Manual

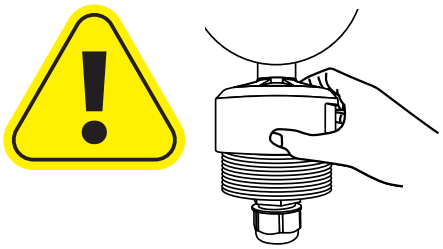
Read the user's manual carefully before starting to use the unit.
Producer reserves the right to implement changes without prior notice.

LevelPro® — TankPro® Series
Submersible Level Sensor Transmitter

ICON PROCESS CONTROLS™ Corrosion-Free Instrumentation Equipment™

Safety Information

De-pressurize and vent system prior to installation or removal
Confirm chemical compatibility before use
DO NOT exceed maximum temperature or pressure specifications
ALWAYS wear safety goggles or face-shield during installation and/or service
DO NOT alter product construction



Warning | Caution | Danger
Indicates a potential hazard. Failure to follow all warnings may lead to equipment damage, or failure, injury, or death.

Hand Tighten Only
Over tightening may permanently damage product threads and lead to failure of the retaining nut.

Note | Technical Notes
Highlights additional information or detailed procedure.

Do Not Use Tools
Use of tool(s) may damage produced beyond repair and potentially void product warranty.

Introduction

The Solution to Tough Applications Where Ultrasonic Sensors Simply DO NOT WORK!

The TankPro® Submersible Level Transmitter provides continuous level measurement for both corrosive and non-corrosive liquids. These submersible hydrostatic transmitters have been designed for the toughest industrial applications. Unlike ultrasonic level transmitters, submersible liquid level sensors are completely unaffected by any foam, vapor, turbulence or condensate in the tank.

The TankPro® Level Transmitter comes equipped with a local LCD display and mounts on top of the tank with a 2" NPT connection.

The TankPro® Series comes in PVC, PP, PVDF, PTFE Teflon® or 316 SS making them the perfect level sensor for your chemical tank application.

VaporBloc® Technology

Blocks Out Corrosive Chemical Fumes
Pressure Tested to 75 Psi
Protects Internal Wiring Connections

RoHS Compliant CE

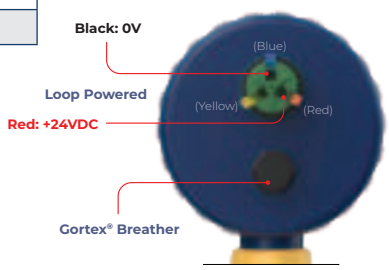
Technical Specifications

Input Pressure Range											
Level ft/H_2O	14' *Consult Factory for Levels > 14 ft										
Overpressure | Psi	210 | 290 | 290 | 380										
Output Signal | Supply											
Output Signal	4-20mA										
Power Supply	9–36 VDC | Loop Powered										
Performance											
Accuracy	<±0.5% Full Scale										
Permissible Load	Rmax = [(Vs-Vsmin)/0.02 A]Ω										
Influence Effects	Supply: 0.05% Full Scale/10V | Load: 0.05% Full Scale/KΩ										
Long Term Stability	<± 0.1% Full Scale over One Year										
Response Time	<10 msec										
Permissible Temperatures											
Storage/Media Temperatures	PVC :	32 to 140°F 0 to 60°C	PP :	-20 to 170°F -28 to 76°C	PVDF :	-40 to 170°F -40 to 76°C	PTFE :	-40 to 170°F -40 to 76°C	316 SS :	-40 to 170°F -40 to 76°C	
Thermal Effects | Offset & Span											
Thermal Drift	<± 0.02% FSO/K in Compensated Range | -20 to 170°F										
Display											
LCD											
Materials | Wetted											
Housing	PVC | PP | PVDF | PTFE | 316 SS										
Seal	FFKM - Kalrez®										
Diaphragm	Pure Ceramic 96% AI203 | 316 SS										
Electrical Protection											
Short-Circuit Protection	Permanent										
Reverse Polarity Protection	No Damage to Sensor										
Electromagnetic Compatibility	Emission Immunity According to EN 61326										
Electrical Connection											
Jacketed Cable	PTFE Teflon® | -40 to 200°F										
3-Wire Cable with Integrated Air Tube for Reference to Atmospheric Pressure											
General (Sensor Only)											
Current Consumption	Max. 25mA										
Weight | Grams	PVC : 575g | PP : 475g | PVDF : 825g | PTFE : 875g | 316 SS : 875g										
Ingress Protection	IP 68 | NEMA 4X										
CE-Conformity	EMC Directive: 2004 | 108 | EC										
Standards & Approvals											
CE | FCC | RoHS Compliant											

