NEW PRODUCT

Three Phase Synchronous and DC Machine

PT 040105

Features

- This trainer is designed to practice the principals of three phase synchronous and DC Compound machine as motor and generator.
- Students/users will know how the characteristics of the three phase synchronous machine or the DC compound machine operates as motor or generator.
- This trainer is equipped with digital power meter to measure electrical values.
- The electrical machine can be connected to the other machine by coupling it.
- Current protection panel suitable for providing earth fault protection. Operation fault current of 30 mA with indicating light.
- The panel printed graphic symbol and technical data.
- All input and output on each panel are equipped with safety socket and safety connecting cross 4 mm.
- Complete with comprehensive experiment manual book to guide student step by step conducting experiments.

Covered Topics

- LE11001E Characteristics of three phase synchronous motor
- LE11002E The Characteristics of n, I, cos σ, P2, η = f (M) Load of the Three Phase Synchronous Motor
- LE11003E The Characteristics of IE, n, η, I, P2, = f (M) Load with cos σ =1 Constant of the Three Phase Synchronous Motor
- LE11004E I = f (IE) V Curve Characteristic of the Three Phase Synchronous Motor
- LE11005E Three Phase Synchronous Motor as the Three Phase Generator
- LE11006E Synchronization
- LE11007E Characteristics of Three Phase Generator of Without Load and Short-circuit
- LE11008E Characteristics of RLC Load of Three Phase Generator
- LE11009E Start Characteristic and Rotation Direction Changing of the DC Series Motor
- LE11010E Setting the Speed of DC Series Motor
- LE11011E Characteristics of n, IA, P2, η = f(M) Load of DC Series Motor
- LE11012E Start Characteristic and Rotation Direction Changing of the DC Shunt Motor.
- LE11013E The Characteristics of n, IA, P2, η = f (M) Load of DC Shunt Motor
- LE11014E Characteristics of Excitation Current and Speed n = f(IE) of DC Shunt Motor
- LE11015E Characteristics of Voltage and Speed n = f(V) of DC Shunt Motor
- LE11016E Characteristics Torque and Speed n = F(M) Of The DC Shunt Motor
- LE11017E Characteristics of Torque and Speed n = f(M) of DC Shunt Motor with Armature Equipped by Rheostat Resistance
- LE11018E Start Characteristic and Rotation Direction Changing of the DC Compound Motor
- LE11019E Characteristics of n, Ia, P2, η = F (M) Load of DC Compound Motor
- LE11020E Characteristics of the Zero Load and Loaded Separately Excited DC Generators
- LE11021E Series Connection of DC Generator
- LE11022E Shunt Connection of DC Generator
- LE11023E Lompound Connection of DC Generator

Training Panel System

Specification

- **Three Phase Supply Unit with FCCB [PTE-052-01]**
  - Came Switch 4 pole
  - Fault Current Circuit Breaker 30 mA
  - Motor Protection Switch 2.5 - 4 A
  - Phase Control Lamps L1, L2, L3
  - Main Cabel with Plug

- **Single Phase Supply Unit [PTE-052-02]**
  - Came Switch 2 pole
  - Fault Current Circuit Breaker 30 mA
  - Phase Control Lamp L1

- **Single Phase Variable Power Supply [PTE-052-03]**
  - Supply Voltage : 230 V, 50 Hz.
  - Output : 0 - 240 VAC
  - Current : Max. 5 A
  - Power : Max. 1 kVA

- **Three Phase Variable Power Supply [PTE-052-011]**
  - Supply Voltage : 380 V, 50 Hz.
  - Output : - Three Phase Variabel Power Supply, max. 0 - 415 VAC
    - Three Phase Supply Voltage, 380 VAC.
  - Power : Max. 3 kVA

- **DC Variabel Power Supply [PTE-052-13]**
  - Main Source : max. 240 V, 50 Hz
  - Output : min. 0 - 200 VDC
  - Current : Max. 10 A

- **Three Phase Synchronous AC Machine [PTE-046-08]**
  - Rating for motor operation: Power 250 Watt, Voltage 220/380 V Δ/Y
  - V Excitation 200 VDC, Current 0.65/0.37 A, I excitation 0.25 A
  - Speed 3000 RPM
  - frequency 50 Hz

- **DC Compound Machine [PTE-046-09]**
  - Rating for motor operation: Power 250 Watt, Voltage 220 VDC
  - Excitation voltage 200 VDC, Speed 3000 RPM

- **Brake machine [PTE-046-10]**
  - Serves in connection with the brake machine control unit to record the torque and speed in electrical machines. The source is provided by the brake machine control unit via a connecting lead.
  - Nominal voltage: 12 VDC, current: 0.52 A, and max. torque: 5 N.m

- **Unit Control Brake Machine [PTE-046-11]**
  - For the supply control and regulation of the magnetic powder brake.
  - The characteristic (speed/torque) recording is possible in automatic operation.
  - Main source : 220 V/ 50 Hz.
  - Display : - RPM reading are four digits and maximum: 0 - 9.999 RPM.
  - Torque reading are three digits and the maximum number the digital meter handled is 5.00 for torque and residual torque is 0.1N.m
  - Dimension : 228 x 297mm

- **Starter for DC machine [PTE-046-13]**
  - Circular rheostat for starting DC Motors
  - Resistance : 100 Ω, 160 W
  - Dimension : 228 x 297 mm

- **Field Regulator for ac and dc machine [PTE-046-14]**
  - Circular rheostat for field regulator ac and dc machine
  - Resistance : 3300 Ω, 160 W
  - Dimension : 228 x 297 mm

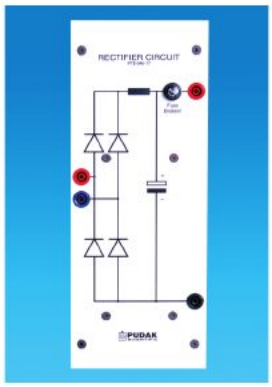
Continue >>

Unit Control Brake Machine
PTE-046-11

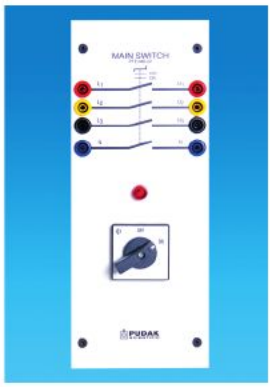
Starter for DC Machine
PTE-046-13

Field Regulator for AC and DC Machine
PTE-046-14

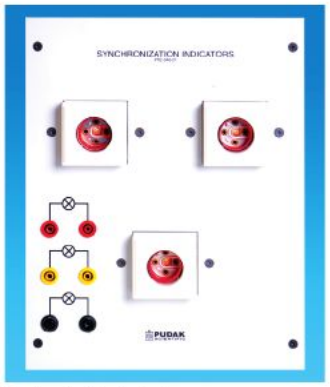
Field Regulator for AC and DC Generator
PTE-046-15



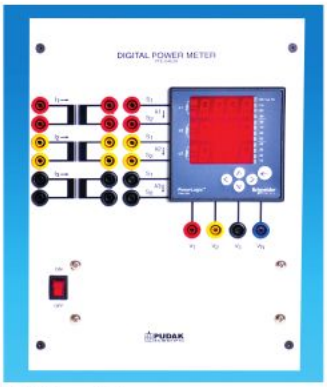
Rectifier Circuit
PTE-046-17



Main Switch
PTE-046-22



Synchronization Indicators
PTE-046-21



Digital Power Meter
PTE-046-28

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>> Specification Continued

- **Field Regulator for ac and dc generator [PTE-046-15]**
  - Circular rheostat for field regulator ac and dc generator
  - Resistance : 3300 Ω, 160 W
  - Dimension : 228 x 297 mm

- **Single phase load [PTE-046-16]**
  - Nominal power 30 W - 300 Watt continously variabel
  - Tolerance: ± 5%

- **Rectifier Circuit [PTE-046-17]**
  - Nominal Voltage 230 VAC, current source 10 A
  - Dimension : 228 x 297 mm

- **Resistive Load [PTE-046-18]**
  - Three reistances with possibility to connect in star/delta, controlled by three switches with 7 steps
  - Variable per phase nominal voltage: 220/380 VAC, max power: 300 Watt

- **Inductive Load [PTE-046-19]**
  - Three inductive with possibility to connect in star/delta, controlled by three switches with 7 steps
  - Variable per phase nominal voltage: 220/380 VAC, max power: 300 VAR

- **Capacitive Load [PTE-046-20]**
  - Three capacitive with possibility to connect in star/delta, controlled by three switches with 7 steps
  - Variable per phase nominal voltage: 220/380 VAC, max power 300 VAR

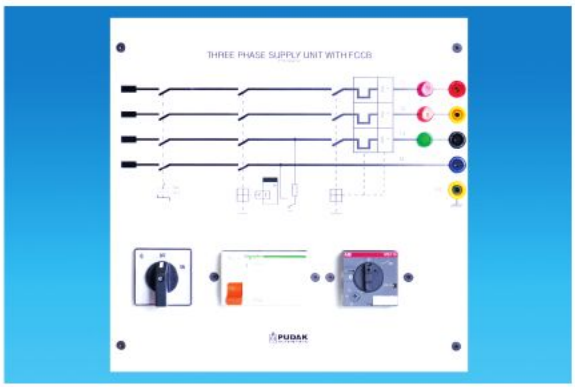
- **Synchronization Indicators [PTE-046-21]**
  - With three indicator lamps for qualitative indication of the phase relationship between mains and generator voltage (bright-dark circuit)
  - Dimension : 228 x 297 mm

- **Main Switch [PTE-046-22]**
  - On/Off switch, swicth load 10 A/ 400 V, 4 pole
  - Switch position : OFF - ON
  - Dimension : 114 x 297 mm

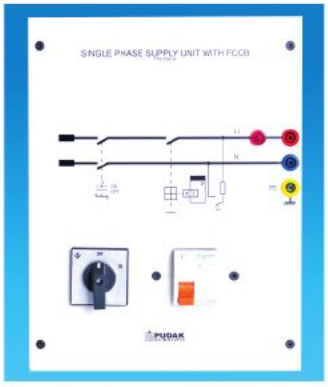
- **DC Voltmeter [PTE-046-26]**
  - Measuring instrument DC voltage, measuring range: 0 - 125 - 250 VDC,
  - Instrument : moving coil meter, classes 2, equipped with selector switch for selecting the voltage range.
  - Dimension : 114 x 297 mm

- **DC Amperemeter [PTE-046-27]**
  - Measuring instrument DC ampere, measuring range:0 - 1 - 5 A
  - Instrument : moving coil meter, classes 2, equipped with selector switch for selecting the ampere range.
  - Dimension : 114 x 297 mm

- **Digital Power meter [PTE-046-28]**
  - Measuring instrument power meter, main supply 220VAC. Can be used for measuring voltage current, frequency, power VA, power Watt, power VAR, and power factor. Display 4 digit LED.



