

HEATING SYSTEM CONTROL



MAIN FEATURES

- Permits the assembly and exploration of several heating system controllers;
- Utilizes Consulab Moduponents®;
- Wall brackets or mobile carts available for assembling;
- Ignition circuits, valves, relays, controllers, thermostats, switches and more.

DESCRIPTION

The CL-5100, Heating System Control, has been designed as a training aid to teach heating system controllers. Because of its high versatility and its expansion capability, the CL-5100 allows the student to produce and explore a multitude of assemblies using a wide range of industrial components such as: pressure regulators, switching relays, thermostats, flame detectors, etc.

Introducing the principles of heating system control can be done in a scalable situation from very simple to complex actions to be taken. The characteristics offered by this trainer are rarely found in competing systems. Assemblies executed with Moduponents®* are built on supports fitted with anchoring grooves. It can be used in two different ways:

1. It may be fastened on rails to a classroom wall over a workbench. In this fashion, many work stations may be installed without disturbing the classroom desk layout.
2. It can be installed on a mobile stand panel. If the classroom wall cannot be permanently utilized, it is possible to install two work stations on a mobile stand.

* Plexiglas boards used as pneumatic component support. The standard component symbol is silk-screened on the board.

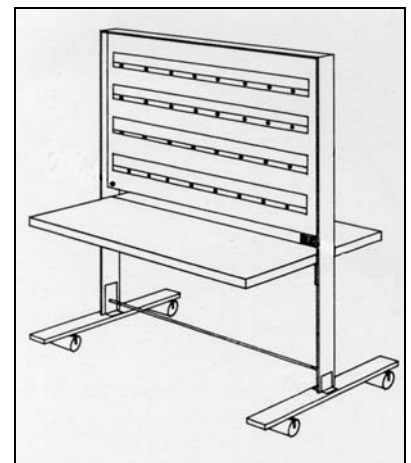
Each module is held in place by a fastening device located at the top front of the Moduponent®. Electrical connections are 4mm flexible wire connectors and equivalent size terminals. Moreover, the user may keep up with the state-of-the-art technology by procuring the most recent Moduponents® at minimal cost.

MODULAR AND COMPLEMENTARY

The CL-5100 trainer is essentially a modular system. It is possible to produce various types of assemblies, by the simple and easy arrangement of available Moduponents®. Unlimited possibilities are available to the user through the combination of exercise boards. The construction of the CL-5100 is identical to that of many other existing trainers designed and built by Consulab Educatech Inc. It is therefore possible to complete a given trainer with Moduponents® from another trainer due to their structure compatibility. All exercise boards are made of clear Plexiglas and contain fasteners and the necessary plug-in connectors.



Wall Support with Rails



Mobile Stand Panel

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INDUSTRIAL TYPE COMPONENTS (INDUSTRIAL REALISM)

The CL-5100 trainer gives the user the possibility of using genuine industrial type components. The possibility of introducing components of different makes in the system is available to the user for the student to learn about control components from more than one manufacturer. A complete trainer consists of:

MODEL	QTY	DETAILS
CL-5100-01	1	Pressure Switch <ul style="list-style-type: none"> • 2 to 15 psi • Ambient temperature: 66 °C/150 °F max. • Automatic or manual reset for pressure control and limit • Mercury switch
CL-5100-02	1	Universal Transformer <ul style="list-style-type: none"> • 120/208/220/26.5V, 40V A, 50/60 Hz
CL-5100-03	1	Electromagnetic Valve <ul style="list-style-type: none"> • Rated pressure: 1035 kPa • Maximum consumption: 8 W • Ambient temperature: 0-46 °C, 32-115°F/ 54 °C (125°F) max • Rate of flow: 132 L/Hr – 35 gal/Hr • Voltage 120V AC – 60 Hz
CL-5100-04	1	Change-Over Relay <ul style="list-style-type: none"> • 24V coil included • Maximum ambient temperature: 40-45 °C – 105-115 °F - 5 W • Nominal contact voltage: 120V AC, 50/60 Hz <ul style="list-style-type: none"> - Running: 10.2 A - Drawing: 61.2 A
CL-5100-05	1	Motorized Zone Valve <ul style="list-style-type: none"> • Opening and closing time: 15 seconds • Max. air-tight pressure: 20 lbs/sq. in - 138 kPa • Max. liquid temperature: 200 °F – 93 °C • Max. ambient temperature: 125 °F – 52 °C • Normally closed with end of stroke low voltage switch incorporated
CL-5100-06	1	Integrated Servo-Motor Valve with a Two Way Valve <ul style="list-style-type: none"> • Output torque: 5 N.m - 45 lbs.in • Power supply: 24V - 60 Hz • 6 W nominal - 12 W blocked load • Nominal ambient temperature: 0 to 55 °C • 3 positions, two ways • Valve position indicator included
CL-5100-07	1	Register Motor with Return Spring <ul style="list-style-type: none"> • Shaft with two control ends • Angular stroke: 75° • Consumption: 27 W (open) • Ambient temperature scale: 0 to 52 °C (32 to 125° F) • Reversible integrated internal single pole contact to control auxiliary equipment
CL-5100-08	1	Outdoor Reset Control <ul style="list-style-type: none"> • 1 to 1.5 ratio • Internal capillary: 3 m • External capillary: 9 m • Differential adjustment: 3.3 at 11 °C (6 at 20 °F) • Compensation ratio: 1 to 1

