Hydro-Pneumatic Press:

Brief Description:

"MERCURY" "N" series range of Hydro-Pneumatic Presses, combines the advantages of efficient, low cost pneumatics, to achieve the large output forces associated with hydraulics. The system operates on normal compressed air pressure of 5 bar, using standard pneumatic controls, thus completely eliminating the use of expensive hydraulic power pack and associated control equipment.

The system consists of a hydraulic cylinder, an air to oil intensifier and an oil reservoir, all combined into a compact integral unit. The output ram approaches the work piece at rapid speed (which can be adjusted) under low pressure (hence low force) compressed air. On touching the work piece (at any point along the travel) the intensifier is automatically energized by means of a suitable directional control valve. This results in a high pressure (hence high force) stroke up to a maximum of 24 mm. The ram retracts rapidly at low pressure on completion of the work cycle.

The SALIENT features of "N" Series Hydro-Pneumatic Presses are:

- Very low air consumption, resulting in energy saving of up to 80% over equivalent pneumatic cylinders and 50% over equivalent hydraulic systems. The Speed of Operation is also much higher than an equivalent standard pneumatic or hydraulic system.
- Compact Cylinder design, which can be mounted in any position.
- Compact, Lightweight Press Frames, which can be mounted on a light work table.
- Simple Design for easy maintenance.
- High stroke frequency because of shorter oil path between the oil reservoir and the output hydraulic cylinder.
- Force and Speed can be infinitely adjusted.
- Rapid pneumatically operated approach stroke and return stroke. In the "N" Series the return force is larger than the approach force, resulting in the loading of heavier tools for respective tonnages.
- Absolute separation of air and oil chambers. This has been achieved by providing bleed holes between the pneumatic and hydraulic seals. In the event of failure of pneumatic seals, the air escapes to atmosphere through a bleed hole and does not mix with the hydraulic oil. If the hydraulic seals fail, oil escapes from its bleed hole, indicating deterioration of the seal, which can be procured and replaced well before total breakdown occurs.

Advantages of Hydro-pneumatic Presses:

- Uses Compressed air as the power source resulting in reliable, inexpensive components and piping. Completely eliminates the use of expensive hydraulic components and a large oil tank to be filled with a large quantity of expensive hydraulic oil.
- Fast response because of the use of compressed air for rapid approach and retraction.
- Compact and light weight. Can be mounted on a table top. Further there is a saving in floor space occupied by a hydraulic power pack of a hydraulic system.
- Saves up to 50% in energy input over fully pneumatic and hydraulic systems and 70% in cost compared to hydraulic systems.
- Easy to maintain because of simple pneumatic elements and sealing components.

Applications:

Mercury low cost hydro-pneumatic presses are an ideal replacement for expensive hydraulic presses for varied applications such as riveting, Forming, Clamping, Bending, Straightening, Marking, Punching etc. Low
investment, Energy saving, negligible maintenance, fast action and infinite control over force and speed are the major advantages over equivalent hydraulic systems.

**Technical Specifications:**

- **Tonnages:** 1T, 2T, 4T, 8T, 15T & 30T
- **Strokes:** 50, 75, 100 & 150 mm
- **Power stroke:** 6 mm, 12 mm & 24 mm at any point along the travel.
- **Types:** 2 Pillar, 4 Pillar & “C” Frame with & without guided moving platen.

**Types of Industry where these presses are mainly used:**

Sheet Metal Work: Riveting, Forming, Clamping, Bending, Marking, Punching, Folding, Straightening etc. Also for spreading of bearing cages, Assembly operations in bearing industries, Automobile industries, Gas lighter and kitchen ware appliances manufacturing plants, Electrical switches, Switch gears, Rubber parts, Shaft straightening applications, Bush Pressing applications and many more

**Operator’s Safety:**

The press is operated by means of micro-processor based control card in electrical panel to take care of operator’s safety during the operation. This is called as True, Non Tie down, Interlocked Two hand safety operation.

