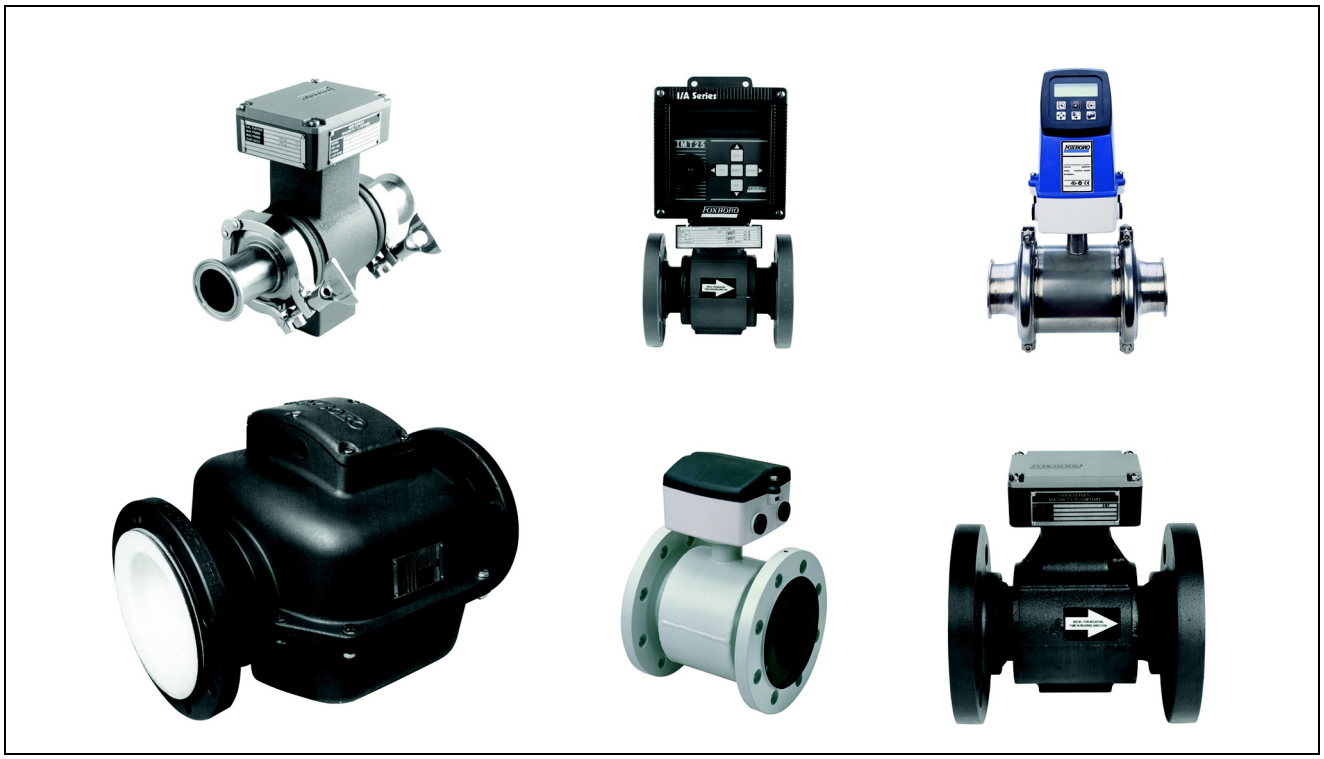
Magnetic Flowmeters
Electrical Conductivity of Process Liquids



The purpose of this technical information document is to provide a listing of the electrical conductivity of various process liquids. The process liquids listed are separated into three tables. Table 1 lists aqueous solutions, Table 2 lists pure liquids, and Table 3 lists miscellaneous liquids. The conductivity values listed are based on published data, and are offered here as a convenience to the user as an aid in determining whether a magnetic flowmeter could measure the flow of a particular process liquid. For a magnetic flowmeter to work on a given process liquid, the liquid must possess a minimum level of conductivity.

The minimum conductivity required for a Foxboro 2800 Series Flowtube used with an IMT96 Magnetic Flow Transmitter (MagEXPERT™) applications is 2 µS/cm. The minimum conductivity required for an 8000A, 9100A, 9200A, 9300A, or 8300 Series Flowtube used with an IMT25 I/A Series Transmitter (pulsed dc applications) is 5 µS/cm. The minimum process fluid conductivity for the 4700S sanitary flowtube with a 47 or 48 Transmitter is 5 µS/cm.

