

UTX TUNING FORK LEVEL SWITCH

Summary

UTX Tuning Fork Level Switch is suitable for measuring the high and low levels of various materials/liquid media in tanks or pipelines, with a wide range of applications, such as chemical fiber industry, rubber industry, tire industry, cement industry, iron and steel industry, food factories, pharmaceutical factories, petrochemical factories, feed factories and other industrial raw materials/processes/products of barrels and tanks of the material/liquid level control.

Operating Principle

The piezoelectric component is used to drive the tuning fork and feedback signal, which produces the resonance on the fork. When the fork comes into contact with a material, the fork will release some frequency signal as feedback. It will be converted into the output of the contact signal when the circuit detects the frequency decrease of the signal.

The product relies on the damping effect by covering the testing material on the tuning fork which reduces the vibration frequency of the tuning fork and outputs a Controller signal.

Therefore, there is no signal amplification circuit inside, which can eliminate the trouble of frequent sensitivity adjustment due to the material change.

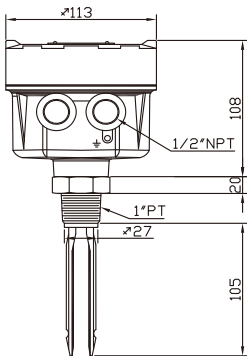
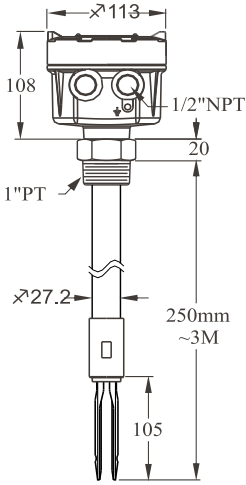
Features

1. SPDT Relay output, SSR MOSFET output.
2. Wide voltage supply range 20~250 Vac/Vdc, 50/60Hz
3. No frequent calibration required, easy-to-use, sturdy and durable design. High/low failure safe mode, safe and reliable.
4. Sensitivity adjustment is available for different densities of media. Fine powder can be detected.
5. Suitable for liquid, powder, and solid application.
6. Dual insulation can reduce damage on the PCB board caused by great changes in temperature and humidity, as well as condensation effects (UTX3 series).
7. It can be tested by pressing the test button after installation (UTX3 series)
8. Output Controller delay function (UTX3 series).
9. Self-diagnosis mechanism can detect the abnormality such as the abrasion of the tuning fork or the material viscosity (UTX3 series).
10. The compact built-in wiring box can save the installation space (UTX3 series).
11. The wiring box can rotate 270 degrees, facilitating adjustment of the inlet direction.
12. The minimum measurable specific gravity can reach 0.01 g/cm³ (UTX35 series).
13. Ultra protection mechanism can set the secondary output contact point as alarm output (UTX35 series)
14. Support the function of detecting underwater sediments (UTX35 series).
15. All-in-one design, 3/4" thread is suitable for the installation of a small tube (UTX38 series).
16. Adjustment setting for different densities of media $\rho > 0.5 \text{ g/cm}^3$ or $\rho < 0.7 \text{ g/cm}^3$ (UTX38 series).
17. Controller delay setting function (UTX38 series).
18. Alarm indicators based on failure status or output status selected according to the customer's habits (UTX38 series).
19. Automatic calibration of the operation points for different densities of media as required by the customer (UTX38 series).



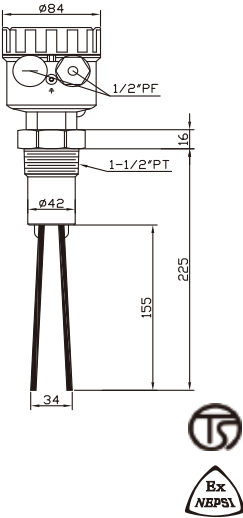
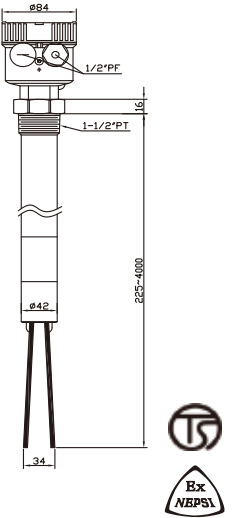
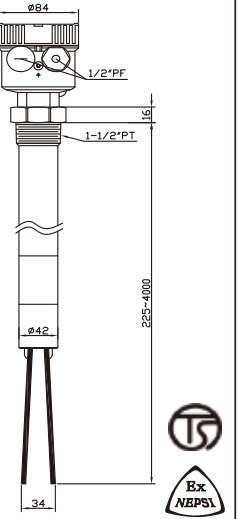
Technical Parameters

EX-proof type

<p>Dimensions (Unit:mm)</p>	 <p>TS Ex NEPSI Ex</p>	 <p>TS Ex NEPSI Ex</p>
<p>Model</p>	<p>UTX1740 Standard type</p>	<p>UTX1741 Ultra Extension type</p>
<p>Level sensor housing</p>	<p>Aluminum</p>	
<p>Probe construction</p>	<p>SUS304 / SUS316/SUS316L</p>	
<p>Mounting</p>	<p>1"PT (depend on factory)</p>	<p>1"PT (depend on factory)</p>
<p>Conduit</p>	<p>1/2"NPTx2</p>	
<p>Max. vertical load on rod.</p>	<p>177in.Lbs(20Nm)</p>	
<p>Process pressure</p>	<p>vacuo~600PSI(40BAR)</p>	
<p>Power supply</p>	<p>20-250Vac/Vdc,50/60Hz</p>	
<p>Power consumption</p>	<p>10VA</p>	
<p>Ambient Temp.</p>	<p>-20°C-70°C</p>	
<p>Process Temp.</p>	<p>-40°C-130°C</p>	
<p>Signal output</p>	<p>Relay, SPDT, 3A/250Vac/ 28Vdc, 1 set or 2 set SSR(MOSFET)400mA/60 Vac/Vdc, 1 set or 2 set</p>	
<p>Min. fluid density sensed</p>	<p>Powder: ≥0.07g/cm³, Liquid ≥0.7g/cm³, Viscosity:1-10000 cst</p>	
<p>Time delay</p>	<p>0.6 Second /Operate; 1-3 Second/Reset</p>	
<p>Vibrating frequency</p>	<p>350-370Hz</p>	
<p>Selectable fail-safe</p>	<p>High / Low</p>	
<p>Selectable sensitivity</p>	<p>High / Low</p>	

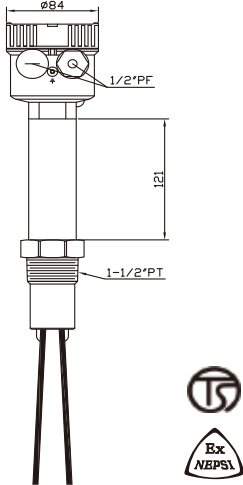
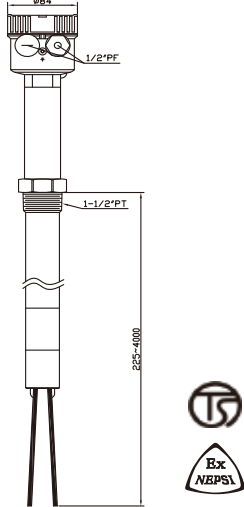
Technical Parameters

UTX35 Tuning Fork Level Controller

Dimensions (Unit:mm)				
	Model	UTX350 Standard type	UTX351 Extension type	UTX352 Cable Type
	Level sensor housing	Built-in box, aluminum coating IP66/IP67		
	Power supply	NPN/PN(P-50vdc)		
Probe construction	Max. 1.5 W			
Voltage endurance capability	3.7 kV			
Overvoltage protection	overvoltage category II			
Storage Temp.	-40°C~85°C			
Ambient Temp.		-40°C~85°C	-40°C~75°C	
Process Temp.	-40°C~150°C	-40°C~150°C	-40°C~80°C	
Fluid density	$\geq 0.01 \text{ g/cm}^3$ or $\geq 0.05 \text{ g/cm}^3$			
Measuring frequency	140 Hz \pm 5 Hz			
Fluid dimension	Max.10 mm			
Conduit	1/2"PF / 1/2"NPT(Ex-proof is only supports 1/2"NPT)			
External diameter of cable applicable to conduit	$\phi 6 \sim \phi 10\text{mm}$			
Pressure resistance	Max.25Bar	Max.25Bar	Max.2 Bar	
Output signal	Dual- relay2 /Dual- MOSFET/3 wires (NPN/PNP) transistor Output			
Connection capacity	Relay:6A/250Vac, 6A/28Vdc; Crystal pipe:400mA,60Vac/Vdc			
Ex-Proof certification	Dust Ex-proof (DIP A20/21 TA, T2-T6 IP66/67, optional)			

Technical Parameters

UTX35 Tuning Fork Level Controller

<p>Dimensions (Unit:mm)</p>		
<p>Model</p>	<p>UTX350 High-Temp. type</p>	<p>UTX351 High-Temp. Extension type</p>
<p>Level sensor housing</p>	<p>Built-in box, aluminum coating IP66/IP67</p>	
<p>Power supply</p>	<p>19~253 Vdc/Vac, 50/60 Hz</p>	
<p>Probe construction</p>	<p>Max. 1.5 W</p>	
<p>Voltage endurance capability</p>	<p>3.7 kV</p>	
<p>overvoltage protection</p>	<p>overvoltage category II</p>	
<p>Storage Temp.</p>	<p>-40°C~85°C</p>	
<p>Ambient Temp.</p>	<p>-40°C~85°C</p>	
<p>Process Temp.</p>	<p>-40°C~280°C</p>	
<p>Fluid density</p>	<p>≥0.01 g/cm³ or ≥0.05 g/cm³</p>	
<p>Measuring frequency</p>	<p>140 Hz ± 5 Hz</p>	
<p>Fluid dimension</p>	<p>Max.10 mm</p>	
<p>Conduit</p>	<p>1/2"PF / 1/2"NPT(Ex-proof is only supports 1/2"NPT)</p>	
<p>External diameter of cable applicable to conduit</p>	<p>φ 6~ φ 10mm</p>	
<p>Pressure resistance</p>	<p>25Bar</p>	
<p>Output signal</p>	<p>2 sets of SPDT relay output/2 sets of transistor output</p>	
<p>Connection capacity</p>	<p>Relay:6A/250Vac, 6A/28Vdc; Crystal pipe:350mA,60Vac/Vdc</p>	
<p>Ex-Proof certification</p>	<p>Dust Ex-proof (DIP A20/21 TA, T2-T6 IP66/67, optional)</p>	

Technical Parameters

UTX38 Tuning Fork Level Controller

Dimensions (Unit:mm)				
	<p style="text-align: center;">UTX380 Standard Type UTX381 Extension Type UTX382 Ultra Extension</p>			
	Output type	8-16mA output type	3 wire(NPN/PNP) output type	Dual-relay output type
	Working voltage	11~36 Vdc 600mW	10 ~55 Vdc < 830mW	19~253Vac/dc,50/60Hz Max. 1.3W
Input protection	Reversed power supply protection function	Reversed power supply protection function	NA	
Overvoltage protection	overvoltage category III			
Measuring error	Max.±1mm			
Repeatability	0.5mm			
Hysteresis band	Approx.2mm			
Storage temp.	-40~85°C			
Ambient temp.	-40~85°C (Intrinsicly safe type-40~70°C)	-40 ~85°C (Reference operation manual)		
Process temp.	-40 ~150°C (Reference operation manual)			
Applicable density liquid	≥0.5g/cm ³ or ≥0.7g/cm ³			
Liquid viscosity	Max.10000mm ² /S(10000cst)			
Granule size contained in the liquid	Max.Φ 5mm			
External diameter of cable applicable to conduit	Φ6 ~ Φ10mm			
Pressure resistance	Max.40 Bar			
Output signal	Intrinsicly safe signal(8~16)mA	Transistor output NPN/PNP	2 sets of SPDT relay output	
Contact capacity	NA	350mA, 55Vdc	6A/250 Vac, 6A/28Vdc	
IP rating	IP66/67			
Intrinsicly safe parameters	Ui(V)=36V,Ii=100mA,Pi=1W Ci(nF)=0,Li(uH)=0	NA	NA	

Note:

It shall combine with the ex-proof fence meeting level Ex ia to form the intrinsicly safe system.

Technical Parameters

SC38 Multi-functional tuning Fork Level Controller

Dimensions (Unit:mm)			
	UTX 380 High-temp. Type	UTX381 High-temp.	UTX382 High-temp.Extension Type

Output type	8-16mA current output type	3 wire(NPN/PNP) output type	Dual-relay output type
Working voltage	11~36 Vdc	10 ~55 Vdc	19~253Vac/dc,50/60Hz
Power consumption	600mW	< 830mW	Max. 1.3W
Input protection	Reversed power supply protection function	Reversed power supply protection function	NA
Overvoltage protection	overvoltage category III		
Measuring error	Max.±1mm		
Repeatability	0.5mm		
Hysteresis band	Approx.2mm		
Storage temp.	-40~85°C		
Ambient temp.	-40 ~85°C (reference to operation manual)		
Process temp.	-40~150°C		
Applicable density liquid	≥0.5g/cm ³ or ≥0.7g/cm ³		
Liquid viscosity	Max.10000mm ² /S(10000cst)		
Granule size contained in the liquid	Max.Φ 5mm		
External diameter of cable applicable to conduit	Φ6 ~ Φ10mm		
Pressure resistance	Max.40 Bar		
Output signal	Intrinsically safe signal(8~16)mA	Transistor output NPN/PNP	2 sets of SPDT relay output
Contact capacity	NA	350mA, 55Vdc	6A/250Vac
IP rating	IP66/67		
Intrinsically safe parameters	Ui(V)=36V,Ii=100mA,Pi=1W Ci(nF)=0,Li(uH)=0	NA	NA

Note:

It shall combine with the ex-proof fence meeting level Ex ia to form the intrinsically safe system.

Model Selection Table (Standard type/ Explosion proof type)

UTX () ()

Model _____
1740 ---Ex-proof standard type
1741 ---Ex-proof extended type

Power supply _____
20~250Vac/ Vdc, 50/60Hz
R: Relay O/P-Euro Type
N: SSR (MOSFET) Euro Type
Q: Relay O/P x 2 -Euro Type
M: SSR (MOSFET) x 2 -Euro Type

Material Code _____
0: SUS304 6: SUS316 L: SUS316L
A:Stainless steel+PFA E:Stainless steel+ECTFE
※ Surface coating carbon rod length is max.400m
※ For UTX 17 series, A surface coating can not be selected

Continue type (wetted) _____

Size	Specification
D---1"(25A)	M---5kg/cm ² Y---PN 25
3---1-1/4"(32A)	N---10kg/cm Z---PN 40
E---1-1/2"(40A)	O---150 Lbs S---special specification
F---2"(50A)	P---300 Lbs 9---sanitary joint
G---2-1/2"(65A)	Q---PT
H---3"(80A)	R---PF (G)
I---4"(100A)	T---BSP
J---5"(125A)	U---NPT
K---6"(150A)	W---PN 10
S---special specification	X---PN 16

Sensor rod length: (unit: mm) _____

0500: under 500mm
1000: 501~1000mm ※ 500mm as the base
1500: 1001~1500mm

⋮

- ※ The total length of the product due to functional adjustments, the allowable tolerance is 5mm
- ※ Product features, specifications and dimensions, if necessary, need to be modified at any time without prior notice.
- ※ If customers need more detailed information, please contact the nearest company or agent.

Model Selection Table (Standard type/Explosion proof type)

UTX35 UTX35

Probe type _____
0: Standard type 1: Extended type 2: Cable type

Power supply _____
C: 19~253 Vdc/Vac 50/60Hz
Two relay output 6A 250Vac/6A 28Vdc
D: 19~253 Vdc/Vac 50/60Hz
Two transistor output: 400mA 60Vac/Vdc
F: 10~55Vdc 3 wire NPN/PNP output

Certification _____
00: None, 1/2"PF 31: NEPSII, Dust Ex-proof, 1/2" NPT
01: None, 1/2"NPT

Connection _____

	Size	Specification
Thread	E---1-1/2"(40A) F---2"(50A) G---2-1/2"(65A) H---3"(80A) I---4"(100A) J---5"(125A) K---6"(150A) S---Special specification	Q---PT(R) U---NPT R---PF(G) S---Special specification T---BSP
Flange		M---5 kg/cm ² P---300 Lbs X---PN 16 N---10 kg/cm ² L---600 Lbs Y---PN 25 O---150 Lbs W---PN 10 Z---PN 40

Fluid Temperature Specification _____

Type Tp	UTX350 Standard Type	UTX351 Extension Type	UTX352 Cable Type
80°C			4
150°C	0	2	
230°C(High Temp. type)	1	3	
280°C(High Temp. type)	5	6	

※Tp:Fluid Temperature

Tuning fork length and solid density _____

0: 155mm min. ≥0.01g/cm³

Probe material and surface roughness _____

0: SUS316L, Ra ≤3.2um 1: SUS316, Ra ≤3.2um 2: SUS304, Ra ≤3.2um

Coating Material _____

0: None 2: ECTFE 3: PTFE

Note: Probe length is Max. 400mm when choosing surface coating.

Probe length _____

xx: standard length	A0: 9501~10000 mm	SS: Special specification
05: under 500mm	A1: 10001~11000 mm	
10: 501~1000 mm	⋮	Standard: only apply xx standard length
⋮	A9: 18001~19000 mm	Extend model: Max length 4m
95: 9001~9500 mm	B0: 19001~20000 mm	Cable model: Max length 20m

Model Selection Table

UTX38 UTX38 G O

Probe type _____
 0: Standard type 1: Extension type 2: Cable type

Power supply _____
 C: 19~253 Vdc/Vac 5060Hz
 Two relay output 6A 250Vac/6A 28Vdc
 F: 10~55Vdc 3 wire NPN/PNP output
 G: 11~36 Vdc 8/16mA output
 (To be used in flammable and explosive places, the Intrinsically safe system should be composed of explosion proof isolating grid)

Certification _____
 0: None 2: Intrinsically safe (only for pre selection of G)

Line Entrance Specification _____
 0: 1/2"PF 1: 1/2"NPT

Connection _____

	Size	Specification			
Thread	C---3/4"(20A)	H---3"(80A)	Q---PT(R)	U---NPT	
	D---1"(25A)	I---4"(100A)	R---PF(G)	S---Special specification	
	3---1-1/4"(32A)	J---5"(125A)	T---BSP		
Flange	E---1-1/2"(40A)	K---6"(150A)	M---5 kg/cm ²	P---300 Lbs	X---PN 16
	F---2"(50A)	S---Special specification	N---10 kg/cm ²	L---600 Lbs	Y---PN 25
	G---2-1/2"(65A)		O---150 Lbs	W---PN 10	Z---PN 40

Fluid Temperature Specification _____

Type	UTX380 Standard Type	UTX381 Extension Type	UTX382 Cable Type
90°C to 85°C/ 150°C to 50°C (Normal type)	0	1	2
150°C to 85°C (High Temp. type)	3	4	5

※Tp: Fluid Temperature Ta: Ambient Temperature

Probe material and surface roughness _____

0: SUS304, Ra£0.3um 1: SUS304, Ra £ 0.8um 2: SUS304, Ra<1.5um
 A: SUS316, Ra£0.3um B: SUS316, Ra £ 0.8um C: SUS316, Ra<1.5um
 D: SUS316L, Ra£0.3um E: SUS316L, Ra £ 0.8um F: SUS316L, Ra<1.5um

Coating Material _____

0: None 2: ECTFE 3: PTFE 4: PFA
 Note: Probe length is Max. 400mm when choosing surface coating.

Probe length _____

25: 2001~2500 mm
 30: 2501~3000 mm
 ⋮
 SS: Special specification
 Extension Type: Max length 3m (If you have other requirements, please contact business agent.)

Order Information

- ▶ Model Installation Type Fluid name Operating pressure
- ▶ Operating temperature Flange standard Wetted material Fluid density
- ▶ Neck length Other special requirements