ZUT Intelligent Displacer Liquid Level Transmitter

Description

ZUT intelligent displacer level transmitter adopts stress measuring method by applying the lever principle to acquires the signal being consistent with fluid level change and being measured through high precision spectacles cantilever stress sensor. Via being processed by A/D converter, MPU and D/A converter, the measured signal is transferred into 4-20mA analog signal and digital signal that is conformity with HART PROTOCOL and is superimposed on the analog signal, and then the processed signal is output. It is provided with the function of highly accuracy for linearity treatment, strong interfere- resistance, remote configuration, checking, maintenance and adjustment. This meter can work together with equipment being conformity with HART protocol in the field bus so as to realize the digital two-way communication, process checking and automatic controlling. It also is compatible with analog meter. It features pretty external appearance as its fashionable shell structure design. This structure makes each chamber separately to make the meter more reliable and safe. Also the meter is added a precise static pressure adjustment device so as to keep high precision and reliability. Both shell structure design and the static pressure adjustment device have been granted the national patents.

The patent number for external appearance design: 99 3 21507.6;

The patent number for static pressure adjustment device: 99 2 23728.9;

Main performances and Qualifications

Performances

LCD display: field display related variables;

Local and remote configuration function: through the magnetic switch in the transmitters head, or a handle communicator or a computer with commissioning software to read and write and configure all kinds of process variables, the signal (4～20mA)on which every parameter and variables being conformity with HART protocol;

Self-diagnosis function: alarm when the fluid level exceeds the range and various failures occur;

Shock resistance, electromagnetic interference resistance;

Zero point and full scale adjustments, no interference between the two kinds of adjustment;

Protection grade: IP65;

Flange standard: JB/T82.1-94; JB/T82.2-94. (please note if other standard being adopted)

Qualifications

Operating voltage: DC24V;

Input impedance: > 100MΩ;

Load Resistance: ≤600MΩ;

Nominal Pressure: 2.5, 4.0, 6.4MPa;

Precision: 0.5% FS, 1.0% FS;

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Operating Temperature: ≤100° C (without radiating fin) ； ≤400° C (with radiating fin);
Damping Period: 0～199 second
Power supply inlet: M20×1.5.

Explosion-proof and Guard Grating

Explosion-proof type	Intrinsically safe explosion-proof
Explosion-proof sign	ia Ⅱ CT_5
Explosion-proof certificate number	CYB 99270

Qualified and Compatible Guard Grating

Qualified and Compatible Guard Grating	
Shanghai Intrinsic Explosion-proof instrument System Co. Ltd	LS4041-E_X
Shanghai Automation Instrument Research Institute	GS8041-E_X
Longfei Group Corporation	LF1045
Britain	MTL3046B MTL5042 MTL706$^+$
Germany P+F	KFD2-STC3-E_{X1}
Dandong Top Electronic Instruments Co., Ltd	TP5041 – Ex TP5045 - Ex

Measuring Range and Medium Density

Measuring Category	Measuring Range (mm)	Medium Density
Liquid Level	300、500、600、800、1500、2000、2500	0.3～1.6g/cm^3
Interface Level	500、600、800、1000	Density Difference ≥0.1g/cm^3
	1500、2000、2500	Density Difference ≥0.2g/cm^3
Density	Same as the interface level measuring range	Density Difference ≥0.1g/cm^3

Operation principle

A displacer is hung on the end of the lever. A buoyancy force F1 that change consistently with the level change applies on the displacer. Then F1 is transmitted and applies on lever 1 (see the schematic diagram). Lever 1 with the shaft gland diaphragm (which functions both as the levers' supporting point and as a gland seal) as a supporting point transmits the F1 to lever 2 then produce F2. An end of the lever 2 is connected with a weight sensor that transfers F2 into electric signal. Via being processed by A/D converter, MPU, D/A converter, the signal is transmitted out.
.(see figure 1, figure 2)

