Quick Start Guide

Cyl-Tel® & Tank-Tel®

Liquid Level Gauges

TANK-TEL

Designed and Built by:

Chart Inc.

407 7th Street NW
New Prague, MN 56071 USA
(800) 400-4683

Part Number 20664277 Rev. E

Contents

Revision Log

Revision Level	Date	Description
B	07/15/2014	Reformat with new layout and update to include Gen 4.
C	10/06/2014	Add Sensor Names section
D	04/10/2015	Update information in #5 of DP Sensor (Selecting correct sensor type) section
E	08/26/2015	Update with information for Gen 5

Preface

General

The Cyl-Tel & Tank-Tel Liquid Level Gauges are digital electronic level gauges. The gauge has been updated to Gen 5 to include the latest in electronic and differential pressure measurement technologies. The new design includes accurate liquid level reading using differential pressure, a graphical display, and a simplified logic with nine selectable units of measure that eliminate the need for lookup charts. The Cyl-Tel & Tank-Tel gauges are telemetry-ready with built-in outputs which eliminate the need for additional boards and is completely compatible to most current telemetry system requirements.

Highlights

- Improves customer readability by eliminating calibration charts
- Programmable to tank model or by tank geometry
- Telemetry-ready outputs compatible with many systems
- Standard Pulse, and 4-20 mA output signals for level and pressure (if pressure is equipped)
- Power: Battery (2 x 1.5V Long Life Lithium) powered or optional 12Vdc adapter (for continuous power)
- Improved readability with a graphical display
- Built-in additional analog input port (0-5V) for optional pressure sensor connection

Quick Start Guide

This Cyl-Tel & Tank-Tel Quick Start Guide is designed to be used in conjunction with PN 20544482 Cyl-Tel & Tank-Tel Product Manual. If there are any questions regarding the operation of the Cyl-Tel/Tank-Tel gauge, contact Chart's Technical Service at 1-800-400-4683.

To obtain a complete installation and user manual, please scan QR code or go to: www.chartparts.com and click on Manuals, then MicroBulk, then PN 20544482 Cyl-Tel & Tank-Tel Product Manual.

Terms

Throughout this quick start guide safety precautions will be designated as follows:

Caution! Description of a condition that can result in equipment or component damage.

Note: *A statement that contains information that is important enough to emphasize or repeat.*

Acronyms / Abbreviations

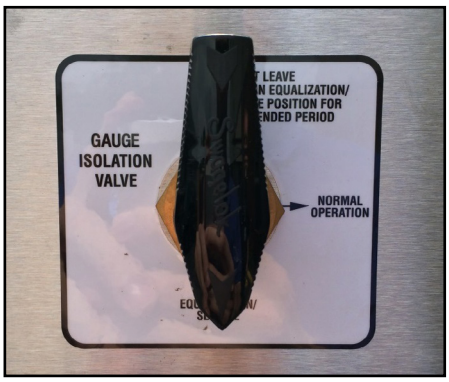
The following acronyms / abbreviations are used throughout this manual:

Ar	Argon
CO_2	Carbon Dioxide
N_2	Nitrogen
O_2	Oxygen
PB	Pressure Builder
PSID	Pounds per Square Inch Differential

