OPERATING INSTRUCTIONS

MAGFLO™ MMFM
MAGNETIC FLOW METER

Introduction

Please read carefully! No liability can be accepted for damage caused by improper use or installation of the Flow Meter.

The MAGFLO™ Magnetic Flow Meter is ideal for most liquid process applications such as pulp and paper, agricultural, chemical, water, wastewater, oil and gas, and OEM applications. The units are offered in a wide variety of sizes and flow ranges. The MAGFLO™ is available in flanged and wafer style. Line sizes available range from 1/2 inch to 24 inches.

⚠ Safety Precautions

If you are unsure of the suitability of a MMFM Flow Meter for your installation, please consult your FLO-CORP representative for further information.

NOTE: REMOVE ALL PACKING INSERTS BEFORE OPERATING FLOW METER.

Authorized Personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorized by the plant operator. During work on and with the device the required personal protection equipment must always be worn.

Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards , e.g. vessel over fill or damage to system components through incorrect mounting or adjustment.

General Safety Instructions

The user must take note of the safety instructions in this operating instructions manual , the country specific installation standards as well as all prevailing safety regulations and accident prevention rules. The instrument must only be operated in a technically flawless and reliable condition . The operator is responsible for trouble-free operation of the instrument. During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.

Disclaimer

The information contained in this document is subject to change without notice. FLO-CORP makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

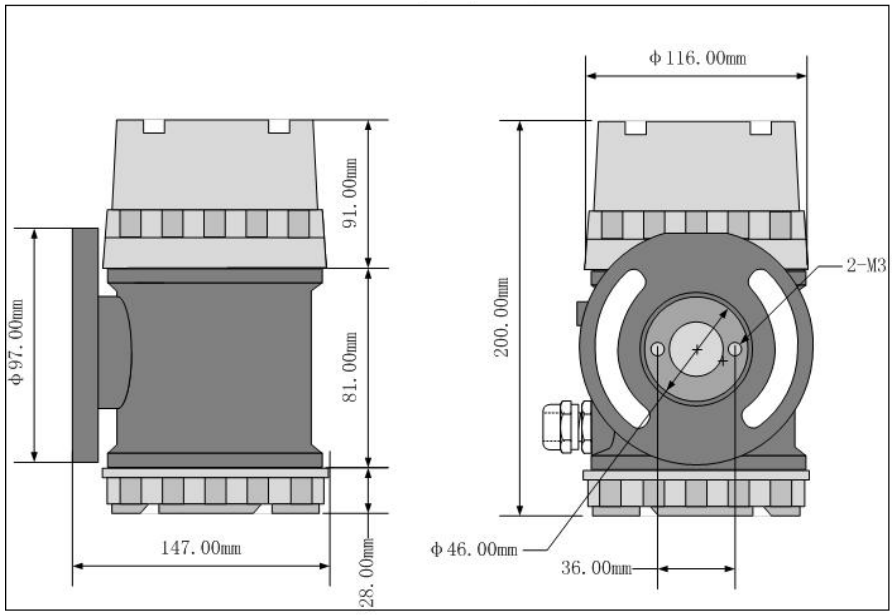
SPECIFICATIONS

Power Supply	• 110 - 240 VAC, 45~65 Hz (Single Phase AC) • 18 - 36 VDC • Battery
Power Consumption	Approx. 10W max. with sensors connected
Accuracy	± 0.5% accuracy of rate from .98 to 40 ft/s ± 1.0% accuracy of rate from .32 to .98 ft/s
Repeatability	0.2%
Minimum Fluid Conductivity	5.0 micromhos/0.39”
Flow Direction	Unidirectional or bidirectional, 2 separate totalizers (programmable)
Analog Outputs	4-20mA, 750ohms max load
Output Frequency	Scaled pulse output, (open collector) max 5Khz
Noise Damping	Programmable via HART or Push Buttons
Pulse Width	Programmable up to 500 ms via HART or Push Buttons

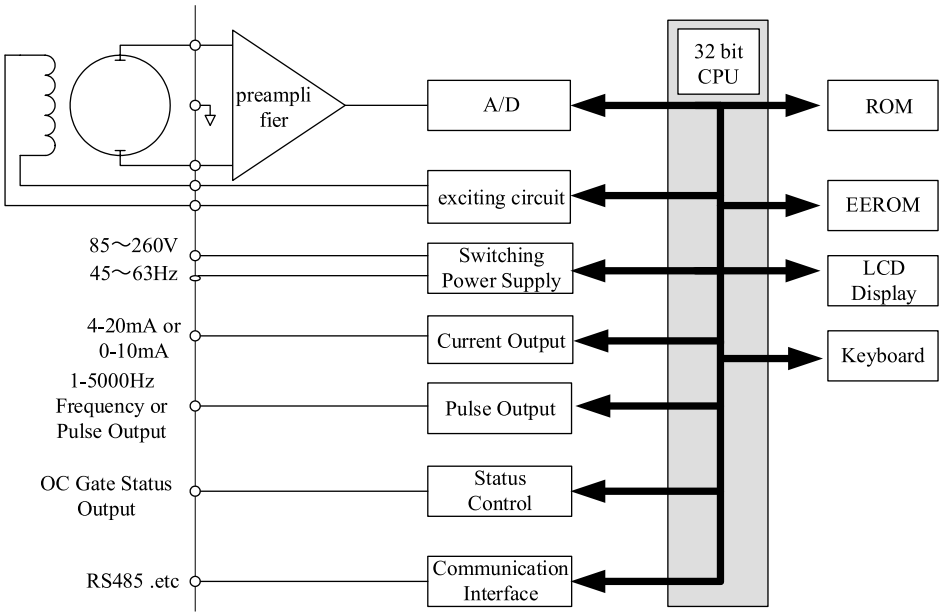
Zero-point Stability	Automatic correction or programmable
Ambient Temperature	Hard Rubber Liner: -20 to 140°F (-20 to 60°C) PTFE Liner: -20 to 248° (-20 to 120°C)
Electrode Materials	Standard: SS316L Optional: Titanium; Hastelloy Alloy C; Tantalum
Liner Material	PTFE, Hard Rubber, Other Liner Material Upon Request
Fluid Temperature	PTFE: 248° F standard (customized 356°F) Rubber: 140°F
Pressure Limits	Standard: 165 PSIG Optional: 580 PSIG
Coil Power	Pulsed DC
Pipe Spool Material	SS316 Flow Tube beneath liner
Meter Housing Material	Carbon Steel - Standard (ISO 7005-1) Polyurthane Coated Optional Stainless Steel Grounding Rings
Process Connections	Standard: ANSI 150 lbs RF Type Other sizes and pressure ratings on request
Grounding Rings or Electrode	Standard: SS316L Optional: Titanium; Hastelloy Alloy C; Tantalum

Specifications subject to change

DIMENSIONS



BASIC CIRCUIT OF CONVERTOR



The converter can supply current to the coil in the sensor of electronetic flowmeters. The head amplifier amplifies the electromotive force from the sensor and converts it into standard signals of current or frequency so that the signals can be used for displaying, controlling and processing.

