

AC 650



Cylinder boring machine

A Company
of ThyssenKrupp

BERCO S.p.A.



The machine and its components

Fig. 4



Fig. 5



Fig. 6



Fig. 7

Fig. 8

Fig. 9

Standard Outfit

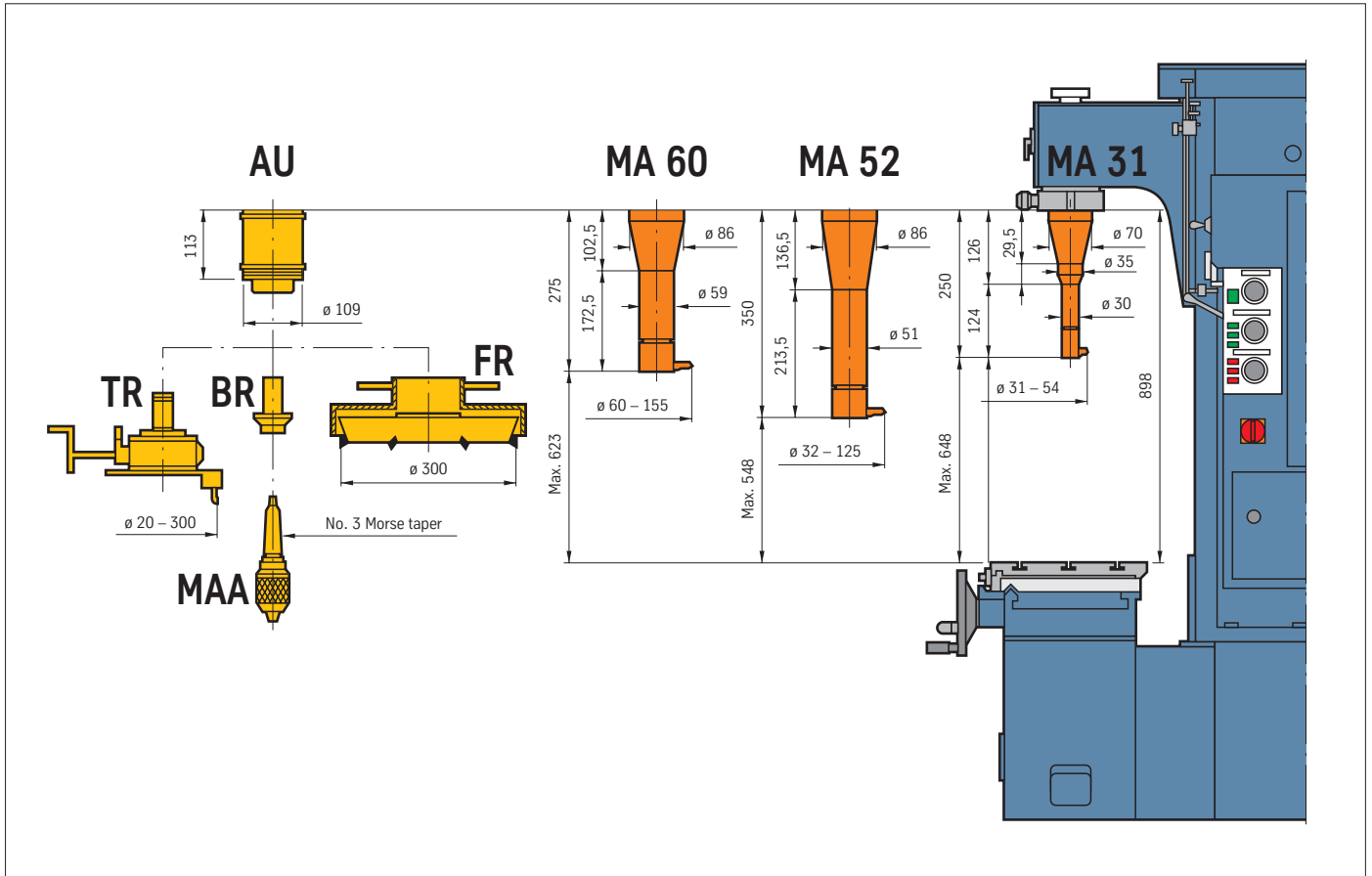
- Spindle Safety Guard
- Parallel support assy, 120 mm (4.72") high, complete with screws, nuts and clamps for securing the cylinder block.
- DM 52 measuring device (Fig. 5), 52 - 155 mm (2.05" - 6.10"), complete with micrometer (metric or imperial).
- Locking rod for counterweight.
- Tool puller, grease gun and set of service spanners.

