

# Test Rig for 130LPM Pump of LCA

#### **About**

The Test Rig is self-contained, Electro Hydraulic Test Rig. Safety & user Friendliness are the key features of the provided Test Rig. The Test Rig provided has been designed to address all the requirements testing of 130 LPM Pump. The brief spec and tests of this pump is given below as:

The brief specs of the pump-

Rated Pressure = 270 bars Rated Flow = 130 LPM at 270 bar Rated Speed = 6000 RPM





# **Specifications**

	Drive System		
SNo.	Characteristic	Value of Characteristic	
1	Motor	Squirrel cage Induction Motor, 160 kW, Rated	
		Speed:2980 RPM, 2 pole,	
		415 Volts, 50 Hz, 3-Ô,	
		Frame Size: M2BA315MLC2	
2	AC Drive	250Hertz, Rating: 160kW,	
		Model: ACS 800 with Control Panel	
3	Gear Box	Max. output Speed :10000 RPM	
4	Mounting and coupling for UNIT	Flange and spline shaft	
5	Coupling between Gear Box and	Flexible Disc Coupling with Shear Pin option for	
	Torque Sensor	protecting the UUT	
6	Torque Sensor	Range 0-200N-meter, Model Lebow-1703	
Lubrication System			
1	Pump Type used	Gear Pump, parker make	
2	Max Output Pressure	2 bar	
3	Max Output Flow	20 LPM	
4	Sampling port with Minimess	1/4" - 1 No	
5	Filtration capacity	up to 10 micron	
6	power supply	3 Ö , 415 <u>+</u> 5 V	
7	Tank size	50 Liters oil Capacity	
8	Working media	ISO VG 46	
9			
High Pressure System			
1	Pump Type	Fix Displacement Piston Pump, Parker, Model F12-30	
2	Max Pressure	480 bar	
3	Max Flow	27 LPM	
4	Motor	A.B.B make Standard Horizontal Foot mounted	
		(B3const.) Squirrel cage induction motor,	
		415+/-10% volts, 50Hz+/-5%, 3 phase, AC	
		supply, insulation F, Deg. Of Protection IP55,	
		TEFC. Ambient Temperature 50 ° C,	
		30KW/40HP, 1000 RPM,(syn), Frame size	
		HX+225SMC6	
5	Line size with their respective QCDC's	1/2" (1 No each)	

