VARNSDORF TOS

WHN(Q) 13 CNC

HORIZONTAL MILLING AND BORING MACHINES

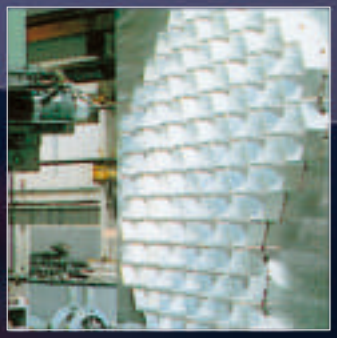
WHN 13 CNC

WHQ 13 CNC

WHN 13 MC

WHQ 13 MC

New goals need new solutions



Certifikovaný systém řízení SQS reg. č. 12392-01 TOS VARNSDORF SKQS reg. č. 12392-01 ISO 9001:2008

TOS VARNSDORF a.s.

09/2011

ABOUT COMPANY

www.tosvarnsdorf.com

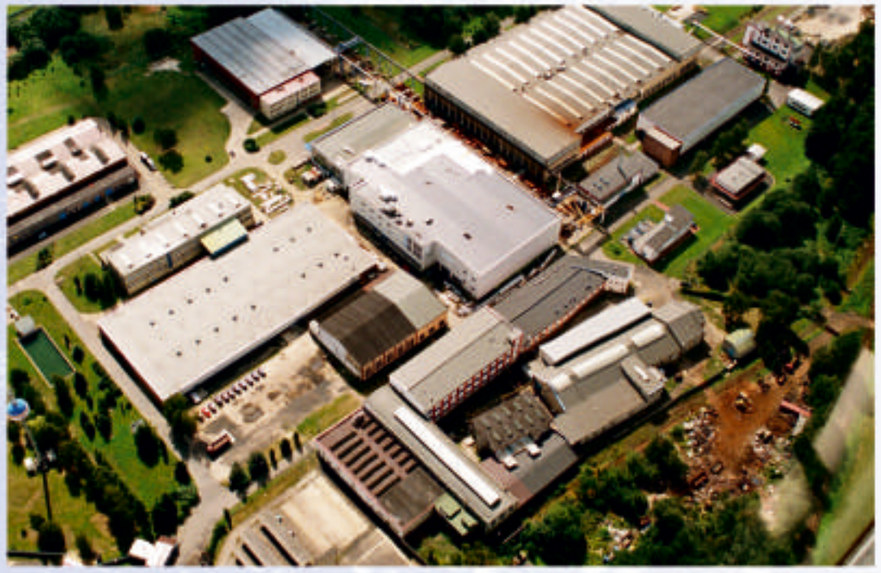
Company TOS VARNSDORF a.s. situated in Varnsdorf, Czech Republic has a years-lasting tradition in machine tool production. The company was founded, under the name of Arno Plauert Machine Works, as early as 1903 and up to now it grew up into a big engineering company, known with its products all around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

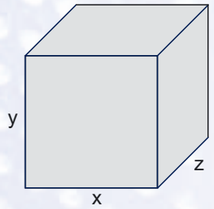
High engineering standards of TOS VARNSDORF a. s. products were recognized in 1996 when the company was awarded the ISO 9001 certificate.



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

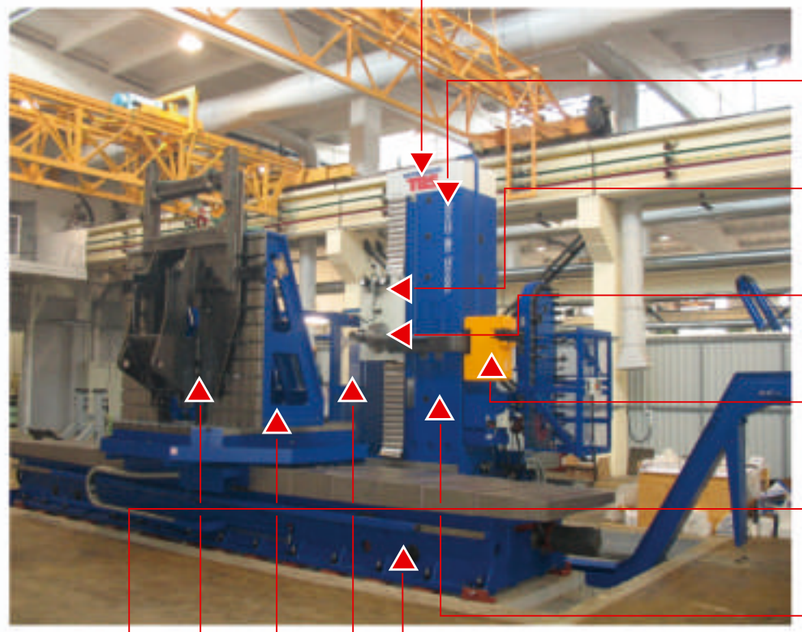


> 1 m³ (0.01mm)
x > 1 m
y > 1 m
z > 1 m

SERVICES

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

CONTENT



HORIZONTAL MILLING AND BORING MACHINE WHN(Q) 13 CNC

www.tosvarnsdorf.com

TECHNICAL PARAMETERS

The WHN(Q) 13 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 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 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.

