

### Features 'The Ultimate Magflow Solution'

- The Latest 'Capacitive Mag' Technology
- Unsurpassed performance in the most difficult applications
- No electrodes in contact with medium which means:-
  - 'No Coating of electrodes'
  - 'No Wearing of electrodes'
  - 'No Corrosion of electrodes'
- No cleaning or ongoing maintenance required
- Extremely hard high performance ceramic liner
- Will work on liquids with practically no conductivity
- Suitable for CIP & SIP cleaning
- Stable measurement in the noisiest of applications
- Operation in liquids with up to **70% solids content**



### Integral Mount S300 CAP Display



### Specifications:

- Ceramic liner with non wetted capacitive electrodes
- Flow sensor sizes 25mm to 100mm
- Wafer connection suites ANSI 150lb & TABLE flanges
- Self-verifying. Accuracy:  $\pm 0.5\%$  +/- 5mm/s.
- 85 - 253 vac or 11 - 31 vdc powered
- Totaliser up to 10 digits. With Flowrate display.
- Integral '**S300 CAP**' display.
- Durable die cast aluminium display box (Optional 316 L)
- Pulse and 4-20mA outputs. HART protocol.
- Programmable via reflective buttons or via HART to PC
- Empty pipe detection.
- Pressure rating DN25 - 80: 4000 kPa, DN100: 1600 kPa
- Process temperature: -40 °C to 100 °C
- Measured liquid conductivity as low as 0.05  $\mu\text{S}/\text{cm}$  or
- 1  $\mu\text{S}/\text{cm}$  in the case of Demineralised water

### Application examples:

- Toxic, aggressive & abrasive mediums
- Emulsions including paint & bitumen
- Adhesives
- Organic mass production
- Low conductive liquids: alcohols, spirits, glucols, glycerine etc
- Abrasive slurries: grouts, cement etc
- Water mixed with oil or metallic particles
- Fibrous products
- Oil-based products: vegetable oils
- Dairy products: fat creams, milk, cheese, yoghurt

### Non wetted electrodes with high tech ceramic liner:

The **KMS307W** combines the advantages of non wetted capacitive electrodes, a ceramic liner and the a powerful signal converter. This electromagnetic flowmeter can be used for noisy applications, low conductivities, mediums tending to form an insulating film, applications with high vibrations, and oxidizing, abrasive and toxic mediums.

Instead of conventional electrodes that have a direct contact with the process liquid, **KMS307W** has a non-contacting capacitive signal pick-up. The electrodes are designed as large-area capacitor plates, mounted behind the ceramic liner. Because the electrodes have no contact with the medium, unwanted catalytic action with metallic parts is eliminated. A second benefit is that the insulation of electrodes no longer forms a risk. In case of a medium that tends to form a non conductive surface coating on the tube wall, the signal pick up between medium and electrodes will not be interrupted.

The smooth and pore free ceramic tube construction does not leak and is CIP / SIP resistant, making it highly suitable for hygienic applications in for example the food & beverage and pharmaceutical industry. It is very hard, non permeable and has an extreme and broad chemical resistance, fulfilling requirements of the chemical industry.

The construction of the **KMS307W** offers an absolute leak tight solution, because leakage through the liner and leakage along the electrodes is not possible. The S300 converter as standard includes extensive diagnostics of the process and meter and powerful filter settings for stable flow measurements.

### The K-MAG advantage:

All **K-MAG** electromagnetic flowmeters are supplied fully wired custom configured to your specific application requirements and have been tested prior to shipping to confirm correct functionality, with Total and Flow Rate Display. They offer quality performance with accuracy of  $\pm 0.5\%$  of rate (for **KMS307** flowmeters) and are capable of operating over very wide flow ranges. With no moving parts and an obstruction-less bore, this type of flowmeter guarantees the highest level of performance, unaffected by specific gravity or viscosity variations, or the most contaminated of fluids, whilst maintaining a high degree of accuracy for liquids with conductivity even as low as  $0.05\mu\text{S}/\text{cm}$ . A unique self-verifying feature is implemented in K-mags, providing ultra-stable performance over time

Size (mm)	Order Code	MINIMUM Flowrate		MAXIMUM Flowrate
		(Litres/minute) @ ±2% accuracy *	(Litres/minute) @ ±0.5% accuracy	(Litres/minute) @ ±0.5% accuracy
25	KMS307-025W	4	30	330
40	KMS307-040W	11	75	905
50	KMS307-050W	14	80	1413
80	KMS307-080W	31	150	3619
100	KMS307-100W	56	250	5655

\* will measure at lower flowrates, but at reduced accuracy.