Extra Outfit

- **A00.20473**
Parallel support assembly, 80 mm (3.15") high, with screws and nuts (2 pcs. required).
- **A00.20458**
Parallel support, 200 mm (7.87") high (2 pcs. required).
- **A00A27820**
Tool grinder (Fig. 4).
- **A00.67506**
Diamond wheel (Fig. 4).
- **A00A07602B**
Tool grinding jig assembly (Fig. 4).
- **A00.58100**
Stud puller, 8 - 13 mm (0.32" - 0.51") capacity.
- **A00.58105**
Ditto, 12 - 25 mm (0.47" - 0.1") capacity.
- **V11A23003**
Spindle infeed reading fixture (draw. No. A00A23770), assembled on the machine, metric (Imperial: V11A23004).
- **P00A23908**
MA 31 Boring spindle and DM 31 Measuring device (Fig. 11), 31 - 54 mm (1.20" - 2.13") capacity, cpl. with dial indicator, metric (Imperial: P01A23908).

- Fig. 1 Boring a cylinder block.
- Fig. 2 Milling an in-line block top with multiedged insert milling cutter.
- Fig. 3 View of the controls box on AC 650M.
- Fig. 4 Tool grinder, complete with diamond wheel and tool grinding jig.
- Fig. 5 DM 52 measuring device, for setting tool out of machine.
- Fig. 6 Centering a cylinder with the fixture equipping the boring spindle.
- Fig. 7 Boring a cylinder with an insert type tool.
- Fig. 8 Chamfering a cylinder with the chamfering tool.
- Fig. 9 Boring a machine tool component with a dead-end hole tool.

The machine and its components



Spindler and Accessories

SPINDLES		TOOLS FOR CAST IRON														
Type	Tool-holder	BORING				SPOT-FACING				DEAD-END HOLE				CHAMFERING		
		capacity dia. mm	brazed tip	insert holder	insert type	capacity dia. mm	brazed tip	insert holder	insert type	capacity dia. mm	brazed tip	insert holder	insert type	capacity dia. mm	brazed tip	
MA31	-	31 - 42 1.22" - 1.65"	U202265301 *	A03.19396	U003101000	31 - 42 1.22" - 1.65"	U202265301	A03.19396	U003101000	44 - 54 1.73" - 2.13"	U202248071	A04.19362	U003101000			
		40 - 54 1.57" - 2.13"	U202265331 *	A03.19399		40 - 54 1.57" - 2.13"	U202265331	A03.19399		75 - 107 2.95" - 4.21"	U202248101	A00A23678	U003101000	64 - 98 2.52" - 3.86"	U202269091	
MA52	A00A23668	52 - 62 2.05" - 2.44"	U202267051 *	A00A23676	U010101060	56 - 66 2.21" - 2.60"	U202265351	A00A07891	U003101000	65 - 77 2.56" - 3.03"	U202248121	A00A23680	U003101000	54 - 66 2.13" - 2.60"	U202269101	
	A00A23669	60 - 92 2.36" - 3.62"	U202267061 *	A00A07882		64 - 102 2.52" - 4.02"	U202265361	A00A07894		75 - 107 2.95" - 4.21"		U202248121		A00A23680		64 - 98 2.52" - 3.86"
	A00A23670	90 - 125 3.54" - 4.92"	U202267061 *	A00A07882		100 - 135 3.94" - 5.32"	U202265361	A00A07894		105 - 139 4.13" - 5.47"		U202248121		A00A23680		96 - 130 3.78" - 5.12"
MA60	A00A23669	60 - 92 2.36" - 3.62"	U202267051 *	A00A23676	U010101060	64 - 102 2.52" - 4.02"	U202265351	A00A07891	U003101000	75 - 107 2.95" - 4.21"	U202248101	A00A23678	U003101000	64 - 98 2.52" - 3.86"	U202269091	
	A00A23670	90 - 125 3.54" - 4.92"	U202267061 *	A00A07882		100 - 135 3.94" - 5.32"	U202265361	A00A07894		105 - 139 4.13" - 5.47"		U202248121		A00A23680		96 - 130 3.78" - 5.12"
	A00A23771	123 - 155 4.84" - 6.10"	U202267061 *	A00A07882		133 - 165 5.24" - 6.50"	U202265361	A00A07894		137 - 165 5.39" - 6.50"		U202248121		A00A23680		128 - 165 5.04" - 6.50"

* Tools supplied as standard outfit of the relevant spindles

Tools for steel on request

ACCESSORIES

AU	A00A23800	Universal adaptor for milling cutter and step-down bush	MAA	A00A23903	Drill chuck, capacity dia. mm 1 - 13 ($\frac{3}{64}$ " - $\frac{3}{16}$ " ¹⁾)
BR	A00A23902	Step-down bush with No. 3 Morse taper	TR	A00A23840	Toolhead with radial feed tool, cpl. with tool No. U202265422 for cast iron
FR	A00A23820A	300 mm (11.8") dia. milling cutter with 8 multidedged insert No. U003355020 for cast iron and aluminium (only for AC 650M)			

All of the spindles and accessories are extra outfit.

