KURZ INSTRUMENTS INC.™

Mass Flow Meter Product Guide

Thermal Mass Technology

Kurz Instruments manufactures thermal mass flow meters designed to accurately monitor and measure dry air, dry gas, and wet gas environments.

Thermal mass technology uses dual stings – one as a temperature reference and one as a process flow measurement. Thermal mass devices introduce heat into the flow stream, using the concept that stronger flows cause a greater cooling effect.

Kurz thermal mass flow meters are immune to issues that inhibit the accuracy of other technologies, such as low velocities, errors caused by particulates in the flow, buildup in the duct, or buildup on the sensor.

Thermal mass technology can be more reliably accurate when compared against differential pressure, ultrasonic, and Coriolis devices. Thermal devices also can be much more cost-effective in purchase, installation, or maintenance costs.

Even among thermal manufacturers, Kurz is the only company using a constant temperature method that auto adjusts the power to protect the sensor at high temperatures, eliminate sensor burnout, and support stable zero point.

Kurz constant temperature thermal mass flow meters:

- Support a wide range of flow rates
- Work accurately even with extremely low flows
- Operate at higher process temperatures than other thermal devices
- Respond very quickly to flow and temperature changes (perfect for control systems)
- Require no temperature or pressure corrections
- Are available as insertion or in-line devices
- Are insensitive to sensor orientation
- Do not impose any type of significant flow restriction in ducts or pipes, which increases performance and efficiency.
- Are fully digital and have no moving parts
- Use constant temperature technology - sensor signal increases with increasing flow

	454FTB Single-Point Insertion	454FTB-WGF Single-Point Insertion	504FTB In-Line	534FTB In-Line	534FTB-CL2 In-Line	KBAR-2000B Multipoint Insertion
Process Line Size	2" → 36"	2" → 36"	3/8" → 4"	½" → 8"	1", 1 ½", and 2"	24" → 450"
Velocity Range or Mass Rate	0 → 100,000 SFPM (0 → 500 NMPS)	0 → 4,000 SFPM (0 → 18.7 NMPS)	0 → 1,000 SCFM (0 → 1,560 NCMH)	0 → 1,754 SCFM (0 → 2,736 NCMH)	0 → 27,600 PPD based on line size	0 → 100,000 SFPM (0 → 500 NMPS)
Process Temperature Rating	-40ºF → 500ºF (HT) or → 932ºF (HHT) (-40ºC → 260ºC or → 500ºC)	-40ºF → 248ºF (-40ºC → 120ºC)	-40ºF → 257ºF (-40ºC → 125ºC)	-40ºF → 257ºF (-40ºC → 125ºC)	32ºF → 140ºF (0ºC → 60ºC)	-40ºF → 500ºF (HT) or → 932ºF (HHT) (-40ºC → 260ºC or → 500ºC)
Process Pressure Rating	Up to 300 PSIG (20 BARg)	Up to 150 PSIG (10 BARg)	Up to 300 PSIG (20 BARg)	Up to 300 PSIG (20 BARg)	Up to 54 PSIG (3.67 BARg)	not applicable
Accuracy*	±(1% of reading +20 SFPM)	±(1% of reading +20 SFPM) (dry)	±(1% of reading +20 SFPM)	±(1% of reading +20 SFPM)	±(3% of reading +30 SFPM)	±(1% of reading +20 SFPM)

*Basic flow meter velocity accuracy for insertion flow meter:
$U(v) = \pm (1 + 100U_L / v)$ %
*Extrapolated velocity range ($v > V_{CM}$):
$U(v) = \pm (1 + 100U_L / V_{CM})(v / V_{CM})$ %

