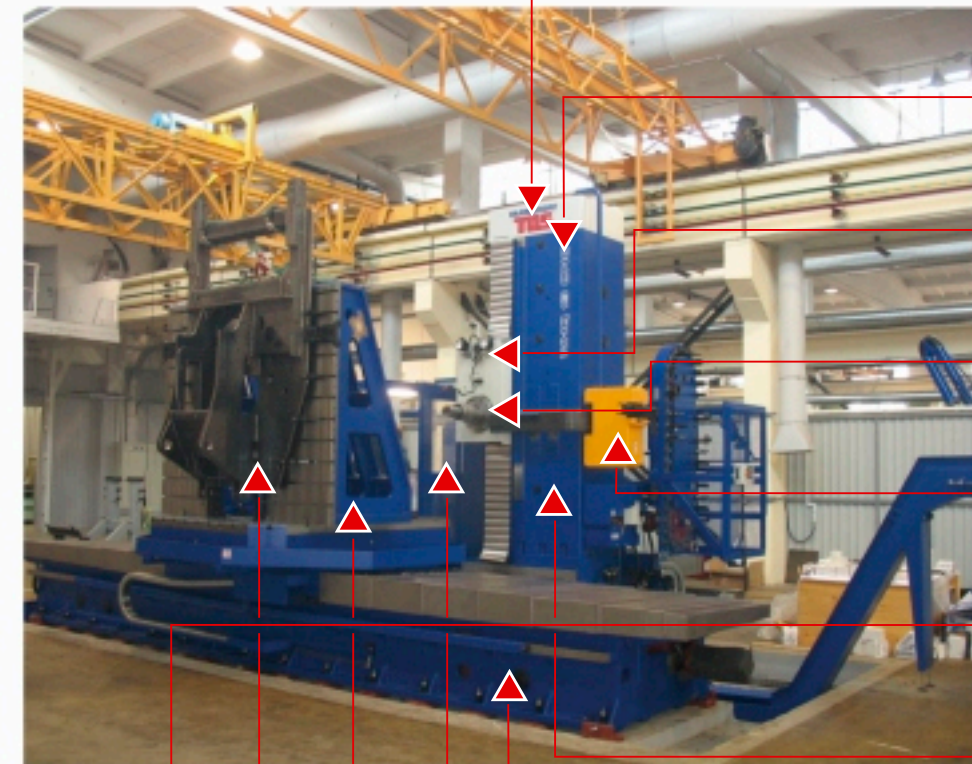
- TECHNOLOGICAL SUPPORT: TRAINING, TECHNOLOGICAL STUDIES, ETC.
- SPARE PARTS, OVERHAULS AND MODERNIZATIONS
- COOPERATION (METALWORKING, MEASURING SERVICES, CHEMICAL AND HEAT TREATMENT OF METALS)



>1 m³ (0.01mm)

x > 1 m
y > 1 m
z > 1 m

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HORIZONTAL MILLING AND BORING MACHINE WHN(Q) 13/15 CNC

www.tosvarnsdorf.com

The WHN(Q) 13/15 CNC horizontal milling and boring machine is an universal machine tool designed for precise milling, coordinate boring, the boring and cutting of box and plate screws and complicated workpieces with a weight of up to 25,000 kg.

The WHN(Q) 13/15 CNC is the most successful machine in the company's production range. The first model of this machine was produced in 1969.

The fact that to date more than 2,000 of these machines have been manufactured bears witness to the success of the WHN(Q) 13/15 CNC.

It stands out mainly thanks to the ratio of its utility properties to its purchase price. Users also appreciate the machine structure, which guarantees high rigidity and reliability, high technical parameters and the wide range and comfort of the technological functions.

X	max.	6,000 mm	236.2 inch
Y	max.	3,500 mm	137.8 inch
Z	max.	3,200 mm	126 inch
W		900 mm	35.4 inch



NEW DESIGN

WHN(Q) 13/15 CNC – TECHNICAL PARAMETERS

BASIC SPECIFICATIONS

Headstock with traveling spindle	Headstock R	Headstock N	Headstock „15“
Spindle diameter	130 mm 5.1 inch	130 mm 5.1 inch	150 mm 5.9 inch
Spindle taper	ISO 50 / ISO 50 BIG+	ISO 50 / ISO 50 BIG+	ISO 50 / ISO 50 BIG+
Spindle speed range	10 - 3,000 RPM	10 - 1,500 RPM	10 - 3,000 RPM
Main motor power (S1 / S6-60)	37 / 46 kW 49.6 / 61.7 HP	37 / 46 kW 49.6 / 61.7 HP	46 / 55 kW 61.7 / 73.8 HP
Spindle stroke W	800 mm 31.5 inch	800 mm 31.5 inch	900 mm 35.4 inch
Headstock with non-traveling spindle			
Spindle taper	ISO 50 / ISO 50 BIG +		
Spindle speed range	10 - 5,000 RPM		
Main motor power (S1 / S6-60)	28 / 35 kW 37.6 / 46.9 HP		
Column			
Headstock vertical travel Y	2,000; 2,500; 3,000; 3,500 mm 78.7; 98.4; 118.1; 137.8 inch		
Column longitudinal travel Z	1,250; 1,600; 2,200; 3,200 mm 49.2; 63; 86.6; 126 inch		
Table			
Workpiece weight max.	12,000 / 25,000 kg 26.455 / 55.125 lbs		
Table clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 2,000 x 3,000 mm (18,000 kg); 2,500 x 3,000 mm (16,000 kg) 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch 78.7 x 118.1 inch (39,690 lbs); 98.4 x 118.1 inch (35,280 lbs)		
Table transverse travel X	2,000; 3,500; 4,000; 5,000; 6,000 mm 78.7; 137.8; 157.5; 196.9; 236.2 inch		
Tilting table			
Workpiece weight max.	16,000 kg 35,280 lbs		
Tilting range	0 - 5°		
Automatic pallet change			
Pallet clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch		
Workpiece weight max.	16,000 kg 35,280 lbs		
Number of pallet in system	2		
Time of pallet change	120 sec		
Feeds			
Feed range - X, Y, Z	4 - 5,000 (8,000)* mm.min ⁻¹ 0.16 - 197 (315.2)* inch.min ⁻¹		
Feed range - W	4 - 5,000 mm.min ⁻¹ 0.16 - 197 inch.min ⁻¹		
Feed range - B	0.003 - 1.5 RPM		
Rapid traverse - Y, Z	10,000 (12,000)* mm.min ⁻¹ 394 (472.4)* inch.min ⁻¹		
Rapid traverse - W	10,000 mm.min ⁻¹ 394 inch.min ⁻¹		
Rapid traverse - X = 2,000; 3,500 (S12)	10,000 (12,000)* mm.min ⁻¹ 394 (472.4)* inch.min ⁻¹		
Rapid traverse - X = 2,000; 3,500 (S25)	8,000 mm.min ⁻¹ 315.2 inch.min ⁻¹		
Rapid traverse - X = 4,000; 5,000; 6,000	8,000 mm.min ⁻¹ 315.2 inch.min ⁻¹		
Rapid traverse - B S12 / S25	2 / 1.5 RPM		

