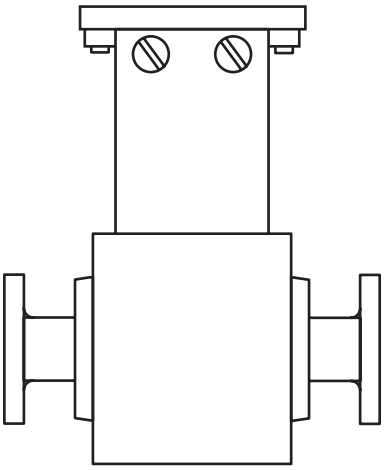
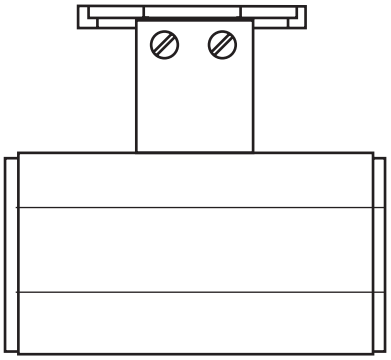
Installation Manual

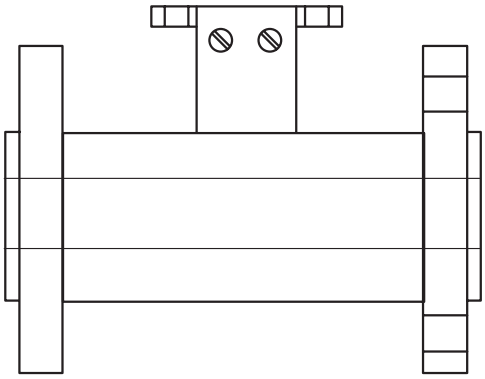
Electromagnetic Flowmeters

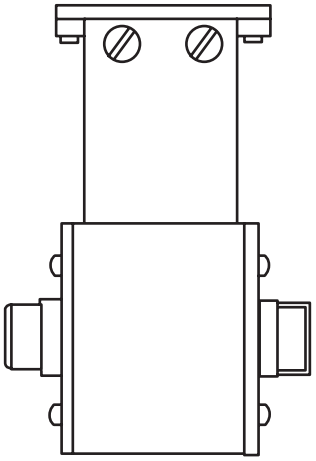
Models HMS501, HMS600, HMS1000, HMS2400, HMS2500, and HMS5000

LIQUID CONTROLS
A Unit of IDEX Corporation
IDEX CORPORATION









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Publication Updates and Translations

The most current English versions of all Liquid Controls publications are available on our website, **www.lcmeter.com**. It is the responsibility of the Local Distributor to provide the most current version of LC Manuals, Instructions, and Specification Sheets in the required language of the country, or the language of the end user to which the products are shipping . If there are questions about the language of any LC Manuals, Instructions, or Specification Sheets, please contact your Local Distributor.

⚠ WARNING

- Before using this product, read and understand the instructions.
- Save these instructions for future reference.
- All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of equipment and/or systems in accordance with all applicable codes and ordinances.
- Failure to follow the instructions set forth in this publication could result in property damage, personal injury, or death from fire and/or explosion, or other hazards that may be associated with this type of equipment.

Introduction

- This manual is an integral part of the product. Carefully read and understand all the instructions contained in this publication since it contains important information regarding safety, operation, and maintenance of the instrument.
- The product and technical information contained in this manual may be changed without notice.
- This flow meter must be used only in the applications for which it has been designed. The improper use, tampering with the instrument, or substitutions of any components immediately voids the product warranty.
- The manufacturer is considered responsible only if the instrument is used in its original configuration.
- Reproduction of this manual or of software supplied with this instrument is expressly forbidden.

General

This manual contains information concerning the application, installation, and operation of the HMS501, HMS500, HMS1000, HMS2410, MS2500, and HMS5000 full bore flow meters. Keep a copy of this manual with the flow meter for future reference.

Applications

LCMag electromagnetic flow meters are designed for liquid flow measurement in most industries including water & waste water, food & beverage, pharmaceutical, chemical, and more. These meters are not suitable for measurement of gases, petroleum products, or other liquid media with low electrical conductivity. Minimum electrical conductivity of measured liquids is 5µS.

Basic Components

An LCMag electromagnetic flow meter system consists of two basic components: the flow sensor, and the converter. The flow sensor is the lined tube through which the liquid flows for measurement. The converter is the electronic control that provides power to the electromagnetic coils surrounding the flow tube, and that provides signal processing, flow calculation, and display outputs for the user.

