(1940) *III(5)a*

National Measurement Office

SUPPLEMENT TO CERTIFICATE

Series S039

Certificate No.	*Supplement No.*
1940	94

Submitted by: ***Pumptronics Europe Ltd***
Lyngate Industrial Estate,
Folgate Road,
North Walsham,
Norfolk, NR28 0AJ,

Authorisation is hereby given by the Secretary of State for Business, Innovation & Skills for the following Certificate of approval relating to a pattern of a liquid flowmeter to be modified as described below.

As described in the Certificates listed above but modified to have an alternative self service device, as detailed in the descriptive annex, and having the following characteristics:-

DISPENSER(s): Dispensers described in above certification numbers.

SELF SERVICE DEVICE: Gilbarco TS1000 kiosk control unit as described in the descriptive annex.

Signatory: G Stones
for Chief Executive
National Measurement Office
Department for Business, Innovation and Skills
Stanton Avenue
Teddington
Middlesex, TW11 0JZ
United Kingdom

Reference No: TS0901/0027
Date: 01 October 2014

ILLUSTRATIONS

CERTIFICATION NO 2650/8

1 INTRODUCTION

Having the dispensers as described on the front page and having the Gilbarco TS1000 kiosk control system as listed below connected as shown at Figure 1.

TS1000 Kiosk control console	4 off (Figure 2)
C1000 Controller	1 off (Figure 4)
Power distribution module	2 off (Figure 8)
Data distribution module	3 off (Figure 5)
Receipt printer (Star SP300)	4 off (Figure 6)
Purchaser display	4 off (Figure 7)
Power distribution module	2 off (Figure 8)
Uninterruptible power supply (Accupower 20)	1 off (Figure 9a and Figure 9b)

Alternatives at Section 4 of this Certificate authorise connection of the equipment in configurations from 1 to 4 TS1000 kiosk control consoles and peripherals.

2 CONSTRUCTION

2.1 Mechanical

2.1.1 Kiosk control console (Figure 2)

The kiosk control console is housed in a plastic enclosure and comprises the following:-

(i) An operator's keyboard. Details of the keys and their functions are shown at Figure 3.

(ii) An operator's display.

(iii) Security keyswitch.

2.1.2 Power supply (Figure 10)

This is an ELPAC unit housed in a plastic enclosure.

2.1.3 Purchaser's display (Figure 7)

The purchaser's display is housed in a metal enclosure with a plastic window.

2.1.4 Controller (Figure 4)

The controller is housed in a metal enclosure the front panel of which contains connectors.

2.1.5 Uninterruptible power supply (Figure 9a and Figure 9b)

This is either an Accupower 20 (Figure 9a) or Accupower 30 (Figure 9b) unit and is housed in a metal enclosure with a plastic front panel.

2.1.6 Data distribution module (DDM) (Figure 5)

This unit is housed in a metal enclosure. Indicators are visible through the front panel and show communications loop status.

2.1.7 Power distribution module (PDM) (Figure 8)

This module is of steel construction. Connection of the dispensers to the nominal 240 V electrical mains is via this module which also serves as a connection point for the two-wire communication loop.

2.1.8 Receipt printer (Figure 6)

Star SP300 printer.

2.2 Electrical and electronic

Power for the kiosk control unit is derived from the uninterruptible power supply unit. This unit provides a power source in the form of rechargeable batteries to enable the completion of memorised and current transactions in the event of power failure.

2.2.1 Kiosk control console

The console electronics are housed on the three printed circuit boards described below:-

(i) Logic board
(ii) Keyboard
(iii) Display board (vacuum fluorescent displays)

2.2.2 Power supply

This is an ELPAC unit input 240 V ac, output 5 V dc.

2.2.3 Purchaser's display

The electronics for this unit are contained on the two printed circuit boards described below:-

(i) CPU board
(ii) Display board (7-segment LCD displays)

2.2.4 Controller

The controller electronics are contained on three types of circuit board as set out below:-

(i) Memory board
(ii) IO board
(iii) CPU board

2.2.5 Uninterruptible power supply

This is either ACCUPOWER 20 or ACCUPOWER 30.

Each of these units is capable of supporting a system up to and including four kiosk control consoles for a minimum of 15 minutes. At mains failure power is derived from sealed lead acid rechargeable batteries.

2.2.6 Data distribution module

The electronics for this unit are contained within one circuit board and contains opto-couplers.

2.2.7 Power distribution module

This module contains an emergency stop power contactor, miniature power circuit breakers and two pole isolators is a PCB for the communication loop.

2.3 Legends at the kiosk control unit

2.3.1 Power connection

A warning label as shown at Figure 11 is attached to the power supply unit(s) and controller adjacent to the power connection.

2.3.2 Operator's display

The legends at the operator's display are as shown at Figure 2.

2.3.3 Purchaser's display

Legends and displays are given in Table 1 and are shown at Figure 7.

Table 1

DISPLAY FUNCTION	DISPLAY	HEIGHT mm	LEGEND	HEIGHT mm
Memory	Bar	-	Current	5
Memory	Bar	-	Stored	5
Pump	x	12.5	Pump	5
Unit price	xxx.x	12.5	Pence per litre	5
Volume			Litres	10
dispensed	xxx.xx	12.5	This Sale	10
Price-to-pay	xxx.xx	12.5	£	10

3 OPERATION

3.1 Dispenser control

The kiosk control unit may be set by use of the lockable keyswitch in one of the following modes:

OFF MODE	Normal use disabled
OPERATOR (OPR)	Normal operation
MANAGER (MGR)	Manager programming
SERVICE (SRV)	

The following keypads are used for dispenser control:

Note: The use of () indicates the reference used at Figure 3.

PUMP SELECT(a)	Used to call up dispenser data at the operator's and purchaser's displays.
A/B MEMORY KEY (c)	Used to select between **CURRENT** or **STORED** transaction.
AUTHORISE KEY (g)	Used to authorise a dispenser.
PUMP STOP(l)	Used to stop a specific dispenser.
ALL STOP(p)	Used to stop all dispensers.

Above each of up to twenty-four **PUMP SELECT** (a) keypads there are two light-emitting diode indicators with the legends **A** and **B** (g). These indicators show the status of the corresponding dispenser as listed below:

FAST BLINK	Pump requesting authorisation (nozzle lifted)
STEADY ON	Pump authorised
SLOW BLINK	Payment due (nozzle stowed)
LIGHT OFF	Pump idle

3.2 Sequence of operation

3.2.1 Postpay

The operation is given in Table 2:

Table 2

AT THE DISPENSER	THE CONSOLE AND OPERATOR ACTION	PURCHASER'S DISPLAY
Lifts nozzle	**INDICATOR A** fast blink	See note 1
	Presses **PUMP X** and **AUTHORISE** **INDICATOR A** steady on	May display stored transaction
Takes fuel	Sale may be monitored	May display stored transaction
Stows nozzle	**INDICATOR A** slow blink	May display stored transaction See Note 2
Offers payment	Presses **PUMP X** and **A/B MEMORY** to display correct transaction	Transaction displayed
Agree transaction	Presses **FUEL** and method of **PAYMENT** keys	Display clears

Note 1: The display at the purchaser display may show any delivery complete but unpaid transaction for any dispenser are shown by use of the **A/B MEMORY** key and the appropriate **PUMP** key.

Note 2: At this stage the dispenser may be authorised for another purchaser. Should this purchaser offer payment before the first the display would, when showing the correct transaction, indicate **CURRENT** at both the operator's and purchaser's displays. The first purchaser's transaction will be **STORED**. There is only one level of memory.

3.2.2 Prepay and Preset

Prepay or preset is only operational when

(a) a suitable printer is connected, and

(b) the dispenser is fitted with suitable flow control solenoid valves.

3.2.2.1 Prepay

The sequence of operations is as follows:

Purchaser enters kiosk, tenders £x.xx and agrees dispenser to be used.

