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***Revolution Not Evolution***

**7333**

**DIPTRONIC™**

**CPU (DIP200 & DIP240)**

**SOFTWARE UPGRADE INSTRUCTIONS**



**Issue D March 2010**



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## **P7403 Electrical equipment service and installation guide for road tankers**

Liquip supplies the following document as a guide for installing and operating electrical equipment on road tankers. It should be used in conjunction with local legislation and standards, owner's requirements and tank manufacturer procedures.

### **INFORMATION PERTAINING TO WORKING ON A TANK VEHICLE**

1. Prior to working on a tank vehicle it must be degassed or certified to work on. Before working in a tank compartment an appropriate device must be used to check for the presence of volatile gases.
2. Any work carried out on a tank vehicle must be done so in a non-hazardous area.
3. Before working on any electrical equipment on a tank vehicle power must be isolated either via the battery isolation switch (BIS), by disconnecting the truck battery or by disconnecting the positive of the electrical equipment.
4. Never weld on a tank vehicle unless all electronic equipment is completely disconnected electrically from both the tanker and other equipment.
5. Hazardous conditions may be present when working with high voltage devices (such as gantry monitors). Qualified technicians only should be servicing these devices.
6. Do not connect a battery charger or other pulsed power supply to the truck battery without first isolating all electrical equipment as permanent damage may result.
7. Long sleeve and pants protective clothing should be worn at all times. Clothing must be non-static generating. Any petroleum contact with skin should be washed off immediately.
8. Always follow manufacturer guidelines when working on electrical equipment. Failure to do so may void warranty or cause damage.

### **INFORMATION PERTAINING TO INSTALLING EQUIPMENT ON A TANK VEHICLE**

1. All electrical equipment and fittings must be suitable for use on a tanker and meet all local regulations for operation.
2. Use high quality waterproof conduit and fittings to IP66 minimum for all wiring and junction boxes.
3. Use waterproof flexible compound such as Silastic in all glands and joints not available as waterproof by design.
4. Mount all equipment away from direct spray areas such as behind the tyres and out of direct sunlight. Always select the most sheltered aspect.
5. Ensure all installations adhere to appropriate guidelines.
6. Coat all terminals, cable end and joints with non-conducting grease or Vaseline after final testing. This will prevent corrosion.



7. Prior to crimping, check wiring connections are electrically correct. When crimping make sure there is good electrical contact between the wire strands and metal section of the crimp terminal. Pull on the crimp to ensure a good connection has been made.
8. Cable ends may be crimped with ferrules for better connection. Do not solder the cable ends (fatigues and corrodes). Pre-coat with non-conductive grease for corrosion protection.
9. At any point a cable is extended or joined to a standard cable assembly, all cable screens must be connected to the chassis, refer to relevant wiring diagram. Insulate exposed screen wire using heat shrink, terminate with an eye terminal and attach to the junction box mounting screw. If the junction box is mounted to a panel not electrically connected to the chassis, the screens must still be joined together and connected to the chassis at one point, as per wiring diagram.
10. Common grounding of a system is most important. Do not rely on common chassis grounding at various points, run a full-length dedicated ground cable. Max resistance, battery ground to any ground point to be  $1\Omega$ . Refer Liquip Tech Talk #48: Electrical Bonding on Tankers. The electrical resistance between the tank and tanker chassis, prime mover chassis, or trailer undercarriage, and between the tank and the connection of the tanker pipework to the delivery hose, shall not exceed  $10\Omega$  (refer to AS2809.2).
11. Always fit as much loose cable length into junction boxes and housings as practicable to allow for future servicing.
12. Always segregate power and intrinsically safe wires in accordance with I.S wiring rules.
13. Carry out a complete wiring check for accuracy and continuity before connecting power to any device.
14. Observe international and local legal requirements. In the event of conflicting instructions seek qualified advice before proceeding.
15. Do not route communication cables past 'noisy' electrical apparatus such as solenoids and alternators.
16. Check instruction manual for recommended cable type and torque settings.
17. Use specialised, genuine tools for all electrical work.
18. Mount equipment to clean, dry, bare surfaces on a metal bracket mounted to the chassis/sub-frame. It is recommended the bracket be welded to the chassis/sub-frame to facilitate good electrical contact.
19. Ensure adequate clearance around equipment being installed. This will provide for ease in future maintenance.
20. When bolting equipment into place, the use of Teflon tape or anti-seize compound on threads is advised.
21. Fuses located in hazardous areas must be suited to that location.
22. Always allow suitable separation between intrinsically safe wiring and power from line power source.



