

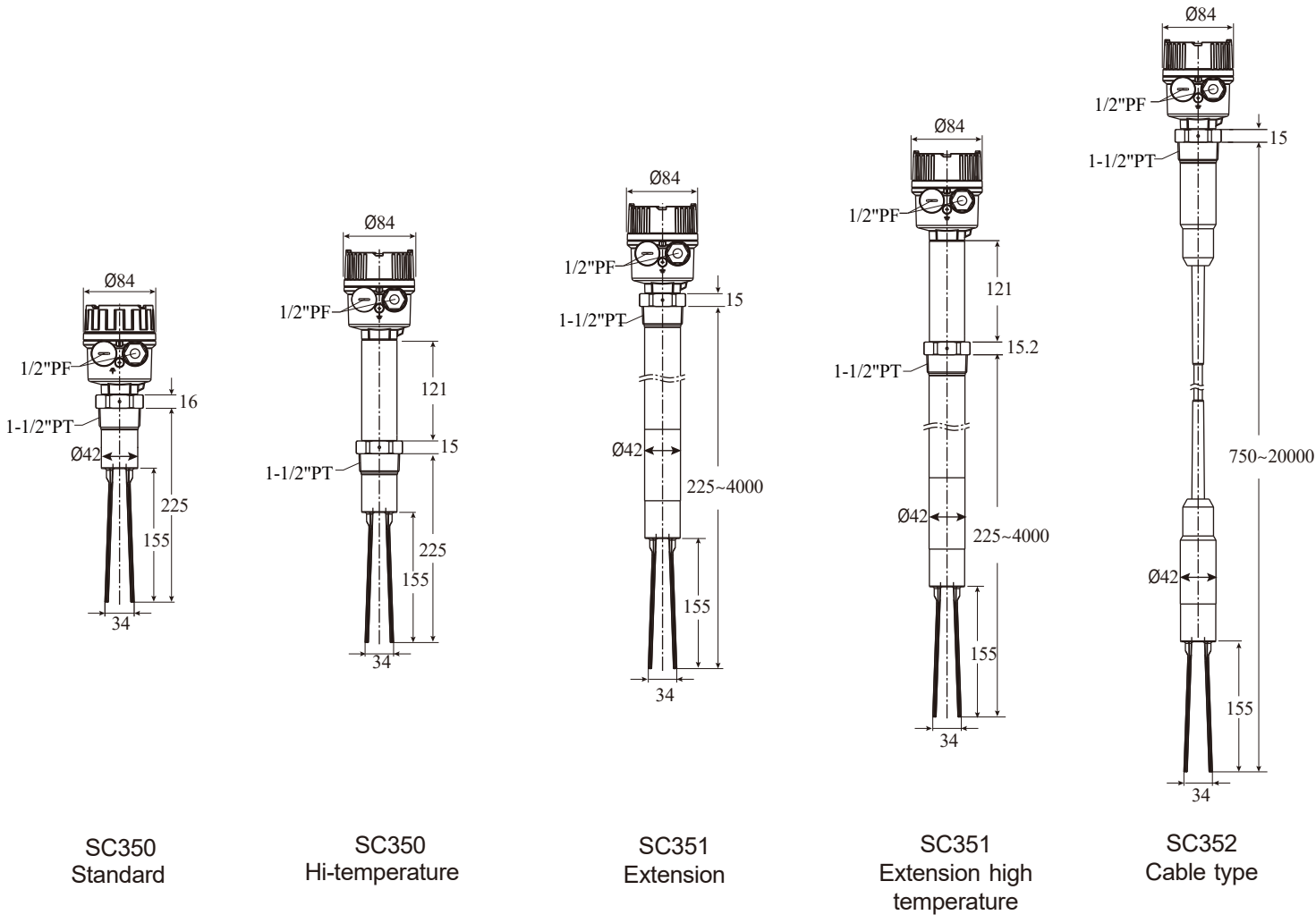
SC35 Tuning Fork Level Switch Operation Manual

