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Technical Teaching Equipment

Heat Exchangers Training System

TICB

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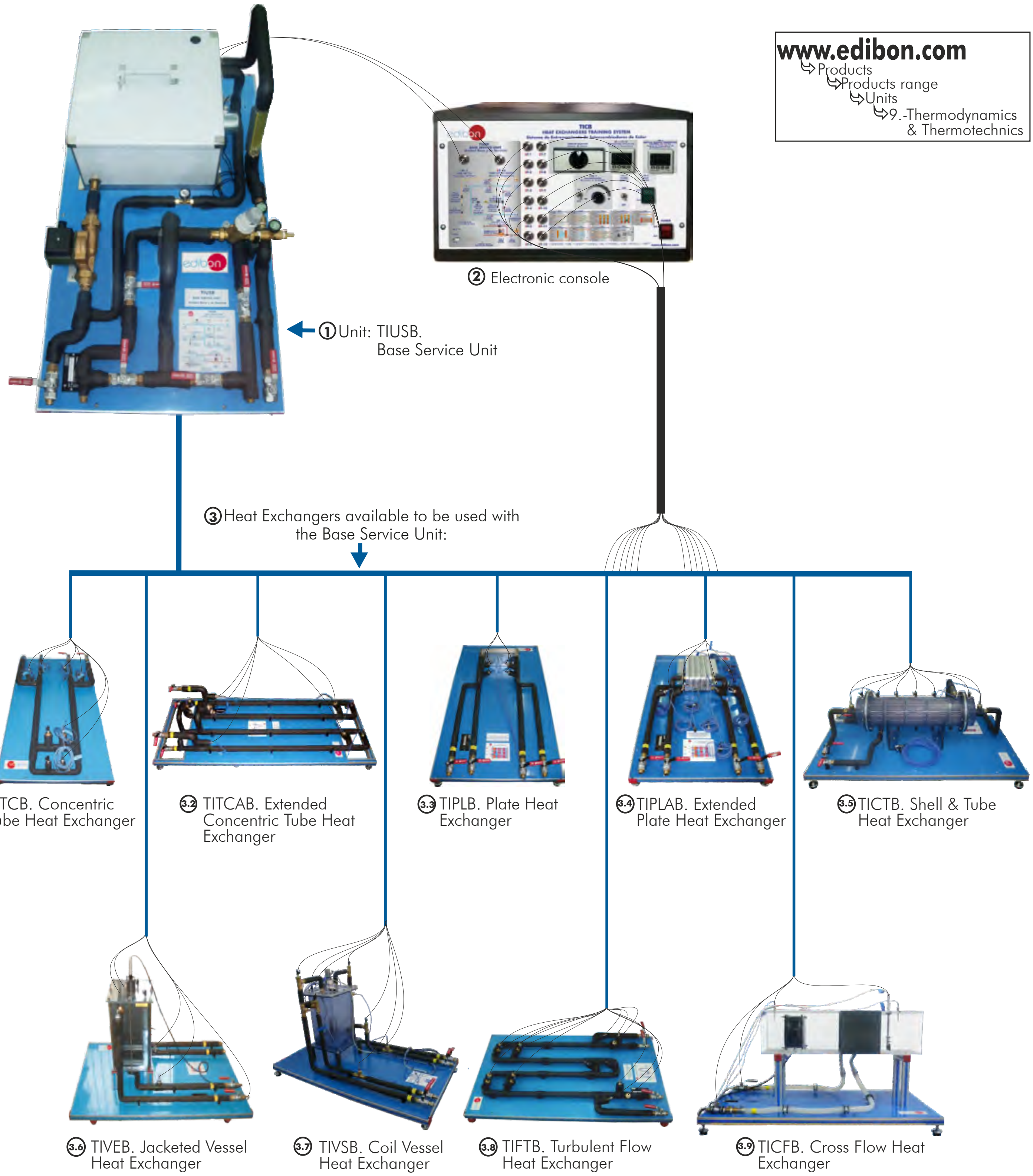