Instructions

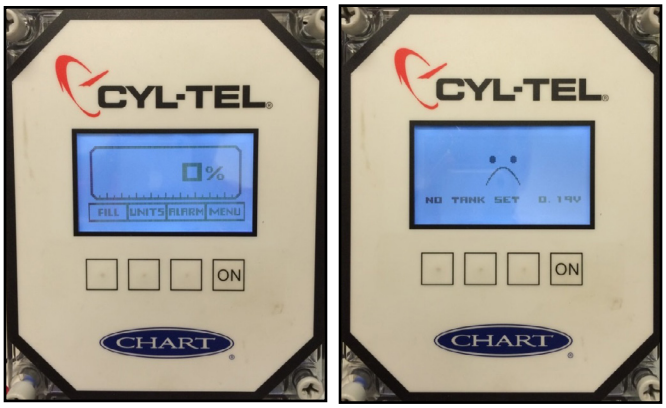
Installation

The Cyl-Tel/Tank-Tel Liquid Level Gauge has a maximum operating differential pressure of 29 psid. In order to protect the sensor from damage, ensure that the equalization valve is in the 'EQUALIZATION SERVICE' position before removing or installing a Cyl-Tel/Tank-Tel Gauge onto a Chart tank. If the valve is not in equalization then the diaphragm in the sensor can be permanently damaged. Refer to the user manual for more information.



Initial Setup

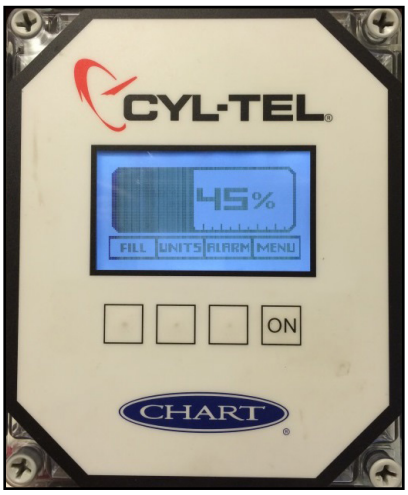
Upon receiving, the Cyl-Tel/Tank-Tel Gauge will look one of two ways. If it has been setup at the factory it will show 0% (left). If it has not been setup it will show a sad face (right).



If "NO TANK SET" is displayed, refer to First Time Setup in this guide.

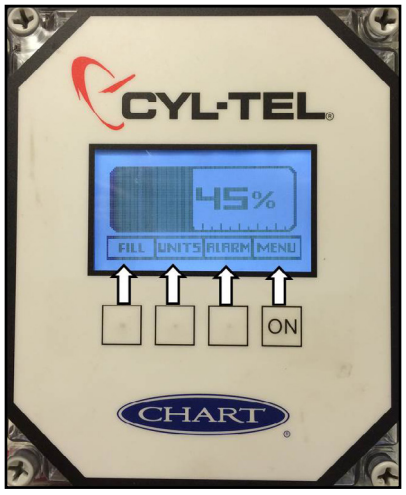
ON Button

Pressing the 'ON' button will turn the Cyl-Tel/Tank-Tel Gauge display on and run through the startup diagnostics and tests. When the test is complete the screen will display the tank's liquid level and pressure (pressure display is optional). Once the unit is on and the level is displayed, holding the 'ON' button for 15 seconds will access the Cyl-Tel/Tank-Tel Gauge setup menus.



Keypad Use

There are four buttons on the Cyl-Tel/Tank-Tel Gauge face. Each one has a different purpose. Each button performs the operation of the text box above the button on the screen.



FILL - This button will lock the display on for 15 minutes.

UNITS - This button will toggle the different units available.

ALARMS - This button will toggle the display of any setup alarms on and off. It will not clear any alarms.

MENU - When on, holding this button for 15 seconds will allow the user to enter the 'MAIN MENU' for the gauge.

Cyl-Tel/Tank-Tel Quick Start Guide

First Time Setup ('NO TANK SET' displayed)