SPECIFICATION

Supply voltage	19 ~253 Vdc/Vac, 50/60 Hz	Bulk density	≥0.01 g/cm ³ or ≥0.05 g/cm ³
Power consumption	Max. 1.5 W	Measuring frequency	140Hz±5Hz
Separation voltage	3.7 kV	Material size	Max.10 mm
Overvoltage protection	Overvoltage category II	Connecting cable	φ6~10mm
Storage temp.	-40~85°C	Operating pressure	SC350/SC351: 25 Bar SC352: 2 Bar
Ambient temp.	-40~85°C (Cable type: -40~75°C)	Output signal	2 sets SPDT relay 2 sets transistor
Process temp.	Standard / Extension: -40~150°C Hi-temp. / Extension: -40~230°C Hi-temp. II / Extension II: -40~280°C Cable wire: -40~80°C	Contact rating	Relay: 6A / 250 Vac, 6A / 28 Vdc Transistor: 400mA, 60 Vac / Vdc
		IP rating	IP 66/IP 67

DIMENSIONS

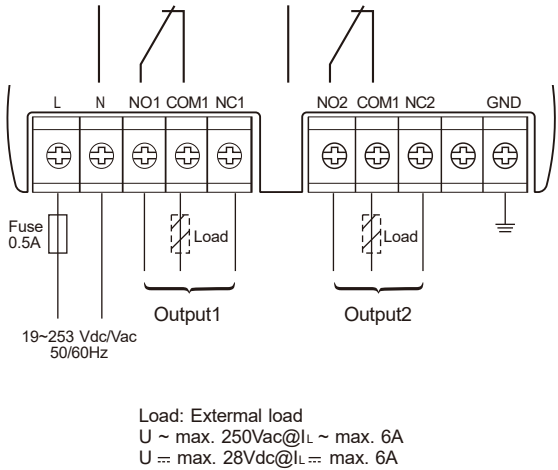
(Unit:mm)



NEPSI Ex ta IIIC T95°C ...T136°C Da
Ex tb IIIC T80°C ...T290°C Db
IECEX Ex ta IIIC T95°C / T130°C / T136°C Da
Ex tb IIIC T80°C / T95°C / T130°C / T160°C / T240°C / T290°C Db

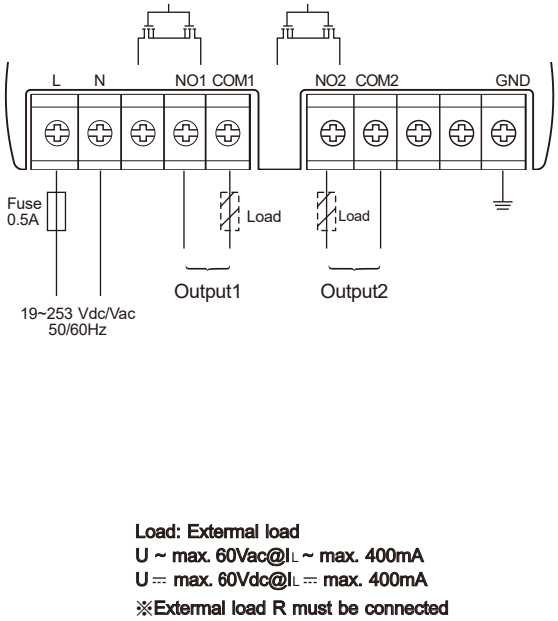
WIRING AND FUNCTION

Two relay output



Load: External load
U ~ max. 250Vac@I_L ~ max. 6A
U = max. 28Vdc@I_L = max. 6A

Two NPN/PNP output



Load: External load
U ~ max. 60Vac@I_L ~ max. 400mA
U = max. 60Vdc@I_L = max. 400mA
※External load R must be connected