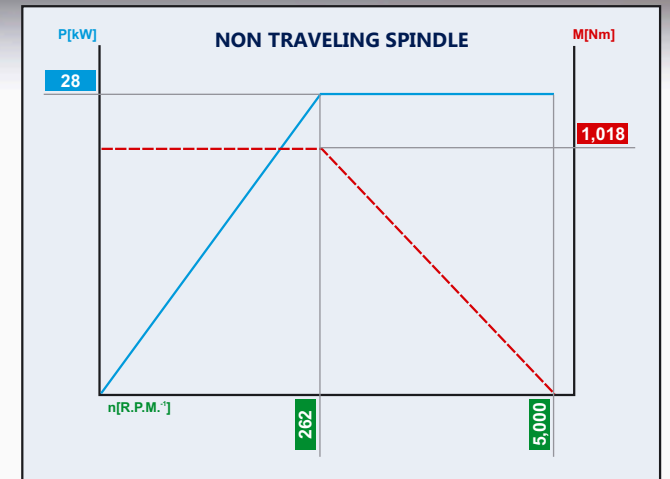
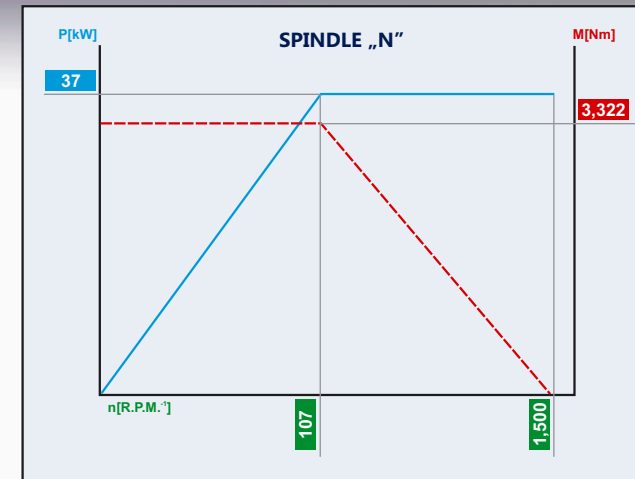
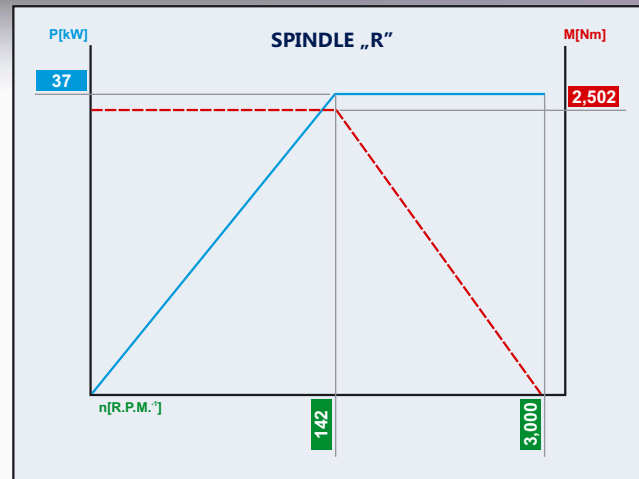
* option

THE HEADSTOCK

contains all the spindle bearings and the spindle driving mechanism as well as the ones for the longitudinal travel of the live spindle (W-axis).

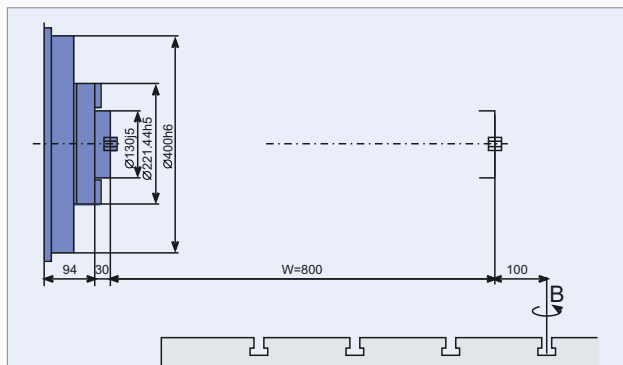
The main housing of spindle heads consists of an assembly of hollow and work spindles. The hollow spindle (quill) is housed in precision spindle oblique-contact ball bearings in a multiple pre-stressed design.

The work spindle is nitrided, hardened and mounted to slide with a minimum clearance in the hollow spindle. Clamping of tools is lever operated; the clamping force is created by plate springs; hydraulically controlled process of releasing. Also, the customer may request the tool clamping in the BIG-PLUS system. During the automatic tool change, the taper is cleaned with pressure air.



WHN(Q) 13 CNC

SPINDLE TYPE	Headstock R	Headstock N
Main motor power S1/S6-60	37 / 46 kW 49.6 / 61.7 HP	37 / 46 kW 49.6 / 61.7 HP
Max. spindle torque S1/S6-60	2,502 / 3,111 Nm 1,845 / 2,294 ft lb	3,322 / 4,132 Nm 2,450 / 3,047 ft lb
NON TRAVELING SPINDLE		
Main motor power S1/S6-60	28 / 35 kW	37.6 / 46.9 HP
Spindle torque S1/S6-60	1,018 / 1,265 Nm	751 / 933 ft lb



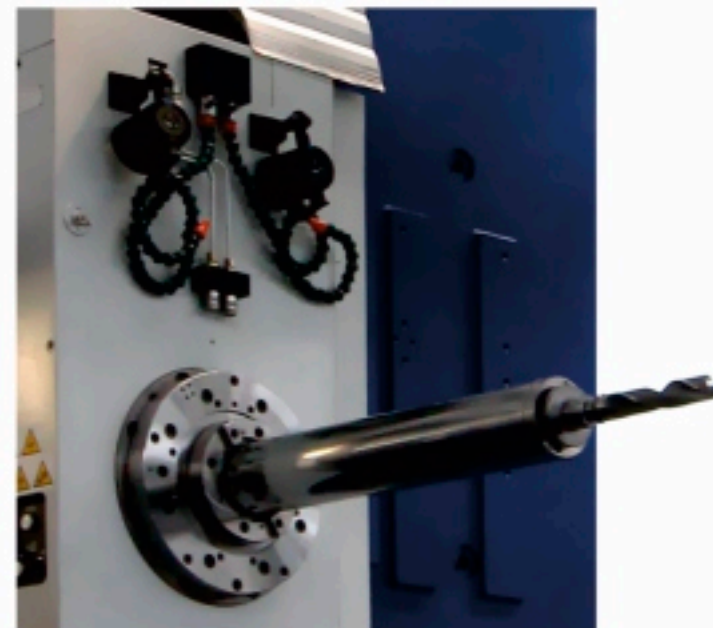
WHN(Q) 15 CNC

THE HEADSTOCK „15“ - SPINDLE DIAMETER 150 MM // 5.9 INCH

In case of customer's wish the machine can be deliver in design „15“ with spindle diameter of 150 mm // 5.9 inch.

