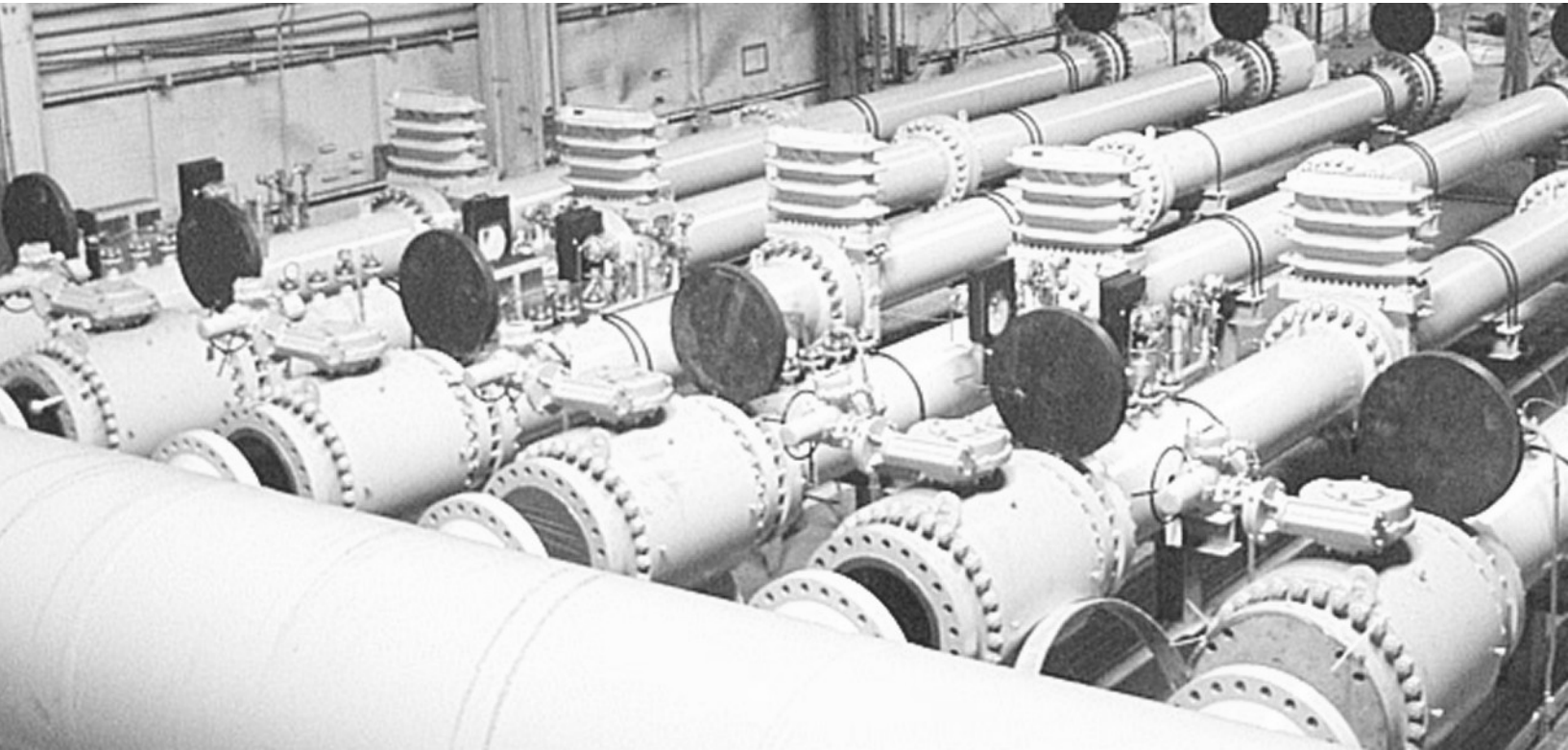




INSTRUMENTATION & CONTROL TECHNOLOGIES (I&CT)



Gas and Liquid Measurement Catalog

SOLUTIONS FOR:

- PRODUCTION
- REFINERIES
- DISTILLERY
- TRANSPORTATION AND STORAGE
- OIL DEPOTS
- DISTRIBUTION.

.....Engineered Solutions.

ORIFICE METERS | ULTRASONIC METERS | GAS TURBINE METERS | GAS CORIOLIS METERS | GAS ANALYSIS



ORIFICE FITTINGS AND METER RUNS

Orifice Fittings

The Orifice Fitting is a high quality, high accuracy orifice fitting manufactured in a wide selection of sizes and materials. These units are built to meet or exceed ASME and ANSI specifications as well as to comply with the requirements of the latest editions of AGA-3, ISO-5167 and API-14.3. The fittings are available to meet the NACE MR-0175 specification.

