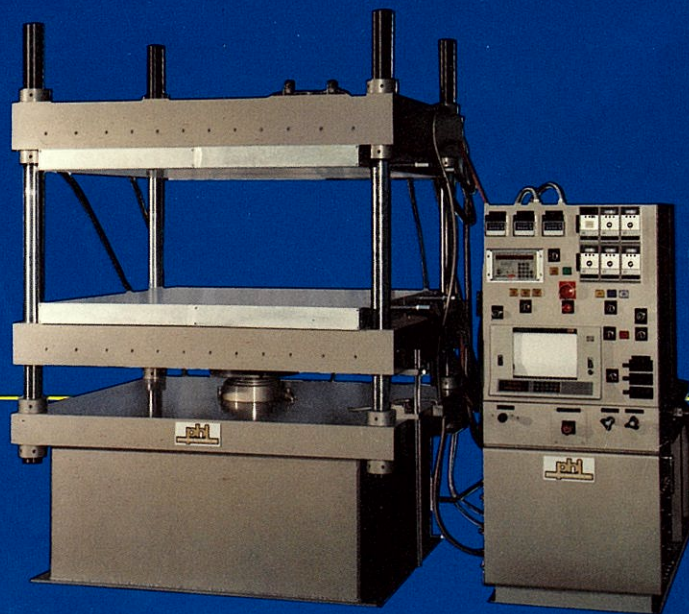
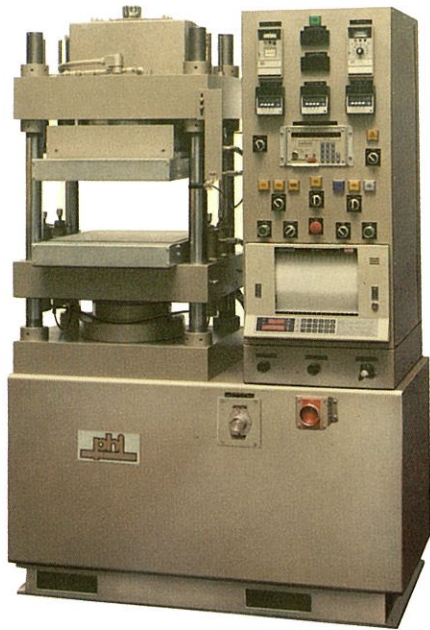


PHI
HYDRAULIC
COMPRESSION PRESSES



PHI COMPRESSION
PRESSES



Special compression press, 75 ton capacity, provides precise pressure control utilizing PHI's advanced control instrumentation. Press includes 3 pressure control ranges, electrically heated platens, microprocessor based temperature programmer, operational load cell and a digital temperature and pressure data logger/multipoint recorder with full alarm capabilities.



Compression press, 50 ton capacity, designed to operate per requirements of ASTM standard D 1928, Procedure C, for preparation of compression molded polyethylene test samples. Microprocessor based temperature programmer allows programming of heating and cooling cycles. Special platen design, utilizing proportional control valves and separate temperature controllers for heating and cooling, allow press to follow exact and programmable cooling rate under controlled pressure.

PHI HYDRAULIC COMPRESSION PRESSES

for high quality, high production plastic and rubber molding, bonding and laminating.

"BUILDING-BLOCK" DESIGN AND CONSTRUCTION

To most efficiently and economically meet the increasingly varied operating and production needs of the plastic, rubber and electronic industries, PHI has developed a versatile, standardized "building-block" system for the design and construction of its compression presses.

The basic "building-blocks" include a wide range of standard frames, platens, heating systems, hydraulic power supplies and electric cycle controls. Utilizing these basic "building-blocks" in various combinations, PHI can quickly and inexpensively supply compression presses with capacities, controls, features and capabilities tailored to your specific needs.

With this proven, pre-engineered "building-block" technique, press users now have the opportunity to select presses with "special" capabilities at realistic, economical "standard" prices. Lead time is greatly reduced, and deliveries of most presses can be made in a few weeks.