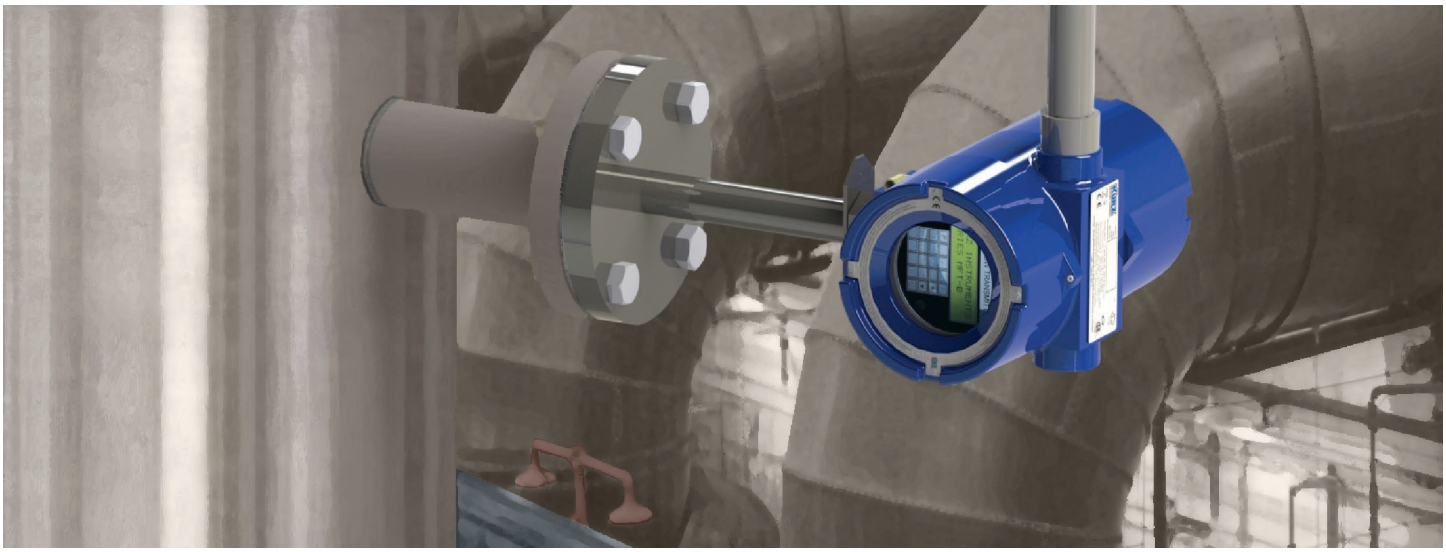
where: v = velocity
U(v) = meter accuracy as a function of velocity
V_{CM} = velocity at the calibration maximum
U_L = accuracy at low velocity (20 SFPM or 0.102 SMPS for most meters)

Please visit kurzinstruments.com for complete technical specifications.

The qualities and features found in all Kurz thermal flow meters that make them outperform all other currently available thermal mass flow meters include:

- The highest repeatability, accuracy, and reliability available
- Mass balanced sensors provide the fastest response to temperature and velocity changes in the industry
- Exceptionally low end-to-end in-line pressure drop
- Sensors that do not overheat at zero flow
- Continuous self-monitoring electronics that verify the integrity of sensor wiring and measurements
- Completely field configurable electronics
- Velocity-temperature mapping (VTM) for wide ranging velocity and temperature
- A rugged all-welded design
- Interchangeable sensor and electronics (single circuit board) — no matched sets
- Sensor lead length independent circuitry

454FTB Insertion Meter



The Kurz 454FTB single-point insertion flow meter incorporates the most advanced state-of-the-art microprocessor and electronics technology to provide accurate and realtime diagnostics in a variety of environments.

The 454FTB product line supports process temperatures ranging from -40°F to 500°F (-40°C to 260°C) (standard) or from -40°F to 932°F (-40°C to 500°C) (high heat). A wet gas option is available.

Process pressure ratings are supported up to 300 PSIG (20 BARg) with a velocity range from 0 to 100,000 SFPM (500 NMPS). The 454FTB is ATEX certified for Zone 1 and Zone 2.

Applications

- Stacks, flares & emissions (CEM, AMS)
- Boilers & recovery boilers
- Combustion air
- Primary, secondary & tertiary air
- Gas lines
- Chemical processing
- Aeration air
- Utilities & cogeneration
- Pulp & paper mills
- Metal smelters, foundries, refineries, mills & recyclers
- Cement plants
- Petrochemical plants
- Bulk powder drying
- Incinerators
- Coal pulverizers

454FTB-WGF Insertion Meter

The Kurz WGF single-point insertion flow meter for wet gas environments is the first thermal mass flow meter offering accurate, reliable, and realtime wet gas flow measurements for digester and landfill applications.

The WGF has a built-in dry gas flow calculation for saturated processes that provides a true gas flow for accurate reporting.