Stainless Steel internals are also available to meet extreme corrosive applications.

These Fittings are designed and constructed to allow for the orifice plate replacement or inspection under pressure without the interruption of the flow in the line.

Conformance and Reporting

- All fittings come standard with a documentation package including hydro-test, functional test, inner valve seal test, quality control inspection report and material test reports.
- Trace ability is maintained in accordance with the ISO-9001 Quality Control Program.
- When requested, radiography, stress relief, ultra sonic and liquid dye penetrate tests can be performed with the relative report submitted.
- An AGA 2000 inspection report is included with the purchase of every fitting. The documented tests include:

- * I.D. Bore Tolerance
- * Instrument Tap Diameter
- * Instrument Tap Location
- * Tap Communication

- * Seal Protrusion
- * Orifice Eccentricity
- * Bore Roughness
- * Bore Inside Diameter

Current production Capacities:

- **Dual Chamber:**
 - 2" thru 12" in 150 through 1500 ANSI
 - 16" in 150 through 900 ANSI
 - 20", 24" and 26" in 150 through 600 ANSI
- **Single Chamber:**
 - 2" thru 16" in 150 thru 900 ANSI
 - 8" thru 12" single chamber fittings are fitted with a gear shaft to assist with insertion and retraction of the plate carrier.
- All Single & Dual Chamber fittings are available in weld by flange, flange by flange or weld by weld configurations.
- Materials available are A216 WCB, A352 LCC and CF8M Stainless Steel.

Meter Tubes

Available in two and three section designs with flow conditioning plates the meter tube is the most critical component for accurate measurement. Meter Runs are fabricated from pipe that is selected for diameter, roundness and straightness we offer the entire package.

Orifice Plate Seal Assemblies

The Assemblies comply with the latest editions of AGA-3 and ISO- 5167. The seal assembly mounts securely into the existing plate carrier with setscrews. It is comprised of a stainless steel seal and retainer ring. Standard size O-Ring seals in a variety of compositions are incorporated. A solid seal is established both on the orifice plate and on the seal surfaces of the orifice fitting body. This unit simplifies orifice plate changing.

Two styles are available depending upon the application:

- Standard 2000 Edition Seal Assembly
- Dual Ring Orifice Plate Seal Assembly

Ultrasonic Flowmeters

These ultrasonic flowmeters are specially designed for high accuracy gas flow measurement such as

- Custody transfer
- Transmission and distribution
- Pipeline balancing
- Compressor station metering
- Any gas application where high accuracy is required.

The system employs a two diametrical-path, single-traverse meter body design with a ten diameter upstream pipe run and a flow conditioning plate. Advanced ultrasonic transducer technology combined signal processing optimized for speed and robustness, provide the capability of the system to operate even in air at atmospheric pressure, which is important for field verification of the meter system during commissioning.

Conformance and Reporting

- Compliant to AGA9
- NMI approval (Netherlands B37)
- Inmetro approval
- Approval from the Italian Ministry of Industry
- BRML Approval (Romania)
- PAC Approval (China)
- Algeria Approval (ONML)



Features & Benefits

- Accuracy <0.1%
- Least complicated path configuration
- True redundancy
- 70:1 turndown
- Retractable transducers
- Operational from atmospheric pressure

Current production Capacities:

Available in pipe sizes ranging from 4 to 24 inches (and beyond) and meets or exceeds AGA9 criteria.

Meter Tubes

Available in two and three section designs with flow conditioning plates the meter tube is the most critical component for accurate measurement. Meter Runs are fabricated from pipe that is selected for diameter, roundness and straightness we offer the entire package.

Flow Conditioning System

The complete system includes a flow profile conditioning plate and a straight pipe run of ten diameters upstream of the Sentinel meter body. The system requires the customer to provide a minimum of five-diameter straight pipe run both upstream and downstream of the installation. When used in a bidirectional flow application, the system includes an additional flow profile conditioning plate and ten diameters of straight pipe run on the downstream side of the flowmeter. The customer-provided five-diameter pipe runs upstream and downstream are still required.



Turbine Flowmeters

Turbine meters suitable for natural gas and all noncorrosive gaseous media is made of spheroidal graphite iron, cast steel or welded steel, depending on the pressure rate. Several versions of the turbine meters are available.

