EMCO GmbH.
Salzburger Straße 80
A-5400 Hallein-Taxach
AUSTRIA

20.02.2019

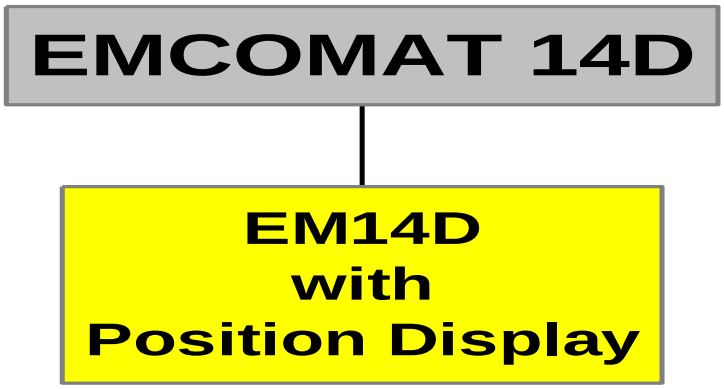
TECHNICAL SPECIFICATION

EMCOMAT 14 D

CONVENTIONAL TURNING LATHES

CE

Machines:



Basic machines		
	DESCRIPTION**:**	REF.NO.:
	**EMCOMAT 14D** Universal center lathe, for direct connection DIN55029-S4 CAMLOCK, toolmaker accuracy DIN 8605, Distance between centers 650 mm, center height 140 mm, with machine base and standard equipment, mechanics metric, capacity 5,5 kW, spindle speed from 60 - 4000 rpm., electr. infinitely variable, electric 400V / 50 Hz / ~3 / PE, integrated position display EMCO ACC , incl. chuck guard and spindle cover acc. the european safty standard (CE)	**6AC7D000**

Basic equipment and Standard Accessories:	
• Machine bed with prismatic guides • Machine stand with electric cabinet • Splash guard • Headstock • Tailstock • Longitudinal-, cross- and top slide • Single tool post (clamping claw) • Electric chuck guard with limit switch • Feed gear drive • Feedshaft with slip clutch • Leadscrew with claw clutch • 1 pc.fixed center for main spindle • 1 pc. fixed center for tailstock •	• 1 pc. double-end ring spanner 17x13 DIN837 • 1 pc. socket spanner B13x17-A DIN896 • 1 pc. wrench SW5 DIN911 • 1 pc. wrench SW6 DIN911 • 1 pc. double open-end spanner 8x10 DIN895 • 1 pc. single open-end spanner SW13 DIN894 • 1 pc. key for electric cabinet • 1 pc. grease gun • 3 pcs. shear pins • 1 pc. user manual with spare part list • 1 pc. electrical documentation • 1 pc. inspection protcol • Digital read out • Packing

Position Display:

- permanent position display of the bed-, cross- and top slide

- the position control of the bed slide is accomplished by a precise measuring toothed rack moving the rotatory position transmitter over a gearwheel

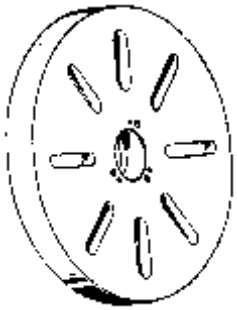
- the position of the cross slide is measured by a glass scale with a 0,001 mm accuracy, in order to adjust the diameter with maximal accuracy

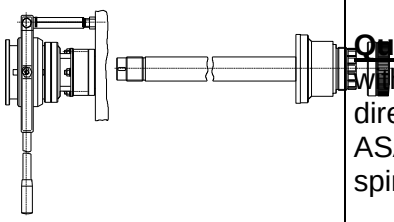
- the position of the top slide is measured by direct drive of the shaft encoder over the adjusting spindle

