

## H-ICS-7627 Instrumentation & Controls Program

### Purpose

To provide a convenient and realistic way of training students in the fundamental concepts of process system control and instrumentation. The student is given the opportunity to connect, operate, adjust and calibrate actual pneumatic and electronic control and measuring components and devices such as those used in functioning process loops. Study of advanced interactive systems can also be accomplished.

### Description

This unit consists of the following modules.

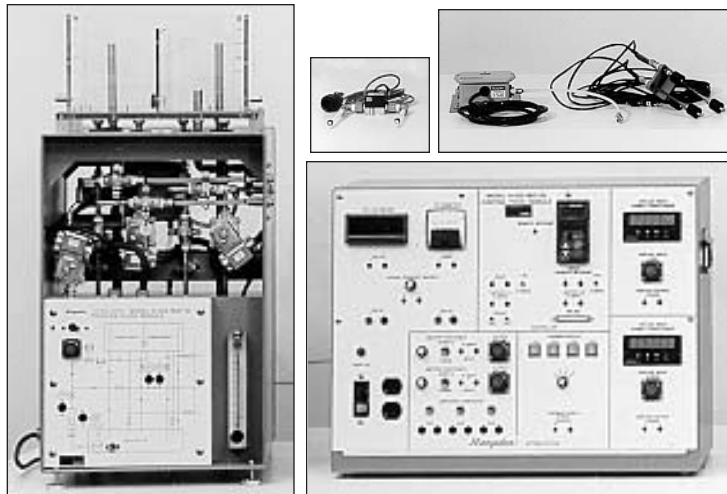
#### H-ICS-7627-10 Process Plant Module

This Process Plant Module consists of the following components:

- 1 Steel frame assembly with feet
- 1 Nalgene storage tank with drain valve and level switch
- 1 Pump
- 1 Flowmeter with needle valve
- 3 Solenoid valves, two with different CVs
- 1 Clear Lexan® dual process tank with overflow
- 1 Control valve, electronic w/stepper motor
- 1 Flow control module interface
- 5 Ball valves
- 1 Lot of Interface self-seal fittings and hoses

#### H-ICS-7627-11 Process Plant Module

This Process Plant Module consists of the same components as the **Model H-ICS-7627-10** except configured with base and back support panel.



- A. H-ICS-7627-10
- B. H-ICS-7627-30
- C. H-ICS-7627-40
- D. H-ICS-7627-20

#### H-ICS-7627-20 Control Panel Module

The Control Panel Module consists of the following features:

- 1 Microprocessor single-loop system (PID) w/ two 4-20mA outputs, one relay output, two 4-20mA inputs and one RS-485 port
- 1 Digital voltmeter
- 1 Analog ammeter
- 1 Digital pulsed input signal conditioner with 4-20mA output
- 1 Digital analog input signal conditioner with 4-20mA output
- 1 4-20mA signal source
- 1 Motor control positioner, 4-20mA
- 1 Voltage switched output control, 120V(240V) and 24V
- 1 Ground fault main circuit breaker
- 1 Lot of Hampden HR-1S color coded socket receptacles
- 1 Lot of Hampden MPP-3 mini-plug cords
- 4 Thermocouple inputs with selector switch and 4-20mA transmitter

#### H-ICS-7627-21 Control Panel Module

The Control Panel Module consists of the following features:

- 1 Ground fault main circuit breaker
- 1 Signal source, 4-20mA
- 1 Control valve interface
- 1 Control circuits interface, 6-req
- 1 24V. DC power supply
- 1 Hampden HR-1S color coded socket receptacle
- 1 Hampden interface receptacle

#### H-ICS-7627-30 Flow Control Module

The Flow Control Module consists of the following items:

- 1 Flow transmitter with interface cable and connector
- 1 Interface hose set

#### H-ICS-7627-40 Level Control Module

The Level Control Module consists of the following components:

- 1 Dual two level adjustable float switches complete with interface plugs
- 1 Level differential pressure transmitter with interconnection hoses and interface plug

All Hampden units are available for operation at any voltage or frequency

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# Instrumentation and Control Systems