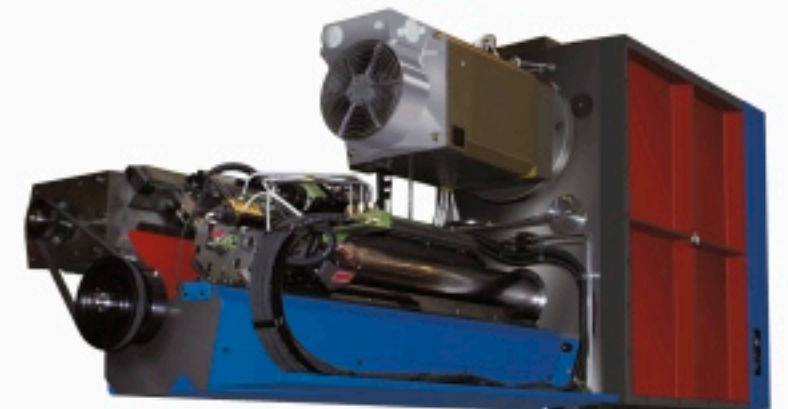
BASIC TECHNICAL PARAMETERS

Spindle diameter	150 mm	5.9 inch
Spindle speed range	10 – 3,000 RPM	
Main motor power S1	46 kW	61.7 HP
Max. spindle torque S1	3,100 Nm	2,286 ft lb
Spindle stroke W	9900 mm	35.4 inch



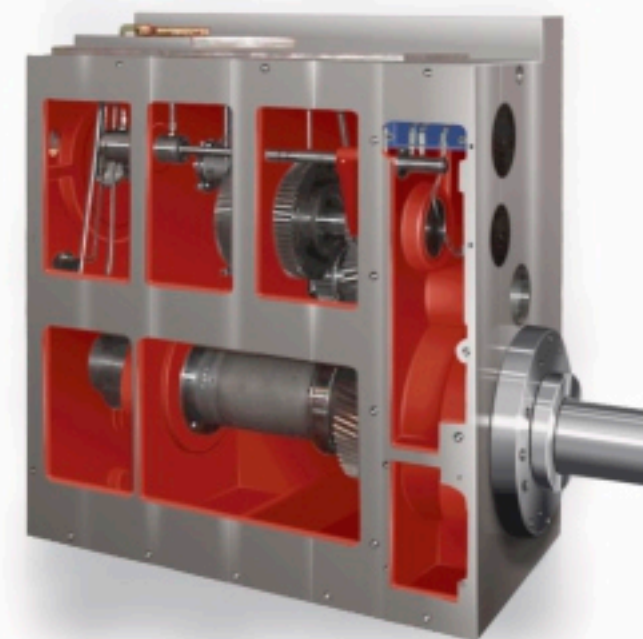
THE SPINDLE PULLOUT

is accomplished using an independent servo-drive. Equipment for sensing the revolutions of the spindle and for measuring the spindle pullout using a HEIDENHAIN electrical-optical linear measuring scale is located on the headstock tail.



THE SPINDLE DRIVE

has been resolved in two mechanical rows banked automatically by hydraulic feeding attachments.



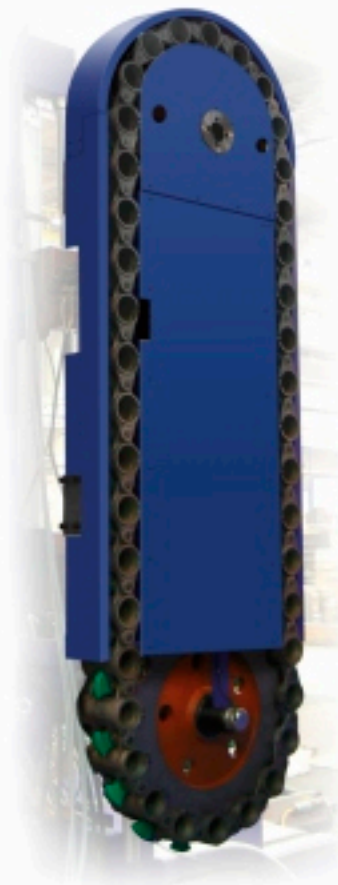
WHN(Q) 13/15 CNC – AUTOMATIC TOOL CHANGE (ATC)

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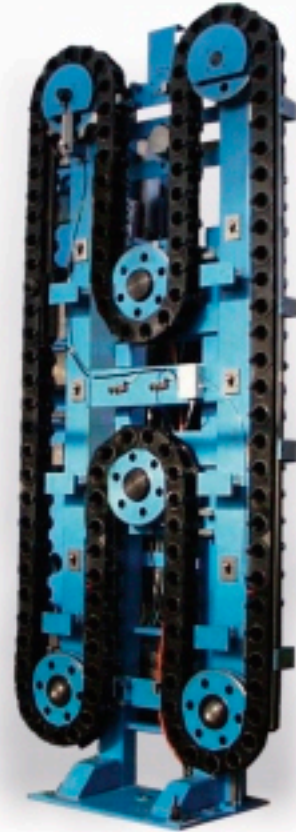
ATC consists of a chain or loop type tool magazine and horizontally traversing manipulator with rotating two-arm hand, manipulator is fitted to the back of the column (basic design for 40 or 60 tools). The ATC equipment adapted with respect to the tool standard can be as follows:

