TECHNICAL SPECIFICATION

Concept MILL 55

PC-controlled 3-axis Milling Machine
for universal CNC Training
With/without 8-station tool turret

Control Systems

Sinumerik Operate 840D sl / 828D
FANUC Series 31i
HEIDENHAIN TNC 640
HEIDENHAIN TNC 426/430
FAGOR 8055 MC
CAMCONCEPT

Contents

Technical Data of the Machine

Working area		
Slide travel (X-axis)	[mm]	190 (7,5 inch)
Cross travel (Y-axis)	[mm]	140 (5,5 inch)
Vertical travel (Z-axis)	[mm]	260 (10,2 inch)
Effective Z-stroke, with / without turret	[mm]	120/190 (4,7/7,5 inch)
Distance spindle nose – table surface	[mm]	77 – 337 (3,0-13,3 inch)
Milling table		
Clamping surface (L x W)	[mm]	420 x 125 (16,5 x 4,9 inch)
Maximum table load	[kg]	10
2 T-slots acc. to DIN 650	[mm]	11 (0,4 inch)
T-slots distance	[mm]	90 (3,5 inch)
Milling spindle		
Bearing type		Roller bearing
Tool system (F1F P02)		
Pick-up system with swivel arm on the left of the milling head placed; incl. blow out facility		
System drive / expiry		electr., mech.
Proceeding speed tool turret trick plate	[m/min]	10 (393,7 inch/min)
Tool mounting similar DIN 2079		SK30
Draw bolts		Works standard
Tool clamping		automatic
Number of tool stations		8
Maximum tool weight	[kg]	1
Maximum tool diameter with / without turret	[mm]	40 / 60 (1,6 / 2,4 inch)
Main drive		
Asynchronous AC motor, power	[kW]	0,75
Speed range (stepless)	[rpm]	150 - 3500
Maximum torque	[Nm]	3,7
Speed per minute with option high speed spindle	[rpm]	14.000
Feed drives		
3 phase step motor in X/Y/Z axis with resolution of	[mm]	0,0005 (0,00002 inch)
Feed rate and rapid traverse in X/Y/Z axis	[m/min]	2 (78,7 inch/min)
Middle positioning variation acc. to VDI 3441 in X, Y, Z	[mm]	0.008 (0,0003 inch)
Maximum feed force X,Y / Z	[N]	800 / 1000
Lubrication system		
Guideways	oil lubrication	
Main spindle bearing	lifetime grease lubrication	

Subject to technical modifications!

Basic pneumatic (standard included in basic machine)		
Pneumatic service unit for tool taper blow-out device (with filter), supply pressure	[bar]	6
Air hose connection	[mm]	ø 10
Compressed air quality (acc. DIN ISO 8573-1)		cleanliness class 4
Painting		
light gray		RAL Nr. 7035
traffic red		RAL Nr. 3020
graphite gray		RAL Nr. 7024
Electrical connection		
Voltage supply (adjustable) 1/N/PE	[V]	115/230
Admissible voltage fluctuation	[%]	+5/-10
Frequency	[Hz]	50/60
Connection value	[kVA]	0,85
Maximum pre-fusing of machine	[A]	12
Safety devices		
Fully enclosed working area, axis limit switch door limit switch, emergency-off switch		Safety category 3
Step motor drive with brake		At tool turret
Procedures with the tool turret only with closed door, without setting function		
Dimensions/weight (approx. values !)		
Overall height	[mm]	980 (38,6 inch)
Floor requirement WxD	[mm]	960 x 1000 (37,8x39,4 inch)
Overall weight incl. tool turret	[kg]	ca. 220
Sound pressure level		
Mean sound pressure level	[dB(A)]	70
Machine acceptance		
Works standard similar DIN 8615		
Safety rules/norms		
Acc. to EEC-rules / acc. to CE EN292 part 1 / 2, EN60204 part 1 EEC machine guiding rules appendix 1		

PC Control

The machine is controlled by a standard PC.
The PC is provided by the customer.

Machine license

Does the direct control of the CONCEPT Machines and includes machine specific data.
For every CONCEPT machine a new machine license is to be produced.

