

# MODEL MS MAGNETOSTRICTIVE LEVEL MEASUREMENT



## Features

- High Accuracy:  $\pm 1\text{mm}$  or 0.1% F.S. for SS float  
 $\pm 2\text{mm}$  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, magnetostriuctive level measurement, is especially designed for precise measurement. With its high accuracy of  $\pm 1\text{mm}$  or  $\pm 0.1\%$  F.S. for SS float and  $\pm 2\text{mm}$  or  $\pm 0.2\%$  F.S. for PVC float, the MS is ideal for continuous level monitoring for beer and other beverages, pharmaceuticals, etc.

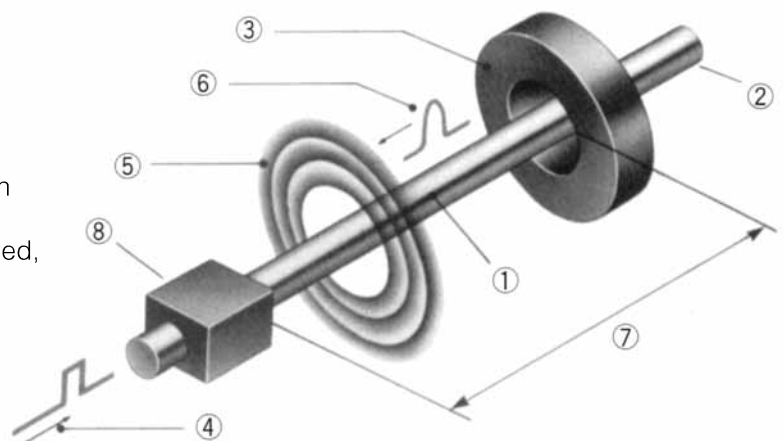
We recommend connecting with power unit of PU2000 for stable operation.

## 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).

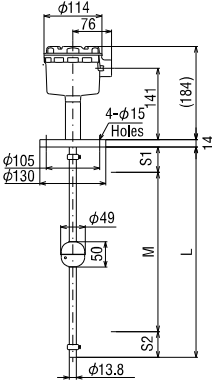
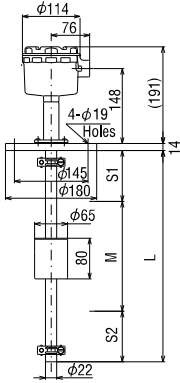
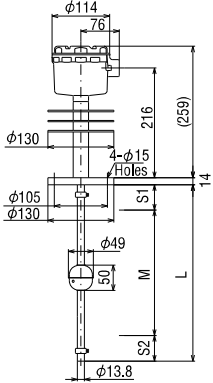


## Specifications

Model	MS210S		MS210V	
Description	Integral			
Drawing				
Mounting	JIS5K50A		JIS5K80A	
Supply Power	24V DC $\pm 10\%$ 110mA Max.			
Power Consumption	Approx. 7.5W Max.			
Output Signal	4 to 20mA DC			
Load Resistive	600 $\Omega$ 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	$\pm 1\text{mm}$ (Measuring length $\leq 1000\text{mm}$ )		$\pm 2\text{mm}$ (Measuring length $\leq 1000\text{mm}$ )	
	$\pm 0.1\%$ (Measuring length $> 1000\text{mm}$ )		$\pm 0.2\%$ (Measuring length $> 1000\text{mm}$ )	
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)			

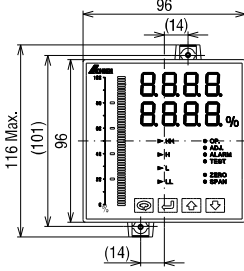
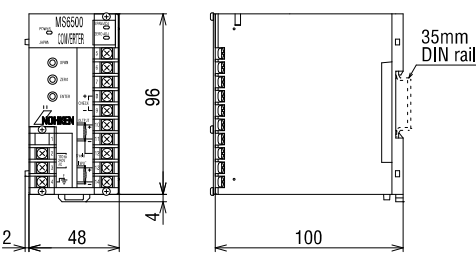
\*Other materials are available.

Sensor

Model	MS350S	MS350V	MS360S
Description	Compact Separation		Heat-proof
Drawing			
Mounting	JIS5K50A	JIS5K80A	JIS5K50A
Operating Temperature	-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	PVC	304SS
	Float	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)	

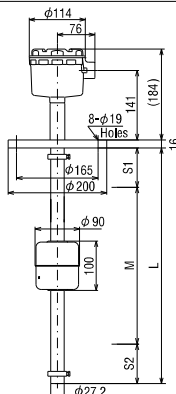
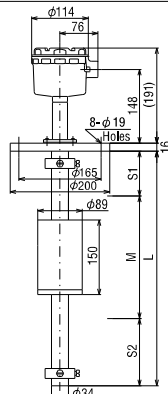
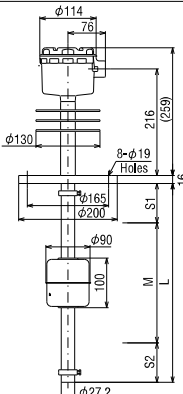
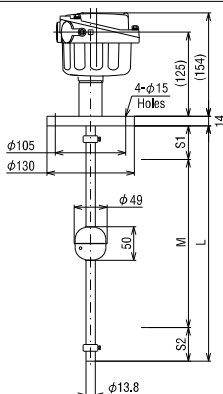
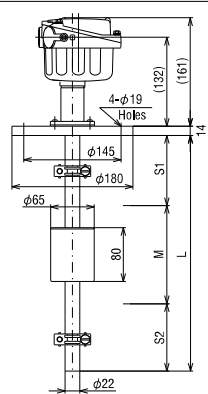
\*1 The environmental temperature is indicated for intrinsically safe.

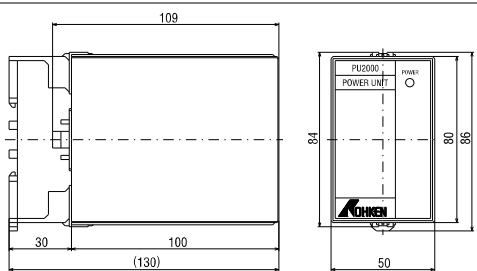
\*2 The temperature of measuring object is indicated for intrinsically safe.

\*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-OJA-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.