Fail-safe mode	Level	Output signal			LED Indicator		
		output1	output2		Power green	Status yellow	Alarm red
MAX	Level 1	NO1 COM1 NC1	NO2 COM2 NC2	NO2 COM2 NC2	☀	O.S. ☀ F.S. ○	○
	Level 2	NO1 COM1 NC1	NO2 COM2 NC2	NO2 COM2 NC2	☀	O.S. ○ F.S. ☀	○
MIN	Level 1	NO1 COM1 NC1	NO2 COM2 NC2	NO2 COM2 NC2	☀	O.S. ☀ F.S. ○	○
	Level 2	NO1 COM1 NC1	NO2 COM2 NC2	NO2 COM2 NC2	☀	O.S. ○ F.S. ☀	○
Fork build-up		Maintain the previous state		NO2 COM2 NC2	☀	O.S. ○ F.S. ☀	⊘
Fork brasion		NO1 COM1 NC1	NO2 COM2 NC2	NO2 COM2 NC2	☀	○	☀

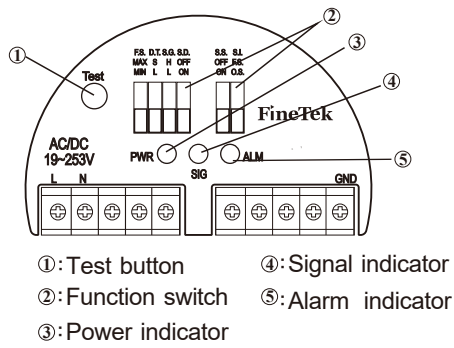
Fail-safe mode	Level	Output signal			LED Indicator		
		output1	output2		Power green	Status yellow	Alarm red
MAX	Level 1	NO1 I _L COM1	NO2 I _L COM2	NO2 I _L COM2	☀	O.S. ☀ F.S. ○	○
	Level 2	NO1 <100μA COM1	NO2 <100μA COM2	NO2 I _L COM2	☀	O.S. ○ F.S. ☀	○
MIN	Level 1	NO1 I _L COM1	NO2 I _L COM2	NO2 I _L COM2	☀	O.S. ☀ F.S. ○	○
	Level 2	NO1 <100μA COM1	NO2 <100μA COM2	NO2 I _L COM2	☀	O.S. ○ F.S. ☀	○
Fork build-up		Maintain the previous state		NO2 <100μA COM2	☀	O.S. ○ F.S. ☀	⊘
Fork brasion		NO1 <100μA COM1	NO2 <100μA COM2	NO2 <100μA COM2	☀	○	☀
Output1 > 400mA		NO1 <100μA COM1	Maintain the previous state		☀	⊘	☀
Output2 > 400mA		Maintain the previous state		NO2 <100μA COM2	☀	☀	☀
Output1 & Output2 > 400mA		NO1 <100μA COM1	NO2 <100μA COM2	NO2 <100μA COM2	☀	⊘	⊘

※When output is off, there will be no error current status.

