

Aichi Tokei Denki has over 20 years experience  
of battery-powered electromagnetic technology

# SA

## Electromagnetic Flow Meter

### Operation Manual



- Accurate Measurement
- Easy-To-Read
- Negligible Pressure Loss
- Simple Installation
- Easy Access to AMR Devices
- Zero Maintenance

 **Aichi tokei denki co., Ltd.**

30180219-SA-AICHI

  
Dewatering Technologies



● This Document specifies environments and conditions for assuring the performance of the following products.

- Electromagnetic Water Meter SA (hereinafter SA)
- Remote Display: Data Transmitter MX35-2 (hereinafter MX35)  
Receiver SR-4DP3AW/ SR-4DP4BW (hereinafter SR-4DP)
- Pulse Transmitter MX39-1 (hereinafter MX39)

Aichi Product Type & Description are indicated below.

### SA - Display Only

Nominal Diameter ( mm )	Model	Description
50	SA50-K	50 mm - Display Only
65	SA65-K	65 mm - Display Only
75 ( 80 )	SA75-K	75 mm ( 80 mm ) - Display Only
100	SA100-K	100 mm - Display Only
125	SA125-K	125 mm - Display Only
150	SA150-K	150 mm - Display Only
200	SA200-K	200 mm - Display Only

### SA & MX35 & SR-4DP - Remote Version

Nominal Diameter ( mm )	Model	Description
50	SA50-K	50 mm - Remote Version ( 100 L/P for CH1, 1000 L/P for CH2)
65	SA65-K	65 mm - Remote Version ( 100 L/P for CH1, 1000 L/P for CH2)
75 ( 80 )	SA75-K	75 mm ( 80 mm ) - Remote Version ( 100 L/P for CH1, 1000 L/P for CH2)
100	SA100-K	100 mm - Remote Version ( 100 L/P for CH1, 1000 L/P for CH2)
125	SA125-K	125 mm - Remote Version (1000 L/P for CH1, 10000 L/P for CH2)
150	SA150-K	150 mm - Remote Version ( 1000 L/P for CH1, 10000 L/P for CH2)
200	SA200-K	200 mm - Remote Version ( 1000 L/P for CH1, 10000 L/P for CH2)

## SA&MX39 - Pulser Version

Nominal Diameter ( mm )	Model	Description
50	SA50-K	50 mm - Pulser Version ( 100 L/P)
65	SA65-K	65 mm - Pulser Version ( 100 L/P)
75 ( 80 )	SA75-K	75 mm ( 80 mm ) - Pulser Version ( 100 L/P)
100	SA100-K	100 mm - Pulser Version ( 100 L/P)
125	SA125-K	125 mm - Pulser Version ( 1000 L/P)
150	SA150-K	150 mm - Pulser Version ( 1000 L/P)
200	SA200-K	200 mm - Pulser Version( 1000 L/P)

- Please confirm if the installation kit (threaded rods, nuts, spacers) is required when ordering.  
\* For the installation kit, there are two versions, one is the version for JIS10K flange connection and the other is the version for JWWA flange connection.
- When each requirement applies to all of SA, MX35, SR-4DP and MX39, it shall be described as “all products”.

This document specifies the handling requirements (environments, conditions, notice of operation and installation, etc.) for assuring the performance of products (SA, MX35, SR-4DP, MX39) that are specified in the Product Specifications. Before you use these products, read all operating instructions.

Installation, connection and servicing must be carried out by personnel only who have obtained proper and reasonable ability by receiving training for doing so.

Also, save this manual for future reference.

## SAFETY INSTRUCTIONS



### **Warning**

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



### **Caution**

Caution indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

NOTICE is used to address practices not related to physical injury.

ISO 7010



Don't step

GB 2894



No open flames



Don't disassemble



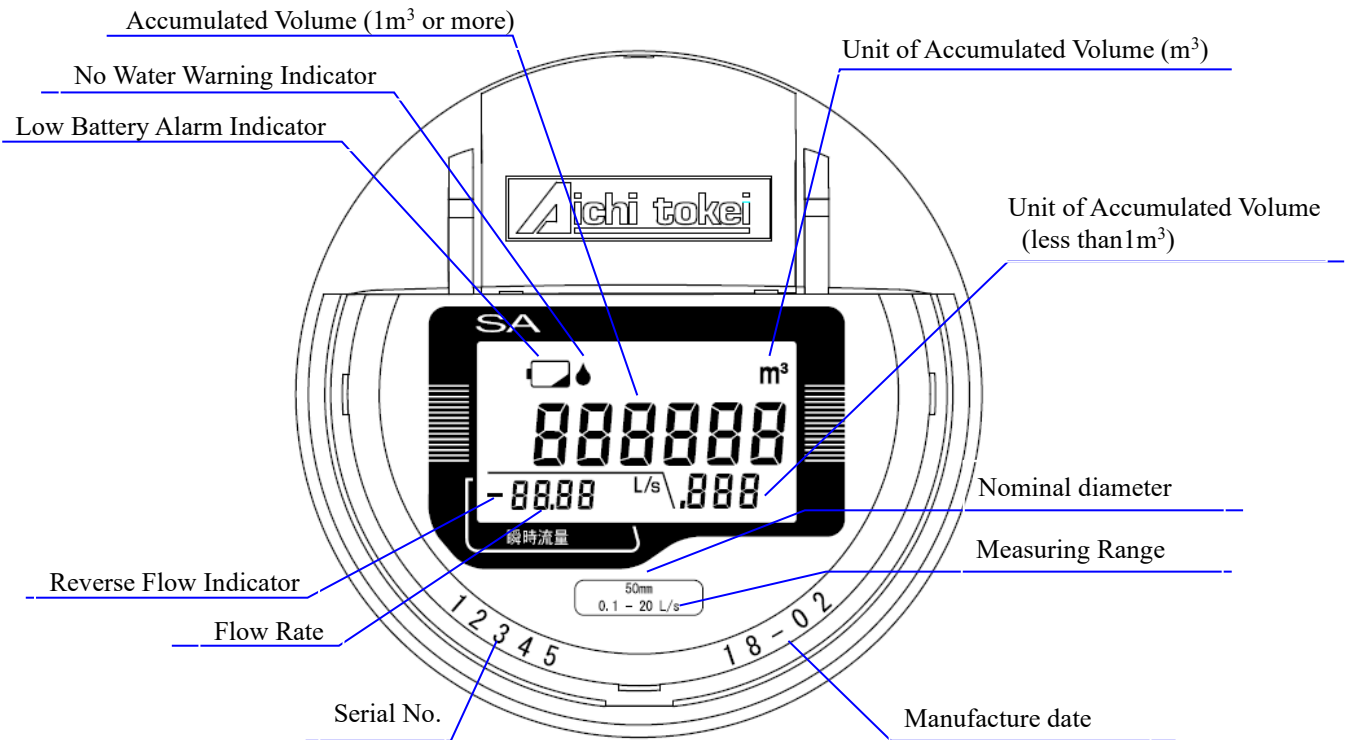
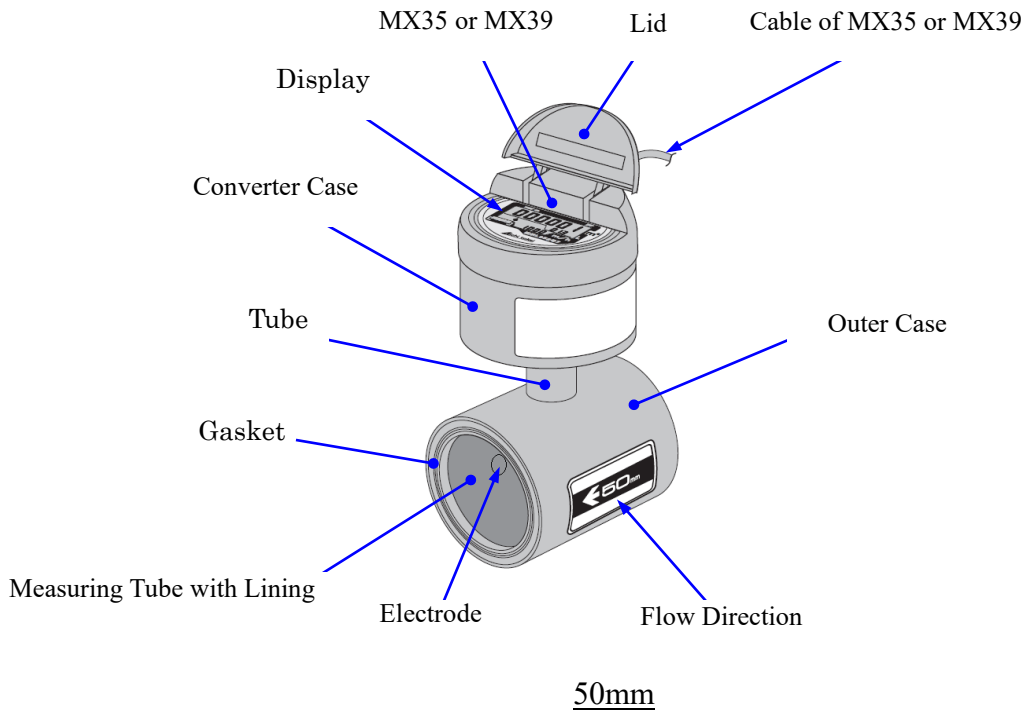
Don't touch with wet hands

