

## INTRODUCTION

The Cussons P7665 Boiler Control Demonstration Unit has been designed to demonstrate clearly and simply a range of boiler control sequences relating to oil or gas fired boilers. Since steam pressure is 'simulated' the whole functioning of a boiler may be studied in a relatively safe situation. The Demonstration Unit can act as a valuable teaching aid for the training of boiler operating personnel in the diagnosis of boiler system faults which may occur in practice.

## EXPERIMENTAL CAPABILITY

Designed to provide demonstration and investigation of:

- ◆ Automatic operational functioning of an oil/gas fired boiler
- ◆ Predetermined faults imposed on the system
- ◆ Safety control operation
- ◆ Feedwater pump control by various methods
- ◆ Basic boiler mounted indicating and control systems

To study the conditions which arise when various combinations of 13 faults are imposed on the Demonstration Unit make it a powerful diagnostic tool in the understanding of boiler fault conditions.

P7665

## BOILER CONTROL DEMONSTRATION AND FAULT SIMULATOR UNIT

### DESCRIPTION

#### BOILER OPERATIONAL FUNCTION

An arrangement of up to date integrated circuits is used to simulate boiler pressure and burner control together with the sensing and control systems associated with modern boiler systems. The simulated boiler itself is constructed from a clear acrylic tank and thus the demonstration unit provides a clear visual appreciation of the operating characteristics of the various level controls i.e. float operated magnetic, reed or mercury switch or electronic system using electrode sensors. The operation of these level sensing devices can readily be investigated since they may be removed from the Demonstration Unit, dismantled and re-assembled, without the attendant problems which would occur on an operational boiler. These systems would not normally all be fitted in the same boiler but are included in this unit to give the student an appreciation of the characteristics of each system. Conversion of water from the boiler into steam is simulated so that the level sensors need to operate as in a true Boiler system.

A Boiler Water Gauge is fitted to the Boiler Drum so that possible misuse of this item can be demonstrated clearly and safely.

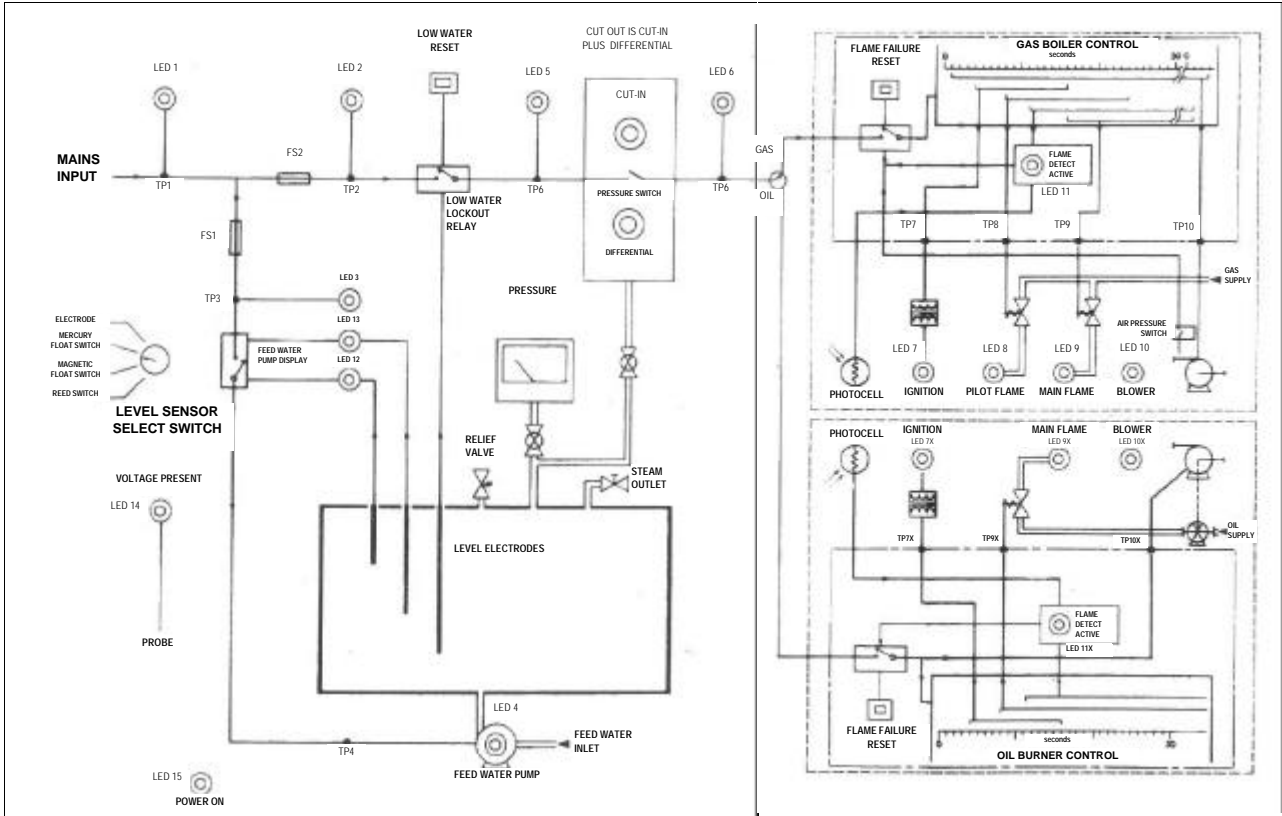
This Gauge can also be used to demonstrate the method of changing a 'sight glass' for such a gauge under simulated working conditions - a circumstance which can be 'safely' taught on this Demonstration Unit.

