EF+EG Calibration and setting

Operation Instruction

FineTek Co., Ltd
No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 236, Taiwan
Tel: 886-2-22696789 Fax: 886-2-22686682
Email: info@fine-tek.com http://www.fine-tek.com

08-EFEG-B0-EK,04/10/2012

Contents

1. Reading Before Use

Thank you for your purchase for FineTek product. This menu introduces the product features, operations, maintenance and troubleshooting to help user get familiar with product, and avoid harm by unperoper use. Before use, please carefully study the details of product. Extra support requirement can be found at www.fine-tek.com or directly contact us by telephone and facsimile. On line revision will issue at web site and not further inform. User can get newest support and download at ww.fine-tek.com. In case of any unexpected problem, don’t disassembe it by yourself or you will lose the product guarantee. Contact us, if you have any question hard to be defined.

Symbol Instruction

Danger→ Deathly danger or significant harm might be caused with unproper use.

Notice→ Damage to user or equipment with unproper use.

Electric Shock→ Notice for Electric Shock.

Fire→ Notice for Fire.

Prohibit→ Prohibit for Wrong Operation.

2. Warranty

2.1 Warranty for New Product

All FineTek products will get one year guarantee in regular operation. Product within guarantee period will get service and no charge for any nominal fee. User finds any defect during delivery process or not be broken by wrong operation that can ask return or replace. In maintenance, user has the obligation to send all complete parts back to FineTek in well carefully package. Over range operation, over charge or any abnormal operation will excess out the guarantee range. Product not in guarantee period and condition will charge necessary fee for the repair or replace.

- Things below will not in guarantee coverage and will be charged service fee:
- Expire the guarantee date.
- Not properly use according to operation manual.
- Irresistible environment effects or natural disaster (earthquake, flood disaster, fire, lighting stroke, hurricane)
- Human-made damage (scratch, cutting, throwing down, hammering) or abnormal operation (over power range, over ambient condition, over range operation, corrosion, watering, electric charge),non-proved third-party device connection or expend, replace non-proved components or module.

2.2 Warranty Under Maintenance

Maintenance Guarantee: All the products will get six months guarantee service since repair or replace components. During six months, any fault caused in same will be serviced in free charge.

2.3 Service Network

Beanch	Address	Tel	Fax
Head Quarter (Taiwan)	No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 236, Taiwan	+886 2-2269-6789	+886 2-2268-6682
Fineautomation Co.,Ltd. (China)	No.451 DuHui Rd, MinHang District, Shanghai, China 201109	+86 216490-7260	+86 216490-7276
Beijing Branch Office (China)	No.8 GuanGqu Men Street, Block A, Room 191	+86 108353-5118	+86 108353-2816
Guangzhou Branch Office (China)	No.536 LongKou Rd West, Grass Park B-18C TianHe District, Guangzhou, China	+86 203846-1387	+86 203846-1397
Wuhan Branch Office(China)	No.14 ZhongZan Rd, Century square , Block B, WuChang District, Wuhan, China	+86 27-8733-2314	+86 27-8733-2341
Jinan Branch Office (China)	No.44 HongLou Rd South, HuiKe Park Building 6, Unit 2, Room 1601, LicHeng District, Jinan, China	+86 531-83173652	+86 31-83173670
Nanjing Branch (China)	Everest Building Room 1709, 19 Cutral Road, Nanjing Drum Tower District, Nanjing, China	+86 025-83176832	+86 025-83176831
Finetek Pte Ltd. (Singapore)	No. 11 Kaki Bukit Road 1 #04-01 Eunos Technolink 415939, Singapore	+65 6452-6340	+65 6734-1878
FineTeK GmbH (Germany)	Frankfurter Str. 62, OG D-65428 Ruesselsehim, Germany	+49 (0)6142-17608-16	+49 (0)142-17608-20

3. Product Inspection

3.1 Product Checking

1 pcs EG Magnetostrictive Level Transmitter sensor, 1 pcs EF By-Pass chamber, 1 pcs cable (standard M12 connector, length 2M)

3.2 Safety Inspection

a. Open box

b. Please check the packaging before unpacking whether deformed or damaged. If packing is damged,please take photos as evidence for the basis for subsequent compensation

c. After unpacking, please check the contents and product quality and take photos as evidence for future use.

d. After unpacking, please immediately check whether your purchase contents and quantity are correct.

e. In case any anomaly in products contents, please contact our company within 7 days of receiving the product (together with photo). Otherwise, company will not liable for replacement or free of charge repair.