1. Press and release the 'ON' button to turn on the gauge display.
2. Hold the 'ON' button for 10-15 seconds to access the menu. The screen will read "PLEASE WAIT".
3. Once the 'ON' button is held long enough, the "SETUP STD TANK" screen will ask you to select a standard tank. Use the up/down arrow buttons to select from the tank on the tanks list. To set up a custom tank select the first tank on this screen as you will need to access the custom tank menu to change the tank dimensions.
4. With the correct tank highlighted, press the 'NEXT' button to select this tank. Press the 'NEXT' button again to move to the next screen.
5. Set the contents of the tank by pressing the up/down arrow buttons. The options for the contents are Nitrogen (N_2), Oxygen (O_2), Argon (Ar), Carbon Dioxide (CO_2) and Nitrous Oxide (N_2O). When the correct contents are highlighted, press the 'NEXT' button to move to the next screen.
6. If the default units of display are "%" you are finished. You can press the 'EXIT' button and can skip to step 10.
7. To read the level in units other than "%" highlight the "TANK UNITS" option in the menu and press the 'NEXT' button.
8. The currently selected units will appear on the left side of the screen. Use the up/down arrows to change the units.
9. When the desired units are displayed press the 'NEXT' button to proceed.
10. At this point you are done setting up the tank. To exit press the 'EXIT' button. A SETTINGS CHANGED notification will appear on the left side of the screen. The unit is asking you if you would like to save the new settings. Press the 'SAVE' button at the bottom of the screen to save the settings and return you to the main menu.
11. If you do not need to or have already set the DP zero for the unit you can skip to step 16.
12. Using the up/down arrow buttons highlight the "DP ZERO" option on the main menu.
13. Make sure the equalization valve is open or set to equalization/service.
14. Press the 'NEXT' button to display the current DP ZERO along with the new DP ZERO on the left side of the screen.
15. Press the 'NEXT' button to accept the new DP ZERO.
16. At this point the unit should be fully setup. Press the 'EXIT' button to exit to the main display.
17. A SETTINGS CHANGED notification will appear on the left side of the screen. The unit is asking if you would like to save the new settings. Press the 'SAVE' button on the bottom of the screen.

DP Sensor (selecting correct sensor type)

Note: *The gauge can come with a variety of different sensors depending on the range needed for the tank. To ensure an accurate reading the correct sensor must be chosen.*

Note: *Changing the sensor type also resets the DP Zero setting. Upon changing the DP Sensor type remember to follow the DP Zero procedure.*

1. Press and release the 'ON' button to turn on the gauge display.
2. To access the menu hold the 'ON' button for 10-15 seconds. The screen will read "PLEASE WAIT".
3. Once the 'ON' button has been held long enough the MAIN MENU will display with the "SET TANK" option highlighted.
4. Use the arrow buttons to highlight the "DP SENSOR" option in the MAIN MENU.
5. Press the 'NEXT' button to change the DP SENSOR.
6. Use the arrow buttons to cycle through the DP Sensors. To determine which DP Sensor to select look for a white label on either the back or top of the enclosure. Refer to the table at the end of this guide to help you determine which DP Sensor you should be using.
7. Once the correct DP Sensor is highlighted press the 'NEXT' button to select.

Caution! ***Any time the DP Sensor is changed it is suggested that a new DP Zero is set.***

8. Use the arrow buttons to highlight the “DP ZERO” option in the MAIN MENU.

Caution! Make sure the Equalization Valve is open or set to equalization/ service before setting the DP ZERO!

9. Press the ‘NEXT’ button to display the current and new DP ZERO.
10. Press the ‘NEXT’ button again to accept the new DP ZERO. If you think the number is wrong press the ‘EXIT’ button to cancel the new DP ZERO.
11. At this point you are done. Press the ‘EXIT’ button to leave the MAIN MENU. The unit will inform you the SETTINGS CHANGED. Press the ‘SAVE’ button to save the new settings.
12. Close the equalization valve or rotate the isolation valve back into normal operation.

Setting DP Zero

1. Press and release the ‘ON’ button to turn on the gauge display.
2. To access the menu hold the ‘ON’ button for 10-15 seconds. The screen will read “PLEASE WAIT”.
3. Once the “ON” button has been held long enough the MAIN MENU will display with the “SET TANK” option highlighted.
4. Use the arrow buttons to highlight the “DP ZERO” option in the MAIN MENU.

Caution! Make sure the Equalization Valve is open or set to equalization/service before setting the DP ZERO!

