

JOHANNESBURG WATER (SOC) Ltd.
BULK WASTEWATER

PARTICULAR SPECIFICATION
VOLUME 8 : FLOW MEASUREMENT



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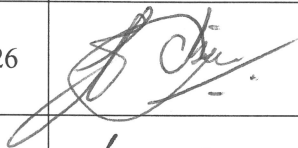


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8 FLOW MEASUREMENT

8.1 Scope

- 8.1.1 This specification covers the supply and installation of Flow meters, complete with sensors, transmitters, indicators, panels, etc. used for process monitoring and control applications at Johannesburg Water wastewater sites.

8.2 Abbreviations

- 8.2.1 In this specification the following abbreviations will apply :-

BS	:	British Standards
PLC	:	Programmable Logic Controller
I/O	:	Input/Output
CPU	:	Central Processing Unit
UPS	:	Uninterruptible Power Supply
MCC	:	Motor Control Centre
MCB	:	Miniature Circuit Breaker
SPD	:	Surge Protection Device
FJB	:	Field Junction Box
SSO	:	Switched Socket Outlet
SPDT	:	Single Pole Double Throw (refers to relay or switch contact arrangements).
LCD	:	Liquid Crystal Display
LED	:	Light Emitting Diode
PTFE	:	Polytetrafluoroethylene
O&M	:	Operating And Maintenance

NPT	: National Pipe Thread
DP	: Differential Pressure
LP	: Low Pressure
HP	: High Pressure
RH	: Relative Humidity
IS	: Intrinsically Safe

8.3 Standards

- 8.3.1 The supply and installation of all Flow meters and associated cabling, panels and any other equipment shall be subject to the latest amendments and editions of the following standard specifications:-

SANS 10142-1	: National Standards for the wiring of premises.
SANS 1091:2004	: National Colour Standard.
SANS 1274-2005	: Coatings applied by the powder-coating process.
BS 381C:1980	: Paint colour chart.
BS 3680	: Measurement of liquid flow in open channels.
SANS10108:2005	: The classification of hazardous locations and the selection of apparatus for use in such locations.
SANS60079-10:2005	: Electrical apparatus for explosive gas atmospheres. Part 10: Classification of hazardous areas.
SANS60079-11:2005	: Electrical apparatus for explosive gas atmospheres. Part 10: Intrinsic safety “i”.
SANS10086-1	: The installation, inspection and maintenance of equipment used in explosive atmospheres Part 1: Installations including surface installations on mines

8.4 General Requirements

- 8.4.1 This specification must be read in conjunction with the following specifications:-

8.4.1.1	PLC Panels Specification (Volume 3 of the Automation And Control Standards).
8.4.1.2	Clean Power And Surge Protection Specification (Volume 5 of the Automation And Control Standards).
8.4.1.3	Cabling Specification (Volume 6 of the Automation And Control Standards).
8.4.1.4	Field Junction Boxes And Panels (Volume 19 of the Automation And Control Standards).

