

CHEVALIER®

Grinding / Turning / Milling



FM Series

High Efficiency Vertical Turret
Milling Machine

FM-2S / 2SK / 2SKH / 4SKH
FM-3VS / 3VK / 3VKH / 4VKH

FM-2S · 2SK · 2SKH · 4SKH FM-3VS · 3VK · 3VKH · 4VKH

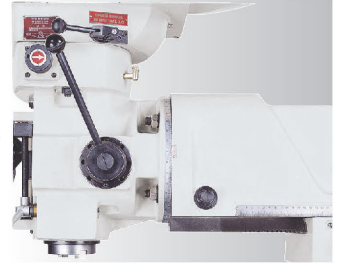
High Efficiency Vertical Turret Milling Machine

Features

These high quality and low cost milling machines have been manufactured by CHEVALIER to meet the needs of machine tool industry. The slideways of table, knee and column are hardened and ground for accurate, smooth and wear resistant slideway systems. The upper and lower surfaces of the saddle are laminated with Turcite-B and precisely hand-scraped to provide a low friction and accurate slideway system. The one shot lubrication system has a flow rate that can be adjusted to assure adequate quantity of oil supplying to the slideway system. All essential castings are made of high grade of Meehanite cast iron which has been stress relieved by annealing to provide a rigid machine structure. CHEVALIER milling machines offer one year warranty for mechanical and electrical parts.

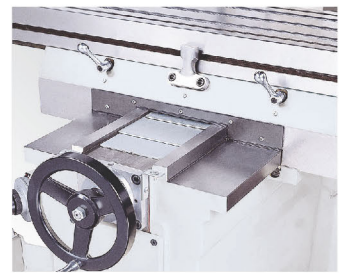
Spindle Head

NST40 spindle head is rigidly fixed to the ram for heavy duty milling and is available with tilting head as standard and fixed head as optional.(FM-4SKH/4VKH)



Saddle

Extra wide saddle is constructed to handle heavy work loads and to avoid table overhang. (FM-4SKH/4VKH)



FM-2S

Note: Machine shown with optional accessories



FM-3VS

Note: Machine shown with optional accessories

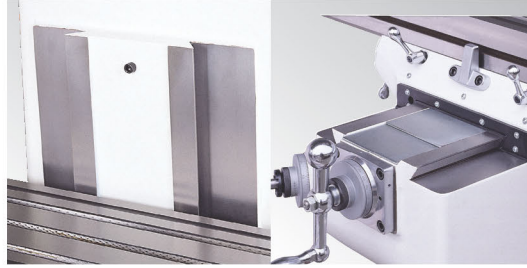
FM-2S • 2SK • 2SKH • 4SKH FM-3VS • 3VK • 3VKH • 4VKH

FEATURES



Step Pulley Head

Spindle speeds are reached by manually switching V belt positions to match with cutting demands or cutter sizes. A braking system is equipped to facilitate operations.



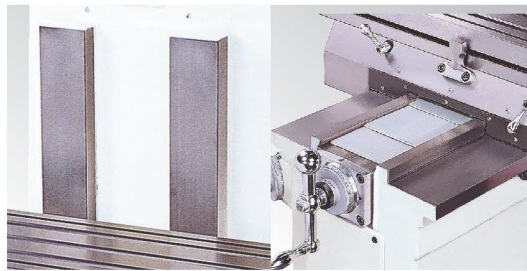
Dovetail Ways

Hardened and ground dovetail slideways are available for accurate locking of the way system.
L: Dovetail column ways
R: Dovetail knee ways



Vari-Speed Head

The variable spindle speed is displayed and can be controlled by a handwheel during running, eliminating the need to completely stop machine for speed changes. A braking system is also equipped to facilitate operations.



Square Ways

Hardened and ground squareways are available to provide considerably more load bearing surfaces for heavy duty machine.
L: Square column ways
R: Square knee ways



