SERVOMEX
EMISSIONS ANALYSERS

SERVOPRO 1440D1
Light Industrial Gas Analyser

Service Manual

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01440D1
Light Industrial Gas Analyser
Service Manual

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1 INTRODUCTION

1.1 Scope of this Manual

This manual covers the servicing of the Servomex 1440D series of gas analysers. This range of analysers can measure up to two gases, based on one of two measurement principles; a Servomex Single Beam Single Wavelength (SBSW) infrared transducer and a Servomex paramagnetic oxygen transducer.

- Refer to the QuickStart Manual or the Technical Data Sheet for the latest technical specification.
- Addresses for technical assistance and spares are given on the rear cover.
- For information on installation and operation, please refer to the QuickStart Manual, reference part number 01440003D

About this Manual

Ref.: 01440/002D/5

Order as part no.: 01440002D

- This manual includes **WARNINGS**, **CAUTIONS** and **NOTES**, which provide information relating to the following:

WARNINGS

- **Hazards which could result in personal injury or death.**

CAUTIONS

- **Hazards which could result in equipment or property damages.**

NOTES

- **Alert the user to pertinent facts and conditions.**

WARNING

- **The electrical power used in this equipment is at a voltage high enough to endanger life. Trained personnel should only perform servicing. Service training is available from Servomex.**
- **Before carrying out servicing or repair the equipment should be disconnected from the electrical power supply. Tests must be made to ensure that disconnection is complete. Note that the relay contacts may be supplied from a separate source of electrical power.**
- **It may be necessary to fault find with the electrical power connected. Where this is necessary extreme caution should be exercised.**
- **The analyser may contain toxic, corrosive, flammable or asphyxiant gases. Flush the analyser pipe work with clean dry air before commencing work.**

2 REPAIR

2.1 Test Equipment and Tools

The following test equipment and tools should be available to personnel responsible for maintenance and calibration of the analyser.

- Volt/ohm/milli-amp meter of high input impedance, resolution 0.1mV.
- Flat blade screwdriver, 6mm width.
- Soldering iron 25W.
- De-solder braid or vacuum de-soldering tool.
- Potentiometer trimming tool.
- 2.5mm AF Allen Key
- 3mm AF Allen Key
- Open-ended wrench, width across flats 0.45 in (7/16in) British 3/16 nominal, non-magnetic.
- Manometer, with a range exceeding 500mm Wg and a bore not exceeding 5mm.
- Calibration gases:
- Clean dry nitrogen with an oxygen concentration of less than 0.1% O_2.
- 01440D1STD and 01440D1FTX: Clean dry air, nominal concentration 20.9 O_2 (for oxygen analysers) or a certified calibration gas with a suitable CO_2 content (for Carbon Dioxide analyser).
- 01440D1FTX only: A certified calibration gas with a suitable CO or CH_4 content (for Infra-red analysers).

2.2 Sample condition requirements

Table 2.1 Requirements for Sample Conditions

Dew Point		At least 5°C below ambient temperature.
Temperature		Nominally at ambient temperature.
Inlet / Outlet connections **Note: do not restrict analyser vent**	**01440D1STD**	6.4mm (1/4”) OD tube.
	01440D1STD + BPR	
	01440D1FTX	3.2mm (1/8”) OD tube.
Inlet pressure	**01440D1STD**	1 to 10psig (7 to 70kPag).
	01440D1STD + BPR	17 to 20psia (120 to 140kPaa).
	01440D1FTX	Typically 0.3kPag (30mmWG) at 200ml/min.
Flow Rate	**01440D1STD**	1 to 6l/min.
	01440D1STD + BPR	1 to 2l/min.
	01440D1FTX	USER LIMITED to 250ml/min. MAXIMUM.
Particulates	**01440D1STD**	<3µm (micro meters), an internal, replaceable, 0.6µm filter is fitted as standard.
	01440D1STD + BPR	
	01440D1FTX	The user must fit an external filter of 0.6µm.
Condition	**01440D1STD**	Must not be flammable, toxic or corrosive, as well as being clean and oil free.
	01440D1STD + BPR	
	01440D1FTX	Must not be corrosive, as well as being clean and oil free.

2.3 Servicing the Oxygen Transducer

WARNING

- **The opening of covers or removal of parts, except those to which access can be gained by hand, may expose electrical terminals. Ensure power is disconnected before working on the analyser.**

NOTE

- **Due to the strong magnetic field, which exists around the transducer, it is advisable to remove wristwatches if worn when servicing the oxygen transducer.**

2.3.1 Replacement of the 1158 Transducer

1. Carefully remove the foam cover from the transducer and disconnect the 16-way ribbon cable from the transducer, the sample connections to the cell and the heater and thermal fuse wires from TB2 on front the panel PCB.
2. Loosen the 4 off M4 nuts retaining the bracket that the transducer is located on. Slide the whole assembly to one side and lift out from the analyser.

   With 01440D1FTX versions, when the assembly is free, unsolder the Yellow and Black wires from the transducer cell connections. Move the sleeves on the Pink and Grey wires and unsolder them from the yellow and black wires from the transducer PCB.
3. Unscrew the transducer from the bracket by the 3 off screws located on the underside of the bracket, then remove the remaining insulation and the 3 off M4 pillars.
4. Remove the thermal fuse and heating element, from the underside of the transducer, being careful not to damage it.
5. Installation is the reverse of the removal process. Ensure thermal fuse and heater are correctly reconnected. For wiring see Figure 2.7 (or 2.10 for FTX version).

   With 01440D1FTX versions, the Yellow and Black wires to the cell on the new transducer must be unsoldered and then resoldered to the Pink and Grey wires from the Protection PCB (connect Yellow to Pink and Black to Grey). Replace the sleeves and fit a cable tie to secure them.

   The Yellow and Black wires from the Protection PCB must be soldered to the transducer cell connections (Yellow to the connection marked with yellow spot).

6. The pipe from the outlet of the flow sensor, if fitted, goes to the upper gas connector on the cell.

7. Ensure pipework is leak tight. See Section 2.13.1 or 2.13.2.

8. Calibrate the analyser and check both the analogue output and display reading. See Section 2.5.

2.3.2 Replacement of the measuring Cell

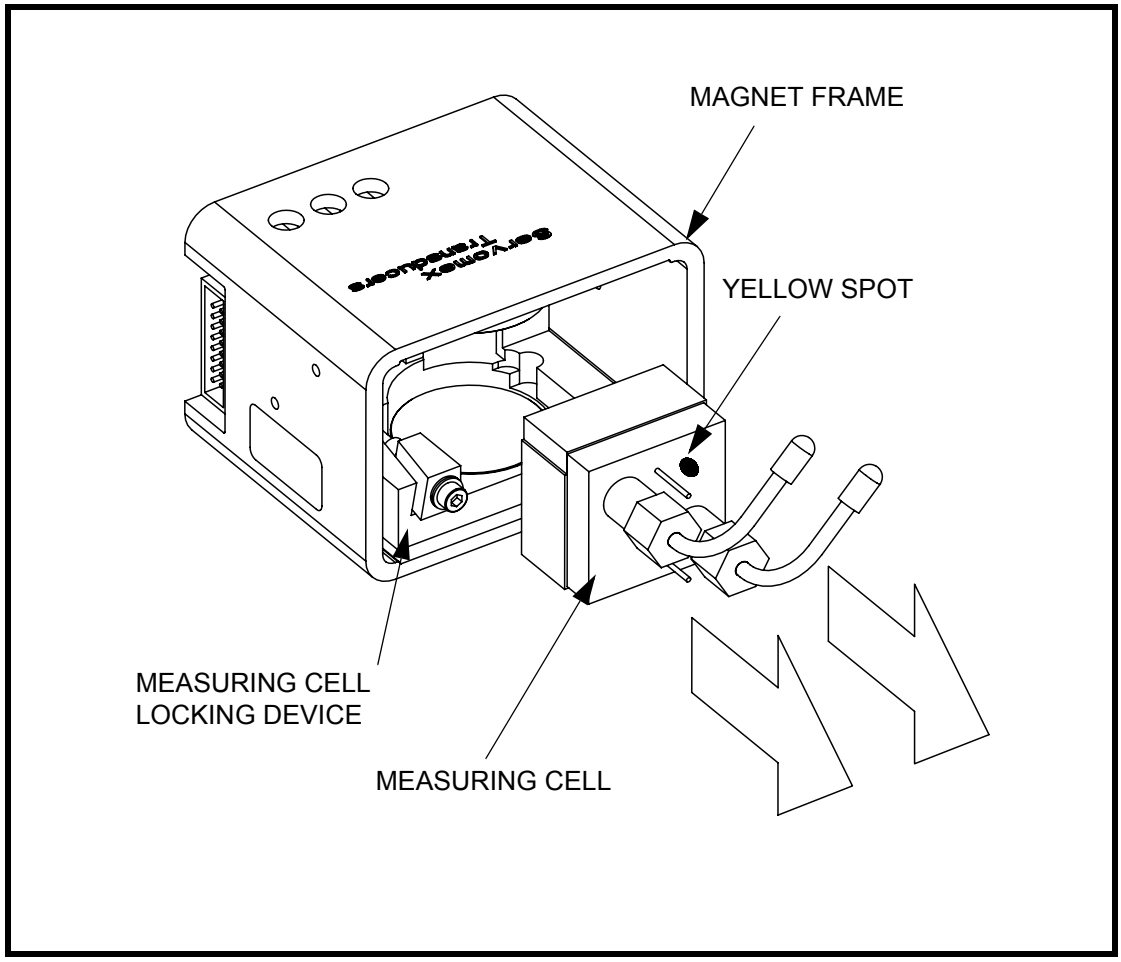

Figure 2.1 Cell Replacement

1. Remove the Transducer as described in section 2.3.1.

2. Unsolder the yellow and black wires from the measuring cell and with an Allen key loosen the cell locking clamp screw. Grip the cell by the sides and pull the cell out of the magnet frame. (note that the magnet will exert a very strong holding force on the cell)

3. The replacement cell must be fitted the correct way up with the yellow spot connection at the top. With the cell fully home tighten the cell locking clamp screw and re-solder the wires to the cell with the yellow wire to the connection marked with the yellow spot.