The wetted parts of the flow meter (liner and electrodes) must be selected for compatibility with the liquid being measured.

The converter must be selected for compatibility with the environment in which it will operate.

Unpacking

Always inspect the instrument for damage from shipping upon receipt. File a damage claim with the carrier if damage is discovered.

Transportation and Handling

Do not lift the instrument from the carton by the converter head. Use lifting eyes where provided for larger meters, or lift by the sensor body.

When transporting, never use forks of a forklift, chains, wire slings, or any other object in the flow tube of the meter. Serious damage to the instrument will result.

Start up and Maintenance

- Before starting up the instrument, always make sure that there is a suitable connection to ground as described on page 6 of this manual.
- Periodically verify the following: the integrity of the power supply cables, the proper tightening of the sealing elements (cable glands, covers, etc.), the mechanical attachment of the instrument to the pipe or to the wall stand.

Safety Legend

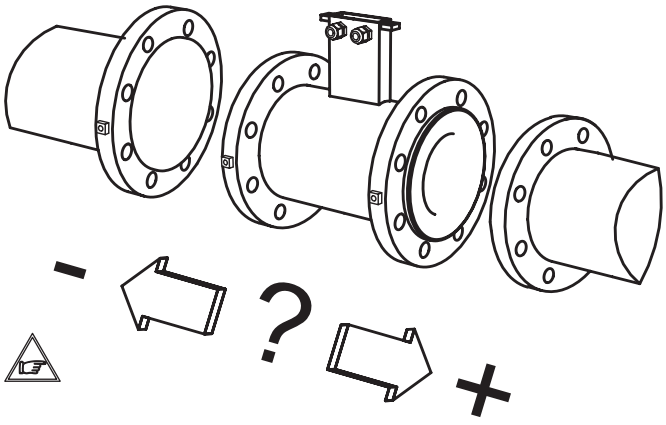
	Before using the instrument, always establish a reliable electrical connection to ground.
	Avoid any attempt to repair the instrument. If the instrument is not functioning properly, please call the nearest authorized representative.
	Pay maximum attention during operation.
	Caution.
	Danger.

Installation

Flow Direction

Before installing the sensor, confirm the direction of the liquid flow in the piping. The sign of the flow rate **is positive,** when the flow direction is from **- to +** as printed on the nameplate on the sensor body.

If flow direction is reversed after the installation, it is sufficient to reverse the sign of the KA coefficient in the converter (refer to converter installation manual).

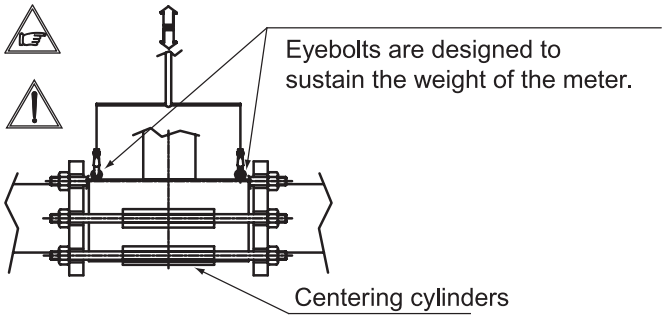


Lifting Meters with Eyebolts

Recommended hoisting procedure for sensors with lifting eyebolts.

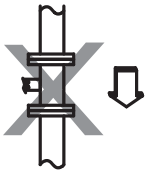
NOTE: For sensor models HMS1000 and larger, the use of centering cylinders is recommended.

To facilitate installation, sensors with nominal diameter greater than 6" are provided with eyebolts that must be used for lifting as illustrated in the drawing to the right.



Sensor Installation Guidelines

NO



For vertical installations with descending flow direction contact the manufacturer.

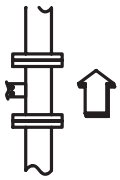
Avoid the installation of the sensor in a long unsupported pipe line. Always provide adequate support.

Avoid operation of the instrument with the pipe partially empty.

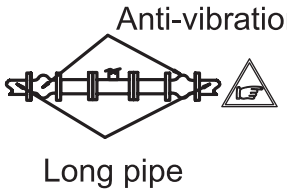
Avoid installation of this instrument near bends in the piping or accessories such as valves.

Avoid using the closing force of the nuts to draw the meter and pipe together over a large distance.

YES

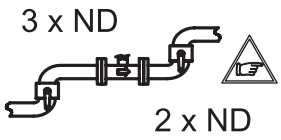


For vertical installations, use ascending flow conditions, only.