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with Minimess 7   Power pack return port		Ta (a.)	
7 Power pack return port 8 Temperature gauge Calibration Port 9 Filtration capacity 10 Working media 1 Pump type 2 LOW PRESSURE SYSTEM 1 Pump type 2 Motor KW/HP 3 Max Supply Pressure (UUT Suction Pressure) 4 Max Flow 5 Return Line Maximum Pressure (UUT Delivery Pressure) 6 Filtration capacity 7 Max. flow @269 bar pressure 8 Flow Meter 7 Servo Valve for Cyclic Test 1 Case Drain Port 1 Case Drain Port or Temperature Gauge 14 Working media 1 L/2" - 1 No 1/2" - 1 No 1/2	6	Sampling port/Calibration Port	1/4" - 1 No
8 Temperature gauge Calibration Port 9 Filtration capacity Up to 2 micron 10 Working media Hydraulic oil MIL-H-5606E  LOW PRESSURE SYSTEM 1 Pump type Centrifugal Pump, KSB 2 Motor KW/HP 5.5 KW/ 7.5 HP, ABB Make 3 Max Supply Pressure (UUT Suction Pressure) 4 Max Flow 200LPM 5 Return Line Maximum Pressure (UUT Delivery Pressure) 6 Filtration capacity Up to 2 micron 7 Max. flow @269 bar pressure 130 LPM 8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM) 9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line) 10 Supply and Return Port 1". 11 Case Drain Port 1". 12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media Hydraulic oil MIL-H-5606			
Port  Port  Piltration capacity  Up to 2 micron  Hydraulic oil MIL-H-5606E  LOW PRESSURE SYSTEM  Pump type  Centrifugal Pump, KSB  Max Supply Pressure (UUT Suction Pressure)  Max Flow  Return Line Maximum Pressure(UUT Delivery Pressure)  Filtration capacity  Max. flow @269 bar pressure  Flow Meter  Servo Valve for Cyclic Test  Supply and Return Port  Case Drain Port  Supply and Return Port tor Temperature Gauge  Motor KW/HP  Servo Valve for Love in the Make  Low PRESSURE SYSTEM  Hydraulic oil MIL-H-5606E  Low PRESSURE SYSTEM  Low	7	Power pack return port	
9 Filtration capacity Up to 2 micron  10 Working media Hydraulic oil MIL-H-5606E  LOW PRESSURE SYSTEM  1 Pump type Centrifugal Pump, KSB  2 Motor KW/HP 5.5 KW/ 7.5 HP, ABB Make  3 Max Supply Pressure (UUT Suction Pressure)  4 Max Flow 200LPM  5 Return Line Maximum Pressure (UUT Delivery Pressure)  6 Filtration capacity Up to 2 micron  7 Max. flow @269 bar pressure  8 Flow Meter Two Flow Meters (7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make (one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606	8	Temperature gauge Calibration	½. BSPP( Female)-one port
10 Working media Hydraulic oil MIL-H-5606E  LOW PRESSURE SYSTEM  1 Pump type Centrifugal Pump, KSB  2 Motor KW/HP 5.5 KW/ 7.5 HP, ABB Make  3 Max Supply Pressure (UUT Suction Pressure)  4 Max Flow 200LPM  5 Return Line Maximum Pressure (UUT Delivery Pressure)  6 Filtration capacity Up to 2 micron  7 Max. flow @269 bar pressure  8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606		Port	
LOW PRESSURE SYSTEM  1  Pump type	9	Filtration capacity	Up to 2 micron
1Pump typeCentrifugal Pump, KSB2Motor KW/HP5.5 KW/ 7.5 HP, ABB Make3Max Supply Pressure (UUT Suction Pressure)3.5 to 4 bar4Max Flow200LPM5Return Line Maximum Pressure (UUT Delivery Pressure)270 bar6Filtration capacityUp to 2 micron7Max. flow @269 bar pressure130 LPM8Flow MeterTwo Flow Meters (7.5 to 150 LPM and 1 to 15 LPM)9Servo Valve for Cyclic TestTwo Servo Valve of moog make (one at Return line and one at Case Drain line)10Supply and Return Port1".11Case Drain Port1".12Sampling/Calibration Port with micro bore hose1/4". (3 no.)13Calibration Port for Temperature Gauge1/2". BSPP (Female)-3 no.14Working mediaHydraulic oil MIL-H-5606	10	Working media	Hydraulic oil MIL-H-5606E
2 Motor KW/HP 3 Max Supply Pressure (UUT Suction Pressure)  4 Max Flow 200LPM 5 Return Line Maximum Pressure (UUT Delivery Pressure) 6 Filtration capacity 7 Max. flow @269 bar pressure 8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM) 9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line) 10 Supply and Return Port 1". 11 Case Drain Port 1". 12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media  Hydraulic oil MIL-H-5606	LOW PRESSURE SYSTEM		
3.5 to 4 bar  Suction Pressure)  4 Max Flow  5 Return Line Maximum Pressure (UUT Delivery Pressure)  6 Filtration capacity  7 Max. flow @269 bar pressure  8 Flow Meter  Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media  15 South PM  270 bar  Tron Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Hand Supply and Return Port 1". 11 Hand Supply and Return Port 1". 11 Hand Supply and Return Port 1". 11 Hand Supply and Return Port 1". 12 Sampling/Calibration Port with micro bore hose 13 Hydraulic oil MIL-H-5606	1	Pump type	Centrifugal Pump, KSB
Suction Pressure)  4 Max Flow  5 Return Line Maximum Pressure( UUT Delivery Pressure)  6 Filtration capacity  7 Max. flow @269 bar pressure  8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media  Hydraulic oil MIL-H-5606	2	Motor KW/HP	5.5 KW/ 7.5 HP, ABB Make
Suction Pressure)  4 Max Flow  5 Return Line Maximum Pressure( UUT Delivery Pressure)  6 Filtration capacity  7 Max. flow @269 bar pressure  8 Flow Meter  130 LPM  8 Flow Meter  Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media  Hydraulic oil MIL-H-5606	3	Max Supply Pressure (UUT	3.5 to 4 bar
5 Return Line Maximum Pressure( UUT Delivery Pressure)  6 Filtration capacity			
Pressure (UUT Delivery Pressure)  6 Filtration capacity Up to 2 micron  7 Max. flow @269 bar pressure 130 LPM  8 Flow Meter Two Flow Meters (7.5 to 150 LPM and 1 to 15 LPM)  9 Servo Valve for Cyclic Test Two Servo Valve of moog make (one at Return line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606		Max Flow	200LPM
Pressure)  6 Filtration capacity  7 Max. flow @269 bar pressure  8 Flow Meter  130 LPM  9 Servo Valve for Cyclic Test  10 Supply and Return Port  11 Case Drain Port  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for Temperature Gauge  14 Working media  Up to 2 micron  Up to 2 micron  130 LPM  Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM)  17 Two Servo Valve of moog make( one at Return line and one at Case Drain line)  18 Two Servo Valve of moog make( one at Return line and one at Case Drain line)  19 Two Servo Valve of moog make( one at Return line and one at Case Drain line)  19 Supply and Return Port  10 Supply and Return Port  11 Case Drain Port  12 Sampling/Calibration Port with micro bore hose  19 Two Servo Valve of moog make( one at Return line and one at Case Drain line)  19 Two Servo Valve of moog make( one at Return line and one at Case Drain line)  10 Supply and Return Port  10 Supply and Return Port  11 Case Drain Port  12 Sampling/Calibration Port with micro bore hose  13 Hydraulic oil MIL-H-5606	5	Return Line Maximum	270 bar
6 Filtration capacity 7 Max. flow @269 bar pressure 130 LPM 8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM) 9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line) 10 Supply and Return Port 1". 11 Case Drain Port 1". 12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media 15 Up to 2 micron 130 LPM 16 Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM) 17 Two Servo Valve of moog make( one at Return line and one at Case Drain line) 18 Two Servo Valve of moog make( one at Return line and one at Case Drain line) 19 Supply and Return Port 1". 10 Supply and Return Port 1". 11 Case Drain Port 1". 12 Sampling/Calibration Port with Micro Barbara Port 1". 12 Hydraulic oil MIL-H-5606		Pressure( UUT Delivery	
7 Max. flow @269 bar pressure 130 LPM 8 Flow Meter Two Flow Meters( 7.5 to 150 LPM and 1 to 15 LPM) 9 Servo Valve for Cyclic Test Two Servo Valve of moog make( one at Return line and one at Case Drain line) 10 Supply and Return Port 1". 11 Case Drain Port 1". 12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for Temperature Gauge 14 Working media Hydraulic oil MIL-H-5606		Pressure)	
Flow Meter  Two Flow Meters (7.5 to 150 LPM and 1 to 15 LPM)  Servo Valve for Cyclic Test Two Servo Valve of moog make (one at Return line and one at Case Drain line)  Supply and Return Port 1".  Case Drain Port 1".  Sampling/Calibration Port with micro bore hose  Calibration Port for Temperature Gauge  Hydraulic oil MIL-H-5606	6	Filtration capacity	Up to 2 micron
Flow Meter  Two Flow Meters (7.5 to 150 LPM and 1 to 15 LPM)  Servo Valve for Cyclic Test Two Servo Valve of moog make (one at Return line and one at Case Drain line)  Supply and Return Port 1".  Case Drain Port 1".  Sampling/Calibration Port with micro bore hose  Calibration Port for Temperature Gauge  Hydraulic oil MIL-H-5606	7	Max. flow @269 bar pressure	130 LPM
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line and one at Case Drain line)  10 Supply and Return Port 1".  11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for 7/2". BSPP (Female)-3 no.  Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606			LPM)
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11 Case Drain Port 1".  12 Sampling/Calibration Port with micro bore hose  13 Calibration Port for Temperature Gauge  14 Working media 1".  1".  14". (3 no.)  14". (8 no.)  15".  16".  1			
12 Sampling/Calibration Port with micro bore hose 13 Calibration Port for ½". BSPP (Female)-3 no. Temperature Gauge 14 Working media Hydraulic oil MIL-H-5606	10	Supply and Return Port	1".
micro bore hose  13 Calibration Port for ½". BSPP (Female)-3 no.  Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606	11	Case Drain Port	1".
micro bore hose  13 Calibration Port for ½". BSPP (Female)-3 no.  Temperature Gauge  14 Working media Hydraulic oil MIL-H-5606	12	Sampling/Calibration Port with	1/4". (3 no.)
Temperature Gauge 14 Working media Hydraulic oil MIL-H-5606			
14 Working media Hydraulic oil MIL-H-5606	13	Calibration Port for	½". BSPP (Female)-3 no.
		Temperature Gauge	·
	14	Working media	Hydraulic oil MIL-H-5606
15   Working Temperature   120 °C	15	Working Temperature	120 °C

