



# **IM3000 Flow Meter**

## **Installation Manual**

P/N 1605606 Rev A (ECN 32937)

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# IM3000 Flowmeter Safety Instructions



## WARNING

**Personal Safety:** Through out this manual and on all safety signs, the precautionary statements (“DANGER”, “WARNING”, “CAUTION” and “NOTICE”) can be found, followed by a hazard description and preventative actions to be taken. These precautions are intended for the personal safety of the operator and those within the vicinity of the machinery. Please take time to read these precautions.

| Hazard Severity Panels    |                |                                                                                                                                                                                                                                                                                                                       |                                                                                       |
|---------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Background Color of Panel | Contrast Color | Meaning/Use                                                                                                                                                                                                                                                                                                           | Hazard Severity Panel Illustration                                                    |
| Red                       | White          | Danger hazard severity panels indicate a high level of risk that can result in serious injury or death. The signal word “Danger” is to be limited to the most extreme situation. Danger panels are not to be used for property damage hazards unless personal injury risk appropriate to this level is also involved. |    |
| Orange                    | Black          | Warning hazard severity panels indicate a moderate level of risk that if ignored, could result in death or serious injury. Warning panels should not be used for property damage unless personal injury risk appropriate to this level is also involved.                                                              |    |
| Yellow                    | Black          | Caution hazard severity panels indicate a low level of risk that if not avoided, minor or moderate injury could result. Caution panels without the alert symbol may be used to alert against unsafe practices that can result in property damage only.                                                                |  |
| Blue                      | White          | Notice severity panels are used to address practices not related to personal injury. The alert symbol is never used with Notice panels. As an alternative to the signal “Notice”, the word “Caution” without the alert symbol may be used to indicate a message not related to personal injury.                       |  |



## WARNING

**Machine Safety:** Additional precautionary statements (“ATTENTION” and “IMPORTANT”) are intended for machine safety and are followed by specific instructions.

**ATTENTION:** The word “ATTENTION” is used to warn the operator of potential machine damage if a certain procedure is not followed.

**IMPORTANT:** The word “IMPORTANT” is used to provide the reader with information necessary to prevent minor machine damage if a certain procedure is not followed.



**WARNING:** All maintenance and service must be performed by a Lindsay Dealer.



**WARNING**

**Disconnect Power Source:** Do not connect source power to the flow meter until all installation operations are completed, all covers have been properly installed and all personnel are clear of the equipment.



**WARNING**

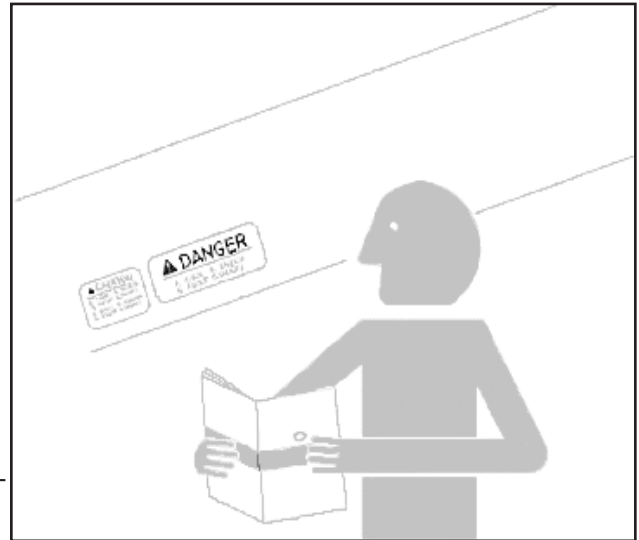
**Training:** All individuals involved in the installation, operation or maintenance of this equipment must receive and understand training in the safe and proper methods of performing all duties assigned to them at the time of the initial assignment and at least annually thereafter. Safety messages and appropriate response procedures to emergencies or other situations which may arise should be fully understood.



**WARNING**

**Follow Safety Instructions:** Carefully read all safety messages in this manual and safety signs on the meter. Keep safety signs in legible condition. Replace any missing or damaged safety signs.

Learn how to operate the machine and controls properly. Do not allow anyone to operate the meter without proper instructions.



Keep the meter in proper working condition. Only have the machine serviced by a trained service technician on a routine basis. Unauthorized modifications to the meter may impair the function and/or safety and reduce the life of the meter.



**CAUTION**

**Practice Safe Maintenance:** Understand maintenance procedures before doing work.

Always disconnect power to the meter before performing any maintenance.

Keep all parts in good condition. Remove any build up of grease, oil and debris. Ensure that all parts have been properly installed by a certified technician.



**WARNING**

**Proper Source Voltage:** Make sure the source power voltage matches the voltage specified on the flowmeter name plate.



**WARNING**

**Electrical Connections:** Keep all sparks and flames away from battery, as gases given off by electrolyte are explosive. Avoid sparks by connecting the ground cable last and disconnecting it first.

**WARNING**

**Inspecting the System Prior to Operation:** Always inspect the meter before operation. If the meter appears impaired, do not operate the meter and contact a Lindsay Dealer.

**CAUTION**

**Area Lighting:** The owner shall provide area lighting as may be required.

**WARNING**

**Repairing the Meter:** In the event that the IM3000 Flowmeter needs to be repaired; disconnect the power source, depressurize the system and contact the Lindsay Dealer.

Only a Lindsay Dealer should make necessary repairs to the system.

Ensure that only Genuine Lindsay Parts are used on the system.

**WARNING**

**Lifting Components:** Extreme care is needed for lifting components during installation/assembly. Only a Lindsay Dealer using the proper lifting equipment may perform this task.

Use caution when lifting heavy objects. Components weighing in excess of 50 lbs. (22.7 kg.) must be lifted with the assistance of another individual or mechanical lifting device.

**WARNING**

**Impaired Safety Protection:** Do not attempt to operate if protection may be impaired. If the equipment appears to have been changed or operates abnormally, protective devices may be impaired. Do not attempt to operate and have the equipment serviced by a Lindsay Dealer.



**WARNING:** Wear appropriate PPE (Personal Protective Equipment)



**WARNING:** Ensure that power is turned off/disconnected before removing any protective covers.



**WARNING:** Do not use this product in a manner not specified in this manual.

**WARNING**

**Data Cables:** Only use the supplied data cables with this meter. Use of any Lindsay non-approved cable may damage the equipment and void warranty.

**WARNING**

**Battery Storage and Transport:** Lithium batteries are a high energy power source and can become a potential hazard if improperly handled.

Lindsay Manufacturing is not responsible for any battery failures due to operator misuse.

Lithium batteries are non-corrosive. However, extreme heat (contact with open flame or system shorting) will cause the battery to rupture and cause severe injury and damage equipment. Observe the following when handling or transporting batteries:

- When transporting, all packaging must have the proper warning labels clearly displayed on the outside of the containers.
- Do not transport or operate batteries at temperatures beyond their specified range.
- Do not crush, break, or disassemble the battery.
- Do not short circuit, recharge, overcharge, or connect the battery with reversed polarity.
- Do not weld or solder onto the battery casing or within close proximity to the battery.
- Do not submerge the battery in water or apply any fluids onto the battery.
- If the battery is drained of power or damaged, consult Lindsay Manufacturing for replacement.
- Adhere to all local laws and regulations for disposal/recycling of lithium batteries.

**CAUTION**

**Prepare for Emergencies:** Be prepared for any emergency that may occur.

Always wear appropriate Personal Protective Equipment (PPE).

Keep emergency numbers for doctors, hospital, ambulance service and fire department near your telephone.