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| | | <ul style="list-style-type: none">• Inductive current: 2A - 24V AC |
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MODEL	QTY	DETAILS
CL-5100-09	1	Dual-Bulb, Two-Stage Temperature Controller <ul style="list-style-type: none"> • 1 to 1.5 ratio • 1 ambient temperature probe • 1 outside temperature probe • Scale: 21 to 60 °C (70 to 140 °F) • Max. pressure at bulb: 344.7 kPa (50 lbs/sq. in) • Reset ratio: 1 to 1 1/2
CL-5100-10	1	120-V Heavy Duty Thermostat <ul style="list-style-type: none"> • Temperature: (46 to 84 °F) (8 to 29 °C) • Voltage: 120V AC - 60 Hz • Heating: Full load: 16 A at 120V AC Blocked load: 96 A at 120V AC • Air conditioning: Full load: 8 A at 120V AC Blocked load: 48 A at 120V AC
CL-5100-11	1	24 V Thermostat <ul style="list-style-type: none"> • Scale: 10 to 30 °C • 24V • Contact: Mercury switch
CL-5100-12	1	Multi-Stage Thermostat with Terminal Block <ul style="list-style-type: none"> • 24V to 30V AC • Scale: 10 to 30 °C (50 to 86 °F) • Differential switching: 1.7 °C (3.0 °F)
CL-5100-13	1	Sequential Switch <ul style="list-style-type: none"> • Control voltage: 24V AC, 0.40 A • Minimum ambient temperature: -29 °C • Maximum ambient temperature: 66 °C
CL-5100-14	1	Temperature Regulator with Switch Plate <ul style="list-style-type: none"> • 10 to 30 °C scale • Nominal voltage: 1.5 A at 24V DC • Variance: Approximately 1 °C • Switching: Directional single pole mercury switch
CL-5100-15	1	Monitor Relay <ul style="list-style-type: none"> • Intermittent lighting • Input voltage: 120V AC - 60 Hz • Value at lighting: 360V A
CL-5100-16	1	Main Monitor Relay <ul style="list-style-type: none"> • Line voltage • Contacts nominal voltage • 30 second safety switch • Running: 10.0 A at 120V AC • Drawing: 60.0 A at 120V AC
CL-5100-17	1	Photoconductor Cell Flame Detector <ul style="list-style-type: none"> • Glass-metal welded plug-in cell • Normal ambient temperature: 60 °C/140 °F at cell • Cadmium sulphide detector
CL-5100-18	1	Combined Limiter-High/Low Speed Simulator <ul style="list-style-type: none"> • Length of insertion element: 5 in. - 127 mm • Max. ambient temperature: 88 °C at switch - 117 °C at bi-metal strip • Control circuit: 2A, 24V AC