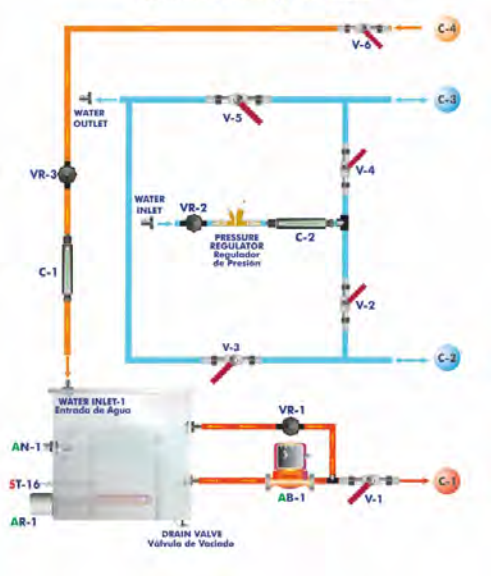
ISO 9000: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)

European Union Certificate (total safety)

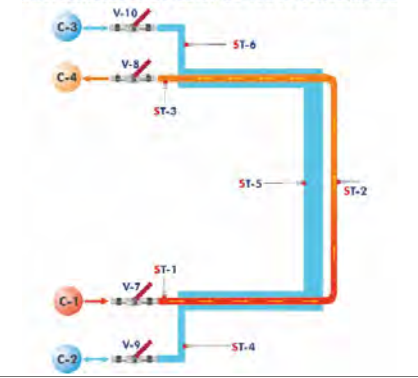
Certificates ISO 14000 and **ECO-Management and Audit Scheme** (environmental management)

Worlddidac Quality Charter Certificate and **Worlddidac Member**

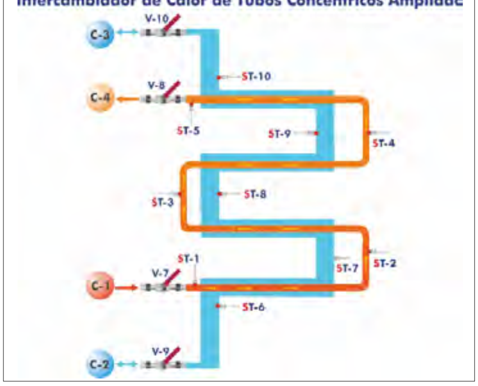
TIUSB
BASE SERVICE UNIT
Unidad Base y Servicio



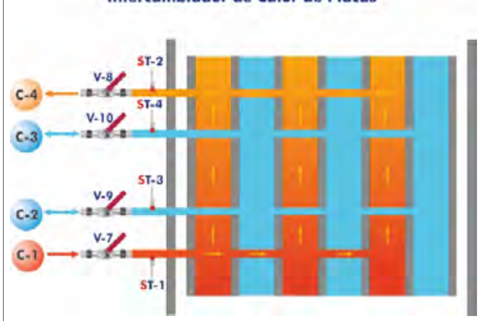
TITCB
CONCENTRIC TUBE HEAT EXCHANGER
Intercambiador de Calor de Tubos Concéntricos



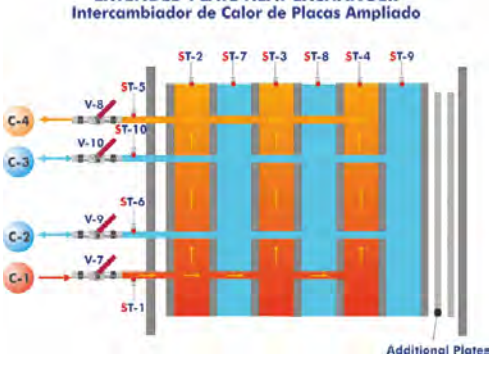
TITCAB
EXTENDED CONCENTRIC TUBE HEAT EXCHANGER
Intercambiador de Calor de Tubos Concéntricos Ampliado



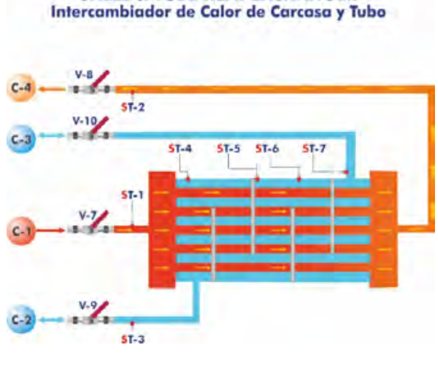
TIPLB
PLATE HEAT EXCHANGER
Intercambiador de Calor de Placas