## Contents

<b>General information .....</b>	<b>5</b>
<b>Enabling printer .....</b>	<b>5</b>
<b>Inserting new EPROM .....</b>	<b>6</b>
<b>17.1 Entering number of compartments .....</b>	<b>7</b>
<b>17.2 Temperature factors .....</b>	<b>8</b>
<b>17.3 Litres offset .....</b>	<b>9</b>
<b>17.4 Level message setup .....</b>	<b>10</b>
<b>17.5 Truck number .....</b>	<b>10</b>
<b>17.6 Date format .....</b>	<b>11</b>
<b>17.7 Current Date .....</b>	<b>12</b>
<b>17.8 Customer name .....</b>	<b>12</b>
<b>17.9 Current time .....</b>	<b>13</b>
<b>17.10 Calibration data. ....</b>	<b>14</b>
<b>18 Sensor length &amp; Dielectric .....</b>	<b>15</b>
<b>19 Diagnostic settings .....</b>	<b>16</b>
<b>APPENDIX 1 - Diptronic Reference Booklets .....</b>	<b>18</b>



## General Information:

These instructions are for the upgrade of the Diptronic CPU (DIP200/240) software:

Note that when changing the Diptronic software, all previous stored data including calibration will need to be deleted for **pre DIP200 01.00.05 EPROM's**. This may also be the case for some DIP240's. For these cases only, it is necessary to print all the data via a ticket printer and re-enter.

Ensure the software update is performed in a dry area. All EPROM handling must be carried out by an approved electrical technician. Liquip accepts no responsibility for EPROM's installed by unqualified personnel.

**Note:** DipRecall allows all stored data to be saved to and restored from a PC. This applies to post 01.00.09 DIP200 EPROM's and all DIP240 EPROM's. Refer DipRecall manual for instructions.

1. Remove calibration seal from front panel of CPU.
2. Enable printer (if not already enabled) in CPU setup by following the 9 steps below.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK 5 times	PRINTER SETUP? NO
4	Press INC then OK	PRINTER: OFF
5	Press INC for TM-295	PRINTER: TM-295
6	Press OK to save selection	PRINTER: TM-295
7	Press MENU	COM 1 ACK? YES
8	Press MENU	EXIT CALIBRATION? YES
9	Press OK	



3. Connect printer via printer harness to CPU (if not already connected).
4. Power up printer via 24Vdc supply.
5. Select compartment 1 by continuously pressing and holding the NEXT button.
6. Insert paper into ticket or blaster printer.
7. Hold the NEXT and PRINT buttons at the same time to print the calibration report ticket.
8. Feed extra paper into printer as required.
9. Select compartment 2 (if present) & repeat above steps to print.
10. Repeat for remaining compartments.
11. Isolate power to CPU.
12. Remove 4 retaining cap screws from CPU front cover.
13. Remove EPROM from CPU (by approved electrical technician).
14. Carefully insert new EPROM into CPU (by approved electrical technician). Make sure it is oriented correctly when inserted (the same orientation as the removed EPROM) and ensure no pins are damaged when pushing into place.
15. **For pre DIP200 01.00.05 EPROM's or DIP240 CPU's that have erroneous data following EPROM change only**, hold CAL, MENU & OK at the same time & power up the CPU (release all the buttons as soon as the reset message appears). If no reset message appears power down the CPU and repeat this step.



**Note that this step does not apply to post DIP200 01.00.05 EPROM's or DIP240's whose data has been unaffected by the EPROM change.**

16. Enable printer as in step 2 above.
17. For pre DIP200 01.00.05 EPROM's & DIP240 CPU's that have had their data corrupted after the EPROM change re-enter all erased/erroneous data manually in the following steps (17.1 - 17.10). For post DIP200 01.00.05 EPROM's & DIP240's that have not had their data effected by EPROM change print a calibration report ticket for each compartment as per steps 2 to 10 and compare to the calibration report tickets of the replaced EPROM. If discrepancies exist for any of the data indicated re-enter as required according to any of the corresponding following steps.
- 17.1 Enter the number of compartments indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC	CALIBRATION? YES
3	Press OK	SENSOR SETUP? NO
4	Press OK	SYSTEM SETUP? NO
5	Press INC	SYSTEM SETUP? YES
6	Press OK	NO.OF COMPARTMENTS: 1
7	Repeatedly press INC to select no. of compartments	NO.OF COMPARTMENTS: #
8	Press OK	NO.OF COMPARTMENTS: #
9	Hold CAL & press OK	EXIT CALIBRATION? YES
10	Press OK to exit	