Whether Strain Rod or Unitized Frame, all PHI compression presses are carefully engineered and ruggedly built for years of heavy duty service. Only the finest hydraulic, electrical and mechanical components, controls and safety devices are used. Components are conveniently located to afford maximum accessibility for ease of operation, inspection and maintenance.

HYDRAULIC COMPRESSION PRESSES

PHI offers one of the industry's most complete and respected lines of hydraulic compression presses. With dozens of standard models, ranging in capacity from 20 to 300 tons, there's a PHI compression press that's ideal for almost any pressing requirement...be it high production or research and development.

For high temperature laminating, adhesive bonding and other specialized plastic and rubber applications, PHI can supply special purpose presses with capacities up to 1,000 tons.

CAPACITY (tons)	STRAIN ROD FRAME NO.	UNITIZED FRAME NO.	DIE SPACE (in.)	RAM DIA. (in.)	RAM STROKE (in.)	STRAIN ROD ADJ. DAYLIGHT ^① (in.)		UNITIZED FIXED DAYLIGHT ^① (in.)	WEIGHT ^② (lbs.)	HEIGHT ^② (in.)	FLOOR SPACE (in.)
						MIN.	MAX.				
20	20R	20U	8 × 8	4	4	4	8	4 or 8	550	52	45 × 20
	20R	20U	12 ½ × 9 ½	4	4	4	8	4 or 8	650	52	45 × 20
	20R	20U	12 ½ × 12 ½	4	4	4	8	4 or 8	800	52	45 × 20
30	30R	30U	12 ½ × 12 ½	5	4	4	8	4 or 8	900	54	45 × 20
	30R	30U	18 ½ × 12 ½	5	4	4	8	4 or 8	1050	54	45 × 20
	30R	30U	18 ½ × 18 ½	5	4	4	8	4 or 8	1250	54	45 × 20
50	50R	50U	12 ½ × 12 ½	6 ½	6	6	10	6 or 10	1100	56	55 × 20
	50R	50U	18 ½ × 12 ½	6 ½	6	6	10	6 or 10	1300	56	55 × 20
	50R	50U	18 ½ × 18 ½	6 ½	6	6	10	6 or 10	1600	56	55 × 20
75	75R	75U	18 ½ × 12 ½	8	8	8	12	8 or 12	2900	70	55 × 20
	75R	75U	18 ½ × 18 ½	8	8	8	12	8 or 12	3300	70	55 × 20
	75R	75U	24 ½ × 18 ½	8	8	8	12	8 or 12	3700	70	60 × 26
	75R	75U	24 ½ × 24 ½	8	8	8	12	8 or 12	4100	70	60 × 26
100	100R	100U	18 ½ × 18 ½	9	10	10	15	10 or 15	3600	72	55 × 20
	100R	100U	24 ½ × 18 ½	9	10	10	15	10 or 15	4100	72	60 × 26
	100R	100U	24 ½ × 24 ½	9	10	10	15	10 or 15	4400	72	60 × 26
125	125R	125U	18 ½ × 18 ½	10 ½	10	10	15	10 or 15	3800	72	55 × 20
	125R	125U	24 ½ × 18 ½	10 ½	10	10	15	10 or 15	4300	72	60 × 26
	125R	125U	24 ½ × 24 ½	10 ½	10	10	15	10 or 15	4600	72	60 × 26
	125R	125U	30 ½ × 24 ½	10 ½	10	10	15	10 or 15	5200	72	70 × 33
150	150R	150U	24 ½ × 18 ½	11 ½	12	12	17	12 or 17	5600	75	60 × 26
	150R	150U	24 ½ × 24 ½	11 ½	12	12	17	12 or 17	7200	75	60 × 26
	150R	150U	30 ½ × 24 ½	11 ½	12	12	17	12 or 17	8200	75	70 × 33
	150R	150U	30 ½ × 30 ½	11 ½	12	12	17	12 or 17	10600	75	70 × 33
200	200R	200U	24 ½ × 24 ½	13	12	12	17	12 or 17	7800	75	60 × 26
	200R	200U	30 ½ × 24 ½	13	12	12	17	12 or 17	9000	75	70 × 33
	200R	200U	30 ½ × 30 ½	13	12	12	17	12 or 17	11200	75	70 × 33
	200R	200U	36 ½ × 30 ½	13	12	12	17	12 or 17	12200	75	80 × 33
250	250R	250U	24 ½ × 24 ½	15	14	14	19	14 or 19	9900	78	60 × 26
	250R	250U	30 ½ × 24 ½	15	14	14	19	14 or 19	11900	78	70 × 33
	250R	250U	30 ½ × 30 ½	15	14	14	19	14 or 19	14000	78	70 × 33
	250R	250U	36 ½ × 30 ½	15	14	14	19	14 or 19	16000	78	80 × 33
	250R	250U	36 ½ × 36 ½	15	14	14	19	14 or 19	18200	78	80 × 40
300	300R	300U	24 ½ × 24 ½	16 ½	14	14	19	14 or 19	10600	80	60 × 26
	300R	300U	30 ½ × 24 ½	16 ½	14	14	19	14 or 19	13900	80	70 × 33
	300R	300U	30 ½ × 30 ½	16 ½	14	14	19	14 or 19	14800	80	70 × 33
	300R	300U	36 ½ × 30 ½	16 ½	14	14	19	14 or 19	17500	80	80 × 33
	300R	300U	36 ½ × 36 ½	16 ½	14	14	19	14 or 19	19200	80	80 × 40

