Kele®
INDUSTRIAL AUTOMATION

What's the right level technology for your application?

Need help figuring out which level measurement instrumentation to use in your process? Start with the reference charts below.

Find your media type, process conditions, and tank design to help narrow down your choices. Depending on your application, there may be more than one technology for you.

Key
- ▲ *Excellent: Recommended*
- ○ *Good: Works in most cases*
- ◇ *Fair: Others work better*
- ▼ *Poor: Do not use*

Continuous Level Technologies	**Armored Site Gauge**	**Bubbler**	**Capacitance**	**Guided Wave Radar**	**Hydrostatic Pressure**	**Load Cells**	**Magnetic Site Gauge**	**Nuclear**	**Radar**	**Servo Gauges**	**Ultrasonic**
Liquids — Clean	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Liquids — Coating	▼	▼	○	▼	◇	▲	◇	▲	▲	▼	▲
Liquids — Shifting Specific Gravity	▲	▼	▲	▼	▼	▼	○	▲	▲	▲	▲
Slurries	○	▼	○	▼	○	▲	◇	▲	▲	◇	▲
Liquid/Liquid Interfaces	○	▼	▲	▲	▼	▼	▲	○	▼	▲	○
Liquid/Solid Interfaces	▼	▼	▼	▼	▼	▼	▼	○	▼	▼	▲
Solids — Low Dust	▼	▼	◇	▼	▼	◇	▼	▲	◇	▼	▲
Solids — High Dust	▼	▼	◇	▼	▼	◇	▼	▲	▲	▼	▼
Dielectric <2	▲	○	▼	○	◇	▲	▲	○	○	▲	▲
Shifting Dielectric	▲	○	▼	○	▲	▲	○	○	▼	▲	▲
Process Environment											
Process Temperature>350° F	▲	○	○	▼	○	▲	▲	▲	▲	○	▼
Process Pressure >50 PSI	▲	▼	○	▲	○	▲	▲	▲	▲	▲	▼
Vacuum Pressure	▲	▼	○	▲	○	▲	▲	▲	▲	○	▼
Vapors Present	▲	○	○	○	○	○	▲	▲	▲	▲	▼
Foam Present	○	◇	▼	▲	○	◇	○	○	▼	◇	▼
Turbulence Present	▲	◇	▼	◇	○	▲	▲	▲	○	○	○
Tank Design and Structural Properties											
Agitators	—	◇	▼	◇	○	▲	—	○	○	▼	○
Obstructions	—	◇	○	◇	○	▲	—	○	○	◇	○

Point Level Technologies	***Capacitance***	***Floats***	***Rotary Paddle***	***Ultrasonic***	***Vibratory Fork***
Liquids — Clean	▲	○	▼	▲	▼
Liquids — Coating	○	▼	▼	▲	▼
Slurries	○	▼	▼	▲	▼
Liquid/Liquid Interfaces	▲	▼	▼	▼	▼
Liquid/Solid Interfaces	▼	▼	▼	▼	▼
Solids — Low Dust	○	▼	○	○	○
Solids — High Dust	○	▼	○	▼	○
Process Environment					
Process Temperature >350° F	▼	▼	▼	▼	▼
Process Pressure >50PSI	○	○	▼	▼	▼
Vacuum	○	○	▼	▼	▼
Vapors	○	○	▼	▼	▼
Foam	◇	◇	▼	▼	▼
Turbulence	○	▼	▼	○	○
Tank Design and Structural Properties					
Agitators	○	▼	▼	○	○
Obstructions	○	○	○	○	○

Key
- ▲ *Excellent: Recommended*
- ○ *Good: Works in most cases*
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- ▼ *Poor: Do not use*

Due to manufacturer agreements, not all products are available in all geographic areas and markets. Prices in this catalog are current at the publication date, and are subject to change without notice.

Not sure what you need? Fill out an application datasheet at Lesman.com/datasheets/ and send it to Lesman for an engineering review.

Kele® INDUSTRIAL AUTOMATION

Contact Lesman: 800-953-7626
Contact A-Tech Inc: 800-225-6102
Contact AC Controls: 704-545-4500

What's the right flow technology for your application?

Need help figuring out which flow measurement instrumentation to use in your process? Start with the reference charts below. Find your media type to help narrow down your choices. Then, take a look at the comparative specifications in the chart at the right. Depending on your application, there may be more than one technology for you.