## 17.2 Enter the temperature factors for each sensor as indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press INC then OK	CHANGE INDIVIDUAL SENSOR ID: #
4	Press MENU button	TEMPERATURE FACTOR? NO
5	Press INC then OK	SELECT SENSOR NO.: 1
6	Repeatedly press INC for sensor number and press OK	VIEW TEMP.FACTOR ARRAY? NO
7	Press OK	EDIT TEMP.FACTOR ARRAY? NO
8	Press INC then OK	SENSOR:# STEP:1 TEMP. FACTOR ###.#, ###.#
9	Repeatedly press NEXT & INC to enter correct temp & factor. Press OK to save	SENSOR:# STEP:1 TEMP. FACTOR ###.#, ###.#
10	Hold CAL & press NEXT for next step	SENSOR:# STEP:2 TEMP. FACTOR ###.#, ###.#
11	Repeat above steps for all data	
12	If END displayed hold CAL & press NEXT	ADD ANOTHER STEP? NO
13	Press INC then OK to add another step and OK to save or press OK to exit	SENSOR:# STEP:# TEMP. FACTOR ###.#, ###.#
14	Repeat above to add more steps	
15	(Hold CAL & press NEXT)	VIEW TEMP.FACTOR ARRAY? NO





STEP	OPERATION	DISPLAY
16	To add another sensor's array of data press MENU 3 times and go to step 6 or proceed to step 17 to exit	SELECT SENSOR NO.: #
17	Hold CAL & press OK to exit	EXIT CALIBRATION? YES
18	Press OK	

17.3 Enter any litre offset indicated by the calibration report ticket.

### Adding an offset in Litres

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK twice	COMPART.CALIBRATION? NO
4	Press INC then OK	SELECT COMP.NO.: 1
5	Continue to press INC for the desired compartment then press OK	CALIBRATE LEVEL/VOLUME? NO
6	Continue to press OK for add offset in litres menu	ADD OFFSET IN LITRES? NO
7	Press INC then OK	COMP# OFFSET: ###L
8	Repeatedly press INC then NEXT for offset then press OK to save	COMP# OFFSET: ###L
9	Hold CAL & press OK	EXIT CALIBRATION? YES
10	Press OK to exit	



#### 17.4 Enter level messages as indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK	SYSTEM SETUP? NO
4	Press INC then OK	NO.OF COMPARTMENTS: #
5	Press MENU 4 times	C:1 L2: ##### L3: 00000## SFL: ##### L4: 00000## L5: 00000## L6: #####
6	Repeatedly press NEXT or INC to input C:, L2, 3, L6 & SFL	C:# L2: ##### L3: 00000## SFL: ##### L4: 00000## L5: 00000## L6: #####
7	Press OK to save after entering each compartment.	
8	Hold CAL & press OK	EXIT CALIBRATION? YES
9	Press OK	

#### 17.5 Enter truck number as indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK	SYSTEM SETUP? NO
4	Press INC then OK	NO.OF COMPARTMENTS: #
5	Press MENU 3 times	##### TRUCK ID



STEP	OPERATION	DISPLAY
6	Repeatedly press INC then NEXT to I/P truck ID. and press OK to save	##### TRUCK ID
7	Hold CAL & press OK	EXIT CALIBRATION? YES
8	Press OK to exit	

17.6 Enter date format as indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC	CALIBRATION? YES
3	Press OK	SENSOR SETUP? NO
4	Press OK 3 times	CLOCK SETUP? NO
5	Press INC	CLOCK SETUP? YES
6	Press OK	## : ## : ## TIME
7	Press MENU	DD/MM/YY DATE FORMAT
8	Repeatedly press INC to select format.	## / ## / ## DATE FORMAT
9	Press OK to save	## / ## / ## DATE FORMAT
10	Hold CAL & press OK	EXIT CALIBRATION? YES
11	Press OK to exit	



### 17.7 Enter date indicated by calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK 3 times	CLOCK SETUP? NO
4	Press INC then OK	## : ## : ## TIME
5	Press MENU twice	## / ## / ## DATE
6	Repeatedly press INC then NEXT to I/P date	## / ## / ## DATE
7	Press OK to save	## / ## / ## DATE
8	Hold CAL & press OK	EXIT CALIBRATION? YES
9	Press OK	

### 17.8 Enter the customer name indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	EXIT CALIBRATION? YES
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK	SYSTEM SETUP? NO
4	Press INC then OK	NO.OF COMPARTMENTS: #
5	Press MENU 2 times	LIQUIP SALES PL COMPANY NAME REFERENCE
6	Repeatedly press INC & NEXT to input company. Press OK to save	##### COMPANY NAME REFERENCE
7	Hold CAL & press OK	EXIT CALIBRATION? YES
8	Press OK to exit	