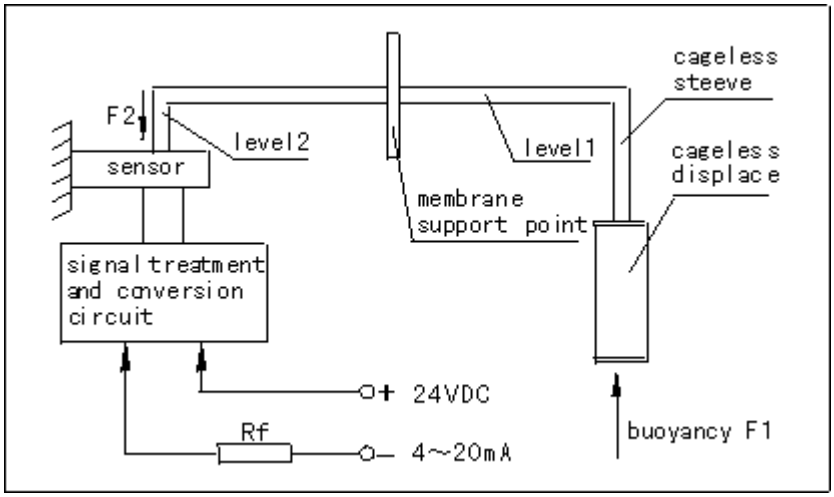


figure 1

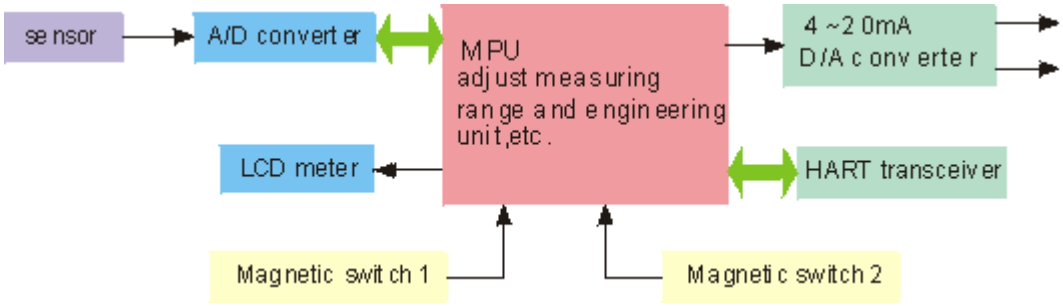


Figure 1 electric principle frame chart

Product Model Designation forming Sheet

Model	Specification code								Contents
ZUT-									Intelligent Displacer Transmitter
	1								Level Measurement
	2								Interface Measurement
	3								Density Measurement
		A							Top-Side Mounted
		B							Top-Bottom Mounted
		C							Side-Side Mounted
		D							Bottom-Side Mounted
		E							Top Mounted
		F							Side Mounted
		S							Top-Bottom Mounted
			1						Nominal Pressure PN2.5MPa
			2						Nominal Pressure PN4.0MPa
			3						Nominal Pressure PN6.4MPa
				/					
					i				Explosion-proof type: intrinsically safe ex-proof

						T			Liquid Contacting Material: Carbon Steel	
						H			Liquid Contacting Material: 1Cr18Ni9Ti	
							D		Measured Fluid Temperature: ≤100oC	
							G		Measured Fluid Temperature: ≤400oC	
								□	Fluid Density: （0.3～1.6g/cm3）	
Measuring Range	1	2	3	4	5	6		7	8	L
	300	500	600	800	1000	1500		2000	2500	Non-standard Measuring Range
Additional Code						F	Flange joint with steam tracing DN15, Pn2.5			
						Z	Thread joint with steam tracing ZG1/2″			

Example : ZUT-2C3/iTD0.8-1.0/4F Intelligence Displacer Level Transmitter : measuring interface level, side-side mounted, nominal pressure is 6.4MPa, intrinsic explosion-proof, material for measuring chamber is carbon steel, measured fluid temperature≤100° C, two kinds of fluid densities are 0.8g/cm^3 and 1.0g/cm^3 respectively, measuring range is 800mm, flange joint with steam tracing.