The machine and its components

Fig. 10



Fig. 11



Con-rod setup fixture

- **A00A23860**
PFB fixture for clamping con-rods with 50 - 370 mm (1.97" - 14.56") center distance (Fig. 12).

- **A00.21900A**
Expanding mandrel (Fig. 12), 17 - 31 mm (.67" - 1.22") capacity, for PFB fixture.

- **A00.21911A**
Expanding mandrel (Fig. 12), 31 - 63 mm (1.22" - 4.45") capacity, for PFB fixture.

- **A00A28800**
Expanding mandrel (Fig. 12), 63 - 113 mm (2.48" - 4.45") capacity, for PFB fixture.

- **A00A18834**
Boring spindle (Fig. 12), 17 - 35 mm (.67" - 1.38") capacity, complete with two tools, 15 mm (0.59") and 21 mm (0.83") long.

- **A00A23907**
Taper seat bush for No. A00A18834 boring spindle.

- **A00.21978**
Tool setting fixture for No. A00A18834 boring spindle.

- **A00.41700A**
Centering fixture (Fig. 12) for No. A00A18834 boring spindle, complete with dial indicator (metric or imperial).



Fig. 12

Fig. 13



Fig. 14



Fig. 10
Toolhead with radial tool feed. Quite necessary for facing, milling and boring of counterbores.

Fig. 11
DM 31 measuring device mounted on MA 31 spindle.

Fig. 12
Centering of conrod mounted on the PFB fixture and subsequent boring.

Fig. 13, 14
Drilling machine tool components with, respectively, a drill mounted in taper seat bush and in the drill chuck.

The machine and its components

Fig. 15



Fig. 15
Motorcycle cylinder clamping fixture.

Fig. 16
Quick clamping fixture for in-line block mounted on parallel supports.

Fig. 17
PCV Universal V-block fixture. Photo shows the 45° setup square.

Fig. 18
Fixture for boring 90° and 60° V-blocks.



Fig. 16



Fig. 17



Fig. 18

Cylinder block fixtures

- **A03.20456**
Cylinder block quick clamping fixture (Fig. 16), 2 pcs. required.
- **A00.56934**
Motorcycle cylinder clamping fixture (Fig. 15).
- **A01A07824**
90° and 60° V-block fixture (Fig. 18).
- **A00.69650**
PCV Universal V-block fixture (Fig. 17), cpl. with 45° setup square.
- **A00.69670**
30° setup square for PCV fixture.

- **A00.69689**
22° 30' setup square for PCV fixture (Ford Transit).
- **A00.69690**
30° setup square for PCV fixture.
- **A00.69691**
30° setup square for PCV fixture (Ford 20M).
- **A00.69692**
32° setup square for PCV fixture (GM 8V-M107).

Cylinder head fixtures (AC 650M)