# Consignes de sécurité pour le débitmètre IM3000



## AVERTISSEMENT

**Sécurité individuelle :** Vous trouverez tout au long de ce manuel et sur tous les panneaux de sécurité des avis de mise en garde (« **DANGER** », « **AVERTISSEMENT** », « **MISE EN GARDE** » et « **AVIS** »), suivis de la description des risques en question et des actions préventives à mettre en œuvre. Ces précautions visent à protéger physiquement l'opérateur et toutes les personnes qui se tiennent à proximité de la machine. Prenez le temps de lire ces précautions.

| Panneaux de gravité des risques   |                      |                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                       |
|-----------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Couleur d'arrière-plan du panneau | Couleur de contraste | Signification/Utilisation                                                                                                                                                                                                                                                                                                                                                                                         | Illustration des panneaux de gravité des risques                                      |
| Rouge                             | Blanc                | Les panneaux de gravité des risques Danger indiquent un niveau de risque pouvant entraîner des blessures graves ou mortelles. Le terme « Danger » est uniquement employé dans les cas les plus extrêmes. Les panneaux de danger ne doivent pas être utilisés pour signaler des risques de dégâts matériels à moins que ces dangers impliquent aussi des risques de blessures physiques correspondant à ce niveau. |    |
| Orange                            | Noir                 | Les panneaux de gravité des risques Avertissement indiquent un niveau de risque modéré qui, s'il est négligé, peut entraîner des blessures graves ou mortelles. Les panneaux d'avertissement ne doivent pas être utilisés pour signaler des risques de dégâts matériels à moins qu'ils n'impliquent aussi des risques de blessures physiques correspondant à ce niveau.                                           |   |
| Jaune                             | Noir                 | Les panneaux de gravité des risques Mise en garde indiquent un niveau de risque faible qui, s'il n'est pas évité, peut entraîner des blessures mineures ou modérées. Les panneaux de mise en garde qui ne comportent pas le symbole d'alerte seront uniquement employés pour signaler des pratiques peu sûres susceptibles d'entraîner des dégâts matériels.                                                      |  |
| Bleu                              | Blanc                | Les panneaux de gravité Avis sont employés pour signaler les pratiques qui n'entraînent pas de blessures corporelles. Le symbole d'alerte n'est jamais utilisé sur ce type de panneau. Au lieu du terme « Avis », le terme « Mise en garde » sans le symbole alerte peut être employé pour signaler un message qui n'implique pas de blessures corporelles.                                                       |  |



## AVERTISSEMENT

**Sécurité de la machine :** Les avis de mise en garde additionnels (« **ATTENTION** » et « **IMPORTANT** ») portent sur la sécurité de la machine et sont suivis d'instructions spécifiques.

**ATTENTION :** Le terme « **ATTENTION** » est employé pour avertir l'opérateur d'un risque d'endommagement potentiel de la machine si une procédure particulière n'est pas respectée.

**IMPORTANT :** Le terme « **IMPORTANT** » est employé en vue de communiquer au lecteur les informations nécessaires pour éviter un endommagement mineur de la machine si une procédure particulière n'est pas respectée.



**AVERTISSEMENT** : Tous les entretiens et opérations de maintenance doivent être effectués par un concessionnaire Lindsay.



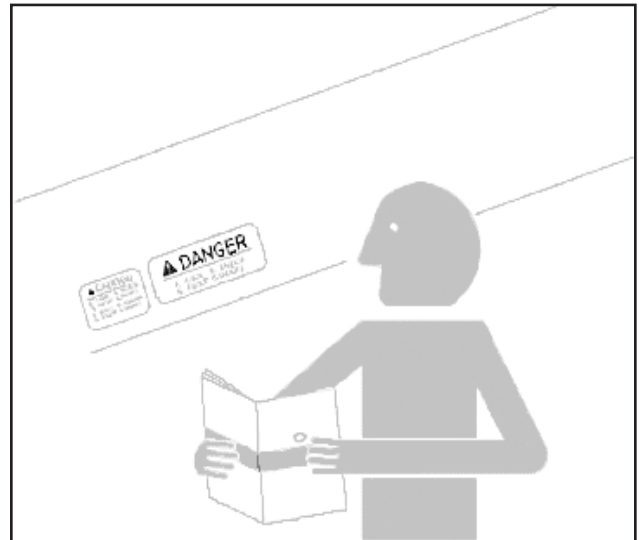
### AVERTISSEMENT

**Déconnexion de la source d'alimentation** : Ne connectez pas la source d'alimentation au débitmètre tant que toutes les opérations d'installation ne sont pas terminées, que tous les capots n'ont pas été correctement installés et que tout le personnel ne se tient pas éloigné de l'équipement.



### AVERTISSEMENT

**Formation** : Toutes les personnes appelées à participer à l'installation, à l'utilisation ou à la maintenance de cet équipement doivent suivre une formation sur les méthodes à mettre en œuvre pour mener à bien leurs obligations, au moment de leur mission initiale et au moins une fois par an ensuite. Il convient de vérifier que ces individus ont bien assimilé cette formation. Les messages de sécurité et les procédures appropriées à suivre en cas d'urgence ou dans d'autres situations doivent être bien compris.



### AVERTISSEMENT

#### Respect des consignes de sécurité

**sécurité** : Lisez attentivement tous les messages de sécurité présentés dans ce manuel ainsi que les panneaux de sécurité présents sur le débitmètre. Veillez à ce que les panneaux de sécurité soient bien lisibles. Remplacez tout panneau de sécurité manquant ou abîmé.

Apprenez à utiliser la machine et les commandes correctement. Ne laissez aucune personne utiliser le débitmètre si elle ne dispose pas des instructions appropriées.

Maintenez le débitmètre en bon état de marche. La machine doit être régulièrement révisée par un technicien qualifié. Toute modification non autorisée peut altérer le fonctionnement et/ou la sécurité du débitmètre, et réduire sa durée de vie.



### MISE EN GARDE

**Pratique sûre en matière de maintenance** : Veillez à bien comprendre les procédures de maintenance avant toute intervention.

Déconnectez toujours l'alimentation du débitmètre avant d'effectuer une opération de maintenance.

Maintenez toutes les pièces en bon état. Éliminez les graisses, huiles et débris qui s'accumulent. Assurez-vous que toutes les pièces ont été correctement installées par un technicien certifié.



### AVERTISSEMENT

**Tension de source appropriée** : Assurez-vous que la tension de source correspond à la tension indiquée sur la plaque signalétique du débitmètre.



### AVERTISSEMENT

**Connexions électriques** : Évitez tout contact de la batterie avec des sources d'étincelles ou de flammes, car les gaz dégagés par l'électrolyte sont explosifs. Évitez la formation d'étincelles en connectant le câble de terre en dernier et en le débranchant en premier.





### **AVERTISSEMENT**

**Inspection du système avant utilisation :** Inspectez toujours le débitmètre avant de l'utiliser. S'il semble endommagé, ne l'utilisez pas et contactez votre concessionnaire Lindsay.



### **MISE EN GARDE**

**Éclairage général :** Le propriétaire de l'équipement doit fournir l'éclairage général requis.



### **AVERTISSEMENT**

**Réparation du débitmètre :** Si le débitmètre IM3000 doit être réparé, déconnectez la source d'alimentation, dépressurisez le système et contactez votre concessionnaire Lindsay.

Seul un concessionnaire Lindsay est habilité à effectuer les réparations nécessaires du système.

Assurez-vous que les pièces du système sont des pièces Lindsay authentiques.



### **AVERTISSEMENT**

**Levage de composants :** Il convient de faire très attention lorsque vous soulevez des composants pendant l'installation/l'assemblage. Seul un concessionnaire Lindsay utilisant l'équipement de levage approprié peut effectuer cette tâche.

Faites attention lorsque vous soulevez des objets lourds. Les composants pesant plus de 22,7 kg (50 livres) doivent être soulevés avec l'assistance d'un tiers ou d'un appareil de levage mécanique.



### **AVERTISSEMENT**

**Protection de sécurité endommagée :** N'utilisez pas le système s'il est possible que la protection soit altérée. Si l'équipement a été modifié ou s'il fonctionne de manière anormale, il se peut que les dispositifs de protection aient été altérés. N'essayez pas d'utiliser l'équipement et faites-le réparer par un concessionnaire Lindsay.



**AVERTISSEMENT :** Portez un équipement de protection individuelle (EPI) adéquat



**AVERTISSEMENT :** Vérifiez que l'alimentation est coupée/débranchée avant de retirer tout couvercle de protection.



**AVERTISSEMENT :** N'utilisez pas ce produit autrement que ce qui est indiqué dans ce manuel.



### **AVERTISSEMENT**

**Câbles de données :** Utilisez uniquement les câbles de données fournis avec ce débitmètre. L'utilisation d'un câble non approuvé par Lindsay peut endommager l'équipement et entraîner l'annulation de la garantie.



## AVERTISSEMENT

**Stockage et transport de la batterie :** Les batteries au lithium sont une source d'énergie importante et peuvent constituer un risque potentiel si elles ne sont pas manipulées correctement.

Lindsay Manufacturing n'est pas responsable des défaillances des batteries en raison d'une mauvaise utilisation.