3.3 Transportation safety

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4. Product Introduction

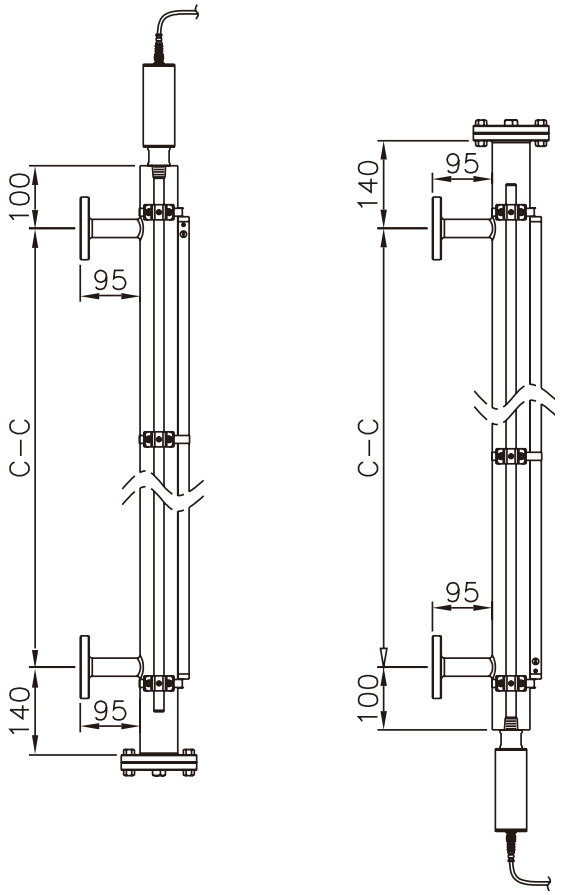
4.1 Product Features

This product is an integration of benefits of EF Magnetic Float type By-Pass Level Indicator with easy level observation and EG Magnetostrictive Level Transmitter with high accuracy, quick response time into one unit. This unit can easily installed on the side of the tank for level measurement and control.

4.2 Working Principle

EG Magnetostrictive Level Transmitter & EF By-Pass Level Indicator uses the magnetic field interaction between Magnetic flag and Magnetic float inside the By-Pass chamber to measure the liquid level. Magnetic flags outside the chamber will flip together with the magnetic float inside the By-Pass chamber with the rise in liquid level. At the same time, EG Magnetostrictive Level Transmitter continuously sends spiral magnetic field current pulse signal. When these signal meets the magnetic field of float produces seismic waves. EG calculates the travel time and speed of the signal formed by two different magnetic field to find out the absolute level of liquid.

4.3 Machine composition



4.4 Product Application

Textiles Dyeing equipments
Waste Water Treatment
Chemical Machinery (Raw material tanks, storage tanks, reaction tanks)
Power plant
Pharmaceutical equipments (medicine raw materials storage tanks)
Kerosene, Heavy oil, fuel storage tanks
Petrochemical industry
Water processing industry (water storage, hot water recycling equipments etc)

5. Product Specification

5.1 Probe Specification

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5.1.1Panel Introduction

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5.1.2 External Dimension

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5.1.3 Hole Dimension

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5.1.4 Order Information

During model selection of EF Series, please select EG Transmitter parts code as described below:

Transmitter:

A: EG37 Intrinsically Safe Explosion-Proof Modbus RS-485 Output
(EG371BQ00-00AB-L)

B: EG37 Intrinsically Safe Explosion-Proof 4~20mA(Bottom~Top)Output
(EG371BQ00-00A0-L

C: EG37 Intrinsically Safe Explosion-Proof 4~20mA(Top~Bottom)Reverse Direction Output
(EG371BQ00-00B0-L)

D: EG31Modbus RS-485 Output
(EG311BQ00-00AB-L)

E: EG31 4~20mA(Bottom~Top)Output
(EG311BQ00-00A0-L)

F: EG31 4~20mA(Top~Bottom)Reverse Direction Output
(EG311BQ00-00B0-L)

※ EG Transmitter is not suitable for By-Pass Indicator with Dual Flange, Blanket type, Jacket type & Removable Insulation type.

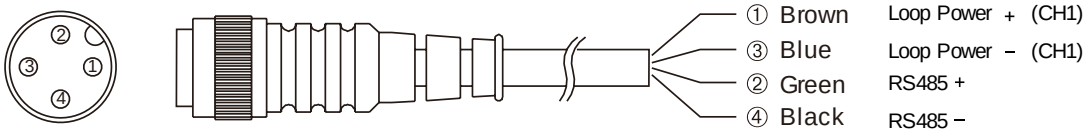
5.2 Electrical Specification

Power supply: 24VDC±10% (EG Magnetostrictive Level Transmitter)