The maximum cable length between flowtube and a pulsed dc transmitter, using Foxboro cable Part Number R0101ZS, is 300 m (1000 ft) provided that the coil drive cable and the signal cable are is separate conduits. Refer to MI 021-402 for information on the process fluid conductivity and cabling when using a 2800 Series Flowtube with an IMT96 Transmitter.

In conjunction with the process liquid conductivities listed here, the user is also directed to technical information document TI 27-71f. This TI aids the user in selecting the process-wetted materials (for example, flowtube lining, electrode material, and so forth.) recommended for a particular process, whether the process be corrosive, abrasive, or sanitary.

Again, the data listed in this TI and TI 27-71f are presented for the user's convenience, and are based on published data and experience.

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Table 1. Electrical Conductivity of Aqueous Solutions

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Acetic Acid	CH_3CO_2H	0.3	18° C (64° F)	3.18×10^{2}
		1		5.84×10^{2}
		5		1.23×10^{3}
		10		1.53×10^{3}
		20		1.61×10^{3}
		30		1.40×10^{3}
		40		1.08×10^{3}
		50		7.40×10^{2}
		60		4.56×10^{2}
		70		2.35×10^{2}
		99.7		4.00×10^{-2}*
Ammonia	NH_3	0.10	15° C (59° F)	2.51×10^{2}
		0.40		4.92×10^{2}
		0.80		6.57×10^{2}
		1.60		8.67×10^{2}
		4.01		1.10×10^{3}
		8.03		1.04×10^{3}
		16.15		6.32×10^{2}
		30.50		1.93×10^{2}
Ammonium Chloride	NH_4Cl	5	18° C (64° F)	9.18×10^{4}
		10		1.78×10^{5}
		15		2.59×10^{5}
		20		3.37×10^{5}
		25		4.03×10^{5}
Ammonium Iodide	NH_4I	10	18° C (64° F)	7.72×10^{4}
		20		1.60×10^{5}
		50		4.20×10^{5}
Ammonium Nitrate	NH_4NO_3	5	15° C (59° F)	5.90×10^{4}
		10		1.12×10^{5}
		30		2.84×10^{5}
		50		3.63×10^{5}
Ammonium Sulfate	$(NH_4)_2SO_4$	5	15° C (59° F)	5.52×10^{4}
		10		1.01×10^{5}
		20		1.78×10^{5}
		30		2.29×10^{5}
		31		2.32×10^{5}
Barium Chloride	$BaCl_2$	5	18° C (64° F)	3.89×10^{4}
		10		7.33×10^{4}
		15		1.05×10^{5}
		24		1.53×10^{5}
Barium Nitrate	$Ba(NO_3)_2$	4.2	18° C (64° F)	2.09×10^{4}
		8.4		3.52×10^{4}
Barium Hydroxide	$Ba(OH)_2$	1.25	18° C (64° F)	2.50×10^{4}
		2.50		4.79×10^{4}

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Butyric Acid	$C_3H_7CO_2H$	1	18°C (64°F)	4.55×10^{2}
		5.02		8.63×10^{2}
		10.07		9.86×10^{2}
		15.03		9.55×10^{2}
		20.01		8.88×10^{2}
		50.04		2.96×10^{2}
		70.01		5.60×10^{1}
		100		6.00×10^{-2}*
Cadmium Bromide	$CdBr_2$	0.0324	18°C (64°F)	2.31×10^{2}
		0.0748		4.70×10^{2}
		0.154		8.44×10^{2}
		0.506		2.13×10^{3}
		1.0		3.57×10^{3}
		5.0		1.09×10^{4}
		10.0		1.64×10^{4}
		20.0		2.36×10^{4}
		30.0		2.73×10^{4}
		43.0		2.61×10^{4}
Cadmium Chloride	$CdCl_2$	0.0503	18°C (64°F)	4.95×10^{2}
		0.200		1.56×10^{3}
		0.599		3.64×10^{3}
		1.0		5.51×10^{3}
		5.0		1.67×10^{4}
		10.0		2.41×10^{4}
		15.0		2.82×10^{4}
		20		2.99×10^{4}
		30		2.82×10^{4}
		40		2.21×10^{4}
		50		1.37×10^{4}
Cadmium Iodide	CdI_2	1	18°C (64°F)	2.12×10^{3}
		5		6.09×10^{3}
		10		1.04×10^{4}
		15		1.46×10^{4}
		20		1.86×10^{4}
		30		2.54×10^{4}
		40		3.03×10^{4}
		45		3.14×10^{4}
Cadmium Nitrate	$Cd(NO_3)_2$	1	18°C (64°F)	6.94×10^{3}
		5		2.89×10^{4}
		10		5.13×10^{4}
		20		8.27×10^{4}
		30		9.56×10^{4}
		40		9.03×10^{4}
		48		7.55×10^{4}