Les batteries au lithium ne sont pas corrosives. Cependant, une température extrême (contact avec une flamme ouverte ou court-circuit du système) entraînera la rupture de la batterie ainsi que des blessures graves et des dommages au niveau de l'équipement. Respectez les précautions suivantes lors de la manipulation ou du transport des batteries :

- Lors du transport, les étiquettes d'avertissement appropriées doivent être clairement apposées à l'extérieur des conteneurs.
- Ne transportez pas de batteries ou ne les faites pas fonctionner à des températures qui ne sont pas comprises dans la plage indiquée.
- N'écrasez pas, ne cassez pas ou ne démontez pas la batterie.
- Ne créez pas de court-circuit, ne rechargez pas, ne surchargez pas ou ne connectez pas la batterie en inversant la polarité.
- Ne soudez pas au-dessus du boîtier de la batterie ou à proximité immédiate de la batterie.
- N'immergez pas la batterie dans l'eau et n'appliquez aucun liquide sur la batterie.
- Si la batterie est déchargée ou endommagée, consultez Lindsay Manufacturing pour la faire remplacer.
- Respectez toutes les lois et réglementations locales en ce qui concerne la mise au rebut/le recyclage de batteries au lithium.



## MISE EN GARDE

**Préparation aux situations d'urgence :** Soyez prêt à gérer la moindre urgence.

Portez toujours les équipements de protection personnelle appropriés.

Gardez les numéros de téléphone des médecins, hôpitaux, services d'ambulance et pompiers près de votre téléphone.

# IM3000 Irrigation Magnetic Flowmeter Installation Instructions

## Overview

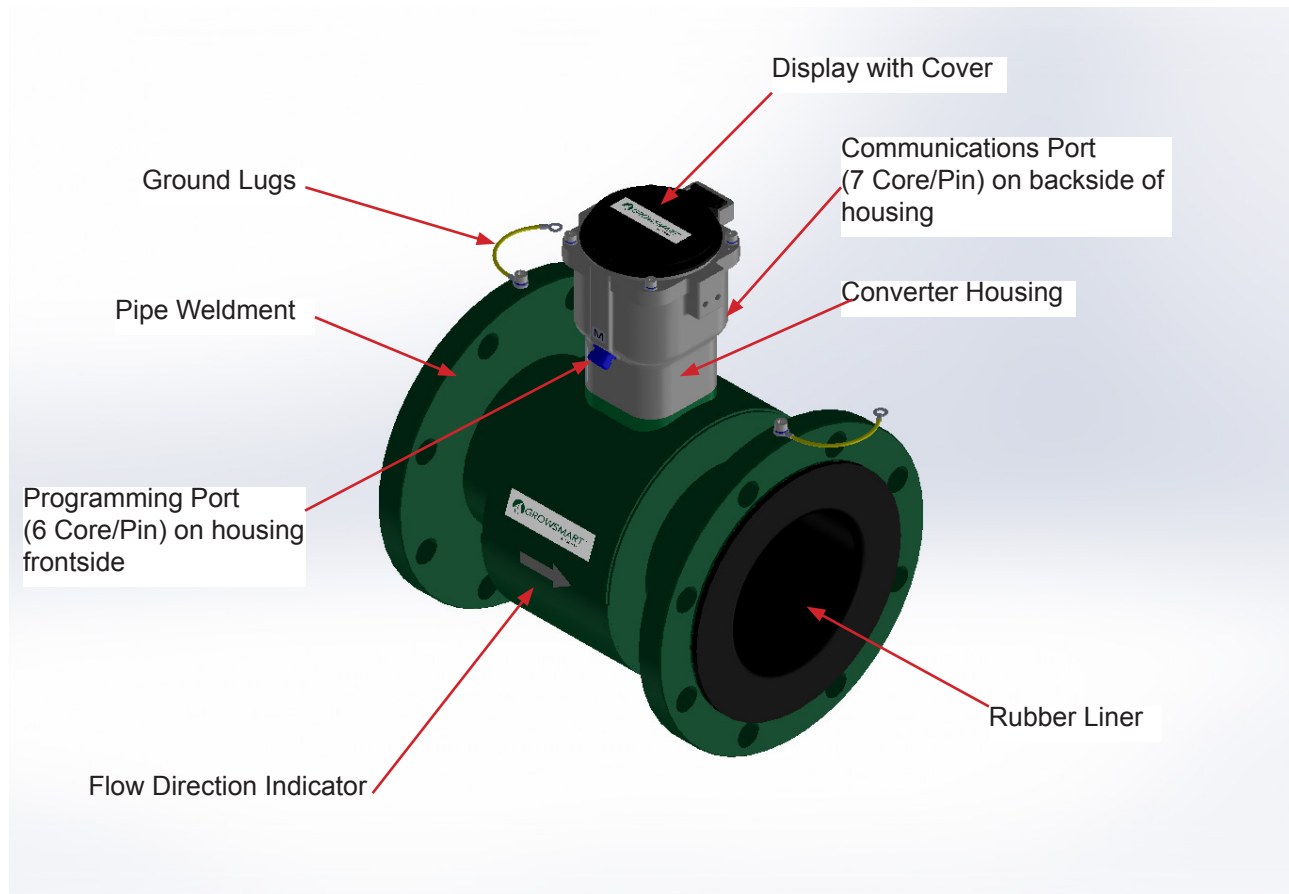
These instructions describe the Growsmart IM3000 Magnetic Flowmeter features as well as provide instructions for meter installation, specifications, user interface explanation and troubleshooting.

The IM3000 comes in these models according to pipe diameter size.

- IM3000-04 for 4" pipe.
- IM3000-06 for 6" pipe.
- IM3000-08 for 8" pipe.
- IM3000-10 for 10" pipe.
- IM3000-12 for 12" pipe.

## Features

The Growsmart IM3000 Magnetic Flowmeter provides the following features that set it apart from the competition.



## Transportation

During shipping or transporting of the flowmeter, avoid exposing the meter to strong shock or vibrations or impact. Avoid scratching the rubber liner inside the pipe.

## Storage

If possible, store the meter in its unopened packaging until actual installation.

Avoid storing the meter outdoors for an extended period of time. Avoid rain and any direct contact with fluids prior to installation.

Avoid exposing the signal converter to direct sunlight.

## Installation

### Performance and Operating Specifications

The IM3000 is constructed from the following materials:

The pipe consists of epoxy coated carbon steel, with a rubber liner and EPDM constructed O-ring.

The electrodes are made of 316 stainless steel and the electronics housing is constructed from die-cast aluminum with a powder-coated exterior.

The flanges are ANSI 150# which provides a maximum pressure rating of 150 psi.

The IM3000 is rated for operating between 14°F to 131°F (-10°C to 55°C) and should be stored in temperatures between -40°F to 140°F (-40°C to 60°C).

The IM3000 has the IP68 and NEMA 4x electrical enclosure ratings for environmental protection of the electrical components.

The IM3000 is available in 4", 6", 8", 10" and 12" pipe sizes. With the following accuracies for their given pressure ranges. (See the following chart.)

| Pipe Size     | Measurement Range GPM (LPM) |                 | Accuracy       |                 |
|---------------|-----------------------------|-----------------|----------------|-----------------|
|               | Minimum                     | Maximum         | 0-10% Max Flow | 0-100% Max Flow |
| 4" (10.2 cm)  | 12 (45.4)                   | 1000 (3785)     | ±2%            | ±1%             |
| 6" (15.2 cm)  | 30 (113.6)                  | 2500 (9463)     | ±2%            | ±1%             |
| 8" (20.3 cm)  | 50 (189.3)                  | 4480 (16,958)   | ±2%            | ±1%             |
| 10" (25.4 cm) | 80 (302.8)                  | 7010 (26,535)   | ±2%            | ±1%             |
| 12" (30.5 cm) | 115 (435.3)                 | 10,090 (38,195) | ±2%            | ±1%             |

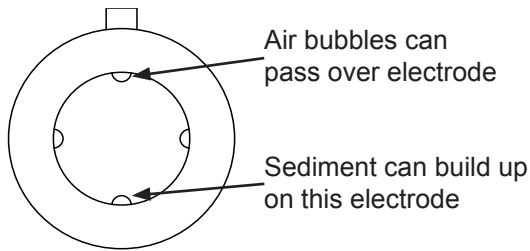
IM3000 flowmeters are equipped with conductivity-based empty pipe warning functionality.

All IM3000 are factory calibrated and require no field calibration.

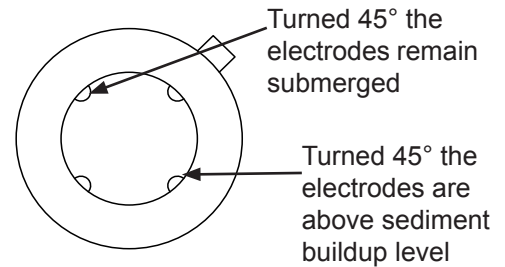
## Meter Positioning

It is important to install flowmeters so the readings are always accurate. The meters are designed to give a zero reading should one or more electrodes become exposed. Air bubbles and sediment in the pipe can cause false readings.

