Electric Power / Controls

PLC APPLICATIONS SERIES 8075

Series 8075 shown with optional components

GENERAL DESCRIPTION

The Lab-Volt PLC Applications, Series 8075, aim to further develop the students' understanding of PLC programming that was acquired either with Lab-Volt's Programmable Logic Controller Training System (Model 3240) or other equipment. Basic principles are integrated with more advanced concepts in order to design small-scale systems typical of what can be found in industry. Through practical examples, students will gain a strong knowledge of PLCs and of the studied applications. The systems' training capabilities are enhanced by their modularity and by the ability to use instructor-inserted faults.

Fault switches are included on selected modules to enhance troubleshooting activities by simulating open coils and contacts, defective contacts, shorted connections, and crossed wires.

The modules of the PLC Applications Series can be interconnected with those of other Lab-Volt training systems for interdisciplinary training applications. Connections are made using flexible, PVC-insulated connecting leads terminated with 2-mm plugs. The control circuits operate at 24 V – DC and are compatible with a variety of PLCs.

The PLC Applications series is divided into seven systems, each system covering a specific topic related to PLC controls.

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INTERNET: http://www.labvolt.com

The Traffic Light System, Model 8075-10, is a well-known classic PLC training system pertaining to vehicle and pedestrian traffic control at an intersection.

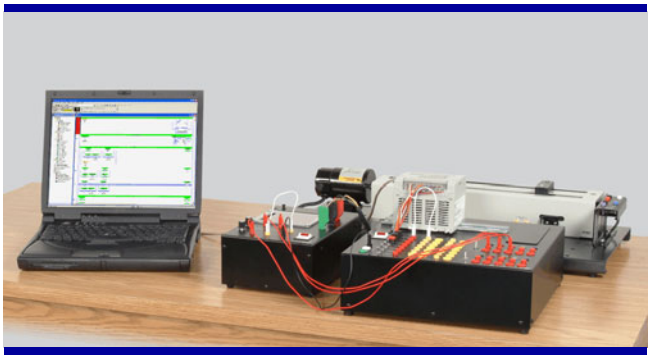
Traffic Light System, Model 8075-10

The Electro-Pneumatic System, Model 8075-20, uses a PLC to control a variety of pneumatic industrial applications.

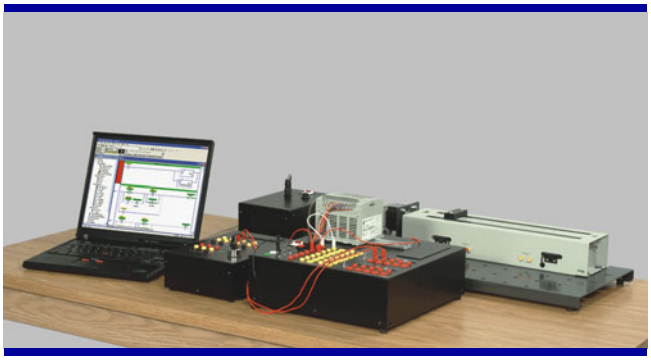
Electro-Pneumatic System, Model 8075-20

TABLE OF CONTENTS

The Electro-Mechanical System Using DC Motor, Model 8075-30, and the Electro-Mechanical System Using Stepper Motor, Model 8075-40, enable diverse PLC-controlled positioning and motion processes.



Electro-Mechanical System Using DC Motor, Model 8075-30



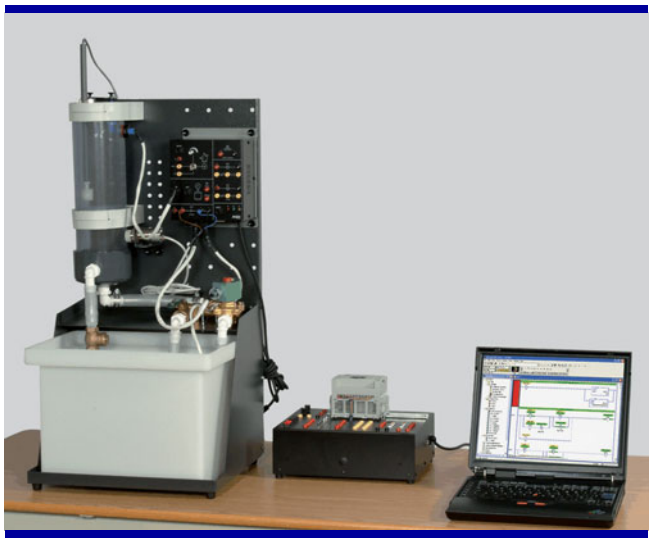
Electro-Mechanical System Using Stepper Motor, Model 8075-40

The Wind Turbine System, Model 8075-50, uses a PLC to monitor the speed and direction of the wind and control the position of the wind turbine nacelle.

Wind Turbine System, Model 8075-50

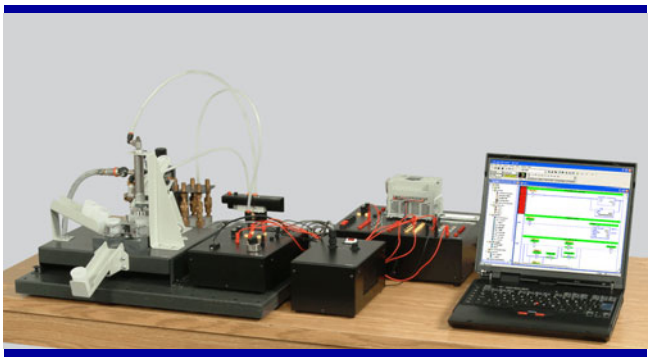
(continued on next page)

The Level Process System, Model 8075-60, introduces level control using a PLC, control relays, a pump, and a set of sensors.



Level Process System, Model 8075-60

The Bottling Process System, Model 8075-70, is a small-scale reproduction of a widespread industrial process combining pneumatics, motion control, and PLC sequencing.



Bottling Process System, Model 8075-70

Courseware

Each manual of the PLC Applications Series concentrates on a specific utilization of a PLC, starting with a familiarization and evolving into more complex concepts and troubleshooting. With each manual, new components are introduced to create different learning opportunities.

