TECHNICAL GUIDANCE

Liquid level is outputted by DC4~20mA analog signal.
Different types of material are available!

FP-7100 Series

LEVEL TRANSMITTER

OUTLINE

FP-7100 is a magnet float type level transmitter. The liquid level is detected by float and converted into DC4~20mA current signal. The electronics are isolated from internal tank atmosphere by stainless steel or other pipe materials for safety.
FP-7100 is suitable for tough applications such as inflammable, corrosive liquids or pressurized and vacuum tanks.
In addition to standard material of stainless steel, PVC, PP and PFA lined versions are available for corrosive applications.

STANDARD SPECIFICATION

Measuring objects : Liquids with density of 0.5g/cm^3 or more
(Max. viscosity 600mPa·s and without sticking and crystallization. Type of float may be limited min. density of application liquid. Refer to FLOAT AVAILABILITY LIST for details.)
Interface measurement is also applicable.
(Density difference 0.2g/cm^3 or more)

Measuring range : Min. 0~250mm
Max. 0~5000mm (Flameproof version is Max.4000mm)
Refer to DIMENSIONS for details.

Max. pressure :

Stainless steel float	1MPa
PVC,PP and PFA lined float	0.2MPa
Titanium float	1.5MPa and 2.4MPa

Refer to FLOAT AVAILABILITY LIST for details.

Temp. range : 0~100°C (0~60°C for PVC float)
AMB temp : −10~60°C (−10~55°C for Flameproof version)
Enclosure : Weatherproof (equiv. to IP65),
Flameproof (TIIS Exd IIB T6)
(Certificate No. TC14701~TC14703),
Intrinsically safe (Ex ia IIC T4)
(Certificate No. TC16353)
Output : DC4~20mA
Max.load 500Ω
Output accuracy : ±(20+0.002H) mm H: Measuring span (mm)
Cable entry : G3/4 x1 (Standard)
Process connection :
Standard : Tank top installation through flange JIS10K, ANSI#150, others
Minimum size of flange:3" (80mm)
Refer to FLOAT AVAILABILITY LIST for flange size

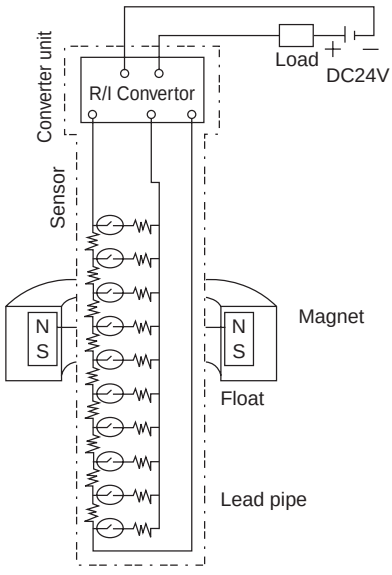
Material availability :

Flange	CARBON STEEL, SUS304, SUS316, SUS316L, PVC, PP, PFA
Lead pipe	SUS304, SUS316, SUS316L, PVC, PP, PFA
Float	SUS316, SUS316L (std.), PVC, PP, PFA, Titanium
Housing	ADC12

Refer to MATERIAL CONSTRUCTION for details.

OPERATION PRINCIPLE

A position sensor which consists of fine resistors and reed switches is located in the lead pipe. The position of float which corresponds to liquid level is converted into resistance value. Such resistance value is converted into analog current signal by R/I converter to output in DC4~20mA. The output loop is 2-wire system and no additional power supply line is required.



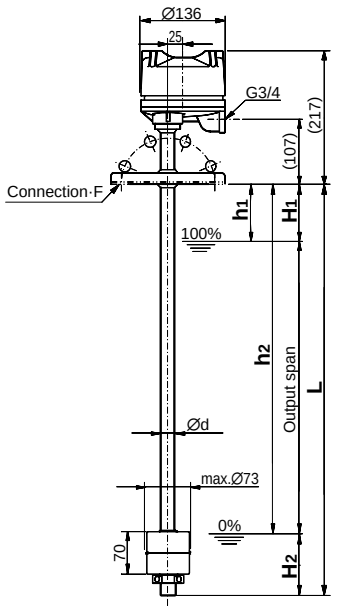
MODEL CODE

FP-71				—			Description
Flange size*1	3						3" (80mm)
	4						4" (100mm)
	5						5" (125mm)
	6						6" (150mm)
	8						8" (200mm)
	Z						Others
Flange rating		1					JIS10KRF
		2					JIS10KFF
		3					ANSI#150
		4					JPI#150
		5					JIS5KFF
		Z					Others
Enclosure			W				Weather proof
			E				Flameproof (TIIS Exd IIB T6)
			S				Intrinsically safe Ex ia IIC T4 *2
Lead pipe, Flange Material					1		Refer to MATERIAL CONSTRUCTION
					2		
					3		
					4		
					5		
					6		
					7		
					Z		Others
Float type						1	Refer to FLOAT AVAILABILITY LIST
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						Z	Others

*1 Refer to FLOAT AVAILABILITY LIST and select suitable size of flange.

*2 In case of intrinsically safe version, use it combining with a safety barrier. It is recommended to be combined with MTL728+ (MTL made) as the standard.

DIMENSIONS



h1: Please indicate distance between flange face and 100% liquid level

h2: Please indicate distance between flange face and 0% liquid level

Refer to the FLOAT AVAILABILITY LIST for the size of H1 and H2.

Short output span version can be also manufactured. The available short span range is shown as follows.