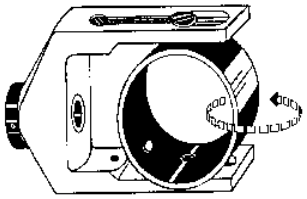
- functions: constant cutting speed, 99 tools, 99 datums, referencepoint, distance to go △, inch/metric, radius-/diameter, separate or sum display for Z and Zo, clock
Languages: German, English, Spanish, French, Italian, Dutch, Czech

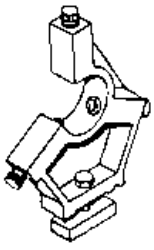
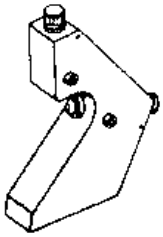
- Screensize 6,5“ color-TFT, 640x480 resolution (VGA)

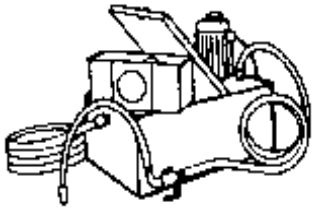
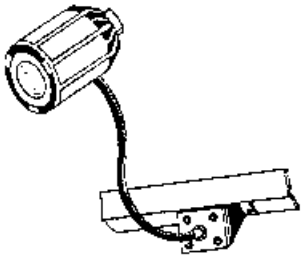
	DESCRIPTION**:**	REF.NO.:
Clamping devices		
	**<u>High precision 3-jaw lathe chuck ZS ø 140 mm</u>** **incl. 1 set out- and inside jaws**, for direct mounting acc. to DIN 55029-S4 rsp. Camlock, a max. permissible run out and plan error 0,04 rsp. 0,03 mm, permissible speed 5000 rpm., hole through chuck ø 40 mm, gripping capacity: outside: 3-140 mm, internal: 39-132 mm	**6A444010**
	**<u>Block jaw, unstepped, soft, material 16MnCr5</u>** 1 set (3 pcs.) jaws for lathe chuck Ref.No. 6A444010	**6AT1D013R**
	**<u>Outward stepped hardened jaws</u>** 1 set (3 pcs.) jaws for lathe chuck Ref.No. 6A444010	**6AV3Z010R**
	**<u>Innward stepped hardened jaws</u>** 1 set (3 pcs.) jaws for lathe chuck Ref.No. 6A444010	**6AV3Z020R**
	**<u>High precision 4-jaw lathe chuck ZS ø 140mm</u>** **incl. 1 set out-and inside jaws**, for direct mounting acc. to DIN 55029-S4 rsp. Camlock, guarantees a max. permissible run out and plan error 0,04 rsp. 0,03 mm, hole through chuck ø 40 mm, permissible speed 5000 rpm., gripping capacity: outside: 3-140 mm; inside: 39-132 mm	**6A444020**

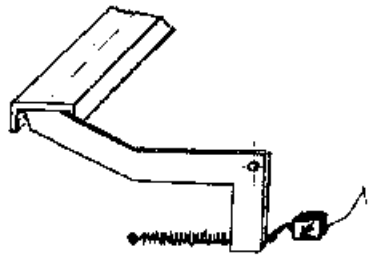
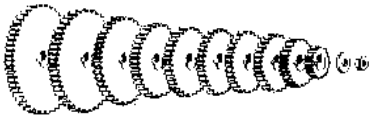
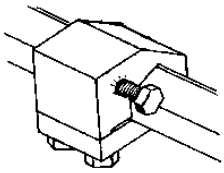
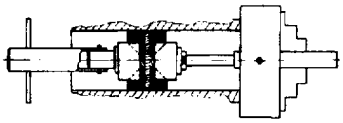
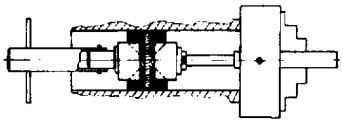
	DESCRIPTION**:**	REF.NO.:
	**<u>Block jaw, unstepped, soft, material 16MnCr5</u>** 1 set (4 pcs.) jaws for lathe chuck Ref.No. 6A444020	**6AT1D014R**
	**<u>Outward stepped hardened jaws</u>** 1 set (4 pcs.) jaws for lathe chuck Ref.No. 6A444020	**6AZME301264**
	**<u>Innward stepped hardened jaws</u>** 1 set (4 pcs.) jaws for lathe chuck Ref.No. 6A444020	**6AZME301274**
	**<u>High precision Face plate ø 160mm</u>** **Incl. 4 individually adjustable reversable jaws**, permissible speed 3820 rpm. flange-mounted acc. to DIN 55029-S4 rsp. Camlock,	**6AC7Z650**
	**<u>Clamping plate ø 254mm</u>** for unsymmetrical workpieces Clamping device: clamping shoes or direct fix with a screw for direct mounting acc. to DIN 55029-S4 rsp. Camlock	**6AC6Z540**