CSN 22 0432
CSN 22 0434
DIN 69871
BT 50 MAS 403-1982
CAT ANSI/ASME B5.50-1985

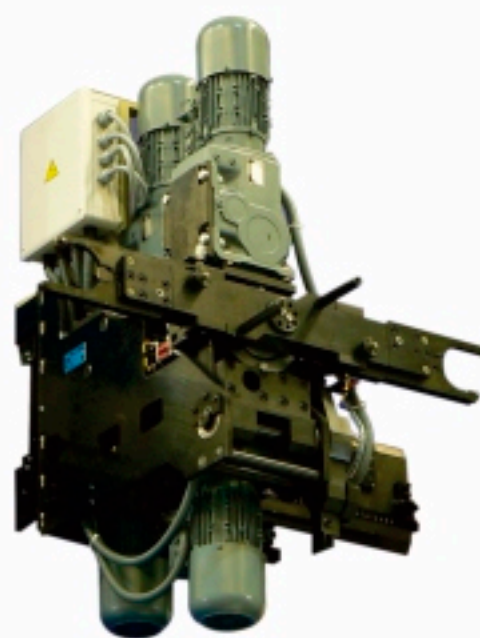
CHAIN MAGAZINE



LOOP MAGAZINE



TOOL MANIPULATOR



(ATC) CONTROL PANEL



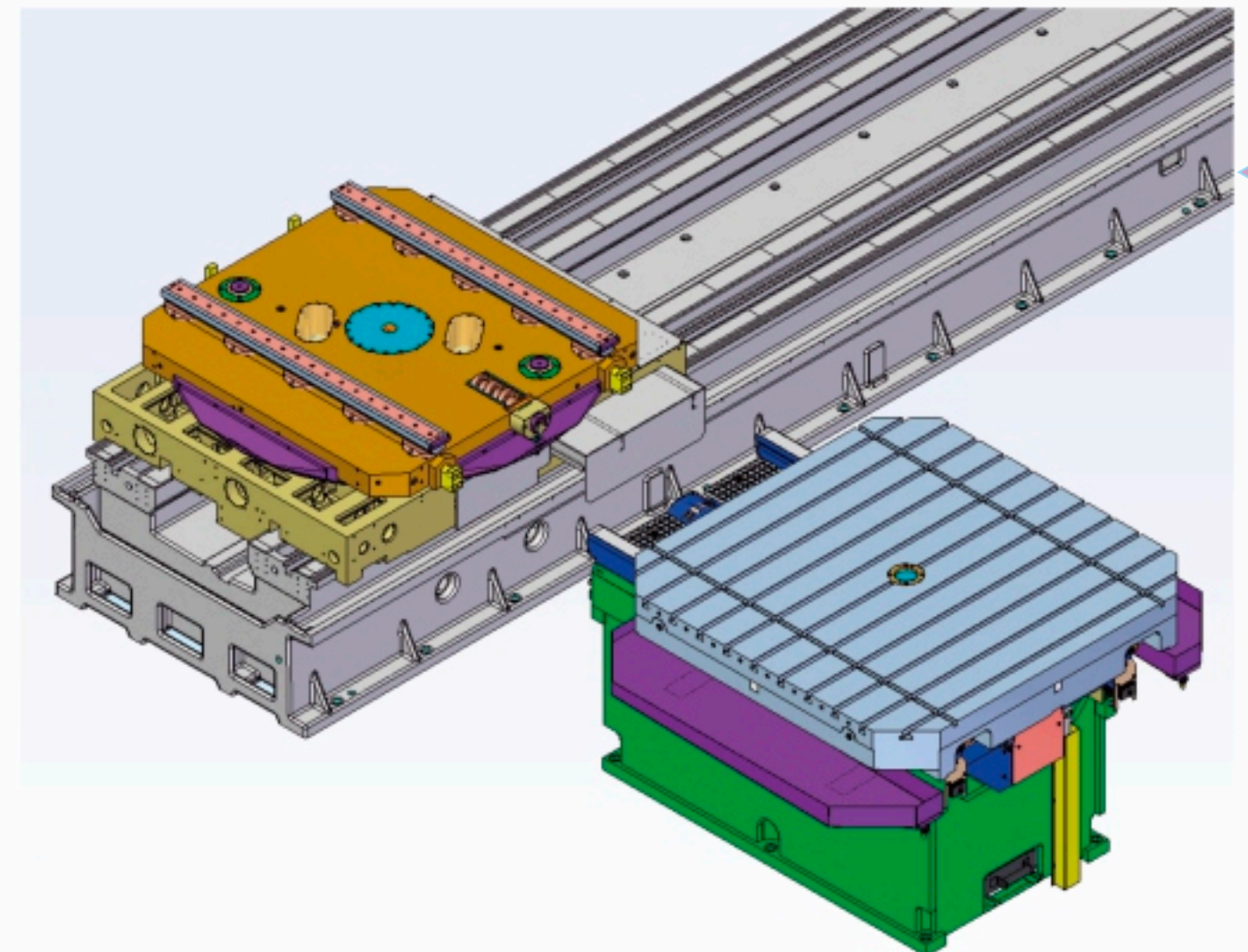
Quantity of pockets in magazine	40, 60, 80*, 120*
Pitch of pockets in magazine	130 mm 5.1 inch
Tool dia max	
- with fully loaded magazine	125 mm 4.9 inch
- with free neighbouring places	320 mm 12.6 inch
Tool length max.	500 mm 19.7 inch
Tool weight max.	25 kg 55.1 lbs
Total tool change time	15 sec

* stationary magazine beside column

WHN(Q) 13/15 CNC – AUTOMATIC PALLET CHANGE (APC)

Concept of the pallet change system is based on automatic change of production pallets between pallet stations, which are equipped with pallet changing mechanism, and a pallet clamping base on the machine saddle. Pallet is arrested on the clamping base by Hirths tooth system (center rings and base of the pallets) and it is clamped by cup springs, unclamping of pallet is hydraulic. Dimensions of pallet and T-slots are given with ISO standard. When two pallet system is used, pallets are changed directly between stations and the pallet base.

Pallet clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch
Workpiece weight max.	16,000 kg 35,280 lbs
Size of T-slots	22H8 mm 0.87H8 inch
Number of pallet in system	2
Time of pallet change	120 sec

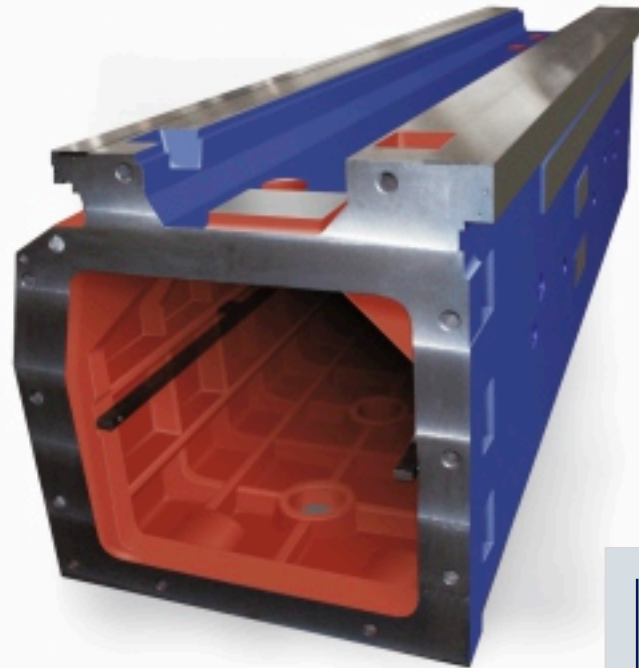


WHN(Q) 13/15 CNC – DESIGN OF MACHINE GROUPS

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COLUMN

The structure and ribbing of the column mouldings guarantee their high rigidity.