Operator	Presses	**PUMP SELECT**	(for chosen dispenser)
	Enters	£x.xx	(using numeric keys)
	Presses	**FUEL**	
	Presses	**FORM OF PAYMENT**	(CASH, CREDIT)

Receipt for cash tendered is automatically issued.

The transaction proceeds as described at Table 2. Should 'Price-to-Pay' indication at the dispenser be less than the amount tendered for prepay then when the purchaser returns to the kiosk a receipt showing the cash refund is issued. A typical receipt is shown at Figure 12.

3.2.2.2 Preset

Preset may be used on any dispenser, the preset amount being the money only.

The sequence of operations is as follows:

Operator Presses Pump Select (when dispenser calls)
Enters £x.xx using numeric keys
Presses Authorise

The transaction proceeds as described at Table 2 with the dispenser stopping at the preset amount.

3.3 Receipt issue

With the exception of prepay, printer receipts may be issued automatically or on demand by use of the **PRINT** key.

3.4 Interlocks and security features

There are the following interlocks and security features:

3.4.1 Prepay is inhibited when the receipt printing peripheral is not functioning (paper low), is not connected, or where the dispensers are not fitted with suitable flow control solenoid valves.

3.4.2 Only one level of memory is permitted.

3.4.3 Price changes at the dispenser may only be made when all transactions are complete.

3.4.4 Fuel transactions, when printed on a receipt, are separated by at least one line feed from other sales or information.

3.4.5 Fuel sales may not be entered manually.

3.4.6 Where 13 amp style plugs are used for connection to the uninterruptible power supply output covers are to be fitted to prevent easy removal of these plugs.

4 AUTHORISED ALTERNATIVES

4.1 Alternative dispensers

There may be any of the alternatives of Certification No 2650 at Section 4.

4.2 Kiosk control console

(i) Up to three kiosk control consoles removed.

(ii) Keyboard modified to allow control of 36 dispensers (Figure 18).

4.3 Kiosk control console peripherals

(i) Up to three printers removed.

(ii) Without any printer in which case prepay is inhibited.

(iii) With no purchaser displays in which case memorised transactions are not permitted.

(iv) Any, or all of the printers replaced by a DHP4100 (Formerly Eaton) printer, in which case prepay is allowed.

4.4 Controller

(i) When only one data distribution module is between controller and power distribution modules then the IO Board is not required.

(ii) When three data distribution modules are present between controller and dispensers then an additional IO board is used.

(iii) With an approved opto-isolator (Figure 17a and Figure 17b) attached to allow the connection of any unspecified management equipment.

The legend: UNSPECIFIED EQUIPMENT FOR MANAGEMENT PURPOSES ONLY is adjacent to the output connection shown at Figure 17b.

4.5 Uninterruptible power supply

(i) Without the uninterruptible power supply, in which case memorised transactions are inhibited.

(ii) The Accupower unit removed and replaced by either ONDYNE HO 300 Figure 13a and Figure 13b or DOWTY 300 Figure 14a and Figure 14b.

4.6 Data distribution modules

(i) Without the data distribution module between controller and kiosk control console when only one kiosk control console is present.

(ii) With the data distribution module between controller and two kiosk control consoles removed and replaced by a splitter cable.

(iii) With only one data distribution module between controller and power distribution modules when system has 12, or fewer, fuelling positions.

(iv) With an additional data distribution module between controller and power distribution modules when system has 25 or more fuelling positions.

4.7 Power distribution modules

(i) Without one power distribution module when the system is comprised of eight, or fewer, pump frames.

(ii) With an additional power distribution module when the system is comprised of seventeen, or more, pump frames.

(iii) One or more of the power distribution modules may be removed and replaced by a similar unit containing rotary mains isolator switches and an external emergency stop power contactor.

4.8 Tank gauges

(i) With either of Veeder Root TLS200R (Figure 15) or Gilbarco Tank Monitor 2 (Figure 16) directly connected to the controller.

4.9 Alternative DHP 4410 printer

Having the receipt/voucher printer replaced by a DHP 4410 printer as shown in Figure 18.

4.10 TS1000 kiosk control keypads re-labelled

Having the following keypads on the TS1000 kiosk control unit re-labelled:

`OTHER' and `CREDIT' are blanked
`CASH' becomes `ACCEPT'
`ALL STOP' is blanked and disabled

4.11 Optically isolated dual serial interface

Having an optically isolated link provided by an interface box and RS232 wire connections. The interface can be used to connect approved kiosk equipment, where spare I/O ports are available, to any tank gauging system, thus allowing communication of tank related data. It is also possible to use the interface to connect approved POS terminals, where spare I/O ports are available, to any tank gauging system for the transfer of tank related data.

4.12 Optically isolated connection to TS1000

Having a Scimar OP232/UA2 opto isolator (Figure 19) connected to the TS1000 kiosk control unit.

This opto isolator is primarily intended for the connection of a Site Sentinel tank gauge unit to the TS1000. However there may be any peripheral equipment connected to the opto isolator in use for management purposes only.

4.13 Connection of any uninterruptible power supply

Having the approved un-interuptable power supply (UPS) replaced by any UPS of the "on-line", "off-lin"e, or "line interactive" type.

Note: The UPS connected to the TS1000 maintains a metrological feature (e.g. memorised transaction data). It remains a requirement that in the event of site power failure the UPS supports the TS1000 kiosk control unit for a minimum period of 15 minutes (or as detailed in the certificate).

Prior to conducting this test the UPS should have been powered for at least 12 hours.

4.14 Connection of any of the DHP range of printers

Having the approval of the DHP 4410 printer associated with either the T24, TMS15 or TS1000 kiosk control unit extended to any of the DHP range of printers.

4.15 STIC 867 tank gauge

As described in the certificate but having STIC 867 tank inventory system connected to the kiosk control unit or to any POST approved for connection to the KCU under this certificate. The STIC receiver is shown in Figure 20.

4.16 Universal distribution box

As described in the certificate but having a Universal Distribution Box as shown in Figure 21 in place of the Data Distribution Box. It may be fitted with one or two circuit boards each containing power supply, opto-coupled current loop interface, RS422 interface, 8 dispenser current loops, and isolation circuitry. The box also contains the power supply transformer and connection blocks.

5 RECOMMENDED TESTS

In addition to the tests described in Certification No 2650/57 at Section 5, the following tests may be undertaken to determine conformity with the approved pattern.

5.1 Check that the interlocks at Section 3.4 above are operative.

5.2 System features

5.2.1 Check that the dispenser displays are accurate and maintained for at least 15 minutes following a mains power failure.

5.2.2 Check that price changes are inhibited when sales are in progress.

5.2.3 Check that the controller, consoles and purchaser displays are kept powered by the UPS in the event of mains power failure.

5.2.4 Check that memorised transactions are correct and that it is not possible to release the pump to a third purchaser.

5.2.5 Check that dispensers cannot be authorised when the kiosk control unit is in management modes.

5.2.6 Check that the purchaser's display units remain blank when the kiosk control console is in management mode.

5.2.7 Check that system is programmed for no memorised transactions if the uninterruptible power supply is not present.

5.2.8 Check that the certification that authorises the dispensers (Certification No 2650) is amended to include the method of flow control and price computation for PREPAY transactions.

Should there be no such authorisation on any one of the dispensers then PREPAY should be inhibited at the kiosk control unit.

5.2.9 Check that when the prepay method of operation is used that:

(i) The dispenser stops at exactly the PREPAY cash value.

(ii) The price computation is within the permitted errors for unit from 25 pence per litre to the maximum that may be set.

(iii) A credit slip is available for the cash tendered and is as shown at Figure 12.

(iv) For a prepay controlled delivery that is terminated before the cash tendered amount is reached the subsequent receipt shows the correct refund amount.

(v) A receipt is available for all prepay controlled deliveries upon completion as shown at Figure 12.

