

MXEX-INST
Rev 13
10/2019



**MX06 - MX100
 OVAL GEAR FLOWMETER SERIES
 APPROVED FOR USE IN HAZARDOUS AREAS
 INSTRUCTION MANUAL**



EXPLOSION/ FLAME PROOF



INTRINSICALLY SAFE

To the Owner

Please read and retain this instruction manual to assist you in the operation and maintenance of this product.

This manual contains connection and operating instructions for the MX-Series Flow Meters with Pulse Outputs.

Liquid Crystal Displays have an additional instruction manual supplied. If you need further assistance, contact your local representative or distributor for advice

This Flow Meter has incorporated the oval gear principle into its design. This is proven to be a reliable and highly accurate method of measuring flow. Exceptional repeatability and high accuracy over a wide range of fluid viscosities and flow rates are features of the oval gear design.

With low pressure drop and high pressure ratings, oval gear flow meters are suitable for gravity and (in-line) pump applications.

Macnaught offer a comprehensive set of web based support materials to compliment this instruction manual.

macnaught.com

Installation

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IMPORTANT INFORMATION



NOTE

The information contained in this manual relating to installation is guideline and should be treated as such.

Please consult all relevant standards and conditions required by the governing bodies in area of installation prior to commissioning.



SAFETY BARRIER

The Exia sensors must be installed with an approved safety barrier



GROUNDING

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in an explosion or fire and cause serious injury.



STATIC

If there is static sparking or if you feel an electric shock while using the meter, stop dispensing immediately. Identify and correct the problem before continuing.



FLUID COMPATIBILITY

Before use, confirm the fluid to be used is compatible with the meter. Refer to Industry fluid compatibility charts or consult your local representative for advice.



STRAINER

To prevent damage from dirt or foreign matter it is recommended that a Y or Basket type mesh strainer be installed as close as possible to the inlet side of the meter. When a strainer is installed it should be regularly inspected and cleaned. Failure to keep the strainer clean will dramatically effect flow meter performance. Contact your local representative for advice.



AIR PURGE / LINE PRESSURE

To prevent damage caused by air purge slowly fill the meter with fluid.
To reduce pressure build-up turn off the pump at the end of each day.



NOTE

Equipment must be protected from impact at all times.

OPERATING PRINCIPLE

Fluid passing through the meter causes the rotors to turn, as shown below.

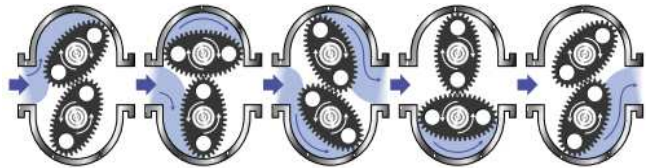
One of the rotors (the active rotor) is fitted with magnets.

The passing of the magnets are picked up by the electronic sensor.

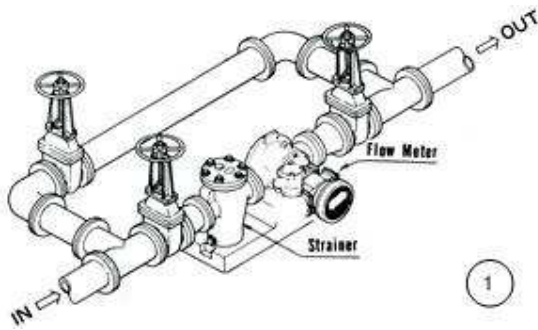
The excitation of this switch provides a 'Raw Pulse Output' which relates to the K-Factor.

(e.g. $KF\ 36 = 36\ pulses\ per\ litre\ of\ fluid\ passed$)

This Pulse Output Signal can either be fed directly to an external receiving element (e.g. Data Logger or PLC) or alternatively to an LC Display which conditions the Pulse input signal to display volume of fluid passed. (e.g. *Display 1 Litre per for every 36 pulses received*)

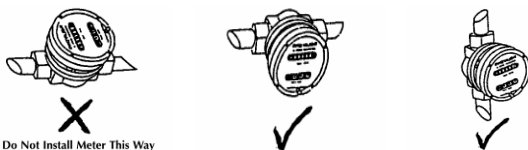


INSTALLATION PROCEDURE



1. It is recommended that when setting up pipe work for meter installations, a bypass line be included in the design. This provides the facility for a meter to be removed for maintenance without interrupting production. (see figure above)
2. Use a thread sealant on all pipe threads.
Caution: Thread tape must not enter flow meter, stopping flow meters operation.
3. For pump applications ensure pipe work and Meter have the appropriate working pressure rating to match the pressure output of the pump. Refer to Meter Specifications section for further details.
4. Install a wire mesh strainer, Y or basket type as close as possible to the inlet side of the meter.
Meter 1/4" 74 micron / 200 mesh
Meter 1/2" - 2" 250 micron / 60 mesh
Meter 3" - 4" 400 micron / 40 mesh
5. Note: The flow meter can accept flow in any direction.
6. The meter can be installed in any orientation as long as the meter shafts are in a horizontal plane. (Refer to diagram below for correct installation)

Note: Incorrect installation can cause premature wear of meter components.



7. Do not over tighten meter connections.
8. **It is important that after initial installation you fill the line slowly, high speed air purge could cause damage to the rotors.**
9. Test the system for leaks.
Do not continue use if meter is leaking.
10. Check the strainer for swarf or foreign material, after the first 200 litres check periodically, particularly if the flow rate is noted to be decreasing.

MAINTENANCE PROCEDURE

Note: Inspection and maintenance of installations should only be carried out by experienced personnel, whose training has included instruction on the various types of protection and installation practices.

DISASSEMBLY

Note: Care should be taken not to drop, damage or impact equipment due to risk of spark.

Non sparking tools should be used.

Meter should be removed from explosive atmosphere when maintenance to any part of the meter is required, the meter must be isolated and the line pressure released.

Refer to the *exploded parts* diagram on pg.13-14 for item numbers.

Note: It is advisable to mark all components with a marker pen before disassembly, to ensure all the components are replaced to their correct position during the reassembly process.

1. Remove the meter cap by loosening the bolts on the underside of the meter body. (see FIG 1)
2. Remove the O-Ring from the O-Ring groove in the meter cap.
Wipe clean of grease and store in clean place
3. Remove rotors from the meter body

MAINTENANCE PROCEDURE

REASSEMBLY

1. Before reassembling check the condition of the rotors and bushes (replace if necessary).
2. There are two Rotor Types. **Active** and **Neutral**. The *Active Rotor* is fitted with the magnets. They can be identified by running a metal object over the face of the rotor (smooth side)

Caution: The active rotor is always fitted nearest 'dimple' on the meter body
(see FIG 3)

Replace Active Rotor.

Check the smooth side of the rotor is the *leading* face when fitting onto the shaft and into the meter body. (see FIG 2).

Replace Neutral Rotor. Check that the smooth side of the rotor is the leading face when fitting onto the shaft. (see FIG 2)
Fit the neutral rotor onto the shafts ensuring that the rotor pair are at 90 degrees to one another. (see FIG 3)

Check their operation by turning either of the rotors. If the rotors are not in mesh correctly, or do not move freely, remove one of the rotors and replace correctly at 90 degrees to one another.

3. Check condition of O-Ring and bolts, replace if damaged.

Smear the O-Ring with a light film of grease. Grease applied should meet the following requirements:
Not harden with age.
Not contain an evaporating solvent.
Not cause corrosion of joint surfaces.

Replace the O-Ring into groove in the meter cap. The O-Ring will need to be replaced if it has grown or is damaged in anyway.

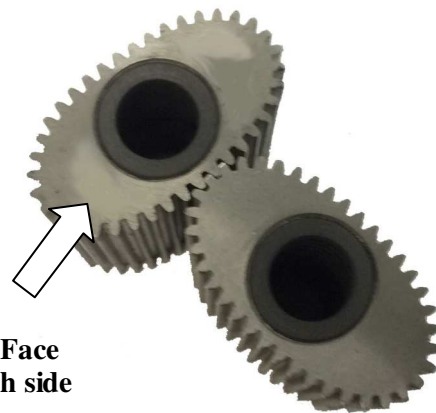
4. Replace the meter cap.
5. Insert the cap head screws and tighten in a diagonal sequence 1, 5, 7, 3, etc. (see **Meter Torque Ratings**, page 15)
6. Test the meter by turning the rotors with a finger or by applying very low air pressure (no more than a good breath) to one end of the meter, before returning the meter to service.

Note: When reassembling the meter, all joints should be thoroughly cleaned and smeared with a suitable grease to prevent corrosion and to assist weather-proofing. Blind bolt holes should be kept clear of grease. Only non metallic scrapers and non corrosive cleaning fluids should be used to clean flanges. (see IEC 60079-14)

FIG 1



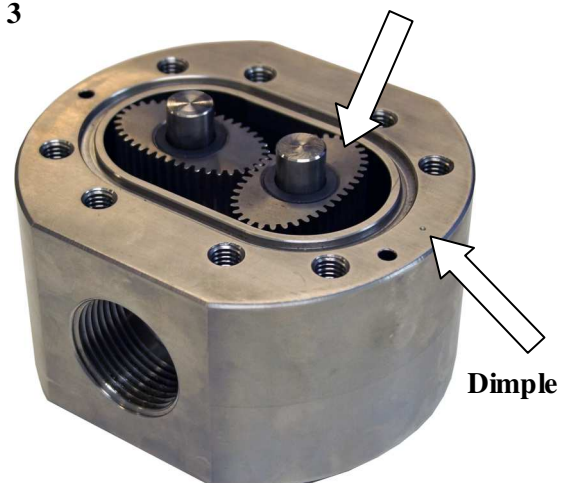
FIG 2



Rotor Face
Smooth side

Active Rotor

FIG 3



Dimple

FLOWMETER SPECIFICATIONS

series MX06		Metric	US
Flow Range	Below 5 cP	2 to 100 LPH	0.5 to 26 GPH
	5 to 1000 cP	0.5 to 100 LPH	0.13 to 26.4 GPH
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX06S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX06P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		6895 kPa	1000 psi
Accuracy of Reading		±0.5% of reading	

series MX09		Metric	US
Flow Range	Below 5 cP	25 to 500 LPH	6.6 to 132 GPH
	5 to 1000 cP	15 to 500 LPH	4 to 132 GPH
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX09S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX09P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		6895 kPa	1000 psi
Accuracy of Reading		±0.5% of reading	

series MX12		Metric	US
Flow Range	Below 5 cP	3 to 25 LPM	0.8 to 6.6 GPM
	5 to 1000 cP	2 to 30 LPM	0.5 to 8 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX12S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX12P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		13790 kPa	2000 psi
Accuracy of Reading		±0.5% of reading	

¹Flow meter process temperature range may be limited to sensor temperature classification. Consult relevant sensor data page and approval documentation. Further information available from the Macnaught Technical Support Team.

FLOWMETER SPECIFICATIONS

series MX19		Metric	US
Flow Range	Below 5 cP	8 to 70 LPM	2 to 18.5 GPM
	5 to 1000 cP	3 to 80 LPM	0.8 to 21 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to Flow meter data plate	
Temperature Range ¹ (models <i>MX19S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX19P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		13790 kPa	2000 psi
Accuracy of Reading		±0.5% of reading	

series MX25		Metric	US
Flow Range	Below 5 cP	10 to 100 LPM	2.6 to 26 GPM
	5 to 1000 cP	6 to 120 LPM	1.6 to 32 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX25S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX25P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		13790 kPa	2000 psi
Accuracy of Reading		±0.5% of reading	

series MX40		Metric	US
Flow Range	Below 5 cP	15 to 235 LPM	4 to 62 GPM
	5 to 1000 cP	10 to 250 LPM	2.6 to 66 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX40S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX40P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		10342 kPa	1500 psi
Accuracy of Reading		±0.5% of reading	

¹Flow meter process temperature range may be limited to sensor temperature classification. Consult relevant sensor data page and approval documentation. Further information available from the Macnaught Technical Support Team.