8.4.1.5 Labelling (Volume 25 of the Automation And Control Standards).

- 8.4.2 Where cables are exposed to physical damage (including damage from rodents) armoured cables must be used or un-armoured cables must be run in steel conduit.
- 8.4.3 All power supply cables to instruments must have a black outer sheath, while all control cables (such as digital and analogue signals to PLC's) must have an orange outer sheath as specified in the Cabling Specification (Volume 6 of the Automation And Control Standards).
- 8.4.4 FJB's and as far as practically possible all instrument sensors and transmitters, must be mounted such that all equipment, wiring, numbers, terminations, etc. are readily accessible and can be viewed clearly. No equipment may be mounted such that it becomes a hazard or dangerous to view or gain access to such equipment.
- 8.4.5 Where sensors and/or transmitters cannot be mounted where they are readily accessible, the installation must be done in such a way that the sensor or transmitter can easily be moved to a safe and convenient position for testing, maintenance, replacement, etc. (e.g. by using hinged brackets, telescopic brackets, etc.).
- 8.4.6 Where transmitters can be exposed to the elements (wind, rain, ultra violet, etc.) such transmitters must be installed inside the FJB. LCD displays must always be protected from direct sunlight, either by facing them away from the sun or by installing it inside the FJB, in the shade of the FJB canopy. Where transmitters are protected from the elements (i.e. inside buildings) but they are exposed to potentially harmful conditions like moisture from splashing or equipment being hosed down, or the sensor is in such a position that the transmitter display is not clearly visible from floor level, without the need to climb onto ladders or structures to access it, the transmitter must also be installed inside the FJB. Only where transmitters are not exposed to the elements or any other harsh or potentially harmful conditions and where the displays on such transmitters are clearly legible by an average person standing on the ground or the normal walking surface (e.g. grating above ground level), can the transmitter be mounted outside the FJB.
- 8.4.7 FJB's must be mounted against a wall or structure or on a sturdy pedestal such that the top of the FJB enclosure is no higher than 1.8 m from the floor and easily accessible from the front.
- 8.4.8 All instrument installations must be done in accordance with the manufacturer's requirements and recommendations for proper operation. It is the tenderer's responsibility to ensure that he/she is familiar with both the requirements of the manufacturer as well as the installation requirements, in terms of location, site conditions, materials, equipment or substances to be measured (e.g. hot liquids, acids, abrasive material, etc.) and to ensure that if there are potential problems, they can be pointed out and rectified before orders for equipment are placed.
- 8.4.9 Costs incurred for alterations required to ensure proper operation of instruments, after orders have been placed, will be for the tenderer's account. For example, if instruments have been ordered and it is found there is insufficient space to install the instrument, or the instrument is not flooded with liquid all the time as it is required for proper operation, or the instrument transmitter is sometimes flooded in its installed position, or the sensing head is sometimes outside the medium it is supposed to measure, or the instrument linings are damaged by abrasive liquids, or the sensor is does not have a suitable range of measurement, etc. alterations or

replacements required to rectify such problems will be for the tenderer's account if the Engineer finds that the tenderer was negligent in his/her assessment of the installation.

- 8.4.10 Each instrument must be equipped with a circuit breaker connected to the power supply of the instrument, to enable local isolation in case of repairs or replacement.
- 8.4.11 The supplier of the instrument must be present for the installation, testing and commissioning of the instrument on site. Due allowance must be made for this in the tender sum.
- 8.4.12 The tenderer must supply a complete and detailed set of documentation for the installation, connections, terminations, power supply, technical details, setting up, calibration (if applicable), testing, etc. of the instrument for inclusion in a final O&M manual.
- 8.4.13 If a flow meter (for any application) is offered, which has the facility to store calibration and set-up data electronically, so that it can be downloaded when an instrument is replaced, the contractor must include the supply of all the necessary equipment (special cables, memory cards, etc.) to enable the use of this facility.
- 8.4.14 Completed data sheets are required as part of the returnable documents of each tender. Failure to complete these data sheets, supplied at the end of this specification, will lead to disqualification of the tender.

8.5 Surge Protection

- 8.5.1 Each instrument and its associated equipment must be suitably protected against surges from induced voltages, switching of equipment, lightning strikes, etc. as detailed in the Clean Power And Surge Protection Specification (Volume 5 of the Automation And Control Standards).
- 8.5.2 The power supply to the instrument must be equipped with suitable surge protection, both at the instrument and at the source of the power supply (i.e. at the distribution board, MCC, PLC panel, etc.), as detailed in the Clean Power And Surge Protection Specification (Volume 5 of the Automation And Control Standards).
- 8.5.3 Both the digital and analogue signals between the instrument and other remote devices (such as the PLC), must be equipped with suitable surge protection, both at the instrument and at the remote device as detailed in the Clean Power And Surge Protection Specification (Volume 5 of the Automation And Control Standards).

8.6 Open Channel Flow Measurement – Controller/Transmitter

- 8.6.1 Flow calculations for all open channel flow measurement must be done in accordance with BS 3680.
- 8.6.2 All flow measurements in open channels must be done by using ultra-sonic distance measurement, which is converted into a flow value at weirs or venturi flumes. Where there are no weirs or venturi flumes, area/velocity flow meters must be used (see requirements later in this specification).
- 8.6.3 All instrument transmitter enclosures must have at least an IP 65 or higher rating.