#### OPTIONS:

-DC	11-31 VDC Powered	-TRB	Totaliser Reset Button
<b>ANSI-150 PVC or Galvanized Iron connection kits available (Refer ManuFlo)</b>			

#### TECHNICAL DATA

KMS307W

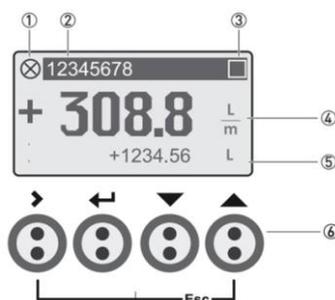
Signal converter / Display	
Design	Integrally mounted electronics
Outputs	4-20mA & Pulse output
Input	External totaliser reset input
Counter	2 internal counter, 10 digits max
Verification	Integrated verification Diagnostic functions Empty Pipe detection
Comms interface	HART <sup>®</sup>
Graphic display	59 x 31 mm white backlit LCD
Operating elements	4 Optical keys
Units	Totaliser L; mL; m <sup>3</sup> ; gal
	Flowrate L/sec; L/min; L/h; m <sup>3</sup> /h; gal/min
Protection category	IP67
Materials	Aluminium (polyurethane coated) (option) 316 L SST
Power supply	85 – 253 VAC @ 22 VA 11 – 31 VDC @ 12 W
Signal cable	Not applicable (Integral only)
Cable entries	M20 x 1.5 (8...12mm)

Measuring sensor / Tube	
Accuracy	±0.5% of MV +/- 5 mm/s
Repeatability	±0.1% of MV, min. 1 mm/s
Temperature	-40 to 100 °C
Pressure rating: DN25 - 80 DN100	4000 kPa 1600 kPa
Conductivity	Demin. Water: ≥ 1.0 µS/cm Other media: ≥ 0.05 µS/cm
Solid content (volume)	≤ 70%
Protection category	IP67
Materials	Liner: Ceramic Electrodes: (non wetted) Housing: Stainless steel
Cable entries	M20 x 1.5 (8...12mm)

Basic Input and Outputs (I/Os)	
Analog 4-20mA Output	Active: R <sub>L</sub> ≤ 1kΩ @ I ≤ 22mA Passive: U <sub>ext</sub> ≤ 32VDC; I ≤ 22mA
Digital Pulse Output	Passive: U <sub>ext</sub> ≤ 32VDC; I ≤ 100mA
Pulse rate	0.25 to 10KHz
Pulse width	Symmetric (50% duty cycle) Fixed ( 0.05 up to 2000mS)
Totaliser Reset Input	Passive: 12 – 32 VDC

#### DISPLAY AND OPERATING ELEMENTS

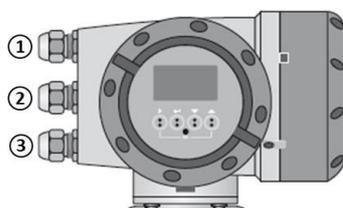
KMS307W



#### Display example:

Flow indication in Litres per minute (L/m) and totaliser in Litres (L)

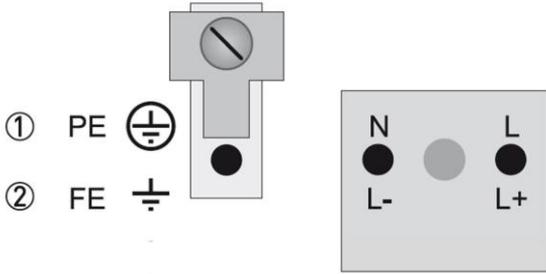
- (1) Indicates a possible status message in the status list
- (2) Tag number (is only indicated if this number was entered previously by the operator)
- (3) Indicates when a key has been pressed
- (4) Flowrate in large representation
- (5) Forward totaliser
- (6) Optical keys for accessing menu and settings



#### Integral display:

- (1) Cable entry for power supply input (AC or DC) version
- (2) Cable entry for inputs and outputs/totaliser reset button
- (3) Cable entry for inputs and outputs....