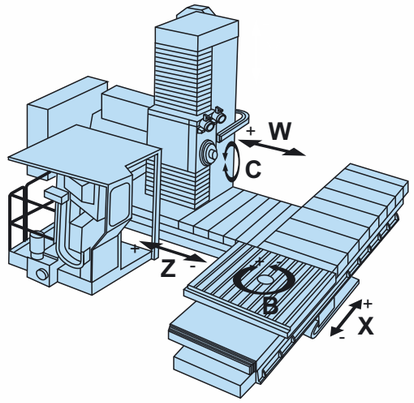
X	max. 6,000 mm
Y	max. 3,500 mm
Z	max. 3,200 mm
W	800 mm

BASIC SPECIFICATIONS

Headstock with traveling spindle		**Headstock R**	**Headstock N**
Spindle diameter	mm	130	130
Spindle taper		ISO 50	
Spindle speed range	R.P.M.	10 - 3,000	10 - 1,500
Main motor power (S1 / S6-60)	kW	37 / 46	
Spindle stroke **W**	mm	800	800
Headstock with non-traveling spindle			
Spindle taper		ISO 50	
Spindle speed range	R.P.M.	10 - 5,000	
Main motor power (S1 / S6-60)	kW	28 / 35	
Column			
Headstock vertical travel **Y**	mm	2,000; 2,500; 3,000; 3,500	
Column longitudinal travel **Z**	mm	1,250; 1,600; 2,200; 3,200	
Table			
Workpiece weight max. (S12 / S25)	kg	up to 25,000	
Table clamping surface	mm	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500; 2,000 x 3,000; 2,500 x 3,000	
Table transverse travel **X**	mm	2,000; 3,500; 4,000; 5,000; 6,000	
Tilting table			
Workpiece weight max.	kg	16,000	
Tilting range		0 - 5°	
Automatic pallet change			
Pallet clamping surface	mm	1,800 x 1,800; 1,800 x 2,200 (2,500)	
Workpiece weight max.	kg	16,000	
Number of pallet in system		2	
Time of pallet change	sec	120	
Feeds			
Feed range - **X, Y, Z, W**	$mm.min^{-1}$	4 - 5,000	
- **B**	min^{-1}	0.003 - 1.5	
Rapid traverse - **Y, Z, W**	$mm.min^{-1}$	10,000	
Rapid traverse - **X = 2,000; 3,500 (S12)**	$mm.min^{-1}$	10,000	
Rapid traverse - **X = 2,000; 3,500 (S25)**	$mm.min^{-1}$	8,000	
Rapid traverse - **X = 4,000; 5,000; 6,000**	$mm.min^{-1}$	8,000	
Rapid traverse - **B S12 / S25**	min^{-1}	2 / 1.5	

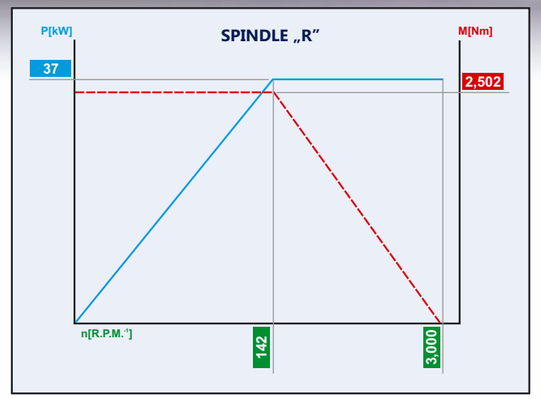
NEW DESIGN

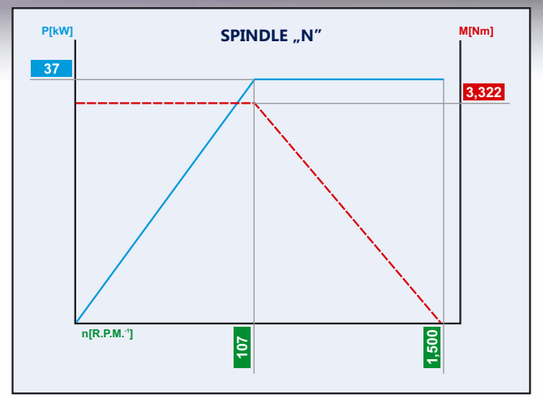
Since this year we are prepared to deliver the WHN(Q) 13 CNC machine with new modern and compact design.

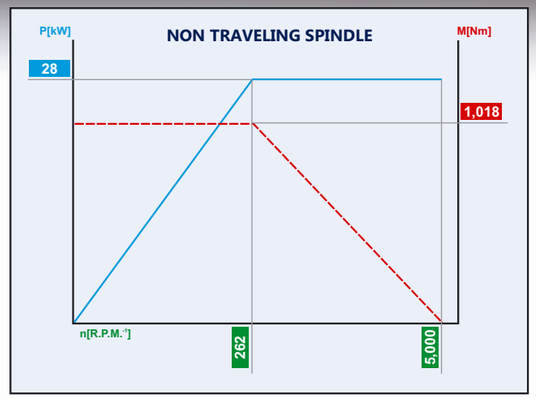


THE HEADSTOCK

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.

