

Features

- Totally self contained with all power supplies and fluid sources
- Industrial control devices and sensors
- Modular and versatile
- Allows calibration and testing of process transmitters
- 4-20mA current loops
- Mobile wheeled trolley
- Fully developed curriculum

Description

Modern control devices and sensors are becoming increasingly complex and functionally very powerful.

To expose students to these devices and give them experience in the selection and utilisation of them Feedback has designed this process instrumentation rig.

All the devices used in this system are based on industrial sensors and actuators. This unit has been specifically designed to give students hands-on experience of industrial process devices and systems. Based on a mobile trolley that incorporates all electrical, water (including a water heater) and air supplies, the system provides a totally self-contained unit.

The punched front panel provides a construction area that allows devices to be fixed to it via a series of keyhole slots. The instrumentation devices are mounted on robust carriers that allow them to be located and locked onto the front panel.

Modules for Process Instrumentation

The majority of the modules shown on the facing page can be stored on the front of the Process Instrumentation Services 38-540 below the keyhole construction area of the front panel.

A standard industrial control valve is supplied that is opened by air pressure to cause flow, and is closed by means of a spring. The principle operation and the governing features of this type of valve are investigated.

Display instruments and transmitters are programmable so that they can be used to measure units such as degrees C, litres/min etc.

It is possible to take any individual device, examine its characteristics, calibrate, test, and configure it before connecting it into a working system. Simple process loops for level, flow, temperature and pressure may be constructed.



Accessories
Kit 38-540-AK

The complete Process Instrumentation Trainer 38-023 comprises:

Process Instrumentation Services 38-540

and the following Modules:

Current Loop Resistor	38-541-CLR
Current/Pressure Converter	38-541-CPC
Control Valve	38-541-CV
Pressure Transmitters	38-541-PT
Flow Meter	38-541-FM
Frequency Transmitter	38-541-FT
Level Probe	38-541-LP
Manual Valve	38-541-MV
Orifice Block	38-541-OB
Programmable Display	38-541-PD
Pulse Flow Sensor	38-541-PFS
Pressure Gauge	38-541-PG
Programming Equipment	38-541-PE
Solenoid Valve	38-541-SV
Temperature Probes	38-541-TP
Temperature Transmitter	38-541-TT
Universal Transmitter	38-541-UT

Accessories supplied with the 38-023

Accessories Kit 38-540-AK
includes 4mm and DIN interconnecting leads and
25 metre coil of 10mm plastic tubing

Mobile fluid drain container
Front drain shelf

Process Instrumentation Services Mobile Unit 38-540

Electrical Supply Controls

The mains electrical supply is fed to the unit via an Earth Leakage Circuit Breaker (ELCB).

There is also an emergency shut down button that removes all supplies making the unit safe.

A further three push buttons supply power to the rig, compressor and water heater.

Ancillary power connections can be made via a bank of IEC connectors fitted on the side panel of the unit.

Instrumentation and Control Supplies

Dual 4-20mA dc isolated current sources terminated with 4mm safety sockets.

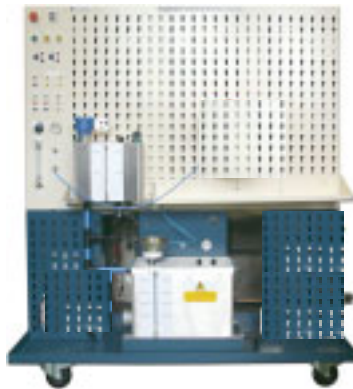
Dual 24Vdc 70mA isolated supplies terminated with 4mm safety sockets.

Dual output 24Vdc, 1.6A supply terminated with DIN sockets.

Air Supply Controls

The compressor input is fed into a regulator with bourdon pressure gauge to provide two air outlets.

A variable area flow meter provides visual indication of flow rate from one of the two air outputs.



A second air outlet is provided, direct from the compressor.

Variable Speed Water Pump

4-20mA input via two 4mm safety sockets to control the speed, and hence flow rate, of the water pump.

Reservoir

A 25 litre reservoir tank is provided with an integral water heater and water level indicator. Water is pumped from the tank to the process instruments on the keyhole panel connected via a flexible pipe with self-sealing connector. The integral pump provides flow and pressure, and its speed of operation is controlled from a 4-20mA input.

A 3kW immersion water heater is fitted to the reservoir tank quickly generating hot water for the process components. A series of safety devices protects the heater and the pump in the event of the tank being allowed to run dry.

