

**Analog Signal.** A signal which communicates or controls by changing an amount. The information in an analog signal is of the “How Much?” variety. There may be “more” voltage or “less” voltage or more or less electrical current, to represent more or less flow, for instance. See “Digital Signal.”

**Bleed.** The process of dumping some of the chemical-laden water in a cooling tower. This is done at intervals to prevent excessive buildup of chemicals.

**Cooling Tower.** A piece of equipment which is used to cool water which has been heated in an air conditioning or other system. The cooling is done by letting the warm water fall through the air or by spraying it through air. Cooling water is recirculated over and over, and water treatments are added in the cooling tower.

**Chemical Metering Pump.** A specialized pump which delivers small, controlled amounts of chemical with each stroke or over a given time period. See also “Pulse-responsive Metering Pump”.

**Data Logger.** An electronic memory device which accepts information from instruments and records it for future use, usually in a form which can be read with the help of a personal computer.

**Digital Signal.** A signal which communicates or controls by a series of electronic pulses (“on” or “off” or “high” or “low”) which can be translated at the receiving end into useful information.

**Divider.** An electronic device which accepts pulses in and after a certain number (the “divider factor”) puts a pulse out.

**Dry Contact.** Any switch which has mechanical means as opposed to electronic means of switching with a 0.4 VA maximum rating at 20V or less. It is called “dry” because the working of the switch is independent of the electricity passing through it and there is not sufficient amount of electrical power to clean the contacts. A reed switch is a dry contact, and doesn't need a specific voltage (12 Volts DC for instance) in order to work.

**Electronic Metering Pumps.** See “Pulse-responsive Metering Pump.”

**Engineering Units.** The common measurement units; in the case of liquid flow these are, for instance, gallons per minute (GPM), liters per minute (LPM), cubic meters per hour, and so on.

**EPROM.** A type of electronic component which carries the program of a “computer” control. It is installed at the factory when the control is built and can be erased for loading a new program.

**Four-to-twenty Milliamp (4-20 mA).** A commonly-used analog control signal which varies in electrical current (measured in milliamperes) between 4 and 20 milliamps. Ordinarily, four represents the lowest value, for instance zero flow, and twenty represents the maximum, for instance, 300 gallons per minute (in a two-inch pipe).

**Hall-effect Sensor.** An electronic sensor which responds to magnetic fields. The sensors used by Hays “turn on” in the presence of the field from a small magnet.

**Hot-Tap (also Pressure Tap).** A method of inserting a meter into a pipe without shutting off the flow or releasing the pressure in the pipe.

**Insertion Meter.** Any flow meter which is installed in a pipe by putting it in through a relatively small hole in the side of the pipe.

**Jewel Bearings.** The type of bearings used in Hays IP meters are sapphire, consisting of a doughnut-shaped ring jewel and a flat end jewel, together in a tubular stainless steel housing.

**K-Factor.** Also known as “Meter Factor”, the number of pulses per unit (usually, per gallon) which an electronic meter produces.

**Linearity.** A measurement of the ability of a meter to be accurate at any flow rate within its range. For electronic meters, the degree to which K-factor remains the same at any flow rate. (See “K-factor”).

**Makeup Water.** Water which is added to a closed circulating system to make up for that which has been lost by evaporation or leaks. Usually used in reference to cooling towers or boilers. Of interest because it is often metered in order to add water treatment chemicals.

**Mag Meter (Magnetic Flow Meter).** A type of meter which measures flow rate by detecting the electrical voltage caused by the movement of a conductive liquid through a magnetic field.

**Microprocessor.** A type of electronic component which serves as the “brain” of the more complex electronic control. This is the same type of “chip” or integrated circuit which gives personal computers their capabilities.

**Open Channel.** A type of liquid flow which is not under pressure, and moves solely by gravity. A drainage ditch would be one example, a half-full sewer pipe another. A special type of flow meter is necessary to measure it.

**Percent of Reading (% Reading).** A method of describing meter accuracy based upon percentage of actual reading (method used by AWWA). This measuring method is tighter tolerated than Percent of Full Scale method.

**Percent of Full Scale (% FS).** A method of describing meter accuracy which is based on a percentage of the maximum flow rate. This method of measuring accuracy is less strict than Percent of Reading.

**Programmable Pulse.** A feature of an electronic control which allows the user to choose any desired pulse output rate (pulses per gallon, gallons per pulse).

**Proportional Feed.** A process using a metering pump and meter to inject small amounts of chemical into a water flow, at a rate matching the flow of the water.

**Pulse-responsive Metering Pump.** A type of metering pump which responds to a signal from a pulse meter like the Hays M Series. Each time the meter pulses once, the pump strokes once. Also called “electronic metering pump”.

**Reed Switch.** A tiny electrical switch which turns on when a magnet comes close to it. The magnet pulls a pair of hair-like metal fingers (the “reeds”) together, closing the electrical circuit.

**Regeneration.** A process used with water softeners in which the efficiency of the unit is restored by flowing some chemical through it for a period of time. This has to be repeated at intervals of so many gallons.

**Sensors:**

**Hall Effect** — Solid state sensor which detects the presence of a magnetic field. Hall-effect switches off and on much like a transistor and needs a power source to function.

**Reed Switch** — Provides a dry contact closure to pumps and controls. No external power source is required.

**Sine-wave Signal.** An electronic signal which changes like a sea wave, continuously going higher and then lower and higher and lower . . . See "Square-wave Signal".

**Square-wave Signal.** A signal which jumps from one level to another and back, over and over again. Think of it as being like a blinking light: on-off-on-off . . . See "Sine-wave Signal".

**Telemetry.** Automatic measurement and transmission of data. This process is electrical and is used to measure pressure, speed and temperature.

**Totalizing.** Keeping track of the total amount of flow which has gone through a meter, as opposed to "rate", which is the speed of flow at the present moment.

**VAC.** Abbreviation for "Volts of Alternating Current".

**VDC.** Abbreviation for "Volts of Direct Current".

**Velocity Profile.** The pattern of rates of flow within the pipe. The liquid closer to the center of the pipe flows faster than that which is nearer to the wall.