

HOUNSELL HYDRAULIC PRESSES

Operator and Maintenance Manual

MACHINE: 50 Tonne 4 Column Press

MACHINE NO: 697/2

JOB NO: D7875

CUSTOMER: Zotefoams Plc

HOUNSELL ENGINEERING LTD
Park Lane, Halesowen, West Midlands, B63 2QS
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E.C. DECLARATION OF CONFORMITY

Equipment description: 50 Tonne 4 Column Laboratory Press

Serial Number: 697/2

Manufacturer's Name: Hounsell Engineering Limited

Responsible Person: Brian Hicks (Managing Director)

Full address: Park Lane
Halesowen
West Midlands
B63 2QS
UK

Transposed Harmonised

Standards used: BS EN 292
BS EN 294
BS EN 418
BS EN 60204

Additional Standards: BS 5304
EN 811

Signed

B HICKS
MANAGING DIRECTOR

PREFACE

This machine originally has been supplied to:-

Zotefoams Plc
675 Mitcham Road
Croydon
CR9 3AL

The press supplied is for the purpose of Experimental Mouldings.

The machine supplied does not include any tooling or equipment for tool clamping. The supplier of this equipment wishes to point out that this machine is safe for the purpose supplied, but cannot be liable for any safety aspects associated with tool fixing, tool changing or tool operation.

The machine is guarded with a rising front screen guard. The customer must satisfy himself following a tool change that the new tool is fixed correctly and operates correctly before entering into an automatic cycle. It is expected that the customer will employ procedures during tool change and first cycle to ensure the tool installation is safe.

The press has been supplied with a comprehensive operating and maintenance manual. This should be carefully read and understood and adhered to. The machine can be operated and maintained without putting persons at undue risk, provided that such operations are carried out in accordance with the instruction manual.

Should there be any queries with regard to the safety or operation of this machine the user should immediately contact the supplier.

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MACHINE TECHNICAL SPECIFICATION

ORDER NO: D7875
MACHINE NO: 697/2
TYPE: 4 COLUMN LABORATORY PRESS

PRESS SPECIFICATION

MAIN PRESS

MAX UPWARD FORCE 50 TONNE
MAX STROKE 300 mm
MAX DAYLIGHT 300 mm
CLOSING SPEED 12 mm/sec
OPENING SPEED 15 mm/sec
PUMP MOTOR 5.5 KW
BED AREA - (LEFT TO RIGHT BETWEEN COLUMNS) 650 mm
(FRONT TO BACK OVER BED) 610 mm
HEATED PLATENS 610 X 610 mm

SUPPLIES

CONTROL 110V
MAINS 400V/3PH/50Hz
HYDRAULIC FLUID TYPE TEXACO HFC 46
HYDRAULIC FLUID CAPACITY 250 LITRE
MAX HYDRAULIC FLUID TEMP 55°C
MAX HYDRAULIC SYSTEM PRESSURE 250 BAR
HEATED PLATENS. 12 KW EACH 50 - 300° C

DRAWING LIST

CUSTOMER: ZOTEFOAMS PLC

EQUIPMENT: 50 TONNE 4 COLUMN LABORATORY PRESS

ORDER NUMBER: D7875

MACHINE NUMBER: 697/1

DRAWING NOS.	DESCRIPTION
301-50-620B/1	GENERAL ARRANGEMENT OF PRESS
301-50-33B/1	GENERAL ARRANGEMENT MAIN CYLINDER
301-50-621C/-	HYDRAULIC CIRCUIT
PR 214-1-280/1	ELECTRICAL CIRCUIT

INSTALLATION

Provision has been made for lifting by means of a fork lift truck, alternatively, lifting holes in the top platen are provided for eye bolts for lifting by crane. The customer should satisfy himself that unloading and moving of the machine is carried out safely by competent personnel.

The machine supplied to you is to be provided with a suitably designed and constructed concrete floor area.

The legs of the machine are provided with flat surface, the machine can be raised by using a jack and with the aid of steel packing plates, can be levelled across the machine bed.

Having achieved the desired level the machine can then be fixed by methods of customer preference. Four 19 mm dia holes are provided in the feet for this purpose. It is recommended that the press is fixed to the floor and grouted.

