

Lab work

Climatic tests

Work objective

Climatic chamber set up for ISO 16750-4:2010 temperature cycling part 5.3 and climatic test of prepared electronics equipment.

Theoretical part



To ensure electronics device quality, reliability and long lifetime various climatic tests should be carried out.

Various electronics applications might have different temperature and climatic requirements:

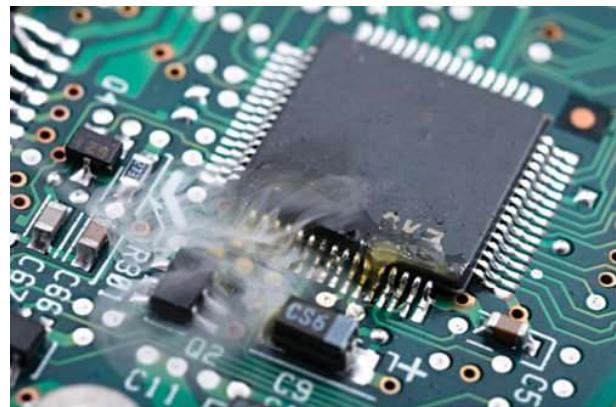
- Commercial: 0 ° to 70 °C
- Industrial: -40 ° to 85 °C
- Military: -55 ° to 125 °C

Depending on manufacturer requirements, different temperature ranges might be specified:

- Full Military: -55 °C to 125 °C
- Automotive: -40 °C to 125 °C
- AEC-Q100 Level 2: -40 °C to 105 °C
- Extended Industrial: -40 °C to 85 °C
- Industrial: -20 °C to 85 °C

Thermal influence for electronic devices:

- Degradation of operation:
 1. Frequency fluctuations, jitter, noise, voltage, sensitivity or other parameter drift.
 2. Interruptions and interferences in intercomponent communications.
- Irreversible changes and degradation:
 1. Data errors.
 2. Component overheat and aging.
 3. Plastic component deformations and melting.
 4. Product safety problems (safety stickers detach, insulation melting...).



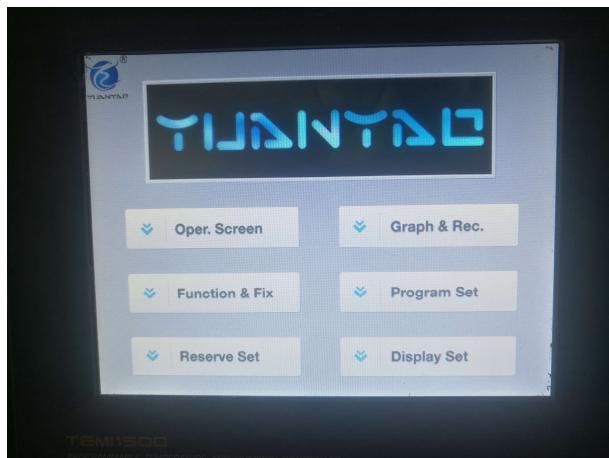
Tasks

1. Preparation climatic chamber for fixed and thermocycling tests ISO 16750-4:2010 5.3.
2. Electronics device testing.
3. Test report (thermo cycle profile, photos and analysis of device under test before and after testing).

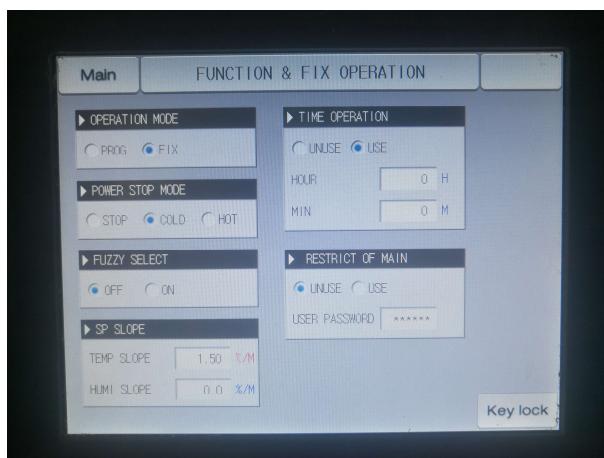
Practical Part

Task1. Fixed operation

- Starting from main screen:



Press "Function & Fix" button and set Operation mode for "Fix" operation.



- Press temperature SP to set the temperature.



Set the temperature of operation from -45°C to 160°C

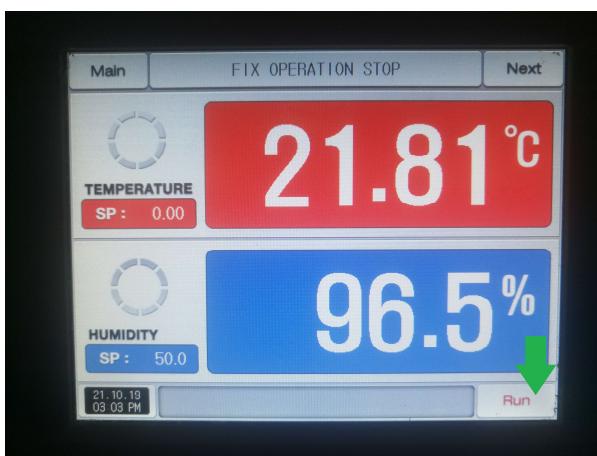


- Set the humidity. In the case of no humidity requirements, set humidity to 0. It will not be controlled during test.