4. Refit the transducer, using the ‘O’ rings supplied with the new cell, the reverse of section 2.3.1, but do not refit the foam cover at this stage.

5. Connect a nitrogen supply to the analyser, flow or pressure rates as per section 2.2.

6. Ensure the electrical safety of all parts and power-up the analyser.

SETTING THE ZERO (follows on from cell change procedure)

7. Set the ZERO on the front panel to mid point (5 turns from either end).

8. Adjust the ZERO pot on the top of the transducer, so that the display reads 0 ± 2% O_2.

9. Set the ZERO on the front panel so that the display reads 0 ± 0.1% O_2.

SETTING THE SPAN (follows on from setting the zero)

10. Adjust the FINE SPAN pot on the top of the transducer fully clockwise. The potentiometer will ‘click’ when it reaches the end.

11. Adjust the SPAN on the front panel fully clockwise.

12. Connect an air supply to the analyser, flow or pressure rates as per section 2.2.

13. Adjust the COARSE SPAN pot on the top of the transducer, so that the front panel displays a nominal 120% of air, approximately 25.1% O_2.

14. Adjust the SPAN on the front panel fully counter clockwise.

15. Adjust the FINE SPAN pot on the top of the transducer, so that the display reads 93% of air, approximately 19.5% O_2.

16. Refit the foam cover from transducer of the transducer and allow the analyser to stabilise.

17. Adjust the SPAN on the front panel so that the display reads 20.9 ± 0.1% O_2.

2.3.3 Adjusting the Transducer Gain

It may be necessary to adjust the Span of the transducer if the altitude of use is greater than about 1200m (4000ft) above sea level.

1. Carefully remove foam cover from transducer.
2. Adjust the FINE SPAN pot on the top of the transducer fully clockwise. The potentiometer will ‘click’ when it reaches the end.
3. Adjust the SPAN on the front panel fully clockwise.
4. Connect an air supply to the analyser, flow or pressure rates as per section 2.2.
5. Adjust the COARSE SPAN pot on the top of the transducer, so that the front panel displays a nominal 120% of air, approximately 25.1% O_2.
6. Refit the foam cover of the transducer and allow the analyser to stabilise.
7. Adjust the SPAN on the front panel so that the display reads 20.9 $\pm$ 0.1% O_2.

2.3.4 Replacing the Thermal Fuse Assembly and/or Heater Disc

1. Remove the Transducer as described in section 2.3.1.
2. If replacing the heater disc, remove the protective backing from the new heater disc and press firmly onto the base of the transducer. Ensure transducer base is clean.
3. Refit transducer as described in section 2.3.1. Refit the foam cover of the transducer.
4. After replacing the thermal fuse assembly or heater disc, the transducer temperature should be re-checked. Connect a voltmeter to pins 7 and 8 (0V) on SK5. When the instrument has warmed up, adjust RV1 on control PCB 1420/915 so that the reading is 323 ±3mV.

2.4 Servicing the Infrared Transducer

WARNING

- **The opening of covers or removal of parts, except those to which access can be gained by hand, may expose electrical terminals. Ensure power is disconnected before working on the analyser.**

The Infrared transducer in the analyser is non-field serviceable. In the unlikely event of failure, the transducer should be removed by following the procedure below and returned to Servomex for repair or replacement.

A list of the IR transducers available is given in Section 3.4.

2.4.1 Removal of the Infrared Transducer

1. Remove the two M4 nut holding down the interface assembly 01415930.
2. Carefully ease the interface assembly (01415930) from the pin connectors on the transducer PCB.
3. Disconnect the transducer pipes from the sampling system.
4. Loosen the 4 off M4 nuts retaining the bracket that the transducer is located on. Slide the whole assembly to one side and lift out from the analyser.
5. When the assembly is free, unscrew the transducer from the bracket by the 3 off screws located on the underside of the bracket.
6. For the longer “off board” sensors only: slacken the two fixing screws, which retain the Infrared bench to the side mounting plate. Utilise the slot on the front fixing to remove the bench without completely undoing the fasteners.
7. Remove the transducer PCB by squeezing the catches on the 4 off PCB mounting supports, and gently pulling the board off the mounts.
8. Installation of the new transducer is the reverse of the above procedure.

9. Transducer pots must be wound fully clockwise, reference Figure 2.2.

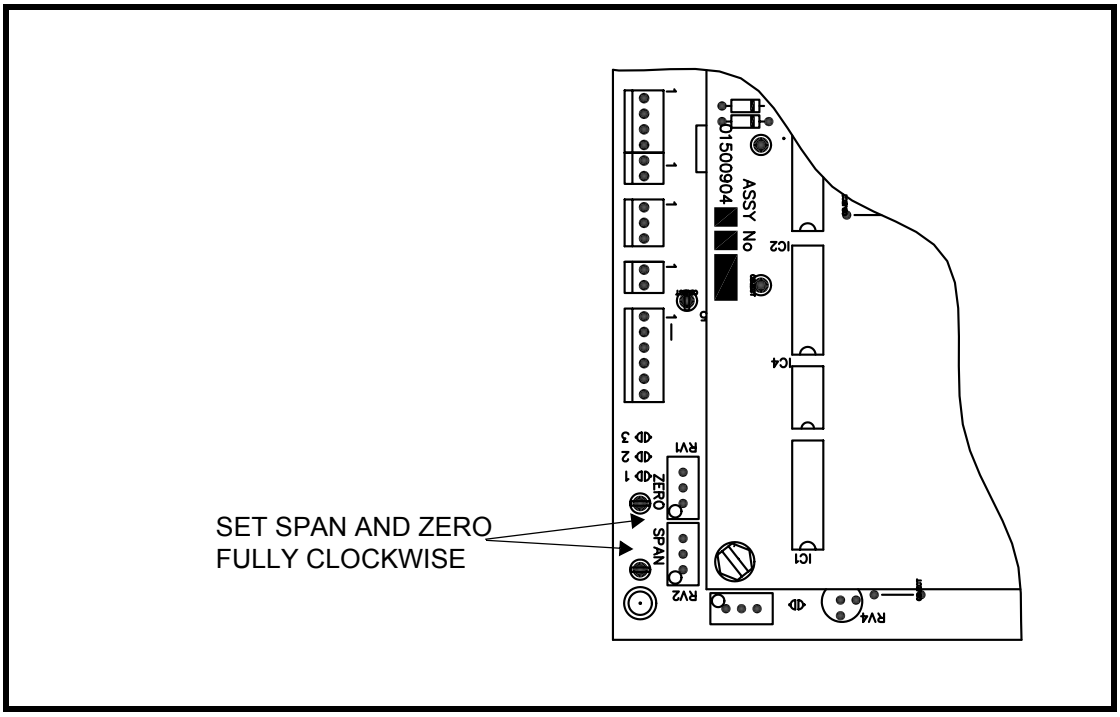

Figure 2.2 Transducer Pot Adjustment

2.5 Checking the Analogue Outputs and Display.

NOTE

- **Calibration gas accuracy must be taken into consideration when setting the zero and span. The figures in the following steps assume pure N_2 and either air (for oxygen) or 100% FULL SCALE (Infra-red transducers) span gas.**

Ensure that the analyser has warmed up for at least 1 hour before calibration.

For oxygen units set range to the lowest O_2 concentration (usually range 2).

2.5.1 Checking the Zero

1. Connect a DVM across pins 8(-ve) and 15(+ve) on SK5.
2. With nitrogen connected to the inlet at the correct pressure and flow (see section 2.1), the DVM should read 0.0000V ±0.0001V.
3. If not then adjust zero control behind flip down door on front panel. (For oxygen units if zero is not achievable then the coarse zero will need adjustment. See section 2.3.2. Setting the zero)
4. The instrument display should read ‘zero’% ±1 least significant digit.