NOTES: ① Special Stroke and/or Daylight Available

② The weights and dimensions shown are approximate, and are for Strain Rod frame presses. Unitized frame presses are slightly lighter and smaller.

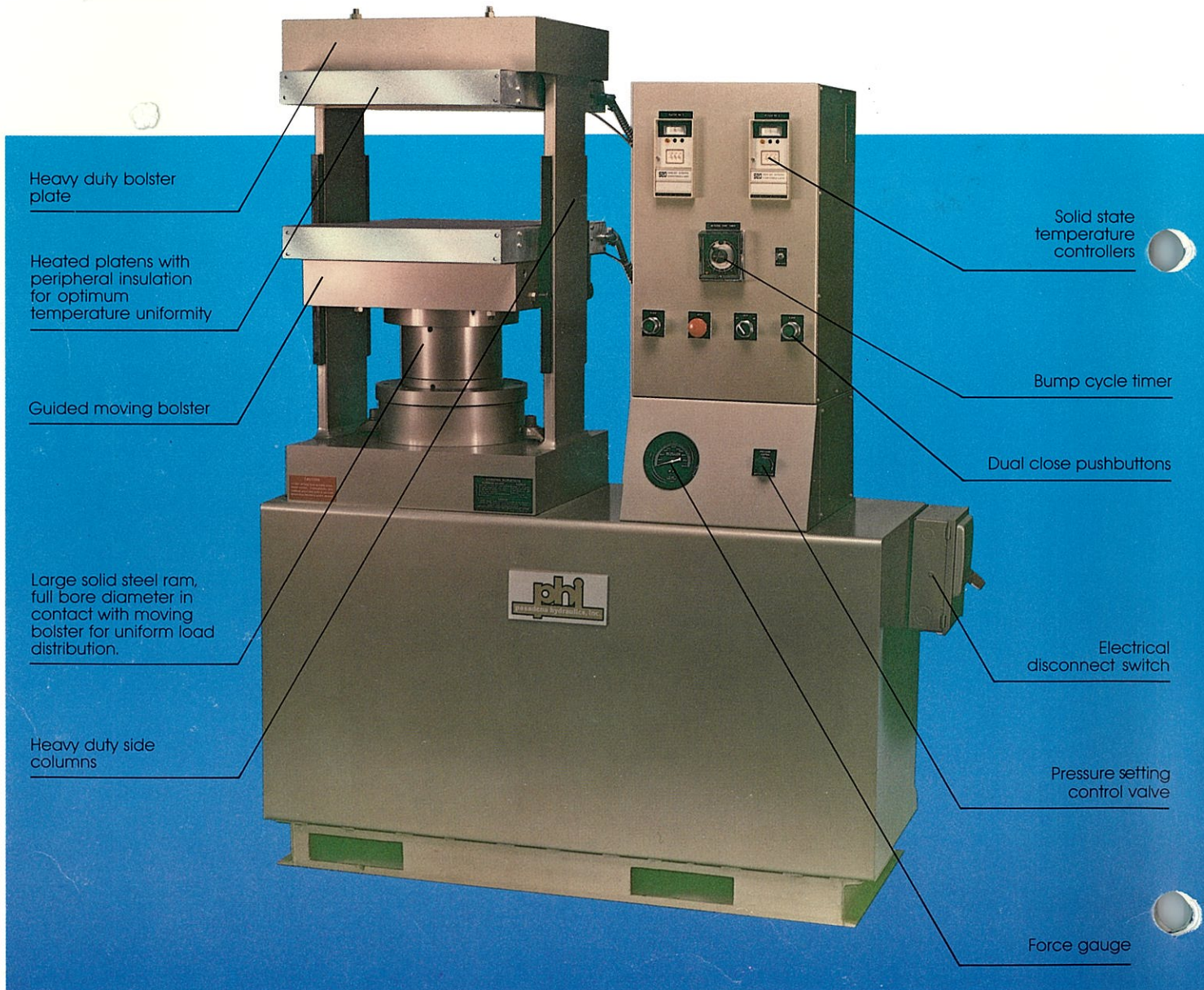
UNITIZED FRAME COMPRESSION PRESSES

In PHI unitized frame construction, the frame columns are heavy duty steel plates structurally joined to the solid steel bolsters. Bolsters are ground, and the frame is precisely aligned to insure accurate platen parallelism. The moving bolster is fully guided. This strong, rigid design affords minimal deflection, assures accurate mold mating and uniform pressure application under all operating conditions.

The table on page 3 outlines basic specifications for standard PHI compression presses in capacities from 20 to 300 tons. Representative of typical compression press specifications, the listing is not intended to limit your selection of unitized frame presses to the capacities, platen sizes, etc. shown. With the wide flexibility afforded by our "building-block" design and construction, unitized frame compression presses can be supplied with the specific capacity, platen size, daylight, controls and operating features necessary to most efficiently and economically meet your individual production requirements.

FEATURES:

- Flexible "building-block" design and construction.
- Heavy duty, all steel construction, including bolsters and frame columns, provides maximum strength, minimal deflection and accurate platen alignment.
- Large ram provides rigid platen support and permits lower hydraulic system pressure.
- Up acting, single acting ram standard. Double acting (up or down acting) rams available.
- Standard capacities from 20 to 300 tons.
- Special capacities to meet your requirements.
- Special sizes and types of platens available.
- Multiple openings can be provided for increased productivity.
- Choice of cycle control systems and instrumentation to meet specific operating requirements.



Model Shown Above:
100 ton rubber bonding press with bump cycle
for automatic mold outgassing