5. Press the ‘NEXT’ button to display the current and new DP ZERO.
6. Press the ‘NEXT’ button to accept the new DP ZERO. If you think the number is wrong press the ‘EXIT’ button to cancel the new DP ZERO.
7. At this point you are done. Press the ‘EXIT’ button to leave the MAIN MENU. The unit will inform you that the SETTINGS CHANGED. Press the ‘SAVE’ button to save the new settings.
8. Close the equalization valve or rotate the isolation valve back into normal operation.

Setting Correct Saturation Pressure

1. Press and release the ‘ON’ button to turn on the gauge display.
2. To access the menu hold the ‘ON’ button for 10-15 seconds. The screen will read “PLEASE WAIT”.
3. Once the “ON” button has been held long enough the MAIN MENU will display with the “SET TANK” option highlighted.
4. Use the arrow buttons to highlight the “SET CUSTOM” option. Press the ‘NEXT’ button to proceed.
5. “SETUP CUSTOM TANK” will appear with the “LENGTH” option highlighted.
6. Use the arrow buttons to navigate to the “PRESSURE” option and press the ‘NEXT’ button.
7. The word “SELECT” on the upper left side of the screen will disappear. You are now able to change the saturation pressure.
8. Use the Up/Down arrow buttons to change the saturation pressure of the currently selected tank.
9. Once the desired saturation pressure is set, press the ‘NEXT’ button to select the option. Press the ‘EXIT’ button to exit the menu.
10. The unit will ask if you would like to save changes. Press the ‘SAVE’ button to proceed out of the menu.
11. The unit will back out to the MAIN MENU. Press the ‘EXIT’ button again to exit the MAIN MENU.

Custom Tank Setup

1. Press and release the ‘ON’ button to turn on the gauge display.
2. To access the menu hold the ‘ON’ button for 10-15 seconds. The screen will read “PLEASE WAIT”.
3. Once in the MAIN MENU use the arrow buttons to highlight the “SET CUSTOM” option and press the ‘NEXT’ button to advance to the next screen.
4. This is the custom tank setup menu. The first option to input is the overall length of the inner vessel. To enter this length press the ‘NEXT’ button.
5. When the ‘NEXT’ button is pressed “*” will appear next to the length. Use the arrow buttons to change the dimension to the desired length of the inner vessel in inches “in”.

6. When you have the number entered press the right arrow button until the "*" goes away.
7. Use the arrow buttons to highlight "DIAMETER" and press the 'NEXT' button to change the tank diameter.
8. When the 'NEXT' button is pressed "*" will appear next to the length. Use the arrow buttons to change the dimension to the diameter of the inner vessel in inches "in".
9. When you have the number entered press the right arrow button until the "*" goes away.
10. Use the arrow buttons to highlight the "PRESSURE" option in the menu. This is the estimated saturation pressure of the liquid in the tank. It should be close to the average between the tank operating pressure and the delivery truck operating pressure (usually 25 psi).
11. Press the 'NEXT' button to change the saturation pressure option. Once you press the 'NEXT' button the word "SELECT" will disappear from the top left corner of the screen.
12. Use the arrow buttons to change the saturation pressure setting in the program.
13. Once the pressure is set, press the 'NEXT' button to enter the pressure.
14. Use the arrow buttons to highlight the orientation option on the menu. Press the 'NEXT' button to change the tank orientation.
15. When the 'NEXT' button is pressed a "*" will appear next to the tank orientation.
16. Use the arrow buttons to change the tank orientation.
17. Once the orientation is set use the right arrow button to move the cursor to the right until the "*" goes away.
18. Use the arrow buttons to highlight the "CONTENTS" option and press the 'NEXT' button to move to the next screen.
19. Use the arrow buttons to set the contents in the tank and press the 'NEXT' button to move to the next screen.
20. At this point you are done with the custom tank setup. Press the 'EXIT' button to return to the MAIN MENU.
21. The unit will inform you that SETTINGS CHANGED and will ask if you would like to save the changes. Press the 'SAVE' button to save the new settings.
22. At the MAIN MENU press the 'EXIT' button to return to the main display.