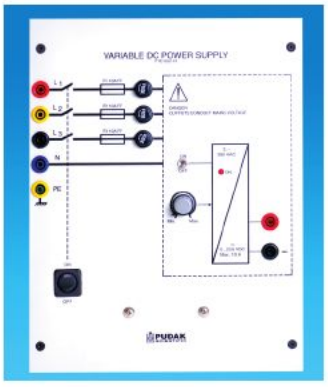
Three Phase Supply Unit with FCCB
PTE-052-01



Single Phase Supply Unit with FCCB
PTE-052-02

Single Phase Variable Power Supply
PTE-052-03

Three Phase Variable Power Supply
PTE-052-011



DC Variable Power Supply
PTE-052-13

Three Phase Synchronious AC Machine
PTE 046-08

PT 040105 Three Phase Syncronous AC and DC machine Trainer
consists of

Cat. No.	Description	Qty.
PTE-052-01	Three Phase Supply Unit with FCCB	1 pc
PTE-052-02	Single Phase Supply Unit	1 pc
PTE-052-03	Single Phase Variable Power Supply	1 pc
PTE-052-11	Three Phase Variable Power Supply	1 pc
PTE-052-13	DC Variabel Power Supply	1 pc
PTE-046-08	Three Phase Synchronous AC Machine	1 pc
PTE-046-09	DC Compound Machine	1 pc
PTE-046-10	Brake machine	1 pc
PTE-046-11	Brake Machine Control Unit	1 pc
PTE-046-13	Starter for DC machine	1 pc
PTE-046-14	Field Regulator for ac and dc machine	1 pc
PTE-046-15	Field Regulator for ac and dc generator	1 pc
PTE-046-16	Single phase load	1 pc
PTE-046-17	Rectifier Circuit	1 pc
PTE-046-18	Resistive Load	1 pc
PTE-046-19	Inductive Load	1 pc
PTE-046-20	Capacitive Load	1 pc
PTE-046-21	Synchronization Indicators	1 pc
PTE-046-22	Main Switch	1 pc
PTE-046-26	DC Voltmeter	1 pc
PTE-046-27	DC Amperemeter	1 pc
PTE-046-28	Digital Power Meter	1 pc
GSE-233-02	Safety Connecting Lead 100cm, Red	10 pcs
GSE-233-04	Safety Connecting Lead 100cm, Yellow	10 pcs
GSE-233-03	Safety Connecting Lead 100cm, Blue	10 pcs
GSE-233-01	Safety Connecting Lead 100cm, Black	10 pcs
GSE-231-04	Safety Connecting Lead100cm, Yellow-Green	5 pcs
GSE-232-02	Safety Connecting Lead 50cm, Red	5 pcs
GSE-232-01	Safety Connecting Lead 50cm, Black	5 pcs
GSE-232-01	Safety Connecting Lead 50cm, Yellow	5 pcs
GSE-231-02	Safety Connecting Lead 30cm, Red	10 pcs
GSE-231-01	Safety Connecting Lead 30cm, Black	10 pcs
GSE-231-05	Safety Connecting Lead 30cm, Yellow	10 pcs
GSE-235	Safety Connecting Cross	20 pcs
L11S-01E	Experiment Manual book	1 pc
GSN-245	TPS Frame 1200mm	1 set
GSN-305	Coupling	2 pcs

DC Compound Machine
PTE 046-09

Brake Machine
PTE-046-10

Single Phase Load
PTE-046-16

Resistive Load
PTE-046-18

Inductive Load
PTE-046-19

Specifications and illustrations are subject to change without prior notice

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Features

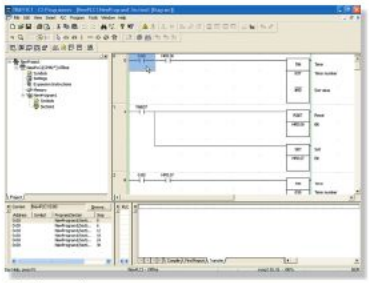
- The trainer is designed for easy teaching and practicing about the automation system and to train students so they have high skill in the automation system for industries.
- The system consists of modular blocks to enable the student in learning PLC system in modular way. The panel type constructions are easy to handle by student when conducting the experiment.
- All inputs and outputs on each panel are equipped with robust 4-mm sockets for easy connection.
- Model (simulation) plant are included for plant implementation, so the training goals can be achieved straightforward and simple.
- Complete with comprehensive experiment manual book to guide student step by step in conducting experiments.

PLC Trainer

PT 970100A

Covered Topics

- DE03001E Introduction to Programmable Logic Controller
- DE03002E Basic Programming
- DE03003E Outputs Instructions
- DE03004E Logic Instructions
- DE03005E Timer Instructions
- DE03006E Counter Instructions
- DE03007E Simulation to Run a Motor with a Contactor
- DE03008E Application of PLC in Traffic Light Control



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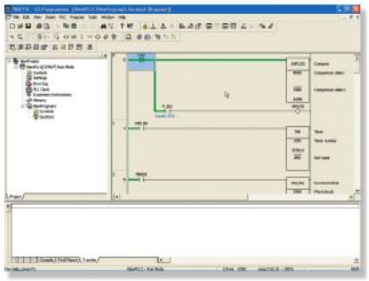


Online monitoring

Specification

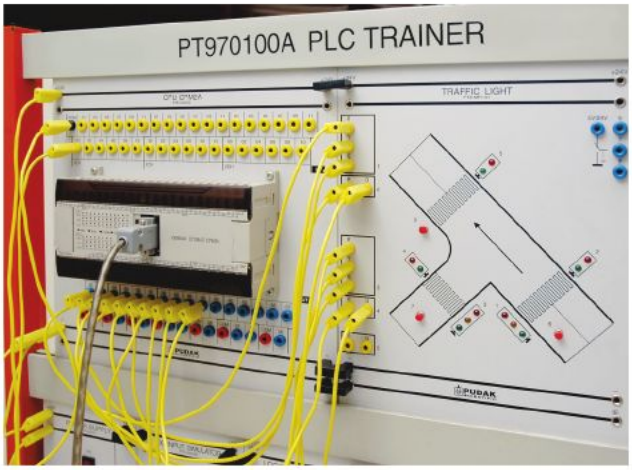
- **Power Supply [PTE-033-01]**
  - Output voltage : DC 24V
  - Output current : 2.1A
  - Input voltage : 220V / 50Hz
- **Main CPU [PTE-033-02]**
  - CPU : OMRON CPM2A
  - Program memory : 4096 words
  - Data memory : read/write 2048 words
  - External interrupt : 4
  - High speed counter
  - DC inputs : 36 inputs
  - DC outputs : 24 outputs
  - Analog control : 2 controls (setting range: 0-200)
  - PID control instruction : yes (with analog I/O)
  - Built in peripheral port : support host link, peripheral bus, no-protocol or Programming console connection
  - Built in RS232 port : support host link, peripheral bus, no-protocol 1:1 slave unit link, 1:1 master unit link, or 1:1 NT link connections
  - Max digital I/O capacity with additional I/O expansion units: 120 point
  - Max analog I/O with additional expansion units : 3 analog I/O unit (6 analog inputs 3 analog outputs)
- **Relays [PTE-033-05]**
  - DC inputs : 8 inputs
  - Relay outputs : 8 relay SPDT 220V, 0.5A
- **DC Input Simulator [PTE-033-06]**
  - 8 switches
  - Output voltage switch on : 24VDC
- **Logical LED Display [PTE-033-07]**
  - 16 LED as indicator
  - Inputs voltage : 24VDC

Continue >>

Training Panel System

>> Specification Continued

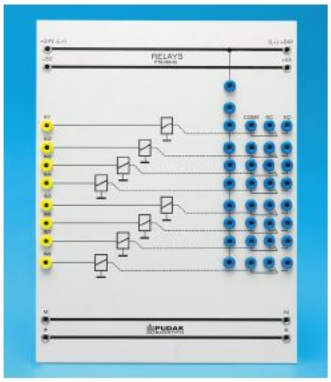
- **Traffic Light Model [PTE-MP1-01]**
  Traffic light model to simulate junction of main road and a branch/ minor road traffic light system inputs voltage: 24VDC
- **CX Programmer Software for PLC Programming [GSC 700]**
- **RS-232 Cable [GSE 230 02]**
- **Required Computer (Not included), with:**
  - Operating system minimum : Windows 98
  - Serial port (RS 232) minimum : 1 pc
  - CD ROM



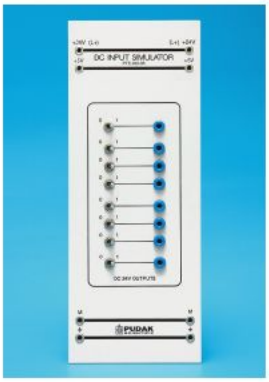
CPU CPM2A Omron [PTE-033-02] with Model (Simulation) Plant

PT 970100A PLC Trainer
consists of

Cat. No.	Description	Qty.
PTE-033-01	Power Supply	1 pc
PTE-033-02	CPU CPM2A Omron	1 pc
PTE-033-05	Relays	1 pc
PTE-033-06	DC Input Simulator	1 pc
PTE-033-07	Logical LED Display	1 pc
PTE-MP1-01	Traffic Light Model	1 pc
GSC 700	CD CX Programmer Software	1 pc
GSE 230 02	RS232 Cable	1 pc
FLS 20.02/097	Connecting Cross	40 pcs
KAL 99/40-050	Connecting Lead 50cm, Yellow	40 pcs
KAL 99/10-050	Connecting Lead 50cm, Black	10 pcs
KAL 99/20-050	Connecting Lead 50cm, Red	10 pcs
D03S-01E	Experiment Manual Book	1 pc
D03T-01E	SYSMAC CPM2A Programming Manual Book	1 pc
GSN 240	TPS Frame 600mm	1 set



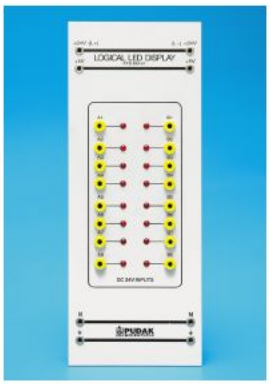
Relay Module
PTE 033-05



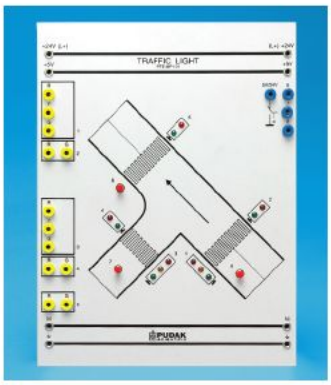
DC Input Simulator
PTE-033-06

Optional Model (Simulation) Plant

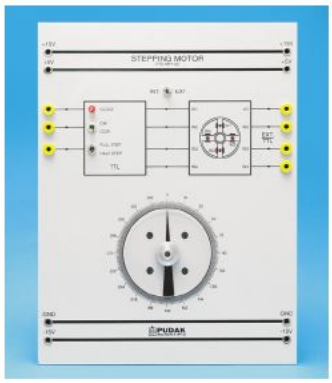
1. PTE-MP1-02 Stepper Motor
2. PTE-MP1-03 Washing Machine
3. PTE-MP1-04 Parking System
4. PTE-MP1-05 Tank System



