nexa™ by WATTS

User Guide

Flow Meter
Clamp-on 1½" - 8"

EDP 80070011 | EDP 80070012 | EDP 80070015 | EDP 80070033

Contents

⚠ WARNING

Read this Manual BEFORE using this equipment. Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment. Keep this Manual for future reference.

Overview

Nexa Clamp-On, Ultrasonic Flow Meters

SKUs: 80070011, 80070012, 80070015, 80070033

Important: Nexa Flow Meters must be installed with a Nexa Connection Kit which communicates to the cloud and Nexa platform. Please refer to the Nexa Connection Kit User Guide (UserGuide-N-ConnectionKit 2410), found at nexaplatform/hardware-support.com

Features

- Works with Nexa! Nexa remotely connects to your flow meters, and receives real-time system data, empowering insight to identify system inefficiencies + enhance troubleshooting, issue resolution, and system optimization
- Non-invasive installation and set up ensures that there will be zero impact on the flow system
- Intuitive bracket design removes the guess work and ensures consistent mounting by just a single individual
- Mounts securely in minutes. No pipe modifications are necessary
- All models feature rugged three-piece design, consisting of the lower bracket, upper bracket, and main unit which are quickly and easily secured to the pipe with either 4 or 6 screws
- Utilizes an ultrasonic signal 20X stronger than conventional models
- Automatically increases its signal strength to blast through harsh build-up for lasting detection

Operation

- Nexa improves upon conventional technology by simultaneously monitoring two signals (one moving in the direction of flow and one moving against the direction of flow). By doing this, the readings remain consistent and stable regardless of external factors such as clogging or temperature changes. Conventional flow meters measure flow by monitoring the time it takes for an ultrasonic pulse to travel from a transmitting element to a receiving element. As the flow rate increases, the signal is accelerated and the transmission time decreases. This transmission time can be directly correlated to the instantaneous flow rate.

Applications

- Domestic hot water pipes, risers, branches and returns
- Cold water lines
- Boiler and chiller supply and return
- Additional applications

Sizes (pipe outer diameter)

- 80070033: 1.5 – 2” (44mm – 64mm)
- 80070011: 2.5 – 3” (64mm – 100 mm)
- 80070012: 4 – 5” (100mm – 152mm)
- 80070015: 6 – 8” (152mm – 220mm)

Compatible Pipe Materials

- Copper, Iron, Stainless Steel, PVC, Resin

Tools Needed

- No special tools or knowledge required
- Phillips-head screwdriver installs securely to an existing pipe ensures proper installation by any member of the team

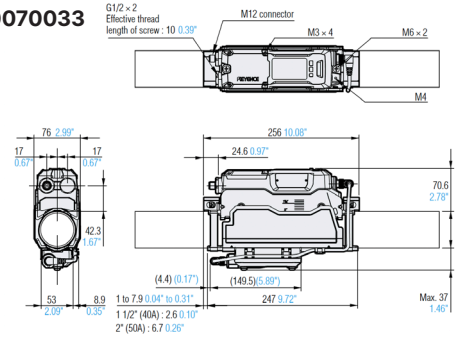
Unit Selection Size

Supported Pipe Size (outer diameter)	Appearance	Model	Rated Flow Velocity Range	Flow Rate Range (typical)	Weight
1 1/2" (40A) (ø44 to ø55 ø1.73" to ø2.17")		80070033	0.3 m/s to 5 m/s	36 to 400 L/min 9 to 100 gal/min 2.4 to 24 m3/h	Approx. 2.5 kg 5.51 lb
2" (50A) (ø55 to ø64 ø2.17" to ø2.52")				36 to 600 L/min 9 to 150 gal/min 2.4 to 36 m3/h	
2 1/2" (65A) (ø64 to ø83 ø2.52" to ø3.27")		80070011		90 to 1000 L/min 24 to 260 gal/min 5.4 to 60 m3/h	Approx. 3.0 kg 6.61 lb
3" (80A) (ø83 to ø100 ø3.27" to ø3.94")				90 to 1500 L/min 24 to 390 gal/min 5.4 to 90 m3/h	
4" (100A) (ø100 to ø127 ø3.94" to ø5.00")		80070012		220 to 2500 L/min 60 to 660 gal/min 12 to 150 m3/h	Approx. 3.3 kg 7.28 lb
5" (125A) (ø127 to ø152 ø5.00" to ø5.98")				220 to 3700 L/min 60 to 990 gal/min 12 to 220 m3/h	
6" (150A) (ø152 to ø191 ø5.98" to ø7.52")		80070015		570 to 5500 L/min 150 to 1400 gal/min 36 to 330 m3/h	Approx. 3.5 kg 7.72 lb
8" (200A) (ø191 to ø220 ø7.52" to ø8.66")				570 to 9500 L/min 150 to 2500 gal/min 36 to 570 m3/h	

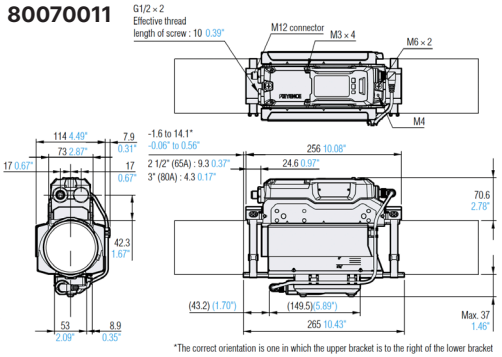
*The minimum flow rates (flow rates) can be changed in the settings.

Dimensions

80070033

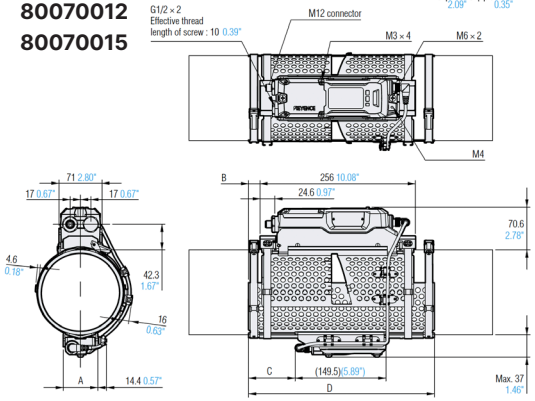


80070011



*The correct orientation is one in which the upper bracket is to the right of the lower bracket

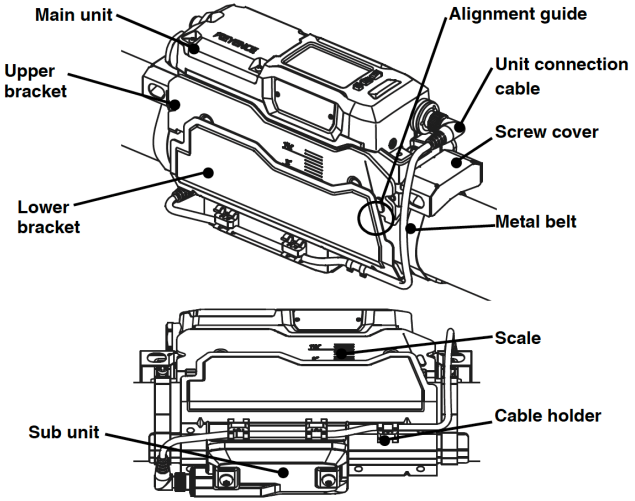
80070012
80070015



	80070012	80070015
A	57 2.24"	62 2.44"
B	14.1 to 34.6 0.56" to 1.36" 4"(100 A): 29 1.14" 5"(125 A): 19 0.75"	17.1 to 42.9 0.67" to 1.69" 6"(150 A): 37.6 1.48" 8"(200 A): 18.5 0.73"
C	(76.9)(3.03")	(104.3)(4.11")
D	306 12.05"	315 12.40"