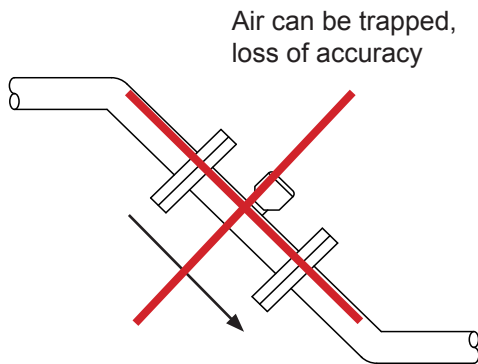
For the best performance, install the flowmeter in pipeline locations where the pipe will be full when there is flow. Also, rotating the pipe 45° (or one flange hole position) will offset the electrodes enough to avoid air bubble and sediment locations that typically occur over center within the pipe. The following diagram shows proper and improper installation options.



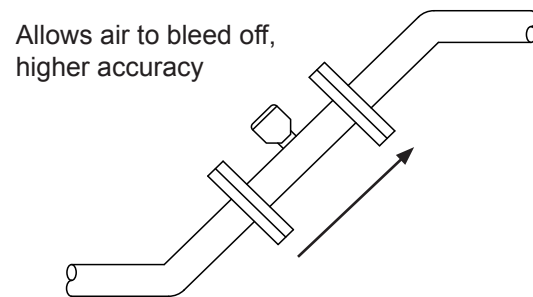
**Problematic Sensor Orientation**



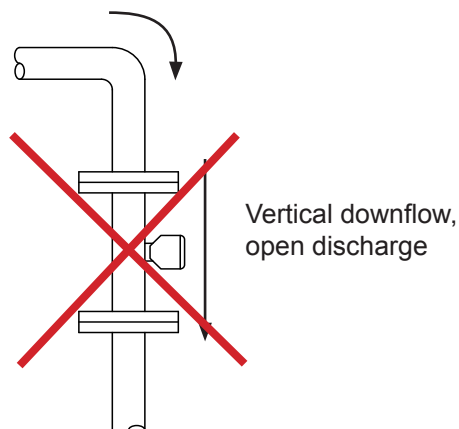
**Recommended Sensor Orientation**



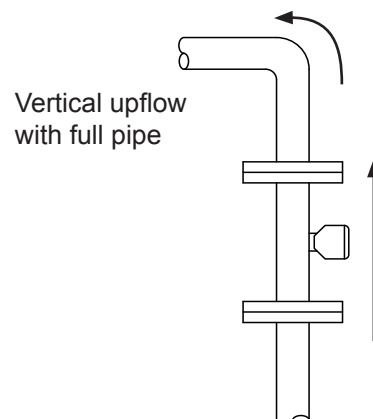
**Problematic Meter Positioning**



**Recommended Meter Positioning**



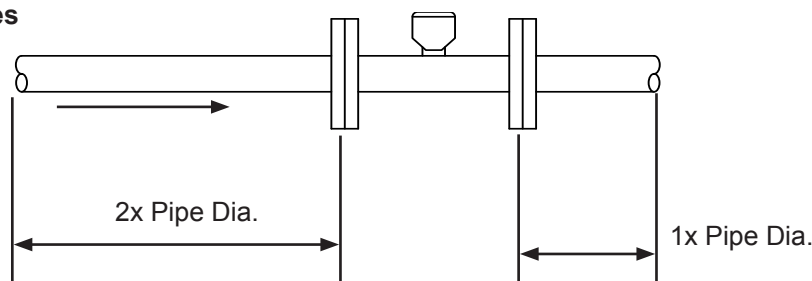
**Problematic Meter Positioning**



**Recommended Meter Positioning**

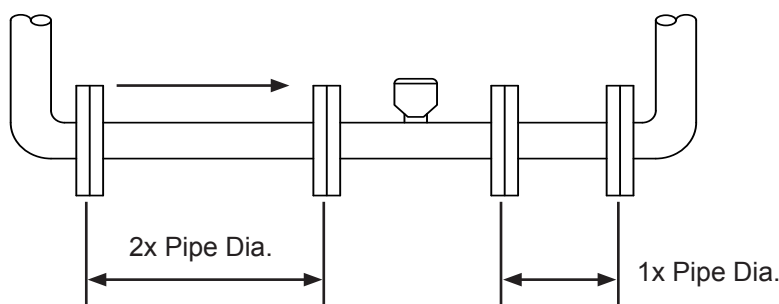
The following diagram shows proper straight pipe installation recommendations.

### Inlet and Outlet Distances



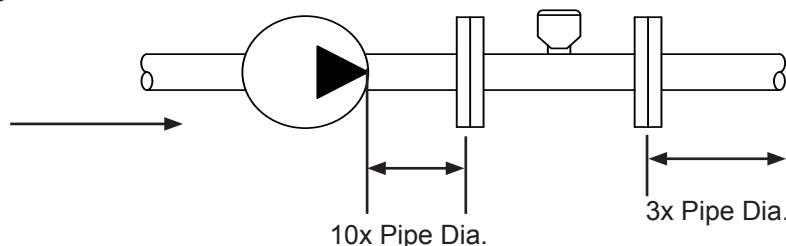
Minimum length of straight pipe at the meter inlet must be two times the pipe diameter and one times the pipe diameter at the meter outlet. Expansion joints can be installed in the pipeline after the meter.

### Elbow Distance



Elbows should not be placed closer than two times the pipe diameter to the meter inlet and one times the pipe diameter to the meter outlet.

### Pump Distance



Turbulence from pump actuation can cause drops and spikes in reading if meters are install too close to the pump outlet. Meters should be installed downstream from the pump discharge and never at the pump inlet. The minimum straight pipe length for downstream installation must be 10 times the pipe diameter at the meter inlet and three times the pipe diameter at the meter outlet.

In chemigation applications, the IM3000 flowmeter must be placed either upstream from the chemical injection line or far enough downstream (typical pump distance) that complete mixing occurs before the solution reaches the meter. Proper placement will prevent spikes and drops in readings that result when fluids with varying conductivity pass through the meter.

The measured fluid must have a minimum 20 $\mu$  Siemens/cm conductivity.



### WARNING: Electrical Shock

When installing IM3000 flowmeters to a plastic pipeline, or when externally powered, it is very important to ground the meter to avoid electrical shock hazard. Failure to do so can result in electrocution.

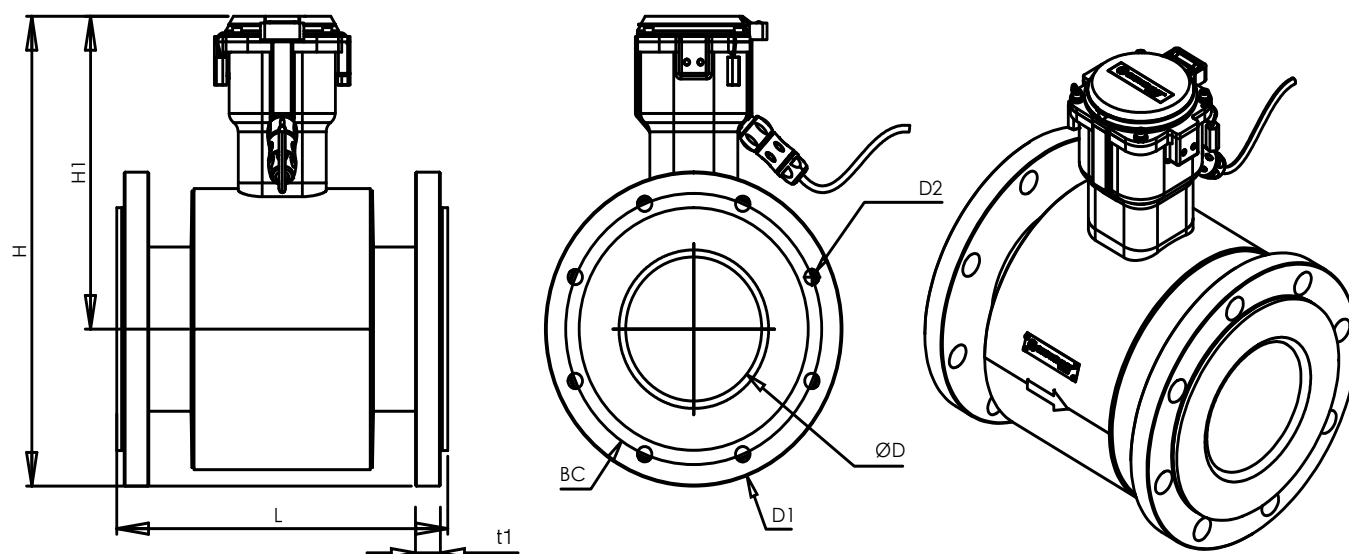
## Flow Meter Dimensions

The following dimensions and weights are provided for pipeline design and installation.