Having secured the machine to the floor ensure the hydraulic tank is clean and fill with hydraulic fluid having checked the type is correct. NOTE: this machine should use Texaco HFC 46. When filling the hydraulic tank normal safety precautions should be taken in using a mobile platform or ladder to get to the elevated tank. The suppliers recommendation for handling the oil should be adhered to.

The filling of the tank should be carried out using a filtration pump unit, the tank should be filled through the strainer in the tank up to the maximum level on the tank sight gauge. It is recommended a 3 micron absolute filter in the filling unit is used to ensure cleanliness of the oil. The cap to the filler should be replaced after completion. The filling of the oil should be carried out by competent personnel.

The following service should be connected:

1. Electrical

A competent qualified electrician should be used to connect the 3 phase mains into the machine. This connection should be done to meet all current standards of installation including BS EN 60204. The maximum power is 29.5 KW.

Pump must run in the correct direction.

MACHINE CONSTRUCTION

GENERAL

The machine supplied is designed and constructed on a steel unitary basis consisting of the following primary areas:

1. LEGS
2. BASE PLATEN
3. TOP PLATEN
4. COLUMNS
5. MOVING PLATEN
6. GUARDS
7. HYDRAULICS
8. ELECTRICAL PANEL

1. LEGS

The press stands on four rolled steel channel legs securely bolted to the base platen and incorporating 19 mm dia holes in each foot to facilitate fixing to the floor.

2. BASE PLATEN

The base platen is manufactured from steel plate. Holes are machined in the four corners to locate the columns. The top surface is ground flat.

3. TOP PLATEN

The top platen is again manufactured from steel plate . The lower surface is ground flat with four holes in the corners to locate the columns.

4. COLUMNS

The four guide columns are attached to the top and bottom platens and hold them in place. The moving platen has bushes which slide up and down the columns.

5. MOVING PLATEN

The moving platen is machined from steel, ground top and bottom to provide a parallel platen. The top face has drillings to carry the connection to the main ram. The bottom surface also carries four guide bush housings which keep the platen aligned as it slides up and down the columns.

6. GUARDS

The machine is provided with fixed mesh and steel sheet guards bolted in position. Working access at the front of the press is provided by a interlocked rising screen guard.

7. HYDRAULICS

All the hydraulics including the pump, motor, tank and valvery are mounted alongside the press. The valves are manifold mounted to keep piping to a minimum.

The hydraulic cylinder is of displacement with hard chrome plated rod guided by POM-PTFE-BRONZE compound bearing rings.

8. ELECTRICAL PANEL

Control of the machine is by Telemec Relays. These will control all sequential movements.

DESCRIPTION OF OPERATION

HYDRAULIC SYSTEM

Refer to circuit No. 301-50-621

PUMP RUNNING

With the motor running the pump draws oil from the reservoir via the suction filter and passes through the solenoid directional valve V1 and back to the reservoir at virtually zero pressure.

PRESS CLOSE

With the "up" solenoid energised oil now flows into the single acting press cylinder via pilot operated check valve V3, the press closes until contact with the component causes the pressure to rise to the pre-determined setting of the pressure switch.

PRESS OPEN

After the timed dwell the "down" solenoid is energised causes pump flow to open the pilot operated check valve at a reduced pressure controlled by the low pressure section of the sandwich relief valve. With the check open oil is exhausted from the cylinder which descends under gravity until the solenoid is de-energised.

Pump pressure and applied tonnage can be ascertained by operation of the push to test valves of the respective gauges.

SECTION 6

OPERATING INSTRUCTIONS

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Adjustable Controls	14
Push Buttons etc.	15

CONTROL PANEL

The control panel is fixed to the right hand side of the machine on the hydraulic unit. This contains all appropriate lamps, buttons and switches required for routine operation.

NOTE: The control panel doors can only be opened after isolating the supply via the isolator housed within the panel door.

ADJUSTABLE CONTROLS

TONNAGE

This is controlled by the pressure switch.
Turn knob clockwise to increase and vice versa.

DWELL TIME

Set by the panel mounted timer.

TEMPERATURE

Two temperature controllers are provided, one for the top platen and one for the moving platen.