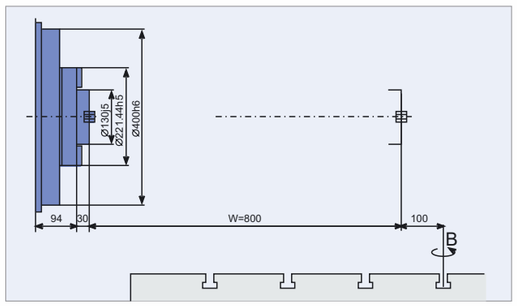


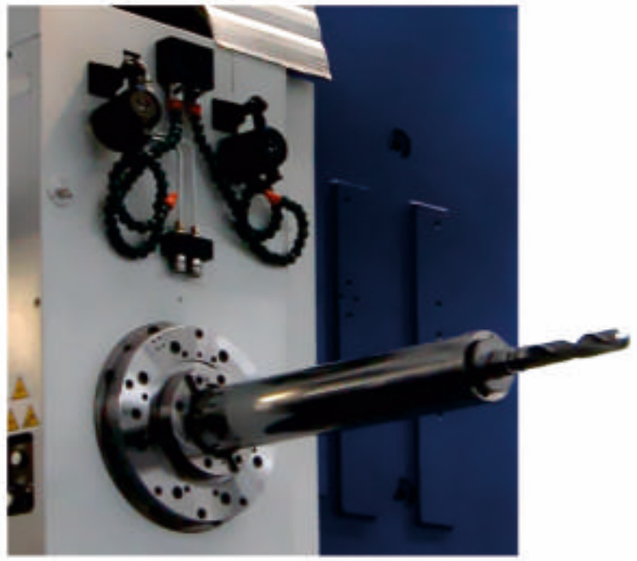




WHN(Q) 13 CNC

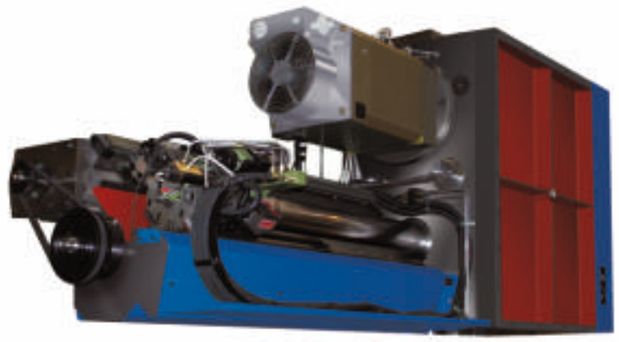
SPINDLE TYPE		R	N
Main motor power S1/S6-60	kW	37 / 46	37 / 46
Max. spindle torque S1/S6-60	Nm	2,502 / 3,111	3,322 / 4,132
NON TRAVELING SPINDLE			
Main motor power S1/S6-60	kW	28 / 35	
Spindle torque S1/S6-60	Nm	1,018 / 1,265	





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 taile.



THE SPINDLE DRIVE

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

THE HEADSTOCK „15" - SPINDLE DIAMETER 150 MM

Request on headstock „15" with spindle diameter 150 mm is possible discussed with machine tool manufacturer. Deliver from 7/2011.

BASIC TECHNICAL PARAMETERS

Spindle diameter	mm	150
Spindle speed range	R.P.M.	10 - 3,000
Main motor power (S1 / S6-60)	kW	46 / 55
Spindle torque (S1 / S6-60)	Nm	3,000 / 3,720
Spindle stroke **W**	mm	900

AUTOMATIC TOOL CHANGE (ATC)

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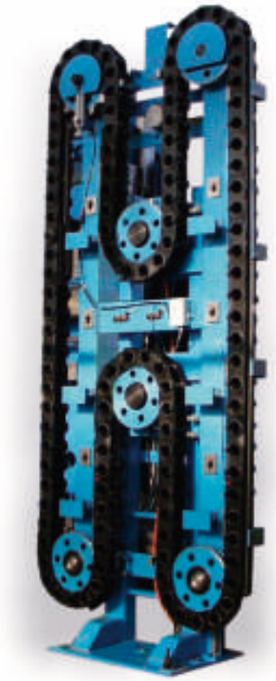
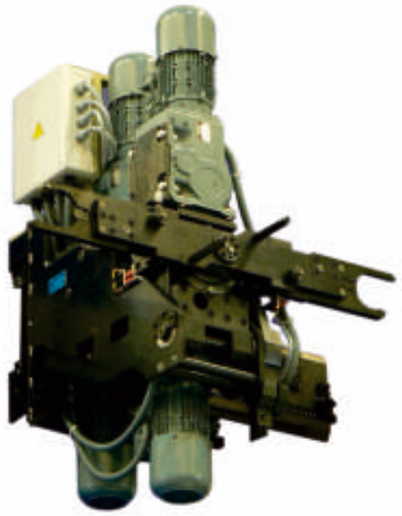
ATC consists of a chain or loop type tool magazine and horizontally traversing manipulator with rotating two-arm hand, manipulator is fitted to the back of the column (basic design for 40 or 60 tools).The ATC equipment adapted with respect to the tool standard can be as follows:
CSN 22 0432
CSN 22 0434
DIN 69871
BT 50 MAS 403-1982
CAT ANSI/ASME B5.50-1985