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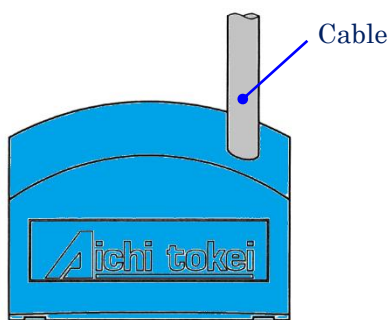
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# 1. Terminology of Each Part

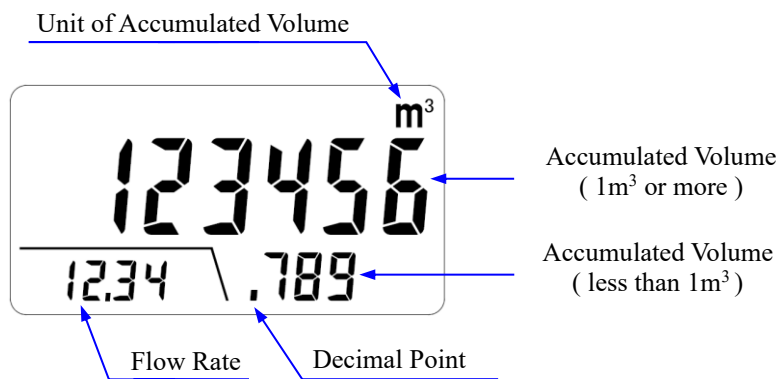
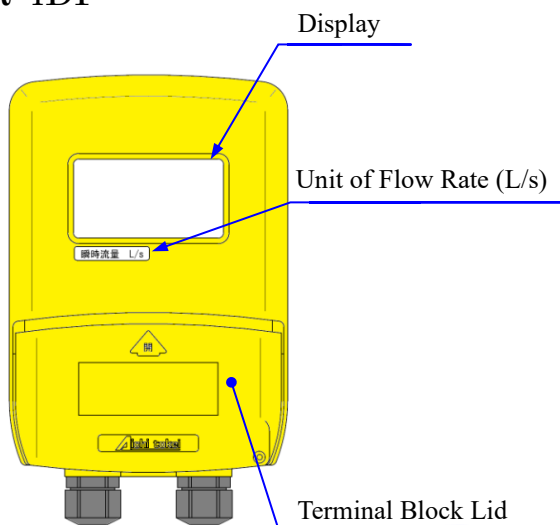
## 1-1. SA



1-2. MX35



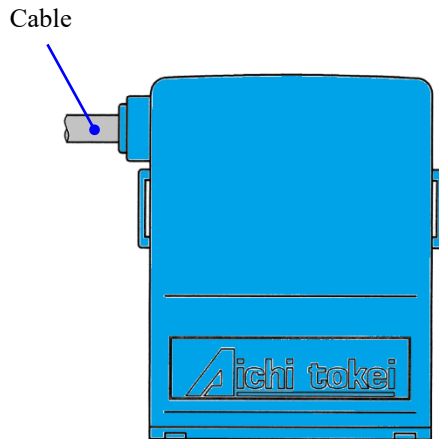
1-3. SR-4DP



Display (50 - 75mm)



## 1-4. MX39



## 2. Working Conditions

### 2-1. SA

#### (1) Measured fluid

Water quality: Potable water

Measured fluid must not contain any substance that damages SA or affects the operation of SA. It must not contain bubbles, either.

Conductivity: Min. 5 mS/m (50  $\mu$ S/cm)

#### (2) Environmental resistance

Working ambient temperature: -10 °C to +55 °C (+14 °F to +131 °F)

Storage ambient temperature: -15 °C to +60 °C (+5 °F to +140 °F)

Fluid temperature: 0.1 °C to +30 °C (+32.18 °F to +86 °F) \* Freezing must be avoided.