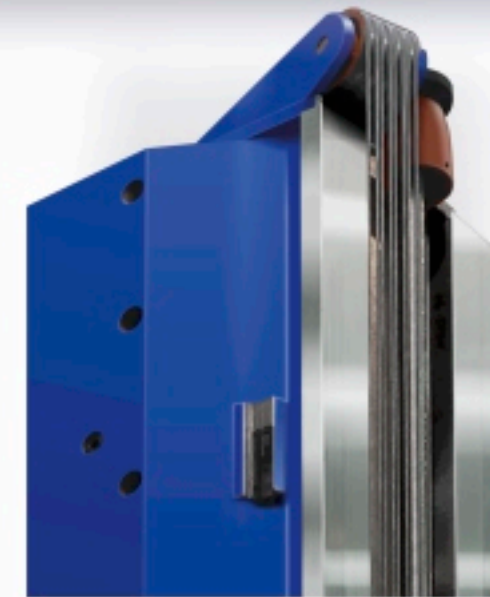
THE FEED DRIVES

are equipped with digitally controlled AC servo-drives from Siemens. There is a clearance-free gearing in between the servo-drive and the round-headed screw in order to achieve increased shearing force.



THE GUIDE WAYS

Main guide ways for the longitudinal and cross beds and the columns are equipped with hardened and grinded steel lining strips. The mating face of the column slide, the table slide and the lower cylindrical surface of the table are covered in a layer of plastic with a low friction coefficient.



HEADSTOCK COMPENSATION

The weight of headstock is compensated by opposite plumb fixed over pulleys on set of ropes in column cavity.



THE ELECTRIC OUTFIT

The electrical installation is mostly wired into an independent electrical box. It contains a basic control system module, components controlling the servo- and spindle-drives plus other electrical elements supplied by leading specialized companies. The electrical box is cooled by a unit integrated into the box door.



THE OPERATOR PLATFORM

The WHN(Q) 13/15 CNC machine in standard execution is equipped with operator platform upon which the central control panel is placed. The operator platform is autonomously convertible-vertically and parallel with spindle axis as well.



ROTATION CLAMPING TABLE

Table rotation is realized as by CNC controlled positioning (one pinion drive), or as connected controlled (2 pinion drive controlled by Master - Slave system). It is in its center equipped by rotation sensor, which gives the possibility of automatic table positioning with increment of 0,001°.



HYDRO-AGGREGATE

Guideways of X, Y, Z and B axes are lubricated automatically by means of oil metering unit placed together with hydro-aggregate in the separate energobox.



WHN(Q) 13/15 CNC – MACHINE CONTROL

www.tosvarnsdorf.com

**THE WHN(Q) 13/15 CNC MACHINE IS NORMALLY CONTROLLED
BY THE HEIDENHAIN iTNC 530, SINUMERIK 840 D OR FANUC 31i CONTROL SYSTEM**

All types of control systems in basic configuration consists of:

- basic electronic module
- collar LCD display unit
- operational panel with keyboard
- portable auxiliary control panel with an electronic handwheel.

In addition, control system functions and equipment may be equipped with:

- measuring touch probes

- network interface allowing remote diagnostics

All offered systems provide full control of 5 machine axes (**X, Y, Z, W** and **B**) plus spindle rotation (**C**).

An independent digital AC servo-drives applied with all convertible groups allow for simultaneous interpolation:

- linear - upto 5 axes
- circular
- helical

Option: continuously controlled **B** axis

**CONTROL PANEL
OF SINUMERIK 840 D
CONTROL SYSTEM**



**CONTROL PANEL
OF HEIDENHAIN iTNC 530
CONTROL SYSTEM**



**CONTROL PANEL
OF FANUC 31i
CONTROL SYSTEM**



**PORTABLE
CONTROL PANEL
SINUMERIK**



**PORTABLE
CONTROL PANEL HEIDENHAIN
(OPTION TYPE HR 520)**



WORKPIECE AND TOOL PROBES

WE DELIVER THE FOLLOWING PROBES AS STANDARD:

MEASURING TOOL PROBE for the system:		
iTNC 530	HEIDENHAIN TT 140	measuring touch probe with cable transport
iTNC or Sinumerik 840D	RENISHAW TS 27 R	measuring touch probe with cable transport
MEASURING WORKPIECE PROBE for the system:		
iTNC 530	HEIDENHAIN TS 220	measuring touch probe with cable transport
	HEID. TS 640 + SE 640	measuring touch probe with optical transport
iTNC or Sinumerik 840D	RENISHAW OMP 60 - set	measuring touch probe with optical transport
	RENISHAW RMP 60 - set	measuring touch probe with wireless transport
	M+H 20.41 Multi	measuring touch probe with wireless transport

TOOL CONTROL PROBE



MEASURING TOUCH PROBE



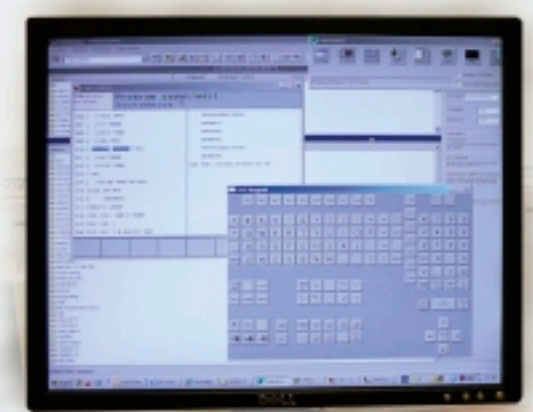
WE ALSO OFFER A SYSTEM OF SERVICES FOR THE PERMANENT SUPPORT OF CUSTOMERS:

TOSmessage

- ensures communication between the machine's control system and the customer's mobile phone. The customer is informed about the predefined statuses of the machine, e.g. the completion of an automatic cycle or possibly program interruption.

TOSwide

- the remote diagnostic system allows our service engineer to obtain required data about the status of the machine necessary to specify possible diagnostic messages about the non-standard condition of the machine's control system.



WHN(Q) 13/15 CNC – OPTIONAL ACCESSORIES

www.tosvarnsdorf.com

MILLING HEADS

HPR 50



The HPR 50 and HUR 50 heads are used for machining the surfaces that are oriented in the basic direction (also generally) with regard to the orthogonal coordinate system of the machine.

