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DIPTRONIC STORAGE TANK JIG CALIBRATION PROCEDURE Page 1 of 15

Procedure: Diptronic	Section: 6/6	Document No:	Date Issued: DRAFT
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P7490

DIPTRONIC STORAGE TANK JIG CALIBRATION PROCEDURE

DRAFT

DATE	ISSUE	DETAILS
31/03/06	DRAFT	DRAFT

Diptronic storage tank calibration procedure:

- This procedure applies to calibration of Diptronic storage tank sticks only.
- Sensors up to a maximum of 3m in length can be calibrated.
- One sensor at a time only can be calibrated.
- Storage tank calibration charts must be obtained from the customer or tank manufacturer.
- DIP100-1 Diptronic base must be removed for the calibration.

1. Equipment required

- Diptronic storage tank calibration jig.



Fig 1. Calibration jig in vertical position.

2. Setup

2.1 Setup CPU and sensors as per P7437 Diptronic pre-programming of all sensors in tanker sets.

2.2 Retract the pin in the rear of the calibration jig to allow the jig to rotate. Slowly rotate the jig into the horizontal position depicted in figure 2. Be careful to ensure no cables get caught while rotating.



Fig 2. Calibration jig in horizontal position.

2.3 Remove sensor flange plate and attach to sensor stick. Refer figure 3.

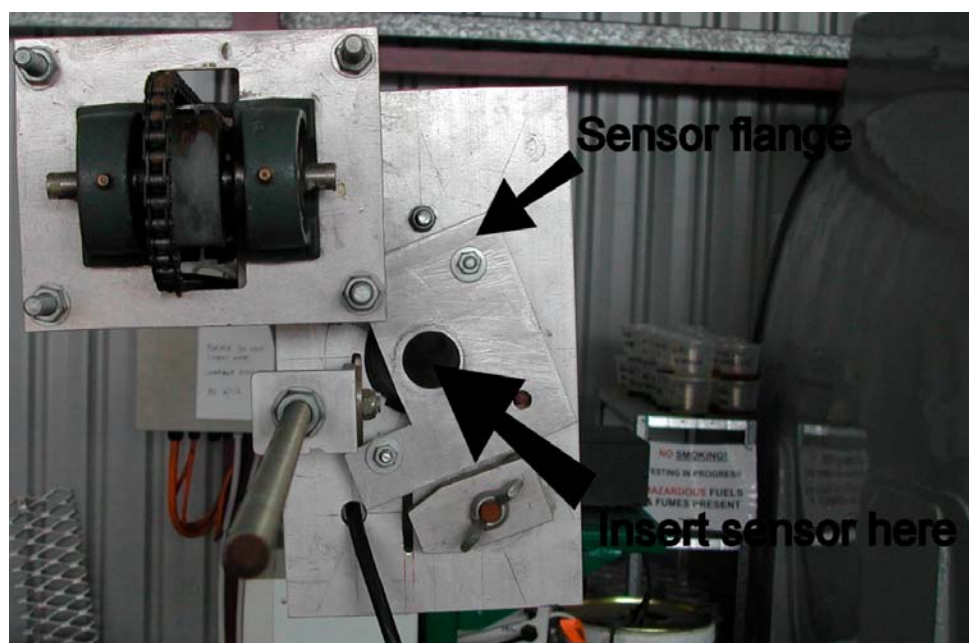


Figure 3. Sensor mounting plate.