5. If not, check for correct signal and supply voltages at the connector to the instrument display module.
6. If these are correct but the instrument display does not read correctly, the display module may need to be replaced. Note: There is no ‘zero’ adjustment for the display module itself.
7. To set mA output, connect the DVM across pins 5(-ve) and 12(+ve) on SK5.
8. The DVM should read 4.00mA ± 0.02mA.
9. If not, adjust RV2 on the control PCB (01420915).

2.5.2 Checking the Span

NOTE

- **Set ranges to full scale (or 0-25% oxygen if air is used as the oxygen span gas).**

1. Connect the DVM to pins 8(-ve) and 15(+ve) on SK5.
2. Introduce span gas to the inlet at the correct pressure and flow (see section 2.1), the DVM should read 1.0000V, ±0.0001V.

   If the O2 calibration gas is air, at 20.9% purity, then the figure would be 0.8360V ±0.0001V.
3. If not adjust span control behind flip down door on front panel. (For oxygen units if span is not achievable then the gain of the transducer will need adjustment. See section 2.3.2. Setting the span)
4. The display should read correct calibration value ± 1 least significant digit.
5. If not, adjust RV5 on the front panel PCB (01420904B) so that the display reads calibration value ±1 least significant digit.

NOTE

- **It is not essential for the output voltage to be exactly 1.0000V. E.g. if the voltage is 0.9970V then RV5 is adjusted for a display reading of 99.7 ±0.1.**

6. To set the mA output, connect the DVM across SK5 pins 5(-ve) and 12(+ve).
7. The DVM should read 20.00 ± 0.02mA, (or 17.38 ± 0.02mA at air point).
8. If not adjust RV3 on control PCB (01420915).

2.6 Replacing the Flow Sensor (01800925)

1. Unscrew both wires from TB4 on relay and output PCB (01420906).
2. Disconnect inlet and outlet tubes.
3. Unscrew flow sensor from rear panel assembly.
4. Installation is reverse of the removal process. (Reconnect to TB4)
5. The pipe from the AFCD goes to the inlet on the flow sensor.
6. Ensure pipework is leak tight. (See section 2.14.1 or 2.14.2)

2.7 Replacing the Power Supply Unit (PSU)

WARNING

- **The opening of covers or removal of parts, except those to which access can be gained by hand, may expose electrical terminals. Ensure power is disconnected before working on the analyser.**

1. If necessary remove the transducer to improve access (See Section 2.3.1 for the oxygen transducer or Section 2.4.1 for the infrared transducers). Note: For oxygen transducers it is only necessary to disconnect the thermal fuse and heating coil at TB2 on control PCB.
2. Remove the vented metal cover from over the power supply.
3. Disconnect mains power cable and the power cable to the control PCB at the power supply.
4. Power supply variants

   i) For analysers fitted with an old version power supply (MAP40 or FLU3-40-3AD). Remove the hexagonal spacers and power supply.

   ii) For latest version power supplies (Emerson LPT63) unscrew the 4 off M4 waisted screws holding power supply and cover mounting brackets and remove brackets and power supply.
5. Installation is for power supply type Emerson LPT63 only.

   i) Fit shakeproof washers to waisted M4 screws and screw through power supply pcb, from component side.

   ii) Position mounting brackets with individual lugs on copper side of supply pcb.

   iii) Secure power supply and brackets to analyser chassis using m4 waisted screws.

   iv) Re-connect mains and control connector to power supply pcb, fit grommets to new power supply cover and secure cover to brackets.
6. Ensure pipework is leak tight. See Sections 2.14.1 or 2.14.2.
7. Calibrate the analyser as described in the Operator Manual and check both the analogue output and display reading. See Section 2.5.

2.8 Replacing the Relay/Output PCB (01420906)

1. Disconnect the flow sensor wires from TB4 and undo the four hexagonal fixing sets located adjacent to the 15 way ‘D' connectors.
1. Disconnect the lower 34 way ribbon connector from the front panel PCB.
2. Disconnect the 16 way ribbon connector at the transducer.
3. The Relay/Output PCB may now be replaced, installation is the reverse of the removal process, ensure all connections are remade (including the link across TB4, 01440D1FTX only).

2.9 Replacing the Main Control PCB (01420915)

1. If necessary remove the transducer and power supply to improve access (See Section 2.3.1 for oxygen transducer or 2.4.1 for infrared transducer).
2. Disconnect all connections to the display, noting their positions.
3. Undo the M3 screws and lift the PCB off of the three self-clinching spacers.
4. Fit new control PCB, TRANSFER LINK SETTINGS for ranges and alarms (reference Figure 2.3).
5. Infra-red units only; it will be necessary to utilise links from the old PCB. Range 1 must be set to 100, range 2 must be linked across 10, 20 and 50).
6. Installation is the reverse of the removal process. Ensure spacers are positioned correctly between boards.

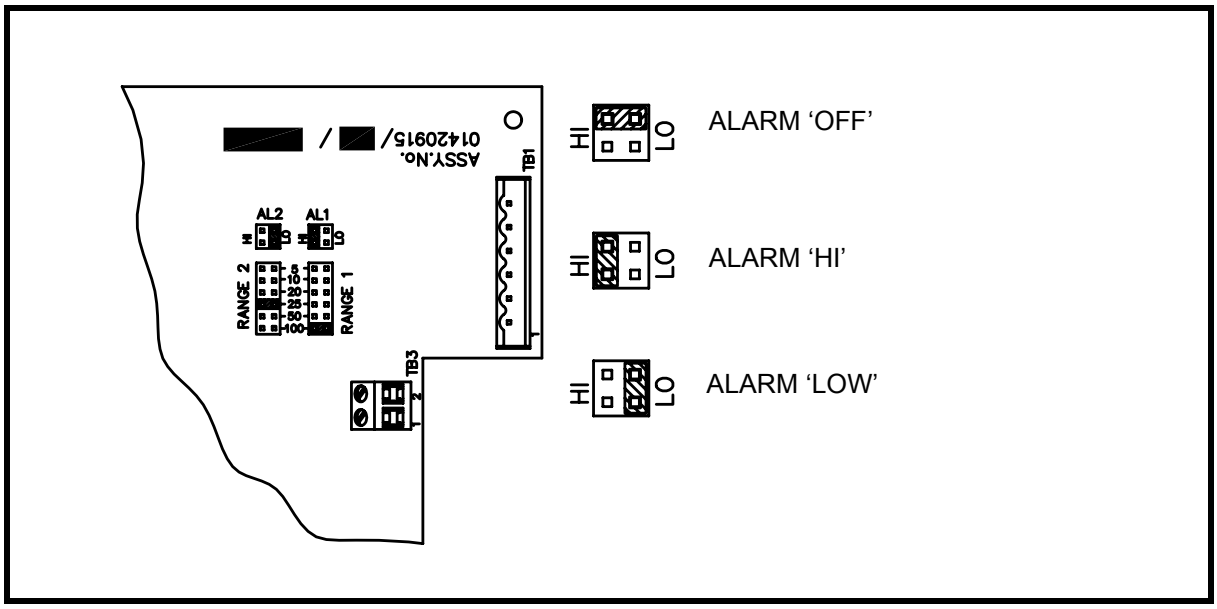

Figure 2.3 Range Changes and Alarm Function Setting

2.10 Replacing the Front User Interface PCB (01420904)

1. Remove the main control PCB, refer to section 2.9.
2. Disconnect the display ribbon cable.
3. Undo the five screws which retain the PCB.
4. Before installing new control PCB, transfer the switch settings for the display (reference Table 2.2 and Figure 2.4).
5. Replace the front panel PCB, paying particular attention to the alignment of the LED's associated with the function switches and bezels. Before tightening the fixing screws, ensure that the switches operate without ‘sticking'.
6. Installation is the reverse of the removal process. Ensure spacers are transferred from old PCB as required.

