12 - MB NUMERICAL CONTROL (OPTION)

12 - 1 DESCRIPTION

The MB numerical control is a very simple option, ideal for increasing the productivity of a Promecam AMADA press brake.

The MB numerical control manages 1, 2 or 3 axes (X, Y, R or Z). There are 4 different versions.

A self-diagnostic program, linked to the appearance of numbered error messages, facilitates usage and maintenance of the numerical control.

12 - 2 GENERAL CHARACTERISTICS OF THE MB NUMERICAL CONTROL

- The numerical control unit accepts up to 81 program steps.
- 380/220 V supply voltage, three-phase, 50/60 Hz current.
- Power consumed, according to case of usage, either 300 or 500 W.
- Display of 1 to 30 program steps.
- Alphanumeric display.
- Values shown on display.
- Memory capacity: 9 programs. The number of bends stored in memory can include up to 81 steps.
- Operating mode: manual or automatic.
- Programming mode.
- Data recording format: X axis: 999.9 mm; Y axis: 99.99 mm; AUX axis: 999.9 mm
- Automatic conversion of data stored in inches or millimeters.
- Visual and sound signal in case of operating errors.
- Automatic recalibration.
- Programming of up to 8 machine functions.
- Backup of programs in external memory.
- Unlimited duration of memories.
- Incremental positions sensors.

12 - 3 MANAGEMENT OF AXES

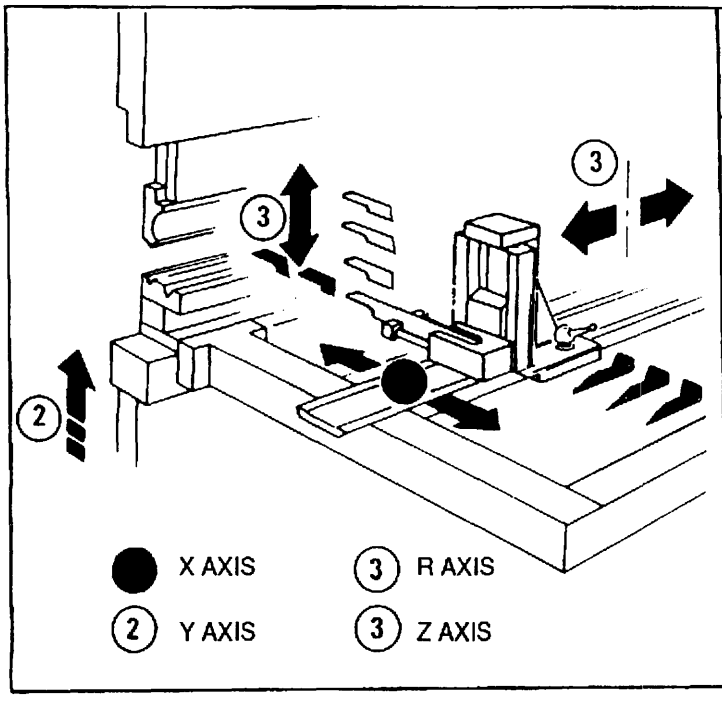
There are 4 versions of the MB computerized numerical control (CNC).

1) 1-axis MB CNC:
   - management of X axis

2) 2-axis MB CNC:
   - management of X and Y axes

3) 3-axis MB CNC:
   - management of X, Y and R axes

4) 4-axis MB CNC:
   - management of X, Y and Z axes



CONTROL UNITS

MODELS	NUMBER OF AXES	REAR GAUGE BLOCK X	BENDING Y	GAUGE BLOCK HEIGHT R	GAUGE BLOCK GAP Z
mb 1	1	●			
mb 2	2	●	○		
mb 3 R	3	●	○	○	
mb 3 Z	3	●	○		○

* There is an all-or-nothing pneumatic R option, which positions the stop finger 15 mm apart.