### Meter Weights

| Meter Model | Lindsay P/N | Weight in lbs. (kg) |
|-------------|-------------|---------------------|
| IM3000-04   | 1608505     | 44 (20)             |
| IM3000-06   | 1605551     | 60 (27)             |
| IM3000-08   | 1605548     | 97 (44)             |
| IM3000-10   | 1605549     | 130 (59)            |
| IM3000-12   | 1605550     | 185 (84)            |

### Meter Dimensions



Dimensions are in Inch (mm).

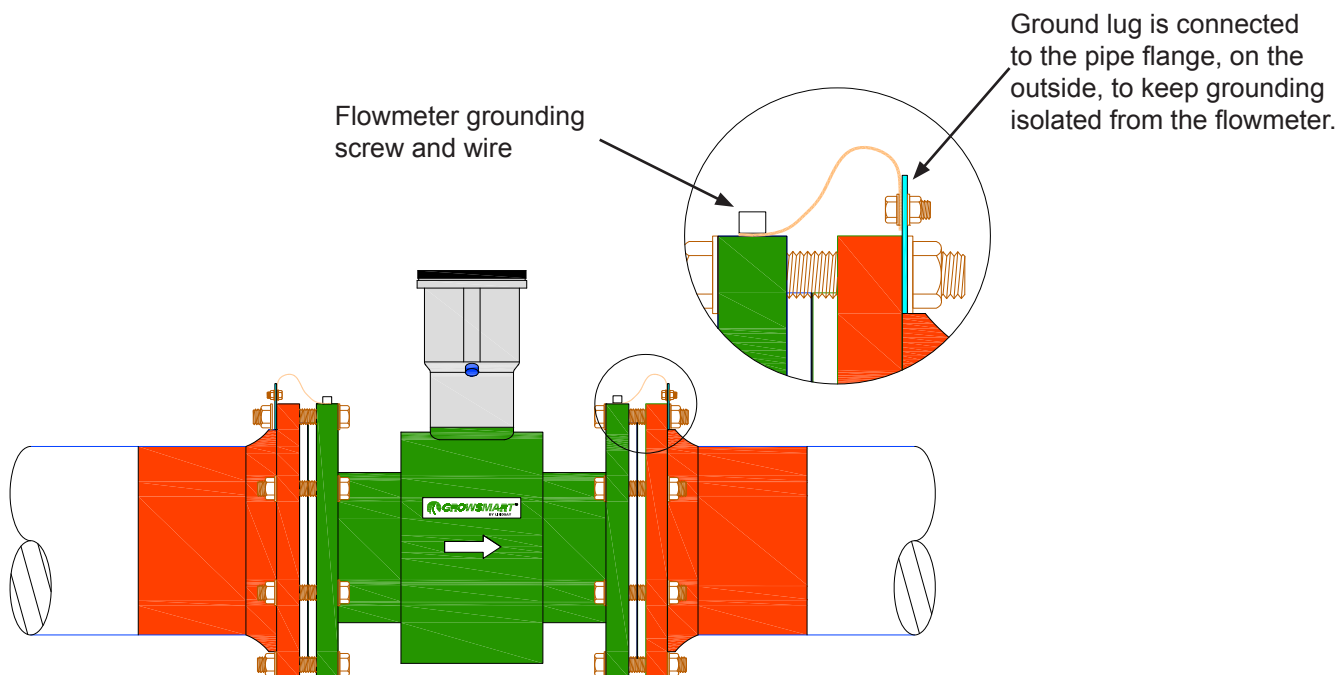
| Nom. Ø   | H           | H1          | L           | ØD          | D1          | t1        | BC          |
|----------|-------------|-------------|-------------|-------------|-------------|-----------|-------------|
| 4 (100)  | 14.30 (363) | 9.80 (249)  | 10.24 (260) | 3.15 (80)   | 9.00 (227)  | 0.94 (24) | 7.50 (191)  |
| 6 (150)  | 16.00 (406) | 10.50 (267) | 12.28 (312) | 5.12 (130)  | 11.00 (279) | 1.00 (25) | 9.50 (241)  |
| 8 (200)  | 18.00 (455) | 11.20 (284) | 14.25 (362) | 6.46 (164)  | 13.50 (343) | 1.13 (29) | 11.75 (299) |
| 10 (250) | 20.30 (515) | 12.30 (312) | 18.19 (462) | 8.58 (218)  | 16.00 (406) | 1.19 (30) | 14.25 (362) |
| 12 (300) | 22.70 (576) | 13.20 (335) | 20.16 (512) | 10.31 (262) | 19.00 (483) | 1.25 (32) | 17.00 (432) |

| Nom. Ø   | D2        | # of Holes |
|----------|-----------|------------|
| 4 (100)  | 0.75 (19) | 8          |
| 6 (150)  | 0.88 (22) | 8          |
| 8 (200)  | 0.88 (22) | 8          |
| 10 (250) | 1.00 (25) | 12         |
| 12 (300) | 1.00 (25) | 12         |

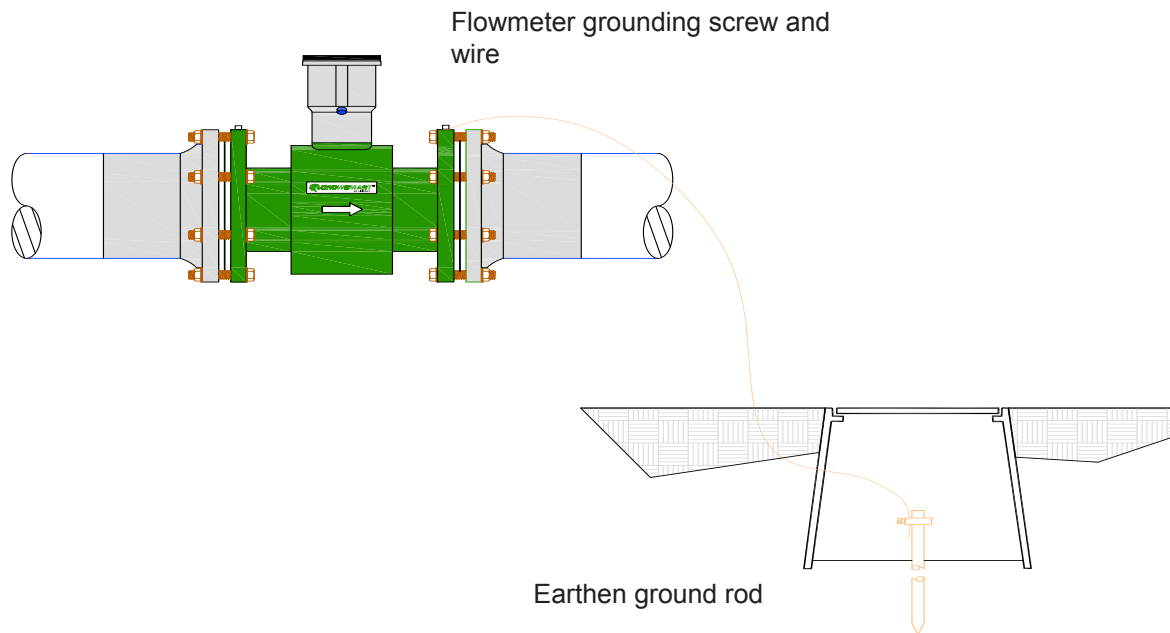
## Grounding

When grounding on metal pipe, the electric potential of the fluid, meter and surrounding pipe must be equalized. This is done by connecting the ground wires on the flowmeter body to one of the lug locations on the mating flange connection.

**NOTE:** Make sure the ground wire or lug is between the flange bolt head (or nut) and the outside surface of the mating pipe flange. This grounding must be completely isolated from the flowmeter. (See the following diagram.)

