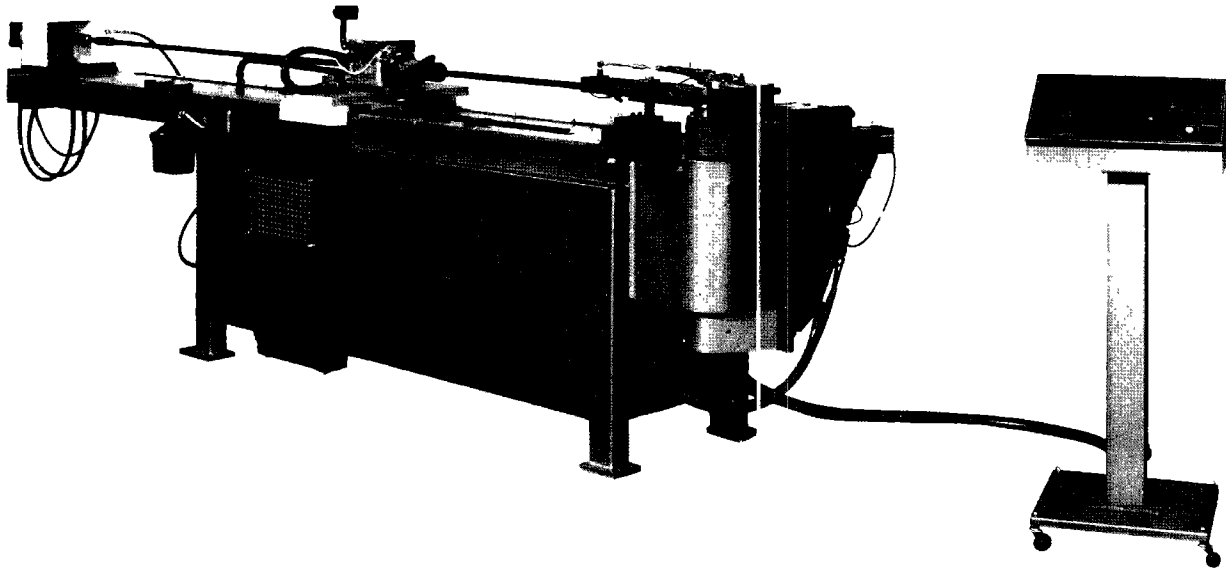


# PHI 220-HR SYNCHRO BENDING MACHINE



## Synchronized bending machine with microprocessor controller for semi-automatic bends up to 2" OD

PHI's synchronized bending machine, Model 220-HR, offers three-axis bending with one powered axis for the degree of bend (DOB). When configured as shown, the 220-HR provides high-speed production of simple and complex bent tube shapes up to 2" outside diameter (OD) and pipes up to 1" OD.

Our modular design - a basic machine with many options - allows each machine to be custom fitted to best meet your needs.

PHI's user friendly programmable digital controller is specifically designed for bending and is logically laid out for proper bending sequencing. It has a capacity for 100 programs consisting of 1 to 10 bends (DOB's) per program.

The optional carriage allows mechanical presetting of up to 10 planes of bend (POB) and distance between bends (DBB). When incorporated with the controller, the machine will synchronize and interlock all three positions (POB, DOB, and DBB) to ensure correct tube alignment before bending can occur. This ensures easily repeatable bent tube shapes and scrap-free production.

### QUALITY OUTPUT

Perfect part duplication, scrap-free production, quality tooling, positive POB stops and DBB stops.

### LABOR SAVINGS

Single setup for multiple bend parts.

### RELIABLE PERFORMANCE

Heavy duty construction and extra-large electric motors.

### PERFORMANCE-ENHANCING FEATURES

- Precision PHI tooling to help reduce wall thinning and ovality.
- Synchronized interlock positioning for accurate, scrap-free parts.

# 220-HR SYNCHRO BENDING MACHINE SPECIFICATIONS

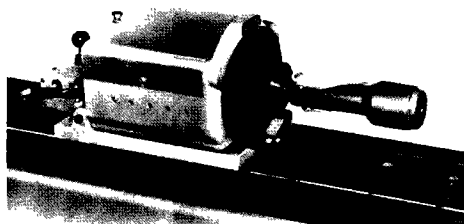
|                                  |                  |   |
|----------------------------------|------------------|---|
| CAPACITY                         | - Tube<br>- Pipe | 2" (50mm) OD x 125" (3.175m) wall thickness x 2D minimum CLR<br>1-1/2" (37.5mm) OD x Schedule 40 x 3D minimum CLR |
| MATERIALS                        | - Tube<br>- Pipe | 35,000 psi (930 MPa) yield, 35% elongation<br>ASTM A-587 or equivalent  |
| Direction of Bend                |                  | Clockwise (Counter-clockwise rotation is available on special order.)   |
| Centerline Radius                |                  | 10" (254mm) standard.   |
| Maximum Bend Arm Movement        |                  | 180° and springback allowance   |
| Maximum Over-mandrel Tube Length |                  | 10 feet (3.0m) standard. Longer lengths optional  |
| Machine Floor Space              |                  | 15 feet (4.5m) long x 51" (110cm) wide x 49" (122cm) high   |
| Shipping Weight                  |                  | 3500 lbs (1588 kg), approximate   |

## ACCESSORIES

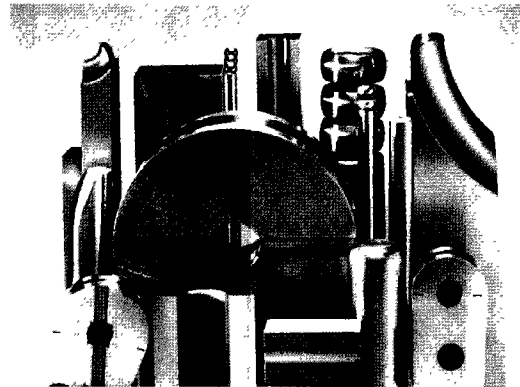
All necessary wrenches are included with the machine. Many accessories or options are available such as mandrel extractor, rail and carriage, wiper die bracket, pressure die assist, mandrel lubrication, air collet, manual or hydraulic clamping, etc.



**210-HR Control.** Three bend modes are available. They are manual, semi-automatic (with or without the carriage), and synchro semi-automatic (with the carriage). The 210-HR controller has the capacity for 100 programs consisting of 1 to 10 bends (DOB's) per program.



**Synchro Carriage.** A 360° POB dial permits accurate POB settings. Disc Stops on the carriage rotation ensure accurate POB positioning for each of the 10 presets. Settings for DBB are positioned on the rail for each of 10 bends. They are positive mechanical stops ensuring accurate location of bends. The standard tube-over-mandrel length is 10 feet. A collet chuck with special lever-type collet closer holds the tube or pipe firmly in place. To bend longer sections, extended bed lengths can be specified



**Tooling.** PHI is a full-line supplier of bender tooling, for PHI benders. Please call us for a price quotation for your tooling requirements.

# PHI

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