

SPX504 Online Tuning Fork Density Meter

SPX504 Online Tuning Fork Concentration Meter

Product Overview

SPX504 on-line tuning fork density and concentration meter is a continuous on-line measurement of the density and concentration of liquids, can provide fully integrated "plug and play, maintenance-free" type density or concentration measurement. Mainly used in industrial process automation control. It can be widely applied to industrial sites such as on-site pipelines, open or closed storage tanks.



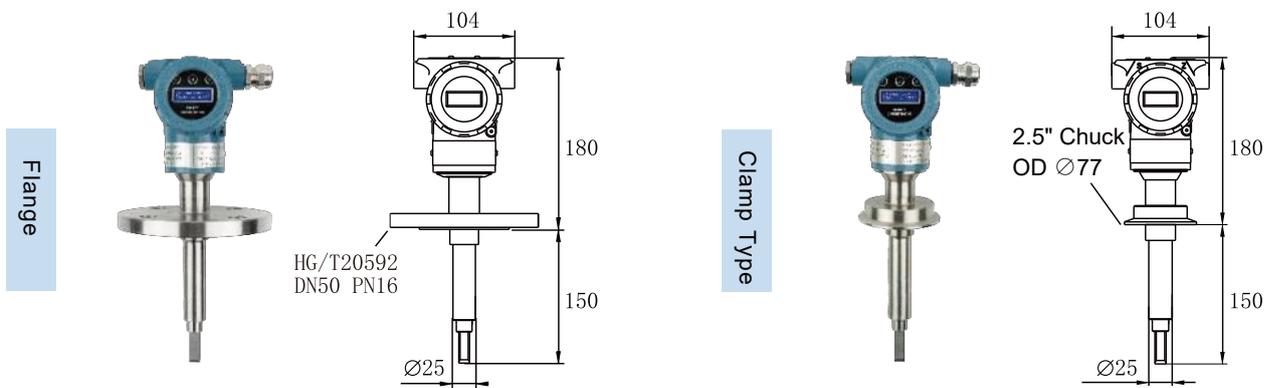
Areas of Application

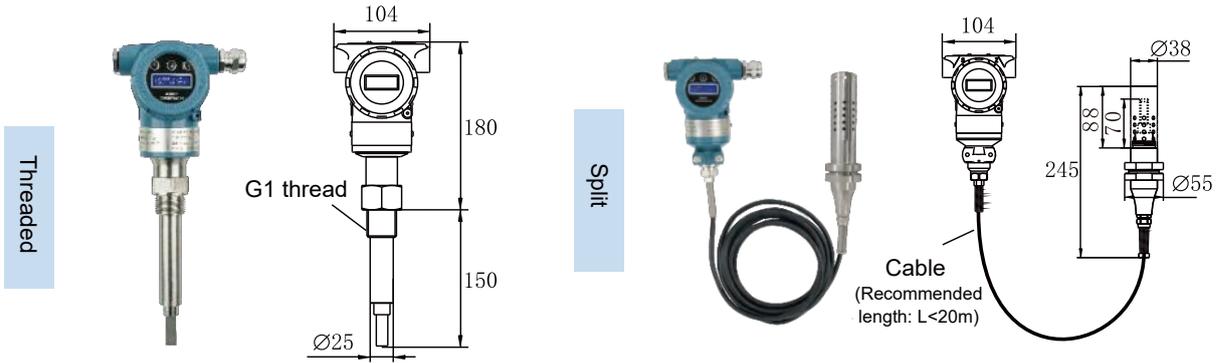
1. Petrochemical industry: diesel, gasoline, ethylene, etc.
2. Chemical industry: sulfuric acid, hydrochloric acid, nitric acid, chloroacetic acid, ammonia, methanol, ethyl alcohol, brine, sodium hydroxide, freezing liquid, sodium carbonate, glycerol, hydrogen peroxide, etc.
3. Pharmaceutical industry: drug solution, biological liquids, alcohol, acetone, alcohol recovery, etc.
4. Food and beverage industry: sugar water, fruit juice, brewing, cream and so on.
5. Battery and electrolyte industry: sulfuric acid, lithium hydroxide, etc.
6. Environmental protection industry: desulfurization (lime slurry, gypsum slurry), denitrification (ammonia, urea), wastewater treatment MVR (acid, alkali, salt recycling) and so on.

