

## Karman Vortex Flowmeter VSP-A/V/DA Series

### Instruction Manual

#### Warning

Before using the Flow Checker, please read this Instruction Manual with caution, and then use it properly. If any further difficulties that are not covered in this Manual, Please contact us, and we could give you appropriate advices you would require. Please keep this Instruction Manual at hand for your quick reference when necessary.



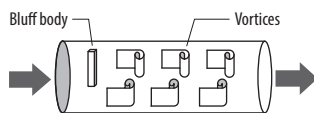
M306E-R01



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#### How it works

As liquid flows around a bluff body inside the flow path, swirling vortices are formed and carried downstream. The number of vortices formed is directly proportional to the linear velocity of the liquid passing through the flow meter. With this VSP Series, alternate vortex streams are detected by a piezoelectric element that measures frequencies and converts them into analog signals each time a vortex passes the sensor element.



#### Warning

#### Installation Precautions

1. Please use this product in an ambient temperature ranging from 0-50°C.
2. Please use this product in a place with no direct sunlight as this is made out of plastic. This product has IP64 rating (JIS C0920), but please avoid using this product outdoors.
3. Please use this product in a place with no shock and vibration.
4. Please use this product in a place with no electromagnetic interference occurred. If you must use it in such an environment, please have this product electromagnetic-shielded.
5. VSP Series can be installed into either horizontal or vertical piping as long as the flow path is filled with fluid. As to flow direction, please find the arrow on the side of the body.
6. An upward flow direction is recommended when flowing fluid with bubbles, especially when flowing low rates. A horizontal flow direction may cause bubbles to stay into the flow path, resulting in unstable flow measurement.
7. For stable flow measurement, please install a valve on the downstream side of the flow meter. Please use a pressure value of 50kPa or greater during measurement.
8. Maximum supply pressure should be 1MPa.
9. Please use this product in a place with no corrosive gas atmosphere.
10. Please use DI water or city water-based industrial water.

#### Warranty period and scope

The warranty period shall be for one year after the date of delivery to your designated place. When any trouble for which we are liable occurs during the warranty period, we will repair or replace it free of charge. Provided that in the case of the following items they shall not be covered by warranty.

- ① Due to the improper handling and abuse
- ② Due to the causes arisen from other product than that we delivered.
- ③ Due to the improper remodeling, disassembling and repairing conducting by other than those who delivered.
- ④ Due to the improper use of the Flow Checker which is not originated in it.
- ⑤ Due to natural calamity, disaster and others for which we are not liable.

In addition the warranty said above means the warranty of the single unit of product we delivered. Please be advised that as to the damage triggered by the trouble of the delivery goods we cannot assume any responsibility for the damage.

#### Others

1. Service costs such as engineer dispatch and etc. are not included in the price of the delivered product. The following cases will be charged separately.
  - ① Guidance to the installation and adjustment and attendance for trial operation.
  - ② Adjusting and repairing
  - ③ Technical assistance and training
2. The product is subject to change due to improvement without prior notice.

#### Safety precaution

The " Safety precaution " intends to prevent the users or persons in charge from injury or to take precaution against damage to the property which might be caused. So that it is needed to read this manual thoroughly with a better understanding.

	<b>Warning</b>	This is a safety-alert symbol which assumes the potential for the death or serious injury which might be caused.
	<b>Caution</b>	This is a safety - alert symbol which assumes the potential for personal injury, or only material damage which might be caused.

#### Specifications

Operating fluid	Purified water, Water	Ambient temperature	0~50°C
Accuracy	±3%F.S.	Ambient humidity	5~90%RH
Repeatability	±0.5%F.S.	Power supply	DC10.8~26.4V 1W
Operating temperature	0~70°C		
Fluid pressure	0~1MPa		

Types	VSP□-A / VSP□-DA(with indicator)	VSP□-V
Output	DC4-20mA/Alarm output 2point (with indicator) Load resistanc: 0~250Ω (DC12V) 250~500Ω (DC24V)	0-5V Load resistanc:More than 10KΩ
Time constant	1s (Response: 63%)	
Cable	3-pole shielded 0.2mm (2 AWG.24) , 3m-long Outer diameter 3.5mm (Pre-tinned stripped end)	
Structure	IP64 (JIS C0920 Protected against splashing of water)	

#### Flow Ranges and Connection Sizes

Types	Base model	Flow range	Connection size
VSP□-A	16	2 ~ 16L/min	R 1/2
	40	4 ~ 40L/min	
	250	25 ~ 250L/min	
VSP□-V	150	10 ~ 150L/min	UN 25
VSP□-DA	16	2 ~ 16L/min	R 1/2

#### Warning

#### Plumbing Connections

1. Please plumb this product with no stress applied as this is made out of plastic. Do NOT overtighten nuts when plumbing.
2. Please install a 10D or greater straight pipe on the upstream side of the flow meter when using a valve or a greater pipe size.
3. Please install pipes, confirming the arrow indicated on the side of the body.
4. Please use threaded adaptors for using Rc (PT) or NPT connections.

#### Warning

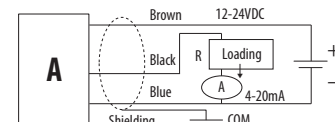
The body and threaded connections are made out of plastic. Do NOT overtighten nuts for damage prevention.

#### Note

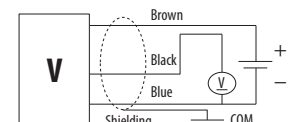
#### Electrical Connections

Please make electrical connections as below.

#### VSP□-A : 4-20mA

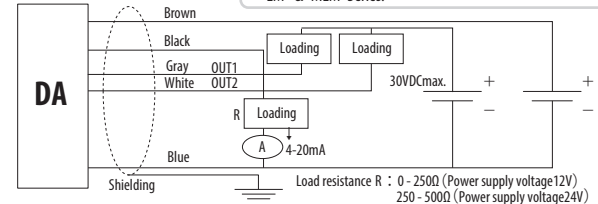


#### VSP□-V : 0-5V



#### VSP□-DA : with indicator

Please locate the DC power source when using with displays such as "EM" & "MEM" Series.



#### Note

#### Flow

1. After confirming that all connections are secure, turn on fluid flow slowly and check for leaks at the connections.
2. Air may be staying in the pipes before using this product. This causes the flow meter to measure incorrectly so that please be sure to get Air out of pipes.

#### Warning

Do NOT surge pressure and increase flow rates rapidly for damage protection.

#### Display-integrated model "DA Series": Alarm Setup (AL1/AL2)