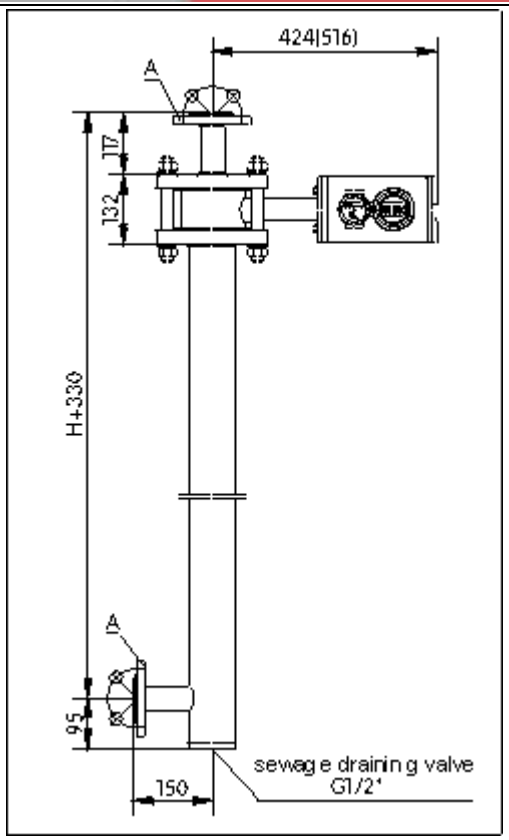
Notes: Please note the measuring range, when choose L (non-standard measuring range).

Outside Drawings and Installation Dimensions

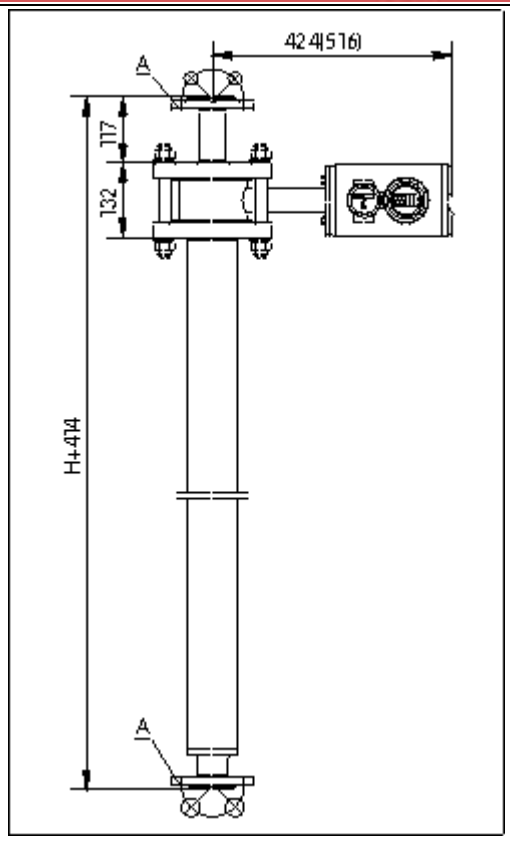
Descriptions for the flanges in the form

Flange Code	Nominal Diameter DN(mm)	Nominal Pressure PN (MPa)	Flange Style	Standard
A	40	2.5	Plate flange	JB/T82.2-94
		4.0、6.4	Convex flange	
B	40	6.4	Concave flange	
C	15	2.5	Plate flange	