(vi) A notice is displayed advising purchasers using the prepay facility to take a credit slip for the amount prepaid.

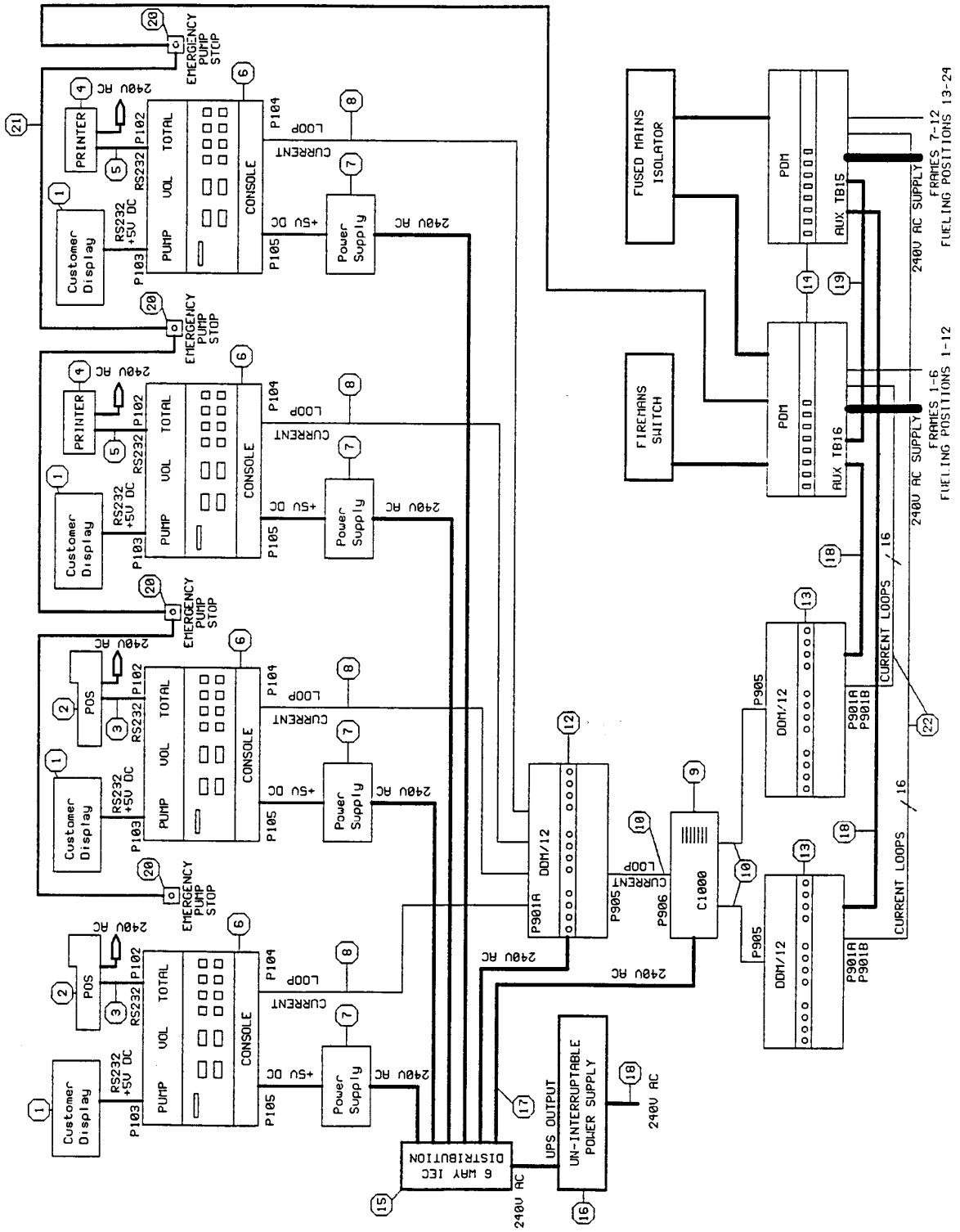
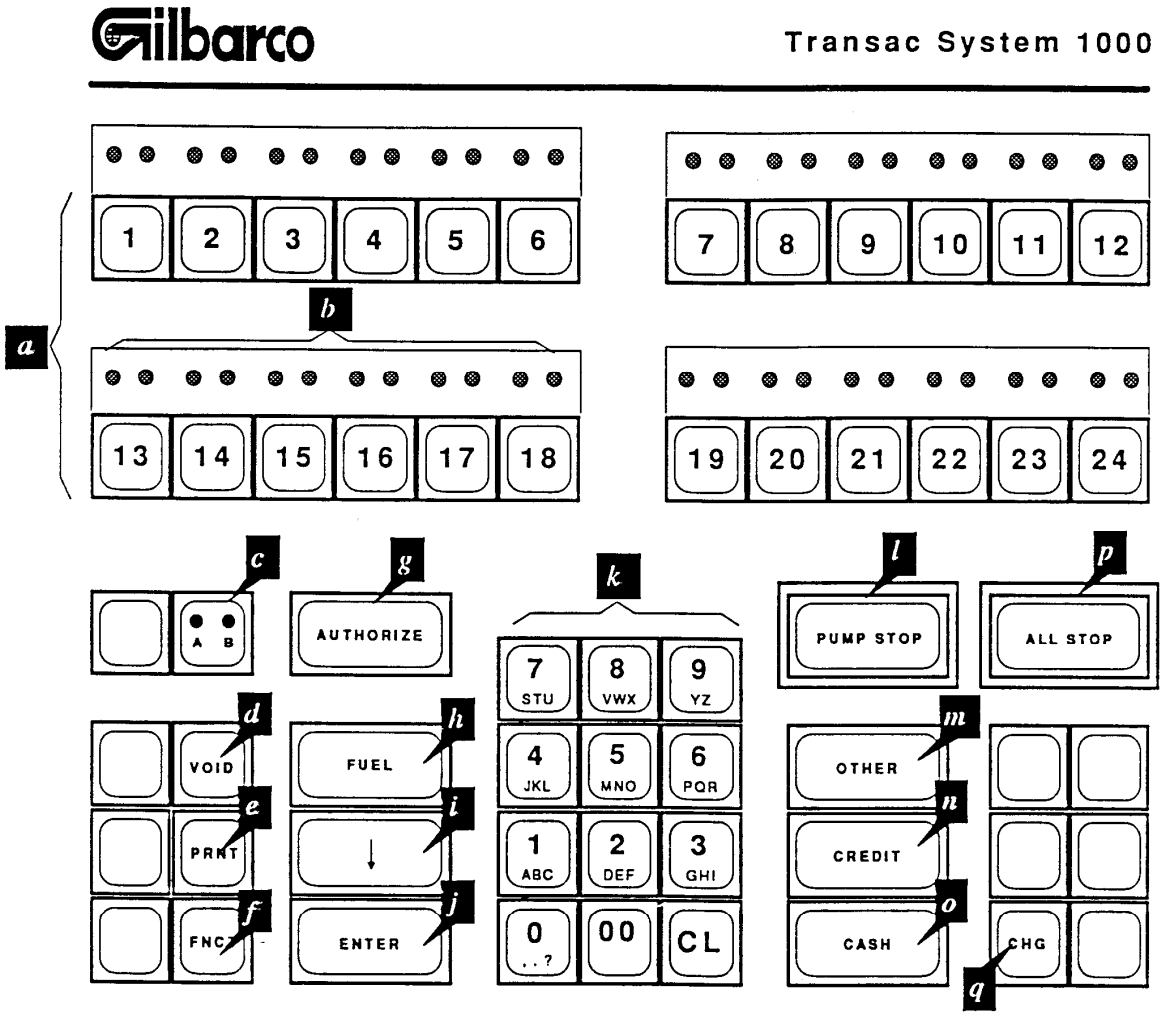