**DANGER!** The device must be grounded in accordance with regulations in order to protect personnel against electric shocks.  
**CAUTION!** Observe connection polarity



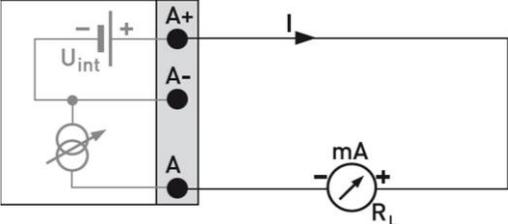
① PE

② FE

### Power supply connection

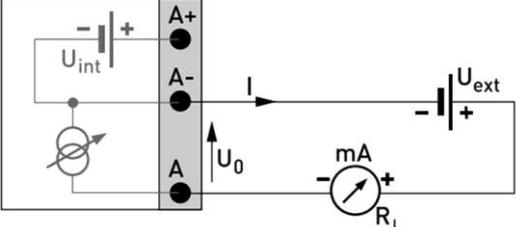
(1) 85 – 253 VAC @ 22 VA  
(2) 11 – 31 VDC @ 12 W

- ◆ Terminal compartment for power supply w/ safety cover



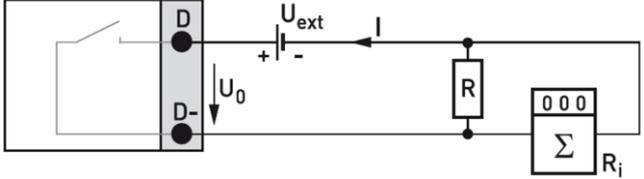
### Current output active (HART®)

- $U_{int, nom} = 24 \text{ VDC}$
- $I \leq 22 \text{ mA}$
- $R_L \leq 1 \text{ k}\Omega$
- HART® at connection terminals A



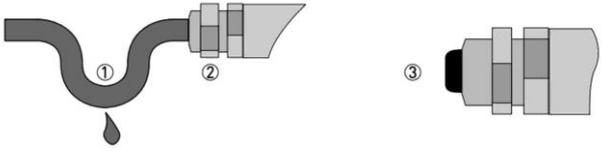
### Current output passive (HART®)

- $U_{int, nom} = 24 \text{ VDC}$
- $U_{ext} \leq 32 \text{ VDC}$
- $I \leq 22 \text{ mA}$
- $U_0 \geq 1.8 \text{ V}$  at  $I = 22 \text{ mA}$
- $R_L \leq (U_{ext} - U_0) / I_{max}$
- HART® at connection terminals A



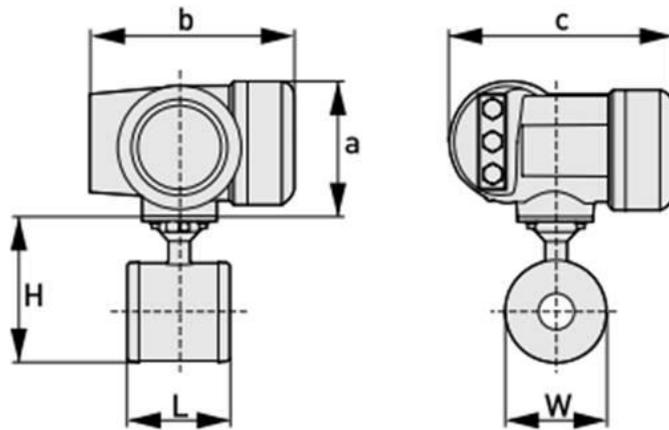
### Pulse output passive (standard)

