ENV120 Series

SLUDGE BLANKET

LEVEL METER

Royce RWT Water Technologies

SAFETY PRECAUTIONS

The ENV120 product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read the operating information carefully before using the product.

Users of this product must be protected from electric shock at all times. Product users must be trained to protect themselves from the risk of electric shock.

Before operating the instrument, make sure the mains supply is connected to a properly grounded power supply. Periodically inspect the connecting cables for possible wear, cracks, or breaks.

The fuse may only be replaced with same type and rating for continued protection against fire hazard.

Definition of Equipment Symbols

This symbol means CAUTION and alerts you to possible danger or instrument malfunction. Refer to this manual before proceeding.

This symbol means that this is a protective ground terminal and alerts you to connect an earth ground to it.

In addition to information on installation and operation, this instruction manual may contain WARNINGS pertaining to user safety, CAUTIONS regarding possible instrument malfunction, useful operating guidelines.

WARNING

A Warning looks like this. Its purpose is to warn you of the potential for personal injury

CAUTION

A Caution looks like this. Its purpose is to alert you to important operating information

WARRANTY

WESS Global, Inc. warrants the ultrasonic sludge blanket monitoring system, ENV120, to be free from defects in material or workmanship for a period of 1 year (12 months) from the date of this product was shipped from local distributors. A warranty claim will not be honored if defects are not reported within the warranty period, or if WESS Global, Inc. determines that defects or damages are due to normal wear, misapplication, lack of maintenance, abuse, improper installation, alternation, or abnormal conditions. WESS's obligation under this warranty shall be limited to, at its option, replacement or repair of this product. The product must be returned to WESS or WESS's distribution centers, freight prepaid, for examination. The product must be thoroughly cleaned and any process chemicals removed before it will be accepted for replacement or repair. WESS's liability shall not exceed the cost of the product. Under no circumstances will WESS be liable for any incidental or consequential damages, whether to person or property. WESS will not be liable for any other loss, damage or expense of any kind, including loss of profits, resulting from the installation, use, or inability to use this product.

TABLE OF CONTENTS

1. PRODUCT DESCRIPTION

1.1 OVERVIEW

ENV120 series is a non-contacting ultrasonic instrument that measures the sludge blanket in series liquid. It consists of a probe and a firmware-driven controller. The firmware controls the ultrasonic probe and analyzes signals sent from the ultrasonic probe. (See Fig. 1)

ENV120 Features:

- Continuous measurement
- Visual Threshold Adjustment(VTA)
- 10,000 points data logging & trend mode
- ASF(Abnormal Signal Filter) Function
- Built-in probe cleaning nozzle
- swing bracket for skimmer avoidance

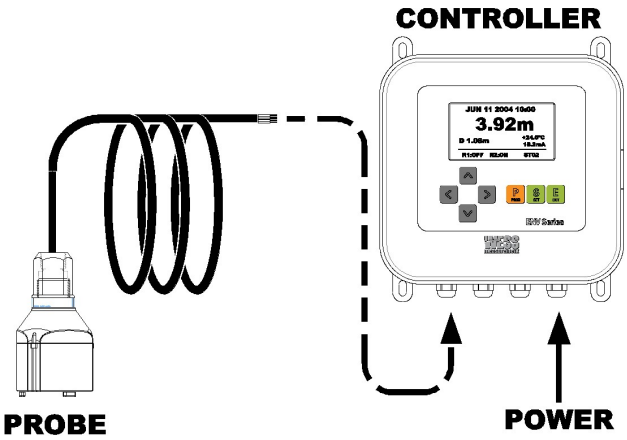

Fig.1 Configuration of the ENV120

1. PRODUCT DESCRIPTION

1.2 PROBE(S1T)

The Fig.2 is an illustration of the ultrasonic probe S1T.

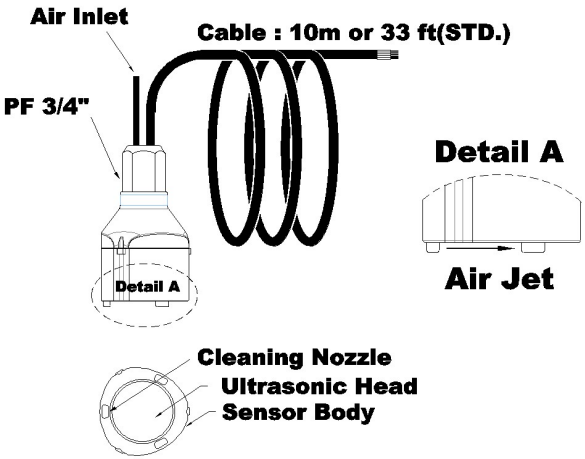

Fig.2 Probe(S1T)

Specifications

Material	Body: PP
	Ultrasonic Head: PP
Mounting Thread	3/4" PF thread
Cable Length	10m or 33ft (STD.)
	Extendable to max. 100m
Opera. Temp.	-10 to 60°C (14 to 140°F)
Dimensions	Φ 88mm x 121(H)mm
Weight	1.2 kg (inc. 10m cable)
IP Rating	IP68
Cleaning Method	Air Jet (built-in cleaning nozzle)
Connection with Optional Cleaning Device	
	One-Touch fitting for Φ6 tube

1. PRODUCT DESCRIPTION

1.2 PROBE(S1G)

The Fig.3 is an illustration of the ultrasonic probe **S1G**.

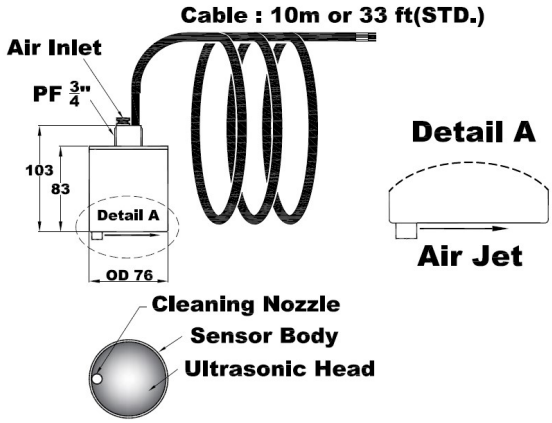

Fig.3 Probe(S1G)

Specifications

Material	Body: STS304, STS316(Option)
	Ultrasonic Head: Epoxy
Mounting Thread	3/4" PF male thread
Cable Length	10m or 33ft (STD.)
	Extendable to max. 100m
Oper. Temp.	-10 to 60°C (14 to 140°F)
Dimensions	Φ 76mm x 83(H)mm
Weight	2.2 kg (inc. 10m cable)
IP Rating	IP68
Cleaning Method	Air Jet (built-in cleaning nozzle)
Connection with Optional Cleaning Device	
	One-Touch fitting for Φ6 tube

1. PRODUCT DESCRIPTION

Fig.4 illustrates the controller

1.3 CONTROLLER

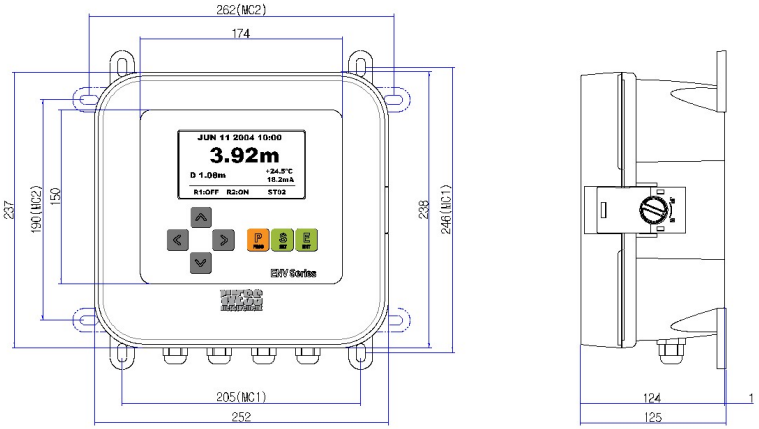

Fig.4 Controller

Specifications

Range	0.35 to 30m (1 to 33ft)
Resolution	1cm (metric), 0.1ft (imperial)
Accuracy	±0.5% of measured range or 1 inch, whichever is greater
Oper. Temp.	-20 to 70°C (-4 to 158°F)
Outputs	Current: 4 to 20mA, nom. load 250Ω (Load range: 100 to 750Ω) Relay: 3 SPDT (5A, 250VAC)– “ER” “R1” “R2” Digital: RS232 or 485(option)
Power supply	STD.: 100 to 240V AC, 50 to 60Hz, <15W OPT.: 24V DC
Fuse	T315mAL 250V 5 x 20mm
Casing	Body/Cover: ABS
Dimensions	252(W) x 238(H) x 125(D) mm
Mounting	Center hole 205(W) x 190(H) (Φ 6 x 4ea)
Weight	2.2 kg
IP Rating	IP67

1.