Basic parameters and performance

There are two currents of 125mA in exciting loop, which make up of 250mA, and every 125mA is controlled by one 10Ω exact resistance. So user can choose different exciting current by changing the number of exact resistance.

The current will be 250mA when the signal converters leave factory, as such, if there are three 20Ω exact resistance or one 20Ω and one 10Ω exact resistance, the current will be 187.5 mA; if two 20Ω, 125mA.

Resistance of sensor exciting coil:
500mA exciting current: 20 ~ 30Ω
250mA exciting curren: 50 ~ 60Ω
187mA exciting current: 60 ~ 80Ω
125mA exciting current: 100 ~ 120Ω

Measure precision for assembly

Setting measurement range (m/s)

Diameter(mm)	Range(m/s)	Accuracy
3 ～ 20	≤0.3	±0.25%FS
	0.3～1	±1.0R
	1～15	±0.5%R
25 ～600	0.1～0.3	±0.25%FS
	0.3～1	±0.5%R
	1～15	±0.3%R
700～3000	≤0.3	±0.25%FS
	0.3～1	±1.0%R
	1～15	±0.5%R
%FS：for relative ranges； %R：for relative value of measurement		

Simulated current output
Load resistor: 0~1.5kΩ (0~10mA);
0~750Ω (4~20mA).
Basic Errors: 0.1%±10μA

Frequency output range: 1~5000Hz
Output electric isolate: Photoelectric isolate. Isolate voltage: > 1000VDC
Frequency output drive: output by field-effect transistors, the highest subjected voltage is 36VDC, maximum of output current is 250 mA.

Digital pulse output
Pulse output range: 0 ~100 pulse/s (When higher than upper limit, pulse will lose);
Pulse output value: 0.001~1.000 m3 / cp
0.001~1.000 Ltr / cp
Pulse output width: setting by user.
Pulse output isolate: photo electricity isolate. Isolate voltage: > 1000VDC
Pulse output drive: output by field-effect transistors, the highest subjected voltage is 36VDC, maximum of output current is 250 mA.

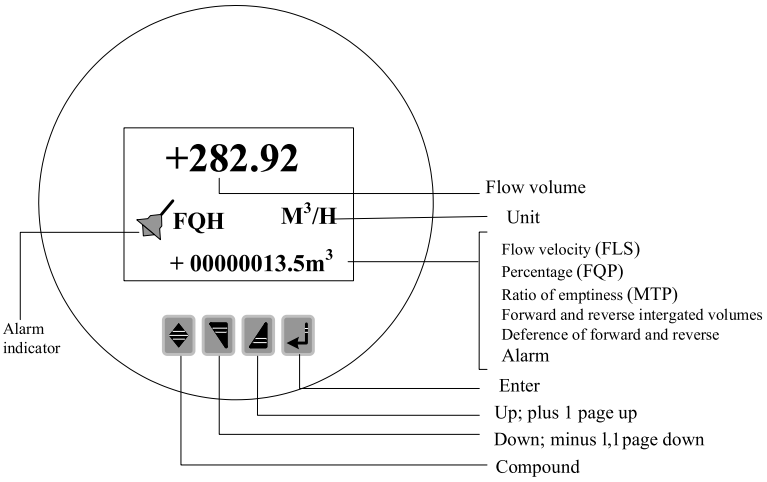
Alarm output
Alarm output junction: ALMH--- upper limit; ALML--- lower limit;
Output isolate: photo electricity isolate. Isolate voltage: > 1000VDC;
Alarm output drive: output by Darlington pipe, the highest subjected voltage is 36VDC, maximum of output current is 250 mA.

Digital communication port and protocol
MODBUS interface: format of RTU electric isolate 1000V
HART interface: designed by standard of HART, if you choose our hand held unit, you can display the measure value on line and setting the parameters.

Electric isolate
Insulated voltage between simulated input and simulated output should be higher than 500V;
Insulated voltage between simulated input and alarm power supply should be higher than 500V;
Insulated voltage between simulated input and AC power supply should be higher than 500V;
Insulated voltage between simulated output and AC power supply should be higher than 500V;
Insulated voltage between simulated output and earth should be higher than 500V;
Insulated voltage between pulse output and AC power supply should be higher than 500V;
Insulated voltage between pulse output and earth should be higher than 500V;
Insulated voltage between alarm output and AC power supply should be higher than 500V;
Insulated voltage between alarm output and earth should be higher than 500V;

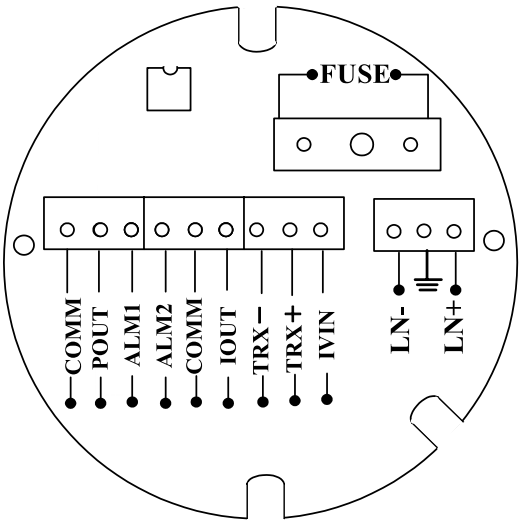
OPERATION CONVERTER

Keys and Displays



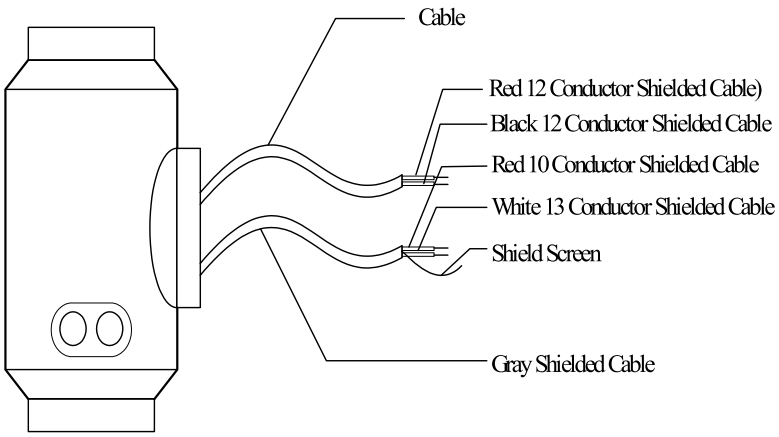
Note: When measuring, pushing down “Compound Key + Enter” will appear password of changing state, base on distinction of secrecy, and change the password as we provide. Then pushing “Compound Key + Enter” again, and you can inter the state of setting parameter. If want to return to the running state, push “Enter” for several seconds.