CHAIN MAGAZINE

LOOP MAGAZINE



TOOL MANIPULATOR



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

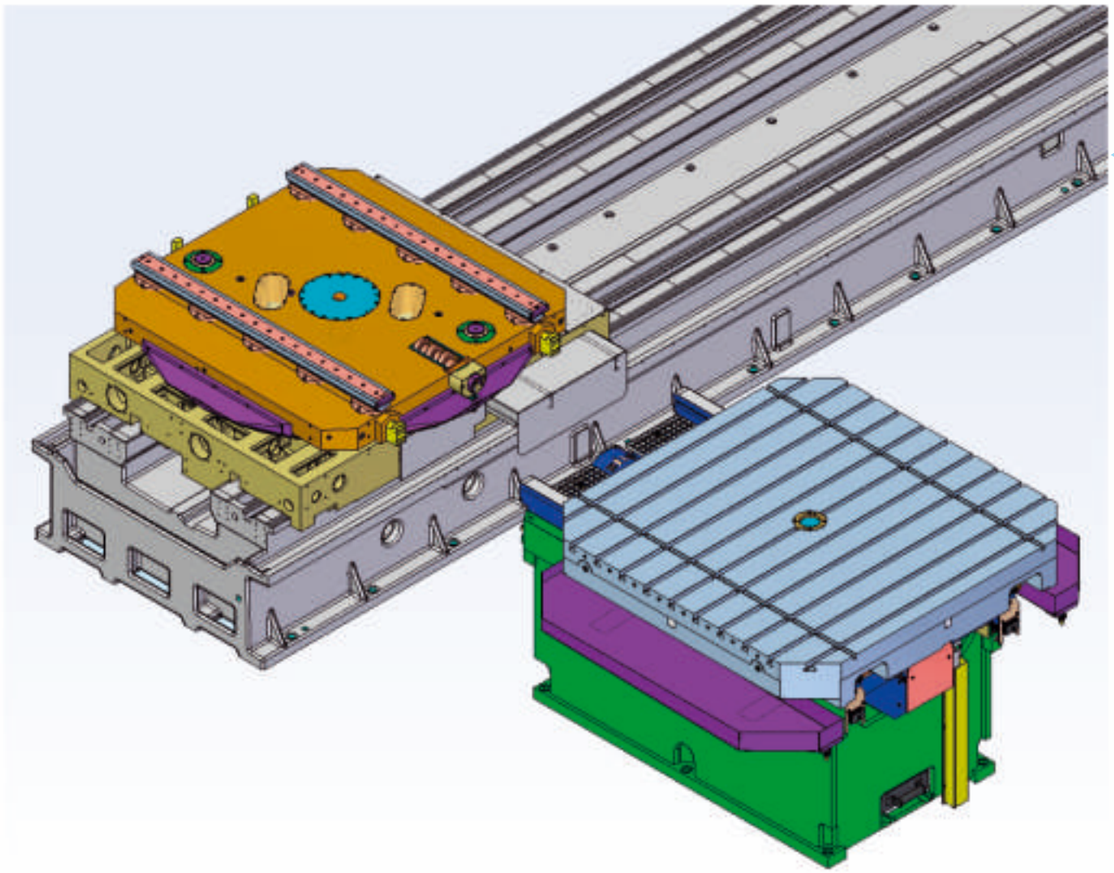
** stationary magazine beside column*

(ATC) CONTROLPANEL

AUTOMATIC PALLET CHANGE (APC)

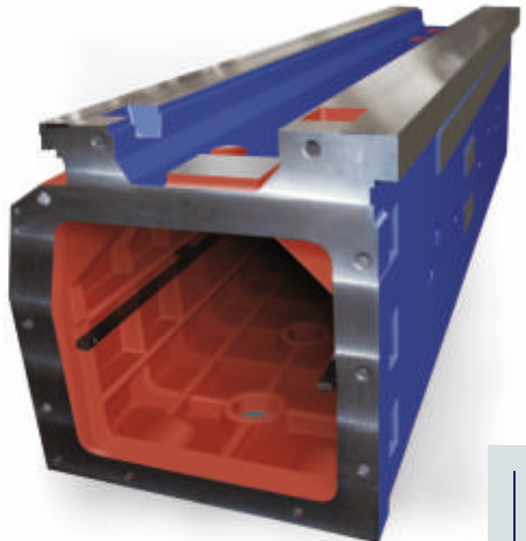
Concept of the pallet change system is based on automatic change of production pallets between pallet stations, which are equipped with pallet changing mechanism, and a pallet clamping base on the machine saddle. Pallet is arrested on the clamping base by Hirths tooth system (center rings and base of 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	mm	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500
Workpiece weight max.	kg	16,000
Size of T-slots	mm	22H8
Number of pallet in system	pc	2
Time of pallet change	sec	120



DESIGN OF MAIN MACHINE GROUPS

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.

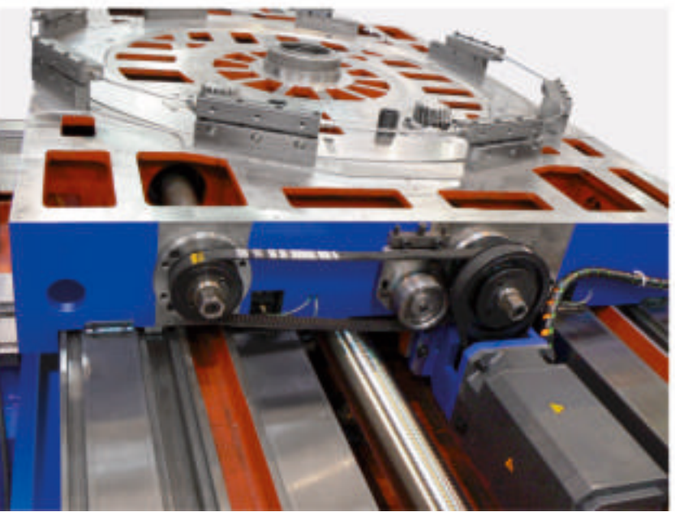
THE GUIDE WAYS
Main guide ways for the longitudinal and cross beds and the columns are equipped with hardened and grinded steel lining strips. The mating face of the column slide, the table slide and the lower cylindrical surface of the table are covered in a layer of plastic with a low friction coefficient.

