Technical Description

BIMA 400 V Type 145/510

Scope of supply

10 **1 electronically controlled CNC-processing center**
BIMA 400 V type 145/510

Equipment:
-with 1 machine table, safety mats Y-axis for edgebanding unit, central lubrication, ICOS-Open, 1 portable desk for setting operations

Technical data:

Processing area		
- in X-direction:		5100 mm
- in Y-direction with main spindle + tool-Ø 20 mm:		2000 mm
- in Y-direction with edgebanding:		1925 mm
-in Y direction with boring unit: (all vertical drills)		1450 mm
max. clamping height as from upper edge vac. clamp. plate:	Z1	125 mm
max. panel thickness:	Z2	depending on equipment / use
Working table height:		approx. 950 mm
Single field operation, without gluing:	X =	2 x 2450 mm
Free space in the middle:	X =	200 mm
Single field operation, with gluing:	X =	2 x 2200 mm
Free space in the middle:	X =	700 mm
Processing alternating:	X =	2 x 1800 mm
Free space in the middle:	X =	1500 mm
Weight:		approx. 8500 kg

The data refer to equipment with standard units. Modified support configurations may have different processing areas.
The min. panel size depends on the utilized clamping devices as well as on the panel surface and contour.

20 **BIMA 400 machine description**

Basic machine
Statically and dynamically rigid heavy-duty steel construction.
The head assembly, movable in X direction, is mounted on the machine bed. This head assembly carries the cross-beam. On the left side of the cross-beam, the machining head moves in Y and Z.
The bed has built-in chip chutes for removal of chips.

Guide way system
All axes are fitted with linear ball bearings running on pre-stressed and surface-hardened precision linear guide ways.

Centralized lubrication
Manual centralized lubrication for all linear guides of the main axes and the ball screw of the Z axis.

Feed drive system
All axes (X, Y and Z) are fitted with close-loop positional control. The X axis is driven via a pre-stressed rack and pinion system; the Y and Z axes, via a play-free ball screw. The drive is taken from maintenance-free three-phase servomotors with integrated absolute encoder for sensing the actual position.
Rapid traverse speeds:

X axis:	100 m/min
Y axis:	60 m/min
Z axis:	30 m/min

Extraction system
Central connection for the extraction system
The extraction hood for the main spindle is adjustable to 3 working positions, which can be programmed depending on the length of the tool clamped in the spindle.
Standard: |
Extraction air velocity: |--as per installation drawing
Extraction volume: |

Compressed air
Central connection for ¾ outlet with pneumatic service unit.
A constant air pressure of 7 bars is required. For reasons of environmental protection and simplified maintenance, IMA machining centers use water-free unoiled air. Cylinders and valves are designed for this kind of operation. If the on-site conditions do not meet these requirements, we recommend the utilization of a cold drier.

Documentation
Electrical handbook (2 copies), operation manual, lubrication plan, programming manual and spare parts list (1 copy each)

Electrical equipment
- Electrical installation in accordance with European standards, switching elements housed by a separate control cabinet; control devices, by a control panel.

- Switching units installed and tested completely with all switching devices, push-buttons and electronic components such as CNC motion controller, operator panel and servo controller – safety and protective devices in accordance with CE regulations.

- Control cabinet at fixed position on the right side of the machine (HxWxD) 2000 mm x 1800 mm x 600 mm (The width of the control cabinet can vary depending on the individual equipment of the machine).

- The electrical equipment of the machine is intended to be connected to an industrial power network in accordance with EN81800. The ratio of system nominal power to short-circuit power needs to be 1:100. The company operating the machine will need to clarify with the local utility company whether the power network to which the machine is connected meets these requirements.
- Control voltage: 24 volts (DC)

- Admissible ambient temperature: +15 to +35° C

Machine equipment and extended facilities:
- Safety devices include: pressure sensitive mat on the front side of the machine. According to legal regulations, machining centers in operation need to be enclosed by a fencing. Hence, the scope of delivery includes 1 right-hand fencing element, 1 left-hand front fencing element and 1 door. As the construction conditions on the site are different for each site, they can be considered when further safety fences are ordered.

30 **Special voltage electrical equipment**
for the connection of a BIMA 200 to BIMA 410 to a 480 V,
60 c/s network, installation as per UL-regulations.
External transformer 27-55 KVA protection class IP20.

40 **Machine labeling: English**

50 **Spare parts catalog in English as CD-ROM**

60 **Operating manual English**
1 x paper copy + 1 CD-Rom

70

›ICOS CNC‹ machine controller
Modern powerful PC-oriented control system with:
- industrial PC configured with at least two 2.2 GHz processors and 2GB RAM.
- Windows XP (US) operating system
- 19 inch TFT monitor
- PC keyboard and optical mouse
- **IMA backup and restore system** including two hard disks: one hard disk for daily operation and a second hard disk for data backup. Both hard disks fixed-mounted but accessible.
- USB port
- software PLC in accordance with IEC 61131 (international standard)
- digital Ethernet-based field bus for centralized and decentralized I/O modules
- **handheld keypad** for setup and trial mode.