- 8.6.4 The instrument must be equipped with an isolated, active, 4 – 20mA output which will be connected to a maximum 500 ohm load. This output must be user-programmable.
- 8.6.5 The instrument must be equipped with at least one SPDT relay, rated for at least 230V AC, 500mA, for totalised flow pulses. This output must be user-programmable for the units-per-pulse.
- 8.6.6 The transmitter must be suitable for use with a 230V AC, 50/60 Hz power supply.
- 8.6.7 The transmitter must have an accuracy of at least 0.25% or 6mm, whichever is greater.
- 8.6.8 The transmitter must have a resolution of at least 0.1% or 2mm, whichever is greater.
- 8.6.9 The transmitter must have an LCD or LED display showing instantaneous flow and totalised flow.

8.7 Open Channel Flow Measurement – Sensor/Transducer

- 8.7.1 The range of the sensor must be suitable for the application (see items 8.4.8 and 8.4.9 of this specification).
- 8.7.2 The sensor must be suitable for an operating temperature range of -10°C to +50°C.
- 8.7.3 The sensor must be equipped with automatic temperature compensation.
- 8.7.4 The sensor must have a protection rating of at least IP 67 or higher.
- 8.7.5 Brackets used for the mounting of ultra-sonic sensor heads and velocity sensor heads (if external velocity sensors are used) must be made of at least 3CR12 grade stainless steel.

8.8 Full Pipeline Flow Measurement – Controller/Transmitter

- 8.8.1 All flow measurements in full pipelines must be done by using electro-magnetic flow (mag-flow) measurement, which is converted into a flow value where accuracy of measurement is required for dosing and/or custody transfer of flow. Where measurement for flow distribution or flow diversion is required or for pump protection (i.e. where high accuracy is not essential), non-intrusive flow measurement using external sensors can be applied. These systems must incorporate either ultrasonic time of flight or Doppler principles. Ultrasonic time of flight systems can be used on clean water with low contents of air bubbles or other entrained gasses and suspended solids of less than 10,000 milligrams/litre. Doppler systems can be used on liquids with entrained particles or gasses of 100 microns or larger and suspended solids in excess of 75 milligrams/litre.
- 8.8.2 All instrument transmitter enclosures must have at least an IP 65 or higher rating.
- 8.8.3 The instrument must be equipped with an isolated, active, 4 – 20mA output which will be connected to a maximum 500 ohm load. This output must be user-programmable.

- 8.8.4 The instrument must be equipped with at least one SPDT relay, or an output that can be used to drive a relay, for totalised flow pulses. This output must be user-programmable for the units-per-pulse.
- 8.8.5 The transmitter must be suitable for use with a 230V AC, 50/60 Hz power supply.
- 8.8.6 The transmitter for electro-magnetic flow meters must have an accuracy of at least 0.5%, or better, of the measured value for flow velocities which are greater than 0.5 meters/second. Transmitters of flow meters for flow distribution/diversion can have an accuracy of less than 0.5% but they must not be less accurate than $\pm 2\%$ of the full scale for Doppler meters and not less than $\pm 2\%$ of the measured value for time of flight meters. For both Doppler and time of flight meters these accuracy requirements apply to flow velocities of 0.5 meters/second or greater. Repeatability must not be less than 1% of the measured value.
- 8.8.7 The transmitter must have an LCD or LED display showing instantaneous flow and totalised flow.

8.9 Full Pipeline Flow Measurement – Sensor/Transducer

- 8.9.1 The range of the sensor must be suitable for the application (see items 8.4.8 and 8.4.9 of this specification).
- 8.9.2 The sensor lining for electro-magnetic flow meters used in sludge or non-corrosive liquids must be Neoprene or Rubber, suitable for operating in temperatures ranging from -10°C to $+80^{\circ}\text{C}$.
- 8.9.3 The sensor lining for electro-magnetic flow meters used in corrosive or heated liquids must be PTFE, suitable for operating in temperatures ranging from -20°C to $+150^{\circ}\text{C}$.
- 8.9.4 The sensor must have a protection rating of at least IP 68 or higher.
- 8.9.5 The sensor tube material for electro-magnetic flow meters must be at least 304, 316 or 3CR12 grade stainless steel.
- 8.9.6 The sensor electrode material for electromagnetic flow meters must be at least 304, 316 or Hastelloy C grade stainless steel.
- 8.9.7 The sensor for electromagnetic flow meters must have either a grounding electrode or earth rings fitted.
- 8.9.8 Where process flow in the pipeline cannot be stopped or isolated by any other means, isolation hand valves must be fitted on either side of electro-magnetic flow meters for removal/replacement of the flow meter.
- 8.9.9 The sensor material for flow meters used for flow distribution/diversion must be stainless steel.
- 8.9.10 Magnetic flow meters must be equipped with an “Empty Pipe” detection which is configurable to stop the 4-20mA flow indication and/or operate a potential free contact, or an output that can be used to drive a relay, for PLC interfacing.
- 8.9.11 Electro-magnetic flow meters must not be a wafer-type. I.e. the sensor tube or wafer must be housed in a flanged stainless steel spool piece which can readily be bolted onto flanges in the pipe where it must be installed.