- $U_{ext} \leq 32 \text{ VDC}$
- $f_{max}$  in operating menu set to  $100 \text{ Hz} < f_{max} \leq 10 \text{ kHz}$ :  
(over range up to  $f_{max} \leq 12 \text{ kHz}$ )
- $I \leq 20 \text{ mA}$
- $R_L \leq 10 \text{ k}\Omega$  for  $f \leq 1 \text{ kHz}$
- $R_L \leq 1 \text{ k}\Omega$  for  $f \leq 10 \text{ kHz}$
- closed:  
 $U_0 \leq 5 \text{ V}$  at  $I = 20 \text{ mA}$
- open:  
 $I \leq 0.05 \text{ mA}$  at  $U_{ext} = 32 \text{ V}$
- The minimum load impedance  $R_L, min$  is calculated as follows:  $R_L, min = (U_{ext} - U_0) / I_{max}$
- The output is open if the device is de-energised.



### Laying electrical cables correctly

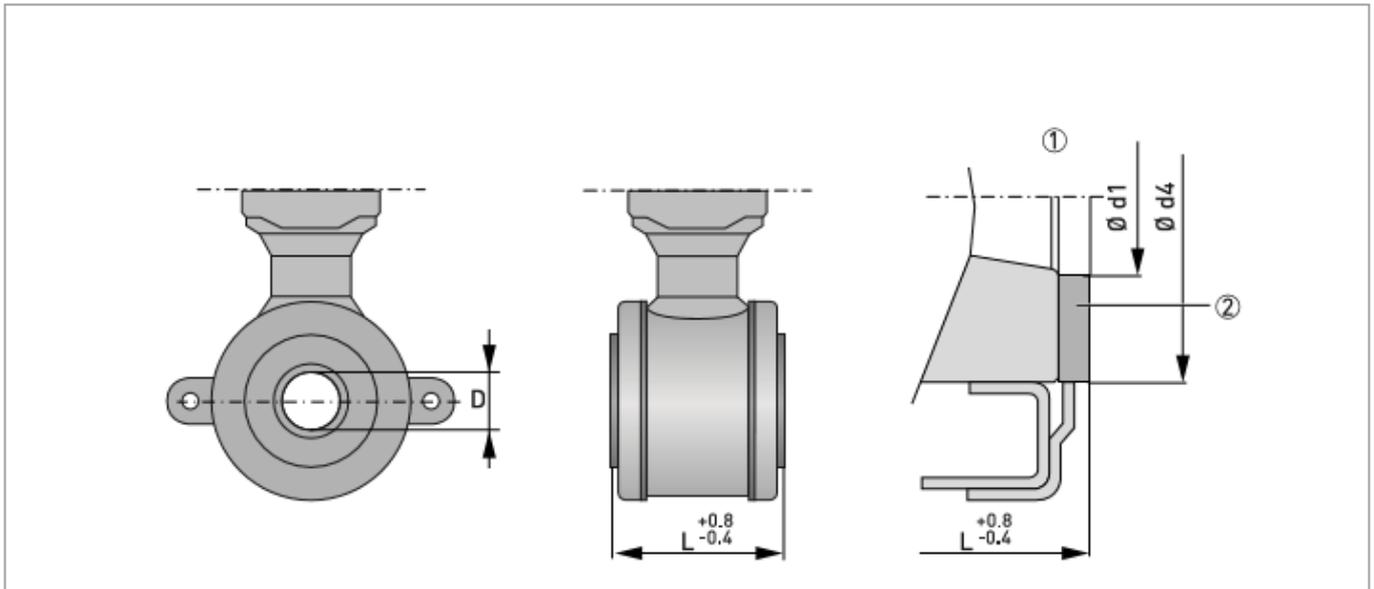
- (1) For compact versions with nearly horizontally-oriented cable entries, lay the necessary electric cables with a drip loop as shown in the illustration.
- (2) Tighten the screw connection of the cable entry securely.
- (3) Seal cable entries that are not needed with a plug.



