

최고품질의 신명서

Ultrasonic Flowmeter & Levelmeter

2200 Series



SECHANG INSTRUMENTS

CONTENTS

- 1. (Installation) 4
 - 1.1. 4
 - 1.2. 4

- 2. 5
 - 2.1. 5
 - 2.2. 5
 - 2.3. 6

- 3. 7
 - 3.1. 7

- 4. Door Lock 8
 - 4.1. Door 8

- 5. 9
 - 5.1. 9
 - 5.2. 10
 - 5.2.1. Programming Level 10
 - 5.2.2. Programming Flow 11
 - 5.2.3. Totalizer 18
 - 5.2.4. 4-20 Out 18
 - 5.2.5. Setpoints 19
 - 5.2.6. Sensor Cal..... 19
 - 5.2.7. Damping 19
 - 5.2.8. Lost Echo 20
 - 5.2.9. Flow Sim..... 20
 - 5.3. 21
 - 5.4. 22
 - 5.5. 22
 - 5.6. 23

		(FB2) 0-16 ft. (offset) (FB3) 0-50 ft. (offset 52ft.)
		DC 4-20mA(Max 1000), 5 relay : SPDT 0.25A @AC120V, 0.5A@DC24V. RS-232, RS-485(Modbus protocol)
		4 , 20 LCD
		PANEL 16 KEY
		80/240 VAC, 50/60HZ DC 9-32 V
		(FB2): ± 0.08% or ± 0.1% of target distance (FB3): ± 0.16% or ± 0.2% of target distance
		(FB2) : 9m . (300m) / -30 70 50kHz / Tefzel™ Body, Teflon™ cap Mounting Bracket. (FB3) : 30m . (90m) / -40 90 30kHz / PVC Body Mounting Bracket.
		IP66/NEMA 4X, / -20 80
		NEMA 4X + , / -40 80

1 inch = 2.54 cm = 25.4 mm
 1 feet = 0.3048m = 30.48 cm
 1 Gallon (US) = 3.785

1. (Installation)

1.1.

MODEL 2200

NEMA 4X

9.496"

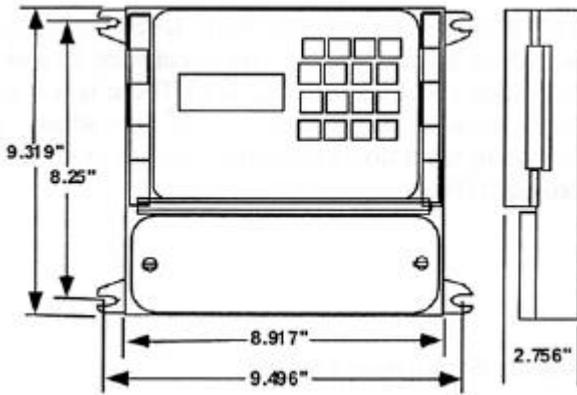
9.319"

2.756"

MODEL 2200

가 METER
 , METER

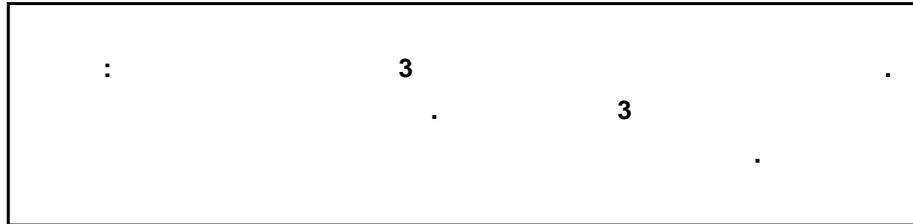
가



1.2.

1/4" 가

4

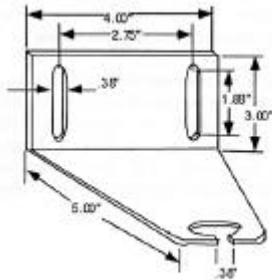


2

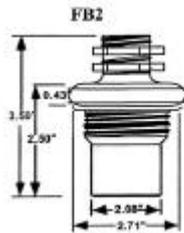
2.1.