## 17.9 Set the correct time.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC	CALIBRATION? YES
3	Press OK	SENSOR SETUP? NO
4	Press OK 3 times	CLOCK SETUP? NO
5	Press INC	CLOCK SETUP? YES
6	Press OK	## : ## : ## TIME
7	Repeatedly press INC or NEXT to I/P current time	## : ## : ## TIME
8	Press OK to save	## : ## : ## TIME
9	Hold CAL & press OK	EXIT CALIBRATION? YES
10	Press OK to exit	



17.10 Manually enter the calibration data for each sensor (if any). Note that for most cases the calibration data should not be effected by updating software (except pre DIP200 01.00.05 EPROM's).

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC then OK	SENSOR SETUP? NO
3	Press OK twice	COMPART.CALIBRATION? NO
4	Press INC then OK	SELECT COMP.NO.: #
5	Continue to press INC for the desired compartment then press OK	MANUAL CALIBRATION? NO
6	Press OK twice	EDIT LEVEL/VOLUME ARRAY? NO
7	Press INC then OK	COMP: # STEP: 1 MEASURED TRUE +####.#, +0000.0
8	Continue to press INC then NEXT to enter. Press OK to save	COMP: # STEP: 1 MEASURED TRUE +####.#, +####.#
9	Hold CAL & press NEXT for next step	COMP: # STEP: 2 MEASURED TRUE +####.#, +####.#
10	Repeat above steps to end	END
11	Hold CAL & press NEXT	ADD ANOTHER STEP? NO
12	Press INC then OK to add step and proceed as above	COMP: # STEP: # MEASURED TRUE +####.#, +####.#
13	Alternatively, hold CAL & press OK	EXIT CALIBRATION? YES
14	Press OK to exit	



- 18 Enter the sensor length & dielectric for each compartment indicated by the calibration report ticket.

STEP	OPERATION	DISPLAY	
1	Hold CAL & press OK	EXIT CALIBRATION? YES	
2	Press INC then OK	SENSOR SETUP? NO	
3	Press INC then OK	CHANGE INDIVIDUAL SENSOR ID: #	
4	Press MENU twice	COMP.: 1	HT: #####mm DIEL.: 1.4-1.7 S/L MAX: #####mm
5	Repeatedly press NEXT or INC to change selection	COMP.: #	HT: #####mm DIEL.: ##-### S/L MAX: #####mm
6	<b>Press OK to save</b>	COMP.: #	HT: #####mm DIEL.: ##-### S/L MAX: #####mm
7	Repeat steps 5 & 6 for all compartments	COMP.: #	HT: #####mm DIEL.: ##-### S/L MAX: #####mm
8	Hold CAL & press OK		
9	Press OK to exit		

**Note:** Sometimes it is necessary to press OK a number of times in step 6 to save the entered data correctly. Ensure that after pressing OK, HT, DIEL & S/L MAX are the same as indicated on the ticket.





- 19 For post 01.00.05 DIP200 EPROM's & post 11.00.00 DIP240 EPROM's  
save the diagnostics settings of each sensor in the CPU.

STEP	OPERATION	DISPLAY
1	Hold CAL & press OK	CALIBRATION? NO
2	Press INC	CALIBRATION? YES
3	Press OK 5 times	DIAGNOSTICS? NO
4	Press INC	DIAGNOSTICS? YES
5	Press OK	IDENTIFY THE SENSOR? NO
6	Press OK	SELECT COMP.NO.: #
7	Repeatedly press INC for Compartment 1	SELECT COMP.NO.: 1
8	Press OK	DISPLAY LEVEL AND TEMP
9	Press MENU	SENSOR: 1 DIGITAL SETUP? NO
10	Press INC	SENSOR: 1 DIGITAL SETUP? YES
11	Press OK	DISPLAY FIDUCIALS & TICKS
12	Press (hold) MENU	DISPLAY FACTORY PARAMETERS
13	<b>Press OK to save</b>	DISPLAY FACTORY PARAMETERS
14	Press MENU (x2 for LIPS)	SELECT COMP.NO.: #
15	Repeatedly press INC for next compartment	SELECT COMP.NO.: #
16	Repeat steps 9 to 16 until all compartments have been saved	
17	Hold CAL & press OK	EXIT CALIBRATION? YES
18	Press OK to exit	



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20. Hold NEXT & PRINT for each compartment to print new calibration report ticket (as in steps 5 to 10 on page 6). This step only needs to be performed for post 01.00.05 DIP200 EPROM's & post 11.00.00 DIP240 EPROM's if any changes were made in steps 17.1 to 17.10.
21. Compare report tickets from step 20 above with previous software report tickets. Check that all entered data matches. Note that other settings such as FID.TICKS, WINDOW etc. need not be the same. If any discrepancies exist, edit following the appropriate steps previously indicated.
22. Disable printer if not required.
23. Replace calibration seal & reseal by suitably qualified person.