a = 155 mm  
 b = 139 mm  
 c = 106 mm  
 Total height = H + a

INTEGRAL Display

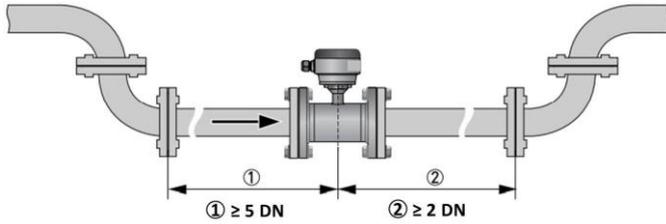
Nominal size DN [ mm ]	Dimensions [ mm ]				Approx. weight [ kg ]
	L	H	W	D	
25	58	116	68	20	1.6
40	83	131	83	30	2.4
50	103	149	101	40	2.9
80	153	181	133	60	6.4
100	203	206	158	80	8.8



Construction details DN25 - 100

① Without Grounding Rings ② Gasket

**Straight Pipe Requirements**



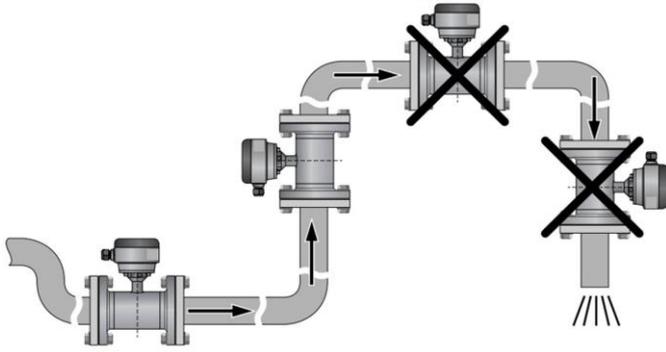
**To ensure accurate measurement:**

- Pipe must be full at all times
- Must have straight pipe of length > 5x pipe diameter upstream of sensor and also straight pipe of length > 2x pipe diameter downstream of sensor.

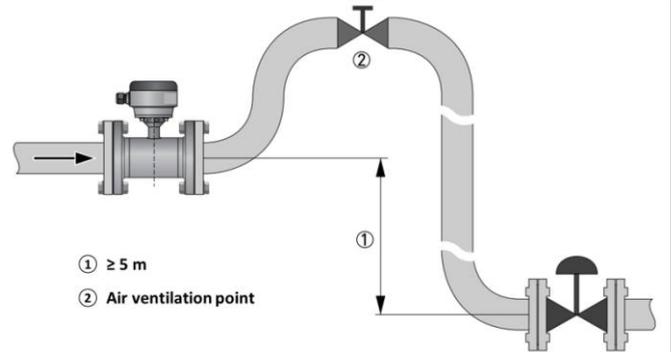
**e.g. 50mm flowmeter requires**

at least 250mm of straight 50mm Ø pipe upstream, and at least 100mm of straight 50mm Ø pipe downstream

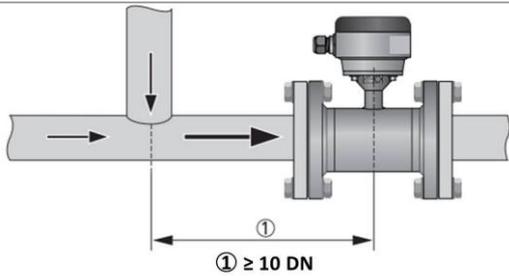
**Installation on bending pipes**



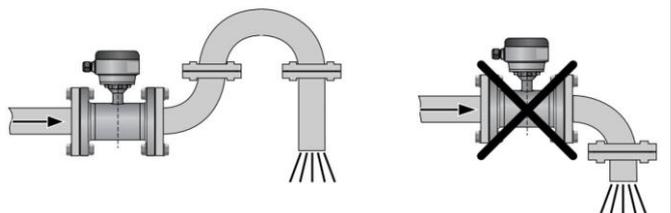
**Air venting**



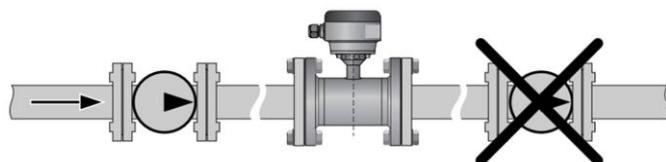
**T - section**



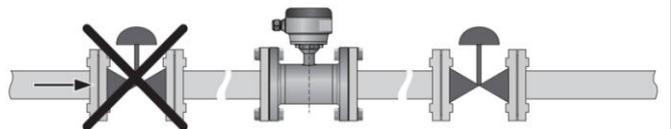
**Installation in front of an open discharge**