Figure 1 Typical system configuration

Figure 2 TS1000 Kiosk control console showing 24 pump keys

TS1000 Keyboard Layout



Key :

a) Pump Select keys
b) Pump Status Indicators
c) A/B Memory Indicator and key
d) Void key
e) Print key
f) Function key
g) Authorise key
h) Fuel key
i) Function Scroll key
j) Function Enter key
k) Numeric Entry Keypad and Clear key
l) Individual Pump Stop key
m) Other Payment Method key
n) Credit Payment key
o) Cash Payment key
p) All Stop key
q) Change key

Figure 3 Operator's keyboard (24 pump keys)

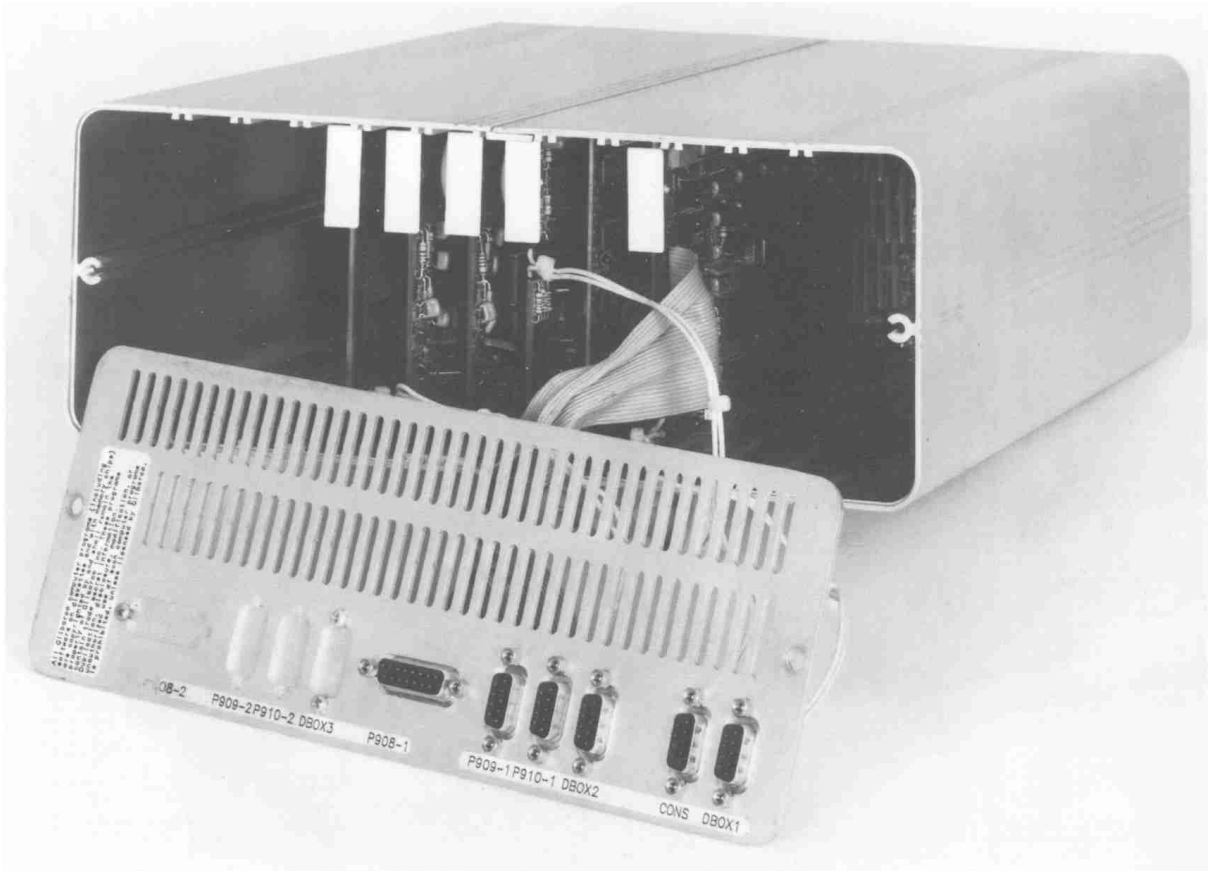


Figure 4 C1000 Controller

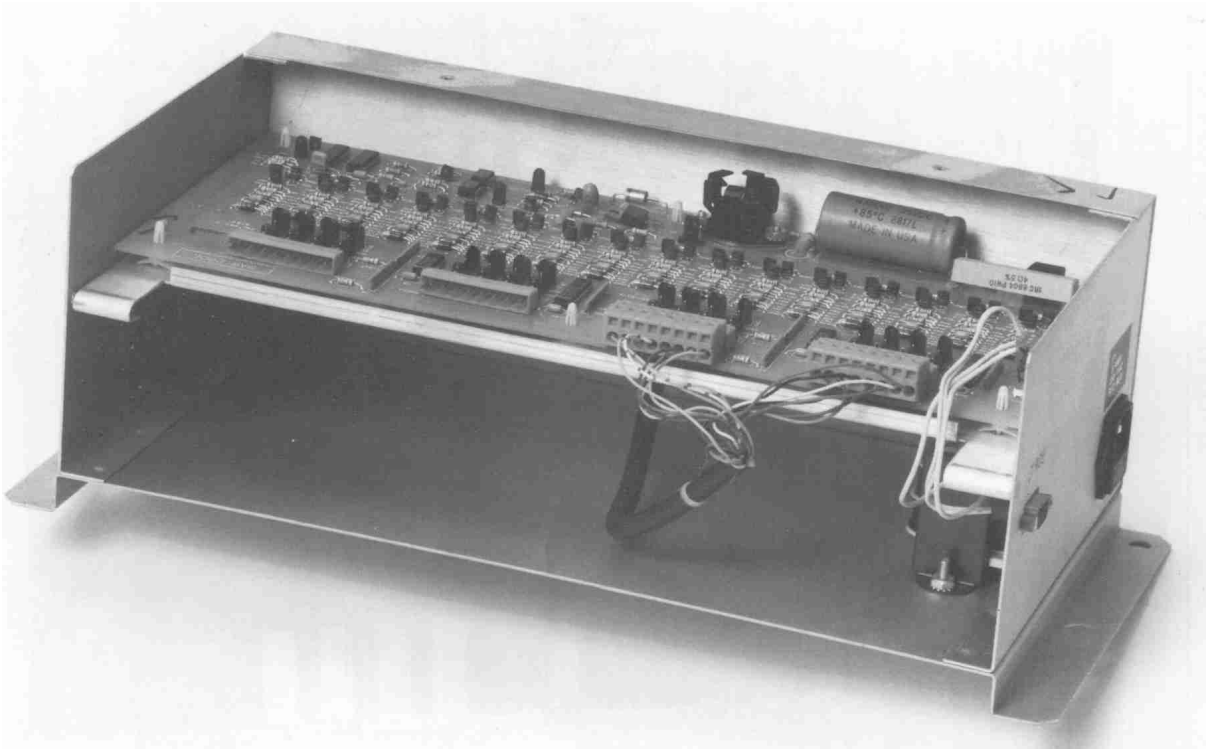


Figure 5 Data distribution module

Figure 6 Receipt printer (Star SP300)