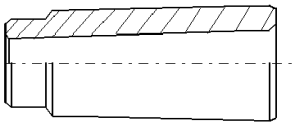
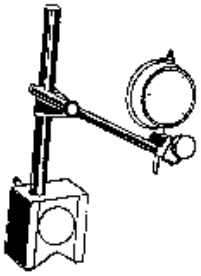
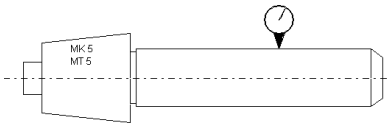
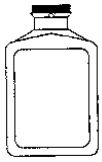
	DESCRIPTION**:**	REF.NO.:
	**Quick action collet chuck** with hand lever and end-switch supervision for direct mounting acc. to DIN 55029-S4 rsp. Camlock ASA B5.9 Gr.4 spindel bore in tension tube ø32mm Use with collets 163E, 2-30 mm	**6AC7Z080** **Factory fitted only (Class 2) !**
	**collets 163E** suitable to C7Z080 Clamping capacity 2 - 30 mm in increments of 1 mm Order example: collet ø 20 ==>> collet ø 33 ==>>	 **6A434200** **6A434330**
	**Collet chuck for type 5C** American standardcollets type 5C; Connection Camlock DIN55029 S4 Clamping by key on the chuckbody	**6A585330B**
	**Set of 17 pcs. Collets Type 5C** Clamping capacity ø 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 6 8 / 10 / 12 / 14 /15 / 16 / 17 / 18 / 20 mm (suitably article to 6A585330)	**6A585320**

	DESCRIPTION**:**	REF.NO.:
Accessories for tailstock		
	**Live Center MT2**	**6AB2Z260**
	**Center Drill Top** incl. 2 pcs. short center drills (6A212350) (suitable to live center MT2 – 6AB2Z260)	**6A585280**
	**Rapid clamping drill chuck, type 136 supra** clamping range ø 1 - 13 mm, mount B12 (requires morse taper arbor MT2 – 6A251010)	**6A250030**
	**Morse Taper Arbor MT2-B12** for take up of drill chuck in the tailstock (suitable to – 6A250030)	**6A251010**

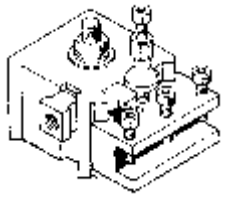
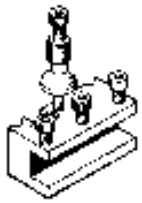
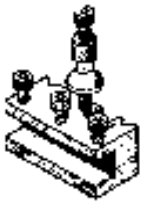
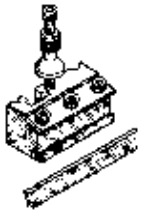
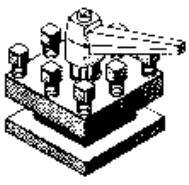
Steadies		
	**Fixed Steady** with exchangeable bronze inserts, center height 140 mm, for workpiece diameters ø 4 - 70 mm (suitable for Maximat Super 11CD as well)	**6AC6Z740**
	**Follow Rest** with exchangeable bronze inserts, center height 140 mm, for workpiece diameters ø 4 - 60 mm (suitable for Maximat Super 11CD as well)	**6AC7Z730**