Technical Specification

Display: density or concentration display
 Measuring range: 0~1.5g/cm³, 0~2.5g/cm³, 0~50%, 0~100%
 Allowable temperature: -20~120 C
 Operating voltage: 18~30VDC
 Electrical interface: M20X1.5
 Output: 4~20mA (4-wire), RS485, or Hart protocol
 Process interfaces: flanges, clamps, threads and cables Split Installation
 Protection Level: IP67
 Explosion-proof Type: Explosion-proof

dimension figure



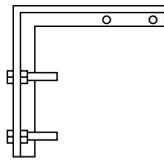


Above dimensions are for reference only.
Actual dimensions are subject to production.

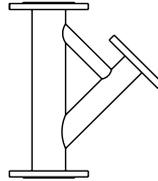
Selection table

SPX504	<input type="checkbox"/>								Online Tuning Fork Density Meter Online Tuning Fork Concentration Meter	
Measuring medium	A								Density Concentration of hydrochloric acid Sulfuric acid concentration Ammonia water concentration Alcohol concentration Sodium hydroxide concentration Others	
Range	R1								0~1.5g/cm ³ 0~2g/cm ³ 0~50% 0~100% Others	
Output signal	W1								4~20mA 4~20mA+RS485 4~20mA+HART protocols	
Process interface	A1								2"150LB flange 2"300LB flange DN50PN16 flange (Standard) DN50PN25 flange 2"clamp 3"clamp G3/4 thread G1 thread Others	
Insertion length	L0								150mm (Standard) 100mm 200mm 300mm 400mm Others	
Catch material	A								316L 316L lined with Teflon (PTFE) titanium Hastelloy Ceramic Others	
Surface treatment	1								Standard polishing Others	
Explosion protection	N								no Flameproof ExdbIICT6 Gb	
Mounting accessories	F0								no Installation bracket Bypass pipe Circulation room Flushing port Flange support Protective cover Others	

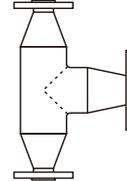
Installation accessories



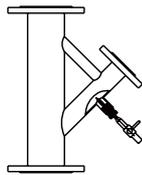
F1



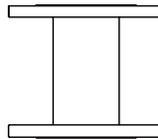
F2



F3



F4



F5



F6

Note: The above mounting accessories, the conventional material is 304 or 316, the specific size specifications material to order shall prevail.

Material Classification

Liquid-contact material: 316L

Material characteristics:

316L stainless steel is a high-quality steel material, with a certain degree of corrosion resistance, oxidation resistance, good toughness and strength, can be at relatively low temperatures to maintain excellent performance, so it is widely used in the chemical industry, petroleum, pharmaceuticals, food processing and other fields.

Applicable measurement media:

Acetaldehyde, acetic acid, acetone, ethanol, lead sulfate, ammonia, aniline, benzene, benzoic acid, boric acid, butane, carbonic acid, copper sulfate, ethane, ether, chloroethane, ethylene, ethylene glycol, formaldehyde HCHO, hydrogen peroxide (hydrogen peroxide), magnesium hydroxide, methyl ethyl ketone, butanone, methanol, picric acid, calcium chlorite, potassium hydroxide, propane, sodium acetate, sodium carbonate, sodium chromate, Sodium hydroxide, sodium thiosulfate, tin dichloride, stearic acid, tar, trifluoroethylene, turpentine, vinegar, citric acid, zinc sulfate, urea, isopropyl alcohol, lithium bicarbonate, lithium carbonate, heptane and so on...



Note: The above materials are for reference only, the specific material to the site conditions and the degree of corrosion of the medium selection shall prevail.

Liquid contact material: Titanium



Material Characteristics:

Titanium is an important structural metal, titanium high strength, alkali, chloride, chlorine organics, such as excellent corrosion resistance, and in the low temperature and ultra-low temperature, can still maintain its mechanical properties, widely used in the chemical industry, marine oil and gas development, seawater desalination, medical care and other fields.

Applicable measurement media:

acetone, ethanol, lead sulfate, ammonia, ammonium chloride, ammonium nitrate, ammonium phosphate, ammonium sulfate, ammonium sulfite, aniline, benzoic acid, boric acid, calcium chloride, calcium hypochlorite, carbonic acid, carbon tetrachloride, chromic acid H₂CrO₄, copper sulfate, ethane, ether, chloroethane, ethylene, formaldehyde HCHO, gasoline, hydrogen peroxide (hydrogen peroxide), magnesium hydroxide methanol, calcium chlorite, Potassium Hydroxide, Propane, Sodium Acetate, Sodium Carbonate, Sodium Chloride, Sodium Chromate, Sodium Hydroxide, Sodium Thiosulfate, Tin Dichloride, Stearic Acid, Sulfite Solution, Sulfurous Acid, Tar, Trifluoroethylene, Turpentine, Vinegar, Seawater, Zinc Chloride, Citric Acid, Zinc Sulfate, Urea, Isopropyl Alcohol, Lithium Hydrogen Carbonate, Lithium Carbonate, Heptane...