#### FAULT FINDING FACILITY

A mimic diagram illustrating the system simulated, forms part of the front panel of the control console. This diagram incorporates a number of 'Light Emitting Diodes' (LED's) which can indicate the conditions existing at various system positions if required. A number of voltage test points are included and by appropriate use of these facilities the Demonstration Unit can be used as a fault finding teaching aid.

## FAULT SWITCH FUNCTIONS

Switch	Fault	Switch	Fault
A	Blower motor failure	H	Feedwater pump fault
B	Ignition transformer failure	I	Pump fuse failure
C	Pilot flame solenoid failure	J	Pressure switch failed open
D	Main flame solenoid failure	K	Pressure switch failed closed
E	Power failure	M	Closed electrode probe short circuited
F	Ignition circuit fuse failure	N	Photocell operation fault
G	Pressure gauge system fault		



**BOILER CONTROL PANEL LAYOUT**

The facility is provided to deliberately switch in up to 13 individual system faults or various combinations as desired. These fault switches are housed in a lockable compartment so that the faults placed on the system can be completely unknown to the student.

## TENDER SPECIFICATION

Boiler Control Demonstration Unit comprising a clear acrylic tank representing the boiler drum containing level sensors and indicator, glass reinforced plastic feedwater tank, feedwater pump and interconnecting pipework, Control Console with Mimic diagram of the Unit incorporating Light Emitting Diodes to indicate system conditions and voltage test points for fault diagnosis, small recessed compartment (fitted with a lockable door), containing switches to simulate up to 13 individual system faults when the Demonstration Unit is used for fault diagnosis training, all mounted on a mobile steel frame.

## SERVICES

Water supply for initial fill of feed water tank and suitable drain.

Electrical supply for 110/115 or 220/240 volts, 50/60 Hz single phase (please specify when ordering).

## SHIPPING DETAILS

Gross weight: 410 kgs  
 Nett weight: 220 kgs  
 Case size: 134 x 96 x 193 cm

**Cussons Technology Ltd.**

102 Great Clowes Street, Manchester M7 1RH, England

Tel. +(44)161 833 0036

Fax. +(44)161 834 4688

E-mail: sales@cussons.co.uk Web: www.cussons.co.uk