FLOWMETER SPECIFICATIONS

series MX50		Metric	US
Flow Range	Below 5 cP	15 to 500 LPM	4 to 130 GPM
	5 to 1000 cP	15 to 500 LPM	4 to 130 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX50S</i>)		-40°C - 120°C	-40°F - 248°F
(models <i>MX50P</i>)		-40°C - 150°C	-40°F - 302°F
Maximum Operating Pressure		8274 kPa	1200 psi
Accuracy of Reading		±0.5% of reading	

series MX75		Metric	US
Flow Range	Below 5 cP	60 to 600 LPM	17 to 170 GPM
	5 to 1000 cP	20 to 733 LPM	5 to 194 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX75S</i>)		-40°C - 120°C	-40°C - 248°F
Maximum Operating Pressure		1200 kPa	175 psi
Accuracy of Reading		±0.5% of reading	

series MX100		Metric	US
Flow Range	Below 5 cP	220 to 1000 LPM	60 to 250 GPM
	5 to 1000 cP	120 to 1200 LPM	30 to 300 GPM
K-Factor (Sensor Pulses per Unit of Measure)		Refer to flow meter data plate	
Temperature Range ¹ (models <i>MX100S</i>)		-40°C - 120°C	-40°C - 248°F
Maximum Operating Pressure		1200 kPa	175 psi
Accuracy of Reading		±0.5% of reading	

¹Flow meter process temperature range may be limited to sensor temperature classification. Consult relevant sensor data page and approval documentation. Further information available from the Macnaught Technical Support Team

High Viscosity Applications

Ensure the flow meter is fitted with 'High Viscosity Rotors' if the fluid being metered is typically 1000 cP or above. For further information, contact the Macnaught Technical Support Team

High Viscosity Rotors	For Fluids above 1000 Centipoise (cP)
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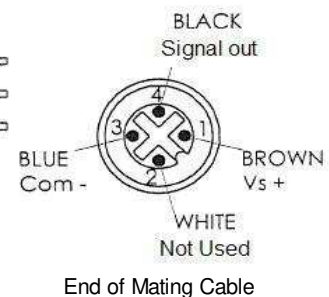
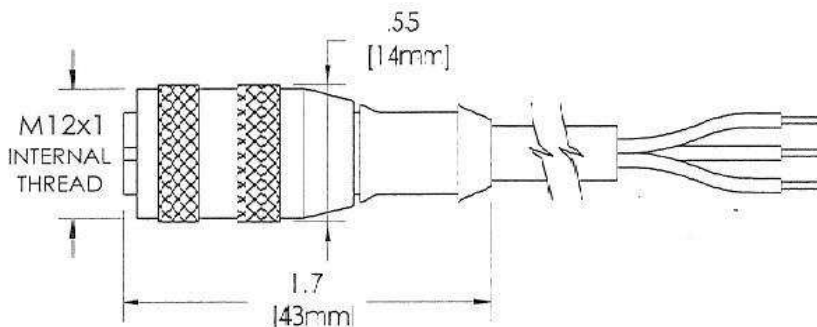
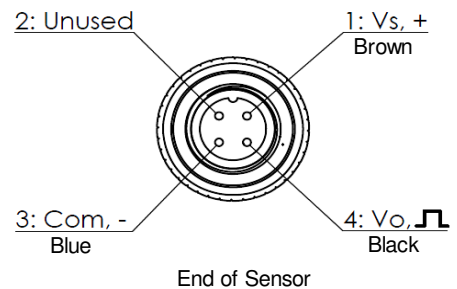
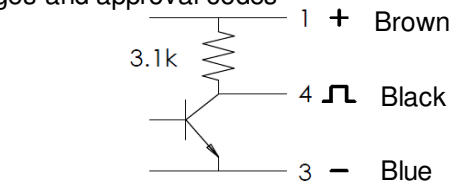
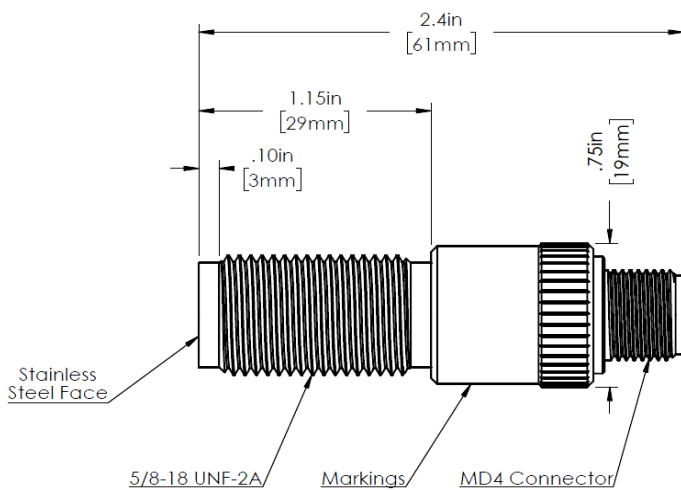


CAUTION: This sensor must be installed with an approved safety barrier.

Pulser Specifications

SENSOR TYPE	Omni Polar	Supply Tracking , NPN with 3.1kΩ pull-up resistor
SPECIFICATIONS	Markings ¹	ATEX & IECEX: II 1 G Ex ia IIC T6...T4 Ga, T6@ -40°C ≤T _{amb} ≤+65°C US & CAN: Class 1, Division 1 GROUP ABCD T6...T5 Class 1, Zone 0, AEx/Ex ia IIC T6...T5 T6 @ -40°C ≤T _{amb} ≤+65°C
	Construction	303 Stainless Steel Housing
	Operating Voltage	5V to 30V DC @ ≤ 15mA
	Maximum Sinking Current	25mA
	Process Temperature Range ¹	-40°C - 65°C or -40°F - 149°F
	Approvals ¹	ATEX, IECEX, US & CAN (THROUGH FM)
	Entity Parameters	U _i = 30V, I _i = 100mA, P _i = 0.66W, C _i = 12nF, L _i = 0
	I.S Barrier (Associated Equipment)	V _{max} , U _i ≥ U _o , V _{oc} or V _t I _{max} , I _i ≥ I _o , I _{sc} , I _t C _o or C _a ≥ C _i + C _c L _o or L _a ≥ L _i + L _c P _t or P _o ≤ P _i

¹Refer to sensor certificates for complete markings, temperature ranges and approval codes



Pulser Specifications

SENSOR TYPE	Omni Polar	Supply Tracking , NPN with 3.1kΩ pull-up resistor
SPECIFICATIONS	Markings ¹	ATEX & IECEx: II 2 G Ex db IIC T6...T3 Gb, T3@ Ta = -55°C... +140°C USA & CAN: Class 1 Division 1 GROUP ABCD T6...T3 Class 1, Zone 1, AEx/Ex db IIC T6...T3 Gb T3 @ Ta = -50°C... +140°C
	Construction	303 Stainless Steel
	Operating Voltage	5V to 27V DC @ ≤ 15mA
	Maximum Sinking Current	25mA
	Process Temperature Range ¹	-50°C - 140°C or -58°F - 284°F
	Approvals ¹	ATEX, IECEx, US & CAN (THROUGH FM)

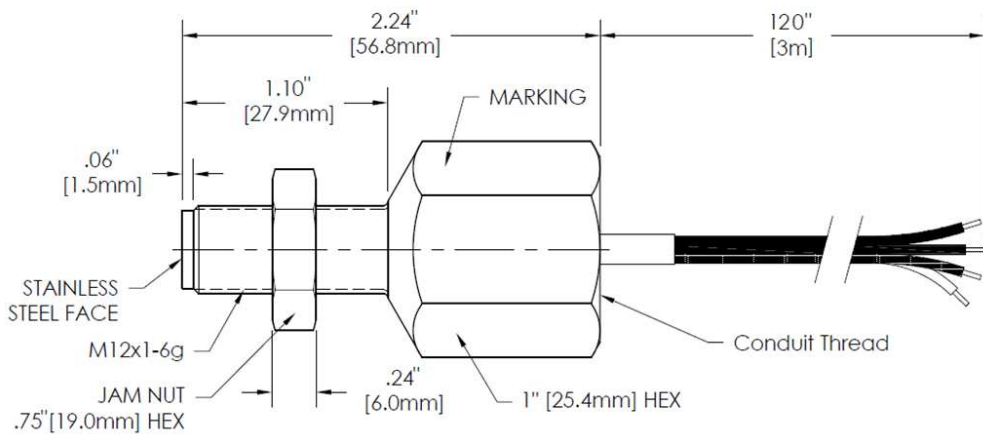
¹Refer to sensor certificates for complete markings, temperature ranges and approval codes



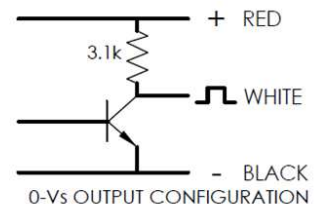
CAUTION: The green wire MUST be connected to an Earth ground



CAUTION: A poured conduit seal MUST be applied within 0.45m/18" of the sensor



Flow Meter Process Connection	Conduit Thread
G Thread	M20x1.5-6H
ANSI(AUS) / DIN / JIS	
NPT Thread	1/2-14 NPT
ANSI (US)	



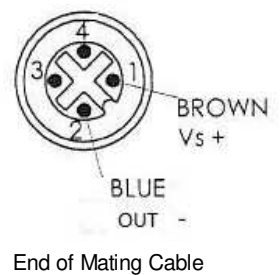
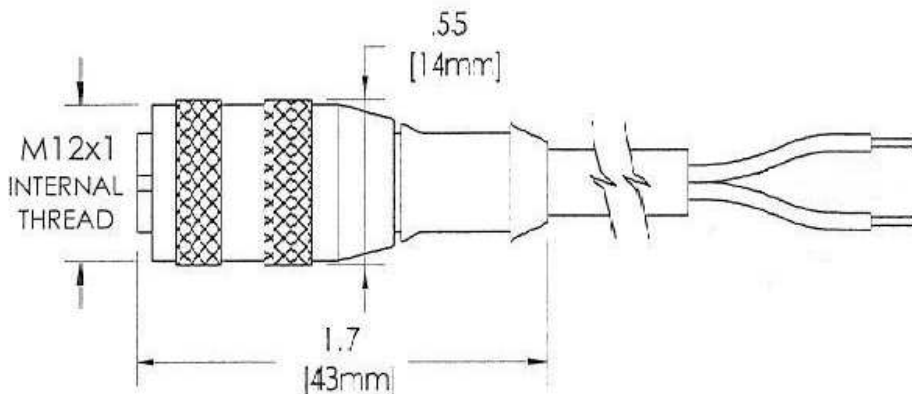
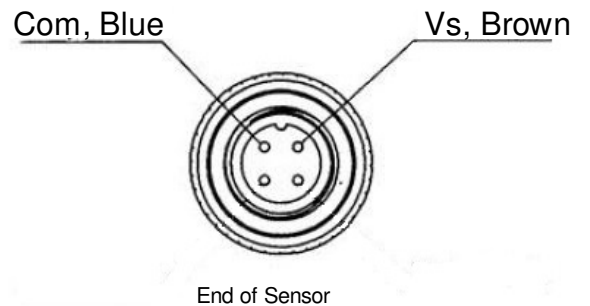
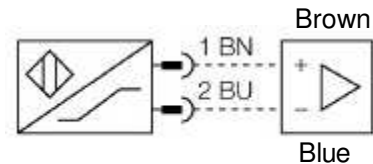


CAUTION: This sensor must be installed with an approved safety barrier.