Liquid contact material: Hastelloy



Material Properties:

Hastelloy is an alloy with a very low silicon and carbon content and is considered to be a universal corrosion resistant alloy. It is mainly resistant to wet chlorine, various oxidizing chlorides, chlorinated salt solutions and oxidizing salts. Therefore, in the chemical industry, petrochemical industry, paper making, environmental protection and other industrial fields have a fairly wide range of applications.

Applicable measurement media:

Acetaldehyde, acetic acid, acetone, ethanol, lead sulfate, ammonia, ammonium chloride, ammonium nitrate, ammonium phosphate, ammonium sulfate, ammonium sulfite, aniline, benzene, benzoic acid, boric acid, butane, calcium hypochlorite, carbonic acid, carbon tetrachloride, liquid chlorine, chromic acid H₂CrO₄, copper sulfate, ethane, ether, ethylene chloride, ethylene, ethylene glycol, formaldehyde HCHO, formic acid HC₂H₃O₂, gasoline, magnesium hydroxide Methyl ethyl ketone, Butanone, Oxalic acid, Methanol, Phosphoric acid, Picric acid, Calcium chlorite, Potassium hydroxide, Propane, Sodium acetate, Sodium carbonate, Sodium chloride, Sodium chromate, Sodium hydroxide, Sodium thiosulphate, Tin dichloride, Stearic acid, Sulphate solution, Sulphuric acid, Sulphurous acid, Tar, Fluorine vinyl chloride, Turpentine, Vinegar, Seawater, Zinc chloride, Citric acid, Zinc sulphate, Urea, Isopropanol, Lithium hydrogen carbonate, Lithium carbonate, Sodium sulfate, sodium sulfite, lime slurry for desulfurization, heptane, etc...

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Liquid-contact material: Ceramic



Material characteristics:

Ceramic materials are synthetic compounds made of a class of inorganic non-metallic materials after molding and high temperature sintering, with a high melting point, high hardness, high abrasion resistance, oxidation resistance and other advantages, not easy to oxidize at high temperatures and wear resistance, and good corrosion resistance to acids, alkalis and salts.

Applicable measurement media:

hydrochloric acid, acetaldehyde, acetic acid, acetone, ethanol, lead sulfate, ammonia, ammonium chloride, ammonium nitrate, ammonium phosphate, ammonium sulfate, ammonium sulfite, aniline, benzene, benzoic acid, boric acid, calcium chloride, calcium hypochlorite, carbon dioxide, carbon tetrachloride, liquid chlorine, copper sulfate, ethane, ether, ethyl chloride, ethylene, ethylene glycol, iron chloride, formaldehyde HCHO, formic acid HC02H, gasoline, hydrochloric acid, Hydrogen peroxide (hydrogen peroxide), magnesium hydroxide nitric acid, methanol, phosphoric acid, calcium chlorite, potassium hydroxide, propane, sodium acetate, sodium carbonate, sodium chloride, sodium chromate, sodium hydroxide, sodium hypochlorite, sodium thiosulphate, stannous chloride, stearic acid, sulphate solution, sulphuric acid, sulphurous acid, tar, trifluoroethylene, turpentine, vinegar, seawater, zinc chloride, citric acid, zinc sulphate, urea, sodium hypo-phosphate, isopropyl alcohol Lithium bicarbonate, lithium carbonate, sodium sulfate, sodium sulfite, lime slurry for desulfurization, heptane...