#### (3) Maximum permissible working pressure

Nominal Diameter	( mm )	50	65	80	100	125	150	200
Maximum permissible working pressure	( MPa )	2						1
	( psi )	290						145

#### (4) Piping

Front straight pipe: 5D or more, Rear straight pipe: 2D or more  
(D: Pipe nominal diameter)

Other conditions shall be according to 6-3-1-1. Piping Conditions

#### (5) Pressure loss

0.063 [ MPa ] (9.135 [ psi ] ) less at flow rate  $Q_{max}$  [ m<sup>3</sup>/h ] / [ gpm ]

#### (6) Waterproof

IP68 ( SA can be used continuously at the water depth of 1 m. )

## 2-2. MX35

### (1) Environmental resistance

Working ambient temperature: -10 °C to +55 °C ( +14 °F to +131 °F)

Storage ambient temperature : -15 °C to +60 °C ( + 5 °F to +140 °F )

### (2) Waterproof

IP68 ( MX35 can be used continuously at the water depth of 1 m. )

## 2-3. SR-4DP

### (1) Environmental resistance

Working ambient temperature: -10 °C to +55 °C (+14 °F to +131 °F)

Storage ambient temperature: -15 °C to +60 °C (+5 °F to +140 °F)

### (2) Waterproof

IP63

## 2-4. MX39

### (1) Environmental resistance

Working ambient temperature : -10 °C to +55 °C (+14 °F to +131 °F)

Storage ambient temperature : -15 °C to +60 °C (+5 °F to +140 °F)

### (2) Water proof

IP68 (MX39 can be used continuously at the water depth of 1 m.)

## 3. Transportation

This chapter describes how to transport SA, MX35, MX39 and SR-4DP.

### **Notice**

Transportation on product containing lithium batteries (all products)  
Take care to ship the products in compliance with the latest requirements of the local and international regulations regarding transportation of products containing lithium batteries.

For the transportation for SA & SR-4DP, each of them must be shipped as "Dangerous Goods UN3091 (Class9)" because each of SA & SR-4DP incorporate lithium batteries exceeding the lithium content 2 gram, prompting special transportation guidelines regulated by United Nations.

## 4. Contents of Package

This chapter describes how to check the products when receiving them.

Checking of specifications and external appearance (all products)  
Prior to installation work, check whether the delivered product is the required model or not and for any abnormalities including damage and deformation caused by vibration or shocks during the transportation.

## 5. Storage

This chapter describes how to store SA, MX35, MX39 and SR-4DP.

### **Notice**

#### **•Notes on storage condition and environment (all products)**

Transport and store the products in an appropriate container until installation work is carried out.

Select a storage place having good ventilation avoiding rainwater and direct sunlight.

Furthermore, do not place combustibles, flammable substances or heating elements around the products.

- \* Refer to the storage ambient temperature of “2-1. SA (2) Environmental resistance,” “2-2. MX35 (1) Environmental resistance,” “2-3.SR-4DP (1) Environmental resistance” and “2-4. MX39 (1) Environmental resistance” in 2. Working Conditions.

## 6. Installation

This chapter describes how to install SA, MX35, MX39 and SR-4DP.  
Make sure that working conditions are not deviated.

### 6-1. Notes on Handling

#### **Caution**

##### •Wear safety shoes (SA)

Wear safety shoes to prevent injury caused by dropping SA on your foot.

#### **Notice**

##### •Prohibition of drop (all products)

Do not drop the products, or do not apply a strong shock to the products. It may be damaged.

##### •Do not grab Tube and Converter Case (SA)

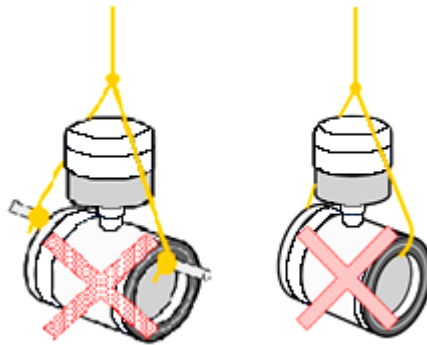
Hold an Outer Case when carrying SA. Grabbing the Tube and the Converter Case may damage the Tube part and result in the inability of measurement.

##### •Do not hold Cables (SA)

Do not carry SA holding the Cables when MX35 or MX39 is mounted on SA. This may cause the damage to MX35 or MX39. Also the drop of SA caused by the damage to the mounting part may cause the inability of measurement.

##### •Protection of Electrodes and Lining (SA)

Carry SA taking care not to impair the Electrode and/or the Lining. If they were damaged, its performance and durability are affected. Be sure to avoid lifting SA with a rod or a wire passed through the Measuring Tube in particular.



Lifting

## **Notice**

### **• Prohibition of installation at a place affected by strong electromagnetic field (all products)**

Do not install the products at the following places, because the accuracy and operation of the products may be affected by the strong electromagnetic field that is generated:

- (1) Near a power line or a transformer  
\* Install the products 2 m or more away from it.
- (2) Near an electric pump or an electric motor  
\* Install the products 2 m or more away from it.
- (3) Immediately below high-voltage transmission lines
- (4) In the vicinity of other electromagnetic flow meter or other equipment that generates magnetic field

### **• Prohibition of installation at a place where a stray current is flowing (SA)**

The accuracy and operation of SA may be affected if installed at a place where what is called a stray current like an electrolytic corrosion current or a leakage current from a submersible pump is flowing in a fluid. If influence by the stray current is observed, work it out with a three-item earth kit (optional).

### **• Notes on ambient temperature (all products)**

Install and use the products in an environment within the specified range of the ambient temperature. Installation out of the specified range of the ambient temperature may affect the performance and durability of the products.

\* Refer to the storage ambient temperature of “2-1. SA (2) Environmental resistance,” “2-2. MX35 (1) Environmental resistance,” “2-3. SR-4DP (1) Environmental resistance” and “2-4. MX39 (1) Environmental resistance” in 2. Working Conditions.

### **• Prohibition of direct sunlight (all products)**

When installing the products outdoors, provide shade to prevent exposure to direct sunlight. Otherwise, high temperature may damage electronic parts and cause the inability of measurement.

<In the case of SA>

Even installing it indoors, keep the Lid closed except when checking the Display in order to protect the LCD of the Display.

<In the case of SR-4DP >

Install it inside a protection box to protect it from direct sunlight, wind and rain.

### **• Prohibition of high temperature environment (SA, SR-4DP and MX39)**

Avoid a high average temperature environment 20 °C or more (68 °F or more) because it may shorten the battery life.

\* Ambient temperature shall be less than 55 °C (131 °F) and average ambient temperature shall not exceed 20 °C (68 °F).

## **Notice**

### **• Prohibition of corrosive gas environment (all products)**

Do not use or store the product in the place where corrosive gases or liquid (sulfur dioxide, hydrogen sulfide, nitrogen oxide, chlorine, ammonia, ozone, ethylene compounds, acids, sea water, salt water, etc.) exist.

Also, when directly embedding SA in earth including above corrosive gas and liquid, connect sacrificial anode such as zinc with SA electrically and embed sacrificial anode in earth in order to prevent corrosion.

### **• Prohibition of contamination of foreign substances into a fluid (SA)**

Do not cause a fluid contaminated with foreign substances (solid substances including sand, stones, iron powder, and rust) to flow because the Lining may be damaged.

Furthermore, accurate measurement may not be achieved if the Electrodes or the Earth Ring is covered by non-conductive substances of fats and oils, etc. When a fluid is contaminated, therefore, the periodical cleaning and maintenance of the products are required.