MODEL	QTY	DETAILS
CL-5100-19	1	Immersion Regulator (38 to 116 °C) <ul style="list-style-type: none"> • Scale: 100 to 240 °F / 38 to 116 °C • Single pole, two throw switch with brass immersion socket • Horizontal or vertical insertion
CL-5100-20	1	Regulator with Contacts (18 to 93 °C) <ul style="list-style-type: none"> • 65 to 240 °F - 18 to 93 °C scale
CL-5100-21	1	Triple Immersion Regulator <ul style="list-style-type: none"> • Scale: High limit: 55-65-75-85-95-105 °C Low limit: 45-55-65-75-85-95 °C or circular
CL-5100-22	1	Bulb Immersion Regulator <ul style="list-style-type: none"> • Differential: 8.5 °C – 15 °F nominal, non-adjustable • Max. pressure on tubing: 1758 kPa • Scale: 140 to 240 °F / 60 to 116 °C • Voltage: 120V AC - 60 Hz • Max. ambient temperature: 66 °C with a load of 1.2 A at 24V 25 °C with a load of 1.4 A at 24V
CL-5100-23	1	Temperature Simulator with Digital Display Electronic Thermometer, Thermal Probes and Rotary Selector <ul style="list-style-type: none"> • Temperature display range: - 40 to + 93 °C - 40 to +199 °C • Max. operation ambient temperature: 0 to 49°C 32 to 120°F • Voltage: 24V AC - 60 Hz • Consumption: 4V A per selector
CL-5100-24	1	SPST Switching Relays <ul style="list-style-type: none"> • Voltage: 120V AC • Double wire control circuit • Single pole, single throw switching
CL-5100-25	1	Heating/Air Conditioning Electrical Thermostat <ul style="list-style-type: none"> • 4 stage program • 2 heating/2 air conditioning
CL-5100-26A	1	Proportional Thermostat, Coupling and Shutter <ul style="list-style-type: none"> • Voltage: 24V to 30V AC • Proportional band: 1.4 °F - 2.5 °C • Scale: 10 to 30 °C
CL-5100-26B	1	Proportional Modulation Actuator with Return Spring <ul style="list-style-type: none"> • Stroke: 90 to 160 ° • Delay: 30 to 60 seconds • Voltage: 24V • Torque: 5.7 N.m - 50 lbs.in
CL-5100-26C	1	Coupling <ul style="list-style-type: none"> • Equipped with ball, motor handle arm and shaft register arm
CL-5100-26D	1	Shutter <ul style="list-style-type: none"> • Opposed multiple lamps
CL-5100-27	1	Heater Simulator with Immersion Wells
CL-148-24	1	24-V Power Supply <ul style="list-style-type: none"> • 124V AC - 12-24V AC - 60 Hz, 2 A

MODEL	QTY	DETAILS
CL-1012-00	1	4 mm Connection Patch Cord Set <ul style="list-style-type: none"> Quantity: 41 Colours: 5 4 different lengths (25 cm, 50 cm, 75 cm, 100 cm) Diameter: 4 mm Type: plug-in
CL-1991-40	4	Wall Bracket (6' Long Aluminum Design Section) <ul style="list-style-type: none"> Boards support C/W Brackets
CL-832-02	1	Lamp Outlet <ul style="list-style-type: none"> Porcelain outlet for domestic 120 V lamp
CL-832-04	1	DPDT Relay <ul style="list-style-type: none"> DPDT relay, 12V AC coil. 225 Ω Contact: 5 A, 240V AC - 2 VA
CL-832-06	1	DPDT Flip-Flop switch <ul style="list-style-type: none"> Flip-flop switch DPDT - in-out-in 10 A, 240V AC - 15 A, 125V AC
CL-832-08	1	Push-buttons <ul style="list-style-type: none"> 2 x push-buttons: 1 N.O., 1 N.C., 1 A
CL-832-10	1	Resistors <ul style="list-style-type: none"> 2 W metal films 5% resistor 500 Vrms, max. 4 x 100 Ω, 2 x 270 Ω, 2 x 1000 Ω
CL-832-11	1	Lamp Outlets <ul style="list-style-type: none"> 2 outlets for bayonet type lamp
CL-832-16	1	Resistors <ul style="list-style-type: none"> 4 x 10 Ω, 10 W, 5%
CL-832-18	1	Outlet and Lamp <ul style="list-style-type: none"> Outlet for bayonet type lamp with wires and banana plugs on each Lamp: 12.8V
CL-835-02	1	Low Heat Thermocouple Simulator
CL-835-16	1	Disassembled Transformer Kit <ul style="list-style-type: none"> Capable of being quickly disassembled and reassembled Complete with core and 5 coils