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# **Application**

The Test Rig provided has been designed to address all the requirements testing of 130 LPM Pump.





## **Key features**

- Drive System with Gear Box Lube Oil System
- ➤ High Pressure System for Pressure Proof Testing
- Low Pressure System for Functional Test
- Control and Indicator Panel
- Data Acquisition System.
- ➤ The test rig is design to work up to 120°C.
- > Two moog make servo valves have been provided in Rig for Cyclic Test.
- ➤ Cooling System: We are using water as the medium for the cooling purpose, with the help of Heat Exchanger. Total three heat exchanger has been provided in system.
- ➤ **Filtration:** Proper filtration has been provided and the filters have electronic clogging indicators.
- ➤ The rig is developed for Hydraulic Oil (MIL-H- 5606E) or equivalent.
- ➤ Three SS 304 Reservoirs of oil capacity 90, 225 and 50 liters have been provided with all related fittings.

## **Safety Interlocks**

- ➤ The Pump will not start in case the Reservoir oil level is low/ high.
- > The Pump will stop/ will not start, in case the oil temperature goes beyond a set limit.
- ➤ There would be alarm and indication, in case any abnormality happens.
- ➤ In case any of the filters are clogged, there would be alarm; Indication and the Test rig will stop.
- ➤ It is also independent of the Computer automation system.
- ➤ Computer: The Rig Diagnostics/ Monitoring & Recording are implemented Through the National Instruments data acquisition System and PC. The customized Software is implemented in Lab View.