Pulser Specifications

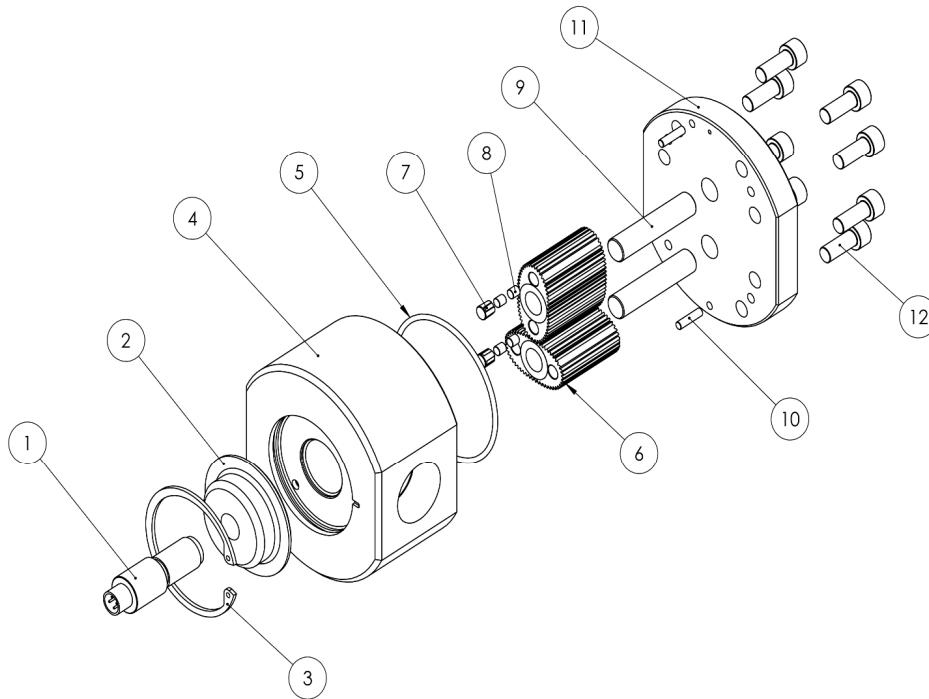
SENSOR TYPE	Magnet-inductive Proximity Sensor	NAMUR
SPECIFICATIONS	Markings ¹	ATEX & IECEx: II 1 G Ex ia IIC T4...T6 Ga US: Class 1, Division 1 GROUP ABCD T4 resp. T5 Class 1, Zone 0, AEx/Ex ia IIC T5...T4 T5 @ -25°C ≤ T _{amb} ≤ +70°C
	Construction	CuZn, Chrome-plate
	Operating Voltage	8V to 15V DC
	Maximum Current	5mA
	Process Temperature Range ¹	-25°C - 70°C or -13°F - 158°F
	Approvals ¹	ATEX, IECEx, US (THROUGH FM AND CSA)
	Entity Parameters	U _i = 20V, I _i = 60mA, P _i = 200mW, C _i = 150nF, L _i = 150uH

¹Refer to sensor certificates for complete markings, temperature ranges and approval codes



TROUBLESHOOTING GUIDE

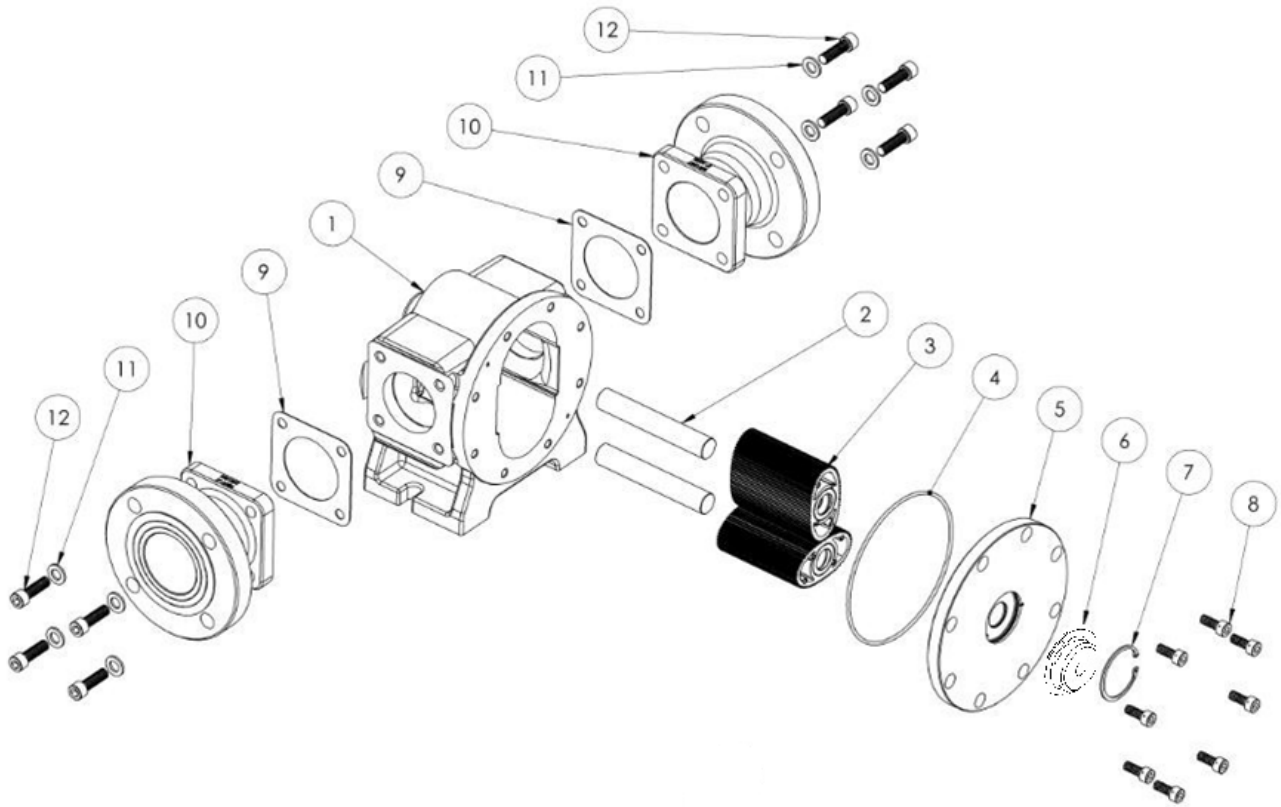
<i>Problem</i>	<i>Cause</i>	<i>Remedy</i>
Fluid will not flow through meter	<ul style="list-style-type: none"> a) Foreign matter blocking rotors b) Line strainer blocked c) Damaged rotors d) Meter connections over tightened e) Fluid is too viscous 	<ul style="list-style-type: none"> a) Contact Macnaught b) Clean strainer c) Re-adjust connections d) See specifications for maximum viscosity
Reduced flow through meter	<ul style="list-style-type: none"> a) Strainer is partially blocked b) Fluid is too viscous 	<ul style="list-style-type: none"> a) Clean strainer b) See specifications for maximum viscosity
Meter reading inaccurate	<ul style="list-style-type: none"> a) Fluid flow rate is too high or too low b) Air in fluid c) Excess wear caused by incorrect installation 	<ul style="list-style-type: none"> a) See specifications for minimum and maximum flow rates b) Bleed air from system c) Check meter body and rotors. Replace as required. Refer to installation instructions
Meter not giving a pulse signal	<ul style="list-style-type: none"> a) Faulty sensor b) Magnets failed 	<ul style="list-style-type: none"> a) Replace sensor b) Replace magnets



PARTS IDENTIFICATION

METER COMPONENTS	ITEM NO.
SENSOR	1
SENSOR HOLDER	2
CIRCLIP	3
METER BODY	4
METER CAP O-RING	5
ROTORS	6
MAGNET HOUSING	7
MAGNETS	8
ROTOR SHAFTS	9
LOCATING PIN	10
METER CAP	11
METER CAP SCREWS	12

EXPLODED DIAGRAM models MX75-MX100



PARTS IDENTIFICATION

METER COMPONENTS	ITEM NO.
METER BODY	1
ROTOR SHAFTS	2
ROTORS	3
METER CAP O-RING	4
METER CAP	5
CAM	6
CIRCLIP	7
METER CAP BOLTS	8
FLANGE SEALS	9
PROCESS CONNECTION (FLANGED OR THREADED)	10
FLANGE WASHERS	11
FLANGE BOLTS	12

METER TORQUE

Meter Torque Ratings			
Series	Pressure (psi)	Torque (Nm)	Lubrication -
MX06	1000	6.5 Nm	Yes
MX09	1000		
MX12	2000		
MX19	2000	15 Nm	Yes
MX25	2000		
MX40	1500	33 Nm	Yes
MX50	1200		
MX75	175		
MX100	175		

SPARE PARTS KITS

Spare Kit options, for both flow meter and pulser modules, are available as replacement components.

- **Pulser Kit**
 - Replacement Intrinsically safe sensor.
- **Rotor Kit**
 - Rotor assembly (includes Meter Cap bolts and O-Ring)
- **Seal Kit**
 - O-Rings/Gaskets

SPARE PARTS KITS

spare kits Series MX06		MX06P	MX06S
ROTOR KIT	<i>Standard</i>	MXS06P-HTrotor	MXS06S-rotor
SEAL KIT		MXS06P-seal	MXS06S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

spare kits Series MX09		MX09P	MX09S
ROTOR KIT	<i>Standard</i>	MXS09P-HTrotor	MXS09S-rotor
	<i>High Viscosity</i>	MXS09P-HVrotor	MXS09S-HVrotor
SEAL KIT		MXS09P-seal	MXS09S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

spare kits Series MX12		MX12P	MX12S
ROTOR KIT	<i>Standard</i>	MXS12P-HTrotor	MXS12S-rotor
	<i>High Viscosity</i>	MXS12P-HVrotor	MXS12S-HVrotor
SEAL KIT		MXS12P-seal	MXS12S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

SPARE PARTS KITS

spare kits Series MX19		MX19P	MX19S
ROTOR KIT	<i>Standard</i>	MXS19P-HTrotor	MXS19S-rotor
	<i>High Viscosity</i>	MXS19P-HVrotor	MXS19S-HVrotor
SEAL KIT		MXS19P-seal	MXS19S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

spare kits Series MX25		MX25P	MX25S
ROTOR KIT	<i>Standard</i>	MXS25P-HTrotor	MXS25S-rotor
	<i>High Viscosity</i>	MXS25P-HVrotor	MXS25S-HVrotor
SEAL KIT		MXS25P-seal	MXS25S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

spare kits Series MX40		MX40P	MX40S
ROTOR KIT	<i>Standard</i>	MXS40P-HTrotor	MXS40S-rotor
	<i>High Viscosity</i>	MXS40P-HVrotor	MXS40S-HVrotor
SEAL KIT		MXS40P-seal	MXS40S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

SPARE PARTS KITS

spare kits Series MX50		MX50P	MX50S
ROTOR KIT	<i>Standard</i>	MXS50P-HTrotor	MXS50S-rotor
	<i>High Viscosity</i>	MXS50P-HVrotor	MXS50S-HVrotor
SEAL KIT		MXS50P-seal	MXS50S-seal
PULSER KIT	Ex ia, NPN	MXD-BS	MXD-BS
	Ex ia, NAMUR	MXD-NS	MXD-NS
	Ex D	MXD-CS	MXD-CS

spare kits Series MX75		MX75S
ROTOR KIT	<i>Standard</i>	MXS75S-rotor
	<i>High Viscosity</i>	MXS75S-HVrotor
SEAL KIT		MXS75S-seal
PULSER KIT	Ex ia, NPN	MXD-BS
	Ex ia, NAMUR	MXD-NS
	Ex D	MXD-CS

spare kits Series MX100		MX100S
ROTOR KIT	<i>Standard</i>	MXS100S-rotor
	<i>High Viscosity</i>	MXS100S-HVrotor
SEAL KIT		MXS100S-seal
PULSER KIT	Ex ia, NPN	MXD-BS
	Ex ia, NAMUR	MXD-NS
	Ex D	MXD-CS

WETTED PARTS

Wetted parts series MX06	MX06P	MX06S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	SS316
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

Wetted parts series MX09	MX09P	MX09S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	SS316
High Viscosity	SS316	SS316
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

Wetted parts series MX12	MX12P	MX12S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	SS316
High Viscosity	SS316	SS316
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

WETTED PARTS

Wetted parts series MX19	MX19P	MX19S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	SS316
High Viscosity	SS316	SS316
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

Wetted parts series MX25	MX25P	MX25S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	SS316
High Viscosity	SS316	SS316
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

Wetted parts series MX40	MX40P	MX40S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	AL 6061
High Viscosity	SS316	AL 6061
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