MODEL 2200 SENSOR Tefzel™ . SENSOR
 1" 가 2 가 Bracket .

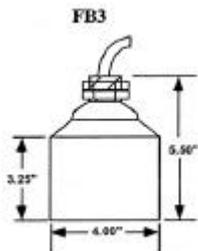
2.2.



FB2 SENSOR 16 ft . SENSOR
 1" 가 2 가 Bracket .
 2" NPT



FB3 . SENSOR 50 ft
 . SENSOR 1" 가 2 가
 Bracket .
 1" NPT



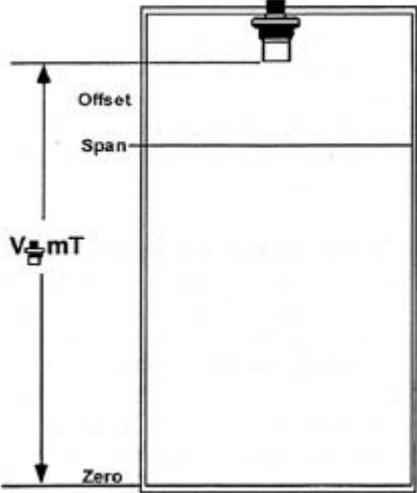
2.3.

가 가

(VmT)

(Throat)

(HmT)

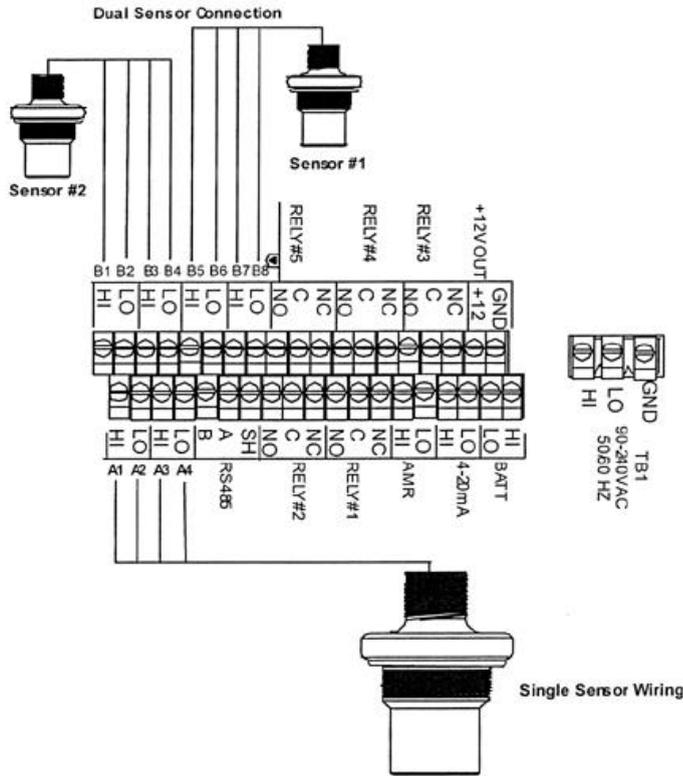


3.

3.1.

Model 2200

3



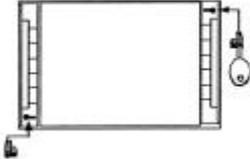
FB2 Single Sensor	
RED	A1
BLUE&SHIELD	A2
YELLOW	A3
GREEN&SHIELD	A4
FB3 Single Sensor	
RED	A1
BLUE&SHIELD	A2
YELLOW	A3
GREEN&SHIELD	A4

FB1 Single Sensor	
INNER CONDUCTOR	A1
INNER SHIELD	A2
OUTER SHIELD	A3

Dual Sensor Wiring			
Term	FB2	FB3	FB1
B1	Red	Red	Inner Conduct
B2	Blue/Shield	Black/Shield	Inner Shield
B3	Yellow	White	Outer Shield
B4	Green/Shield	Green/Shield	Not Used
B5	Red	Red	Inner Conduct
B6	Blue/Shield	Black/Shield	Inner Shield
B7	Yellow	White	Outer Shield
B8	Green/Shield	Green/Shield	Not Used

4. Door Lock

4.1. Door



Model 2200

가 가 가

5.