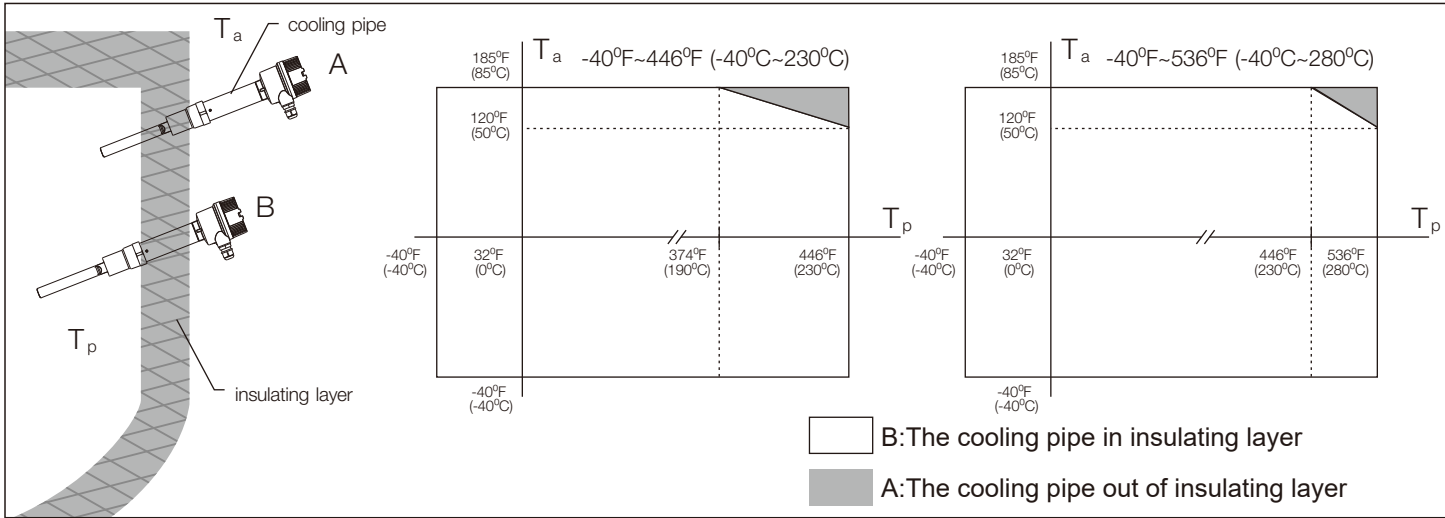
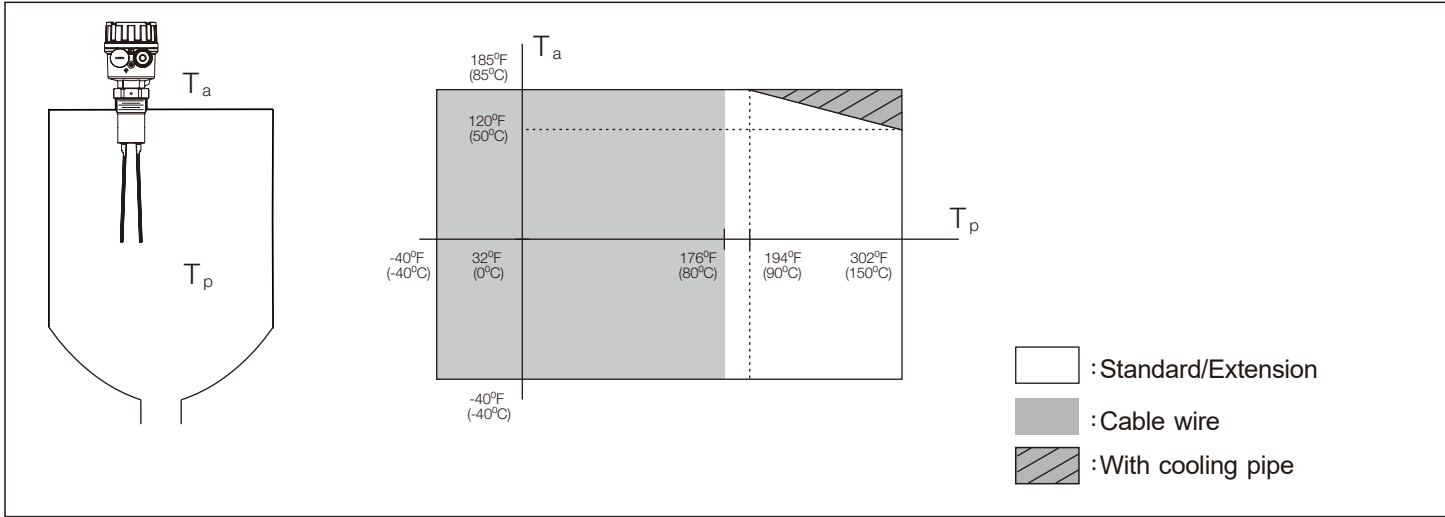
☀ : ON ⊘ : Blinking ○ : OFF | | : Relay ON | / : Relay OFF I_L : Load current