PRODUCT DESCRIPTION

1.3 CONTROLLER	**Max Altitude**	2,000 m
	Max Humidity	80% (31℃)
		50% (40°C ~ 60℃)
	Installation Category	II – IEC644
	Pollution Degree	2 – IEC644
	CE EMC	Complies with EN61326 (Class A)
		EN61000, EN61010-1:2001

1.4
CLEANING DEVICE

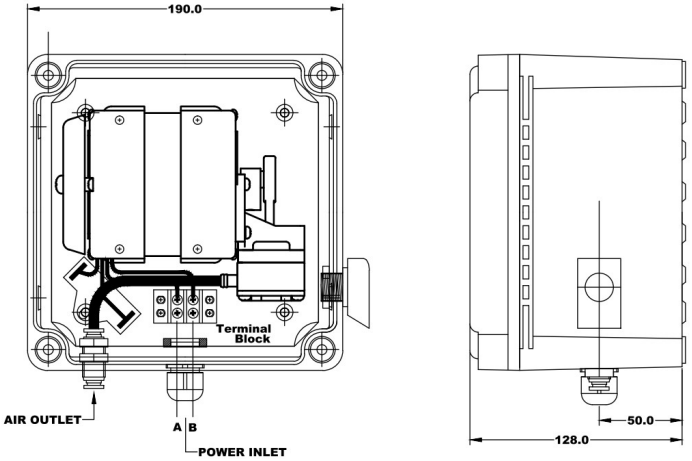

Fig.5 Cleaning Device

Specifications

Free Flow Rate	25L/min
Max Pressure	4.5bar
Oper. Temp.	-10 ~ 60°C (14~ 140°F)
Power supply	
	STD.: 220V AC ±10%, 50~60Hz, ≤50W
	OPT.: 110V AC ±10%, 50~60Hz
Casing	ABS
Dimension	190(W) x 190(H) x 130(D) mm
Mounting	Center hole 155(W) x 100(H) (M5 x 4ea)
Weight	2 kg
IP Rating	IP66

1. PRODUCT DESCRIPTION

1.5
SWING BRACKET

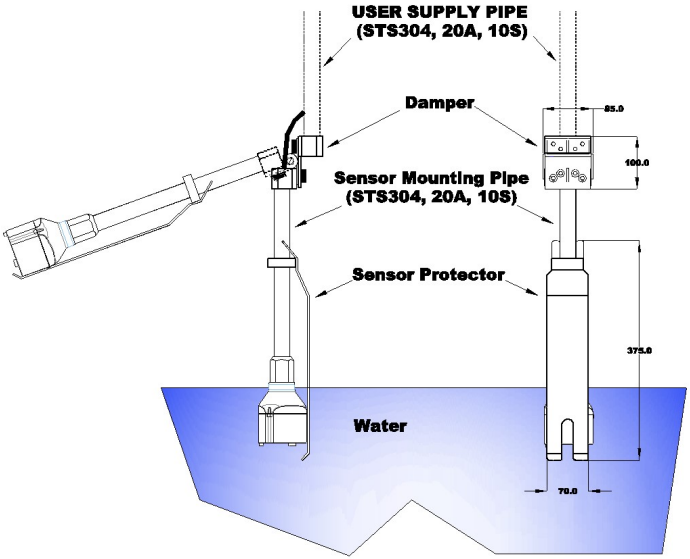

Fig.6 Swing bracket

Specifications

Material	Probe Protector: STS 304
	Probe Mounting Pipe: STS 304
Mounting Thread	3/4” PF male thread
	(Probe/user supply pipe)
Damper	Buffer
Dimensions	Damper : 85(W) x 100(H)
	Swing Bracket : 70(W) x 375(H)
Weight	Damper : 0.75 kg
	Swing Bracket : 0.40 kg

2. APPLICATIONS

The ENV120 is designed to monitor the levels of solid contents (sludge) in various types of liquids (water, liquor, etc.), to control the pumps engaged in the processes, and to initiate events based on measured process conditions.

Some applications examples include:

- Water & wastewater treatment clarifiers
- Water & wastewater gravity & DAF thickeners
- Raw water clarifiers
- Sumps, lagoons, settling ponds
- Industrial process thickeners
- Salt brine tanks
- Material inventory tanks
- Process thickeners

3. INSTALLATION

3.1 PROBE

Do not inflict impact or unnecessary external force on the probe during handling. The ultrasonic head (see Fig .7), which transmits and receives sound waves, should be handled with extra care and stored wrapped in sponge or other soft materials to absorb the impact of an external blow.

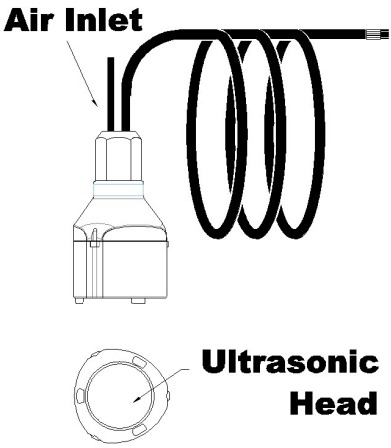

Fig.7 Ultrasonic head

Attach and secure the probe using the 3/4" PF male thread located on the upper section of the probe. Pipe length selection should be based on the lowest liquid level (see Fig.7). The pipe's material should be chosen in consideration for material strength or application fluid characteristics. STS 304 20A, 10S pipe is the preferred choice in most applications. The cleaning air supply tube connects to the probe's one-touch fitting only if the cleaning device is used. The schematic diagram used for the installation process is identical to Fig.8 and can be modified according installation site requirements.

Position the probe at a location where the ultrasonic signal from the bottom of the pool or tank is not blocked by surrounding structures (agitator, pipe, etc.). Additionally, to ensure stable measurement, the probe should be positioned away from air bubbles and active floating solids resulting from sudden changes in velocity

3. INSTALLATION

Refer to the Fig.8 to decide the depth of probe installation

3.1 PROBE

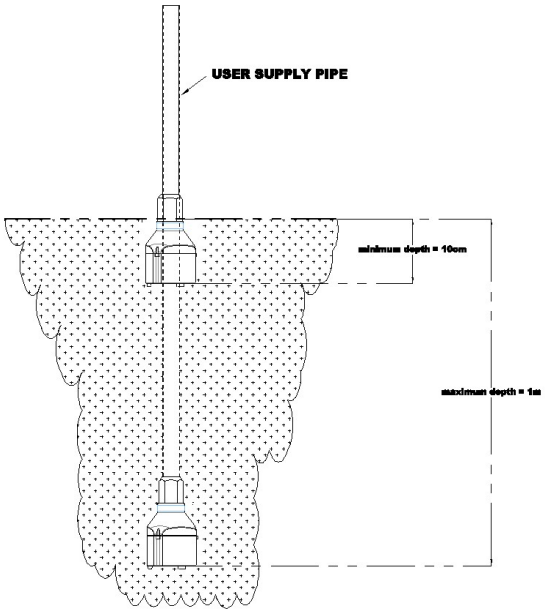

Fig.8 Stationary Installation of the Probe

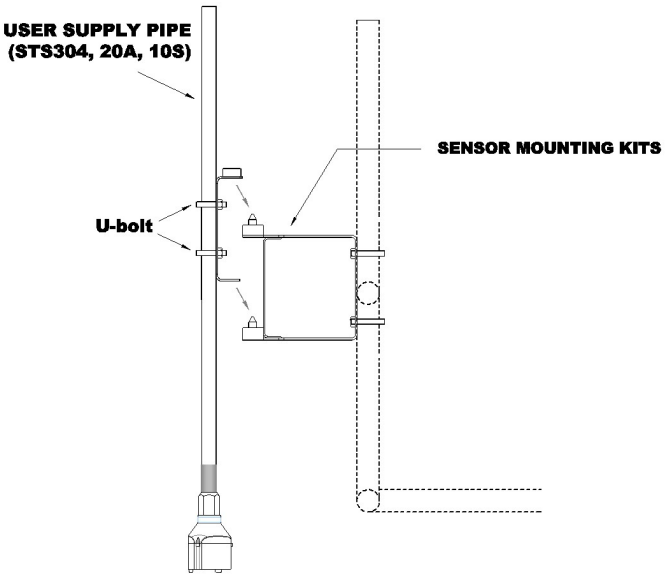

Fig.9 Probe Installation Structure (an example)

3. INSTALLATION

3.1 PROBE

For tank or rectangular pool applications, maintain at least 1m of separation distance from the wall to minimize interference (see Fig.10 and Fig.11) and try to avoid a hopper area where the shape of sludge blanket varies upon pumping activity(see Fig.11)

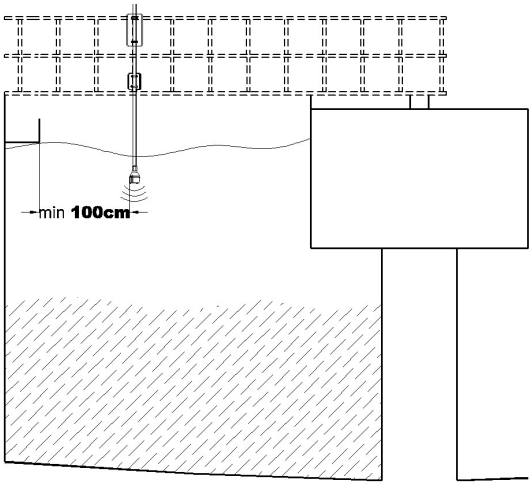

Fig.10 Minimum Separation Distance of Circular Clarifier

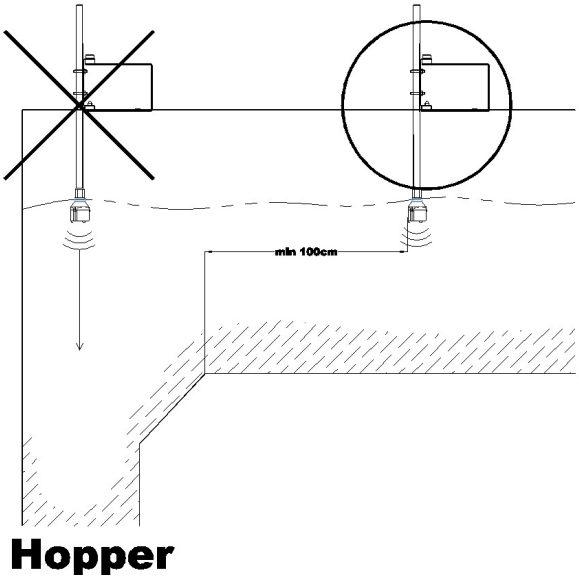

Fig.11 Minimum Separation Distance of Rectangular Clarifier

3. INSTALLATION

Protect the controller from impact and unnecessary external force until it is installed.