8.10 Partially Filled Pipeline Or Channel Flow Measurement – Controller/Transmitter

- 8.10.1 Where electro-magnetic flow meters (e.g. for full pipes) or conventional ultrasonic flow meters (e.g. at weirs or venturi flumes) cannot be used, such as in partially filled pipes or open channels without a weir or venturi, area-velocity flow meters must be used. A liquid velocity measurement as well as a liquid depth measurement, together with the dimension of the pipe or channel which is programmed into the controller/transmitter, must then be used to produce a proportional flow measurement.
- 8.10.2 The flow measurement must be done by using ultrasonic, microwave or radar signals to measure both velocity and depth of liquid.
- 8.10.3 The controller/transmitter must have at least an IP66 rating or higher.
- 8.10.4 The controller/transmitter must have a backlit LCD display to display flow rate and total flow.
- 8.10.5 The error of the level measurement must not be more than 0.25% of the range and the error of the velocity must not exceed 2% of the velocity reading.
- 8.10.6 The repeatability and linearity must be 0.1% or better.
- 8.10.7 The unit must be suitable for use with a 230V AC supply.
- 8.10.8 The unit must have 3 x 4-20mA outputs, one for flow, one for level and one for velocity.
- 8.10.9 The unit must have at least 2 x SPDT relays, rated at no less than 2A at 230V AC. One of the relays must be programmable for flow pulses and the other must be programmable for flow and/or level alarm.
- 8.10.10 The unit must have at least 3 x 4-20mA outputs, one for velocity, one for level/depth and one for flow. These outputs will be connected to a maximum 500 ohm load.
- 8.10.11 The unit must be suitable for operating in temperatures ranging from minus 15°C to +60°C.

8.11 Partially Filled Pipeline Flow Measurement – Sensors/Transducers For Velocity Measurement

- 8.11.1 If the velocity sensor is installed below the water, the velocity sensor must be shaped and installed in such a manner that the cabling to it is protected from any debris that might flow in that pipe or channel.
- 8.11.2 The velocity sensor must be able to measure in a range of 0.03 to 6.2 m/sec and reverse flow of -1.5m/sec if a submerged sensor is used. If a non-submerged sensor is used, it must be able to measure in a range of 0.2 to 6 m/sec.
- 8.11.3 The velocity sensor must be suitable for operating in temperatures ranging from minus 15°C to +65°C.

- 8.11.4 The velocity sensor must be equipped with continuous, automatic temperature compensation.

8.12 Partially Filled Pipeline Flow Measurement – Sensors/Transducers For Level Measurement

- 8.12.1 The level sensor must have a low profile, in order to provide the maximum measuring distance in enclosed pipes.
- 8.12.2 The level sensor must have a measuring range of at least 3.66m and a minimum range (deadband) of not more than 203.2mm.
- 8.12.3 The level sensor must be suitable for operating in temperatures ranging from minus 15°C to +65°C.
- 8.12.4 The level sensor must be equipped with continuous, automatic temperature compensation.

8.13 Partially Filled Pipeline Flow Measurement – General

- 8.13.1 The submerged velocity sensor must not be installed in locations where sediment builds up.
- 8.13.2 The sensors must not be installed in locations where there is high water turbulence (the lower the turbulence, the higher the accuracy).
- 8.13.3 The sensors must be installed in locations where the velocity and level are equally distributed across the channel or pipe.
- 8.13.4 The channel or pipe where the sensors are installed must not have drops or direction changes immediately upstream of the sensors.
- 8.13.5 The slope of the pipe or channel where the sensors are installed must not exceed 3%.
- 8.13.6 Under no circumstances must sensors be installed in a manner or in a location which makes it impossible for site maintenance staff to access it for repairs or replacement later.