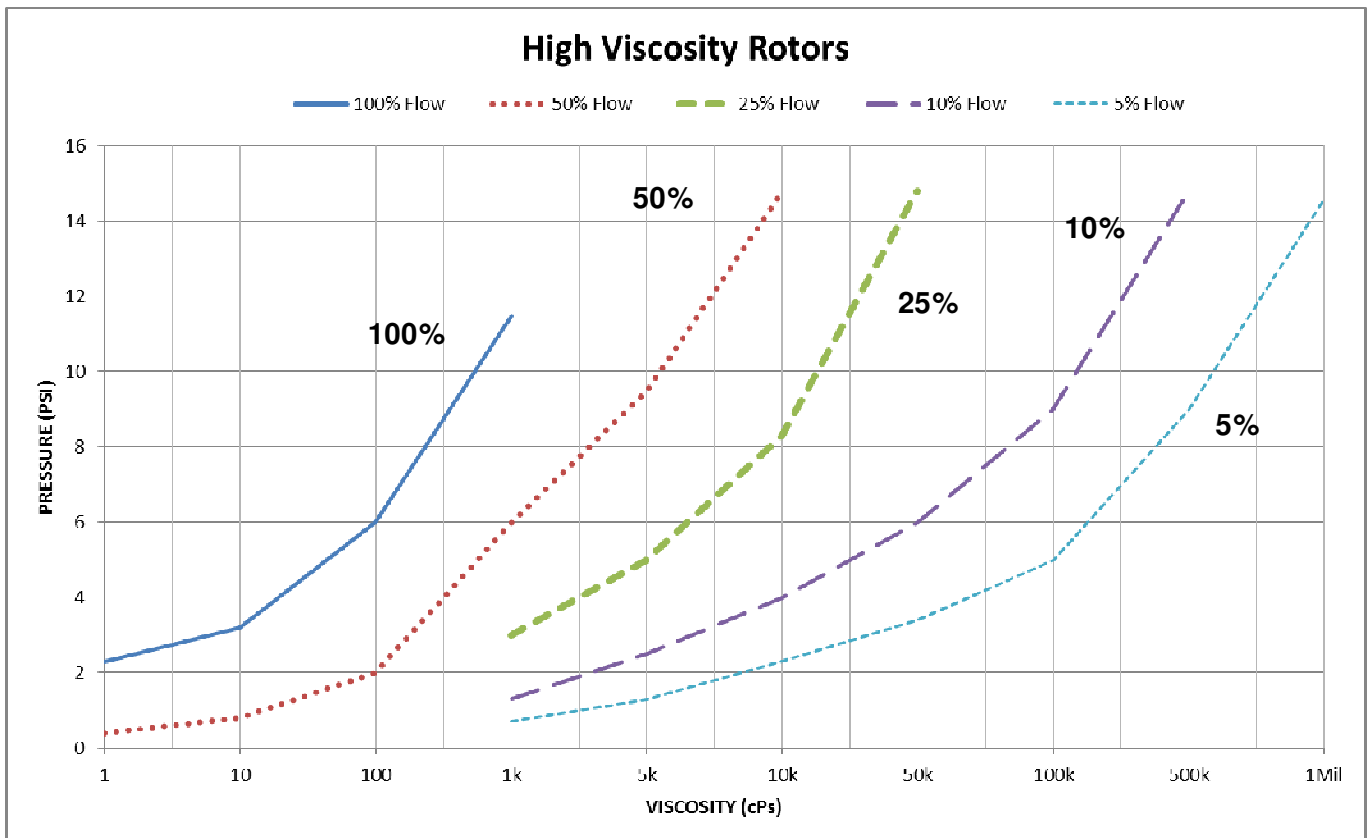
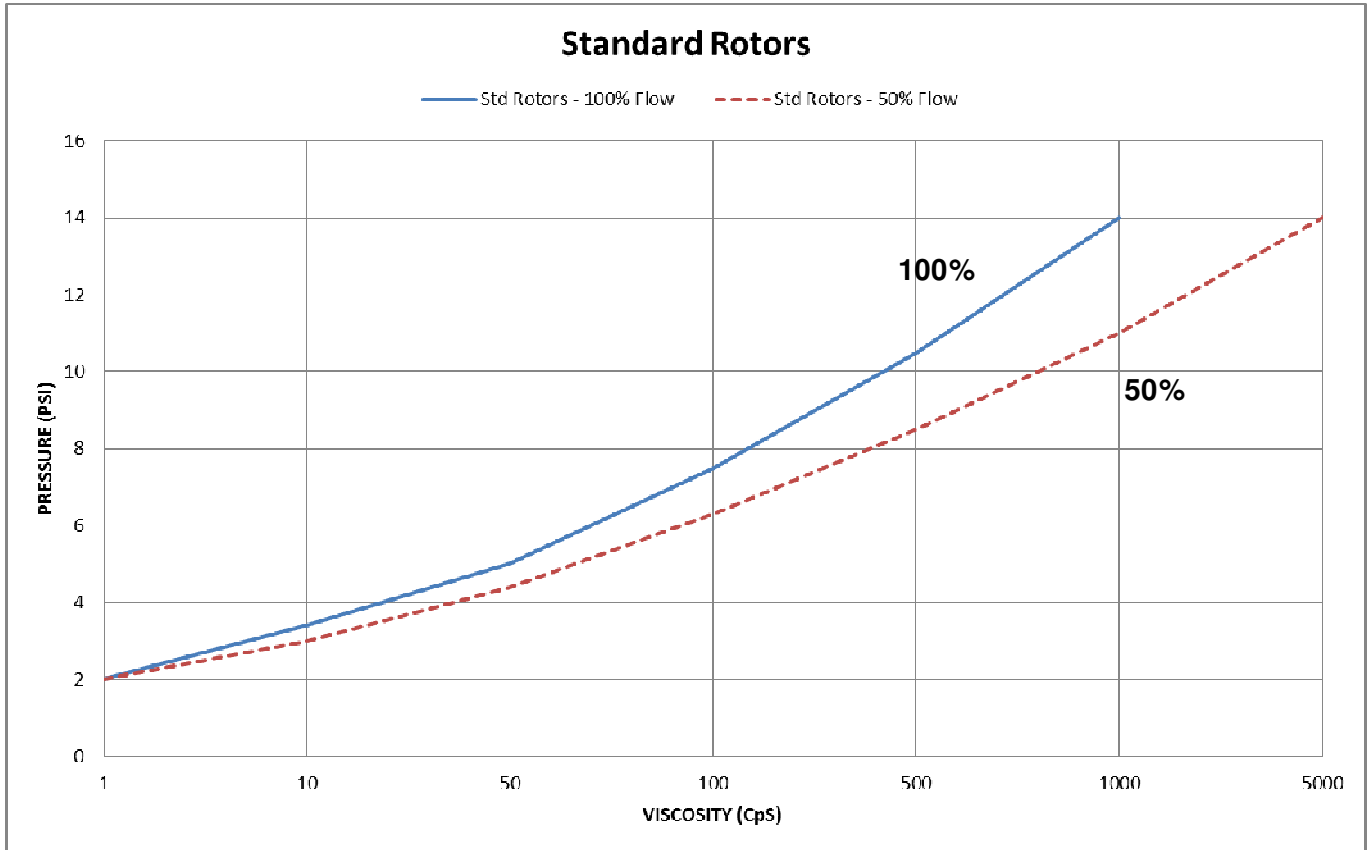
WETTED PARTS

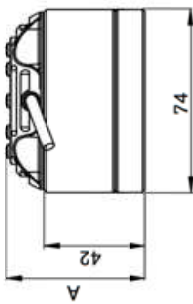
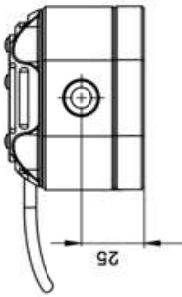
Wetted parts series MX50	MX50P	MX50S
METER BODY	SS316	AL 6061
METER CAP	SS316	AL 6061
ROTORS	SS316	AL 6061
High Viscosity	SS316	AL 6061
ROTOR SHAFTS	SS316	SS316
ROTOR BUSHES	Carbon	Carbon
O-RINGS	FEP	FEP

Wetted parts series MX75	MX75S
METER BODY	AL 6061
METER CAP	AL 6061
ROTORS	AL 6061
High Viscosity	AL 6061
ROTOR SHAFTS	SS316
ROTOR BUSHES	Carbon
O-RINGS	FEP

Wetted parts series MX100	MX100S
METER BODY	AL 6061
METER CAP	AL 6061
ROTORS	AL 6061
High Viscosity	AL 6061
ROTOR SHAFTS	SS316
ROTOR BUSHES	Carbon
O-RINGS	FEP

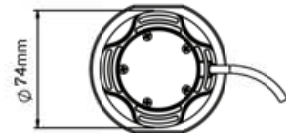
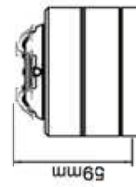
PRESSURE DROP v VISCOSITY



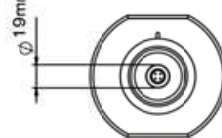
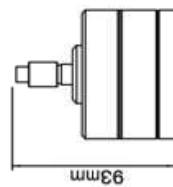


PULSER AND DISPLAY HEIGHT - A

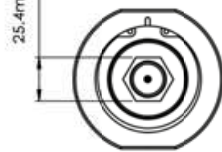
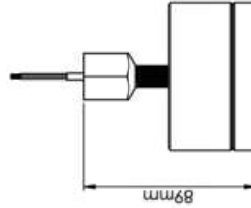
OUTPUT A,I,J,K
PULSER - Standard



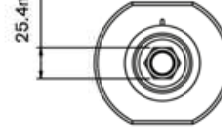
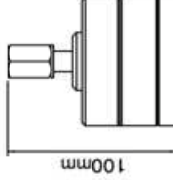
OUTPUT B
PULSER - Exia



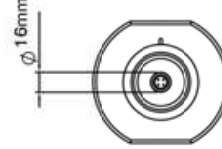
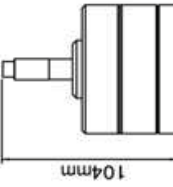
OUTPUT C
PULSER - EXd



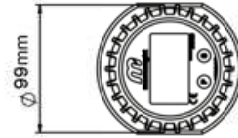
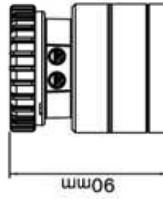
OUTPUT N
PULSER - Exia



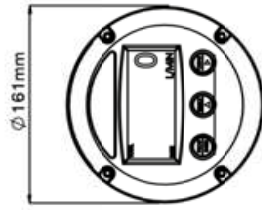
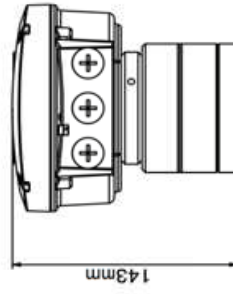
OUTPUT T
PULSER - High Temp.

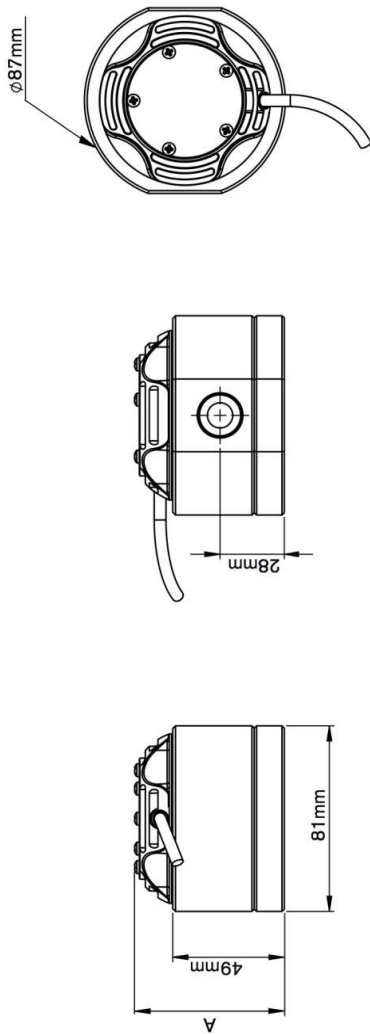


OUTPUT D,E
DISPLAY - LCD 12mm



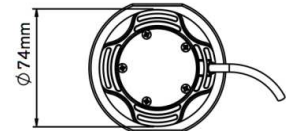
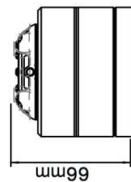
OUTPUT F,G,H DISPLAY
- LCD 17mm



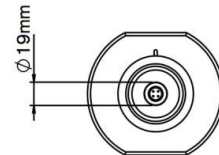
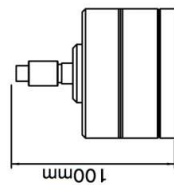


PULSER AND DISPLAY HEIGHT - A

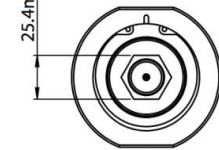
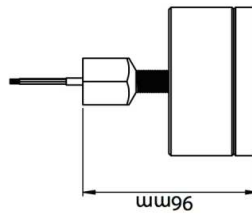
OUTPUT A,I,K
PULSER - Standard



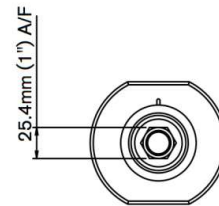
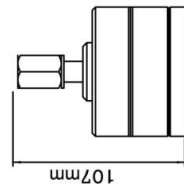
OUTPUT B
PULSER - Exia



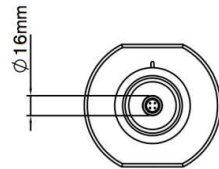
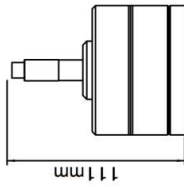
OUTPUT C
PULSER - EXd



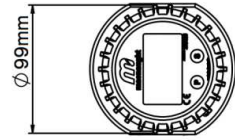
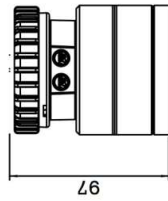
OUTPUT N
PULSER - Exia



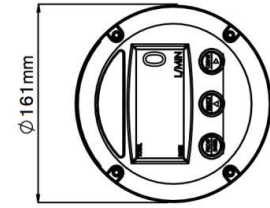
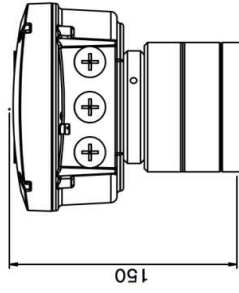
OUTPUT T
PULSER - High Temp.

