Auto Air
Gloucester Limited

CLT1 – Your optimal companion by compressor diagnosis

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User Manual

CLT1 – Test- Tool for external controlled compressors

Dear Costumer,

Thank you for making the decision to purchase the **CLT-1** from Adiator.

The CLT-1 can be used for testing all - clutch less direct drive externally controlled compressors - all year round, no matter how low or high the ambient temperature is.

The CLT-1 has been designed "**By Technicians for Technicians "**

Technical Application;
The **CLT1** will provide a direct power supply to the electronic control valve on all clutch less direct drive externally controlled A/C Compressors without having to integrate the vehicles electric; its simple, easy to use format will greatly save valuable A/C Diagnostic time. The **CLT-1** allows you to expand your A/C Diagnostic skills.

Content CLT1 Professional Set

Contains:

Art. Nr.	Description
 **CLT1**	CLT1-central unit for the control of clutchless compressors, including the power supply cable. This unit enables you to control clutchless compressors from Sanden (PXExx) and Denso (6SEU16: 7SEU16).
 **CLTHK**	Hook with magnet clip
 **CLTUNI**	Universal cable harness (2m) for connecting to any kind of clutch less compressor.
 **CLT PS**	Power supply cable for connecting to the vehicle battery. 12V power supply is needed,
 **CLTVAG**	Connecting cable (2 m) for Sanden (PXExx) compressors for Audi; Lamborghini; Porsche; Seat; Skoda; and Volkswagen.
 **CLTDEN**	Connecting cable (2 m) for Denso (6SEU16: 7SEU16) compressors for BMW; GM; Jaguar; Lexus; Land Rover. Mercedes; Rolls Royce and Toyota.
 **CLTSIM**	Solenoid valve simulator, to prevent the board net to generate unnecessary faults that needs to be deleted after wards with a diagnose unit.

Extras and spare parts

Art. Nr.	Description
CLTHK	Hook with magnet clip
CLTVAG	Connecting cable (2 m) for Sanden (PXExx) compressors
CLTDEN	Connecting cable (2 m) for Denso (6SEU16: 7SEU16) compressors
CLTSIM	Solenoid valve simulator
0170	Digital Multi meter to measure the frequency and pulse with. Is delivered with a thermometer, current sensor in a special bag.

Technical specification 0170

Function	Range	Accuracy
Voltage DC	400mV, 4V, 40V, 400V, 1000V	+-(0.5%+2d)
Voltage AC	400mV, 4V, 40V, 400V, 700V	+-(0.8%+4d)
Current DC	400uA,4000uA,40mA,400mA,4A,20A	+-(1.2%+2d)
Current CA	400uA,4000uA,40mA,400mA,4A,20A	+-(1.5%+4d)
Resistance	400Ω 4kΩ 40kΩ,400kΩ,4MΩ,40MΩ	+-(0.8%+3d)
RPM (Tach)	600 - 4000RPM; 600 - 12000RPM (x 10 RPM)	+-(2.0%+2d)
Dwell Angle	4, 5, 6, 8CYL	+-(2.5%+2d)
Duty Cycle	0,1-99.9%	+-(1.5%+2d)
Frequency	0.001Hz-9.99MHz	+-(2.0%+2d)
Temperature	-20°C - 760°C / -4°F-1400°F	+-(3.0%+2d)
Capacitance	40nF, 400nF, 4uF,40uF, 100uF	+-(3.0%+2d)
Pulse Width	0.1-10mS / 0,1% bis 99,9%	+-(3.0%+2d)
Diode Check	Open circuit voltage 1.5V dc; Test current 0.3mA typical	
Continuity Test	Threshold 30Ω, Continuity Beeper 2.7KHz	
Size	195mm x 92mm x 38mm	
Weight	380g	
Battery	9V	

General Information

- Please read this user manual carefully to do no mistakes during the test. It helps you to save the test unit and the compressor.
- The user/technician has to have A/C knowledge.
- This unit is replacing non specialist knowledge.
- Perfect would be a temperature up to +15°C, but it is not necessarily.
- For damages due to of not correct using Adiator is not responsible.

Technical Data

- Voltage supply: 11 to 15 Volt
- Temperature to use -10°C to 40°C
- Storage temperature -20°C to +50°C
- Power consumption max. 3A
- Drives the compressor from 3 to 100%
- Weight: ca. 600 Gram
- CE and EMV approved

Unit description

1. Button to increase the compressor capacity
2. Button to decrease the compressor capacity
3. LED indicating short-circuit or interruption at the electromagnetic valve
4. LED indicating excess high power input of the electromagnetic valve
5. 8 LED Tachometer display for changing control valve capacity - / +

Connection on the CLT1

A.) 2 Pin plug port for the Compressor control valve harness.

B.) 3 pin Plug for the vehicle 12v battery power supply.

Preparation and start-up of the CLT1

Fig. 1 Fig. 2

1.) Fig.1 Power supply harness for connecting the hand unit to the vehicle battery.

2.) Fig. 2 Compressor Control Valve harness

3-Options of Control Valve connector Harness available,

This illustration shows the combination with the harness for Sanden compressors for the VAG - group.

1. **Universal 2-pin Cable Harness: Pt No: CLTUNI**
   Connecting to all compressors

2. **VAG-Group Harness: Pt No: CLTVAG**
   Connecting to VW Group

3. **Denso Control Valve Harness; Pt No; CLTDEN**
   Connecting to BMW, Mercedes etc.