The PLC Applications series courseware consists of one student manual and one instructor guide per application. The student manuals are divided into job sheets detailing relevant information and providing clearly stated objectives and procedure steps. The instructor guides contain ladder programs and answer keys for all exercises and questions in the student manuals.

Please refer to the Table of Contents of the Student Manuals section of this datasheet for a list of the topics covered in each student manual.

TABLE OF CONTENTS OF THE STUDENT MANUALS

Traffic Lights (85249-20)

- **Basic Traffic Light System**
  - Comparator and Timer Instructions
  - Structured Programming
- **Sequencer Operation**
  - Counter and Move Instructions
  - Sequencer Operation
- **Proximity Detector and Pushbutton**
  - Latch and Unlatch Instructions
  - Priority Management
- **Troubleshooting**
  - Fault Identification
- **Optional Project**
  - Independent Sequences
  - Visual Warning

Electro-Pneumatics (85250-20)

- **Familiarization with the Electro-Pneumatic System**
  - Control Valve Station
  - Pneumatic Cylinders
  - Pressure Regulator
- **Single Cylinder Control**
  - PLC Ladder Programming
  - Double- and Single-Solenoid Valve Control
- **Clamp and Work Operation**
  - Stamping Process
  - Pressure Regulation
  - Proximity Detectors
- **Troubleshooting**
  - Fault Identification

TABLE OF CONTENTS OF THE STUDENT MANUALS (cont'd)

PLC COMPATIBILITY

		SYSTEM						
		8075-10	8075-20	8075-30	8075-40	8075-50	8075-60	8075-70
MODEL NUMBER[1]	**DESCRIPTION**	**QTY**						
3240-30	PLC Allen-Bradley MicroLogix 1500	●	●	●	●	●*	●*	P
3240-40	PLC Allen-Bradley MicroLogix 1200	●	●	●	●	●*	●*	P†
3240-A0	PLC Allen-Bradley MicroLogix 1100	P	●	●	●	●	●*	●
3240-B0	PLC Siemens ET200S IM151-8	●	●	●	●	●*	●*	P
3240-C0	PLC Siemens ET200S IM151-8	●	●	●	●	●*	●*	P
3270-40	PLC Allen-Bradley MicroLogix 1000	P	●	●	●	X	P	P
3270-60	PLC Siemens S7-222	P	●	●	●	X	P	P

●: Complete curriculum coverage
P: Partial curriculum coverage
X: PLC not recommended for the application
*: Analog I/O Expansion Kit (Model 3244-30, -40, -A0, -B0, or -C0) required to perform all the exercises
†: Only the optional Job Sheet with PTO function files cannot be completed

PLC REQUIREMENTS

		SYSTEM						
		8075-10	8075-20	8075-30	8075-40	8075-50	8075-60	8075-70
	TYPE	**QTY**						
Inputs	24 V – DC	3	5	8	5	6	6	5
	24 V – DC High-Speed	-	-	2*	-	-	-	-
	0-10 V – DC / 4-20 mA	-	-	-	-	1	1*	-
Outputs	24 V – DC	10	4	3	3	2	6	6
	24 V – DC High Speed	-	-	-	-	-	-	2*
	0-10 V – DC / 4-20 mA	-	-	-	-	-	1*	-

*: For the optional exercise only.

[1] The model numbers shown apply to the English 120-V version. Other versions are available. Refer to the Ordering Numbers section.

LIST OF EQUIPMENT

TRAFFIC LIGHT SYSTEM – MODEL 8075-10

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Traffic Light Module	3291-00
1	PLC Applications Traffic Lights (Student Job Sheets)	85249-20
1	PLC Applications Traffic Lights (Instructor Job Sheets)	85249-30

OPTIONAL EQUIPMENT

2	Push-Buttons and Lights	3201-00

ELECTRO-PNEUMATIC SYSTEM – MODEL 8075-20

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Pressure Regulator	3216-00
1	Electro-Pneumatic Valve Island	3217-00
1	Electro-Pneumatic Module	3292-00
1	Storage/Work Surface	6309-00
1	PLC Applications – Electro-Pneumatics (Student Job Sheets)	85250-20
1	PLC Applications – Electro-Pneumatics (Instructor Job Sheets)	85250-30

OTHER REQUIRED EQUIPMENT

1	Air Compressor	6410-A0
1	Conditioning Unit	6411-A0

OPTIONAL EQUIPMENT

1	Push-Buttons and Lights	3201-00
1	Toggle Switches and Lights	3202-00
1	Rotary Switches	3203-00
1	Emergency Switch	3204-00
2	Wiring Module	3205-00
1	Signal Tower	5924-00

ELECTRO-MECHANICAL SYSTEM USING DC MOTOR – MODEL 8075-30

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	DC Motor Drive	3209-00
1	DC Motor Electro-Mechanical Module	3293-00
1	PLC Applications – Electro-Mechanical Systems Using DC Motors (Student Job Sheets)	85251-20
1	PLC Applications – Electro-Mechanical Systems Using DC Motors (Instructor Job Sheets)	85251-30

ADDITIONAL EQUIPMENT FOR THE OPTIONAL JOB SHEET

1	Optical Encoder	3210-00

OPTIONAL EQUIPMENT

1	Push-Buttons and Lights	3201-00
1	Toggle Switches and Lights	3202-00
1	Rotary Switches	3203-00
1	Emergency Switch	3204-00
2	Wiring Module	3205-00
1	Signal Tower	5924-00

LIST OF EQUIPMENT (cont'd)

ELECTRO-MECHANICAL SYSTEM USING STEPPER MOTOR – MODEL 8075-40

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Stepper Motor DC Power Supply	3206-00
1	Stepper Motor Drive	3207-00
1	Stepper Motor Electro-Mechanical Module	3294-00
1	PLC Applications – Electro-Mechanical Systems Using Stepper Motors (Student Job Sheets)	85252-20
1	PLC Applications – Electro-Mechanical Systems Using Stepper Motors (Instructor Job Sheets)	85252-30

OPTIONAL EQUIPMENT

1	Push-Buttons and Lights	3201-00
1	Toggle Switches and Lights	3202-00
1	Rotary Switches	3203-00
1	Emergency Switch	3204-00
2	Wiring Module	3205-00
1	Optical Encoder	3210-00
1	Signal Tower	5924-00