8.14 Gas Flow

- 8.14.1 The flow measurement must be done by using thermal dispersion technology, with a guaranteed drift-free operation and a turn down ratio up to 100:1 to measure volumetric gas flow. With thermal dispersion, two temperature probes are used. The first probe generates a temperature and the second one measures the dispersed temperature. Thermal dispersion measurement must be unaffected by changes in gas pressure or gas temperature. The sensor must also maintain a minimum accuracy of 2% of the reading $\pm 0.2\%$ of full scale for changes in gas composition as high as $\pm 2.5\%$ of CH₄.
- 8.14.2 The instrument must be equipped with a remote transmitter which can be mounted in an IJB located in an easily accessible location in a non-hazardous area for viewing, maintenance and repairs. The transmitter shall have a 10-digit LED display for indication of flow rate and totalised flow. Where compensating leads for Pt100s are used, the contractor must ensure that the cable between the sensor

and transmitter is installed as supplied by the supplier. I.e. cables must not be cut. Excess cable must be coiled up neatly at the IJB.

- 8.14.3 The instrument must be equipped with integrated compensation for humidity. The average biogas composition which will be used must be 60% Methane and 40% Carbon Dioxide.
- 8.14.4 All instrument transmitter enclosures must have at least an IP 67 or higher rating.
- 8.14.5 The instrument must be equipped with a 4 – 20mA output which will be connected to a maximum 500 ohm load, for instantaneous volumetric flow in m³/hr. It must also be equipped with a pulsed output for flow totalization.
- 8.14.6 The instrument must be suitable for use with a 24V DC power supply and it must have an EEx [i, e or d] rating, suitable for use in a Zone 1 area with Methane gas.
- 8.14.7 The sensor shall be of the insertion type with full stainless steel design. The housing shall be a compression-proof, dual compartment, stainless steel housing of material type DIN 1.4571 (316Ti). All sealing on the housing shall be done with Viton “O” rings.
- 8.14.8 The sensor must be equipped with a hot tapping unit for ease of insertion removal during normal digester operation. The compression fitting on the hot tapping unit must be with a metal-Viton elastomer design, resistant to pipe vibration and with a robust, threaded process connection for frequent mounting/dismounting of the sensor for inspection.
- 8.14.9 The sensor must be installed strictly in accordance with the supplier’s recommendations and requirements. The sensor must be equipped with locating pins to ensure that the sensor cannot be replaced incorrectly after removal.
- 8.14.10 The range of the instrument must be suitable for the application (see items 8.4.8 and 8.4.9 of this specification)
- 8.14.11 The instrument must be suitable for an ambient operating temperature range of minus 20°C to +70°C and a process temperature operating range of minus 20°C to +120°C.
- 8.14.12 The instrument must be suitable for operating in a humidity range of 0 to 100% RH.

8.15 Spares

- 8.15.1 The tenderer will be required to provide a recommended spares list for three years maintenance. This item must be completed so that spares may be ordered as part of the capital contract. Tenderers ignoring this condition may be disqualified.

8.16 Hazardous Areas

- 8.16.1 If the flow meter is going to be used for any combustible gas flow measurement, the tenderer must ensure that there is a hazardous area classification for the area in which the instrument will be installed.
- 8.16.2 If no hazardous area classification exists, the tenderer must allow a suitable cost for the classification of all relevant areas and must clearly indicate this cost in either the Bill Of Quantities or in a covering letter.

- 8.16.3 The flow meter and associated equipment supplied must all be suitable for use in the hazardous area concerned.

8.17 Intrinsically Safe Installations

- 8.17.1 Where intrinsically safe (IS) installations are required the tenderer must allow a cost to have the IS design from the Engineer certified as safe and compliant with the relevant legal requirements. This certification can only be done by a suitably accredited organization or company.
- 8.17.2 Once the certified IS design has been installed, the installation must be certified as correct and in accordance with the certified design. The tenderer must allow a cost for the certification. This certification can only be done by a suitably accredited organization or company.
- 8.17.3 All instruments supplied for use in a hazardous area must have the hazardous area rating and classification (E.g. Ex ia IIC T5) and suitable marking as specified in SANS 10108, ARP 0108:2007, Annex B, indicated on the instrument and the instrument must be certified by an approved testing/certification body as listed in SANS 0108, ARP 0108:2007.

8.18 Data Sheets

- 8.18.1 All data sheets in the attached Appendix 1 must be completed.

