H-6252

Modular Chemical Reactor System

Purpose

The Hampden **Model H-6252** Modular Chemical Reactor System is used to investigate the chemical reactor which is the most commonly used, important piece of equipment in a chemical plant. Chemical reactors are used to manufacture a wide variety of products including: polyvinyl chloride, epoxy resin, and pharmaceuticals, to name a few. This apparatus permits the student to move from classroom theory to hands-on applications with practical training. The student will control the process, and measure those variables which control the reactor.

Equipment Overview

The fundamental device is a reactor vessel. These vessels have usable process volumes of 1 to 2 liters (adjustable) and are equipped with variable speed stirrers, reagent feed ports, product outlet ports, product sampling ports, and temperature measurement ports.

The reagents are stored in a pair of corrosion-resistant tanks, each matched with a chemical metering pump and flow calibration port. The metering pumps are equipped with an external control feature. A product collection tank (constructed out of corrosion-resistant material) is also provided. All of the tanks are covered and are provided with drain valves.

The measurement and control of temperature are accomplished with a microprocessor based PID controller and a type 'T' thermocouple. The controller operates an electric heating element. In addition, a cooling/heating coil is provided to carry out heat transfer studies.

The variable speed allows experiments to be performed studying the effects of reagent mixing.

MODEL H-6252-C
Batch Reactor Module

MODEL H-6252-D
Tubular Reactor Module

MODEL H-6252-E Continuous Stirred Tank Reactor Module

MODEL H-6252-F Control Module

MODEL H-6252-A Reagent Service Module
(Quantity 2)

MODEL H-6252-B Hot Water Service Module

MODEL H-6252-J
Product Tank Module

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

Hampden® ENGINEERING CORPORATION

030817

P.O. Box 563, East Longmeadow, MA 01028 • Tel 413-525-3981 • Fax 413-525-4741 • E-mail sales@hampden.com **800-253-2133**

Chemical Engineering Systems

Educational Training Equipment for the 21st Century

H-6252

Modular Chemical Reactor System

Description

This system is designed for table top mounting. All modules consist of bases with non-mar feet and incorporate disconnect hose connections or electrical interface connections where required.

Thermocouples are located in both the reactor vessel and heating or cooling fluid stream for accurate temperature control. Reagents are introduced to the process using two electronic chemical metering pumps complete with manual or external 4-20mA control. Both feed tanks are non-corrosive.

The Hampden **Model H-6252** Modular Chemical Reactor System consist of the following modules:

- 2 - **Reagent Service Modules**
  MODEL H-6252-A
- 1 - **Hot Water Service Module**
  MODEL H-6252-B
- 1 - **Batch Reactor Module**
  MODEL H-6252-C
- 1 - **Tubular Reactor Module**
  MODEL H-6252-D
- 1 - **Continuous Stirred Tank Reactor Module**
  MODEL H-6252-E
- 1 - **Control Module**
  MODEL H-6252-F
- 1 - **Data Logging I/O Module**
  MODEL H-6252-G (Optional)
- 1 - **Hose Set**
  MODEL H-6252-H
- 2 - **Flow Transmitter Modules**
  MODEL H-6252-I (Optional)
- 1 - **Product Tank Module**
  MODEL H-6252-J

The Hot Water Service Module consists of a hot water source with circulation pump. Cold water is supplied direct from the local source. Ball valves are provided for on-off control along with a needle valve for flow control.

The Batch Reactor Module consists of an insulated stainless steel enclosure with insert cavity for either a vacuum insulated glass reactor vessel or non-insulated vessel, heat transfer coil, stirrer, and thermowell.

The Tubular Reactor Module consists of a clear glass vessel with a single continuous reactants tube. This vessel contains a thermowell and connections for either heating or cooling.

The Continuous Stirred Tank Reactor Module consists of a clear glass vessel, stirrer, reactor tube, thermowell and connections for either heating or cooling.

The Control Module consists of three microprocessor based temperature controllers, one main ground fault circuit breaker, pump circuit breakers, thermocouple switch, digital temperature indicator, interface control receptacles and duplex receptacle.

The Computer Data Logging National Instruments I/O Module Option consists of interface components, power supply and converters to process seven thermocouples and two 4-20mA inputs directly to the USB port of a PC computer. Computer is supplied. LabVIEW® control software and templates for LabVIEW® control software are included.

MODEL H-6252-I
Flow Transmitter Modules (Optional, Qty 2)

MODEL H-6252-G
Data Logging I/O Module (Optional)

Service Requirements

Power:	208VAC 3Ø 30A
Water:	Cold
Waste:	Water Drain

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

Hampden® ENGINEERING CORPORATION

030817

P.O. Box 563, East Longmeadow, MA 01028 • Tel 413-525-3981 • Fax 413-525-4741 • E-mail sales@hampden.com **800-253-2133**