Input possibilities

- EMCO Easy2Operate (Option)
  Panel for machine functions and onscreen display of the control keyboard (Easy2Control is included)
- PC keyboard and mouse
  possible, but not recommended

PC system requirements

Processor	PC Dual Core 2GHz	
Operating system	Windows 7 or higher (32 bit or 64 bit)	
Working memory	4 GB RAM	
Monitor	16:9 Full HD 1920x1080 (only for easy2control / easy2operate)	
Free hard disk memory	2 GB	
Interfaces	easy2control:	1x USB for Dongle
	easy2operate:	2x USB for Dongle + machine keyboard
	Machine connection	1x LAN (cable) – only for machine licence
	optional:	LAN or WLAN for network connection

Description EMCO Easy2control

EMCO Easy2control is a software visualizing the control- and machine-specific keyboards of the WinNC-controls on a 16:9 Full-HD screen.
The diverse operation fields for machine, control and short-cuts can be switched by tabs.
e.g.:

The buttons and regulation keys can be operated by the mouse.
When using a Full-HD-Touchscreen, you can operate these buttons and keys with this screen.

For operating the Software on the programming station (without machine), you need a license dongle.
For every work station an Easy2Control single license must be acquired. There is no multiple license.

Monitor requirements
16:9 Full-HD monitor with min. 1920 × 1080 pixel

For operating the machines CT 60, CM 55, CT 105 und CM 105, Easy2Operate is required.

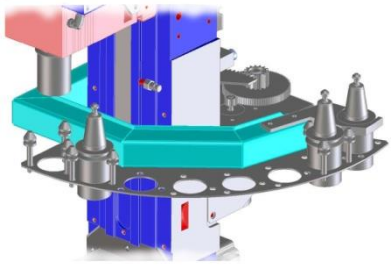
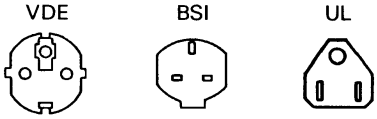
Description EMCO Easy2Operate

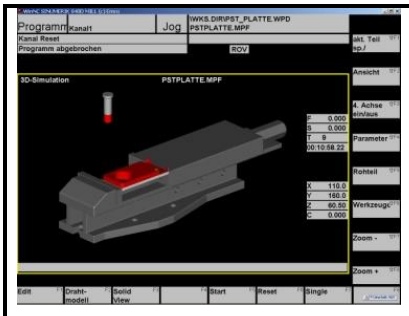
Easy2Operate is used to operate the machines CT 60, CM 55, CT 105 und CM 105.

Easy2Operate consists of Easy2Control (incl.dongle) + panel

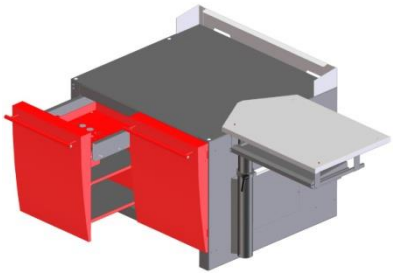
Basic Machine

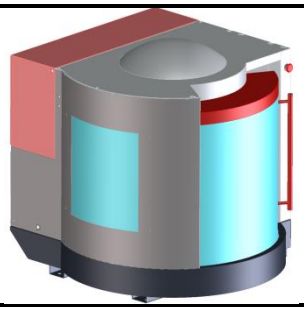
ATTENTION:
PC, software and control keyboard are not included in scope of supply of basic machine.

