MODEL MS MAGNETOSTRICTIVE LEVEL MEASUREMENT

Features
- High Accuracy: ±1mm or 0.1% F.S. for SS float
  ±2mm or 0.2% F.S. for PVC float
- 4 to 20mA output
- Works in a wide range of liquids

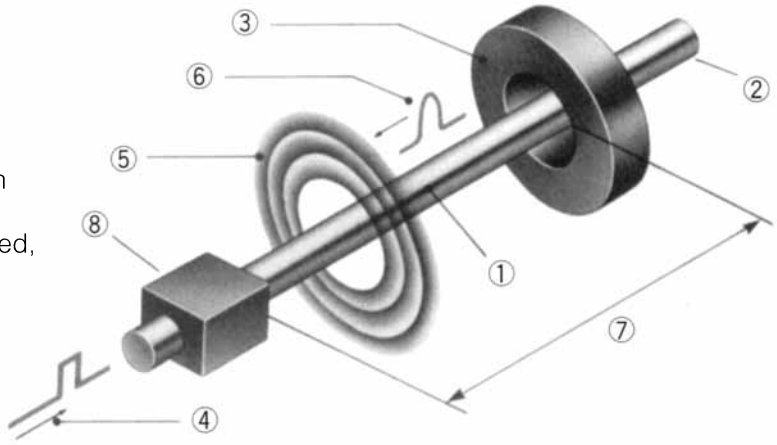
Approval
Ex ia II CT5

General Description
The MS series, magnetostrictive level measurement, is especially designed for precise measurement. With its high accuracy of ±1mm or ±0.1% F.S. for SS float and ±2mm or ±0.2% F.S. for PVC float, the MS is ideal for continuous level monitoring for beer and other beverages, pharmaceuticals, etc.

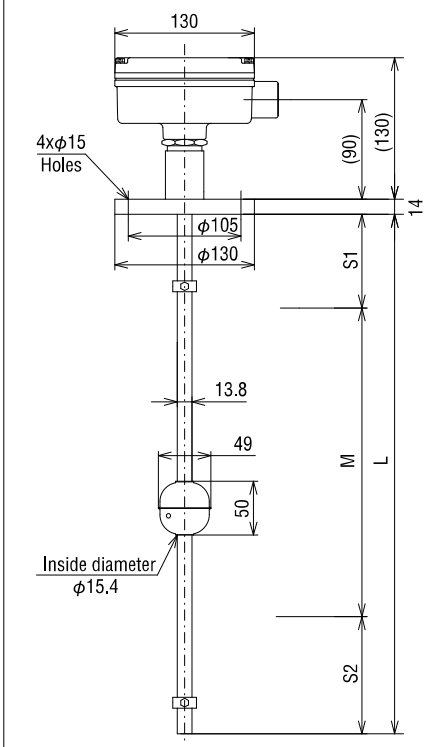
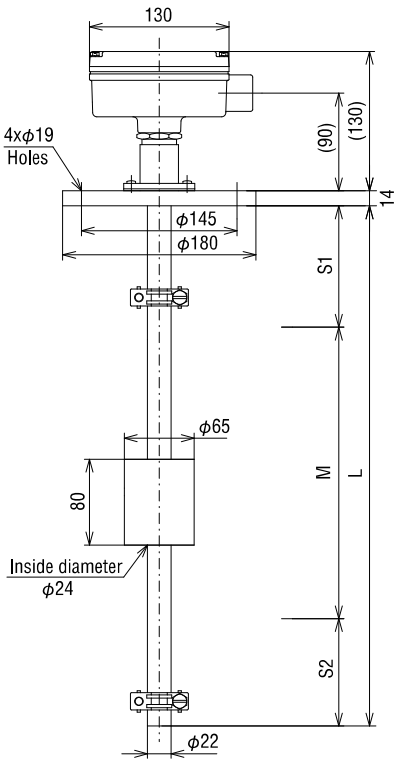
We recommend connecting with power unit of PU2000 for stable operation.

Technical Note
The safety barrier must be connected between sensor and controller for Intrinsically Safe. MTL722+ (Cooper Industries plc) is recommended, prepared in locally.

Operational Description
The MS series consists of a magnetostrictive wire ① in the stem ② and a permanent magnet inside the float ③. The float is the only moving part which travels vertically on the stem. Once a pulse current ④ is induced from the end of the magnetostrictive wire, a tubular magnetic field emanates ⑤. As the float travels, torsional vibration ⑥ is launched by the interaction between the float magnetic field and the magnetostrictive wire. The float position is determined by measuring the lapse of time ⑦ from the inducing of a pulse current to the return of the torsional vibration to the pick-up (⑧).