FM-3VKH

Note: Machine shown with optional accessories



FM-4VKH

Note: Machine shown with optional accessories

FM-2S · 2SK · 2SKH · 4SKH FM-3VS · 3VK · 3VKH · 4VKH MACHINE CONSTRUCTION

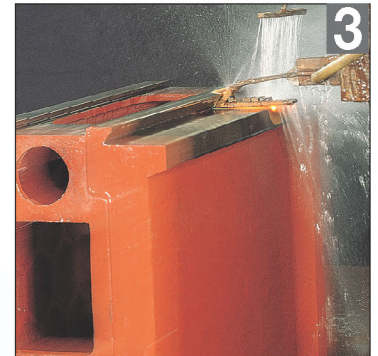
FM-3VK

Note: Machine shown with optional accessories

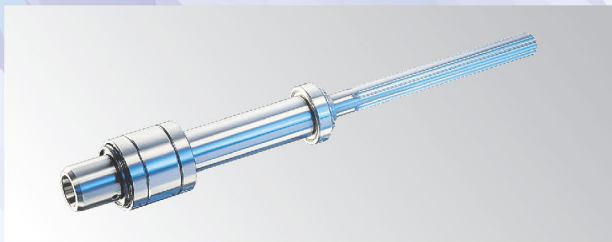


Hardened and Ground Slideways & Table Surface

The table, knee, column slideways and table surface are all hardened and ground for wear resistance and excellent longevity. Thus the high accuracy of the machine can be assured even after long period of operation.

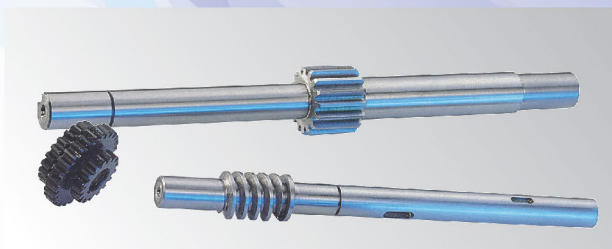


MACHINE CONSTRUCTION



High Precision Spindle

The spindle is supported by super precision ABEC class 7(P4) angular contact ball bearings which have been accurately measured, selected and pre-loaded, then assembled in a temperature-controlled room to ensure better accuracy and rigidity throughout the full RPM range.



Solid Quill-Feed

The quill-feed mechanism utilizes a one-piece pinion gear and shaft as well as a one piece worm and worm-shaft both providing strength, rigidity and less maintenance.



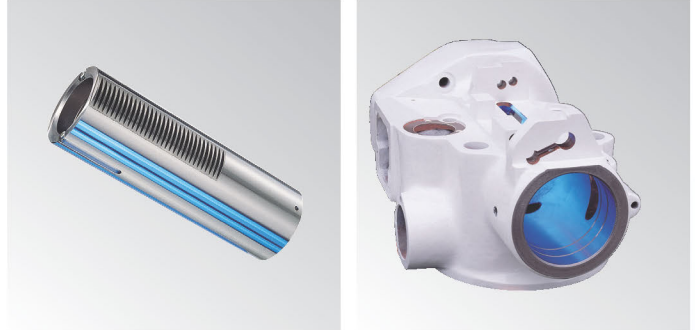
Low Vibration Vari-Speed Spindle Drive

Spindle motor shaft is chrome plated to ensure smooth speed changes and excellent shaft longevity. The pulleys are ground to lengthen belt life. The motor and pulleys are dynamically balanced to provide an extremely smooth, low vibration and quiet drive.

FM-2S • 2SK • 2SKH • 4SKH FM-3VS • 3VK • 3VKH • 4VKH MACHINE CONSTRUCTION

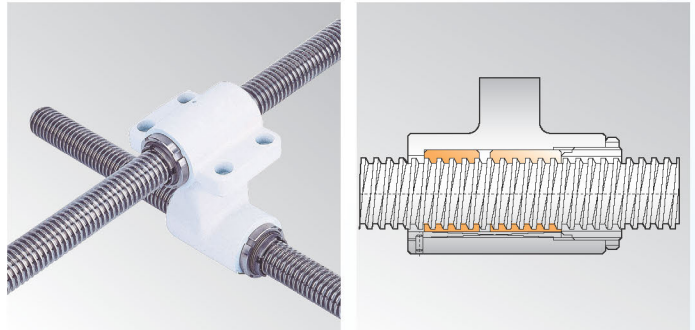
Accurately Ground Quill and housing

The hard chromed quill is ground to a mirror finish and the quill housing is precisely ground to a 0.01mm(0.0004") oversize to ensure smooth movement and provide excellent rigidity. The sturdiness of the quill provides excellent rigidity during light or heavy cuts.



Backlash Adjustment

The double-nut arrangement utilized on the table and saddle allows backlash to be nearly eliminated and can be adjusted in a matter of minutes.