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 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 on the column saddle.

THE WHN(Q) 13 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
- collor 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

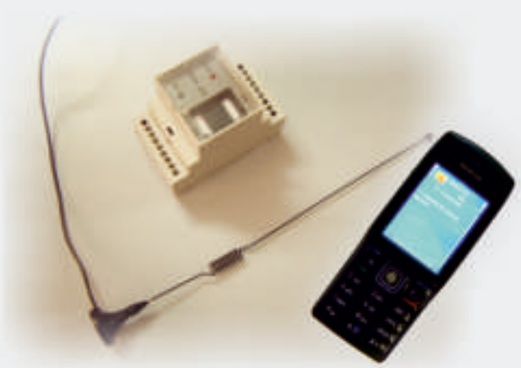
TOOL CONTROL PROBE

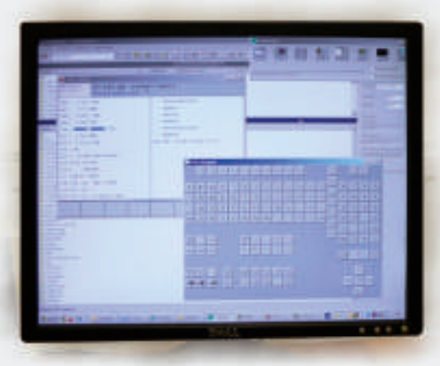
MEASURING TOUCH PROBE

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

TOS*message*
- 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.

TOS*wide*
- 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.





OPTIONAL ACCESSORIES

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MILLING HEADS

HF 50

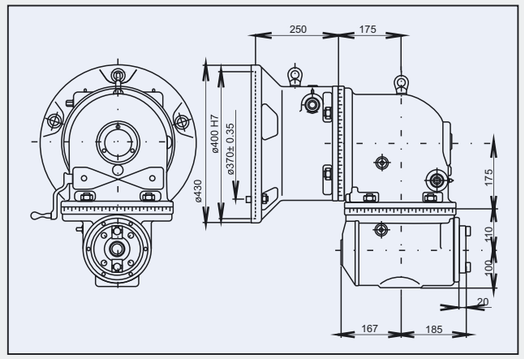
The HF 50 and HUR 50 heads are used for machining the surfaces that are oriented in the basic direction (also generally) with regard to the orthogonal coordinate system of the machine.

HUR 50

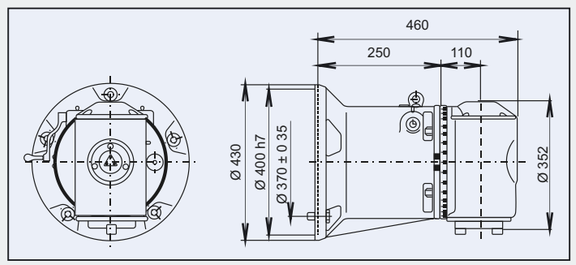
HUI 50

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.

UFP 50-13
universal milling head

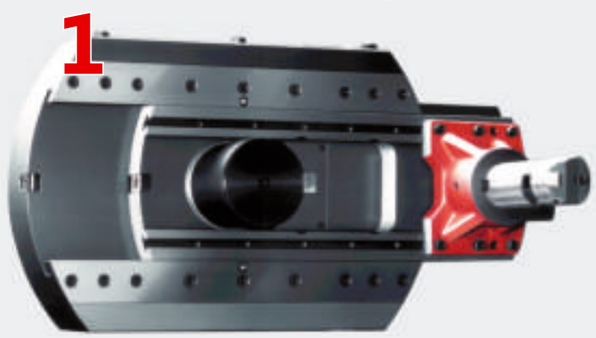


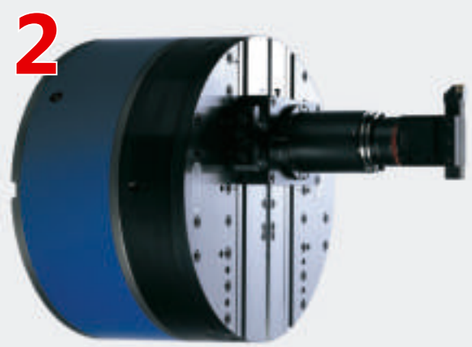
FP 50-13
vertical milling head



FACING HEAD

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





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
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.