Table 2.2 SW3 Switch Settings

Measurement	SW3 Settings					
	1	2	3	4,5,6	7	8
100% O_2, CO_2 & CH_4	ON	OFF	OFF	OFF	OFF	OFF
50% CO_2, CO & CH_4	ON	OFF	OFF	OFF	ON	OFF
25% CO_2, CO & CH_4	ON	OFF	OFF	OFF	OFF	ON
10% CO_2 & CO	OFF	ON	OFF	OFF	OFF	OFF
5% CO_2 & CH_4	OFF	ON	OFF	OFF	ON	OFF
2.5% CO_2 & CO	OFF	ON	OFF	OFF	OFF	ON
1% CO_2 & CO	OFF	OFF	ON	OFF	OFF	OFF
0.5% CO_2	OFF	OFF	ON	OFF	ON	OFF
0.25% CO_2	OFF	OFF	ON	OFF	OFF	ON

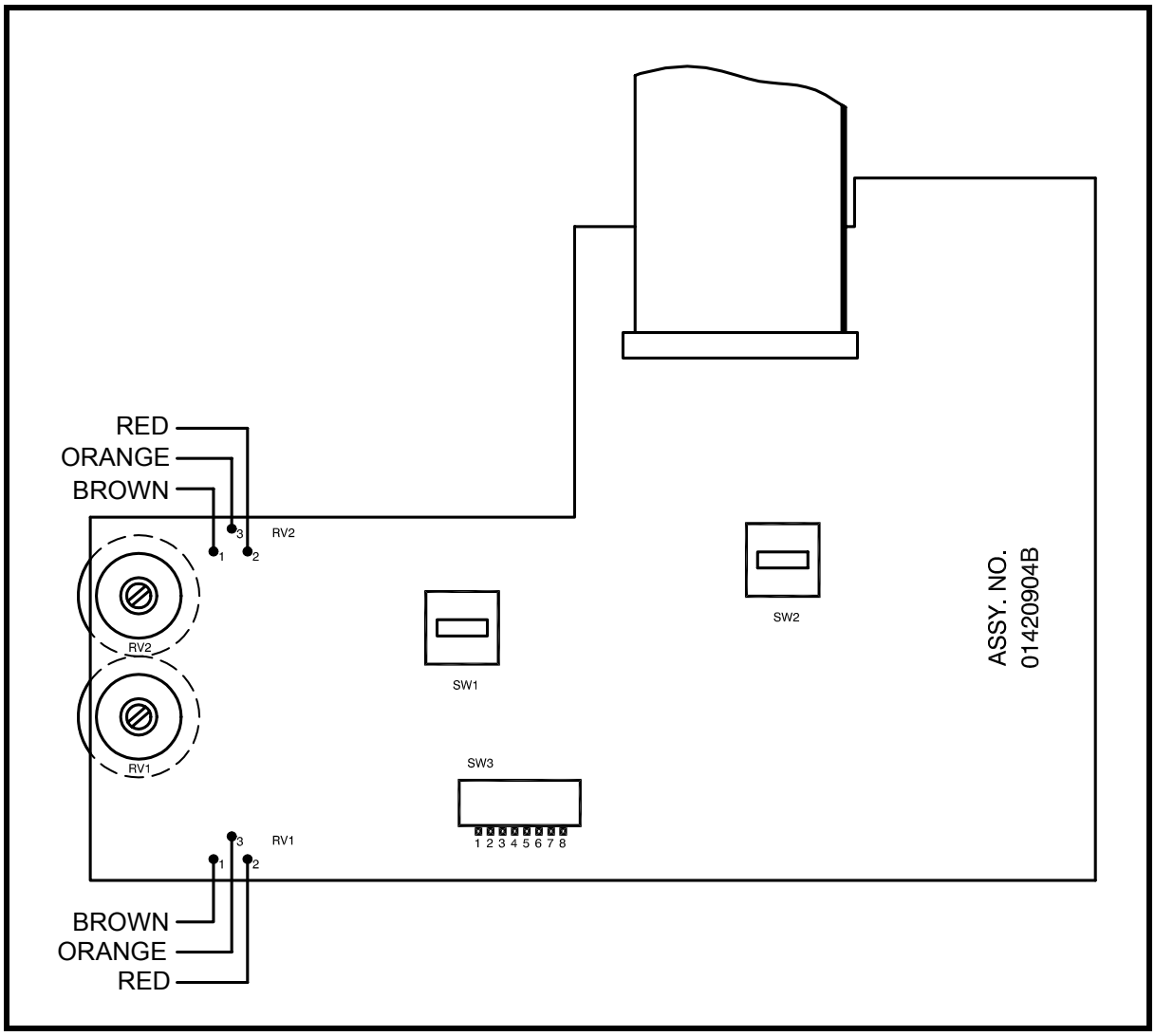

Figure 2.4 Component Layout, Front Panel PCB (01420904B)

2.11 Replacing the Led Front Panel display (2553-7332)

1. Remove the front panel PCB's, reference sections 2.9 and 2.10.
2. Undo the four corner screws on the LED module to replace.

2.12 Replacing the infra-red Interface PCB (01415930)

1. Remove the two M4 screw holding down the interface PCB, 01415930.
2. Carefully ease the interface from the pin connectors on the transducer PCB.
3. Disconnect the connectors that go between the interface PCB to the control panel PCB.
4. Installation is the reverse of the removal process.

2.13 Replacing the Internal Pump (S1420940)

1. Disconect the pump switch at the front panel of the analyser.
2. Remove the Transducer as described in section 2.3.1.
3. Cut the cable ties holding down the pump and lever the pump and pads off the tranducer mounting bracket.
4. Installation is the reverse of the removal process.

2.14 Replacement Plumbing Kits

2.14.1 01440D1FTX

1. Follow the plumbing flow schematic shown in Figure 2.5.

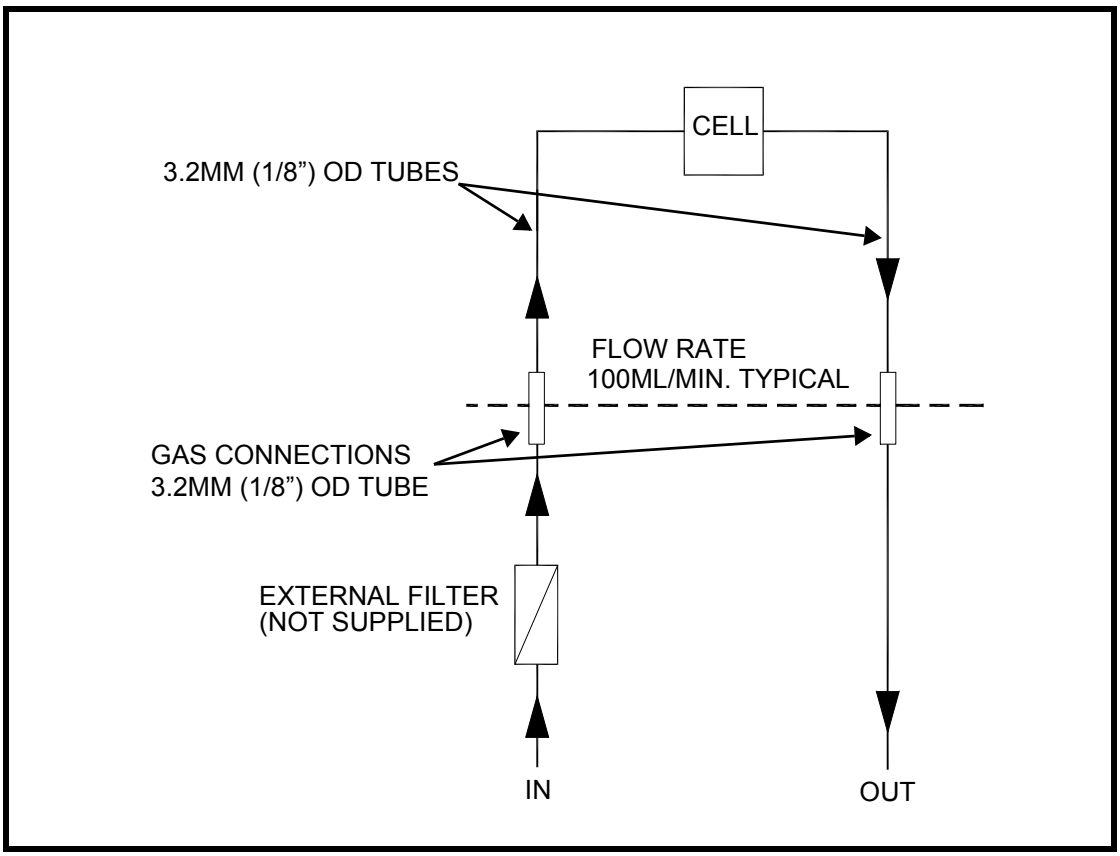

Figure 2.5 01440D1FTX Plumbing Schematic

2. Leak test by connecting together the sample 'IN' and 'OUT' gas connections and connect a water manometer to them. Pressurise the system to approx. 500mm water gauge and leave to stabilise. No change in manometer level should be detected once the reading has stabilised.
3. If a leak exists, check connections using a soap solution (max. internal pressure 10psig). This testing should also include the oxygen cell and its window.
4. Rectify leaks and re-check.