Logical LED Display
PTE-033-07



Traffic Light Model
PTE-MP1-01



Stepper Motor Model
PTE-MP1-02

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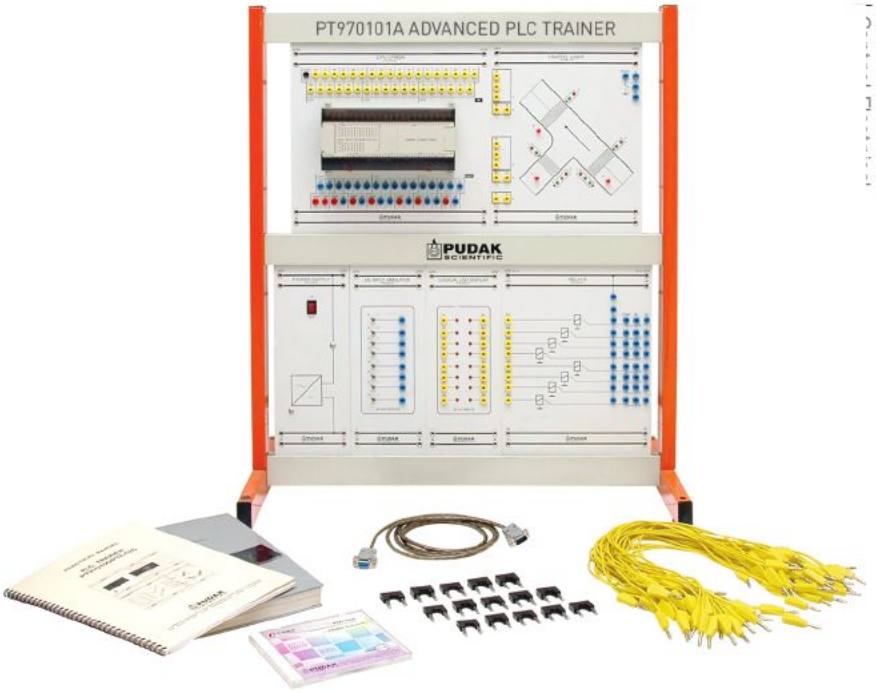
Features

- The trainer is designed for easy teaching and practicing about the automation system and to train students so they have high skill in the automation system for industries.
- The system consists of modular blocks to enable the student in learning PLC system in modular way. The panel type constructions are easy to handle by student when conducting the experiment.
- All inputs and outputs on each panel are equipped with robust 4-mm sockets for easy connection.
- Model (simulation) plant are included for plant implementation, so the training goals can be achieved straightforward and simple.
- Digital outputs expansion module is included for extended digital outputs point. Analog inputs/outputs expansion module is included for interfacing analog to digital form or digital to analog form.
- Complete with comprehensive experiment manual book to guide student step by step in conducting experiments.

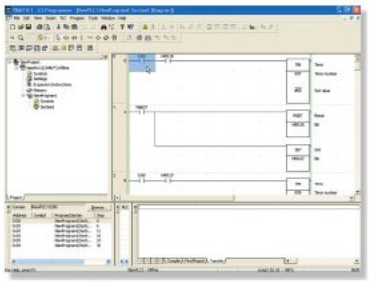
Advanced PLC Trainer

PT 970101A

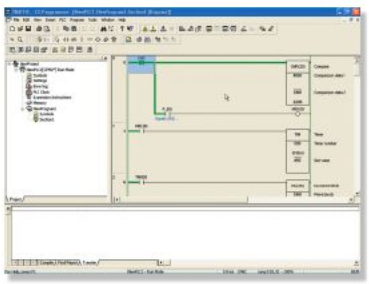


Covered Topics

- DE03001E Introduction to Programmable Logic Controller
- DE03002E Basic Programming
- DE03003E Outputs Instructions
- DE03004E Logic Instructions
- DE03005E Timer Instructions
- DE03006E Counter Instructions
- DE03007E Simulation to Run a Motor with a Contactor
- DE03008E Application of PLC in Traffic Light Control
- DE03009E Digital Outputs Expansion Module 8ET1
- DE03010E Analog Inputs/Outputs Expansion Module MAD01



Ladder editor



Online monitoring

Specification

- **Power Supply [PTE-033-01]**
  - Output voltage : DC 24V
  - Output current : 2.1A
  - Input voltage : 220V / 50Hz
- **Main CPU [PTE-033-02]**
  - CPU : OMRON CPM2A
  - Program memory : 4096 words
  - Data memory : read/write 2048 words
  - External interrupt : 4
  - High speed counter
  - DC inputs : 36 inputs
  - DC outputs : 24 outputs
  - Analog control : 2 controls (setting range: 0-200)
  - PID control instruction : yes (with analog I/O)
  - Built in peripheral port : support host link, peripheral bus, no-protocol or Programming console connection
  - Built in RS232 port : support host link, peripheral bus, no-protocol 1:1slave unit link, 1:1 master unit link, or 1:1 NT link connections
  - Max digital I/O capacity with additional I/O expansion units : 120 point
  - Max analog I/O with additional expansion units : 3 analog I/O unit (6 analog inputs 3 analog outputs)
- **Digital Expansion 8ET1 [PTE-033-03]**
  - Digital output : 8 outputs
- **Analog Expansion MAD01 [PTE-033-04]**
  - Analog input : 2 inputs (voltage or current input, selectable)
  - Analog output : 1 output (voltage or current output, selectable)
- **Relays [PTE-033-05]**
  - DC inputs : 8 inputs
  - Relay outputs : 8 relay SPDT 220V, 0.5A

Continue >>

Training Panel System

>> Specification Continued

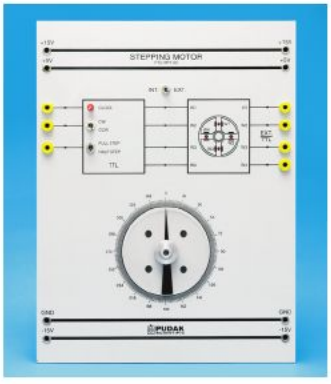
- DC Input Simulator [PTE-033-06]
  - 8 switches
  - Output voltage switch on: 24VDC
- Logical LED Display [PTE-033-07]
  - 16 LED as indicator
  - Inputs voltage : 24VDC
- Traffic Light Model [PTE-MP1-01]
  Traffic light model to simulate junction of main road and a branch/ minor road traffic light system inputs voltage: 24VDC
- CX Programmer Software for PLC Programming [GSC 700]
- RS-232 Cable [GSE 230 02]
- Required Computer (Not included), with:
  - Operating system minimum : Windows 98
  - Serial port (RS 232) minimum : 1 pc
  - CD ROM

PT 970101A Advance PLC Trainer
consists of

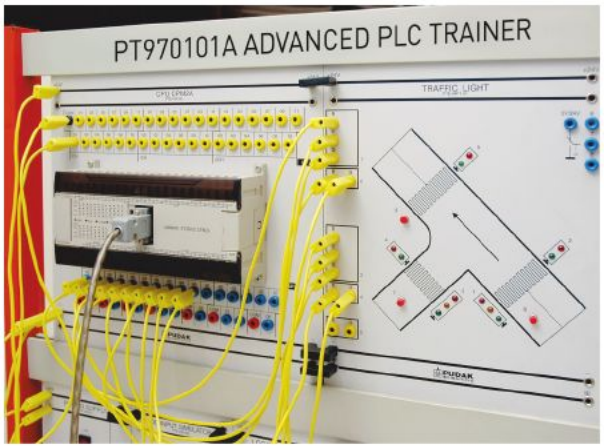
Cat. No.	Description	Qty.
PTE-033-01	Power Supply	1 pc
PTE-033-02	CPU CPM2A Omron	1 pc
PTE-033-03	Digital Expansion 8ET1	1 pc
PTE-033-04	Analog Expansion MAD01	1 pc
PTE-033-05	Relays	1 pc
PTE-033-06	DC Input Simulator	1 pc
PTE-033-07	Logical LED Display	1 pc
PTE-MP1-01	Traffic Light Model	1 pc
GSC 700	CD CX Programmer Software	1 pc
GSE 230 02	RS232 Cable	1 pc
	Expansion Connecting Cable	2 pcs
FLS 20.02/097	Connecting Cross	40 pcs
KAL 99/40-050	Connecting Lead 50cm, Yellow	40 pcs
KAL 99/10-050	Connecting Lead 50cm, Black	10 pcs
KAL 99/20-050	Connecting Lead 50cm, Red	10 pcs
D03S-02E	Experiment Manual Book	1 pc
D03T-01E	SYSMAC CPM2A Programming Manual Book	1 pc
GSN 240	TPS Frame 600mm	1 set

Optional Model (Simulation) Plant

1. PTE-MP1-02 Stepper Motor
2. PTE-MP1-03 Washing Machine
3. PTE-MP1-04 Parking System
4. PTE-MP1-05 Tank System



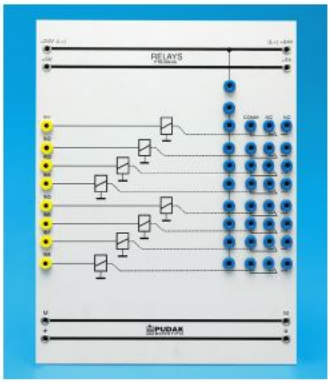
Stepper Motor Model
PTE-MP1-02



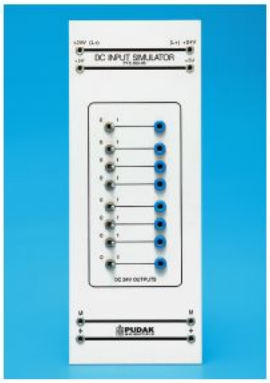
CPU CPM2A Omron [PTE-033-02] with Model (Simulation) Plant

Digital Expansion 8ET1
PTE 033-03

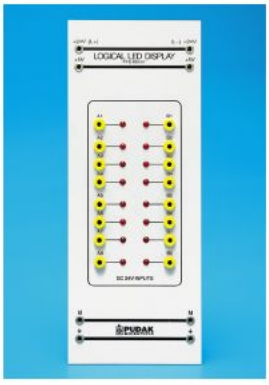
Analog Expansion MAD01
PTE-033-04



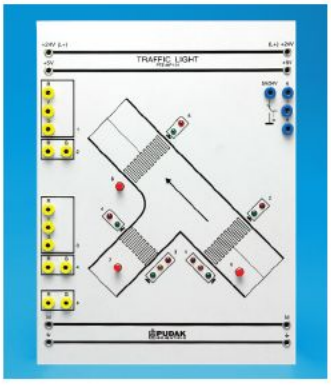
Relays
PTE 033-05



DC Input Simulator
PTE-033-06



Logical LED Display
PTE-033-07



Traffic Light Model
PTE-MP1-01

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ViPSim System

PT 992322

ViPSim Software

- The ViPSim software is a virtual graphic 2D process simulation program with numerous attractive examples for PLC training. This includes realistic exercises and processes.
- The function behavior of the plant process hardware is replaced by emulated plant process models on a PC. The control signals exchange between the PC and actual PLC (any PLC can be used) is via portbridge interface. This means that the PLC working environment is identical to the industrial plant through to the portbridge.
- The ViPSim software is provided with an extensive library of interesting process models to emulate the functional behavior of real plant processes. The students have the option to operate manually the actuators. This provides students with a process-orientated understanding of the model which is fundamental and important for creation of a control sequence. The practical models are documented and met a broad range of requirements.

PortBridge Interface

- PortBridge brings together the world of software and simulation with actual training equipment.
- The PortBridge interface is used for bidirectional transmission of process signals between a real control process (24V DC system) and a PC.
- The communication between PortBridge interface to the PC is via serial Rs232 interface. This line communication is electrically isolated to protect the PC from damage possibility.
- The principle is simple, the PortBridge is connected to the PC via the serial RS232 interface and connected to the actual PLC by 4mm sockets. Input and output signals can be read by the PC.
- All input and output terminals of the digital function are equipped with LED indicators to indicate the current state of the input or output terminals.
- Provided with two analog outputs and one analog input. All inputs and outputs on PortBridge are equipped with robust 4-mm sockets for easy connections.