5.1.

MODEL 2200

"MENU"

"MENU"

가

>1)Review Meter	Meter (Max level, Offset, VmT, Totalizer, Logger)	
>2)Program	1) Level	offset
	2) Flow	
	3) Totalizer	
	4) 4-20 Out	4-20mA ZERO, SPAN
	5) Setpoints	/ On/Off
	6) Sensor Cal	
	7) Damping	
	8) Lost Echo	
	9) Flow Sim.	
	F21) Integrator	
	F22) Pump Alternation	Relays
	F23) Relays	Relay (setpoints, lost signal,)
>3)Status	1) Sensor	
	2) Level	
	3) Alarms/Relays	Relay
	4) Logger	, , ,
	5) History	
	6) Daily Sum	, , ,
>4)Data logger	1) Set Time/date	
	2) Storage Rate	(1, 5, 10, 15, 30, 60)
	3) Secondary	(#1,2,3) (1, 5, 10, 15, 30, 60)
	4) Log channels	8
	5) Clear data	("5")

>5)System Setup	1) Language	
	2) Display	
	3) Communications	(RS232, RS-485)
	4) Display lines	(8)
	5) Sensor Used	
	6) Options	가 Relay Isolated 485
	7) Totals Reset	
	8) New Password	
	9) Summary Reset	
	F21)Meter Reset	
	F22)New Firmware	
	>6)Calibration	1) Flow Simulation
2) 4-20 Adjustment		4-20mA ZERO, SPAN
3) Sensor Cal.		

5.2.

5.2.1. Programming Level

```
Flw1 00 GPM
1T GAL
Lv1 00 In
Alm Sig 4-20
```

(MENU)

"2"

() "MENU"

가

```
Level Units
1) Inches
2) Feet
3) Millimeters
4) Centimeters
5) Meters
```

"1"

```
Sensor #1
Units - *****
Max Level ____
Offset ____
```

"Enter"

DC 4-20 mA

/

5.2.2. Programming Flow

```
Flw1 00 GPM
1T   GAL
Lv1  00 In
Alm Sig 4-20
```

(MENU)

"2"

() "MENU"
가

```
Level Units
1) Inches
2) Feet
3) Millimeters
4) Centimeters
5) Meters
```

"2"

가

(Flumes,

Weirs, Nozzles, Manning , H/Q 32Points)

1)GPM, gallons/minute	6)CFD, cubic/day	F22)MS3, cubic meters/second
2)GPD, gallons/day	7)LPS, liters/second	F23)M3H, cubic meters/hour
3)MGD, million gallons/day	8)LPM, liters/minute	F24)M3D, cubic meters/ day
4)CFS, cubic foot/second	9)LPD, liters/day	F25)IGM, imperial gallons/ day
5)CFM, cubic foot/minute	F21)MLD, million liters/ day	F26)BPH, barrels/ hour

>1)Flumes	1)Parshall	1)2inch, 2)3inch, 3)6inch, 4)9inch, 5)12inch, 6)18inch, 7)24inch, 8)36inch, 9)48inch
	2)Manhole	1)4inch, 2)6inch, 3)8inch, 4)10inch, 5)12inch
	3)Palmer Bowlus	1)6inch, 2)8inch, 3)10inch, 4)12inch, 5)15inch, 6)18inch, 7)21inch, 8)24inch
	4)Trapezoidal	1)Large V60 ° , Plasti-Fab HQ curves are used
	5)H Flume	1)H 4.5ft, 2)HL 4.0ft, Plasi-Fab HQ curves are used
	6)Lagco	1)6inch, 2)8inch, 3)10inch, 4)12inch, 5)15inch, 6)18inch, 7)21inch, 8)24inch