3.2 CONTROLLER

Install the controller on a panel/handrail or wall using the mounting holes (Φ 6) located at the back of controller (see Fig.12). Schematic diagram for U-bolt installation on a handrail is illustrated in Fig.13.

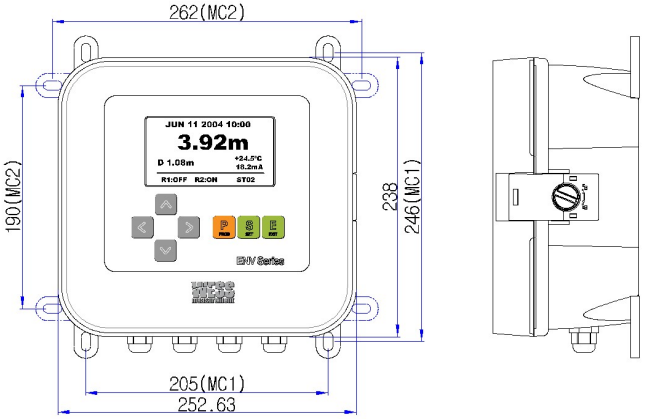

Fig.12 Mounting Hole Position (Φ6 x 4ea)

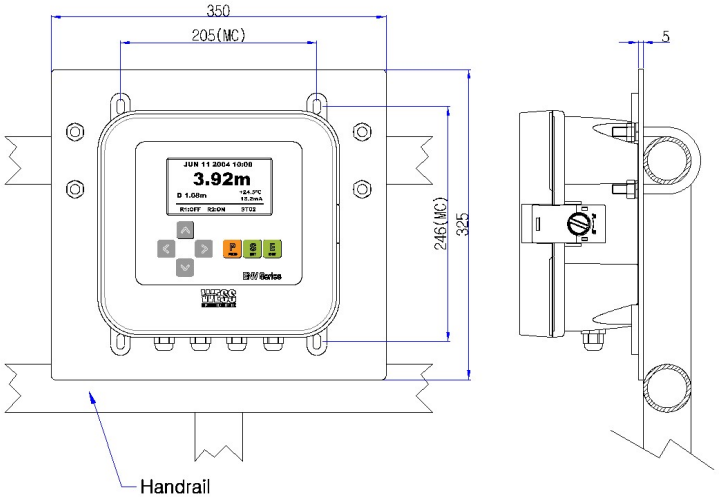

Fig.13 Handrail Installation Example

3. INSTALLATION

3.2 CONTROLLER

Located on the bottom of the controller are four cable glands the user can use selectively for his/her specific application (see Fig.14). Each cable gland should be connected using a cable of correct diameter (Φ 4.5 ~ 10mm) to ensure IP67

Most products generally use the direct cable connection method, in which stripped wires connect directly to a terminal block (TB). This makes for a difficult wiring process because of the sheer number of wires in a confined space.

ENV120, on the other hand, utilizes a new wiring method that uses an additional plug connector for the primary wiring and then it connects to TB stationed on PCB. For detailed information, refer to Chapter 4.

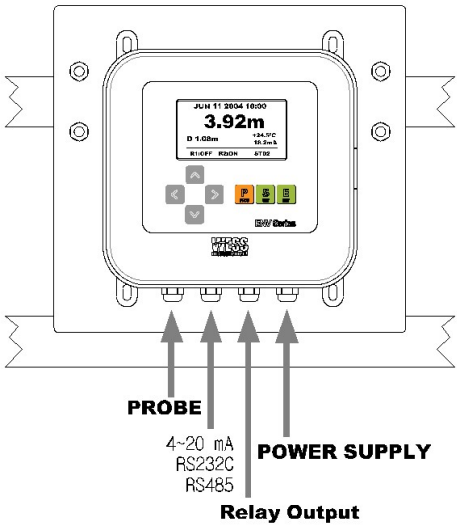

Fig.14 General Usage of Cable Distribution

WARNING

To avoid the risk of electric shock, this equipment must only be connected to a main supply with protective earth.

3. INSTALLATION

3.3 CLEANING DEVICE (OPTIONAL)

Use the female thread (M5) located at the rear to install the cleaning device on a panel/handrail (see Fig.15).

Normally the cleaning device installs horizontally against the controller. Fig.16 illustrates a typical application using U-bolts.

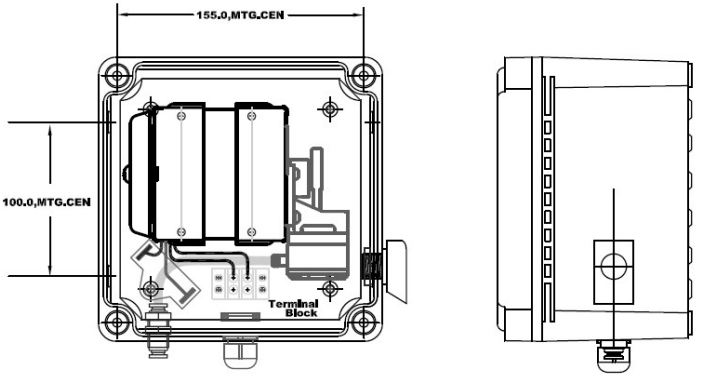

Fig.15 Locations of Female Threads (M5 x 4ea)

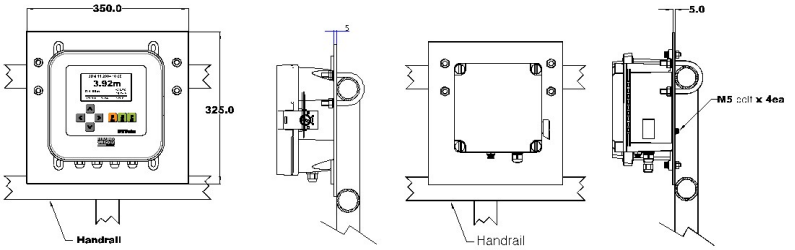

Fig.16 Handrail Mounting Example

3. INSTALLATION

3.3 CLEANING DEVICE

Fig.17 illustrates the connection between the cleaning device and the probe / controller. Refer to Chapter 4 for detailed information of this electrical connection.

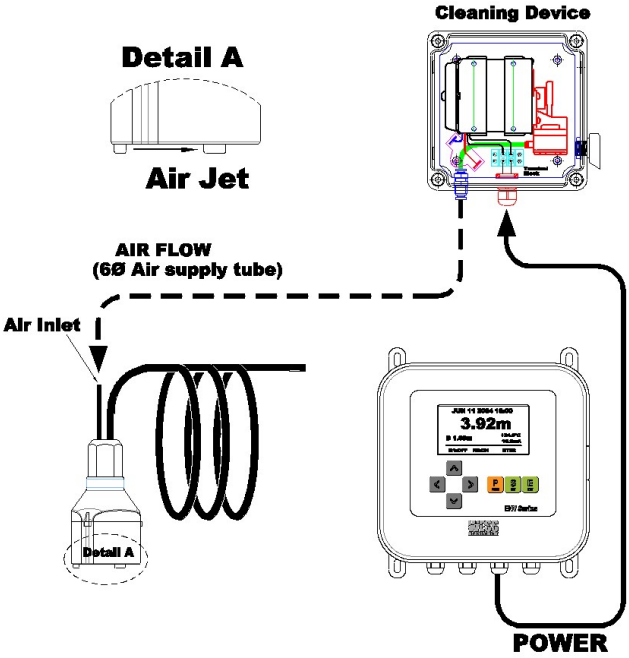

Fig.17 connecting to enable the Cleaning Device

3. INSTALLATION

3.4 SWING BRACKET (OPTIONAL)

The swing bracket is used to protect the probe from damage caused by skimmer/scraper that exists at circular or rectangular clarifiers of the sewage treatment plant.

ENV120's swing bracket features a hinge damper that dampens the skimmer's impact during pendulum motions.

To connect the swing bracket to a probe, link the probe's 3/4" PF thread to the cleaning device's 3/4" PF socket (see Fig.18). Consider the distance from the probe head to the skimmer when preparing the 20A, 10S STS pipe with a 3/4" male thread.

Fig.19 (Circular Clarifier) and Fig.20 (Rectangular Clarifier) are typical sewage plant applications.