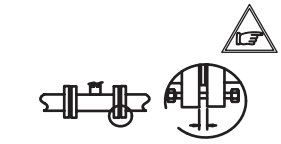


For installations on long runs of pipe use anti-vibration joints, as shown

During operation of the instrument, the pipe must be completely full of liquid, or completely empty.



Install the sensor away from bends in the pipe and accessories such as valves.



Bring the flange of the piping as close as possible to the flange of the sensor before tightening the nuts on the connection bolts.

Operating Temperature Range

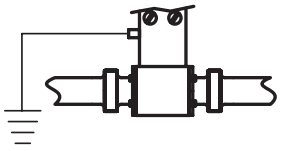
	Ebonite Liner				Polypropylene Liner				PTFE Liner			
	Liquid Temp.		Ambient Temp.		Liquid Temp.		Ambient Temp.		Liquid Temp.		Ambient Temp.	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
°F	32	176	23	140	32	140	32	140	-4	302	14	140
°C	0	80	-5	60	0	60	0	60	-20	150	-10	60

Installation

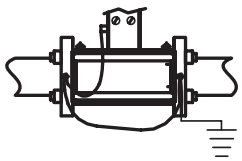
Grounding Instructions

For correct operation of the meter, it is essential that the sensor and the liquid are at the same electrical potential. Always connect the sensor and the converter to ground.

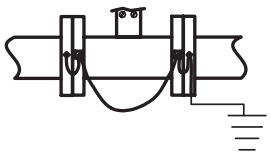
Grounding for metallic pipes



Sensors with ground socket on the connection box

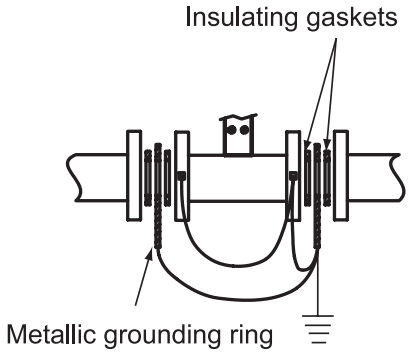


Wafer sensors



Flanged sensors

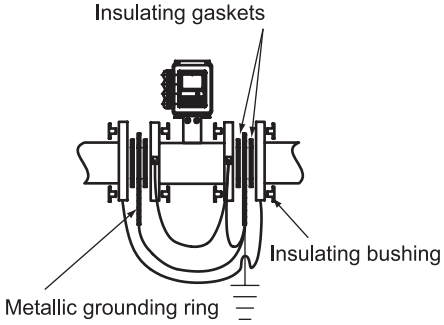
Grounding with insulating pipe



If the sensor is to be mounted on a pipe made of an insulating material, it is necessary to perform the following:

- Install two metallic grounding rings between the sensor flanges and the counter flanges of the pipe line or:
- Use a sensor with the additional grounding electrode.

Grounding with cathode protection pipe



If the sensor is to be installed in piping with cathode protection, it is necessary to perform the following:

- Insulate bushings to isolate the bolts.
- Install metallic grounding rings to ground the liquid and use insulating gaskets between the rings.

Torque Specifications (Nm) for HMS1000 and HMS2500 Meters

Operating Pressure (PSI)										
140			260			350		600		1000
Liner	PTFE	Ebon.	PTFE	Ebon.	PP	PTFE	Ebon.	PTFE	Ebon.	Ebon.
N.D										
1"			25		19	25		25		
1¼"			43		28	43		43		
1½"			53		36	53		53		
2"			68		52	68		68		
2½"			90		75	45		45		
3"			53		41	53		53		
4"			59		56	83		83		
5"			71		71	112		112		
6"			108		106	135		135		
8"	148	123	99	82		134	112	178	149	233
10"	123	103	140	117		204	170	267	223	321
12"	142	119	175	146		201	168	278	232	317
14"	172	143	205	171		324	270	422	352	481
16"	217	181	282	235		426	355	619	516	623
18"	194	161	281	234						
20"	224	186	382	318						
24"	323	269	568	474						

- Tighten bolts uniformly in diagonally opposite sequence.
- The torques listed in the table are applicable to flanges: UNI 2223, DIN 2501, BS 4504, ANSI B16.5
- The use of DIN 2690 gaskets is recommended.
- Contact the manufacturer for nominal diameters greater than 24" .

Backed by our Worldwide reputation for Quality, Accuracy and Advanced Design.

LIQUID CONTROLS
A Unit of IDEX Corporation
105 Albrecht Drive
Lake Bluff, IL 60044-2242
1.800.458.5262 • 847.295.1050
Fax: 847.295.1057
www.lcmeter.com

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