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Cadmium Sulfate	$CdSO_4$	0.0289 0.0999 0.495 1 5 10 25 36	18°C (64°F)	2.47×10^2 6.92×10^2 2.39×10^3 4.16×10^3 1.46×10^4 2.47×10^4 4.30×10^4 4.21×10^4
Calcium Chloride	$CaCl_2$	5 10 20 25 30 35	18°C (64°F)	6.43×10^4 1.14×10^5 1.73×10^5 1.78×10^5 1.66×10^5 1.37×10^5
Calcium Nitrate	$Ca(N0_3)_2$	6.25 12.50 25.00 37.50 50.00	18°C (64°F)	4.91×10^4 8.04×10^4 1.05×10^5 8.76×10^4 4.69×10^4
Chromic Acid	CrO_3	35%	25°C (77°F)	6.70×10^5
Citric Acid	$C_6H_8O_7$	20%	25°C (77°F)	7.9×10^3
Cupric Chloride	$CuCl_2$	1.35 9 18.20 28.75 35.2	18°C (64°F)	1.87×10^4 7.16×10^4 9.24×10^4 8.97×10^4 6.99×10^4
Cupric Nitrate	$Cu(NO_3)_2$	5 10 15 20 25 35	15°C (59°F)	3.65×10^4 6.35×10^4 8.58×10^4 1.02×10^5 1.09×10^5 1.06×10^5
Cupric Sulfate	$CuSO_4$	2.5 5 10 15 17.5	18°C (64°F)	1.09×10^4 1.89×10^4 3.20×10^4 4.21×10^4 4.58×10^4
Ferric Chloride	$FeCl_3$	16%	25°C (77°F)	9.6×10^4
Ferrous Sulfate	$FeSO_4$	24%	25°C (77°F)	5.3×10^4

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Formic Acid	HCO_2H	4.94 9.55 20.34 29.83 39.95 50.02 70.06 89.02 100.00	18°C (64°F)	5.50×10^3 7.56×10^3 9.84×10^3 1.04×10^4 9.84×10^3 8.64×10^3 5.23×10^3 1.87×10^3 2.80×10^2
Hydriodic Acid	HI	5	15°C (59°F)	1.33×10^5
Hydrobromic Acid	HBr	5 10 15	15°C (59°F)	1.91×10^5 3.55×10^5 4.94×10^5
Hydrochloric Acid	HCl	5 10 20 30 40	15°C (59°F)	3.95×10^5 6.30×10^5 7.62×10^5 6.62×10^5 5.15×10^5
Hydrofluoric Acid	HF	0.004 0.007 0.015 0.030 0.060 0.121 0.242 0.484 1.50 2.48 4.80 7.75 15.85 24.50 29.80	18°C (64°F)	2.50×10^2 3.80×10^2 5.00×10^2 8.00×10^2 1.23×10^3 2.10×10^3 3.63×10^3 6.73×10^3 1.98×10^4 3.15×10^4 5.93×10^4 9.63×10^4 1.85×10^5 2.83×10^5 3.41×10^5
Lactic Acid	$CH_3CHOHCOOH$	15	25°C (77°F)	5.7×10^3
Lanthanum Nitrate	$La(NO_3)_3$	28	25°C (77°F)	9.7×10^4
Lead Nitrate	$Pb(N0_3)_2$	5 10 15 20 25 30	15°C (59°F)	1.91×10^4 3.22×10^4 4.29×10^4 5.21×10^4 6.00×10^4 6.68×10^4
Lithium Carbonate	Li_2CO_3	0.20 0.63	18°C (64°F)	3.43×10^3 8.85×10^3