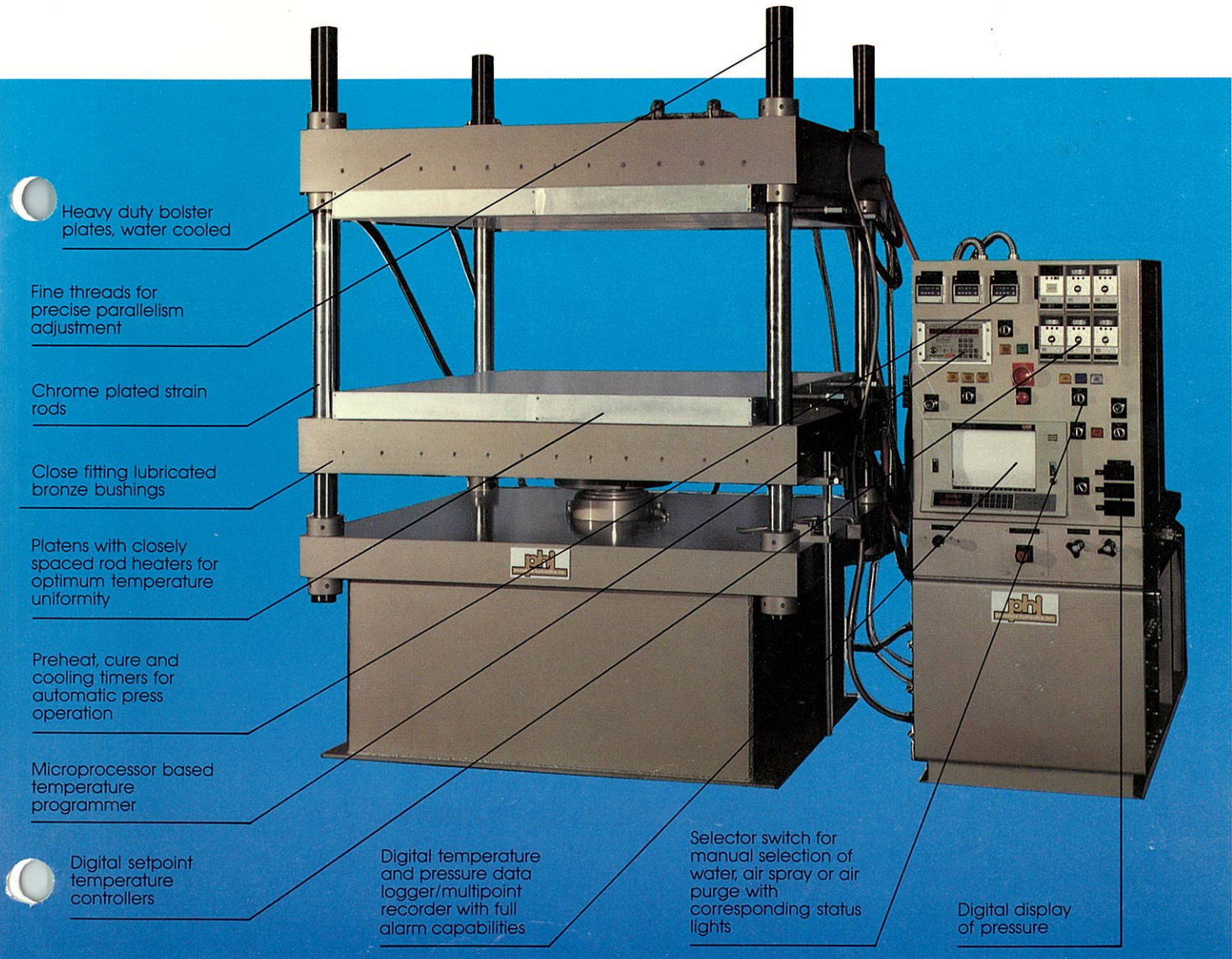
STRAIN ROD COMPRESSION PRESSES

PHI strain rod compression presses feature extra large strain rods and solid steel bolsters for maximum strength and rigidity. The heavy duty strain rods are ground and finely threaded to provide precise platen alignment, parallelism and exceptionally accurate bolster guidance. The bolsters are ground for precision platen mating, and the moving bolster is guided by four large lubricated bushings. This superior design provides unmatched accuracy in alignment and parallelism of platens— $\pm .001$ inches per foot of span—for more uniform pressure and accurate mold mating.

Outlined on page 3 are basic specifications for standard PHI compression presses in capacities from 20 to 300 tons. This listing is merely representative of typical PHI compression presses. Due to the extreme versatility inherent in our "building-block" design and construction, strain rod frame compression presses can easily and economically be supplied with the precise capacity, platen size and type, operating characteristics and time, temperature and pressure controls you require.

FEATURES:

- Flexible "building-block" design and construction.
- Heavy duty, strain rods with fine threads provide precise platen alignment and parallelism and insure precision guidance for moving bolster.
- Large ram provides rigid platen support and permits lower hydraulic system pressure.
- Up acting, single acting ram standard. Double acting (up or down acting) rams available.
- Standard capacity from 20 to 300 tons.
- Special capacities to 1,000 tons.
- Special sizes and types of platens available.
- Multiple openings can be provided for increased productivity.
- Choice of cycle control systems and instrumentation to meet specific operating requirements.