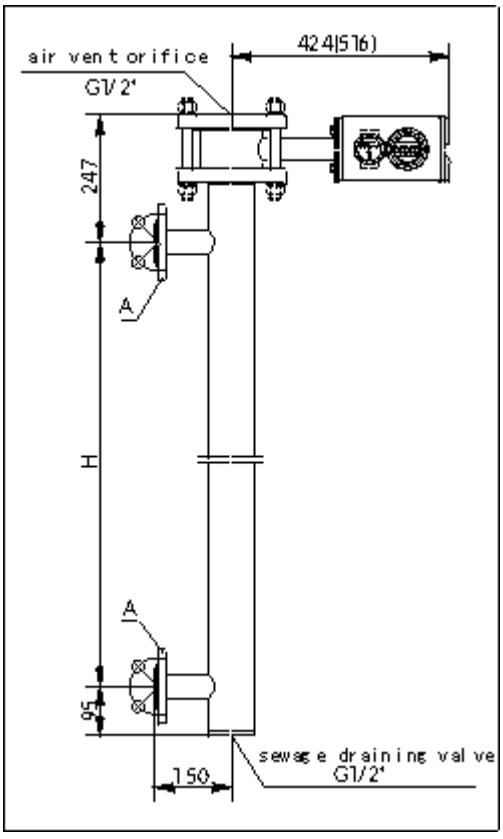
Note: The dimensions in brackets are for the products with steam tracing, H represents the ranges