Connecters and Labels



POUT：	Frequency(Pulse) Output for Bi-directional Flow
ALM1：	Alarm Output for Upper Limit
ALM2：	Alarm Output for Low Limit
COMM：	Frequency, Pulse and Current Common (GND)
COMM：	Frequency, Pulse and Current Common (GND)
IOUT：	Current Output of Flux (Two Routes Out)
IVIN	Two Routes 24V Power Supply
TRX+	+Communication Signal Input
TRX-：	-Communication Signal Input
LN+：	220V Power Supply
LN-：	220V Power Supply

CHARACTERISTIC AND CONNECTION OF CABLE



Twisted-pair cable (for exciting current): 12 Conductors (Red)
12 Conductors (Black)
Gray shielded twisted-pair cable: 10 Conductors (Red) connected to “Signals 1”
13 Conductors (white) connected to “Signals 2”
Shielded Conductor connected to “Signal Ground”

Flux signal line

When separated models of converters are assembled with sensors for measuring flow of fluid which conductivity is larger than 50μS/cm, RVVPB2*0.12*280 mm 2 model cable (metal shielded signal cable covered with PVC) can be used as communication cable for flow signals. The length of signal cable should be less than 100 m. Signal cables have to be connected to sensors that were assembled by producers. Connections of signal cables are shown above.

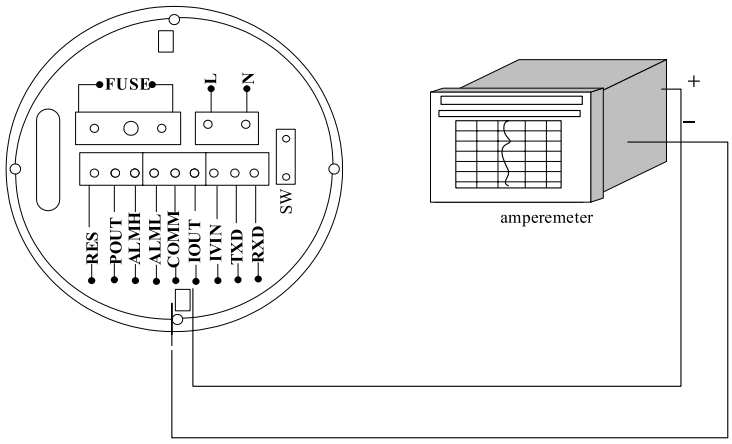
The converter can output equivalent level of shielded exciting signal voltage so that interference to flow measurement signals can be reduced by means of lowering the distributed capacitance of communication cable. When measured conductivity is less than 50μS/cm or signals are transferred in remote distances, double-conductor and double-shielded signal cable at equivalent levels of voltage can be used. For example, special STT3200 cable or BTS model signal cable (triple-shielded) can be used for signal communication.

Exciting Current Cable

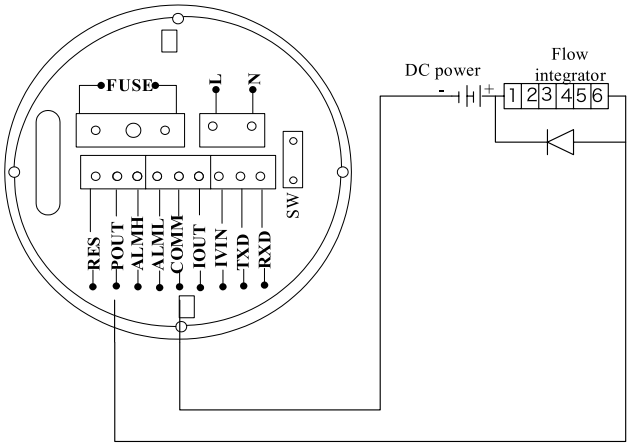
Two conductor and insulating rubber- covered cables can be used as exciting current cables. Length of exciting current cable should be equal to that of signal cable.

Output and Power line

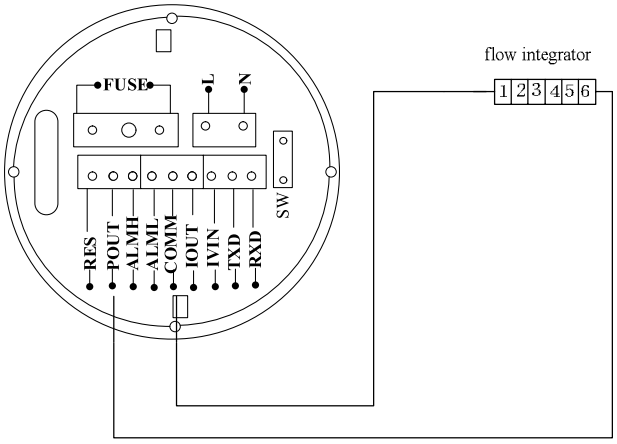
All cables for signals transferring and power supply have to be prepared by users. Choose the cables that meet the upper limit load of consuming current. Pulse current output, alarm current output and external power supply can be seen in the below figure.

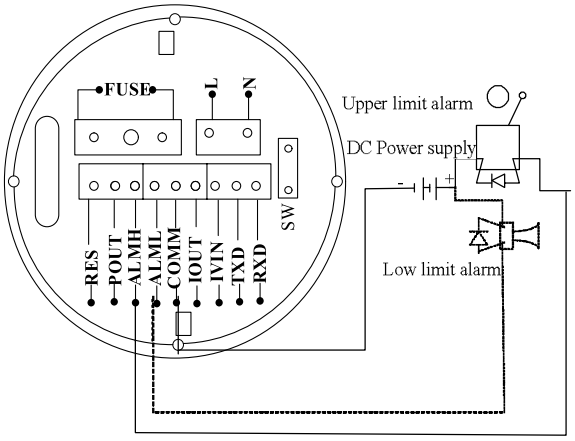


When inductive load is connected to converter, diode should be used as in the below figure.

