

User Manual

Automotive Compressors

CLT1 – Hand Held A/C Test - Module for externally controlled A/C Compressors

Dear Customer,

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

The CLT-1 can be used for testing all Clutch Less Direct Drive Externally Controlled compressors simply all year round, no matter how Low or High the ambient Temperature. The CLT-1 allows you to expand your A/C Diagnostic Skills and 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 electrics. Its simple, easy to use format, will greatly save valuable A/C Diagnostic time.

CLT-1 Kit Options:

Pt No: CLT1

- CLT1 Test- Unit with User Manual
- Cable with clamps for 12v Battery Power Supply
- Universal Cable to connect the Control valve
- Shipped in a rugged plastic box

Pt No: CLT-SET-1

- CLT1 Test- Unit with User Manual
- Cable with clamps for 12v Battery Power Supply
- Universal Cable to connect the Control valve
- Shipped in a rugged plastic box
- Hook with a strong magnet
- Cable with connector for VAG - Group
- Cable with connector for Compressor from Denso
- Simulator for connecting on the car
- Digital Measuring unit for measuring signals from the car.

Pt No: CLT-SET-2

- CLT1 Test- Unit with User Manual
- Cable with clamps for 12v Battery Power Supply
- Universal Cable to connect the Control valve
- Shipped in a rugged plastic box
- Hook with a strong magnet
- Cable with an connector for VAG - Group
- Cable with an connector for Compressor from Denso
- Simulator for connecting on the car

CLT-1 Overview;

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1. Button to increase the compressor voltage
2. Button to decrease the compressor voltage
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, - / +

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

CLT-1 Connections

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

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

General Information:

- Please read the User Manual prior to connecting to the Vehicle A/C Compressor.
- The Technician using the CLT-1 must have good working knowledge and A/C Diagnostic trouble shooting skills prior to using the CLT-1
- Ideal testing conditions would be a temperature of +15°C, but the CLT-1 can operate below this temperature.
- Warranty is not covered by Incorrect use and application of the CLT-1

Preparation and set up of the CLT1

Automotive Compressors



Fig. 1(B)

Fig. 2(A)

1.) Fig.1 (B) 3-pin port 12v Battery supply cable Harness

2.) Fig. 2 (A) 2-pin port Compressor Control Valve harness 3-Options of Control Valve connector Harness available,

This illustration shows the combination with the cable of the VAG - group.

I.) Universal 2-pin Cable Harness: Pt No: CLTUNI

(Included in Standard Pt No-CLT-1 Kit)

II.) VAG-Group Harness: Pt No: CLTVAG

Specially Order or included in CLTSET1 & CLTSET2

III.) Denso Control Valve Harness; Pt No; CLTDEN

Special Order or included in CLTSET1 & CLTSET2

IV.) Digital Measuring Unit, Pt No; CLTMU-0170

For measuring the signal output from the vehicle harness

Or included in CLTSET1

V.) Dummy Simulator unit, Pt No; CLTSIM

Plugs into Vehicle harness, while carrying out CLT-1 Tests, prevents faults codes logging on Vehicle Electronics memory system.

Preparing the CLT-1 prior to connecting to the vehicle:

- Check Vehicle has correct Charge weight in A/C System
- The vehicle should be at operating temperature.
- The operation of the air conditioning system is to be set on maximum cold.
- Set the blower fan set on maximum speed.
- The airflow should be positioned and set at face vent level, and 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 & 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