Heavy duty bolster plates, water cooled

Fine threads for precise parallelism adjustment

Chrome plated strain rods

Close fitting lubricated bronze bushings

Platens with closely spaced rod heaters for optimum temperature uniformity

Preheat, cure and cooling timers for automatic press operation

Microprocessor based temperature programmer

Digital setpoint temperature controllers

Digital temperature and pressure data logger/multipoint recorder with full alarm capabilities

Selector switch for manual selection of water, air spray or air purge with corresponding status lights

Digital display of pressure

Model Shown Above:
100 ton laminating press, with 60" x 60" electrically heated platens and programmable cycle controls

PLATEN HEATING SYSTEMS

Standard platens are available in sizes to fit all presses, and in numerous types to handle the simplest to the most demanding "state-of-the-art" operating requirements. The various platen heating systems differ primarily in heating rate, maximum temperature capability and temperature uniformity. Since cost of the systems is dependent upon desired performance, it is most practical and economical to select the simplest system which meets your particular requirements.

All platens are Blanchard or surface ground to

provide a flat and parallel working area. Blanchard grinding results in a .001" per foot flatness and an 85-90 RMS surface finish. Surface ground platens (see Table 1) are flat to 0.0005" per foot and have a 32 RMS or better finish.

Electrically heated platens are available for use with most common electrical services. They have separately fused circuits and are wired with high temperature silicone or glass insulated wire. Platens for 600°F and higher service have silver soldered heater connections to protect against wire failures.

TABLE 1. PLATEN HEATING SYSTEM PERFORMANCE/CONTROL SPECIFICATIONS

FEATURES PERFORMANCE CONTROL	SYSTEM DESIGNATION CODE	NON HEATED	STEAM HEATED			ELECTRICALLY HEATED						
		A	B	C	D	E	G	U	H	J	K	L
PLATEN	Max. Temp. (°F)	—	400	400	450	450	600	600	600	800	800	1000
	Heat Rise (°F/Min.)	—	50	50	13	13	8	8	13	15	25	20
	Material	Steel	Steel	Steel	Alum.	Alum.	Steel	Steel	Steel	Steel	Steel	Stainless
	Hard Anodized	No	No	No	Yes	Yes	No	No	No	No	No	No
	Surface Ground	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
	Edge Insulation	No	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes
TEMPERATURE UNIFORMITY	± °F @ 350°F	—	—	5	10	5	15	12	6	10	6	6
	± °F @ 550°F	—	—	—	—	—	25	20	10	20	10	10
	± °F @ 750°F	—	—	—	—	—	—	—	—	30	15	15
	± °F @ 950°F	—	—	—	—	—	—	—	—	—	—	30
TEMPERATURE CONTROLLER	Sensitivity (%)	—	—	.1	2.0	.1	2.0	.2	.1	.1	.1	.1
	Set Point Acc. (°F)	—	—	5.0	—	1.0	—	1%	1.0	1.0	1.0	1.0
	Sensor Type	—	—	Bulb	Bi-Metal	T.C.	Bi-Metal	T.C.	T.C.	T.C.	T.C.	T.C.
	Scale	—	—	Analog	None	Digital	None	Analog	Digital	Digital	Digital	Digital
	Manufacturer*	—	—	Taylor	Fenwal	Barber Colman	Fenwal	Barber Colman	Barber Colman	Barber Colman	Barber Colman	Barber Colman
	Model No.*	—	—	122R	17000	522B	17000	120	522B	522B	522B	522B

*Subject to change without notice.

ELECTRIC CYCLE CONTROLS

All electric cycle control systems include dual guarded pushbuttons for safe press closing, a single pushbutton for press opening, as well as all necessary switches and relays. Wiring is number coded for ease of identification.

A power transformer fused on the high side and

grounded on the low side is supplied for 120V control voltage. PHI offers various standard cycle control systems which give you the flexibility to perform most press operations either manually or semi-automatically. Table 2 lists the various cycle control systems available and their operating features.

