



Laboratoire Central des ponts et Chaussées

Equipments for test in centrifuges

CONSOLIDATION SYSTEM

The laboratory soil consolidation system permits fine grained soil consolidation in rectangular or cylindrical centrifuge container prior to centrifuge experiment.

The system consists of:

- 1 mainframe
- 1 hydraulic actuator
- 1 rectangular or cylindrical piston
- 1 hydraulic power supply
- 1 control system

Rectangular consolidation system showing two stacked containers



Two consolidation methods can be used:

- Uniform consolidation, with a maximum pressure of 0.2 MPa
- Depth variable consolidation (rectangular containers only) based on the hydraulic gradient method that permits to impose up to 1.5 MPa fluid pressure differential between the top and the bottom surfaces of the soil model.

The control system is made of individual programmable industrial grade controllers.

All parameters such as pressure, flow, temperature, else are independently controlled and monitored.

The control system also includes safety circuitry that are essential to the safe operation of the system.

A personal computer is used as the operator interface but is not an active part of the control and safety circuitry.

The consolidation system is designed to be operated as a fully automatic system that does not require human surveillance.

Technical Data	Model			PRE-72		
		C61	C65-C67	C72	C80	C84-C85 Per request
For centrifuge Mainframe						
Width	m	1	1.5	1.2	1.7	
Depth	m	0.7	1	1.2	1.2	
Floor surface	m ²	0.7	1.5	1.44	2	
Height total	m	2	2	4.5	2.6	
Weight	kg	1900	3500	3500	4500	
Internal volume	m ³	0.4	0.9	1	1.28	
Actuator						
Travel range	m	0.3	0.4	1.5	0.44	
Operating pressure	MPa	16.6	16.6	16.6	16.6	
Air and oil power supply						
Air pressure max.	MPa	1	1	-	1	
Air flow	l/min			-		
Oil pressure range	MPa	1 to 15	1 to 15	1 to 15	1 to 15	
Oil pres. control resolution	MPa	0.1	0.1	0.1	0.1	
Oil pres. control accuracy	%	0.1	0.1	0.1	0.1	
Demineralized water supply						
Output pressure min.	MPa	0.1	0.1	-	0.1	
Output pressure max.	MPa	2	2	-	2	
Pump flow	l/min	0 to 1	0 to 1	-	0 to 1	
Supply pressure min.	kPa	50	50	-	50	
Flow range	l/h	0.025 to 40	0.025 to 40	-	0.025 to 40	
Flow measure resolution	l/h	0.001	0.001	-	0.001	
Flow measure accuracy	%	0.1	0.1	-	0.1	
Miscellaneous						
AC mains line voltage	V	380/480	380/480	380/480	380/480	
Number of phase		3	3	3	3	
Operating frequency	Hz	50/60	50/60	50/60	50/60	
Installed power	kW	3	5	5	8	
Operating temperature	°C	15 to 35	15 to 35	15 to 35	15 to 35	
Humidity (non condensing)	%	20 to 80	20 to 80	20 to 80	20 to 80	