Troubleshooting

Refer to the table below for troubleshooting procedures. The table is arranged in a Symptom/Possible Cause/Solution format. Note that possible causes for specific symptoms are listed in descending order of significance. That is, check out the first cause listed before proceeding to the next. If you need further assistance please call the Customer Support Hotline at 1-800-400-4683.

Symptom	Possible Cause	Solution
Cyl-Tel/Tank-Tel gauge does not turn on.	Battery dead, low, installed incorrectly or missing.	Replace battery.
	Transformer not plugged in or faulty wiring.	Inspect wiring and insure transformer is plugged in. Reset circuit breaker.
	Electrical supply circuit breaker tripped.	Reset breaker.
	Faulty Cyl-Tel/Tank-Tel.	Replace Cyl-Tel/Tank-Tel front.
	Physical keypad not connected to Cyl-Tel/Tank-Tel circuit board.	Verify that the ribbon cable for the keypad is connected to the Cyl-Tel/ Tank-Tel circuit board.

Symptom	*Possible Cause*	*Solution*
Cyl-Tel/Tank-Tel display always reads 0%.	No product in tank.	Ensure there is liquid in tank.
	Equalization valve in the equalization position.	Turn valve to the "Normal Operation" position.
	Equalization valve installed incorrectly.	See user manual to confirm proper installation.
	Phase lines installed incorrectly.	See user manual to confirm proper installation.
	Tank parameters are improperly set.	Verify each parameter in the Cyl-Tel/ Tank-Tel focusing on the tank selection and DP zero setting.
	Faulty Cyl-Tel/Tank-Tel gauge.	Replace Cyl-Tel/Tank-Tel front.
Display always reads 100%.	Tank parameters are improperly set.	Verify each parameter focusing on the tank selection and DP zero setting.
Display reads “OUT OF RANGE”.	The gauge thinks the tank is over 100% full.	Verify each parameter focusing on the tank selection and DP zero setting.
Liquid level display does not drop to 0% when in equalization mode.	Cyl-Tel/Tank-Tel DP zero setting is incorrect.	Follow the DP zero section to reset the DP zero setting.
Liquid level display is not accurate.	DP zero setting is incorrect.	Follow the DP zero section to reset the DP zero setting.
	Incorrect differential pressure sensor selected.	Refer to user manual to ensure correct sensor selected.
	Incorrect pressure setting.	Follow pressure section to reset the pressure setting.
	Incorrect tank dimensions.	Follow tank selection section to select tank.
	Incorrect tank orientation.	Follow tank selection section to select tank.
Display reads “OPEN LOOP”.	DP sensor not connected to Cyl-Tel/ Tank-Tel circuit board.	Verify that the sensor is connected to the back of the board (J21).
	Incorrect differential pressure sensor selected.	Refer to user manual to ensure correct differential pressure sensor is selected.
(Optional) pressure display always reads 0.	Pressure sensor not connected to the Cyl-Tel/Tank-Tel circuit board.	Verify that the pressure sensor is connected to terminal J18 on the back of the Cyl-Tel/Tank-Tel circuit board.

Standard MicroBulk Tank List

Note: *This table includes recommended pressure settings for the Cyl-Tel Liquid Level Gauge*