### **• Prohibition of oil adhesion (all products)**

Avoid using the products at a place affected by soot, oil and other liquids. Otherwise, failures or malfunctions may be caused to occur.

### **• Prohibition of continuous vibration (all products)**

Install the products at a place having no continuous vibration.

Vibration may damage electronic parts or cause a connection failure, which may lead to the inability of measurement.

### **• Notes on underwater installation (SA, MX35 and MX39)**

Do not install the meter at a depth of 1 meter or more under the water.

\* Refer to “2-1. SA (6) Waterproof,” “2-2. MX35 (2) Waterproof” and “2-4. MX39 (2) Waterproof” of 2. Working Conditions.

### **• Notes on direct embedding (SA, MX35 and MX39)**

When directly embedding the products underground, select an environment free from weight and vibration.

### **• Prohibition of excessive pressure to a fluid (SA)**

Do not apply excessive pressure that exceeds the rating.

Excessive pressure may break the Measuring Pipe and thereby may cause fluid leakage, breakdown and the deterioration of performance.

\* Refer to “2-1. SA (3) Maximum working pressure” of 2. Working Conditions.

• **Provision of the conductivity of a fluid (SA)**

SA performs measurement using the conductivity of a fluid. SA becomes incapable of measuring a fluid, when using a fluid having the conductivity lower than the specified conductivity.

\* Refer to “2-1. SA (1) Measured fluid Conductivity” of 2. Working Conditions.

• **Provision of fluid temperature (SA)**

Measure a fluid at a temperature within the specified range. A fluid temperature out of the range may affect its performance and durability.

\* Refer to “2-1. SA (2) Environmental resistance Fluid temperature” of 2. Working Conditions.

• **Use of fluids other than potable water is not allowed (SA)**

Avoid using fluids (chemicals, sea water, etc.) other than the potable water and not containing any substance that damages SA or affects the operation of SA.

Avoid using fluids not containing bubbles, either.

• **Prohibition of submergence and dew condensation (SR-4DP )**

Installation under the environment of submergence is prohibited. Installation under the environment of high temperature and high humidity that causes dew condensation is prohibited.

\* Refer to “2-3. SR-4DP (2) Waterproof” of 2. Working Conditions.

6-3. Installation Work

6-3-1. SA

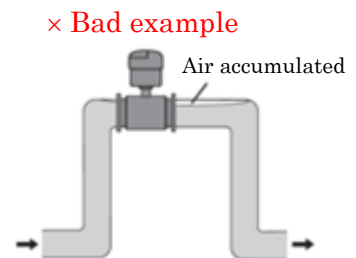
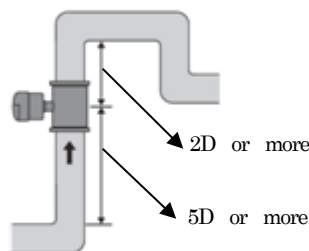
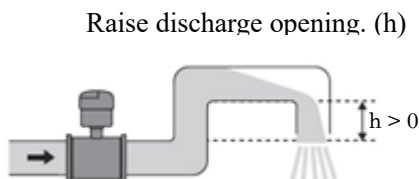
6-3-1-1. Piping Conditions

*Notice*

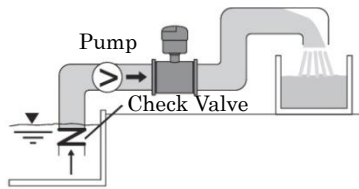
• **Notes on piping**  
Arrange the piping observing the following notes in such a way that air entry and eccentric flow can be minimized to satisfy accuracy: (D: Pipe nominal diameter)

• **Pipe must always be filled completely with the flowing fluid.**

Mount the meter in the upward flow direction at a vertical piping part.

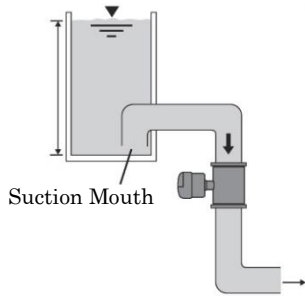


When the pump stops working in leakage condition of Check Valve, the air ingress may affect the meter performance.

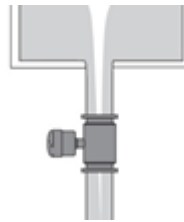


• **No air must be sucked in.**

Consider suction mouth position

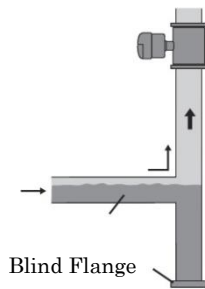


× **Bad example**



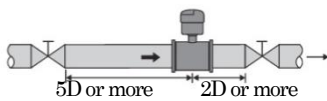
• **No solid substances must precipitate.**

Mount SA in the upward flow direction at a vertical piping part.  
Mount Blind Flange for cleaning.

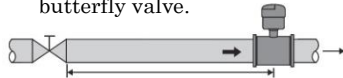


• **Straight section of the pipe must be provided.**

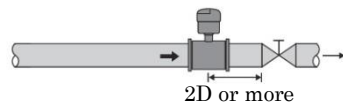
When fully opened by various valves



Applicable to various control valve including ball valve and butterfly valve.



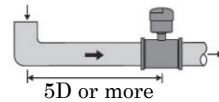
Install various control valves at downstream side as much as possible.



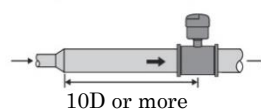
In the case of confluence



125~200mm : 20D or more



When enlarged pipe is used for upstream pipe: 10D or more

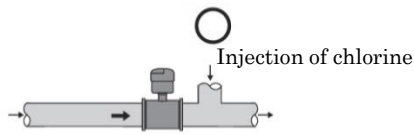


• **A fluid (chlorine etc.) of different water quality must be mixed at downstream side of meter.**

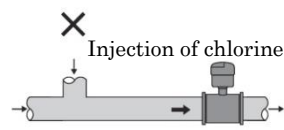


Mixture of fluid of different water quality at upstream side makes conductivity unequal and causes malfunction of meter.  
It also causes corrosion.

✓ Good example



× Bad example



## Notice

### • Execution of pipe cleaning

Clean the pipes before installation. When the pipes are used without cleaning, SA is adversely affected by foreign substances, fats and oils inside the pipes often seen in newly installed pipes.

Typically, this issue may occur when the new pipes are installed.

### • Preparation of mounting work clearance

Provide clearance for mounting work around SA. Provide clearance (0.3 m or more from the pipe edge to floor) for turning wrench, particularly at the lower side where nuts are hard to fasten.

### • Avoid pulsation flow

Select a place having fewer pulsation flows. The pulsation flows may hinder accurate measurement.

### • Piping for making it easy to carry out maintenance work

#### (1) Preparation of maintenance space

Install the products at a place where workers can easily enter, considering maintenance work, inspection, reading of Display, and the easiness of changing the setting.