DAYLIGHT

A sliding proximity switch mounted in the side of the front guard and fixed by a knurled knob giving provision to limit the downward opening movement (see note page 20).

PUSH BUTTONS

The control panel is provided with the following push buttons etc.

Start and stop for the pump motor.

Man-auto selector switch providing the facility to inch the press up or down.

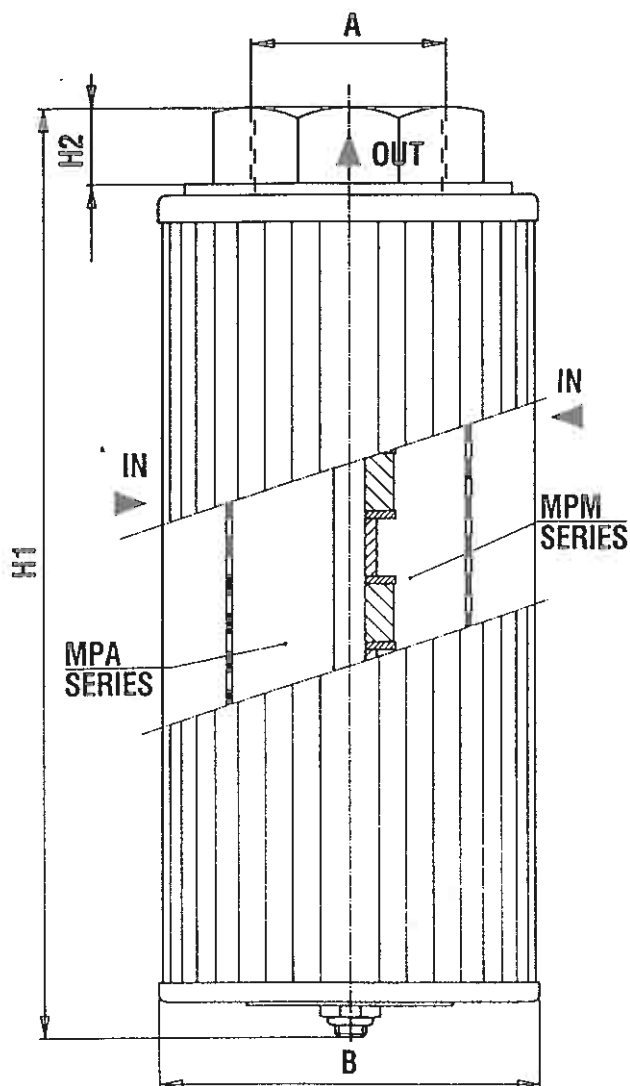
Cycle button which initiates the press cycle in auto or for inching up in manual.

Down button which will open the press at any time whilst in auto or can be used for inching down in manual.

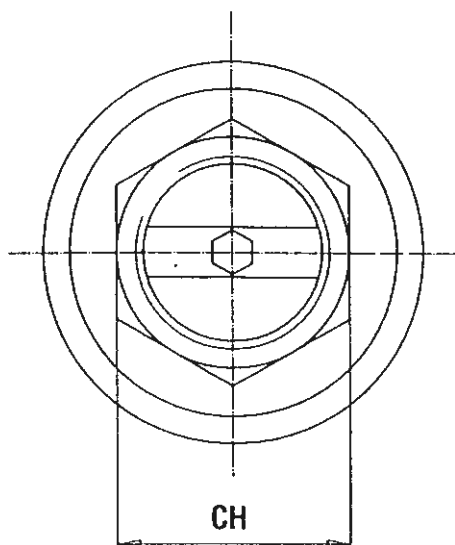
Timing light which is illuminated whilst the press is in the timed dwell mode.

