nexa™

by WATTS

Flow Meter
Clamp-on 1/4" - 2"

EDP 80070010 | EDP 80070031 | EDP 80070032 | EDP 80070041

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.

THINK SAFETY FIRST

Overview

Nexa Clamp-On, Ultrasonic Flow Meters
SKUs: 80070010, 80070031, 80070032, 80070041

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
- The clamp-on style of Nexa prevents pressure losses, contamination, and excessive downtime associated with conventional flow sensors
- The slim design enables mounting in close proximity or in tight spaces
- Mounts securely in minutes. No pipe modifications are necessary
- Utilizes an ultrasonic signal 20X stronger than conventional models
- Automatically increases its signal strength to blast through harsh build-up for lasting detection
- High water resistance enables use in even the harshest environment, IP65 & IP67 approved

Operation

- Nexa emits and receives two different sets of ultrasonic pulses. One traveling from A to B and the other traveling from B to A. By doing this, Nexa can stably monitor flow by comparing the two signals. This method of detection minimizes the effects of any external factors.

- Build-up or rust on the inside of a pipe can become problematic over time for conventional sensors. Nexa automatically adjusts its power to compensate for build-up and provide long periods of stable detection.
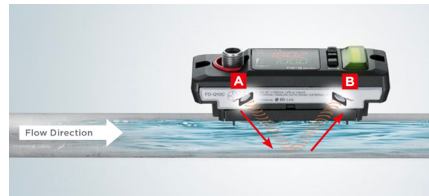
Applications

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

Sizes (pipe outer diameter)

- 80070031: ¼ – 3/8" (13mm – 18mm)
- 80070032: ½ – ¾" (18mm – 28mm)
- 80070041: 1 – 1 ¼" (28mm – 44mm)
- 80070010: 1 ½ – 2" (44mm – 64mm)

Compatible Pipe Materials

- Copper, Iron, Stainless Steel, PVC, Resin

Tools Needed

- No special tools, parts or knowledge required
- Easily mounts with just a Philips screwdriver
- Bracket attaches with only four screws

Unit Selection Size

Appearance	Model	Rated Flow Range	Connection Bore Diameter
	80070031	20L/min	1/4"(8A)
		5.2 gal/min	13 mm to 16 mm
		30L/min	3/8" (10A)
		7.9 gal/min	16 mm to 18 mm
	80070032	60L/min	1/2" (15 A)
		15.9 gal/min	18 mm to 23 mm
		100 L /min	3/4" (20A)
		26.6 gal / min	23 mm to 28 mm
	80070041	200 L / min	1" (25A)
		52.8 gal / min	28 mm to 37 mm
		300 L / min	1 1/4" (32A)
		79.3 gal / min	37 mm to 44 mm
	80070010	400 L / min	1 1/2" (40A)
		105.7 gal / min	44 mm to 52 mm
		500 L / min	2" (50A)
		132.1 gal / min	52 mm to 64 mm

*When using the EDP 80070031, the width of the sensor and the bracket are the same.

Sensor

Model	A	B	C
EDP 80070031	2* │ 0.08"	38 │ 1.50"	25.3 │ 1.00"
EDP 80070032	max. 2.5 │ 0.10"	48 │ 1.89"	30 │ 1.18"
EDP 80070041	max. 4.2 │ 0.17"	67 │ 2.64"	46.7 │ 1.84"
EDP 80070010	max. 3.6 │ 0.14"	88 │ 3.46"	56 │ 2.20"

*When installing the unit on a 1/4" pipe, the threaded portion of the screw will protrude by approximately 0.8 mm 0.03".

Pipe outside diameter

<for securing the main body>
M4 thread x2
(PO.7, length 16mm 0.63", SUSXM7)
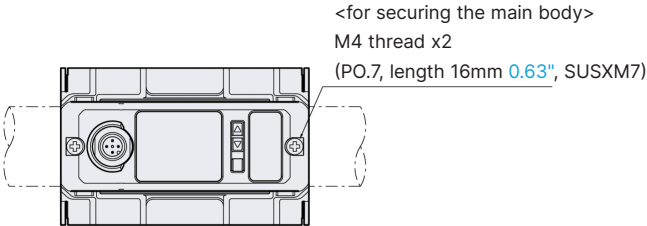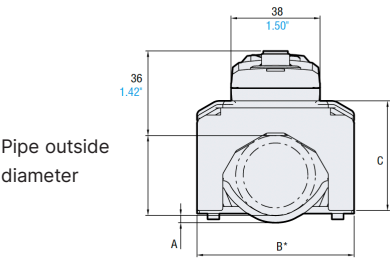
12 0.47" (When a side cover is opened)
*EDP 80070041 only
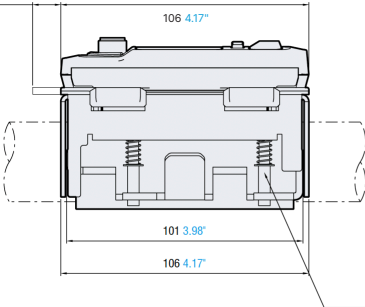
<for securing the bracket>
EDP 80070031 : M4 thread x 4
(PO.7, length 13 mm 0.51", SUSXM7)
EDP 80070032 : M4 thread x 4
(PO.7, length 19 mm 0.75", SUSXM7)
EDP 80070041 : M4 thread x 4
(PO.8, length 30 mm 1.18", SUSXM7)
EDP 80070010 : M4 thread x 4
(PO.8, length 38 mm 1.50", SUSXM7)