**Auto-cycling & Parking Features:**

The Press can be operated to have total 9 Nos of power stroke in sequence with auto cycling feature in electrical control panel there by removing the limitation of limited travel of power stroke. Also our parking feature will help you to increase the operating frequency by limiting the reversal travel of ram up to available power stroke through parking system which is available as an option.

**Auto-Lube System:**

Our new Auto Lubrication feature has greatly enhanced the reliability of our presses. After a set (with jumper on PCB) number of cycles, the auto lube solenoid comes on for a short time. This actuates a built-in pump which injects under high pressure, about 8 drops of oil from the reservoir. This high pressure injection ensures complete lubrication of the entire pneumatic components. The advantage of this system is that lubrication is positive and not dependent on air flow volume as in a standard lubricator of a FRL set. Also the quantity of lubrication is positive and not dependent on any arbitrary setting by machine operator.

We invite you to visit our web-site [www.aakashhydraulics.com](http://www.aakashhydraulics.com) to have a look of the various types of models available suitable for your application. You are requested to contact us if you would like to have more information or have personal discussion to clarify your queries.

Thanking You,

Your’s Faithfully,
For, Aakash Hydraulics,

(Bipin Joshi)
Hydro Pneumatic Press

Salient Features

- Fast action
- Compact, light weight & vibration free
- Versatile
- Energy efficient
- Low cost

Applications

- Blanking
- Clamping
- Forming
- Rivetting
- Stamping
- Straightening
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Hydro Pneumatic Presses

- NEW
- AUTOMATIC LUBRICATION SYSTEM
- LOW OIL LEVEL SENSOR SYSTEM

Mercury Pneumatics Pvt. Ltd.
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Ph.: +91-22-28474449 / 28470063 / 28471020 Fax: +91-22-28470632
E-mail: mercurypneumatics@vsnl.net Website: www.mercuryindia.net
**MERCURY** Hydro Pneumatic Presses are products of extensive development efforts initiated in 1988. Over 13,000 of these time tested, reliable machines are working in various industries all over India as of January 2009.

**MERCURY** Hydro Pneumatic Presses are efficient, low cost alternative to Hydraulic, Power and Hand operated Presses.

**Salient Features**
- **Fast Action**: 2T @ 100 cycles/min. (CPM), 4T @ 60 CPM, 8T @ 40 CPM, 15T & 30T @ 20 CPM.
- **Compact, light weight & vibration free**: Can be mounted on existing work benches without any foundation.
- **Versatile**: Force & speed can be varied infinitely. Machine can be mounted in any orientation.
- **Energy efficient**: 50% to 70% saving over equivalent hydraulic and pneumatic systems.
- **Lost cost**: Upto 60% cheaper than hydraulic presses.
- **Safety**: True, non tie down, interlocked Two Hand Safety operation.

**Sequence of Operation**
There are three stages of operation
(a) Initial low force, large travel, fast approach (Fig. 2)
(b) High force, short travel (6, 12 or 24 mm), Power Stroke (Fig. 3)
(c) Low force, rapid retraction (Fig. 4)

The low force approach and retraction at 5 bar air pressure results in upto 70% saving in energy.

**Typical Applications**
**MERCURY** Hydro Pneumatic Presses are ideal machines for any application requiring pressing force from 0.4 tonnes to 30 tonnes. They are specially suited for metal forming.
Hydro Pneumatic Press Cylinder

- Oil Fill / Air Vent Plug
- Oil Level Sensor
- Parking Valve (Optional) for High Speed Applications
- New Auto Lube
- Output Oil Pressure Gauge Calibrated to Indicate Force
- Pressure Gauge Isolator Valve to Enhance Gauge Life
- Precision Honed & Hard Chrome Plated Barrels
- Precision Ground & Hard Chrome Plated Piston Rod
- Regulator Air Pressure Gauge
- Sub-Base Mounted Solenoid Valves for Quick Replacement Without Disturbing Original Piping
- Heavy Duty Piston Type Air Pressure Regulator with Lockable Knob to Adjust Tonnage
- Bleed Vents for Detecting Seal Failure
- Flow Control Valve for Forward Speed Control