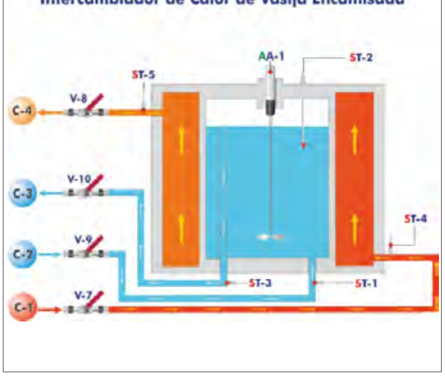
TIPLAB
EXTENDED PLATE HEAT EXCHANGER
Intercambiador de Calor de Placas Ampliado



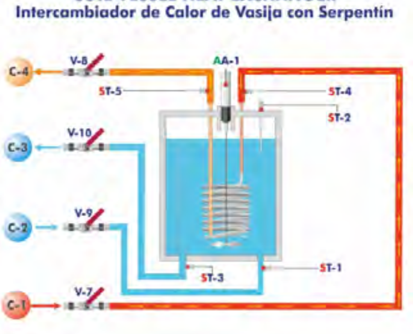
TICTB
SHELL & TUBE HEAT EXCHANGER
Intercambiador de Calor de Carcasa y Tubo



TIVEB
JACKETED VESSEL HEAT EXCHANGER
Intercambiador de Calor de Vasija Encamisada



TIVSB
COIL VESSEL HEAT EXCHANGER
Intercambiador de Calor de Vasija con Serpentín



TIFTB
TURBULENT FLOW HEAT EXCHANGER
Intercambiador de Calor de Flujos Turbulentos

TICFB
CROSS FLOW HEAT EXCHANGER
Intercambiador de Calor de Flujos Cruzados

Note:

ST=Temperature sensor. C= Flow meter. AR= Heating element. AB= Pump. AN=Level switch. V=Valve. VR=Regulation valve.
©= Connection between Base Service Unit and Exchanger. AA=Stirrer. VA=Anemometer. AVE=Fan.

Common items for Heat Exchangers type "TI..B":

① TIUSB. Base Service Unit:

This unit is common for Heat Exchangers type "TI..B" and can work with one or several exchangers.

This unit performs the following tasks:

- Heating the water.
- Pumping of hot water.
- Change in the direction of cold water flows.
- Cold and hot water measures.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Stainless steel tank (30 l.), equipped with:

- Electric heating element (3000W) with thermostat (70° C), to heat the water.
- Temperature sensor ("J" type) to measure the water temperature.
- Level switch to control the water level in the tank.
- Stainless steel cover to avoid the contact with hot water. In this cover there is a hole that allows us to visualize the water level and also to stuff the tank.
- Draining water valve.


TIUSB

Centrifugal pump, range: 0 - 3 l./min.

2 Flow meters, one for hot water and the other for cold water, range: 0.2 to 2 l./min.

Control valves for the cold and hot water.

4 Ball valves that, depending on how we manipulate them, give us co-current or counter-current flux in the exchanger.

2 Ball valves to control and drain the hot water of the base unit.

Pressure regulator to avoid the introduction of too much pressure in the exchangers, tared at 0.6 bar.

4 Flexible tubes to connect with the different exchangers.

Cables and accessories, for normal operation.

② Electronic console:

This unit is common for Heat Exchangers type "TI..B" and can work with one or several exchangers.

Metallic box.

Temperature sensors connectors.

Digital display for the temperature sensors.

Selector for temperature sensors.

Level switch connector.

Heating element connector.

Heating element control (temperature control).

Fan switch.

Fan regulator.

Stirrer switch.

Pump connection.

Pump switch.


Electronic console

Continue...

③ **Heat Exchangers** available to be used with the Base Service Unit:

③.1 TITCB. Concentric Tube Heat Exchanger:

This Concentric Tube Heat Exchanger allows the study of heat transfer between hot water flowing through an internal tube and cold water flowing in the ring area lying between the internal and the external tubes.