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Lithium Chloride	LiCl	2.5 5 10 20 30 40	18°C (64°F)	4.10×10^4 7.33×10^4 1.22×10^5 1.68×10^5 1.40×10^5 8.44×10^4
Lithium Hydroxide	LiOH	1.25 2.5 5 7.5	18°C (64°F)	7.81×10^4 1.42×10^5 2.40×10^5 3.00×10^5
Lithium Iodide	LiI	5 10 20 25	18°C (64°F)	2.96×10^4 5.73×10^4 1.09×10^5 1.35×10^5
Lithium Sulfate	Li_2SO_4	5 10	15°C (59°F)	4.00×10^4 6.10×10^4
Magnesium Chloride	$MgCl_2$	5 10 20 30 34	18°C (64°F)	6.83×10^4 1.13×10^5 1.40×10^5 1.06×10^5 7.68×10^4
Magnesium Nitrate	$Mg(NO_3)_2$	5 10 17	18°C (64°F)	4.38×10^4 7.70×10^4 1.10×10^4
Magnesium Sulfate	$MgSO_4$	5 10 15 25	15°C (59°F)	2.63×10^4 4.14×10^4 4.80×10^4 4.15×10^4
Manganese Chloride	$MnCl_2$	5 10 15 20 25 28	15°C (59°F)	5.26×10^4 8.44×10^4 1.06×10^5 1.13×10^5 1.09×10^5 1.02×10^5
Manganous Sulfate	$MnSO_4$	22	25°C (77°F)	5.15×10^4
Mercuric Bromide	$HgBr_2$	0.223 0.422	18°C (64°F)	1.60×10^1 2.60×10^1
Mercuric Chloride	$HgCl_2$	0.229 1.013 5.08	18°C (64°F)	4.40×10^1 1.14×10^2 4.21×10^2

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Nitric Acid	HNO_3	6.2	18°C (64°F)	3.12×10^5
		12.4		5.42×10^5
		24.8		7.68×10^5
		31.0		7.82×10^5
		37.2		7.55×10^5
		49.6		6.34×10^5
		62.0		4.90×10^5
Oxalic Acid	$(CO_2H)_2$	3.5	18°C (64°F)	5.08×10^4
		7.0		7.83×10^4
Phosphoric Acid	H_3PO_4	10	15°C (59°F)	5.66×10^4
		20		1.13×10^5
		30		1.65×10^5
		35		1.86×10^5
		50		2.07×10^5
		70		1.47×10^5
		80		9.79×10^4
		85		7.80×10^4
		87		7.09×10^4
Potassium Acetate	KCH_3CO_2	4.67	15°C (59°F)	3.47×10^4
		9.33		6.25×10^4
		28.00		1.26×10^5
		46.67		1.12×10^5
		65.33		4.79×10^4
Potassium Bromide	KBr	5	15°C (59°F)	4.65×10^4
		10		9.28×10^4
		20		1.91×10^5
		30		2.92×10^5
		36		3.51×10^5
Potassium Carbonate	K_2CO_3	5	15°C (59°F)	5.61×10^4
		10		1.04×10^5
		20		1.81×10^5
		30		2.22×10^5
		40		2.17×10^5
		50		1.47×10^5
Potassium Chloride	KCl	5	18°C (64°F)	6.90×10^4
		10		1.36×10^5
		15		2.02×10^5
		20		2.68×10^5
		21		2.81×10^5
Potassium Cyanide	KCN	3.25	15°C (59°F)	5.27×10^4
		6.5		1.03×10^5
Potassium Fluoride	KF	5	18°C (64°F)	6.52×10^4
		10		1.21×10^5
		20		2.08×10^5
		30		2.56×10^5
		40		2.52×10^5

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Potassium Hydroxide	KOH	4.2 8.4 16.8 25.2 33.6 42.0	15°C (59°F)	1.46×10^{5} 2.72×10^{5} 4.56×10^{5} 5.40×10^{5} 5.22×10^{5} 4.21×10^{5}
Potassium Iodide	KI	5 10 20 30 40 55	18°C (64°F)	3.38×10^{4} 6.80×10^{4} 1.46×10^{5} 2.30×10^{5} 3.17×10^{5} 4.23×10^{5}
Potassium Nitrate	KNO_3	5 10 15 20 22	18°C (64°F)	4.54×10^{4} 8.39×10^{4} 1.19×10^{5} 1.51×10^{5} 1.63×10^{5}
Potassium Oxalate	$K_2C_2O_4$	5 10	18°C (64°F)	4.88×10^{4} 9.15×10^{4}
Potassium Sulfate	K_2SO_4	5 10	18°C (64°F)	4.58×10^{4} 8.60×10^{4}
Potassium Sulfide	K_2S	3.18 4.98 9.93 19.96 29.97 38.08 47.26	18°C (64°F)	8.45×10^{4} 1.28×10^{5} 2.34×10^{5} 4.02×10^{5} 4.56×10^{5} 4.11×10^{5} 2.58×10^{5}
Procaine Hydrochloride	$C_{13}H_{20}N_2O_2$	32	25°C (77°F)	3.4×10^{4}
Propionic Acid	$C_3H_6O_2$	1.00 5.01 10.08 20.02 30.03 50.09 69.99 100.00	18°C (64°F)	4.79×10^{2} 9.25×10^{2} 1.11×10^{3} 1.04×10^{3} 8.18×10^{2} 3.77×10^{2} 8.50×10^{1} 7.00×10^{-2}*
Silver Nitrate	$AgNO_3$	5 10 20 40 60	18°C (64°F)	2.56×10^{4} 4.76×10^{4} 8.72×10^{4} 1.57×10^{5} 2.10×10^{5}
Sodium Acetate	CH_3CO_2Na	5 20 32	18°C (64°F)	2.95×10^{4} 6.51×10^{4} 5.69×10^{4}