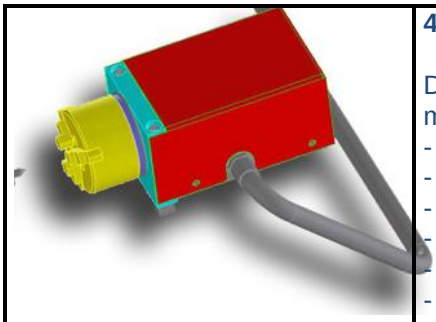
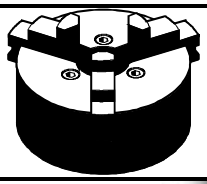
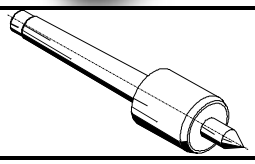
	**EMCO Concept MILL 55** PC-controlled 3-axis milling machine for basic CNC training with various industrial control systems. Machine complete with fully enclosed working area, safety units acc. to CE, stepless adjustable main drive, automatic movement to the reference position, electrical and mechanical preparation for automation, connection cable for PC-machine, machine lamp. USB stick with machine data, tool set for operating, operating instruction manual with spare parts list. Possibility for remote monitoring, **Tool turret Factory installed only !!**	F1F P01
 	**EMCO Concept MILL 55 with tool turret** PC-controlled 3-axis milling machine for basic CNC training with various industrial control systems Machine complete with fully enclosed working area, safety units acc. to CE, stepless adjustable main drive, automatic movement to the reference position, electrical and mechanical preparation for automation, connection cable for PC-machine, machine lamp. 8-station tool turret with electric/mechanical pick-up system with blow out facility milling spindle incl. pneumatic unit (for blow out facility) USB stick with machine data, tool set for operating, operating instruction manual with spare parts list. Possibility for remote monitoring,	F1F P02
	**Power supply cable** Indicate type of cable when ordering Power supply cable VDE Power supply cable BSI Power supply cable UL	 A4Z 010 A4Z 030 A4Z 050

	**WinNC Machine License** Operating the machine. Works only with connected machine. SINUMERIK OPERATE 840D sl / 828D FANUC Series 31i HEIDENHAIN TNC 640 (Milling only) HEIDENHAIN TNC 426/430 (Milling only) FAGOR 8055 Former versions … will be produced only for justified cases. Anyhow the technical preconditions have to be considered because old Windows versions could be requested.	 X3Y 400 X3Y 360 X3Y 460 X3A 200 X3A 300 On request
	**EMCO CAMCONCEPT, machine license** For CAD/CAM Programming and direct operation of PC controlled CNC machines. Only for: PC and Concept Turn 55/60 + Mill 55 PC and Concept Turn 105 + Mill 105	X3A 400
	**EMCO Win 3D-View, Milling** 3D graphic simulation Option for all WinNC EMCO Win 3D-View, Milling, single and machine license Not necessary for CAMCONCEPT!	X5A 260
	**Easy2Operate** Portables Maschinenbedienpult zur Bedienung der Maschine über Hardware, mit Achstasten, Vorschuboverride-Schalter Betriebsarten-wahlschalter etc. inklusive Easy2control Einzellizenz mit Lizenzdongle Vorzugsweise zur Bedienung von CT60, CM55, CT105 und CM105	X9C E2C

Accessories

	**Machine base** Base including: drawer for tools and other devices, deposit for PC-tower. WxDxH 1035x1100x800 mm. **Cover sheet for machine base** Only for ConceptTurn 60 and ConceptMill 55 **Swivel table** Deposit for monitor and control keyboard. With drawer for PC-keyboard. Height adjustment with gas-pressure-spring from 720 to 970 mm. Swivelling range +/- 30°. Installation on both sides possible. Installation left: Extension lead for monitor, keyboard and mouse necessary! WxD 845x550 mm. Table area 700x550 mm.	A7Z 210 A6Z 670 A7Z 430
	**Levelling element** 4 pieces required, when using with machine base	F3Z 150

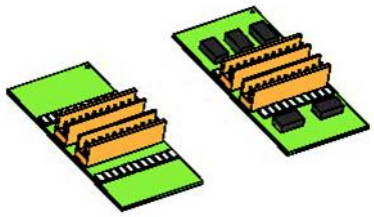
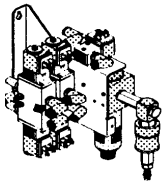
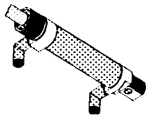
	View Window left	F1Z420
	**Minimum- lubrification unit** Container volume 500ml 2 oil volume regulators 2 nozzles with flexible hose Pressured air connection 4bar with regulator and pressure gauge Level display Coaxial supply hoses **Pneumatic unit A6Z540 and extension board A6Z640 necessary!!** **Factory installed only !!**	F1Z 400
	**Electronic handwheel** For moving the machine's axes manually to proceed zero point- and tool offsets **Retrofit able by EMCO technician !!** **Possible with ACC-Hardware V2 and higher!!**	Q1Z 340