PT 992322 ViPSim System consists of:

Cat. No.	Description	Qty.
PTE-MP1-3236	PortBridge interface	1 pc
GSC 700 02	ViPSim software	1 pc
GSC 230 15	Standard serial cable	1 pc
FLS 20.02/097	Bridging plug	10 pcs
KAL 99/10-075	Connecting lead 75cm, black	60 pcs
GSC 230 16	USB to Serial cable	1 pc

Specification

- **DC input :** 32 inputs
- **DC output :** 36 outputs (transistor source)
- **Analog output :** 2 outputs (range 0 - 10V)
- **Analog input :** 1 input (range 0 - 10V)
- **Communication:** RS 232 electrically isolated (optocoupler)
- **LED Status indicator**
- **Power supply :** 24V DC

Experiment with VIPSim Trainer

Covered Plant Models

- Hot Water Tank
- Digital Counter
- Home Alarm System
- Automatic Garage System
- PDA Timer
- Ball Sorting System
- Ball Packaging
- Three Pistons
- Safety Box Lock System
- Traffic Light Control System
- Traffic Light Control System 2
- Elevator Control System
- Traffic Light Control For
- 3-Way Inter Section
- Bottling Wine System
- Controlling Water Level

We continue developing new plant process models. Please contact us or see our website to see newest plant model

Computer Requirement (not included)

- Minimum Pentium III 800MHz
- Serial port (RS232) or USB port
- CD ROM
- Minimum operating system Windows ME

Related Equipment (not included)

Cat. No.	Description	Qty.
PT 970100A	PLC Trainer	1 set
PT 970101A	Advance PLC Trainer	1 set

Color Ball Sorting System

Digital Counter

Home Alarm System

Balls Packaging

Automatic Garage Door

Hot Water Tanks

Traffic Light control

Traffic Light Control
For 3-Way Inter Section

Bottling Wine System

Safety Box Lock System

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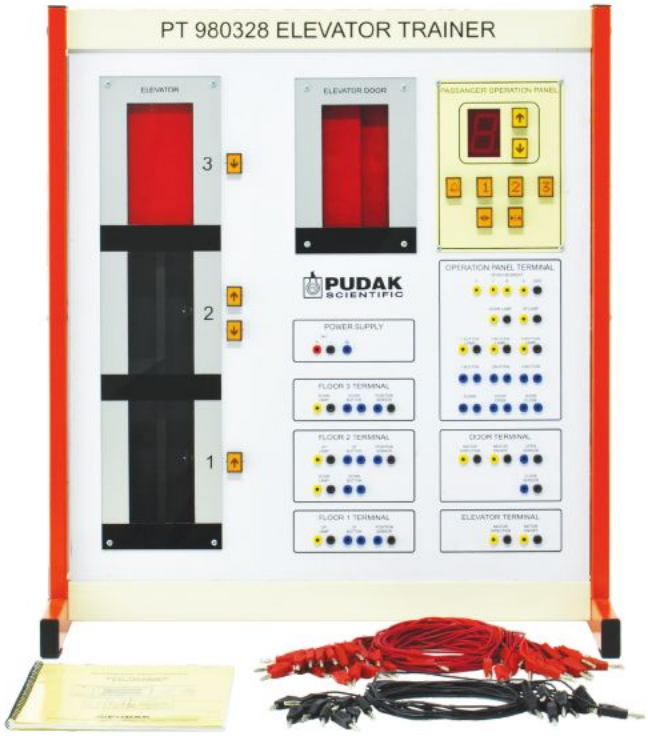
Elevator Trainer

PT 980328

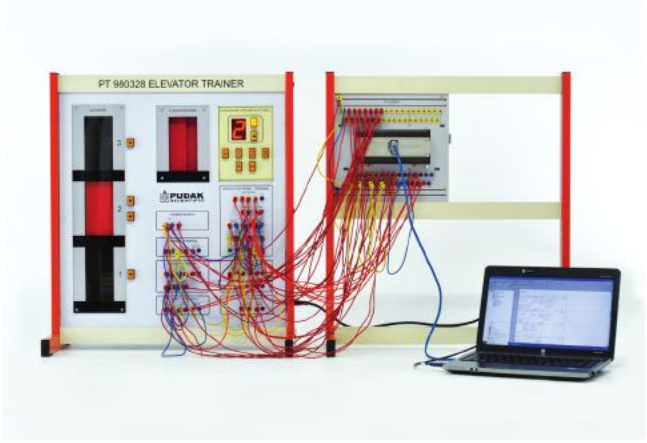
Features

- The trainer is designed to demonstrate and simulate the operations of the real elevator.
- The trainer can be used as an PLC application to show PLC interfacing and control based on real life plan application.
- Three level elevator with elevator door simulation.
- Equipped with cabin over travel safety switch both in top and down.
- Equipped with door over travel safety switch both in open and close side.
- Equipped with over travel LED indicator for both cabin and door.
- Manual control of cabin and door movement.
- DC motorized for cabin and elevator door.
- Passenger operation panel with seven segment display for the level number.
- Can be Interfaced with any PLC type.
- All input and output are equipped with robust 4-mm sockets for easy connection.
- Completed with comprehensive experiment manual book to guide student step by step in conducting experiment.



Covered Topics

- DE070001E Introduction to elevator.
- DE070002E Elevator Inisialization.
- DE070003E Basic Control of Elevator.
- DE070004E A Two Level Elevator.
- DE070005E A Three Level Elevator.
- DE070006E Advanced Three Level Elevator.



Advanced Three Level Elevator

Specification

Power Supply
- Input Voltage : 220V, 50Hz
- Output voltage : 24V DC, 2.1A

Elevator cabin
- Motor type : Geared DC Motor
- Motor ON/OFF input
- Motor Direction Input
- Bottom and Top over travel safety switch

Elevator door
- Motor type : Geared DC Motor
- Motor ON/OFF input
- Motor Direction Input
- Open sensor
- Close sensor

Passenger operation panel
- 7 segment display, BCD input
- Floor button : 3pcs
- Open button
- Close button
- Bell button
- Up indicator lamp
- Down indicator lamp

Floor 1
- Position sensor
- Up button with indicator lamp

Floor 2
- Position sensor
- Up button with indicator lamp
- Down button with indicator lamp

Floor 3
- Position sensor
- Down button with indicator lamp

PT 980328 Elevator Trainer
consists of

Cat. No.	Description	Qty.
PT980328	Elevator Trainer	1 set
KAL 99/10-75	Connecting lead 75cm, black	60 pcs
KAL 99/20-75	Connecting lead 75cm, Red	10 pcs
D07S-01E	Experiment Manual Book (for Omron PLC)	1 pc

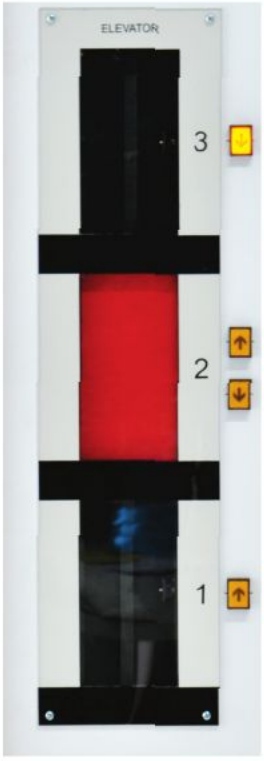
Required Equipment (not included)

Cat. No.	Description	Qty.
PT 970100A	PLC Trainer	1 set
PT 970101A	Advanced PLC Trainer	1 set

or other PLC with specification as below:
- Inputs and outputs should be 24V DC system.
- Minimum input number : 16 inputs.
- Minimum output number : 17 outputs.

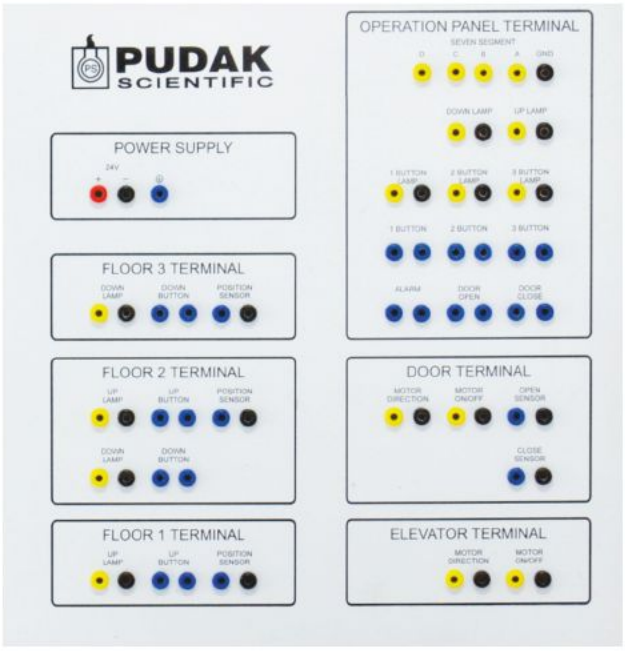
Passenger Operation panel

Elevator Door



Elevator Cabin

Manual Control



Elevator Terminal Connection

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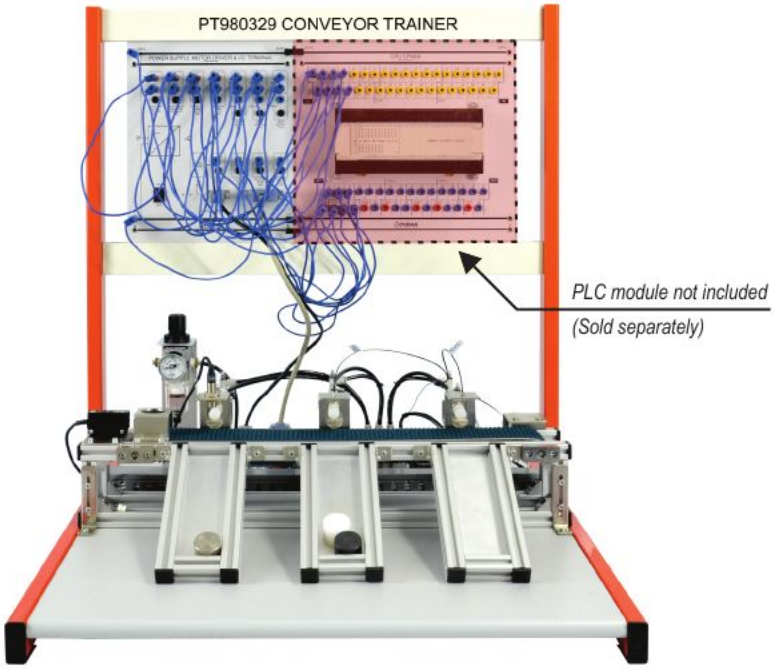
Features

- The trainer is designed to demonstrate and simulate the operations of the belt conveyor.
- The trainer can be used as an PLC application to show PLC interfacing and control based on production line application in manufacture industry.
- Used industrial pneumatic valves, cylinder and sensor.
- Based on a belt type conveyor with sensors placed at various location to detect object on the belt.
- The object sorted and distributed based on metal or non-metal object.
- For non-metal object sorted again and distributed based on color (black or white).
- Can be Interfaced with any PLC type.
- All input and output are equipped with robust 4-mm sockets for easy connection.
- Completed with comprehensive experiment manual book to guide student step by step in conducting experiment.