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Sodium Carbonate	Na_2CO_3	5 10 15	18°C (64°F)	4.51×10^4 7.05×10^4 8.36×10^4
Sodium Chloride	NaCl	5 10 15 20 25 26	18°C (64°F)	6.72×10^4 1.21×10^5 1.64×10^5 1.96×10^5 2.14×10^5 2.15×10^5
Sodium Citrate	$Na_3C_6H_5O_7$	23	25°C (77°F)	6.45×10^4
Sodium Diatrizoate	$C_{11}H_8NO_4I_3Na$	40	25°C (77°F)	1.85×10^4
Sodium Dichromate	$Na_2Cr_2O_7$	40	25°C (77°F)	1.65×10^5
Sodium Hydroxide	NaOH	1 2 4 6 8 10 15 20 25 27.5 30 32.5 35 37.5 40 45 50	18°C (64°F)	4.65×10^4 8.87×10^4 1.63×10^5 2.24×10^5 2.73×10^5 3.09×10^5 3.49×10^5 3.28×10^5 2.72×10^5 2.39×10^5 2.07×10^5 1.80×10^5 1.56×10^5 1.36×10^5 1.21×10^5 9.77×10^4 8.20×10^4
Sodium Iodide	NAI	5 10 20 40	18°C (64°F)	2.98×10^4 5.81×10^4 1.14×10^5 2.11×10^5
Sodium Nitrate	$NaNO_3$	5 10 20 30	18°C (64°F)	4.36×10^4 7.82×10^4 1.30×10^5 1.61×10^5
Sodium Phosphate	NaH_2PO_4	28	25°C (77°F)	6.00×10^4
Sodium Sulfate	Na_2SO_4	5 10 15	18°C (64°F)	4.09×10^4 6.87×10^4 8.86×10^4

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Sodium Sulfide	Na_2S	2.02	18°C (64°F)	6.12×10^4
		5.03		1.32×10^5
		9.64		2.02×10^5
		14.02		2.40×10^5
		16.12		2.24×10^5
		18.15		2.18×10^5
Sodium Tartrate	$Na_4C_4H_4O_6$	24	25°C (77°F)	6.85×10^4
Sodium Thiocyanate	NaSCN	34	25°C (77°F)	2.06×10^5
Sodium Thiosulfate	$Na_2S_2O_3$	29	25°C (77°F)	1.52×10^5
Strontium Chloride	$SrCl_2$	5	18°C (64°F)	4.83×10^4
		10		8.86×10^4
		15		1.23×10^5
		22		1.58×10^5
Strontium Nitrate	$Sr(NO_3)_2$	5	15°C (59°F)	3.09×10^4
		10		5.27×10^4
		15		6.90×10^4
		20		8.02×10^4
		25		8.66×10^4
		35		8.61×10^4
Sulfuric Acid	H_2SO_4	5	18°C (64°F)	2.09×10^5
		10		3.92×10^5
		15		5.43×10^5
		20		6.53×10^5
		25		7.17×10^5
		30		7.39×10^5
		35		7.24×10^5
		40		6.80×10^5
		50		5.41×10^5
		60		3.73×10^5
		65		2.91×10^5
		70		2.16×10^5
		75		1.52×10^5
		80		1.11×10^5
		85		9.85×10^4
		86		9.92×10^4
		87		1.01×10^5
		88		1.03×10^5
		89		1.06×10^5
		90		1.08×10^5
		91		1.09×10^5
		92		1.10×10^5
		94		1.07×10^5
		95		1.03×10^5
		96		9.44×10^4
		97		8.00×10^4
		99.4		8.50×10^3