Accessories for machine		
	**Coolant Equipment 400V / 50 Hz / ~3 / PE**	**6AD4Z460**
	**LED Machine Lamp 24V, 3W**	**6AF3Z310**
	**Additional chip guard door (moveable)**	**6AC7Z010**
	**Tool cupboard (drawer) - possible to retrofit**	**6AC7Z700**
	Chip guard with magnetic prism	**6A565780**

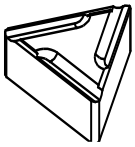
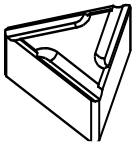
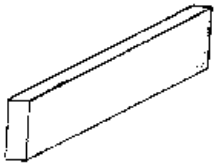
	DESCRIPTION**:**	REF.NO.:
	**Foot-Operated Spindle-STOP (Foot Brake)**	**6AC7Z750**
	**Change Gear Quadrant** to cut following additional thread pitches: Number of Metric threads: 13 Range of Metric threads: 0.125 - 5.0 mm Number of Inch threads: 29 Range of Inch threads: 76 - 4 tpi Number of Module threads: 12 Range of Module threads: 0.25 - 2.5 m Number of Diametral threads: 25 Range of Diametral threads: 96 - 11 tpi (Details of thread pitches ⇨ please see Technical Data - Thread Cutting)	**6AC7Z200**
	**Longitudinal Stop**	**6AC6Z710**
	**Hollow spindle stop** 39-47mm, incl. Key .	**6A212520**
	**Hollow spindle stop for quick action collet chuck (6AC7Z080)** 31-39mm, incl. Key	**6A212530**

	DESCRIPTION**:**	REF.NO.:
	**Reduction Sleeve MT2 – MT1**	**6A585040**
	**Levelling Elements** 3 pieces necessary	**6A585120**
	**Dial Gauge with Magnetic Dial Gauge Stand** Outer dial gauge diameter ø 58 mm, measuring range 10 mm, scale division 0.01 mm, with shock protection and fine adjustment of pointer, magnetic dial gauge stand with prism.	**6A565065**
	**Test mandrel** Main spindle Big Bore MT5 (packed in wooden box) Tailstock MT2 (packed in wooden box)	**6AC7Z620** **6AC7Z610**
	**Gear Oil for Headstock and Gearbox** 1 Litre Mobil DTE 25	**6A751000**
	Special paint finish	**Only ex works (Class 3) !**

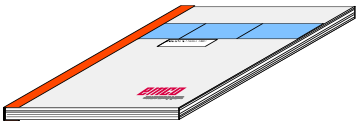
Tool posts		
	DESCRIPTION**:**	REF.NO.:
	**<u>Quick-change toolpost – SET A</u>** comprising basic holder, 4 pcs. standard AD 1675 and 1 pcs. prism tool post AH 2085	**6A599170**
	**<u>Quickchangetoolpost Size A</u>**	**6A599180**
	**<u>Standard toolpost</u>** AD1675 for Ref. No. 6A599180	**6A599181**
	**<u>Prism toolpost</u>** AH2085 for Ref.No. 6A599180	**6A599182**
	**<u>Parting off holder</u>** Multifix cutting-off holder T AT-K incl. cutting-off blade TS AO-F for Ref.No. 6A599180	**6A599280**

