

# TK TECHNICAL GUIDANCE

## NEW GENERATION OF TORQUE TUBE

### INTELLIGENT FST-3000 series

UP-GRADED!

### TORQUE TUBE, DISPLACE TYPE LEVEL INDICATOR / TRANSMITTER

## GENERAL

FST-3000 is a torque tube, displacement type level indicator / transmitter with intelligent data processing function. Adding to all features of existing torque tube type level transmitters, highly advanced signal processing unit offers high function and high accuracy as well as function of field adjustment of density, range etc.

The measured data is indicated on LCD display and output by DC4 ~ 20mA signal. 4 point level alarm contact is optionally available. Also, remote control, function check and monitoring etc. can be done by HART digital communication.

Several different material selection is ready to meet various applications such as high temperature application of boilers as well as low temperature applications upto minus 196°C of liquefied gases.

Intrinsically safe version is newly added.

## STANDARD SPECIFICATION

Detection Method	: Torque Tube Type Displacer
Measuring Range	: Min. 0 ~ 300mm Max. 0 ~ 3000mm
Other measuring ranges on request. Consult factory for details.	
Liquid density	:
1) For level measurement	: 0.2 ~ 1.5
2) For interface measurement	: Difference of density of 2 liquids : To be more than 0.1
3) Density measurement	: Min. density span 0.2
Other density range on request. Consult factory for details.	
Available Pressure class	:
ANSI#150, #300, #600, #1500 and #2500 class	
Fluid Temp. Range	: -196 ~ +400°C
Installation	: Tank Top Installation or Tank Side Installation
Connection Size	: External chamber type: 1 1/2" or 2" flange Internal chamber type: 4" flange
Amb. Temp.	: For Weather proof (W) and Pressure tight ex-proof (E) -25 ~ +60°C
For intrinsically safe (S1 and S2) -25 ~ +60°C	
Available Material	:
1) Torque tube	SUS316L, Hastelloy C-276, Inconel
2) Bonnet	SCPH2,SCS13A, SCS14A, SCS16A,Titanium
3) Chamber	Carbon steel, SUS304, SUS316, SUS316L, Titanium, Hastelloy C-276, Monel, PVC
4) Displacer	SUS304, SUS316, SUS316L, Titanium, Hastelloy C-276, Monel, PVC
5) Indicator	AC2A
Local Indication	: By 2 line LCD indication (Height 12.7mm) Line 1: Function Indication (4 digit) Line 2: Data Indication (4 digit)
Output	: DC4 ~ 20mA, 2 wire Supply Voltage (UB) and max. load (Ra) 1) FST-3000W and FST-3000E UB-DC 12.2 ~ 40V Ra=46.3UB - 565 (Ω) ex. at UB=24V, Ra=546Ω



at UB=40V, Ra=1267Ω

2) FST-3000S1

UB-DC12.5 ~ 26V, Ra=1kΩ (ISOLATION BARRIER)

3) FST-3000S2

UB-DC11.0 ~ 26V

Ra=650Ω (FOR ISOLATION BARRIER)

Ra=(UB-11)/22 [kΩ] (FOR ZENER BARRIER)

ex. at UB=24V, Ra=591Ω

## Communication

Protocol : HART™

Transmission : FKC (Frequently irregular system)

•Communication needs the load resistance beyond 250Ω

## Alarm Contact (Option) : SPST relay contact, Max. 4 points

Capacity : AC 250V, 3A, DC 30V, 3A

•Optionally available only for Weather proof version (FST-3000W) and Pressure tight ex-proof version (FST-3000E). NOT available for intrinsically safe version and HART communication Foundation.

•Separate power supply of DC24V is additionally required than signal line. One cable entry will be added. Alarm action to be specified (Hi or Lo).

Accuracy : ±0.5% F.S. (For level measurement)  
(Including Linearity and Repeatability)

## Enclosure

- 1) Weather Proof (IP65 eq.)
- 2) Pressure Tight Explosion Proof (ExdCT6)
- 3) Intrinsically Safe (Ex ia IIC T4)

Cable Entry : Std. 1 x G1/2  
Option 1 x 1/2NPT

For alarm contact version, 1 cable entry (Max. G3/4 or 3/4NPT) will additionally be provided.

## Intelligent Data Setting Function :

Ex-proof Built-in Key Board provided for data setting (Data setting can be conducted in Hazardous area during operation.)

## Setting Items :

Burn-out setting, Density, Alarm point (Max. 4 points), Alarm reset span, Alarm action, Analog output direction, Indication unit (mm, % or density), Analog output test, Indication test, others

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JUN., 2000

# Intelligent Fst 3000 Series Tokyo Keiso

**DP Hallahan**



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