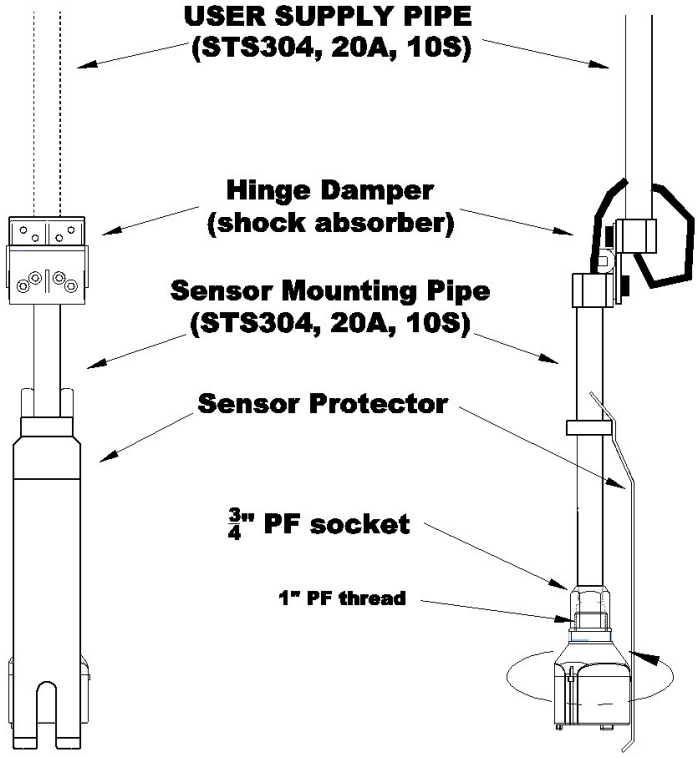

Fig.18 Swing Bracket + Probe

3. INSTALLATION

3.4
SWING BRACKET

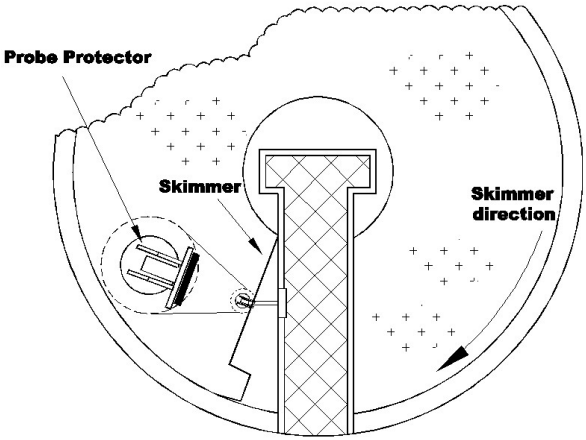

Fig. 19 Typical Circular Clarifier Installation

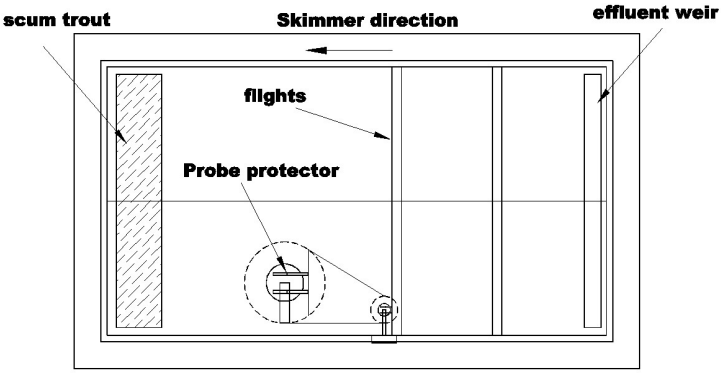

Fig. 20 Typical Rectangular Clarifier Installation

CAUTION

Take care not to damage a damper and a sensor protector by checking a surface skimmer's direction

4. POWER, WIRING AND CONNECTIONS

AC 100 to 240V, 50/60Hz, < 15W

Use copper conductors only.

A user-supplied disconnect switch on a separate 15A circuit breaker should be located near the processor unit. Power line noise and interference are filtered by a built-in EMI filter.

4.1 POWER REQUIREMENTS

WARNING

To avoid the risk of electric shock, this equipment must only be connected to a main supply main with protective earth.

CAUTION

Do not position the equipment where it is difficult to operate the circuit breaker.

4.2 PROBE WIRING

A 10m (33ft) of probe telemetry cable is supplied as standard. Contact your authorized distributor for extensions.

The maximum length of cable extension is up to 100m (33ft) when authorized cable is in use.

CAUTION

Take care not to damage the jacket of the telemetry cable during extension. Improper wiring may cause water to enter the probe.

4. POWER, WIRING AND CONNECTIONS

The controller supports up to 5 parts of connections.

Connections include Probe, mA and Serial Communication Outputs, Relay Output, Cleaning Device, and Power (see Fig.21). The controller accommodates up to 5 parts of connections.

4.3 USER CONNECTIONS

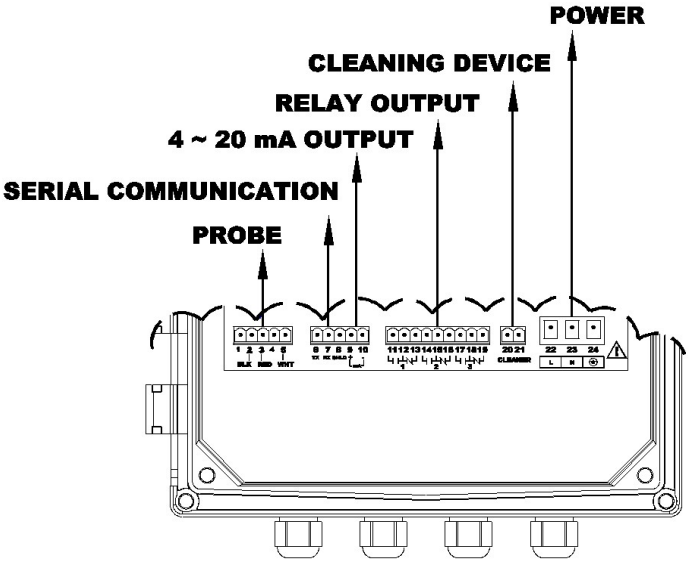

Fig.21 Connection Diagram

4. POWER, WIRING AND CONNECTIONS

Connect the three respective colored wires from the probe cable to a 5-position PHOENIX connector and then put it into the PCB board (see Fig.22).

4.3 USER CONNECTIONS

4.3.1 PROBE(S1T) CONNECTION

PIN NO.	PIN COLOR	FUNCTION
1		V+
2	BLACK	GND
3	RED	TX(Sensor)
4		RX
5	WHITE	TEMP

Table 1. Probe(S1T) Connection

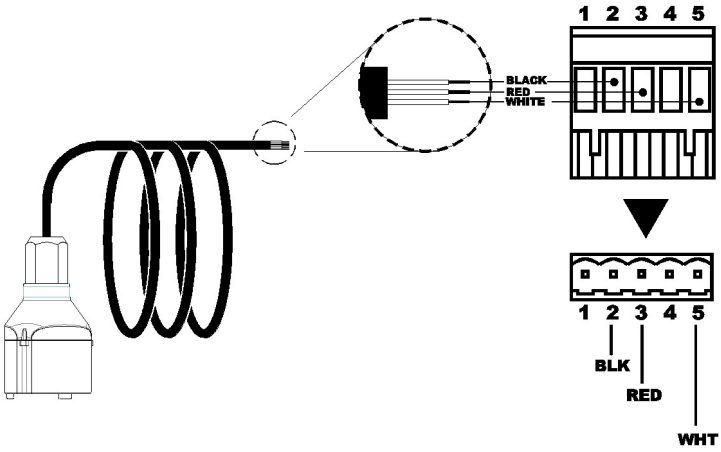

Fig.22 Probe(S1T) Connection

4. POWER, WIRING AND CONNECTIONS

Connect the five respective colored wires from the probe cable to a 5-position PHOENIX connector and then put it into the PCB board (see Fig.23).

4.3 USER CONNECTIONS

4.3.1 PROBE(S1G) CONNECTION

PIN NO.	PIN COLOR	FUNCTION
1	RED	V+
2	BLACK	GND
3	YELLOW	TX
4	WHITE	RX
5	BLUE(GREEN)	TEMP

Table 2. Probe(S1G) Connection

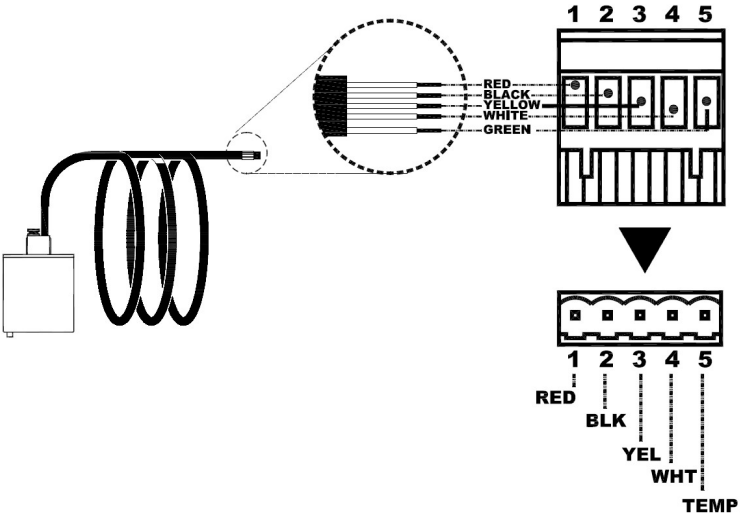

Fig.23 Probe(S1G) Connection

4. POWER, WIRING AND CONNECTIONS

4.3 USER CONNECTIONS

4.3.2 SERIAL COMMUNICATION

Serial communication (RS232/485) users may connect the serial wires to a 5-position PHOENIX connector and put it into the PCB board. The 5-position connector is composed of serial communication and analog output connections. The Fig.24 illustrates the serial communication part.