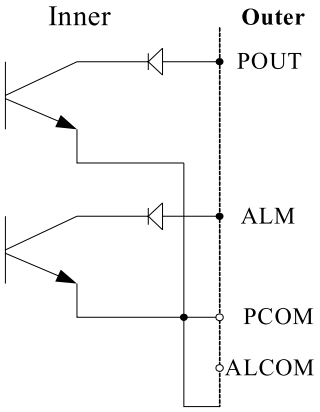


Connection of MagFlo Counter





Connection of Alarm Output



Connection of OC Gate

Grounding

Contact area of copper Connector PE on Converter Cabinet for grounding should be larger than 1.6mm^2. Contact resistance should be less than 10Ω.

Digital output and calculate

Digital output means frequency output and pulse output, and both of them use the same output point, so user can choose only one type of them but not both.

Frequency output

Frequency output range is 0~5000HZ, and corresponding the percent of flux.

$$F = \frac{\text{Measure Value}}{\text{Full Scale Value}} \bullet \text{Frequency Range}$$

The up limit of frequency output can be adjusted. It can be chosen from 0 ~ 5000HZ, and also can be chosen low frequency: such as 0 ~ 1000HZ or 0 ~ 5000HZ.

Frequency output mode general can be used in control application, because it responses the percent flux. Users can choose pulse output when the equipment is applied to count.

Pulse output mode

Pulse output mainly applies in count mode. A pulse output delegates a unit flux, such as 1L or,1M3etc. Pulse output unit divide into 0.001L--1L, 0.001M3--1 M3 ,0.001UKG--1UKG,0.001USG--1USG.When users choose the pulse unit, they should notice the match of the flux range of flowmeter and pulse unit. For volume flux, count formula as follows:

QL=0.0007854×D2×V (L/S)
Or QM=0.0007854×D2×V×10-3 (M3/S)

Note: D-nozzle (mm)
V-velocity of flow (m/s)

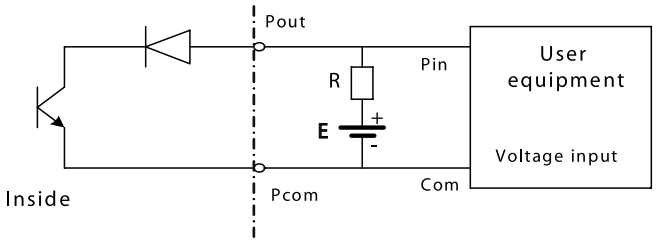
The oversize flux and too small pulse unit will be made the pulse output over the up limit. Generally, pulse output should be controlled below 3000P/S. However, the too small flux and too large pulse unit will be made the instrument exports a pulse long time. Otherwise, pulse output is different from frequency output. When pulse output
cumulates a pulse unit, it exports a pulse. Therefore, pulse output is not equality. Generally, measure pulse output should choose to count instrument, but not frequent instrument.

The connection of digital output

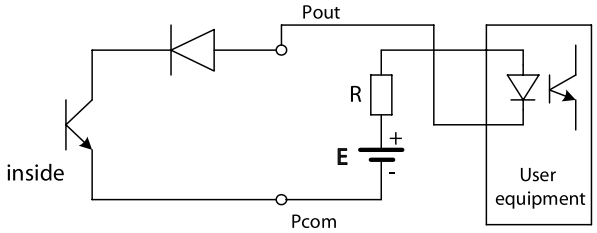
Digital output has tow connected points: digital output connected point, digital ground point, and symbol as follows:

POUT ----- digital output point;
PCOM ----- digital ground point;
POUT is collector plough output, user may refer to next circuit to connect.

The connection of digital voltage output

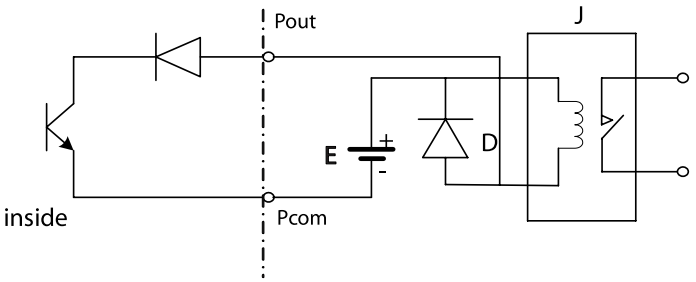


Digital output connect photoelectricity coupling (PLC etc.)



Commonly user's photoelectricity coupling current is about 10mA, so about E/R=10mA, E=5~24V.

Digital output connect relay



Commonly relay needs E as 12V or 24V. D is extend diode, most middle relays has this diode inside. If it does not have this diode the user can connect one outside.

Table of digital output parameter: POUT

Parameter	Test condition	Mini	Typical	Max	Unit
Volatge	IC=100 mA	3	24	36	V
Current	Vol≤1.4V	0	300	350	mA
Frequency	IC=100mA Vcc=24V	0	5000	7500	HZ
High voltage	IC=100mA	Vcc	Vcc	Vcc	V
Low voltage	IC=100mA	0.9	1.0	1.4	V

Simulation signal output and calculate

Simulation signal output

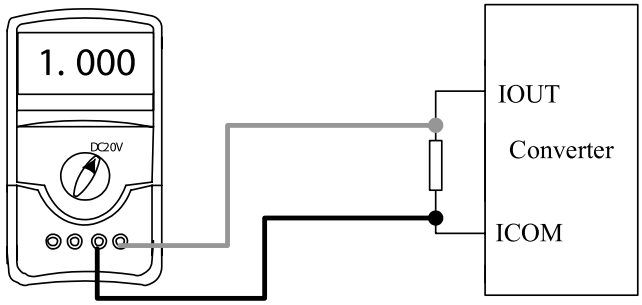
There are two signal system: 0~10mA and 4~20mA, user can select from parameter setting.
Simulation signal output inner is 24V under 0~20mA, it can drive 750Ω resistance. The percent flux of simulation signal output:

The current zero is 0 when 0~10mA, and the current zero is 4mA when 4~20mA.
It can be advanced simulation signal output distinguish. User can select the range of measure.