#### (2) Installation of gate valve, expansion pipe, and bypass

Install a gate valve, an expansion pipe, and a bypass for making it easy to mount and remove SA.

#### (3) Preparation of cleaning aperture

Provide sufficient space for cleaning (e.g. Blind Flange) so that the internal pipes can be cleaned easily.

## 6-3-1-2. Piping and Installation

## Notice

### • Setting of Flow Direction

Mount SA in such a position that the Flow Direction of a fluid corresponds to the

- **Notes when counterpart pipe is of a non-metallic material**

When a counterpart pipe is of a non-metallic material (polyvinyl chloride etc.), take care not to fasten the nuts too tightly, because if the nuts are fastened too tightly, the nuts deforms the flange of the counterpart pipe and causes fluid leakage.

- **Check of Gasket displacement**

Visually check for the displacement of a Gasket after fastening the nuts temporarily.

- **Do not apply stress**

SA is not designed so as to withstand external load. To prevent the damage to SA, do not install the pipe that applies the stress to SA.

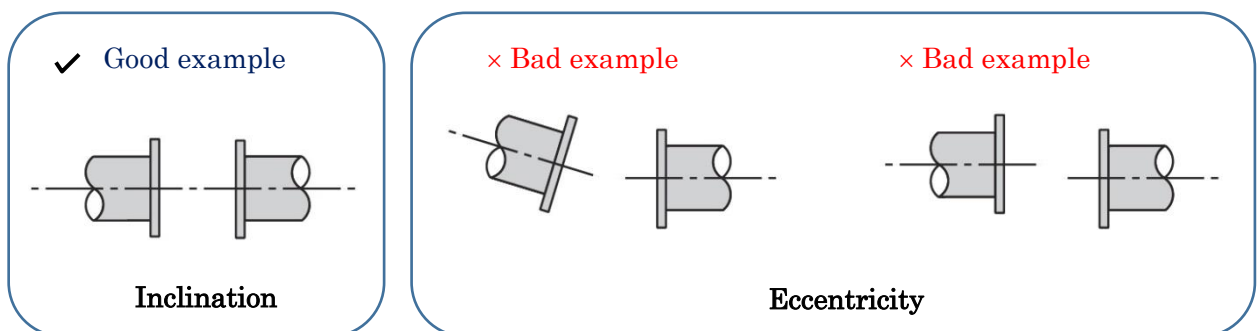
Observe the following notes so as not to apply stress to SA in particular:

**(1) Notes of pipe inclination and eccentricity**

Make sure that neither inclination nor eccentricity of a counterpart pipe exists before mounting SA.

**(2) Attachment of pipe support brackets**

Fix pipes by attaching brackets for supporting the pipes to the counterpart pipes at both ends to which SA is mounted.



- **Notes on piping and mounting work**

NEVER correct the inclination of SA holding the Converter Case or NEVER correct displacement by hitting SA after fastening the nuts. Otherwise, SA may be damaged, accurate measurement may not be achieved or measurement may become impossible. Loosen the bolts and start again from [4] to correct the inclination and displacement of SA. And do not step on SA, because injury may be caused in the case of falling or SA may be

broken.

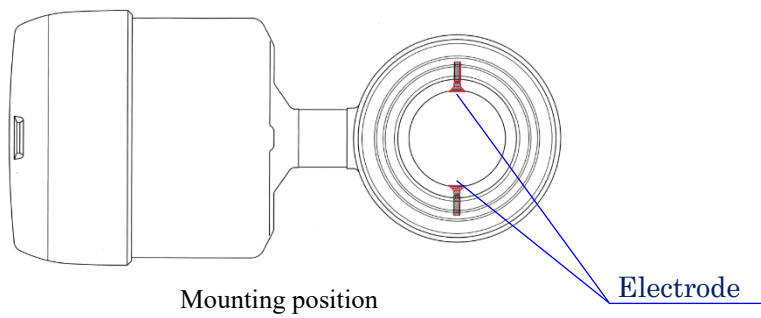
- **Air Bleeding**

If there is a risk of the air ingress into water, air bleeding must be done.

- **Provision of mounting position**

There is no restriction on the mounting position (horizontal, vertical or inclined), but avoid such mounting position that the Electrodes come on top (See Fig. below.). When air is mixed, malfunction may occur.

× Bad example



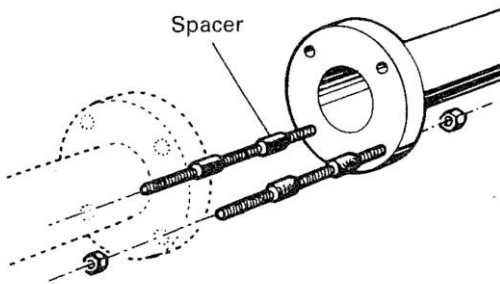
**[Installing and piping method]**

Don't let water flow through the pipe.

[1]

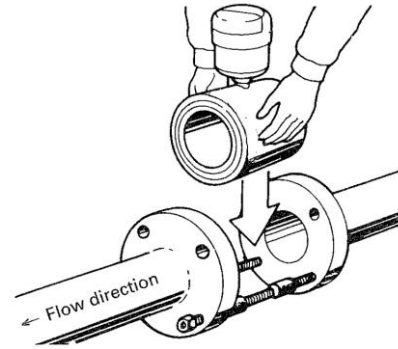
Insert the spacers in the lower two threaded rods and fix threaded rods to the flanges.

\*Threaded rods, nuts and spacers are the installation kit.



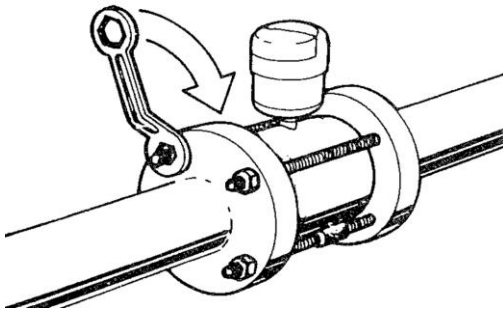
[2]

Place SA on the spacers and set it in the desired position, taking care not to subject it to damage.



[3]

Fix the upper threaded rods to the flanges and slightly tighten all bolts.



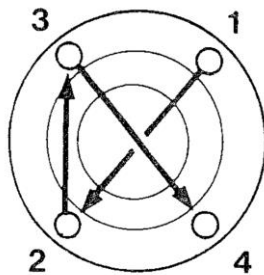
[4]

Make sure that Gasket is stuck on each of meter side. Make sure that the meter pipe center is not dis-placed and the Display is not askew.

\*Gasket is not necessary for meter installation because Gasket is stuck on each of meter side.

[5]

After you check the displacement of the meter pipe center, tighten the nuts diagonally in the order shown by the arrows in the figure below.



[6]

Tighten the nuts to squeeze the Gasket until the housing and flange come in contact with each other.