PANEL DESCRIPTION

Abb.	Functions	Description	Remarks
Test	Test Bottom	Reverse output signal	Reverse output signal can be used to provide a method for testing control equipment which is connected to sensor output
F.S.	Fail Safe	MAX: High MIN: Low	Includes high low fail-safe mode
D.T.	Delay Time	S: General settings L: Delay of 5 seconds	Material covered: 0.5s Material not covered: 150°C:£1.5s 230L/280LC:£2s L sets delay of 5s for covered/ uncovered
S.G.	Specific Gravity	H: 0.05 g/cm³ L: 0.01 g/cm³	High Density >0.05 g/cm³ Low Density >0.01 g/cm³
S.D.	Self Diagnosis	OFF ON	ON setting allows the sensor to detect fork abrasion or material build-up; SIG LED will flash if trouble exists
S.S.	Super Safe	OFF ON	When set ON Output 2 will be dedicated to indicate self-diagnostics alarm exists
S.I.	Signal Indicator	F.S.: failsafe mode O.S.: output status mode	F.S. (fail safe) selected = Normal / Alarm status; O.S. (relay output status) selected = Relay energized (on) or de-energized (off)



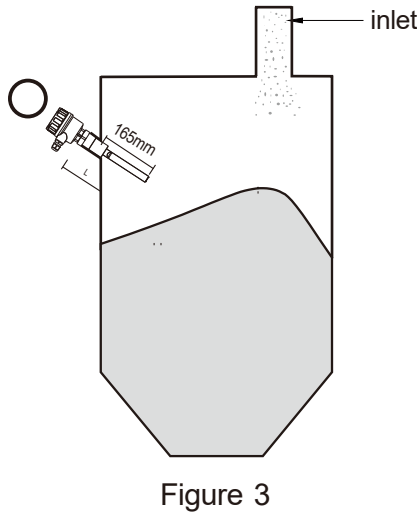
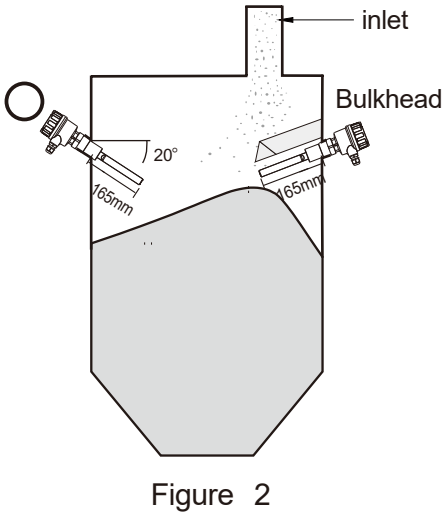
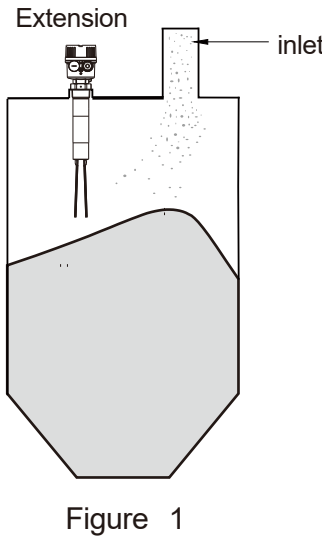
AMBIENT TEMPERATURE / PROCESS TEMPERATURE



- ※ ETFE Coating : T_p max.= 150°C
- ※ PTFE Coating : T_p max.= 230°C
- Product installation must ensure that the temperature at the connection flange does not exceed the maximum ambient temperature.