Safety Precautions

Symbols

This instruction manual uses the following symbols that alert you to important messages. Be sure to read these messages carefully.

DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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

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

NOTICE Indicates a hazardous situation which, if not avoided, could result in product damage as well as property damage.

General Cautions

DANGER

1. Do not use the sensor out of the specification ranges. Comply with the contents described in the instruction manual when using the product.
2. Do not use the sensor for facilities where death or serious property damage is possible, such as nuclear power generation, aircraft, railway, ship, vehicles, medical equipment, playground equipment, etc.
3. Do not use this product for the purpose of protecting a human body or a part of human body.
4. This product is not intended for use as an explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere.

WARNING

1. Do not modify the sensor.

Precautions for Handling

CAUTION

1. When installing the sensor on a high-temperature pipe, the main unit can become hot. Be careful not to burn yourself.

NOTICE

1. Do not drop the sensor, hit it against something, or apply excessive force.
2. Do not use a sharply pointed object to press the setting keys.

Precautions for Detectable Fluid

NOTICE

1. High-viscosity, high-turbidity, or sparkling fluid may cause unstable detection. Keep this in mind before using.
2. When the fluid temperature rises or pressure is reduced, air bubbles may form in the fluid within the pipe, resulting in unstable detection.

Precautions for Wiring

CAUTION

1. Before wiring the sensor, check the colors of wires.
2. Use the sensor within the rated range. The sensor is a product that uses a DC (direct current) power source. Do not apply AC (alternating current) or other power supplies. Do not use a load that exceeds the allowable limit.
3. If the temperature of the pipe exceeds 80°C (176°F), arrange the cable so it does not come in contact with the pipe.

NOTICE

1. Use an insulated stabilizing power supply.
2. Do not apply excessive tensile force to the cable.
3. Ensure that the cable tip is not submerged in water during wiring work.
4. Isolate the cable from power supply lines or power lines when wiring.
5. Isolate the cable as far away as possible from any source of noise.
6. Do not use a cable longer than 20m 65.62' in length.

Precautions for Installation

CAUTION

1. Do not install the sensor in locations used as footholds.

NOTICE

1. Install the sensor at a location where the inside the measuring pipe is always filled with the fluid.
2. To prevent a situation where the sensor is affected by air bubbles or the pipe not being filled with fluid, it is recommended to secure it in a position where the display surface is perpendicular to the ground.
3. Arrange piping so that gas does not enter it. When the fluid contains bubbles, detection performance of the sensor may be affected.
4. When installing the sensor on a vertical pipe, choose the position where the fluid flows in the upward direction.
5. To improve the detection stability, it is recommended that the sensor be installed in a location with straight sections of pipe upstream that are at least five times the length of the pipe inside diameter.

6. Install the sensor on the upstream side of a flow regulating valve, etc.

7. Install the sensor on a surface with no seams or rust.

8. Do not install the sensor in a location exposed to intense light, such as direct sunlight, or radiation from a heat source.

9. Do not install the sensor at a location where it may become submerged in a liquid.

10. When installing the sensor at a location where vibrations occur, fix the pipe with tubes or supports as close to the main unit as possible. Excessive vibration may cause unstable operation.

11. To avoid interference of detection signals, do not install multiple units closely in series.

Other Precautions

NOTICE

1. When power is applied to the sensor, it enters a 6 second "startup" process before it is ready to use. Do not use the outputs from the sensor during this period.

2. Initial drift may occur after the power is turned on. To detect a subtle difference in the flow rate, let the sensor warm up for approx. 15 to 30 minutes before use.

3. Do not bring a strong magnet or magnetic field close to the main body of the sensor.

IMPORTANT

The sensor cannot be used as a measuring instrument for measurement in business deal or certification.