Liquid contact material: Tetrafluoroethylene (PTFE)



Material Characteristics:

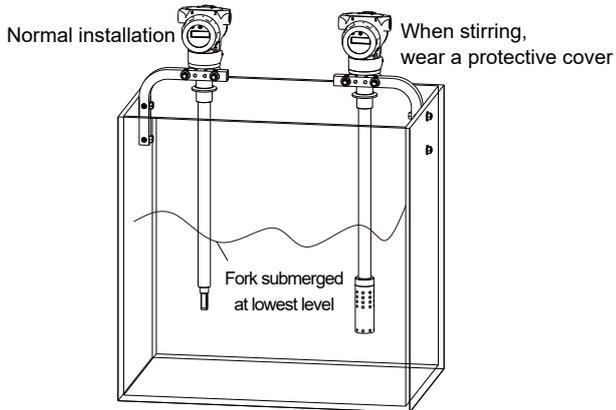
Tetrafluoro material is a polymer inert material, does not react to most chemicals, almost not subject to any chemical reagent corrosion, has excellent corrosion resistance, mainly made of polymerized tetrafluoroethylene (PTFE), widely used in a variety of need to be resistant to acids, alkalis and organic solvents of the media.

Applicable measurement media:

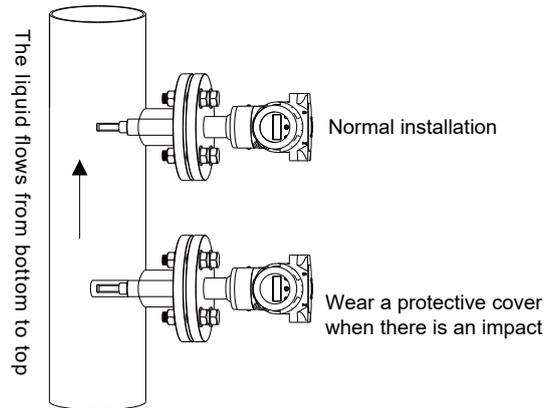
Acetic acid, ethanol, lead sulfate, ammonia, ammonium chloride, ammonium nitrate, ammonium phosphate, ammonium sulfate, ammonium sulfite, boric acid, calcium chloride, calcium hypochlorite, carbonic acid, carbon tetrachloride, liquid chlorine, chromic acid H2CrO4, copper sulfate, ethylene glycol, ferric chloride, formaldehyde HCHO, formic acid HC02H, gasoline, hydrochloric acid, hydrofluoric acid, hydrogen peroxide (hydrogen peroxide), magnesium hydroxide nitric acid, oxalic acid, methanol, phosphoric acid, bitterness, and so on. , methanol, phosphoric acid, picric acid, calcium chlorite, potassium hydroxide, propane, sodium acetate, sodium carbonate, sodium chloride, sodium chromate, sodium hydroxide, sodium hypochlorite , sodium thiosulfate, stannous chloride, stearic acid, sulfate solution, sulfuric acid, sulfurous acid, tar, trifluoroethylene, turpentine, vinegar, seawater, zinc chloride, citric acid, zinc sulfate, urea, sodium hypophosphite, fluorosilicic acid, isopropyl alcohol, lithium bicarbonate, Lithium Bicarbonate, Sodium Sulfate, Sodium Sulfite, Heptane...

Note: The above materials are for reference only, the specific material to the site conditions and the degree of corrosion of the medium selection shall prevail.