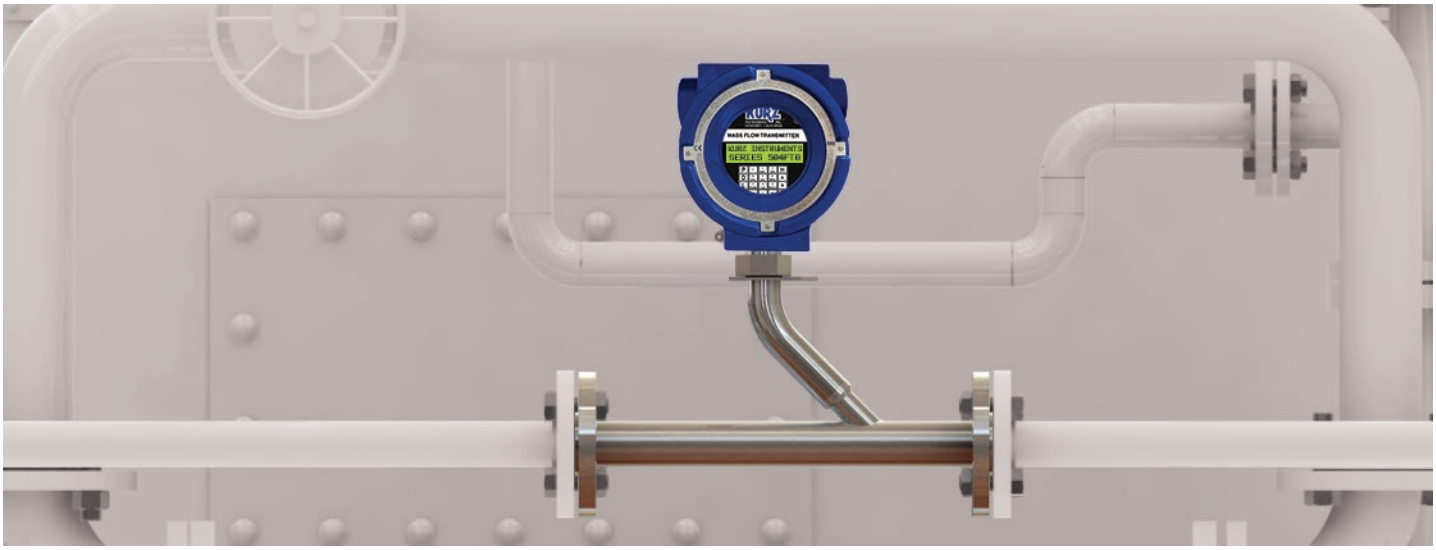
The WGF product line supports process temperatures ranging from -40°F to 248°F (-40°C to 120°C).

Process pressure ratings are supported up to 150 PSIG (10 BARg) with a velocity range from 0 to 4,000 SFPM (18.7 NMPS). The 454FTB-WGF is ATEX certified for Zone 2. CSA Explosion-Proof and ATEX Zone 1 pending.

Applications

- Wastewater digesters
- Landfills
- Livestock lagoons
- Dry & wet stacks
- Greenhouse gas reporting
- Flare management
- Pulp & paper mills
- Chemical processing
- Gas lines (methane)
- Utilities & cogeneration

504FTB In-Line Meter



The Kurz 504FTB in-line flow meter is designed for applications where flow disturbances or line-size changes are not an issue. The 504FTB is available in 10 models for in-line sizes from 3/8" to 4" pipes.

The 504FTB product line supports process temperatures ranging from -40°F to 257°F (-40°C to 125°C). A wet gas option is available.

Process pressure ratings are supported up to 300 PSIG (20 BARg) with a mass rate up to 1,000 SCFM (1,560 NCMH). The 504FTB is ATEX certified for Zone 1 and Zone 2.

Applications

- Fuel lines
- Natural gas
- Treatment & control gases
- Compressed air
- Combustion air
- Chemical processing
- Air sampling
- Gas blending
- Isokinetic sampling
- Pulp & paper mills
- Pharmaceutical production
- Petrochemical plants
- Nuclear
- Incinerators

534FTB In-Line Meter

The Kurz 534FTB is designed with built-in inlet and outlet piping reducers/ expanders to produce exceptional immunity to upstream and downstream flow disturbances caused by elbows, valves, and line size changes.

The patented technology results in output with exceptional low end-to-end pressure drop and the fastest response to velocity and temperature changes in the industry.