PIN NO.	PIN NAME
6	TX
7	RX
8	SHLD

Table 3. Serial Communication Connection

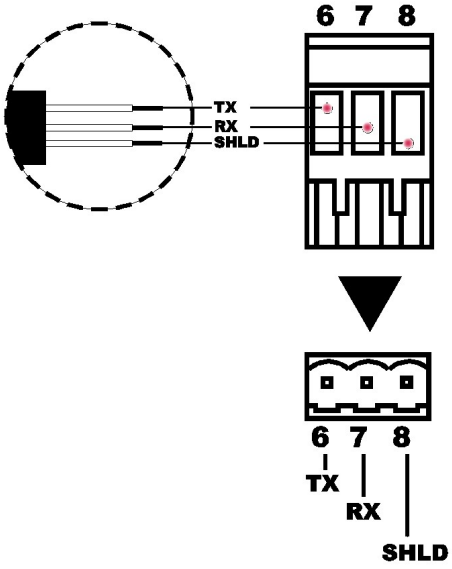

Fig.24 Serial Communication Connection

4. POWER, WIRING AND CONNECTIONS

4 to 20mA current output users may connect the wires to a 5-position PHOENIX type connector and put it into the PCB Board (see Fig.25).

4.3 USER CONNECTIONS

PIN NO.	PIN NAME
9	+
10	-

Table 4. Current Output Connection

4.3.3 ANALOG OUTPUT

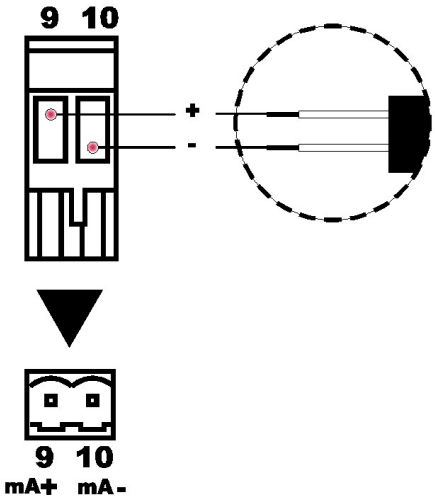

Fig.25 Analog Output Connection

4. POWER, WIRING AND CONNECTIONS

Relay users may connect the wires to a 9-position PHOENIX type connector and put it into the PCB board (see Fig.26).

Relay Rating: 250V AC, 5A

4.3 USER CONNECTIONS

4.3.4 RELAY OUTPUT

PIN NO.	PIN NAME	FUNCTION
11	1-NO	HIGH ON
12	1-COMMON	COMMON
13	1-NC	HIGH STOP
14	2-NO	LOW ON
15	2-COMMON	COMMON
16	2-NC	LOW STOP
17	3-NO	ERROR ON
18	3-COMMON	COMMON
19	3-NC	ERROR STOP

Table 5. Relay Output Connection

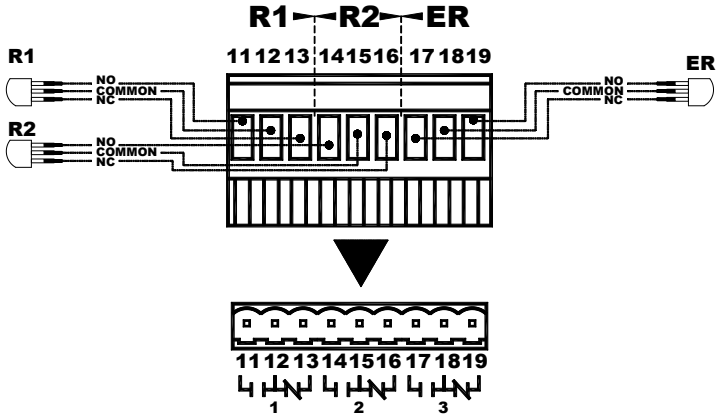

Fig. 26 Relay Output Connection

4. POWER, WIRING AND CONNECTIONS

The cleaning device is activated using the controller's power source. Connection is made using a 2-position PHOENIX connector (see Fig.27). Use AC power.

4.3 USER CONNECTIONS

4.3.5 CLEANING DEVICE

PIN NO.	PIN COLOR	FUNCTION
20	RED	Line
21	BLK	Neutral

Table 6. Cleaning device Connection

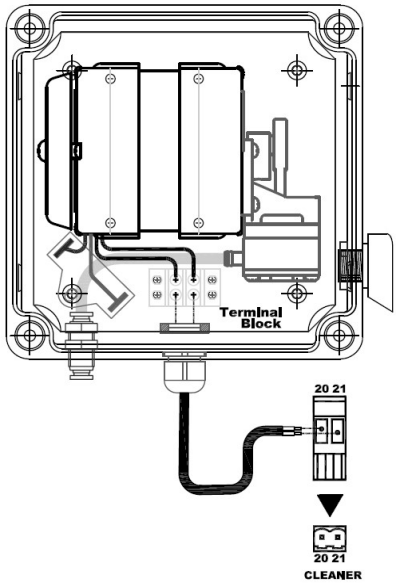

Fig.27 Cleaning Device Connection

4. POWER, WIRING AND CONNECTIONS

An external power source (100 to 240V, 50 to 60Hz) activates the ENV120. Connection is made using a 3-position PHOENIX connector (see Fig.28).

4.3 USER CONNECTIONS

4.3.6. POWER CONNECTION

PIN NO.	PIN NAME	FUNCTION(AC)	FUNCTION(DC)
22	L	Line	DC +
23	N	Neutral	DC -
24	FG	Ground	X

Table 7. Power Connection

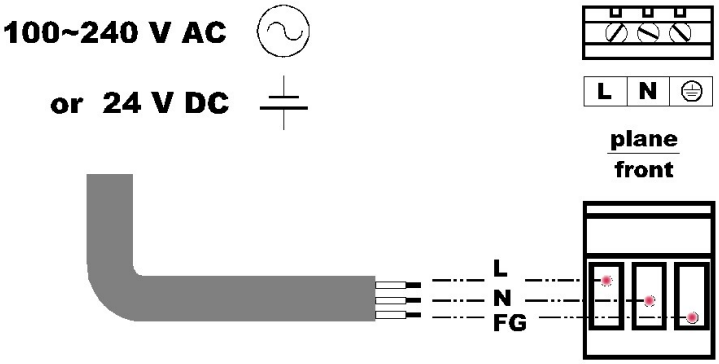

Fig.28 Power Connection

CAUTION

When using a DC power source, ensure that the positive wire connects to No.22 and negative one to No.23.

5. SCREENS

ENV120 features four types of visual screens: NUMERIC SCREEN, ECHO SCREEN, PARAMETER SCREEN, and DATA TREND SCREEN. When power is supplied, “Start…” prompts on the LCD before entering the Numeric Screen mode (see Fig.29).

Fig. 29 Start-up Screen

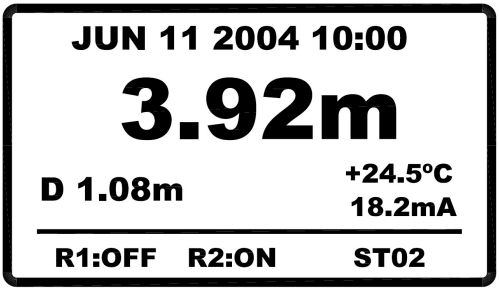

Fig. 30 Numeric Screen

The Numeric Screen (refer to 5.1) displays some fundamental information, including present time, sludge level, distance, temperature, and mA.

To reference the present echo status (depth, size, time), press the **<** , **>** key to access the Echo Screen(refer to 5.2).

ENV120 also offers a built-in flash memory utilizing 10,000-point data logging function for trend analysis. Data Trend Screen gives easy interpretation of approximate data in field with saved data (refer to 5.4). To access the Data Trend Screen, press the **SET** key for 3 seconds from the other 3 screens.

To return to numeric, echo, and parameter screen, press the **EXIT** key (see Fig.30).

5. SCREENS

The present measurement values appear when the power is supplied (see Fig.31).

5.1 NUMERIC SCREEN

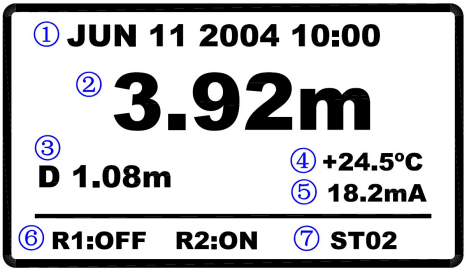

Fig.31 Numeric Screen information

Numeric Screen Values

① **Present time** for real time data logging(mm/dd/yy h:m)
② **Sludge Level** see Fig. 32
③ **Sludge Distance** see Fig. 32
④ **Temperature** for level compensation
⑤ **Analog Output** for mA information
⑥ **Relay Status** for relay on/off status
⑦ **Measurement** for the current measurement status

- ST00 : No reception signal
- ST01 : Signal exist but no good
- ST02 : Measurement in normal
- ER01 : No signal reception
- ER02 : Thermistor failure

These values can be used to measure the “Empty”
(Empty = Sludge Level + Distance)

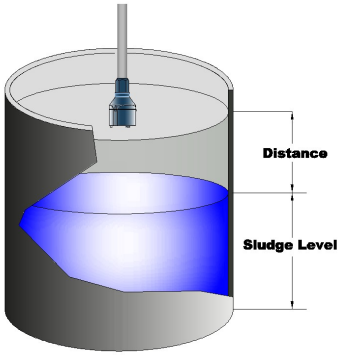

Fig.32 Sludge Level & Distance

5. SCREENS

5.2 ECHO SCREEN

The numeric screen mode described in 5.1 does not, however, provide form and size of reflected echo. The Echo screen offers this information to confirm the credibility of the values and to heighten measurement accuracy by inputting corrected value in field.