Simulation Signal Output Adjust

(1) The Converter adjust preparative

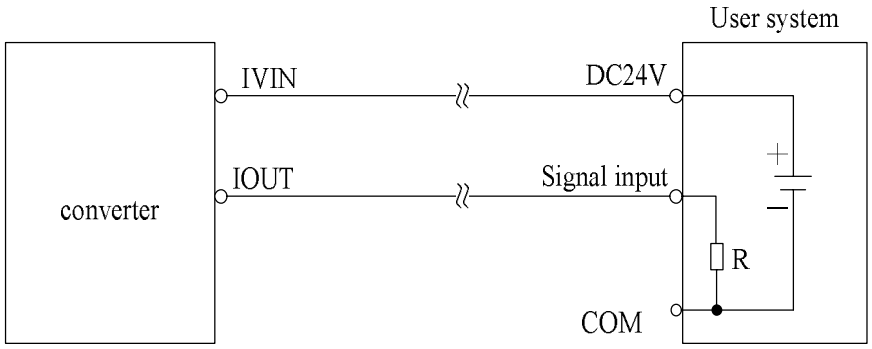
When the converter is running 15 minutes, the inner of converter becomes stabilized. Preparative 0.1% amperemeter or 250Ω, 0.1% voltage instrument.



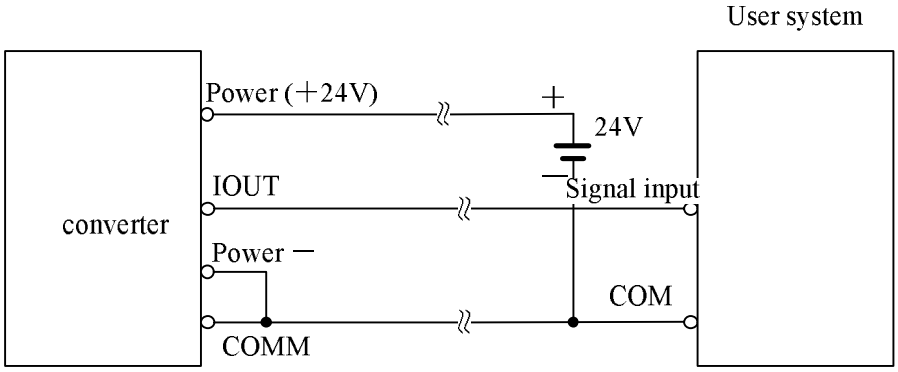
(2) Current zero correct
When the converter is getting into parameter setting, select the “Analog Zero” and change it to the standard of signal fountain getting to “0”. Adjust parameter make amperemeter is 4mA (±0.004mA).

(3) The full scale current correct
To select “Anlg Range” to enter. Adjust the converter parameter make amperemeter is 20mA (±0.004mA)
Adjust the current zero and the full range, the current function of the converter reached exactness.The line degree of current output of conversion should be controlled within the scope of 0.1%

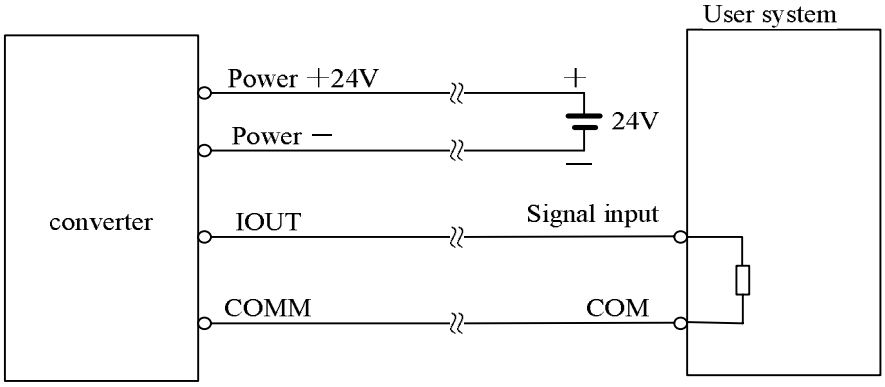
MAGFlo™ electromagnetic flowmeter converter's connection of current output:



Two connection



Three Connection (power supply and current output are not insulated)



Four connection (power supply and current output are insulated)

Setting parameters

After the MagFlo™ electromagnetic flowmeter converter and sensor connect to the pipe continue with below steps:

1) Connect the pipe fore-and-aft the sensors tighten.
2) Make sure the sensor connects to the ground.
3) Make sure the liquid stillness when regulating zero of the instrument.
4) Make sure the oxidation velum of sensor makes steadily (electrode and liquid contact continuously about 48 hours).

Key parameters and settings

Under the parameter setting way, user can set the parameter by the four keys.

a) Keys' function in self- testing way
"Down" key: Selecting displayed data on lower line in turn;
"Up" key: Selecting displayed data on higher line in turn;
"Compound" key + "Enter" key: Come into parameter setting 19
"Enter" key: Press it to come into the picture of select function.
Under the measure, adjust of the LCD contract is used "Compound" key + "Up" key or "Compound" key + "Down" key for several seconds;

b) Function keys for parameters setting
"Down" key: Subtract 1 from the number at cursor area;
"Up" key: Plus 1 to the number at cursor area;
"Compound" key + "Down" key: Cursor turns left;
"Compound" key + "Up" key: Cursor turns right; "Enter" key: In/Out submenu;
"Enter" key: Press for two seconds under any state and will return to automated measure.

Note:
(1) When using the "Compound" key, you should press "Compound" key and "Up" or "Down" both;
(2) It will return to the measure way automatically after 3 minutes when under the parameter setting way;
(3) Direct select of zero correction about the flow, you can move the cursor to the left + or - , and use "Down" or "Up" to switch

Function keys for setting parameters

To set or correct working parameters, the converter should be running in parameters setting way instead of measuring status. In measuring status, push "Compound"+"Enter" keys getting to the select of parameter and transfer password (0000), and then correct the password with one of the new passwords that are provided by manufacturer.

Finally, push the "Compound"+"Enter" keys to work in Parameters Setting Way. There are 6 Passwords in design and among them 4 for deferent operators in secret and 2 are fixed passwords for system operation.