This exchanger allows measuring hot and cold water temperatures at different points of the exchanger.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

The exchanger is formed by two concentric copper tubes with hot water circulating through the interior tube and cold water circulating in the ring space.

This exchanger has 2 equal sections of 500 mm each one, where heat transfer takes place.

Exchange length: $L = 2 \times 0.5 = 1$ m.

Internal tube:

- Internal diameter: $D_{int} = 16 \cdot 10^{-3}$ m. External diameter: $D_{ext} = 18 \cdot 10^{-3}$ m. Thickness = 10^{-3} m.
- Heat transfer internal area: $A_h = 0.0503$ m^2. Heat transfer external area: $A_c = 0.0565$ m^2.

External tube:

- Internal diameter: $D_{int} = 26 \cdot 10^{-3}$ m. External diameter: $D_{ext} = 28 \cdot 10^{-3}$ m. Thickness = 10^{-3} m.

6 Temperature sensors ("J" type):

- 3 Temperature sensors for measuring cold water temperature:
  - Cold water inlet.
  - Cold water mid-position.
  - Cold water outlet.
- 3 Temperature sensors for measuring hot water temperature:
  - Hot water inlet.
  - Hot water mid-position.
  - Hot water outlet.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

TITCB

③.2 TITCAB. Extended Concentric Tube Heat Exchanger:

This Extended Concentric Tube Heat Exchanger allows the study of heat transfer between hot water flowing through an internal tube and cold water flowing in the ring area lying between the internal and the external tubes.

This exchanger allows measuring hot and cold water temperatures at different points of the exchanger.

TITCAB is a more sophisticated unit than TITCB, with four longer tube sections, giving four times the overall heat transfer area and three interim temperature measurement points (temperature sensors) in each fluid stream.

This exchanger has sufficient heat transfer area for demonstrating the typical counter-current flow conditions where the outlet of the heated stream is hotter than the outlet of the cooled stream.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

The exchanger is formed by two concentric copper tubes with hot water circulating through the interior tube and cold water circulating in the ring space.

TITCAB

This exchanger has 4 equal sections of 1000 mm each one, where heat transfer takes place.

Exchange length: $L = 4 \times 1 = 4$ m.

Internal tube:

- Internal diameter: $D_{int} = 16 \cdot 10^{-3}$ m. External diameter: $D_{ext} = 18 \cdot 10^{-3}$ m. Thickness = 10^{-3} m.
- Heat transfer internal area: $A_h = 0.0503$ m^2. Heat transfer external area: $A_c = 0.0565$ m^2.

External tube:

- Internal diameter: $D_{int} = 26 \cdot 10^{-3}$ m. External diameter: $D_{ext} = 28 \cdot 10^{-3}$ m. Thickness = 10^{-3} m.

10 Temperature sensors ("J" type):

- 5 Temperature sensors for measuring cold water temperature:
  - Cold water inlet.
  - Cold water at different interim positions (3).
  - Cold water outlet.
- 5 Temperature sensors for measuring hot water temperature:
  - Hot water inlet.
  - Hot water at different interim positions (3).
  - Hot water outlet.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

Continue...

③ Heat Exchangers available to be used with the Base Service Unit:

3.3 TIPLB. Plate Heat Exchanger:

This Plate Heat Exchanger allows the study of heat transfer between hot and cold water through alternate channels formed between parallel plates.

The exchanger allows measuring cold and hot temperatures at the inlet and outlet of the exchanger.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Formed by corrugated stainless steel plates. It can be dismantled to observe its structure.

4 Ports or connections of hot and cold water input and output.

Maximum flow: 12m^3/h.

Maximum work pressure: 10 bar.

Maximum work temperature: 100° C.

Minimum work temperature: 0° C.

Maximum number of plates: 20.

Internal circuit capacity: 0.176 l.

External circuit capacity: 0.22 l.

Area: 0.32m^2.

4 Temperature sensors ("J" type):

2 Temperature sensors for measuring cold water temperature (inlet and outlet).

2 Temperature sensors for measuring hot water temperature (inlet and outlet).

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

TIPLB

3.4 TIPLAB. Extended Plate Heat Exchanger:

This Extended Plate Heat Exchanger allows the study of heat transfer between hot and cold water through alternate channels formed between parallel plates.