Preparing the CLT-1 prior to connecting to the vehicle

- Check that the vehicle has the correct charge weight in its A/C System
- The vehicle should be at operating temperature.
- The operation of the air conditioning system is to set on maximum cold.
- Set the blower fan speed on maximum.
- The airflow should be positioned and set at face vent level. Position a temperature probe in the centre allowing you to measure the air outlet temperature.
- Connect a manifold set or A/C service station to allow you to view the operating low and high side system pressures.
- Disconnect the plug on the A/C Compressor control valve or control valve harness, and connect the appropriate **CLT-1** Universal, VAG-Group or Denso Harness.

Fig. 3

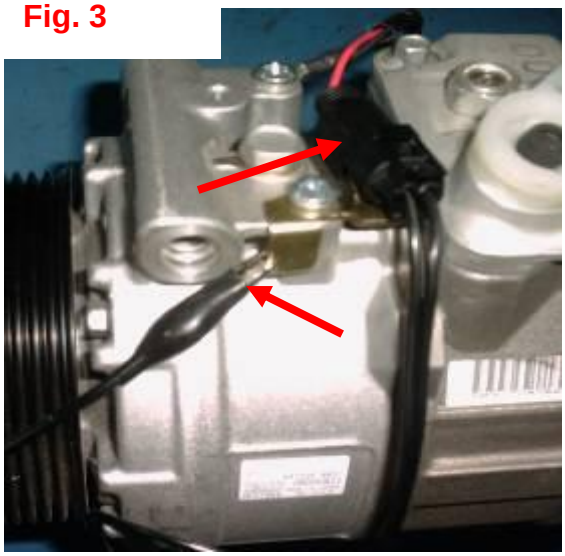

Fig. 4

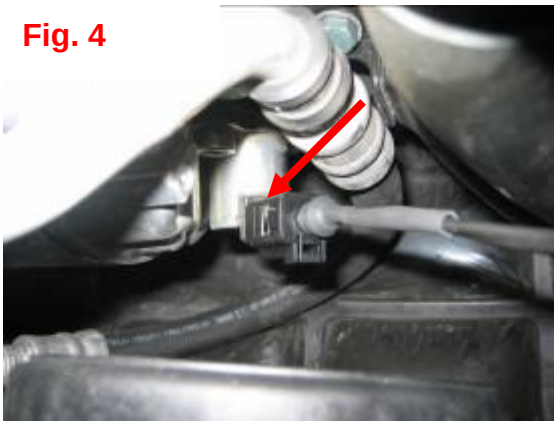

Fig. 3 Shows you the point of connection at a **Denso** compressor.

Fig. 4 Shows you the point of connecting in a VW Touran with a **Sanden** compressor.

General Advise

Observing the ***correct polarity*** when connecting the **CLT-1** Control valve harness, and 12v Battery power supply should be maintained for the protection of the Test equipment and the compressor.

Connecting to the Vehicle Battery

Attach the 12V battery clamps to the vehicle battery observing the ***Correct Polarity*** connections; otherwise the **CLT-1** Unit will be **damaged.**

That means:

Red = positive = plus = 30

Black = negativ = ground = 31

Prevent error codes with CLTSIM

- To prevent storing an error code in vehicle electronics fault code memory system, use the simulator (Pt No**: CLTSIM**). Connect it to the original factory control valve harness block connector, while you are carrying out tests with the **CLT-1.**

The **CLTSIM** has a universal 2-pin connector that will fit all vehicle control valve harness applications. Single wire vehicle harness should be connected to ground 31 on the simulator box.

Test procedure

CLT1 Double click the -minus button until the unit switches off, this is indicated by the LED Tachometer display no longer being illuminated = zero compressor capacity load.

- Start & run the vehicle, then increase the idling speed to (~1500 U/min)
- Proceed by double click the + (plus) button stage by stage, **(allowing a 15-second gap between each stage)** this will start to load the compressor control valve mechanical capacity. Observe that the vehicle A/C operating low & high side pressures are changing accordingly - on your manifold gauges.
- Care should be taken, as the high side pressure can increase during testing with the **CLT-1,** and the Quick start-up operation of vehicles control fans will interrupt correct testing of the A/C Compressors control valve.
- Always observe the A/C systems temperatures & pressures while testing with the **CLT-1**.
- Between each increase control whether the compressor the stages promotes accordingly
- Keep always the pressures in your eye. Unfavourable operating conditions do not lead a starting of the condenser fans to an enormous rise of high pressure by that!
- Check Temperatur and Pressures!

Setting on CLT1	Low Pressure	Outlet Temp.
Maximum	1,6 +/- 0,5 bar	0°C +/- 3°
Minimum	3 +/- 0,7 bar	10°C +/-3°

It is to be noted that the tolerances are compared against ambient temperature compressor load conditions, and must be evaluated in minimum & maximum stages while testing the compressor. The changes on low-pressure side should be similar to the change of the settings on the **CLT1.**

Measuring of the signals in the Vehicle Electronic

If you want to measure the signal from the car you are able to choose the digital measuring instrument. Pt No.: 0170.

For this operation please connect the cables direct to the free connector of the vehicle electronic system.

Select „Hz-%Duty“

After that, you are able to measure the frequency.

The results should be between 300 and 500Hz.

Through press the key "hz - %" you can measure now the pulse width. This should be between 20 and 90%, depending upon performance requirement.

The measuring wires contact at "COM" and "Hz - %"

For further information’s - take the separately user manual of this unit.

Possible electrical disturbances of the electronic single solenoid valve

Led “OC“ indicate:

- Poor control valve connection
- control valve complete interruption
- control valve with short-circuit (smaller than 3 ohm)

Led “OC“ indicate:

- Too high power consumption of the valve