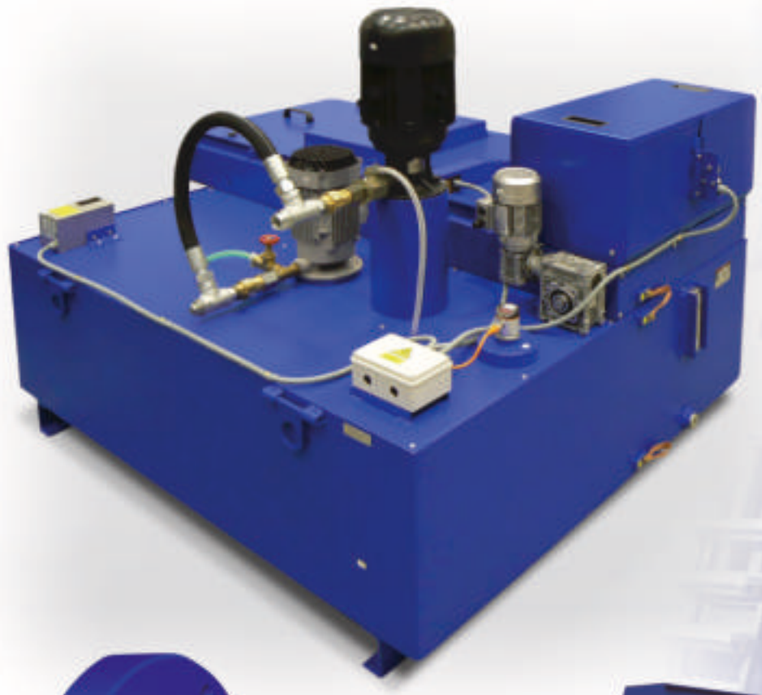
ANOTHER OPTIONAL ACCESSORIES YOU CAN FIND ON www.tosvarnsdorf.cz/en/products/accessories/

OPTIONAL ACCESSORIES

www.tosvarnsdorf.com

TOOL COOLING DEVICE

Customer may choose ether CHZ 13 outer tool cooling kit or CHOV 13 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.

CHIP CONVEYOR

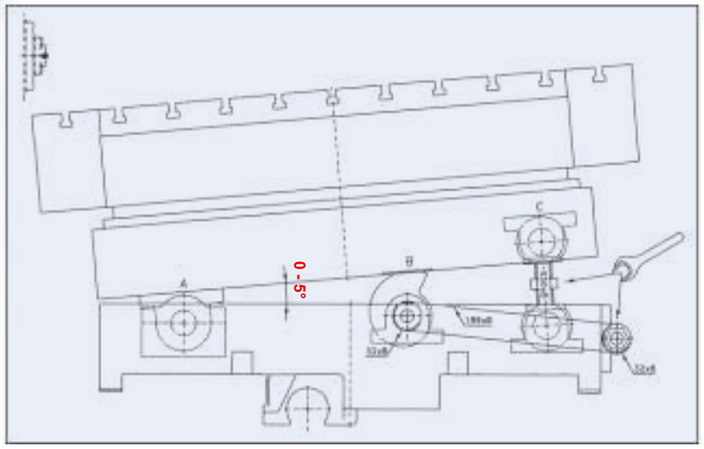
The length of a chip conveyer and its discharge height can be accommodated to user's needs.

CLAMPING CUBES

UK 500; UK 1000; UK 2000; UK 2500

TILTING TABLE

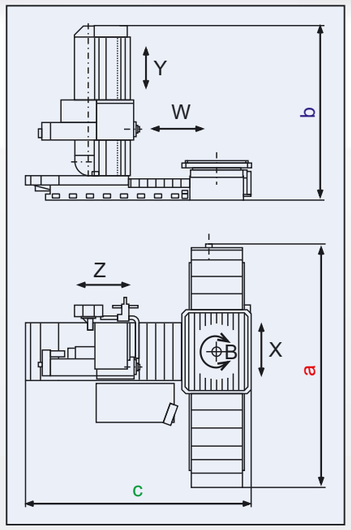
Tilting table is possible to use for workpiece clamping and positioning, in axes **B** and **X** is controlled by control system of the machine, tilting is made manually.



DIMENSIONS AND WEIGHTS

Coordinate travel (mm)		Dimension (mm)	
X	2,000 3,500 4,000 5,000 6,000	5,630 7,125 7,650 8,650 9,750	a
Y	2,000 2,500 3,000 3,500	4,850 5,350 5,850 6,350	b
Z	1,250 1,600 2,200 3,200	6,807 7,307 7,807 8,807	c

Machine weight (kg)		
X	Y	Table dimensions (mm)
3,500	2,500	1,800 x 2,200
WHN 13 CNC	**WHQ 13 CNC**	
36,850	38,650	