2.14.2 01440D1STD

1. Follow the plumbing flow schematic shown in Figure 2.6.

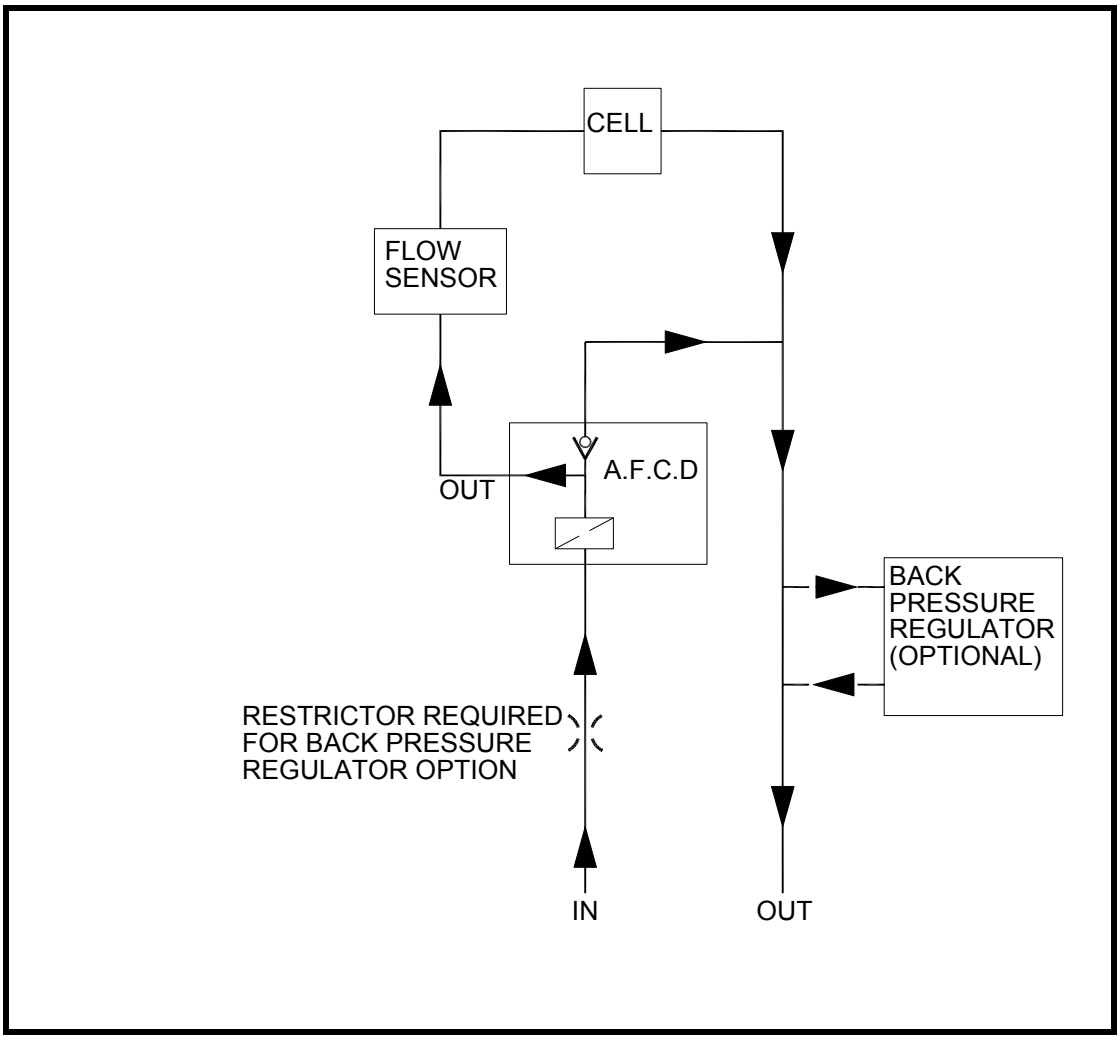

Figure 2.6 01440D1STD Plumbing Schematic

2. Leak test by connecting together the sample 'IN' and sample 'OUT' gas connections and connect a water manometer to them.
3. Pressurise the system to approx. 500mm water gauge and leave to stabilise. The leak rate should be less than 2mm/min. after the level has initially stabilised.
4. If a leak exists, check connections using a soap solution. This testing should also include the oxygen cell and its window.
5. Rectify leaks and re-check.