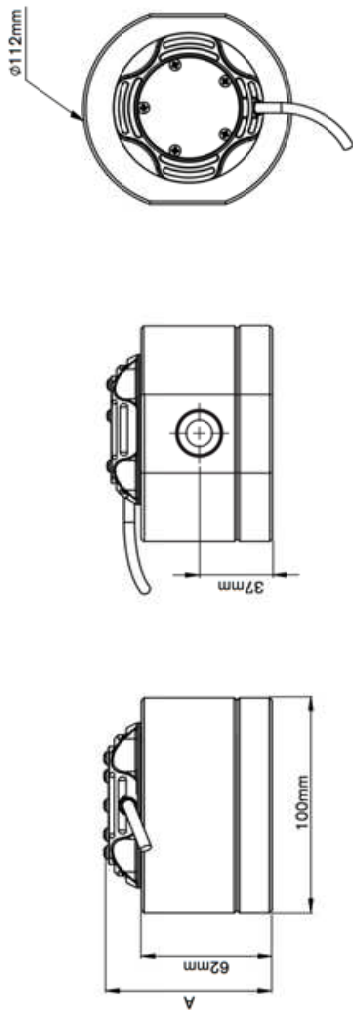


OUTPUT D,E
DISPLAY - LCD 12mm



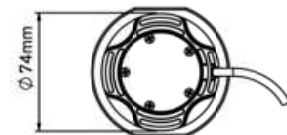
OUTPUT F,G,H DISPLAY
- LCD 17mm



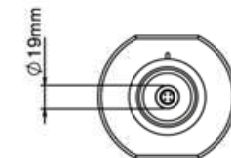
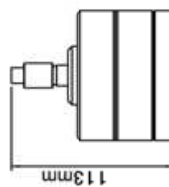


PULSER AND DISPLAY HEIGHT - A

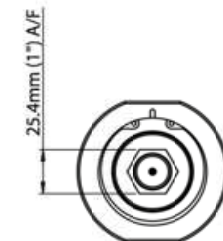
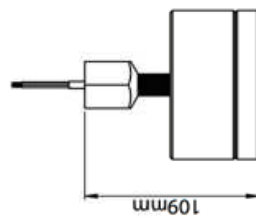
OUTPUT A,I,J,K
PULSER - Standard



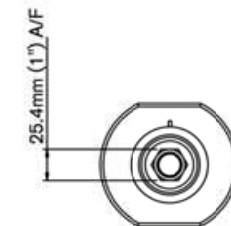
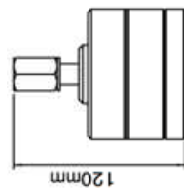
OUTPUT B
PULSER - Exia



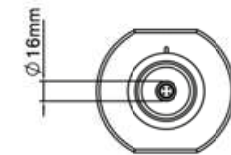
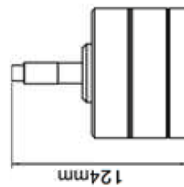
OUTPUT C
PULSER - EXd



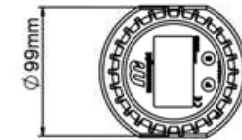
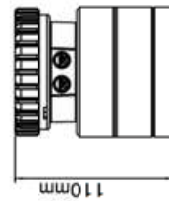
OUTPUT N
PULSER - Exia



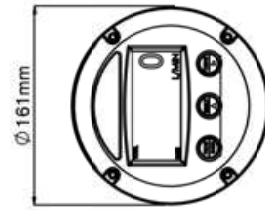
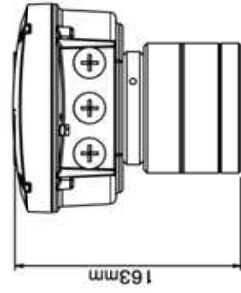
OUTPUT T
PULSER - High Temp.

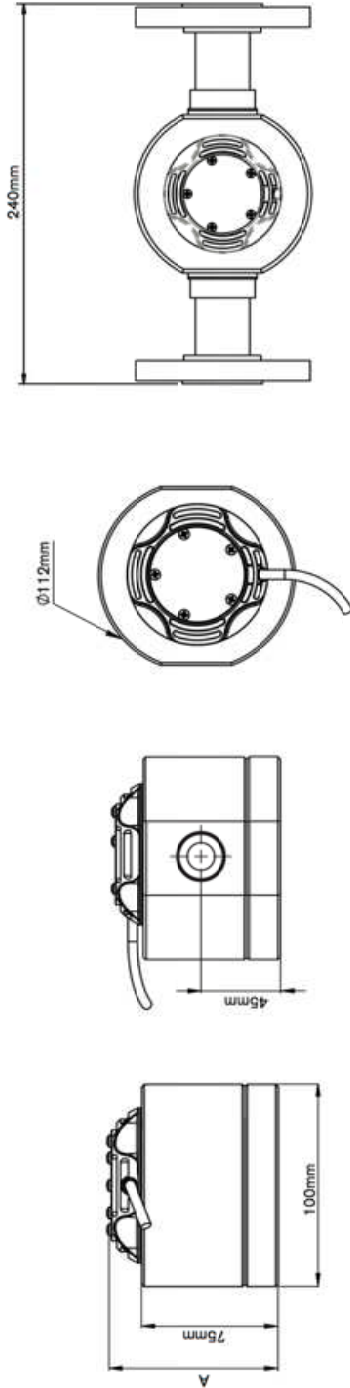


OUTPUT D,E
DISPLAY - LCD 12mm



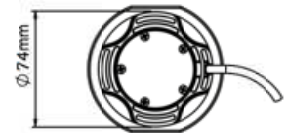
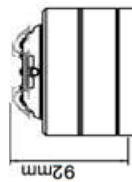
OUTPUT F,G,H
DISPLAY - LCD 17mm



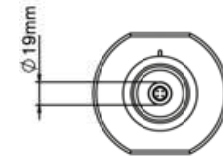
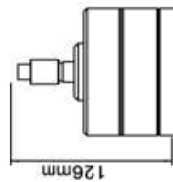


PULSER AND DISPLAY HEIGHT - A

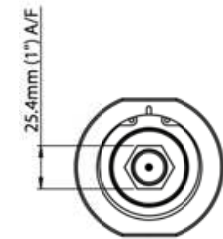
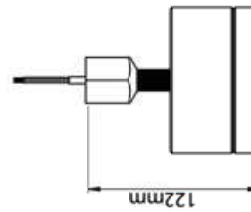
OUTPUT A,I,J,K
PULSER - Standard



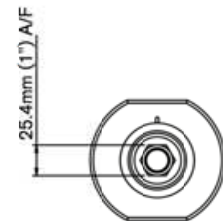
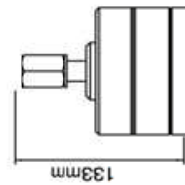
OUTPUT B
PULSER - Exia



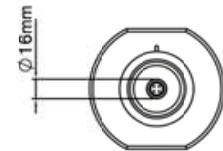
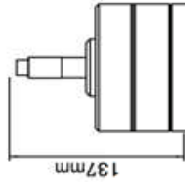
OUTPUT C
PULSER - EXd



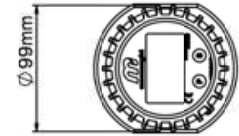
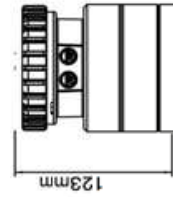
OUTPUT N
PULSER - Exia



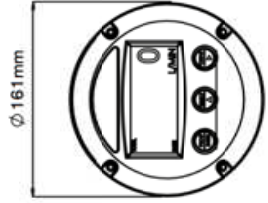
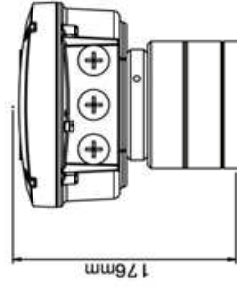
OUTPUT T
PULSER - High Temp.

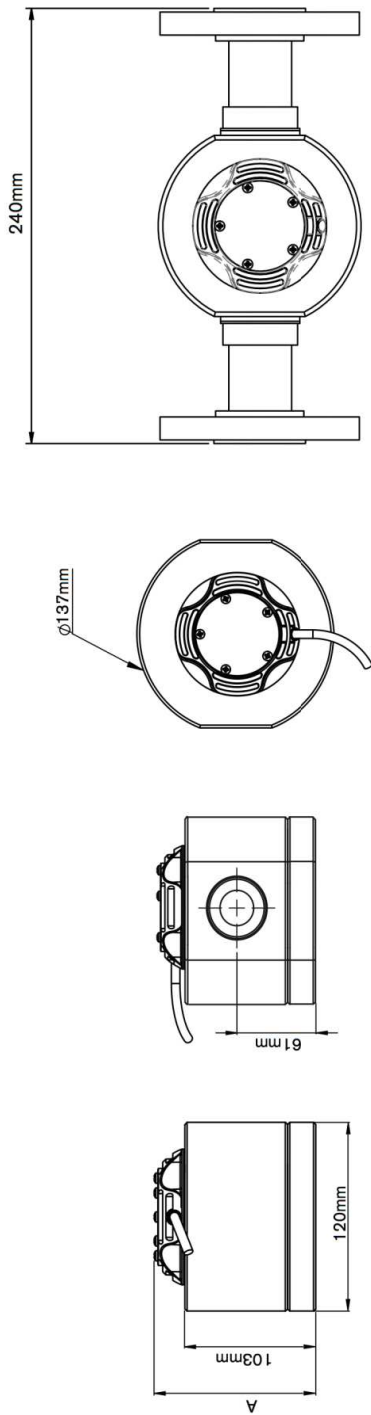


OUTPUT D,E
DISPLAY - LCD 12mm



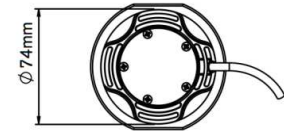
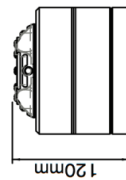
OUTPUT F,G,H
DISPLAY - LCD 17mm



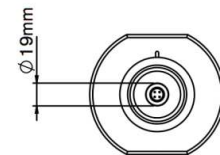
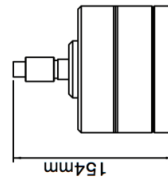


PULSER AND DISPLAY HEIGHT - A

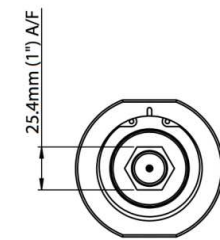
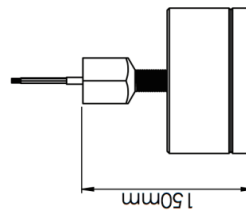
OUTPUT A,I,J,K
PULSER - Standard



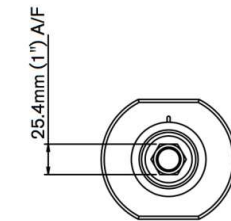
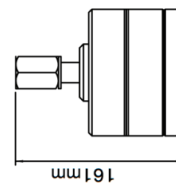
OUTPUT B
PULSER - Exia



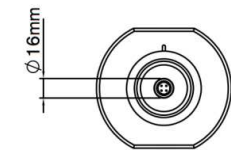
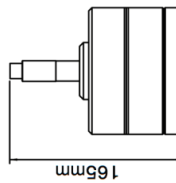
OUTPUT C
PULSER - EXd



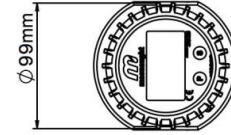
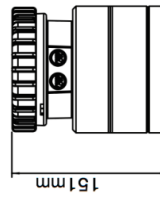
OUTPUT N
PULSER - Exia



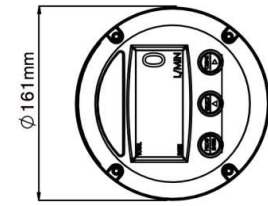
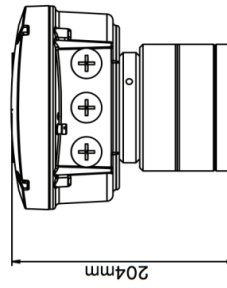
OUTPUT T
PULSER - High Temp.