MACHINE COVERS

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

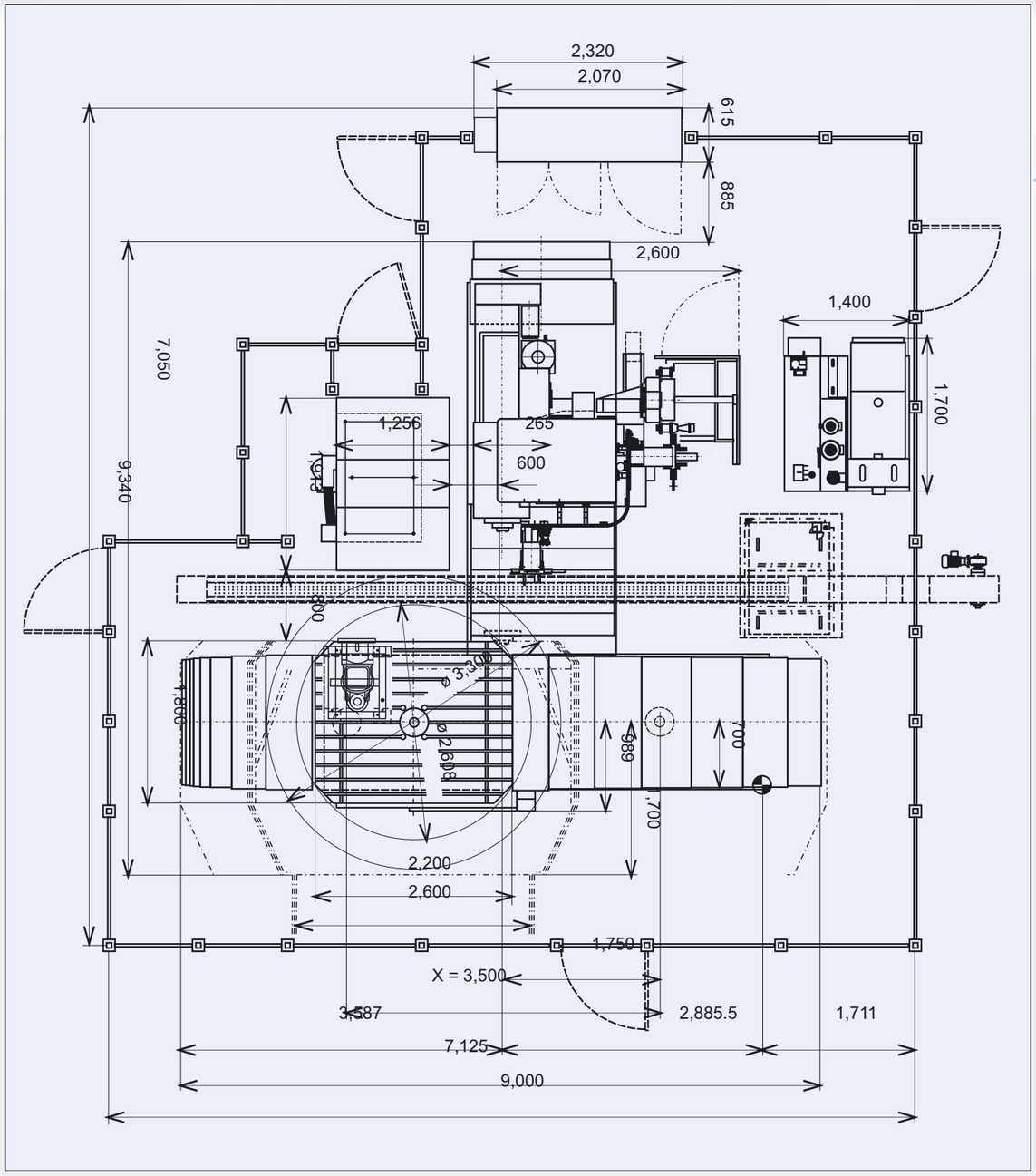
COMPLETE COVERING
the top quality design without any residual risks

KVR CABIN
protective covers for working space

MOBILE / MOVABLE
protective partitions

C-COVER
compact and technically advanced design

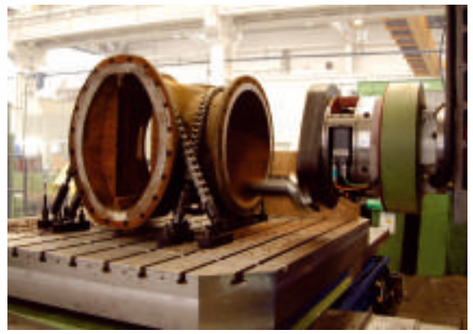
MACHINE LAYOUT



MILLING AND BORING OF A CARRIAGES

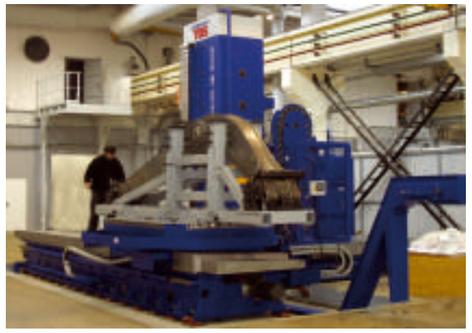
MILLING OF A CRANE ARM

MILLING OF A VALVE FACE



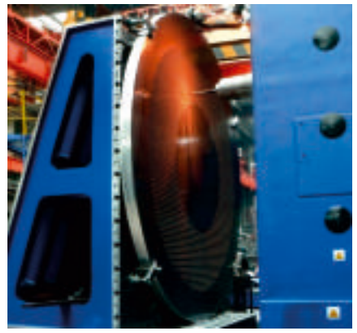
MILLING OF A HEAT EXCHANGER

DOUBLE-SIDED MILLING OF A CRANE ARM



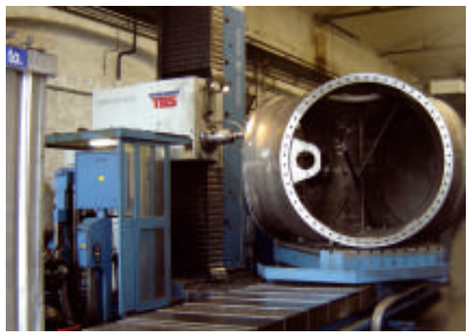
MILLING OF A CARRIAGE AXLE

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

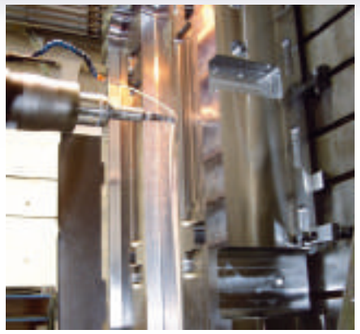
MILLING OF A DEEP WELL PUMP CRANKSHAFT IN ONE PIECE