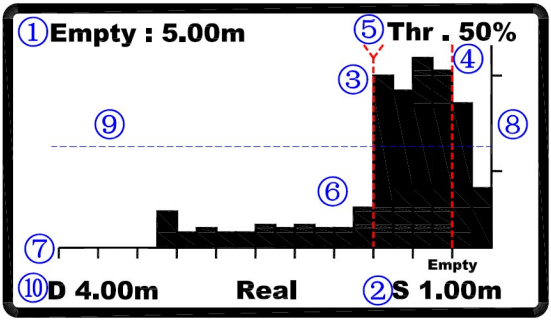

Fig.33 Echo screen

This echo screen shows many values which help field operators.

① Empty value: distance from the sensor surface to tank bottom
② Sludge level: the current sludge level
③ Measuring position: the current measurement position
④ Empty: the tank bottom position
⑤ Threshold voltage: the set threshold value
⑥ Profile: the shape of echo profile
⑦ X axis: composed of 11 sections. The first 10 sections are equal to Empty(④). 1 section = 1/10 of empty value
⑧ Y axis: voltage value of signal reception (max.2.4V)
⑨ Threshold voltage: the current threshold voltage level
⑩ D(Distance): the value from the sensor to sludge level

Some products adjust the threshold value to correct signal recognition by entering into their menu options. However, ENV120 enables this threshold voltage adjustment directly on its echo screen mode through VTA (Visual Threshold Adjustment) (see Fig.34).

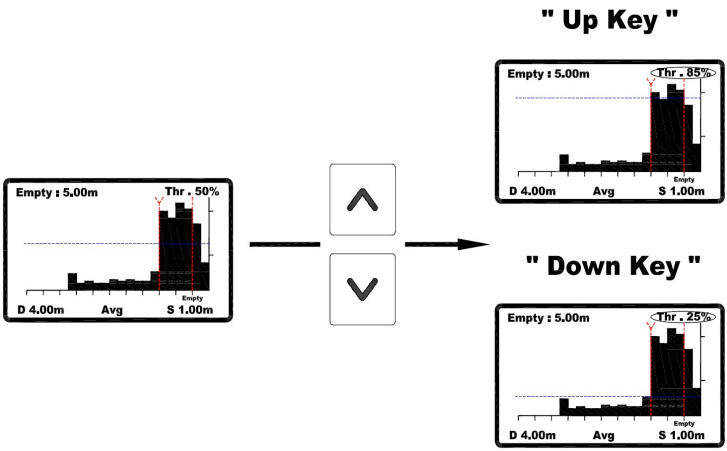

Fig.34 VTA adjustment

Pressing the ∧ or ∨ key under the Echo screen initiates VTA. When a dotted line with arrow appears, the value can be changed using the ∧ and ∨ keys. One press of each key is equivalent to **±5%**.

After set-up, press the **SET** key for one second to save the set value. The dotted line with an arrow disappears and the system reverts back to the Echo screen mode automatically.

5. SCREENS

5.3 PARAMETER SCREEN

The parameter screen displays some important parameters to check brief field condition. The parameters of this screen are Empty, Dead Zone, 4/20mA, Echo Amp, ASF, Offset, Test Mode, and Density. Table 8 explains parameters and its functions.

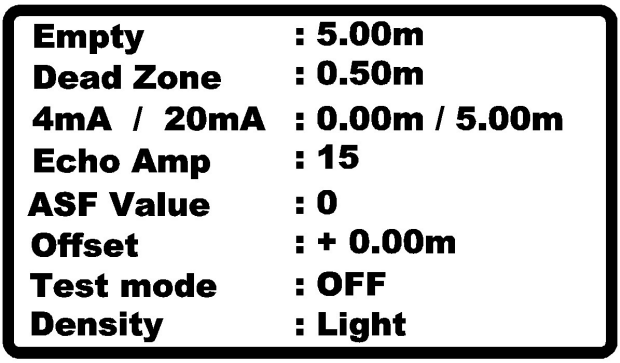

Fig.35 Parameter Screen

Parameter	Function
Empty	The distance from sensor surface to tank bottom
Dead Zone	Sensor blanking distance
4mA / 20mA	Analog output
Echo Amp	Signal reception strength
ASF	Abnormal signal filter
Offset	Minor measurement trim
Test Mode	Test mode on/off
Density	Light or heavy layer measurement

Table 8. Parameter's function

5.4
DATA TREND
SCREEN

ENV120 offers data trend screen mode to complement its 10,000-point data logging function. Under this mode, the user can check the data trend (time/blanket level) and residual memory points through a graph (see Fig.36)

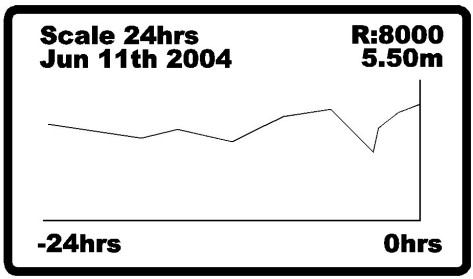

Fig.36 Data Trend Screen

The value of graph is sludge blanket level and selected data logging time scale. The table 9 below shows data logging interval and selectable time scale.

Data Logging Interval	Selectable Time Scale
1 min	12 hrs
	24 hrs
10 min	24 hrs
	7 days
60 min	14 days
	30 days

Table 9. Data Logging Intervals vs. Time Scale

Screen Values

Present Time: Jun 11th 2004
Time scale 12/24 hrs, 7/14/30 days
Trend Graph
Residual memory points: R: 8000

This mode enables the field operator to monitor and check process changes on the spot.

5. SCREENS

5.5 SCREENS SWITCHING

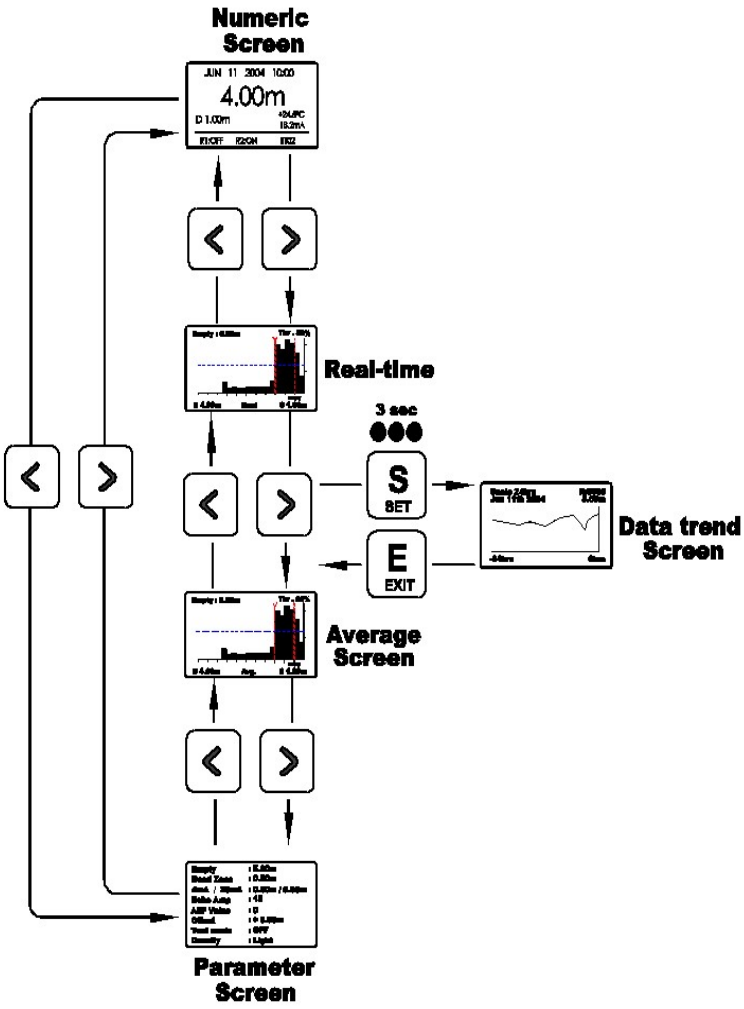

Fig.37 Screen Switching Key Operation

- **(>), (<)** : Switch between four screens
- **E(EXIT)** : Return to previous screen(On the Data trend screen)
- **S(SET)** : Switch to Data trend screen(continued for more than 3 seconds)

6. MENU SYSTEM

The following section describes menu system navigation and parameter selections.

6.1 BASIC KEY OPERATION

The front panel of ENV120 contains 7 membrane keys and a graphic LCD display. These keys are used to navigate through the menu system, allowing the user to operate ENV120 with ease (see Fig.38).