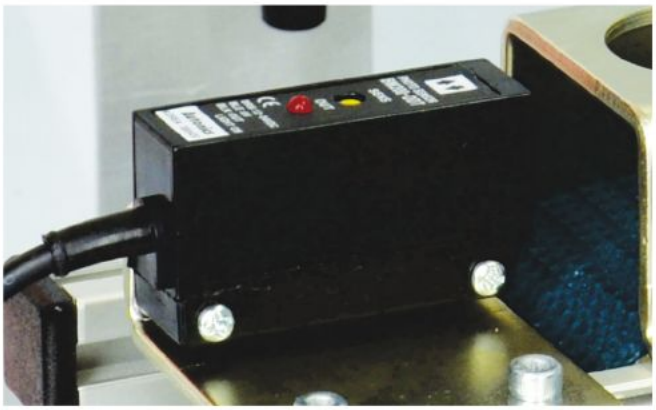
Conveyor Trainer

PT 980329



Covered Topics

DE080001E	Introduction to Conveyor
DE080002E	Object Sensor
DE080003E	Actuation of Cylinder
DE080004E	Motor Control
DE080005E	Sorting and Distribution Based on Metal or Non-Metal
DE080006E	Sorting and distribution based on material type and color of object



Diffusion reflective photo sensor

Specification

- **Power Supply**
  - Input Voltage : 220V, 50Hz
  - Output voltage : 24V DC, 2.1A
- **Conveyor**
  - Type : Belt
  - Belt size : 45(W)x490(L)mm
  - Speed : Fixed
  - Motor type : Geared DC Motor
  - Motor driver
  - Motor input voltage : 24V DC
- **Object Sensors**
  - Diffusion reflective photo sensor
    - Quantity : 1 pc
    - Power supply : 24V DC
    - Sensitivity adj. : Adjuster
    - Output : Transistor source
  - Fiber optic photo sensor
    - Quantity : 2 pcs
    - Power supply : 24V DC
    - Sensitivity adj. : Sensitivity adjustment button
    - Output : Transistor source
  - Proximity sensor
    - Quantity : 1 pc
    - Type : Inductive
    - Power supply : 24V DC
    - Setting distance
    - Output : Transistor source
- **Object sorting & distribution**
  - Double acting cylinder
  - Quantity : 3 pcs
  - Equipped with flow control
  - Equipped with 2 Position sensor
    - Type : Two wire
    - Load voltage : 24V DC

Continue >>

Training Panel System

>> Specification Continued

- 5/2 single solenoid valve : 3 pcs
  - Type of actuation : 2 position single
  - Rate voltage : 24V DC

- Accessories
  - Connecting cables
  - Object sample
  - Silent compressor
    - Power supply : 220V AC

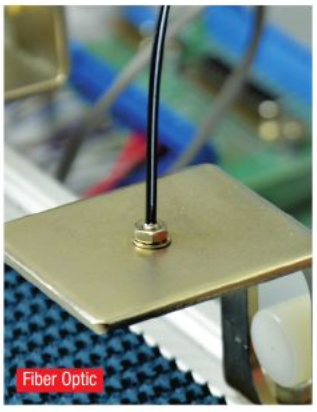
PT 980329 Conveyor Trainer consists of

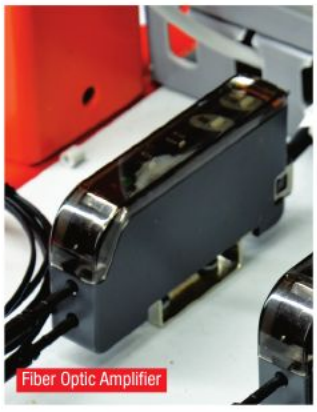
Cat. No.	Description	Qty.
PT980329	Conveyor Trainer	1 set
PTE-039-01	Power supply, motor driver & I/O terminal	1 pc
	DB25 I/O Connecting Cable	1 pc
	DB9 Motor Connecting Cable	1 pc
KAL 99/10-75	Connecting lead 75cm, black	60 pcs
KAL 99/20-75	Connecting lead 75cm, Red	10 pcs
	Metal object sample	4 pcs
	White object sample	4 pcs
	Black object sample	4 pcs
	Silent Compressor	1 pc
D08S-01E	Experiment Manual Book (for Omron PLC)	1 pc

Required Equipment (not included)

Cat. No.	Description	Qty.
PT 970100A	PLC Trainer	1 set
PT 970101A	Advanced PLC Trainer	1 set

or other PLC with specification as below:
- Inputs and outputs should be 24V DC system.
- Minimum input number : 16 inputs.
- Minimum output number : 4 outputs.

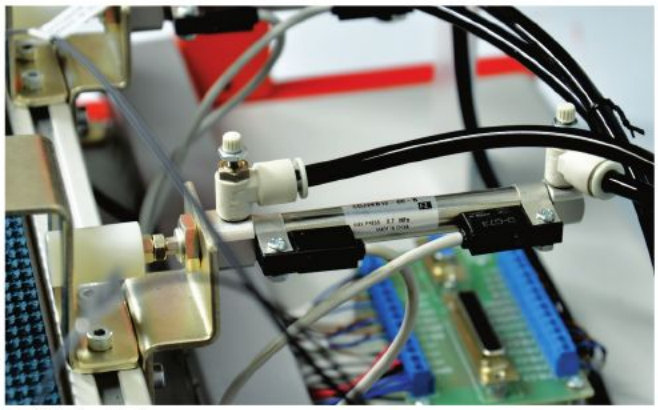




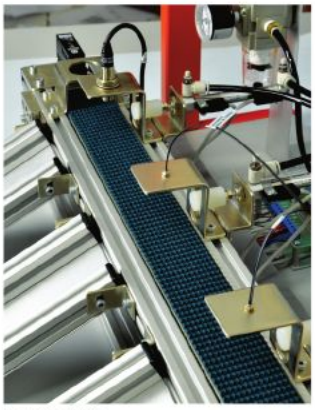
Fiber Optic Foto Sensor

Proximity

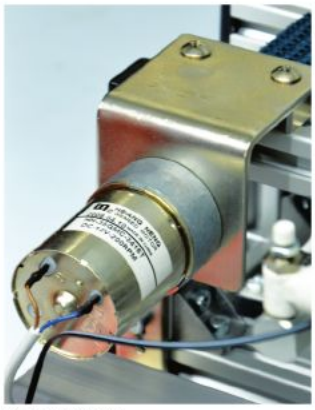
5/2 single solenoid valve



Double Acting Cylinder



Conveyor Belt



Geared DC Motor

DB25 and DB9 Connecting Cable

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Features

- The trainer is designed to introduce, familiarizing and understanding the pneumatic and electro pneumatic technology.
- All pneumatic and electro pneumatic components are securely attached to the panel. This eliminates the potential of lost or misplaced items and reduces set-up time for each class.
- Complete with three interchangeable modules (ends of stroke, sliding door, feeder-stamper-sorter) allow the user to start up examples of real applications using pneumatic and electro pneumatic technologies.
- Inductive proximity sensor used to sorting parts based on metal and non-metal.
- All electrical input and output are low level DC and equipped with robust 4-mm sockets for easy connection.
- Completed with comprehensive experiment manual book to guide student step by step in conducting experiment.

NEW PRODUCT

Electro-Pneumatic Trainer

PT 030100

Covered Topics

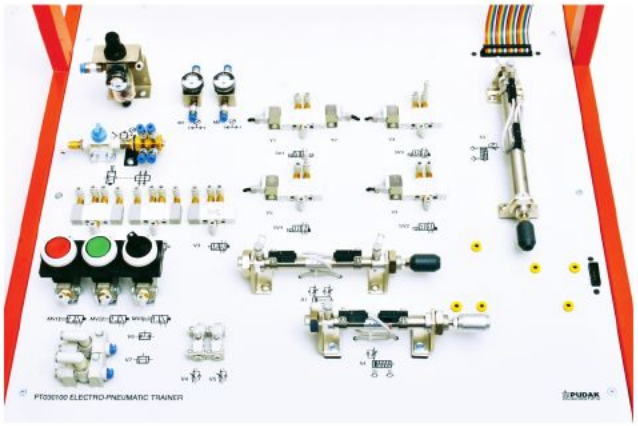
- DE090001E Basic Pneumatic & Electro-pneumatic System
- DE090002E Direct Control Of a Single Acting Cylinder
- DE090003E Indirect Control Of a Single Acting Cylinder
- DE090004E Indirect Control Of a Double Acting Cylinder
- DE090005E Control Of a Double Acting Cylinder With Double Valve
- DE090006E Control Of a Double Acting Cylinder From Two Independent Locations
- DE090007E Control Of a Double Acting Cylinder From Two Simultaneous Locations
- DE090008E Memory Function With a Single Valve
- DE090009E Detection And Control Of the Cylinder Position
- DE090010E Activation Of a Control Signal According to Pressure
- DE090011E Speed Adjustment in a Double Acting Cylinder
- DE090012E Single Control Of a Single Acting Cylinder With a Single Solenoid Valve
- DE090013E Control Of a Single Acting Cylinder With a Double Solenoid Valve
- DE090014E Single Control Of a Double Acting Cylinder With a Single Solenoid Valve
- DE090015E Control Of a Double Acting Cylinder With a Double Solenoid Valve
- DE090016E Control With a Single Solenoid Valve With Double Effect (Memory)
- DE090017E Detection And Control Of a Double Acting Cylinder Position With Mechanical Ends Of Stroke
- DE090018E Detection And Control Of a Double Acting Cylinder Position With Auto Switches
- DE090019E Pneumatic Actuation Of a Door Using a Double Acting Cylinder
- DE090020E Electro-pneumatic Actuation Of a Door Using Two Push-buttons
- DE090021E Feeding Of Part From a Vertical Warehouse
- DE090022E Feeding Of Parts from a Vertical Warehouse With Detection Of Presence Of Parts
- DE090023E Feeding Of Parts From a Vertical Warehouse With Ejection Of Parts
- DE090024E Pneumatic Press With Safety Actuation (With Two Push-buttons)
- DE090025E Feeding Of Parts From a Vertical Warehouse With Ejection of Parts
- DE090026E Stamper By Means Of a Double Acting Cylinder
- DE090027E Stamper By Means Of a Double Acting Cylinder With Vertical Warehouse And Part Feeder
- DE090028E Stamper By Means Of a Double Acting Cylinder With Vertical Warehouse, Part Feeder And Ejection Mechanism and Sorting Mechanism