	**4th axix Dividing Head (without chuck)** Dividing head Ries RSC-20 with casing and mounting pieces for Montage on the Milling table - continuously adjustable - Nominal moment: 42 Nm - Fast traverse: 8 min-1 - Accuracy of indexing: +/- 100" - Repeating accuracy: +/- 15" - Spindle height: 48 mm - Total height: 95 mm **- No hole through spindle !** **- No control possible with the PAL and the EMCOTRONIC** **Retrofitable by EMCO technician !!**	F1Z 240
	**3-jaw lathe chuck dividing head** Chuck diameter 74mm, throat 15 mm with chuck wrench, incl. 1 set inside/outside graduated jaws	A6Z 630
	**Tailstock for dividing head (without live center)** - Center height: 48 mm - Connection cone MK 1 - Displace range: 20 mm - Max. workpiece lenght: 100 mm	F1Z 450
	**Live center MT1 for dividing head** Triple-beared live center for supporting long work-pieces.	A5Z 260

Engraving Spindle Facility

	**Engraving spindle facility** Including 6 collets (1/1,5/2/2,4/3/3,2 mm), union nut and holder. Transmission case with EMCO spindle acceptance similar SK 30 and mechanically belt driven step-up gear. The spindle facility is directly mounted at the main spindle. Transmission 4:1	F1Z 190
	Set of engraving tools 5 pcs. Engraving tools	223 180

Accessories for Automation

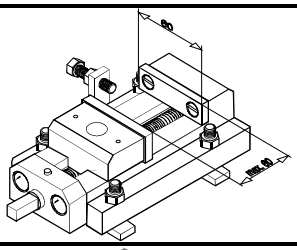
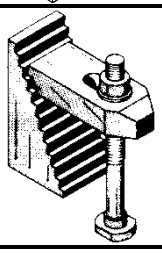
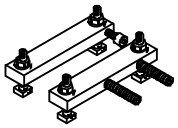
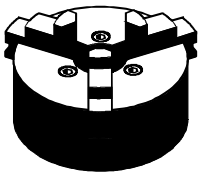
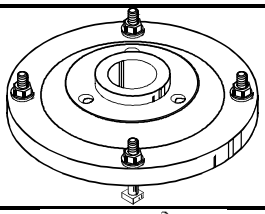
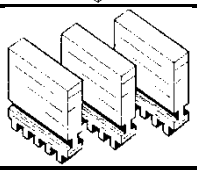
	**I/O – Extension board** I/O - extension board is required for ALL automation accessories and the minimum lubrication unit necessary. **Retrofitable by EMCO technician!!**	A6Z 640
	**Pneumatic unit** For connection of automatic door, pneumatical machine vice with blow out facility and the Minimum- lubrification unit. **Factory installed only !!**	A6Z 540
	**Automatic door** Incl. stroke control **A6Z 540, A6Z640 necessary !!** **Factory installed only !!**	F1Z 210
	**Pneumatic machine vice** Type Gressel Stroke and blow-out unit Jaw width: 72 mm Jaw opening: max. 70 mm Total length: 344 mm Total height: 63 mm Clamping force: 700 to 3000 N Pneum. pressure: 2 to 6 Bar **A6Z 540, A6Z640 necessary!!** **Factory installed only !!**	F1Z 740

	**Robotic Interface** Necessary for FMS/CIM operation. **Robotik-Interface Hardware or I/O extension board required!!**	X1A 000
	**DNC Interface** Enables the remote control of WinNC via a software- protocol. The communication is done via TCP/IP interface **Not available for Heidenhain TNC426/430 and Fagor 8055 MC**	X5A 050

The accessories are containing all electrical and mechanical parts for mounting on the machine and a mounting manual.