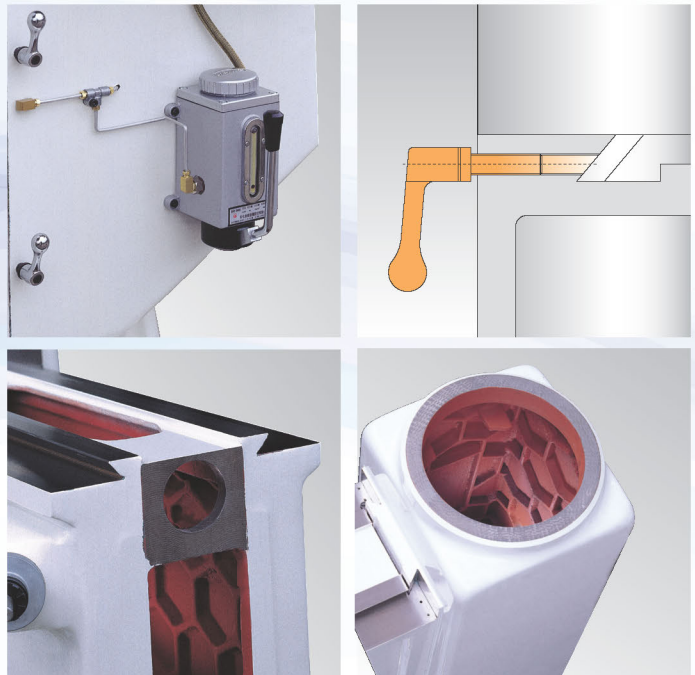
Meehanite Cast Iron

All essential castings are made of high grade of Meehanite cast iron which has been stress relieved to provide a rigid machine structure.



Precision Hand Scraping

The upper and lower surface of the saddle are laminated with Turcite-B and precisely hand-scraped to provide a smooth, accurate and wear resistant slideway surface.



Optional ACCESSORIES

Automatic Feeding Device	
1	Air power draw bar for FM-2/3 series
2	Air power draw bar for FM-4 series
3	Air power draw bar (CE conformity) for FM-2/3 series
4	Air power draw bar (CE conformity) for FM-4 series
5	Longitudinal (X) powerfeed system (110V only) for FM-2/3/4 series (must order control box system)
6	Cross (Y) powerfeed system (110V only) for FM-2/3/4 series (must order control box system)
7	Knee (W) powerfeed system (110V only) for FM-2/3/4 series (must order control box system)
8	X axis Gear feeder, with separate control box (not recommend)
9	X axis Gear feeder, for FM-2/3/4 series (must order control box system)
10	Y axis Gear feeder, with separate control box (not recommend)
11	Y axis Gear feeder, , for FM-2/3/4 series (must order control box system)
12	W axis Gear feeder, with separate control box (not recommend)
13	W axis Gear feeder, , for FM-2/3/4 series (must order control box system)
14	Machine lamp (must order control box system)
15	Machine lamp with transformer
16	Rapid elevating drive with motor at bottom side of knee for FM-2SKH/3VKH/4SKH/4VKH (must order control box system)
Control Box System for CE machine	
1	Electric box and knee type control panel for machine with 1,2 or 3 axis powerfeed system for FM-2/3/4 series
2	CE conformity and pendant control panel, if order 1 or 2 axis powerfeed system
3	CE conformity and pendant control panel, if order 1 or 2 axis gearfeeder or B95-0439 system for FM-2/3/4 series
4	CE conformity and pendant control panel, if order 3 axis gearfeeder or B95-0439 system for FM-2/3/4 series
Control Box System for Non-CE machine	
1	Economic electric control box with transformer (250V) for machine with 1 axis powerfeed system (without transformer for machine lamp)
2	Electric control box with knee type control panel for machine with 1 or 2 or 3 axis powerfeed system or 1 axis gear feed system FM-2/3/4 series
3	Electric control box with Pendant control panel for machine with 1 or 2 axes gear feeder
4	Electric control box with pendant control panel for machine with 3 axes gear feeder or 2 axes gear feeder and rapid elevating device.
5	Electric control box with pendant type control panel for machine with 3 axes power feeder; or 2 axes power feeder and rapid elevating device.
Milling Attachment	
1	R-8 collet (1/8"~3/4", 11 pcs/set) FM 2/3 series
2	R-8 collet (6,8,10,12,16,20 mm, 6 pcs/set) FM 2/3 series
3	NST-30 milling chuck set with collet (6,8,10,12,16,20,25mm) FM2/3 series (metric thread)
4	NST-30 milling chuck set with collet (6,8,10,12,16,20,25mm) FM2/3 series (inch thread)
5	NST-30 milling chuck with collet (1/4"~1" 7pcs/set) FM2/3 series
6	R-8 milling chuck with collet (6~25mm, 7 pcs/set) FM2/3 series
7	R-8 milling chuck with collet (1/4"~1" 7 pcs/set) FM2/3 series
8	NST-40 milling chuck with collets (1/4"~1" 7 pcs/set) FM 4 series
9	NST-40 milling chuck with collets (6~25 mm, 7 pcs/set) FM 4 series
10	Modified NST-40 spindle for FM-3VK machine
Spindle Motor & Table	
1	9" x 48" table for FM-3VS/2S
2	3HP spindle motor for FM-2S/2SK/2SKH
3	10" x 54" table for FM-4 series
4	5HP spindle motor instead of 3HP on FM-4VKH
5	3HP spindle inverter motor with AC variable speed (60-5,000rpm) for 3VK machine, 200-230V
6	3HP spindle inverter motor with AC variable speed (60-5,000rpm) for 3VK machine, 380-460V
7	5HP spindle inverter motor with AC variable speed (60-5,000rpm) for 4VKH machine,200-230V
8	5HP spindle inverter motor with AC variable speed (60-5,000rpm) for 4VKH machine,380-460V
9	2 speed motor (3HP) instead of 2HP for FM-2S
Riser Block	
1	4" (100mm) Riser block FM-2/3 series
2	8" (200mm) Riser block FM-2/3 series
3	4" (100mm) Riser block FM-4 series
4	8" (200mm) Riser block FM-4 series
Coolant System	
1	Coolant pump & fittings (must order for CE machine)
2	Oil tray for FM-3VS/2S
3	Oil tray for FM-3VK/2SK
4	Oil tray for FM-4 series
5	Oil tray for FM-2SKH/3VKH