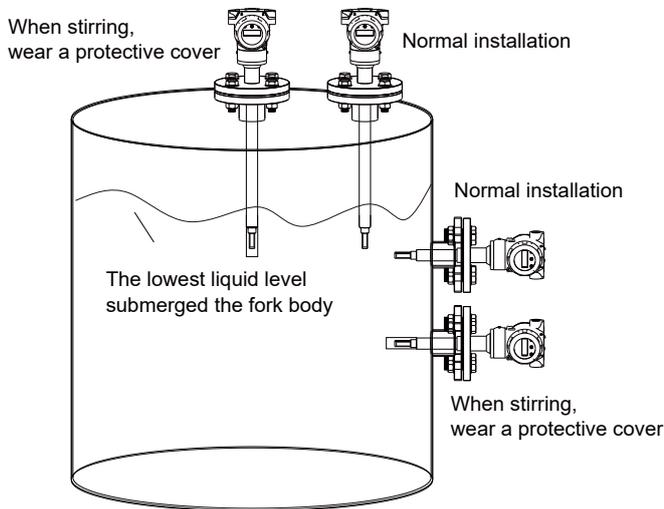
One-piece installation



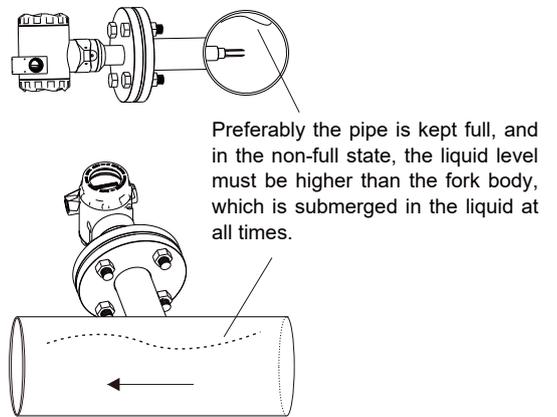
Open pool or open tank installation



Vertical pipe installation



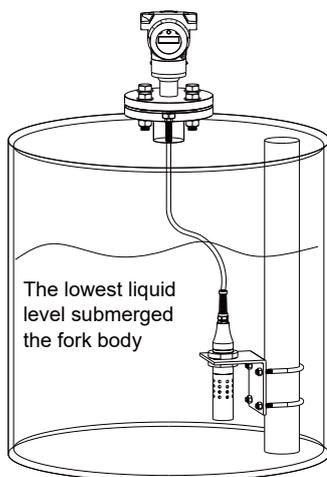
Installation of sealed tanks



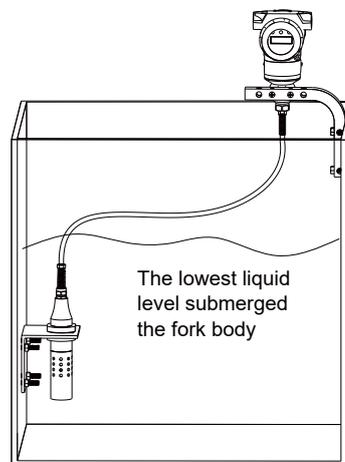
Horizontal pipeline installation

Note: Pipe diameter requirements
 $< \text{DN}80$ or flow rate $> 1\text{m/s}$ need to do expansion tee
 $\geq \text{DN}80$ and flow rate $> 1\text{m/s}$ need to do bypass installation

Split installation method



Flange installation



Bracket installation

The above installation methods are for reference only

Applications in the chemical industry



In the domestic chemical industry, due to the working conditions, the limitations of the installation method, the traditional densitometer instrumentation, large size, cumbersome installation, large measurement error, material is relatively single; manual sampling and measurement and the existence of hysteresis, sampling is inconvenient, has not been able to meet the requirements of the enterprise automation control and the needs of large-scale production.

Our online tuning fork density meter has no moving parts, compared with other density testing equipment, tuning fork density meter has a small size, long life, high reliability, light weight and other characteristics, no pressure loss of the pipe system, plug and play, easy to install, easy maintenance, with other types of density measurement instrumentation can not be replaced by the superiority of the instrument, has a good application prospect.

Applications in the pharmaceutical industry

Currently used in the pharmaceutical industry density measurement methods, there are sample testing, that is, glass tube manual testing, a more traditional testing program, the way the data is accurate, the instrument price is low, but time-consuming and laborious, up to the effect of time and time on-line monitoring, the use of inconvenience, low efficiency.

In order to adapt to market needs, to break this traditional way, to maximize efficiency, to overcome the shortcomings of the above instruments, Zhongshan City, three easy to measure the principle of vibration of the tuning fork density/concentration meter produced by the instrument, fully integrated "plug and play, maintenance-free" type of digital measurement, can be used for monitoring and control. The density meter is closely integrated with the on-site process piping with the following advantages:

1. Adopting integrated structure, flexible and convenient installation, less maintenance;
2. Continuous on-line measurement, with density and temperature directly displayed on the meter head;
3. Built-in temperature sensor, with temperature compensation function;
4. High precision, good stability, standard industrial type and sanitary process.



Applications in the desulphurization industry

In the lime slurry (calcium hydroxide) wet flue gas desulfurization (FGD) system, it is necessary to measure the density of the limestone slurry entering the absorption tower, which is related to the efficiency of desulfurization.

The limestone slurry into the absorption tower has the following characteristics:

- (1) slurry in the mixing process, there is heat dissipation phenomenon, temperature changes, density changes are obvious .
- (2) calcium hydroxide solution contains a large number of particles, easy to crystallize and scale, especially after the shutdown.

Therefore, when choosing a density meter to measure the density of calcium hydroxide solution, we should consider the measurement impact brought by particles, and the convenience of post maintenance.

The tuning fork density/concentration meter can measure the density of calcium hydroxide solution containing a large number of particles on-line, which can be converted according to customer's needs and directly display the density/concentration value.