Figure 7 Purchaser display

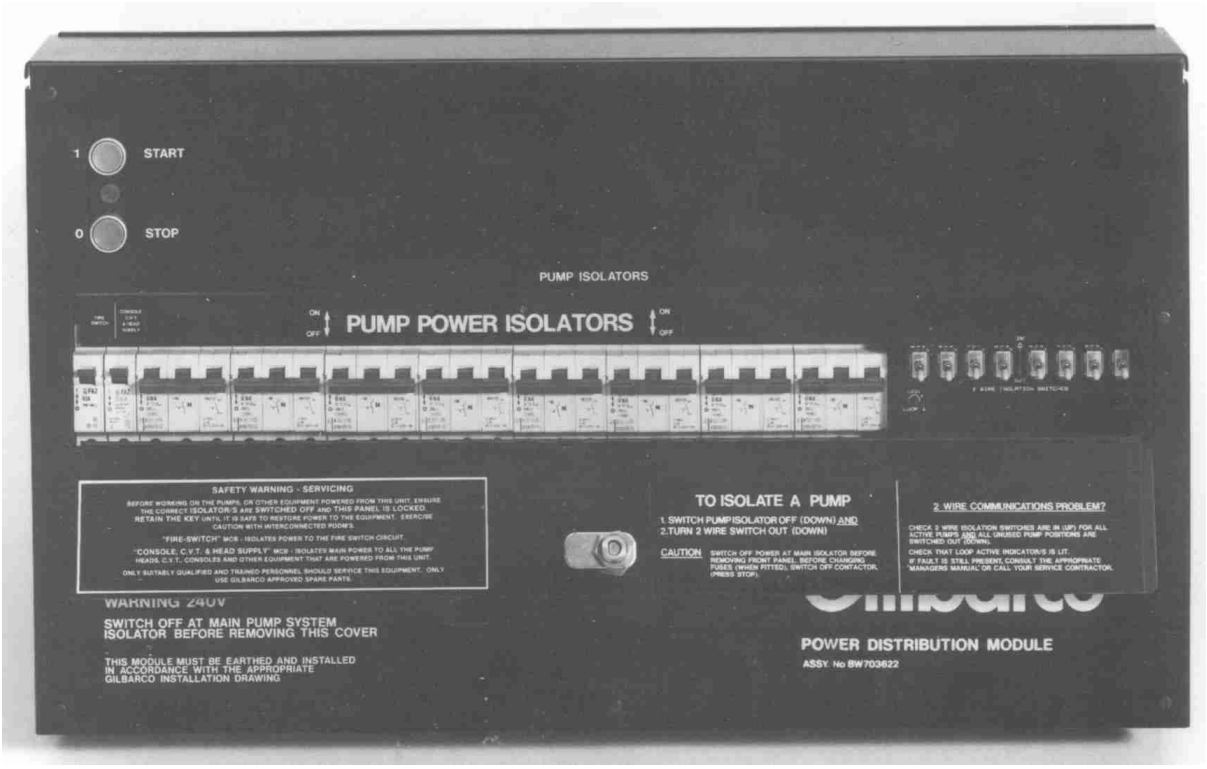


Figure 8 Power distribution module

Figure 9a Uninterruptible power supply (Accupower 20)

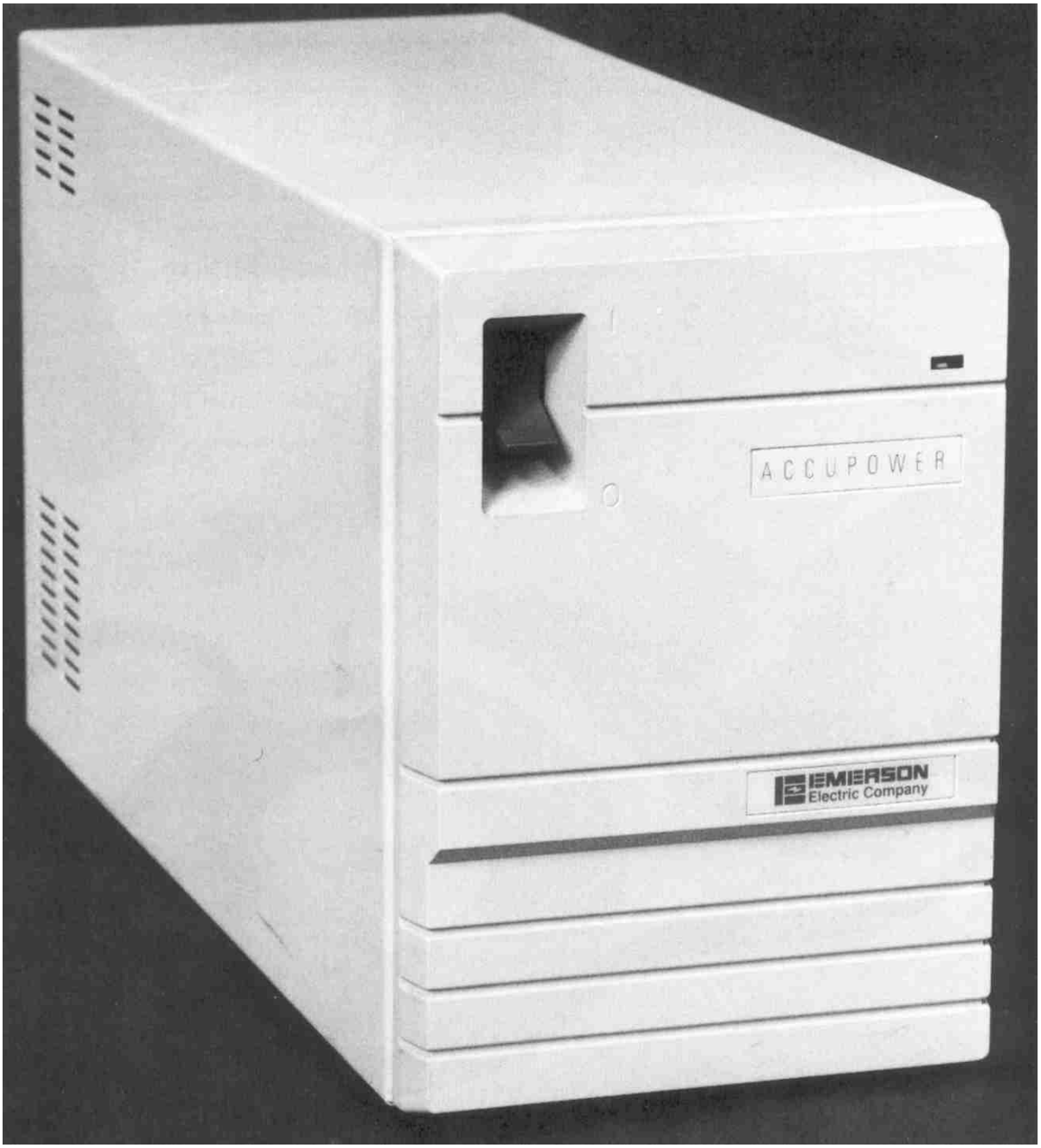


Figure 9b Uninterruptible power supply (Accupower 30)

Figure 10 Power supply (Elpac)

