ELE
International

Operating Instructions

PNEUMATIC CONSOLIDATION APPARATUS

Models: 25-0555 (C-230)
25-0560 (C-232)

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TABLE OF CONTENTS

Rev. 2: 10/04

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PNEUMATIC CONSOLIDATION APPARATUS
MODEL 25-0555 (C-230) SERIES

I. GENERAL INFORMATION

Used worldwide for stress controlled consolidation testing, the **Pneumatic Consolidation Apparatus** is a pneumatic load frame designed to apply loads instantaneously and to maintain any set load, regardless of sample compression occurring within the loading interval. The unit is self-contained with a built-in digital readout with 0.25% accuracy.

Available in three load ranges, the load frame uses a dual-piston system for handling loads to 16, 32, or 64 tsf while retaining sensitivity in the lower load ranges. A precision, low-bleed type of pressure regulator is used to set and maintain the load on the specimen.

Adjustable centering pads on the load platform aid in aligning the Consolidometer and will accept any Consolidometer up to a maximum diameter of 7.25 " (184 mm). The top loading design eliminates time-consuming weight calculations.

II. RELATED USER DOCUMENTATION

These operating instructions do not contain all the necessary information on the specific test procedures. Please refer to ASTM D-2435, D-4546 or AASHTO T-216 for additional testing information.

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III. CONNECTIONS

A. Screw the Dial Indicator Rod into the center rear of the load platform between the two eccentric stops.

B. Attach the Dial Indicator Clamping Arm to the Dial Indicator Rod.

C. With the screw provided, attach the Dial Indicator to the clamping arm.

D. Connect the airline to the 1/4" fitting located at the right rear of the cabinet.

NOTE: A constant supply of air is required. The inlet air pressure should not exceed 200 psi, nor should it ever be less than 20 psi higher than the highest pressure setting. An optional air filter removes condensation from air lines and prevents damage to the precision regulators.

E. Attach the optional linear displacement transducer to the clamping block on the dial indicator clamping arm.

IV. PANEL CONTROLS

A. **PRESSURE READOUT**: The readout is a precision instrument with a 0.25% accuracy. It is used for setting pressures on the regulator. A zero adjustment knob is located on the front of the readout. A span adjustment is also located on the front but has a cover screw in front of the adjusting screw. The readout is factory set to turn off after 20 minutes to save batteries. The on/off switch is labeled with “PSI”.

B. **LOAD REGULATOR**: A precision regulator is used to set and maintain the air pressure to the pistons, which provide load to the sample. The regulator is sensitive to 1/8" variations in water column.

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C. **HIGH LOAD/LOW LOAD SELECTOR VALVE**: This valve has three positions. The “low load” is used for loads to 1 tsf. The “high load” position is used for loads up to 32 tsf. The “off” position is used when changing from 1 to 2 tsf loads.

D. **LOAD VALVE**: This valve is actuated by 90 degree rotation of the handle. When open, it allows air to flow from the regulator to the pistons (HIGH or LOW LOAD) selected.

V. OPERATION

The load platform is designed with adjustable centering pads for aligning the Consolidometer and accepting any brand Consolidometer that has a maximum diameter of 184 mm (7.25"). The pads require setting if using another brand Consolidometer. The stops have been set for a 5" diameter Consolidometer.

A. Adjust the centering pads to center the Consolidometer to the ball on the load pad.

NOTE: When using floating ring Consolidometers, alignment of the ball and the cross arm center are required each time. When using fixed ring Consolidometers, alignment is automatic when it is placed against the eccentric stops.

B. With the Consolidometer in place, adjust the lower nuts on the cross arm supports so that there is an approximate 1/16" (1.588 mm) gap between the cross arm and the ball on the Consolidometer load pad or piston when using a back pressure Consolidometer. This adjustment allows installation or removal of the Consolidometer without loosening the nuts on the upright rods.

C. The upper cross arm has a displacement indicator pin that is positioned on the Consolidometer ball or piston. Adjust the dial indicator or linear displacement transducer to the top of this pin and allow for sufficient travel when the soil sample compresses.