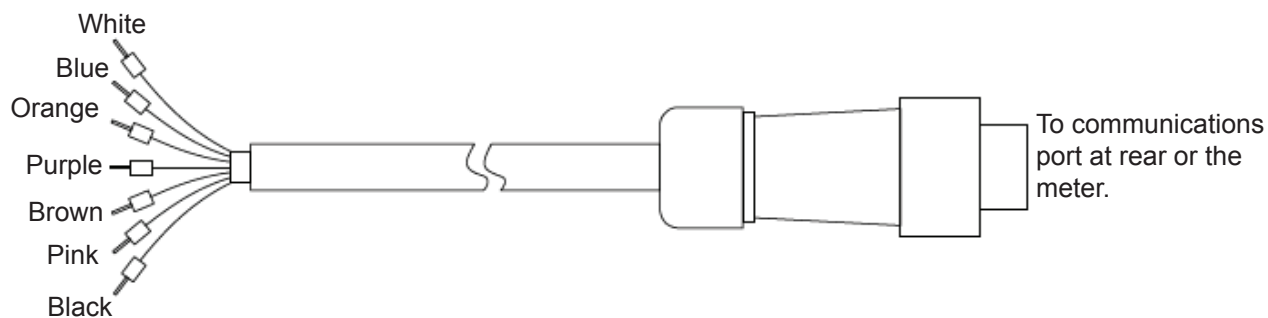


With plastic pipe, a grounding rod or other ground-to-earth connection must be installed.





## Wiring IM3000 Power / Output Cable

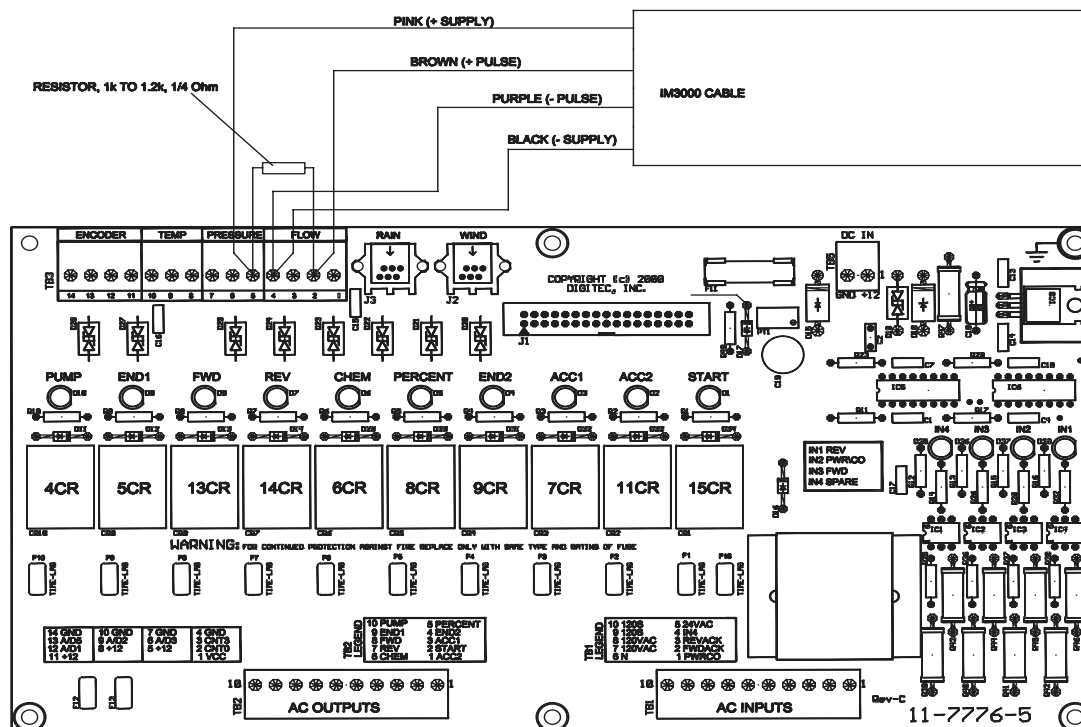


| Wire Color | Core # | Function              |
|------------|--------|-----------------------|
| White      | 1      | Communications Ground |
| Blue       | 2      | M_RXD                 |
| Orange     | 3      | M_TXD                 |
| Purple     | 4      | Pulse Output (-)      |
| Brown      | 5      | Pulse Output (+)      |
| Pink       | 6      | External Power (+)    |
| Black      | 7      | External Power (-)    |

## Wiring BOSS to the IM3000

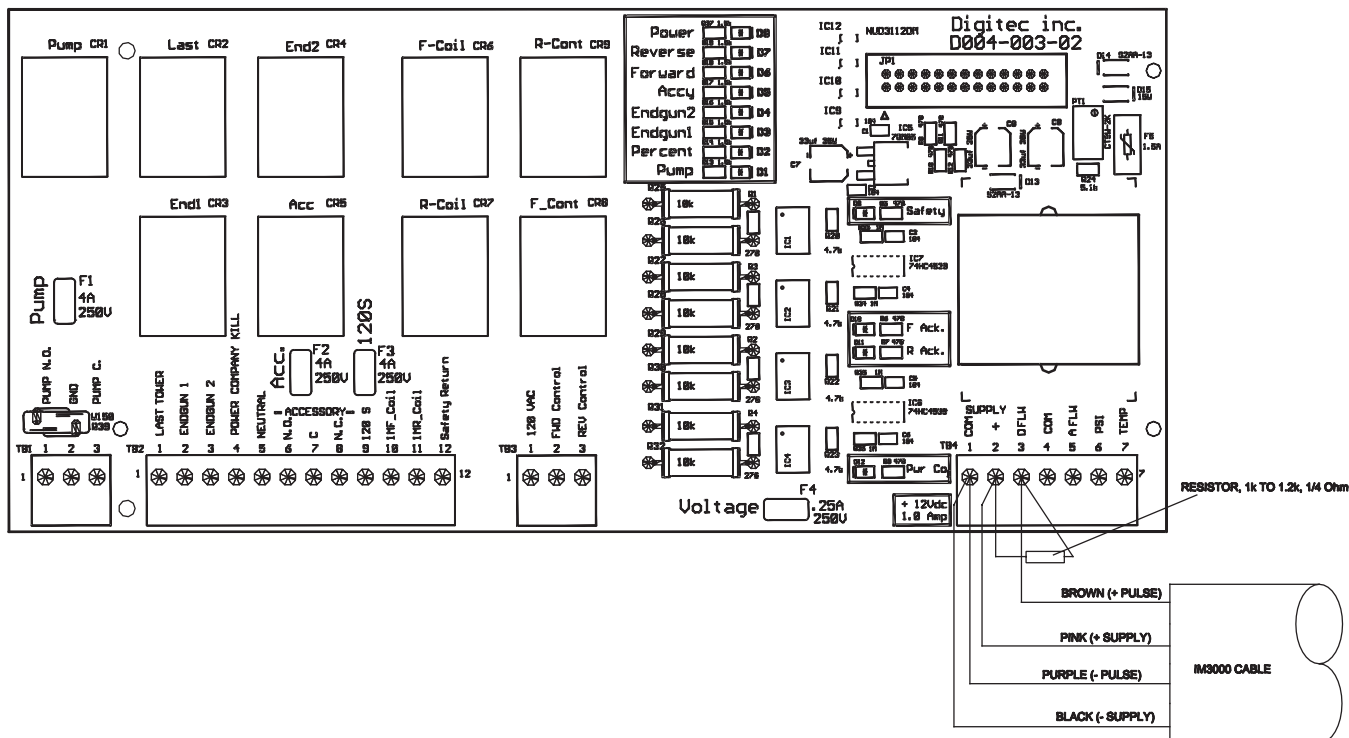
Pink (+) Supply to TB 3.5  
Black (-) Supply to TB 3.4  
Purple (-) Pulse to TB 3.4  
Brown (+) Pulse to TB 3.2  
Resistor to TB3.2 and TB3.5  
Bare drain wire can be connected to panel ground.

| IM3000 K-Factors |              |               |
|------------------|--------------|---------------|
| Pipe Size        | Raw K-Factor | BOSS K-Factor |
| 4"               | 12,000       | 12            |
| 6"               | 6,000        | 6             |
| 8"               | 3,000        | 3             |
| 10"              | 2,000        | 2             |
| 12"              | 1,500        | 1.5           |



## Wiring VISION to the IM3000

Pink (+) Supply to TB 4.2  
Black (-) Supply to TB 4.1  
Purple (-) Pulse to TB 4.1  
Brown (+) Pulse to TB 4.3  
Resistor to TB 4.2 and 4.5  
Bare drain wire can be connected to panel ground.



| IM3000 K-Factors |              |                 |
|------------------|--------------|-----------------|
| Pipe Size        | Raw K-Factor | VISION K-Factor |
| 4"               | 12,000       | 12              |
| 6"               | 6,000        | 6               |
| 8"               | 3,000        | 3               |
| 10"              | 2,000        | 2               |
| 12"              | 1,500        | 1.5             |

## Vibrations

Vibrations in the system pipeline can damage the flowmeter and should be negated. The meter meets IEC 68-2-64 standards for shock resistance. However, if there is significant vibration in the pipeline, support brackets can be installed on both sides of the meter to help eliminate vibration.