MACHINING OF A GEARBOX PART FOR A LOGGING MACHINE

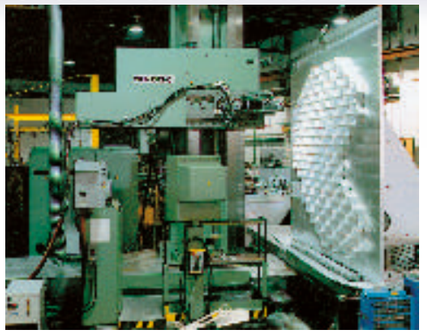
TECHNOLOGIES / REFERENCES

MILLING OF A HOLE INTRADOS

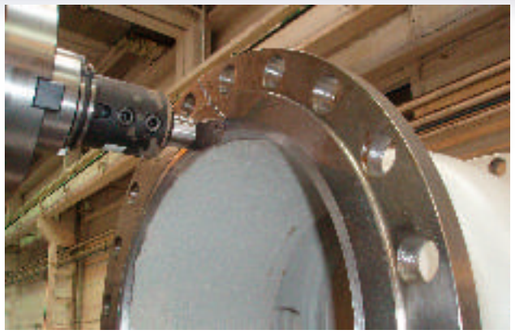
MILLING OF AN INJECTION MOLD



MILLING OF A PANEL HONEYCOMB STRUCTURE FOR THE SOLLAR CELLS

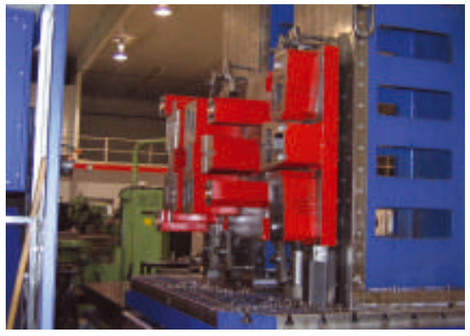


INTERPOLATION TURNING OF FLANGE VALVE



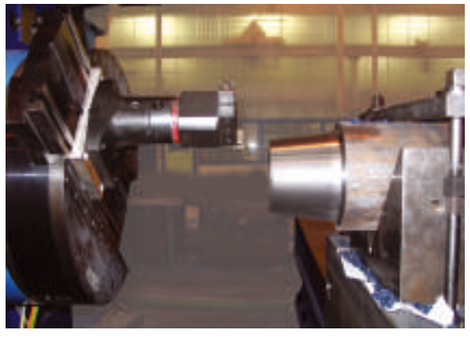
MILLING OF A MOULD

MILLING OF A MOULD PART



MORE TECHNOLOGIES YOU CAN FIND ON www.tosvarnsdorf.cz/en/technologies/

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.

2,280 STATISTICS OF SOLD WHN(Q) 13 OF ALL TYPES: 1969 – AUGUST 2011

Germany	380	India	33	Egypt	4
Czechoslovakia	252	Bulgaria	32	Thailand	4
Italy	195	Belgium	31	Australia	3
Canada	157	Switzerland	29	Portugal	3
France	120	Russia	22	Singapore	3
Czech Republic	116	Iran	21	Syria	3
Austria	90	GDR	20	Afghanistan	2
Poland	70	Hungary	20	Chile	2
Finland	64	Slovakia	16	Iraq	2
Soviet Union	62	Japan	14	Kazakhstan	2
Romania	59	Norway	13	Mexico	2
United States of America	57	Argentina	10	Grece	1
Spain	48	Brazil	10	Iceland	1
Slovenia	47	Croatia	10	Kuwait	1
Sweden	47	Turkey	10	Luxembourg	1
Yugoslavia	46	United Kingdom	6	Saudi Arabia	1
Netherlands	41	Estonia	5	South Korea	1
China	37	United Arab Emirates	5	Sudan	1
Denmark	37	Belarus	4	Venezuela	1
				T o t a l	**2,280**

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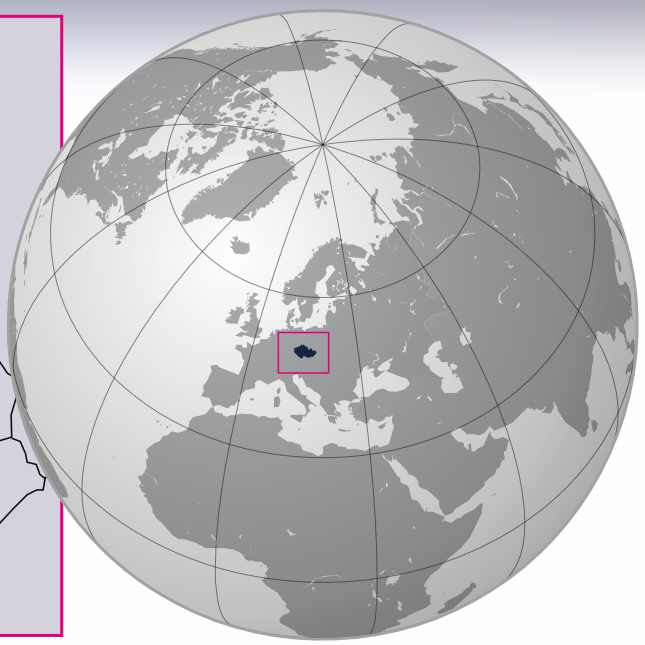

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