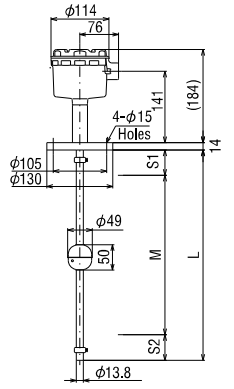
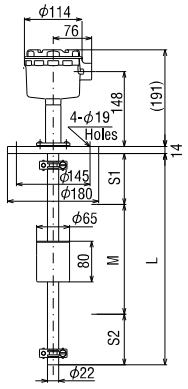
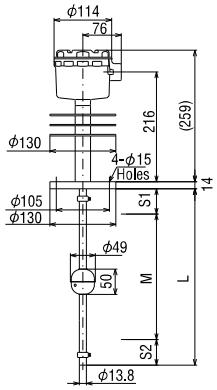


Specifications

Model		MS210S	MS210V
Description		Integral	
Drawing			
Mounting		JIS5K50A	JIS5K80A
Supply Power		24V DC ±10% 110mA Max.	
Power Consumption		Approx. 7.5W Max.	
Output Signal		4 to 20mA DC	
Load Resistive		600 Ω Max.	
Operating Temperature	Housing	0 to 50˚C	0 to 50˚C
	Wetted part	0 to 80˚C	0 to 50˚C
Maximum Pressure		500 kPa	200 kPa
Maximum Humidity		85% RH	
Minimum Specific Gravity		0.8	
Accuracy		±1mm (Measuring length≦1000mm) ±0.1% (Measuring length＞1000mm)	±2mm (Measuring length≦1000mm) ±0.2% (Measuring length＞1000mm)
Material	Housing	ADC12	
	Flange Stem*	304SS	PVC
	Float*	316SS	PVC
Maximum Length of Stem		3000mm	
Minimum Length of S1		50mm	100mm
Minimum Length of S2		50mm	100mm
Cable Entry		G3/4	
Protection		IP64	
Recommended Cable		CVVS (3-core, shielded cable)	

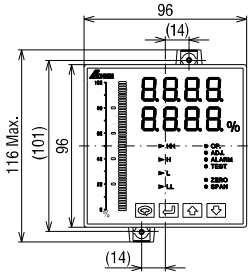
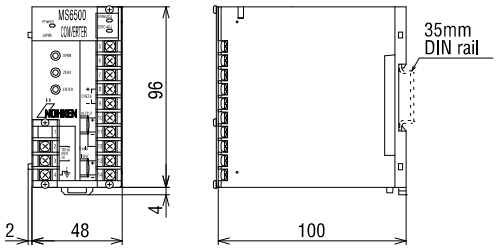
*Other materials are available.

Sensor

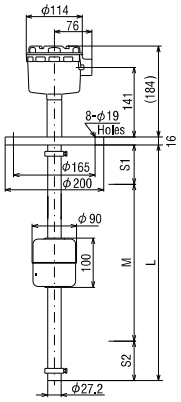
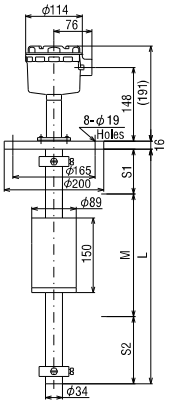
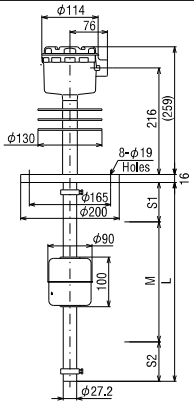
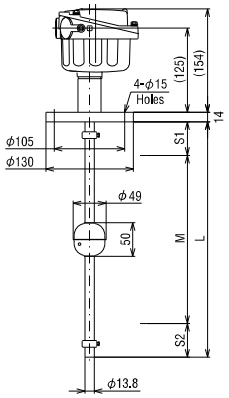
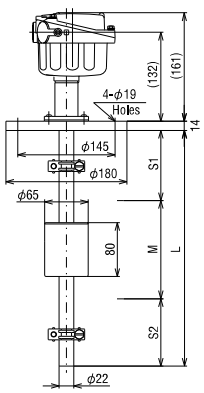
Model		MS350S	MS350V	MS360S
Description		Compact Separation		Heat-proof
Drawing				
Mounting		JIS5K50A	JIS5K80A	JIS5K50A
Operating Temperature	Housing*3	-10 to 50˚C*1	-10 to 50˚C*1	-10 to 50˚C*1
	Wetted part*4	-10 to 80˚C*2	-5 to 50˚C*2	-10 to 150˚C*2
Maximum Pressure		2 MPa	200 kPa	2 MPa
Maximum Humidity		5 to 95% RH		
Minimum Specific Gravity		0.55	0.65	0.55
Material	Housing	ADC12		
	Flange Stem	304SS	PVC	304SS
	Float	316SS	PVC	316SS
Maximum Length of Stem		3000mm		
Minimum Length of S1		50mm	80mm	50mm
Minimum Length of S2		50mm	85mm	50mm
Cable Entry		G3/4		
Protection		IP65		
Recommended Cable		3C2V (Coaxial cable)		
Maximum Separation		500m		
Connected Controller		MS2000		