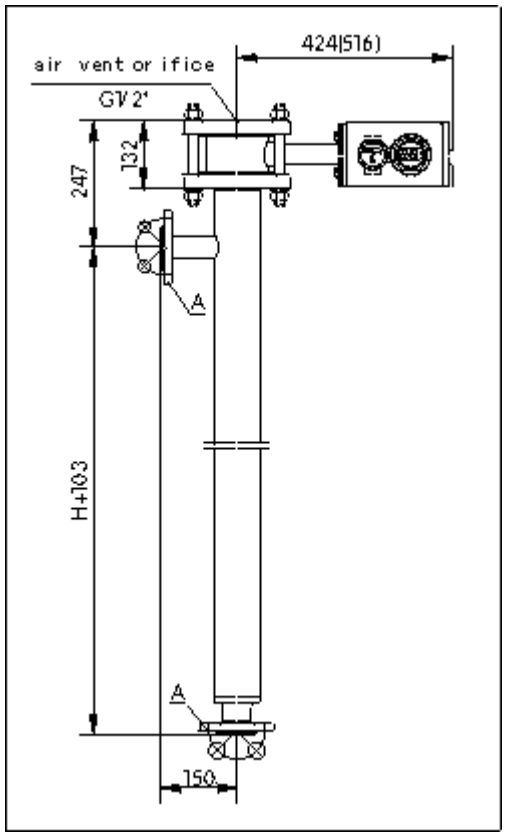
A Top-Side Mounted



B Top-Bottom Mounted



C Side-Side Mounted



D Bottom-Side Mounted

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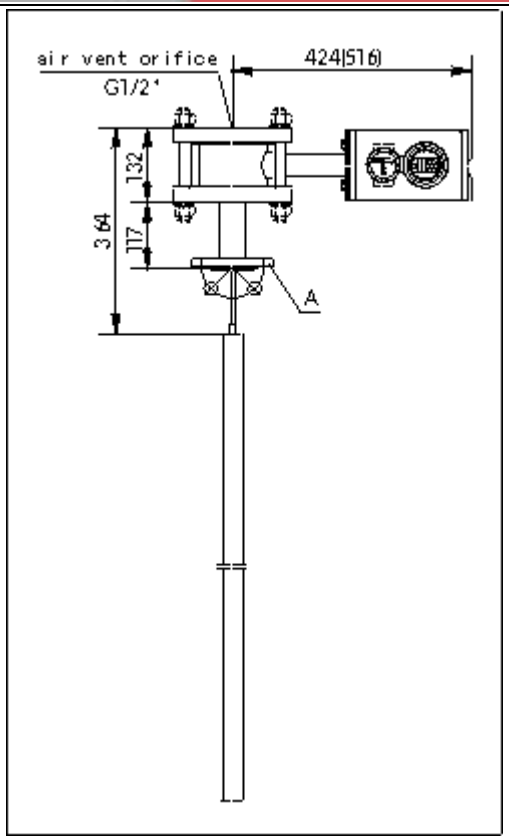
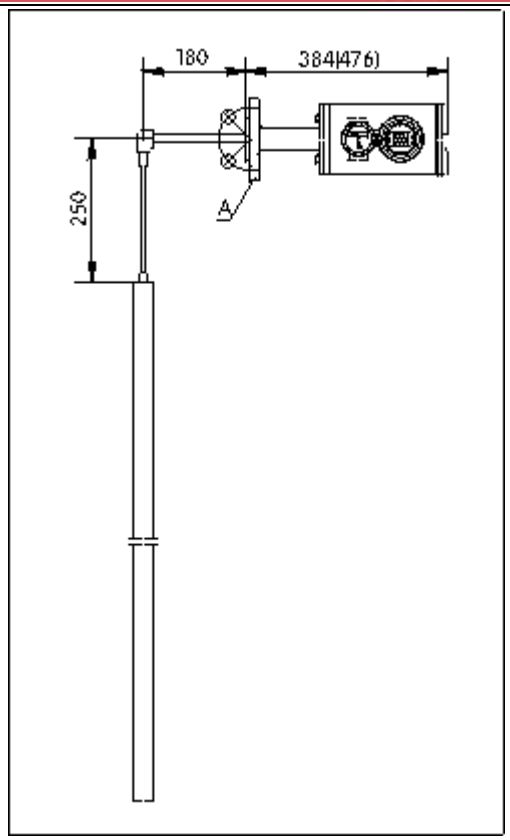
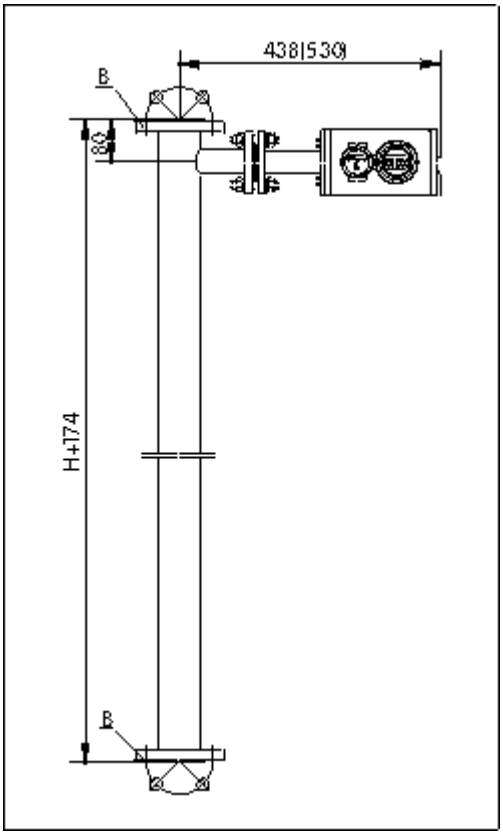