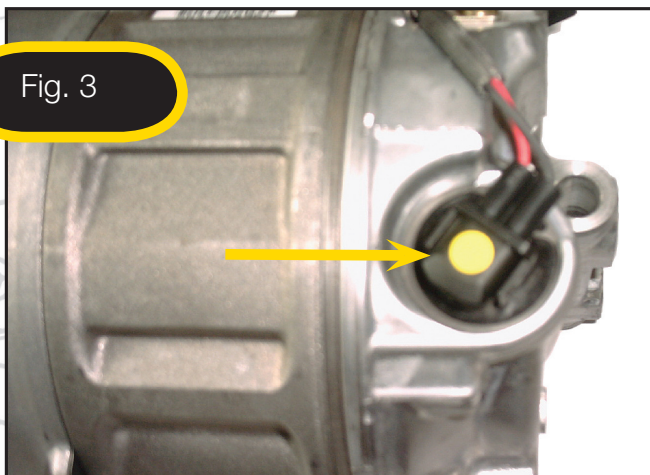


Fig. 4

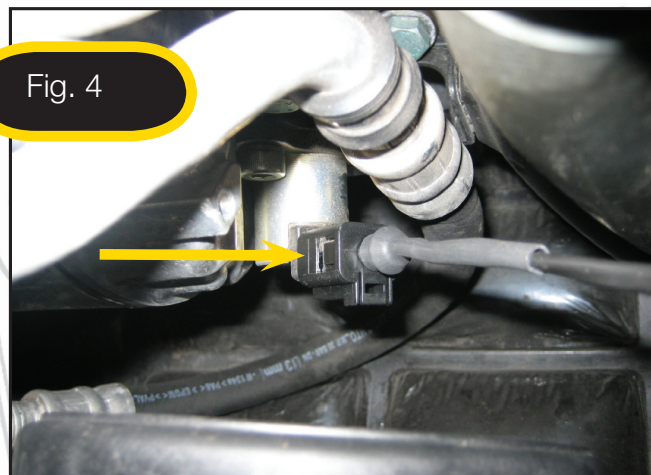


Fig. 3

Shows you the point of connection for 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.

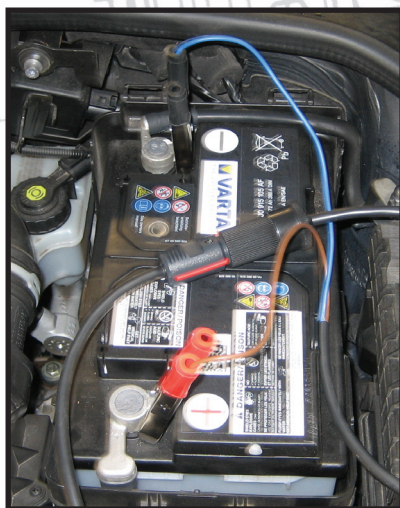
Connecting to the Vehicle Battery

Attach the 12v Battery Clamps to the vehicle Battery observing the Correct Polarity connections, otherwise the CLT-1 Unit will be damaged.

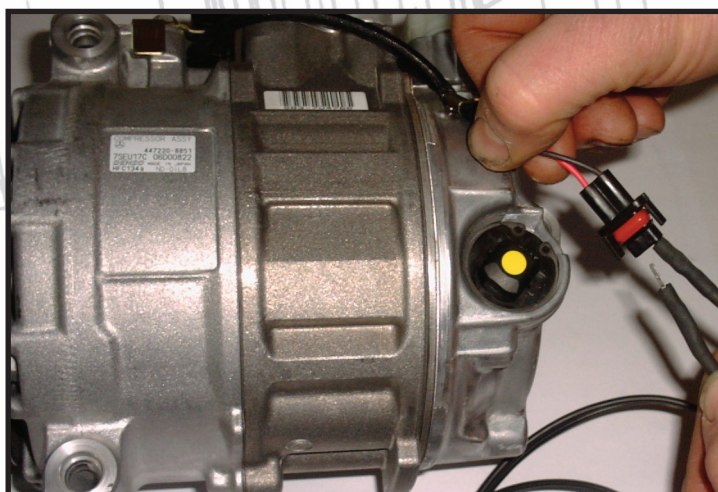
That means:

Red = positive = plus = 30

Black = negative = ground = 31



- 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. The CLTSIM can be ordered separate, and is included in kits CLTSET1 & CLTSET2.

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 to 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. Take care to observe 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 Vehicle's 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.

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 should be noted that the tolerances are compared against Ambient Temperature vs. Compressor Load conditions, and must be evaluated in Minimum & Maximum stages while testing the compressor. The changes on the low-pressure side should be similar to the change of the settings on the CLT1.

Measuring of signals in the Vehicle Electronics:

If you want to measure signals from the car you should choose the Digital Measuring instrument.
Pt No CLTMU-0170.

- For this operation please connect the cables direct to the Original factory Control Valve Harness Block Connector, while you are Carrying out tests with the CLT-1 and the Digital Measuring unit Pt No CLTMU-0170.



Choose the selection "Hz-%Duty"

Observe & measure the frequency.

The results should be between 300 and 500Hz.

Through press the key "hz - %" you can now measure 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 – see the separate user manual for this unit.

Please note image is for reference use only.

Trouble Shooting possible electrical disturbances when connected to the Compressor electronic control valve:

If the "OC" Lamp illuminates:

Illumination of the "OC" Lamp indicates:

- Poor Control Valve connection
- Control Valve complete interruption (open circuit)
- Control Valve with short-circuit (less than 3 ohm)

If the "OL" Lamp illuminates:

Illumination the "OL" Lamp indicates:

- Power consumption of the valve is too high



Compressortech UK Ltd

66-102 Cherrywood Road
Bordesley Green
Birmingham
United Kingdom
B9 4UD

Tel: +44 (0)121 766 5006
Fax: +44 (0)121 772 8397
Email: sales@compressortech.co.uk
Web: www.compressortech.co.uk