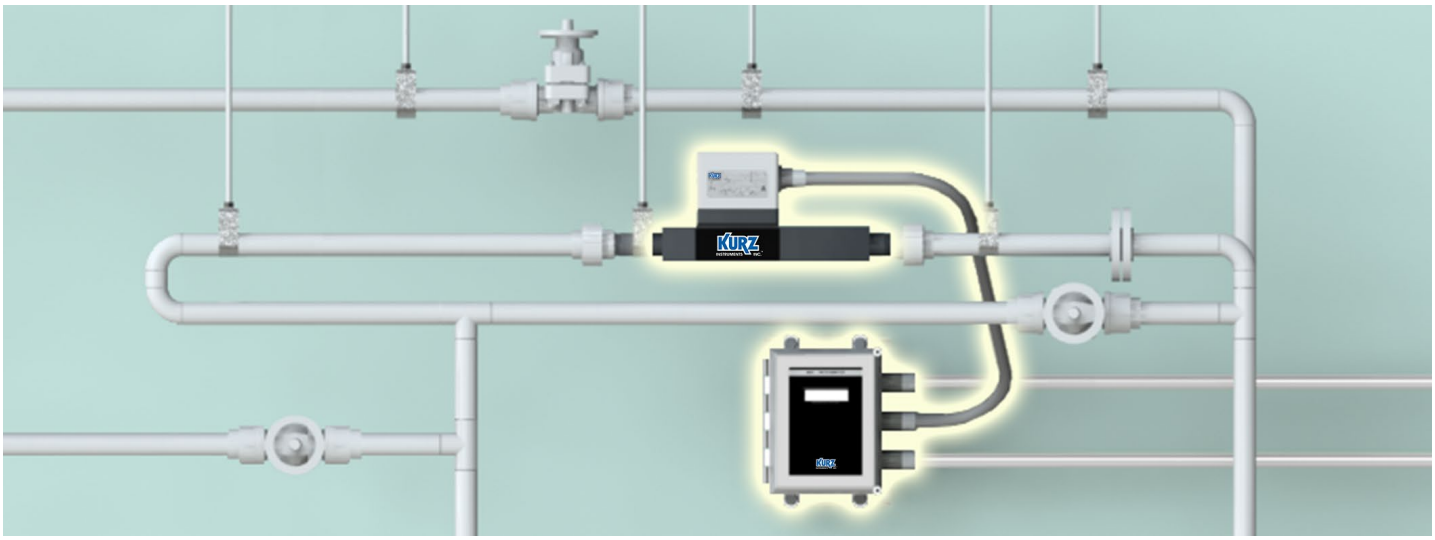
The 534FTB product line includes models constructed for corrosive and noncorrosive applications, with a range of models supporting flow rates up to 1,754 SCFM (2,736 NCMH). A wet gas option is available.

The 534FTB product line supports process temperatures ranging from -40°F to 257°F (-40°C to 125°C). Process pressure ratings are supported up to 300 PSIG (20 BARg). The 534FTB is ATEX certified for Zone 1 and Zone 2.

Applications

- Fuel lines
- Natural gas
- Treatment & control gases
- Compressed air
- Combustion air
- Chemical processing
- Air sampling
- Gas blending
- Isokinetic sampling
- Pulp & paper mills
- Pharmaceutical production
- Petrochemical plants
- Nuclear
- Incinerators

534FTB-CL2 In-Line Meter



The Kurz 534FTB-CL2 in-line meter has superior pressure drop recovery and immunity to upstream and downstream disturbances for chlorine applications. The CL2 is available in three in-line sizes for 1", 1½" and 2" pipes.

The high molecular weight (70.9) of chlorine gas generates significant pressure drop, which reduces low-end performance and can generate up to 10% errors, resulting in excess chlorine added to the water.

The CL2 is designed with a PVC flowbody to withstand the harsh chlorine environment.

The CL2 supports process temperatures ranging from 32°F to 140°F (0°C to 60°C).

Process pressure ratings are supported up to 54 PSIG (3.67 BARg) with a velocity range up to 27,600 PPD (500 kg/hr).

Applications

- Water purification
- Wastewater dosing
- Treatment & control gases
- Chemical processing
- Chlorine metallurgy

Series 2440 Portable Meters

The Series 2440 are rugged and reliable portable thermal air velocity meters for nearly all flow measurement applications requiring accurate measurements of mass flow, volume, and velocity.