SECHANG INSTRUMENTS

>2)Weirs	1)V-Notch	1)11.25 ° , 2)22.5 ° , 3)30 ° , 4)45 ° , 5)60 ° , 6)90 °
	2)Contracted	1)12inch, 2)18inch, 3)24inch, 4)30inch, 5)36inch, 6)48inch, 7)60inch, 8)72inch, 9)96inch, F21)120inch
	3)Suppressed	1)12inch, 2)18inch, 3)24inch, 4)36inch, 5)48inch, 6)60inch
	4)Cipoletti	1)12inch, 2)18inch, 3)24inch, 4)36inch, 5)48inch, 6)60inch
	Weir 가 HQ (>5)Special)	
>3) Nozzles	1)Open Flow	1)6inch , 2)8inch, 3)10inch, 4)12inch, 5)14inch, 6)16inch, 7)18inch, 8)20inch, 9)24inch,
	2)Kennison	1)8inch, 2)10inch, 3)12inch
>4) Manning	Manning 1) % 2) (concrete =0.013) 3)	
>5)Special	가 H/Q (H: ,Q: 1)Q=KH^PWR : K PWR 가 "Enter" 2)Data Input : 32 point 10 point	

```

Flow Primary Element
Max Flow   ***.**
VmT =     **.**
HmT =     **.**
    
```

), HmT(() VmT()가
"Enter"

```

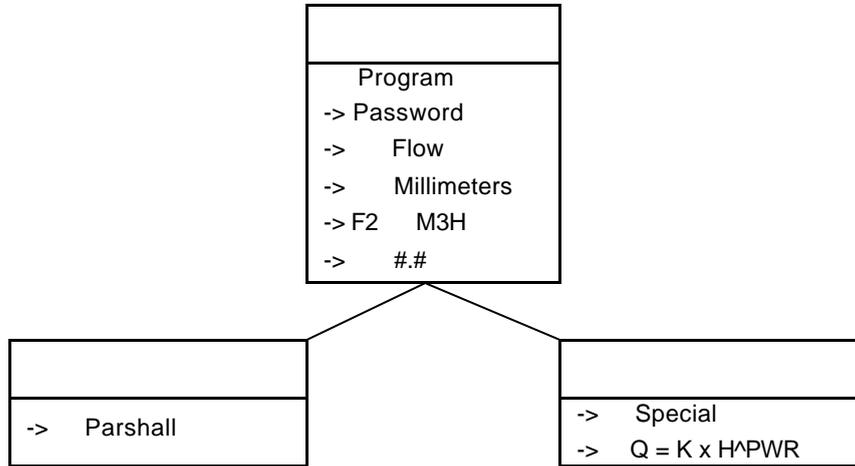
Element Application
Max Flow and VmT
Max Flow   **.**
VmT =     **.**
    
```

VmT "MENU"
"ENTER" "ENTER"

```

Press ENTER to
store Any changes.
Press any other key
To not store changes.
    
```

Parshall Fume



가

(Badger 2100

$$Q() = K() \text{ times } H()^{PWR()}$$

2200

3

-> 3 inch

Flow Primary Element Max Flow 193.0 V Mt . = 767 H Mt . = 304
--

==>

193 m3h 가

V Mt

H Mt

V-cal

Function $Q=K \times H^{PWR}$
 Units - M3H
 K = 0.021
 Power = 1.547

==>

3

	K	PWR	H
1	0.007	1.550	()
2	0.014	1.550	
3	0.021	1.547	
6	0.040	1.58	
9	0.068	1.53	
12	0.091	1.522	
18	0.131	1.538	
24	0.170	1.55	
36	0.244	1.566	
48	0.317	1.578	