HUR 50

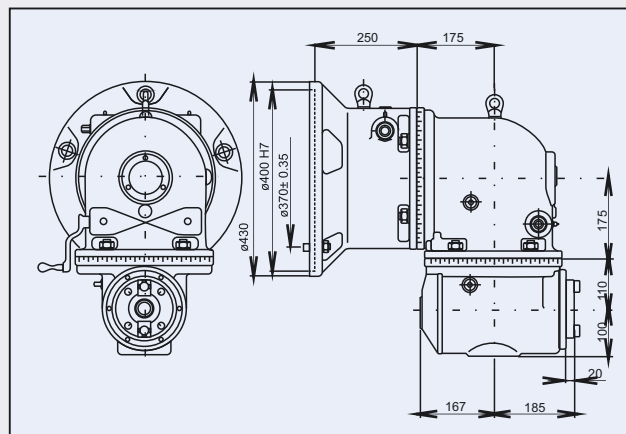


The HUI 50 head is automatically indexed on both the planes with an increment of 2.5°, providing higher efficiency during the turning of the head spindle with regard to the orthogonal coordinate system of the machine.

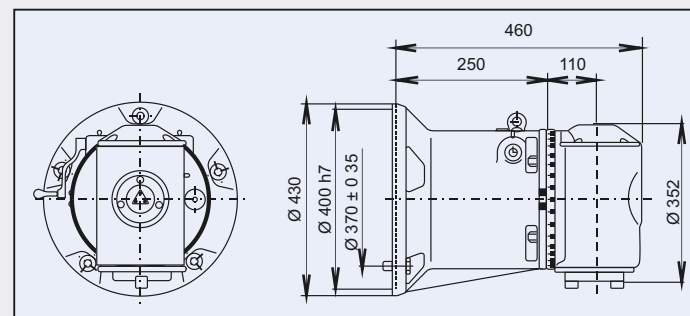
HUI 50



UFP 50-13
universal milling head



FP 50-13
vertical milling head



FASTENING OF MILLING HEADS

MANUAL FASTENING

Manual fastening of the head on the machine is carried out by means of a lifting device.

HALF-AUTOMATIC FASTENING

HALF-AUTOMATIC FASTENING
The head is fixed to the machine also in a half-automatic way from an auxiliary rack. The auxiliary rack is manually locked on hinged arms on the table.

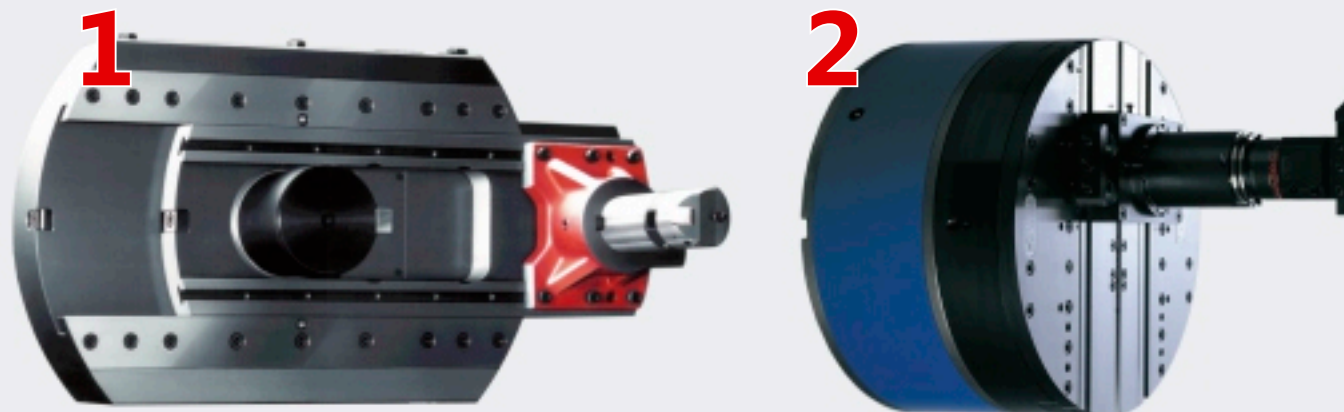
AUTOMATIC FASTENING

Automatic fastening of the head (facing head) on the machine is carried out by means of an accessory magazine. Its execution is subject to prior consultation with the manufacturer.



FACING HEAD

Facing head LD 650 (1) or D'Andrea (2) are used for demanding technological operations with the possibility of continuous CNC control of the slide position.



**ANOTHER OPTIONAL ACCESSORIES
YOU CAN FIND ON www.tosv.com**

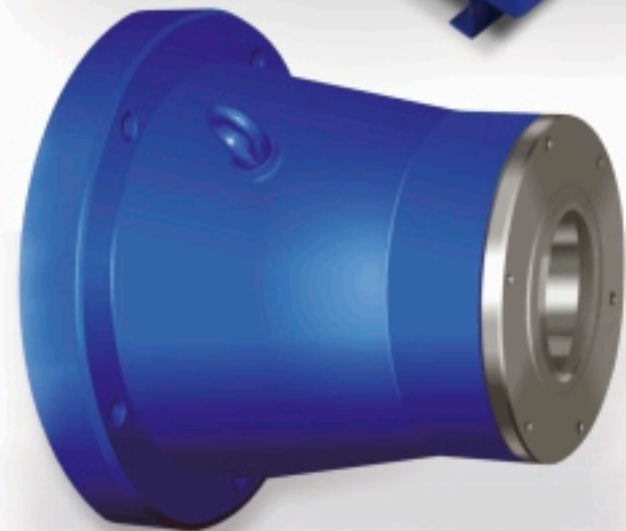
N www.tosvarnsdorf.cz/en/products/accessories/

WHN(Q) 13/15 CNC – OPTIONAL ACCESSORIES

www.tosvarnsdorf.com

TOOL COOLING DEVICE

Customer may choose either CHZ 13/15 outer tool cooling kit or CHOV 13/15 through spindle tool cooling kit which brings coolant to the cutting edge through outsider nozzles as well. Possible choose is 10, 20, 30 or 40 bar.



SPINDLE SUPPORT

The spindle support ensures a significant increase in the rigidity of the work spindle in the case of larger pullouts.

CLAMPING ANGLE PLATES

Clamping angle plates are supplied in the following sizes as standard: 800; 950; 1,120; 1,450; 1,620; 2,000; 2,500; 3,000; 3,500 mm // 31.5; 37.4; 44.1; 57.1; 63.8; 78.7; 98.4; 118.1; 137.8 inch.