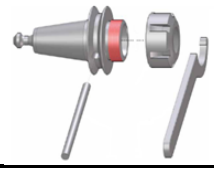
Subject to technical modifications!

Clamping Devices

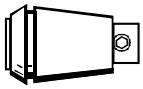
	**Machine vice** Machine vice complete with adjustable longitudinal limit stop. Width of jaws 60 mm, clamping width 60 mm	F1Z 310
	**Stepped clamping shoe** Stepped clamping shoe complete with clamping screw. Clamping range up to 60 mm	C3Z 300
	**Clamping rails** 1 set of clamping rails	F1Z 060
	**3-jaw lathe chuck** Chuck diameter ø82 mm Incl.1 set of inside/outside graduated hardened jaws	V4W 186R
	**Adapter plate** Required for mounting the chuck V4W 186R on the milling table	F1Z 800
	**Clamping jaws** Jaws suitable to V4W 186R 1 set of toothed soft jaws	V0W 013R

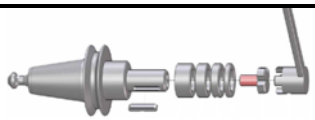
Tool Holders

Tool holder package CM55 consisting of:			F1Z 971
6 x	F1Z 100	Collet holder ESX 25	
1 x	225 001	Set collets ESX 25	
1 x	225 100	Collet ESX 25 ø10	
1 x	225 060	Collet ESX 25 ø6	
1 x	F1Z 110	Milling arbor ø16	
1 x	153 940	Tapping collet M5-M8	

	**Collet holder** For double coned ESX-25 collets and tapping collets with length compensation, complete with operating key	F1Z 100

	**Set of 16 Collets ESX 25** In box Nominal-ø 2 - 16 mm	225 001
	**Collet ESX 25** **DIN 6499 B** Nominal-ø Clamping area 2,0 1,5 - 2,0 2,5 2,0 - 2,5 3,0 2,5 - 3,0 4,0 3,0 - 4,0 5,0 4,0 - 5,0 6,0 5,0 - 6,0 7,0 6,0 - 7,0 8,0 7,0 - 8,0 9,0 8,0 - 9,0 10,0 9,0 - 10,0 11,0 10,0 - 11,0 12,0 11,0 - 12,0 13,0 12,0 - 13,0 14,0 13,0 - 14,0 15,0 14,0 - 15,0 16,0 15,0 - 16,0	 225 020 225 025 225 030 225 040 225 050 225 060 225 070 225 080 225 090 225 100 225 110 225 120 225 130 225 140 225 150 225 160

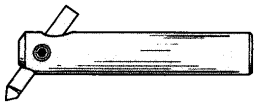
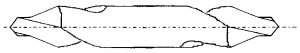
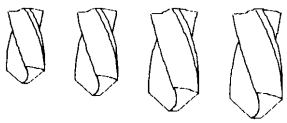
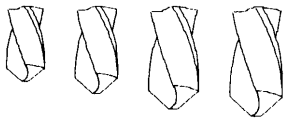
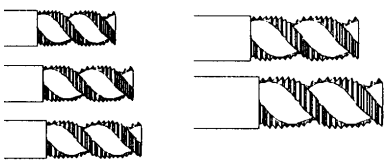
	**Tapping collets ER25 with length compensation** For the support of screw taps. Tapping collet M2 (shaft ø2,8 mm) Tapping collet M3 (shaft ø3,5 mm) Tapping collet M4 (shaft ø4,5 mm) Tapping collet M5 - M8 (shaft ø6 mm)	 153 910 153 920 153 930 153 940