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 1. Electrical Conductivity of Aqueous Solutions (Continued)

Name of Aqueous Solution	Chemical Formula	Concentration by Weight, %	Values Listed at a Temperature of	Conductivity in µS/cm
Tartaric Acid	$C_4H_6O_6$	24	25°C (77°F)	1.18×10^4
Zinc Chloride	$ZnCl_2$	2.5	15°C (59°F)	2.76×10^4
		5		4.83×10^4
		10		7.27×10^4
		20		9.12×10^4
		30		9.26×10^4
		40		8.45×10^4
		60		3.69×10^4
Zinc Sulfate	$ZnSO_4$	5	18°C (64°F)	1.91×10^4
		10		3.21×10^4
		15		4.15×10^4
		25		4.80×10^4
		30		4.44×10^4

* If asterisk is noted against conductivity value, it denotes that the value may be too low for the magnetic flowmeter. Refer to the particular flowmeter specification for minimum allowable conductivity.

Table 2. Electrical Conductivity of Pure Liquids

Name of Pure Liquid	Value Listed at Temperature of**	Conductivity in µS/cm
Acetaldehyde	15°C (59°F)	1.7*
Acetamide	100°C (212°F)	43
Acetic Acid	0°C (32°F) 25°C (77°F)	0.005* 0.00112*
Acetic Anhydride	0°C (32°F) 25°C (77°F)	1.0* 0.48*
Acetone	18°C (64°F) 25°C (77°F)	0.02* 0.06*
Acetonitrile	20°C (68°F)	7.0
Acetophenone	25°C (77°F)	0.006*
Acetyl Bromide	25°C (77°F)	2.4*
Acetyle Chloride	25°C (77°F)	0.4*
Alizarin	233°C (451°F)	1.45*
Allyl Alcohol	25°C (77°F)	7.0
Ammonia	-79°C (-110 °F)	0.13*
Aniline	25 °C (77°F)	0.024*
Anthracene	230°C (446°F)	0.0003*
Arsenic Tribromide	35°C (95°F)	1.5*
Arsenic Trichloride	25°C (77°F)	1.2*
Benzadehyde	25°C (77°F)	0.15*
Benzine	–	0.076*
Benzoic Acid	125°C (257°F)	0.003*
Benzonitrile	25°C (77°F)	0.05*
Benzyl Alcohol	25°C (77°F)	1.8*
Benzyl Benzoate	25°C (77°F)	<0.001*
Benzylamine	25°C (77°F)	<0.0017*
Bromine	17.2°C (63°F)	1.3×10^{-7}*
Bromobenzene	25°C (77°F)	$<2.0 \times 10^{-4}$*
Bromoform	25°C (77°F)	<0.02*
ISO-Butyl Alcohol	25°C (77°F)	<0.02*
Capronitrile	25°C (77°F)	3.7*
Carbon Disulfide	1°C (34°F)	7.8×10^{-12}*
Carbon Tetrachloride	18°C (64°F)	4.0×10^{-12}*
Chlorine	-70°C (-94°F)	$<1 \times 10^{-10}$*
Chloroacetic Acid	60°C (140°F)	1.4*
M-Chloroaniline	25°C (77°F)	0.05*
Chloroform	25°C (77°F)	<0.02*
Chlorohydrin	25°C (77°F)	0.5*
M-Creosol	25°C (77°F)	<0.017*
Cyanogen	–	<0.007*
Cymene	25°C (77°F)	<0.02*
Dichloroacetic Acid	25°C (77°F)	<0.07*
Dichlorohydrin	25°C (77°F)	12
Diethyl Carbonate	25°C (77°F)	0.017*
Diethyl Oxalate	25°C (77°F)	0.76*
Diethyl Sulfate	25°C (77°F)	0.26*
Diethylamine	-33.6°C (-29°F)	0.0022*
Dimethyl Sulfate	0°C (32°F)	0.16*
Epichlorohydrin	25°C (77°F)	0.034*
Ethyl Acetate	25°C (77°F)	<0.001*

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** The temperatures listed may be beyond the limits of the flowtube. Check applicable flowtube specifications for process temperature limits.

