Product name:	Product code:
Trainer for Various Heat Exchangers	NEECHL0264



Description

Trainer for Various Heat Exchangers

Technical specification

0.25 – 6.5 l/min.
Control valves for the cold and hot water.
Four ball valves that, depending on how manipulated, could give co- current or counter-current flux in the exchanger.
Two 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.
Four flexible tubes to connect with the different exchangers.
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.). With Concentric Tube Heat Exchanger: Exchange length: L = 2 x 0.5 = 1 m. Internal tube: Internal diameter: Dint = 16
• 10^{-3} m. External diameter: Dext = 18
• 10^{-3} m. Thickness = 10^{-3} m. Heat transfer internal area: Ah = 0.0503 m^2. Heat transfer external area: Ac = 0.0565 m^2.
External tube: Internal diameter: Dint = 26
• 10^{-3} m. External diameter: Dext = 28
• 10^{-3} m. Thickness = 10^{-3} m. Six temperature sensors (“J” type) Extended Concentric Tube Heat Exchanger: Exchange length: L=4x1=4 m. Internal tube: Internal diameter: Dint = 16
• 10-3 m. External diameter: Dext = 18
• 10-3 m. Thickness = 10-3 m. Heat transfer internal area: Ah = 0.0503 m^2. Heat transfer external area: Ac = 0.0565 m^2.
External tube: Internal diameter: Dint = 26
• 10-3 m. External diameter: Dext = 28
• 10-3 m. Thickness = 10-3 m.
Ten temperature sensors (”J” type)
Plate Heat Exchanger 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: 0.32 m^2.
Four temperature sensors (“J” type) Extended Plate Heat Exchanger Maximum flow: 12 m^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: 0.32 m^2.
Ten temperature sensors (”J” type)
Shell & Tube Heat Exchanger
Four segmented baffles located transversaly in the shell. Exchange length of the shell and each tube: L = 0.5 m. Internal tube (21 tubes):
Internal diameter: Dint= 8
• 10^{-3} m. External diameter: Dext = 10
• 10-3 m. Thickness = 10-3 m. Internal heat transfer area: Ah= 0.0126 m^2. External heat transfer area: Ac= 0.0157m^2.
Shell:
Internal diameter: Dint,c= 0.148 m.
External diameter: Dext,c= 0.160 m. Thickness = 6
• 10-3 m. Seven temperature sensors (“J” type), for measuring cold and hot water temperatures at different points of the exchanger.
Jacketed Vessel Heat Exchanger:
Anodized aluminum frame and panels made of painted steel. Main metallic elements made of stainless steel.
Diagram in the front panel with distribution of the elements similar to the real one.
Constituted of a vessel. Vessel total volume: 14 l.
Interior vessel volume: 7 l approx. Jacket volume: 7 l approx.
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.
Jacket surrounds the vessel through where hot water flows. Electric stirrer.

Five temperature sensors (“J” type)
Coil Vessel Heat Exchanger
Anodized aluminum frame and panels made of painted steel. Main metallic elements made of stainless steel.
Diagram in the front panel with distribution of the elements similar to the real one.
Formed by a pvc-glass vessel, volume: 14 l.
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.
Copper coil where the water circulates: Dint= 4.35 mm.
Dext= 6.35 mm.
Total length of the tube that forms the coil: 1.5 m.
Electric stirrer.
Five temperature sensors (“J” type)
Turbulent Flow Heat Exchanger
With Anodized aluminum frame and panels made of painted steel. With Main metallic elements made of stainless steel.
Diagram in the front panel with distribution of the elements similar to the real one.
Formed by two copper concentric tubes with hot water circulating through the internal tube and cold water circulating through the annular space.
The exchanger should have 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: Dint = 8
• 10-3 m. External diameter: Dext= 10
• 10-3 m. Thickness = 10-3 m.
Internal heat transfer area: Ah= 0.0377 m². External heat transfer area: Ac= 0.0471 m².
External tube:
Internal diameter: Dint,c =13
• 10-3 m. External diameter: Dext,c = 15
• 10-3 m. Thickness = 10-3 m.
Twelve temperature sensors: (“J” type)
Cross Flow Heat Exchanger
Anodized aluminum frame and panels made of painted steel. Main metallic elements made of stainless steel.
Diagram in the front panel with distribution of the elements similar to the real one.
Poly methyl methacrylate (PMMA) rectangular duct of 800 x 200 x 200 mm.
Radiator located across the air duct.
The fins of the radiator should made of aluminum and have a heat transfer area of 35000 mm².
Axial fan with speed control from computer (PC). It should provide a maximum air velocity of 3 m/s.
Four “J” type temperature sensors to measure input and output water and air temperatures.
Velocity sensor to measure air velocity, range: 0 – 4 m/s. Two ball valves.
Installation & Basic operational training included

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- examination and comparison of various heat exchanger types
- five different types of heat exchangers included in the scope of delivery
- finned heat exchanger with fan
- operating mode (parallel flow or counter flow) selectable via valves
- flow rates adjustable via valves