Key
- ▲ *Excellent: Recommended.*
- ◇ *Fair: Works, but depends on the application.*
- ▼ *Poor: Do not use.*
- *H High*
- *M Medium*
- *L Low*

	Media Types									Specification						
	Clean Liquid	Dirty Liquid	Viscous Liquid	Corrosives	Slurries	Clean Gas	Dirty Gas	Steam	Cryogenics	Turndown Ratio	Available Sizes	Accuracy (% FS)	Repeatability (%)	Upstream Pipe Diameter	Permanent PSI Drop	Relative Cost
Technology																
Accelabar	▲	◇	◇	◇	▼	▲	◇	▲	▲	60:1	3″–12″	0.75%	0.05%	0	M	H
Coriolis Flowmeter	▲	▲	▲	▲	▲	◇	◇	◇	◇	25:1	0.1–6″	0.15%	0.1%	0	L	H
DP Mass Flowmeter	▲	▲	▲	◇	◇	▲	▲	▲	▼	40:1	—	0.1%	0.1%	—	—	H
DP Orifice Plate	▲	◇	◇	▲	▼	▲	◇	▲	▲	4:1	>1″	1%	0.1%	10–30	H	L
DP Pitot Tube	▲	▼	▼	◇	▼	▲	◇	▲	▼	4:1	0.5–72″	0.75%	0.1%	10	L	L
DP Wedge	▲	▲	▲	▲	▲	▲	▲	▲	▼	10:1	0.5–30″	3%	0.5%	12	H	H
DP Venturi	▲	▲	◇	◇	▼	◇	◇	▲	▼	10:1	0.5–72″	1%	0.1%	10	M	L
Fluidic Oscillatory	▲	◇	▲	◇	▲	▼	▼	▼	▲	15:1	1–3″	1.5%	0.2%	10	L	H
Magnetic Flowmeter	▲	▲	▲	▲	▲	▼	▼	▼	▼	10:1	>0.1%	0.5%	0.2%	5	L	M
Paddlewheel	▲	▼	◇	◇	▼	◇	◇	▼	▼	3:1	0.1–1.5″	2.5%	1%	0	H	L
Positive Displacement	▲	▲	▲	◇	▼	▲	◇	▼	◇	20:1	0.5–6″	1%	0.3%	0	H	M
Rotameter	▲	▼	◇	◇	▼	▲	▼	◇	▼	5:1	0.2–3″	4–8%	2%	0	M	L
Thermal Dispersion	▲	◇	◇	◇	◇	▲	▲	▼	◇	100:1	0.2–72″	0.5%	0.2%	10	L	H
Turbine Flowmeter	▲	▼	◇	◇	▼	▲	◇	▲	◇	10:1 to 50:1	>0.25″	0.5%	0.1%	10–20	H	H
Ultrasonic Clamp-On	▲	◇	▲	▲	▼	◇	▼	▼	▼	40:1	0.25–360″	0.5–1.0%	0.15%	10	L	H
V-Notch	▲	◇	▼	◇	◇	▼	▼	▼	▼	300:1	—	2–5%	2%	4	0	L
Verabar	▲	◇	◇	◇	▼	▲	◇	▲	▲	10:1	2″–192″	1.0%	0.10%	10	L	L
Vortex Flowmeter	▲	◇	◇	◇	▼	▲	◇	▲	▼	H	>1″	1%	0.2%	20–30	M	L
Weir	▲	◇	▼	◇	◇	▼	▼	▼	▼	300:1	—	2–5%	2%	4H	0	L

Viscosities of Common Substances

Medium @68°F	*Approx. Viscosity*
Ammonia	0.009 82 cP
Argon	0.022 17 cP
Benzene	0.652 cP
Benzyl Ether	5.33 cP
Caster Oil	986 cP
Chloroform	0.58 cP
Chocolate Syrup	25,000 cP
Confectioners' Glucose	1,000,000.0 cP
Corn Syrup	10,000.0 cP
Ether	0.233 cP
Ethyl Alcohol	1.2 cP
Glycerin	1,490 cP
Glycol	19.9 cP
Heavy Machine Oil	233 cP
Honey	10,000 cP
Hydrogen	0.008 6 cP
Kerosene	10.0 cP