NOTES

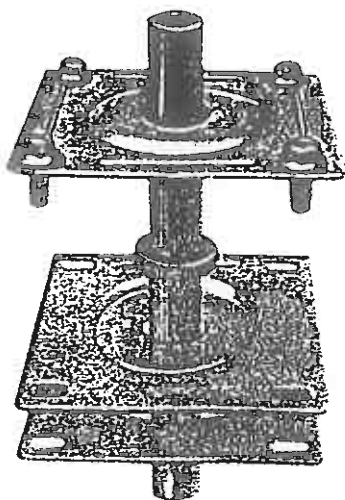
INSTALLATION DATA MPA MPM SERIES



Type MPA-MPM	A	B	H1	H2	CH	Weight Max (kg)
012 G1	3/8" BSP	50	95	15	28	0,17
012 G2	3/8" NPT					
015 G1	1/2" BSP	50	95	15	28	0,17
015 G2	1/2" NPT					
025 G1	1/2" BSP	70	110	15	28	0,27
025 G2	1/2" NPT					
030 G1	3/4" BSP	70	111,5	17	42	0,36
030 G2	3/4" NPT					
045 G1	3/4" BSP	70	156,5	17	42	0,39
045 G2	3/4" NPT					
050 G1	1" BSP	70	156,5	17	42	0,35
050 G2	1" NPT					
075 G1	1" BSP	99	146,5	17	42	0,54
075 G2	1" NPT					
095 G1	1 1/4" BSP	99	147	21	60	0,63
095 G2	1 1/4" NPT					
120 G1	1 1/4" BSP	99	237	21	60	0,95
120 G2	1 1/4" NPT					
150 G1	1 1/2" BSP	99	237	21	60	0,91
150 G2	1 1/2" NPT					
180 G1	1 1/2" BSP	136	172	21	60	0,98
180 G2	1 1/2" NPT					
220 G1	2" BSP	136	160	13	80	1,00
220 G2	2" NPT					
280 G1	2" BSP	136	270	13	80	1,60
280 G2	2" NPT					
300 G1	2 1/2" BSP	136	279	21	90	1,67
300 G2	2 1/2" NPT					
380 G1	2" BSP	136	320	13	80	1,60
380 G2	2" NPT					
430 G1	3" BSP	136	333	22	106	1,93
430 G2	3" NPT					



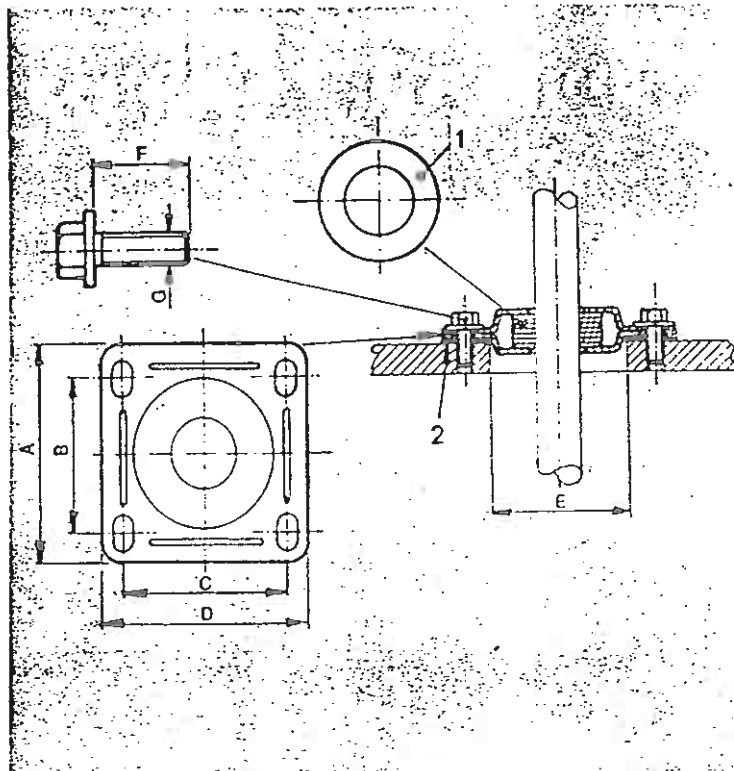
MPM-095-G1-M60



Serie di flange per il fissaggio sui serbatoi, di tubazioni in aspirazione, con diametri varianti da 12 a 89 mm. Vengono fornite complete di viti di fissaggio e boccale in elastomero per una immediata installazione a un basso costo di manodopera. Particolare interessante è che si può accedere attraverso il foro praticato sul serbatoio alla rimozione del filtro in aspirazione con estrema facilità.