Table 2. Electrical Conductivity of Pure Liquids (Continued)

Name of Pure Liquid	Value Listed at Temperature of**	Conductivity in µS/cm
Ethyl Acetoacetate	25°C (77°F)	0.04*
Ethyl Alcohol	25°C (77°F)	0.0013*
Ethyl Benzoate	25°C (77°F)	0.001*
Ethyl Bromide	25°C (77°F)	0.02*
Ethyl Ether	25°C (77°F)	4×10^{-7}*
Ethyl Iodide	25°C (77°F)	<0.02*
Ethyl Isothiocyanate	25°C (77°F)	0.126*
Ethyl Nitrate	25°C (77°F)	0.53*
Ethyl Thiocyanate	25°C (77°F)	1.2*
Ethylamine	0°C (32°F)	0.4*
Ethylene Bromide	19°C (66°F)	$<2.0 \times 10^{-4}$*
Ethylene Chloride	25°C (77°F)	0.03*
Ethylidene Chloride	25°C (77°F)	<0.017*
Eugenol	25°C (77°F)	<0.017*
Formamide	25°C (77°F)	4.0*
Formic Acid	18°C (64°F) 25°C (77°F)	56.0 64.0
Furfural	25°C (77°F)	1.5*
Gallium	30°C (86°F)	36.8×10^{9}
Germanium Tetrabromide	30°C (86°F)	78.0
Glycerol	25°C (77°F)	0.064*
Glycol	25°C (77°F)	0.3*
Guaiacol	25°C (77°F)	0.28*
Heptane	–	$<10^{-7}$*
Hexane	18°C (64°F)	$<10^{-12}$*
Hydrogen Bromide	-80°C (-112°F)	0.008*
Hydrogen Chloride	-96°C (-140°F)	0.01*
Hydrogen Cyanide	0°C (32°F)	3.3*
Hydrogen Iodide	Boiling Point	0.2*
Hydrogen Sulfide	Boiling Point	10^{-5}*
Iodine	110°C (230°F)	1.3×10^{-4}*
Kerosine (ene)	25°C (77°F)	<0.017*
Mercury	0°C (32°F)	10.6×10^{9}
Methyl Acetate	25°C (77°F)	3.4*
Methyl Alcohol	18°C (64°F)	0.44*
Methyl Ethyl Ketone	25°C (77°F)	0.1*
Methyl Iodine	25°C (77°F)	<0.02*
Methyl Nitrate	25°C (77°F)	4.5*
Methyl Thiocyanate	25°C (77°F)	1.5*
Naphthalene	82°C (180°F)	4×10^{-4}*
Nitrobenzene	0°C (32°F)	5×10^{-3}*
Nitromethane	18°C (64°F)	0.6*
O-OR M-Nitrotoluene	25°C (77°F)	<0.2*
Nonane	25°C (77°F)	<0.017*
Oleic Acid	15°C (59°F)	$<2 \times 10^{-4}$*
Pentane	19.5°C (67°F)	$<2 \times 10^{-4}$*
Petroleum	–	3×10^{-7}*
Phenetole	25°C (77°F)	<0.017*
Phenol	25°C (77°F)	<0.017*

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** The temperatures listed may be beyond the limits of the flowtube. Check applicable flowtube specifications for process temperature limits.

Table 2. Electrical Conductivity of Pure Liquids (Continued)

Name of Pure Liquid	Value Listed at Temperature of**	Conductivity in µS/cm
Phenyl Isothiocyanate	25°C (77°F)	1.4*
Phosgene	25°C (77°F)	0.007*
Phosphorus	25°C (77°F)	0.4*
Phosphorus Oxychloride	25°C (77°F)	2.2*
Pinene	23°C (73°F)	$<2 \times 10^{-4}$*
Piperidene	25°C (77°F)	0.2*
Proionaldehyde	25°C (77°F)	0.85*
Propionic Acid	25°C (77°F)	$<10^{-3}$*
Propionitrile	25°C (77°F)	0.1*
M-Propyl Alcohol	18°C (64°F) 25°C (77°F)	0.05* 0.02*
ISO-Propyl Alcohol	25°C (77°F)	3.5*
M-Propyl Bromide	25°C (77°F)	<0.02*
Pyridine	18°C (64°F)	0.053*
Quinoline	25°C (77°F)	0.022*
Salicylaldehyde	25°C (77°F)	0.16*
Stearic Acid	80°C (176°F)	$<4 \times 10^{-7}$*
Sulfonyl Chloride	25°C (77°F)	2.0*
Sulfur	115°C (239°F) 130°C (266°F) 440°C (824°F)	10^{-6}* 5.0×10^{-5}* 0.12*
Sulfur Dioxide	35°C (95°F)	0.015*
Toluene	–	$<10^{-8}$*
O-Toluidine	25°C (77°F)	<2.0*
P-Toluidine	100°C (212°F)	0.062*
Trichloroacetic Acid	25°C (77°F)	0.003*
Trimethylamine	-33.5°C (-28°F)	2.2×10^{-4}*
Turpentine	~	2.0×10^{-7}*
ISO-Valeric Acid	80°C (176°F)	$<4.0 \times 10^{-7}$*
Water (Distilled)	–	0.04*
Xylene	–	$<10^{-9}$*

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** The temperatures listed may be beyond the limits of the flowtube. Check applicable flowtube specifications for process temperature limits.