The exchanger allows measuring cold and hot temperatures at different points of the exchanger.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Formed by corrugated stainless steel plates. It can be dismantled to observe its structure.

4 Ports or connections of hot and cold water input and output.

Maximum flow: 12m^3/h.

Maximum work pressure: 10 bar.

Maximum work temperature: 100° C.

Minimum work temperature: 0° C.

Maximum number of plates: 20.

Internal circuit capacity: 0.176 l.

External circuit capacity: 0.22 l.

Area: 0.32m^2.

10 Temperature sensors ("J" type):

5 Temperature sensors for measuring cold water temperature (inlet, outlet and interim positions).

5 Temperature sensors for measuring hot water temperature (inlet, outlet and interim positions).

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

TIPLAB

Continue...

③ **Heat Exchangers** available to be used with the Base Service Unit:

③.5 TICTB. Shell & Tube Heat Exchanger:

It consists on a group of tubes inside the heat exchanger. The hot water flows through the internal tubes and the cooling water circulates through the space between the internal tubes and the shell.

There are traverse baffles placed in the shell to guide the cold water to maximize the heat transfer.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Formed by tubes of stainless steel with hot water circulating in the interior.

4 Segmented baffles located transversely in the shell.

Exchange length of the shell and each tube: L = 0.5m

Interior tube (21 tubes):

- Internal diameter: $D_{int} = 8 \cdot 10^{-3}$ m.
- External diameter: $D_{ext} = 10 \cdot 10^{-3}$ m.
- Thickness = 10^{-3} m.
- Internal heat transfer area: $A_h = 0.0126\ m^2$.
- External heat transfer area : $A_c = 0.0157 m^2$.

Shell:

- Internal diameter: $D_{int,c} = 0.148$ m.
- External diameter: $D_{ext,c} = 0.160$ m.
- Thickness = $6 \cdot 10^{-3}$ m.

7 Temperature sensors ("J" type), for measuring cold and hot water temperatures at different points of the exchanger.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

TICTB

③.6 TIVEB. Jacketed Vessel Heat Exchanger:

This Jacketed Vessel Heat Exchanger allows the study of heat transfer between hot water flowing through a jacket and the cold water contained in a vessel.

It can work in continuous supply or in a batch process (heating of a constant mass of water contained in a vessel).

The exchanger allows measuring temperatures at the inlet and outlet of the exchanger in cold as well as in hot water.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Constituted of a vessel.

Vessel total volume: 14 l.

Interior vessel volume: 7 l. approx.

Jacket volume: 7 l. approx.

An overflow or a pipe allows the exit of the water in the vessel through its upper part to maintain a constant flow during the process with a continuous supply.

A jacket surrounds the vessel through where hot water flows.

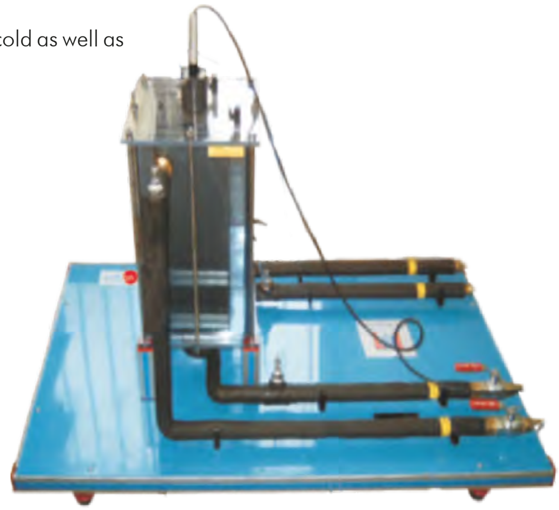
An electric stirrer.

5 Temperature sensors ("J" type):

- 3 Temperature sensors for measuring cold water temperature.
- 2 Temperature sensors for measuring hot water temperature.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.



TIVEB

Continue...

③ **Heat Exchangers available to be used with the Base Service Unit:**

3.7 TIVSB. Coil Vessel Heat Exchanger:

This heat exchanger allows the study of heat transfer between hot water flowing through a coil and cold water contained in the vessel.