TABLE 2. ELECTRIC CYCLE CONTROL OPERATING FEATURES

PRESS OPERATION	CYCLE CONTROL SYSTEM DESIGNATION CODE															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
Two Pushbutton Close/One Pushbutton Open	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Adjustable Limit Switch Interlocks Circuit			•	•	•	•	•	•	•	•	•	•	•	•	•	•
Adjustable Pressure Switch Stops Motor			•	•												
Motor Runs Continuously					•	•	•	•	•	•	•	•	•	•	•	•
Bump Close Timer/Bump Open Counter							•									
Adjustable Timer for Low Pressure Preheat											•	•	•	•	•	•
Pressure Rise Control											•			•		•
Adjustable Timer for High Pressure Cure		•		•		•	•	•	•	•	•	•	•	•	•	•
Air-Water Cooling									•				•	•		
Adjustable Cooling Timer								•	•	•	•	•	•	•	•	•
Automatic Press Opening		•		•		•	•	•	•	•	•	•	•	•	•	•
Adjustable Timed Air Purge								•	•		•	•	•	•		
Timed Steam Purge/Timed Steam Blowdown										•					•	•

A. Manual Control – Intermittent Motor Operation
B. Semi-Automatic Cure Control – Intermittent Motor Operation
C. Pressure Switch Control – Intermittent Motor Operation
D. Semi-Automatic Cure, Pressure Switch Control – Intermittent Motor Operation
E. Manual Control – Continuous Motor Operation
F. Semi-Automatic Cure Control – Continuous Motor Operation

G. Semi-Automatic Cure, Automatic Bump Cycle – Continuous Motor Operation
H. Semi-Automatic Control of Cure, Cooling and Air Purge for 500°F Maximum Electrically Heated Systems – Continuous Motor Operation
J. Same as H for Over 500°F Systems
K. Same as H for Steam Presses
L. For Standard Multilayer Presses. Semi-Automatic Control of Low Pressure, High Pressure, Cooling and Air Purge for Electrically Heated Presses Up to 500°F – Continuous Motor Operation

M. Same as L but Including Pressure Rise Control
N. Same as L for Systems Above 500°F
P. Same as N but Including Pressure Rise Control
R. Same as L for Steam Presses
S. Same as M for Steam Presses

HYDRAULIC POWER UNITS

Outlined in Table 3 are the various standard hydraulic power units available with PHI compression presses. These hydraulic systems include pump or pumps, motor, high pressure control, dump valve, oil strainers, reservoir, air breather and all related components and devices for a complete system.

The APPROACH SPEED (A) and PRESSING SPEED (P) of each system is given in inches per minute. The system which best fulfills your operating requirements relative to both approach and pressing speeds should be selected. Special hydraulic power units with faster approach and/or pressing speeds are also available.

TABLE 3. STANDARD HYDRAULIC POWER UNITS (SINGLE ACTING RAM)

CODE	H.P.			PRESSING CAPACITY – TONS																																			
	ONE MOTOR	TWO MOTOR		20		30		50		75		100		125		150		200		250		300																	
		1200 RPM	1800 RPM	1200 RPM	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P															
M	1½	—	—	77	4.2	49	2.7	29	1.6	NOT RECOMMENDED																													
Y	3	1	2½			130	12.0	80	7.6																			52	5.0	42	4.0								
Z	3	1½	2½	NOT RECOMMENDED				122	7.6																			80	5.0	63	4.0	46	2.9	38	2.4				
F	4	1½	2½																																				
G	4	2	2½																																				
J	5	2½	2½																																				

For 50 Hertz voltage supplies, multiply speeds by .83

HYDRAULIC SYSTEM CONTROLS

To achieve the more sophisticated operating performance afforded by many of the various electric cycle control systems, certain additional hydraulic controls and pressure gages (not furnished with standard units) are necessary. (See Table 4.)

Please note that dependent upon the electric cycle controls selected, minimum hydraulic controls are required. Alternative optional control systems may also be selected. (See Table 5.)