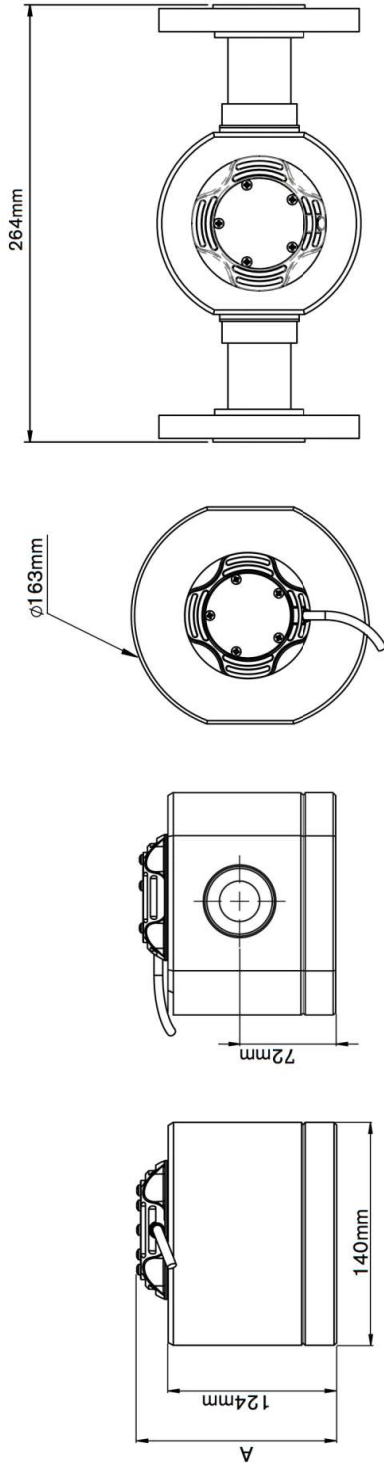


OUTPUT D,E
DISPLAY - LCD 12mm



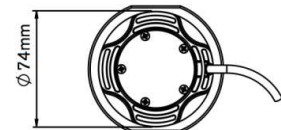
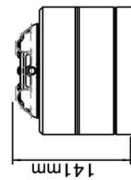
OUTPUT F,G,H DISPLAY
- LCD 17mm



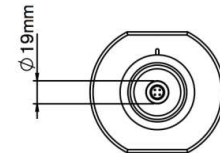
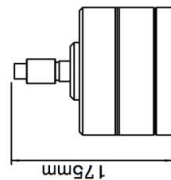


PULSER AND DISPLAY HEIGHT - A

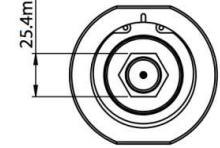
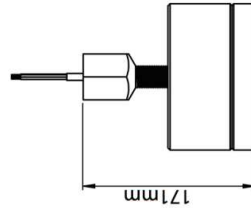
OUTPUT A,I,J,K
PULSER - Standard



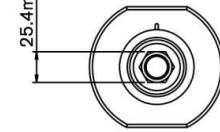
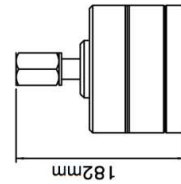
OUTPUT B
PULSER - Exia



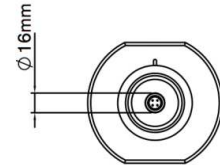
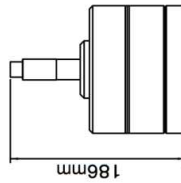
OUTPUT C
PULSER - EXd



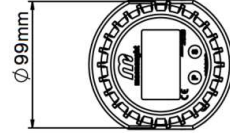
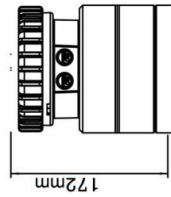
OUTPUT N
PULSER - Exia



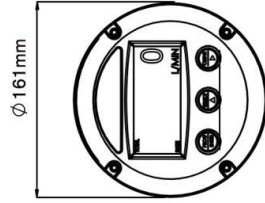
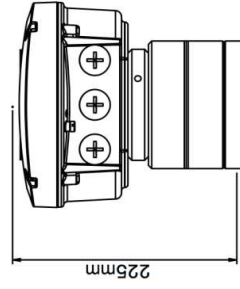
OUTPUT T
PULSER - High Temp.

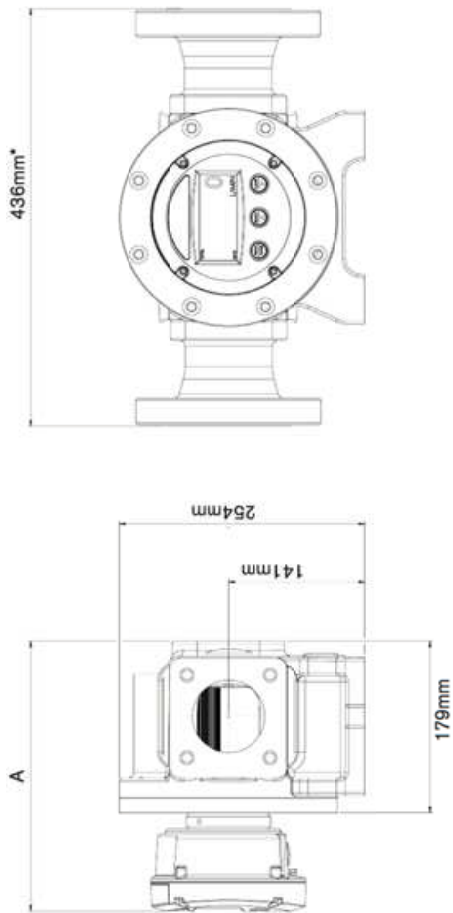


OUTPUT D,E
DISPLAY - LCD 12mm



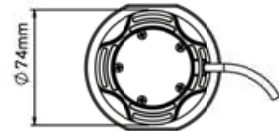
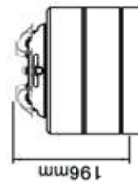
OUTPUT F,G,H
DISPLAY - LCD 17mm



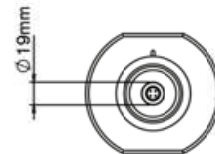
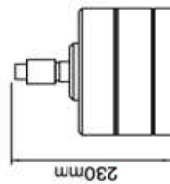


PULSER AND DISPLAY HEIGHT - A

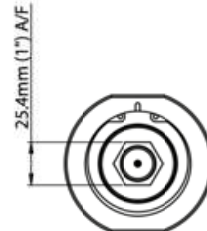
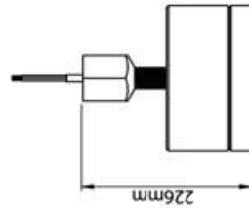
OUTPUT A,I,I,K
PULSER - Standard



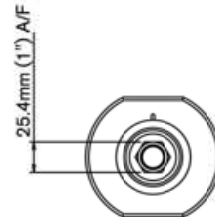
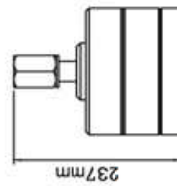
OUTPUT B
PULSER - Exia



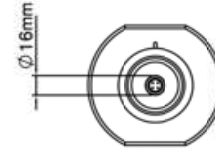
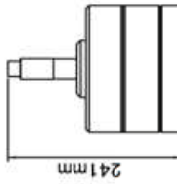
OUTPUT C
PULSER - EXd



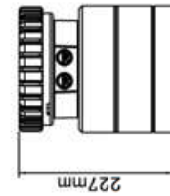
OUTPUT N
PULSER - Exia



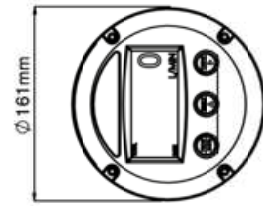
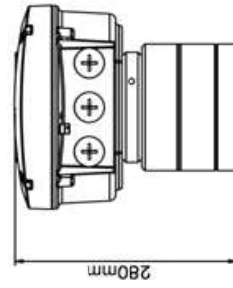
OUTPUT T
PULSER - High Temp.

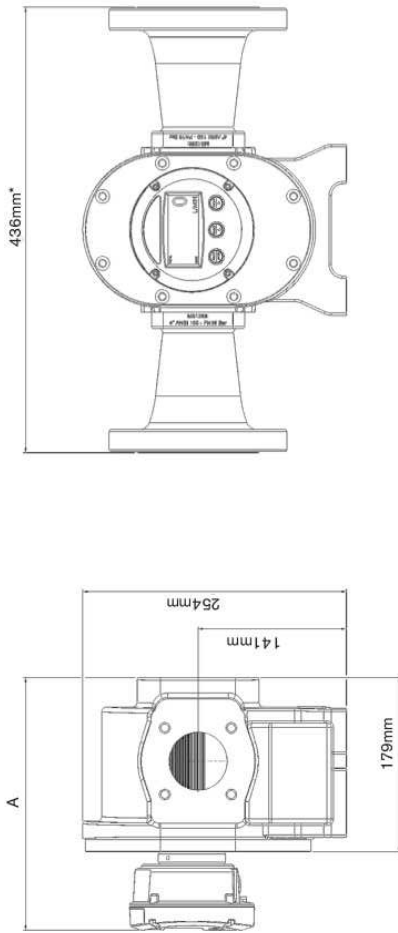


OUTPUT D,E
DISPLAY - LCD 12mm



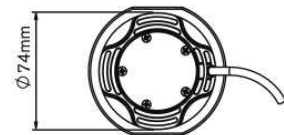
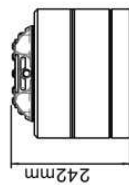
OUTPUT F,G,H DISPLAY
- LCD 17mm



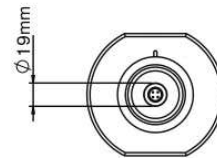
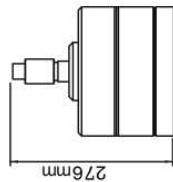


PULSER AND DISPLAY HEIGHT - A

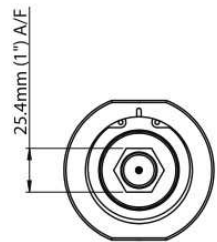
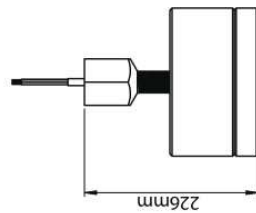
OUTPUT A,I,K
PULSER - Standard



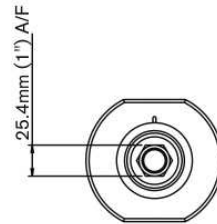
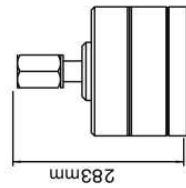
OUTPUT B
PULSER - Exia



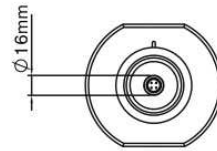
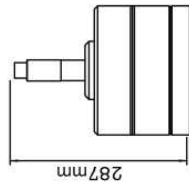
OUTPUT C
PULSER - EXd



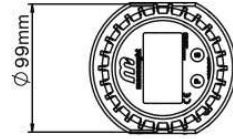
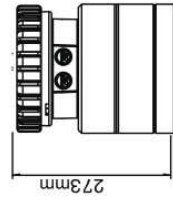
OUTPUT N
PULSER - Exia



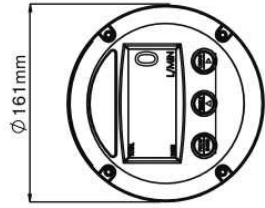
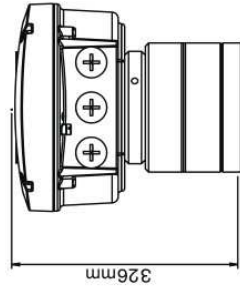
OUTPUT T
PULSER - High Temp.