Display Order	PN	Tank Model	Length (in)	Diameter (in)	Orientation	RV PSI	PB PSI	Pressure Setting PSI
1		PERMA-CYL 230 MP	37.1	24.0	VERTICAL	250	125	100
2	10982263	PERMA-CYL 230 VHP	37.1	24.0	VERTICAL	350	300	200
3	11529508	PERMA-CYL 300 MP	49.1	24.0	VERTICAL	250	120	100
4	10914877	PERMA-CYL 450 MP	50.9	27.6	VERTICAL	250	120	100
5	10899005	PERMA-CYL 450 HP	50.4	27.6	VERTICAL	350	300	200
6	10907634	PERMA-CYL 450 VHP	51.8	27.2	VERTICAL	500	450	250
7	11684305	PERMA-CYL 700 HP	47.5	37.3	VERTICAL	350	300	200
8		PERMA-CYL 700 VHP	47.5	37.3	VERTICAL			200
9	10879864	PERMA-CYL 1000 MP	65.2	37.4	VERTICAL	250	120	100
10	10923909	PERMA-CYL 1000 HP	65.0	37.3	VERTICAL	350	300	200
11	11075024	PERMA-CYL 1000 VHP	64.8	37.1	VERTICAL	500	450	250
12	11501804	PERMA-CYL 1500 HP	69.0	44.0	VERTICAL	350	300	200
13	11202441	PERMA-CYL 1500 VHP	69.0	44.0	VERTICAL	500	450	250
14		PERMA-CYL 2000 HP	94.2	44.0	VERTICAL	350	300	200
15	11844313	PERMA-CYL 2000 VHP	94.2	44.0	VERTICAL	500	450	250
16	14401278	PERMA-CYL 3000 HP	98.0	50.4	VERTICAL	350	300	200
17	14507523	PERMA-CYL 3000 VHP	98.0	50.4	VERTICAL	500	450	250
18		PT-1000	96.1	59.6	HORIZONTAL			0
19		XT-2500	219.8	60.0	HORIZONTAL			0
20		DURA-CYL 265 MP	42.2	24.0	VERTICAL	230	100	100
21		DURA-CYL 265 HP	42.2	24.0	VERTICAL	350	100	100
22	10672951	MEGA-CYL 450 MP	50.4	27.6	VERTICAL	250	120	100
23	10588979	MEGA-CYL 450 HP	50.4	27.6	VERTICAL	350	300	200
24	10473573	MEGA-CYL 600 MP	51.5	33.5	VERTICAL	250	120	100
25	10513758	MEGA-CYL 600 HP	51.3	33.3	VERTICAL	350	300	200
26	10485283	MEGA-CYL 800 MP	55.5	37.4	VERTICAL	250	120	100
27	10670262	MEGA-CYL 800 HP	55.9	37.2	VERTICAL	350	300	200
28	10858975	MEGA-CYL 1000 MP	65.2	37.4	VERTICAL	250	120	100
29	10752281	MEGA-CYL 1000 HP	65.2	37.4	VERTICAL	350	300	200
30	10619659	LASER-CYL 450 VHP	50.4	27.4	VERTICAL	500	450	250
31		CARBO-MAX 750	49.3	24.0	VERTICAL			300

Cyl-Tel/Tank-Tel Sensor Names

The following tables explain the sensor names used in the Cyl-Tel/Tank-Tel liquid level gauge firmware on rev. 2.6M and later. If the Cyl-Tel/Tank-Tel gauge has rev. 2.6M or later then the sensor name will be printed on the back label of the gauge for the customer's reference. The names are used when selecting the sensor type in the Cyl-Tel/Tank-Tel gauge menu. For example, if a Cyl-Tel gauge has a brass block sensor on the back, the sensor needs to be DP4 in the sensor type in the setup menu.

The tables below give a complete list of sensors currently compatible with the Cyl-Tel/Tank-Tel liquid level gauges.

Differential Pressure Sensors

Cyl-Tel/Tank-Tel Sensor Name	Sensor Type	Sensor Range
DP1	AST15	415 "H_2O
DP2	AST7.25	200 "H_2O
DP3	AST30	830 "H_2O
DP4	Brass Block 200	200 "H_2O
DP5	Brass Block 1000	1000 "H_2O
DP6	Brass Block 2000	2000 "H_2O

Gauge Pressure Sensors

Cyl-Tel/Tank-Tel Sensor Name	Sensor Type	Sensor Range
OFF	None Attached	--
GP1	AST 50 Bar	725 psig
GP2	MLH Honeywell	1000 psig
GP3	WIKA	600 psig