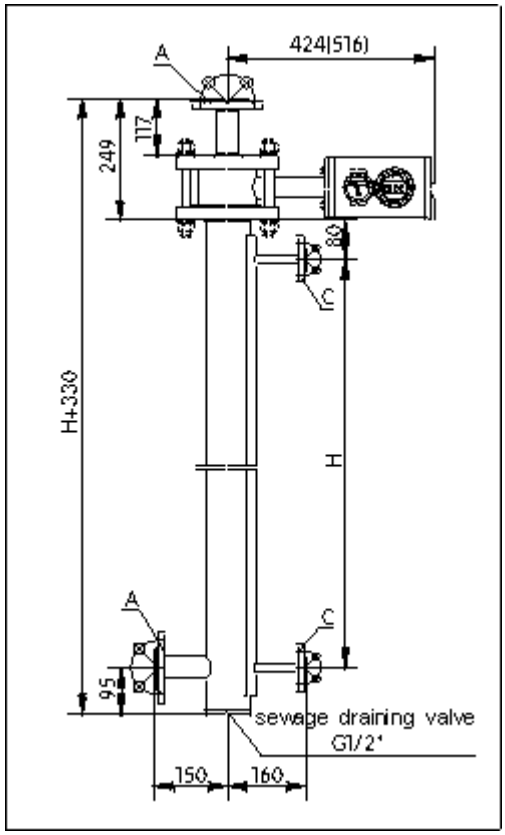
E Top Mounted



F side Mounted



S Top-bottom Mounted



A Top-side Mounted with Steam Tracing

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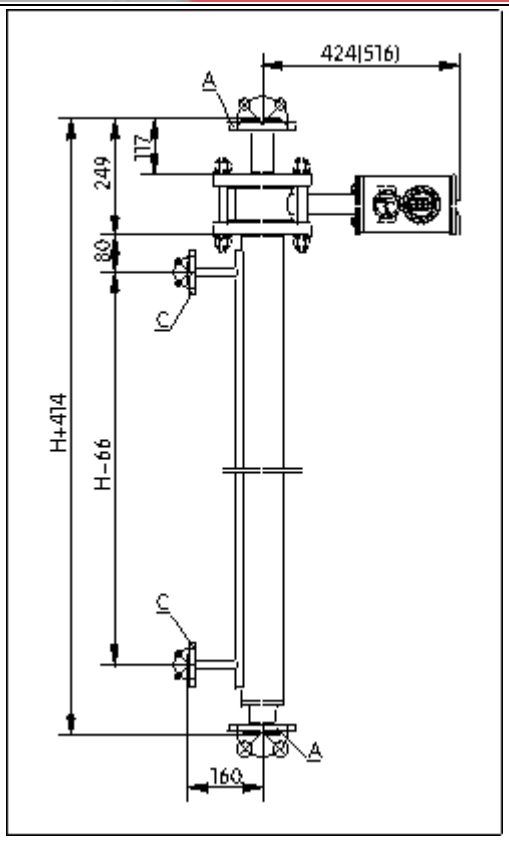
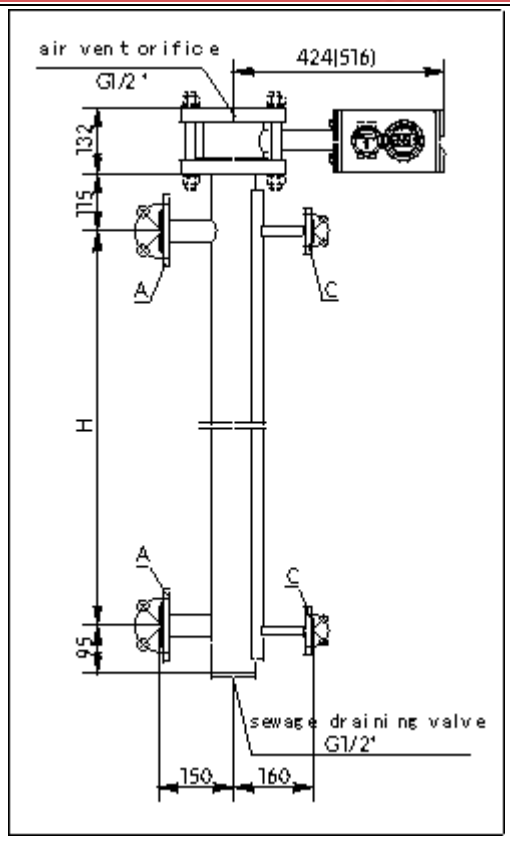
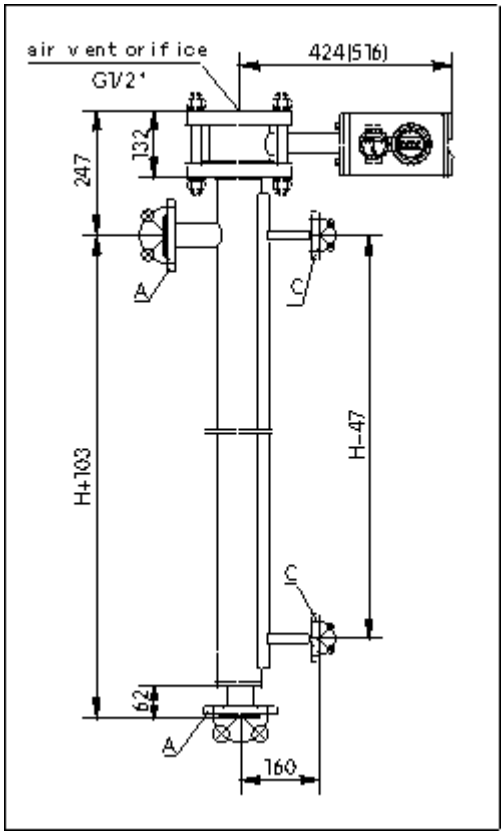