Press enter.

- Run the chamber in fix operation



- You can check the temperature and humidity profiles during operation by pressing Next button in main screen.

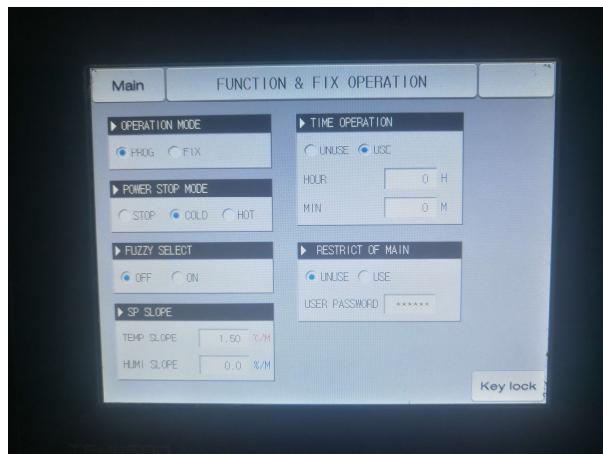


Task2. Temperature cycling

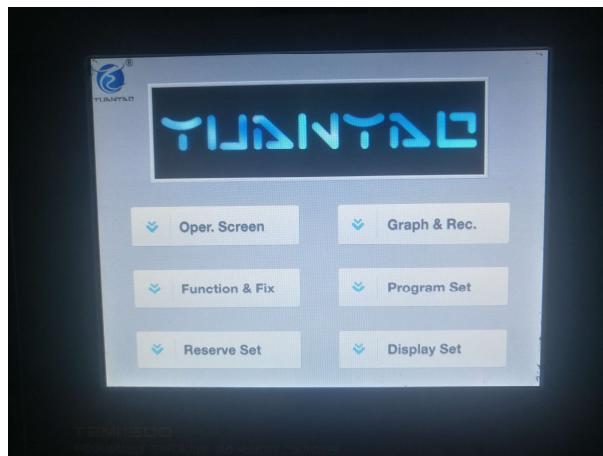
1. In main screen press “Function & Fix”



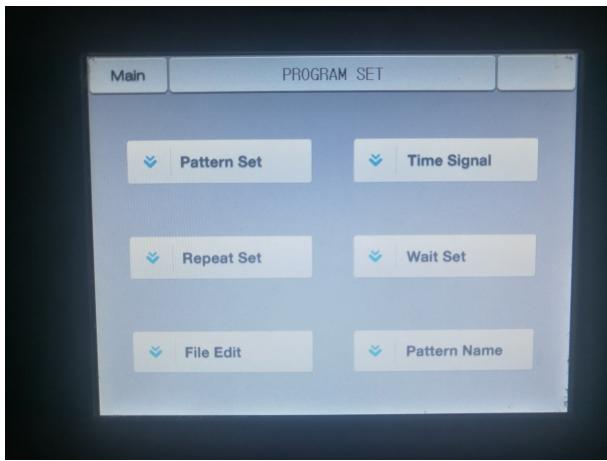
And choose operation mode “Prog”



2. Choose “Program Set” button:



And “Pattern Set”

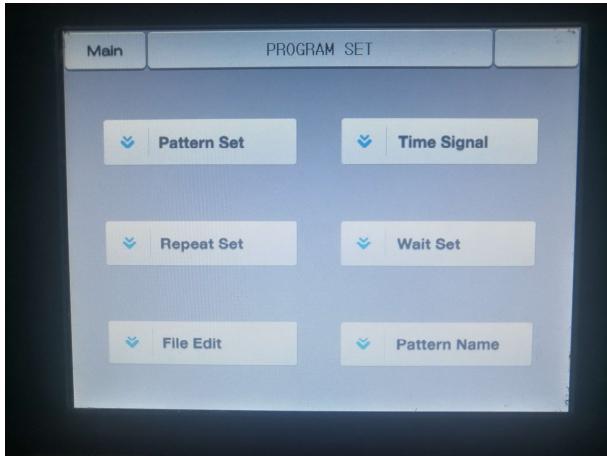


3. Set the pattern by setting temperature and humidity values for specific time frames.

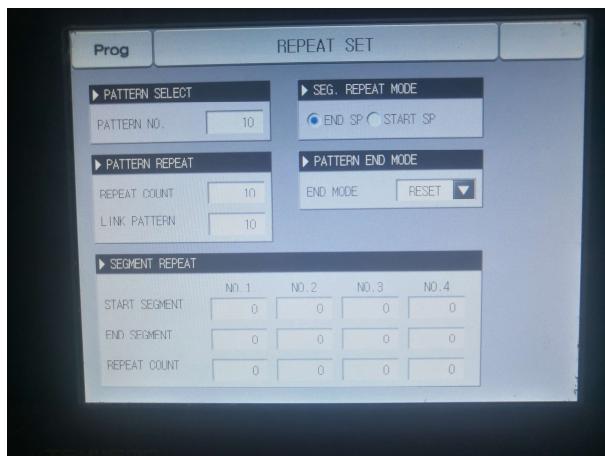


All unused segments should be with -00.00.01 time.

4. For pattern repeat choose "Repeat Set"



Set many times to repeat (Repeat Count) which pattern (Pattern No)



5. Run the chamber