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VI. LOADING SEQUENCE

A. Set the HIGH/LOW LOAD selector valve to LOW LOAD.

B. Set the LOAD valve to OFF.

C. Select a seating load per the Load Setting Table. See Table 1.

D. Set the regulator to the desired pressure per the Load Setting Table.

NOTE: The weight of the load pad, porous stone and steel ball has not been figured into the calibration sheets. When using a back pressure Consolidometer, the weight of the piston should also be considered along with the cross sectional area of the piston and the pressure during the test. The cross sectional area of 3/4" ((19.050 mm) diameter piston is 0.4418 sq. In.

E. With the vertical dial indicator seated on the cross arm pin, note the reading on the data sheet.

F. Turn the LOAD valve from OFF to LOAD and at the same time, start a stopwatch in order to record the appropriate time deformation characteristics.

G. To apply the next load, turn the LOAD VALVE to OFF and adjust the LOAD REGULATOR to the pressure required. Repeat Step F.

H. When changing from 1 tsf to 2 tsf, turn both valves (LOAD and HIGH LOAD/LOW LOAD) to the OFF position. Adjust the pressure to the desired setting. Once the pressure is set, simultaneously turn the HIGH LOAD/LOW LOAD valve to HIGH LOAD and the LOAD valve to LOAD. Record the appropriate time deformation characteristics.

I. Unloading of the sample can be accomplished by turning the LOAD valve to OFF, adjusting the LOAD REGULATOR to zero psi, and then turning the LOAD valve back to LOAD. This process will exhaust the air through the regulator vent.

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VII. SPECIFICATIONS

Construction	Aluminum cabinet with enamel finish; 1" (25.4 mm) thick aluminum load platform plate; stainless steel vertical rods	
Maximum Load	25-0555 (C-230) series: 25-0560 (C-260) series:	16 tsf 32 tsf
Req. Air Pressure	25-0555 (C-230) series: 25-0560 (C-260) series:	62 psi (427 kPa) 123 psi (848 kPa)
Vertical Clearance	8.25" (210 mm)	
Horizontal Clearance	7.75" (197 mm)	
Max. Piston Travel	0.5 “ (12.7 mm)	
Dimensions	12" w. x 14.5" d. x 20.5" h. (305 x 368 x 521 mm)	
Weight	Net 48 lbs. (21.8 kg)	

VIII. ACCESSORIES

25-0479 (C-327)	Fixed Ring Consolidometer. For 2.5" diam. specimens
25-0455 (C-328)	Fixed Ring Consolidometer. For 50 mm diam. specimens
25-0503 (C-329)	Fixed Ring Consolidometer. For 75 mm diam. specimens
25-0530 (C-275)	Floating Ring Consolidometer. For 2.5" diam. specimens

VIII. ACCESSORIES (cont'd.)

88-4070 (LC-3)	Dial Indicator. 0.4" range x 0.0001" graduations
88-4080 (LC-3M)	Dial Indicator. 10 mm range x 0.0025" graduations
88-4120 (LC-9)	Dial Indicator. 1.0" range x 0.001" graduations
88-4130 (LC-13)	Dial Indicator. 25 mm range x 0.010 mm graduations
88-4210 (LC-28)	Electronic Digital Indicator, 0.600"/15mm range
88-4220 (LC-30)	Electronic Digital Indicator, 1"/25.4mm range
88-4260 (LC-36)	RS232 Data Output Cables. For direct interfacing to computers and serial printers
88-4270/02 (LC-38)	AC Adapter, 110V AC, 50/60 Hz
88-4270/01 (LC-39)	AC Adapter, 220V AC, 50/60 Hz

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TABLE 1 - LOAD SETTINGS FOR MODEL 25-0555 (C-230)

AIR PRESSURE	LBS. FORCE	LOW LOAD	HIGH LOAD
5	2.3	X	
6	3.6	X	
7	4.7	X	
8	5.7	X	
9	6.8	X	
10	7.9	X	
20	18.5	X	
30	29.4	X	
40	40.1	X	
50	50.7	X	
60	61.1	X	
70	71.6	X	
80	81.9	X	
90	92.4	X	
5	89.8		X
10	178.6		X
20	356.5		X
30	534		X
40	708		X
50	883		X
60	1,062		X

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AIR PRESSURE	LBS. FORCE	LOW LOAD	HIGH LOAD
70	1,239		X
80	1,414		X
90	1,592		X

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TABLE 2 - LOAD SETTINGS FOR MODEL 25-0560 (C-232)