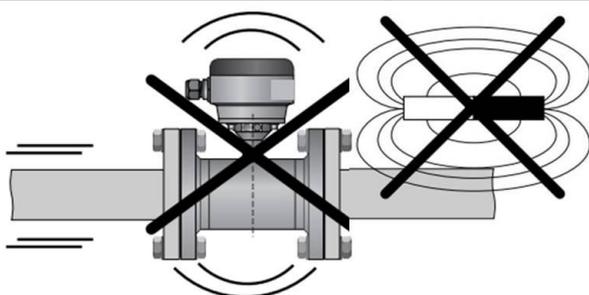
**Installation behind a pump**



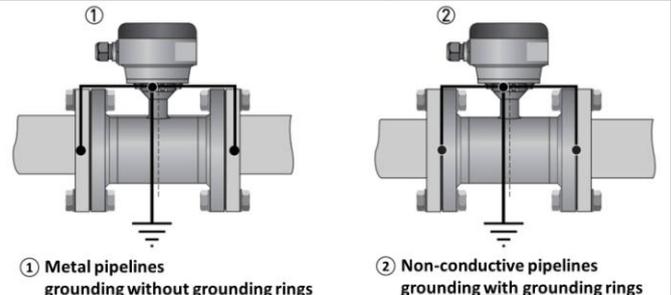
**Installation in front of a control valve**



**Avoid vibrations and magnetic field**



**Grounding**



**KMS Electromagnetic Flowmeter Installation Guide and Checklist**

<b><u>LOCATION</u></b>	
To avoid vibration that may hinder correct flow readings, <b>support the weight</b> of the flowmeter sensor.	<input type="checkbox"/>
Mount the flowmeter's display box in an area that allows <b>easy access</b> for reading.	<input type="checkbox"/>
If mounted outdoors: <ul style="list-style-type: none"> <li>• Install a <b>sunshade</b>, to protect the display box from direct sunlight; and</li> <li>• Consider if you need to install a lockable vandal-proof enclosure, preferably with a window for reading the display.</li> </ul>	<input type="checkbox"/>
To ensure correct flow readings, <b>avoid</b> installing the flowmeter sensor in the vicinity of strong <b>electromagnetic fields</b> , and avoid areas where there is <b>excessive vibration</b> .	<input type="checkbox"/>
Ensure that the chosen location will allow the flowmeter to operate within its <b>environmental rating</b> .	<input type="checkbox"/>
<b><u>ELECTRICAL</u></b>	
Have the appropriate <b>power supply</b> (e.g 85-253vac or 11 -31 VDC) available.	<input type="checkbox"/>
Units in most cases come prewired between sensor and transmitter/display box, otherwise ensure proper colour coding is used when wiring signal cable.	<input type="checkbox"/>
If unsure regarding wiring of outputs – call ManuFlo. Use cable glands provided and make sure they are properly tightened and sealed. Allow for a drip loop before the gland to prevent ingress into the transmitter.	<input type="checkbox"/>
<b><u>PLUMBING</u></b>	
Install the flowmeter sensor in a section of pipe that is <b>full at all times</b> , to ensure correct flow readings.	<input type="checkbox"/>
To prevent turbulence in the flow that may hinder correct flow readings, ensure that there is <b>straight pipe before and after the sensor</b> , of length at least: <ul style="list-style-type: none"> <li>• 5x pipe diameter before (upstream of) sensor; and</li> <li>• 2x pipe diameter after (downstream of) sensor.</li> </ul> e.g. for 50mm diameter pipe, the lengths of straight pipe required are at least 5x50mm=250mm before sensor, and 2x50mm=100mm after sensor.	<input type="checkbox"/>
Install any <b>gaskets and bonding cables</b> according to the type of pipe.	<input type="checkbox"/>

*Note: detailed installation instructions are in the Manual provided with the flowmeter.*

**Due to continuous product improvement, specifications are subject to change without notice.**