Part Names and Functions

80070011, 80070033



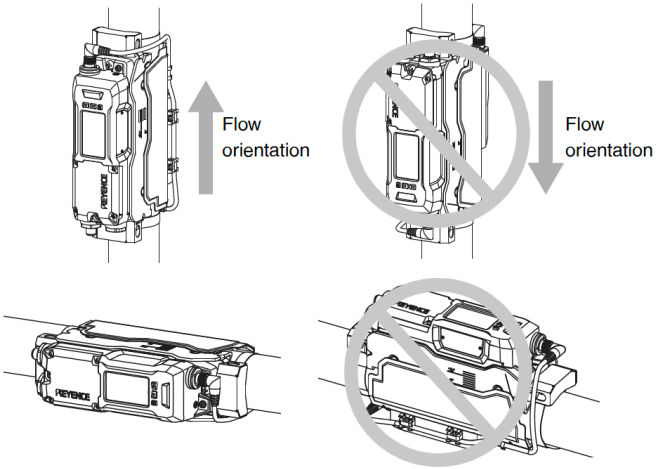
Selecting the Installation Location

80070011, 80070033, 80070012, 80070015

Installation orientation

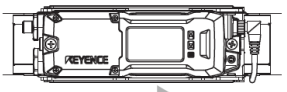
• To avoid the effects of air bubbles and to avoid situations where the pipe is not filled with fluid, it is recommended to secure the FD-R Series in a position where the display surface is perpendicular to the ground.

• When installing the FD-R Series on a vertical pipe, choose a position where the fluid flows in an upward direction.



Flow direction

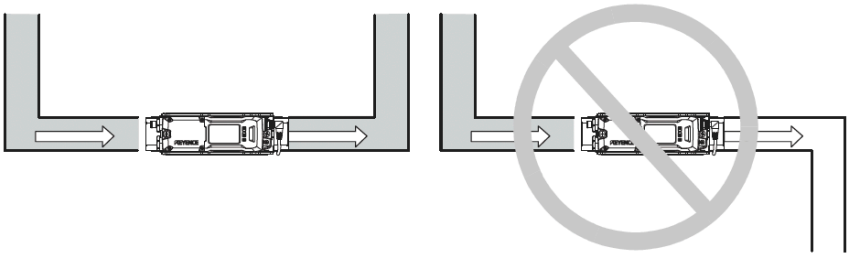
Use “E. Selecting the flow direction” under “3-1 Initial Settings” or “5-2 Additional Functions Menu” to switch the flow direction of the fluid.
This is set to the direction shown in the figure on the right when the product is shipped.



Flow orientation

Main unit installation position

• Install the FD-R Series in a location where the inside of the pipe is always filled with fluid.



• Arrange the piping so that gas does not enter it. When the fluid contains bubbles, the detection performance of the FD-R may be affected.

• Install flow regulating valves and similar pieces of fluid control equipment on the downstream side of the flow meter.

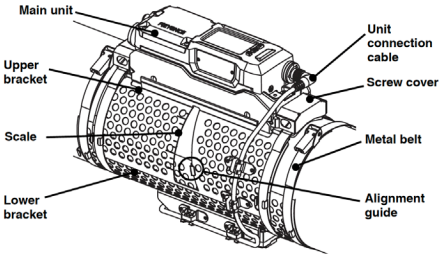
• Install the FD-R Series main/sub units on surfaces with no seams or rust.

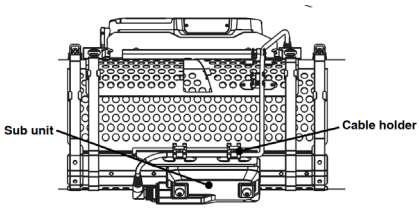
• To avoid interference between detection signals, do not install multiple units in close proximity.

• Avoid locations with large pulsation, such as the discharge section of a pump, when installing the FD-R Series.

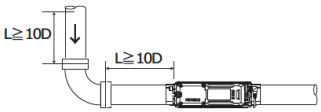
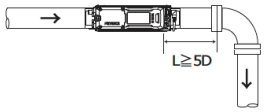
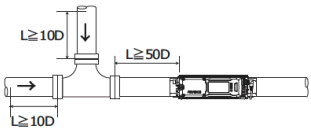
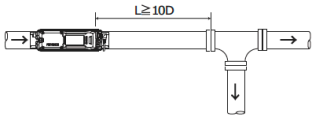
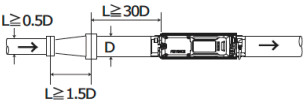
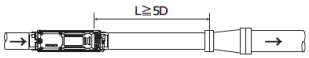
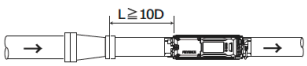
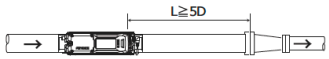
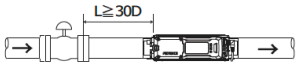
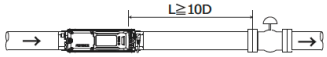
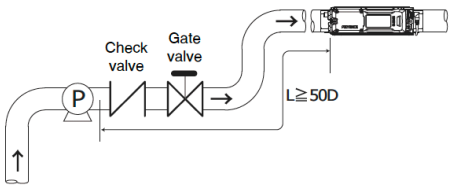
• When the FD-R Series is installed immediately after a location where fluids with different water quality are mixed, the operation of the FD-R Series may become unstable.

80070012, 80070015





• To improve the measurement accuracy, it is recommended that straight sections of pipe, with lengths based on the table below, exist both upstream and downstream of the unit. (D: Pipe outer diameter)

Characteristic	Straight piping length on upstream side	Straight piping length on downstream side
90° bend		
T-joint		
Expanding pipe		
Shrinking pipe		
Various valves		
Pump		

Source: Japan Electric Measuring Instruments Manufacturers' Association Standard JEMIS032-1987

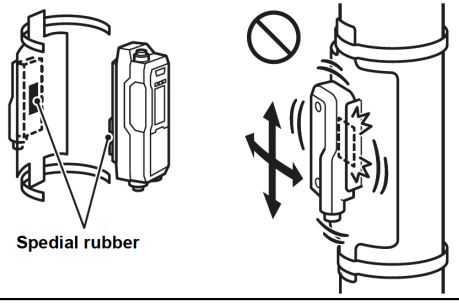
• The information given above is a guideline and does not guarantee the accuracy. When the velocity distribution is not uniform, a straight piping length that is greater than or equal to that indicated above is recommended.

Detachment to install the unit for the first time

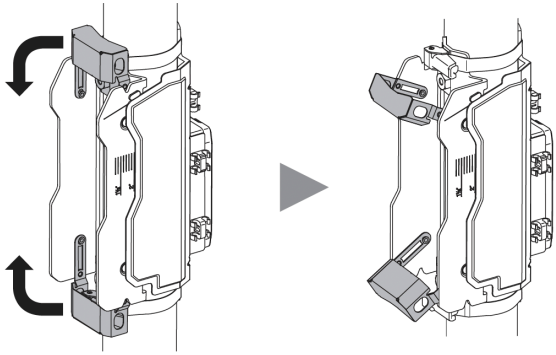
80070011, 80070033

NOTICE

Do not move the special rubber while it is in contact with the pipe.
Doing so may deform or damage the special rubber.

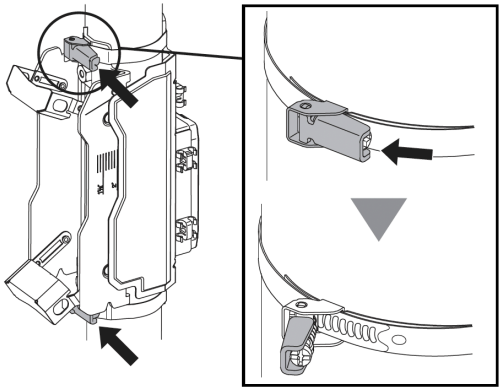


1. Open the screw covers.



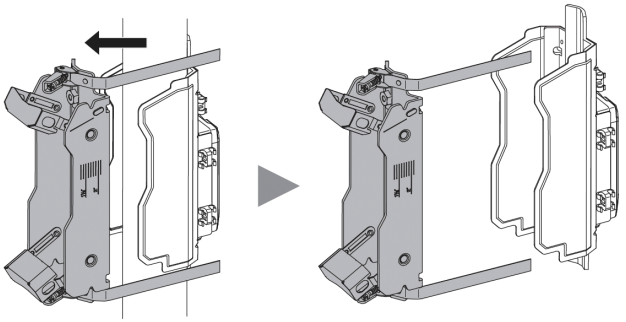
2. Loosen the screws of the metal belts.