	**Milling Arbor** For milling cutter with 16 mm bores, with key and milling machine arbor collars.	F1Z 110

Cutting Tools

Tool Package "Basic"			F1Z 980
with			
2x	225 060	Collet 6mm	
1x	225 100	Collet 10mm	
1x	764 301	Slot End Mill 3mm	
1x	764 303	Slot End Mill 5mm	
1x	764 308	Slot End Mill 10mm	
1x	764 410	Heavy Duty Shell End Mill	
3x	F1Z 100	Collet Holder	
1x	F1Z 110	Milling Arbor	
Tool Package "Extended"			F1Z 991
with			
1x	F1Z 971	Tool Holder Package CM55	
1x	764 410	Heavy Duty Shell End Mill	
2x	764 301	Slot End Mill 3mm	
2x	764 303	Slot End Mill 5mm	
2x	764 308	Slot End Mill 10mm	
2x	781 152	Heavy Duty Shank End Mill 10mm	
1x	771 030	Radius Milling Cutter 6mm	
1x	771 050	Angle Milling Cutter	
1x	771 010	NC-start Drill	
1x	225 100	Collet 10mm	
1x	781 303	Screw Tap M5	
1x	781 304	Screw Tap M6	
1x	771 120	Drills For Core Holes 5 pcs.	
1x	781 280	Twist Drills 25 pcs.	

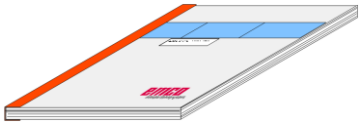
	**Heavy duty shell end mill, HSS** With roughing finishing teeth ø 40 x 20 mm, bore hole ø 16 mm	764 410
	**Staggered tooth side mill, HSS** Bore hole ø 16 mm ø 35 x 5 mm	764 900
	**Radius milling cutter, HSS** Two edged, with parallel shank shank- ø6 mm shank- ø12 mm	 771 030 771 040

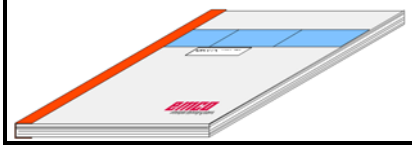
	**Slot end mill, HSS** Acc. to DIN 327, shape B cutting- ø3 mm / shank- ø6 mm cutting- ø4 mm / shank- ø6 mm cutting- ø5 mm / shank- ø6 mm cutting- ø6 mm / shank- ø6 mm cutting- ø8 mm / shank- ø8 mm cutting- ø10 mm / shank- ø10 mm cutting- ø12 mm / shank- ø12 mm	 764 301 764 302 764 303 764 304 764 306 764 308 773 100
	Heavy duty shank end mill, HSS Acc. to DIN 844, shape A cutting- ø8 mm / shank- ø8 mm cutting- ø10 mm / shank- ø10 mm cutting- ø12 mm / shank- ø12 mm cutting- ø16 mm / shank- ø16 mm	 764 200 781 152 781 151 771 020
	**Angle milling cutter, HSS** Acc. to DIN 1833, shape A 60°, ø16 mm, shank- ø12 mm	764 400
	**Angle milling cutter , HSS** Acc. to DIN 1833, shape B 45°, ø16x4 mm, shank- ø12 mm	771 050
	**Boring bar** For bore hole ø16-40 mm shank- ø15 mm	F1Z 050
	**NC-start drill, HSS** Shank ø10 mm, acute angle 120°	771 010
	**Centre drill, HSS** ø6,8 mm A8, HSS, DIN 333	 573 770 271 220
	**Twist drills, HSS** 25 twist drills ø1-13 mm, (0.5 mm graded) 9 twist drills ø2-10 mm, (1 mm graded)	 781 280 260 628
	**Twist drills for core holes, HSS** 5 core hole drills ø2.5, 3.3, 4.2, 5.0, 6.8 mm 6 twist drills for core holes ø2.5 - ø8.5 mm	 771 120 271 230
	**Screw taps, HSS** Set of 5 screw taps M3 - M8, DIN 352 + 371 Screw tap M3, (shank ø 3,5 mm) Screw tap M4, (shank ø 4,5 mm) Screw tap M5, (shank ø 6 mm) Screw tap M6, (shank ø 6 mm)	 781 300 781 301 781 302 781 303 781 304