Multi-channel CNC software
- Motion controller for all servo axes
- Continuous motion without jerking and contour fidelity optimized by speed pre-control and look-ahead function
- Digital drive technology

RJ 45 network connection for Ethernet

UPS
- Uninterruptible power supply to protect against failures of the power supply. If the power supply fails altogether, the PC will be properly shut down and turned off to avoid data loss.

Software
IMAWOP software package for dialog-oriented creation of CNC machining programs.
The comfortable graphical user interface (IMAWOP) includes the following functionalities:
- Menu-guided selection of all object macros, such as drilling, sawing, milling, etc.
- Program library with example programs for all types of furniture
- Tool database for managing all tool data and the tool locations in the tool magazine, with graphical support
- Plausibility check and graphic representation of the workpiece for checking each program step
- Drill path optimization
- **Graphic representation of the clamping elements (vacuum blocks, support bars) with indications of their positions relative to the outer dimensions of the workpiece**
- Easy-to-use variable programming with a comprehensive set of functions, including variables, arithmetic/logic operators and expressions
- Postprocessor for optimized generation of the machine code

Only for machines with edge banding:
- Technology database for edge banding.; comprises different parameters and rules for various edging tapes as a function of the individual workpiece geometries
- Tape track management

Job list / order processing
-Menu-guided CNC operation (MDI)
-Plain language display of faults, fault diagnostics
IMA MDE Basic for recording the machine data:
- Downtime, fault time, production time, setup time
- Quantity
- Clocking on to work
- 'Operating hours' counter (e. g. machine, vacuum pump, spindle, etc.)
- Tool life counters (recording the run times of the tools)

Control system prepared for the ›service platform‹
- ›Service platform‹ (see separate item in the quote/order)
  Remote support via the Service Platform with the functions
  - service ticket
  - remote diagnostics
  - optional transmission of pictures
  (**Basic assumption made:** The control PC needs to be connected to the network of the company, and access to the service platform via the outgoing ports 443 or 22 needs to be enabled; telephone line / internet connection provided on site).

Any modification of the machine controller carried out by unauthorized persons will free IMA from its warranty commitment and product liability.

80 **English language version for ICOS**
Operating system, ICOS open user interface, IMAWOP and keyboard in English.

90 **Machine and production data recording and generation of maintenance intervals**
on the integrated PC.
The following conditions are recorded:
- 3 time signals: downtime
  fault
  production time
- 1 quantity signal: number of parts produced
- 1 staff entry
- 1 maintenance interval
- 1 shift protocol

100 **Set of tools for BIMA 400 V**
consisting of:

1 x 77187	DIA shank-type cutter Ø18x43/Ø25/110mm/Z1+1
1 x 10512047	grooving saw blade Ø125/Ø30x4/12Z
13 x 47850	dowel drill Ø8x57,5mm/27/Ø10x27mm
7 x 34441	dowel drill Ø5x57,5mm/27/Ø10x27mm
1 x 10521748	cheese head drill, right-hand, ø35x57,5mm/31/ø10x26mm
1 x 38175	cheese head drill, right-hand, ø15x57,5mm/31/ø10x26mm/4Z
1 x 16546	tungsten carbide (HW) dowel drill, right-hand, ø10x57,5mm/27/ø10x27mm
1 x 10556935	tungsten carbide (HW) dowel drill, right-hand, ø8x70mm/35/ø10x30mm
1 x 10599157	tungsten carbide (HW) dowel drill, left-hand, ø8x70mm/35/ø10x30mm
1 x 534691	HSK-F63 adapter for shank-type cutters
1 x 46312	462E collet slotted on two sides Ø25/Ø35.05x52mm

110 **Paint:**

- basic machine:	grey white RAL 9002
- safety hoods:	signal red RAL 3001
- switch board:	light grey RAL 7035
- safety grids:	grey RAL 7043
- safety grid posts:	signal red RAL 3001

120 **1 vacuum pump 100 m³/h**

130 **Separate coolant box incl. immersion pump for the spindle cooling**

140 **BIMA 400 machine table (console table)**
consisting of:
2 right-hand and 2 left-hand side stops, fixed in X direction and movable in Y direction
6 support bars steplessly adjustable in X direction, each with one front stop and 6 rear stops fix integrated in the machine bed, all stops program-controlled
6 sets of vacuum blocks, altogether consisting of
12 vacuum pods 114 mm x 160 mm x 100 mm
6 vacuum pods 125 mm x 75 mm x 100 mm
The support bars and the vacuum pods can individually be positioned to the required workpiece size.
The adjustable support bars are locked pneumatically.
The vacuum pods are held by the patented two-circuit clamping system, hence no hoses are required.