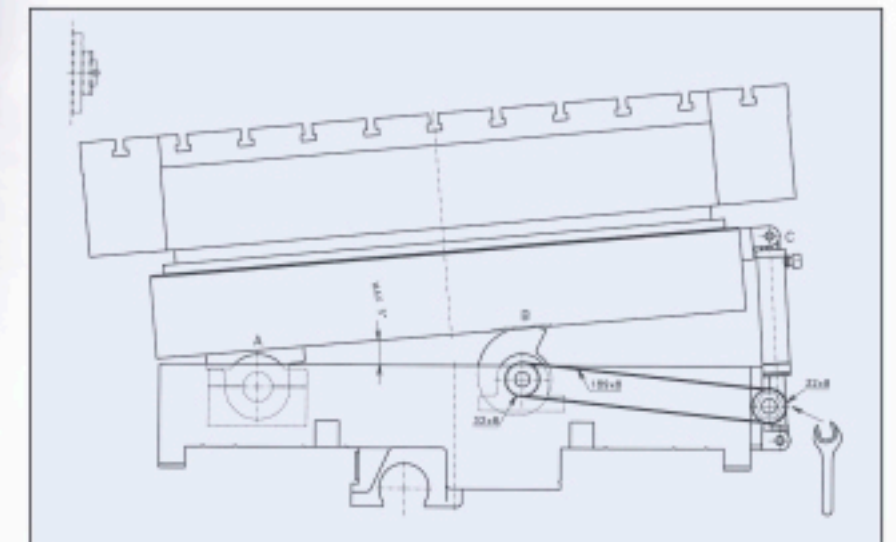
CLAMPING CUBES

UK 500; UK 1000; UK 2000; UK 2500



TILTING TABLE

Tilting table is possible to use for workpiece clamping and positioning, in axes **B** and **X** is controlled by control system of the machine, tilting mechanism is carried out by air-driven hydraulic pump..



CHIP CONVEYOR

The length of a chip conveyor and its discharge height can be accommodated to user's needs.



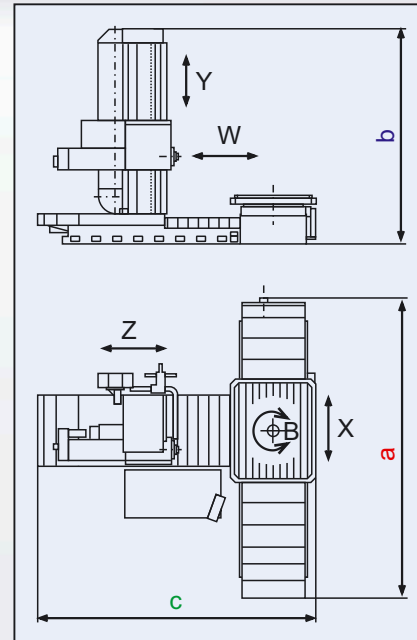
WHN(Q) 13/15 CNC – MACHINE LAYOUT

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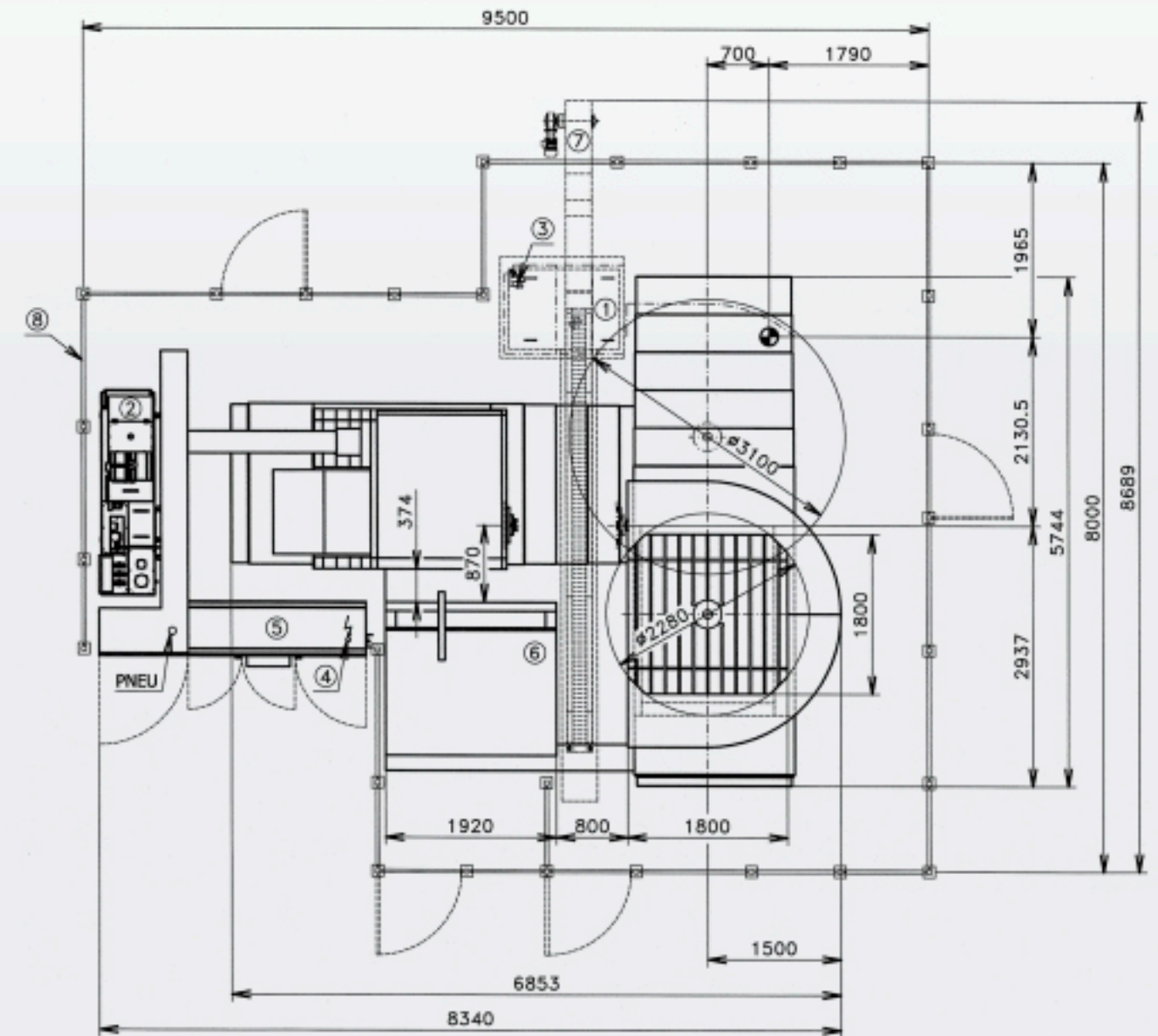
DIMENSIONS AND WEIGHTS

Coordinate travel		Dimension	
X	2,000 mm // 87.7 inch	5,750 mm // 226.4 inch	a
	3,500 mm // 137.8 inch	7,250 mm // 285.4 inch	
	4,000 mm // 157.5 inch	7,750 mm // 305.1 inch	
	5,000 mm // 196.9 inch	8,800 mm // 346.5 inch	
	6,000 mm // 236.2 inch	9,850 mm // 387.8 inch	
Y	2,000 mm // 87.7 inch	4,900 mm // 192.9 inch	b
	2,500 mm // 98.4 inch	5,400 mm // 212.6 inch	
	3,000 mm // 118.1 inch	5,900 mm // 232.3 inch	
	3,500 mm // 137.8 inch	6,400 mm // 252 inch	
Z	1,250 mm // 49.2 inch	6,850 mm // 269.7 inch	c
	1,600 mm // 63 inch	7,200 mm // 283.5 inch	
	2,200 mm // 86.6 inch	7,800 mm // 307.1 inch	
	3,200 mm // 126 inch	8,800 mm // 346.5 inch	