Compact "True" Two Hand "Non Tie Down" Safety Controls

Standard Panel:
- Power "On" Indicator
- Power "On" Switch
- Fast Approach "On" Indicator
- Auto/Manual Switch
- Fuse
- Emergency Stop Button
- Cycle Timer
- Approach Timer
- Push Button Switch for Manual Operation of Power Stroke
- Push Button Switch for Manual Operation of Fast Approach
- Heavy Duty, Two Hand Safety, Shrouded Push Buttons (Can Be Mounted At Any Convenient Location)

Automatic Cycling of Power Stroke Panel:
(for applications requiring more than 24mm power stroke)

- Universal Mounting Arrangement
- Counter to Set No. of Power Strokes (1 to 9)
- Dwell Time Between Power Strokes
- Dwell Time for Each Power Strokes
- Hinged Cover with Screw Lock to Prevent Tampering of Timer Settings

3
To Calculate Compressor Power Capacity

1HP = 120 litres of Free Air (NL) Per Minute at 5 Bars. 
N = Number of Cycles per minute
Q = Free Air Consumed Per Cycle (From Chart) in Normal Litres (NL)
Power Required = \( \frac{Q \times N}{120} \) (H.P.) or \( \frac{Q \times N}{120} \times 0.746 \) (KW)

To Calculate the cost of electricity

Example: A 4Tonner, 50mm stroke with 6mm power stroke press is used at 5 bars to cut Aluminium washers from a sheet at the rate of 10 pieces per minute.

1) From above chart model N041-50 cylinder consumes 8 NL of air per cycle.
2) @ 10 strokes/min air consumption = 8 x 10 = 80 NLPM
3) Electric Power used = 80 x 120 = 0.67 HP = 0.5 KW/m
4) Power used per hour (KWH) = 0.5 x 60 = 30 KWH
5) Cost of electricity @ Rs. 4.5 per KWH = 30 x 4.5 = Rs. 135 per Hour
6) Cost of electricity per cut piece (10 x 60 = 600/hr) = 3 x 150 = 0.225 i.e. Rs. 0.225 per piece

Note: Due to constant improvements, dimensions and technical specifications are subject to change without notice.
2 Column Presses

Plain

Anti Rotation Guide

Guided Moving Platen

### PLAIN (2P--) & WITH ANTI ROTATION GUIDE (2P--R)

### WITH GUIDED MOVING PLATEN (2P--G)

| PLAIN | WITH ARQ | WITH GMP | TON | A | B | C | D | E | F | G | G1 | H | J | ØK | L | L1 | M | M1 | N | ØO | P | ØQ | R | T | U | ØV | ØW |
| 2P02  | 2P02R   | 2P02G   | 2   | 350| 240| 270| 250| 320| 160| 425| 459| 38 | 55 | 20 | 25 | 38 | 6  | 10 | M6 | 60 | 18 | 45 | M10 | 10 | 215| 32 | 32 |
| 2P04  | 2P04R   | 2P04G   | 4   | 400| 300| 300| 300| 364| 205| 493| 534| 43 | 55 | 25 | 30 | 43 | 10 | 12 | M8 | 75 | 18 | 55 | M12 | 10 | 270| 40 | 38 |
| 2P08  | 2P08R   | 2P08G   | 8   | 435| 300| 300| 300| 300| 405| 205| 513| 564| 53 | 55 | 25 | 40 | 53 | 10 | 12 | M8 | 105| 20 | 75 | M12 | 12 | 265| 54 | 50 |
| 2P30  | 2P30R   | 2P30G   | 30  | 525| 350| 350| 350| 480| 240| 677| 765| 85 | 85 | 40 | 80 | 85 | 12 | 15 | M10| 130| 25 | 90 | M20 | 12 | 310| 76 | 73 |
## 4 Column Presses

### PLAIN (4P-) & WITH ANTI ROTATION GUIDE (4P-R)

- **Diagram** showing the structure of a 4-column press with an anti-rotation guide.