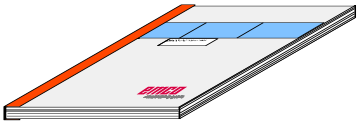
Tool posts		
	DESCRIPTION**:**	REF.NO.:
	**<u>Set - Quick Change Tool Post</u>** Consisting of: • 1 pc. basic quick change tool post • 1 pc. Standard tool holder for cutting tools with shanks up to 12 mm height • 2 pcs. operating keys	**6AC6Z180**
	**<u>Standard Tool Holder</u>** for cutting tools with shanks up to 12 mm height (suitable to quick change tool post – 6AC6Z180)	**6AC6Z290**
	**<u>Boring Bar Holder</u>** for cutting tools with shanks up to 12 mm height (suitable to quick change tool post – 6AC6Z180)	**6AC6Z300**
	**<u>Parting-Off Holder</u>** incl. 1 pc. HSS parting-off blade (suitable to quick change tool post – 6AC6Z180) **<u>Spare blade</u>**	**6AC6Z280** **6A511600**
	**<u>4-Station Tool Post</u>** for cutting tools with shanks up to 12 mm height	**6AC6Z190**

	DESCRIPTION**:**	REF.NO.:
Cutting tools		
	**<u>Right-Hand Roughing Tool</u>** shank 12x12 mm, approach angle 75º DIN norm (J1): CTRNR1212F11 (requires indexable hardmetal inserts – 6A513300)	**6A585250**
	**<u>Right-Hand Turning Tool</u>** shank 12x12 mm, approach angle 90º DIN norm (J1): CTGNR1212F11 (requires indexable hardmetal inserts – 6A513300)	**6A585240**
	**<u>Left-Hand Turning Tool</u>** shank 12x12 mm, approach angle 90º DIN norm (J1): CTGNL1212F11 (requires indexable hardmetal inserts – 6A513300)	**6A585230**
	**<u>Right-Hand Facing Tool</u>** shank 12x12 mm, approach angle 90º DIN norm (J1): CTFNR1212F11 (requires indexable hardmetal inserts – 6A513300)	**6A585210**
	**<u>Left-Hand Boring Bar</u>** shank ø 12 mm, approach angle 90º DIN norm (J1): S12KCTFPR11 (requires indexable hardmetal inserts – 6A585260)	**6A585220**

	**Set of 10 pcs. Indexable Hardmetal Inserts** DIN norm (J1): WSP TNMG 110304EN-TF Hardmetal grade: Gm527 (suitable to 6A585240, 6A585250, 6A585210 and 6A585230)	**6A513300**
	**Set of 10 pcs. Indexable Hardmetal Inserts** DIN norm (J1): TPMR110304EL Hardmetal grade: GM40 (suitable to 6A585220)	**6A585260**
	**Parting-Off Blade, HSS** (suitable to parting-off holder – 6AC6Z280)	**6A511600**

Packing		
	Climate packing Consisting of: pallet, dehumidifier, aluminium-cover and miscellaneous	**6AZVP547700Z**
	Wooden box Additional protection for critical transportation. (Attention: additional to standard or climate packing)	**6AZVP301700Z**

	DESCRIPTION**:**	REF.NO.:
Manual		
	**<u>User Manual with Spare Part List</u>** for EMCOMAT 14D Available in: • German • English • French • Dutch	**6ADE2203** **6AEN2203** **6AFR2203** **6AHL2203**

Brochures		
	**<u>EMCO – Conventional Lathes</u>** General description of all conventional lathes from EMCO Available in: • German • English • French • Spain • Italian	**6ADE3381** **6AEN3381** **6AFR3381** **6ASP3381** **6ATA3381**