*Contact Factory for different options

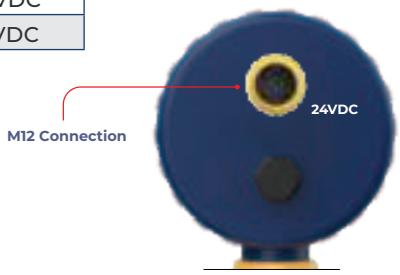
Quick Connect Wiring

Tabs	Description
Red	+VDC
Blue	-VDC



M12 Wiring

Pins	Wire Color	Description
1	Brown	+VDC
3	Blue	-VDC



Understanding Level Measurement

Submersible Level Sensor

All Submersible Sensors have a Calibrated Range which is based on H_2O that has a Specific Gravity or Density = 1

1. **Range Value** : The Overall Measuring Distance that the sensor has been calibrated to by the factory.

   — The Range will be mentioned on the Sensor Body.

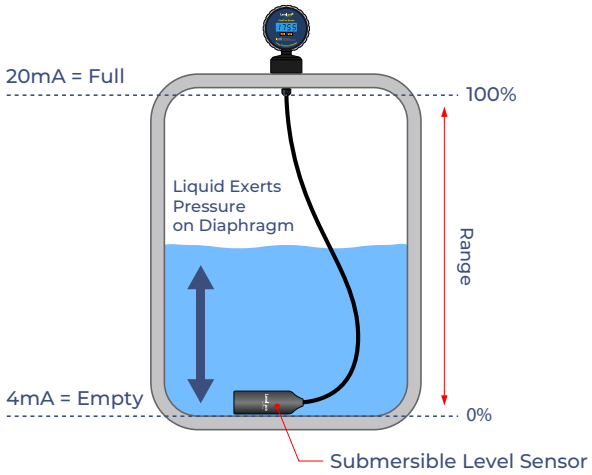
2. **Empty** : The Pressure being exerted on the sensor diaphragm at Lowest Point.

   — Normally this is when the tank is empty.

   Empty = 4mA setting.

3. **Full** : The Pressure being exerted on the sensor's diaphragm at the highest point liquid level within the Tank.

   Full = 20mA setting.



Application Detalis

Chemical _____

Concentration _____

Specific Gravity _____

Temperature _____

Solids : Yes ☐ No ☐

Out-Gassing or Vapors : Yes ☐ No ☐

Tank Dimensions:

W = _____ H = _____

Vertical : ☐ Horizontal : ☐

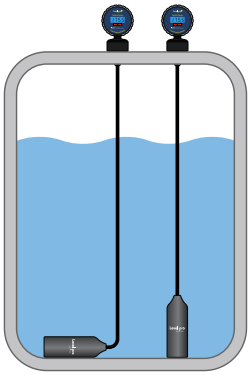
Flat Bottom : ☐ Conical Bottom : ☐

Model Selection

TankPro® — Submersible Level Sensor + Display		
Part Number	**Material**	**Output**
191-1001-A113302F	PVC	4-20mA
191-1001-B113302F	PP	4-20mA
191-1001-E113302F	PVDF	4-20mA
191-1001-SS113302F	316 SS	4-20mA