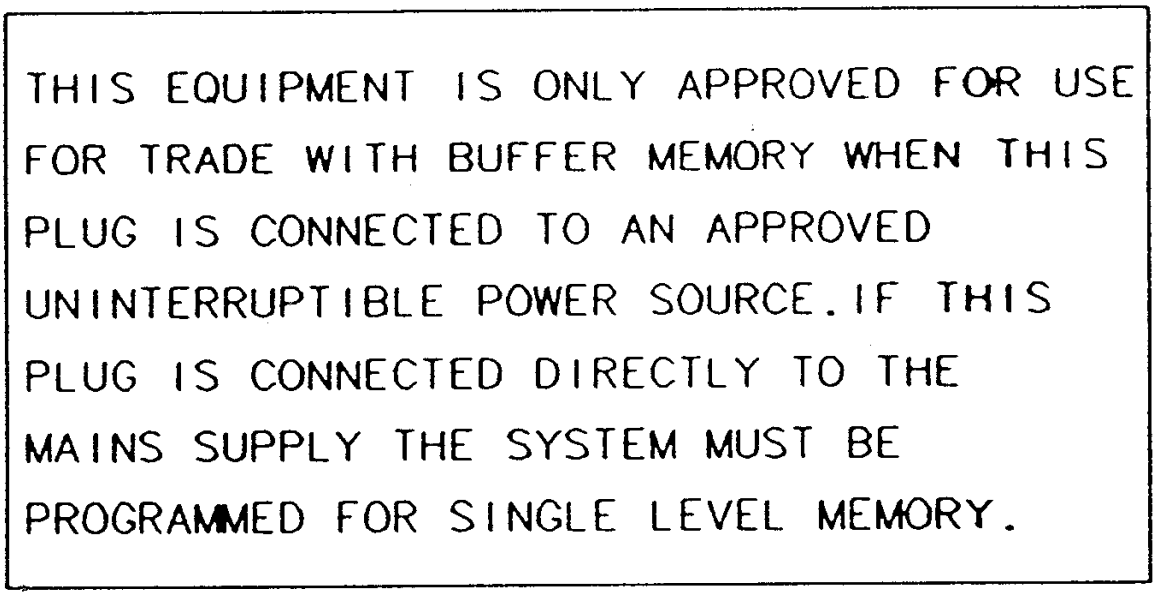


Figure 11 Warning label

```
========================================

          GILBARCO LTD. TS1000
          CROMPTON CLOSE
          BASILDON, ESSEX

15 JAN 91   11:50    RECEIPT NO. 2000078

                     STORE ID 12345

PUMP  GRADE    VOLUME   P/L     AMOUNT
----  -------- -------- -----  ---------
23    SUPER     44.77L  46.9   £   21.00

              CASH     TOTAL  £   21.00

        VAT. NO. 250 3183 94
========================================
```

```
========================================

          GILBARCO LTD. TS1000
          CROMPTON CLOSE
          BASILDON, ESSEX

15 JAN 91   11:43    RECEIPT NO. 2000072

                     STORE ID 12345

PUMP  GRADE    VOLUME   P/L     AMOUNT
----  -------- -------- -----  ---------
24    DIESEL     5.22L  47.7   £    2.49
      PREPAY DEPOSIT           £   -5.50

                   CREDIT  REFUND £    3.01

========================================
```

```
========================================

          GILBARCO LTD. TS1000
          CROMPTON CLOSE
          BASILDON, ESSEX

15 JAN 91   11:43    RECEIPT NO. 2000074

                     STORE ID 12345

PUMP  GRADE    VOLUME   P/L     AMOUNT
----  -------- -------- -----  ---------
23    PREPAY                  £   15.00
              CASH     TOTAL  £   15.00

========================================
```

```
========================================

          GILBARCO LTD. TS1000
          CROMPTON CLOSE
          BASILDON, ESSEX

15 JAN 91   11:51    RECEIPT NO. 2000080

                     STORE ID 12345

PUMP  GRADE    VOLUME   P/L     AMOUNT
----  -------- -------- -----  ---------
23    PREPAY VOID             £   35.00
                CASH    REFUND £   35.00

        VAT. NO. 250 3183 94
========================================
```

Figure 12 Typical receipts

Figure 13a Ondyne HO300 uninterruptible power supply (front)

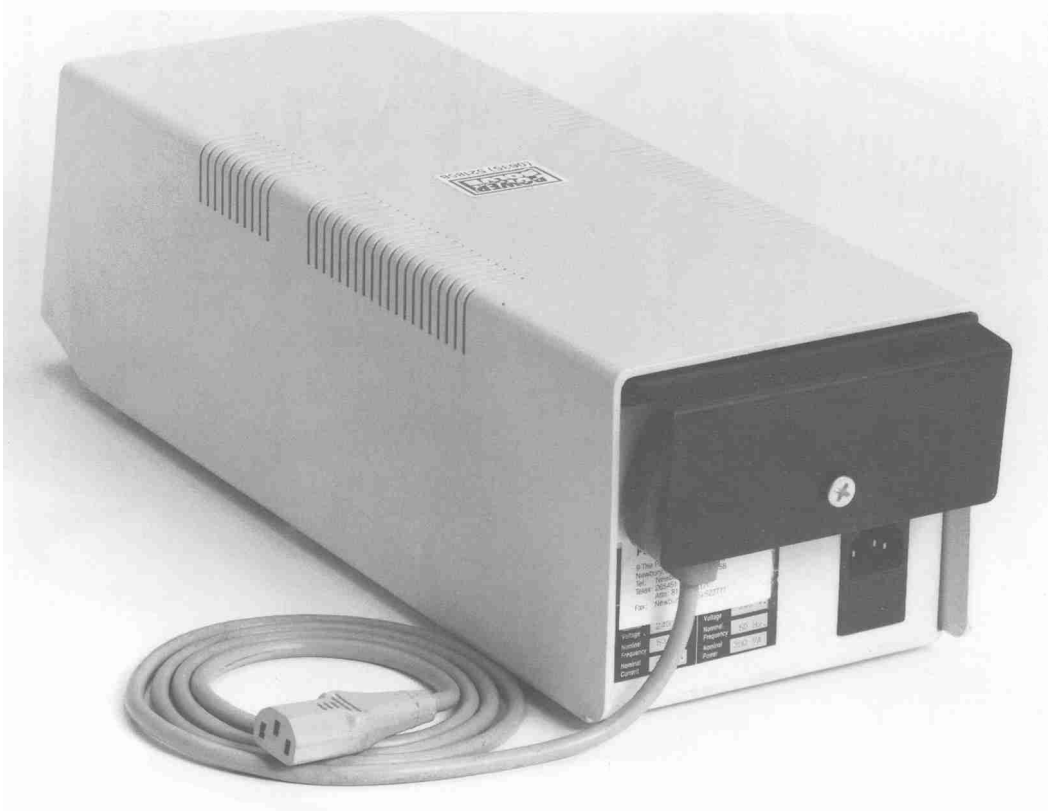


Figure 13b Ondyne HO300 uninterruptible power supply (rear)

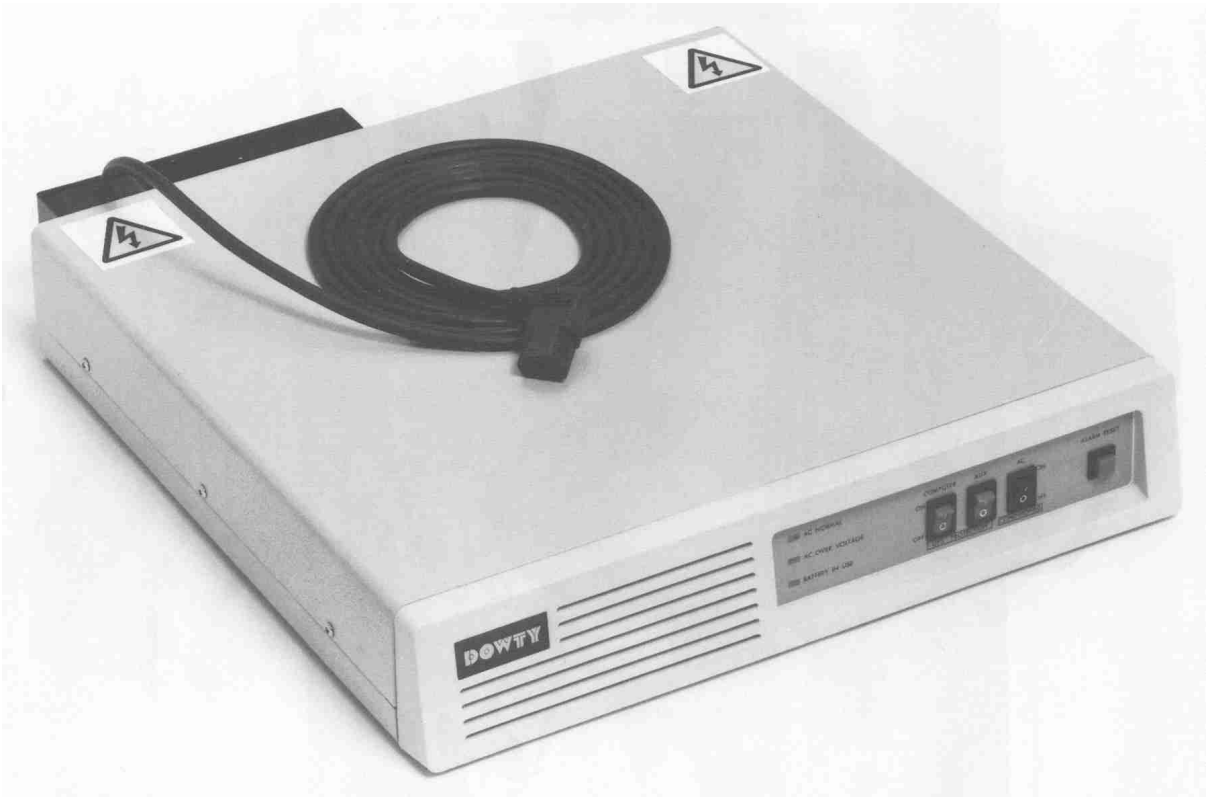


Figure 14a Dowty 300 uninterruptible power supply (front)