5.3 Wiring Information

Single / Double float +RS485

Loop Power 24Vdc ±10%



6. Installation

6.1 Environmental Safety

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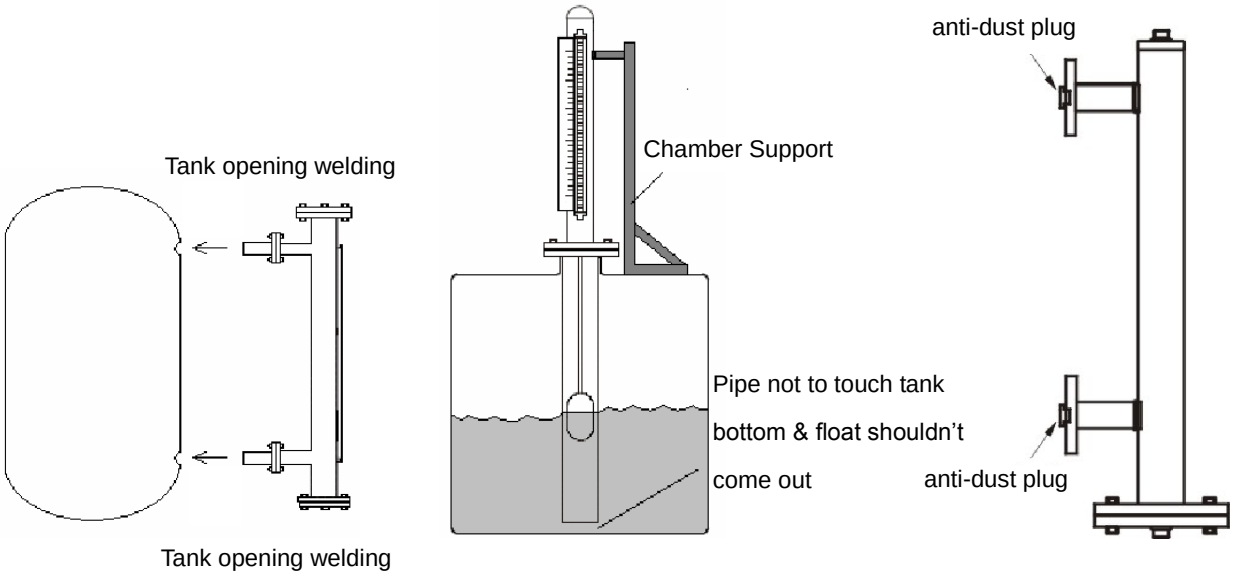
6.2 Product Installation

EF By-Pass Level Indicator Chamber Installation:

a. Firstly read and understand “Product Safety Installation Precautions”
b. Before installation remove from the top and bottom flanges.
c. Please ensure the flange hole position and diameter is in similar position with the flange of the tank extension pipe.
d. Please ensure flange welding of the extension pipe with the tank meets the industrial safety standards.
e. After welding of extension pipe flange, please tightly fix both flanges together screw and bolts.
f. Before welding of extension pipe with the tank, check the alignment of hole of both the flanges. For Top mounting type, chamber must be perpendicular to ground level (or fluid).It is advised to use bubble level scale to ensure the installation is perpendicular. Lower Pipe (shield pipe) is not supposed to touch tank bottom. Float is also not supposed to expose outside shield pipe. For top mounting type,if chamber length is more than 1.5m (for plastic type) & 2m (for metal type), it is advised to use support bracket to prevent bending of the chamber.

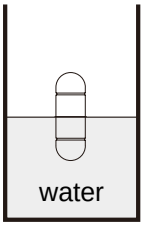


g. After welding, dismantle indicator for check-up, cleaning etc, then add gasket between flange before re-installing By-Pass Level Indicator.
h. Before opening hole and welding, please measure all the every dimension of By-Pass indicator.
g. Please ensure that top & bottom holes are identical in a straight line and perpendicular to ground. Also check if both flanges position are identical in a straight line. Before starting welding process, please confirm that above mentioned requirements are fulfilled.
h. After installation use a magnet to test the if the indicator are working properly.
i. Above liquid level flag color is white and below liquid level is red. Indicator can be tested by slowly filling tank to full and then empty the tank.
j. All the above installation processing such as opening holes, welding etc must follow industry standards, environmental standards.

Flag Display Installation

a. Indicator flag at the bottom indicate zero level and top flag indicate maximum level (float standard are based on specific gravity of water as standard medium). If the medium is not water, flag will little ahead or lag behind to the real level in the tank.

- If specific gravity of liquid is more than water, height of float will rise (compared to float in water). At the same time, flags rotation standards will also rise.



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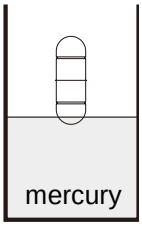

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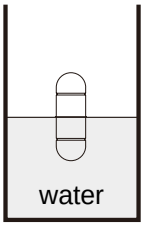
- If specific gravity of liquid is less than water, height of float will drop (compared to float in water). At the same time, flags rotation standards will also drop.



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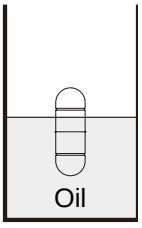