### WITH GUIDED MOVING PLATEN (4P-G)

- **Diagram** showing the structure of a 4-column press with a guided moving platen.

### Table: Specifications

| Model | Model Type | TON | A  | B  | C  | D  | E  | F  | G  | G1 | H  | J  | ØK | L  | M1 | M2 | N  | ØO | P  | ØQ | R  | S | U  | ØV |
|-------|------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 4P02  | 4P02R      | 2   | 340| 250| 270| 250| 200| 220| 417| 445| 32 | 53 | 20 | 25 | 32 | 10 | 10 | 60 | 18 | 45 | 10 | 75 | 30 |
| 4P04  | 4P04R      | 4   | 383| 300| 300| 300| 225| 270| 480| 516| 38 | 47 | 25 | 30 | 38 | 10 | 12 | 75 | 18 | 55 | 12 | 75 | 35 |
| 4P08  | 4P08R      | 8   | 484| 300| 350| 300| 275| 270| 513| 564| 53 | 55 | 25 | 40 | 53 | 10 | 12 | M8 | 105| 20 | 75 | 12 | 75 | 54 |
| 4P15  | 4P15R      | 15  | 500| 325| 350| 350| 275| 285| 621| 677| 62 | 80 | 30 | 60 | 62 | 10 | 12 | M8 | 130| 25 | 90 | M16| 12 | 80 | 60 |
| 4P30  | 4P30R      | 30  | 510| 350| 350| 350| 275| 310| 659| 734| 72 | 80 | 40 | 80 | 72 | 12 | 15 | M10| 130| 25 | 90 | M20| 12 | 90 | 70 |
'C' Frame Presses

Plain

Anti Rotation Guide

Guided Moving Platen

**PLAIN (1C--) & WITH ANTI ROTATION GUIDE (1C--R)**

**WITH GUIDED MOVING PLATEN (1C--G)**

- **OUTPUT FORCE PRESSURE GAUGE WITH ISOLATOR VALVE**
- **FLOW CONTROL VALVE FOR DOWNWARD SPEED CONTROL**
- **DIAGONAL 'T' SLOTS**
- **'N' (2 NOS.) SCREWS FOR LOCKING**

**T-10 'T' SLOT**

**T-12 'T' SLOT**

**DETAIL "D2"**

**DETAIL "D1"**

**Table**

| PLAIN | ARG | WITH GMP | TON | A | B | C | D | E | F | G | H | J | K | L | M | N | ØK | P | ØK | ØR | S | T | U | V | W | X | Y |
| 1C02  | 1C02R | 1C02G  | 2   | 465| 767| 125| 255| 221| 400| 85 | 230| 230| 38 | 20 | 25 | 38 | 10 | 10 | MB | 50 | 18 | 45 | 13 | 566 | 10 | 75 | 239 | 180 | 256 | 200 |
| 1C04  | 1C04R | 1C04G  | 4   | 550| 690| 150| 310| 269| 480| 120| 280| 280| 43 | 25 | 30 | 43 | 10 | 12 | MB | 75 | 18 | 55 | 13 | 664 | 10 | 100 | 269 | 225 | 337 | 200 |
| 1C08  | 1C08R | 1C08G  | 8   | 640| 984| 175| 300| 249| 575| 150| 330| 330| 50 | 25 | 40 | 50 | 12 | 12 | MB | 105| 20 | 75 | 13 | 715 | 12 | 100 | 322 | 296 | 408 | 230 |
| 1C15  | 1C15R | 1C15G  | 15  | 700| 1149| 200| 350| 294| 530| 150| 380| 380| 62 | 30 | 60 | 62 | 10 | 12 | MB | 130| 25 | 90 | 17 | 839 | 12 | 125 | 372 | 311 | 431 | 250 |
| 1C30  | 1C30R | 1C30G  | 30  | 750| 1217| 200| 350| 275| 680| 175| 380| 380| 72 | 40 | 80 | 72 | 15 | 15 | MB | 130| 25 | 90 | 17 | 892 | 12 | 125 | 397 | 360 | 500 | 250 |