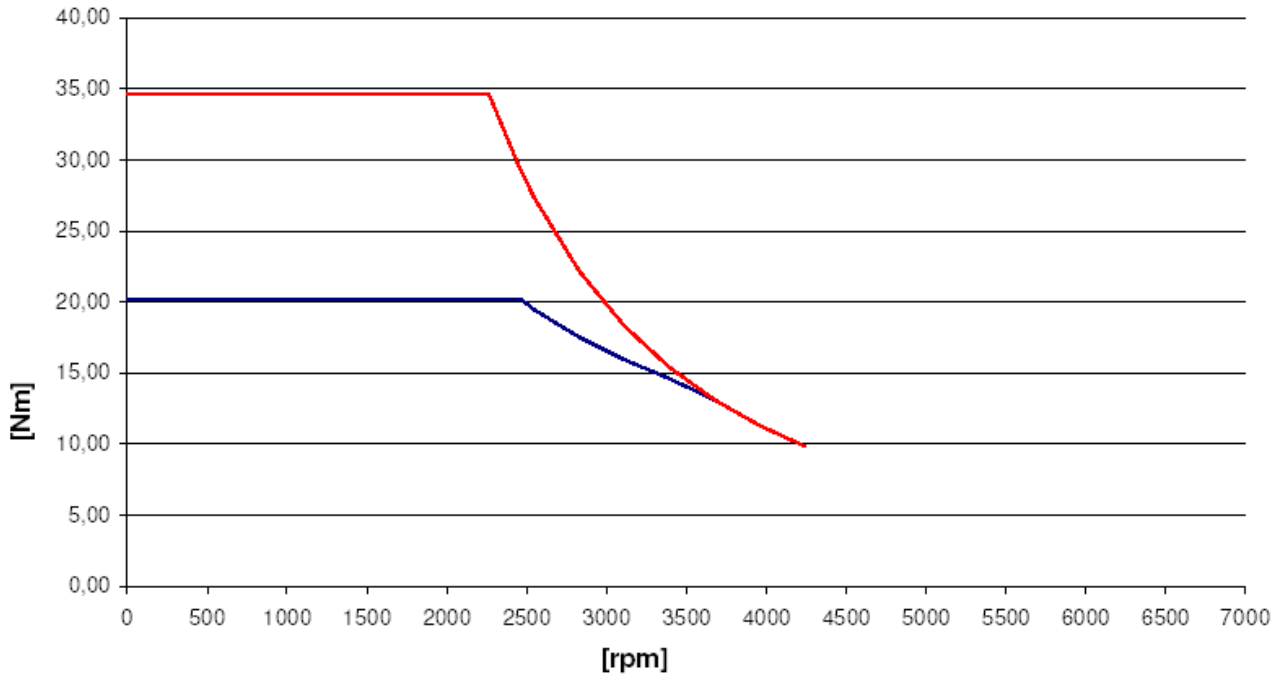
TECHNICAL DATA MACHINE EMCOMAT 14D

Working range		
distance between centers	[mm]	650
center height	[mm]	140
swing over bed	[mm]	∅ 280
swing over cross slide	[mm]	Ø 170
width of lathe bed	[mm]	155
travel longitudinal slide	[mm]	485
travel cross slide	[mm]	135
travel top slide	[mm]	100
cross slide (length over traverse)	[mm]	240
cross slide (width over traverse)	[mm]	120
guiding length of bed slide	[mm]	218
turning tool cross section	[mm]	12x12
distance top slide - turning center	[mm]	23
Swivel-range of top slide	[°]	180/180
Main spindle		
Camlock DIN55029		S 4
hole through spindle	[mm]	Ø 40
inside taper	[MT]	5
spindle diameter in front bearing	[mm]	Ø 54
chuck diameter (maximum)	[mm]	Ø 140
face plate diameter (maximum)	[mm]	Ø 152
spindle speeds	[rpm]	60-4000
spindle speed regulation		variable
Drive motor		
AC motor, three phase motor with brake		
motor speed	[rpm]	1440
capacity at 40% / 100% ED	[kW]	7,5/ 5,4
Feeds		
14 longitudinal feed rates Z	[mm/rev]	0,03-0,3
0,03 / 0,037 / 0,043 / 0,05 / 0,06 / 0,075 / 0,086 / 0,1 / 0,12 / 0,15 / 0,18 / 0,21 / 0,25 / 0,3	[mm/rev]	
14 transversal feed rates X	[mm/rev]	0,015-0,15
0,015 / 0,0185 / 0,0215 / 0,025 / 0,03 / 0,0375 / 0,043 / 0,05 / 0,06 / 0,075 / 0,09 / 0,105 / 0,125 / 0,15	[mm/rev]	