Guide pipe length L (mm)	Possible shortest span (mm)
440~954	250
955~2954	700
2955~5000❇	2000

❇ Flameproof version is L=4000mm (Max.)

Note

Cable gland is supplied with the flameproof version as standard as the flameproof approval includes the cable gland. Therefore, cable gland of flameproof packing type will be attached as standard.

Standard cable outer diameter: Ø7 to Ø10.0 mm

Please inform us of the cable outer diameter if it is out of standard size.

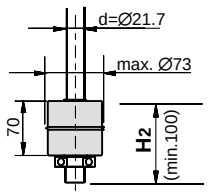
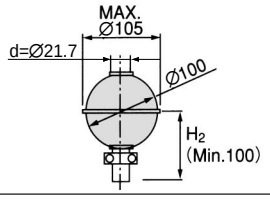
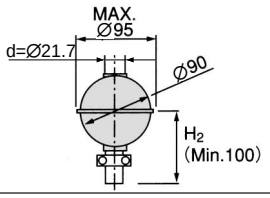
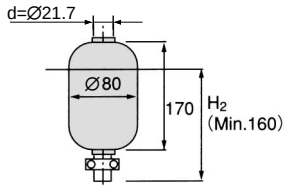
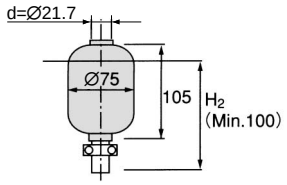
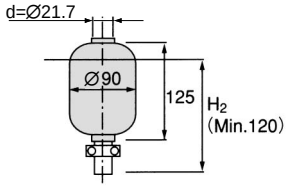
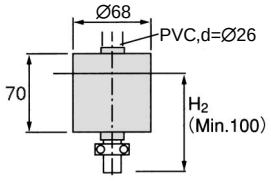
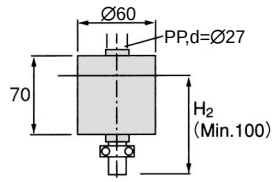
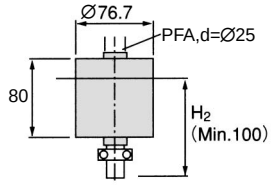
*Applicable cable outer diameter: Max. Ø16 mm

MATERIAL CONSTRUCTION

Material code / Part name	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
Flange	CARBON STEEL	SUS304	SUS316	SUS316L	PVC	PP	PFA/SUS
Lead pipe	SUS304	SUS304	SUS316	SUS316L	PVC/SUS	PP/SUS	PFA/SUS
Stopper	SUS316	SUS316	SUS316	SUS316L	PVC	PP	PFA
Available float type	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	7	8	9

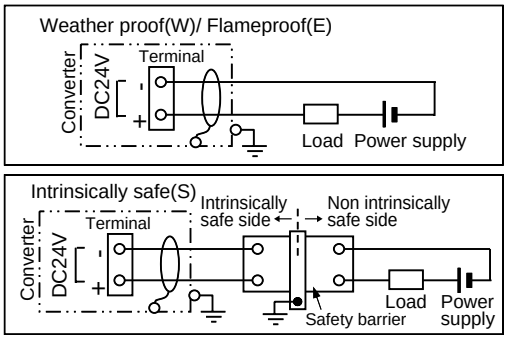
* Housing material is ADC12 (Aluminum di-casting) for all material codes.

FLOAT AVAILABILITY LIST

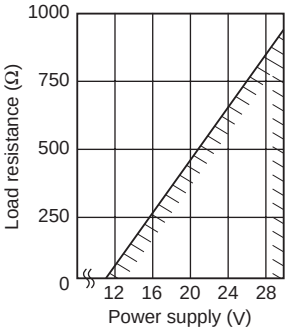
CODE	DIMENSION (DEAD BAND)	MIN. H_1 (mm)	MATERIAL	MIN. DENSITY (g/cm^3)	MAX. PRESS	MIN. NOZZLE FLANGE SIZE
1		90	SUS316L (Standard)	0.72	0.2MPa	3"
2		90		0.6	1.0MPa	5"
3		90		0.7	1.0MPa	4"
4		150		0.73	1.0MPa	4"
5		90	Titanium	0.8	1.5MPa	3"
6		90		0.5	2.4MPa	4"
7		90	PVC	0.85	0.13MPa	3"
8		90	PP	0.8	0.13MPa	3"
9		90	PFA (The inside is filled up with NBR.*)	0.95	0.2MPa (Vacuum pressure is not acceptable.)	3"

❇ It is also possible not to use NBR according to conditions.

WIRING



Power supply and load resistance



ORDERING INFORMATION

Specify the following for order or inquiry ;

- Model code FP-71□□□-□□
  - Liquid name _____
  - Design pressure (MPa) _____
  - Density (g/cm³) _____
  - Guide pipe length L _____ mm
  - 100% output point h1 _____ mm
  - 0% output point h2 _____ mm
  - Cable outer diameter (Flameproof type) ∅_____ mm
- Other instructions/special notice if any

STANDARD ACCESSORIES

- Safety barriers

  Although it is also possible to combine with the barriers other than MTL728+, please use the barriers which satisfy all the following conditions.

  1. The certified barriers
  2. <Rating>

     Protection class:ia

     Group:IIC

     Maximum voltage:DC28V

     Maximum current:DC93mA

     Maximum electric power:650mW

     Inductance>2.23mH+LW

     (LW= The value for the part of electric wire of intrinsically safe circuit)

     Capacitance>0,021μF+CW

     (CW= The value for the part of electric wire of intrinsically safe circuit)

*Specification is subject to change without notice.

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