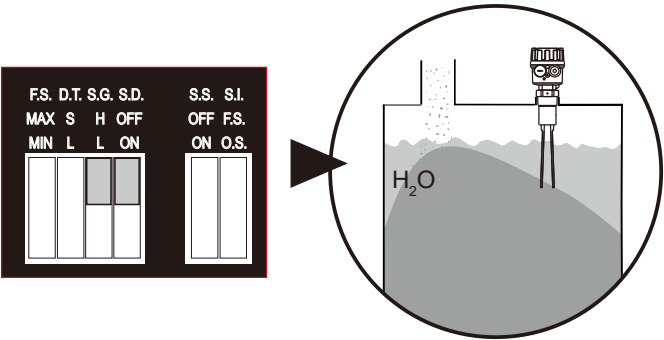
INSTALLATION INSTRUCTIONS

- I. .Top mounts (Figure 1)
 - ※ Keep away from the mouth when installing in order to not cause damage when the sensor bar is hit by the material. Take account of the angle problems when installing, to avoid the material splitting untouched with the sensor bar.
- II. Slide Mount (Figure 2)
 - Need to prevent the instrument be installed from the inlet to re-duce the risk of inflowing material damaging the probe. If it is inevitable, please install another protection cover above the instrument.
 - The best installation angle is leaning 15-20 degrees, as it can reduce the strike and the pile up.
 - The gate of the terminal box should be installed lower in order not to let the water get into and damage the circuit.
- III General Requirements
 - The lead-in of the wire terminal should correctly comply with and the nut should be tightly locked, to ensure the validity of the IP grade.
 - The wire should be installed downwards and again round it and get into the gate in order not let the rain into the box.
 - The total length of the wire should be >the length of the extended pipe + fork length 165mm.(Figure 3)
 - The maximum vertical stress that can be received by the Sensor bar is 177in.Lbs(20Nm)
 - Avoid twisting the box directly during installation and dismantling. Try to spanner tighten the nut.
 - Please avoid cutting the sensor bar or altering the size or specifications of the products on your own.
 - When carrying, avoid sizing tuning fork in order not to cause any damages.
 - When operating in the tub, avoid taking the tuning fork as the climbing ladder.



SEDIMENT DETECTION

- 1.Only sediment is detected.
 - Water-like liquids or entrained substances are not detected.
- 2.S.G. (Specific Gravity) to set to H position.
- 3.S.D. (Self Diagnostics) to be turn off.
- 4.SC352 cable wirid type is not suitable for Immersion.



NEPSI PRECAUTIONS FOR USE

- 1. GB/T 3836.1-2021 Electrical apparatus for use in the presence of combustible dust. Part 1: General requirements.
GB/T 3836.31-2021 Electrical Electrical apparatus for use in the presence of combustible dust. Part 31: Equipment dust ignition Protection by enclosure “t”.
- 2. Make sure there is no harmful gas (corrosive to aluminum alloy) at the installation site.
- 3. A grounding terminal is set on the shell of tuning fork level switch; adjoin it to the ground steadily during installation. The cable wire size is ≥4mm²
- 4. The sensor should be installed in Zone 20 & 21.
- 5. The operating temp. : -40°C ~ 85°C
- 6. The Maximum temperature of environment and medium, as well as the temperature class are as follows:

	Ex ta IIIC T95°C/ T130°C/ T136°C Da		
Ex marking	T95°C	T130°C	T136°C
Ambient temp.	- 40~+40°C	- 40~+75°C	- 40~+85°C
Process temp.	- 40~+40°C	- 40~+75°C	- 40~+85°C
Power cable temp.	- 40~+85°C	- 40~+120°C	- 40~+130°C

	Ex tb IIIC T80°C/ T95°C/ T130°C/ T160°C/ T240°C/ T290°C Db					
Ex marking	T80°C	T95°C	T130°C	T160°C	T240°C	T290°C
Ambient temp.	- 40~+70°C	- 40~+85°C	- 40~+85°C	- 40~+85°C	- 40~+85°C	- 40~+85°C
Process temp.	- 40~+70°C	- 40~+85°C	- 40~+120°C	- 40~+150°C	- 40~+230°C	- 40~+280°C
Power cable temp.	- 40~+95°C	- 40~+110°C	- 40~+110°C	- 40~+110°C	- 40~+110°C	- 40~+110°C

Model Number	Order Code
SC350	SCX3027D-ECFA *****
	SCX3027D-ECFA *****
	SCX3087D-HCFA *****
	SCX3097D-JCFA *****

Model Number	Order Code
SC351	SCX3007D-BCFA *****
	SCX3027D-FCFA *****
	SCX3087D-ICFA *****
	SCX3097D-KCFA *****