WIND TURBINE SYSTEM – MODEL 8075-50

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Wind Generator	3213-00
1	Nacelle Simulator	3297-00
1	PLC Applications – Wind Turbine Generator (Student Job Sheets)	85303-20
1	PLC Applications – Wind Turbine Generator (Instructor Job Sheets)	85303-30

ADDITIONAL EQUIPMENT REQUIRED TO PERFORM THE EXERCISES

1	Analog I/O Expansion Kit	3244-40[2]

OPTIONAL EQUIPMENT

1	Push-Buttons and Lights	3201-00
2	Wiring Module	3205-00

LEVEL PROCESS SYSTEM – MODEL 8075-60

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Level Process Interface	3215-00
1	Level Process Module	3295-00
1	PLC Applications – Level Process Control (Student Job Sheets)	85253-20
1	PLC Applications – Level Process Control (Instructor Job Sheets)	85253-30

ADDITIONAL EQUIPMENT REQUIRED FOR THE OPTIONAL JOB SHEET

1	Level Sensor	3214-00
1	Analog I/O Expansion Kit	3244-40[2]

OPTIONAL EQUIPMENT

1	Push-Buttons and Lights	3201-00
1	Toggle Switches and Lights	3202-00
1	Rotary Switches	3203-00
1	Emergency Switch	3204-00
2	Wiring Module	3205-00
1	Signal Tower	5924-00

[2] For PLC model 3240-4 only. Analog I/O Expansion Kits 3244-30, -B0, -C0 and 3244-A0 are available for PLC models 3240-30, -B0, -C0 and 3240-A0. Refer to PLC Product Guide.

LIST OF EQUIPMENT (cont'd)

BOTTLING PROCESS SYSTEM – MODEL 8075-70

QTY	DESCRIPTION	ORDERING NUMBER[1]
1	Stepper Motor DC Power Supply	3206-00
1	Dual Stepper Motor Drive	3208-00
1	Bottling Process Module	3296-00
1	Storage/Work Surface	6309-00
1	Directional Valve, Single-Solenoid Operated	6424-00
1	PLC Applications – Bottling Process System (Student Job Sheets)	85254-20
1	PLC Applications – Bottling Process System (Instructor Job Sheets)	85254-30
OTHER REQUIRED EQUIPMENT		
1	Air Compressor	6410-A0
1	Conditioning Unit	6411-A0
OPTIONAL EQUIPMENT		
1	Push-Buttons and Lights	3201-00
1	Toggle Switches and Lights	3202-00
1	Rotary Switches	3203-00
1	Emergency Switch	3204-00
2	Wiring Module	3205-00
1	Signal Tower	5924-00

MODULE DESCRIPTION

Model 3206 – Stepper Motor DC Power Supply

The Stepper Motor DC Power Supply provides 32 V – DC power to the Stepper Motor Drive (Model 3207) or to the Dual Stepper Motor Drive (Model 3208). It features two three-pin connector outputs.

Model 3207 – Stepper Motor Drive

The Stepper Motor Drive controls the stepper motor of the Electro-Mechanical System Using DC Motor. The drive has eight inputs including two for jog and two for limit detection. It also has three outputs sending feedback signals to the PLC. The *Si Programmer*™ software accompanying the module enables drive sequence programming.

Model 3208 – Dual Stepper Motor Drive

The Dual Stepper Motor Drive controls both stepper motors of the Bottling Process System. The drive has four inputs for step/run and direction control of the motors. The speed of each motor can be individually set using the appropriate adjustment knob. The drive also has an output designed to send feedback signals to the PLC. The *Exposition*™ software accompanying the module enables basic drive configuration.

Model 3209 – DC Motor Drive

The DC Motor Drive controls the DC Motor Electro-Mechanical Module. The drive is configured to operate the motor at one of two user-defined speeds. Input signals are used to switch between the two set speeds, to select the direction of motion (forward or reverse), and to enable the movement. This versatile drive also allows an external 0 - ±10 V signal to control the motor's speed.

Model 3213 – Wind Generator

The Wind Generator includes a small blower producing a constant air flow (nominal fan speed: 2500 RPM). This sturdy and reliable device is designed to be used with the Wind Turbine System.

Model 3215 – Level Process Interface

The interface is the bridge between the Level Process Module and the PLC. It features a pump drive, a level transmitter, solenoid valve control jacks, two relays, and a 24 V – DC supply.

Model 3216 – Pressure Regulator

The Pressure Regulator offers two different air flow paths: one that is not regulated, and one that is limited in pressure (from 0 to 120 PSI). A rotary knob and an air gauge make it simple to regulate the pressure to the desired value, thus limiting the pressure sent to the Electro-Pneumatic System.

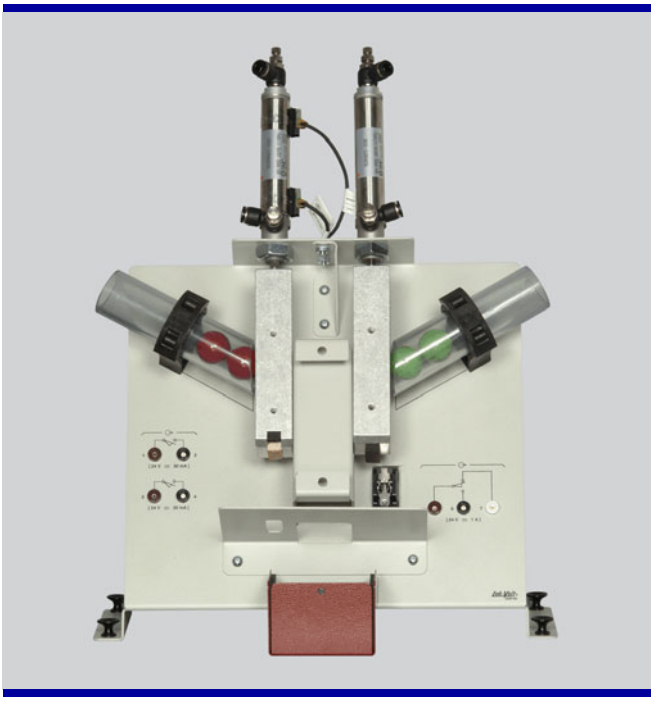
Model 3217 – Electro-Pneumatic Valve Island

The Electro-Pneumatic Valve Island, Model 3217, comprises two 4-way/2-position valves with common input and exhaust ports. One valve is operated by two solenoids and the other by a single solenoid and a spring return. The solenoids are actuated by 24 V – DC signals.