Function $Q=K \times H^{PWR}$
 Flow Capacity - M3H
 Max H = 609
 Max Q = 297

==>

Q 3

Flow Primary Element
 Max Flow 297.0
 V Mt . = 914
 H Mt . = 304

==>

Enter

Enter Application
 Max Flow and V Mt
 Flow = 297.0 M3H
 V Mt . = 914

==>

V-cal
 가 , Reset

Menu

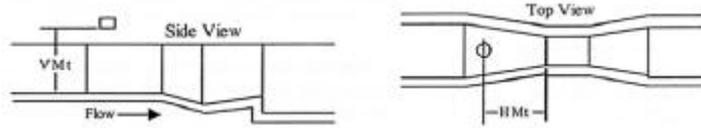
Enter

Press ENTER to store
 any changes.
 Press any other key
 to not store changes

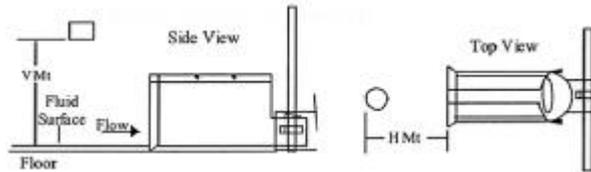
==>

ENTER

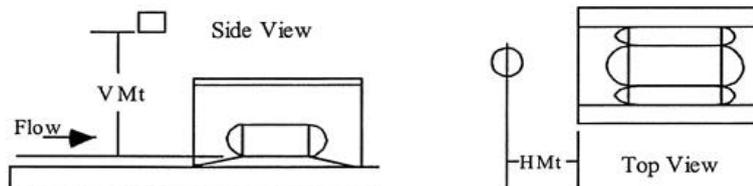
PARSHALL FLUMES								
Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"	Size "	H Mt"	V Mt"
2	11.00	21.46	9	22.50	38.01	24	39.25	43.47
3	12.00	30.21	12	35.25	42.70	36	43.25	43.98
6	16.00	30.29	18	37.25	43.70	48	47.00	44.75



MANHOLE FLUMES					
Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"
4	5.75	17.86	10	11.75	27.58
6	7.75	20.94	12	13.75	29.99
8	9.75	24.32			

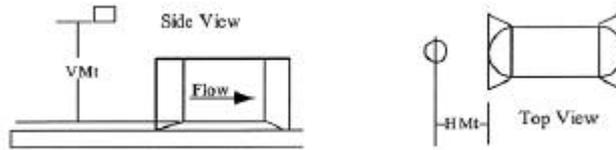


PALMER BOWLUS FLUMES								
Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"	Size "	H Mt"	V Mt"
6	3.00	17.16	12	6.00	22.15	21	10.50	29.85
8	4.00	18.77	15	7.50	24.96	24	12.00	32.77
10	5.00	20.46	18	9.00	27.13			



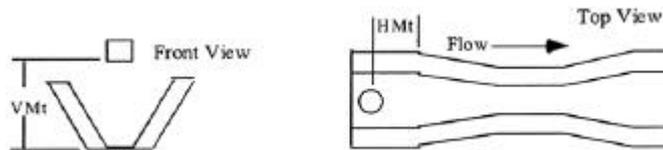
LAGCO FLUMES

Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"	Size "	H Mt"	V Mt"
6	3.00	17.16	12	6.00	22.15	21	10.50	29.85
8	4.00	18.77	15	7.50	24.96	24	12.00	32.77
10	5.00	20.46	18	9.00	27.13			



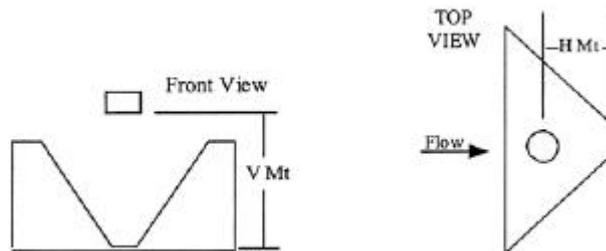
TRAPEZOIDAL FLUMES

Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"	Size "	H Mt"	V Mt"
6	3.00	17.16	12	6.00	22.15	21	10.50	29.85
8	4.00	18.77	15	7.50	24.96	24	12.00	32.77
10	5.00	20.46	18	9.00	27.13			

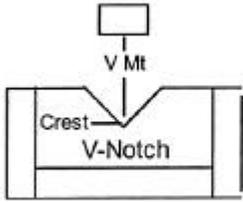
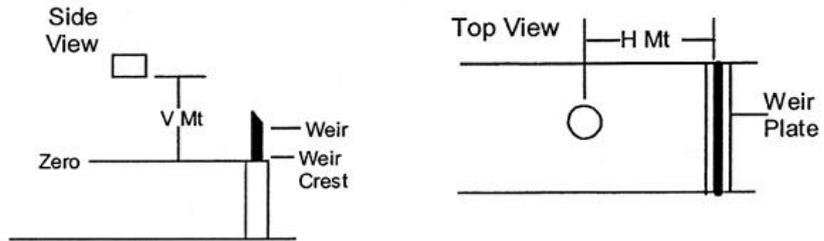