## Power Supply

The IM3000 flowmeter can be powered externally or by battery power.

An external power source that provides 8 to 32 VDC at 30mA can be used. When installed, the battery pack can be used as a backup power source.

A battery pack consisted of 4 lithium 3.6V 19Ah “D” sized batteries with an estimated 3 to 5 years of life. An external expansion battery pack can be used to double battery life. This expansion pack consists of 4 additional 3.6V “D” sized lithium batteries that link to the meter body via IP68 cable connection and secured onto the meter.

An indicator on the meter will show a battery symbol with bars representing the power level of the batteries. When the battery power is depleted, the battery symbol will show no power level bars (empty) and a “Low Bat” warning will display.

## Battery Pack Replacement

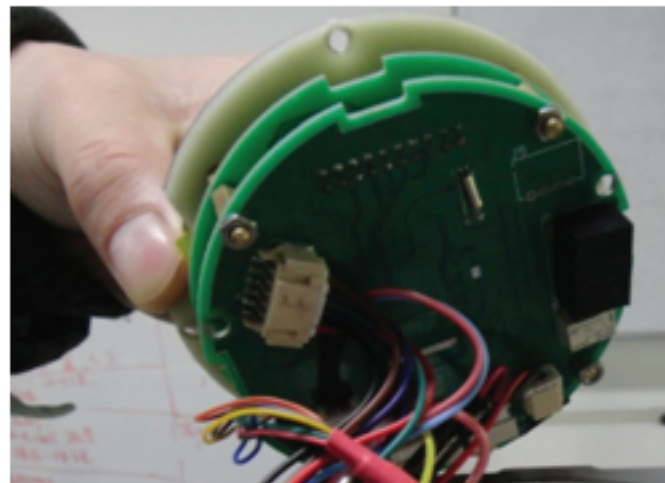
1. Replace the by removing the socket-head cap screws, using a 5mm Allen Wrench. Retain the screws and washer for re-assembly.



2. Remove the phillips-head screws from the face plate. Retain the screws for re-assembly.

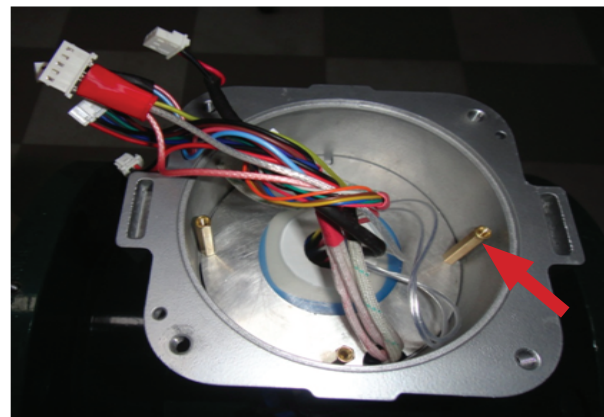


3. Lift the Display/PCB unit from the meter housing.



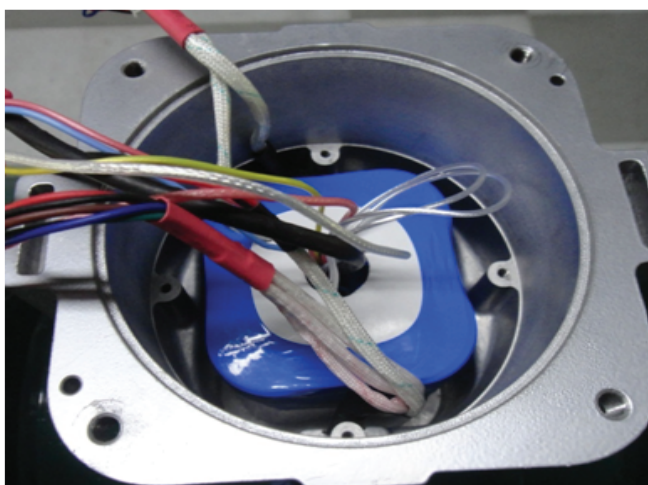
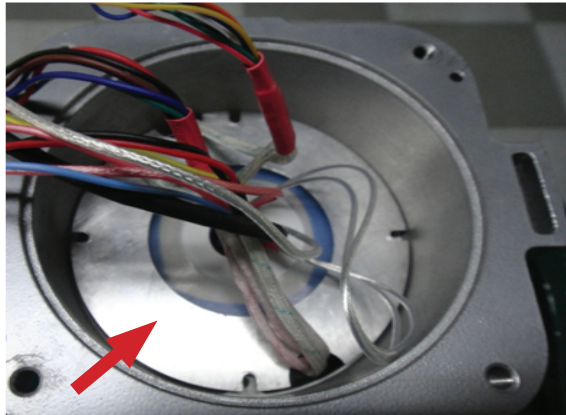
4. Disconnect the cable harness from the PCB unit.

5. Remove the copper standoff fasteners from the aluminum shield.

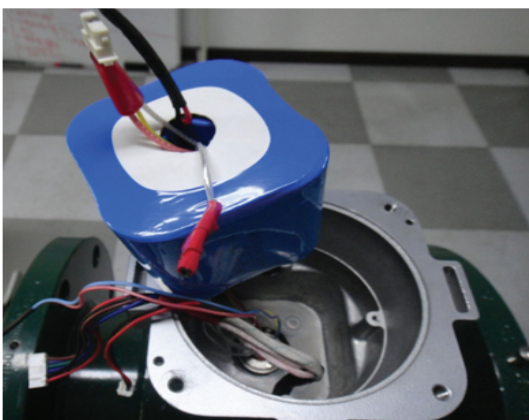




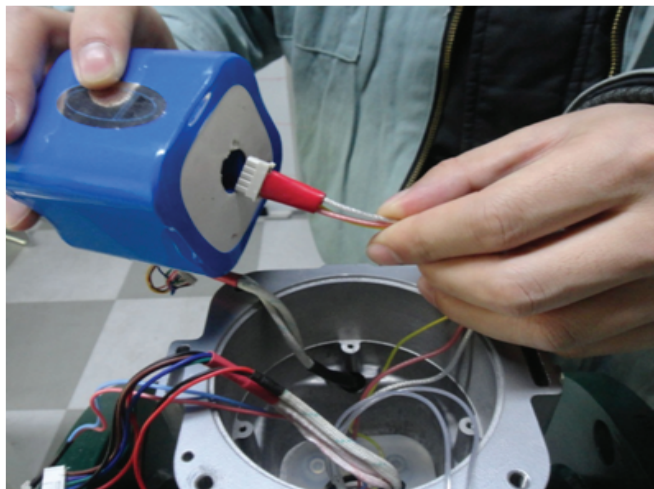
6. Remove the aluminum shield and the silicone gasket underneath which hold the battery pack in place.



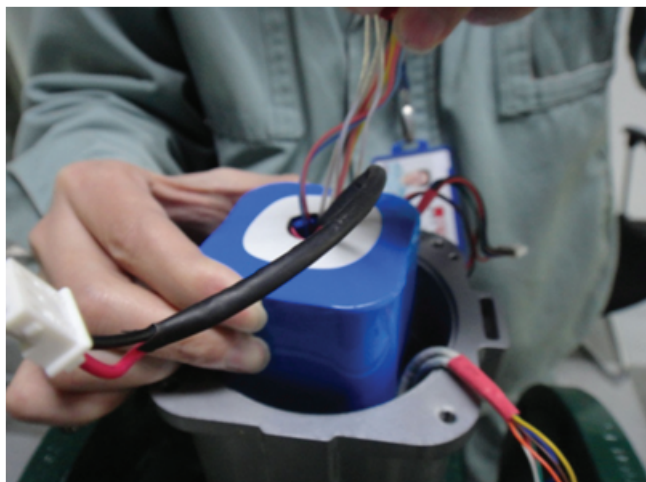
7. Route the signal and excitation cable harnesses through the center of the battery pack and remove the battery pack from the meter housing.



8. Take the new battery pack and route the signal and excitation cable harnesses through the center of the battery pack. Place the battery pack into the meter housing.