Machine weight		
X	Y	Table dimensions
3,500 mm 137.8 inch	2,500 mm 98.4 inch	1,800 x 1,800 mm 70.9 x 70.9 inch
WHN 13 CNC		WHQ 13 CNC
35,500 kg // 78,280 lbs		37,300 kg // 82,250 lbs



MACHINE LAYOUT



MACHINE COVERS

On the customer's request we deliver following types of covers:

COMPLETE COVERING

the top quality design without any residual risks



KVR CABIN

protective covers for working space



MOBILE / MOVABLE

protective partitions



C-COVER

compact and technically advanced design



WHN(Q) 13/15 CNC – TECHNOLOGIES

www.tosvarnsdorf.com

MILLING AND BORING OF A CARRIAGES



MILLING OF A CRANE ARM



MILLING OF A VALVE FACE



MILLING OF A HEAT EXCHANGER



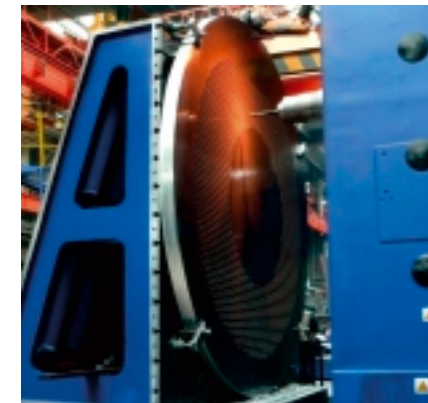
DOUBLE-SIDED MILLING OF A CRANE ARM



MILLING OF A CARRIAGE AXLE



DRILLING OF A TUBE PLATE



MILLING OF A FRONT ROLL FOR A ROADROLLER



PROPELLER HUB FOR A WIND-POWER STATION



MILLING OF A STEAM TURBINE STATOR



MILLING OF A DEEP WELL PUMP CRANKSHAFT IN ONE PIECE



MACHINING OF A GEARBOX PART FOR A LOGGING MACHINE



WHN(Q) 13/15 CNC – TECHNOLOGIES

www.tosvarnsdorf.com

MILLING OF A HOLE INTRADOS



MILLING OF AN INJECTION MOLD



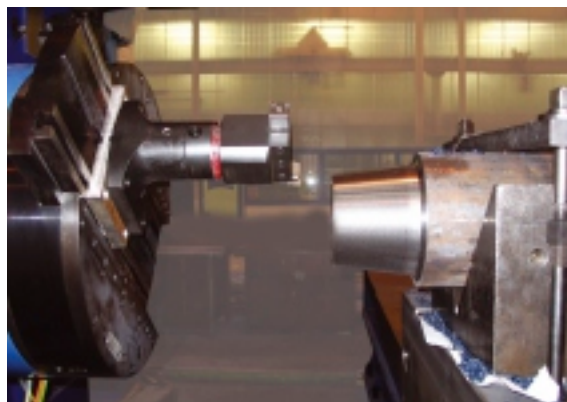
MILLING OF A MOULD



MILLING OF A MOULD PART



MILLING OF A FLANGE FOR PIPELINE



MILLING OF A TOOL FOR A FORM STAMPING



UPON THE CUSTOMER'S REQUEST, IT IS POSSIBLE TO EQUIP THE MACHINE WITH ADDITIONAL DEVICE OR PROCES ACCESSORIES.



Data and features in the present catalogue are not binding. The producer reserves the right to alter them without advance notice at any time.

WHN(Q) 13/15 CNC – TECHNOLOGIES / REFERENCES

MILLING OF A PANEL HONEYCOMB STRUCTURE FOR THE SOLLAR CELLS



INTERPOLATION TURNING OF FLANGE VALVE



MORE TECHNOLOGIES YOU CAN FIND ON

www.tosvarnsdorf.cz/en/technologies/



2,377

STATISTICS OF SOLD WHN(Q) 13/15 OF ALL TYPES: 1969 – 2013 (January)

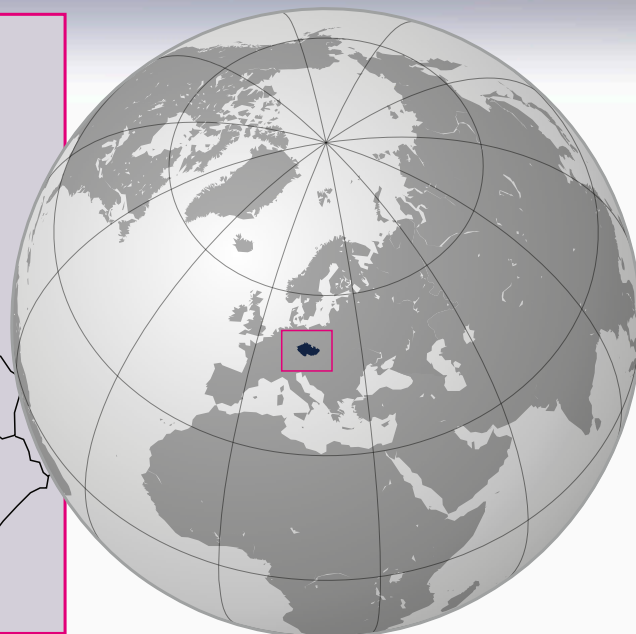
	Germany	386		Russia	34		Australia	3
	Czechoslovakia	252		Belgium	32		Kazakhstan	3
	Italy	195		Bulgaria	32		Portugal	3
	Canada	178		Switzerland	29		Singapore	3
	Czech Republic	123		Hungary	23		Syria	3
	France	121		Iran	21		Ukraine	3
	Austria	92		GDR	20		Afghanistan	2
	Poland	75		Slovakia	18		Chile	2
	United States of America	66		Norway	17		Iraq	2
	Finland	65		Brazil	16		Mexico	2
	Soviet Union	62		Japan	14		Bahrain	1
	Romania	60		Turkey	12		Grece	1
	Slovenia	49		Argentina	10		Iceland	1
	Spain	48		Croatia	10		Kuwait	1
	Sweden	48		Estonia	6		Luxembourg	1
	Yugoslavia	46		United Kingdom	6		Saudi Arabia	1
	Netherlands	43		Belarus	5		Serbia	1
	China	39		Egypt	5		South Korea	1
	Denmark	37		United Arab Emirates	5		Sudan	1
	India	37		Thailand	4		Venezuela	1

Total 2,377



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