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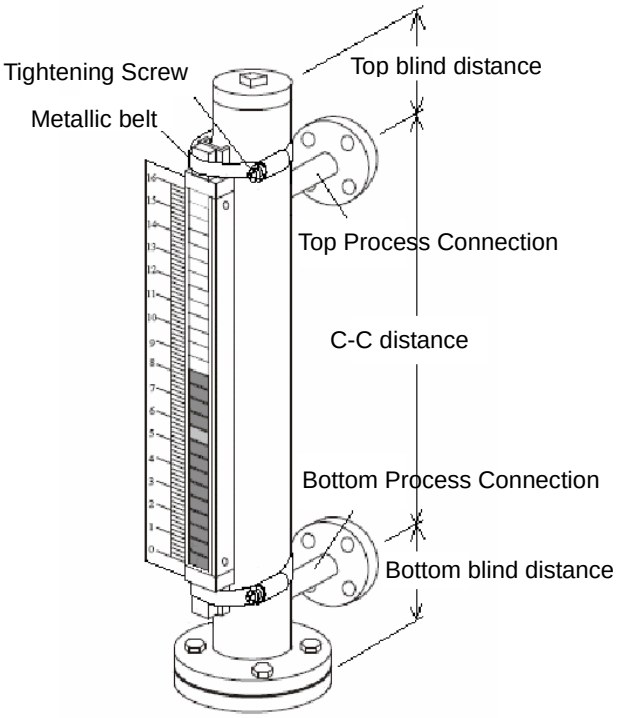
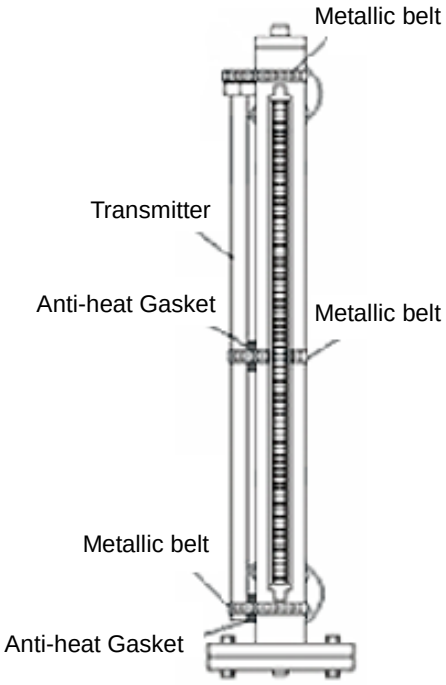
b. If the float specific gravity is not changed together with liquid, calibration is required for minimum and maximum level. This will solve the problem of over indication or incomplete indication of flags. But this will not overcome the issue of flag indication ahead or lag behind real liquid level. Magnetic float (near top of chamber & bottom of chamber) have blind distance which leads to flags don't turn over with liquid level.

c. Please check if flags are fixed in a straight line and stick together with the chamber. Also make sure distance between indicators and chamber is maintained similar from top to bottom.

d. Please make sure that distance between two Metallic belt is not much. Every 1.5 meter length require at one metallic belt tied.

e. For adjustment of indicator please loose the screw, adjust and tighten it back. Please ensure not to tighten to much which can damage the instrument or welding.





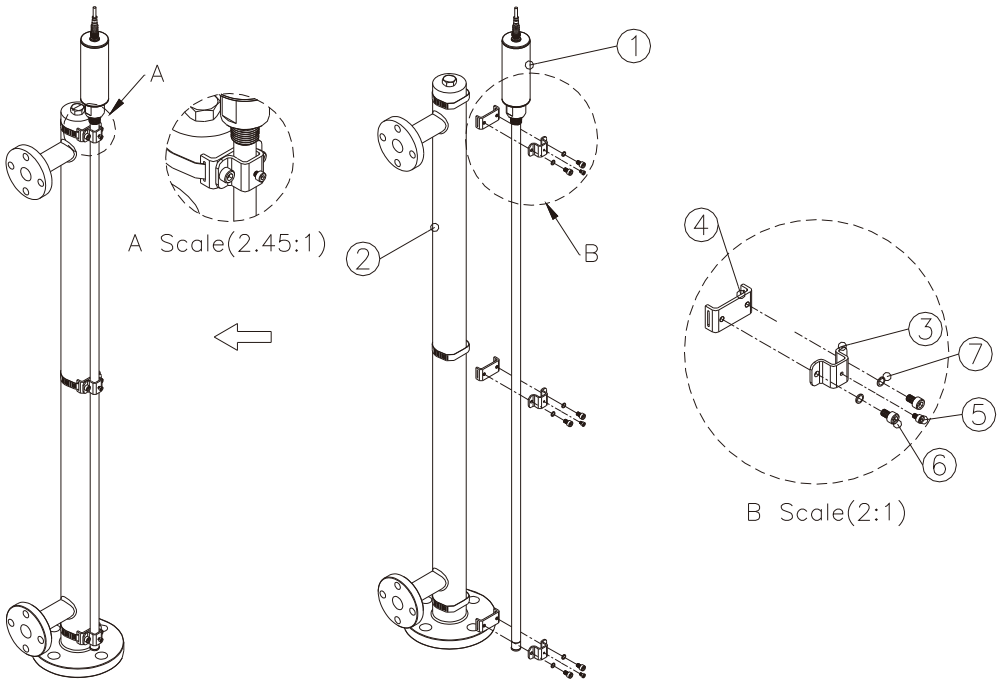
EG Installation

a. Firstly dismantle the metallic belt from the chamber, check the all the fastening components.

b. Fastening base position needs to be placed on the side of the flag indicators. Firstly assemble the position of the fastener with the chamber and then tighten the metallic belt.

c. Firstly tight M6 screw and then fix Magnetostrictive sensor with M4 screws.

d. Please ensure the metallic belt is in the right position and tightly holding the chamber, indicator and EG sensor.