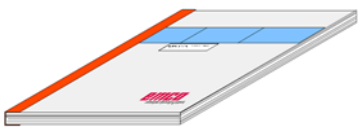
Setting Tools

	**Dial gauge with magnetic stand** Outside ring ø58 mm, division 0,01 mm measuring range 10 mm, with shock protection.	565 065
	**Edge indicator** Probe ø6 Shank ø6 mm	F1Z 390
	**3D sensor** incl. short probe tip ø4 mm clamping shank ø10 mm length without shaft 96 mm measuring range ±2 mm accuracy 0,01 mm	764 841
	**Spare Probe Ball Tip for 3D-Sensor** length 25mm probe tip ø4 mm	764 842

Manuals

	**Machine description Concept Mill 55**	DE 2055 EN 2055 FR 2055 SP 2055 TA 2055 HL 2055 SK 2055 CZ 2055

Programmieranleitungen Fräsen **Programming Instructions Milling** Ältere WinNC's und weitere Sprachen Auf Anfrage Former WinNC's and further languages On request **EMCO Win3D-View - Fräsen** Die Anleitung für Win3DView wurde aufgelassen und in die Anleitung für WinNC integiert. **EMCO Win3D-View - Milling** The manual for Win3DView has been abandoned and integrated into the manual for WinNC. 	**WinNC für SINUMERIK OPERATE 840Dsl/828D M** Manual WinNC Sinumerik Operate - M **WinNC FANUC Series 31i - M** Manual WinNC FANUC Series 31i - M **WinNC HEIDENHAIN TNC 640** Manual WinNC HEIDENHAIN TNC 640 - M **WinNC HEIDENHAIN TNC 426/430** Manual WinNC HEIDENHAIN TNC 426/430 - M **WinNC FAGOR 8055 MC** Manual WinNC FAGOR 8055 MC - M	DE 1848 EN 1848 FR 1848 HL 1848 SP 1848 TA 1848 CZ 1848 DE 1846 EN 1846 FR 1846 HL 1846 SP 1846 TA 1846 CZ 1846 DE 1844 EN 1844 SP 1844 DE 1816 EN 1816 HL 1816 SP 1816 TA 1816 DE 1818 EN 1818 FR 1818 SP 1818

	**Bedienungsanleitung CamConcept** **Instruction Manual CamConcept** Manual CAMConcept M	DE 1828 EN 1828 FR 1828 HL 1828 SP 1828 TA 1828

Courseware

E[MCO] CAMPUS	**E[MCO] Campus** **E-Learning 2.0 for machining.** **Multimedia teaching and learning materials** **for CNC** **.** **E[MCO] Campus** is a multimedia training program that teaches all the basics of modern CNC technology. The cleverly-designed teaching format makes even complex concepts easy to grasp and learn. Interactive dialog features allow students to progress at their own pace. Views are displayed using attractive 2 and 3D graphics, animations, and videos, sustainably improving the success of the learning process.. **Languages** German, English, Spanish, Chinese, Czech, Romanian, Polish, Slovenian	
	Single-user license 1	**X2Y 400**
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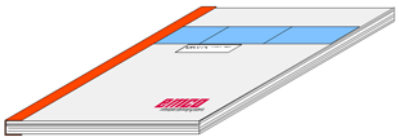
	Campus License A Campus-License consists of several Multiple licenses. The Software is working without any time restriction, a renewal of the version is not necessary. A Software Maintenance Contract (SMC) is not available right now.	**On request**

Brochures

	**EMCONOMY moves** **CONCEPT MILL 55**	DE 2801 EN 2801 FR 2801 SP 2801 RU 2801 CZ 2801 DE 4536 EN 4536 TA 4536 SP 4536 FR 4536

Packing

	Europe packing Standard packing	incl.
	Options to european packing for **Machine Mill55**:	
	Climate packing Pallet, Alu-bandage, various accessories	ZVP 547 120
	Seaworthy packing **Requires climate packing ZVP 547120!**	ZVP 301 124

Packing machine base

	Standard packing for machine base	Incl.
	Climate packing Pallet, Alu-bandage, various accessories	**ZVP 547 120**
	Seaworthy packing **requires climate packing ZVP 547120!**	**ZVP 301 124**