PVC PP PVDF PTFE 316SS RoHS Compliant CE

Getting Started



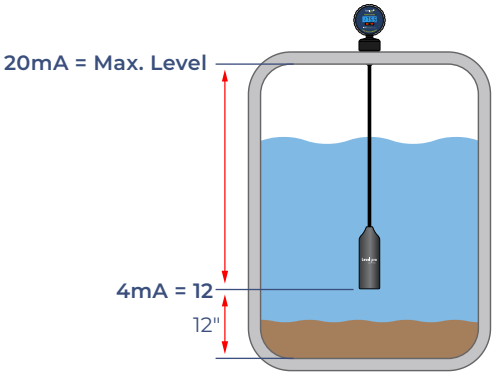
Submersible Pressure Sensore are designed to be completely submersed within the liquid. The transmitters can rest along the bottom of the tank or be suspended at any desired level within the tank.

Please note that the physical location of the level transmitter will indicate the lowest level of measurement within the tank.

ex : Positioning the transmitter 12" from the bottom of the tank, then the lowest reading of liquid will be 12" from the bottom.

When the liquid to be measured is Not H_2O, the New Range of the Sensor needs to be determined.

To achieve this, simply divide the Range of the Sensor Body by the Specific Gravity of the Liquid.



SENSOR RANGE / S.G = NEW RANGE

Examples

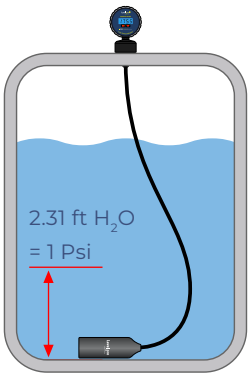
The Importance of the Liquids S.G (Specified Gravity)

The S.G of a Liquid has a Direct Effect on the Sensors Output when Measuring the Height of the Liquid.

Liquids with a S.G 1.0 are than H_2O (i.e. Oil)

Liquids with a S.G 1.0 are than H_2O (i.e. Sulfuric Acid)

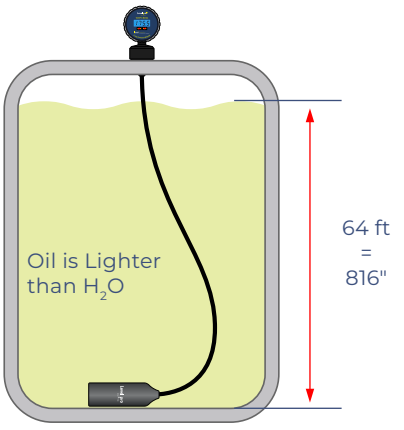
H_2O has a S.G = 1.0



S.G 1.0 Requires to Equal the Same Pressure or Height as with H_2O.

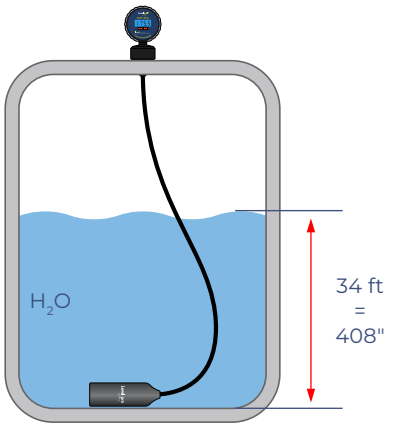
S.G 1.0 Requires to Equal the Same Pressure or Height as with H_2O.

Here are some examples of how the submersible sensor range changes when submersed into liquids with different Specific Gravities ...



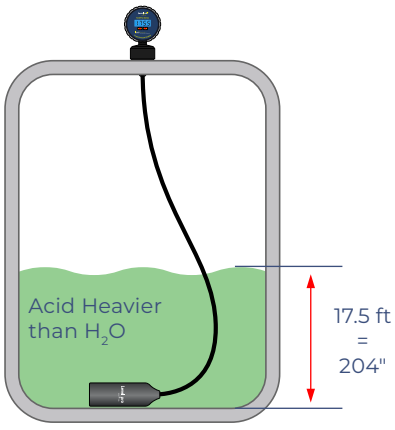
Specific Gravity = 0.5

Tank #1



Specific Gravity = 1

Tank #2



Specific Gravity = 2

Tank #3

Calculating Max. Range of a Sensor

Let's assume a the calibrated range of the submersible sensor is 34" or 408". The range is always referenced H_2O which has a specific gravity S.G or (Density) equal to 1