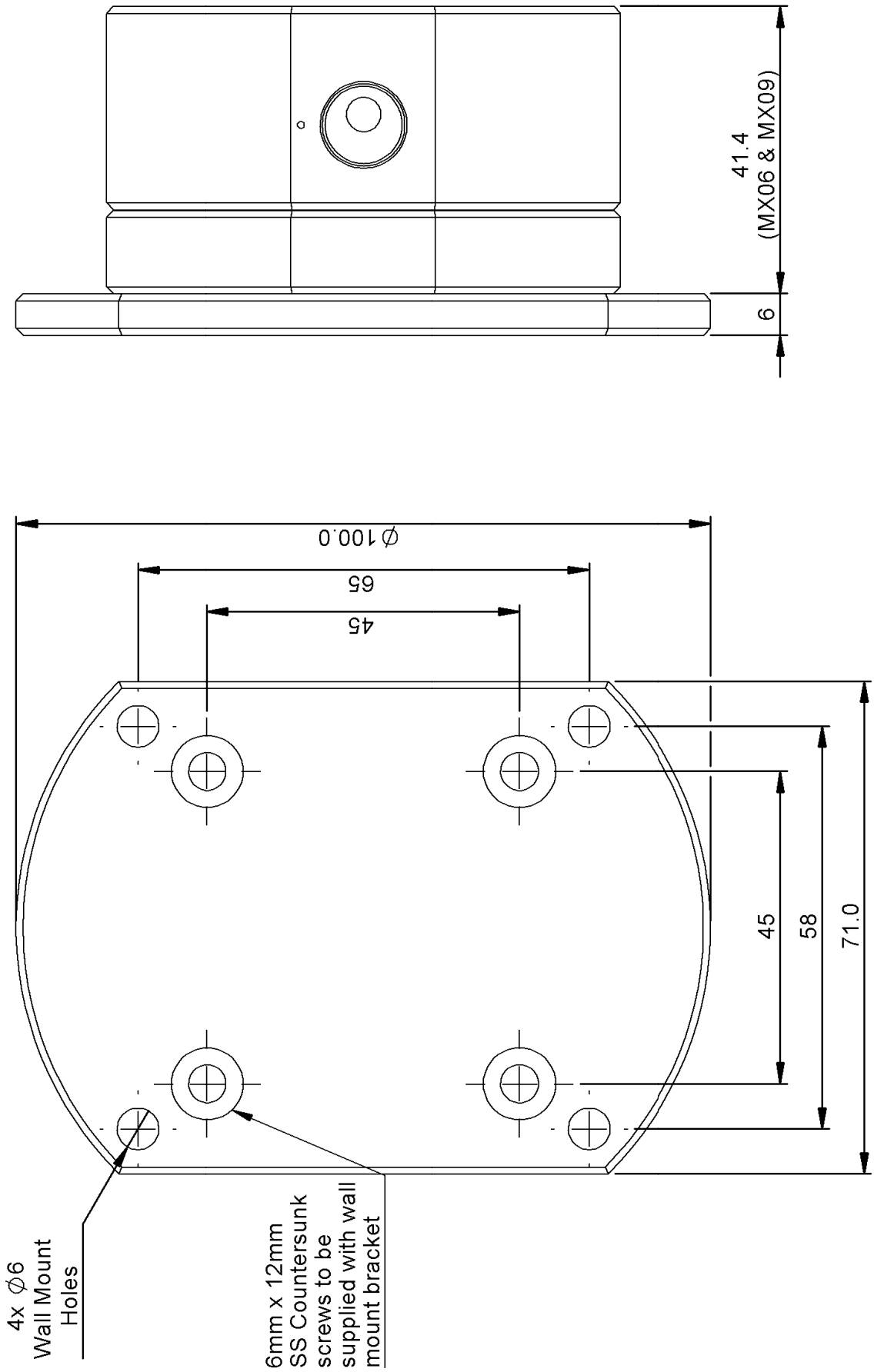
OUTPUT D,E
DISPLAY - LCD 12mm



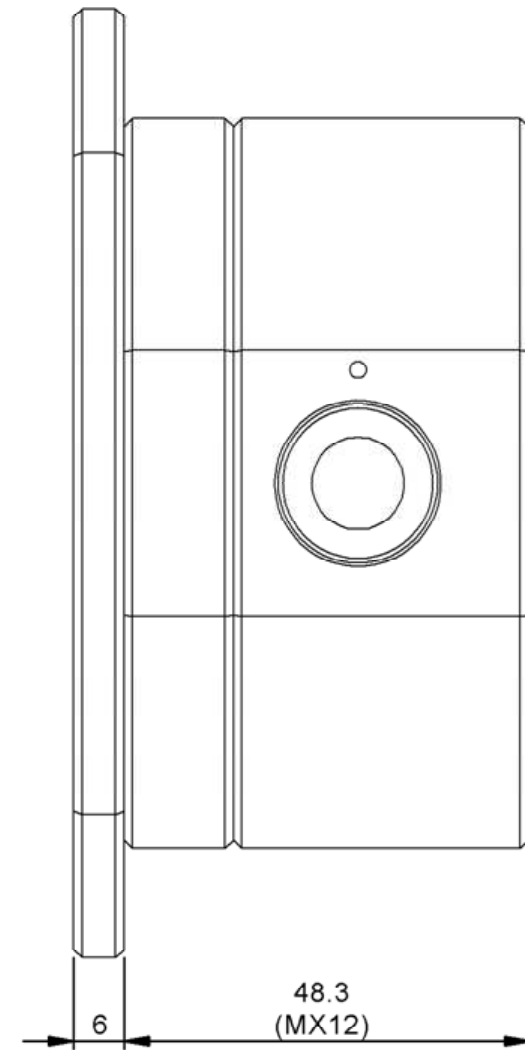
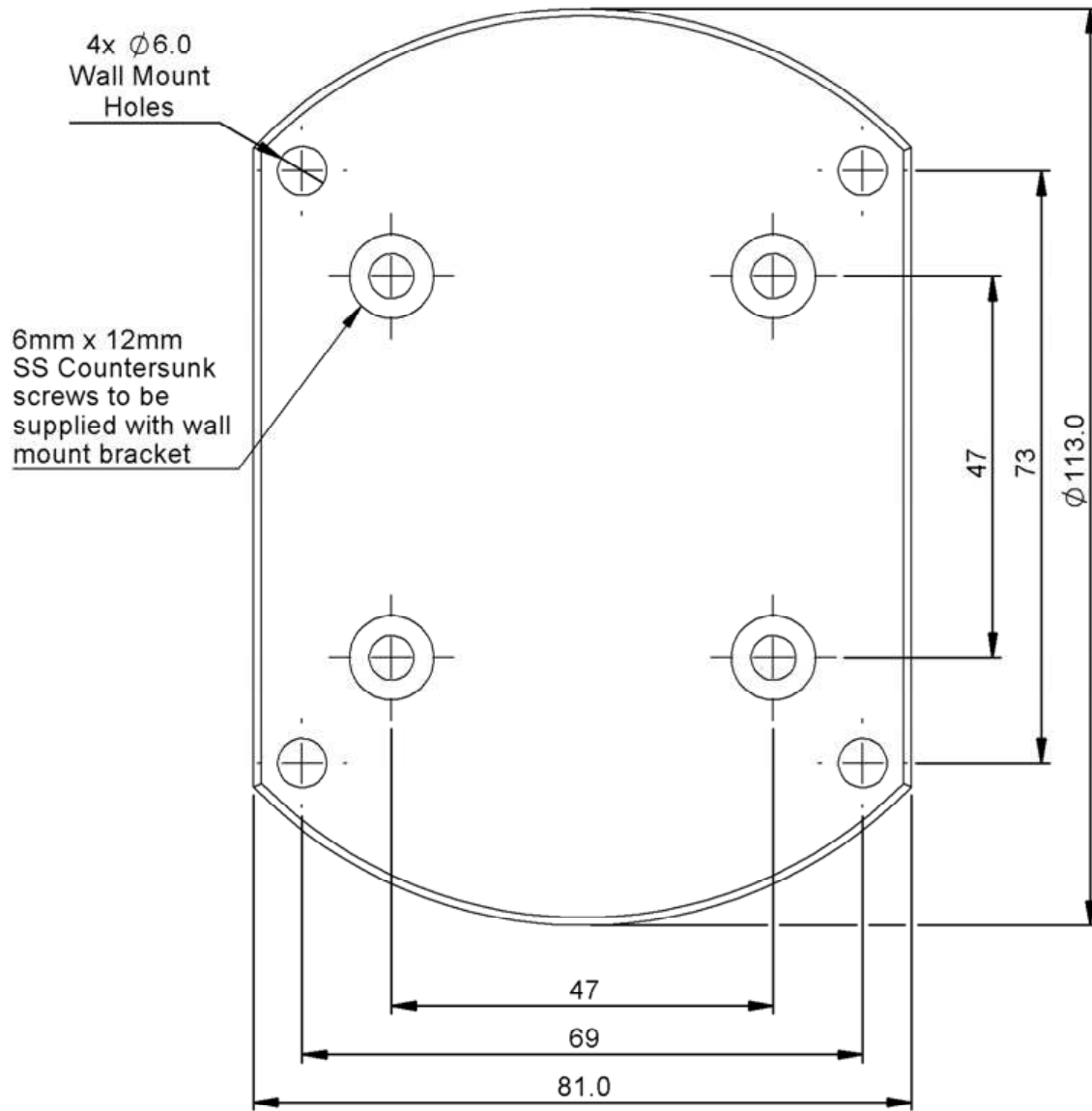
OUTPUT F,G,H
DISPLAY - LCD 17mm



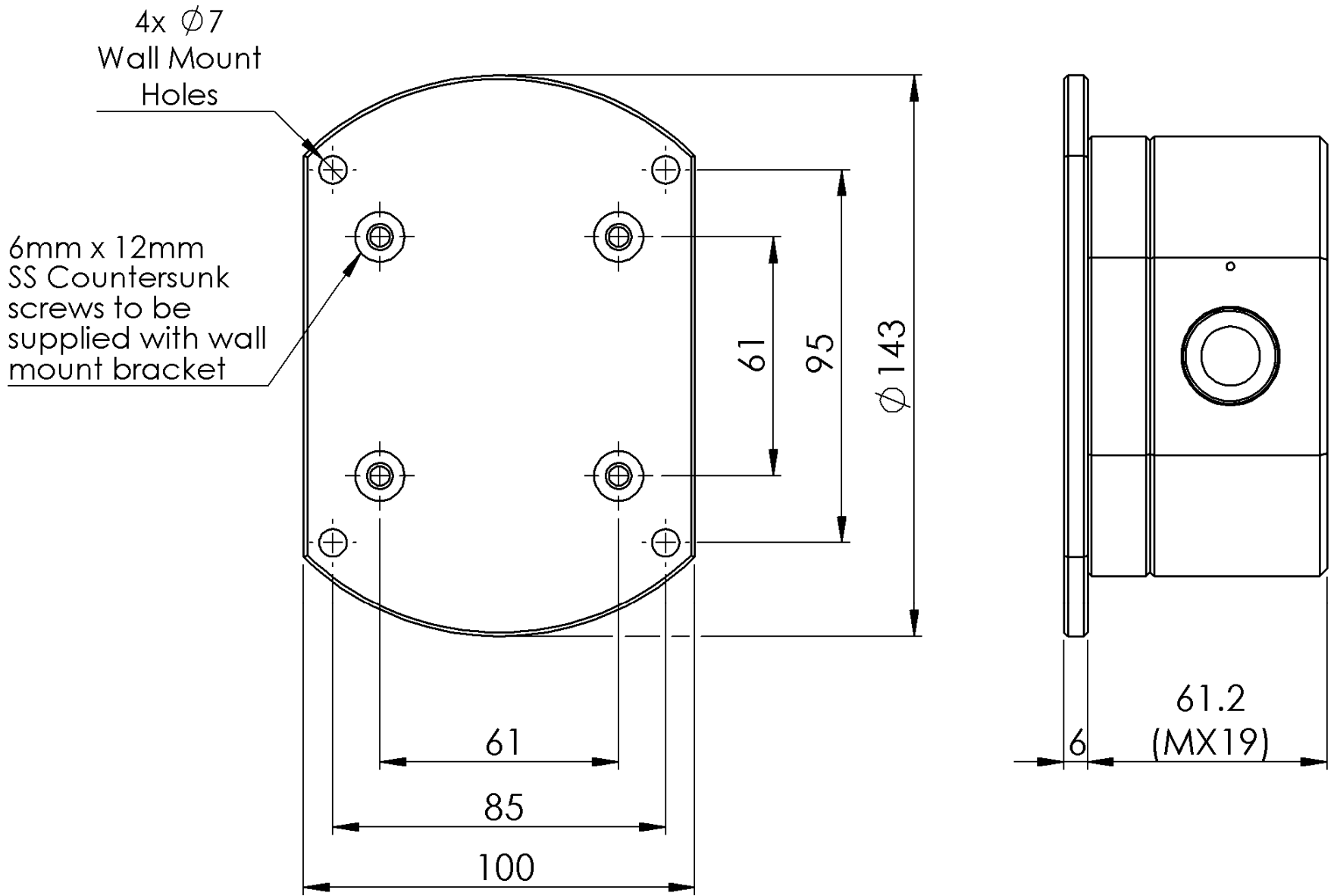
Aluminium Wall Mount bracket to suit model MX06-MX09