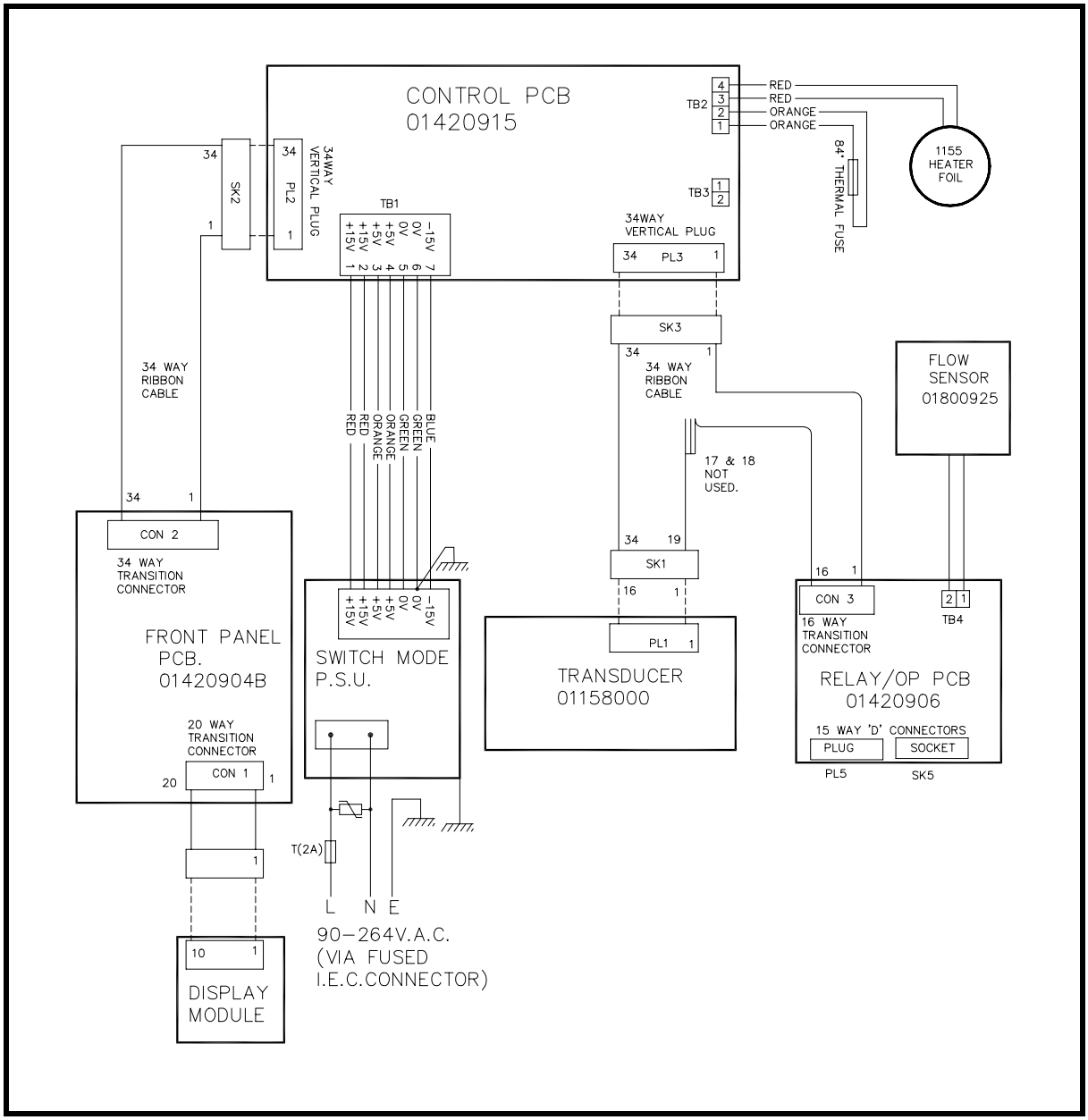

Figure 2.7 Interconnecting Wiring - 01440D1STD Oxygen Analyser

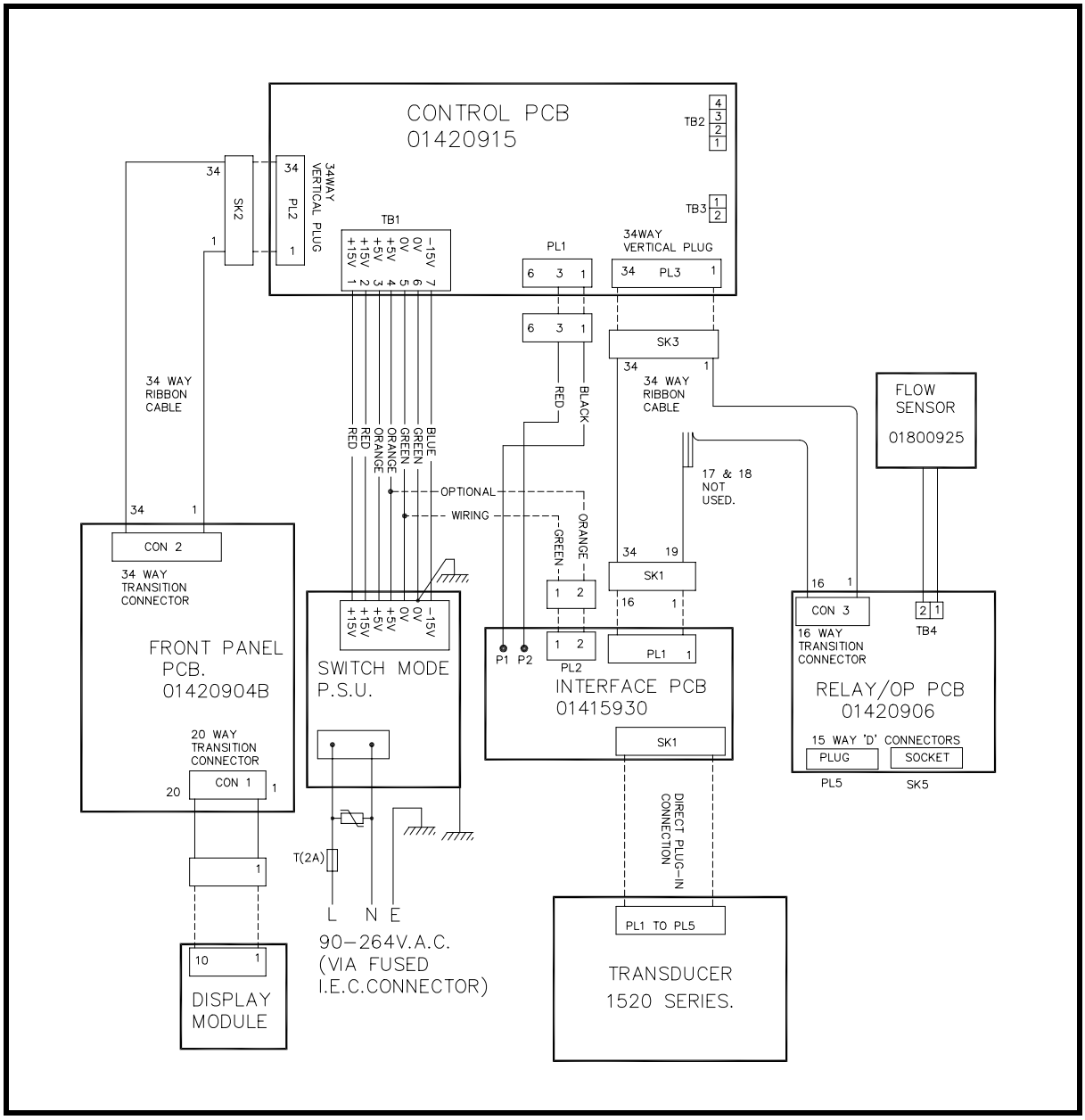

Figure 2.8 Interconnecting Wiring - 01440D1STD Carbon Dioxide Analyser

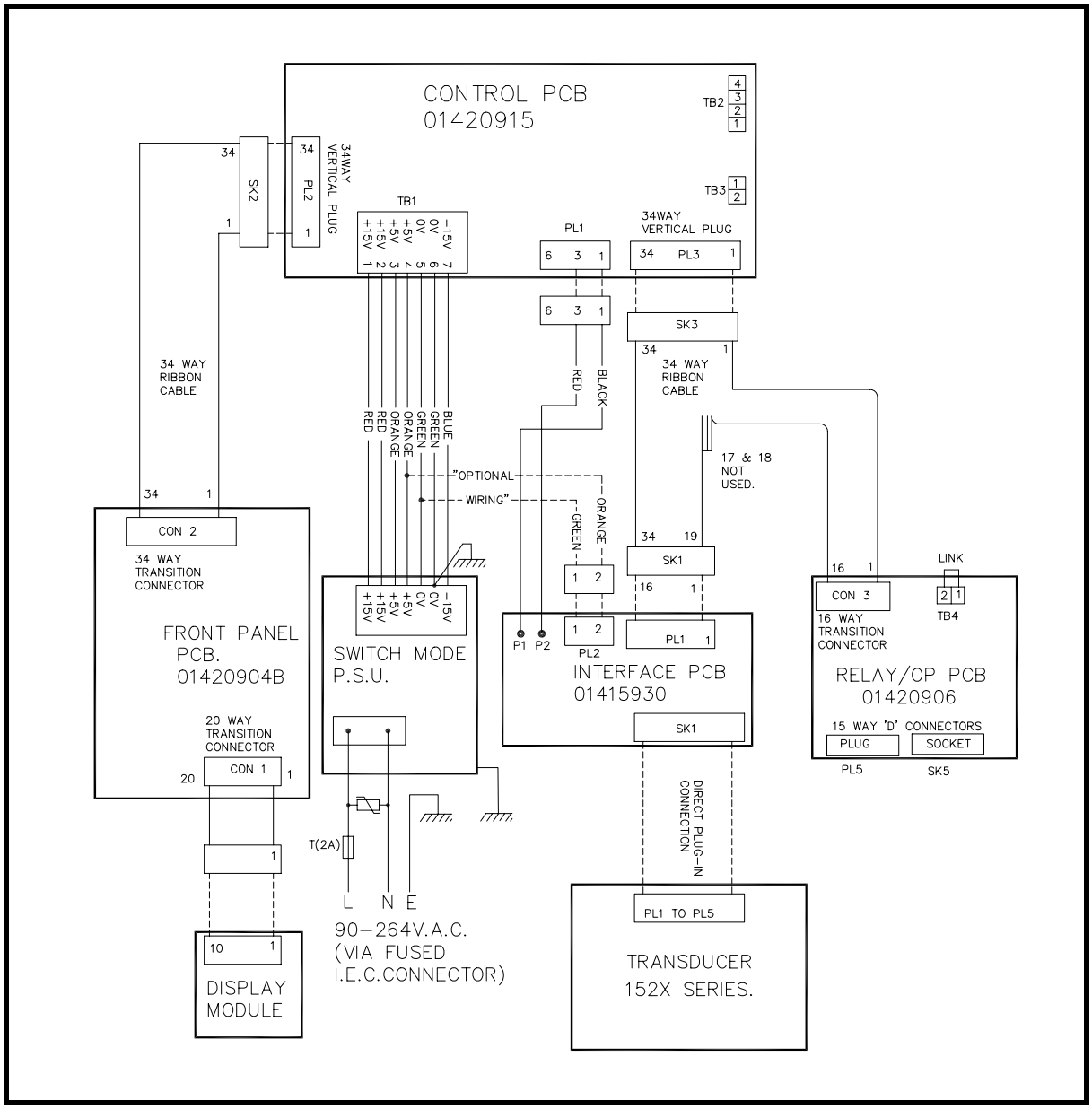

Figure 2.9 Interconnecting Wiring - 01440D1FTX Infra-Red Analyser

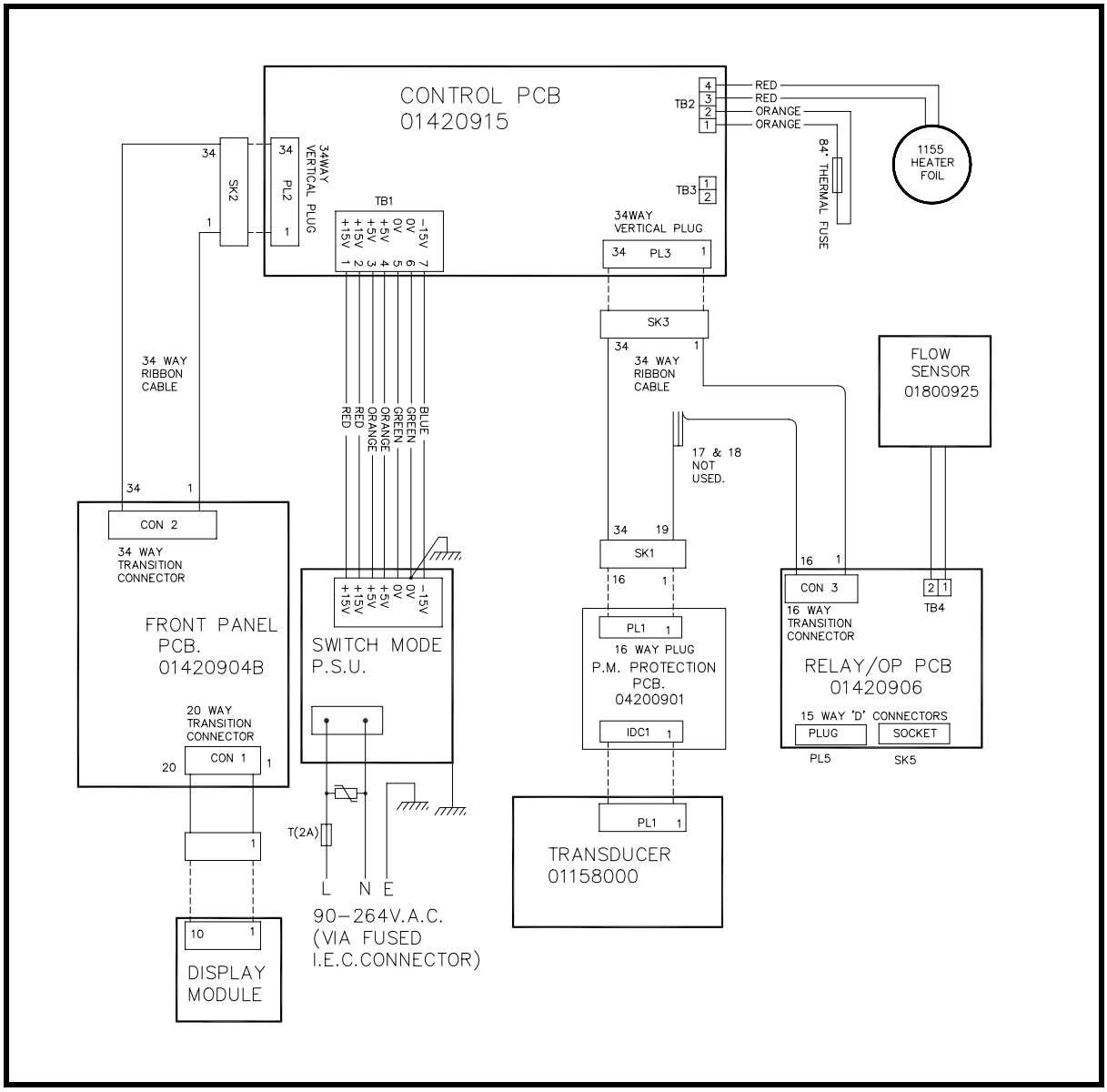

Figure 2.10 Interconnecting Wiring - 01440D1FTX Oxygen Analyser

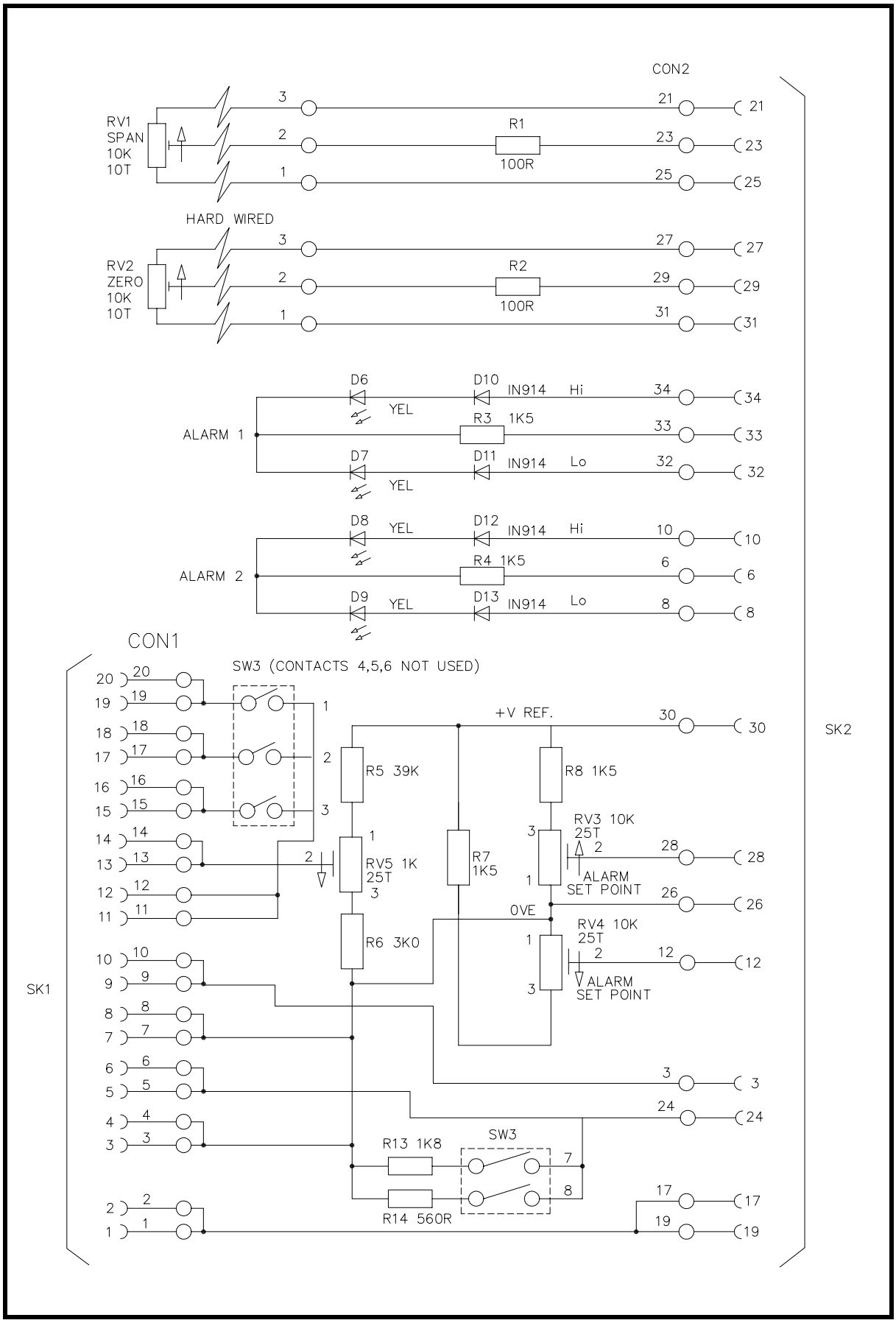

Figure 2.11 Circuit Diagram, Front Panel PCB 01420904B

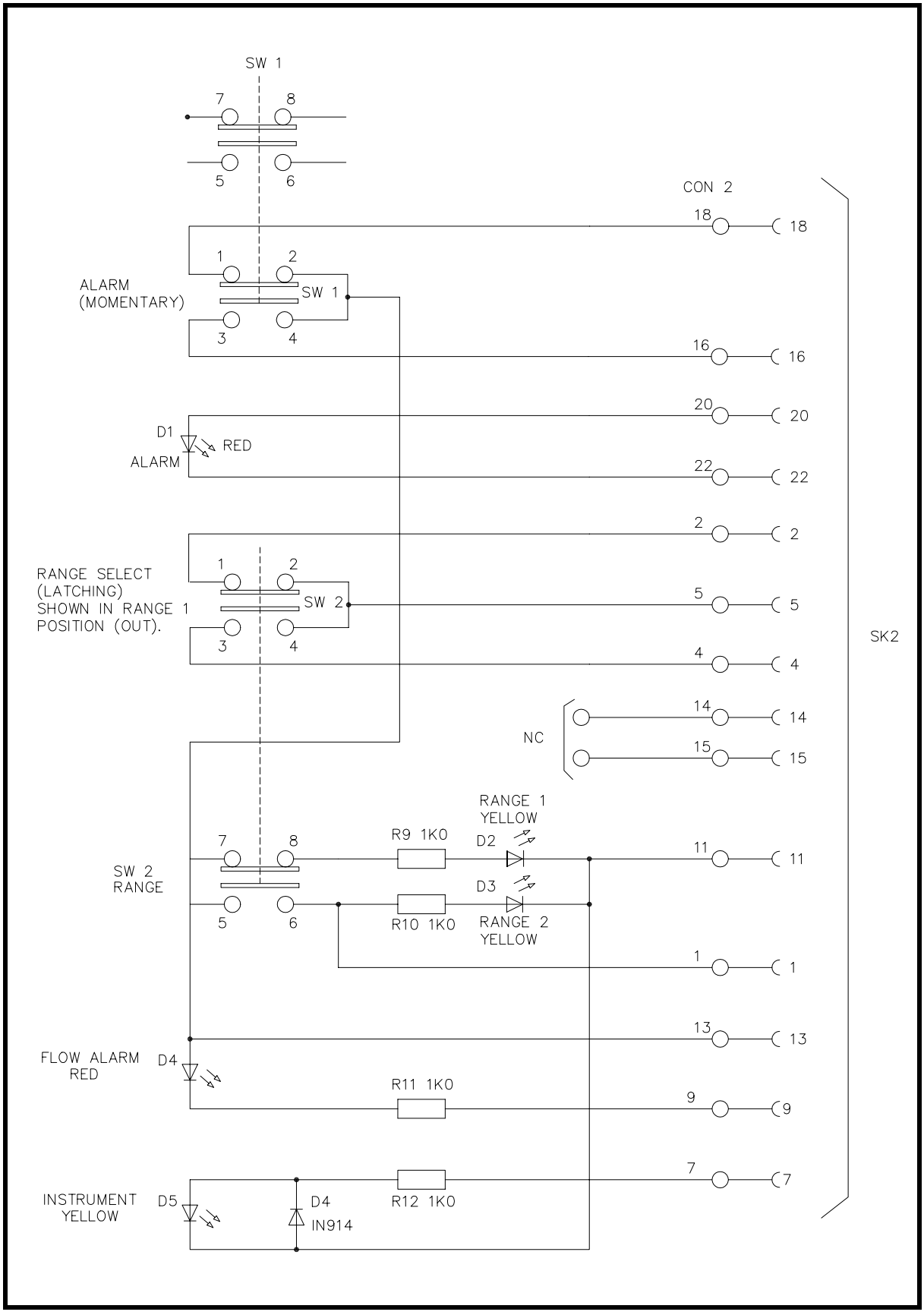

Figure 2.12 Circuit Diagram, Front Panel PCB 01420904B

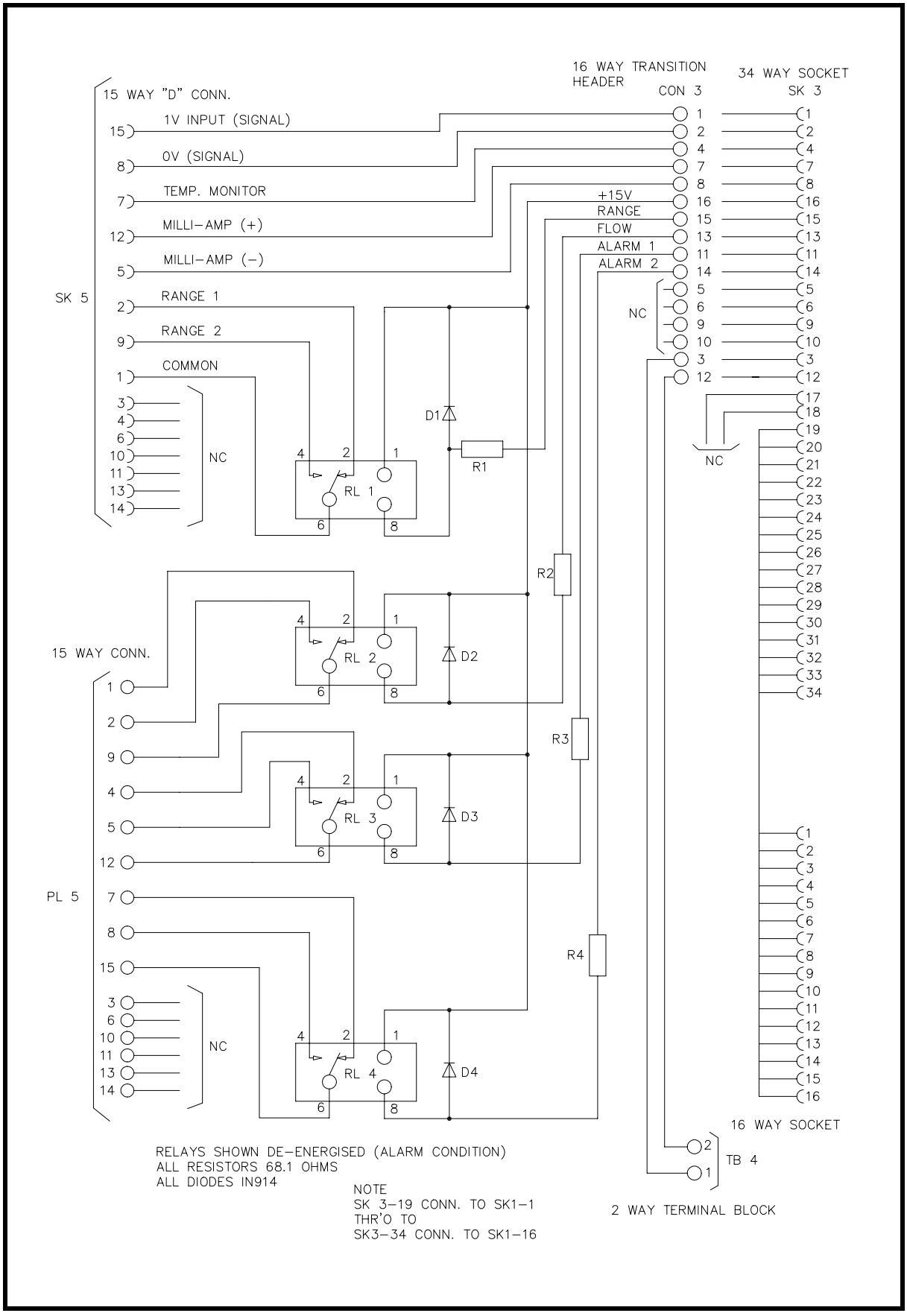

Figure 2.13 Output Connections

3 SPARE PARTS LIST

WARNINGS

- **01440D1FTX and 01440D1STD spares must be supplied by Servomex to comply with personnel safety requirements and to maintain performance specification.**

The recommended quanitity of spares to be held in stock, is a guide only. The exact requirement for spare parts will depend upon the reliance being placed upon the analyser and the distance from *Servomex* or their agent

The following spares are required to maintain normal operation of the analyser.

Table 3.1 Spares for Normal Operation

Part Number	Description	Recommended qty.		
		No. of analysers		
		1-3	4-9	10+
S1400990	AC supply fuse kit. 10 off (T) 2A (Used in single measurement units) 10 off (T) 3.15A (Used in dual measurement units)	2	4	6