AIR PRESSURE	LBS. FORCE	LOW LOAD	HIGH LOAD
5	3.1	X	
6	4.1	X	
7	5.2	X	
8	6.3	X	
9	7.3	X	
10	8.4	X	
20	18.8	X	
30	29.6	X	
40	40.0	X	
50	50.6	X	
60	61.1	X	
70	71.5	X	
80	81.9	X	
90	92.5	X	
100	103	X	
5	92.0		X
6	110.6		X
7	128.4		X
8	146.4		X
9	164.0		X
10	181.3		X
20	358.3		X
60	535.0		X
40	715		X
50	892.0		X
60	1068		X

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AIR PRESSURE	LBS. FORCE	LOW LOAD	HIGH LOAD
70	1242		X
80	1418		X
90	1595		X
100	1772		X
110	1946		X
120	2124		X

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FIGURE 1 - PRESSURE SETTING: LOW LOAD

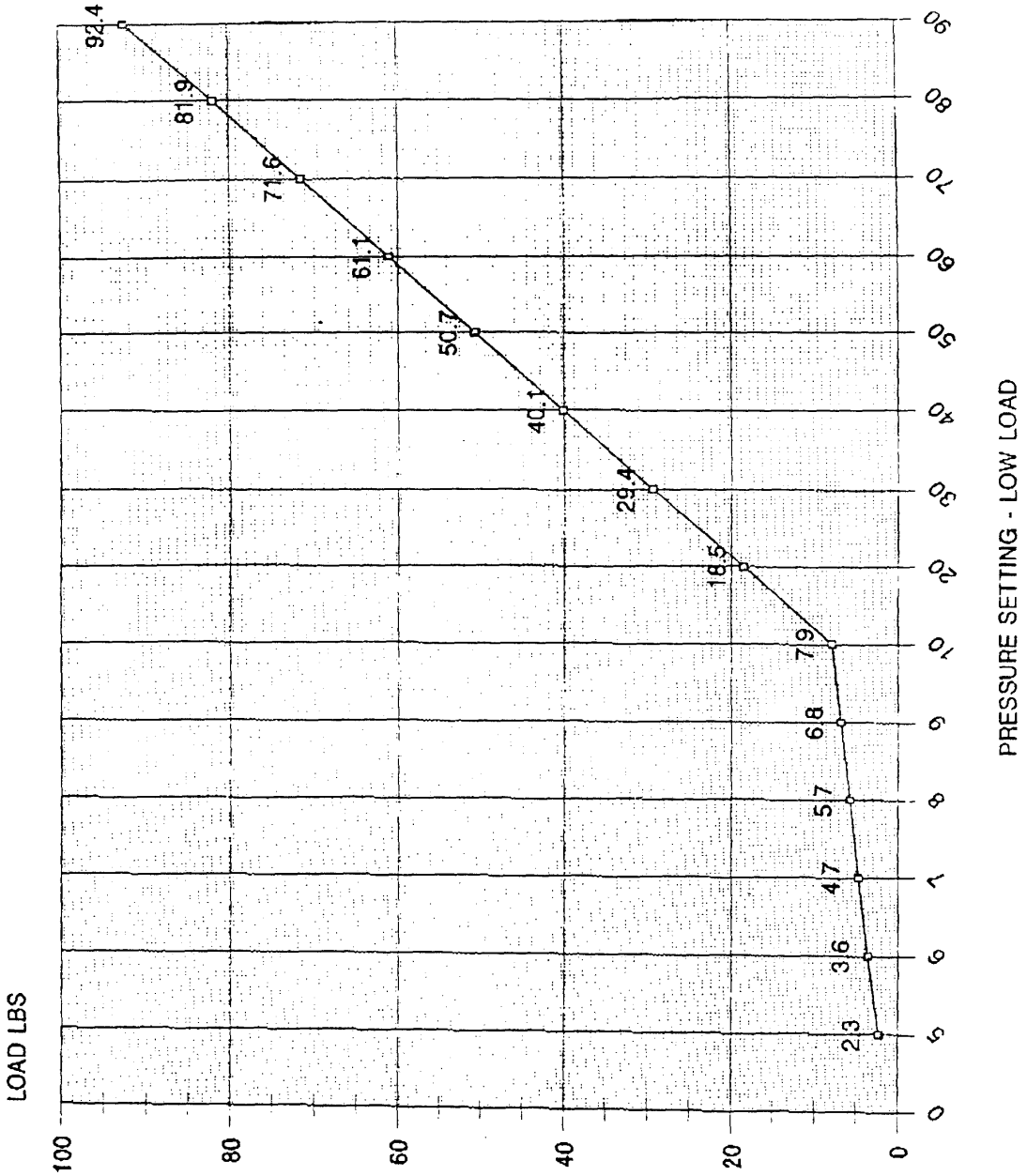

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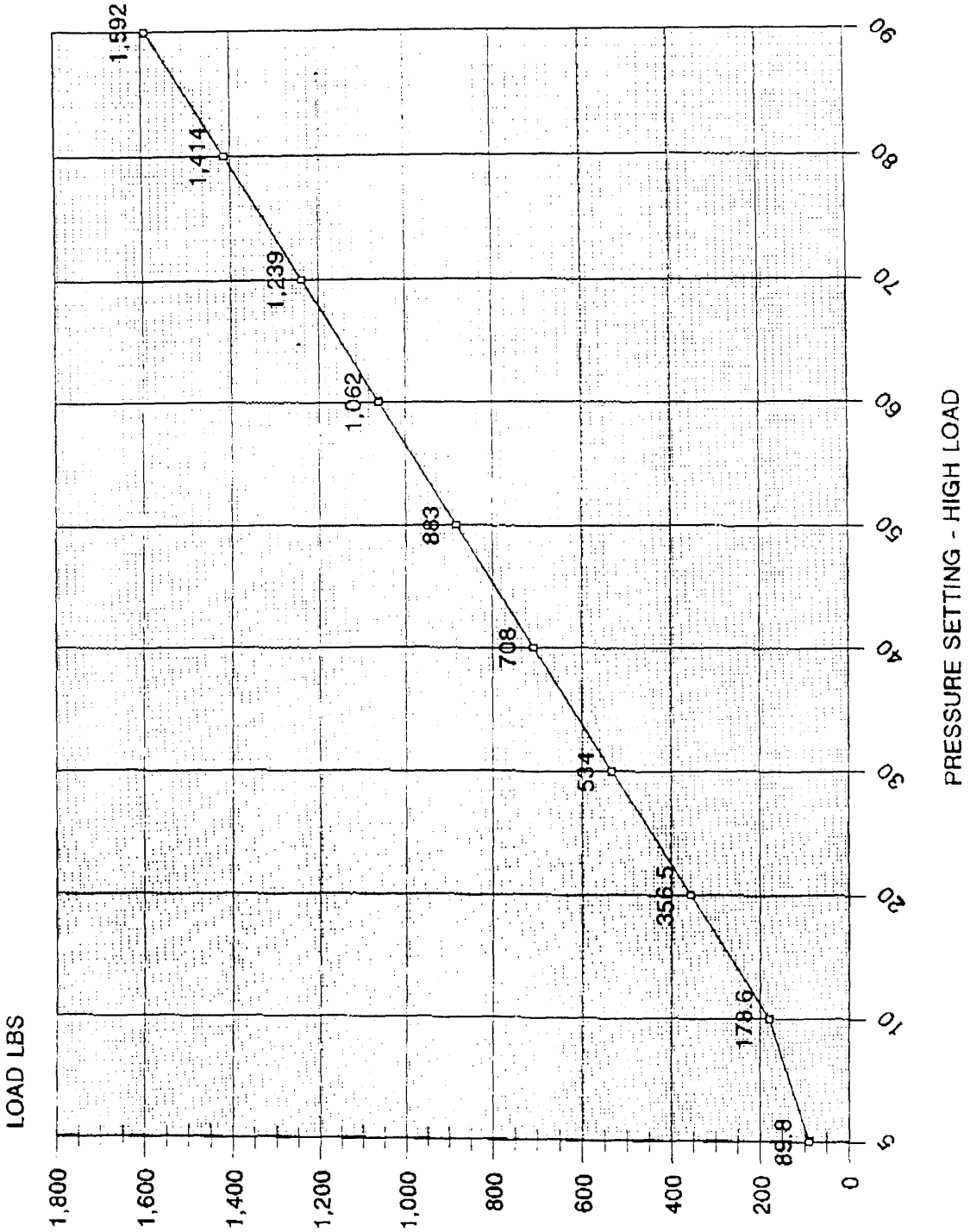
FIGURE 2 - PRESSURE SETTING: HIGH LOAD



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