KW
Karol•Warner

OPERATING MANUAL

Pneumatic Consolidation Load Frames

1016/1016F • 1032/1032F • 1064/1064F

INTRODUCTION

Karol-Warner Pneumatic Consolidation Load Frames are accurate and reliable loading mechanisms for soils consolidation testing of low or high loads. The unique CONBEL™ loading design features greater testing sensitivity and ease of operation. A low-bleed pressure regulator is used to set and maintain specimen loads. Adjustable centering pads allow for alignment of the Consolidometer. A rugged, enamel-coated steel cabinet enables the unit to withstand harsh lab environments.

Consolidometer (fixed or floating ring) and Dial Indicator (mechanical or digital) are required to perform testing and are sold separately. Consolidometer includes loading pad, cutting sample ring, top and bottom porous stones, acrylic inundation ring and load-bearing ball. Calibration Discs (optional) are sold separately. A source of compressed air is required for operation.

FEATURES

- Meets ASTM D2435, ASTM D4546 and AASHTO T 216 standards.
- Stainless-steel vertical support rods.
- 1 in (25.4mm) thick aluminum platforms with adjustable centering pads.
- Sturdy enamel-coated steel cabinets.
- Compact size allows for tabletop operation.
- Digital readout
- Precision pressure regulators and pressure transducers
- Loading ball included.

SPECIFICATIONS

Dimensions: 12x14.5x20.5in (305x368x521mm) WxDxH
Vertical Clearance: 8.25in (210mm)
Horizontal Clearance: 7.75in (197mm)
Weight: 48lbs (21.8kg)
Maximum Piston Travel: 0.5in (12.2mm)
Electric: 120-220 V / 50-60 Hz

Model 1032 shown with floating ring consolidometer and LVDT

Model 1016	Model 1032	Model 1064
Compressed Air Requirements		
62 to 125psi 4.3 to 8.6bar	123 to 150psi 8.5 to 10.3bar	188 to 225psi 13 to 15.5bar
Load Capacities		
16tsf (1,532kPa)	32tsf (3,064kPa)	64tsf (6,129kPa)

REQUIRED ACCESSORIES *(Purchased Separately)*

- Consolidometer – fixed ring or floating ring (Refer to Consolidometer chart below).
- Options for sample displacement measurement
  Model 5102 Mechanical Dial Indicator, 0.5 x 0.0001in
  Model 6820 Digital Dial Indicator, 0.6 x 0.0001in
  Model 6151 Linear Variable Displacement Transducer and Model 6572 Two-Channel Digital Display Readout Box
- Calibration Discs, stainless steel discs for verification of loading system (Refer to Consolidometer chart below).

(Continued on next page)

Rev: 08/2021

PHONE: 800-999-SOIL (7645)
410-987-7330
PO Box 1213 Powell, OH 43065
Email: customerservice@karolwarner.com **Product Web Page:** karolwarner.com
FAX: 410-987-2124

REQUIRED ACCESSORIES *(Purchased Separately)*

Fixed Ring Consolidometer	Model	Calibration Disc
50mm (1.969in)	1240-A	1214-A
50.8mm (2in)	1240-B	1214-B
60mm (2.36in)	1240-C	1214-C
61.5mm (2.42in)	1240-D	1214-D
63.5mm (2.5in)	1240-E	1214-E
70mm (2.756in)	1240-F	1214-F
75mm (2.95in)	1240-G	1214-G
76.2mm (3in)	1240-H	1214-H
Floating Ring Consolidometer	**Model**	**Calibration Disc**
50mm (1.97in)	1210-A	1214-A
50.8mm (2in)	1210-B	1214-B
61.47mm (2.42in)	1210-D	1214-D
63.5mm (2.5in)	1210-E	1214-E
70mm (2.76in)	1210-F	1214-F

ASSEMBLY & CONNECTIONS

- **Dial Indicator rod:** Screws into the center rear of the load platform between the two eccentric stops.
- **Dial Indicator clamping arm:** Attaches to the Dial Indicator rod.
- **Air line:** The 15ft (4.6M)) x 1/4in (6.3mm) ID air line connects to the push-on fitting at the rear of the cabinet.
  - o Air pressure should not exceed 150psi for 1016 and 1032. Air pressure should not exceed 200psi for 1064.
  - o The source of compressed air should have an output pressure at least 20% higher than the pressure setting desired. For example, if the desired sample load is 16 tsf, the compressed air output should be at least 72psi.