H FLUMES

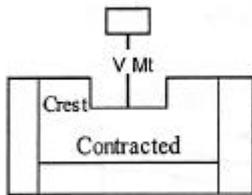
Flume Type	Size(Feet)	H Mt"	V Mt"
H	4.5	16.2	65.52
HL	4.0	12.00	60.00



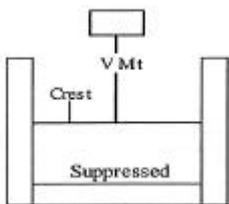
WEIRS



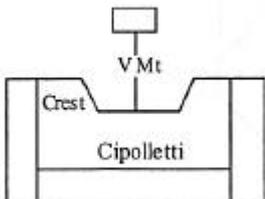
V-Notch Weirs					
Size	H Mt	V Mt	Size	H Mt	V Mt"
11.25 °	45.10	36.00	45 °	45.10	36.00
22.5 °	45.10	36.00	60 °	45.10	36.00
30 °	45.10	36.00	90 °	45.10	36.00



Contracted Weirs								
Size	H Mt	V Mt	Size	H Mt	V Mt	Size	H Mt	V Mt
12	12.0	18.0	36	54.0	30.0	84	124.0	54.0
18	17.0	21.0	48	72.0	36.0	96	144.0	60.0
24	36.0	24.0	60	90.0	42.0	120	180.0	72.0
30	45.0	27.0	72	108.0	48.0			



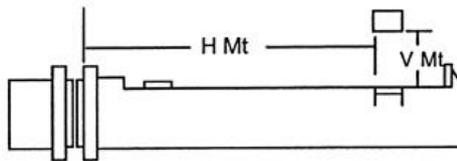
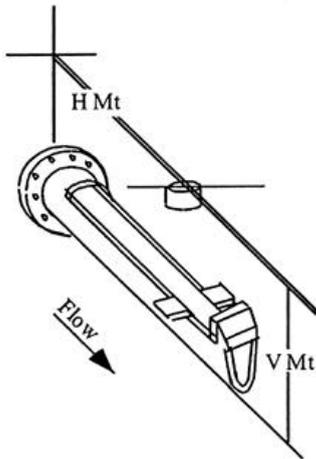
Suppressed Weirs								
Size	H Mt	V Mt	Size	H Mt	V Mt	Size	H Mt	V Mt
12	18.0	18.0	24	36.0	24.0	48	72.0	36.0
18	27.0	21.0	36	54.0	30.0	60	90.0	42.0



Cipolletti Weirs								
Size	H Mt	V Mt	Size	H Mt	V Mt	Size	H Mt	V Mt
12	18.0	18.0	24	36.0	24.0	48	72.0	36.0
18	27.0	21.0	36	54.0	30.0	60	90.0	42.0

OPEN FLOW NOZZLES

Size"	H Mt"	V Mt"	Size "	H Mt"	V Mt"	Size "	H Mt"	V Mt"
6	18.00	16.79	12	54.0	21.55	18	18.00	28.16
8	27.00	18.66	14	72.0	24.75	20	21.00	30.78
10	36.00	20.04	16	90.0	25.87	24	24.00	35.07



5.2.3. Totalizer

3) Totalizer

"3"

1)GAL, Gallons	5)BARR, Barrels
2)MET3, Cubic Meters	6)CUFT, Cubic Feet
3)LTRS, liters	7)ACFT, Acre feet
4)IGAL, Imperial Gallons	

5.2.4. 4-20 Out

4) 4-20 Out

4-20mA DC

“1” , “2”

>1) Up 2) Down

 >3) Coarse 4) Fine
 >5) 4mA 6) 20mA

1) 4-20 mA : “1”

“5” ZERO 4mA “3”
 , “4” “1” “2”

“6” 20mA “3”
 , “4” “1” “2”

2) 4-20 mA : “2”

4-20 mA “1” , “2”

5.2.5. Setpoints

5) Setpoints

3

LOW HIGH ALARM

“1” Setpoint #1, “2” Setpoint #2, “3” Setpoint #3
 가

“1” “2”

ON, OFF

5.2.6. Sensor Cal.

6) Sensor Cal.