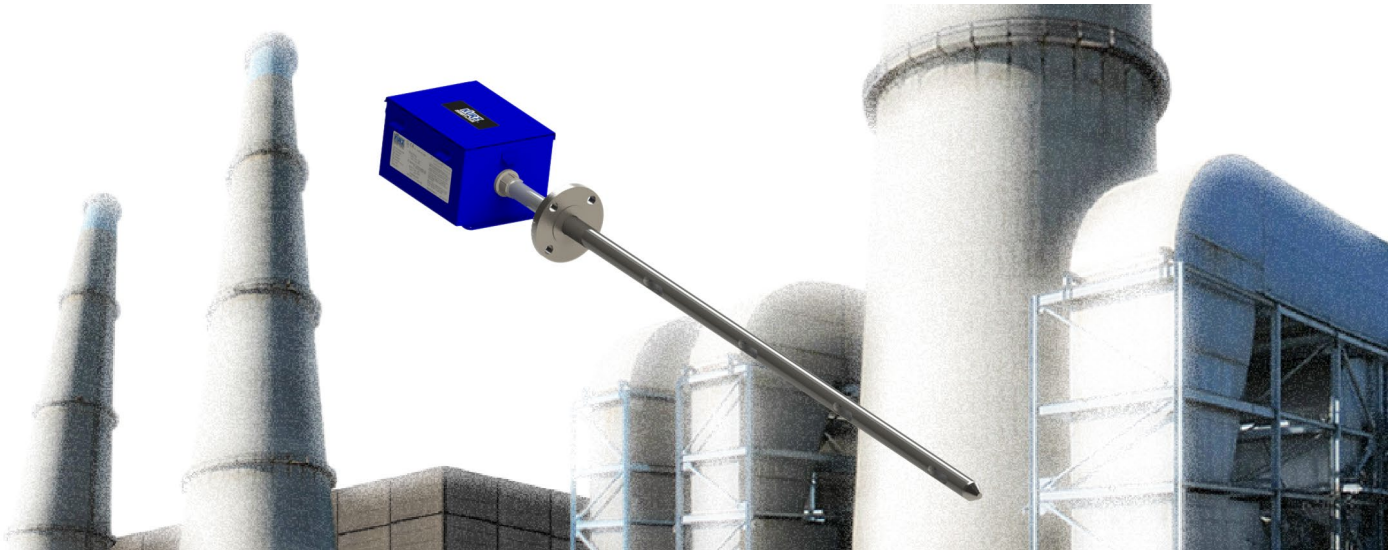
The five models in the Series 2440 range from lab grade to heavy duty and up to industrial high heat for conditions from -40°F to 932°F (-40°C to 500°C) and up to 12,000 SFPM (60 NMPS). All models are extremely sensitive and provide rapid response. Its rugged design make the Series 2440 an excellent choice for heavy field work.

The Series 2440 provides easy-to-use configurable English or metric units, and supports data logging, saving, and exporting. Data can be easily exported for spreadsheet use.

Applications

- In-situ calibration
- Industrial hygiene
- Emissions / air pollution
- HVAC
- Combustion air
- Thermal vent monitoring
- Stack & duct velocity traverses
- Air sampling

KBAR-2000B



The KBAR-2000B multipoint insertion flow meter uses up to four sensors to calculate the mass, velocity, or temperature at each point across large ducts and stacks that have wide-ranging velocity and temperature profiles. Multiple sensors provide measurement redundancy to ensure accuracy. Its rugged design withstands the high stress and high vibration found in industrial applications.

Kurz KBAR-2000B flow meters comply with the EPA's CEM system under 40CFR60 and 40CFR75 and the European Union's Automated Measuring System (AMS) requirements under EN14181, QAL1 certification.