Training Panel System

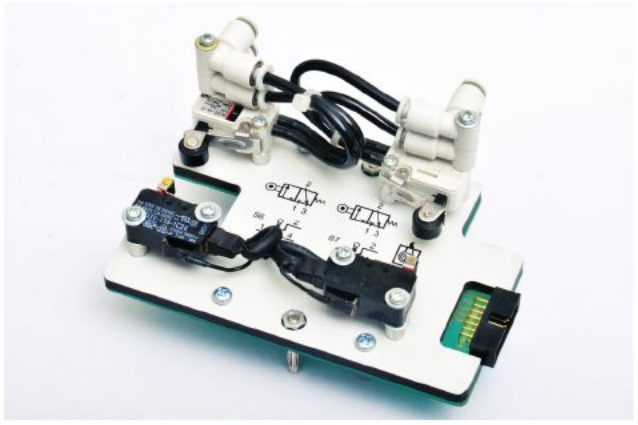
Specification

- **Air Filter regulator**
  - Set pressure range : 0.05 to 0.7MPa
  - Drain capacity (cm3) : 2.5
- **Pressure gauge**
  - Gauge range : 0 to 1MPa
- **Manual valve operated by push-button**
  - Operating pressure : -100kPa to 1MPa
- **Manual valve operated by selector**
  - Operating pressure : -100kPa to 1MPa
- **Shuttle valve**
  - Input ports : 2
  - Output port : 1
  - Operating pressure : 0.05 to 1MPa
- **And valve**
  - Input ports : 2
  - Output port : 1
  - Operating pressure : 0.05 to 1MPa
- **Air operated single valve**
  - Type of actuation : 2 position single
  - Operating pressure range : 0.15 to 0.7MPa
  - Pilot pressure range : 0.2 to 0.6MPa
- **Air operated double valve**
  - Type of actuation : 2 position double
  - Operating pressure : 0.1 to 0.7MPa
  - Pilot pressure range : 0.1 to 0.7MPa
- **Single acting cylinder spring return 50mm**
  - Built-in magnet
  - Stroke : 50mm
  - Bore size : 12mm
  - Operating pressure range : 0.08 to 1MPa
  - Reed switch : 2
- **Single acting cylinder spring return 100mm**
  - Built-in magnet
  - Stroke : 100mm
  - Bore size : 16mm
  - Operating pressure range : 0.05 to 1MPa
  - Reed switch : 2
- **Double acting cylinder 80mm**
  - Built-in magnet
  - Stroke : 80mm
  - Bore size : 12mm
  - Operating pressure range : 0.08 to 1MPa
  - Reed switch : 2
- **Speed controller**
  - Operating pressure range : 0.1 to 1MPa
- **Single solenoid valve**
  - Type of actuation : 2 position single
  - Internal pilot operating pressure range : 0.15 to 0.7MPa
  - Coil rate voltage : 24V DC
  - Indicator : LED
- **Double solenoid valve**
  - Type of actuation : 2 position double
  - Internal pilot operating pressure range : 0.1 to 0.7MPa
  - Coil rate voltage : 24V DC
  - Indicator : LED
- **Air Distributor**
  - Manual valve controlled by selector
  - Input port : 1
  - Output port : 4

Continue >>

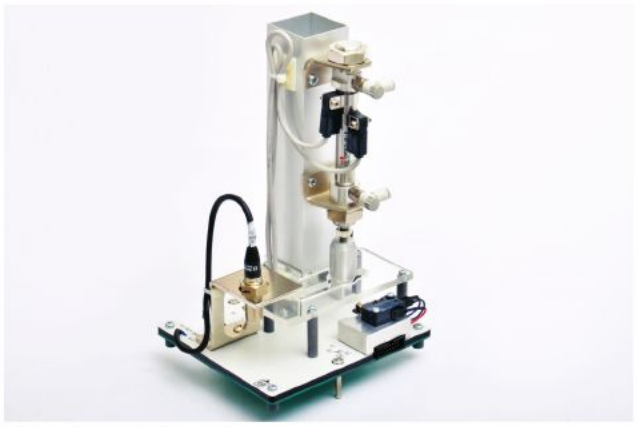


Pneumatic & Electro Pneumatic components



Ends of stroke module

Sliding door module



Fedder-Stamper-Sorter module

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>> Specification Continued

- **End Of Stroke module**
  - Manual valve operated by roller lever
    Mechanical operation : roller lever
    Number of port : 3
    Operating pressure : 0 to 0.8MPa
  - Limit switch
    Rating : 11A at 250V AC
    Contact form : SPDT
    Actuator : Roller lever

- **Sliding door module**
  - Door material : Flexiglass

- **Feeder-Stamper-Sorter module**
  - Double Acting cylinder 40mm
    Built-in magnet
    Stroke : 40mm
    Bore size : 12mm
    Operating pressure range : 0.08 to 1MPa
    Reed switch : 2
  - Vertical warehouse
  - Vertical warehouse presence parts sensor
    Rating : 11A at 250V AC
    Contact form : SPDT
    Actuator : Roller lever
  - Presence part sensor
    Rating : 11A at 250V AC
    Contact form : SPDT
    Actuator : Roller lever
  - Inductive proximity sensor
    Sensing distance : 4mm
    Standard sensing target : 12x12x1mm (iron)
    Control output : NPN N.O.
    Operating voltage : 12 to 24Volt

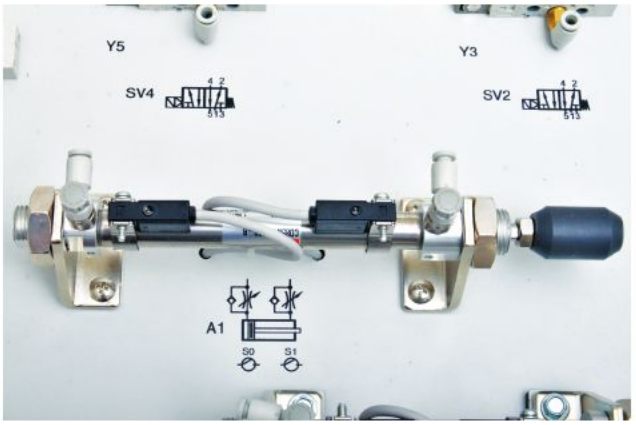
- **Indicator Lamps [PTE-080-01]**
  - LED lamps : 3pcs
  - Input voltage : 24V

- **Locking Push buttons [PTE-080-02]**
  - Locking push buttons : 2pcs
  - Rating : 1A
  - Contact form : DPDT

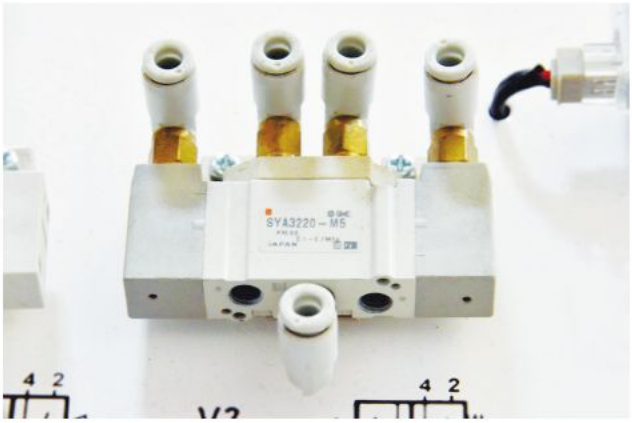
- **Push buttons [PTE-080-03]**
  - Push buttons : 2pcs
  - Rating : 1A
  - Contact form : DPDT

- **Relays [PTE-080-04]**
  - Relays : 2pcs
  - Input voltage : 24VDC
  - Contact form : DPDT
  - Contact rating : 2A (28VDC), 0.5A (125VAC)

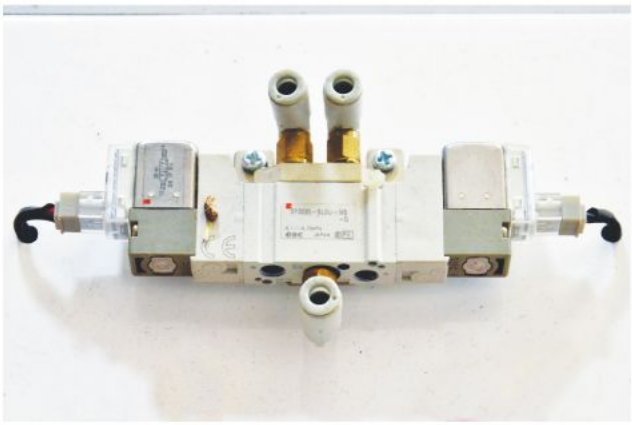
- **Power Supply [PTE-033-01]**
  - Output voltage : 24VDC
  - Output current : 2.1A
  - Input voltage : 220VAC/50Hz



Actuator



Pneumatic Valve



Electro Pneumatic Valve

Tubes cutter

Training Panel System

PT 030100 Electro-Pneumatic Trainer
consists of

Cat. No.	Description	Qty.
PT030100	Electro-pneumatic trainer	1 set
	Ends of stroke module	1 pc
	Sliding door module	1 pc
	Fedder-Stamper-Sorter module	1 pc
PTE-080-01	Indicator lamps	1 pc
PTE-080-02	Locking push buttons	1 pc
PTE-080-03	Push buttons	1 pc
PTE-080-04	Relays	2 pcs
PTE-033-01	Power Supply	1 pc
	Metal parts	4 pcs
	Plastic parts	4 pcs
	Tubes Ø 4mm	10 m
	Tubes Ø 6mm	2 m
	Tubes cutter	1 pc
	Tube extractor	1 pc
	Branch tee fitting	10 pcs
	Plug	10 pcs
KAL 99/10-050	Connecting leads 50cm, black	25 pcs
KAL 99/10-030	Connecting leads 30cm, black	25 pcs
KAL 99/20-075	Connecting leads 75cm, red	20 pcs
FLS 20.02/097	Connecting cross	15 pcs
	Compressor	1 pc
D09S-01E	Experiment manual book	1 pc

Metal parts

Plastic parts

Tube extractor

Tubes Ø 4mm

Branch tee fitting

Tubes Ø 6mm

Specifications and illustrations are subject to change without prior notice

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Features

- The trainer is designed as a teaching aid in basic refrigeration vapor compression system.
- The trainer displays refrigerant pipes and basic refrigeration components to familiarize the student on basic refrigeration cycle.
- Evaporator and condenser are fitted with transparent pipes to enable the student to directly observe the phase transition of the refrigerant.
- The trainer is equipped with an expansion valve and capillary tubes of varying length to familiarize the student on different expansion components.
- Evaporator and condenser fans are equipped with variable speed controller to provide the varying air flow rate.
- Frames are made of rectangular steel pipe with 2mm wall thickness to ensure rigidity, finished with powder coated in orange color.
- Complete with comprehensive experiment manual book to guide student step by step in conducting experiments.