Model 3291 – Traffic Light Module

The Traffic Light Module reproduces a two-way traffic light complete with pedestrian signals and the possibility to simulate broken lights. Its realistic appearance and functionalities make the Traffic Light System vivid and compelling to students. The addition of a second unit creates a full, four-direction traffic light.

Model 3292 – Electro-Pneumatic Module

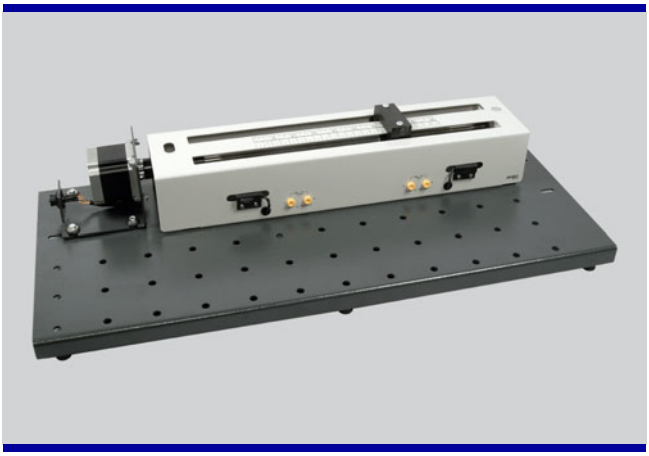


The Electro-Pneumatic Module and the associated equipment enable stamping, hold-and-punch, and filling operations. The module features two pneumatic cylinders arranged so as to distribute a programmed number of marbles from two tubes (feed lines) into a container. A second configuration allows students to perform a clamp-and-work operation on a plane material, e.g. a sheet of paper. Two reed switches and one limit switch are installed to provide feedback on the cylinders' positions. These switches operate on 24 V – DC signals.

Model 3293 – DC Motor Electro-Mechanical Module

The DC Motor Electro-Mechanical Module demonstrates closed- and open-loop positioning control concepts as well as some electromechanical principles. It consists of a 90 V – DC motor driving a lead screw on which a sliding block is installed. Two magnetic limit switches detect when the sliding block reaches the start or end position.

Model 3294 – Stepper Motor Electro-Mechanical Module



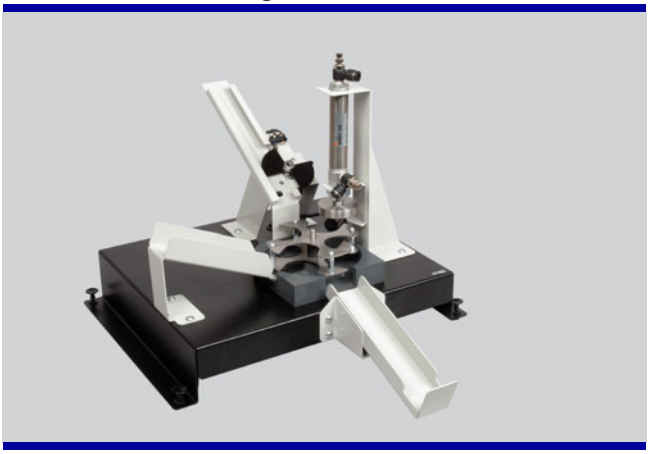
The module consists of a high-torque stepper motor coupled to a lead screw on which a sliding block is installed. Two magnetic limit switches detect when the sliding block reaches the start or end position.

[3] Requires the optional Optical Encoder - Model 3210

Model 3295 – Level Process Module

The Level Process Module includes a submersible variable-speed pump that displaces water from a reservoir up to a cylindrical container. A manual and a solenoid valve as well as an array of switches and sensors (adjustable and fixed float switches, capacitive switch, and an optional Level Sensor - Model 3214) provide the means to experiment with Instrumentation and Control schemes. Level control (On-Off and PID (with optional Level Sensor)) and Batch Process are covered.

Model 3296 – Bottling Process Module

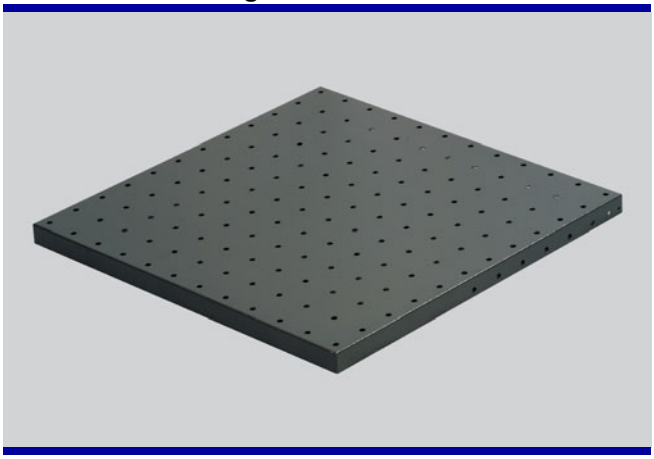


The Bottling Process Module is a compact application which combines pneumatics, motion control, and PLC sequencing. It uses stepper motors to move bottles along an assembly line and to distribute caps. A pneumatic cylinder is used to secure the caps on the bottles. A limit switch and an inductive sensor are also included for synchronization.