Calibrated Range/S.G = Liquid Level Measurement Range 34/1 = 34' or 408/1 = Liquid Level Range = 408"

Example 1

The liquid in Tank # 1 has a S.G = 0.5 which is thank that of H_2O

To determine the New Range of the sensor simply divide the H_2O Range (34') by the S.G of the liquid that is going to be in the tank. S.G = 0.5

34/.5 = 64 ft or 816"

Since the oil is a lighter fluid than H20 the new measuring range of the sensor has increased and is now 64' or 816"

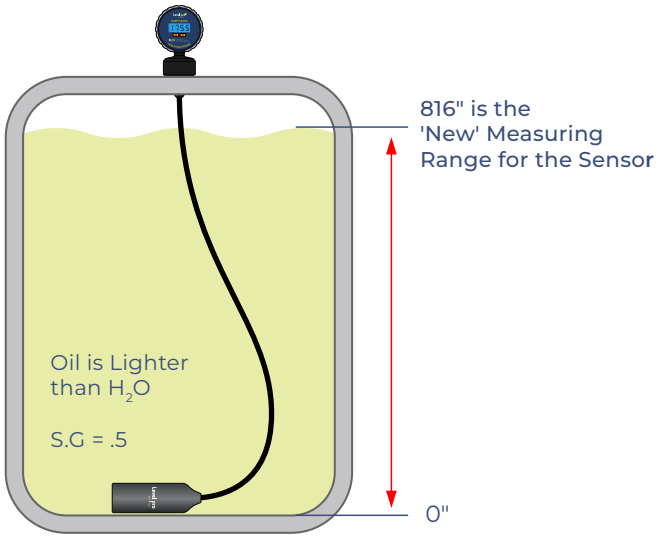
Example 2

The liquid in Tank # 2 has a S.G. = 2 which is 2x than H_2O

The 34' sensor is now going to be installed into a tank to measure a liquid with a S.G = 2
Range / S.G = New Range of the Sensor

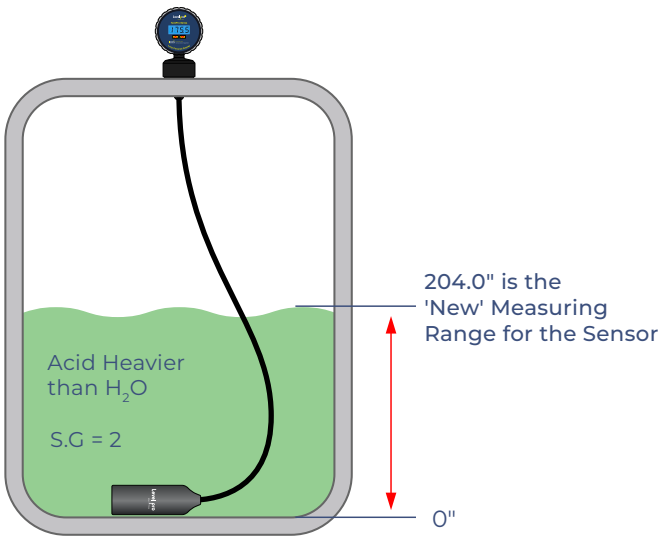
34/2 = 17 ft or 204"

Tank #1



Oil S.G = 0.5	Sensor Signal	Display reading
Tank 1 | Empty	4.0mA	0"
Tank 1 | Full	20.0mA	816"