S1800985	AFCD filter element kit (10 off filters). 01440D1STD only.	1	2	2
2323-7029	Viton O' ring for sealing filter element in AFCD.	1	2	3
5984-7706	Back Pressure Regulator, if fitted. 01440D1STD only.	1	1	2
5981-0593	O' ring for oxygen transducer, if fitted. Two required per transducer.	2	4	10

The following spares are also available for the analyser.

Table 3.2 Spares for General Use

Part Number	Description	Recommended qty.		
		No. of analysers		
		1-3	4-9	10+
S1420904B	Front ‘switching’ PCB.	0	0	1
2726-4119	Span or zero potentiometer.	0	1	2
S1420915	Control PCB.	0	0	1
S1420906	Alarm relay PCB.	0	1	1
210198	Power supply Unit	0	0	1
S1440922	Power supply Assembly (for 2811-2011 replacement only)	0	0	1
255-7332	LED display, 3 1/2 digits.	0	0	1
S1420935	Automatic flow control device.	0	0	1
01800925	Flow sensor assembly. 01440D1STD only.	0	0	1
2653-2518	Heater Disc for oxygen transducer only.	0	0	1
01420928	Thermal fuse assembly for oxygen transducer only.	0	1	2
01415930	Interface PCB for IR modules only.	0	1	2
S1420940	Pump replacement kit, if fitted.	1	2	4
S1420941	Viton Pipe-work kit, 01440D1STD only.	1	2	2
S1420942	Stainless steel pipe-work kit, 01440D1FTX only, oxygen transducer.	1	2	2
S1420943	Stainless steel pipe-work kits, 01440D1FTX only, infra-red transducers. See Table 3.3.	1	2	2
S1420944				
S1420945				
01420908	Protection PCB	1	2	2

Table 3.3 Spares Infrared Transducers