Set of flanges for clamping, on the reservoir, suction pipes, with diameters ranging from 12 to 89 mm. They are supplied complete with fastening screws and elastomer bushes for an immediate installation at a low labour cost. Particularly interesting the fact that it is extremely easy to remove suction filter through the hole provided for on the reservoir.

Serie von Flanschen für die Befestigung der Rückaufrohre am Behälter, mit Durchmessern variierend zwischen 12 und 89 mm. Werden komplett mit Befestigungsschrauben und Mundstück aus Elastomer geliefert; für sofortige Installation bei geringen Arbeitskosten. Eine interessante Besonderheit liegt darin dass man durch eine im Behälter angebrachte Öffnung mit grösster Leichtigkeit den Ansaugfilter herausnehmen kann.



- 1 BUSSOLA IN ELASTOMERO
RUBBER CLAMPING BUSH
GUMMIKLEMMBUCHSE
- 2 GUARNIZIONE IN GUARNITAL
SEALS IN GUARNITAL
GUARNITAL DICHTUNGEN

Type	Ø Tube		A	B	C	D	E	F	G
	min.	max.							
FTA - 1215	12	15	140	108	108	134	110	20	M 10
FTA - 1620	16	20	140	108	108	134	110	20	M 10
FTA - 2225	22	25	140	108	108	134	110	20	M 10
FTA - 2630	26	30	140	108	108	134	110	20	M 10
FTA - 3235	30	35	140	108	108	134	110	20	M 10
FTA - 3842	38	40	140	108	108	134	110	20	M 10
FTA - 4850	48	50	190	159	159	190	164	20	M 10
FTA - 6061	60	61	190	159	159	190	164	20	M 10
FTA - 7577	75	77	190	159	159	190	164	20	M 10
FTA - 8789	87	89	190	159	159	190	164	20	M 10

Applied Hydro Mechanics Ltd



Festing Buildings

Highland Road, Southsea PO4 9BZ

Telex: Portsmouth (0705) 819131

GENERAL INSTRUCTIONS AND FEATURES FOR INSTALLATION AND USE OF GEAR PUMPS AND MOTORS

PRESSURE AT THE INLET SIDE OF PUMPS

The lowest absolute pressure accepted in the inlet side is 0.7 bar.

In the standard version pumps cannot work with pressurised inlet side.

In this case, the special version TR that allows 6 bar (absolute) in suction side, must be used.

We suggest not to exceed a fluid speed of 2-3 m/s in the inlet pipe.

In reversible pumps with external drain it is possible to pressurise the inlet side.

REVERSIBLE AND UNIDIRECTIONAL MOTORS

Motors can be supplied in reversible version, marked M, or in the unidirectional one (marked MS if counter-clockwise, or MD if clockwise).

The external dimensions of unidirectional gear motors are the same as the corresponding pumps.

DRAIN

The drain side cannot be pressurised in reversible pumps, motors or in flow dividers.

The reversible motors can be supplied with internal drain. In that case, outlet side can be pressurised.

Reversible pumps can be supplied with internal drain. In that case, inlet side cannot be pressurised.

SPECIAL VERSIONS

- Viton seal (Code V).
Every group of pumps can be equipped with viton seals.
- Low and high temperatures (Code ST).
Special pumps can be supplied to work from -40°C to $+120^{\circ}\text{C}$ (-40°F to $+248^{\circ}\text{F}$).
- Water Glycol and low lubricating fluid (Code W).
Pumps of groups 1-2-3-4 can be supplied in special versions for low lubricating fluid.
- Phosphoric esters (Code VW).
Pumps of groups 1-2-3-4 can be supplied in special versions for phosphoric esters.

MINIMUM ROTATIONAL SPEED

We recommend a minimum rotational speed for every group of pumps as follows:

group 0.25-0.5	800 r.p.m.
group 1P-1BK	600 r.p.m.
group 1-2	500 r.p.m.
group 5-4	400 r.p.m.

MOTORS OUTLET PRESSURE

The maximum outlet pressure is 6 bar (absolute) for unidirectional motors.

Reversible motors may have outlet side pressurised.