No.	Parts	Material Specifications	Quantity
1	EG	Standard/ Top conduit	1
2	EF	Top cover+1/2”PT plug/ bottom double flange+1/2”PT plug	1
3	Sheet Metal Cover	ϕ16 stem 2.5t SUS304	n
4	Sheet Metal Seat	ϕ16 stem 3t SUS304	n
5	M4 Hexagonal Nut	M4*8L SUS304	n
6	M6 Hexagonal Nut	M4*8L SUS304	n*2
7	M4 Nut	M4 SUS304	n
8	Spring Washer	M6 SUS304 ATEX	n*2

* For NO3/ NO4/ NO5 are same as the metallic belt (EFA-2000)

6.3 Electric Circuit Installment

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6.4 Precautions

Magnetostrictive Level Transmitter (EG):

a. Power supply for Magnetostictive Level Transmitter is 24Vdc ±10%. For high accuracy and normal operation of the sensor, please ensure during installation don't bend or touch the metallic chamber.
b. Please ensure the sensor is not dismantle at any time, which can influence normal operations.
c. During installation, please ensure that sensor is not squeezed or deformed. If unable to measure level due to bending or deformation, immediately send sensor to our factory for calibration.
d. For transportation safety, the sensor is packed with extreme vibration safety using bubble bag and spongy pad etc.
e. Please ensure not to open the housing, which can affect the accuracy of the sensor.

By-Pass Level Indicator (EF):

a. By-Pass Indicator must be installed vertical with the vessel, and vertical deviation must be less than 3°
b. Please check S.G of the liquid medium and S.G indicated on the tag are identical.
c. Liquid level ascending rate must be less that 1cm per second.
d. During installation please check that no external particles enter the chamber which can harm the float.
e. Magnetic switch is influenced by any line of magnetic influx to give switching output. During installation, please ensure no external magnetic field is present 10 cm from Magnetic switch.
f. During installation, magnetic float needs to be protected from severe shocking, which may damage the floats.
g. If external particles have entered the chamber during installation, please dismantle the lower flange to clean. Also clean the floats before tightening the flange back. Please ensure the float arrow symbol↑ is placed upwards.
h. Custom-made floats don't have arrow symbol. In this case heavier side of the float is placed upwards.

7. Operation Instructions

7.1 EG Magnetostrictive Level Transmitter Wiring Connection Considerations

a. During wiring connection, please check that power supply is disconnected.
b. During peeling of wire, please ensure that there is no naked wire which can touch other wires resulting in signal short circuit.
c. For safety of the sensor, please check there is no naked wire touching any other metallic object near the sensors.
d. Please ensure that wiring can’t get any contact with water, rain water to avoid short circuit.

7.2 Button Function Explanation

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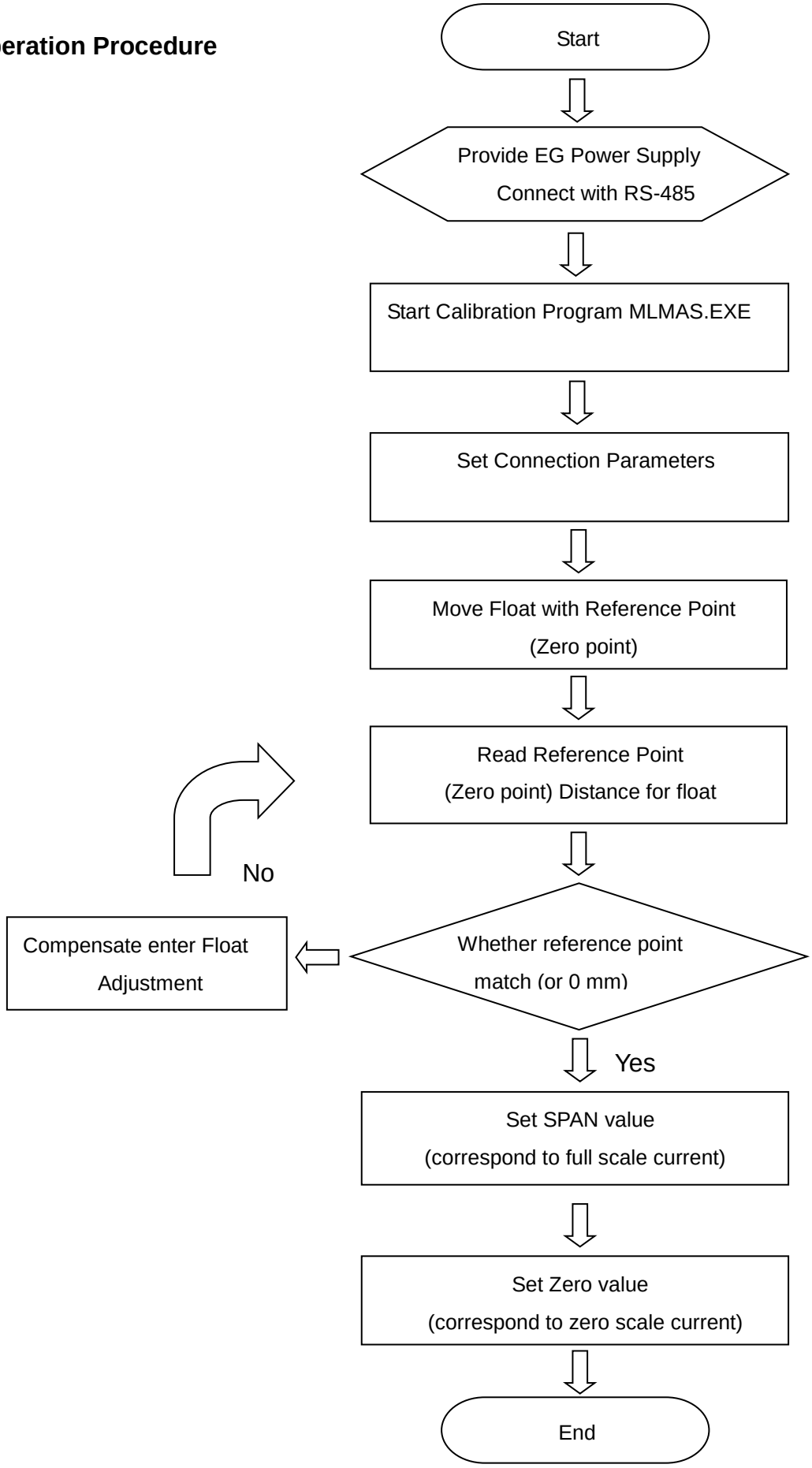
7.3 Operation Procedure