Threads		
14 metric threads in basic version	[mm]	0,25-2,5
0,25 / 0,3 / 0,35 / 0,4 / 0,5 / 0,6 / 0,7 / 0,8 / 1,0 / 1,25 / 1,5 / 1,75 / 2,0 / 2,5	[mm]	
13 metric threads (with option change gear set C7Z200Z)	[mm]	0,125-5,0
0,125 / 0,15 / 0,175 / 0,2 / 0,45 / 0,75 / 0,9 / 2,25 / 3,0 / 3,5 / 4,0 / 4,5 / 5,0	[mm]	
38 inch threads (with option change gear set C7Z200Z)	[tpi]	96-4
4 / 4½ / 5 / 5½ / 6½ / 7 / 8 / 9 / 9½ / 10 / 11 / 12 / 13 / 14 / 16 / 18 / 19 / 20 / 22 / 24 / 26 / 27 / 28 / 30 / 32 / 36 / 38 / 40 / 44 / 48 / 52 / 56 / 60 / 64 /72 / 76 / 80 / 96	[tpi]	
12 module threads (with option change gear set C7Z200Z)		0,25-2,5
0,25 / 0,3 / 0,4 / 0,5 / 0,7 / 1,0 / 1,25 / 1,5 / 1,75 / 2,0 / 2,25 / 2,5		
25 diam. Ptch threads (option change gear set C7Z200Z)	[tpi]	96-11
11 / 12 / 13 / 14 / 16 / 18 / 20 / 22 / 22 / 24 / 26 / 28 / 30 / 32 / 36 / 40 / 44 / 48 / 52 / 56 / 60 / 64 / 72 / 80 / 88 / 96	[tpi]	
Lead screw		
Lead screw diameter	[mm]	∅ 20
Pitch lead screw	[mm]	3
Tailstock		
sleeve diameter	[mm]	∅ 30
Internal taper of tailstock sleeve	[MT]	2
stroke of centre sleeve	[mm]	80
adjustment at the side	[mm]	+10/-8
Graduated Collar Division of Handwheels		
longitudinal side Z	[mm]	0,02
cross slide X	[mm]	to ∅ 0,05
top slide Zo	[mm]	0,025
Tailstock	[mm]	0,05
Allowable Workpiece Weight		
Flying	[kg]	45
with tailstock	[kg]	80
Electrical Connection		
voltage supply 50/60 Hz/ 3 ~ /PE – metric machine	[V]	400
voltage tolerance	[%]	+6/-10
Frequency	[Hz]	50/60
electr. Connection	[kVA]	7
main fuse	[A-inert]	16
temperature (humidity 20-75%)	[degree]	10 – 35

Dimensions		
length	[mm]	1280
Width	[mm]	730
Height	[mm]	1480
operating height (spindle)	[mm]	1100
Weight	[kg]	420
Painting		
Light-grey Red Graphite-grey		RAL Nr. 7035 RAL Nr. 3020 RAL Nr. 7024
Sound Pressure Gage		
sound pressure value by following conditions: • method of measurement: enveloping surface methoe acc. to DIN 45 635 • measuring point: 1m distance and 1,6m over the floor • working condition: highest spindle speed in idle running	[dB (A)]	77

Torque diagram EM14D



***Technical Features* EMCOMAT 14D**

The Concept:

Engineered to meet rugged professional requirements, the EMCOMAT 14D responds with all those fine technical features that distinguish a modern industrial leadscrew / feedshaft lathe. The EMCOMAT 14D is the advancement of the world-wide very successful and well-known EMCO MAXIMAT SUPER 11 CD.

The Users:

The EMCOMAT 14D will prove a reliable partner in all cases calling for the production of complex shapes, spares, dies or small-run production series.
It will prove just as indispensable to: Precision mechanics, Repair workshops, Die makers, Optical workshops, Electrical workshops, Automobile workshops, Airplane and helicopter service enterprises, Technical and scientific laboratories, Schools and apprentices' training shops, Motor tuning, Formula 1 and motorcycle racing service.