It can work in continuous supply or in a batch process.

Anodized aluminum structure and panel of painted steel.

Main metallic elements of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Formed by a pvc-glass vessel, volume: 14 l.

An overflow or pvc-glass tube lets the output of water from the vessel in the upper part in order to maintain the flow constant for continue supply process.

A copper coil where the water circulates:

D_{int} = 4.35 mm. D_{ext} = 6.35 mm.

Total length of the tube that forms the coil: 1.5 m.

An electric stirrer.

5 Temperature sensors ("J" type):

3 Temperature sensors for measuring the cold water temperature.

2 Temperature sensors for measuring the hot water temperature.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

TIVSB

3.8 TIFTB. Turbulent Flow Heat Exchanger:

This Turbulent Flow Heat Exchanger let us study the heat transfer between hot water that circulates through an internal tube and cold water that flows through the annular zone between the internal and the external tube. This exchanger let us measure cold water and hot water temperatures at different points of the exchanger.

Anodized aluminum structure and panel in painted steel.

Main metallic elements in stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Formed by two copper concentric tubes with hot water circulating through the internal tube and cold water circulating through the annular space.

The exchanger has 4 equal sections of 500 mm each one, where the heat transfer takes place.

Exchange length: L = 4 x 0.5 = 2 m.

Internal tube:

Internal diameter: $D_{int} = 8 \cdot 10^{-3}$ m.

External diameter: $D_{ext} = 10 \cdot 10^{-3}$ m.

Thickness = 10^{-3} m.

Internal heat transfer area: $A_h = 0.0377\ m^2$.

External heat transfer area: $A_c = 0.0471\ m^2$.

External tube:

Internal diameter: $D_{int,c}$ $13 \cdot 10^{-3}$ m.

External diameter: $D_{ext,c}$ $15 \cdot 10^{-3}$ m.

Thickness = 10^{-3} m.

TIFTB

12 Temperature sensors ("J" type):

Cold water temperature sensor at the exchanger inlet or outlet.

Hot water sensor at the exchanger inlet.

Cold water sensor between the first and second stretch of the exchanger.

Hot water sensor between the first and second stretch of the exchanger.

Cold water sensor between the second and third stretch of the exchanger.

Hot water sensor between the second and third stretch of the exchanger.

Cold water sensor between the third and fourth stretch of the exchanger.

Hot water sensor between the third and fourth stretch of the exchanger.

Cold water temperature sensor at the exchanger inlet or outlet.

Hot water sensor at the exchanger outlet.

Temperature sensor of the exterior surface of the interior tube at the exchanger inlet.

Temperature sensor of the exterior surface of the interior tube at the exchanger outlet.

Easy connection to the Base Service Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

Continue...

③ **Heat Exchangers** available to be used with the Base Service Unit:

3.9 TICFB. Cross Flow Heat Exchanger:

The cross flow heat exchanger is designed to study heat transfer between two fluids in cross flow configuration.

A hot water flow coming from the base unit enters and leaves a radiator perpendicular to an air current, which is generated by a fan.

The heat exchanger allows to measure water and air temperatures at the inlet and outlet of the exchanger.

Anodized aluminum structure and panel of painted steel.

Main metallic elements made of stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

A Poly methyl methacrylate (PMMA) rectangular duct of 800 x 200 x 200 mm.

Radiator located across the air duct.

The fins of the radiator are made of aluminum and have a heat transfer area of 35000 mm^2.

Axial fan with speed regulation from the electronic console. It provides a maximum air velocity of 3 m/s.

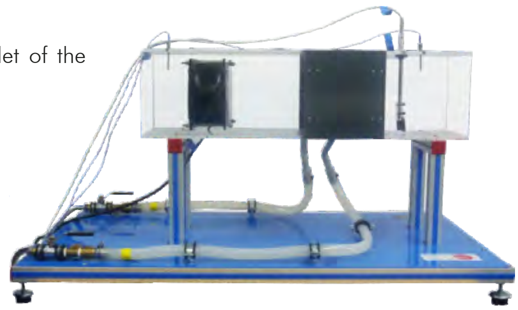
4 "J" type temperature sensors to measure input and output water and air temperatures.