General Cycle Refrigeration Trainer

PT 920800

Covered Topics

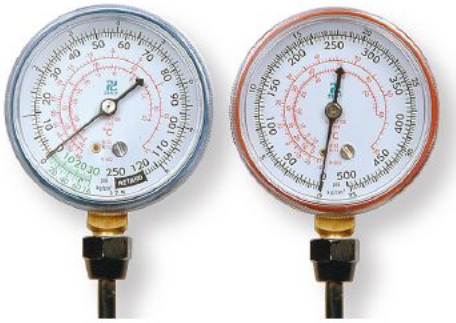
RE01001E	Basic Refrigeration Vapor Compression System
RE01002E	Representation Vapor Compression System on p-h Chart
RE01003E	Refrigerating Effect and Cooling Capacity
RE01004E	Energy Balance on Vapor Compression System
RE01005E	COP (Coefficient of Performance) of Vapor Compression System
RE01006E	Comparison of Capillary Tube and Thermostatic Expansion Device
RE01007E	Comparison of Varying Length on Capillary Tube Expansion Device
RE01008E	Effect of Varying Air Flow Rate on Air-Cooled Condenser

Specification

- **Compressor**
  - Hermetically reciprocating, R-134A
  - 0.25 HP
  - Input voltage: 220-240VAC, ~ 50Hz
- **Condenser**
  - Finned tube fitted with transparent tubes
  - Fan equipped with variable speed controller
- **Evaporator**
  - Finned tube fitted with transparent tubes
  - Fan equipped with variable speed controller
- **Expansion Devices**
  - Thermostatic expansion valve with external equalizer, 0.5TR
  - 3 Capillary tubes : 1m, 1.3m and 2.5m
- **Refrigerant**
  - R-134A
- **Components:**
  - Suction pressure gauge, 0-8Bar
  - Discharge pressure gauge, 0-34Bar
  - High pressure switch, R-134A
  - Low pressure switch, R-134A
  - Refrigerant receiver
  - Filter Driers, R-134A, ¼ in
  - Sight Glass, ¼ in
  - Hand Valves, ¼ in
- **Digital Thermometer with Thermocouples**
  - Resolution: 1/0.1°C

PT 920800 General Cycle Refrigeration Trainer consists of

Cat. No.	Description	Qty.
PT 920800	General Cycle Refrigeration Trainer	1 set
GMM 321	Digital Thermometer	1 pc
PHT 281	Thermocouple, K type	2 pcs
R01S-01E	Experiment Manual Book	1 pc



Suction Pressure Gauge, R-134A and
Discharge Pressure Gauge, R-134A

High Pressure Switch, R-134A and
Low Pressure Switch, R-134A

Compressor, R-134A, 0.25 HP

Condenser with transparent tubes and
Evaporator with transparent tubes

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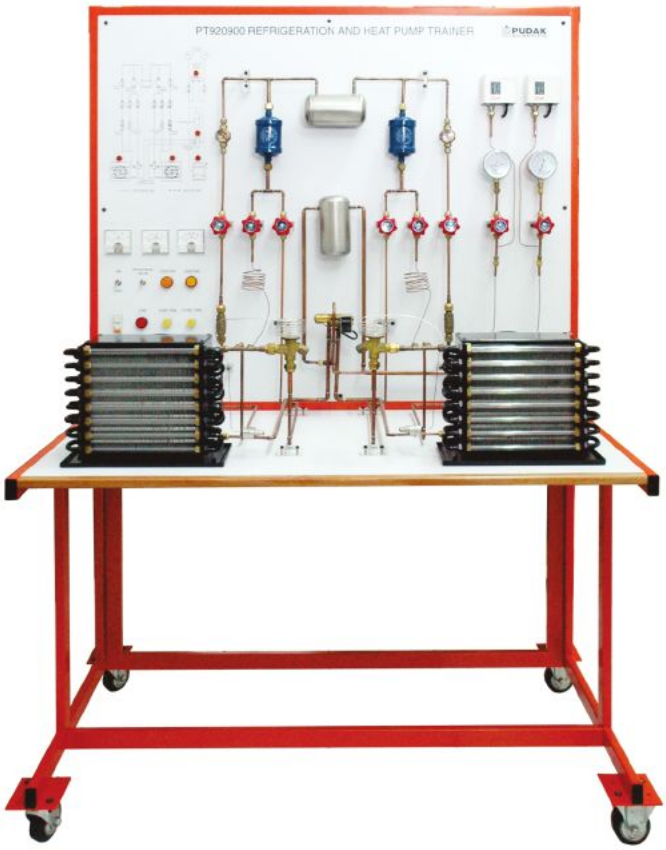
Features

- The trainer is designed as a teaching aid in basic refrigeration and heat pump system with 4-way reversing valve component.
- 4-way reversing valve provide a reversible cycling mode, cooling mode and heating mode.
- Evaporator and condenser are fitted with transparent pipes to enable the student to directly observe the phase transition of the refrigerant.
- The trainer is equipped with an expansion valve and capillary tubes to familiarize the student on different expansion components.
- Evaporator and condenser fans are equipped with variable speed controller to provide the varying air flow rate.
- Frames are made of rectangular steel pipe with 2mm wall thickness to ensure rigidity, finished with powder coated in orange color.
- Complete with comprehensive experiment manual book to guide student step by step in conducting experiments.

Refrigeration and Heat Pump Trainer

PT 920900



Covered Topics

RE02001E	Basic Refrigeration System
RE02002E	Heat Pump System with 4-Way Reversing Valve Component
RE02003E	Representation Heat Pump System on P-H Chart
RE02004E	Energy Balance on Heat Pump System
RE02005E	COP (Coefficient of Performance) of Heat Pump System
RE02006E	Comparison of Capillary Tube and Thermostatic Expansion Device

Specification

- **Compressor**
  - Hermetically reciprocating, R-134A
  - 0.25 HP
  - Input voltage: 220-240VAC, ~ 50Hz
- **Condenser**
  - Finned tube fitted with transparent tubes
  - Fan equipped with variable speed controller
- **Evaporator**
  - Finned tube fitted with transparent tubes
  - Fan equipped with variable speed controller
- **4-way Reversing Valve**
  - Capacity 5kW
- **Expansion Devices**
  - 2 Thermostatic expansion valve, 0.5TR
  - 2 capillary tubes : each 1.3m
- **Refrigerant**
  - R-134A
- **Components:**
  - Suction pressure gauge, 0-8Bar
  - Discharge pressure gauge, 0-34Bar
  - High pressure switch, R-134A
  - Low pressure switch, R-134A
  - Refrigerant receiver
  - Filter Driers, R-134A, ⅜ in
  - Sight Glass, ¼ in
  - Hand Valves, ¼ in
- **Digital Thermometer with Thermocouples**
  - Resolution: 1/0.1°C

PT 920900 Refigeration and Heat Pump Trainer consists of

Cat. No.	Description	Qty.
PT 920900	Refigeration and Heat Pump Trainer	1 set
GMM 321	Digital Thermometer	1 pc
PHT 281	Thermocouple, K Type	2 pcs
R02S-01E	Experiment Manual Book	1 pc

Compressor, R-134A, 0.25 HP

Condenser with transparent tubes and
Evaporator with transparent tubes

Suction Pressure Gauge, R-134A and
Discharge Pressure Gauge, R-134A

4-way Reversing Valve

High Pressure Switch, R-134A and
Low Pressure Switch, R-134A

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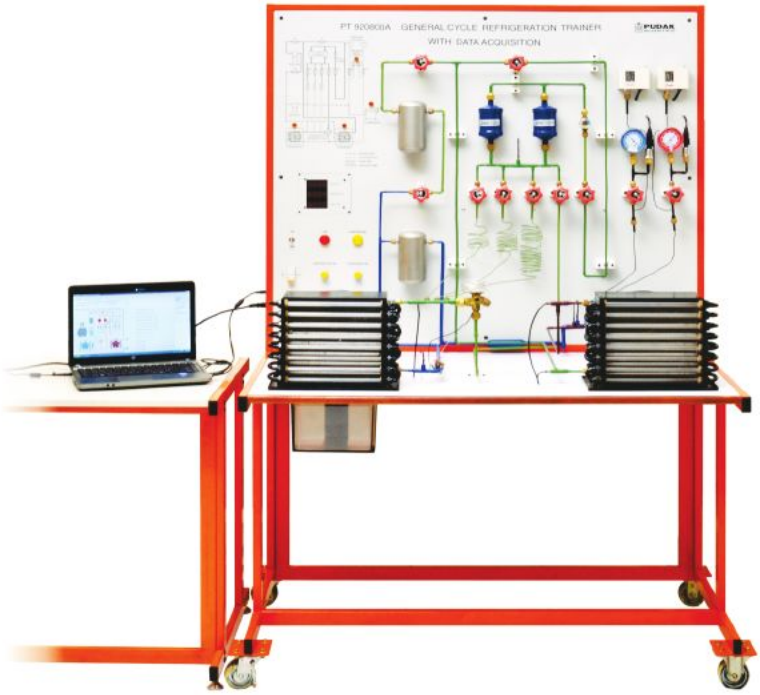
Features

- This trainer is designed as the learning tools of vapor compression refrigeration
- The Data Acquisition Module is integrated for an easier data collection and processing of each experiment conducted.
- This trainer displays the piping and main components of refrigeration system for an easier understanding on the basic refrigeration cycle.
- The evaporator and condenser are equipped with transparant pipe that students will be able to have direct observation toward the refrigerant phase changes.
- Expansion valve and capillary tubes are available in various sizes to introduce students to the expansion devices
- Evaporator and condenser are equipped with fan that have variable speed controller to provide various air flow rate.
- Frame are made of rectangular steel pipe with 2mm wall thickness to ensure rigidity, powder coated in orange color.
- Experiment manual book is included to guide students in doing the experiment properly.

NEW PRODUCT

General Cycle Refrigeration Trainer with Data Acquisition

PT 920800A



Covered Topics

- RE01001E Basic Refrigeration Vapor Compression System
- RE01002E Representation Vapor Compression System on p-h Chart
- RE01003E Refrigerating Effect and Cooling Capacity
- RE01004E Energy Balance on Vapor Compression System
- RE01005E COP (Coefficient of Performance) of Vapor Compression System
- RE01006E Comparison of Capillary Tube and Thermostatic Expansion Device
- RE01007E Comparison of Varying Length on Capillary Tube Expansion
- RE01008E Effect of Varying Air Flow Rate on Air-Cooled Condenser

Specification

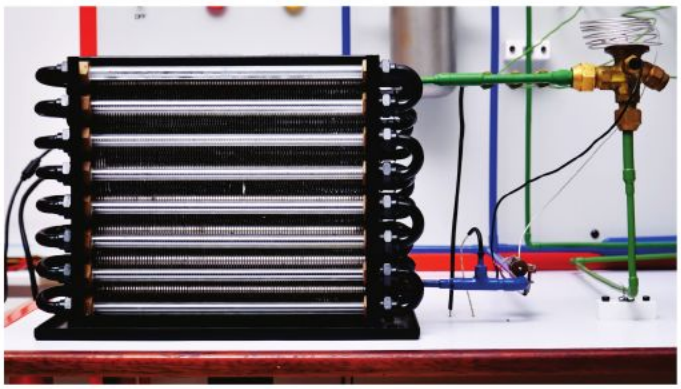
- **Compressor**
  - Hermetic piston, R - 134a
  - 0.25 HP
  - Input voltage : 220 VAC ~ 50 Hz
- **Condenser**
  - Copper pipe with alumunium fins equipped with transparant pipe
  - Fan is equipped with variable speed controller
- **Evaporator**
  - Copper pipe with alumunium fins equipped with transparant pipe
  - Fan is equipped with variable speed controller
- **Components**
  - Suction pressure gauge, 0-8 Bar
  - Discharge pressure gauge, 0-34 Bar
  - High pressure switch, R-134a
  - Low pressure switch, R-134a
  - Refrigerant receiver
  - Filter driers, R-134
  - Sight glass, 1/4 inch
  - Hand Valves, 1/4 inch
- **Digital Thermometer with Type K Thermocouple**
  - Resolution 1/0.1 °C

Training Panel System

Specification of Data Acquicition Module

- Pressure Sensor
  - 2 pressure measurement points
  - Measurement range: 0-20 Bar
  - Resolution: 0,1 Bar
- Temperature Sensor
  - 8 temperature measurement points
  - Type J thermocouple sensor
  - Measurement range: -15 °C - +100 °C
  - Resolution: 0.1 °C
- Power Meter
  - Electrical Voltage Measurement
    Measurement range: 0-300 Volt AC
    Resolution: 0.1 Volt
  - Electrical Current Measurement
    Measurement range: 0-3 Ampere AC.
    Resolution: 0.1 Ampere
  - Power Supply Measurement
    Measurement range: 0-1000 Watt AC
    Resolution: 0.1 Watt.
- Modules-PC Communication
  - USB Virtual Comm Port.
  - Data transfer speed: 38400 bps.
- Software Features
  - Experiment data collection up to 1000 data
  - Sampling frequency: 1 sec/sampling
  - Experiment data is displayed in graph, table, and P-h Chart