2.4 Insert the sensor to be calibrated into the polycarbonate tubing via the opening as indicated in figure 3.

2.5 Reattach the sensor flange plate.

2.6 Attach the DIP100-12 pot to the top plate of the jig as indicated in figure 4.

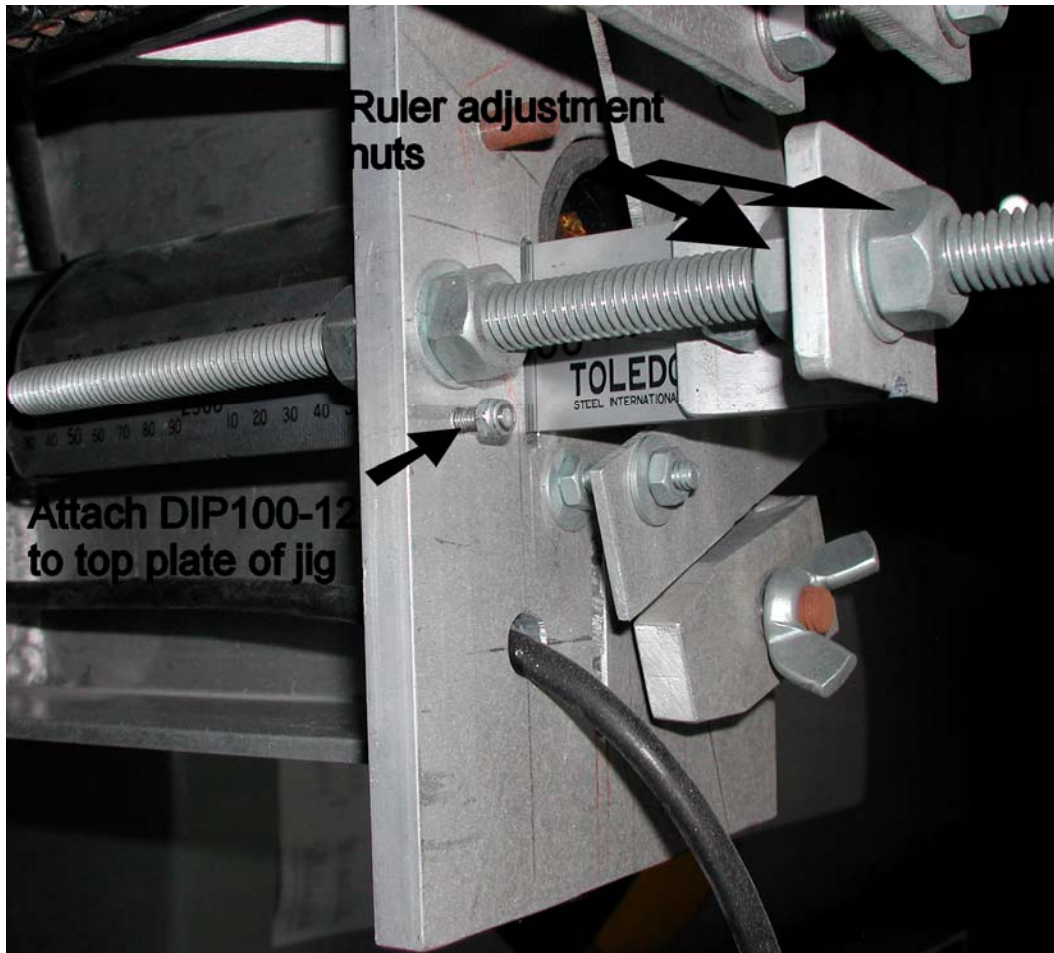


Figure 4. Attach pot to top plate of jig.

2.7 Attach delay line from pot to connector (DIP100-17) on sensor.

2.8 Adjust position of ruler to line end with tank bottom relative to position of sensor tip. Adjust position via nuts as indicated in figure 4. Note, with no steady (DIP300-1) in place this will be 21mm. With steady welded in place this will be 15mm.

2.9 Slowly rotate jig to vertical position and lock into place by inserting pin.

2.10 Place CPU that is part of sensor set on shelf of jig and connect to mil spec connector. Note, sensors 1-3 to be connected to HART 1 (top right mil spec connector). Sensors 4-6 to be connected to HART 2 (middle mil spec connector). Sensors 7-9 to be connected to HART 3 (bottom right mil spec connector). Refer figure 5.



Figure 5. CPU location.