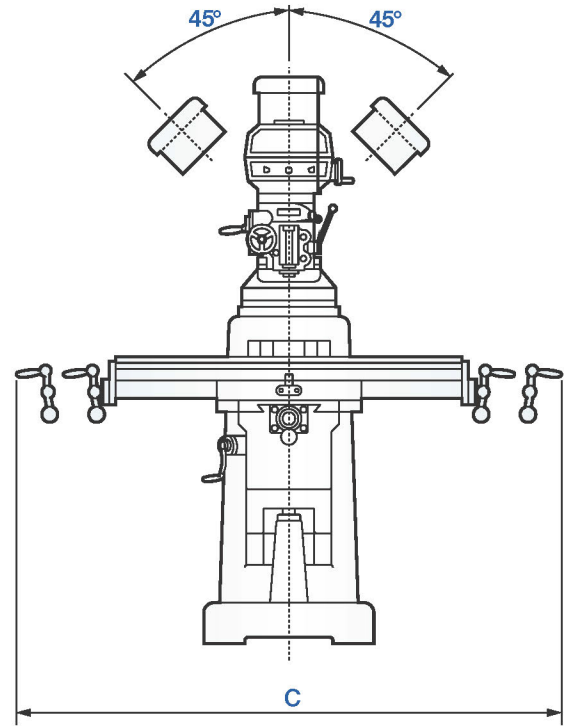
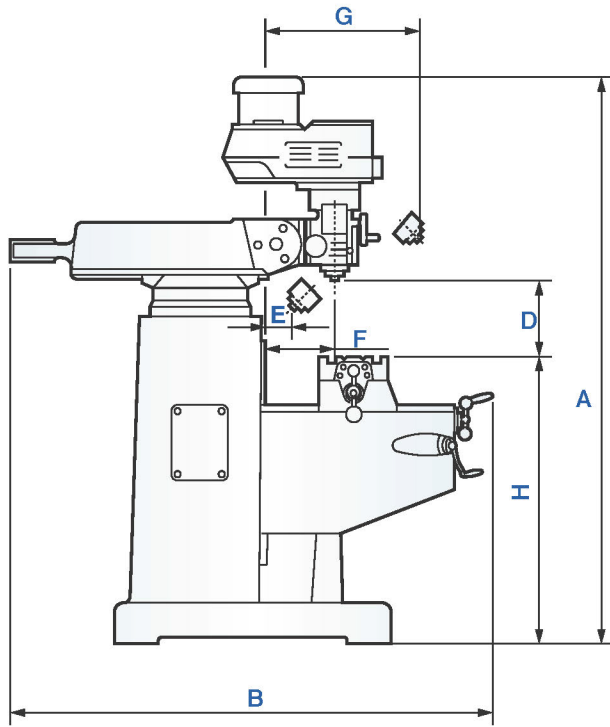
GENERAL SPECIFICATION