Figure 14b Dowty 300 uninterruptible power supply (rear)

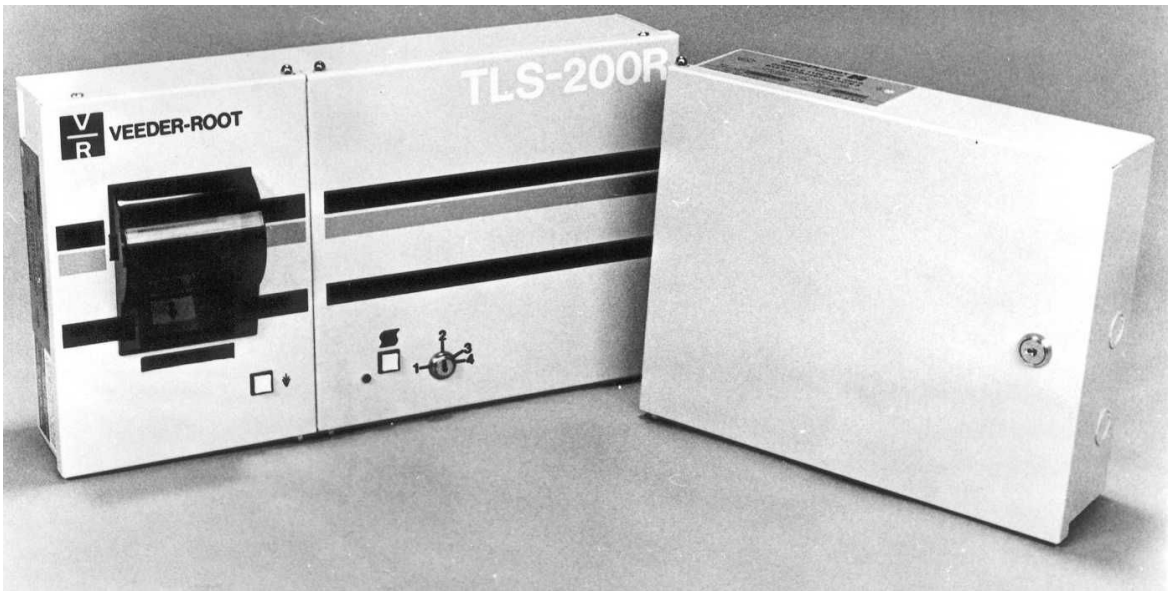


Figure 15 Veeder-Root TLS200R tank gauge controller

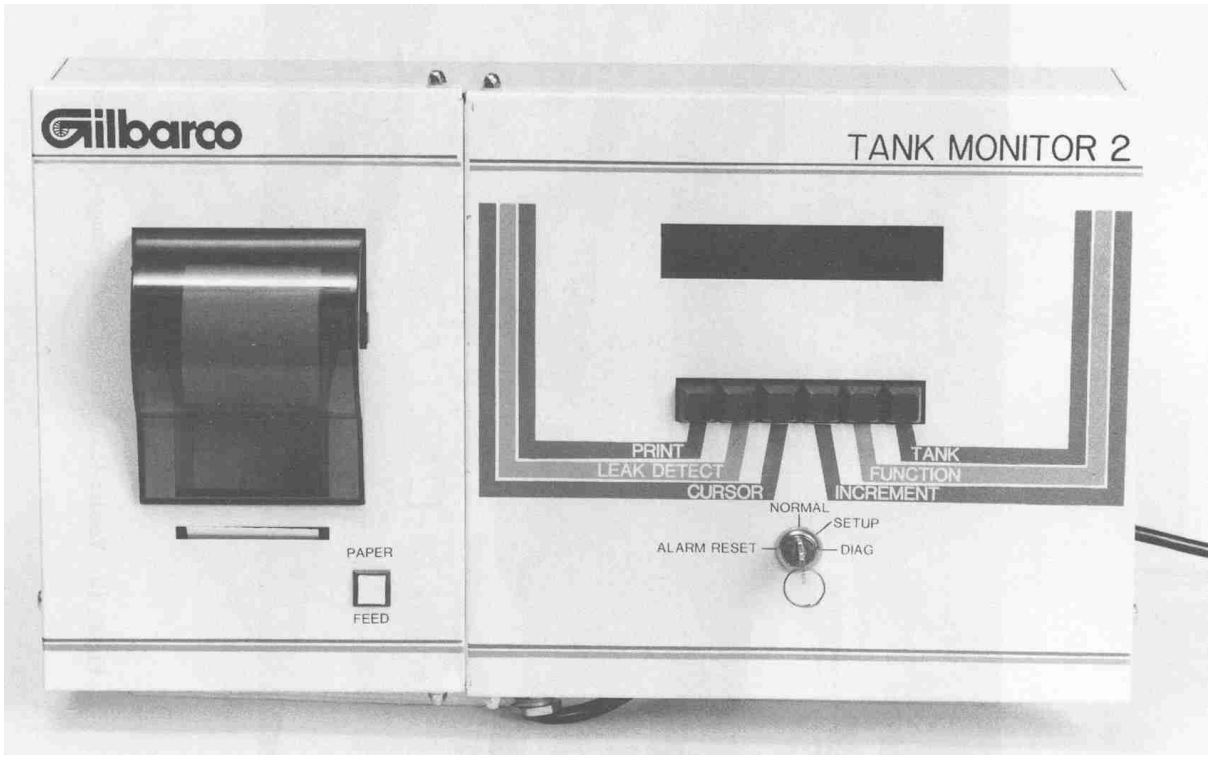


Figure 16 Gilbarco tank monitor 2 tank gauge controller

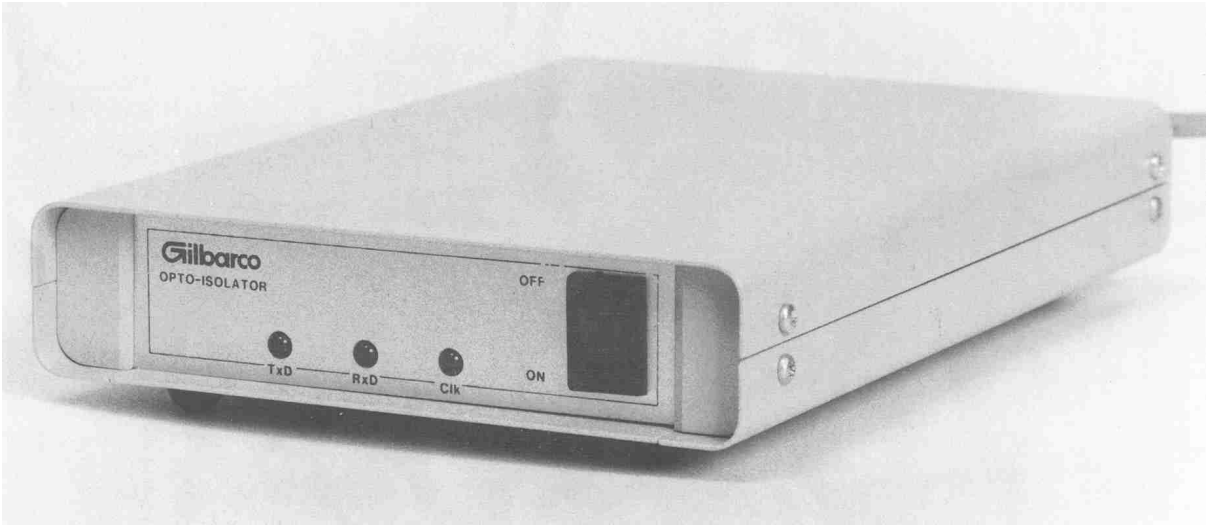


Figure 17a Gilbarco opto-isolator (front)