- 2.11 Connect power of harness of CPU from top right hand gland of CPU to register.
Connect the blue wire from the CPU harness to the red (+) plug on the register.
Connect the green wire from the CPU harness to the green (-) plug on the register.
- 2.12 Switch on the Powertech MP3090 switch mode power supply. Refer figure 6.



Figure 6. Powertech MP3090

- 2.13 Switch on the Powertech MP-3035 12V regulated power supply.
- 2.14 Power on the register (switch the ON/OFF switch to on). The CPU should power on and display MIN- on the top LCD panel.
- 2.15 Power on the camera (switch the ON/OFF switch to on – the switch is located at the rear of the camera). Refer figure 7.



Figure 7. Camera.

2.16 Power on the monitor. A picture of the ruler and polycarbonate tube should appear on the screen.

2.17 Remove the lid of the reservoir tank. Note, refer MSDS on Norpar prior to handling. Refer figure 8.



Figure 8.

3. Calibration

- 3.1 Prior to each batch locate the camera at the same level on the ruler as indicated by the tank calibration chart. Move the camera by switching on the switch located on the grey box as indicated in figure 9. Control the vertical direction of the camera by using the up or down buttons on the grey panel. Control the speed the camera moves by adjusting the voltage control knob on the MP3090 between MIN and MAX.



Figure 9.

Refer tank calibration chart and batch in Norpar to the first calibration point. Use the buttons on the front of the register box and pump in the same manner as an EMH register. Note, complete a manual calibration table for reference as the calibration is carried out.

Once the camera is in place pump in the required amount of Norpar until the camera shows the bottom edge of the meniscus lined up at the same level on the ruler as indicated by the tank calibration chart.



3.2 Manual calibrate each sensor according to the instructions below:

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	MANUAL CALIBRATION? NO
6	Press INC then OK	COMP:# STEP: 2 MEAS.LEVEL:#####.mm VOLUME:+0000.0L
7	Use the NEXT and INC buttons to enter volume indicated by certified measure	COMP:# STEP: 2 MEAS.LEVEL:#####.mm VOLUME:#####.L
8	Press OK to save	COMP:# STEP: 2 MEAS.LEVEL:#####.mm VOLUME:#####.L
9	Hold CAL & press NEXT for another step Pump in Norpar to next level on ruler	COMP:# STEP: 3 MEAS.LEVEL:#####.mm VOLUME:#####.L
11	Continue to press INC then NEXT to select volume indicated by certified measure	COMP:1 STEP: 3 MEAS.LEVEL:#####.mm VOLUME:#####.L
12	Repeat above steps (8-11) until fill complete	
13	Hold CAL & press MENU when calibration complete	VIEW LEVEL/VOLUME ARRAY? NO
14	Hold CAL & press OK to exit	EXIT CALIBRATION? YES
15	Press OK to confirm exit	



3.3 Following calibration view entered data and note any discrepancies between data stored in the CPU and data entered in the manual calibration table that was filled out during calibration. Follow the steps below to view data stored in the CPU.

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	MANUAL CALIBRATION? NO
6	Press OK	VIEW LEVEL/VOLUME ARRAY? NO
7	Press INC then OK	COMP:# STEP: 1 MEAS.LEVEL: +####.#mm VOLUME: +####.#L
8	Hold CAL & press NEXT to view next step	COMP:# STEP: 2 MEAS.LEVEL: +####.#mm VOLUME: +####.#L
9	Repeat above steps to end	
10	Hold CAL & press OK to exit	EXIT CALIBRATION? YES
11	Press OK to confirm exit	



3.4 If any discrepancies were found between data stored in the CPU and data written in the table, edit the CPU data to match the written data as follows:

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	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 edit. 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 to exit	EXIT CALIBRATION? YES
14	Press OK	

Note: To skip by a factor of 10 steps hold CAL & press PRINT.