After the screws are loosened lightly, you can raise them and detach the metal belts.



3. Open the metal belts and detach the upper bracket.

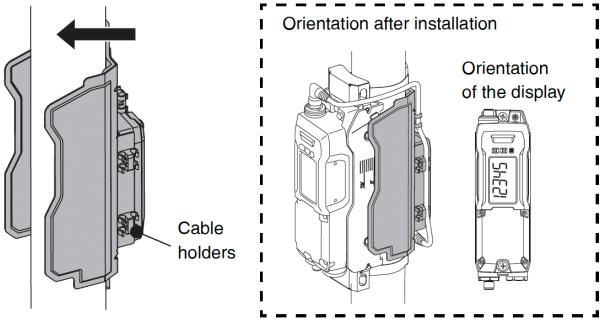
By deforming the metal belts to the opening orientation, you will attach the unit easily.



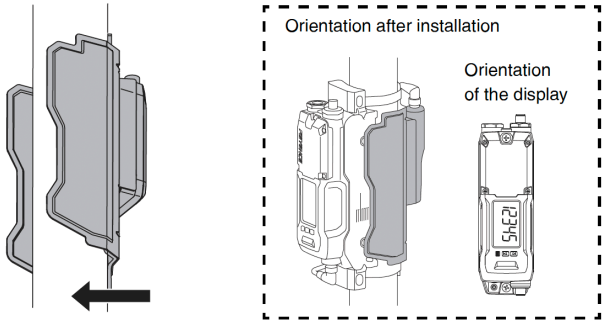
Unit Installation

1. Determine the installation orientation of the lower bracket.

The orientation of the main unit's display is determined by the installation orientation of the lower bracket. Do not move the lower bracket after it has been attached to the pipe.

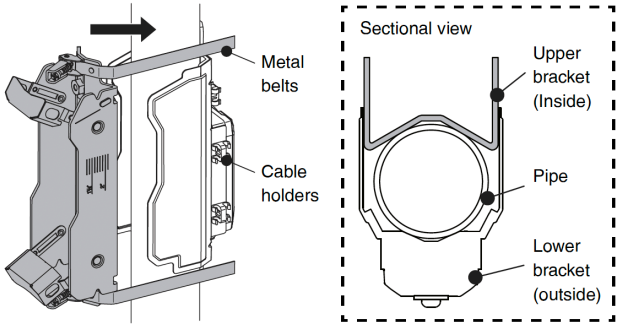


When installed with the opposite orientation



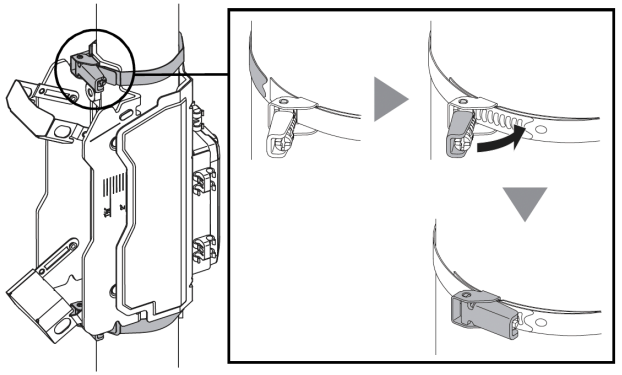
2. Determine the installation orientation of the upper bracket.

Make sure the metal belts and cable holders are the same side of the pipe.
Pay attention to the orientation of the upper bracket when attaching it to the setup.



3. Attach the lower bracket and the upper bracket so that they are pressed against the pipe, and then use the metal belts to lightly fix these brackets in place.

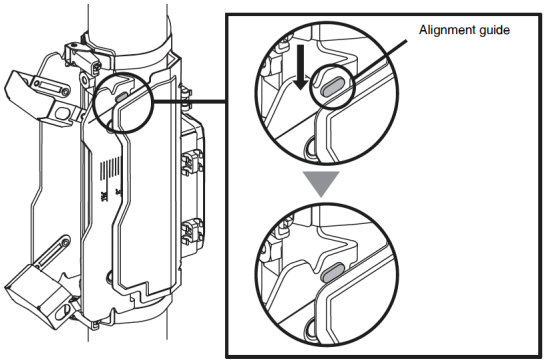
Attaching the metal belt screw. Insert the metal belt as far as it will go into the screw part, and then fold down the screw. Then, tighten the screw while holding down the screw part with your finger.



4. Adjust the position of the upper bracket to align the alignment guide with the lower bracket.

Do not move the lower bracket while it is in contact with the pipe. Doing so may damage the special rubber on the rear surface of the sub unit.

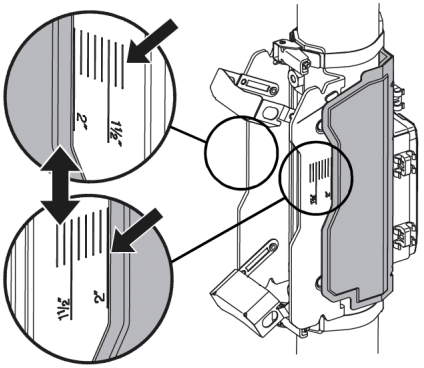
To detect the flow rate stably, adjust the unit position in the longitudinal direction of the pipe.



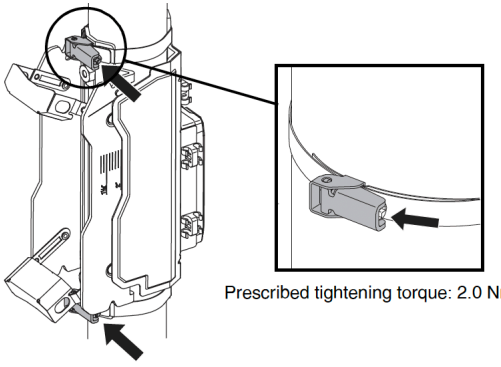
5. Adjust the position of the upper bracket so that the scale position is the same on the left and right.

Do not move the lower bracket while it is in contact with the pipe. Doing so may damage the special rubber on the rear surface of the sub unit.

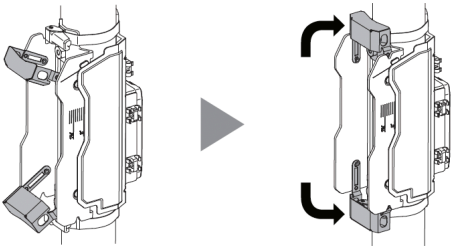
To detect the flow rate stably, adjust the unit position according to the pipe angle.



6. Firmly tighten the metal belt screws.

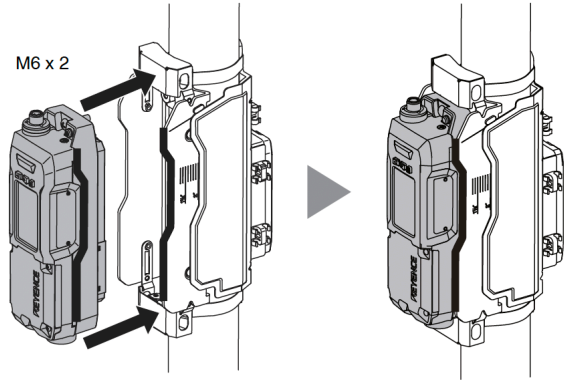


7. Close the screw covers.



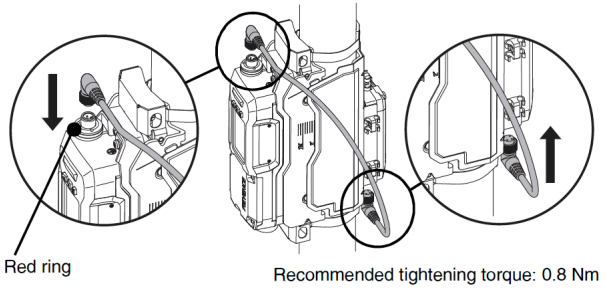
8. Fix the main unit in place on the upper bracket.