Model 3297 – Nacelle Simulator

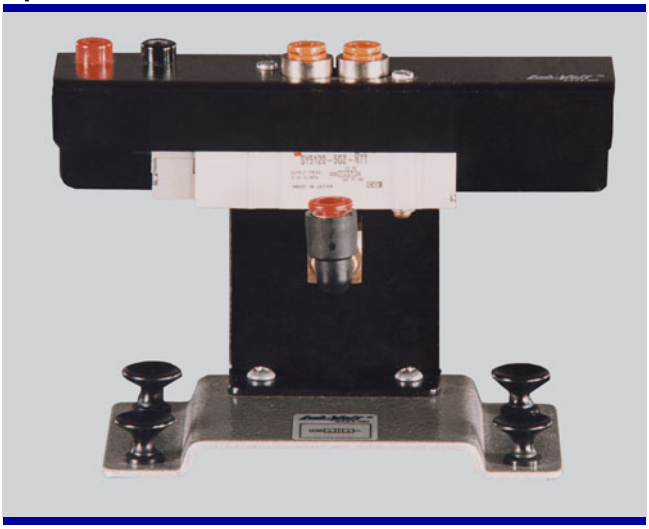
The Nacelle Simulator replicates the main functionalities of a wind turbine. It is designed to measure the speed and direction of the wind so that a PLC can control the position of the nacelle to optimize its operation. Two limit switches with NO and NC contacts allow monitoring of the number of rotations of the nacelle.

Model 6309 – Storage/Work Surface



The Storage/Work Surface consists of perforated plate that can be used as a work surface or for the storage of components.

Model 6424 – Directional Valve, Single-Solenoid Operated



This pneumatic valve consists of a four-way, two-position, single-solenoid operated, spring-return, directional control valve. It allows control of the motion of the Bottling Process System pneumatic cylinder.

OPTIONAL EQUIPMENT

Model 3201 – Push-Buttons and Lights

This module features two NO and one NC momentary pushbuttons as well as three LED indicator lights. The Push-Buttons and Lights module can be used to simulate a Start/Pause/Stop station with indicator lights.

Model 3202 – Toggle Switches and Lights

This model features three toggle switches and three LED Indicator Lights.

Model 3203 – Rotary Switches

This device features two three-position dual pole switches (ON - OFF - ON) with two normally-open contacts.

Model 3204 – Emergency Switch

The Emergency Switch is designed to introduce students to safety standards and provides a readily available way to promptly terminate a problematic process. This model features one emergency switch with two sets of NO contacts (one for low voltage and the other for line voltage).

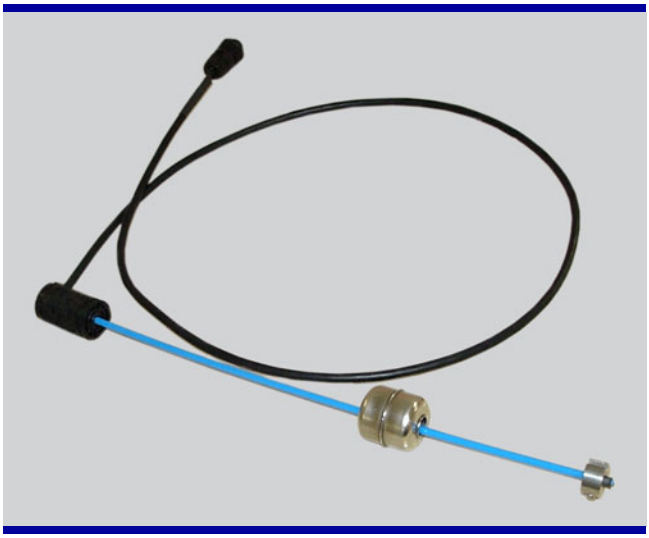
Model 3205 – Wiring Module

This multi-purpose module allows easy interfacing between customers' existing PLCs and 2 mm leads and jacks used with the Lab-Volt PLC Applications. This module can also be used to practice wiring skills using the terminal blocks.

Model 3210 – Optical Encoder

This model is an optional add-onto the Electro-Mechanical applications. It provides position feedback signals (100 PPR) compatible with the PLC 24 V – DC inputs.

Model 3214 – Level Sensor



This sensor, when used in conjunction with the Level Process Interface provides a signal (0-5 V or 4-20 mA) proportional to the position of its floating device.

Model 5924 – Signal Tower

The Signal Tower consists of three lights providing visual feedback of the state of a process. It can be used to indicate if an application is running, paused, or stopped. Lights are stacked one upon another, up to five modules (standard unit contains three modules). Each module is easily programmable without any special wiring or tools. An Acoustic Alarm, Model 39303, is available as an option.

Model 6085 – Sensors Training System

This system contains a selection of photoelectric, inductive, and capacitive sensors representative of what can be found in industry. These sensors can be used with a variety of PLC applications.

Model 6360 – DC Power Supply

The DC Power Supply, Model 6360, is used to power PLCs that require a 24 V – DC source. This power supply is part of the Hydraulics Training System and the Pneumatics Training System, Models 6080 and 6081.

Model 6410-A – Portable Air Compressor

Image for indicative purpose only

The Air Compressor consists of a quiet 7.6-liter (two-gallon) air compressor. Its quiet pump and motor make it ideal for classroom and school laboratories. The Air Compressor can be used to provide compressed air to the Conditioning Unit, Model 6411-A.

Model 6411-A – Conditioning Unit

The Conditioning Unit consists of a main shut-off valve, a filter, a pressure regulator, a pressure gauge, a sleeve valve, and a muffler. It conditions and limits the pressure of the air supplied to the preumatic circuits. The Conditioning Unit must get its compressed air from a central air supply or a portable unit such as the optional Air Compressor, Model 6410-A.