Pressure Gauge and Pressure Sensor
PTE-075-02



Evaporator with Transparant Pipe

Computer Required

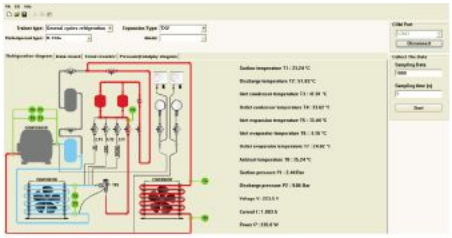
- Computer or Laptop (not included in the trainer package) with the following specifications:
  - Processor: min. Pentium 4
  - Operating System: min. Windows XP
  - RAM: min. 512 MB
  - 4 GB free disk space

PT 920800A General Cycle Refrigeration Trainer with Data Acquisition
consists of

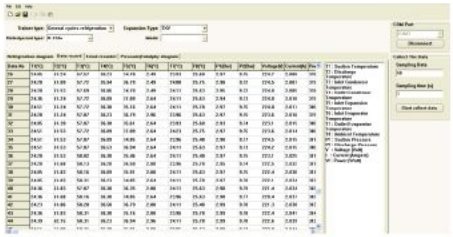
Cat. No.	Description	Qty.
PT 920800A	General Cycle Refrigeration Trainer	1 set
GMM 321	Digital Thermometer	1 pc
PHT 281	Thermocouple, Type K	2 pcs
R01S-01E	Experiment Manual Book	1 pc
PTE-075-01	Temperature Sensor Module	1 pc
PTE-075-02	Pressure Sensor Module	1 pc
PTE-075-03	Power Meter Module	1 pc
PTE-075-04	Power Meter Display Module	1 pc
PTE-075-05	Main Board Module	3 pcs
PTE-075-06	USB to Serial Module	1 pc
MLT 300	DVD for Software Installation	1 pc

Power Meter Display Module
PTE-075-03

USB Interface
PTE-075-06



Real Time Measurement



Data Record Table

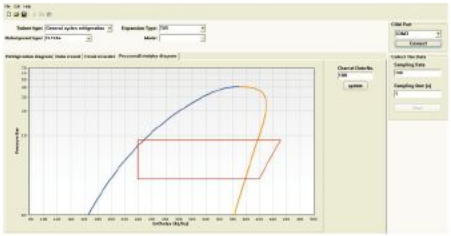


Diagram P-h

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Features

- The Split Type Air Conditioner Trainer is designed for the learning process of the working principle, piping installation, and components system of a split type air conditioner.
- The real split type air conditioner is used for this trainer, including the outdoor unit and indoor unit.
- The indoor unit and outdoor unit are installed on one frame on wheels for easy movement.
- Additional measuring instruments for pressure system and electrical data monitoring are included in this trainer.
- The latest technology products, such as inverter technology, human activity sensor, and air purifying system are used in this trainer.
- Comprehensive experiments' manual book for this trainer is included.

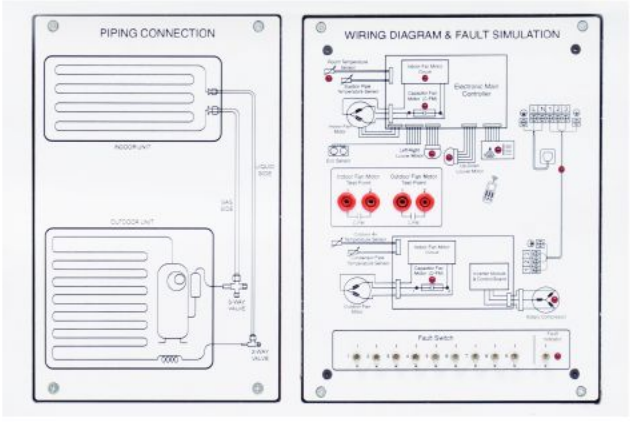
NEW PRODUCT

Split Type Air Conditioner Trainer

PT 110800

Covered Topics

RE03001	Introduction of Split Type Air Conditioner System, Components, and Piping System
RE03002	Air Flow Speed Variation of Split Split Type Air Conditioner System
RE03003	Refrigerant Vacuming and Charging Processes
RE03004	Refrigerant Pump Down Process to Outdoor Unit
RE03005	Troubleshooting and Fault Simulation of the Split Type Air Conditioner System



Piping & Wiring Diagram

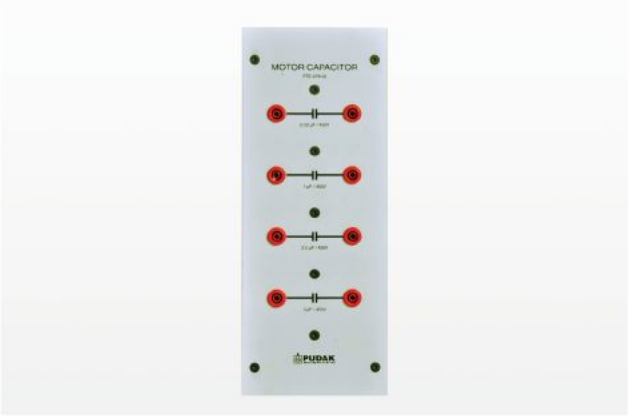
Specification

- **Cooling capacity**
  - 9.720 Btu/h
- **Electrical Data**
  - Voltage: 220-240 V, 50 Hz, 1 Phase
  - Running current: 3.6 - 3.3 A
  - Power input: 730 Watt
- **Indoor unit**
  - Air circulation: 10.3 m³/minutes
  - Moisture removal: 1.7 L/h
  - Sunlight sensor & human activity sensor
  - Air purifier
- **Compressor**
  - 1 HP
  - Inverter technology
- **Refrigerant**
  - Environmentally friendly refrigerant of R410A
- **Measurement components**
  - Low side pressure gauge, 500 psi
  - High side pressure gauge, 800 psi
  - Digital panel meter (Ampere, Voltage, and Power)
- **Dimension**
  - l x w x h : 1000 x 600 x 1600 mm

Training Panel System

PT 110800 Split Type Air Conditioner Trainer consists of

Cat. No.	Description	Qty.
PTE-078-01	Wiring Diagram & Fault Simulation	1 pc
PTE-078-02	Motor Capacitor	1 pc
TMC 240	Split Type Air Conditioner Trainer	1 set
TMC 245	Refrigerant R410A	1 can
TMC 250	Manifold Gauge Set for R410A	1 set
TEM 201	Low Pressure Gauge R410A	1 pc
TEM 201	High Pressure Gauge R410A	1 pc



PTE-078-02 Motor Capacitor

Low Pressure Gauge

High Pressure Gauge

Outdoor Unit

Digital Display Meter

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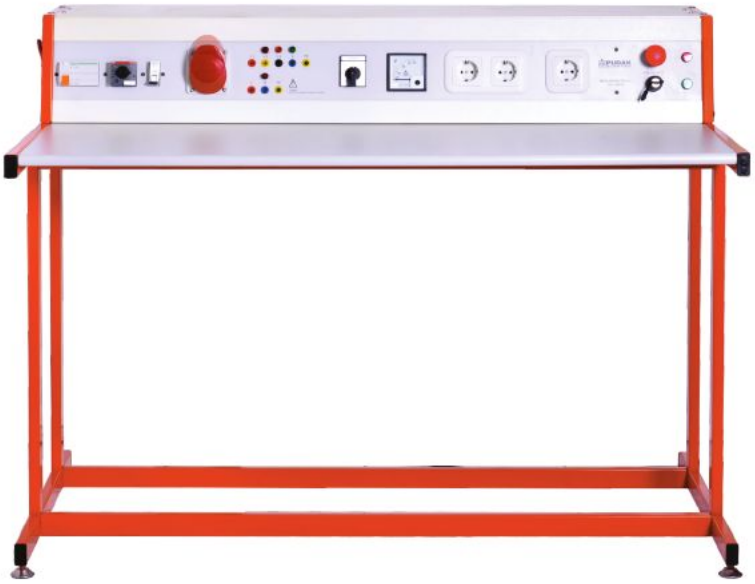
Features

- Workstation is to be used in electronical laboratory as students' or experimenter's workstation.
- Workstation is to be used to place the TPS (Training Panel System).
- The table legs can be adjusted for leveling.
- Equipped with key to turn the works station on and off.
- Equipped with emergency button.
- Knock-down system.

NEW PRODUCT

Workstation Desk

GLF 158 04



Specification

- Workstation dimension: length is 1240 mm, width is 800 mm, and height is 750 mm.
- Material: the table top is 18 mm multiplex, HPL-melamine coated.
- Frame: metal profile (20 x 40 mm), 1 mm thick, and powder coating finishing.
- Dimension of Workstation's panel: length is 1200 mm, width is 321 mm, and height is 200 mm.
- The workstation panel is equipped with:
  1. Three (3) phase socket.
     - Three phase source socket with 3P + N + PE (5 wire) terminal.
     - Maximum current: 16 A/400 VAC.
  2. Three phase ELCB .
     - 4 contact terminals, 3P + N (4 wire).
     - Maximum current: 25 A/400 VAC, with leakage current protector of 30 mA, in accordance with PUIL 3.4.5.1.
  3. Motor over load protector.
     - 3 contact terminals (3 wire).
     - Load break, between 2.5 - 4 A.
     - Nominal voltage: 230/400 VAC.
  4. MCB satu fasa.
     - 1 contact terminal (1 wire).
     - Current interruption maximum is 4 A/250 VAC.
  5. The output terminal consist of:
     - 1 three phase output socket with terminal of 3P + N + PE (5 wire), maximum current: 16 A/400 V.
     - One phase output terminal of P + N + PE (3 wire), closed type (safety type).
     - Three phase output terminal of 3P + N + PE (5 wire), closed type (safety type).
     - 3 outlets with terminal of P + N + PE (3 wire), maximum current is 16 A/250 V.
  6. Panel Meter
     - Measuring range: 0 - 500 VAC, the moving coil instrument 1.5 class.
     - Equipped with selecting switch to select the phase voltage to be selected and measured.
  7. The indicator light consist of :
     - 3 indicator lights of three phase output in the colors of red, yellow, and green. Maximum working voltage is 240 VAC, lamp diameter is 10 mm.
     - 1 red light to indicate the one phase output. Maximum working voltage is 240 VAC, lamp diameter is 10 mm.
     - 1 red light to indicate the input voltage. Maximum working voltage is 240 VAC, lamp diameter is 16 mm.

Excessive current and leakage current protector.

Output socket and terminal, equipped with indicator button.

Continue >>

Training Panel System

>> Specification Continued

- 1 green light to indicate that the Workstation is on. Maximum working voltage is 240 VAC, lamp diameter is 16 mm.

8. Emergency button.
   - 2 contact units, 1 NC dan 1 NO. Maximum voltage is 600 VAC.
   - The contact's maximum current is 1.2 A, diameter is 22 mm.
9. Safety key.
   - For turning on/turning off the power source of the Workstation.
   - Diameter is 22 mm.

- The three phase socket source uses IP 44.
- Equipped with operation manual

Meter panel and selecting switch.

Two outlets

Outlet , emergency button, and protector key, equipped with indicator light.

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