Part Number	Description	Spare Pipe-work Kit	Recommended qty.		
			No. of analysers		
			1-3	4-9	10+
01520709	0 - 0.25% CO_2 transducer.	S1420943	0	0	1
01520708	0 - 0.5% CO_2 transducer.	S1420943	0	0	1
01520707	0 - 1% CO_2 transducer.	S1420944	0	0	1
01520706	0 - 2.5% CO_2 transducer.	S1420945	0	0	1
01520705	0 - 5% CO_2 transducer.	S1420945	0	0	1
01520704	0 - 10% CO_2 transducer.	S1420945	0	0	1
01520703	0 - 25% CO_2 transducer.	S1420945	0	0	1
01520702	0 - 50% CO_2 transducer.	S1420945	0	0	1
01520701	0 - 100% CO_2 transducer.	S1420945	0	0	1
01522707	0 - 1% CO transducer. (01440D1FTX Only).	S1420943	0	0	1
01522706	0 - 2.5% CO transducer. (01440D1FTX Only).	S1420943	0	0	1
01522704	0 - 10% CO transducer. (01440D1FTX Only).	S1420945	0	0	1
01522703	0 - 25% CO transducer. (01440D1FTX Only).	S1420945	0	0	1
01522702	0 - 50% CO transducer. (01440D1FTX Only).	S1420945	0	0	1
01521705	0 - 5% CH_4 transducer. (01440D1FTX Only).	S1420944	0	0	1
01521703	0 - 25% CH_4 transducer. (01440D1FTX Only).	S1420945	0	0	1
01521702	0 - 50% CH_4 transducer. (01440D1FTX Only).	S1420945	0	0	1
01521701	0 - 100% CH_4 transducer. (01440D1FTX Only).	S1420945	0	0	1

Table 3.4 Spare for Oxygen Transducer

Part Number	Description	Recommended qty.		
		No. of analysers		
		1-3	4-9	10+
01158000	Oxygen Transducer	0	0	1
00325000	Measuring Cell	0	1	1

3.1 Drawings Incluced in the Manual

Circuit Diagram of Control Board 01422911: Relevant drawing 01422/111, is enclosed.