SPECIFICATIONS

Model 3201 – Push-Buttons and Lights		
Contacts (Black Push-Buttons)	Type	Momentary, 2 NO contact sets
	Rating	3 A - 24 V – DC
Contacts (Red Push-Button)	Type	Momentary, 1 NC contact set
	Rating	3 A - 24 V – DC
Lights	Type	LED (red, amber, green)
	Rating	0.02 A - 24 V – DC
Physical Characteristics	Dimensions (H x W x D)	80 x 110 x 150 mm (3.1 x 4.3 x 5.9 in)
	Net Weight	0.8 kg (1.8 lb)
Model 3202 – Toggle Switches and Lights		
Contacts	Type	SPST
	Rating	5 A - 24 V – DC
Lights	Type	LED (red, amber, green)
	Rating	0.02 A - 24 V – DC
Physical Characteristics	Dimensions (H x W x D)	80 x 110 x 150 mm (3.1 x 4.3 x 5.9 in)
	Net Weight	0.8 kg (1.8 lb)

SPECIFICATIONS (cont'd)

Model 3203 – Rotary Switches				
Contacts	Type	2 NO contact sets		
	Rating	1 A - 24 V – DC		
Physical Characteristics	Dimensions (H x W x D)	100 x 110 x 150 mm (3.9 x 4.3 x 5.9 in)		
	Net Weight	1.0 kg (2.1 lb)		
Model 3204 – Emergency Switch				
Contacts	Type	2 NC contact sets		
	Rating	10 A - 120 V ac / 1 A - 24 V – DC		
Physical Characteristics	Dimensions (H x W x D)	115 x 110 x 150 mm (4.5 x 4.3 x 5.9 in)		
	Net Weight	0.9 kg (1.9 lb)		
Model 3205 – Wiring Module				
Number of Jacks		8		
Number of Terminal Block Positions		8		
Physical Characteristics	Dimensions (H x W x D)	76 x 70 x 170 mm (3.0 x 2.8 x 6.7 in)		
Model 3206 – DC Power Supply		**120 V – 60 Hz**	**220 V – 50 Hz**	**240 V – 50 Hz**
Power Requirements		150 V A		
Input Voltage Range		108-132 V – AC	216-264 V – AC	
Power Output		32 V – DC – 4 A (full load) 35 V – DC – 1 A		
Physical Characteristics	Dimensions (H x W x D)	230 x 145 x 125 mm (9.1 x 5.7 x 4.9 in)		
	Net Weight	4.6 kg (10.2 lb)		
Model 3207 – Stepper Motor Drive				
Power Requirements		12-42 V – DC - 1.2 A		
Power Output	Power	48 W		
	Current per Phase	0.1 - 1.2 A		
Digital Inputs		8		
Digital Outputs		3 optically isolated (24 V – DC, 100 mA maximum)		
PC Connectivity	Port Type	Serial		
	Software	Si Programmer™		
Step Resolutions		Software selectable (15 settings from 200 to 50800 steps/rev)		
Fault Switches		4		
Physical Characteristics	Dimensions (H x W x D)	265 x 182 x 115 mm (10.4 x 7.2 x 4.5 in)		
	Net Weight	2.4 kg (5.2 lb)		
Model 3208 – Dual Stepper Motor Drive				
Power Requirements		12-35 V – DC - 2 A		
Power Output	Power	70 W / 2 stepper motors		
	Current per Phase	0.1 - 2 A		
Analog Inputs		2 potentiometers (P1 and P2)		
Digital Inputs		4 (Step/Run and Direction for both motors)		
Digital Output		1 optically isolated (30 V – DC, 100 mA maximum)		
PC Connectivity	Port	Serial		
	Software	eXposition™		
Step Resolutions		Software selectable (15 settings from 200 to 50800 steps/rev)		
Fault Switches		4		
Physical Characteristics	Dimensions (H x W x D)	115 x 182 x 265 mm (4.5 x 7.2 x 10.4 in)		
	Net Weight	2.5 kg (5.6 lb)		

SPECIFICATIONS (cont'd)

Model 3209 – DC Motor Drive		**120 V – 60 Hz**	**220 V – 50 Hz**	**240 V – 50 Hz**
Power Requirements		4 A	2 A	
Power Output		0.6 kW (0.75 hp)		
Analog Input		0-10 V – DC (isolated)		
Fault Switches		4		
Physical Characteristics	Dimensions (H x W x D)	115 x 182 x 265 mm (4.5 x 7.2 x 10.4 in)		
	Net Weight	3.1 kg (6.8 lb)		
Model 3210 – Optical Encoder				
Operating Voltage		10.8 - 26.4 V – DC		
Output Type		NPN, open collector (sinking)		
Output Logic		Negative logic (active low)		
Signal Waveform		Two-phase quadrature with home position		
Pulses per Revolution		100		
Maximum Allowable Speed		6000 RPM		
Physical Characteristics	Dimensions (H x W x D)	150 x 58 x 84 mm (5.9 x 2.3 x 3.3 in)		
	Net Weight	0.5 kg (1.2 lb)		
Model 3213 – Wind Generator				
Power Requirements		24 V – DC - 1.1 A		
Nominal Speed		2500 RPM		
Maximum Air Flow		28.3 L/s (60 CFM)		
Physical Characteristics	Dimensions (H x W x D)	207 x 186 x 230 mm (8.1 x 7.3 x 9.1 in)		
	Net Weight	3.0 kg (6.6 lb)		
Model 3214 – Level Sensor				
Input Voltage		5 V – DC		
Output Voltage		0.1 - 4.9 V – DC		
Detection Range		250 mm (9.8 in)		
Physical Characteristics	Dimensions (Length x Diameter)	330 x 23 mm (13.0 x 0.9 in)		
Model 3215 – Level Process Interface		**120 V – 60 Hz**	**220 V – 50 Hz**	**240 V – 50 Hz**
Power Requirements		1.6 A	1.0 A	
Motor Drive	Inputs	Potentiometer / 4-20 mA / 0-5 V – DC		
	Power Output	30 W		
	Minimum Speed Setting	0 - 100% speed		
Level Transmitter	Input	0-5 V – DC		
	Output	0-5 V / 4-20 mA		
	Minimum and Maximum Setting	0 - 100% of the complete span		
Solenoid Valve Ratings		0.5 A - 24 V – DC		
Control Relays	Number	2		
	Contact Type	1 NO, 1 NC		
	Contact Rating	1 A - 24 V – DC		
Physical Characteristics	Dimensions (H x W x D)	140 x 170 x 220 mm (5.5 x 6.7 x 8.7 in)		
	Net Weight	2.2 kg (4.9 lb)		
Model 3216 – Pressure Regulator				
Pressure Range		0-830 kPa (0-120 psi)		
Gauge Range		0-1100 kPa (0-160 psi)		
Physical Characteristics	Dimensions (H x W x D)	95 x 120 x 120 mm (3.7 x 4.7 x 4.7 in)		
	Net Weight	0.5 kg (1.1 lb)		

SPECIFICATIONS (cont'd)