Table 3. Electrical Conductivity of Miscellaneous Liquids

Name of Pure Liquid	Value Listed at Temperature of**	Conductivity in µS/cm
Acintol P	75°C (167°F)	0.7*
Actol 31-56 Trial	25°C (77°F)	0.77*
Adipic Acid	170°C (338°F)	0.20*
Adipic Acid	25°C (77°F)	0.7*
Alphonic	80°C (176°F)	0.5*
Alum	25°C (77°F)	9000
Aluminum Chloride	25°C (77°F)	250 000
Alumina Hydrate Solution	25°C (77°F)	350 000
Animal Fat	70°C (158°F)	$<10^{-7}$*
Asphalt Emulsion	30°C (86°F)	9000
Black Liquor	93°C (199°F)	5000
Carbamate	25°C (77°F)	400
Carboxylic Acid	25°C (77°F)	5
Chemonite	25°C (77°F)	5000
Chlorinated Ether	25°C (77°F)	18
Chocolate Liquor	–	$<10^{-7}$*
Coca Cola Syrup	20°C (68°F)	600
Coffee Extract	84°C (183°F)	5000
Corn Syrup	32°C (90°F)	16
Cranberries Crushed	38°C (100°F)	26
Cream Cheese Mix	79°C (174°F)	5000
Diofan 190D (55%)	25°C (77°F)	6000
Formaldehyde 44%	38°C (100°F)	175
Fudge	57°C (135°F)	46
Fuel Oil	–	$<10^{-7}$*
Gin 90 Proof	25°C (77°F)	10
Hydraulic Fluid	–	$<10^{-7}$*
Hydrogen Peroxide 90%	60°C (140°F)	2*
Ink	93°C (199°F)	$<10^{-7}$*
Isophthalic Polyester Resin	25°C (77°F)	<0.04*
Isoproponol	25°C (77°F)	1.8*
Lactan	25°C (77°F)	43
Lard	–	$<10^{-7}$*
Latex	25°C (77°F)	1750
Latex Paint	25°C (77°F)	700
Methy Isobutyl Ketone	25°C (77°F)	4*
Molasses	10°C (50°F) 50°C (122°F)	300 5000
Oleum 20%	25°C (77°F)	500
Oxygen	–	$<10^{-7}$*
Parafin Wax	66°C (150°F)	$<10^{-7}$*
Paint, Enamel	25°C (77°F)	$<10^{-7}$*
Peanut Butter	93°C (199 °F)	$<10^{-7}$*
Polystyrene	54 °C (129°F)	1200
Propylene Glycel	25°C (77°F)	0.04*
Pyresote	25°C (77°F)	11 000
Royal Crown Cola Syrup	25°C (77°F)	600

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Table 3. Electrical Conductivity of Miscellaneous Liquids (Continued)

Name of Pure Liquid	Value Listed at Temperature of**	Conductivity in µS/cm
Sodium Aluminate	25°C (77°F)	70 000
Sodium Silicate (37%)	25°C (77°F)	26 000
Sodium Silicate (40%)	25°C (77°F)	24 000
Sodium Silicate (46%)	25°C (77°F)	14 000
Soybean Oil	104°C (219°F)	$<10^{-7}$*
Soybean Oil	25°C (77°F)	<0.04*
Starch	27°C (81°F)	3000
Sugar Solution Dilute	30°C (86°F)	585
Sugar Solution Pure	10°C (50°F)	3.0*
Titanium Dioxide	25°C (77°F)	4000
Toothpaste	25°C (77°F)	150
Urea (Pure)	145°C (293°F)	5000
Urea (66%)	25°C (77°F)	100
Vegetable Oil	25°C (77°F)	$<10^{-7}$*
Vodka 100 Proof	25°C (77°F)	4*
Uranium Sulfate Extract	38°C (100°F)	3000
Water, New York City	25°C (77°F)	72
Water, Distilled	–	0.04*
Zinc Oxide	25°C (77°F)	2000

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