Nominal Diameter (mm)	50	65	80	100	125	150	200
Tightening torque (N·m)	16 ~ 32	28 ~ 56	20 ~ 40	25 ~ 50	46 ~ 92	48 ~ 96	41 ~ 82

## 6-3-2. MX35, SR-4DP

### 6-3-2-1. Notes on Work



#### • **Prohibition of work with wet hands**

Do not perform wiring work etc. with wet hands, because they cause a failure.

### 6-3-2-2. Notes on Wiring

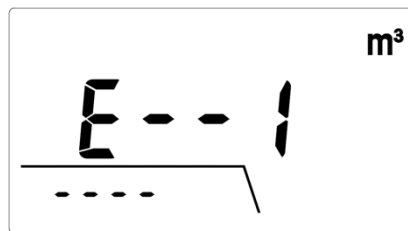
#### *Notice*

#### • **Prohibition of wetting cables**

Soaking Cable ends in water causes a failure. Do not leave Cables at places where they may be soaked in water.

#### • **Sure connection to terminal block**

Connect Cables surely to a terminal block. Wrong wirings, contact failures or insulation defects may cause a breakdown, short service life and incorrect transmission. Make sure that the Cables are connected surely by pulling the Cables lightly after finishing the connection. Be careful sufficiently so as not to cause short-circuits between terminals, either because short-circuits decrease battery life. If the following indication and the Accumulated Volume are indicated alternately, the battery voltage drops and remaining battery capacity is getting less.



• **Use of crimping terminals**

Attach crimping terminals to the Cable ends to prevent loosened terminals, terminal detachment or short-circuits between terminals.

• **Sure handling of wirings**

Handle the Cables surely so that Cables wired may not be hooked by people or objects. Otherwise, injury or breakdown may be caused by falling or by Cable damage respectively.

• **Countermeasures against stray currents and strong electromagnetic field**

Pass Cables through steel conduits away from equipment generating the strong electromagnetic field. Do not wire the Cables close to power lines of other equipment. Wire the Cables as far from the power lines as possible and not to be parallel to the power lines.

• **Notes when Cables are buried underground**

When the Cables are buried underground, use conduit for protecting the Cables.

• **Notes on handling Cables**

Do not put heavy materials on the Cables, or do not pull the Cables. The breaking or damage of the Cables may be caused.

• **Connection method of extension Cables**

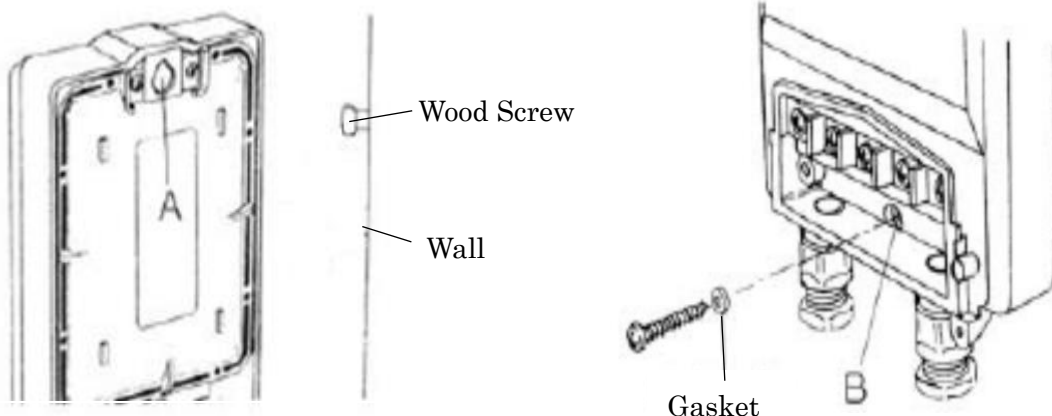
When extending Cables, be sure to use a signal / communication connection / termination processing kit “Scotch Cast” manufactured by 3M or an equivalent to ensure the waterproofing effect of the connection portions. (Refer to Instruction Manual etc. of the products when using it.)

6-3-2-3. Mounting for SR-4DP and connecting SR-4DP with MX35

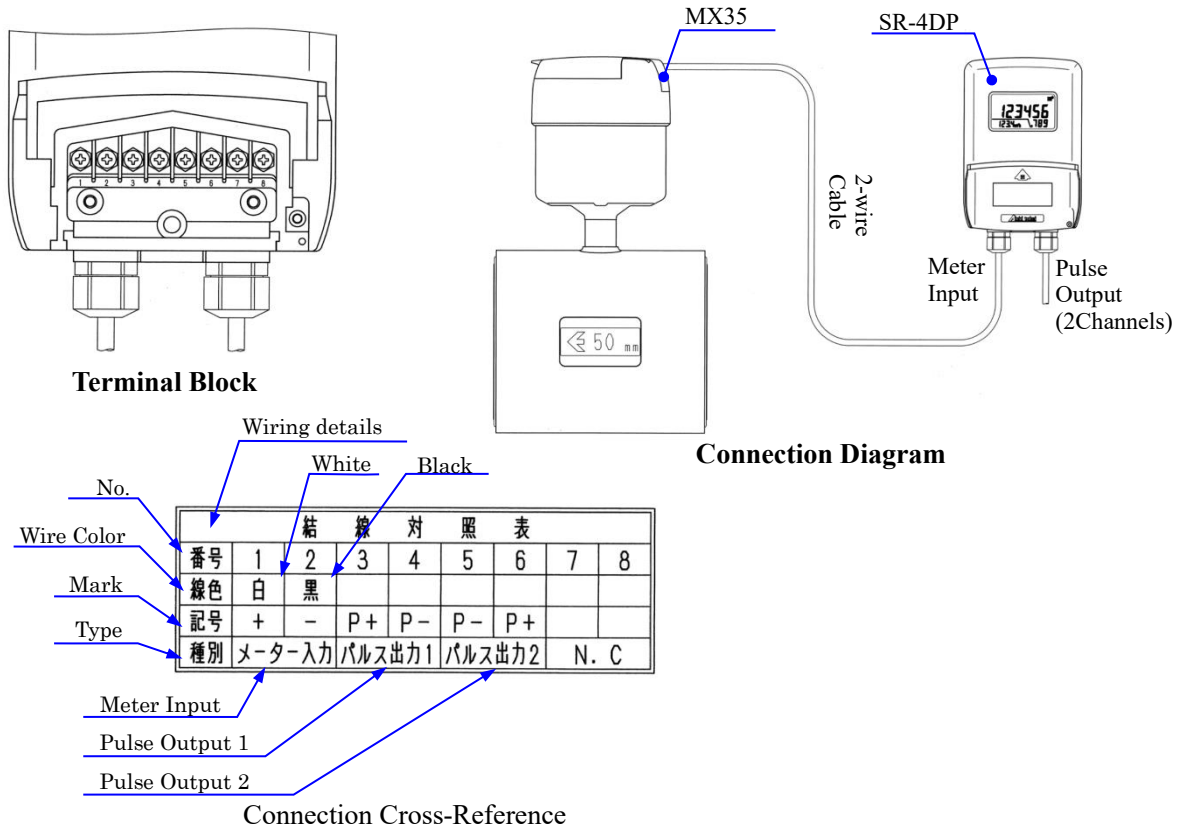
• Mounting method

(1) As follows, attach an included wood screw to wall and hang A section on the wood screw.