Medium @68°F	*Approx. Viscosity*
Ketchup	50,000 cP
Light machine oil	102 cP
Mercury	1.554 cP
Methyl Alcohol	0.597 cP
Molasses	100,000.0 cP
Neon	0.031 11 cP
Olive Oil	84.0 cP
Pancake Syrup	2,500 cP
Peanut Butter	250,000 cP
SAE 10 Motor Oil	100.0 cP
Soybean Oil	69.3 cP
Tar or Pitch	30,000,000,000 cP
Air @ 18°C	0.018 2 cP
Air @ 229°C	0.026 38 cP
Liquid Air @ -192.3°C	0.173 cP
Water	1.002 cP
Water @ 99°C	0.2848 cP
Water Vapor @100°C	0.125 5

Viscosity Conversion:
Centistokes= Centipoise/Specific Gravity (SG)
Centipoise= 0.22 x SG x SSU - (180 x SG/SSU)
SSU= Viscosity in Saybolt Seconds Universal

Still not sure which technology works for you? Narrowed down your choice to one technology, but need more help with specific models? Visit www.Lesman.com/datasheets and fill out an application datasheet. We'll work with our factory sales engineers to recommend the best instrument for your application.

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Dielectric Constants for Common Materials

Unless stated otherwise, values are measured at 68°F

Material	Temp. °F/°C	Dielectric Constant
Acetal		3.6
Acetoaldehyde		22.2
Acetone		21.4
Acrylic resin		2.7 to 6
Alcohol		16 to 31
Aluminium carbonate		5.6
Aluminium chlorate		5.1
Aluminium ether		3.1
Aluminium powder		1.6 to 1.8
Ammonia	-27/-332	2.4
Ash (flyash)		1.9 to 2.6
Bakelite		4.5 to 5.5
Barley, powder		3.4 to 4.0
Benzene		2.3
Benzil	202/94	13
Bleaching powder		1.8 to 2.0
Bromine		3.1
Butane	30/-1	1.4
Calcium carbonate		1.8 to 2.0
Carbon dioxide		1.6
Carbon tetrachloride		2.2
Castor oil	60/16	4.7
Cellulose		6.7
Chlorine		2.1
Chloroform	32/0	5.5
Coal		1.2 to 1.8
Coke, powder		1.1 to 2.2
Corn		2.3 to 2.6
Cyclohexane		2
Dimethylheptane		1.9
Dimethylpentane		1
Ethanol	77/25	24.3
Ethyl acetate		6.4
Ethyl alcohol		23
Ethyl benzene		2.5
Ethyl ether		4.3
Ethylene chloride		10.5
Ethylene glycol		37
Ferric oxide		1.4 to 1.8
Formic acid	60/16	58.5
Glass raw material		2.0 to 2.5
Glass-silicon plate		3.5 to 4.2
Glycerine		47
Glycol		36
Heptane		1.9
Hexane		1.9
Hydrogen chloride	82/28	4.6
Kerosene	70/21	1.8
Manganese dioxide		5.0 to 5.2

Material	Temp. °F/°C	Dielectric Constant
Methanol	77/25	33.6
Methyl acetate		7.3
Methyl alcohol		33.1
Methyl ether	78/26	5
Methyl salycilate		9
Mica		4.5 to 7.5
Napthalene		2.5
Nylon		4 to 5
Oil, mineral		2.2 to 2.4
Oils, petroleum		1.8 to 2.2
Oils, vegetable		2.5 to 3.5
Olefin		3.2
Oleic acid		2.5
Paraffin		1.9 to 2.5
Pentane		1.8
Phenol	118/47	9.9
Phenolic resin		4 to 12
Phosgene	32/0	4.7
Polyacetal resin		2.6 to 3.7
Polycarbonate resin		2.9 to 3
Polyester resin		2.8 to 4.5
Polystrene resin		2.2 to 2.6
Propane	32/0	1.6
Rubber, raw		2.1 to 2.7
Rubber, vulcanized		2.0 to 3.5
Silica sand		2.5 to 3.5
Silicon resin		3.5 to 5
Silicon tetrachloride		2.4
Soap, powder		1.2 to 1.5
Sodium carbonate		5.3 to 8.4
Sodium nitrate		5.2
Soybean		1.8 to 2.0
Styrene (styrol resin)	77/25	2.4
Sugar		3
Sulfur monoxide		4.8
Sulfur, powder		1.5 to 1.8
Teflon		2
Toluene		2.4
Trichloethylene		3.4
Urethane		6.5 to 7.1
Vinyl ether		3.9
Water		80
Wheat, powder		2.5 to 3
Xylene		2.4