The temperature of the water is controlled via a thermostat with a second safety cut-out providing additional over-temperature protection. In the event of either of these events arising, power is removed.

Process Tank

A process control tank is provided with the facilities for level and temperature sensors to be fitted.

A calibrated water volume scale with level indicator is provided.

The unit features quick connect fittings on all components to allow these to be easily connected and disconnected and to be configured into level, temperature or flow control system.

Process Instrumentation Modules 38-541



Universal Transmitter 38-541-UT



Pressure Transmitters 38-541-PT



Current/Pressure Converter 38-541-CPC



Control Valve 38-541-CV



Frequency Transmitter 38-541-FT



Current Loop Resistor 38-541-CLR



Solenoid Valve 38-541-SV



Level Probe 38-541-LP



Pulse Flow Sensor 38-541-PFS



Pressure Gauge 38-541-PG



Programmable Display 38-541-PD



Temperature Transmitter 38-541-TT



Manual Valve 38-541-MV



Orifice Block 38-541-OB

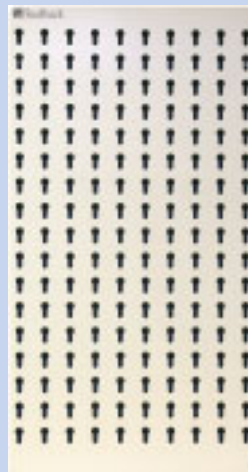


Temperature Probes 38-541-TP



Display Mount 38-540-DM

Optional Accessories



Extension Panel 38-540-EP



Accessory Shelf 38-540-AS



Flowmeter 38-541-FM



Programming Equipment 38-541-PE



Air Compressor 38-540-AC

Curriculum Coverage

Introduction

Familiarisation

4-20mA Current Loops

4-20mA Programmable display

Configuring units
Configuring span

Capacitive Level Sensor and Transmitter

Process tank set up
Probe Calibration
Display of units

Temperature Sensors and Transmitter

Programming the temperature transmitter
Process tank set up
The Platinum resistance thermometer sensor, PT100
The thermocouple sensor type K
Display of units

Flow Devices

Visual flow meter
Programming the Pulse transmitter
Display of the output units
Pulsed Turbine sensor
Calibration
Extended range operation

Introduction to Control Valves

Simple valve construction-Manual Control Valve
Air operated Process Control Valve
Valve C_v

Pressure Devices

Direct indicating pressure gauge
4-20mA Pressure Transmitter
Display of output units

Current to Pressure (I-P) Converter

Connectivity and operation
Current/Pressure relationship
Process Valve control

The Orifice Block

Principle of operation
Basic function - visual pressure gauge output

Universal Transmitter

Setting up and programming
Differential Pressure Transmitter with Orifice Block
Display of output units

Specification

Dimensions & Weight

Width: 1,470mm, Depth: 560mm, Height: 1,700mm approx.
Weight: 120 kg. (including all modules)

Tender Specification

- [1] A totally self-contained unit including power supplies and fluid sources.
- [2] Provides students with hands-on experience of industrial sensors and actuators.
- [3] Based on a mobile, wheeled trolley.
- [4] 4-20mA current loops.
- [5] Has a punched front panel enabling devices to be fixed using keyhole slots.
- [6] Offers 17 optional modules.
- [7] Offers an accessories kit which includes 4mm and DIN leads and a 25m coil of 10mm plastic tubing.
- [8] To be supplied with a variable speed water pump.
- [9] To be supplied with a reservoir tank with capacity of approx. 25 litres.
- [10] To be fitted with an integral water heater of approx. 3kW.
- [11] To be supplied with a process control tank.
- [12] The mains electricity supply to be fed to the unit via an Earth Leakage Circuit Breaker (ELCB).
- [13] To be fitted with an emergency shut-down button.
- [14] To be supplied with an experimental manual.
- [15] To be supplied by a company offering a 2 year parts and labour warranty.

Ordering Information

Process Instrumentation Trainer
(complete with all modules and accessories) 38-023
Process Instrumentation Services Mobile Unit
(excludes all modules 38-541 and Accessories
Kit 38-540-AK) 38-540

Optional Accessories

Extension Panel 38-540-EP
Accessory Shelf (for computer or controller) 38-540-AS
Display Mount 38-540-DM
Air Compressor 38-540-AC

Services Required

220 - 240V ac
Compressed air: 44litres/min flow @ 2 bar maximum.

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