Tighten the left and right screws evenly, a little bit at a time.

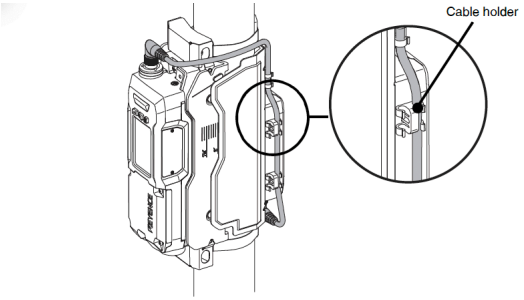


9. Connect the unit connection cable to the main unit and sub unit.

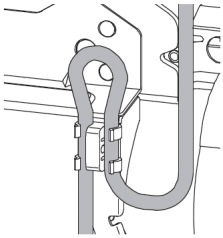
Pay attention to the orientation of the connector when connecting it.
Failing to do so may lead to damage such as bent pins.



10. Fix the unit connection cable to the cable holders.



Reference Freely install the cable in the cable holders.



Check of the stability of detection

After the cable connection is completed, turn on the power.

The STABILITY indicator lights up on the lower left of the display after the initial installation.

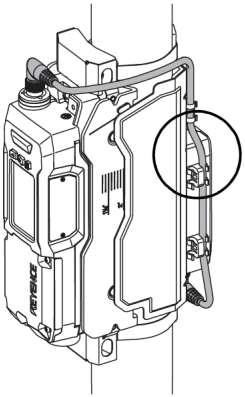
The STABILITY indicator shows the rough stability of detection.

In case of unstable detection or no detection, see “Points to be checked after installation”.

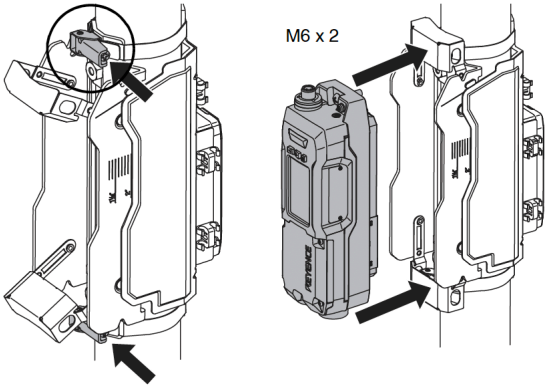
- 4 indicators lit ⇨ Stable detection is possible.
- 3 indicators lit ⇨ Detection is possible.
- 1 indicator or 2 indicators lit
  ⇨ Detection is possible, but may be unstable. When changing the actual flow rate, check that the display tracks the change.
- 1 indicator blinking ⇨ Detection is not possible or it is not possible to perform measurements correctly.
- The indicators blink in order (see the following figure)
  ⇨ Searching for detection condition.

Points to be checked after installation

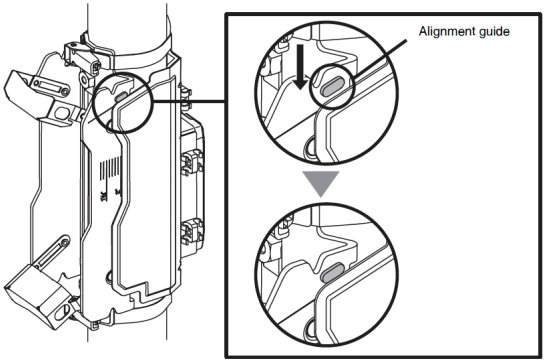
Is the unit connection cable is attached as illustrated below?



Are the screws tightened firmly?

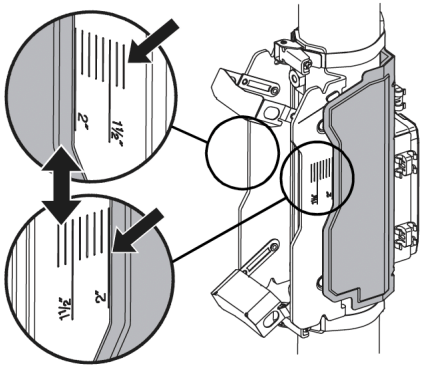


Are the alignment guides touched to the lower bracket?



Are the scales on the both sides the same position?

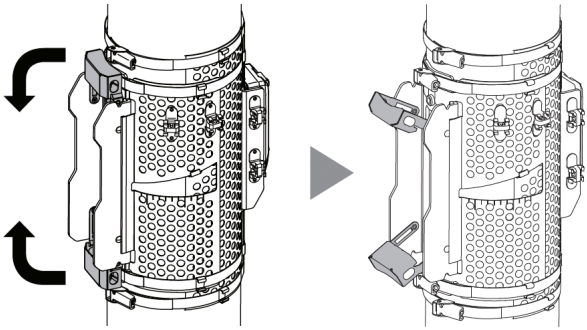
(If there is a gap of 1 gradation or more between the right and left scales, the detection may be unstable.)



Detachment to install the unit for the first time

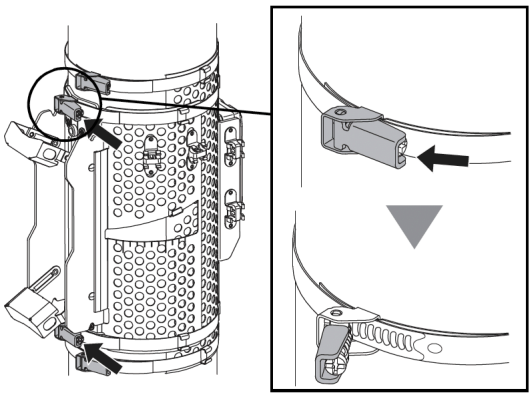
80070012, 80070015

1. Open the screw covers.



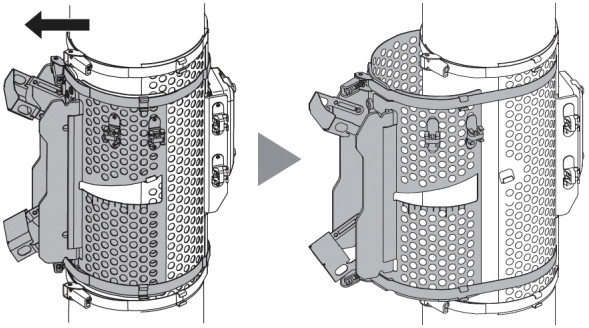
2. Loosen the screws of the metal belts.

After the screws are loosened lightly, you can raise them and detach the metal belts.



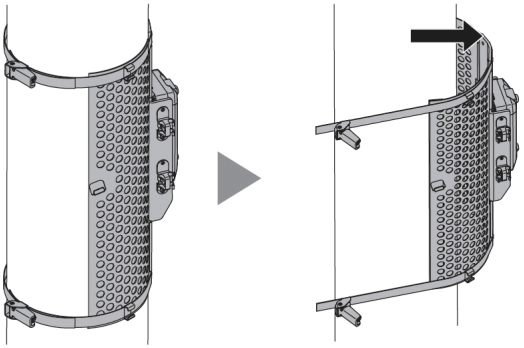
3. Open the metal belts and detach the upper bracket.

By deforming the metal belts to the opening orientation, you will attach the unit easily.



4. Open the metal belts and detach the lower bracket.

By deforming the metal belts to the opening orientation, you will attach the unit easily.