Model 3217 – Electro-Pneumatic Valve Island		
Valves		1 double solenoid 1 single solenoid with spring return
Operating Pressure		Up to 830 kPa (120 psi)
Piloting Pressure		300-830 kPa (43-120 psi)
Coil Voltage		24 V – DC
Fault Switches		4
Physical Characteristics	Dimensions (H x W x D)	85 x 220 x 170 mm (3.3 x 8.7 x 6.7 in)
	Net Weight	1.7 kg (3.7 lb)
Model 3291 – Traffic Light Module		
Lights	Number	10 (2 green, 2 yellow, 2 red, 2 walk, 2 don't walk)
	Type	LED
	Voltage	24 V – DC
Fault Switches		8
Physical Characteristics	Dimensions (H x W x D)	495 x 370 x 326 mm (19.5 x 14.6 x 12.8 in)
	Weight	5.6 kg (12.4 lb)
Model 3292 – Electro-Pneumatic Module		
Reed Switches (2)	Contact Type	NO
	Contact Rating	30 mA - 24 V – DC
Limit Switch	Contact Type	NO
	Contact Rating	1 A - 24 V – DC
Cylinders (2)	Max Pressure	1700 kPa (250 psi)
Physical Characteristics	Dimensions (H x W x D)	410 x 320 x 120 mm (16.1 x 12.6 x 4.7 in)
	Weight	3.1 kg (6.8 lb)
Model 3293 – DC Motor Electro-Mechanical Module		
Motor Ratings	Output Power	29.8 W (0.04 HP)
	Armature Voltage	90 V
	Nominal Speed	1725 RPM
	Full Load Current	0.5 A
Limit Switches	Number	2
	Type	Magnetic, NO
Lead Screw Pitch		1.95 mm (13 TPI)
Physical Characteristics	Dimensions (H x W x D)	130 x 650 x 285 mm (5.1 x 25.6 x 11.2 in)
	Weight	8.8 kg (19.4 lb)
Model 3294 – Stepper Motor Electro-Mechanical Module		
Motor Ratings (parallel connection)	Voltage	5.1 V
	Current per Phase	1.41 A
	Impedance	3.6 Ohms
	Step Angle	1.8 degree (200 steps / revolution)
Limit Switches	Number	2
	Type	Magnetic, NO
Lead Screw Pitch		1.95 mm (13 TPI)
Physical Characteristics	Dimensions (H x W x D)	130 x 650 x 285 mm (5.1 x 25.6 x 11.2 in)
	Weight	8.3 kg (18.2 lb)

SPECIFICATIONS (cont'd)

Model 3295 – Level Process Module		
Pump	Power Requirements	12 V - 2.5 A⎓DC
	Flow Rate	1363 lph (360 gph)
Float Switch (Fixed)	Type	SPST, NC, right angle
	Maximum Switching Volts	250 V ac
	Maximum Switching Current	1.0 A
Float Switch (Adjustable)	Type	SPST, NO or NC selectable by inverting float on stem
	Ratings	0.3 A - 24 V – DC
Capacitive Switch	Type	PNP - Normally-Open
	Operating Voltage	10-30 V – DC
Solenoid Valve	Type	NC
	Operating Voltage	24 V – DC
Reservoir Capacity		22.7 l (6 gal)
Physical Characteristics	Dimensions (H x W x D)	830 x 420 x 420 mm (32.7 x 16.5 x 16.5 in)
	Net Weight	17.6 kg (38.9 lb)
Model 3296 – Bottling Process Module		
Motor 1	Type	Stepper
	Voltage	2.0 V
	Current per Phase	2.0 A
	Impedance	1.4 Ω
	Step Angle	1.8 degree (200 steps / revolution)
Motor 2	Type	Stepper
	Voltage	2.8 V
	Current Per Phase	1.7 A
	Impedance	1.7 Ω
	Step Angle	1.8 degree (200 steps / revolution)
Inductive Switch	Type	PNP - Normally-Open
	Rating	400 mA - 24 V – DC
Limit Switch	Operation	Normally-Open
	Rating	4 A - 24 V – DC
Maximum Cylinder Pressure		1700 kPa (250 psi)
Physical Characteristics	Dimensions (H x W x D)	310 x 372 x 446 mm (12.2 x 14.6 x 17.6 in)
	Net Weight	4.9 kg (10.8 lb)
Model 3297 – Nacelle Simulator		
Power Requirements		24 V - 0.6 A⎓DC
Motor Ratings	Power	3.04 W
	Max Speed	4.2 RPM
Analog Wind Direction Output		0-10 V – DC
Wind Speed Output		24 V – DC
Turn Counter Switch Ratings		2 A - 24 V – DC
Turn Limit Switch Ratings		0.1 A - 24 V – DC
Physical Characteristics	Dimensions (H x W x D)	397 x 235 x 140 mm (15.6 x 9.3 x 5.5 in)
	Net Weight	2.9 kg (6.4 lb)

SPECIFICATIONS (cont'd)