Functions select menu

Push “Compound”+“Enter” keys to the functions select menu, push “Up” or “Down” keys to select, there are two functions:

Code	Functions	Notes
1	Parameters Set	Select this function; It can enter the picture of parameter.
2	Clr Total Rec	Select this function , It can be gross reset operation.
3	Fact Modif Rec	Select this function, It can be check the factor ‘s modif Record

Parameters Set

Press “Compound”+“Enter” key, it displays “Parameters Set” function. Input password. Press “Compound”+“Enter” key, it getting to Parameters Setting status.

Clr Total Rec

To push “Compound”+“Enter” keys getting to the select of parameter, then push “Up” key to “Clr Total Rec”, input the passwords. When the passwords becomes “00000”, this function is done, the gross is 0 in the instrument.

Fact Modif Rec

To push “Compound”+“Enter” keys getting to the select of parameter, then push “Up” key to “Fact Modif Rec”

Setting Parameters in Menu

There are 54 parameters for the MAGFLO™. The user can set every parameter. The List of Parameters is shown below:

Code	Parameter words	Setting Way	Grades	Range
1	Language	Select	2	English
2	Comm Addres	Set count	2	0～99
3	Baud Rate	Select	2	600～14400
4	Snsr Size	Select	2	3～3000
5	Flow Unit	Select	2	L/h、L/m、L/s、m^3/h、m^3/m、m^3/s、UKG、USG
6	Flow Range	Set count	2	0～99999
7	Flow Rspns	Select	2	1～50
8	Flow Direct	Select	2	Plus/ Reverse
9	Flow Zero	Set count	2	0～± 9999
10	Flow Cutoff	Set count	2	0～599.99%
11	Cutoff Ena	Select	2	Enable/Disable
12	Total Unit	Select	2	$0.001m^3$～$1m^3$ 、0.001L～1L、0.001UKG～1UKG、0.001USG～1USG
13	SegmaN Ena	Select	2	Enable/Disable
14	Analog Type	Select	2	0～10mA /4～20mA
15	Pulse Type	Select	2	Freque / Pulse
16	Pulse Fact	Select	2	$0.001m^3$～$1m^3$ 、0.001L～1L、0.001UKG～1UKG、0.001USG～1USG
17	Freque Max	Select	2	1～ 5999 HZ
18	Mtsnsr Ena	Select	2	Enable/Disable
19	Mtsnsr Trip	Set count	2	59999 %
20	Alm Hi Ena	Select	2	Enable/Disable
21	Alm Hi Val	Set count	2	000.0～ 599.99 %
22	Alm Lo Ena	Select	2	Enable/Disable
23	Alm Lo Val	Set count	2	000.0～599.99 %
24	Sys Alm Ena	Select	2	Enable/Disable
25	Clr Sum Key	Set count	3	0～99999
26	Snsr Code1	User set	4	Finished Y M
27	Snsr Code2	User set	4	Product number
28	Field Type	Select	4	Type1,2,3

29	Sensor Fact	Set count	4	0.0000～5.9999
30	Line CRC Ena	Select	2	Enable/Disable
31	Lineary CRC1	User set	4	Set Velocity
32	Lineary Fact 1	User set	4	0.0000～1.9999
33	Lineary CRC2	User set	4	Set Velocity
34	Lineary Fact 2	User set	4	0.0000～1.9999
35	Lineary CRC3	User set	4	Set Velocity
36	Lineary Fact 3	User set	4	0.0000～1.9999
37	Lineary CRC4	User set	4	Set Velocity
38	Lineary Fact4	User set	4	0.0000～1.9999
39	FwdTotal Lo	Correctable	5	00000～99999
40	FwdTotal Hi	Correctable	5	00000～9999
41	RevTotal Lo	Correctable	5	00000～99999
42	RevTotal Hi	Correctable	5	00000～9999
43	PlsntLmtEna	Select	3	Enable/Disable
44	PlsntLmtVal	Select	3	0.010～0.800m/s
45	Plsnt Delay	Select	3	400～2500ms
46	Pass Word 1	User correct	5	00000～99999
47	Pass Word 2	User correct	5	00000～99999
48	Pass Word 3	User correct	5	00000～99999
49	Pass Word 4	User correct	5	00000～99999
50	Analog Zero	Set count	5	0.0000～1.9999
51	Anlg Range	Set count	5	0.0000～3.9999
52	Meter Fact	Set count	5	0.0000～5.9999
53	MeterCode 1	Factory set	6	Finished Y /M
54	MeterCode 2	Factory set	6	Product Serial No

Parameters of converters can decide the running status, process and output ways as well as state of output. Correct option and setting of parameters can keep the converters running optimally and get higher accuracies of output bother in display and in measurement.

There are 6 grades of passwords for setting parameters function. Grades 1 to grade 5 of passwords are for users and grade 6 of password is for manufacturer. Users can reset their passwords of grades 1~4 in grade 5.

Users can check converters parameters in any grade of password. However, if the user wants to change parameters of converters, different grade of parameters have to be used by the users.

Grade 1 of password (set by manufacturer as 00521): users can only read parameter.
Grade 2 of password (set by manufacturer as 03210): users can change 1~24 parameters.

Grade 3 of password (set by manufacturer as 06108): users can change 1~25 parameters.
Grade 4 of password (set by manufacturer as 07206): users can change 1~38 parameters.
Grade 5 of password (Fixed): users can change 1~52 parameters.

Password Grade 5 can be set by skilled users. Grade 4 is mainly used for resetting total volume in password. Grades 1~3 can be set by any one who can be chosen by users.

Detailed Parameters

Language

There are 2 languages for MagFlo™ converter operation. They can be set by users according to the users needs.

Comm Addres

This instrument's address when communicates with many, and has 01~99, holding the 0.

Baud Rate

300,600, 1200, 2400, 4800, 9600, 19200, 38400 baud rate.

Snsr Size

The MagFlo™converters can be equipped with some deferent sensors that have deferent diameter of measuring pipes. The pipes in deferent diameters from 3mm to 3000mm can be chosen in relative table.

Flow unit

The flow unit can choose form the parameters (L/s, L/m, L/h, m3/s, m3/m, m3/h, UKG, USG) and the user can choose the proper unit according to the technological requirements

Flow Range

Flow range means upper limit value, and lower limit value is set "0" automatically. So, it makes the range, and makes the relation of percent display, frequency output and current output with flow:
percent display = (flow measure / measure range) * 100 %;
frequency output = (flow measure / measure range) * frequency full;
current output = (flow measure / measure range) * current full + base point;
pulse output will not affect.

