



ATI-5029

Level Measurement Probe

INSTRUCTIONS

Installation, Calibration & Maintenance of the Explosion-Proof ATI-5029 Adjustable Level Measurement Probe

IMPORTANT

Please read these installation and operating instructions completely and carefully before starting. Failure to do so will void warranty.

filename:
ATI.MAN.5029_Level Measurement Probe

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1 - WARRANTY

The ATI-5029 Level Measurement Probe is warranted against defects in material and workmanship for a period of one (1) year from date of shipment. During the warranty period, *Armstrong Technologies Inc. (ATI)* will repair or replace components that prove to be defective in the opinion of ATI. ATI is not liable for auxiliary interfaced equipment, or consequential damage. This warranty shall not apply to any product, which has been modified in any way, which has been repaired by any other party other than a qualified technician or authorized ATI representative, or when such failure is due to misuse or conditions of use.

1.1 - LIABILITY

All ATI products must be installed and maintained according to instructions. Only qualified technicians should install and maintain the equipment. ATI shall have no liability arising from auxiliary interfaced equipment, for consequential damage, or the installation and operation of this equipment. ATI shall have no liability for labour or freight costs, or any other costs or charges in excess of the amount of the invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF.

1.2 - MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, ATI reserves the right to substitute components and change specifications at any time without incurring any obligations.

1.3 - PRODUCT RETURN

All products returned for warranty service will be by prepaid freight and they will only be accepted with an R.G.A. number issued by ATI. All products returned to the client will be freight collect.

WARNING

<p>USING ELECTRICALLY OPERATED EQUIPMENT NEAR GASOLINE OR OTHER COMBUSTIBLE VAPOURS MAY RESULT IN FIRE OR EXPLOSION, CAUSING PERSONAL INJURY AND PROPERTY DAMAGE. CHECK TO ASSURE THE WORKING AREA IS FREE FROM SUCH HAZARDS DURING INSTALLATION OR WHEN PERFORMING MAINTENANCE, AND USE PROPER PRECAUTIONS.</p>

2 - PRODUCT INFORMATION

NOTE: This page must be filled-in at site by client, contractor or installer.

2.1 - Level Measurement Probe

Sensor Probe Part Number _____

Sensor Probe Serial Number _____

Sensor Warranty Period 1 year

Power Supply Requirement 12 VDC

Operating Temperature -40* to +60 °C (-40 to +140 °F)
* Depends on freezing point or "pour-point" rating of liquid (i.e.: P-30 liquid freezes below -30°)

Operating Pressure Ambient atmospheric pressure

2.2 - FACTORY CONFIGURATION OF PROBE

Manufactured Probe Length _____ inches cm

Bottom Clearance (probe tip to tank bottom) _____ inches cm

Probe Tip Measurement Start Point _____ inches cm
From probe tip to liquid level point on float.

Probe Resolution (increments) 1 inch 2 cm

High Calibration Level (from tank bottom) _____ @ 20 mA

Low Calibration Level (from tank bottom) _____ @ 4 mA

Note:

All *Armstrong Technologies Inc.* products must be installed and maintained according to instructions, to ensure proper operation. Only qualified technicians should install and maintain the equipment.

3 - PRODUCT DESCRIPTION

3.1 - GENERAL DESCRIPTION

The ATI-5029 Level Measurement Probe is designed to detect the liquid level in tanks or reservoirs up to 10 feet in depth. It is CSA certified for use in Class I, Group D hazardous locations such as fuel storage tanks. The probe is designed to operate with AMC digital display modules and is available with a 4-20 mA output.

To produce the liquid level output, the probe features a magnetic float which moves up and down the stainless-steel probe tube following the liquid's level as it changes (see FIGURE 1). The probe is available in standard calibration increments of 1 inch or 2 centimetres, but custom calibration increments may be requested. The plastic cap at the bottom end of the probe has been factory installed and should not be removed. The compression fitting near the top of the probe allows the installer to adjust the height of the probe at the required distance from the bottom of the tank. The compression fitting is installed into a reducer fitting which threads into the tank. A wiring elbow is located at the top of the probe to access the wiring and the sensor level trimmer.