7.4 Order Instruction

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7.5 Model Code Explanation

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8. Technical Words explanation

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9. Functions

9.1 Quick Installation Introduction

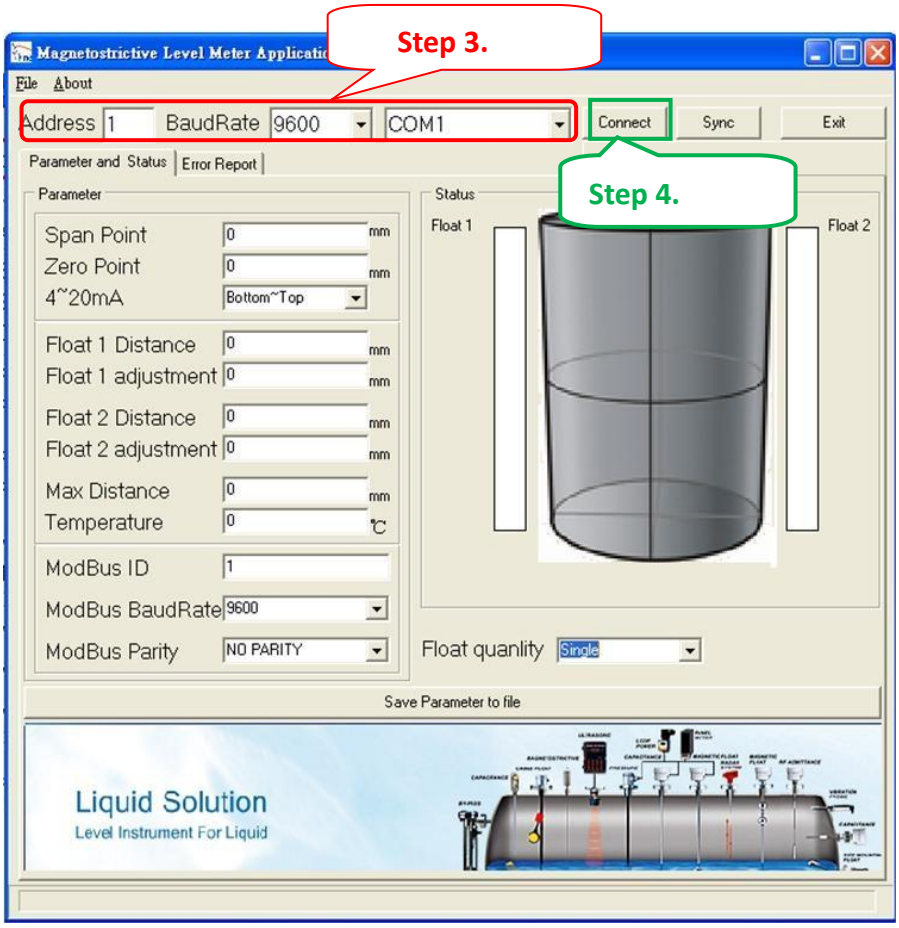
Magnetostrictive Level Transmitter (EG) calibration process and setting program