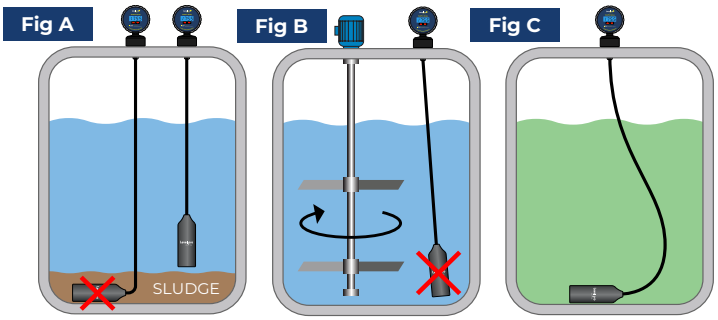
Tank #2



Acid S.G = 2.0	Sensor Signal	Display reading
Tank 2 | Empty	4.0mA	0"
Tank 2 | Full	20.0mA	204"

Correct Sensor Position Setup

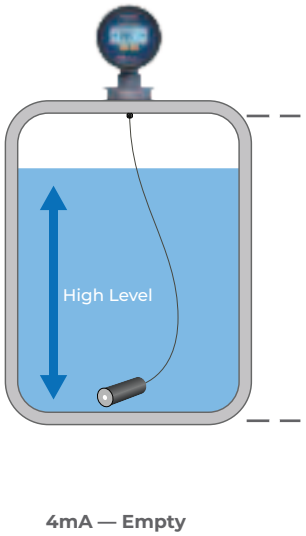
The **Submersible Level Sensor** is intended for use while fully submerged in the process liquid.
Avoid placing the sensor at the tank bottom if sludge or other materials are likely to accumulate and cover it. This includes any debris that may settle at the bottom.
In such cases, it's recommended to suspend the sensor above the maximum expected level of sludge or debris buildup (see Fig A).



⚠ Avoid installations where other tank requirements will cause the transmitter to move or swing.

Programming Display

STEPS	DISPLAY	OPERATION
1 Main Display + 3 SEC	0.0.0.0	Press and hold both buttons to enter the menu
2 Low Level Value	SEn.1	Default Preset = 000.0 No need to change Press ▼ Low Value — 4mA=0
3 + 2 SEC	SEn.2	Press and hold ▼ for 2 seconds
4 High Level Value	1.0.0.0	Change number to desired value (Note: This is your max tank level) Inches | Gallons | Liters Enter Max Tank Value
5 Press to Change + 2 SEC	1.0.0.0	Press and hold ▼ for 2 seconds to save
6 Return To Main Menu + 3 SEC	SEn.3	Press and hold both buttons to return to main display
7 Main Display	1.8.8.0	FINISHED Current Tank Level



Calculating SE-2 (20mA)

Example : S.G of the Liquid is Heavier than H_2O

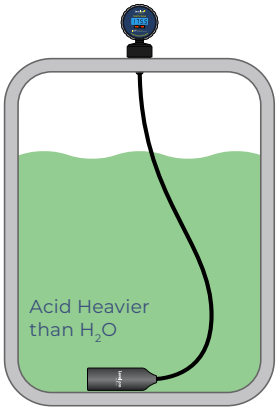
The Submersible Sensor Range is 34' and is now going to be installed into a tank of Acid.

S.G = 2 : Sensor Range = 0-34'

To Calculate the New Range of the Sensor = Range/S.G = 34/2 = 17 ft or 204 inches.

The liquid is heavier than H_2O, so the overall sensor range has been reduced to 14 ft or 204 inches.

So SE-2 will be 204in.