Precautions on Regulations and Standards

CE AND UKCA MARKING

Watts Corporation has confirmed that this product complies with the essential requirements of the applicable EU Directive(s) and UK regulations, based on the following specification. Be sure to consider the following specifications when using this product in the Member States of European Union and in the United Kingdom.
EMC Directive (CE) and Electromafnetic Compatibility Regulations (UKCA)

Applicable standard:
EMI: (BS)EN61326-1, Class A
EMS: (BS)EN61326-1

Remarks: These specifications do not give any guarantee that the end product with this product incorporated complies with the essential requirements of EMC Directive and Electromagnetic Compatibility Regulations. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive Electromagnetic Compatibility Regulations.

CSA CERTIFICATIONS

This product complies with the following CSA and UL standards, and has obtained the CSA certifications.

Applicable standard:
CAN/CSA C22.2 No.61010-1
UL61010-1

Note the following requirements when using this product as a CSA certified product.

- Overvoltage category 1
- Pollution degree 3
- Install indoors
- Install at a height of 2000m or less
- Use either of the power source below

CSA/UL Listing certified power sources that have Class 2 output specified in CEC (Canadian Electrical Code) and NEC (National Electrical Code), or CSA/UL Listing certified power sources that have been evaluated as Limited Power Source specified in CAN/CSA-C22.2 No. 61010-1 / UL61010-1.

Installation and Wiring

Part Names and Functions

Sensor main unit

Output 1 indicator
Output 2 indicator
Current value display
Set value display
Large status indicator
Lights up according to the flowing status of fluid. (For details, see P7)

M12-4pin connector

Setting button (△)
Setting button (▽)

Stability indicator
Detection stability
• 1 to 4 lighting indications ⇒ Stability level display
• 1 blinking indication ⇒ Detection not possible

MODE button (◻)

Sensor bracket

Upper bracket

Base bracket

Piping and Installation

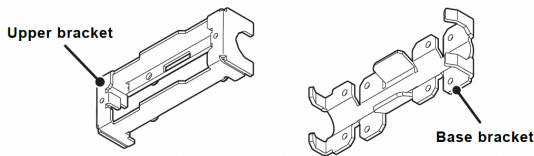### INSTALLATION METHOD

STEP1 Adjust the base bracket direction according to the size of the bore diameter.

• By inverting the base bracket 180 degrees, supported diameters will change.
• Align the bore diameter of the pipe to be used with the corresponding diameter printed on the sides of upper and base brackets.

(1) 1/4" (8A)   (2) 3/8" (10A)

180 degrees inversion
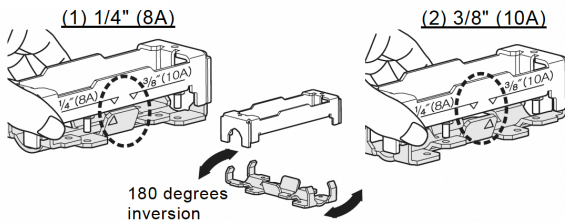
Available bore diameters for each model

Model	(1)	(2)
80070031	1/4"(8A)(Φ13-Φ16)	3/8"(10A)(Φ16-Φ18)
80070032	1/2"(15A)(Φ18-Φ23)	3/4"(20A)(Φ23-Φ28)
80070041	1"(25A)(Φ28-Φ37)	1 1/4"(32A)(Φ37-Φ44)
80070010	1 1/2"(40A)(Φ44-Φ52)	2"(50A)(Φ52-Φ64)

✎ Point   Align the position so the base bracket is completely covered by the upper bracket.

Upper bracket
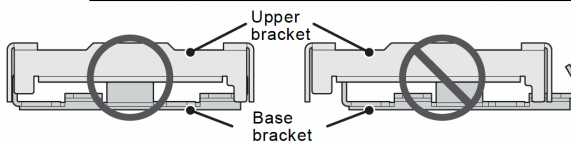
Base bracket

STEP2 Fix the brackets to the pipe.

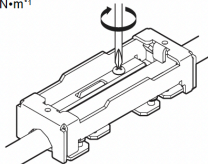✎ **Point** Secure the brackets together uniformly to prevent uneven mounting.
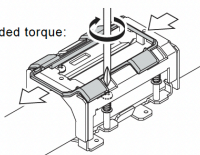
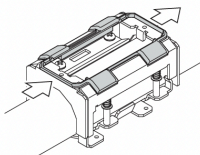■ **80070031 / 80070032**

M4
Recommended torque:
1.5N•m[*1]

■ **80070041 / 80070010**
Attach the brackets with the slide cover slid to one end.

M5
Recommended torque:
1.5N•m[*1]

After the brackets are fixed, shift the slide cover to the center.

STEP3 Fix the sensor main unit to the brackets.

✎ **Point** Secure the main unit uniformly to prevent uneven mounting.