Description		FM-2S	FM-3VS	FM-2SK	FM-3VK
Table Size		230 x 1,067mm (9" x 42")		254 x 1,270mm (10" x 50")	
Longitudinal Travel		750mm (29 1/2")		900mm (35 1/2")	
Cross Travel		305mm (12")		400mm (15 3/4")	
Vertical Travel (Knee)		406mm (16")		370mm (14 5/8")	
Table T-slots	Quantity	3			
	Size	16mm (0.63")			
Maximum Workpiece Weight		340kgs (750lbs)		410kgs (900lbs)	
Vertical Spindle Motor		2HP	3HP	2HP (3HP)	3HP (Optional 5HP)
Spindle Speeds	50Hz	60 ~ 2,280rpm (8 steps)	50 ~ 3,750rpm	60 ~ 2,280rpm (8 steps)	50 ~ 3,750rpm
	60Hz	80 ~ 2,760rpm (8 steps)	60 ~ 4,200rpm	80 ~ 2,760rpm (8 steps)	60 ~ 4,200rpm
Spindle Taper		R8 or NST30			
Spindle Nose to Table		70 ~ 476mm (2 3/4" ~ 18 3/4")		70 ~ 440mm (2 3/4" ~ 17 3/8")	
Spindle Centerline to Column Surface		71 ~ 476mm (2 3/4" ~ 18 3/4")		102 ~ 652mm (4" ~ 25 5/8")	
Quill Travel		127mm (5")			
Automatic Vertical Feeds (per revolution of spindle)		0.04, 0.08, 0.14mm (0.0015", 0.003", 0.006")			
Head Swivel		(R&L)90°, (F&B)45°	(R&L)90°, (F&B)+45°, -38°	(R&L)90°, (F&B)45°	
Overarm Travel		305mm (12")		550mm (21 5/8")	
Overarm Swivel		360°			
Weights approx.		1,080kgs (2,380lbs)		1,410kgs (3,102lbs)	
Floor Space (L x W x H)		2,179 x 1,600 x 2,000mm (85 3/4" x 63" x 78 3/4")	2,197 x 1,600 x 2,100mm (86 1/2" x 63" x 82 5/8")	2,642 x 2,000 x 2,034mm (104" x 79" x 80")	2,642 x 2,000 x 2,134mm (104" x 79" x 84")

Description		FM-2SKH	FM-3VKH	FM-4SKH	FM-4VKH
Table Size		254 x 1,270mm (10" x 50")			
Longitudinal Travel		760mm (30")			
Cross Travel		390mm (15 3/8")		400mm (15 3/4")	
Vertical Travel (Knee)		380mm (15")		470mm (18 1/2")	
Table T-slots	Quantity	3			
	Size	16mm (0.63")			
Maximum Workpiece Weight		430kgs (946lbs)		450kgs (990lbs)	
Vertical Spindle Motor		2HP (Optional 3HP)	3HP	3HP (Optional 5HP)	3HP (Optional 5HP)
Spindle Speeds	50Hz	60 ~ 2,280rpm (8 steps)	50 ~ 3,750 rpm	65 ~ 2,280rpm (10 steps)	50 ~ 3,335 rpm
	60Hz	80 ~ 2,760rpm (8 steps)	60 ~ 4,200rpm	75 ~ 3,450rpm (10 steps)	60 ~ 4,000rpm
Spindle Taper		R8 or NST30		NST40	
Spindle Nose to Table		40 ~ 420mm (1 5/8" ~ 16 1/2")		60 ~ 530mm (2 3/8" ~ 20 7/8")	
Spindle Centerline to Column Surface		102 ~ 652mm (4" ~ 25 5/8")		150 ~ 700mm (5 7/8" ~ 27 1/2")	
Quill Travel		127mm (5")			
Automatic Vertical Feeds (per revolution of spindle)		0.0015", 0.003", 0.006" (0.04, 0.08, 0.14mm)			
Elevating Rapid Travel approx	50Hz	1,100mm/min (Optional)			
	60Hz	1,300mm/min (Optional)			
Head Swivel		(R&L)90°, (F&B)45°		(R&L)90°, (F&B)0° or 45°	
Overarm Travel		550mm (21 5/8")			
Overarm Swivel		360°			
Weights approx.		1,520kgs (3,350lbs)		1,550kgs (3,400lbs)	
Floor Space (L x W x H)		2,572 x 2,000 x 2,050mm (101 1/4" x 79" x 80 5/8")	2,572 x 2,000 x 2,150mm (101 1/4" x 79" x 84 5/8")	2,572 x 2,300 x 2,275mm (101 1/4" x 90 1/2" x 89 1/2")	2,572 x 2,300 x 2,375mm (101 1/4" x 90 1/2" x 93 1/2")