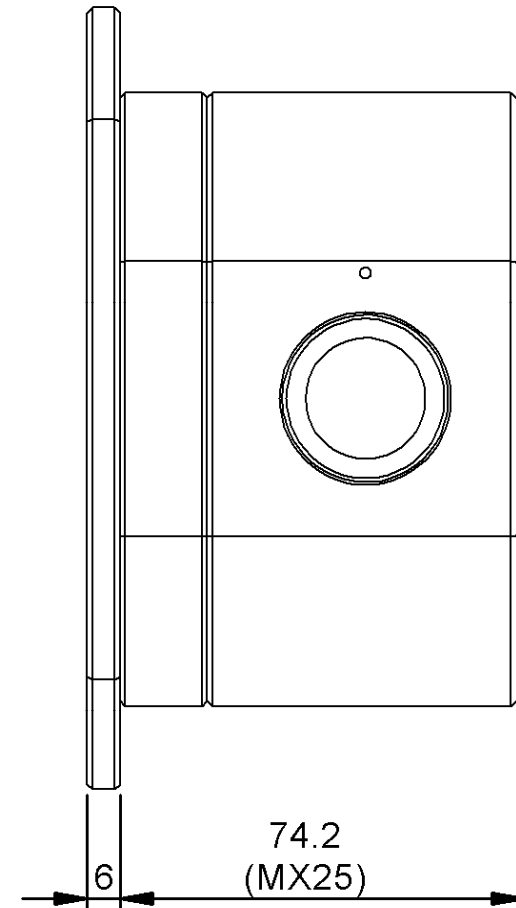
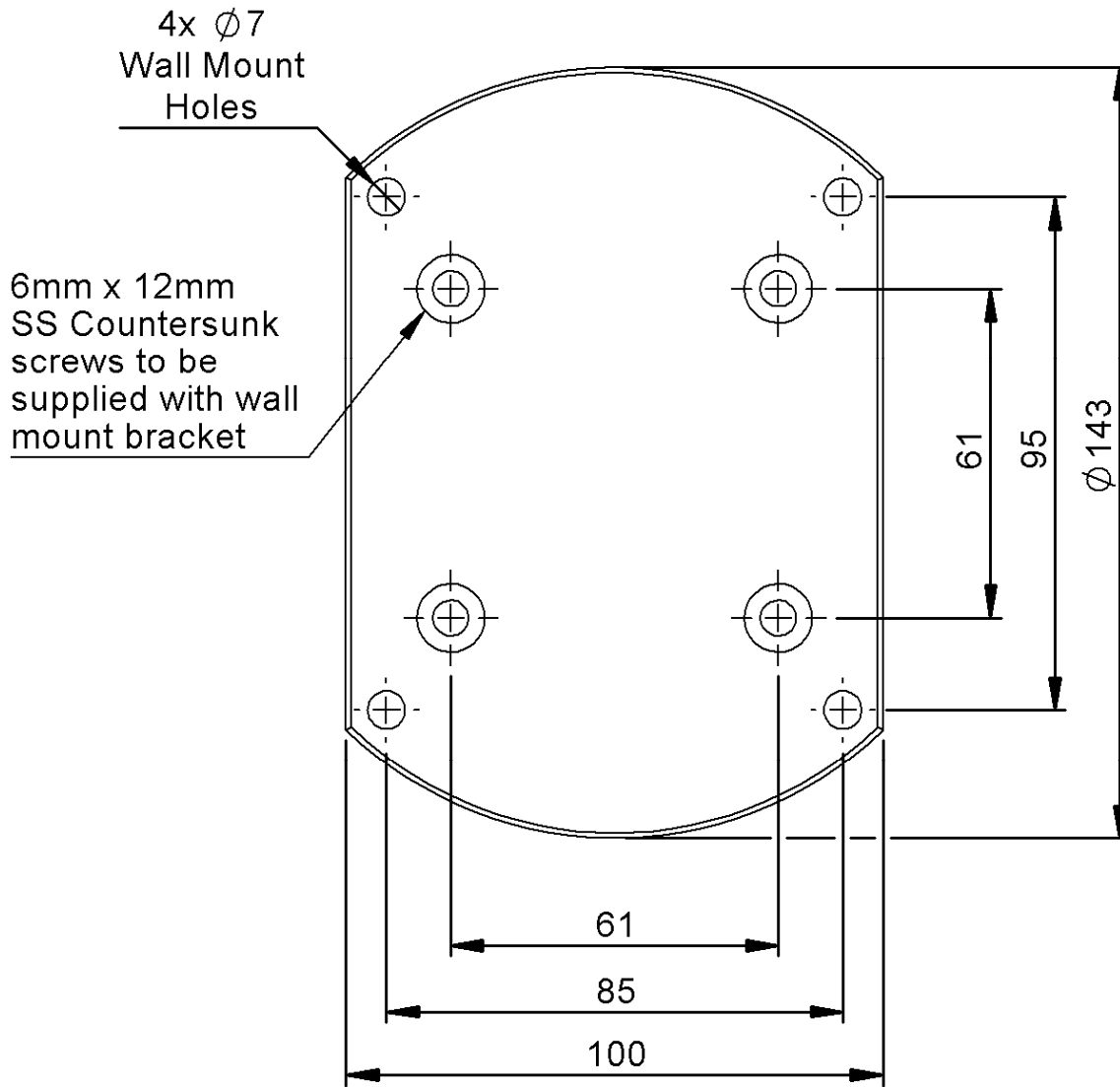
Aluminium Wall Mount bracket to suit model MX12



Aluminium Wall Mount bracket to suit model MX19



Aluminium Wall Mount bracket to suit model MX25



EU Declaration of Conformity

We: Macnaught Pty Ltd Of:
41-47 Henderson St
Turrella NSW 2205
AUSTRALIA

Declare that:

Macnaught Flow Meters prefixed MX, F, CR, M (MH) or S, in accordance with the following Directive; 2006/42/EC Machinery Directive (and its amending directives), have been designed and manufactured to the following specifications; **EN ISO 12100-1:2010 Safety of Machinery**

Declare that:

Macnaught Flow Meters prefixed MX*, F*, CR, M* (MH) or S* with flange nominal bores sizes up to 4", comply with the requirements of the Pressure Directive
97/23/EC until 19th July 2016
2014/68/EU from 20th July 2016

*Macnaught Flow Meters prefixed MX, F, M or S with flange nominal bores sizes of 1.5" and 2" comply to the directive for use at a maximum operating pressure of 725psi and 580psi respectively

Declare that:

Macnaught Flow Meter accessories prefixed MXD family of pulse boards (Macnaught designed) as fitted to the Flow Meters, in accordance with the following Electromagnetic Compatibility – Directive 2014/30/EU (and its amending directives), have been designed and manufactured to the following specifications; **EN 61326-1:2013 Electromagnetic Compatibility – Electrical equipment for measurement, control and laboratory use**, industrial electromagnetic environment.

Declare that:

Macnaught Flow Meter accessories prefixed DR, ER or PR as fitted to the Flow Meters or remotely mounted, have been designed and manufactured to the following specifications; **EN 61326-1:2006 Electromagnetic Compatibility – Electrical equipment for measurement, control and laboratory use**, industrial electromagnetic environment. After due consideration, it has been assessed that the technical requirements of EN 61326-1:2013 have not changed from EN 61326-1:2006 for industrial electromagnetic environments, and is therefore in conformance with the following Electromagnetic Compatibility – Directive 2014/30/EU (and its amending directives).

Declare that:

Macnaught Flow Meters prefixed MX, F, CR, M (MH) or S with flange nominal bores sizes up to 4" are manufactured in accordance with the following Directive; **RoHS Directive 2011/65/EU**.

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The product complies with all essential requirements of the Directives. This declaration is no longer valid if the unit is modified without our agreement.

Name: Steven D'Arcy
Position: European Engineering Manager
Date: 22/04/2016
Done at: Macnaught Pty Ltd; 41-49 Henderson St; Turrella NSW 2205; Australia

Signature: 





EU-Conformity Declaration (2014/34/EU)

Macnaught Pty Limited, 41-49 Henderson St, Turrella NSW 2205 Sydney Australia, herewith confirm that the unit mentioned below complies with the basic safety and health requirements of the relevant EU directives concerning design, construction and putting the model into circulation. This declaration is no longer valid if the unit is modified without agreement from Macnaught.

Description of the unit

Oval wheel flow meter

Type of unit

MX Series

Explosion Protection

-Fulfilling of non-electrical explosion protection requirements for the oval wheel meter.

The evaluation of hazards of ignition by means of a risk analysis shows that there is no own potential source of ignition during normal operation and expected abnormal operation. The oval gear rotors are contained within a suitable body which contains the process fluid. The body & rotors can be made of Aluminium or Stainless Steel. The instruments mentioned in this document comply with the requirements of DIN EN 13463-1 and DIN EN 13463-8 and can be used in hazardous areas requiring devices of Category 2. As these devices have no own energy sources, leading to an increase in temperature, the process fluid temperature can be taken as surface temperature.

Explosion Protection for additional units

Equipment	Standard Applied	Notified Body	Notification of Receipt of Technical Documentation Number	Marking
Non-electrical (Body)	EN13463-1:2009	SIRA 0518	SIRA15XT063	II 2 G k TX*
	EN13463-8:2003			* See Manual
Electronic Sensor (MX7)	Please refer to Manufacturer Declaration of Conformity.			
Electronic Sensor (MX7N)	Please refer to Manufacturer Declaration of Conformity.			
Electronic Sensor (MX8)	Please refer to Manufacturer Declaration of Conformity.			

SIRA: Sira Test and Certification Ltd, Rake Lane, Eccleston, Chester, Cheshire, CH4 9JN, England - <http://www.siracertification.com/>


Robert Armugam, Manufacturing Manager


Alireza Almaslow, Quality Engineer


Marco Uccellini, Ex Authorised Person

Certificates for Approved Switches can be downloaded at MACNAUGHT.com, through your Macnaught Flow Meter distributor, or contact metersinfo@macnaught.com

WEEE Directive - Waste Electrical and Electronic Equipment



The WEEE Directive requires the recycling of waste electrical and electronic equipment in the European Union.

Whilst the WEEE Directive does not apply to some of Macnaught's products, we support its policy and ask you to be aware of how to dispose of this product.

The crossed out wheeled bin symbol illustrated and found on our products signifies that this product should not be disposed of in general waste or landfill.

Please contact your local dealer national distributor or Macnaught Technical Services for information on product disposal.



Macnaught Americas
614 South Ware Boulevard
Tampa Florida USA, 33619

T: +1813 628 5506
E: info@macnaughtusa.com
W: www.macnaughtusa.com

Note:

This product should be disposed of according to all applicable local and national government environment