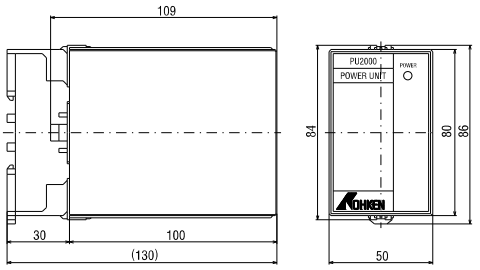
*Other materials are available.

Controller

Model		MS2000	MS6500
Description		Standard	Intrinsically Safe
Drawing			
Supply Power		100 to 240V AC 50/60Hz±10%	100 to 120V, 200 to 240V AC 50/60Hz
Power Consumption		Approx. 20VA Max.	Approx. 5.5VA Max.
Output Signal		4 to 20mA DC	
Load Resistance		600 Ω Max.	
Alarm Output		4 points (2 points x 2 circuits) 240V 3A AC, 30V 3A DC (Resistive)	
Power Source		15V DC	
Operating Temperature		-5 to 50˚C	-10 to 60˚C
Maximum Humidity		85% RH	
Accuracy	with SS	±1mm (Measuring length≦1000mm), ±0.1% (Measuring length>1000mm)	
	with PVC	±2mm (Measuring length≦1000mm), ±0.2% (Measuring length>1000mm)	
Material		ABS	Steel Structure (SPC)
Protection		Non Drip-proof	IP20
Mounting		Panel mount, In conjunction with DIN43 700-96×96 (Panel cut-out: 92mm×92mm)	

*1 The environmental temperature is indicated for intrinsically safe.
*2 The temperature of measuring object is indicated for intrinsically safe.
*3 Get rid of dew.
*4 Get rid of freeze.
*5 The safety barrier must be connected between sensor and controller.

MS370S	MS370V	MS380S	MS650S	MS650V
Standard Separation		Heat-proof	Intrinsically Safe iaIICT5*5	
				
JIS5K100A	JIS5K100A	JIS5K100A	JIS5K50A	JIS5K80A
-10 to 50˚C*1	-10 to 50˚C*1	-10 to 50˚C*1	-5 to 50˚C*1	-5 to 50˚C*1
-10 to 80˚C*2	-5 to 50˚C*2	-10 to 150˚C*2	-5 to 50˚C*2	-5 to 60˚C*2
500 kPa	200 kPa	500 kPa	2 MPa	200 kPa
5 to 95% RH				
0.7	0.8	0.7	0.55	0.75
ADC12				
304SS	PVC	304SS	304SS	PVC
316SS	PVC	316SS	316SS	PVC
3900mm			3000mm	
80mm	90mm	80mm	50mm	100mm
80mm	135mm	80mm	50mm	100mm
G3/4			G1/2	
IP65				
3C2V (Coaxial cable)				
500m				
MS2000			MS6500	

PU2000
Power Unit for MS200

90 to 132V, 180 to 264V AC 50/60Hz
Approx. 10VA Max.
4 to 20mA DC
24V DC
0 to 50˚C
85% RH
ABS
Non Drip-proof
Plug in Type (11pin)

Ordering Information

MS							
210	Standard type						
350	Compact Separation type						
360	Compact Separation Heat Resistive type						
370	Separation type						
380	Heat Resistive type						
650	Explosion proof type, Intrinsically Safe ia II CT5						
	S	304 stainless steel					
	S6	316 stainless steel					
	V	PVC					
	HV	CPVC					
		0	Flat-face flange				
		1	Raised-face flange				
		3	Sanitary Ferrule				
			J	JIS & Sanitary ferrule flange			
			A	ANSI flange			
			D	DIN flange			
				A	316SS ϕ49×H50 for MS210, MS350, MS360 & MS600		
				C	316SS ϕ52×H46 for MS210		
				E	316SS ϕ90×H100 for MS370, MS380		
				N	PVC ϕ65×H80 for MS210, MS600		
				O	PVC ϕ89×H150 for MS370		
				P	PVC ϕ65×H80 for MS350		
				Q	PP ϕ89×H150 for MS370		
				R	PP ϕ65×H80 for MS350		
					■■■■	Specify the length of probe	

MS	210	S	0	J	A	1000	= MS210S-0JA-1000

* The mounting size should be specified when you order.
* The measuring range should be specified when you order.
* MS650 is only available with the material of 304SS and PVC.