(2) As follows, attach an included gasket and wood screw in B section.



• **Connection method**



• Do not connect terminals 7 & 8 together. Failure may occur.

**Notice**

• **Notes on connection**

Insulation defects may shorten the battery life of SR-4DP. Take care not to short-circuit between Terminals. Short-circuits are caused by the adhesion of dust and moisture on the Terminal Block. Take care to prevent the adhesion of dust and moisture.

• **Close Lid firmly**

Close the Lid firmly after connecting the Cables to the Terminal Block.

6-3-3. MX39

6-3-3-1. Notes on Work



• **Prohibition of work with wet hands**

Do not perform wiring work etc. with wet hands, because they cause a failure.

6-3-3-2. Notes on Wiring

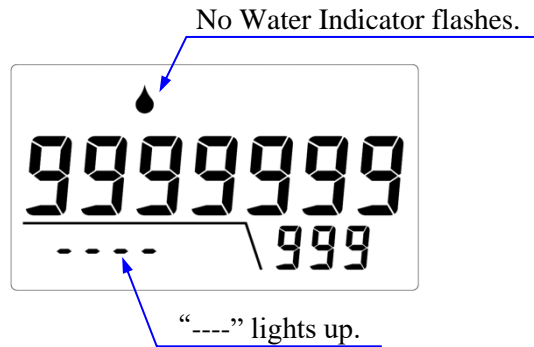
Same with 6-3-2-2. Notes on Wiring.

## 7. Display information

This chapter describes display information and troubleshooting for SA and SR-4DP.

### (1) No Water Warning Indicator

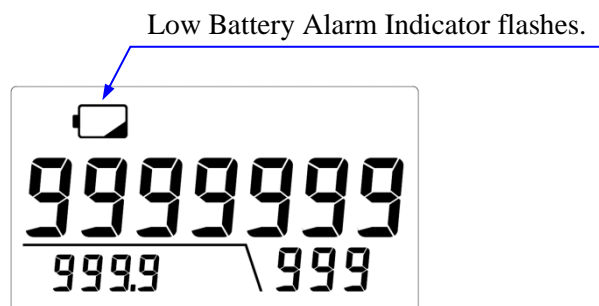
When the SA measuring section is put into a dried state with no water, No Water Warning Indicator as shown below flashes illuminating “- - - -” mark. Accumulated Volume is held even in this state.



### (2) Low Battery Alarm Indicator

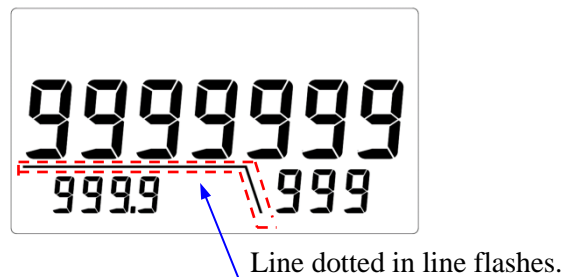
Low Battery Alarm Indicator as shown below flashes when the battery voltage drops and remaining battery capacity is getting less. Measuring operation is continued normally even in this state.

(When the battery voltage is restored, the Low Battery Alarm Indicator disappears.)



### (3) Overloaded Noise Alarm Indicator

Indicator as shown below flashes if pipes or fluid is affected by noise and no measurement accuracy can be maintained by noise entering input signals.



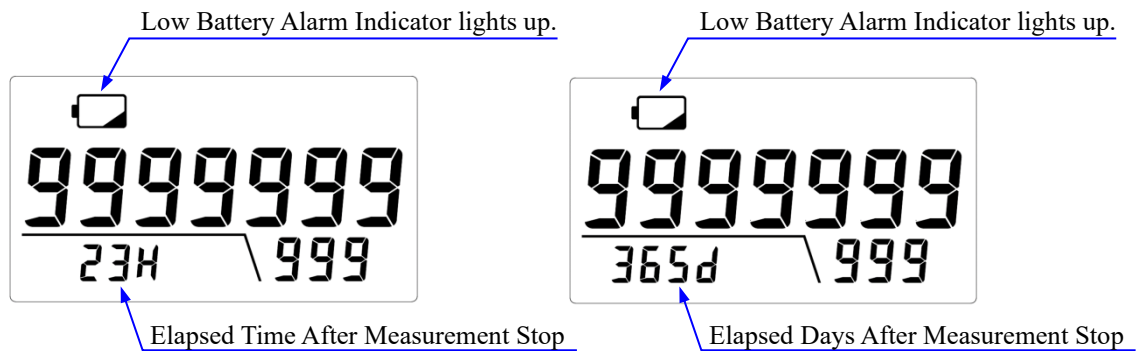


#### (4) Measurement Stop Indicator

Indicator as shown below appears if the battery voltage drops and the state of being incapable of maintaining measurement accuracy continues for an hour. Accumulated Volume is held even in this state. Elapsed time after Measurement Stop Indicator lights up on Flow Rate Display Section.

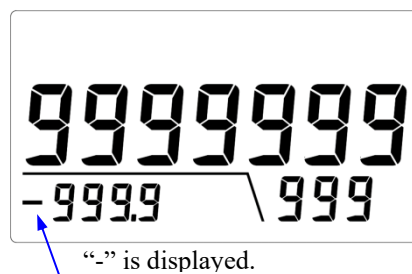
(Hours are indicated as in 0H to 23H for the elapsed time up to 24 hours, while days are indicated as in 1d to 999d for the elapsed time exceeding 24 hours.)

Measurement of Accumulated Volume is stopped and held after Measurement Stop Indicator lights up.



#### (5) Reverse Flow Indicator

Reverse flow is indicated as shown below.



#### Solutions

(1) Confirm if water flow or not and installing position is right or not.

Refer to 6-3-1-2. Piping and Installation

(2) Replace SA.

(3) Remove noise source.

(4) Replace SA.

(5) Confirm if flow direction for water meets flow direction for SA.