PANEL CONTROLS

- **Pressure readout:** Built-in digital precision instrument with ± 0.25% accuracy.
- **Load Regulator:** Sets and maintains air pressure to the pistons to load the sample; sensitive to 0.125in (3.18mm) variations in water column.
- **High/Low Load selector valve:**
  - **Low Load:** loads to 1tsf (95.76kPa)
  - **High Load:** Loads to capacity of machine (see specifications above)
- **Load valve:**
  - **Off:** used when changing from 1 to 2tsf loads
  - **Load:** Allows air flow from the regulator for application of loads.

UNPACKING & SETUP

1. Carefully inspect your Pneumatic Consolidation Frame for damage before removing from the pallet. Immediately report any damage directly to the shipper.

2. Ensure the following items are included:
   - Dial Indicator rod
   - Dial Indicator clamping arm
   - Air line tubing, 15ft (4.6M) x 1/4in (6.3mm) ID
   - Loading ball

3. Unpack the required accessories (ordered separately):
   - Consolidometer(s)
   - Dial Indicator or LVDT

4. Attach the Dial Indicator rod, Dial Indicator clamping arm and air line, as noted in "ASSEMBLY & CONNECTIONS".

5. Centering pads on the loading platform are preset for use of Karol-Warner (or Gilson) Consolidometers. If using a Consolidometer that is not Karol-Warner (or Gilson), adjust the centering pads.
   - When using a Floating Ring Consolidometer, alignment of the ball and crossarm center are required each time.
   - When using a Fixed Ring Consolidometer, alignment is automatic when placed against the eccentric stops.

6. If a back-pressure consolidometer is being used, adjust the lower nuts on the crossarm supports until there is a gap of approximately 1/16in (1.59mm) between the crossarm and the ball on the Consolidometer load pad or piston.

7. Adjust the Dial Indicator or Linear Variable Displacement Transducer to the top of the displacement indicator pin on the upper crossarm to allow for sufficient travel when the sample compresses.

OPERATING INSTRUCTIONS

1. Read all safety and operating instructions before operating the unit.
2. Consult ASTM D2435, ASTM D4546 or AASHTO T 216 for specific instructions on the testing procedures.
3. Set the HIGH/LOW LOAD selector valve to LOW LOAD.
4. Set the LOAD valve to OFF.
5. Select a seating load per the CONBEL™ Load Setting Table.
   - The combined weight of the load pad, porous stone and steel ball has not been factored into the calibration sheets.
   - When using a back pressure Colsolidometer, factor in the weight of the piston along with the cross-sectional area of the piston and the pressure during the test.
   - The cross-sectional area of a 3/4in (19.1mm) diameter piston is .44 in^2 (283.87mm^2).
6. With the vertical dial indicator seated on the crossarm pin, note the reading on the data sheet.
7. Turn the LOAD valve from OFF to LOAD and start a separate timer to record the appropriate time deformation characteristics.
8. To apply the next load, turn the LOAD valve to OFF, adjust the LOAD REGULATOR to the required pressure and repeat the previous step.
9. When changing from 1tsf (95.76kPa) to 2tsf (191.5kPa), turn both valves (LOAD and HIGH/LOW LOAD) to OFF and adjust the pressure to the desired setting.
10. Simultaneously turn the HIGH/LOW LOAD valve to HIGH LOAD and the LOAD valve to LOAD.
11. Record the appropriate time deformation characteristics.
12. When unloading the sample, turn the LOAD valve to OFF and adjust the LOAD REGULATOR to zero psi.
13. Turn the LOAD valve to LOAD to exhaust the air through the regulator vent.