Figure 17b Gilbarco opto-isolator (rear)

Figure 18 TS1000 kiosk control console (36 pump keys)

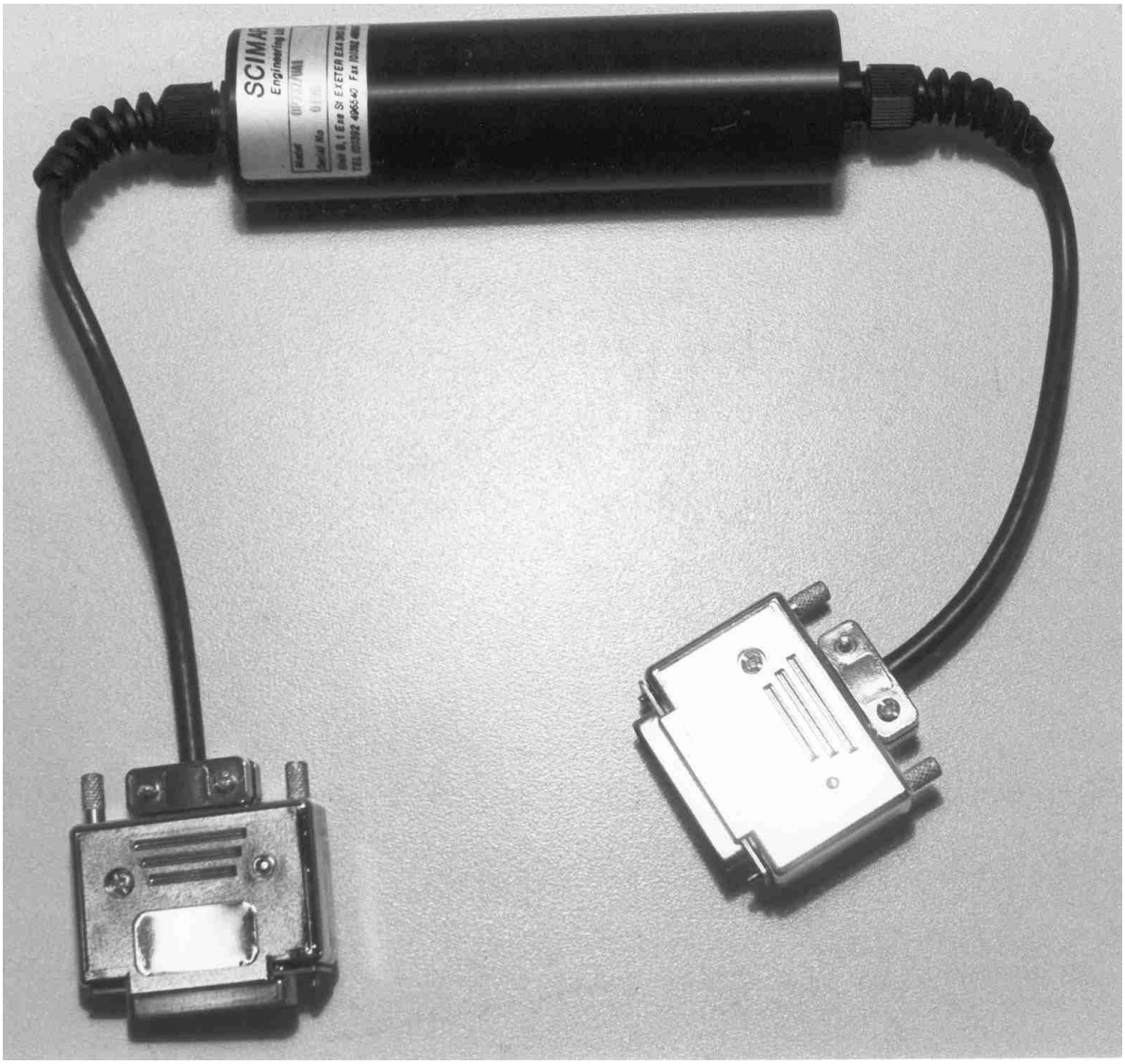


Figure 19 Scimar OP232/UA2 opto-isolator

Figure 20 STIC 867 receiver

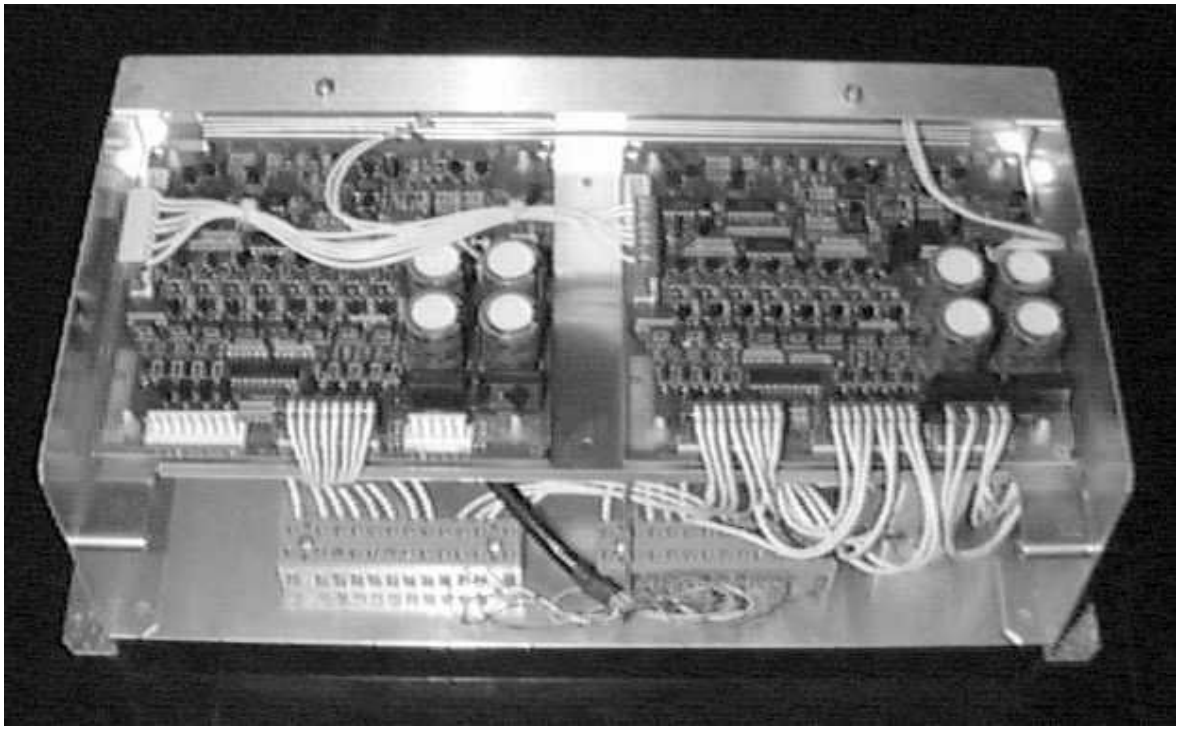


Figure 21 Universal distribution box (cover removed)