

# TCP200



## WATER CHILLER TRAINING UNIT



### Experimental capabilities

- Study of the thermodynamic cycle of the compression refrigerating machine.
- Evaluation of the performances production of cold water.
- Yield measurement of a refrigeration cycle, determining the energy balance of the condenser, of the evaporator and the entire production of cold water.
- The vapor compression cycle comparison established by manipulation with the ideal cycle on pressure diagram – enthalpy
- Influence of the pressure regulation on the evaporator

DIDATEC– Zone d'activité du parc – 42490 FRAISSES- FRANCE  
Tél. +33(0)4.77.10.10.10 – Fax+33(0)4.77.61.56.49 – [www.didatec-technologie.com](http://www.didatec-technologie.com)  
email : [service\\_commercial@didatec-technologie.com](mailto:service_commercial@didatec-technologie.com)

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version : FT-TCP200-STD-B

# TCP200



## Operating principle

The TCP200 bench allows the study of refrigerating cycle.

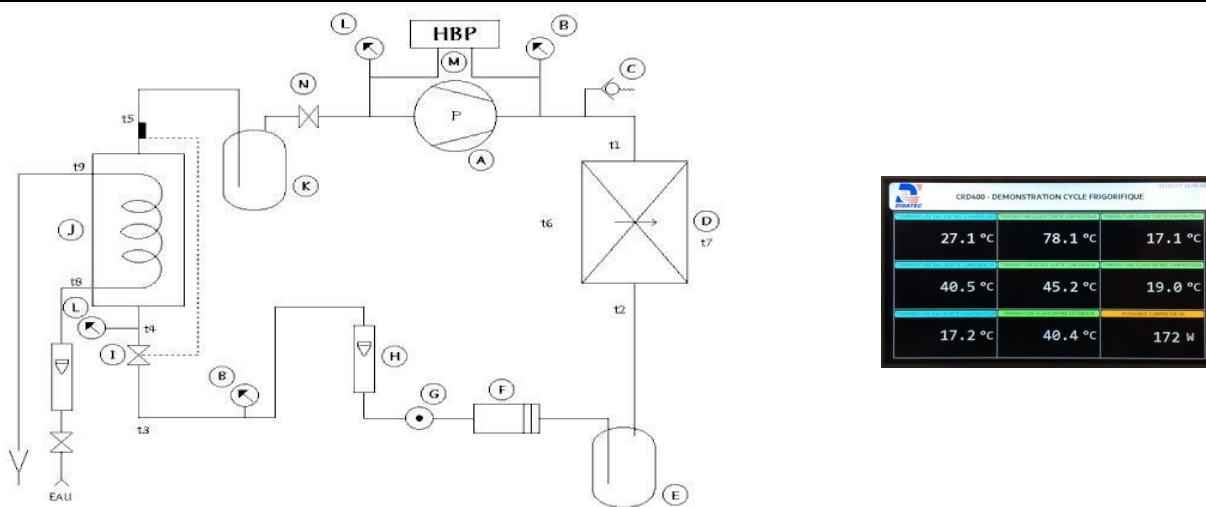
The bench is made of standard elements of a refrigerating circuit. The compressor will first elevate the pressure and the gas temperature (R134a). The air condenser will then transform this high pressure gas into high pressure liquid.

The high pressure liquid will then be stored in a bottle and then be sent towards the pressure reducers. This one will change the state of the fluid, it will go from a high pressure liquid to a low pressure liquid. This low pressure liquid is now in the evaporator and will draw its energy on the water coil (and thus cooling it). The students visualize the transformation because the refrigerant evaporates between the glass shell and the cooling coil. At the outlet of the evaporator, the fluid is in the form of low pressure steam, it goes through a suction line accumulator and will be compressed once again by the compressor.

The robust design of this equipment makes it perfectly suited for use in schools.

Its anodized aluminum structure on wheels makes it extremely robust as well as a great flexibility of integration into your premises. The manufacturing of this equipment meets the European machine directive

## Illustrations



## Technical details

This unit is set up on a frame made of aluminum profile with 4 wheels. It includes an electrical cabinet with main switch and differential circuit breaker.

A. Hermetic piston compressor 408W for a plan 7.2 °C / 55 °C

B. High pressure manometer R134a with dual scale temperature / pressure

C. Safety valve set to 16 bars

D. Air condenser

-With forced convection

-Copper tubes and aluminum fins

E. Liquid tank steel 0.7L volume with service valve

F. Dehydrator filter

G. Fluid state sight glass

H. Flowmeter R134a with floater

-Magnetic transmission

-A needle dial

-Stainless steel construction

I. Thermostatic expansion valve with internal pressure equalization

J. Exchanger R134a/water (evaporator):

- Resistant shell glass (pressure and temperature)

- Copper coil

- Volume of the exchanger: 1.19L

- R134a fluid circulation between the shell and the coil

- Rear lighting by neon (improves the visualization)

K. Suction line accumulator made of steel volume 0.3L

L. Low pressure manometer R134a with dual scale temperature / pressure

M. HP and LP safety pressure switch

N. Evaporator pressure regulation valve

O. Integrated instrumentation:

- Low pressure manometer (R134a) x2: -1 to 10bars

- High pressure manometer (R134a): -1 to 30bars

- Fluid flowmeter R134a: 40 to 250mL /min

- Water flowmeter: 0.2 to 1.5 L/min

- Thermocouple temperature probes T (X10): -20 to +100°C

- Compressor power wattmeter: 0 to 1150W

-portable anemometer

The temperatures and the power are displayed on a 7" touch screen :

# TCP200



## Services required

- Electrical supply: 230 Vac – 50 Hz – 10 A
- Electrical network: 1 live(s) + Neutral + Earth.
- Water supply : 1 L/min
- Dimensions: (LxWxH mm): 900 x 700 x 700
- weight (Kg): 60

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

## Documentation

- User's manual
- Pedagogical manual
- Technical documentation of the components
- Wiring diagram
- Fluidic diagram (PID)
- Lab exercises
- Certificate of conformity CE