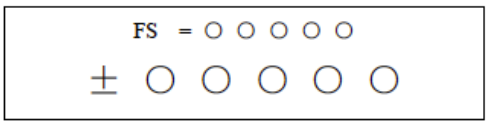
Flow Rspns

It means time of filter measure value. The longer one can enhance the stability of flow display and output digital, and fits for gross add up of pulse flow; the short one means fast respond rate, and fits for production control. It is set by select.

Flow Direct

Flow zero

Make sure the sensor is full of flow, and the flow is stillness. Flow zero is shown as velocity of flow, mm/s.



Flow cutoff

Flow cutoff is set in percentage of Upper Limit Range of flow, and users can delete all Negligible Small Signals of flow volume, velocity and percentage out of displaying and outputting them. Sometimes user can delete output of current output signal and frequency (pulse) output signal only to have flow, velocity and percentage being displayed.

Total Unit

Converter display is counter with 9 bits, and the max is 999999999. Integrator units are L, m3 (liter, stere,).
Flow integrator value:
0.001L, 0.010L, 0.100L, 1.000L,
0.001m3, 0.010m3, 0.100m3, 1.000m3
0.001UKG, 0.010UKG, 0.100UKG, 1.000UKG
0.001USG, 0.010USG, 0.100USG, 1.000USG

SegmaN Ena
When “SegmaN Ena” is “enable”, if the flow flows, the sensor will export pulse and current.
When it is “disable”, the sensor will export pulse as “0” and current as “0”(4mA or 0mA) for the flow flows reversals.

Analog Type
Output current types can be chosen by users as 1~10mA or 4~20mA practically.

Pulse Type

Pulse Fact
Equivalent pulse Unit is referred to one pulse for value of flow. The range of pulse equivalent can be chosen:

Pulse Equivalent	Flow	Pulse Equivalent	Flow
1	0.001L/cp	5	0.001m^3/cp
2	0.01L/cp	6	0.01m^3/cp
3	0.1L/cp	7	0.1m^3/cp
4	1.0L/cp	8	1.0m^3/cp

Under the same flow, the smaller pulse, the higher frequency output, and the smaller error will be. The highest pulse output is 100cp/s, and mechanism electromagnetic counter can get 25 frequency/s.

Freque Max
Frequency output range is as the upper limit of flow measure, just the percent flow 100%. Frequency output upper limit can be selected between 1~ 5000Hz.

The state of empty pipe can be detected with the function of converter. In the case of Empty Pipe Alarm, if the pipe was empty, the signals of analog output and digital output would be zero and displayed flow would be zero, too.

Mtsnsr Ena
The state of empty pipe can be detected with the function of converter. In the case of Empty Pipe Alarm, if the pipe was empty, the signals of analog output and digital output would be zero and displayed flow would be zero, too.

Mtsnsr Trip
When the pipe is full of liquid (whether flowing or not), the parameter of “Mtsnsr” could be modified more easily. The parameter displayed upper line is real MTP, and the parameter displayed bellow is the “Mtsnsr trip” that should be set. When setting “Mtsnsr trip”, you could be according to the real MTP, the value that should be set is usually three to five times of real MTP.

Alm Hi Ena
Users can choose “Enable” or “Disable”.

Alm Hi Val
The parameter of upper limit alarm is percentage of flow range and can be set in the way of setting one numerical value between 0%~199.9%.When the value of flow percentage is larger than the value of setting value, the converter outputs the alarm signal.

Alm Lo Val
The same as upper limit alarm.

Sys Alm Ena
Selecting Enable will have the function, and selecting Disable will cancel the function.

Clr Sum Key
User use more than 3 byte code to enter ,Then set this password in Clr Total Rec.

Snsr Code
It is referred to the produced date of sensor and the serial number of product that can keep the sensors coefficient right and accurate.

Sensor Fact
“Sensor Coefficient” is printed on the Label of the sensor when it is made in factory.
The “sensor coefficient” has to be set into Sensor Coefficient Parameter when it runs with converter.

Field Type
The MagFlo™ has three exciting frequency types: 1/16 frequency (type 1), 1/20frequency (type 2), 1/25 frequency (type 3).The small-bore one should use 1/16 frequency, and large-bore one should use 1/20 or 1/25 frequency. When using, please select type 1 first, if the zero of velocity is too high, select the type 2 or type 3.
Note: Demarcate on which exciting type, working on it only.

FwdTotal Lo, hi
Positive total volume high byte and low byte can change forthcoming and reverse total value, and be used to maintenance and instead.

User use 5 byte code to enter, and can modify the positive accumulating volume (∑+). Usually, it is unsuitable to exceed the maximum the counter set (999999999).

RevTotal Lo, hi
User use 5 byte code to enter, and can modify the negative accumulating volume (∑-). Usually, it is unsuitable to exceed the minimum the counter set (999999999).

PlsntLmtEn
For paper pulp, slurry and other serosity, the flow measure will have "cuspidal disturb", because the solid grain friction or concussion the measure electrode. The MagFlo™ converters use variation restrain arithmetic to conquer the disturbing by designing three parameters to select disturb character. Set it "enable", start variation restrain arithmetic; set it "disable", close variation restrain arithmetic.

PlsntLmtVl
This coefficient can disturb the variation of cuspidal disturb, and calculate as percent of flow velocity, thus ten grades: 0.010m/s, 0.020m/s, 0030m/s, 0.050m/s, 0.080m/s, 0.100m/s, 0.200m/s, 0.300m/s, 0.500m/s, 0.800m/s, and the smaller percent, the higher delicacy of cuspidal restrain.

PlsntDelay
This coefficient can select the width of time of restrain cuspidal disturb and the unit is ms. If the duration is shorter than flow, the MagFlo™ will think it is cuspidal disturb, and if it is longer, the MagFlo™ will think it is natural. It needs to select parameters.

User's password 1~4
Users can use 5 grades of passwords to correct these passwords.

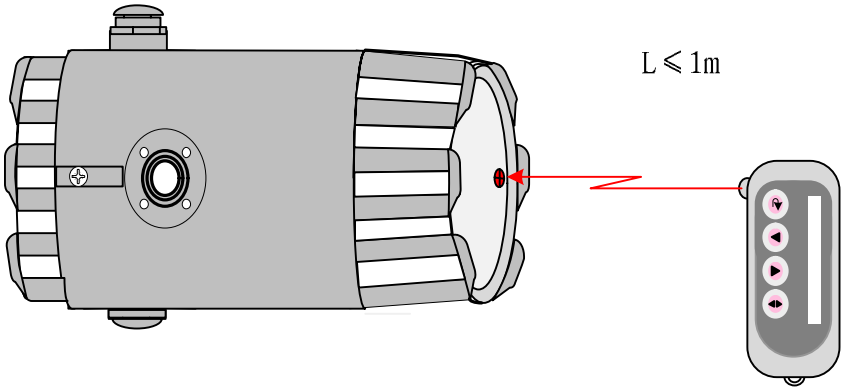
Analog Zero
When the converters are made in the factory, output current has been calibrated to zero scale, that is, accurate 0mA or 4mA output.