M4
Recommended
torque: 1.0N•m[*1]
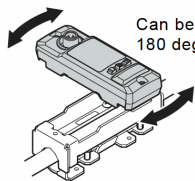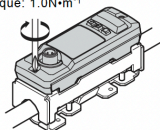
Can be inverted
180 degrees
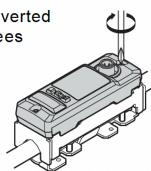
Reference The flow direction relative to the sensor main unit can be changed in the settings.

*Do not exceed recommended torque rating. Apply torque until the unit is sufficiently secured to the pipe. If you are mounting to thin-walled metal pipes or brittle resin pipes, contact Nexa for detail as damage may occur to the pipe even under the recommended torque rating.

PRECAUTIONS FOR PIPING AND INSTALLATION
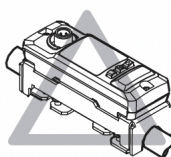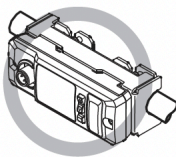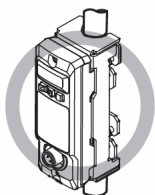
- Installing the sensor as above (△) is not recommended, because detection becomes unstable when the pipe is not completely filled with fluid.
- If there is rust or contaminants on the pipe surface, please try to remove it prior to installation or move the unit to an area without these characteristic.
- When installing the sensor, ensure that there are no seams in line with the main unit of the sensor.
- To improve the detection stability, it is recommended that the sensor be installed in a location with straight sections of pipe upstream that are at least five times the length of the inside diameter.

Wiring

Wiring arrangements vary depending on what function is assigned to input/output pin (2) (White). (Initial settings: P3)
Insulate the input/output lines independently that are not used.

☐ Load (Input device)   ((⊘)) Analog current input device

Pin layout on the sensor side

■ Out1 [1 output mode]

● NPN

(1) Brown ——— 20...30V
(4) Black (ch.1)
(3) Blue ——— 0V

● PNP

(1) Brown ——— 20...30V
(4) Black (ch.1)
(3) Blue ——— 0V
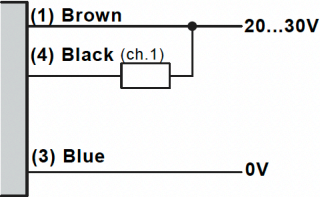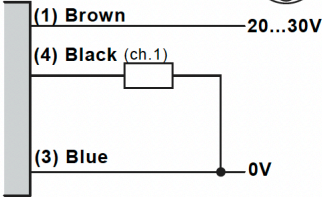
■ Out1+Out2 [2 output mode]

● NPN
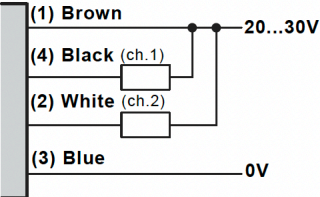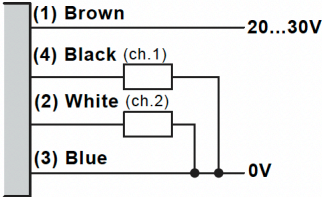
(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White (ch.2)
(3) Blue ——— 0V

● PNP

(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White (ch.2)
(3) Blue ——— 0V

■ Out1+Input [External input mode]

● NPN

(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White
(ch.2)
(3) Blue ——— 0V

● PNP

(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White
(ch.2)
(3) Blue ——— 0V

■ Out1+Analog [Analog output mode]

● NPN

(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White 4 to 20mA or 0 to 20mA
(ch.2)
(3) Blue ——— 0V

● PNP

(1) Brown ——— 20...30V
(4) Black (ch.1)
(2) White 4 to 20mA or 0 to 20mA
(ch.2)
(3) Blue ——— 0V
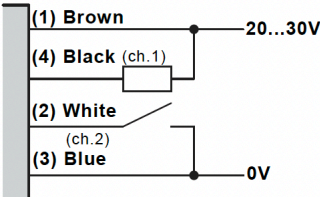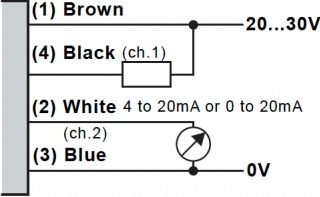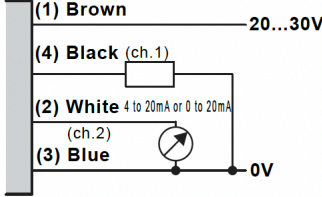
Reference "Simulation mode" (P7) can simulate different fluid-passing statuses to check the output operation of the sensors.

12

Sensor main unit

Output 1 indicator
Output 2 indicator

Current value display
Set value display

Large status indicator
Lights up according to the flowing status of fluid. (For details, see P7)

KEYENCE
35.6
20.0
FD-Q series

Setting button (△)
Setting button (▽)

M12-4pin connector

Stability indicator
Detection stability
• 1 to 4 lighting indications ⇒ Stability level display
• 1 blinking indication ⇒ Detection not possible

MODE button (☐)

Bracket Set-Up

• The bracket provided with each unit is adjustable between the two supported pipe diameters (ex. sensor on the right).
• Simply rotate the bottom half 180° to switch the bracket diameter.

(1) 1/4" (8A)   (2) 3/8" (10A)

180 degrees inversion
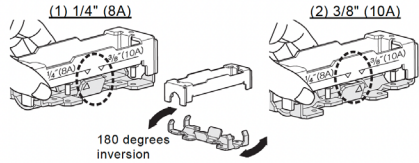
Initializing (Factory Default)

• The initialize, press the △ arrow 5 times while holding down the MODE button.
• From this screen simply arrow up to 'yes' and press MODE to select.
• Press MODE once more to complete initialization.

rSEt
ot
Initialization performed
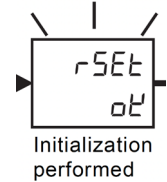
Selecting the Flow Units (Gallons or Liters)

• After initialization or upon start-up, it is possible to change the units.
• Simply press and hold the MODE and △ buttons while on the PNP/NPN selection screen.

Calibration

KEYENCE
OUT
1 ☐
2 ☐
26.7
STABILITY
10.0
FD-Q series
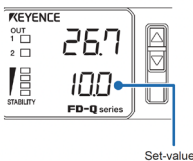
Set-value

• To calibrate the sensor, simply press (and/or hold) the △ or ▽ arrows to change the set-value.
• Image represents default display for standard detection.

Stability Check

STABILITY   STABILITY   STABILITY   STABILITY   STABILITY

Stable ◄———————————————————► Unstable
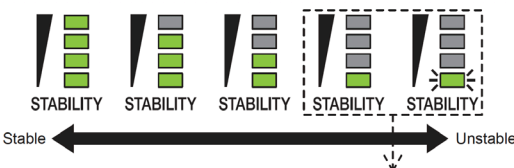
If the stability indicator shows 1-indicator light or 1-blinking indicator light, the detection stability is low.
Stability may improve by changing the installation condition.
See 'Troubleshooting (P4)".

Start-Up/Initialization Settings

```
P-n
nPn
 ▢
MODE
 ↓
ch2
oFF
 ▢
MODE
 ↓
d ir
=r
 ▢
MODE
 ↓
3/8
P iPE
 ▢
MODE
 ↓
End
 ▢
MODE
 ↓
[Initial setting complete]
```

A. Selecting NPN/PNP (Press △ or ▽ to select.)

nPn	NPN output
PnP	PNP output

B. Selecting ch.1 and ch.2 functions (Press △ or ▽ to select.)

Selection		Mode	ch.1 (pin (4))	ch.2 (pin (2))
Ⓐ	oFF	1 Control Output Mode	Control output	—
Ⓑ	out	2 Control Output Mode	Control output	Control output
Ⓒ	in	Control Output + External Input Mode	Control output	External input
Ⓓ	AnLG	Control Output + Analog Output Mode	Control output	Analog output

C. Selecting flow direction (Press △ or ▽ to select.)
"rEu" is displayed if the wrong flow direction is selected.

=r	Flow direction: From left to right
L=	Flow direction: From right to left

D. Selecting bore diameter of pipe (Press △ or ▽ to select.)
Please confirm if the direction and setting of the FD-Q metal fitting match.

Model	Selection	NPS	DN
80070031	1/4	1/4"	8 A
	3/8	3/8"	10 A
80070032	1/2	1/2"	15 A
	3/4	3/4"	20 A
80070041	1	1"	25 A
	1 1/4	1 1/4"	32 A
80070010	1 1/2	1 1/2"	40 A
	2	2"	50 A

To Provide Better Flow Ratings

```
▢(MODE) Press and hold
AdJ
oFF
End
oFF
 ▢   ▢
MODE MODE
[Initial setting complete]
```

E. Correcting the flow rate value (Press △ or ▽ to select.)

oFF	No correction
SEL	Selecting pipe schedule
SPAn	Setting flow rate magnification (Span adjustment)

SEL

```
Sch
SGP
 ▢
MODE
 ↓
End
 ▢
MODE
 ↓
[Initial setting complete]
```

Selecting pipe schedule
Selecting the pipe thickness (schedule) correctly will improve flow rate readings. (Press △ or ▽ to select.)

SGP	SGP
20	Sch.20
40	Sch.40
80	Sch.80

SPAn

```
SPAn
100
 ⤒⤓
234
100
 ▢
MODE
 ↓
End
 ▢
MODE
 ↓
[Initial setting complete]
```

Adjusting flow rate span
The flow rate values can be adjusted by 0.1x to 2.5x the initial values of the instantaneous flow rate value detected by the FD-Q Series. (Press △ or ▽ to select.) Setting range: 0.10 to 2.50

Selecting the Flow Units

```
▢(MODE) + △ Press and hold
Un it
L
 ▢
MODE
```

F. Selecting the units

L	liter
G	gallon

Menu Structure

Normal screen

Ⓐ Out1 [1 output mode]
Ⓑ Out1+Out2 [2 outputs mode]
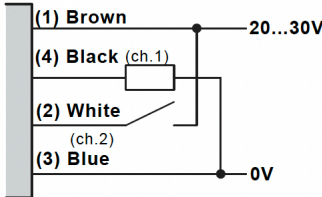Ⓒ Out1+Input [External input mode]
Ⓓ Out1+Analog [Analog output mode]

Press and hold

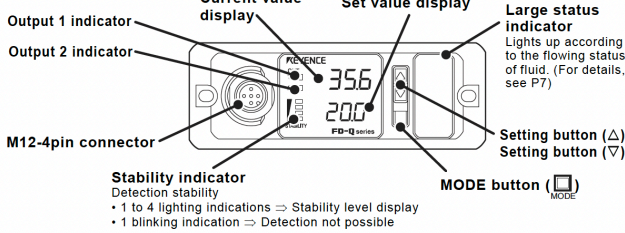**out1**
Std

MODE

In pulse output mode

nonC
n.o

MODE

ⒷⒸⒹ

Ⓐ

SPd
5.0

MODE | Integrated flow value

ttL | **120**

MODE

End

MODE

FuLL — End

Setting complete

---

1. Output 1 detection mode
(Press △ or ▽ to select.)
Std Instantaneous flow rate mode
A-EA Area mode
PULS Pulse output mode
ttL Integrated flow mode

2. Output 1 output logic (Press △ or ▽ to select.)
n.o Normally Open
n.C Normally Closed

3. Response time (Press △ or ▽ to select.)
Setting range (Unit: seconds)
0.5/ 1.0/ 2.5/ 5.0/ 10.0/ 30.0/ 60.0

4. Integrated flow unit (Press △ or ▽ to select.)

Setting range	
80070031 80070032	0.1/1/10/100/1000
80070041 80070010	1/10/100/1000/10000

5. Extended functions menu
(Press △ or ▽ to select.)
End Settings complete
FuLL Extended Functions Menu

Ⓑ
out2
Std

MODE

nonC
n.o

MODE

Ⓒ
in
rSEt

MODE

Ⓓ
AnLG
4-20

MODE

A-Lo
0.0

MODE

A-Hi
30.0

MODE

---

5. Output 2 detection mode
(Press △ or ▽ to select.)
Std Instantaneous flow rate mode
A-EA Area mode
Err Error output mode

6. Output 2 output logic (Press △ or ▽ to select.)
n.o Normally Open
n.C Normally Closed

7. Selecting input function
(Press △ or ▽ to select.)
rSEt Integrated flow reset input
tr.G Flow rate zero input
AdJ0 Origin adjustment input

8. Analog output current (Press △ or ▽ to select.)
4-20 4-20 mA
0-20 0-20 mA

9. Analog output lower limit
(Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

10. Analog output upper limit
(Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

More advanced settings (Extended function settings)

When Instantaneous flow rate or Area mode is not selected

rESo
0.1

MODE

AuEd
1

MODE

HYS
0.3

MODE

cut
10

MODE

LEd
Grn

MODE

Eco
oFF

MODE

oFF — **tESt** — on
oFF

MODE

tESt | **0.00**
30 | **30**

---

11. Display resolution (Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

12. Display averaging (Press △ or ▽ to select.)
Setting range (Unit: seconds) 0 to 10

13. Hysteresis (Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

14. Zero-cut flow rate (Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

15. Display indicator illumination mode
(Press △ or ▽ to select.)
Grn Green lighting - light off mode
rEd Light off - Red lighting mode
G-r Green lighting - Red lighting mode
3-St PMI (predictive maintenance information) mode (Green, Green blinking, Red)

16. Power-saving mode (Press △ or ▽ to select.)
oFF: Normal/on: Power-saving mode

17. Simulation mode (Press △ or ▽ to select.)
oFF: Off/on: Perform Simulation

18. Simulation flow rate (Press △ or ▽ to select.)

Setting range		
80070031	0.00 to 99.99
Other than 80070031	0.0 to 999.9

Loc
Std

MODE

dir
r

MODE

3/8
PiPE

MODE

AdJ
oFF

oFF — **End**

Setting complete

SEL

Sch
SGP

MODE

234 | **SPAn**
1.00 | **1.00**

MODE

End

MODE

Setting complete

---

19. Key lock method (Press △ or ▽ to select.)
Std Normal (without password)
PASS Password-protected key lock

C. Flow direction (Press △ or ▽ to select.)
r Flow direction: From left to right
L Flow direction: From right to left

D. Selecting bore diameter of pipe
(Press △ or ▽ to select.)

Model	Selection	NPS	DN
80070031	1/4	1/4"	8 A
	3/8	3/8"	10 A
80070032	1/2	1/2"	15 A
	3/4	3/4"	20 A
80070041	1	1"	25 A
	1 1/4	1 1/4"	32 A
80070010	1 1/2	1 1/2"	40 A
	2	2"	50 A

E. Correcting flow rate value
(Press △ or ▽ to select.)
oFF No correction
SEL Selecting pipe schedule
SPAn Setting flow rate magnification (Span adjustment)

Selecting pipe schedule (Press △ or ▽ to select.)
Selecting the pipe thickness
(schedule) correctly will improve
flow rate readings.

SGP	SGP pipe
20	Sch.20
40	Sch.40
80	Sch.80

Adjusting flow rate span (Press △ or ▽ to select.)
The flow rate value can be adjusted by 0.1x to 2.5x
the initial values of the instantaneous flow rate value
detected by the FD-Q Series.
Setting range: 0.10 to 2.50

15

Useful Functions

■ Origin adjustment

This function adjusts the instantaneous flow rate value to "Zero" when performed.
This helps to provide better readings when detecting in a low flow rate area, etc.

> **✎ Point** Perform this function when the pipe is filled with fluid and the fluid is not moving. (Err) is displayed when the function fails due to the pipe not being completely filled, liquid isn't stationary, etc.

When failed (Err)

Normal screen (Instantaneous flow rate)

YES

Press △ or ▽ to select.

Press and hold △ ▽ simultaneously.

$AdJ0$ oFF

no

MODE no

Performing origin adjustment
The origin adjustment takes approx. 20 seconds to complete.

0.0
3.0

Canceling origin adjustment
Restores the origin to the factory default state.

$AdJ0$
oFF

To normal screen (Instantaneous flow rate)

■ Key lock

This function prevents operation mistakes by locking/disabling key operations.
This is effective when you do not want the setting to be easily changed.

Enabling/Disabling key lock

Normal screen

Press and hold
MODE ▽ simultaneously.

Loc **Enabled**

unL **Disabled**

Enabling/Disabling password-protected key lock

> **Reference** Set the key lock method to $PASS$ in "Extended function settings (P2)" to use this function.

Normal screen

Press and hold
MODE ▽ simultaneously.

Enter password.

$PASS$
1234

Press MODE and hold

Press △ or ▽ to select. Press MODE to move digit.

At input error (Err)

Loc **Enabled**

unL **Disabled**

■ Condition monitoring function

This function registers the current instantaneous flow rate value as 100% and displays the current status on the screen.
This is an effective way to monitor the flow rate, relative to a base flow rate.

✎ Point	• Perform the Condition monitoring function when the fluid is flowing at a nominal rate that you would like to be represented as 100%. (Err) is displayed if the fluid is not flowing inside the pipe, or the pipe is not completely filled with liquid. • When performed at a low flow rate, the display may become unstable.
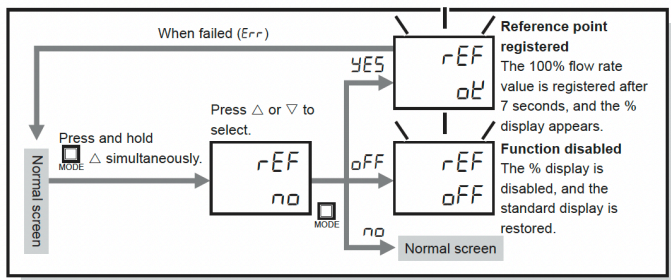
Reference	• After this function is performed, you can check the display by pressing $\square$ MODE. • The condition monitoring function is effective only for the instantaneous flow rate value and its set value. • If the reference point is registered at a low flow rate, the value may become unstable.

■ Quick setting code

This function restores multiple setting parameters instantaneously by entering an 8-digit setting code recorded on the sensor main unit.
This is convenient when applying the same settings to multiple sensors.

NOTICE	Entering the code restores the settings for the control output and external input. If a wrong code is entered, an unexpected operation may occur. Note if a wrong code is entered and an external device connected to the sensor, the sensor may be damaged.

✎ Point	• This function cannot restore set values. Separately record them as necessary. • (Err) is displayed when an invalid code is entered.

Checking the current quick setting code

(Perform from the normal screen.)

Normal screen

Press [MODE] △ ▽ briefly and simultaneously.

`CodE` → `0953` / `0013`

Record the code displayed. (Pressing [MODE] returns to the normal screen.)
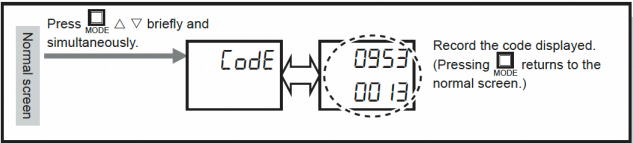
Restoring the settings by entering the code

(Perform from the <u>initial setting</u> screen.)

Initial setting screen

When failed (*Err*)

Press [MODE] △ ▽ briefly and simultaneously.

Press △ or ▽ to select.

`CodE` `no`

`YES` [MODE]

`CodE`

⇕

`0000` `0000` Press and hold

[MODE] Press Restored completely.

`CodE` `oʮ`

`no` [MODE]

Enter setting code. (Press △ or ▽ to select. Press [MODE] to switch the digit.)

Setting range: 0 to 9, and A to H for each of 8 digits
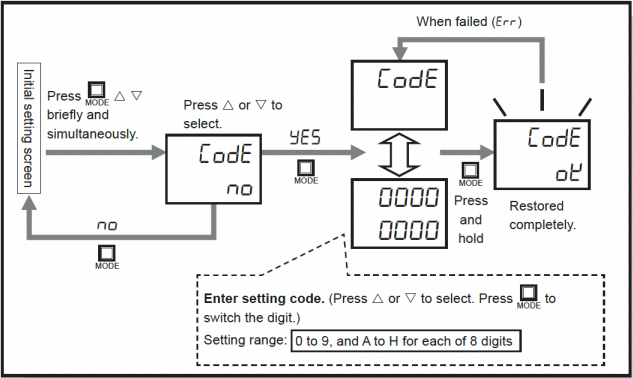
Reference The initial setting screen is displayed when "Initializing" is performed, or when the power is turned on for the first time.

Notes

Troubleshooting

Problem	Cause
ErC is displayed.	Excessive current (overcurrent) is flowing through output 1 or output 2.
ErE is displayed.	The memory has reached its end of life, or the sensor is malfunctioning.
rEu is displayed.	The fluid flows in the opposite direction of the setting.
FFFF is displayed.	The integrated flow display has exceeded the display range.
Loc is displayed.	Key lock function is active.
---is displayed. • The instantaneous flow rate experience large fluctuations. • Occasionally "0" L/min (G/min) is displayed (One stability indicator lights or blinks.) STABILITY STABILITY	The sensor is not properly fixed to the pipe and bracket. • The pipe is not filled with fluid. • The detection signal is unstable.
	The sensor is affected by pulsation, air bubbles or non-ideal flow distribution.
	Cavitation is occuring due to pressure changes.
The instantaneous flow rate does not change from "0".	The integrated flow display has been set.
	When using the external input function, the flow rate zero input (*tr iG*) is selected, and the external input is being sent.
	No flow.
	The fluid is actually flowing, however, with the flow rate value less than the zero cut flow rate.
The flow rate differs greatly from the actual flow rate value.	The bore diameter of pipe or the pipe schedule selected by setting differs from those of the actual pipe.
	The origin adjustment has not been correctly performed.
	The characteristic of the fluid largely differs from that of water.
The display turns on and off.	The power is not turned on. • The connector cable is damaged. • The unit is in the power-saving mode.

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 for the output.
Perform initialization. If the problem persists, contact Nexa.
Set the flow direction according to the correct fluid flow direction.
• Perform the 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.
• Check the sensor for partial tightening, looseness, or uneven mounting, and reinstall it. • Install the sensor so that the display is perpendicular to the ground, not parallel. • If there is rust or dirt on the pipe surface, clean or avoid this area when installing. Also, removing rust or dirt on the pipe surface using sandpaper, etc. may improve the state. • If there is a seam on the contact surface or the back side of the pipe, move the sensor away from the seam before installation. • If air bubbles or foreign matters are expected inside the pipe, change the installation location, or remove them through high-pressure washing. • If the problem persists, then the fluid or the pipe may be causing detection issues, or the sensor may be damaged.
Increase the response time.
• Install the sensor on a straight section of pipe. • Avoid installing just after a bore conversion section or a bulb.
Press the MODE button to switch the screen, and check if the integrated flow display is set.
• Check if the wiring arrangement is correct. • If the input line and output line are in contact, separate them. • If the flow rate zero input ($tr\ i5$) has been set accidentally, select a different option.
Check valves for open and close conditions, and also check the pipe and filter for clog.
Adjust the zero cut flow rate value.
Set the bore diameter and the pipe schedule correctly. Adjust the flow rate span according to the actual flow rate value.
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.
• 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 power-saving mode.

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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