- special version for corrosive gas
- mechanical counter showing total gas
- flow in volume units (working cubic meter)
- high accuracy
- horizontal or vertical gas flow
- simultaneous connection of two auxiliary instruments (e.g. integrator and load recorder) to the output couplings is possible, with electronic output for computer systems
 - max. service pressure p_{max} 100 bar
 - meter sizes G 40 to G 16000 (from Q_{max} 65 m³/h to Q_{max} 25000 m³/h)
 - max. measuring range 1:50



Connections

- DN 50 to DN 600
- flanged to DIN PN 10, PN 16, PN 25, PN 40, PN 63, PN 100 and flanged to ANSI 150, ANSI 300, ANSI 600

Meter Tubes

Available in two and three section designs with flow conditioning plates the meter tube is the most critical component for accurate measurement. Meter Runs are fabricated from pipe that is selected for diameter, roundness and straightness we offer the entire package.

Flow Conditioning System

Our systems been specially designed for gas systems where there are turbulences, swirls or asymmetric flow profiles caused by the pipe network or by the system itself. Flow disturbances can be eliminated to a great extent that the metering results remain within prescribed error limits by installing a flow conditioner



Coriolis Flowmeters


We offer full range of mass flow meters capable of withstanding vibration, abrasion and corrosive media for Liquid, sludge and gas measurement capability. Special features are:

- Models to measure flow rates from as low as 0.03 kg/h up to 1,500,000 kg/h (0.07 lb/h to 3,300,000 lb/h)
- Sizes up to 12" / DN300
- Pressure ratings up to 900bar / 13,050psig
- Temperature ratings from -255°C to +400°C / -425°F to +750°F
- Fiscal/custody transfer approvals (OIML R117 / NTEP)
- ATEX and CSA hazardous area approvals covering most of the world
- Extreme resistance to gas bubbles entrained in the process stream when compared to conventional Coriolis meters
- Unaffected by viscosity, density or pressure changes
- Multifunction measurement capability includes density and temperature
- Available with stainless steel, hastelloy, monel and tantalum wetted materials as standard. Other materials on request




Instrumentation and Fieldbus Solutions


ICT combines world-class products with unparalleled application expertise and industry knowledge. The current generation of Fieldbus-capable devices and systems from ICT provide true inter-operability, allowing you the freedom to select the most appropriate devices and Fieldbus for your application. Our instrumentation product range includes transmitters, recorders, indicators, flow meters, analyzers, and valves. Our Fieldbus offerings guarantee safe, secure and reliable operations through their unique built-in redundancy.



A gas flow computer that incorporates a fully programmable PLC that can be used for process control, valve switching, pressure control and more.




A Modbus multivariable transmitter that measures process temperature, process pressure and differential pressure and offers both Ethernet and Serial communications. Configurable through our software this transmitter includes a PID controller, analog output and LCD display.



Solar-powered, single run EFM with integrated Bluetooth® wireless technology and radio communications for drive-up and remote connections. The multi-run gas flow computer software module can be used in the measurement of up to ten gas flow runs. This product converts any of the ICT controllers into a full function gas flow computer.

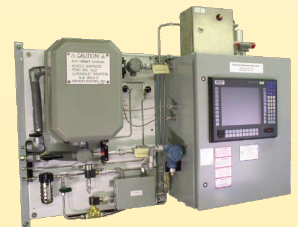
Pressure Temperature and Flow recorders.
Full scallop recorders with clock driving chart—mechanical spring or electrical. Mount directly on diaphragm, rotary positive displacement and turbine meters. Recorder are available in 8" an 12" circular chart sizes. Whether your requirement calls for special chart or the usual pressure temperature range we can provide it. Each recorder matches any chart you wish to use and many parts are interchangeable with recorders from other manufacturers



Gas Analysis



ICT also helps you maintain correct quality control. Our products include sampling systems and analyzers to measure pH, density, conductivity and turbidity; gas chromatographs; mass spectrometers; FTIR spectrometers; photometers (IR and UV); and physical property analyzers. From High quality portable field to stand alone measurement instruments and system ICT offers you end to end solutions that will help you monitor, protect and control your critical processes and applications.



Whether your process is up, mid or downstream, and application demands for custody transfer meters or accurate measurement of liquid or gas, ICT understands that an integrated equipment and expertise solution can help give you a competitive advantage. We are the experts for dependable and accurate flow measurement systems and will work with you to analyze your unique requirements and provide answers to your technical and business problems.



We have the people, the technology and the experience to help you optimize performance, conserve resources and exceed regulations.

Consider us your global partner for all your oil and gas measurement needs. We'll deliver low-risk solutions, innovative and high-performing products and the finest customer support—bringing the best results to you and your customers.



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