Anlg Range
When the converters are made in the factory, output current has been calibrated to full scale, that is, accurate 10mA or 20mA output.

Meter Fact
This fact is the special one of sensor-made-factory and the factory use this fact to unite the MagFlo electromagnetic flowmeters converters to make sure all the instruments can interchange by 0.1%.

Infrared telecontrol function keys

The operation of the infrared-hand-remote control keyboard is the same with the operation of the instrument. When in use, please keep the infrared transmitter of the infrared-hand-remote control keyboard and the receiver of the instrument parallel, with the distance of about one meter.



The communication figure of the infrared-hand-remote control keyboard and the instrument

Alarm information

PCB of electromagnetic flowmeters converters uses SMT, so for user, it is unable to service, and cannot open the shell of converter.

The MagFlo key series Intelligent converters have self-diagnose function. Without trouble of power and hardware circuit, the normal trouble can be alarmed correctly. This information displays on the left of LCD.

FQH ---- Flow high limit alarm; FQL ---- Flow low limit alarm
FGP ---- Flow empty pipe alarm; SYS ---- System exciting alarm.
UPPER ALARM ---- Flow high limit alarm;
LOWER ALARM ---- Flow empty pipe alarm
LIQUID ALARM ---- Flow empty pipe alarm
SYSTEM ALARM ---- System exciting alarm.

Troubleshooting

No display:
a) Check the power supply connection;
b) Check the power fuse to see for OK;
c) Check the contrast of LCD and regulate it to working state;

Exciting alarm
a) Check if the exciting cables EX1 and EX2 did not connected;
b) Check if the total resistance of sensor's exciting coil resistances less than 150Ω;
c) If a) and b) are OK, the converter is failed.

Empty pipe alarm
* If measured fluid full of testing pipe of sensor;
* When shorting circuit three connectors SIG 1, SIG 2, SIGGND of converter, and no "Empty Alarm" displayed then the converter works OK. In this case, it is possible that conductivity of measured fluid may be small or empty threshold of empty pipe and range of empty pipe are set wrongly.
* Check if the signal cable is OK;
* Check if the electro-poles are OK or not.
Let the flow is zero, then the displayed conductivity should be less than 100%. Resistances of SIG1 to SIGGND and SIG2 to SIGGND are all less than 50kΩ (conductivity of water) during measurement operation. (It is better to test the resistances by means of multimeter with pointer to see the charging process well.)
* The DC voltage should be less than 1V between DS1 and DS2 testing the voltage by means of multimeter. If DC voltage is larger than 1V, the electro poles of sensor were polluted that have to be cleaned.

Measure flow disallow
* If measured fluid full of testing pipe of sensor;
* Check if the signal cable is OK;
* Check the sensor modulus and sensor zero whether set as the sensor escutcheon or leave factory checkout.

Ordering Information

FLO-CORP MODEL NUMBER BUILDER

For Assistance Call **877.356.5463**

Use the diagram below, working from left to right to construct your FLO-CORP Model Number.
Simply match the category number to the corresponding box number.

Example: MMFM-04C-SS1-R-A3R-A01-1

MAGFLO™ MMFM Magnetic Flow Meter with 1" Diameter, Compact Transmitter Type, Stainless Steel Electrode Material, 4-20mA Signal Output, Hard Rubber Liner Material with 110-240 VAC Power Supply, HART Communication, a Grounding Ring and ANSI 150# Connections with 1/2" NPT Conduit Entries

MMFM – □□□ – □□□ – □ – □□□ – □□□ – □

MMFM

Diameter	Flow Range (1)
01) 3/8"	-11.00 to +11.00 GPM
02) 1/2"	-25.00 to +25.00 GPM
03) 3/4"	-55.00 to +55.00 GPM
04) 1"	-98.00 to +98.00 GPM
05) 1 1/4"	-150.00 to +150.00 GPM
06) 1 1/2"	-225.00 to +250.00 GPM
07) 2"	-385.00 to +385.00 GPM
08) 2 1/2"	-600.00 to +600.00 GPM
09) 3"	-900.00 to +900.00 GPM
10) 4"	-1,550.00 to +1,550.00 GPM
11) 5"	-2,500.00 to +2,500.00 GPM
12) 6"	-3,500.00 to +3,500.00 GPM
13) 8"	-6,200.00 to +6,200.00 GPM
14) 10"	-9,800.00 to +9,800.00 GPM
15) 12"	-14,000.00 to +14,000.00 GPM
16) 14"	-19,000.00 to +19,000.00 GPM
17) 16"	-25,000.00 to +25,000.00 GPM
18) 18"	-32,000.00 to +32,000.00 GPM
19) 20"	-40,000.00 to +40,000.00 GPM
20) 24"	-55,000.00 to +55,000.00 GPM

Transmitter Type
C) Compact Type
R) Remote Type

Electrode Material
SS) Stainless Steel
Ti) Titanium
Ta) Tantalum
Ha) Hastelloy Alloy C

Signal Output
0) No Output
1) 4-20mA / 1-5KHz

Liner Material
R) Hard Rubber
P) PTFE

Power Supply
A) 110 - 240 VAC
D) 20 - 36 VDC
B) Battery Power Supply

Communication
0) No Communication
1) RS485
2) Modbus
3) HART
4) GPRS

Grounding Ring
N) No Grounding Ring
R) Grounding Ring
E) Grounding Electrode

Connection
A01) ANSI 150# Flange
A03) ANSI 300# Flange
A06) ANSI 600# Flange
A09) ANSI 900# Flange
T00) Tri-Clamp for sanitary Type (Body material: Stainless Steel)

Conduit Entries & Cable Glands
1) 1/2" NPT (2)
2) Cable Glands (2)
3) 1/2" NPT (1), Cable Gland (1)
4) M20 (2)
5) M20 (1), Cable Gland (1)

Ordering Notes:
(1) Select the best configuration based on your requirements