6 smooth-surfaced support rails, with automatic downward movement.

2 mushroom switch for the function panel clamping / release

2 program-controlled vacuum connections
(1x per alternating field) with coupling for special clamping device (template)

150 **2 additional adjustable support arms Y=1450 mm**
with lowerable support rail, 1 front program controlled stop as well as 3 vacuum suction pads

160 **BIMA 400 chips discharge conveyor**
Working area X = 5300 mm

170 **BIMA 400 chips removal conveyor**
removal height approx. 1,400 mm

180 **2 mushroom switch for the function panel clamping / release**

190 **LED setup aid for 6 support bars, 1400 mm long**
Display of the positions of the support arms and the vacuum clamping blocks on the support arms by means of LED bands for the manual setting of the machine table.
The LEDs are all in one row with 5 mm distance between each of them, forming a luminous band on each support bar and in X direction on the machine table.
(working range x = 3000 mm)
The programming of the block positions is carried out using the IMAWOP/IMAwinCAD software, including automatic vacuum block computing on the machine
The block setup picture for the next part program is called up and activated using a push button at the machine table.

200 **Additional LED-setup aid**
when extending the table (X) by 1 meter.

210 **Additional LED setting aid**
for two additional support arms, 1400 mm long.

220 **1 main spindle**

- Drive capacity:	18 kW in S6-operation 14.5 kW in S1-operation
- Tool receptacle:	HSB F63, bevel diameter = 38 mm similar DIN 69893
- Tool infeed:	automatic
- Infeed force:	11000 N
- Tool weight:	max. 6 kg
- Rotating direct.:	r/h, l/h movement, programmable
- Speed:	infinitely variable 0 - 24000 rpm, programmable
- Drive:	vector controlled three-phase motor, asynchronous motor
- Spindle lubric.:	only one lubrication necessary, carried out by manufacturer
- Spindle cooling:	water cooling

230 **pneumatic lowering stroke for the main spindle**
Tools + adapter units not need to be removed from the main spindle while drilling.

240 **1 centrally integrated CNC-axis, rotating with 360°**

250 **1 automatic tool/adapter changing magazine**

arrangement:	running along at support in X-direction
design:	plate changing device
magazine places:	**18**
tool location:	coded
tool weight:	max. 6 kg
tool length:	max. 330 mm
tool diameter:	max. 100 mm when all positions are occupied max. 180 mm when both adjacent positions are empty or one adjacent position is empty

260 **1 vertical drilling unit I21**

Docking places:	1 installation place for add. unit
Stroke:	without
Spindle amount:	**21**
Spindle arrangement:	L(x11+y11)
Spindle distance:	32 mm
Spindle stroke:	45 mm
Drive:	4 x 1,2 KW, 200 c/s
Rotating direction:	r/h
Speed:	6000 - 9000 rpm
Tool receptacle:	Ø 10 mm with clamping bolt
Total tool length:	max. 70 mm
Boring tool Ø:	max. 35 mm on driving spindle max. 20 mm on all other spindles

Individual spindle triggering

270 **Edgebanding unit VT 100**

mechanically designed for:

edge thickness:	0.4 mm - 3 mm
edge height:	14 mm - 64 mm
Inner and outer radius:	Depending on glue & edging material
Edging material length:	min. approx. 300 mm
Measure in front of edge joint:	approx. 250 mm at straight line

Manual feeding of strips or reel material out of magazine.
(Manual feeding at gantry machines only with additional equipment IKL600739)

Consisting of:
1 edgebanding unit for 4-sided edgebanding and round edgebanding on joint with:
- Butt joint edgebanding individually adjustable via operating panel
- air nozzle for cleaning the panel edge
- main pressure roller either diameter 100 mm or 35 mm and pneum. controlled pressure roller, diameter 35 mm
- glue applicator for glue application to the edging tape, with temperature regulation and glue level regulation when a melting unit is used
- servo drive for the edging material transport with automatic adaption to the path speed
- hot-air reactivating unit 0.8 kW, on the glue side
- IR-heater 600 Watt on the decoration side for the forming of the material with small radii
- pneumatically driven cutting saw
- joint edge query
- NC-axis rotating area up to 740 degrees,

The edging material and the glue being used must be appropriate for the application and the contour to be edgebanded. Limitations in working veneer edges.