APPENDIX 1

DATA SHEET – OPEN CHANNEL FLOW METER

DESCRIPTION	DATA
Make/Manufacturer	
Type/Model	
Power Supply (Voltage)	
Analogue Output Type & Programmable (Y/N)?	
Digital Output Type & Rating (E.g. SPDT, 230V AC, 5A) & Programmable (Y/N)?	
Controller/Transmitter Enclosure Rating	
Accuracy	
Resolution	
Programmable Totaliser (Y/N)?	
Display Data & Type (E.g. instantaneous & total LCD)	
Transducer/Sensor range	
Transducer/Sensor temperature operating range	
Transducer/Sensor temperature compensation (Y/N)?	
Transducer/Sensor enclosure rating	
Local agent (Y/N)?	
Local agent contact details	
Guarantee period	

DATA SHEET – FULL PIPELINE FLOW METER (MAGNETIC)

DESCRIPTION	DATA
Make/Manufacturer	
Type/Model	
Power Supply (Voltage)	
Analogue Output Type & Programmable (Y/N)?	
Digital Output Type & Rating (E.g. SPDT, 230V AC, 5A or 24V DC output) & Programmable (Y/N)?	
Controller/Transmitter Enclosure Rating	
Accuracy	
Repeatability	
Programmable Totaliser (Y/N)?	
Display Data & Type (E.g. instantaneous & total LCD)	
Transducer/Sensor range	
Transducer/Sensor wafer-type or flange-type?	
Transducer/Sensor temperature operating range	
Transducer/Sensor temperature compensation (Y/N)?	
Transducer/Sensor enclosure rating	
Transducer/Sensor lining material	
Transducer/Sensor tube material	
Transducer/Sensor grounding details	
Transducer/Sensor equipped with “Empty Pipe” detection as specified (Y/N)?	
Local agent (Y/N)?	
Local agent contact details	
Guarantee period	

DATA SHEET – FULL PIPELINE FLOW METER FOR DISTRIBUTION/DIVERSION

DESCRIPTION	DATA
Make/Manufacturer	
Type/Model	
Power Supply (Voltage)	
Analogue Output Type & Programmable (Y/N)?	
Digital Output Type & Rating (E.g. SPDT, 230V AC, 5A) & Programmable (Y/N)?	
Controller/Transmitter Enclosure Rating	
Accuracy	
Repeatability	
Programmable Totaliser (Y/N)?	
Display Data & Type (E.g. instantaneous & total LCD)	
Transducer/Sensor range	
Transducer/Sensor temperature operating range	
Transducer/Sensor material	
Transducer/Sensor rating	
Local agent (Y/N)?	
Local agent contact details	
Guarantee period	

DATA SHEET – GAS FLOW METER

DESCRIPTION	DATA
Make/Manufacturer	
Type/Model	
Power Supply (Voltage)	
Analogue Output	
Hazardous area rating (E.G. Ex ia IIC T5)	
Hazardous classification certification body (E.G. CSA, CESI, DEMKO, DMT, LCIE, etc.) as approved by SANS 10108, ARP 0108:2007.	
Controller/Transmitter Enclosure Rating	
Accuracy	
Range	
Display Data & Type (E.g. instantaneous m ³ /hr LCD)	
Ambient temperature operating range	
Process temperature operating range	
Humidity range	
Sensor material	
Local agent (Y/N)?	
Local agent contact details	
Guarantee period	

DATA SHEET – AREA-VELOCITY FLOW METER

DESCRIPTION	DATA
Make/Manufacturer	
Type/Model	
Power Supply (Voltage)	
Analogue Output Type & Programmable (Y/N)?	
No. Of Analogue Outputs	
Digital Output Type & Rating (E.g. SPDT, 230V AC, 2A) & Programmable (Y/N)?	
No. Of Relay Outputs	
Controller/Transmitter Enclosure Rating	
Velocity Accuracy	
Level Accuracy	
Repeatability & Linearity	
Programmable Totaliser (Y/N)?	
Display Data & Type (E.g. instantaneous & total LCD)	
Velocity Transducer/Sensor range	
Level Transducer/Sensor range	
Velocity Transducer/Sensor temperature operating range	
Level Transducer/Sensor temperature operating range	
Velocity Transducer/Sensor temperature compensation (Y/N)?	
Velocity Transducer/Sensor temperature compensation (Y/N)?	
Local agent (Y/N)?	
Local agent contact details	
Guarantee period	