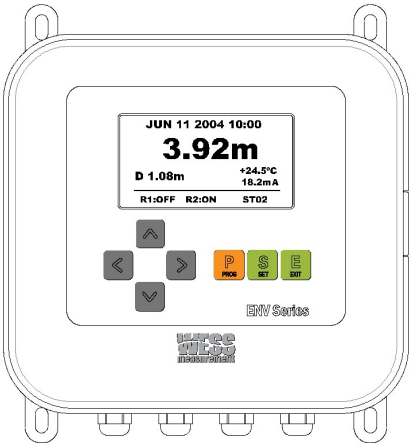

Fig.38 Front Panel

Keys and Functions

PROG	used to access the program mode
SET	used to open menu items and save settings
EXIT	used to return to the previous menu level and/or back out of the program mode
< , >	used to switchover among Numeric, Echo, and Parameter Screen
∧	used to scroll through menu options and/or to increase the numerical value of a menu option parameters
∨	used to scroll through menu options and to decrease the numerical value of a menu option parameters

6. MENU SYSTEM

The program mode consists of five menu sections. The user can access the program mode by pressing the **PROG** key. (see Fig.39)

6.2 OVERVIEW OF MENU SYSTEM

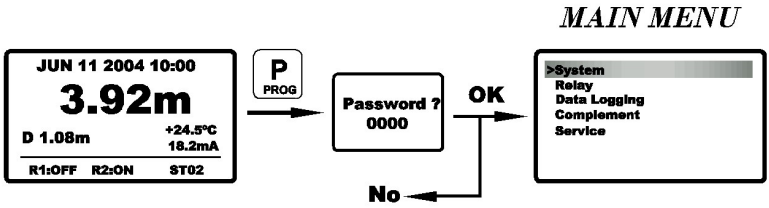

Fig.39 Main menu access

Main menu section consists of System, Relay, Complement, Data Logging, Complement, and Service menu section. (see Fig. 40)

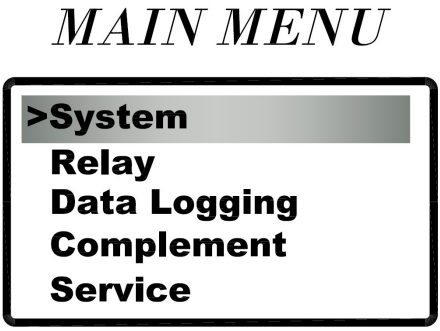

Fig.40 Main menu composition

6.
MENU SYSTEM

6.2 OVERVIEW OF MENU SYSTEM

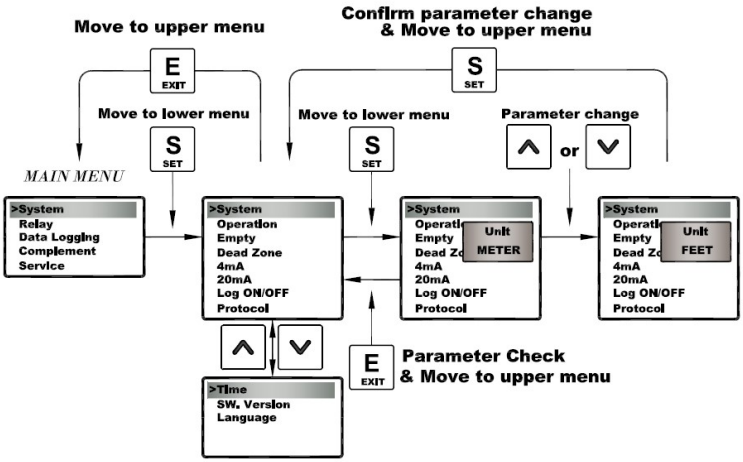

Fig.41 Submenu Access

Each menu setting is saved on a built-in non-volatile memory every time and return to operation mode. (see Fig.41)

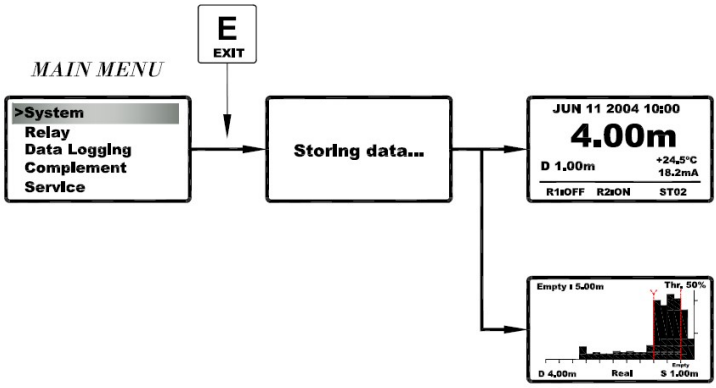

Fig.42 Return to Operation Mode

6.
MENU SYSTEM

General functions of the menu sections are:

6.2 OVERVIEW OF MENU SYSTEM

SYSTEM

Basic parameter settings

- Parameter unit and operation
- Tank depth of measurement site and Dead zone
- Relationship between level and current output
- Log on/off
- Firmware's version
- Language

RELAY

Relay parameter settings

- High, low relay parameter
- Error relay parameter(delay time/mA output)

DATA LOGGING

Data logging parameter settings

- Data download/delete
- Data interval/term parameter
- Data Trend Screen Setting period parameters

COMPLEMENT

Parameters settings for enhancing measurement

- Probe cleaning device operation(cleaning interval/term)
- Damping setting
- Threshold adjustment
- Light/heavy sludge layer selection

6. MENU SYSTEM

6.3 SYSTEM MENU OPTIONS

The system menu section, which contains operation and measurement output menu options, is essential for the operation of ENV120. Menu options of this section are System Unit, Operation, Empty, Dead Zone, 4mA, 20mA, Log on/off, Protocol, Time, SW. Version, and Language.

ENV120 uses a dropdown menu composition, which is shown in Fig.43.

Press the P(PROG) key to access the main menu section. The system menu options appear with 4 other menu sections. Press the S(SET) key to accesses the menu sections.

For each menu option setting, press the SET key and then adjust the value using the ∧ and ∨ keys. Once the parameter is set, press the SET key again to save and then to access the next menu option.

Press the E(EXIT) key to get back to the upper level menu section.

6.
MENU SYSTEM

6.3
SYSTEM
MENU OPTIONS

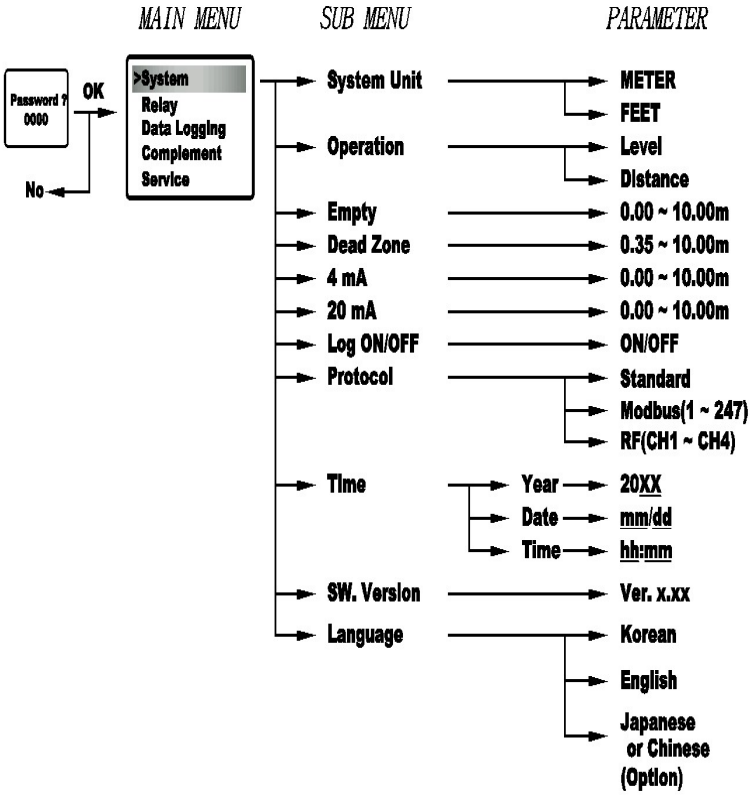

Fig.43 System Menu Overview

6.3
SYSTEM
MENU OPTIONS

Table 10 lists menu options and range of their set values.

MAIN	SUBMENU	FUNCTION	PARAMETER
System	System Unit	Operation Unit	Meter
			Feet
	Operation	Output and measurement value	Level
			Distance
	Empty	Distance between the probe's surface and container's bottom	0.00 ~ 10.00
	Dead Zone[1]	-	0.35 ~ 10.00m
	4mA	4mA output point	0.00 ~ 10.00m
	20mA	20mA output point	0.00 ~ 10.00m
	Log ON/OFF[2]	-	ON/OFF
	Protocol	Communication	Standard
			RF (CH1 ~ CH4)
	Time	Present time	Year(20XX)
			Date(mm/dd)
			Time(hh:mm)
	Sw. Version	Firm/software version	Ver. X.X
	Language	System Language	Korean, English, Chinese, Japanese

Table 10. System Menu Options

1. This option is useful where the big reflected signal coming from obstacles or suspended solid exists near the probe. Increase the value with reference to echo screen
2. This option determines whether or not to use data log function. When off is set, user cannot enter into data logging menu section.

6. MENU SYSTEM

6.4 RELAY MENU OPTIONS

This section is used when ENV120 operates with external actuators such as a pump, a motor, etc. When an alarm is required in field, user sets its parameter in this section. The key setting method is the same as 6.3.system menu section. The menu options of this section include R1 Act, R1 Stop, R2 Act, R2 Stop, Echo Delay, and Echo mA. The Fig.44 illustrates the composition of menu options and Table 11 lists menu options of the relay section.