12 - 4 OPERATING DIAGRAM

Control panel

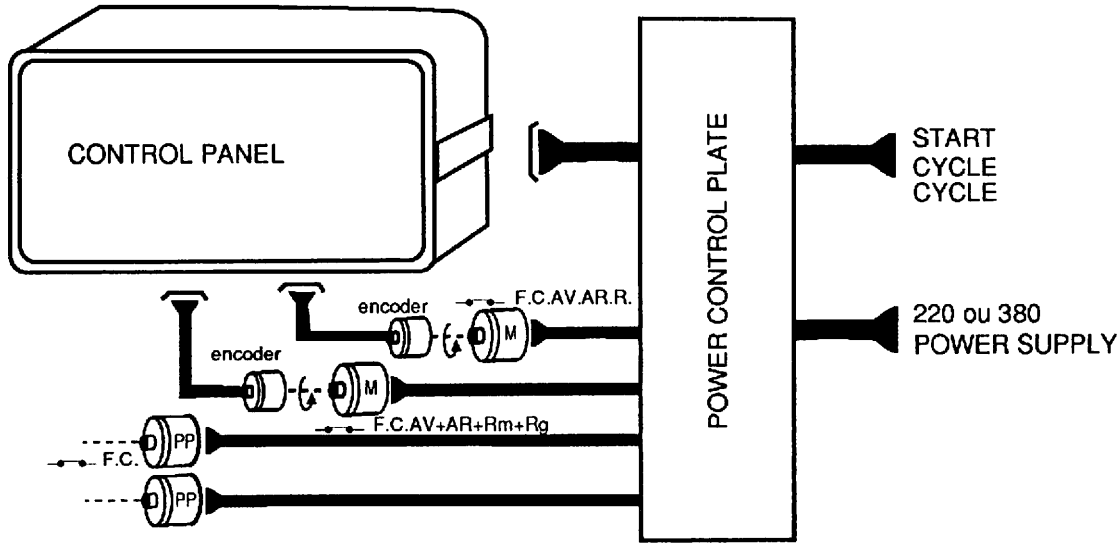
Power control plate

Encoder

Encoder

Start cycle switch on depth control, referred to as "hydraulic gauge block"

380 or 220 V power supply



12 - 5 CHARACTERISTICS OF COMMAND AND CONTROL PANEL BOARDS

The logic unit consists of six boards, the functions of which are listed below.

12 - 5 - 1 E5 POWER SUPPLY BOARD (AL3)

Receives the power supplies coming from the "AU" (emergency stop) power supply board. These power supplies are filtered and stabilized on this board in order to obtain constant voltages for operation of the entire positioning assembly.

Stabilized voltages:

+ 5V	- power supply of integrated circuits
+ 12V - 12V	- power supply of circuits with special technical characteristics requiring these voltages for their operation
- 30V - 12V	- supply voltages for ER 3400 memories.

12 - 5 - 2 E4 MOTOR BOARDS (MOT)

The E4 motor board has three independent circuits whose function is to control the speed and direction of each motor.

12 - 5 - 3 E3 MICROPROCESSOR BOARD (MU)

The E3 microprocessor board controls all the functions of the equipment. These functions are microprocessor-controlled by means of a software program stored in the memories of this board. The microprocessor board can interact with a group of logic circuits through the input and output buses.

12 - 5 - 4 E2 INTERMEDIATE BOARD (INT)

A series of integrated circuits are located on the intermediate board; these circuits receive the square wave signals, phase shifted among themselves by 90°, produced by the incremental sensors (X-Y axes), and transformed on output into pulses that are counted by the microprocessor.

In addition, other types of integrated circuits receive instructions from the microprocessor; they are decoded to select the ER 3400 memories, which contain all the data from the work program. A system of integrated circuits decodes signals for machine functions; other logic circuits transmit the motor speed command to the motor board.

12 - 5 - 5 E1 FRONT PANEL BOARD

The front panel of the command and control unit consists of:

- a keyboard numbered from 0 to 9 for entering data.
- operating push-buttons for selecting the type of machine operation.
- a group of function keys to store data and other special instructions.
- digital and alpha-numeric displays used to display the data entered and to execute other operations.
- a locking socket, onto which is mounted the removable memory for transfer of data.
- a sound signal.

12 - 5 - 6 E6 BASIC BOARD

All the boards above are attached by means of connectors to the basic board, which connects them to each other.

CONTROL BOARD CHARACTERISTICS (power cabinet)

The boards listed below are control boards.

12 - 5 - 7 E8 SETTING BOARD (CMT)

The E8 setting board includes control circuits with double-thyrister triggers (SCR) and an analog stabilization circuit for the current loop.

12 - 5 - 8 E10 CONSTANT-CURRENT REGULATOR BOARD

The E10 constant-current regulator board has a control circuit with thyristors (SC) and a current loop detector.

12 - 5 - 9 E9 REGULATOR BOARD (APP3)

12 - 5 - 10 E7 POWER SUPPLY BOARD (AU)

The E7 power supply board has a hexa-phase Graetz bridge, a +9 V stabilized circuit and integrated circuits for stabilization at +12 V.