3.1.1 - SENSOR SPECIFICATIONS

MEASUREMENT PROPERTY	Levels of most liquids (non-viscous)
DEPTH	Probes available in lengths of up to 10 feet
APPROVALS	CSA certified for Class I, Group D, explosion-proof
POWER	12 VDC
INSTALLATION WIRING	Shielded 2-wire cable, 22 AWG
SIGNAL	4 to 20 mA
CALIBRATION	Factory calibrated as specified by client
RESOLUTION	1 inch or 2 centimetres (as specified by client)
FULL-SCALE ACCURACY	3% or better @ 20°C
STORAGE	5 years
OPERATING TEMPERATURE	-40* to +60 °C (-40* to +140 °F) * Depends on freezing point or "pour-point" rating of the liquid (i.e.: P-30 liquid freezes below -30°)

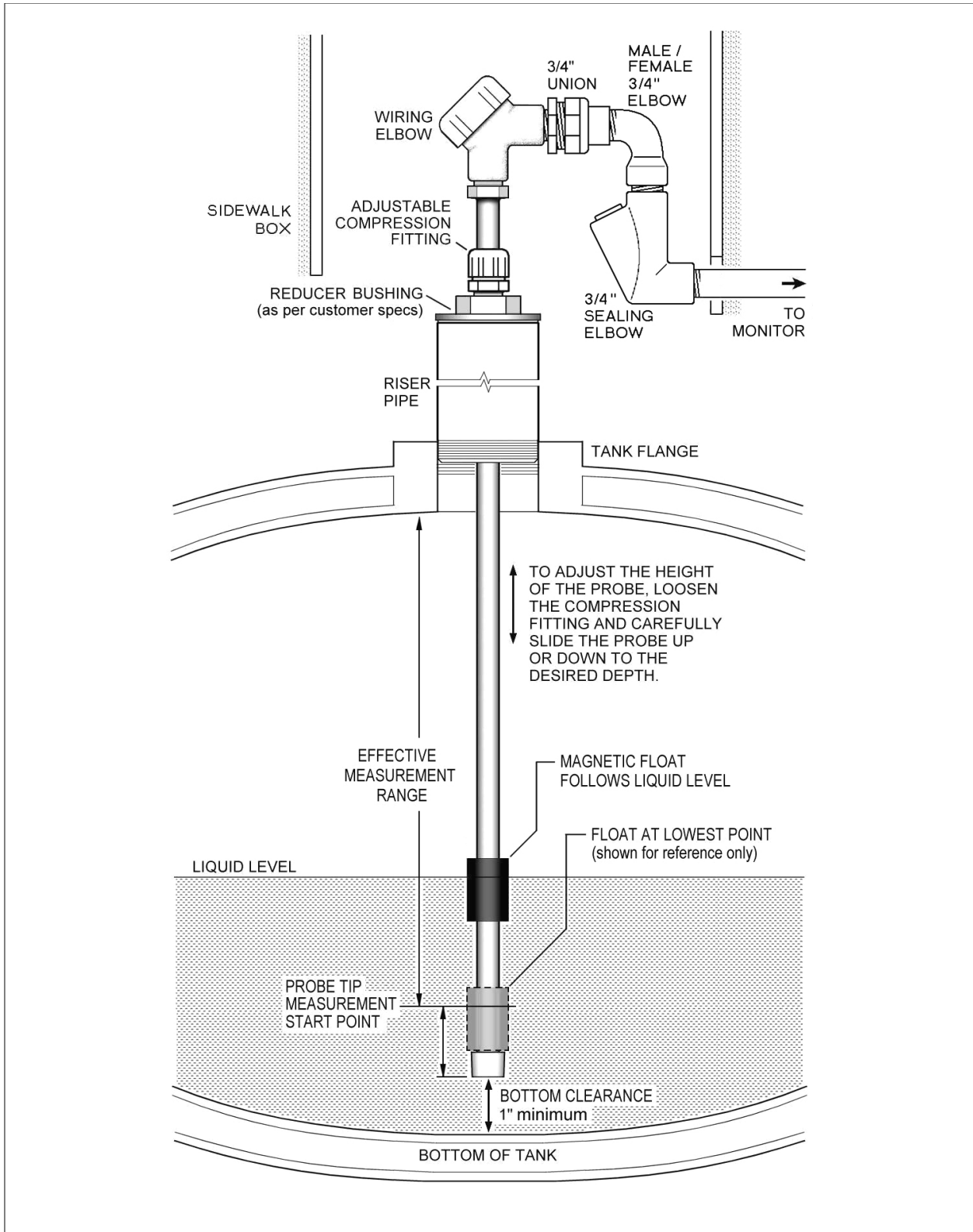


FIGURE 1: Level Measurement Probe installed in tank.

4 - INSTALLATION

Follow the guidelines in this section for proper locations and installation of the ATI-5029 Level Measurement Probe. Although different practices can be followed, the proper method of installation and use of approved mounting hardware and sealing fittings is highly recommended to ensure sound and durable installation.