a. Provide power supply and connect RS-485 wires

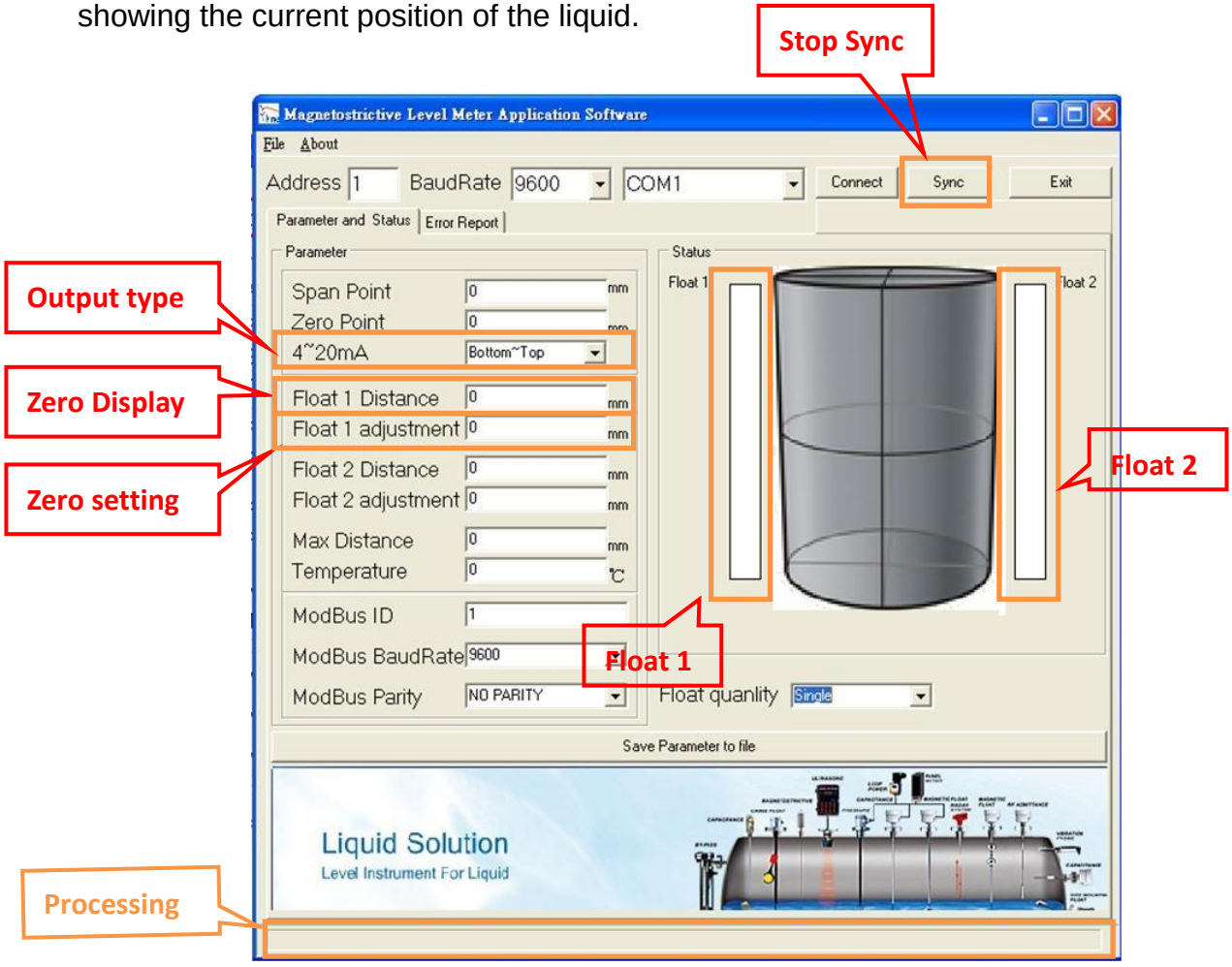
b. Start calibration program MLMAS.exe

c. Input setting Address, BaudRate and Port. Please refer to below picture (Default Address=1,BaudRate=9600,COM1)

d. Click connect.



e. After connection, user will notice below shown interface. Float 1 and Float 2 is showing the current position of the liquid.



f. Click Stop Sync to edit parameters.

g. In case of analog output, if top mounting then select Bottom~Top, otherwise select Top~Bottom. Then press Sync to reset status.

h. For liquid level control enter the standard height. If standard height is not known then calibrate height based on empty tank height.

i. Click Stop Sync to edit parameters.