1 Anemometer to measure air velocity.

2 Ball valves.

Easy connection to the Base Unit.

This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.



TICFB

④ **Cables and Accessories**, for normal operation.

⑤ **Manuals:**

This system is supplied with the following manuals for each Heat Exchanger: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

Some Practical Possibilities of the System:

Practices to be done with the Concentric Tube Heat Exchanger (TITCB):

1.- Global energy balance in the heat exchanger and the study of losses.

2.- Exchanger effectiveness determination. NTU Method.

3.- Study of the heat transfer under counter-current and co-current flow conditions.

4.- Flow influence on the heat transfer. Reynolds number calculation.

Practices to be done with the Extended Concentric Tube Heat Exchanger (TITCAB):

5.- Global energy balance in the heat exchanger and the study of losses.

6.- Exchanger effectiveness determination. NTU Method.

7.- Study of the heat transfer under counter-current and co-current flow conditions.

8.- Flow influence on the heat transfer. Reynolds number calculation.

Practices to be done with the Plate Heat Exchanger (TIPLB):

9.- Global energy balance in the heat exchanger and the study of losses.

10.- Exchanger effectiveness determination. NTU Method.

11.- Study of the heat transfer under counter-current and co-current flow conditions.

12.- Flow influence on the heat transfer. Reynolds number calculation.

Practices to be done with the Extended Plate Heat Exchanger (TIPLAB):

13.- Global energy balance in the heat exchanger and the study of losses.

14.- Exchanger effectiveness determination. NTU Method.

15.- Study of the heat transfer under counter-current and co-current flow conditions.

16.- Flow influence on the heat transfer. Reynolds number calculation.

Practices to be done with the Shell & Tube Heat Exchanger (TICTB):

17.- Global energy balance in the heat exchanger and the study of losses.

18.- Exchanger effectiveness determination. NTU Method.

19.- Study of the heat transfer under counter-current and co-current flow conditions.

20.- Flow influence on the heat transfer. Reynolds number calculation.

Practices to be done with the Jacketed Vessel Heat Exchanger (TIVEB):

21.- Global balance of energy in the heat exchanger and losses study.

22.- Determination of the exchanger effectiveness. NTU Method.

23.- Influence of the flow on the heat transfer. Calculation of the number of Reynolds.

24.- Influence of the vessel stirring on the heat transfer when operating in batches.

25.- Influence of the vessel's water volume on the heat transfer when operating in batches.

Practices to be done with the Coil Vessel Heat Exchanger (TIVSB):

26.- Global balance of energy in the heat exchanger and the study of losses.

27.- Determination of the exchanger effectiveness. NTU Method.

28.- Influence of the flow on the heating transfer. Calculation of Reynolds number.

29.- Influence of the stirring vessel on the heat transfer with operation in batches.

30.- Influence of the water volume in the vessel on the heat transfer with operation in batches.

Practices to be done with the Turbulent Flow Heat Exchanger (TIFTB):

31.- Global energy balance in the heat exchanger and losses study.

32.- Determination of the exchanger effectiveness. NTU Method.

33.- Study of the heat transfer in counter-current and co-current flow conditions.

34.- Flow influence on heat transfer. Reynolds number calculation.

35.- Obtaining of the correlation that relates Nusselt number with Reynolds number and Prandtl number.

36.- Obtaining of the heat transfer coefficients by convection.

Practices to be done with the Cross Flow Heat Exchanger (TICFB):

37.- Introduction to the concept of psychometric properties.

38.- Effect of temperature differential on the heat transfer coefficient.

39.- Familiarization with cross flow heat exchanger.

40.- Overall energy balance in the heat exchanger and study of losses.

41.- Determination of the exchanger effectiveness (NTU method).

42.- Influence of air and water flow on the heat transfer. Reynolds number calculation.

ORDER INFORMATION

Items always supplied as minimum configuration

Common items for Heat Exchangers type "TI..B":

① **TIUSB. Base Service Unit.** (Common for Heat Exchangers type "TI..B" and can work with one or several exchangers).

② **Electronic console.** (Common for Heat Exchangers type "TI..B" and can work with one or several exchangers).