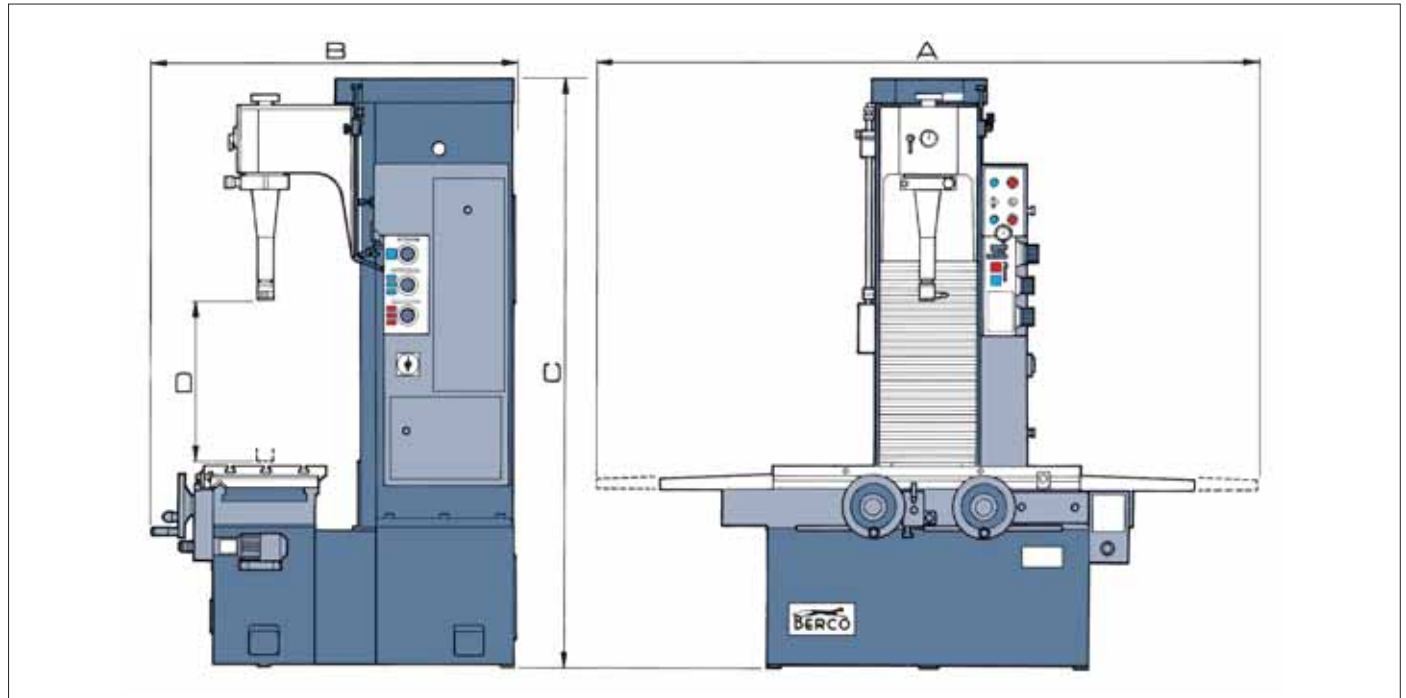
- **A01.32433**
Swinging fixture for holding cylinder heads and V-blocks.

- **A00.41731A**
Universal setup square, with variable angle top, for cylinder heads.
- **A00A02600**
Parallel support for cylinder heads, complete with plate and lock screws (2pcs. required).
- **A00.41749**
Clamp with lock screws for A00A02600 parallel supports (4 pcs. required).

All the setup fixtures are extra outfit.

Technical data

Fig. 20



AC 650

AC 650 M

Working capacity

Boring capacity	mm (inch)	31 - 155 (1.22" ÷ 6.10")	
Max. boring depth	mm (inch)	350 (13.78")	
Max. milling width	mm (inch)		298 (11.73")
Max milling area	mm (inch)		200 x 825 (7.87" x 32.48")

Geometric features

Max spindle head travel (D)	mm (inch)	530 (20.87")	
Distance spindle C/L to column ways	mm (inch)	335 (13.20")	
Useful table surface	mm (inch)	400 x 1000 (15.75" x 39.37")	
Max table traverse	mm (inch)	880 (34.64")	
Max table cross traverse	mm (inch)	100 (3.94")	

Speeds

Spindle rotation speeds (6)	r.p.m.	105 ÷ 210 ÷ 280 (390 ÷ 550 ÷ 780)	
Spindle head work feed speed (3), per revolution	mm (inch)	0.06 ÷ 0.12 ÷ 0.18 (0.0024" ÷ 0.0047" ÷ 0.0071")	
Spindle head fast feed, up and down, per minute	mm (inch)	1200 (47.24")	
Table work feed speeds (2), per minute	mm (inch)		52 ÷ 104 (2.05" ÷ 4.10")

Motor rating

Spindle head work feed and spindle rotation	kW	1.2 ÷ 0.9 (1.6 ÷ 1.2HP)	
Fast spindle head traverse, up and down	kW	0.060 (0.080 HP)	
Table traverse	kW		0.072 (0.094 HP)
Tool grinder	kW	0.190 (0.250 HP)	

Dimensions

Length (A)	mm (inch)	2570 (101")	
Width (B)	mm (inch)	1175 (46.25")	
Height (C)	mm (inch)	1920 (75.59")	

Weight

Approx. weight, unpacked	kg (lbs)	1240 (2731)	1250 (2753)
Approx. weight, ocean packed	kg (lbs)	1540 (3392)	1550 (3414)

Measurements, weights and executions are not binding on the manufacturer. Motor rating is referred to 50Hz frequency.

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00806.WM106GB00A



ISO 9001 Cert. n. 0029/5



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Published by Berco Communications Dept.

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