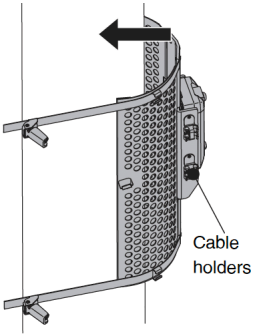


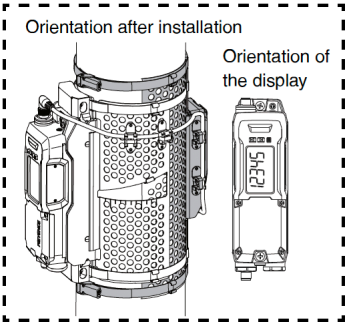
Unit Installation

1. Determine the installation orientation of the lower bracket.

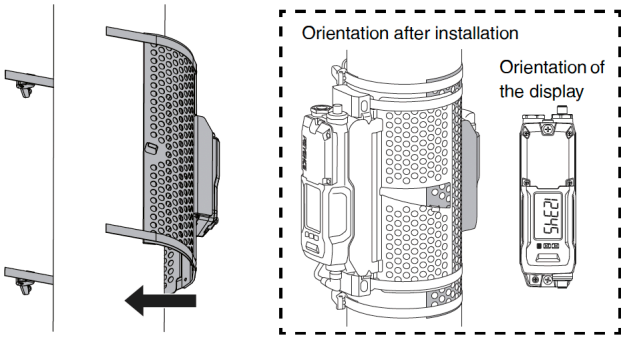
The orientation of the main unit's display is determined by the installation orientation of the lower bracket.

Do not move the lower bracket after it has been attached to the pipe.





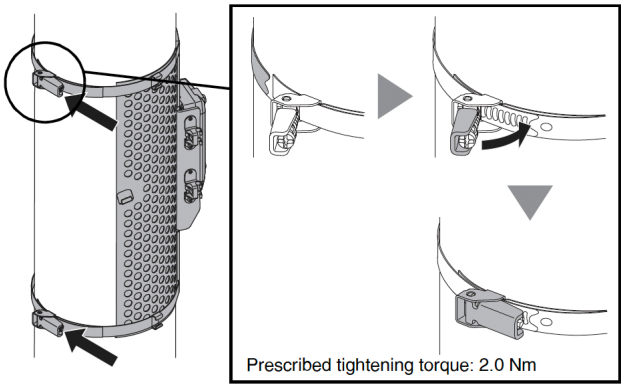
When installed with the opposite orientation



2. Use the metal belt to attach the lower bracket to the pipe.

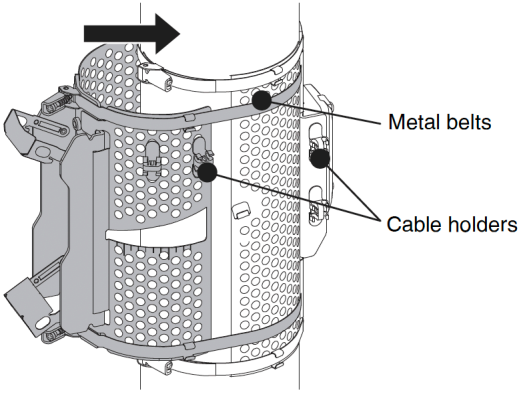
Attaching the metal belt screw Insert the metal belt as far as it will go into the screw part, and then fold down the screw.

Then, tighten the screw while holding down the screw part with your finger.



3. Attach the upper bracket.

Make sure the metal belts and cable holders are the same side of the pipe.
Pay attention to the orientation of the upper bracket when attaching it to the setup.

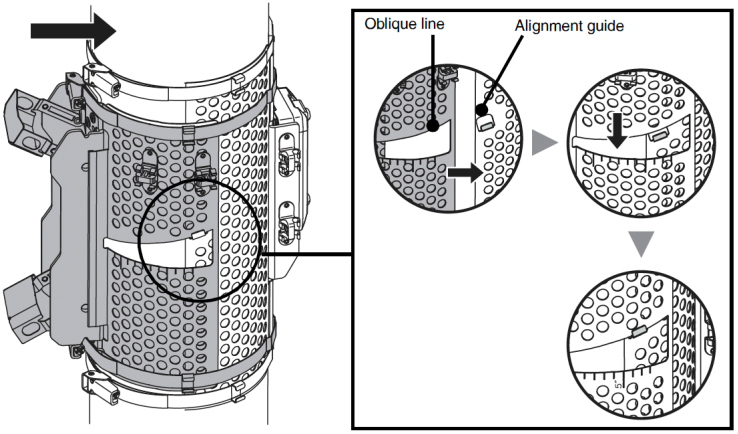


4. Attach the upper bracket so that the left and right alignment guides are aligned with the upper bracket.

Do not move the lower bracket while it is in contact with the pipe. Doing so may d amage the special rubber on the rear surface of the sub unit.

• Press the side of the upper bracket to insert the upper bracket into the alignment guide.

• To detect the flow rate stably, adjust the unit position according to the pipe angle.

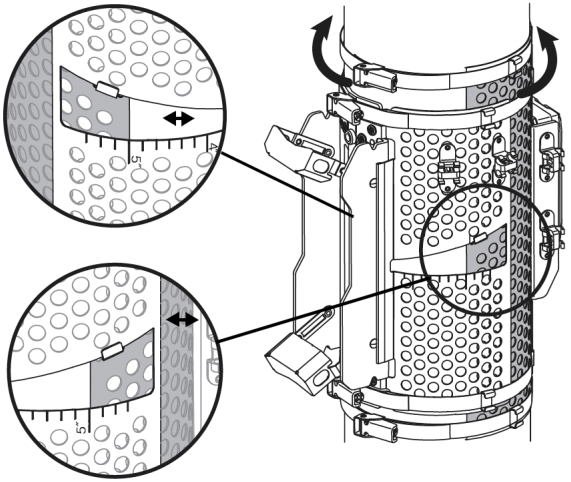


5. Adjust the position of the upper bracket so that the scale position is the same on the left and right.

Do not move the lower bracket while it is in contact with the pipe. Doing so may damage the special rubber on the rear surface of the sub unit.

• Press the side of the upper bracket to insert the upper bracket into the alignment guide.

• To detect the flow rate stably, adjust the unit position according to the pipe angle.

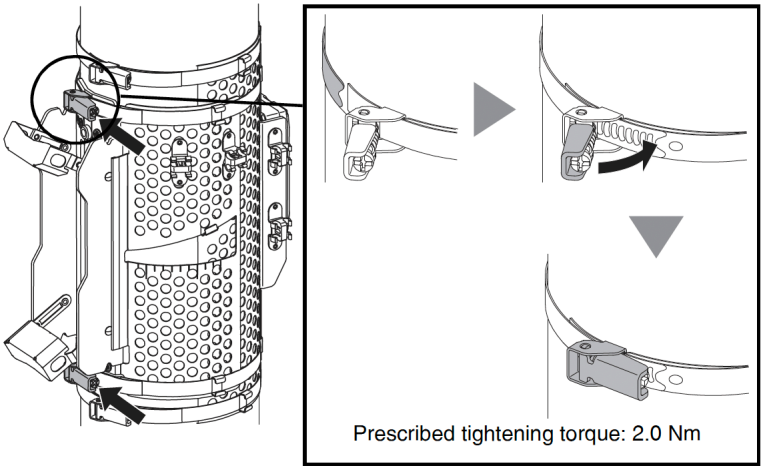


6. Firmly tighten the metal belt screws.

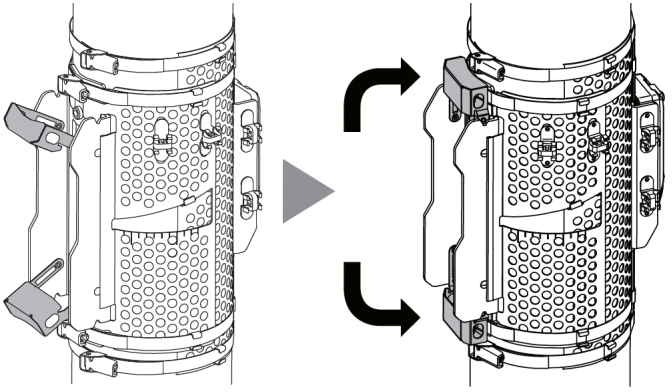
Attaching the metal belt screw

Insert the metal belt as far as it will go into the screw part, and then fold down the screw.