3.5 Following calibration setup adjust level settings L1 to L6 in the CPU as necessary according to customer requirements. Follow the steps below to make any adjustments:

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	Repeatably press NEXT or INC to input C:, L2, L3, 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 to Exit	EXIT CALIBRATION? YES
9	Press OK	

3.6 Close the flow valve on the Norpar reservoir tank.

3.7 Disconnect the hose on the end of the valve being careful to ensure as little Norpar is spilled as possible.

3.8 Insert the drain hose from the perspex cylinder into a storage vessel. Open the drain valve and drain the cylinder completely.

3.9 Pour the contents of the storage vessel back into the Norpar reservoir tank.

3.10 Reconnect the hose from the perspex cylinder to the valve on the reservoir tank.

3.11 Open the flow valve on the Norpar reservoir tank.

3.12 Verify the initial calibration. Verify according to steps in verification table. Refer P7326 Diptronic calibration manual for table.



3.13 Add litres offset as necessary following verification:

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	MANUAL CALIBRATION? NO
6	Press OK 4 times	ADD OFFSET IN LITRES? NO
7	Press INC then OK	COMP# OFFSET: ###L
8	Repeatably press INC then NEXT for offset, then press OK to save	COMP# OFFSET: ###L
9	Hold CAL & press OK to exit	EXIT CALIBRATION? YES
10	Press OK	



- 3.14 Drain Norpar form perspex cylinder as per steps 2.21 to 2.24.
- 3.15 Retract the pin in the rear of the calibration jig to allow the jig to rotate. Slowly rotate the jig into the horizontal position depicted in figure 2. Be careful to ensure no cables get caught while rotating.
- 3.16 Disconnect the delay line of the pot attached to the sensor.
- 3.17 Remove the pot from the jig.
- 3.18 Remove the sensor from the jig.
- 3.19 Reattach DIP100-1 Diptronic base as per P7424 Diptronic DIP100 assembly procedure. Follow the same procedure as necessary to complete assembly prior to shipping to customer.
- 3.20 Repeat calibration procedure from step 1 for remaining sensors.
- 3.21 Following calibration of all sensors contact Engineering to DipRecall the contents of the DIP200 CPU for archiving.

END OF PROCEDURE



Diptronic DIP100 (DIP100-12) Production Procedures in order of Procedure:

1. P7419 Diptronic PCB assembly & setup procedure.
2. P7420 Diptronic PCB assembly conformal coating procedure.
3. P7421 Diptronic PCB assembly soft potting procedure.
4. P7422 Diptronic DIP100-12 hard potting & final assembly procedure.
5. P7423 Diptronic DIP100-12 thermal test procedure.

Diptronic DIP100 Production Procedures in order of Procedure:

1. P7424 Diptronic DIP100 assembly procedure.
2. P7425 Diptronic DIP100 level test procedure.

Diptronic DIP200/240 Production / Contractor List of Procedures:

1. P7426 Diptronic DIP200 series top board test procedure.
2. P7427 Diptronic DIP200 series bottom board test procedure.
3. P7428 Diptronic DIP200 top and bottom board test procedure.
4. P7429 Contractor Diptronic DIP200 top and bottom board test procedure.
5. P7430 Diptronic DIP240 top and bottom board test procedure.
6. P7431 Contractor Diptronic DIP240 top and bottom board test procedure.
7. P7432 Diptronic temperature sensor test procedure.
8. P7433 Diptronic DIP200 series assembly procedure.
9. P7434 Diptronic DIP200 series potting procedure.
10. P7435 Diptronic DIP200 series lid & button assembly and test procedure.
11. P7436 Diptronic DIP200 series final & kit assembly procedure.

Diptronic Miscellaneous Procedures:

1. P7437 Diptronic pre-programming of all sensors in tanker sets.
2. P7438 Diptronic sealed parcel test procedure Liquip part no. DIP100, DIP240, PPM340, PD100.
3. P7439 Diptronic BTS100 assembly and potting procedure.
4. P7440 Contractor and Liquip Diptronic BTS100 test procedure.
5. Diptronic quality checklist following production manufacture.
6. *P7490 Diptronic storage tank jig calibration procedure.*