SE-2 = 20mA = High Tank Level Value

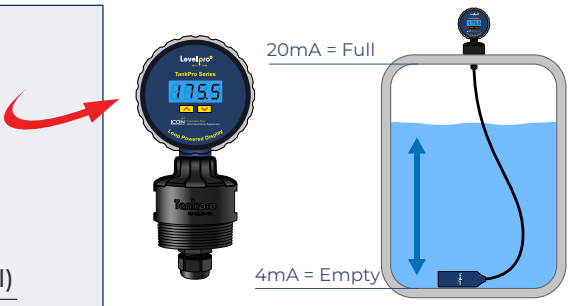
Inches | Feet | Gallons

Display Inches

Max. Range of Sensor/ S.G

Display Gallons

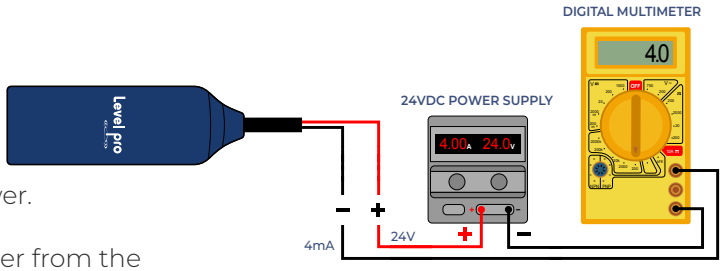
$$\frac{\text{Max. Range of Sensor (in) x Max. Fill Capacity (Gal)}}{\text{Specific Gravity x Straight Wall Height (in)}}$$



Troubleshooting

1. Trouble Shooting the Sensor

1. First, verify that the sensor is wired correctly.
2. Next, check if the power supply is providing the required power.



If transmitter is not functioning properly, isolate the transmitter from the system and wire as shown above.

Be sure to remove the sensor from the classified area when preforming this test. Multimeter should read 4mA with the transmitter out of liquid.

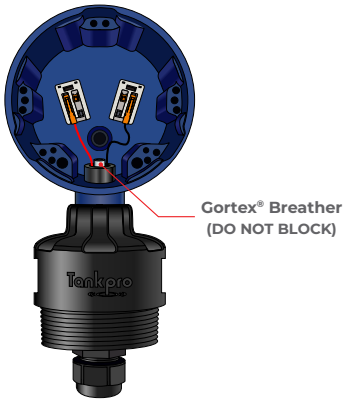
Note:

The reference or capillary tube is fitted with a **Gortex®** Filter - this must remain attached in order to prevent moisture, particulate or insects from entering. **Do Not Remove**.

Avoid Blocking or **Bending** the **Ventilation Tube**

The **TankPro®** is fitted with a **Gortex® Breather** to allow air to pass but not water. Please Ensure this **Not Blocked**.

Always keep the cable termination clean, dry and free of moisture to prevent liquid from entering the **Vent Tube**.



Warranty, Returns and Limitations

Warranty

Icon Process Controls Ltd warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Icon Process Controls Ltd for a period of one year from the date of sale of such products. Icon Process Controls Ltd obligation under this warranty is solely and exclusively limited to the repair or replacement, at Icon Process Controls Ltd option, of the products or components, which Icon Process Controls Ltd examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Icon Process Controls Ltd must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the one year from the date of replacement.

Returns

Products cannot be returned to Icon Process Controls Ltd without prior authorization. To return a product that is thought to be defective, go to www.iconprocon.com, and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Icon Process Controls Ltd must be shipped prepaid and insured. Icon Process Controls Ltd will not be responsible for any products lost or damaged in shipment.

Limitations

This warranty does not apply to products which:

1. are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above;
2. have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use;
3. have been modified or altered;
4. anyone other than service personnel authorized by Icon Process Controls Ltd have attempted to repair;
5. have been involved in accidents or natural disasters; or
6. are damaged during return shipment to Icon Process Controls Ltd

Icon Process Controls Ltd reserves the right to unilaterally waive this warranty and dispose of any product returned to Icon Process Controls Ltd where:

1. there is evidence of a potentially hazardous material present with the product;
2. or the product has remained unclaimed at Icon Process Controls Ltd for more than 30 days after Icon Process Controls Ltd has dutifully requested disposition.

This warranty contains the sole express warranty made by Icon Process Controls Ltd in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL Icon Process Controls Ltd BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF Icon Process Controls Ltd. This warranty will be interpreted pursuant to the laws of the province of Ontario, Canada.

If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.

For additional product documentation and technical support visit:

www.iconprocon.com | e-mail: sales@iconprocon.com or support@iconprocon.com | Ph: 905.469.9283

ICON PROCESS CONTROLS™ Corrosion-Free Instrumentation Equipment

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