

## GLOSSARY

**ATEX:** Atmospheric Explosive; latest European directive which supports the IEC-79-X series safety approach and standards but is based on EN versions of them. Kurz product supports non-incendive (EEx n versions) and flameproof (EEx d versions).

**CABLE GLAND:** This is a cable termination device used to keep both water and EMI out of sealed enclosures. It has two seal types, one a rubber compression type, the other a metal-metal compression for braided shield wires. They come in various sizes to support most cable and enclosure ports sizes

**CORRECTION FACTOR:** For insertion flow transmitters this is a number typically between 0.7 and 1.0 needed to convert a point velocity reading to the true duct average. This number is velocity or flow rate dependent. It can also be used to trim an in-line flow transmitter but the numbers are much closer to unity since the velocity profile information is built into the calibration.

**DD:** Device Descriptor. Provides the user interface for HART products and is device specific. The DD is loaded into the HART master handheld or PC based program.

**DEGC:** Degrees Celsius.

**DEGF:** Degrees Fahrenheit.

**DISPLAY MODE:** The set of user interface menus for viewing the meter parameters and process data.

**EEPROM:** Nonvolatile solid state memory device. Stores meter data, sensor data, electronics calibration, error codes, min-max records and totalizer information. Data stored in EEPROM is persistent between power cycles of the meter.

**EPA ZERO-SPAN:** This is a daily CEMS reporting requirement on all stack monitoring equipment. The test signal for the Kurz flow meters is generated in the meter and triggered by a contact closure from the system operator.

**ERROR CODE;** In the case of the MFT B-Series, this is a 4 byte bit mapped code for internal and external faults detected by the flow meter. The error codes are recorded as events and stored in the EEPROM to support field service on a meter or process.

**EXTENDED UTILITIES MODE:** The set of user interface menus for performing diagnostic tests and utility functions.

**FERRITE:** This is an insulating ceramic donut shaped material used to attenuate high frequency electromagnetic noise from I/O cables on equipment.

**FLASH MEMORY:** Nonvolatile reprogrammable solid state memory device used for program memory.

**FLOW CONTROLLER:** Device which regulates the flow of a process based on a set-point and reference flow measurement being controlled.

**FSK:** Frequency Shift Key. This is the modulation method used for the 1200 and 2200 Hz signals super imposed on the 4-20 mA signal for HART.

**GATEWAY:** Device which does translations between different network protocols. A converter from Modbus to Profibus is an example.

**HART:** Highway Addressable Remote Transmitter, this is an industrial communications standard maintained by the HART Communications Foundation.

**KGH:** Kilograms-per-Hour

**KGM:** Kilograms-per-Minute

**LCD:** Liquid Crystal Display. A 2 line by 16 character, backlit display is available for the Series MFT

**L/D:** This is the Length to Diameter ratio in a pipe or duct between two locations. This non dimensional parameter is a comparative metric used to measure the distance between a flow disturbance and a measurement point. Both upstream and downstream values are needed to quantify an installation.

**LOG MODE:** The set of user interface menus for requesting Log Reports sent to the flow meter's USB port.

**MASS FLOW:** Mass per unit time (i.e. Kg/s). This is the standard volumetric flow multiplied by the standard density.

**MENU:** The top level functional category of screens grouping related meter data

**MENU ITEM:** Any meter data presented on a screen to be changed or displayed. Related MENU ITEMS are found within or under the same MENU (categories).

**METER:** The flow measurement device; used synonymously with MFT.

**MFT:** Mass Flow Transmitter. This is the general name given to several Series of flow meters from Kurz Instruments which all share the same firmware.

**MODBUS:** Simple master-slave protocol for network communications which operates on multi-drop serial lines like RS-485 and on Ethernet as Modbus TCP/IP.

**NE-43:** Alarm signaling method superimposed on the 4-20 mA data output signals of process control equipment. Specification was written by the NAMURA industry organization based in northern Europe.