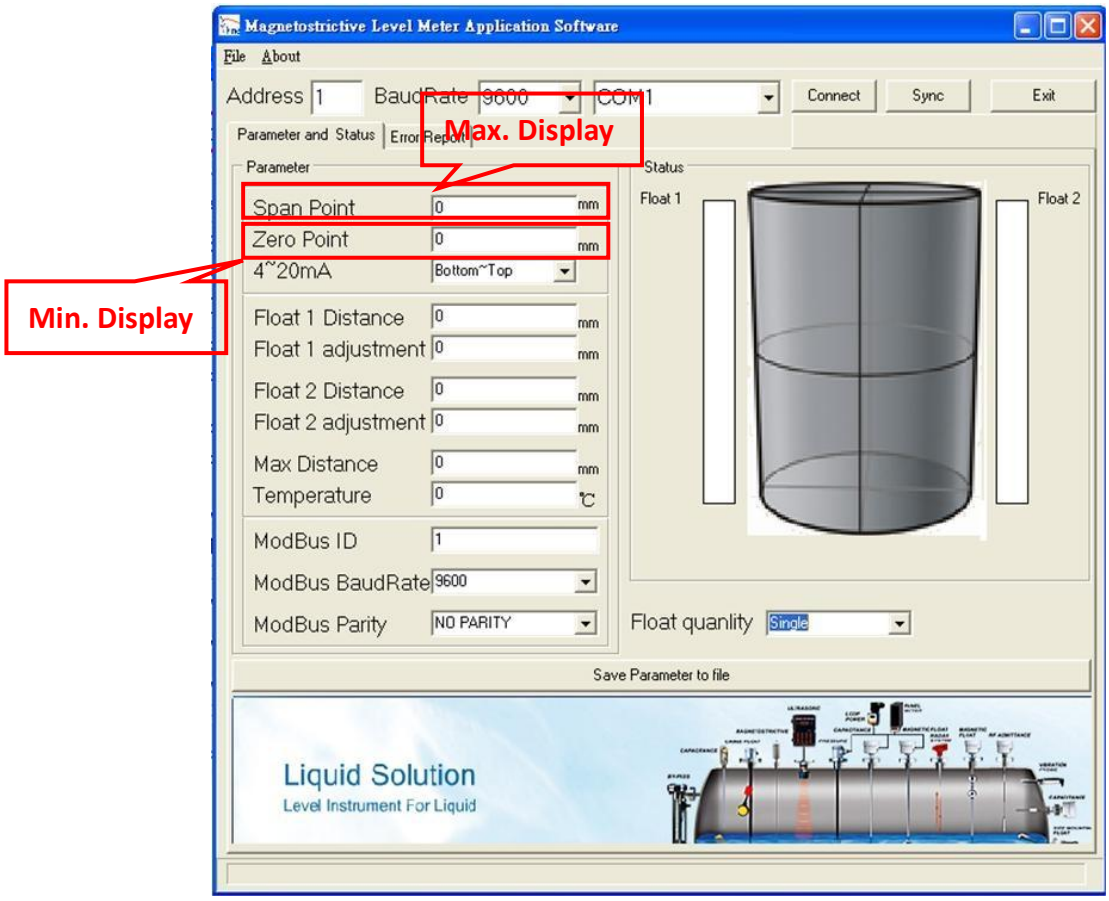
j. Firstly fill the standard height in “Float 1 Distance” column substract the distance needs to be adjusted in “Float 1 adjustment” column. Click Sync for resetting and to get actual visible height.

k. Click Stop Sync to edit parameters.

l. Set full scale value in “Span Point” column. Generally the maximum range to be measured. Based on the span requirement, scale can be calibrated.

m. Set lowest scale value in “Zero Point” column. Generally the minimum range to be zero. Based on the zero requirement, scale can be calibrated.

n. Click Sync to reset and to finish setting.



(Span Value: maximum current position (20mA) is to measure the maximum range calibrated at maximum position)

(Zero Value: minimum current position (4mA) is to measure the lowest level calibrated at manimum position)

ps:Above process will finish calibration setting

9.2 Advanced Settings

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10. Storage & Transportation Requirements

10.1 Environmental Requirements

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10.2 Transportation Requirements

a. Package box must be carefully handled during transportation. High pressure or throwing can damage the product.
b. Mishandling or collision can damage floats, glass indicator or deformation of brackets, may affect flags smooth movement and can also damage magnetic switches.
c. By-Pass Indicator can also damaged by over shaking, rapid rolling during transportation.

11. Maintenance

11.1 Regular Maintenance

a. Regular inspection is required to check if magnetic belt is lose or fix indicator, transmitter, magnetic switch in case deviated from actual position.
b. Regular inspection and fixing required for lose screw or flanges.
c. During draining of sewage and cleaning process, also clean the floats for any sticky impurities. While installing back, please pay attention to the arrow head ↑to be placed upwards.
d. Please disassembly and reinstallation please check the size of screw. Wrong size of screw may damage the sensor.

11.2 Parts Installation

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12. Trouble Shooting

Symptom	Possible cause	Action
1. Flag Display & Real level not consistent	1. Check float S.G is lower than fluid?	Float S.G must be lower than fluid medium, so that it can operate normally. If not then replace float.
	2. Installation environment have Permeable substance?	Permeable substance can easily attract float, so float may not be able to rise with the liquid level. Get rid of these permeable matters.
	3. Check if float position is wrong installed?	Sometimes, during maintenance, floats are installed upside down. Reverse the float for normal indication.
2. Flags display chaos?	1. Whether material inlet and outlet is too quick?	If float movement is too quick, then some flags will not completely rotate. Just use a magnet near the flags and move in the same direction, flags will resume the correct position.
	2. Inspect if the flags tube got bended?	If flags tube got bended, flags may be jammed. Send product back to our factory for repair.
3. Flags is not flipping?	1. Inspect if the flags tube got bended?	If flags tube got bended, flags may be jammed. Send product back to our factory for repair.
	2. Check if magnet inside float is damaged?	If float is hit hard, it may break the magnet inside the float, which result not very smooth flipping of flags. In this case, change new floats.
	3. Installation environment have Permeable substance?	Permeable substance can easily attract float, so float may not be able to rise with the liquid level. Get rid of these permeable matters.
4. Transmitter output is not accurate?	1. Check if the sensor stem is bended?	If the sensor stem is bended or deformed, it may give unaccurate output, send back to our factory for repair and calibration.
	2. If customer has calibrated the sensor?	Please read operation manual before calibration.
5. During the rise and drop of liquid level, why transmitter output is stuck at one point?	1. Will restarting recover this problem?	Restarting will recover the stucking problem. Sometimes, if the liquid level rise or drop is too fast, sensor may look like have error signal or output stuck at one point.