DRIVE AND ASSEMBLY

Assembly and drive of pumps and motors must avoid radial and/or axial loads on the shaft.

The coupling used for drive should be able to compensate eventual misalignment errors due to the assembly.

TORQUE WRENCH SETTING FOR BODY BOLTS OF THE PUMPS

Pump Group	Torque Newton Metres
0.25	8.4-10.3
0.5	0.5-8.4-10.3
1P	20.6-25.5
1	20.6-25.5
2	41.2-45.1
3	56.9-70.6
4	83.4-88.3

FEATURES FOR OILS TO USE

Temperature: from -15°C to $+80^{\circ}\text{C}$
(from 5°F to 176°F)

Viscosity: permissible from 12 cSt to 800 cSt.
(from 2°E to 105°E)
(from 66 SSU to 3708 SSU to 100°F)
recommended from 20 cSt to 100 cSt
(from $2,9^{\circ}\text{E}$ to $13,2^{\circ}\text{E}$)
(from 100 SSU to 460 SSU to 100°F)
starting condition max. 1600 cSt
(max. 211°E)
(max. 7400 SSU at 100°F)

Filtration: suction side $60\text{ }\mu\text{m}$
pressure side $10-25\text{ }\mu\text{m}$

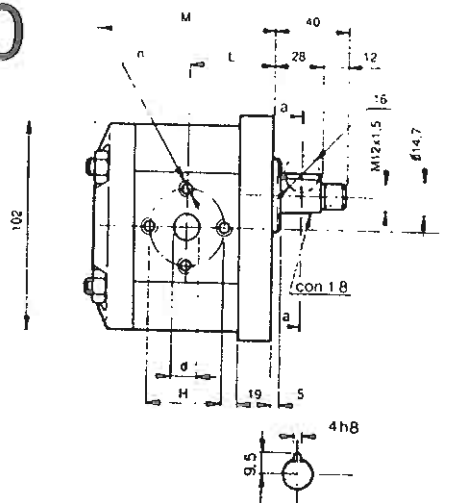
The type of fluid used must be specifically for hydraulic equipments.

It must be non-foaming, antioxidant, non-corrosive and have good lubrication features and meet the following requirements:

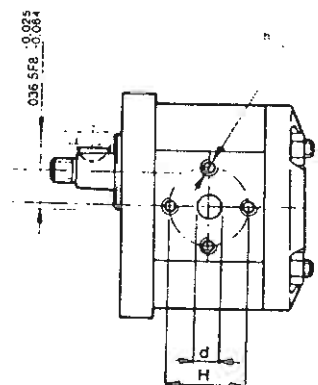
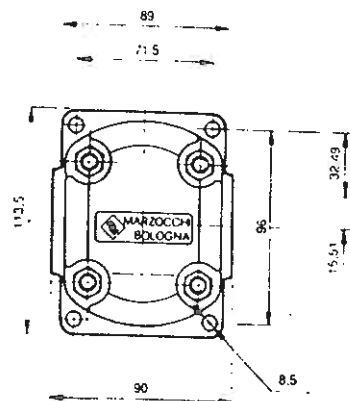
- FZG test — 11th stage
- DIN standard 51525
- Norm VDMA 24317

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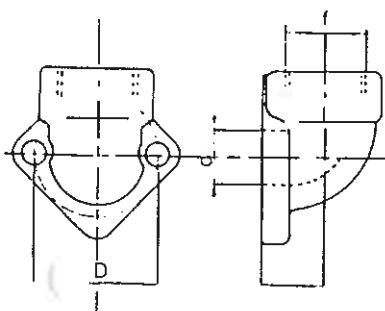
2 RO



inlet (-) section a-a



outlet (~)