Educational Training Equipment for the 21st Century

Bulletin 132-1A

## H-ICS-7627-50 Pressure Control Module

The Pressure Control Module consists of a rack with the following components:

- 1 Bench top frame with control panel four levellers and four handles
- 4 Pressure gauges, dual scale in psi/kPa
- 2 Air pressure regulators
- 1 I/P converter
- 1 Pneumatic control valve
- 1 Differential pressure transmitter
- 1 Pressure transmitter
- 1 Pressure tank with safety relief valve
- 1 Orifice plate assembly
- 1 Air exhaust muffler
- 5 Ball valves
- 1 Hampden HR-1S socket receptacles
- 1 Lot process copper pipe 1/4"

## H-ICS-7627-60 Temperature Control Module

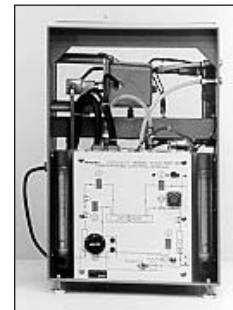
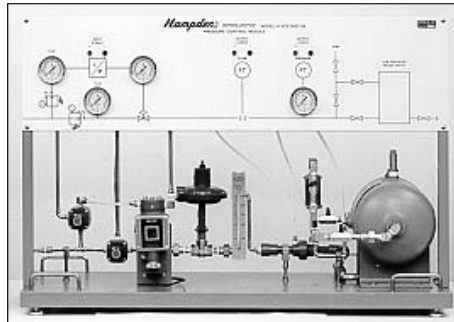
The Temperature Control Module consists of the following components:

- 1 Steel frame assembly with feet
- 2 Flowmeters with needle valves
- 4 Thermocouple type T
- 1 Stainless steel tank with drain valve, 1500 and 750 watt heater elements
- 1 Level switch
- 1 Control valve, electronic with stepper motor
- 1 Thermostat
- 1 Heat exchanger, plate type
- 1 Pump
- 1 Lot of Interface pipe and associated connectors

## H-ICS-7627-70 pH Control Module

The pH Control Module consists of the following components:

- 1 Steel frame assembly with feet
- 2 Flowmeters
- 2 Feed pumps
- 1 Dual stainless steel tank with drains
- 1 Process tank with drain
- 1 Mixer
- 1 Solenoid valve
- 1 Control valve, electronic
- 1 pH electrode, Dip type
- 1 pH transmitter, 4-20mA
- 1 Lot of Interface pipe connectors



- E. H-ICS-7627-50
- F. H-ICS-7627-60
- G. H-ICS-7627-90
- H. H-ICS-7627-91
- I. H-ICS-7627-80

E

F

G

H

I

## H-ICS-7627-80 Dual Channel Recorder Module

The Dual Channel Recorder Module consists of the following components:

- 1 Paperless two channel recorder/data acquisition system module with enclosure, circuit breaker, four Hampden HR-1S socket receptacles and power cord
- 1 Memory card
- 1 Card reader, power supply and software for IBM PC, computer not included

## H-ICS-7627-90 Remote Control Module

The Remote Control Module consists of the following add-on components:

- 1 Flow transducer with interface cable
- 1 Electronic control valve module with ON-OFF switch, power supply, manual control or remote control functions

## H-ICS-7627-91 Process Digital Module

The Process Digital Meter consists of a loop powered 3-1/2" digit digital meter with enclosure and two interface receptacles.

Ranges: 4-20mA

## H-ICS-7627-97 Process Controller

Advanced PID control, auto-tuning with feed-forward circuitry provides fast, stable response.

## H-ICS-7627-CCS Computer Control System

The Computer Control System consists of one LabTech Notebook Software package complete with analog and digital input-output board.

## General

All air fittings are Parker Quick Disconnect Type Poly-tite.

The above components are to be patch connected. Nomenclature and symbols are silk-screened on the control panel.

## Services Required

120VAC-1Ø-60Hz

240VAC-1Ø-50Hz

All Hampden units are available for operation at any voltage or frequency

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