**OPC:** Ole for Process Control. This is a Microsoft network based software standard that has servers for instruments and clients for human-machine interfaces, HMI programs. This software standard provides a common interface for devices from multiple field bus networks to be combined through a common interface to a DCS or PLC if it uses OPC.

**PID:** Proportional, Integral and Differential gas control scheme for feedback control systems.

**PITOT TUBE:** This is a classic gas velocity measurement device based on impact pressure. As it is well understood, it can be a primary velocity standard. They work best at higher velocities where the impact pressure is easier to measure.

**PPH:** Pounds-per-Hour

**PPM:** Pounds-per-Minute

**PROFILE:** See Velocity Profile.

**PROGRAM MODE:** The set of user interface menus for programming or configuring the meter.

**PROTOCOL:** A communications algorithm used on networks to reliably transfer information between computers, meters etc.

**PSIA:** Pounds per Square Inch, Absolute pressure reference.

**PURGE CONTROLLER:** Device which commands the compressed gas cleaning fluid across the velocity sensor and mask off the sensor response until after the cleaning cycle.

**REBOOT:** When a computer restarts there is a delay from the power on until it is operating normally. During this time it is loading its programs, doing some testing and initializing things. For the Series MFT B-Series this takes one second to over a minute depending on the flow rate.

**SBCF:** Sensor Blockage Correction Factor. This is the geometric projection of the sensor element and probe support area subtracted from the duct area, this quantity normalized by the duct area.

**SCFH:** Standard Cubic Feet-per-Hour

**SCFM:** Standard Cubic Feet-per-Minute

**SCMH:** Standard Cubic Meters-per-Hour

**SCMM:** Standard Cubic Meters-per-Minute

**SCMS:** Standard Cubic Meters-per-Second

**SFPM:** Standard Feet-per-Minute

**SMPS:** Standard Meters-per-Second

**SPECIFIC HUMIDITY:** The absolute ratio of water mass to dry Air mass is the specific humidity  $\omega$ . The saturation point of water vapor in Air is temperature dependent. The percentage water vapor compared to the saturation point is known as relative humidity given in a percentage by the weather forecasters.

**SSR:** Solid State Relay, no moving parts relay used for high reliability contact closure signals between equipment.

**STANDARD VOLUMETRIC FLOW:** is the  $\rho v$  product multiplied by an area (like a pipe cross section), normalized to a standard density.

$$\text{Standard Volumetric Flow} = \text{Area} \times (\text{Standard Velocity})$$

$$= A\rho v/\rho_s$$

where  $\rho$  is the actual density,  $v$  is the actual velocity and  $\rho_s$  is the standard gas density and  $A$  is the area.

**STANDARD VELOCITY:** is the  $\rho v$  product normalized to a standard density.

Standard Velocity =  $\rho v/\rho_s$  with units of velocity

where  $\rho$  is the actual density,  $v$  is the actual velocity and  $\rho_s$  is the standard gas density. For air this is 0.07387 lb/ft<sup>3</sup> at 25 °C and 29.92 in Hg.

**TRACER GAS:** This is a contemporary field calibration method measuring flow in a process, nearly independent of its flow profile, gas type, size, temperature and pressure.

**TRAVERS:** This is a test protocol for using a point velocity device to map out the velocity profile in a duct, rectangular or round.

**USB:** Universal Serial Bus, PC serial port standard found on most PCs and Laptops for connecting hardware to a computer.

**VTM:** Velocity Temperature Mapping. This is a calibration method where data at several temperatures are loaded into the flow meter. Flow signal linearization and then interpolation between the different temperature data sets are performed. This method is a second order correction to the sensors response and provides a more accurate temperature compensated flow measurement.

**VELOCITY PROFILE:** Due to drag and viscous fluid flow, the velocity in a duct tends to be its highest in the center and goes to zero at the duct walls. This shape is bullet nose at low velocities known as laminar, and flattens out at the higher more turbulent flow rates. A velocity dependent correction factor is measured based on an in-situ calibration to accurately convert the sensors velocity reading to the true average for computing flow or mass flow.