③ Heat Exchangers available to be used with the Base Service Unit:

- 3.1 **TITCB. Concentric Tube Heat Exchanger**, and / or
- 3.2 **TITCAB. Extended Concentric Tube Heat Exchanger**, and / or
- 3.3 **TIPLB. Plate Heat Exchanger**, and / or
- 3.4 **TIPLAB. Extended Plate Heat Exchanger**, and / or
- 3.5 **TICTB. Shell & Tube Heat Exchanger**, and / or
- 3.6 **TIVEB. Jacketed Vessel Heat Exchanger**, and / or
- 3.7 **TIVSB. Coil Vessel Heat Exchanger**, and / or
- 3.8 **TIFTB. Turbulent Flow Heat Exchanger**, and / or
- 3.9 **TICFB. Cross Flow Heat Exchanger.**

④ **Cables and Accessories**, for normal operation.

⑤ **Manuals.**

REQUIRED SERVICES

- Electrical supply: single-phase, 220 V./50Hz or 110V./60 Hz.

- Water supply (0 to 6 l./min. approx).

- Drainage.

DIMENSIONS & WEIGHTS

TIUSB. Unit:	-Dimensions:	1100 x 630 x 500 mm. approx. (43.3 x 24.8 x 19.68 inches approx.).
	-Weight:	50 Kg. approx. (110.2 pounds approx.).
TITCB. Unit:	-Dimensions:	1100 x 630 x 320 mm. approx. (43.3 x 24.8 x 12.60 inches approx.).
	-Weight:	20 Kg. approx. (44.09 pounds approx.).
TITCAB. Unit:	-Dimensions:	1500 x 700 x 320 mm. approx. (59.05 x 27.55 x 12.6 inches approx.).
	-Weight:	30 Kg. approx. (66.13 pounds approx.).
TIPLB. Unit:	-Dimensions:	1100 x 630 x 320 mm. approx. (43.3 x 24.8 x 12.60 inches approx.).
	-Weight:	20 Kg. approx. (44.09 pounds approx.).
TIPLAB. Unit:	-Dimensions:	1200 x 700 x 320 mm. approx. (47.24 x 27.55 x 12.6 inches approx.).
	-Weight:	25 Kg. approx. (55.11 pounds approx.).
TICTB. Unit:	-Dimensions:	1100 x 630 x 400 mm. approx. (43.3 x 24.8 x 15.74 inches approx.).
	-Weight:	30 Kg. approx. (66.13 pounds approx.).
TIVEB. Unit:	-Dimensions:	1100 x 630 x 700 mm. approx. (43.3 x 24.8 x 27.55 inches approx.).
	-Weight:	35 Kg. approx. (77.16 pounds approx.).
TIVSB. Unit:	-Dimensions:	1100 x 630 x 700 mm. approx. (43.3 x 24.8 x 27.55 inches approx.).
	-Weight:	30 Kg. approx. (66.13 pounds approx.).
TIFTB. Unit:	-Dimensions:	1100 x 630 x 350 mm. approx. (43.3 x 24.8 x 13.78 inches approx.).
	-Weight:	20 Kg. approx. (44.09 pounds approx.).
TICFB. Unit:	-Dimensions:	1100 x 630 x 600 mm. approx. (43.30 x 24.8 x 23.62 inches approx.).
	-Weight:	20 Kg. approx. (44.09 pounds approx.).
Electronic console:	-Dimensions:	490 x 330 x 310 mm. approx. (19.29 x 12.99 x 12.20 inches approx.).
	-Weight:	10 Kg. approx. (22 pounds approx.).

AVAILABLE VERSIONS

Offered in this catalogue:

-TICB. Heat Exchangers Training System.

Offered in other catalogue:

-TICC. Computer Controlled Heat Exchangers Training System.

*Specifications subject to change without previous notice, due to the convenience of improvements of the product.

edibon INTERNATIONAL
C/ Del Agua, 14. Polígono Industrial San José de Valderas.
28918 LEGANÉS. (Madrid). SPAIN.
Phone: 34-91-6199363 FAX: 34-91-6198647
E-mail: edibon@edibon.com WEB site: **www.edibon.com**

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REPRESENTATIVE: