

USER MANUAL

XONIC-100L FIXED FLOWMETER

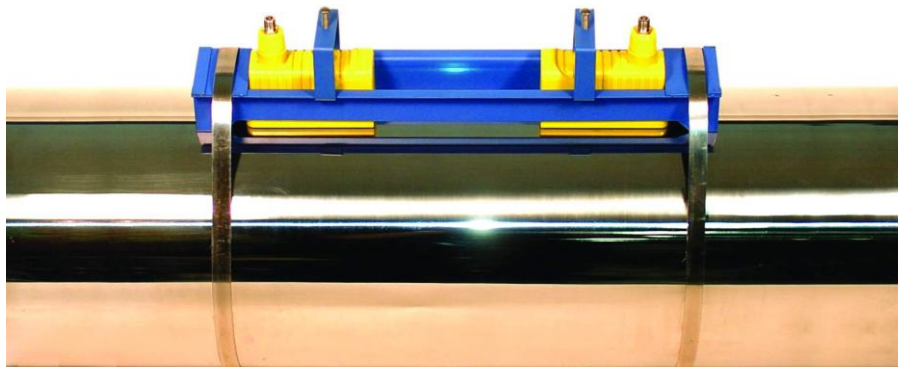


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Fixed Flow Computer



Ultrasonic Transducer with Mounting Track

Preview

Introduction

Xonic-100L Clamp-On Ultrasonic Flowmeter is fully digital, state-of-art flowmeters using DSP (digital signal processing) technology to measure time difference of ultrasonic signals. Please read this manual carefully before installation to ensure Xonic 100 best accuracy.

Safety Consideration

Xonic-100 uses batteries and AC 110~220V power. So please consider safety and any damage to flow computer during installation. Especially, many application is near moisture, so please be careful any electric shock.

Installation Steps

Select best point for transducer installation





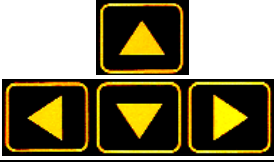

1. input GENERAL DATA
2. select CHANNEL
3. input PIPE DATA
4. select LIQUID TYPE
5. do INSTALLATION
6. select FLOW UNIT & TOTAL UNIT
7. select DATALOGGER

Specifications

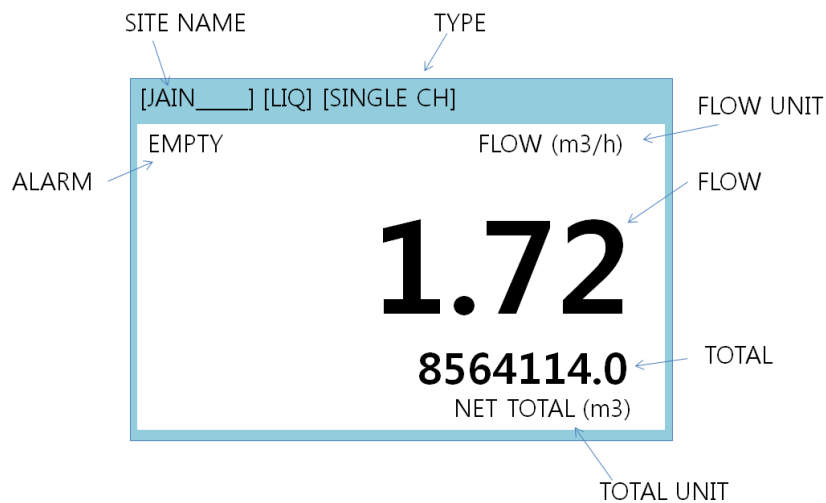
Type	Clamp-On Ultrasonic Flowmeter
Principle	Transit-Time
Measuring Pipe Size	12.7 ~ 6000 mm
Accuracy	±1.0 % (single path), ±0.5 % (dual path)
Flow Velocity	±0.02 ~ 12.0 m/s
Turn-Down Ratio	500:1
Repeatability	0.25%
Required Straight Run	Upstream 10D, Down stream 5D (single path) Upstream 7D, Down stream 3D (dual path)
Data Input	Two 4~20mADC
Data OUTPUT	Two 4~20mADC for flow Relay for Total RS-232C/485 Serial
Data Logger	8 Mbytes (above 500,000 times)
Display	Graphic Color LCD (Flow, Total, Velocity, Delta T, Oscilloscope Shape)
Temperature	Flow Computer -20 ~ +60 °C Transducer -40 ~ +120 °C
Power	110 ~ 220 VAC, free voltage
Enclosure	NEMA 4 (IP65)
Transducer	NEMA 7 (IP68, Water Proof)

Key Functions

Notice : Touch keys do not have alphabet table, so user must select alphabet by pressing numeric keys several times.

Keys	Functions
	Press when start MENU
	Accept Key Data
	Clear
0~9 numeric	Use when input numbers
.	Use when input “.”
	Function Key
	Direction keys
	Negative input

Understanding Display



Site Name : user must input site name for communication

Type : single ch means single path/channel

Flow Unit : user selected flow unit

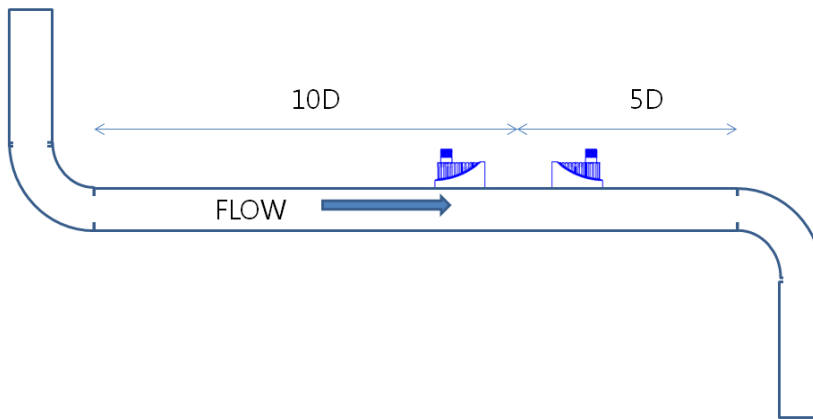
Flow : measured flow

Total : total flow

Total Unit : total flow unit

Best Transducer Installation Place

Choose an installation location that has enough straight pipe runs, 10D for upstream and 5D for downstream. For example, if pipe diameter is 1000mm, then please find 10 metres straight run for upstream and 5 metres straight run for down stream.

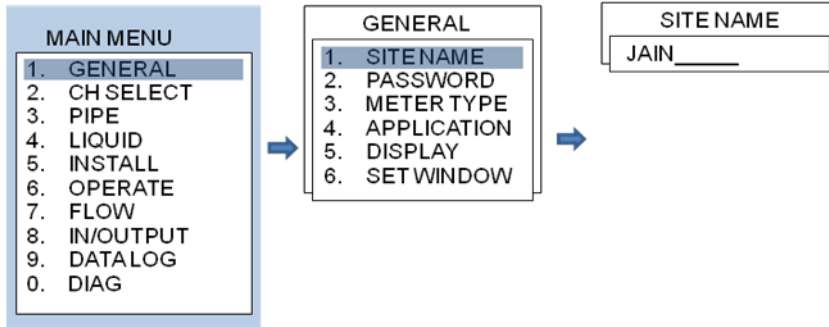


Find 10D for Upstream and 5D for Downstream




Section 1. input GENERAL data


1.1 SITE NAME

User must input SITE MENU for initial setup. SITE NAME can be used as ID of flowmeters when communicate remotely many flowmeters. Press  Cursor move as below.



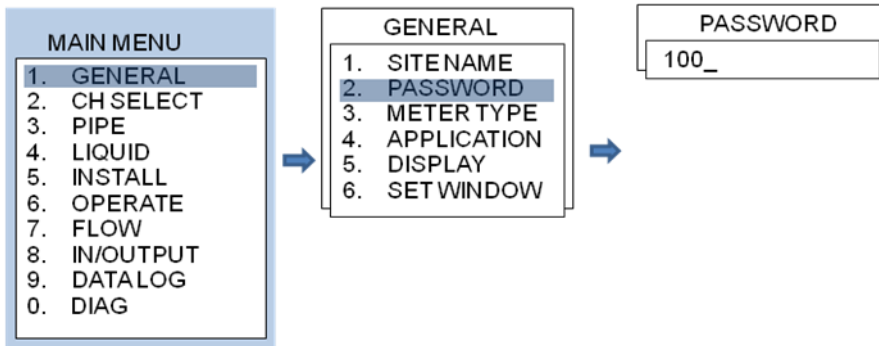
Move cursor as above and input site name [JAIN_____]
Move level from A to C or D and input data

User can input alphabet character by pressing   keys and  to complete.
Press UP/DN key until cursor show "J".
Press UP/DN key until cursor show "A".
Press UP/DN key until cursor show "I".
Press UP/DN key until cursor show "N".

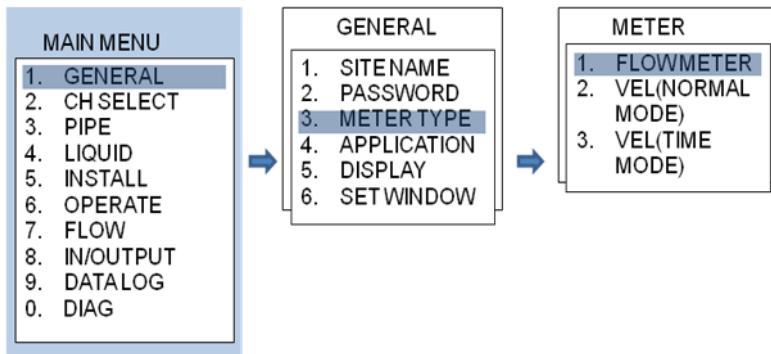
The cursor will move to next menu. If user want to finish menu, press .
※ User can use alphabet and space characters.

1.2 PASSWORD

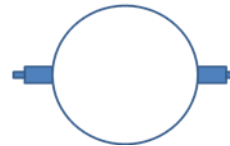
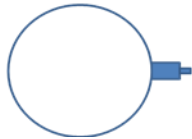
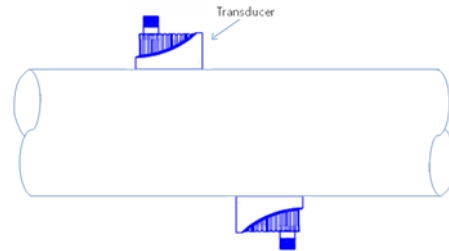
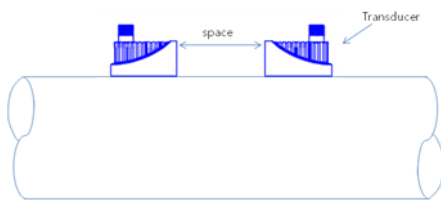
User must input password to secure Xonic 100 from any unauthorized man's operation. Just input number and alphabet by keypad.



1.3 METER TYPE

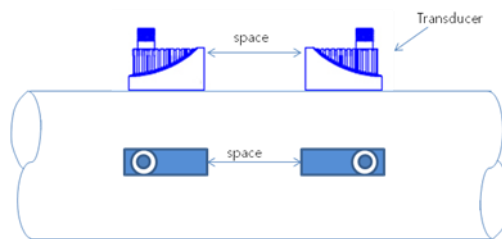


User can select meter type by selecting as below,
 FLOWMETER : Clamp-On flowmeters for single path, dual path/channel.
 VEL NORMAL MODE : Velocity Meter mode for m/s base
 VEL TIME MODE : Velocity Meter mode for time base



Single Path 'V' Method Installation

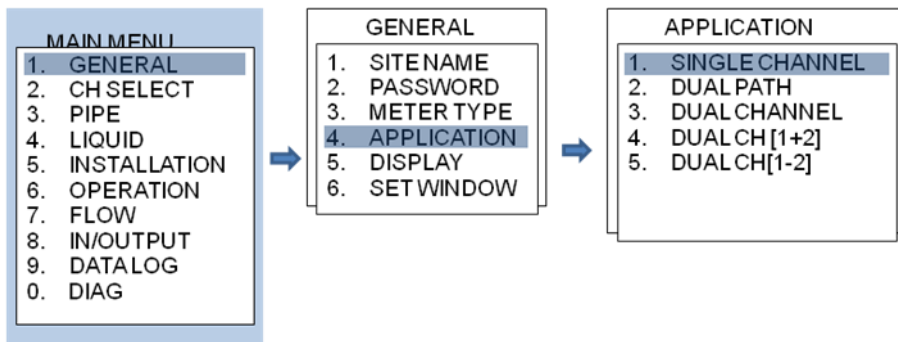
Single Path 'Z' Method Installation



Dual Path 'V' Method Installation

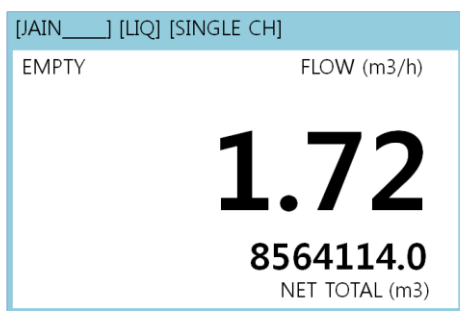
1.4 APPLICATION

Xonic 100 has single path and dual path/channel mode. User can buy only single path type and can add one more channel if need.

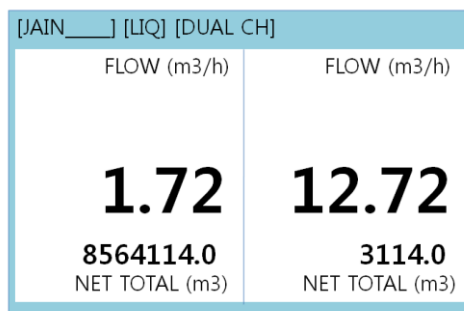


1.5 DISPLAY

Xonic 100 display only channel 1 or channel 2 or two channel simultaneously. User can select by cursor.



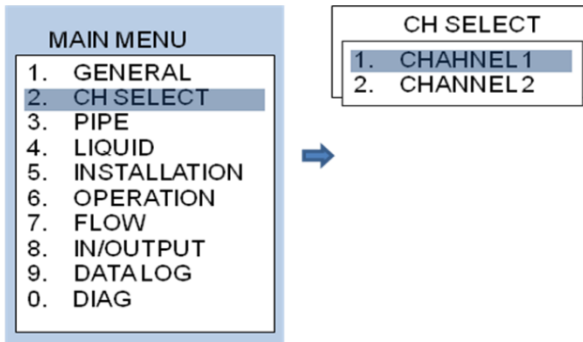
Single Path Display



Dual Path Display

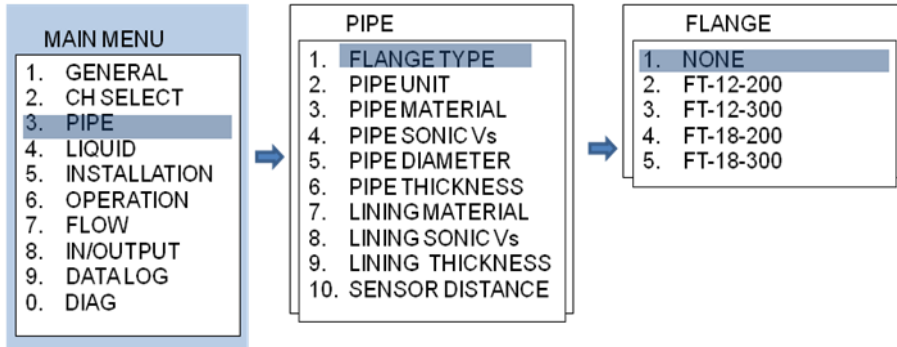
Section 2. CH SELECT

User can select single channel or dual channel. **Single channel** means user will use only 1 pair transducers for one pipe. **Dual channel** means user will use 2 pair transducers for two pipes. In case of dual channel, flowmeter measure two pipes simultaneously. Also, user can select single path or dual path. **Single Path** means user will use 1 pair transducer for one pipe. **Dual Path** means user will use 2 pair transducers for one pipe to increase accuracy.

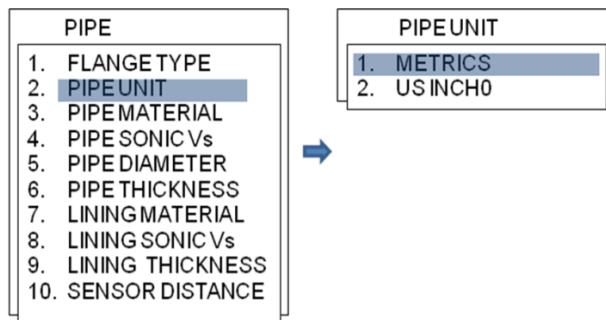


Section 3. input PIPE DATA

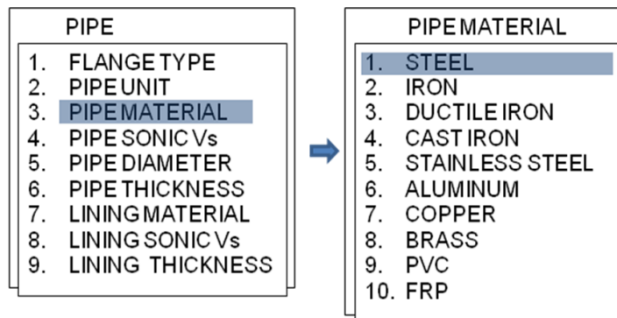
3.1 Flange Type : Just select NONE (Used for different Model)



3.2 Pipe Unit : select METRIC or US INCH

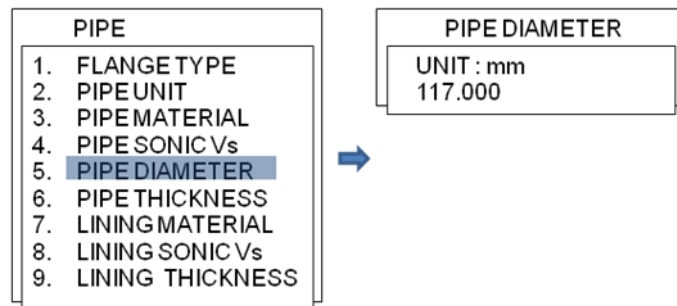


3.3 Pipe Material: select pipe material from list.

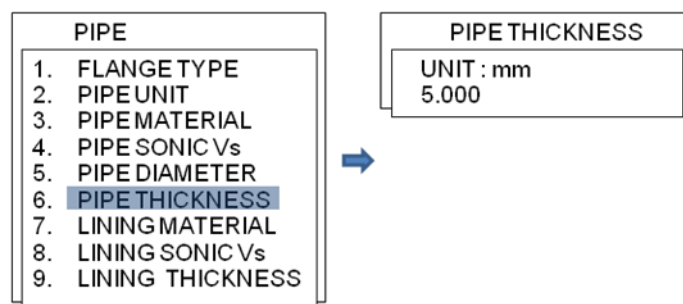


3.4 Pipe Sonic Vs : N/A

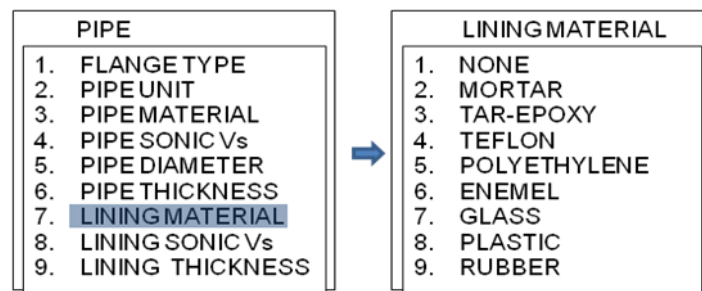
3.5 Pipe Diameter : Input pipe diameter using numeric keys.



3.6 Pipe Thickness : Input pipe wall thickness using numeric keys



3.7 Lining Material : select from list



3.8 Lining Sonic Vs : N/A

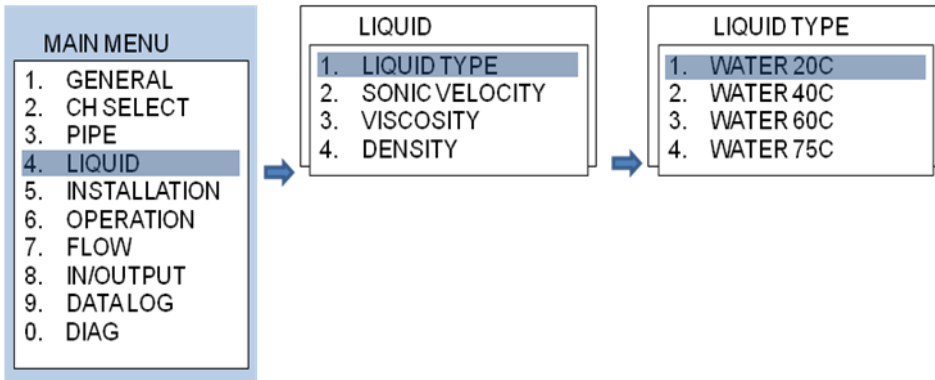
3.9 Lining Thickness : input using numeric keys.

Section 4. Select LIQUID TYPE

User can select liquid type from list. Sonic velocity, viscosity, density is automatically select by flowmeters. If liquid type is unknown, user must input **3.VISCOSITY** and **4.DENSITY** manually.

4.1. LIQUID TYPE

Please select from liquid list.



4.1. SONIC VELOCITY

Flowmeter automatically display sound speed of selected liquid.



4.2. VISCOSITY

User do not need anything, flowmeter automatically display viscosity of selected liquid.

4.3. DENSITY

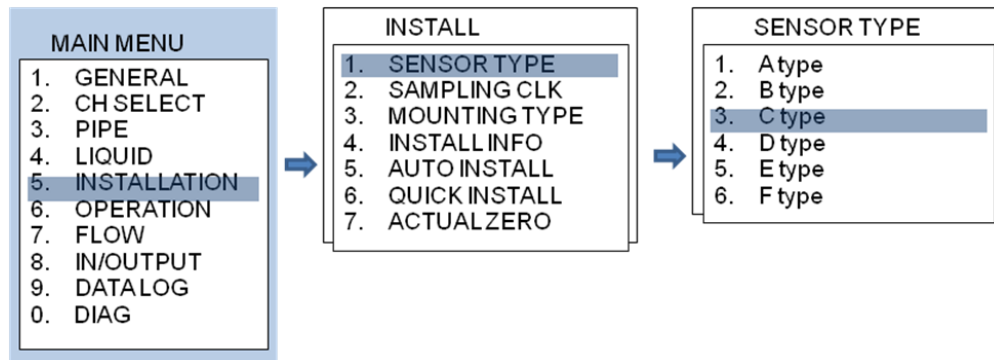
User do not need anything, flowmeter automatically display density of selected liquid.

Section 5. INSTALLATION

For proper installation, please read this section carefully. After you input pipe and liquid data, you can install very fast and easily.

5.1 Select SENSOR TYPE

User must have correct transducer for your pipe. Xonic 100 has 5 size transducers and Xonic 100 will automatically recommend proper transducers for the site. If the Xonic 100 recommends size XLD type, then user must have XLD type transducers. Choose the transducer according to the sensor type displayed in the list.



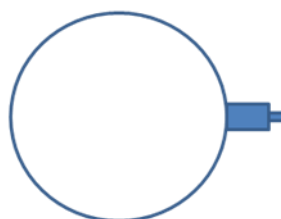
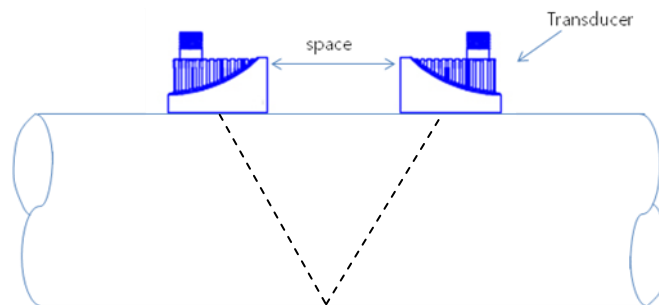
5.2 Select SAMPLING CLK

Xonic 100 automatically select SAMPLING CLOCK, so user do not need change.

5.3 MOUNTING TYPE

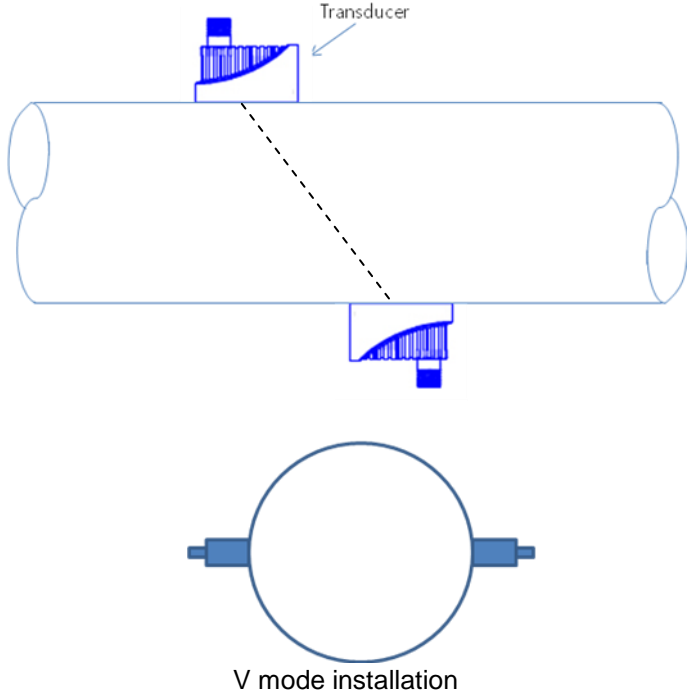
Normally, CLAMP ON V is better for most applications. V method is more accurate and easy for installation.

V method means installation mode which install two transducers onto one pipe side as per below:



V mode installation

If pipe is large in diameter (over 1000mm) or very old (scale or corrosion inside), please use Z MODE installation. These pipes can sometimes make the ultrasonic signal very weak, so flowmeter cannot work in V mode. Also, in the case that liquid is not clean, for example wastewater, please use Z MODE.

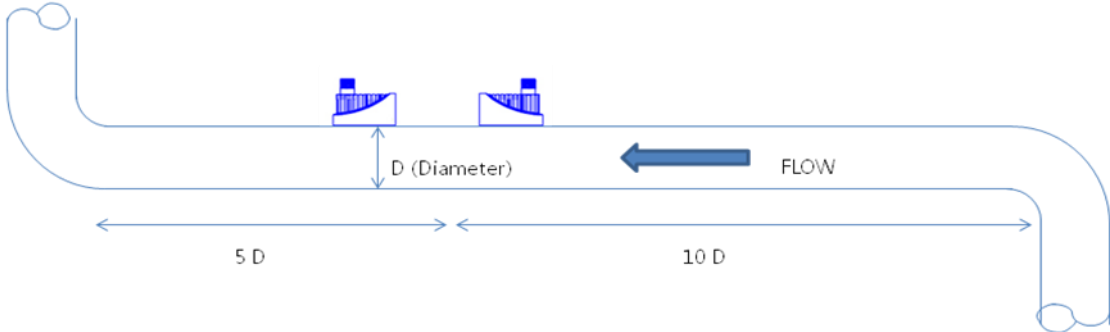


The Z MODE make ultrasonic signal stronger than V MODE.

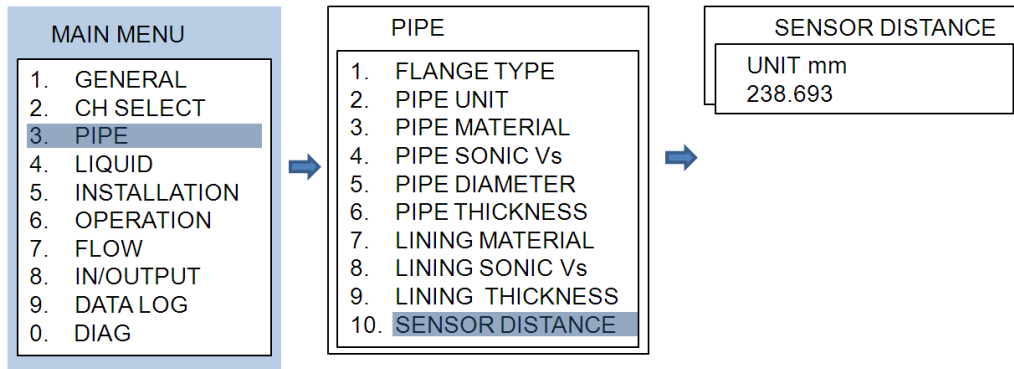
5.4 INSTALL INFO

5.4.1 Finding Installation Position

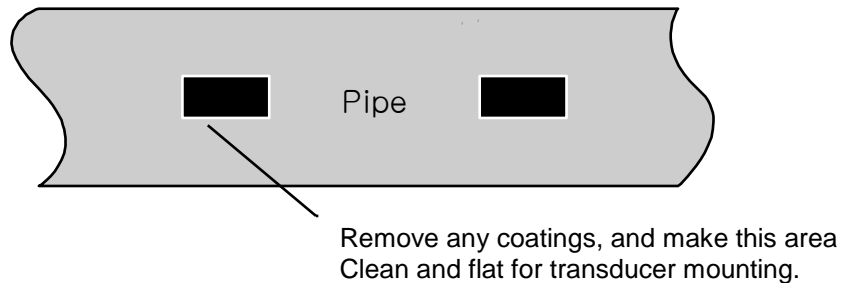
Please find enough straight run pipe position. Normally, clamp-on ultrasonic flowmeter need 10 Upstream and 5 Downstream diameters straight pipe run. Ensure adequate straight pipe to ensure smooth laminar flow. Accuracy will be affected if not enough straight pipe can be found.



5.4.2 Measure the installation area distance using ruler



Using the Sensor distance as a guide from the pipe set up menu measure the installation area on the pipe using ruler. Please remember the area must be large enough for Mounting Track installation with the sensor placement approximately in the centre of the track.

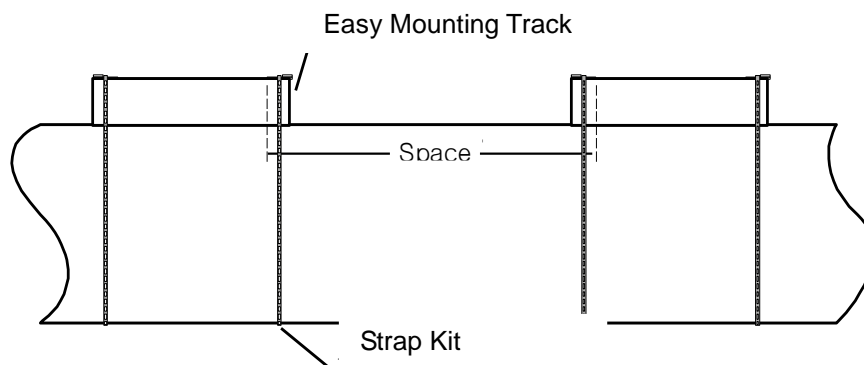


5.4.3 Remove Pipe Coating and Make install position flat and clean

Please remove all pipe coatings and Use an abrasive to thoroughly clean the area. This is essential for good Ultrasonic coupling

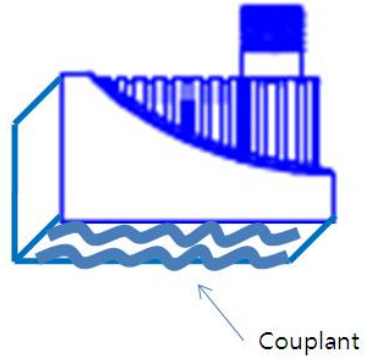
5.4.4 Install Mounting Track

Install mounting track onto the pipe with stainless steel strap. Fix it tightly.



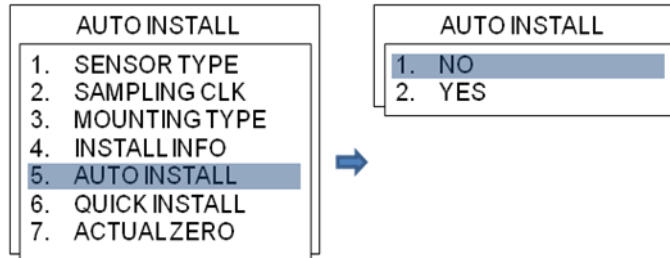
5.4.5 Install Transducers onto Pipe

Apply couplant onto bottom of transducers and locate transducer into mounting track. Make transducers clamp-on pipe by tighten a clamp screw.

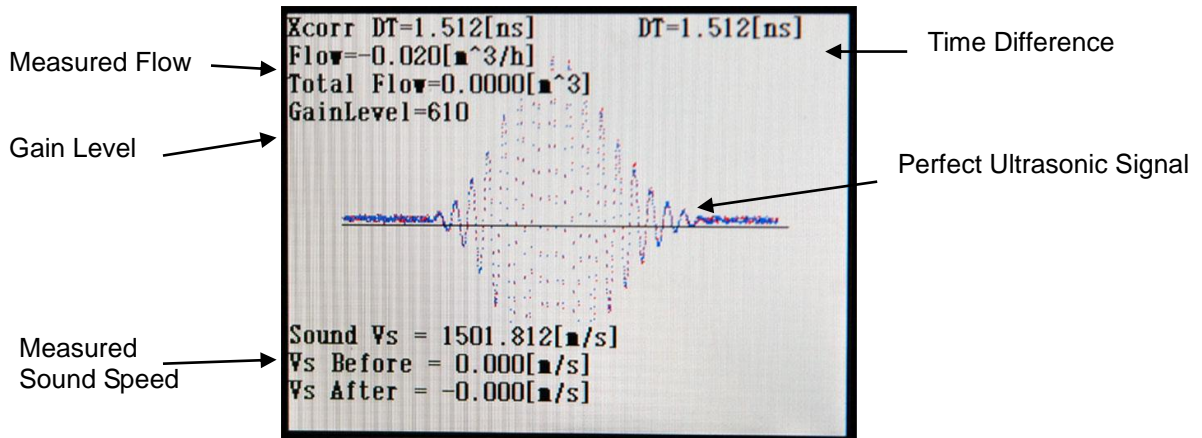


5.5 AUTO INSTALL

Xonic 100 uses its patented AR mode ultrasonic signal for flow measurement. User simply select YES, then Xonic 100 start AR mode automatic installation procedure. User can see how AR mode find best signal.



After auto installation, Xonic 100 shows the below ultrasonic signals. The signal shape must be similar to the below picture.



- Check Points
 1. Sound Vs : In case of water 20°C, the sound speed must be around 1480 m/s. If sound speed is not around 1480, please check pipe size again.
 2. Gain Level : Gain Level must be below 1500. High gain means low ultrasonic signal. So, if gain is over 1500, please check pipe size again and re-install transducers after clean pipe.
 3. Signal Shape must be high in the middle area. If signal shape is not high in the middle area, please check pipe size, pipe material, etc.

5.6 QUICK INSTALL

This is similar to auto installation. Do not use this menu at first installation. This menu is useful when after service flowmeter

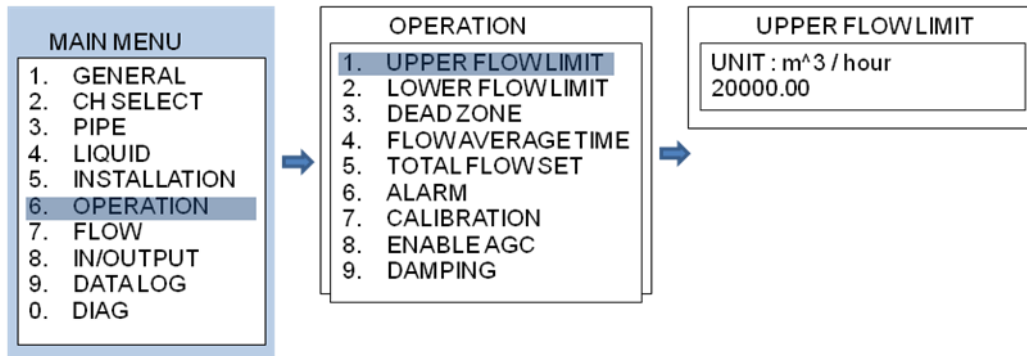
5.7 ACTUAL ZERO

This menu is useful when user can stop the flow. Look flow after stop. If flow is not zero after stop the flow, press ACTUAL ZERO. Then, Xonic 100 makes flow real zero "0". Be sure flow is 0, and open valve.

Section 6. OPERATION

6.1 UPPER FLOW LIMIT

This menu means the site flow cannot exceed flow limitation.



The value is determined by flowmeter automatically. Normally, the value is about double value than measured flow. If the user wants another value, it can be changed by keypad.

6.2 LOWER FLOW LIMIT

Normally, this value is 0.

6.3 DEAD ZONE

DEAD ZONE means the flow than can be disregarded. If pipe is big, so very small flow in meaningless, then use this menu. Normally, flowmeter makes the value automatically.

6.4 FLOW AVERAGE TIME

Default value is 5 seconds. This means display flow is average flow during 5 seconds.

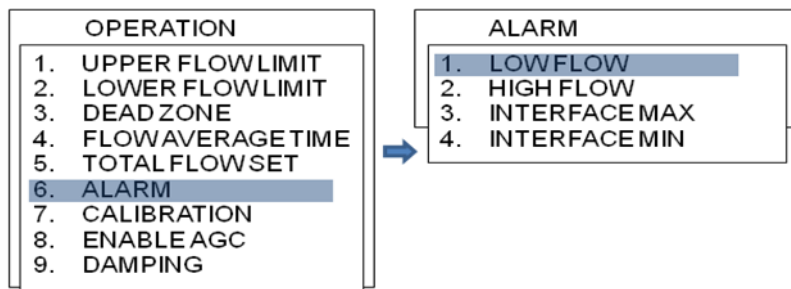
6.5

6.6 TOTAL FLOW SET

If user need to change flow total, can change by keypad.

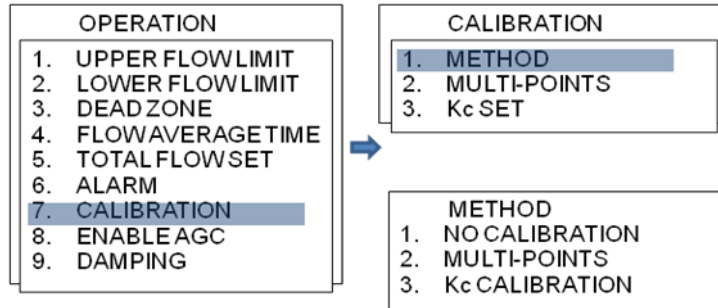
6.7 ALARM

Xonic 100 has alarm functions. User can set HIGH FLOW, LOW FLOW, INTERFACE alarms.



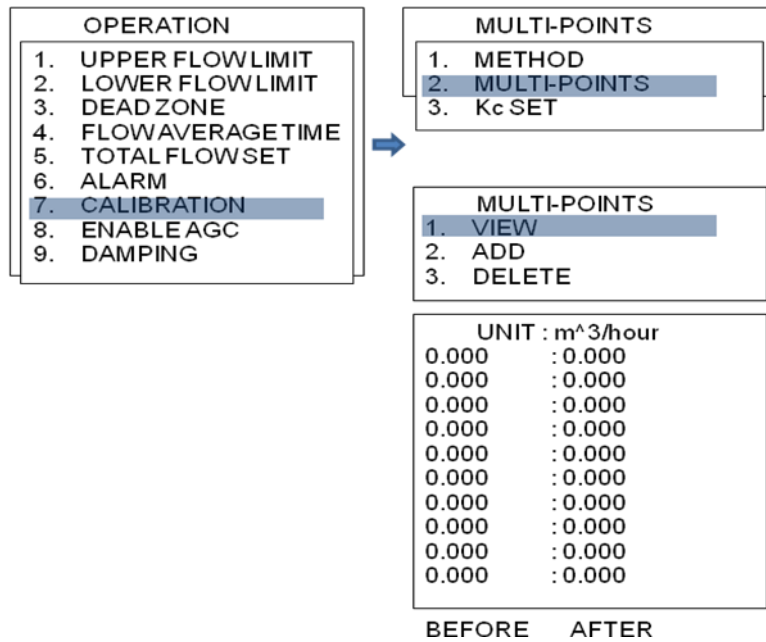
CALIBRATION

In case the user has a calibration instrument or other laboratory instrument to test the Xonic 100, then they can use this menu to calibrate for best accuracy, user can select calibration menu.

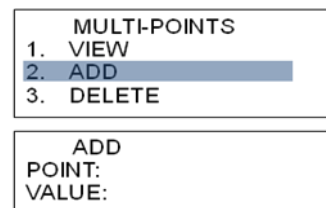


Move cursor to CALIBRATION METHOD.

- 1) NO CALIBRATION is no calibration. It does not affect any calibration to the flow.
- 2) MULTI-POINTS is multi-point calibration menu. User can test flow from minimum to max flow. And can input each test points to flowmeter.



VIEW user can see each input points
ADD user can add test points



DELETE user can delete test points

MULTI-POINTS	
1.	VIEW
2.	ADD
3.	DELETE

UNIT : m ³ /hour	
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000
0.000	: 0.000

Kc SET is flow calibration with calibration factor.
If flow is 100 and Kc is 1.0, then flow became 100
If flow is 100 and Kc is 1.01, then flow became 101
If flow is 100 and Kc is 0.09, then flow became 99.9

OPERATION	
1.	UPPER FLOWLIMIT
2.	LOWER FLOWLIMIT
3.	DEADZONE
4.	FLOWAVERAGETIME
5.	TOTALFLOWSET
6.	ALARM
7.	CALIBRATION
8.	ENABLE AGC
9.	DAMPING

MULTI-POINTS	
1.	METHOD
2.	MULTI-POINTS
3.	Kc SET

Kc SET	
1.0	

6.8 ENABLE AGC

AGC is Automatic Gain Control function. Enable is default.

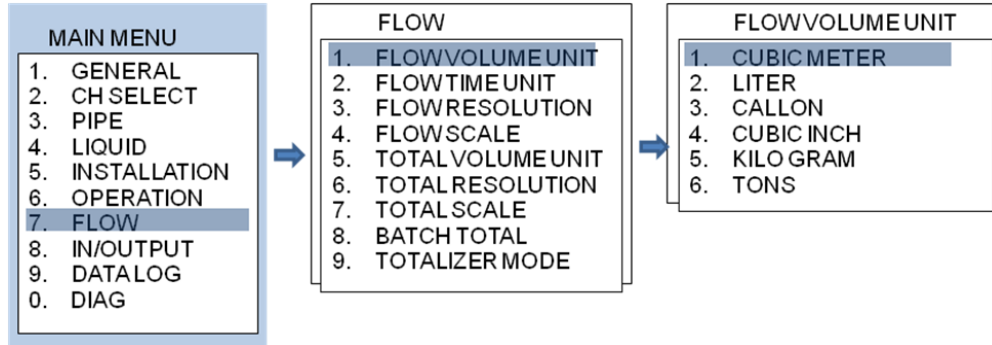
OPERATION	
1.	UPPER FLOWLIMIT
2.	LOWER FLOWLIMIT
3.	DEADZONE
4.	FLOWAVERAGETIME
5.	TOTALFLOWSET
6.	ALARM
7.	CALIBRATION
8.	ENABLE AGC
9.	DAMPING

ENABLE AGC	
1.	DISABLE
2.	ENABLE

Section 7. FLOW

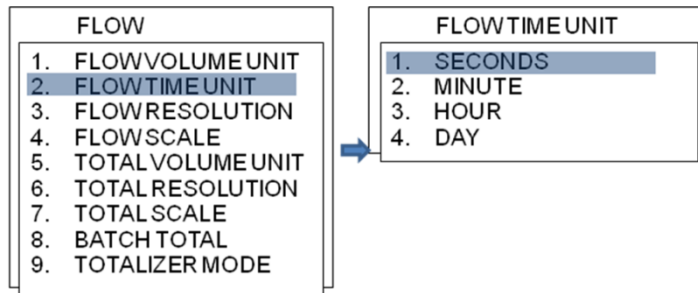
7.1 FLOW VOLUME UNIT

User can select any unit from list.



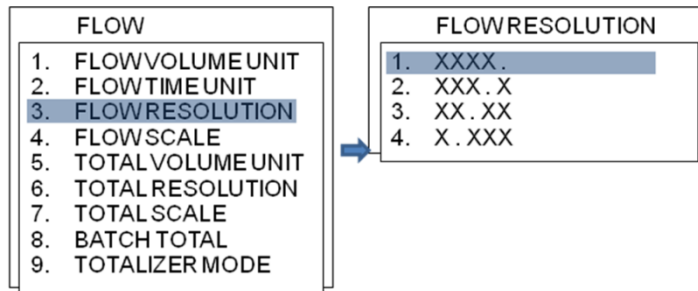
7.2 FLOW TIME UNIT

User can select time unit from list.



7.3 FLOW RESOLUTION

User can select decimal points from list.



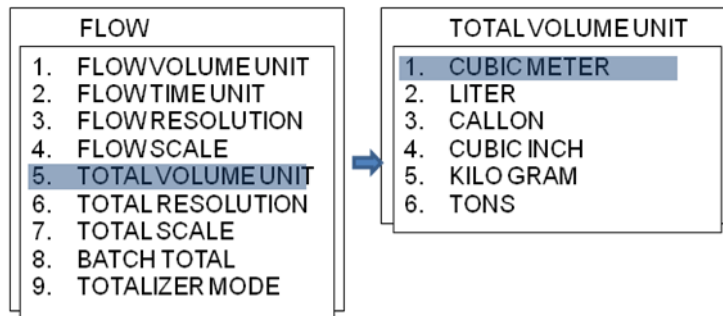
XXXX. means 10 for flow
XXX.X means 10.1 for flow
XX.XX means 10.12 for flow
X.XXX means 10.123 for flow

7.4 FLOW SCALE

In case of big flow, user can select KILO menu.

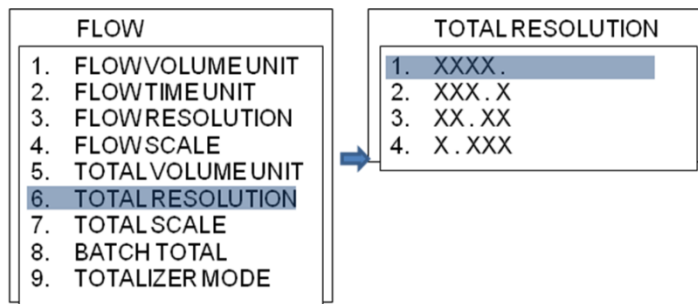
TOTAL VOLUME UNIT

User can select total unit. In most case, total unit is same with flow unit.



7.5 TOTAL RESOLUTION

Choose from the list.

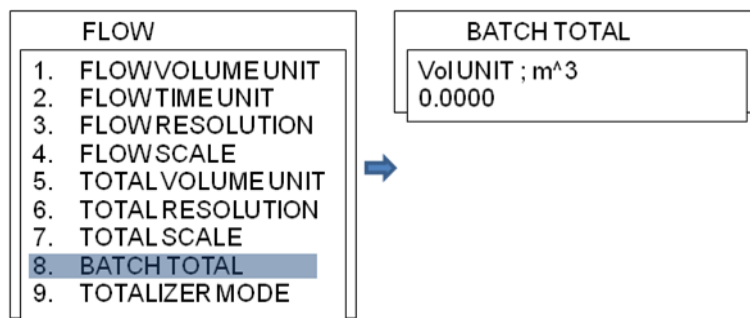


7.6 TOTAL SCALE

User can select KILO for big flow total.

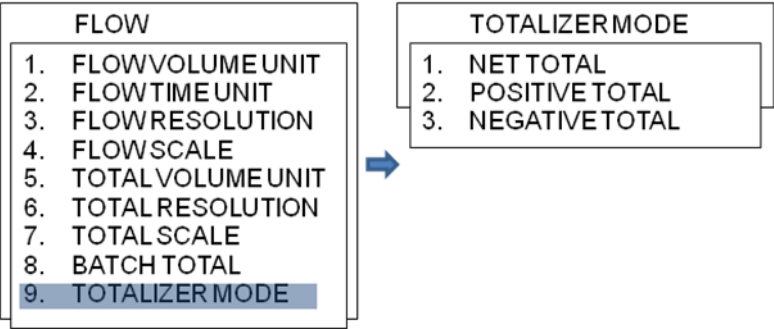
7.7 BATCH TOTAL

Batch total means relay will be on per each batch total. If flow unit is CUBIC METER, then 1.0 means 1 pulse per 1 CUBIC METER. If 0.1 batch total, it means 1 pulse per 0.1 CUBIC METER.



7.8 TOTALIZER MODE

User can select totalizer mode.

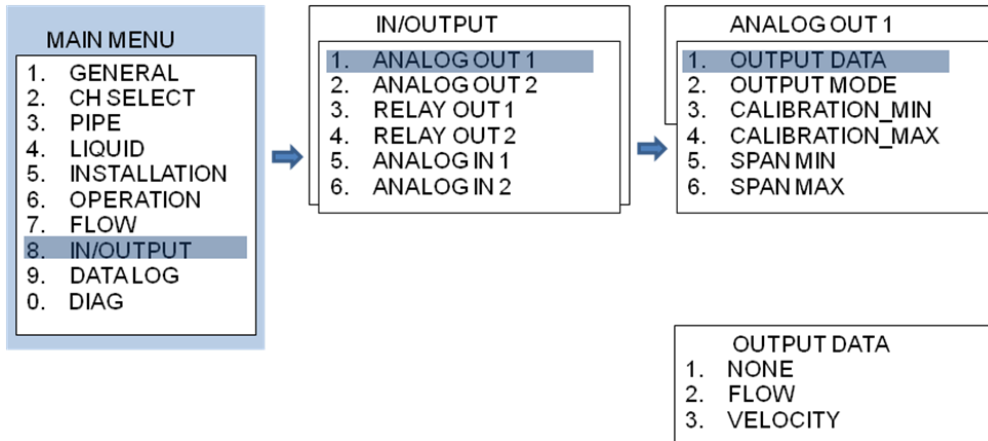


NET TOTAL means flowmeter will totalize positive and negative flow. If positive flow is 100 and negative flow is 10, then total is 90.
POSITIVE TOTAL means flowmeter will only totalize positive flow. If positive flow is 100 and negative flow is 10, then total is 100.
NEGATIVE TOTAL means flowmeter will only totalizer negative flow. If positive flow is 100 and negative flow is 10, then total is 10.

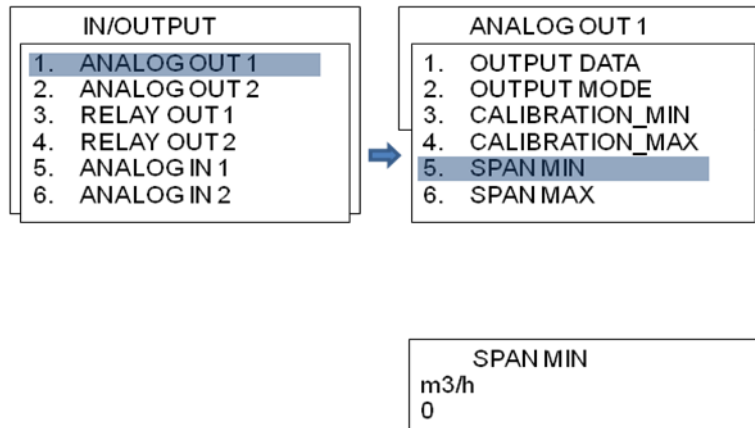
Section 8. IN / OUTPUT

8.1 ANALOG OUT 1

Xonic 100 has two analog output functions for 4-20mADC output. User can assign output data and set range.



User can assign FLOW or VELOCITY to ANALOG OUT 1. In most case, flow is assign to ANALOG OUT 1.



User can set ANALOG OUT 1 min and max span value.

If flow max is 1000, SPAN MAX is 1000

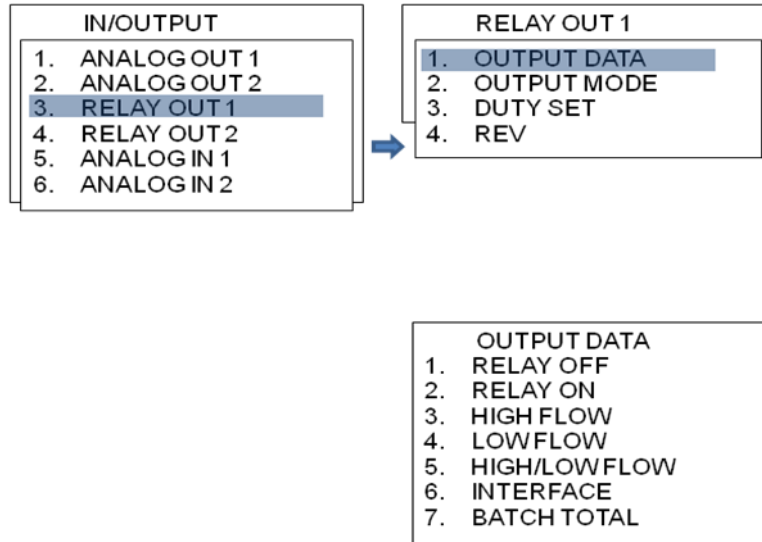
If flow min is 0, SPAN MIN is 0

8.2 ANALOG OUT 2

The same as ANALOG OUT 1 above.

8.3 RELAY OUT 1

Xonic 100 has two relays and user can assign to each functions. Relay is normally used for totalizer function. User can assign RELAY OUT 1 to BATCH TOTAL.

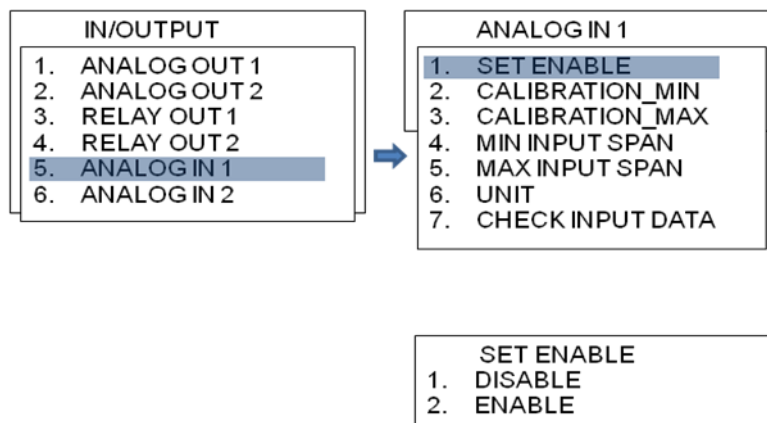


8.4 RELAY OUT 2

Same as RELAY OUT 1.

8.5 ANALOG IN 1

In case the user wants to see pressure, temperature, user can use this function. Just set MIN and MAX input SPAN, the flowmeter send the ANALOG INPUT data through RS-232C.



If pressure transmitter range is from 0 to 10Kg/cm², then
 MIN INPUT SPAN is 0
 MAX INPUT SPAN is 10

8.6 ANALOG IN 2

Same as ANALOG IN 1.

Section 9. DATALOGGER

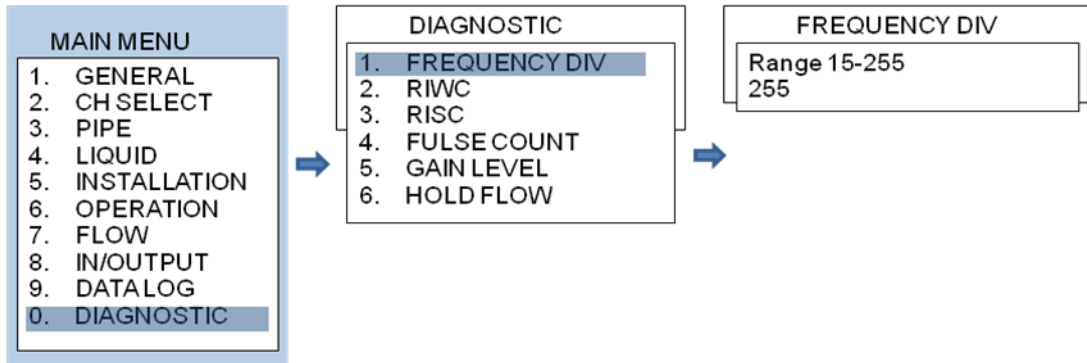


Please set TIME SET after installation.

Please set RS-232C parameters to communicate with your computer.

Section 10. Diagnostics

Use can see what happen in flowmeter through diagnostic functions.



FREQUENCY DIV is frequency functions

RISC is distance from impulse signal to receive signal

FULSE COUNT is numbers of pulse. 5 is default.

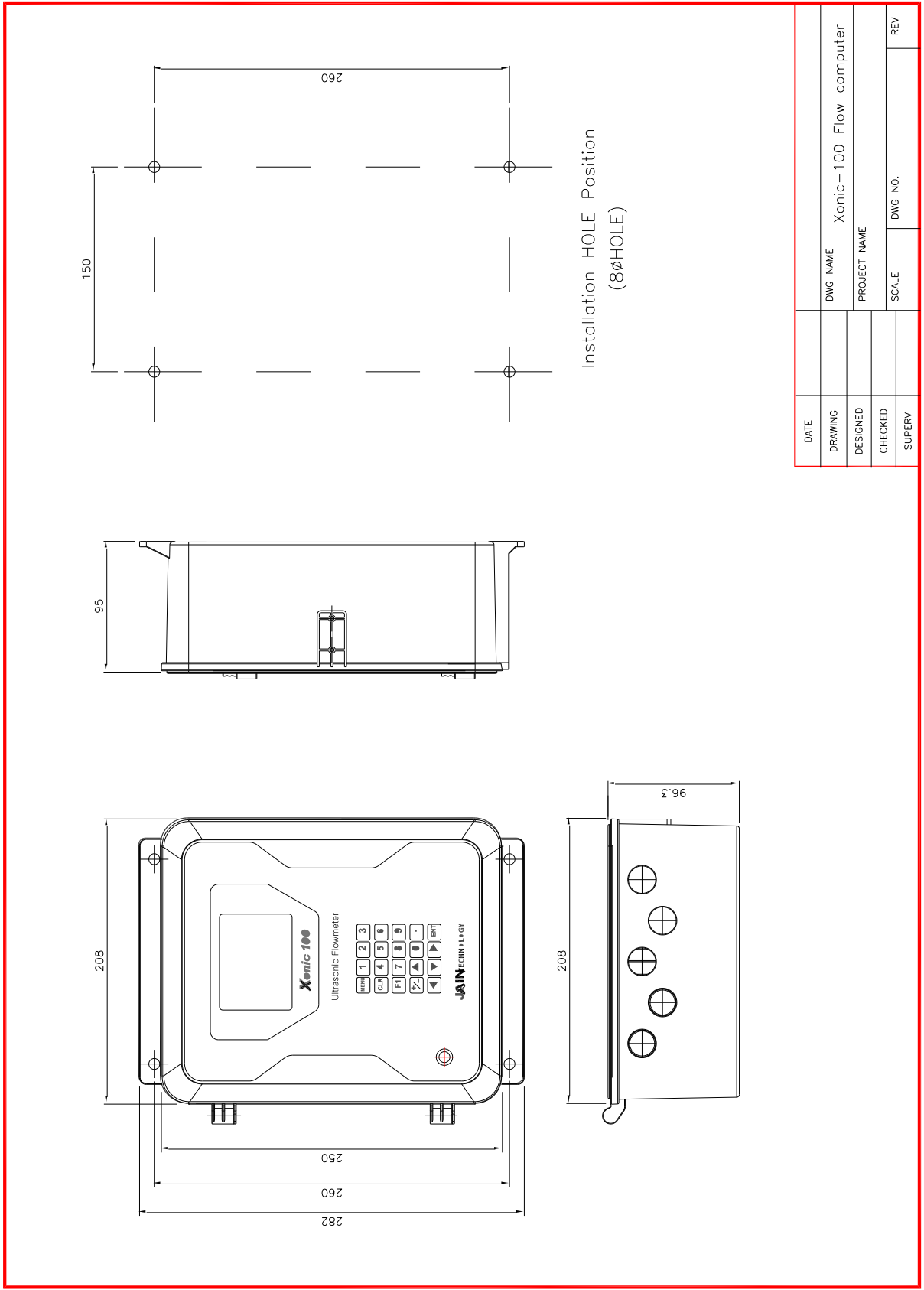
GAIN LEVEL is amplitude level of signal. The number is automatically set by flowmeter.

HOLD FLOW is functions to match with remote indicator.

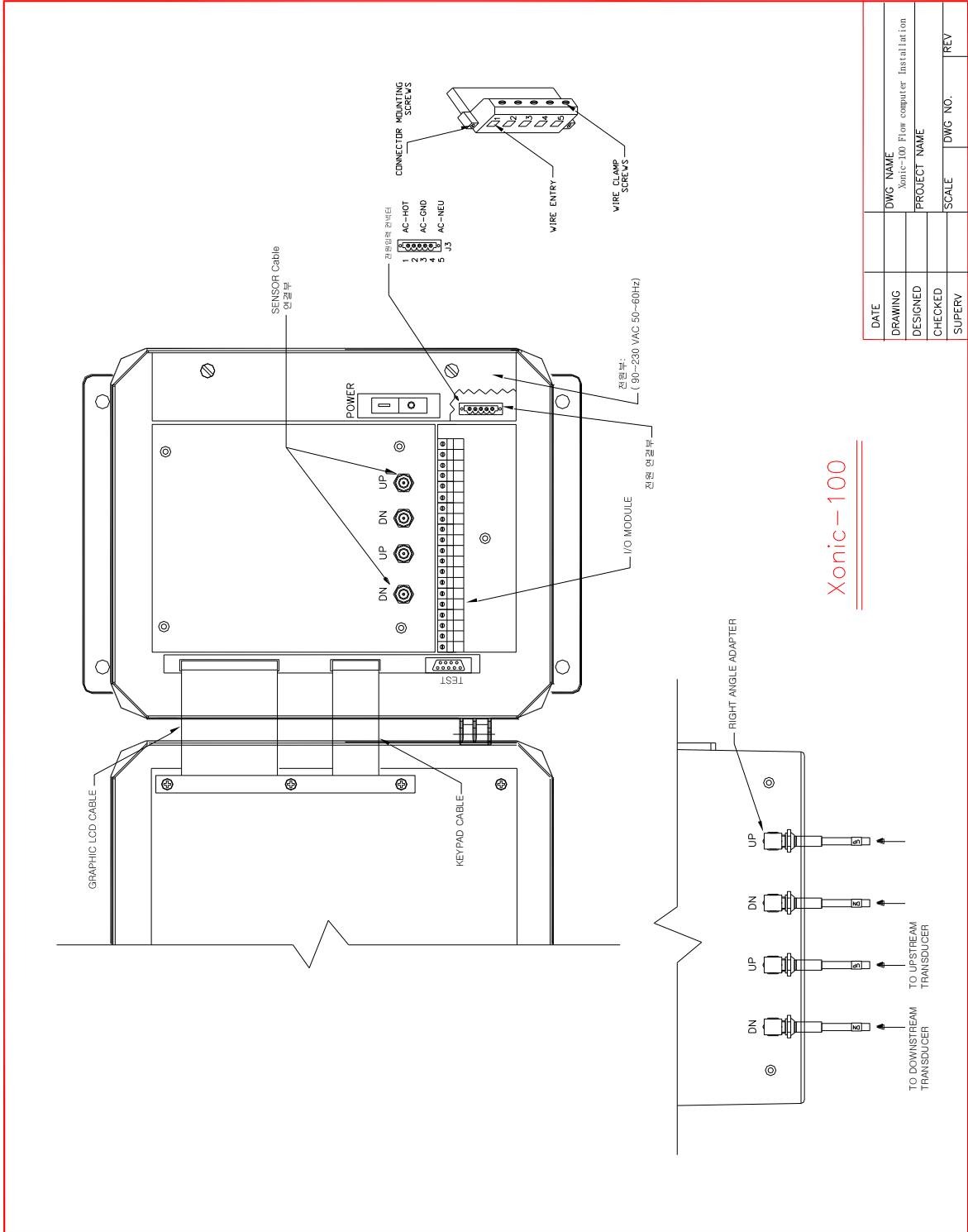
When HOLD FLOW is 0, Xonic 100 send 4mA output.

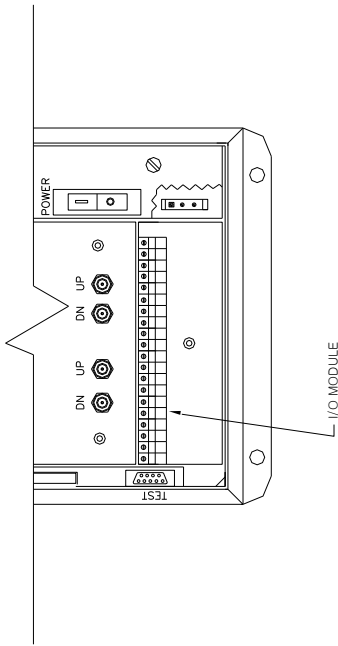
When HOLD FLOW is 1000 (max span flow), Xonic 100 send 20mA output.

DRAWINGS



DATE		DWG NAME	Xonic-100 Flow computer
DRAWING		PROJECT NAME	
DESIGNED		SCALE	DWG NO.
CHECKED			REV
SUPERV			



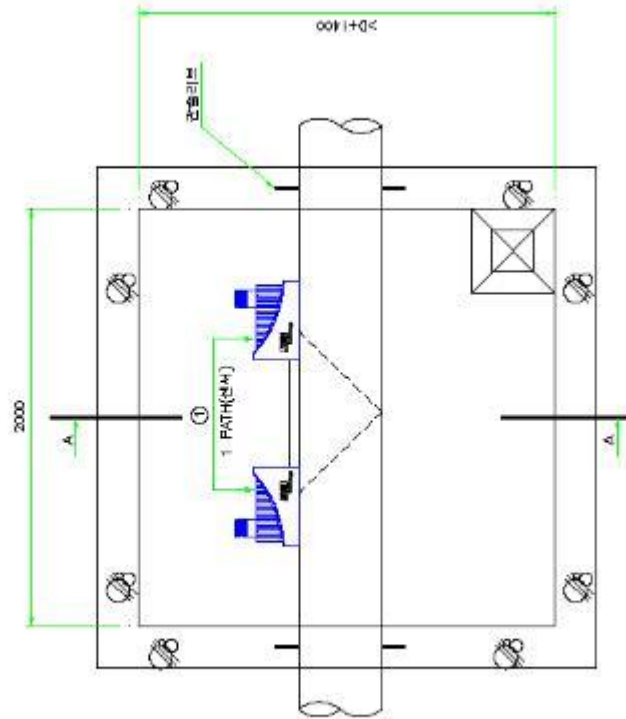
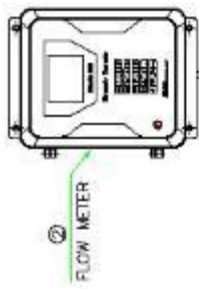


TERMINAL BLOCK WIRING CONNECTIONS

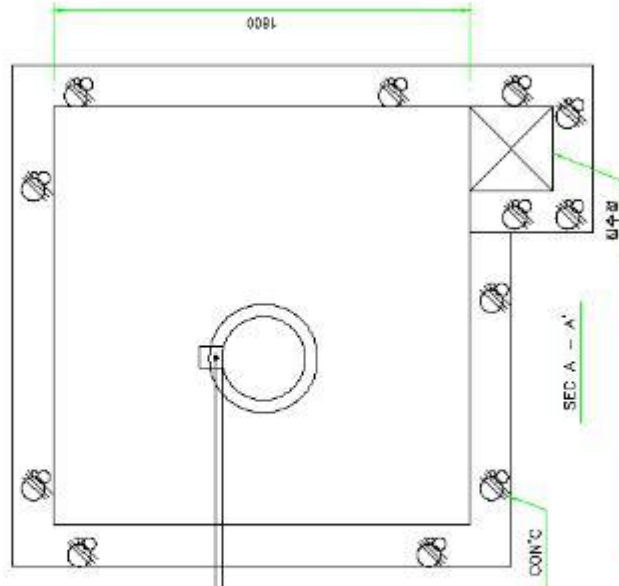
PIN#	SIGNAL	FUNCTION
1	AO1+	4-20mA OUTPUT 1(+)
2	AO1-	4-20mA OUTPUT 1(-)
3	AO2+	4-20mA OUTPUT 2(+)
4	AO2-	4-20mA OUTPUT 2(-)
5	AI1+	4-20mA INPUT 1(+)
6	AI1-	4-20mA INPUT 1(-)
7	AI2+	4-20mA INPUT 2(+)
8	AI2-	4-20mA INPUT 2(-)
9	RTD-VN	NONE
10	RTD-VP	NONE
11	RTD-CN	NONE
12	RTD-CP	NONE
13	GND	RS-232 GND
14	TXD	RS-232 TXD
15	RXD	RS-232 RXD
16	DIN1	NONE
17	DIN2	NONE
18	TRXD-	RS-485 B(-)
19	TRXD+	RS-485 A(+)
20	R2A	RELAY 2 COMMON
21	R2C	RELAY 2 OPEN
22	R1A	RELAY 1 COMMON
23	R1C	RELAY 1 OPEN

DATE		DWG NAME	
DRAWING		Xonic-100 I/O MODULE	
DESIGNED		PROJECT NAME	
CHECKED		SCALE	DWG NO.
SUPERY			REV

NO	PART NO.	DESCRIPTION	MAT'L	QTY.
1		TRANSUCER		
2		FLOW METER		

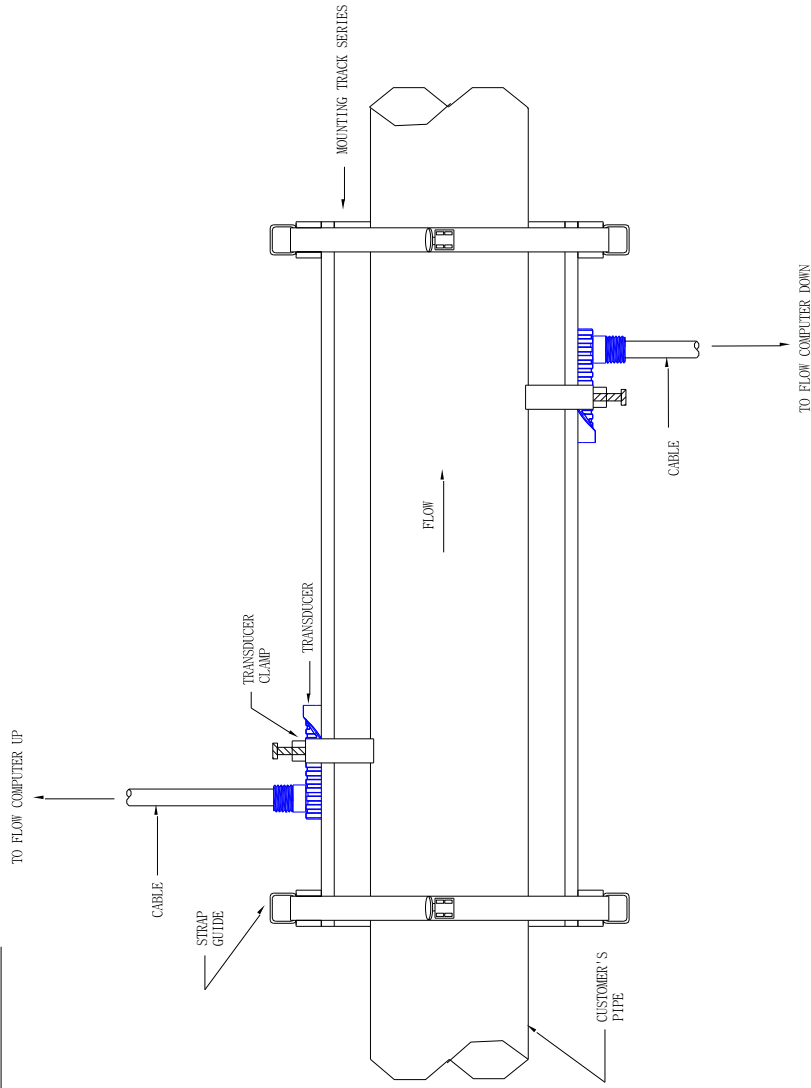


99 01 도



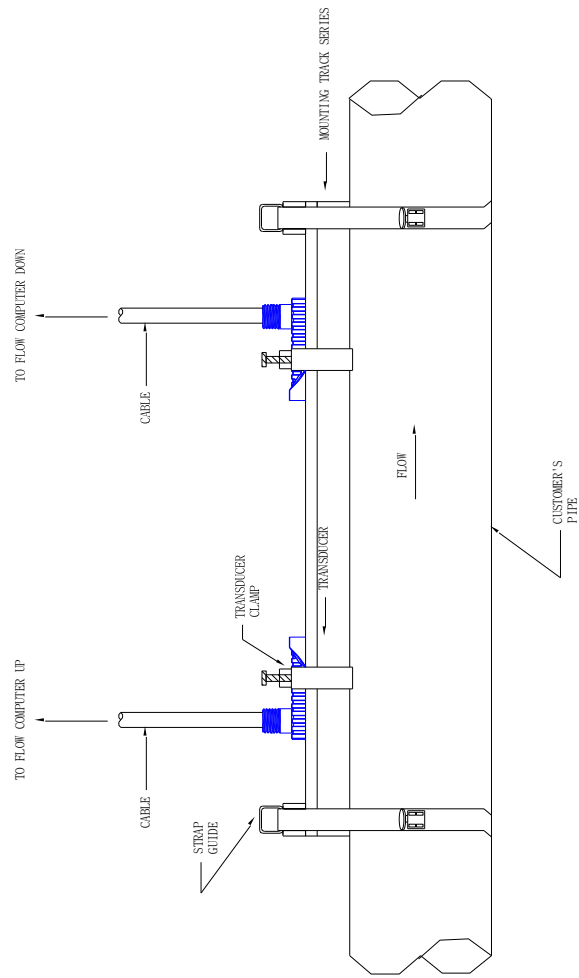
DATE		DWG NAME	X-100 Manhole Installation
DRAWING		PROJECT NAME	
DESIGNED		SCALE	
CHECKED		DWG NO.	
SUPRV		REV	

DIRECT MODE INSTALLATION

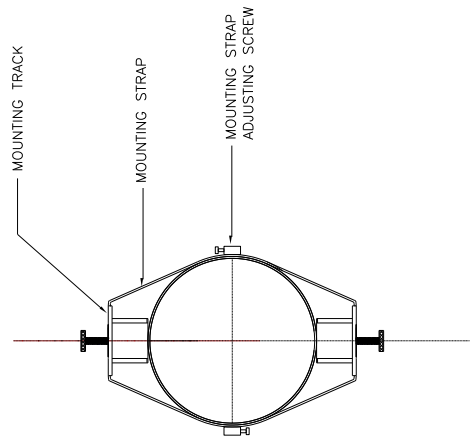
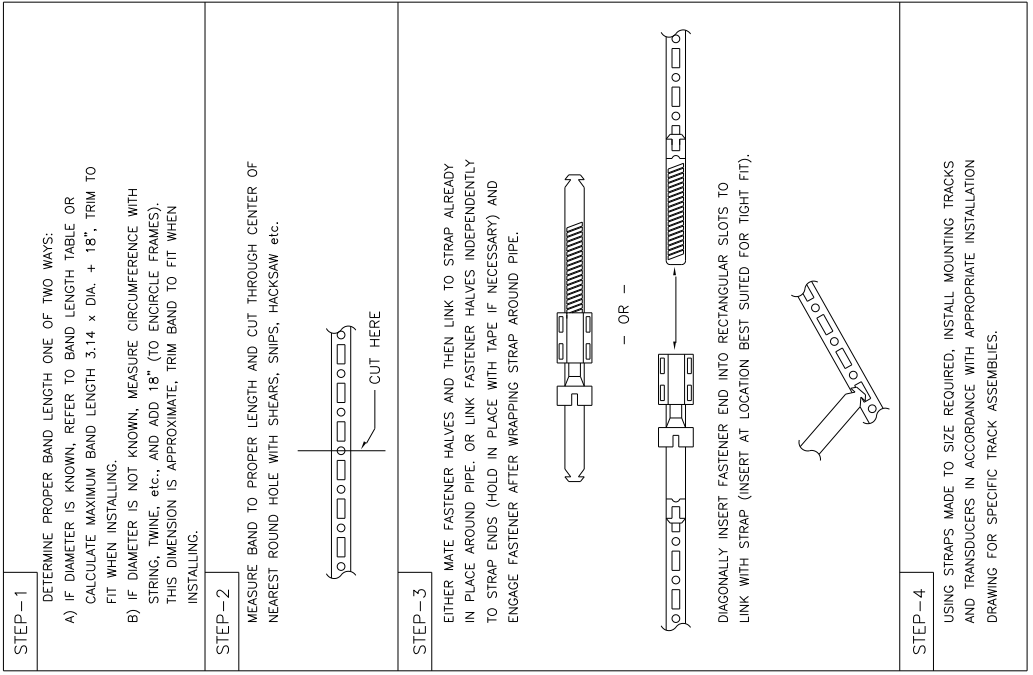


DATE		DWG NAME	TRANSDUCERS INSTALLATION AND MOUNTING TRACKS(DIRECT MODE)
DRAWING		PROJECT NAME	
DESIGNED		SCALE	
CHECKED		DWG NO.	102-TP
SUPERY		REV	

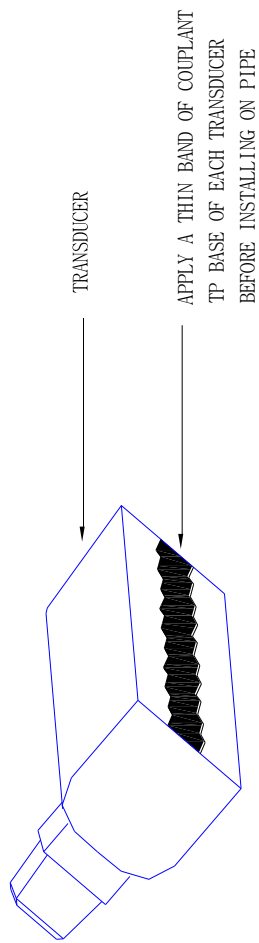
REFLECT MODE INSTALLATION



DATE	TRANSDUCERS INSTALLATION AND MOUNTING TRACKS(REFLECT MODE)		
DWG NAME	PROJECT NAME		
DESIGNED	SCALE	DWG NO.	REV
CHECKED		102-TP	
SUPERY			

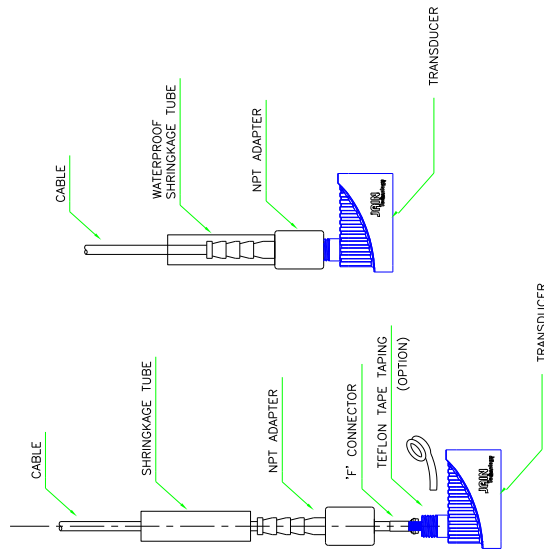
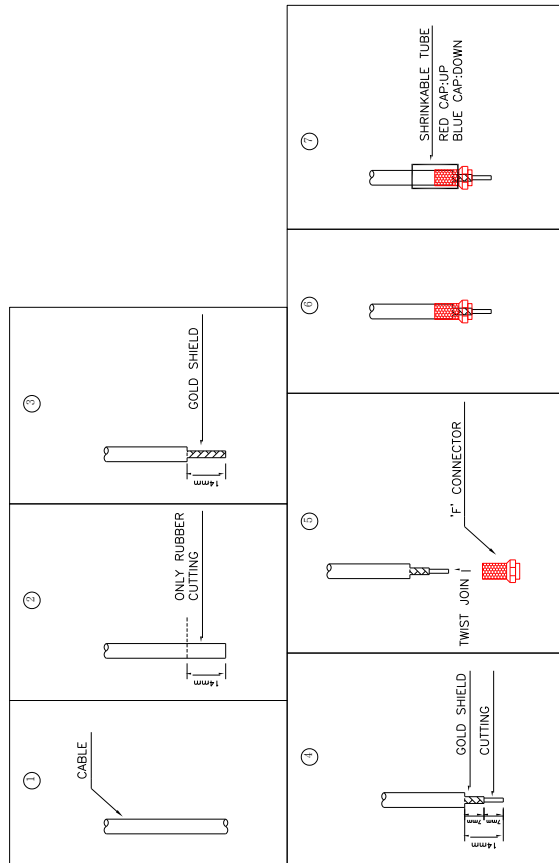


DATE		DWG NAME	INSTALLATION / OUTLINE
DRAWING			ADJUSTABLE MOUNTING STRAP
DESIGNED		PROJECT NAME	
CHECKED		SCALE	DWG NO.
SUPERY			102-S/SF
			REV



USE OF COUPLANT COMPOUND

DATE		DWG NAME	TRANS-DUCERS INSTALLATION COUPLANT
DRAWING		PROJECT NAME	
DESIGNED		SCALE	DWG NO. 102-C
CHECKED			
SUPERY			REV



CABLE CONNECTING

DATE	DWG NAME	CABLE CONNECTING KIT
DRAWING	PROJECT NAME	
DESIGNED	SCALE	DWG NO.
CHECKED		REV
SUPERY		