“1” “3”

5.2.7. Damping



4-20 mA

1) None	5) 60 Seconds
2) 5 Seconds	6) 2 Minutes
3) 15 Seconds	7) 4 Minutes
4) 30 Seconds	7) 8 Minutes

5.2.8. Lost Echo



가

4-20mA

1) 5 Seconds	5) 2 Minutes
2) 15 Seconds	6) 4 Minutes
3) 30 Seconds	7) 8 Minutes
4) 60 Seconds	8) 16 Minutes

Lost Echo

4-20 mA

2)
3)
4)

5.2.9. Flow Sim.

9) Flow Sim.

가

>F21 Integrator

>F22 Pump Alt.

Set Point

1) None
2) Setpoint 1
3) Setpoint 1, 2
4) Setpoint 1, 2, 3

1) None	5) 1, 2, 3, 4
2) 1	6) 1, 2, 3, 4, 5
3) 1, 2	
4) 1, 2, 3	

>F23 Relays.

1) None	4) Setpoint #3	7) Over range 1
2) Setpoint #1	5) Lost signal	8) Over range 2
3) Setpoint #2	6) 4-20 Loop	9) Contact Integrator

5.3.

>3) STATUS

1) Sensor	
2) Level	Lvl : () Dist : (FLUID LEVEL)
3) Alarm/Relay	ALARM RELAY
4) Logger	/ / /
5) History	
6) Daily Sum	

5.4.

>4) Data Logger

1) Set Time/Date	
2) Storage Rate	(1, 5, 10, 15, 30, 60 가)
3) Secondary	(, Setpoint #1, #2, #3)
4) Log Channels	8 (, Level 1, Level 2, Flow 1, Flow 2, Total 1, Total 2, Setpoints, Sensor 1 Temp, Sensor 2 Temp, Lvl 1-Lvl 2
5) Clear Date	"5"

5.5.

>5) System Setup

1) Language	Spanish) .(English, German,
2) Display	(8) (On/Off/)
3) Communication	RS-232, RS-485 (, flow control, Slave I.Ds)
4) Display Lines	8 (Level1, Level2, Flow1, Flow2, Total1, Total2, Tot1&Tot2 Dif, Tot1&Tot2 Sum, Relays, Alarms, Signal1, Signal2, Lvl1-Lvl2, Flw1+Flw2, Distance1, Distance2, Date/Time, Blank Line)
5) Sensor Used	(FB1 60KHz : 2100 2200 , FB2 51KHz : white teflon, 1-16feet, FB3 30KHz : black plastic, 2-50feet
6) Options	Relay Isolated RS-485
7) Totals Reset.	."5"
8) New Password.	가
9) Summary Reset.	
F21) Meter Reset.	
F22) New firmware.	

5.6.

>6) Calibration

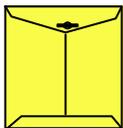
1) Flow Simulation	가
2) 4-20 Adjustment	<p>4-20mA DC</p> <p>“1” , “2”</p> <p>1) 4-20 mA : “1”</p> <p>“5” ZERO 4mA</p> <p>“3” , “4”</p> <p>“1” “2”</p> <p>“6” 20mA</p> <p>“3” , “4”</p> <p>“1” “2”</p> <p>2) 4-20 mA : “2”</p> <p>4-20 mA “1”</p> <p>“2”</p>
3) Sensor Cal.	<p>RS-232, RS-485</p> <p>(, flow control, Slave I.Ds)</p>

 Ultrasonic Flowmeter
2200

1 : 2001 10 22



.
.
. ,
:
.



Bader Meter Inc.



121-220

364-38

TEL : 332-7511 ()

FAX : 332-5912 ()



ID :

e-mail : sechang@sechang.com

Internet Website : <http://www.sechang.com>