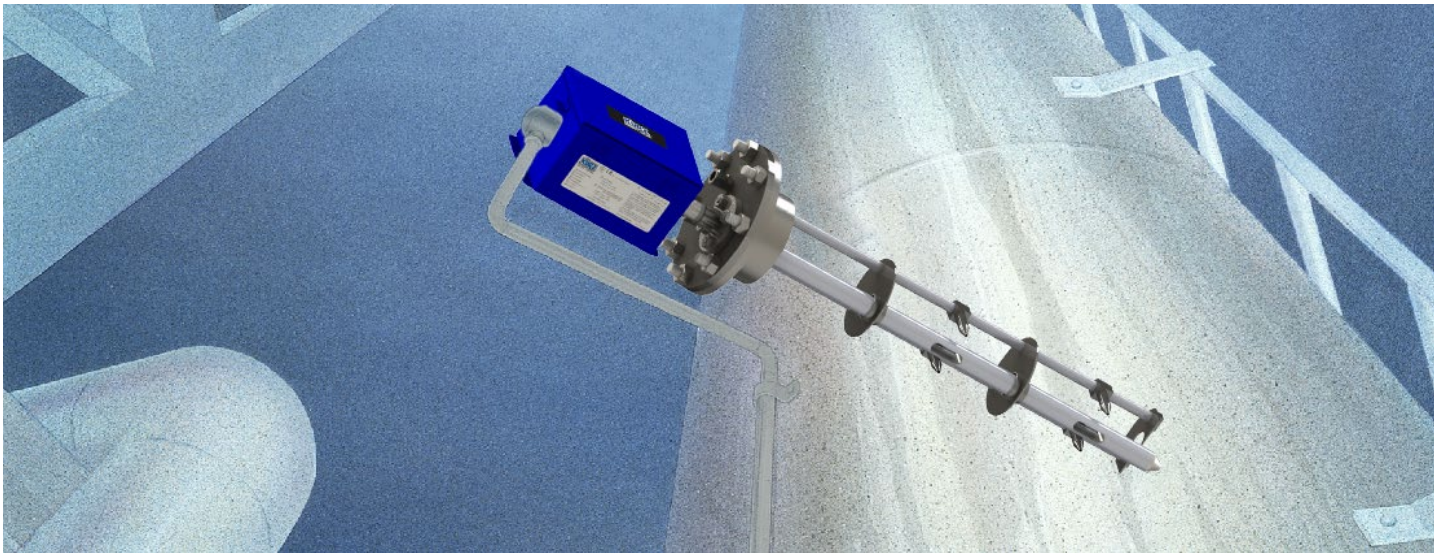
The KBAR-2000B product line supports process temperatures ranging from -40°F to 500°F (-40°C to 260°C) (standard) or from -40°F to 932°F (-40°C to 500°C) (high heat) with a velocity range from 0 to 100,000 SFPM (500 NMPS). A wet stack option is available.

Applications

- Stacks & flares
- Emissions (CEM)
- Boilers & recovery boilers
- Primary, secondary & tertiary air
- High temperature air flows with nonuniform temperature and velocity profiles
- Incinerators
- Coal pulverizers

The KBAR-2000B is designed to work seamlessly with the Series 155 Mass Flow Computer. The Series 155 Mass Flow Computer integrates the functions of temperature and flow measurement, closed loop flow control, flow totalization, alarms, input/output calibration, and data acquisition from up to 22 sensors.

Emissions & Sampling System



All Continuous Emissions Monitoring (CEM) systems must be in continuous operation, and must be able to sample, analyze, and record data at least every 15 minutes. All emissions and flow data are reduced to one hour averages using specific rules.

The Kurz Emissions and Sampling System provides accurate sample collection for use in environmental, process, and nuclear applications. It eliminates under- or over-reporting gas or particulate constituents. A wet stack option is available.

Kurz offers a complete isokinetic sampling system to ensure true sample composition — from stack flow monitoring and sample capture to sample flow control.

- The KBAR-2000B multipoint insertion flow meter
- The Series 220 Isokinetic Sampling System combines high accuracy mass flow measurement in the process with effective sampling nozzles, and fine control and measurement of the sampling rate.
- A Kurz 504FTB or 534FTB in-line flow meter
- The Kurz 730 Rotary Ramp Valve provides fine control of the sample flow
- The Series 155 Mass Flow Computer integrates the functions of temperature and flow measurement, closed loop flow control, flow totalization, alarms, input/output calibration, and data acquisition from up to 22 sensors.

KURZ INSTRUMENTS INC.
MONTEREY, CALIFORNIA

Kurz Instruments, Inc., pioneered the development of thermal instrumentation and rugged thermal industrial devices in 1977. For almost 40 years, Kurz has maintained a reputation for designing and manufacturing Thermal Mass Flow Meters capable of operating in harsh and difficult environments.

Today, the fully digital Kurz sensor design outperforms its competitors by providing a very high level flow signal-to-noise ratio and withstanding the wide temperature swings, vibration, dust, and process contaminants found throughout the world in heavy industry, research, and manufacturing.

Kurz Instruments' quality manufacturing system uses rigorous testing procedures for ensuring device safety in industrial applications. Every Kurz flow meter receives unique calibration using NIST traceable equipment and a thorough quality evaluation before leaving the factory.

Whether an application calls for general information, exacting accuracy, or system protection, Kurz offers the highest quality and most dependable solutions available in a wide array of products that are simple to install and easy to operate.

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