- ※ Actual endurable temperature of the product according to the latest product catalog released by FineTek; should be in accordance with explosion-proof certification.
- 7. When installing in combustible dust environment, please check the cable wire in use must be approved by legal inspection agency ; comply with the standard: GB/T 3836.31-2021□GB/T 3836.1-2021; Explosion proof class NEPSI Ex ta IIIC T95°C ...T136°C Da , Ex tb IIIC T80°C ...T290°C Db ; thread connection in require is 1/2” NPT ; IP66 protection, in order to use in hazardous area.
 - 8. Product in installation or maintenance should be in accordance with the rule of “don’t switch on under a combustible dust environment”
 - 9. Please do not change any components of the instrument on his/her own. In case of any problem occurs, please consult with the manufacturers for technical supports.
 - 10. When installing, using and maintaining the products, the user should strictly comply with the instructions and the following standard: GB/T 3836.13-2021 Explosive atmospheres. Part 13.: Equipment repair, overhaul and reclamation. GB/T3836.15-2017 Explosive atmospheres--Part 15: Electrical installations design, selection and erection.
GB 50257-2014 Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineeringGB 15577-2018 Safety regulations for dust explosion prevention and protection
 - 11. Prohibit any process will generate the brush discharge with propagation form, for instances, dust particles in fast move, powder transmission and Spraying process in Electrostatic coating.
 - 12. Please do not use dry cloth to clean up due to Static electricity.

IECEx PRECAUTIONS FOR USE

- 1. There are internal/external ground terminals in the housing. Connect at least 4 mm² wire grounding cable to the grounding screw. Install the housing properly. The power cord has a wire diameter of at least 1.25 mm². (The cross-sectional area of the grounding conductor should always be greater than or equal to the cross-sectional area of the power cord.)
- 2. The sensor should be installed in Zone 20, and the rest in 21 or 22.
- 3. When tuning fork level switch is installed im explosive dust atmosphere, cable gland or blanking plug, complying with IEC 60079-0:2011 and IEC 60079-31:2013 with corresponding type of protection Ex ta IIIC Da or Ex tb IIIC Db and with degree of protection IP66 shall be adopted.
- 4. The relation between applicable ambient temperature, temperature class and process temperature is listed as following.

	Ex ta IIIC T95°C/ T130°C/ T136°C Da		
Ex marking	T95°C	T130°C	T136°C
Ambient temp.	- 40~+40°C	- 40~+75°C	- 40~+85°C
Process temp.	- 40~+40°C	- 40~+75°C	- 40~+85°C
Power cable temp.	- 40~+85°C	- 40~+120°C	- 40~+130°C

	Ex tb IIIC T80°C/ T95°C/ T130°C/ T160°C/ T240°C/ T290°C Db					
Ex marking	T80°C	T95°C	T130°C	T160°C	T240°C	T290°C
Ambient temp.	- 40~+70°C	- 40~+85°C	- 40~+85°C	- 40~+85°C	- 40~+85°C	- 40~+85°C
Process temp.	- 40~+70°C	- 40~+85°C	- 40~+120°C	- 40~+150°C	- 40~+230°C	- 40~+280°C
Power cable temp.	- 40~+95°C	- 40~+110°C	- 40~+110°C	- 40~+110°C	- 40~+110°C	- 40~+110°C

Model Number	Order Code
SC350	SCX3022D-ECFA *****
	SCX3022D-ECFA *****
	SCX3082D-HCFA *****
	SCX3092D-JCFA *****

Model Number	Order Code
SC351	SCX3002D-BCFA *****
	SCX3022D-FCFA *****
	SCX3082D-ICFA *****
	SCX3092D-KCFA *****

- ※ Actual endurable temperature of the product according to the latest product catalog released by company; should be handled in accordance with explosion-proof certification.
- 5. Observe the warning:”DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT”, “POTENTIAL ELECTROSTATIC CHARGING HAZARD-SEE INSTRUCTIONS”.
 - 6. Minimum service temperature of cable for field wiring shall be much than the value in above table.
 - 7. The installation of product have to ensure the temperature in the flanged joint between medium and air is not much than maximum ambient temperature.
 - 8. The user should not change the parts by themselves. In case of any problems, consult with the manufacturers in order to avoid any damages.
 - 9. The user should check if the screw is effectively fixed. If loose, contact the manufacturer.
 - 10. The locking screw of the junction box needs to be locked tightly after the wiring is completed. Can not be convex.
 - 11. If the product is dirty, wipe it with a damp cloth.



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08-SC35-B8-EM,02/13/2024