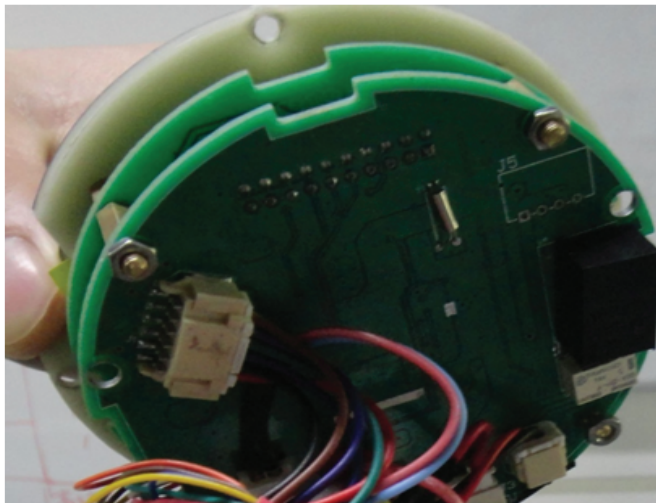


9. Ensure no cable harnesses are caught between the bottom of the battery pack and the meter housing.



10. Re-install the silicone gasket, aluminum shield and copper standoffs.

11. Re-assemble the cable harness to the PCB and re-install the PCB into the meter housing. **NOTE:** the connectors on the PCB are designed to fit into their designated sockets only. DO NOT force a wire connection that does not seem to fit.



12. Replace the O-ring seal on the meter housing before re-installing the housing cover. Apply silicone grease to the O-ring before placing it into the O-ring groove. Omitting this application may cause leaks into the housing through the seal.

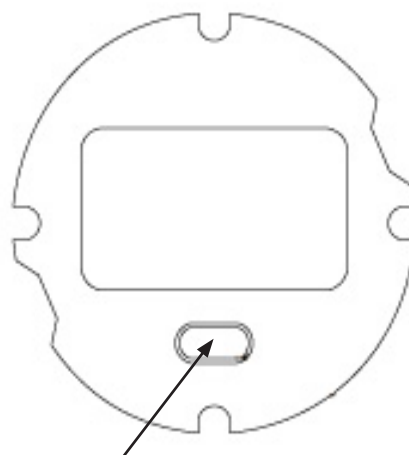


## Outputs

The IM3000 provides 5 output types:

1. Total gallons (x 1000) to a rate of Gallons per Minute (GPM). This is the default.
2. Total Acre Inches to a rate of GPM.
3. Total Acre Feet to a rate of GPM.
4. Total Cubic Meters to a rate of Cubic Meters per Hour (M<sup>3</sup>H).
5. Total Cubic Meters to a rate of Liters per Minute (LPM).

A magnetic toggle reed switch, located below the display, is used to change between any of these output units. Simply pass a magnet over the reed switch one time to change the display to the next set of output units of measure. (Five passes would return to the original set of units of measure.)



Reed Switch: Pass a magnet over this switch to toggle between display settings.

## User Interface

The flowmeter uses a low power consumption dot matrix LCD rate/ total display. The screen displays two line of information. The top line shows the total flow accumulation. The bottom line displays the flow rate.



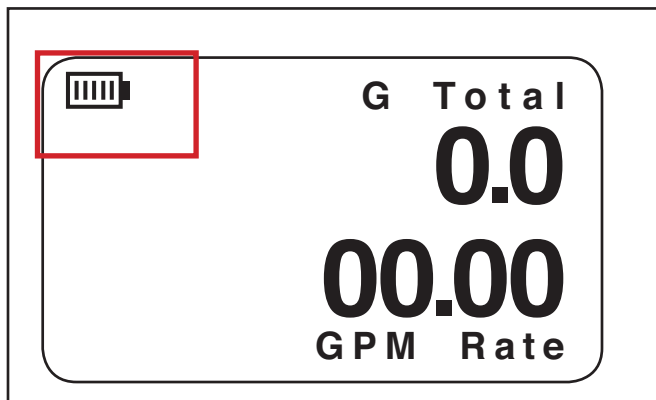
The meter provides the following three power status displays. The screen will be blank if there is no power to the meter.



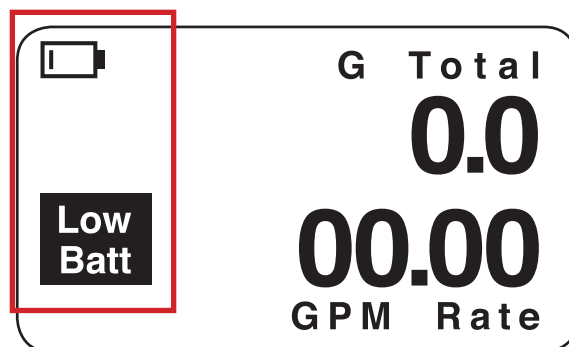
If there is an external power source, the letter "P" will display.



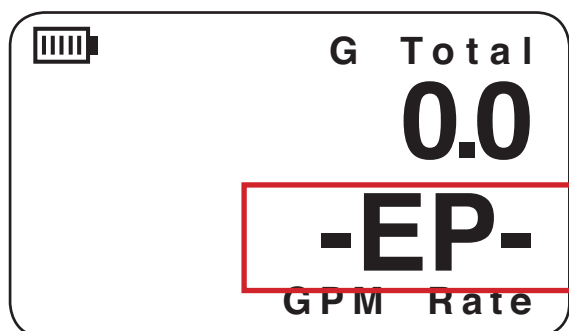
For battery power, a little battery icon displays in the top-left corner of the screen.



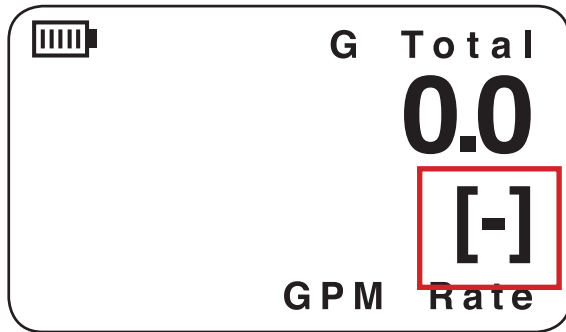
The meter continuously monitors battery life. When the battery power is low, the following warning will display and the battery cell icon will show an empty battery. Battery replacement is required at this time.



When the meter detects an empty pipe, the meter will stop measuring and display the "EP" warning.



If direction of flow of the medium is reversed, the meter will stop measuring and display the “-” warning.



## Troubleshooting

| Problem                                           | Possible Cause                                               | Solution                                                                                                                                |
|---------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| No display                                        | Dead battery                                                 | Replace battery pack                                                                                                                    |
| Flow rate reads zero when there is flow           | Flow is below cutoff                                         | Reading will resume when flow increases                                                                                                 |
|                                                   | There is air in the meter                                    | Reposition meter for full pipe                                                                                                          |
| Display reads “-”                                 | Meter is installed backwards                                 | Note flow direction arrow, reverse meter position                                                                                       |
| Flow rate intermittently drops when there is flow | There is air in the meter                                    | Reposition meter for full pipe or rotate to avoid bubbles                                                                               |
| Jumpy reading                                     | Improperly equalized                                         | Check for proper equalization                                                                                                           |
|                                                   | Pulsing flow                                                 | Use external power source (allows more flow averaging)                                                                                  |
|                                                   | Rapidly changing conductivity (for chemigation applications) | Install meter upstream of the chemigation entry location (or far enough downstream for thorough fluid mixing before reaching the meter) |

## Spare Parts

| Part No. | Description                    | Contents                                                   |
|----------|--------------------------------|------------------------------------------------------------|
| 1608474  | Replacement Battery Kit        | Four Battery Pack, Replacement O-Ring, 25g Silicone Grease |
|          | 15 ft. Power/ Output Cable     |                                                            |
| 1608473  | 25 ft. Power/ Output Cable     |                                                            |
|          | 50 ft. power/ Output Cable     |                                                            |
|          | Housing Set Screw (Housing)    | M5 Hex Screws (x4), M5 Spring Washers (x4)                 |
|          | Housing Set Screw (PCB)        | M4 Standoffs (x4), M3 Phillips Flat Head Screws (x4)       |
|          | Electronic Housing Cover Ass'y | Housing Cover, Glass, O-Ring and Plastic Lid (assembled)   |
|          | Electronic Housing Ass'y       | Housing, Waterproof Connector, O-Rings and Cable Harness   |
|          | Tamper Seal                    |                                                            |
|          | PCB Ass'y with LCD             |                                                            |
|          | Sensor Logo Sticker            |                                                            |
|          | Display Cover Logo Sticker     |                                                            |



| Revisions  |          |       |               |             |
|------------|----------|-------|---------------|-------------|
| Date       | Revision | ECN   | Published ECN | Description |
| 10/17/2014 | A        | 32937 | 32937         | New Release |