B Top-bottom Mounted with Steam Tracing



C side-side Mounted with Steam Tracing



D Bottom-side Mounted with Steam Tracing

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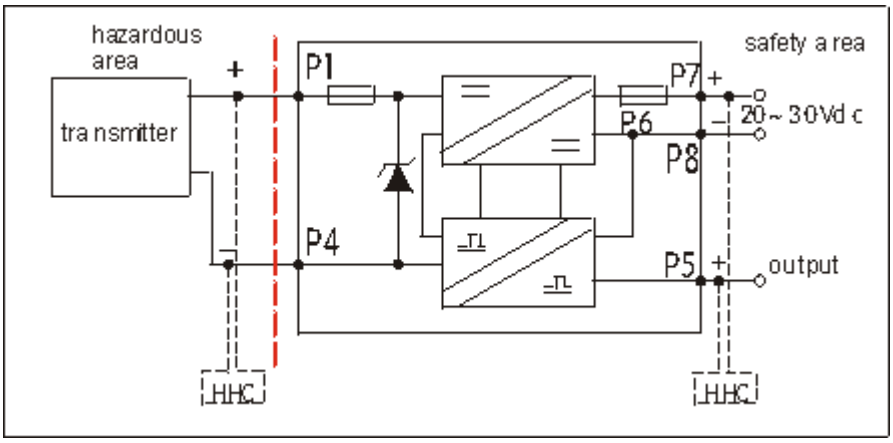