STD. ACCESSORIES

1. Tool and Tool Box
2. Rubber way covers (front and rear)
3. One-shot lubrication system



ITEM	FM-2S	FM-3VS	FM2SK	FM-3VK	FM-2SKH	FM3VKH	FM-4SKH	FM-4VKH
A	2,000mm (78 3/4")	2,100mm (82 5/8")	2,034mm (80")	2,134mm (84")	2,050mm (80 5/8")	2,150mm (84 5/8")	2,300mm (90")	24,00mm (94")
B	1,600mm (63")		2,000mm (78 3/4")		2,000mm (78 3/4")		2,300mm (90 1/2")	
C	1,435mm (56 1/2")		2,522mm (99 1/4")		2,522mm (99 1/4")		2,522mm (99 1/4")	
D	70~476mm (2 3/4"~18 3/4")		70~446mm (2 3/4"~17 1/2")		40~420mm (1 5/8"~16 1/2")		60~530mm (2 3/8"~20 7/8")	
E	0~305mm (0~12")		0~550mm (0~21 5/8")		0~550mm (0~21 5/8")		0~550mm (0~21 5/8")	
F	17~476mm (6 3/4"~18 3/4")		102~652mm (4"~25 5/8")				150~700mm (5 7/8"~27 1/2")	
G	222~527mm (8 3/4"~20 3/4")		241~791mm (9 1/2"~31 1/8")		241~791mm (9 1/2"~31 1/8")		241~791mm (9 1/2"~31 1/8")	
H	825~1,231mm (32 3/4"~48 3/4")		860~1,230mm (33 7/8"~48 1/2")		860~1,240mm (33 7/8"~48 3/4")		876~1,346mm (34 1/2"~53")	



Grinding Machines



Grinding Machines



Turning Machines



Milling Machines



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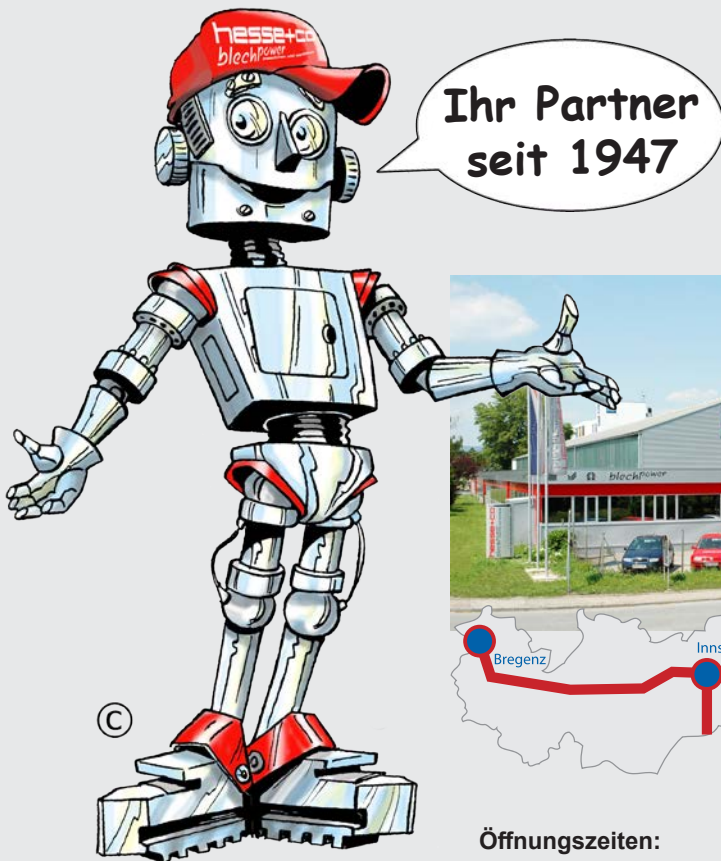
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HESSE+CO was established in 1947 as a manufacturer of sheet metal working machines. Since 1980 we are specialized in dealing with new and second hand sheet metal processing machines and machine tools. We always have approximately 300 machines available in our 2.000 m² showroom, which is located only 20 minutes from the Vienna International Airport, waiting for your inspection.

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