All appreciate the advantages of the EMCOMAT 14D as a small, compact machine with all of the advantages of its bigger brothers (EMCOMAT Series 17D/20D).

Headstock:

Made of vibration absorbing, heavily ribbed cast iron.

The rigid, large size work spindle runs on precise bearings and is equipped with a Camlock ASA 5.9 D1-4 /DIN55029 S4 short taper connection. All bearings are lifetime lubricated.

Feed-gear Mechanism:

The enclosed sliding mesh gearbox contributes to smooth running, effortless gear changing and high reliability of operation. Feed-drive reverse is a fully enclosed construction (integrated in the feed gear).

Main Spindle Connection:

- EMCOMAT 14D Camlock connection ASA 5.9 D1, taper size 4 and 40 mm main spindle bore

Main Drive:

Main drive motor:

AC-standard motor, type of protection IP55

Main drive belts:

The power transmission from the main motor to the countershaft in the headstock is done by a flat multiple V-belt (serves for a smooth start-up)

Slides:

The longitudinal slide is mounted on the prismatic guide of the machine bed and runs free from backlash. The large guide length guarantees an optimum guide ratio (serves for maximum accuracy). The cross slide runs on a dovetail guide on the longitudinal guide. Adjustment will be done by means of thrust strip.

Feed is automatic or by means of the handwheel. Precise downfeed through large-size handwheel with scale ring. The longitudinal- and cross slide can be clamped on.

The top slide, with its dovetail guide, is mounted on the cross slide and can be swivelled 360º.

Double wall apron construction. Feed lever with safety lock prevents accidental switching to longitudinal- and cross feed.

Tailstock:

Made of high-quality, vibration absorbing cast iron.

Mounted on separate prismatic guide.

For taper turning the tailstock can be adjusted off-center.

Electrical Data:

- Fuse for control power circuit and machine lamp
- Built-in thermal-overload relay for main motor, motor of vertical unit and coolant equipment
- Safety guard with microswitch to protect unintentional opening of gear-housing cover
- Electrical cabinet with cableinlet and terminal strip for electrical connection of coolant equipment and machine lamp without power supply cable
- Main motor and electrical cabinet protected according to IP54

Electrical:

The electrical equipment complies with the latest technical guidelines in accordance with EN 60204, EN 292, IEC 204, VDE 0113, ÖVE EN 13, CSA and UL.

All accessories are integrated into the safety concept and can be connected to the assigned terminal strip, provided for the purpose.

Safety:

The EMCOMAT 14D is equipped with a completely new safety concept according to the European safety standards (CE)

Mechanical safety features:

- Feedshaft with slip clutch protects the machine against overload and permits precision turning to dead-stop length
- Feed lever lock prevents unintentional switching from longitudinal- to cross feed and vice versa
- Feed lever and halt-nut lever interlocked. This prevents simultaneous engagement of the feedshaft and leadscrew
- Leadscrew is fitted with claw clutch and is only engaged at thread cutting.
- Bed slide fitted with gibs to prevent shearing point between bed slide and tailstock
- Crush point between cross slide and cross spindle defused by gibs
- Cover for leadscrew
- Splash guard
- Chuck guard cover with chuck guard interlock

Electrical safety features:

- Lockable main switch
- Electric chuck guard with limit switch
- Emergency-Off push-button
- Isolating transformer for control voltage 24V
- Power restoral lock in case of undervoltage or safety feature respond
- Thermal overload protector integrated in main drive motor
- Complete electrical circuit features fuse protected

Quality:

Highest quality standards aac. to ISO9000:2001 are attained by applying advanced production- and testing methods.

These are possibly the reasons accounting for world-wide sales of the EMCOMAT 14D predecessors the S11CD and V 10P, numbering 100,000 units.

Service:

EMCO operates a dense service network, warranting assistance at all times should the occasion arise.