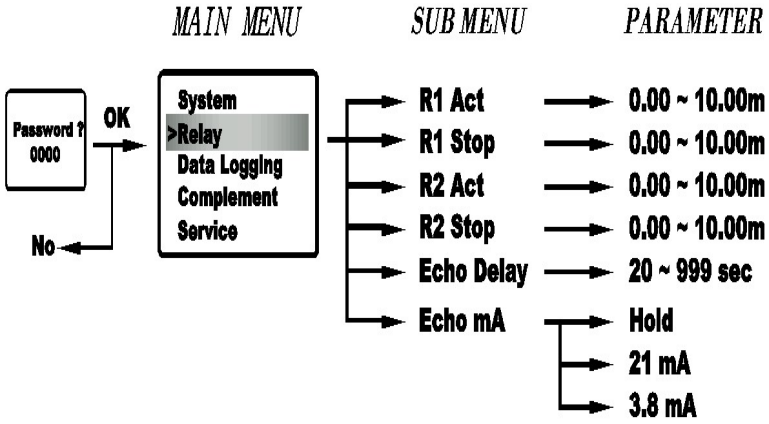

Fig.44 Relay Menu Overview

6.4
RELAY
MENU OPTIONS

MAIN	SUBMENU	FUNCTION	PARAMETER
Relay	R1 Act	High level alarm on(see Fig.40)	0.00 ~ 10.00m
	R1 Stop	High level alarm off((see Fig.40)	0.00 ~ 10.00m
	R2 Act	Low level alarm on (see Fig.40)	0.00 ~ 10.00m
	R2 Stop	Low level alarm off(see Fig.40)	0.00 ~ 10.00m
	Echo Delay[1]		20~999sec
	Echo mA[2]		Hold
			21mA
			3.8mA

Table 11 Relay Menu Options

1. This option determines the error delay time. When an error occurs, ENV120 sends out an error current. If the set value is 20 seconds, ENV120 outputs the error current after 20 seconds.
2. This option determines the type of error outputs. When Hold is chosen, ENV120 outputs the latest measured value. The user can also choose between 3.8mA and 21mA as the error output value.

6.4
RELAY
MENU OPTIONS

Fig.45 illustrates the example of relay setting and Fig.46 shows the operational status of R1 and R2.

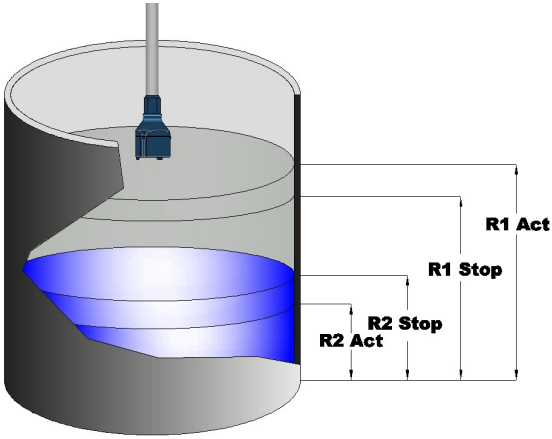

Fig.45 Relay Setting

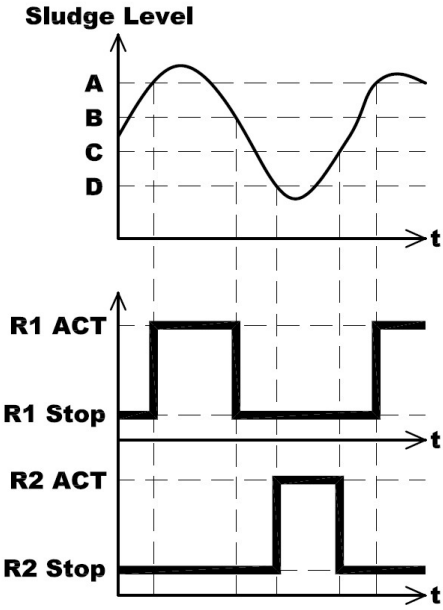

Fig.46 Operational Status

6. MENU SYSTEM

6.5 DATALOGGING MENU OPTIONS

This section is used for field data monitoring and analysis. Menu options of this section include Download, Delete, Data Interval, and Display Term. The Fig.47 illustrates the menu options and Table 12 lists menu options of this section.

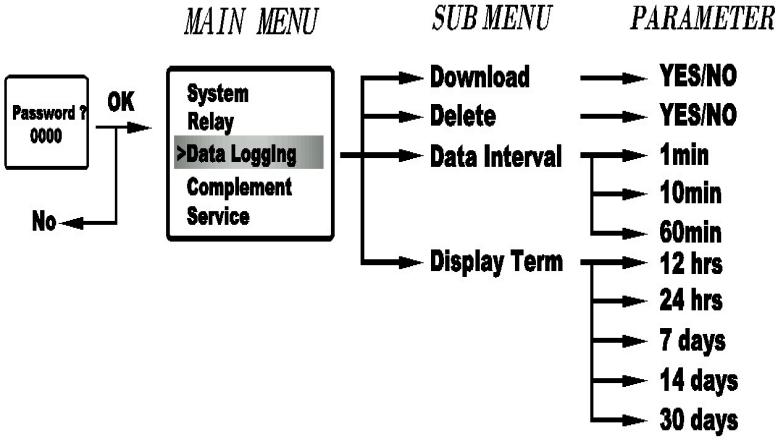

Fig.47 Data Logging Menu Overview

6.5
DATALOGGING
MENU OPTIONS

MAIN	SUBMENU	FUNCTION	PARAMETER	
Data Logging	Download	Download data	Yes/No	
	Delete	Delete data	Yes/No	
	Data Interval[1]	-	1/10/60min	
	Display Term[2]	-	1min	12/24hrs
			10min	24hrs/7days
			60min	14/30days

Table 12 Logging Menu Options

1. This option determines the data logging interval. After setting the desired value, ENV120 informs the maximum data saving period.
2. This option, which is linked with data interval parameter, determines the display term of data logging screen. The user can choose between 12 and 24 hour terms when 1 minute data interval is chosen.

CAUTION

Logged data is automatically deleted when the user changes data interval parameter. Download the logged data before changing the data interval parameter

6. MENU SYSTEM

6.6 COMPLEMENT MENU OPTIONS

This complement menu section is used for enhancing measurement credibility and precision. Menu options of this section include Clean Interval, Clean Term, Damping, Threshold, ASF ON/OFF, and Density. Fig.48 illustrates the menu option composition and Table 13 lists menu options of this section.

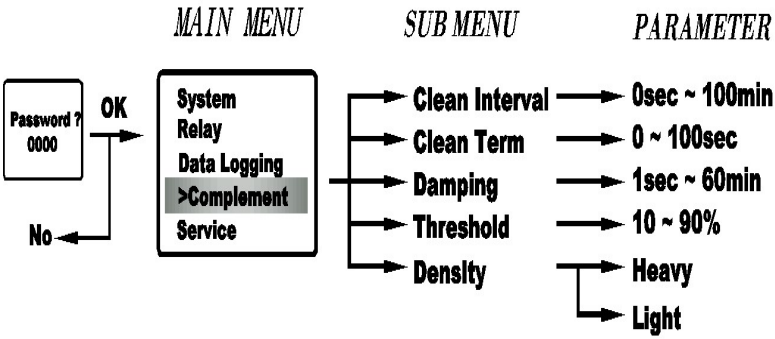

Fig.48 Complement Menu Overview

6.6
COMPLEMENT
MENU OPTIONS

MAIN	SUBMENU	FUNCTION	PARAMETER
Complement	Clean Interval	Operational interval of cleaning device	0 sec ~ 100 min
	Clean Term	Term(period) of cleaning each time	0 ~ 100 sec
	Damping[1]	Weighting ratio of measurement	1 sec ~ 60 min
	Threshold[2]	Voltage value of sludge blanket	10 ~ 90%
	Density[3]	Measuring Medium Selection	Light / Heavy

Table 13 Complement Menu Options

1. This option determines the ratio of adopting the previous measurement value in blanket level calculations. If the parameter increases, stable value outputs. A second is the real-time output value and a short time speed should be set in high-level locations.

2. This menu adjusts the threshold voltage ratio and automatically determines the value of the threshold voltage in real time by the threshold voltage ratio value set based on the size of the received signal.(Please contact the place of purchase for details.)

3. This option is used when applying to light sludge level measurement. The light density option drives different frequency to detect light sludge such as the sedimentation tanks at drinking water treatment plant

7. RS232/485

The data format of RS232/485 is the same as below.

Data Format

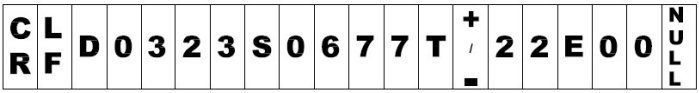

Fig. 49 Data Format

Data frame is composed of 20 bytes.

D: Distance S: Sludge Level T: Temperature E: Error code

The unit of distance and sludge level is in meter.

Ex) Meter: 0323 → 03.23 m

The unit of temperature is ºC or ºF. Although the logged data and numeric display show to 1 decimal place, RS232/485 data transmits no decimal place.

Ex) Measured temp. 22.4ºC → Transmit temp. 22ºC

Standard Measurement Unit: Meter and ºC

Baud Rate : 9600 bps
Data Bit : 8
Stop Bit : 1
Parity Bit : 0
Data Output : 1 sec

8. SYSTEM REPAIR AND RETURN

For spare parts or technical assistance, please contact your local WESS representative or contact WESS Service department.

8.1 CUSTOMER ASSISTANCE

WESS Service Department
E-mail : sales@wessglobal.com
Adress : B-8F, Ace high-tech city, 10 Baekseockgongdan 1-ro, Seobuk-gu, Cheonan, 31094, Korea

8.2 REPAIR AND RETURN POLICY

All systems or probes returned for repair or replacement must have freight prepaid and include the following information

1. A clearly written description of the malfunction
2. Name of person to contact and numbers can be reached

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