Then, tighten the screw while holding down the screw part with your finger.

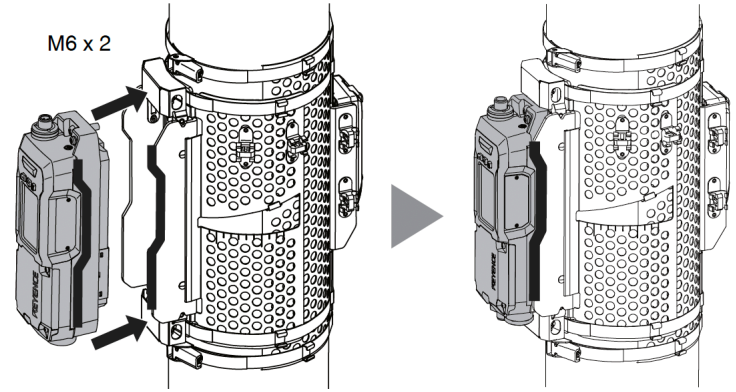


7. Close the screw covers.



8. Fix the main unit in place on the upper bracket.

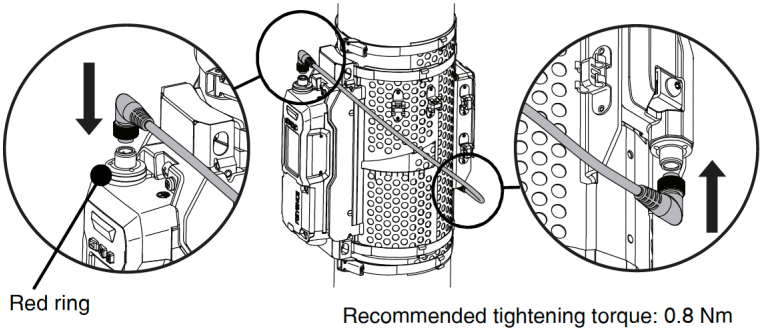
Tighten the left and right screws evenly, a little bit at a time.



Prescribed tightening torque: 2.0 Nm

9. Connect the unit connection cable to the main unit and sub unit.

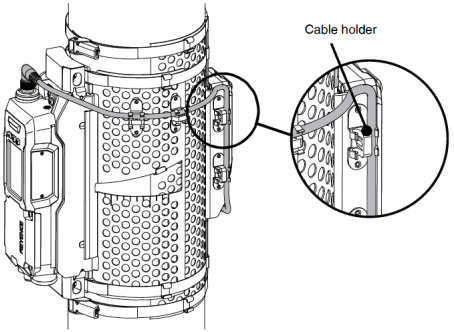
Pay attention to the orientation of the connector when connecting it.
Failing to do so may lead to damage such as bent pins.

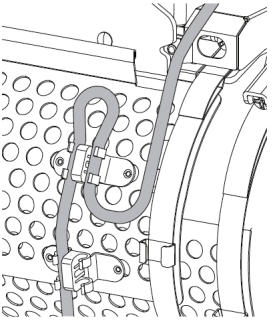


Recommended tightening torque: 0.8 Nm

10. Fix the unit connection cable to the cable holders.

Freely install the cable in the cable holders.





Check of the stability of detection

After the cable connection is completed, turn on the power.

The STABILITY indicator lights up on the lower left of the display after the initial installation.

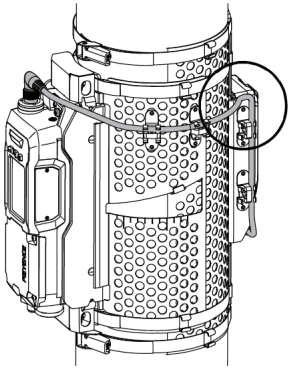
The STABILITY indicator shows the rough stability of detection.

In case of unstable detection or no detection, see “Points to be checked after installation”.

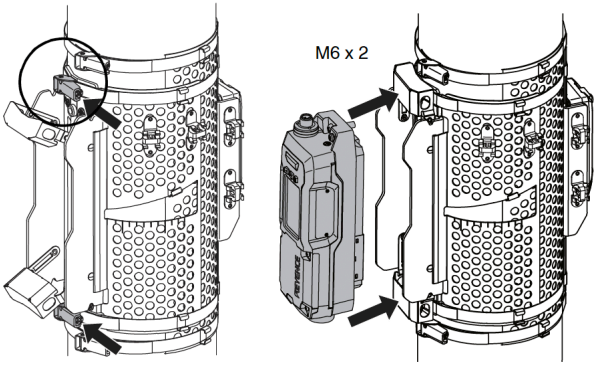
- 4 indicators lit ⇨ Stable detection is possible.
- 3 indicators lit ⇨ Detection is possible.
- 1 indicator or 2 indicators lit
  ⇨ Detection is possible, but may be unstable. When changing the actual flow rate, check that the display tracks the change.
- 1 indicator blinking ⇨ Detection is not possible or it is not possible to perform measurements correctly.
- The indicators blink in order (see the following figure)
  ⇨ Searching for detection condition.

Points to be checked after installation

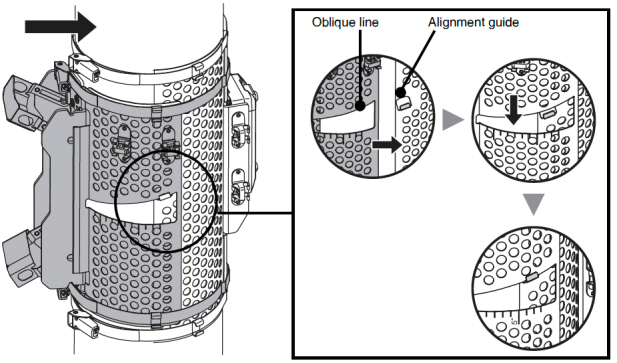
Is the unit connection cable is attached as illustrated below?



Are the screws tightened firmly?

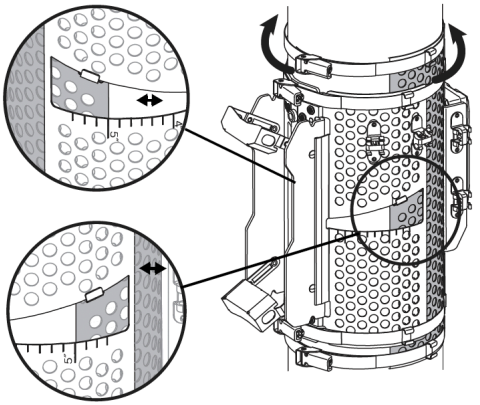


Are the alignment guides touched to the lower bracket?



Are the scales on the both sides the same position?

(If there is a gap of 1 gradation or more between the right and left scales, the detection may be unstable.)



Configuration Settings

Initial Settings

Pipe Size 1 1/2" - 8"

Press [M] + △ when an item is being set to return to the previous screen.

A. Setting the current date and time (Select the value with △, ▽.)

Display	Setting details
YEAR	Year
DATE	Date
TIME	Time

B. Selecting the ch.1 function (Select the value with △, ▽.)

OUT Control output

ANLG Analog output

C. Selecting the ch.2 function (Select the value with △, ▽.)

OFF Not used

OUT Control output*1

INPUT External input

ANLG Analog output

D. Selecting NPN/PNP (Select the value with △, ▽.)

NPN NPN

PNP PNP

E. Selecting the flow direction (Select the value with △, ▽.)

→R Flow direction: From left to right

L← Flow direction: From right to left

F. Selecting the flow unit (Select the value with △, ▽.)*2

L/MIN L/min

M3/H m^3/h

G/MIN gal/min*3

H. Selecting the pipe size (Select the value with △, ▽.)

Model	Selection	Pipe size
FD-R50	1 1/2	1 1/2" (40A)
	2	2" (50A)
FD-R80	2 1/2	2 1/2" (65A)
	3	3" (80A)
FD-R125	4	4" (100A)
	5	5" (125A)
FD-R200	6	6" (150A)
	8	8" (200A)

Detailed Settings

Not all settings require adjustment. Ensure selections made match those highlighted below according to the correct model.

1. Output 1 detection mode (Select the value with △, ▽.)

STD Instantaneous flow rate mode
AREA Area mode
PULSE Pulse output mode
TOTAL Integrated flow mode

2. Output 1 logic (Select the value with △, ▽.)

NO. Normally Open
NC. Normally Closed

---

10. Response time (Select the value with △, ▽.)

Setting range (unit: seconds)
0.5 / 1.0 / 2.5 / 5.0 / 10.0 / 30.0 / 60.0 / 120.0 / 200.0

11. Integrated flow unit (Select the value with △, ▽.)

When the flow unit setting is L or gal
1 / 10 / 100 / 1000 / 10000
When the flow unit setting is m^3
0.1 / 1 / 10 / 100 / 1000

---

12. Additional functions menu (Select the value with △, ▽.)

END Settings complete
FULL Additional functions menu

13. Display resolution (Select the value with △, ▽.)

Model	Setting range		
	L/min	m^3/h	gal/min
FD-R50	0.1/1	0.01/0.1/1	0.1/1
FD-R80	1	0.01/0.1/1	0.1/1
FD-R125	1	0.1/1	0.1/1
FD-R200	1	0.1/1	1

14. Display averaging (Select the value with △, ▽.)

Setting range (unit: seconds): 0 to 10

15. Hysteresis (Select the value with △, ▽.)

Model	Setting range		
	L/min	m^3/h	gal/min
FD-R50	0 to 999.9	0 to 99.99	0 to 999.9
FD-R80	0 to 9999	0 to 999.99	0 to 999.9
FD-R125	0 to 9999	0 to 999.9	0 to 9999.9
FD-R200	0 to 99999	0 to 999.9	0 to 9999

---

16. Zero cut flow rate (Select the value with △, ▽.)

Model	Setting range		
	L/min	m^3/h	gal/min
FD-R50	0.1 to 999.9	0.01 to 99.99	0 to 999.9
FD-R80	1 to 9999	0.01 to 999.99	0 to 999.9
FD-R125	1 to 9999	0.1 to 999.9	0 to 9999.9
FD-R200	1 to 99999	0.1 to 999.9	0 to 9999

17. Detection hold time (Select the value with △, ▽.)

Setting range (unit: seconds): 0.5 / 1.0 / 2.5 / 5.0 / 10.0 / 30.0 / 60.0

---

18. Integrated pulse weight (Select the value with △, ▽.)

Unit	Setting range
L	0.02 to 999.99
m^3	0.002 to 99.999
gal	0.02 to 999.99

19. Display indicator illumination mode (Select the value with △, ▽.)

GREEN	Green light - light off mode
RED	Light off - red light mode
G-R	Green light - red light mode
3-ST	PMI (predictive maintenance information) mode (green light, green blinking, red light)
OFF	OFF

---

20. Display brightness (Select the value with △, ▽.)

STD	Standard (indoor use)
HIGH	High (outdoor use)

21. Power-saving mode (Select the value with △, ▽.)

OFF	Normal
ON	Power-saving mode

---

22. Simulation mode (Select the value with △, ▽.)

OFF	OFF
ON	Perform simulation

25. Key lock method (Select the value with △, ▽.)

STD	Normal (without password)
PASS	Password-protected key lock

E. Selecting the flow direction (Select the value with △, ▽.)

→R	Flow direction: From left to right
L→	Flow direction: From right to left

H. Selecting the standard pipe size (Select the value with △, ▽.)

Model	Selection	Pipe size
FD-R50	1 1/2	1 1/2" (40A)
	2	2" (50A)
FD-R80	2 1/2	2 1/2" (65A)
	3	3" (80A)
FD-R125	4	4" (100A)
	5	5" (125A)
FD-R200	6	6" (150A)
	8	8" (200A)

26. Correcting the flow rate value (Select the value with △, ▽.)

OFF	No correction
PRO	Correcting various values
SPAN	Setting the flow rate magnification (flow rate span adjustment)

---

28. Correcting the pipe outer diameter (Select the value with △, ▽.)

STD	No correction
USER	Correction

30. Selecting the pipe thickness (Select the value with △, ▽.)

Selecting the pipe thickness (schedule) correctly will improve flow rate readings.

SGP	SGP pipe
SCH20	Sch20S
SCH40	Sch40
SCH80	Sch80
USER	Pipe thickness input

---

32. Selecting the liquid type (Select the value with △, ▽.)

WATER	Water
USER	Value input

Checking the NPN/PNP setting

The NPN/PNP settings can be checked, but cannot be changed.

NPN	NPN
PNP	PNP

Troubleshooting

Problem	Cause
ERC is displayed.	Excessive current (overcurrent) is flowing through control output 1 or control output 2.
ERE is displayed.	The memory has reached the end of its service life or the flow meter is malfunctioning.
ERP is displayed.	The response frequency of the integrated pulse output has exceeded 200 Hz.
• *REV* is displayed. • A negative instantaneous flow rate is displayed.	The fluid flows in the opposite direction of the setting or is convecting.
	The origin is offset by a large amount.
	The instantaneous flow rate has greatly exceeded the rated flow rate.
	The zero cut flow rate is set to OFF (when a negative instantaneous flow rate is displayed).
SET CLOCK is displayed.	The clock battery module has been fully discharged or there is no battery capacity.
FFFFF is displayed.	The integrated flow display has exceeded the display range.
LOCK is displayed.	The key lock function is active.
H.TEMP or *L.TEMP* is displayed.	The pipe temperature is less than -40°C or is higher than 140°C.
--- is displayed	• The lower bracket or the upper bracket is not properly fixed in place. • The main unit is not properly fixed in place. • The pipe is not filled with fluid. • The detection signal is obstructed. • The special rubber on the main unit or on the rear surface of the sub unit is deformed. • The sensor is affected by pulsation or air bubbles.
• The instantaneous flow rate occasionally becomes “0.” • One stability indicator or two stability indicators are lit. • One stability indicator blinks. • The stability indicators blink in order.	

Solution
• Check if the output wires are connected correctly and are not in contact with other wires. • Check if the load is within the rated range.
Perform initialization. If the problem persists, contact your nearest Nexa office.
Increase the integrated pulse weight value.
Set the flow direction according to the correct fluid flow direction.
Adjust the origin with the pipe full with nonflowing fluid.
Use this product within the rated flow rate range that can be displayed normally.
Set the zero cut flow rate to a value other than OFF.
• Use the product normally and observe how the product behaves. • If this problem occurs each time that you restart the product, there may be no battery capacity in the clock battery module. If using the full-time recording function, replace the clock battery module. If not using the full-time recording function, set the clock battery alarm to OFF.
• Perform an integrated flow reset. • Change the integrated flow unit to a more appropriate setting or use an external counter.
Disable the key lock function when you want to change the settings. (See "7-2 Key Lock") If you have forgotten the key lock password, contact your nearest KEYENCE office.
Use this product within the specified temperature range.
• Tighten the metal belt screw until the detecting surface is firmly in contact with the pipe. • Check whether the installation orientation and order of the upper and lower brackets are correct. • Check whether the unit connection cable is connected correctly. • Check that the main unit, upper bracket, and lower bracket have not been partially tightened or are not loose. • Install the sensor so that the display is perpendicular, not parallel, to the ground. • Remove the main unit and the brackets from the pipe, and then attach them in a different location. • If there is rust or dirt on the pipe surface, avoid this area when installing the sensor. • If there is a seam on the pipe where the back side of the sensor main unit or sensor sub unit comes in contact with the pipe, move the sensor main unit or sensor sub unit away from the seam before installation. • If air bubbles or foreign particles are expected to be present inside the pipe, change the installation location or remove these items by way of highpressure washing. • If the special rubber is deformed, contact your nearest KEYENCE office. • Increase the response time. • Set a longer detection hold time. If the problem persists, the fluid or the pipe may be causing detection issues or the flow meter may be damaged.

Problem	Cause
The instantaneous flow rate is not stable.	• The pipe is not filled with fluid. • The sensor is affected by pulsation or air bubbles. • Cavitation is occurring due to pressure changes.
	The flow velocity distribution is not uniform over time.
The instantaneous flow rate does not change from “0.”	The total accumulated flow display or the integrated flow display has been set.
	When using the external input function, the flow rate zero input (TRIG) is selected and the external input is being applied.
	The fluid is not flowing.
	The fluid is flowing. However, the flow rate value is less than the zero cut flow rate.
	The fluid is flowing in the incorrect direction.
The flow rate differs greatly from the actual flow rate value.	The product has not been installed correctly.
	The pipe size and the pipe thickness selected with the settings differ from those of the actual pipe.
	Use of seamless piping.
	The origin adjustment has not been performed correctly.
	The characteristics of the fluid largely differ from those of water.
	The flow velocity distribution is not uniform due to factors such as a laminar flow and drift.
The instantaneous flow rate is displayed even though no fluid is flowing through the pipe.	The origin adjustment has not been performed correctly.
	The pipe is not filled with fluid.
	The zero cut flow rate setting is too small.
The display turns on and off.	• The power is not turned on. • The connector cable is damaged. • The unit is in the powersaving mode.

Solution
• Install the sensor so that the display is perpendicular, not parallel, to the ground. • Increase the response time. • Set a longer detection hold time.
Increase the response time. Install the sensor on as straight a section of pipe as possible. Avoid installing the sensor just after a bore conversion section or a valve.
Press the MODE button to switch the screen and check if the total accumulated flow display or the integrated flow display is set.
• Check if the wiring arrangement is correct. • If the input wire and output wire are in contact, separate them. • If the flow rate zero input (TRIG) has been set
Check whether valves are open or closed and check the pipe and the filter for clogging.
Adjust the zero cut flow rate.
When a minor counter flow occurs, 0 is displayed, not REV. Set the zero cut flow rate to OFF.
Check whether the positions of the alignment guide and the scale are correct.
Set the pipe size and the pipe thickness correctly. Alternatively, adjust the flow rate span according to the actual flow rate value.
The piping thickness is not uniform, adjust the flow rate span.
Perform the origin adjustment again when the pipe is filled with fluid and the fluid is still.
• Adjust the flow rate span according to the actual flow rate value. • Enter the ultrasonic speed and the kinematic viscosity.
• Change the installation position. • Adjust the flow rate span according to the actual flow rate value. • Install the sensor so that the alignment guide position does not line up with the brackets.
Perform the origin adjustment again when the pipe is filled with fluid and the fluid is still.
• Install the pipe in a manner so that it is always filled with fluid. • Install the sensor so that the display is perpendicular, not parallel, to the ground.
• Increase the response time. • Increase the zero cut flow rate. • Make the display averaging time longer.
• Check the power capacity. • Check the wiring for crossed wires or loose connections. • Replace the connector cable with a spare. • Check if the sensor is in the powersaving mode.

Output Status during Errors

Display	Control Output	Analog Output	Recorded Data	Large Status Indicator
ERC	OFF	Normal operation	Normal operation	Blinks in red
ERE	Normal operation	Normal operation	Does not operate	Blinks in red
ERP	ON*	Normal operation	Normal operation	Blinks in red
REV	Operates as if the flow rate is zero	When 4-20 mA is set: 3.5 mA When 0-20 mA is set: 0 mA	Records as if the flow rate is zero	Operates as if the flow rate is zero
SET CLOCK	Normal operation	Normal operation	Only sets the correct time and does not operate	Normal operation
L.TEP	Operates as if the temperature is -40.1°C	Outputs as if the temperature is -40.1°C	-40.1	Normal operation
H.TEP	Operates as if the temperature is 140.1°C	Outputs as if the temperature is 140.1°C	140.1	Normal operation
---	Operates as if the flow rate is zero	When 4-20 mA is set: 3.5 mA When 0-20 mA is set: 0 mA	Records as if the flow rate is zero	Operates as if the flow rate is zero

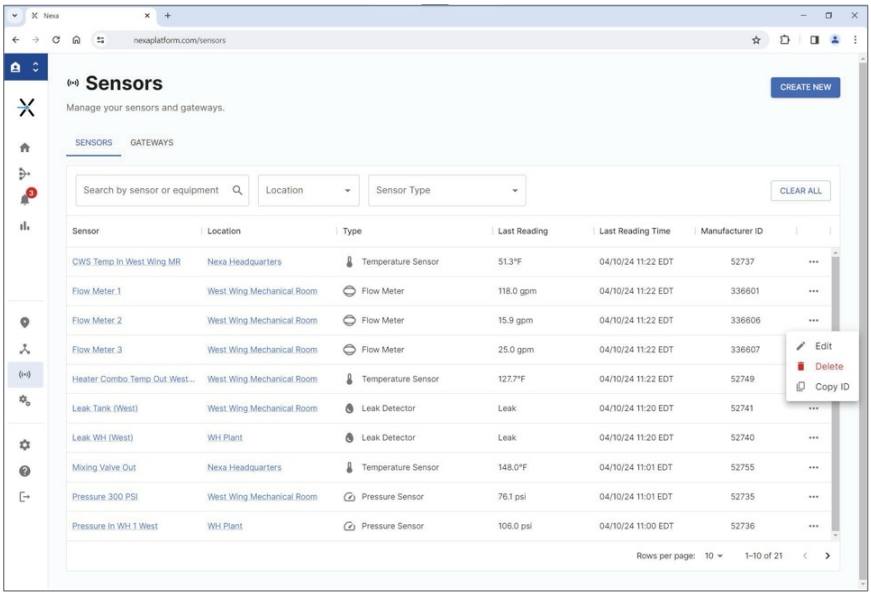
Connecting to Nexa

Now that your flow meter and connection kit have been successfully installed, you need to contact your dedicated Customer Success Manager (CSM) to register you and your team on the Nexa platform.

Your CSM connects your system data to the cloud, creates a system map, sets alerts, and onboards your team, providing visibility and generating valuable insights.

To complete the registration, your CSM will need some important information. Every sensor or gateway has a unique identification number (ID) and security code (SC) located on the bottom. (See example on the right.) Record and relay that information along with the precise location within the facility. Those location names are how you will be able to identify critical data for each device within Nexa.

After the sensors are registered and connected to Nexa, they are listed on the sensor page, as shown below. Each record includes the sensor name, location, type, last reading, last reading time, and manufacturer ID. Tap the 3-dot menu on the right end of a row to edit or delete the record or to copy the ID.



Security Protocols

Data security and integrity are paramount at Nexa. Each layer of the system is secured using encryption and protocols designed to protect customer data and information.

The system consists of sensor(s), gateway(s), and Nexa software. One or more sensors communicate with Nexa software through a gateway.

Sensor to Gateway

Sensor and gateway radio modules are purpose-built devices with proprietary unreadable firmware, which means the sensor cannot be physically hacked or re-purposed for malicious purposes. This adds a strong level of inherent security even before considering encryption. Data transmission between the sensor and the gateway are secured using Encrypt-RF Security (Diffie-Hellman Key Exchange +Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages). Beyond the encryption, data transmissions are also structurally verified and CRC checked before passing up to Nexa or down to the sensor. This ensures the integrity of the data.

Gateway to Nexa

Data transmissions between the gateway and Nexa software are secured using 256-bit, high-level encryption.

Nexa

Access is granted through the Nexa user interface, or an Application Programming Interface (API) safeguarded by 256-bit Transport Layer Security (TLS 1.2) encryption. TLS is a blanket of protection to encrypt all data exchanged between Nexa and you.

nexa™

by WATTS

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