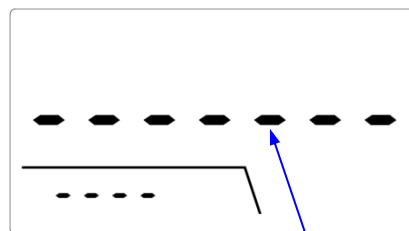
## SR

Warning Indicator	Name of error	Content and solution
Final date and ————— indicate alternately	No date	This indicates no date. <Check item> (1) Forgetting to connect input wire. (2) Output unit in SA For (2), contact a distributor.
💧	No Water Warning Indicator	This indicates that SA measuring section is put into a dried state with no water. 💧 flashes. SR doesn't break down, because SR surely receives date from SA.
E-1	Low Impedance	This indicates that low impedance. E-1 and accumulated volume are alternately indicated. <Check item> (1) Low impedance of input wire (2) Reverse connection of black and white cables of input wire (3) Short-circuit of black and white cables of input wire (4) Low impedance of Terminal Block of SR
🔋	Low battery Alarm Indicator for SA	This indicates that the battery voltage of SA drops. 🔋 flashes. Contact a distributor because the battery of SA is dead.
E-6	Low battery Alarm Indicator for SR	This indicates that the battery voltage of SR drops. E-6 and accumulated volume are alternately indicated. Contact a distributor because the battery of SR is dead.

(Following is an example of indication in the Type SR-4DP. Indications in other Types are different in number of digits of the Accumulated Volume, the decimal point position of Flow Rate and unit.)

### (1) Optical Warning

If signals from SA cannot be read, the following indication and the Accumulated Volume are alternately indicated.



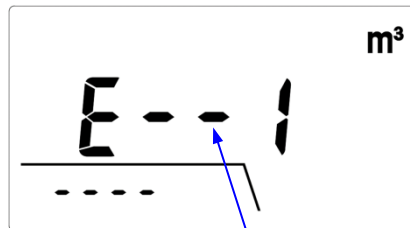
Alternate Indication of "-----" And Accumulated Volume

## (2) Low Impedance MX35

The following indication and the Accumulated Volume are alternately indicated under the conditions of ① to ④.

If SR is used under these conditions, the battery life is shortened.

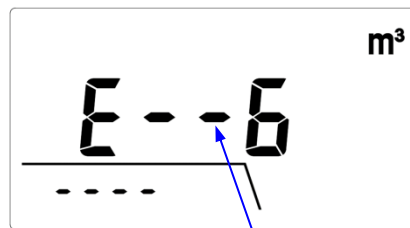
- ① Low Impedance of Input Wire (Wire of MX35)
- ② Reverse Connection of Black And White Cables of Input Wire (Wire of MX35)
- ③ Short-Circuit of Black And White Cables of Input Wire (Wire of MX35)
- ④ Low Impedance of Terminal Block of SR-4DP



Alternate Indication of "E--1" And Accumulated Volume

## (3) Low Battery Alarm Indicator

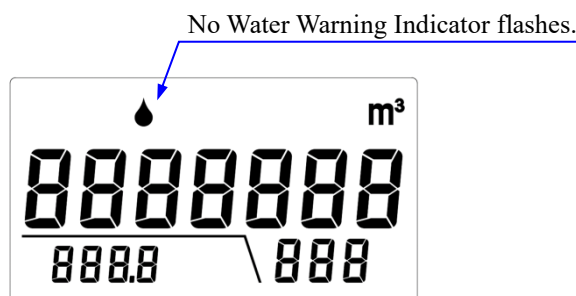
The following indication and the Accumulated Volume are indicated alternately, when the battery voltage drops and remaining battery capacity is getting less.



Alternate Indication of "E--6" And Accumulated Volume

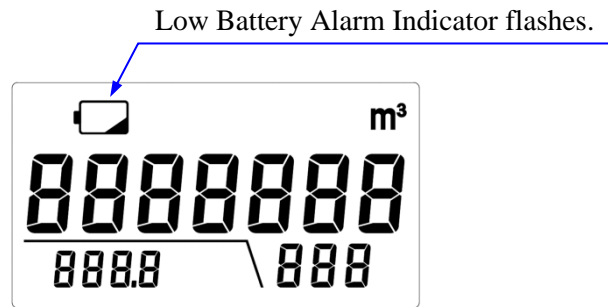
## (4) No Water Warning Indicator

When the SA measuring section is put into a dried state with no water, No Water Warning Indicator as shown below flashes.



### (5) Low Battery Alarm Indicator

Low Battery Alarm Indicator (SA) as shown below flashes when the battery voltage drops and remaining battery capacity is getting less.



## 8. Maintenance

All products are zero maintenance, but maintain SA as below.

### • Notes on cleaning inside of Measuring tube (SA)

Clean the inside surface of the Measuring tube with soft cloth, a soft-bristled brush (Do not use a metallic brush.), etc. Use neutral detergent to scrub fixed contamination.

## 9. Disposal

This chapter describes how to dispose SA, MX35, MX39 and SR-4DP. Dispose of the products containing the lithium batteries with special care.

### **Warning**



#### • **Notes on disposal (all products)**

\*When disposing of products, do not cut, disassemble, alter their shape, heat them, place them near or in naked flame or do anything similar to these activities. In particular, the products SA, SR-4DP and MX39 contain lithium batteries which may heat up, ignite or split if subjected to such treatment so please exercise due care.

\*Used batteries must be disposed of in accordance with applicable federal, state and local regulations

#### • **Damage is irreparable (all products)**

If a product becomes broken or damaged, replace the entire unit. Neither product repair nor parts replacement is possible. Handle the products with sufficient care so as to avoid breakage or damage.



#### • **Prohibition of disassembly and alteration (all products)**

NEVER disassemble or alter the products by use of external force.

## 10. Others

#### • **Use of radio equipment (all products)**

Use of radio equipment near the products may interfere with accurate measurement. Observe the following whenever using radio equipment:

- (1) Do not place the antenna of radio equipment close to any product (including product cables).
- (2) Avoid installing a fixed antenna of radio equipment near any product (including product cables).

\* When using radio equipment near an SA, close the lid of the SA and keep the radio equipment as far away from the SA as possible.

## 11. Warranty Policy

We deeply appreciate your constant patronage to our products. Our warranty policy is as follows.

### **The warranty period**

The warranty period for our products shall be set as one (1) year.

The warranty period shall start from the date of the purchase of our products. (If the date of the purchase of our products cannot be confirmed, the warranty period shall start from the month of manufacture of our products.)

<Notes>

For specified measuring instrument that must be verified, the warranty period shall start from the month of verification test of our products. Valid Period specified by Measurement Act doesn't specify the warranty time but limitation for use.

### **Scope**

We are manufacturing products by the perfect quality assurance system. If the products are failed in spite of normal use within the warranty period, we shall repair our products or supply alternate products without charge. In detail, please confirm the warranty for each product. We shall not be liable for damages to something excluding our products, loss of profits and loss of opportunity, cost of delivery and cost of installation that are due to failure of our products .

<Notes>

If you contract us specially, the warranty is according to the contract.

## About Aichi Tokei Denki

Aichi Tokei Denki is a leading company for water and gas metering in Japan, being ranked number one for water metering in Japan for many years. The company has over 110 years experience as a manufacturer and over 20 years experience of battery-powered electromagnetic technology. For more details, please visit:  
<https://www.aichitokei.co.jp/eng/index.html>

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