Figure 3 Electric system schematic diagram

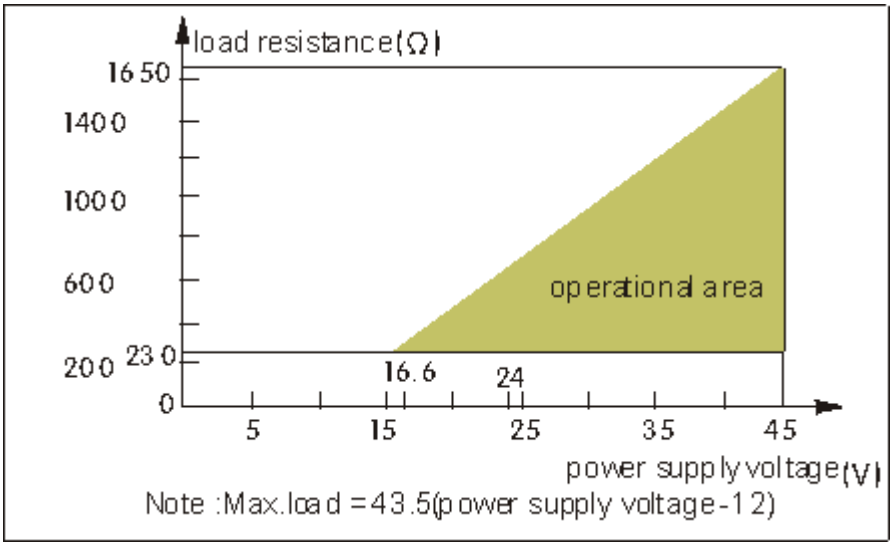
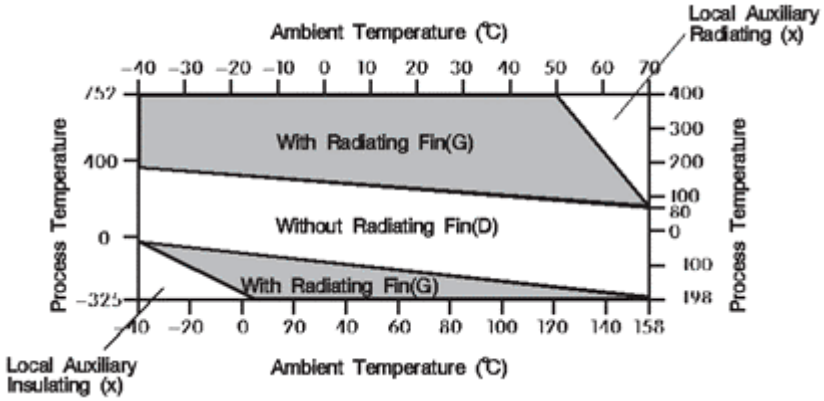
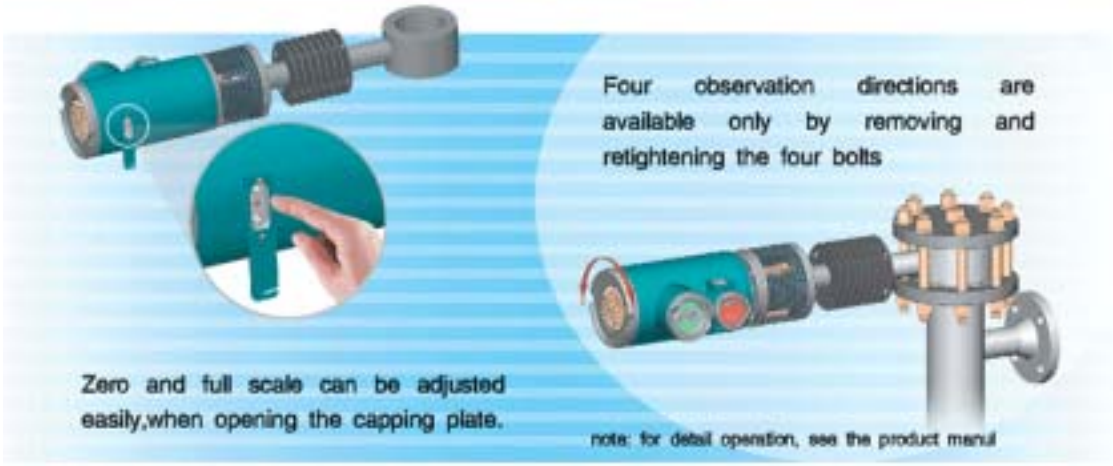


Figure 4 load character diagram



Note: If ambient dew-point temperature is higher than the process temperature Ice formation will cause instrument failure and decrease of effectivity of the insulator.

Figure 5: Look up table for transmitter head and ambient temperature and procedure temperature.



Order requirements

1. Please fill in the purchasing form correctly according to the product model designation forming sheet.
2. Please give the information beyond the product model designation forming sheet:
   Operating pressure;
   Brand number of the special material that will contact the fluids;
   Tag number;
   Accuracy (the accuracy will be 1.0% FS without note).

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