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## APPENDIX 1 - Diptronic Reference Booklets

PART #	DOCUMENT	FILENAME
7310	DIPTRONIC MEASURING SYSTEM MK1 DRIVERS MANUAL	DIP200_INST_DIPTRONIC_MEASURING_DRIVER_INSTRUCTIONS_P7310.pub
7326	DIPTRONIC MEASURING SYSTEM MK1 & L.I.P.S. (WITH GPS) CALIBRATION MANUAL	DIP200_INST_DIPTRONIC_CALIBRATION_P7326.pub
7327	DIPTRONIC MEASURING SYSTEM MK1 & LIPS AUTOMATIC CALIBRATION RIG MANUAL	DIP200_INST_DIPTRONIC_CALIBRATION_RIG_P7327.pub
7328	DIPTRONIC L.I.P.S DRIVERS MANUAL	DIP200_INST_DIPTRONIC_LIPS_DRIVER_INSTRUCTIONS_P7328.pub
7329	DIPTRONIC MEASURING SYSTEM MK1 INSTALLATION MANUAL	DIP200_INST_DIPTRONIC_MEASURING_INSTALLATION_INSTRUCTIONS_P7329.pub
7330	DIPTRONIC L.I.P.S. & GPS INSTALLATION MANUAL	DIP200_INST_DIPTRONIC_LIPS_INSTALLATION_INSTRUCTIONS_P7330.pub
7331	DIPTRONIC GENERAL INFORMATION	DIP200_INST_DIPTRONIC_GENERAL_INFORMATION_P7331.pub
7333	DIPTRONIC CPU (DIP200 & DIP240) SOFTWARE UPGRADE INSTRUCTIONS	DIP200_INST_DIPTRONIC_SOFTWARE_UPGRADE_INSTRUCTIONS_P7333.pub
7334	DIPTRONIC MEASURING SYSTEM MK1 & L.I.P.S. CPU REPLACEMENT INSTRUCTIONS	DIP200_INST_DIPTRONIC_CPU_REPLACEMENT_INSTRUCTIONS_P7334.pub
7335	DIPTRONIC MEASURING SYSTEM MK1 & L.I.P.S. SENSOR (AERIAL & POT) REPLACEMENT INSTRUCTIONS	DIP200_INST_DIPTRONIC_SENSOR_REPLACEMENT_INSTRUCTIONS_P7335.pub
7400	DIPTRONIC MEASURING SYSTEM MK1 & L.I.P.S. DipRecall MANUAL	DIP200_INST_DIPTRONIC_DIPRECALL_INSTRUCTIONS_P7400.pub



## **NOTICE FOR USE IN CEN**

### **Instructions specific to hazardous area installations (reference European ATEX Directive 94/9/EC, Annex<sup>22</sup>, 1.0.6.)**

The following instructions apply to equipment covered by certificate numbers Sira 02ATEX3323X (DIP200) and Sira 02ATEX2322X (DIP100):

1. The equipment may be used in a hazardous area with flammable gases and vapours with apparatus group IIA and with temperature classes T1, T2, T3, and T4.
2. The apparatus is only certified for use in ambient temperatures in the range -20°C to +60°C and should not be used outside this range.
3. The certified numbers have an 'X' suffix that indicates that special conditions of certification apply. These conditions are; The DIP100 has an aluminium cover and precautions must be taken to reduce the risk of a frictional spark occurring. The DIP200 power must be supplied via a fuse that has a breaking capacity capable of clearing the maximum short circuit current of the truck battery.
4. Installation shall be carried out in accordance with the applicable code of practice by suitably trained personnel.
5. Repair of this equipment shall be carried out in accordance with the applicable code of practice.
6. Certification marking as detailed in DIP100 series drawing number P7278 & DIP200 series drawing number P7284.
7. If it is likely the equipment will come in contact with aggressive substances, then it is the responsibility of the user to take suitable precautions to prevent the equipment being adversely effected, ensuring the type of protection is not compromised.

Aggressive Substances: e.g. acidic liquids or gases that may attack metals or solvents that may effect polymeric materials. inspections or establishing from the materials data sheet that it is resistant to specific chemicals.



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