4.1 - LOCATION AND MOUNTING

The ATI-5029 Level Measurement Probe should be installed in an unused tank flange in the top of a storage tank or container. The probe features a compression fitting to adjust the initial probe tip to bottom clearance. Installation of the ATI-5029 Level Measurement Probe requires a probe tip clearance of at least one inch (1") from the bottom of the tank. This clearance will prevent the probe tip from puncturing the tank due to thermal expansion and contraction once the probe body has been locked in place. The probe tip should not be set too far from the tank bottom as this would increase the blind region which the probe would not measure (see FIGURE 1).

WARNING

To comply with the local municipal, provincial state or federal electrical regulations and for safety reasons, ALL cables MUST pass through conduit seals installed between hazardous and non-hazardous areas.

4.2 - WIRING TO MONITOR

The ATI-5029 Level Measurement Probe is a 2-wire device that may be wired to the ATI-DM335 display module (see FIGURE 2). The ATI-5029 can also be wired to a 3rd party monitor or computer that takes a 4 to 20 mA input. Note that no IS barrier is required as the ATI-5029 is CSA certified as explosion-proof for Class I, Group D locations.

Each ATI-5029 Level Measurement Probe should be on a separate cable but more than one cable can be run through the same conduit. The cabling must be installed through conduit and conduit sealing fittings. Consult with Armstrong Technologies Inc for allowable distances and required cable sizes.

NOTE: Turn off the power supply before removing or replacing the sensor.

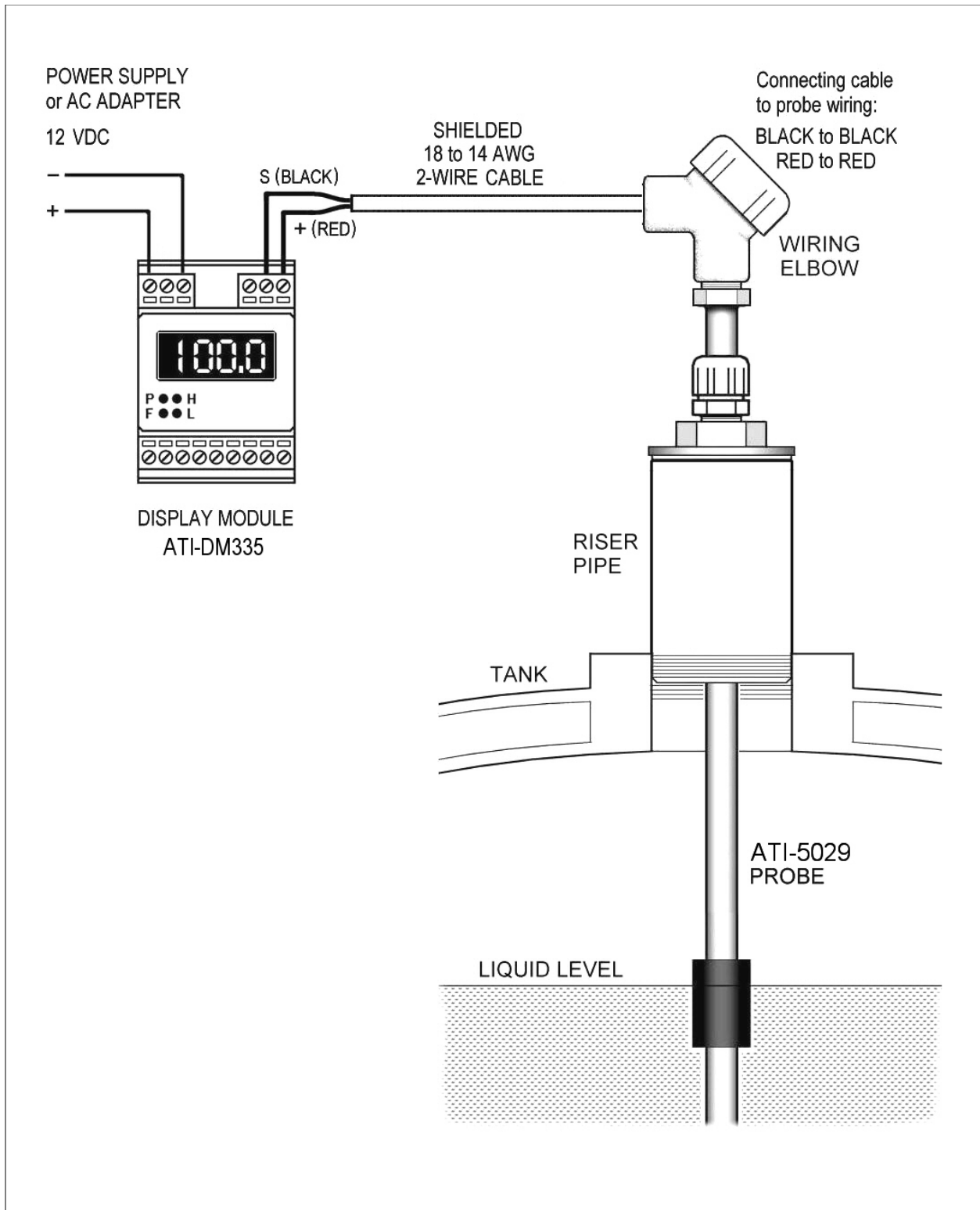


FIGURE 2: Wiring of ATI-5029 probe to ATI-DM335 display module.