3/4-40

TYPE	d	f	h	D
GP1 $\frac{3}{8}$ " x 30	12.5	$\frac{1}{2}$ " BSP	17.5	30
GP1 $\frac{1}{2}$ " x 30	12.5	$\frac{1}{2}$ " BSP	17.5	30
GP2 $\frac{3}{8}$ " x 40	12.5	$\frac{3}{8}$ " BSP	18.5	40
GP2 $\frac{1}{2}$ " x 40	12.5	$\frac{1}{2}$ " BSP	21	40
GP3 1" x 51 40	19	$\frac{3}{4}$ " BSP	21	40
GP3 $\frac{3}{4}$ " x 51	26	1" BSP	25.5	51
GP3 $\frac{3}{4}$ " x 56	20	$\frac{3}{4}$ " BSP	27	56
GP3 1" x 56	26	1" BSP	27	56
GP4 1 $\frac{1}{4}$ " x 62	33	1 $\frac{1}{4}$ " BSP	34.5	62
GP4 1 $\frac{1}{2}$ " x 72.5	40	1 $\frac{1}{2}$ " BSP	34.5	72.5
GP4 2 $\frac{1}{2}$ " x 92	65	2 $\frac{1}{2}$ " BSP	51	92

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MAINTENANCE AND FAULT FINDING

After an initial working period of three to four weeks it may be necessary to check all the pipe couplings for tightness and any possible leaks which may have occurred prior to the "bedding-in" of the couplings.

Take up the slackness, but do not over tighten as this will only create further problems of coupling stretch.

If leaks continue to show then inspect the joint for possible fracture and if necessary replace with good.

A periodic check should be made of all oil levels, also the condition of the oils being used with regard to possible harmful contamination that could occur.

WEEKLY ITEM CHECKS

1. Check pipe couplings for leakage.
2. Check oil tank fluid level.
3. Check hydraulic system pressure.
4. Check hydraulic fluid operating temperature.
5. Check operation and security of all moving/static guards.
6. Clean machine thoroughly.

MONTHLY ITEM CHECKS

(In addition to weekly checks)

1. Check security of tie bar nuts.
2. Oil tank fluid. Check for contamination.

FAULT:

Press will not close.

POSSIBLE CAUSE:

Motor not running

Guard switches not made or reset.

Up solenoid not energises.

HP relief wide open.

Drive coupling defective.

FAULT:

Press closes slowly (with possible louder noise level).

POSSIBLE CAUSE:

Clogged suction filter.

Pump sucking air via input pipe or shaft seal.

Pump excessively worn.

FAULT:

Failure to attain tonnage

POSSIBLE CAUSE:

HP relief valve set too low.

Pump excessively worn.

Pressure switch mal-adjusted.

FAULT:

Timer will not start dwell

POSSIBLE CAUSE:

Pressure switch set higher than press capacity

Defective pressure switch

FAULT:

Press will not hold tonnage for a reasonable period

POSSIBLE CAUSES:

Pilot operated check valve dirty/defective.

Leakage between manifold and cylinder

FAULT:

Press will not open.

POSSIBLE CAUSES:

Timer malfunction.

Press down solenoid not energised

LP relief set very low

FAULT:

Oil gets very hot

POSSIBLE CAUSES:

Dwell timer not activated at set tonnage.

Down solenoid not de-energised at end of stroke.

Pump excessively worn.

NOTE:

If the press has been left standing for a considerable time it could creep down from the adjustable proximity stroke switch to the maximum daylight position, it will automatically return to the adjusted position on completion of the next cycle.

When ordering spares please quote the following:

Press type

Tonnage

Serial No.

OPERATOR SAFETY PROTECTION

The primary safety device is the proven interlocked rising screen guard which must be fully closed for any ram movement to take place.

Special safety limit switches are hard wired into the control circuit and are checked on each guard operation.

Fixed surround guards are provided and the motor stop button arrests any machine movement.

The intrusic low speed and up-stroking operation also enhance safety.

SPARES LIST				
CUSTOMER: ZOTEFOAMS PLC				SHT
STATION REF: 50 TONNE LABORATORY PRESS				1 of
PROJECT NO: D7875				2
Item	Supplier	Description	Ref No.	Qty
1	SHAMBAM	<u>MAIN HYDRAULIC CYLINDER</u> SLYDRING	S55815-1600-47A	2
2	FTL (MERKEL)	OMS.MR SEAL	0159-179-241	1
3		O-RING 6 3/4" X 6 1/2"	BS 260	1
	MARZOCCHI	<u>FOR HYDRAULIC UNIT</u> GEAR PUMP	2D13RO	1