Model 5924 – Signal Tower				
Lights		3 (green, red, and yellow)		
Inputs		6 (24 V – DC)		
Physical Characteristics	Dimensions (H x W x D)	368 x 170 x 170 mm (14.5 x 6.7 x 6.7 in)		
	Net Weight	1.3 kg (2.8 lb)		
Model 6309 – Storage/Work Surface				
Physical Characteristics	Dimensions (H x W x D)	30 x 590 x 590 mm (1 x 23 x 23 in)		
	Net Weight	5 kg (11 lb)		
Model 6360 – DC Power Supply		**120 V - 60 Hz**	**220 V – 50 Hz**	**240 V – 50 Hz**
Power Requirement	Current	1.25 A	0.75 A	
Output		24 V – 2.4 A – DC		
Short-Circuit Protection		Automatic current/limit foldback		
Physical Characteristics	Dimensions (H x W x D)	105 x 135 x 220 mm (4.1 x 5.3 x 8.7 in)		
	Net Weight	3.6 kg (7.9 lb)		
Model 6410-A0 – Portable Air Compressor				
Compressor	Air Flow Rate	20 l/min (0.7 SCFM) at 630 kPa (90 psi)		
		28 l/min (1.0 SCFM) at 276 kPa (40 psi)		
	Maximum Pressure	690 kPa (100 psi)		
Tank Capacity		7.6 dm3 (462 in3)		
Physical Characteristics	Dimensions (H x W x D)	387 x 203 x 381 mm (15.25 x 8 x 15 in)		
	Net Weight	8.2 kg (18 lb)		
Model 6411-A0 – Conditioning Unit				
Filter Regulator	Maximum Air Flow Rate	550 l/min (19 SCFM)		
	Operating Pressure	48-690 kPa (7-100 psi)		
	Filtration	5 µm (0.0002 in)		
Pressure Gauge	Diameter	50 mm (2 in)		
	Operating Pressure	0-690 kPa (0-100 psi)		
Physical Characteristics	Dimensions (H x W x D)	75 x 170 x 120 mm (3 x 6.7 x 4.7 in)		
	Net Weight	1.6 kg (3.6 lb)		
Model 6424 – Directional Valve, Single-Solenoid Operated				
Type		4 ways, 2 positions, single-solenoid operated, spring return		
Solenoids		24 V – DC		
Physical Characteristics	Dimensions (H x W x D)	115 x 150 x 70 mm (4.5 x 5.9 x 2.8 in)		
	Net Weight	0.7 kg (1.5 lb)		

PERSONAL COMPUTER REQUIREMENTS

A personal computer with an available serial port (or a USB port and a serial adapter) running under Microsoft® Windows® XP, Vista or 7 is required.

ORDERING NUMBERS

120 V – 60 Hz			220 V – 50 Hz			240 V – 50 Hz
ENGLISH	**FRENCH**	**SPANISH**	**ENGLISH**	**FRENCH**	**SPANISH**	**ENGLISH**
3201-00	3201-00	3201-00	3201-00	3201-00	3201-00	3201-00
3202-00	3202-00	3202-00	3202-00	3202-00	3202-00	3202-00
3203-00	3203-00	3203-00	3203-00	3203-00	3203-00	3203-00
3204-00	3204-00	3204-00	3204-00	3204-00	3204-00	3204-00
3205-00	3205-00	3205-00	3205-00	3205-00	3205-00	3205-00
3206-00	3206-00	3206-00	3206-05	3206-05	3206-05	3206-0A
3207-00	3207-00	3207-00	3207-00	3207-00	3207-00	3207-00
3208-00	3208-00	3208-00	3208-00	3208-00	3208-00	3208-00
3209-00	3209-00	3209-00	3209-05	3209-05	3209-05	3209-0A
3210-00	3210-00	3210-00	3210-00	3210-00	3210-00	3210-00
3213-00	3213-01	3213-02	3213-00	3213-01	3213-02	3213-00
3214-00	3214-00	3214-00	3214-00	3214-00	3214-00	3214-00
3215-00	3215-00	3215-00	3215-05	3215-05	3215-05	3215-0A
3216-00	3216-00	3216-00	3216-00	3216-00	3216-00	3216-00
3217-00	3217-00	3217-00	3217-00	3217-00	3217-00	3217-00
3244-40	3244-40	3244-40	3244-40	3244-40	3244-40	3244-40
3291-00	3291-00	3291-00	3291-00	3291-00	3291-00	3291-00
3292-00	3292-00	3292-00	3292-00	3292-00	3292-00	3292-00
3293-00	3293-00	3293-00	3293-00	3293-00	3293-00	3293-00
3294-00	3294-00	3294-00	3294-00	3294-00	3294-00	3294-00
3295-00	3295-00	3295-00	3295-00	3295-00	3295-00	3295-00
3296-00	3296-00	3296-00	3296-00	3296-00	3296-00	3296-00
3297-00	3297-01	3297-02	3297-00	3297-01	3297-02	3297-00
5924-00	5924-00	5924-00	5924-00	5924-00	5924-00	5924-00
6085-00	6085-01	6085-02	6085-00	6085-01	6085-02	6085-00
6309-00	6309-00	6309-00	6309-00	6309-00	6309-00	6309-00
6360-00	6360-00	6360-00	6360-05	6360-05	6360-05	6360-0A
6410-A0	6410-A0	6410-A0	6410-A5	6410-A5	6410-A5	6410-AA
6411-A0	6411-A0	6411-A0	6411-A0	6411-A0	6411-A0	6411-A0
6424-00	6424-00	6424-00	6424-00	6424-00	6424-00	6424-00
8075-10	TBE[4]	TBE	8075-10	TBE	TBE	8075-10
8075-20	TBE	TBE	8075-20	TBE	TBE	8075-20
8075-30	TBE	TBE	8075-35	TBE	TBE	8075-3A
8075-40	TBE	TBE	8075-45	TBE	TBE	8075-4A
8075-50	TBE	TBE	8075-50	TBE	TBE	8075-50
8075-60	TBE	TBE	8075-65	TBE	TBE	8075-6A
8075-70	TBE	TBE	8075-75	TBE	TBE	8075-7A
85249-20	TBE	TBE	85249-20	TBE	TBE	85249-20
85249-30	TBE	TBE	85249-30	TBE	TBE	85249-30
85250-20	TBE	TBE	85250-20	TBE	TBE	85250-20
85250-30	TBE	TBE	85250-30	TBE	TBE	85250-30
85251-20	TBE	TBE	85251-20	TBE	TBE	85251-20
85251-30	TBE	TBE	85251-30	TBE	TBE	85251-30
85252-20	TBE	TBE	85252-20	TBE	TBE	85252-20
85252-30	TBE	TBE	85252-30	TBE	TBE	85252-30
85253-20	TBE	TBE	85253-20	TBE	TBE	85253-20
85253-30	TBE	TBE	85253-30	TBE	TBE	85253-30
85254-20	TBE	TBE	85254-20	TBE	TBE	85254-20
85254-30	TBE	TBE	85254-30	TBE	TBE	85254-30
85303-20	TBE	TBE	85303-20	TBE	TBE	85303-20
85303-30	TBE	TBE	85303-30	TBE	TBE	85303-30

Table 1. Equipment Ordering Numbers

[4] TBE = To be established. (Contact your Lab-Volt representative for additional information.)

85762-00 Rev. A1