TABLE 4. HYDRAULIC SYSTEM CONTROLS & FEATURES

SYSTEM DESIGNATION CODE		OPERATING FEATURES INCLUDED				
		PRESSURE CONTROL		PRESSURE GAGE		OIL COOLER
GRAVITY RETURN	POWER RETURN	LOW RANGE	HIGH RANGE	LOW RANGE	HIGH RANGE	
S1	P1		•	—	3 1/2"	
S2	P2		•	3 1/2"	3 1/2"	
S3	P3		•	—	6"	
S4	P4		•	6"	6"	
S5	P5		•	—	3 1/2"	•
S6	P6	•	•	3 1/2"	3 1/2"	•
S7	P7	•	•	6"	6"	•
S8	P8	•	•	6"	6"	•

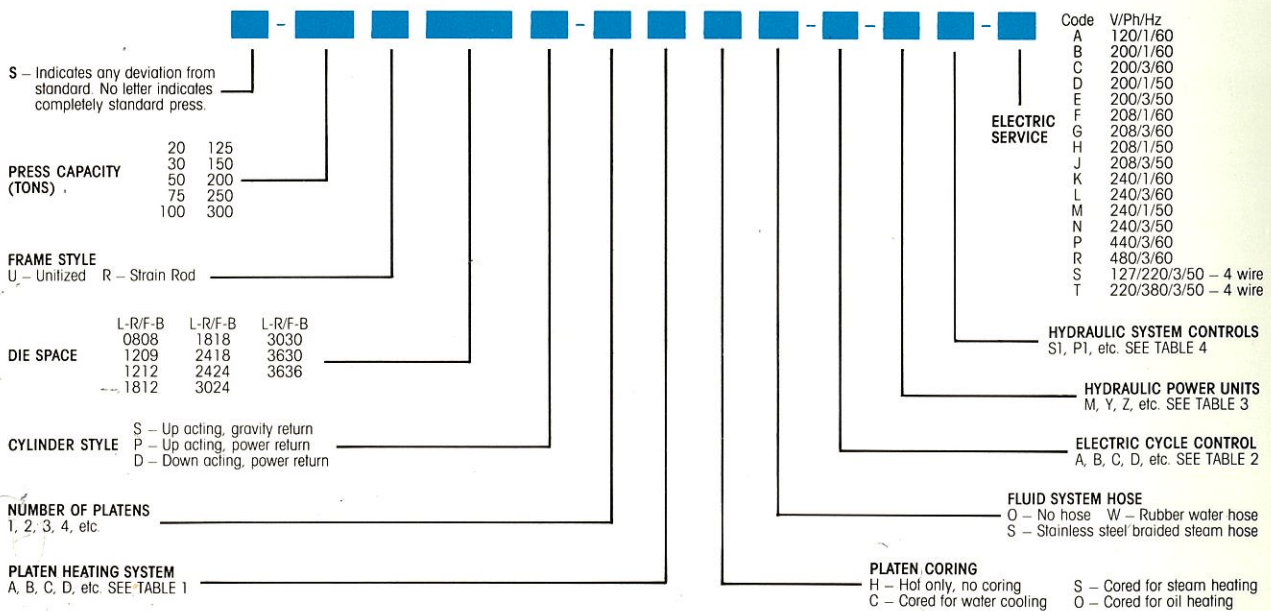
TABLE 5. CONTROL SELECTION

ELECTRIC CYCLE CONTROL (from Table 2)	HYDRAULIC SYSTEM CONTROL (from Table 4)	
	MINIMUM REQUIRED	ALTERNATE (Optional)
A, B, C, D	S1 or P1	S2/P2 S3/P3 S4/P4
E, F, G, H, J, K	S5 or P5	S6/P6 S7/P7
L, N, R	S7 or P7	—
M, P, S	S8 or P8	—

ORDERING INFORMATION

When ordering your PHI compression press, it is most helpful if a complete model number is given. Our standard model identification system is outlined below. All optional features or special requirements not covered in this standard system should be clearly specified. If additional technical information or assistance is required, please contact the factory.

MODEL NUMBER DESIGNATION



14955 Salt Lake Avenue
City Of Industry, CA 91746
(818) 968-9686 TWX: 910-584-4897

REPRESENTED BY: