UTX TUNING FORK LEVEL CONTROLLER

Summary

UTX Tuning Fork Level Controller is a very simple and cost-effective instrument, making it very popular for use in detecting the presence or absence of liquids and bulk solid materials. The product has been widely used in chemical industry, rubber industry, tire industry, cement industry, steel industry, food factory, pharmaceutical factory, petrochemical plants, measuring products such as feed raw materials / process / product barrel tank level control.

Operating Principle

The piezoelectric component is used to drive the tuning fork and feedback signal, which produces the resonation 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.

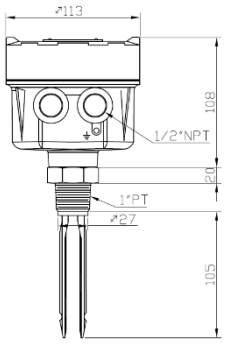
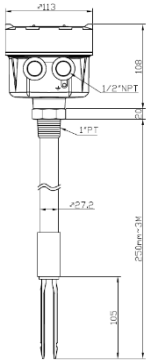
Features

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).

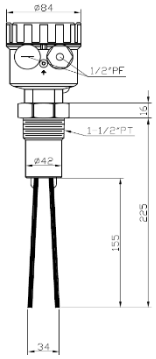
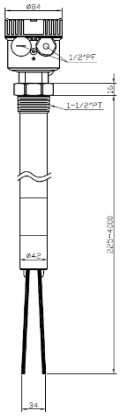
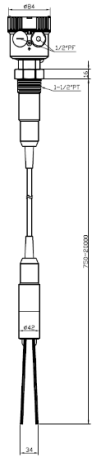
15. All-in-one design, 3/4" thread is suitable for the installation of a small tube (UTX38 series).
16. Adjustment setting for different densities of media ρ>0.5 g/cm3 or ρ.0.7 g/cm3 (UTX38 series).
17. Controller delay setting function (UTX38 series).
18. Alarm indicators based on failure status or 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

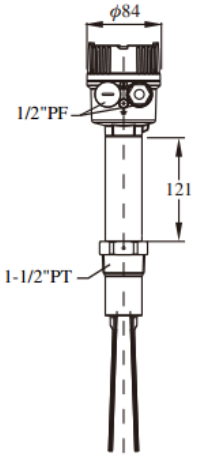
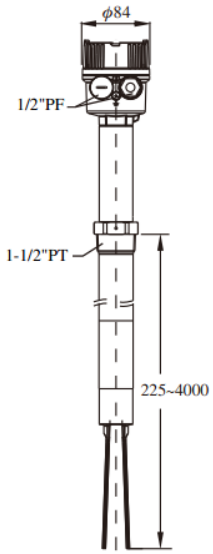
EX-PROOF TYPE

Dimensions (Unit:mm)		
Model No.	UTX1740 Standard type	UTX1741Tuning Fork Ultra Extension type
Level sensor housing	Aluminum	
Probe construction	SUS304 / SUS316/SUS316L	
Mounting	1"PT （depend on factory)	1"PT （depend on factory)
Conduit	1/2"NPT×2	
Max. vertical load on rod.	177in.Lbs(20Nm)	
Process pressure	vacuo~600PSI(40BAR)	
Power supply	20-250Vac/Vdc,50/60Hz	
Power consumption	10VA	
Ambient Temp.	-20℃-70℃	
Process Temp.	-40℃-130℃	
Signal output	Relay, SPDT, 3A/250Vac/ 28Vdc, 1 set or 2 set SSR(MOSFET)400mA/60 Vac/Vdc, 1 set or 2 set	
Min. Material density sensed	Solid: ⩾0.07g/cm³, Liquid⩾0.7g/cm³, Viscosity:1-10000 cst	
Time delay	0.6 Second /Operate; 1-3 Second/Reset	
Vibrating frequency	350-370Hz	
Selectable fail-safe	Hi. / Lo.	
Selectable sensitivity	Hi. / Lo.	

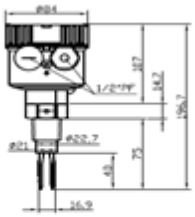
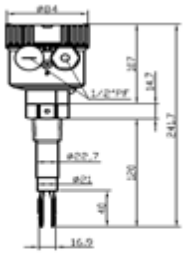
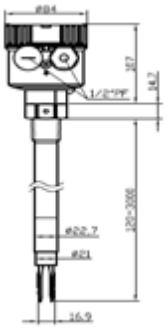
UTX35 Tuning Fork Level Controller

Dimensions (Unit:mm)			
Model No.	UTX350Standard type	UTX351Elongated type	UTX352Cable Type
Level sensor housing	Built-in box, aluminum coating IP66/IP67		
Power supply	NPN/PN(P-55vdc)		
Probe construction	Max.1.5w		
Voltage endurance capability	3.7kV		
Overvoltage protection	Overvoltage category II		
Storage Temp.	-40℃-85℃		
Ambient Temp.		-40℃-85℃	-40℃-75℃
Process Temp.	-40℃-150℃	-40℃-150℃	-40℃-80℃
Material density	⩾0.01g/cm³or ⩾0.05g/cm³		
Measuring frequency	140Hz±5Hz		
Material dimension	Max.10mm		
Conduit	1/2"PF / 1/2"NPT(Ex-proof is only supports 1/2"NPT)		
External diameter of cable applicable to conduit	Φ6-φ10mm		
Pressure resistance	Max.25Bar	Max.25Bar	Max.2 Bar
Output signal	2 sets of SPDT relay output/2 sets of transistor output /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)		

UTX35 Tuning Fork Level Controller

Dimensions (Unit:mm)		
Model No.	UTX350 High-Temp. type	UTX351 High-Temp. Extension type
Level sensor housing	Built-in box, aluminum coating IP66/IP67	
Power supply	19-253vdc/vac,50/60Hz	
Probe construction	Max.1.5W	
Voltage endurance capability	3.7kv	
overvoltage protection	Overvoltage category II	
Storage Temp.	-40℃-85℃	
Ambient Temp.	-40℃-85℃	
Process Temp.	-40℃-280℃	
Material density	⩾0.01g/cm³or ⩾0.05g/cm³	
Measuring Frequency	140Hz±5Hz	
Material dimension	Max.10mm	
Conduit	1/2"PF / 1/2"NPT(Ex-proof is only supports 1/2"NPT)	
External diameter of cable applicable to conduit	Φ6-φ10mm	
Pressure resistance	25Bar	
Output signal	2 sets of SPDT relay output/2 sets of 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)	

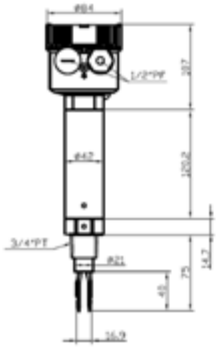
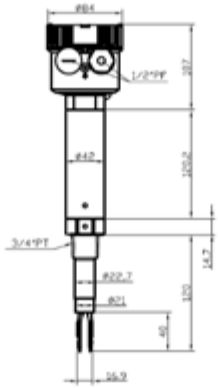
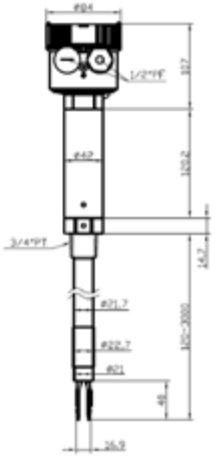
UTX38 Tuning Fork Level Controller

Dimensions (Unit:mm)	 UTX380 Standard Type	 UTX381 Extension Type Extension Type	 UTX382
Output type	8-16mA 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
	600mW	< 830mW	Max.1.3W
Input protection	Reversed power supply protection function	Reversed power supply protection function	N.A.
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 (Intrinsically safe type -40~70°C)	-40 ~85°C (Reference operation manual)	
Process temp.	-40 ~150°C (Reference operation manual)		
Applicable density liquid	⩾0.5g/cm³ or ⩾0.7g/cm³		
Liquid viscosity	Max. 10000mm²/S(10000 cst)		
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/250 Vac, 6A/28Vdc
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.

SC38 Multi-functional tuning Fork Level Controller

Dimensions (Unit:mm)	 UTX 380 high-temp. Type high-temp.	 UTX381 high-temp. Extension Type	 UTX382 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
	600mW	< 830mW	Max.1.3W
Input protection	Reversed power supply protection function	Reversed power supply protection function	N.A.
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/cm³ or ⩾0.7g/cm³		
Liquid viscosity	Max. 10000mm²/S(10000 cst)		
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/250 Vac
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 □ □ □ □ □ (□ □ □) (□ □ □ □)

UTX□□□□ □ (□ □□) (□□□□)Model

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

Power supply
20~250Vac, 50/60Hz

R: Relay O/P-Euro Type
N: SSR (MOSFET) Euro Type
Q: Relay O/P ×2 - Euro Type
M: SSR (MOSFET) ×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	Speification	
D---1"(25A)	M---5kg/cm2	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---specification	X---PN 16	

Sensor rod length: (unit: mm)

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

（UTX35）

UTX35 □ □ □□ □□ □ 0 □ □ □□

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"N
Connection

	Size	Specification		
Thread	E--1-1/2" (40A) F--2"(50A) G-2-1/2"(65A)	Q---PT(R) R---PF(G)	U---NPT S-- Special specification T---BSP	
Flange	H-3"(80A) I---4"(100A)	M---5 kg/cm2 N--10kg/cm2 O--150Lbs	P---300 Lbs L--600 Lbs W---PN10	X---PN16 Y--PN 25 Z---PN40

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

Tp: Medium Temperature
Tuning fork length and solid density
0:155mm min≥0.01 g/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: 9501~10000mm	SS: Special specification
05: under 500mm	A1: 10001~11000MM	
10: 501~1000MM		Standard: only apply xx standard length
	A9: 18001~19000mm	Extend model: Max length 4m
95: 9001 ~9500mm	B0:19001~20000mm	Cable model: Max length 20m

UTX38

UTX38 □ G □ 0 □□ □ □ □ □□

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

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) D---1”(25A) 3---1-1/4”(32A)	Q---PT(R) U---NPT R---PF(G) S-- Special specification T---BSP
Flange	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	M---5 kg/cm2 P---300 Lbs X---PN16 N--10kg/cm2 L--600 Lbs Y--PN 25 O--150Lbs W---PN10 Z---PN40

Medium Temperature Specification

Tp / Type	UTX380 Standard Model	UTX381 Extend Model	UTX382 Cable Model
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: Medium 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: 2501-3000mm

SS: Special specification

Extend Type: Max length 3m (If you have other requirements, please contact business agent.)

Ordering Information

Model Specification

Installation Type

Medium

Operating Pressure

Operating Temperature

Flange Standard

Wetted material

Medium Density

Neck Length

Other Special Requirements