5 - CALIBRATION

The probes are normally calibrated at the factory. The calibration sticker is affixed to the hub of the probe's wiring elbow.

5.1 - STANDARD USER CALIBRATION

The customer can perform the installation calibration of the ATI-5029 Level Measurement Probe as the design incorporates some mechanical depth adjustability. To perform the standard installation calibration the tank liquid level should be over 10". It is preferable that the tank be over 1/3 full. Note the following calibration steps.

5.1.1 - STANDARD CALIBRATION PROCEDURE

- 1) Measure and record the liquid level in the tank with a measurement dipstick.
- 2) Gently lower the probe until the probe tip touches the tank bottom.
- 3) Carefully raise the probe until the display module reading corresponds to the measurement dipstick reading, then tighten the probe in place with the compression fitting.

5.2- ADVANCED USER CALIBRATION

In certain applications the customer may wish to position the probe tip at a tank bottom clearance greater than one inch (1"). To facilitate this, the LEVEL trimmer colored in red and located at the top of the probe may be adjusted to electronically add several inches as required.

5.2.1 - ADVANCED CALIBRATION PROCEDURE

- 1) Measure and record the liquid level in the tank with a measurement dipstick.
- 2) Gently lower the probe until the probe tip touches the tank bottom.
- 3) Carefully raise the probe until the display module reading corresponds to the measurement dipstick reading. Then continue to raise the probe to the required height from the tank bottom.
NOTE: The display module will now show a lower reading than the one taken with the measurement dipstick.
- 4) Tighten the probe in place with the compression fitting.
- 5) Remove the cover cap from the probe's electrical wiring elbow and adjust the trimmer (coloured red) until the display module reading corresponds to the measurement dipstick reading (see FIGURE 2).

5.3 - ATI FACTORY CALIBRATION

Several parameters affect the calibration of the ATI-5029 Level Measurement Probe. (Refer to section 2.2 FACTORY CALIBRATION for items in ***bold italic.***)

The ***probe tip measurement start point*** is the distance from the bottom tip of the probe to the point on the float at which the liquid begins to lift the float. This value may vary from probe to probe and is listed in section 2.2 Factory Calibration. The probe is not usually installed with the probe tip resting on the tank bottom as this type of installation may cause damage to the probe or tank bottom once the probe is locked in place due to possible thermal expansion and contraction of the tank.

The ***bottom clearance*** should be greater than the tank's known thermal expansion/contraction. Allow a safety margin so that the probe does not touch the tank bottom under all environmental conditions. The ***low calibration level*** is the sum of the ***probe tip measurement start point*** and the ***bottom clearance***.

The transmitter of the ATI-5029 Level Measurement Probe is factory calibrated to output 4 mA at the ***low calibration level***. The span is factory set and cannot be modified. This sets the ratio between the current output and the depth measured. The ***high calibration level*** is usually set at 20 mA when the float is at its highest position. This is listed in section 2.2 Factory Calibration.

The display module receives the signal from the probe transmitter and is factory calibrated to display depth units in inches or centimeters. The module features a 4 mA display calibration adjustment and a 20 mA adjustment. These are listed in the PRODUCT INFORMATION section of the display module's manual, along with the optional alarm calibration settings.

For example a maximum current of 20 mA ***high calibration level*** may represent a depth of 162 cm above the 14 cm ***low calibration level*** indicating a liquid level of 176 cm. In this instance the display module and the ATI-5029 Level Measurement Probe would have a calibration label with the following information:

4 to 20 mA 14 to 176 cm

6 - PREVENTIVE MAINTENANCE

WARNING

- When removing the sensor for verification or replacement, always unscrew the assembly with the first reducer fitting below the compression fitting.
- Never unscrew the compression fitting only, or else probe will get damaged when pulled out of the tank.

6.1 - VERIFICATION OF OPERATION

Verification of operation and calibration should be done at least once every 6 months for accuracy and safety reasons. For highly demanding applications, monthly verification is recommended.

6.2 - SENSOR REPLACEMENT

The sensor should be repaired or replaced when the Amber LED (F) on the front of the display module turns ON while the unit is powered, or when the sensor no longer adequately responds to the liquid levels.