280 **2-reel tape magazine with pneumatically actuated automatic tape change, tape feed and knife**
- Edging tape max. 3 mm x 104 mm
- Tape feed drive with close-loop frequency control
- Tape length measuring system
- Vertical reel receptacle for reel diameters of max. 850 mm
- Core diameter 250 mm

Moving along with the machine head in X-direction

290 **Automatic granules feeding**
out of stock tank approx. 10 kg, via suction tube

300 **Automatic hold-down device at the gluing head and strip magazine**
for different edge heights

310 **Draw-in collet chuck with hollow shaft**
DIN 69893-HSK-F63 with cap nut and
adapter sleeve DIN 6388-C 25
(for shaft diam. 2 - 25 mm available)

320 **1 adapter unit saw, 90 degrees fix, with clamping plate**
saw taper Ø 30 mm with 4 borings diam. Ø 6.5 mm
on divided circle 60 mm

saw blade diam.:	max. 200 mm
clamping area:	max. 5 mm
speed:	max. 8000 rpm in continuous operation
cutting height:	55 mm
spindle position:	90°, fixed

330 **1 flush milling & profile scraper adapter unit**

Tracing:	top, bottom and horizontal
Speed of rotation:	12000 rev/min
Tool:	for internal radii > or = 30 mm
Thickness of part:	min. 15 mm, max. 60 mm
Internal radius:	min. 30 mm AND internal angle >or= 90°

340 **1 set of profile milling tools R3**

350 **1 self-tracing flat scraper**
Extension of the flush-milling cutter / profile scraper (IKL600758+59)
with the possibility to use them as a combination unit:
for removal of hot melt glue residues in the area of the upper and lower work piece edges,with 2 air nozzles for blowing the chips off of the scraper,
min. spacing between panel edge and vacuum pod: 36 mm
(Internal (i.e. concave) contours > 90° are possible, min. internal radius R=30)

360 **Left-hand fixed fencing for BIMA**

370 **Fixed fencing at the back-side of the BIMA**

380 **Automatic central lubrication BIMA 400**

390 **Network connection of the ICOS open 231**
Network connection of the ICOS OPEN 231 to an existing Novell / Windows NT network with Ethernet topology.
Including Ethernet network adapter and max. 1 day commissioning by an IMA engineer.
(The network software and network cable are provided by the customer, who is also responsible for the installation of the cable to the ICOS open controller)

400 **Radio barcode reader including interface**
as pre-connected system, consisting of:
- Barcode data (program no., quantity, edging code)
- Radio barcode reader with integrated decoder and loading station
- Project planning, installation, commissioning and test
- Interface V24 (RS 232)
- Adjustable to almost any barcode type
- Barcode width depending on distance from 0.2 to 1 mm
- Contact-free reading of the barcode by manually positioning the laser over the barcode.

410 **Parameter transfer via barcode reader**
with automatic generation of the FMC part program (batch run)
- without barcode reader
- barcode data (basic program, pieces, edging code, length, width, thickness)
- The barcode reader provided by the customer must have an RS 232 interface and needs to be at IMA in due time for commissioning
- The customer needs to install all the hardware (cables, power supply module).

420 **IMAwinCAD for BIMA machines with edgebanding**
Graphical user interface for PC running on Windows.
Without PC license for one terminal only.
CNC programming system for the creation of CNC part programs on a PC with the help of a comfortable, graphically oriented user interface with the following functions:
- Menu-guided selection of the object macros such as boring, sawing, milling.
- Complete CAD functionality
- Graphic representation of the finished part which is actualized with each programming step
- NCAD-edge processing**:**
  Graphic display of all processing units with the finished parts for optical control of the movement of the axes of rotation in order to recognize contour collisions in advance.
- Path optimization
- Graphical display of the vacuum clamping blocks and indication of their positions relative to the external panel dimensions.
- Very easy variable programming with a comprehensive set of functions which allow you to define variables and to program using absolute/incremental dimensions as well as variables and formulas.
- Including the complete IMAWOP functionality

Note: Without postprocessor.
Without automatic vacuum block programming.
Minimum hardware: 2 GHz Pentium, 256 MB RAM, CD ROM drive, USB interface.
Operating system: Windows XP, Vista or Windows 7.

430 **Language version for IMAWOP or IMAwinCAD for PC**
in English

440 **Automatic vacuum block programming in IMAWOP/IMAwinCAD on PC**
Having finished a part program in the programming system, a proposal for the positioning of the vacuum clamping blocks can be generated and displayed automatically.
The positions can be altered if required.
The vacuum clamping blocks are calculated on the basis of a settable vacuum clamping block definition file.

450 **Quicktool with edge banding**
Macros for office and kitchen bench tops, counter tops as well as table tops.
- Consisting of basic program and working macros
- Shape types: bevel, radius, rectangular and diagonal cut-out for stove, sink, etc..
- Free-form contours:

460 **Air conditioning unit for the control cabinet**
required for ambient temperatures exceeding 35°C