

Model 9700A Magnetic Flow Tube



The 9700A magnetic flow tube can be used with IMT30A, IMT31A and IMT33A magnetic flow transmitter.

- ▶ Robust, fully welded construction for industrial process applications
- ▶ For demanding applications including corrosive, abrasive and high pressure
- ▶ Engineered constructions for customer specific solutions

Equipment should be installed, operated, serviced, and maintained only by qualified personnel.

No responsibility is assumed by Schneider Electric for any consequences arising from the use of this material.

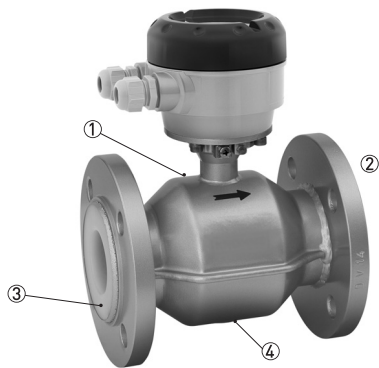
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1.1 The all-round solution for process industries

The **9700A** design meets the demands of a very wide range of applications in industries including the chemical, pulp & paper, water and wastewater, minerals and mining, iron, steel and metals, pharmaceuticals and oil & gas industry.

The 9700A has a field proven and unsurpassed lifetime. This is assured by the fully welded construction, full bore pipe construction, absence of moving parts and wear resistant liner materials. Even for demanding applications in harsh environments or with aggressive and abrasive media the 9700A can offer a solution.

Examples include sub-sea installations, slurries with very high solids contents, alkaline solutions and acids, up to chemical dosing, bleaching, colouring, and black liquor in the paper industry..



- ① Robust fully welded construction
- ② Diameter range: DN10...2000 - 3/8 ... 80"
- ③ PFA, PTFE, ETFE, PU, hard rubber and soft rubber liners
- ④ Hastelloy, titanium, tantalum, stainless steel, platinum and low noise electrodes

Highlights

- Trusted and accepted flow tube for all process applications
- Proven in use and unsurpassed lifetime
- All welded rugged construction, to extend lifetime of equipment
- Good corrosion, erosion / abrasion resistance
- Wide choice of materials for electrodes including Hastelloy, Tantalum, Platinum
- Corrosion resistant and leak tight electrodes.
- Reliable measurement under very demanding conditions:
including high temperatures up to 180°C / 356°F, high solids contents (up to 70%)
- Bi-directional flow metering
- Wide range of approvals for hazardous areas
- No grounding rings with virtual reference option on IMT33A
- Extensive diagnostic capabilities

Industries

- Chemicals
- Pulp & Paper
- Minerals & Mining
- Oil & gas
- Iron, Steel & Metals
- Water and wastewater
- Pharmaceuticals

Applications

- For clean liquids
- For slurries and pastes with high solids content
- For abrasive and aggressive products

1.2 Options

The solution for any industry



From standard to customized

For easy ordering the standard range of the 9700A covers all popular sizes, materials and coatings. Process connections are available in EN 1092-1 (up to PN40), ASME B16.5 and JIS (20K).



Easy installation

Fitting the 9700A is easy with the flanged design and standard ISO insertion lengths. To further ease the operation, the 9700A can be installed without filters and straighteners. Even grounding rings are not required with the patented **"Virtual Reference"** option on the IMT33A transmitter.



IP68

Installation in measurement chambers subject to (constant) flooding is possible with the IP68 rated version. .

1.3 Measuring principle

An electrically conductive fluid flows inside an electrically insulated pipe through a magnetic field. This magnetic field is generated by a current, flowing through a pair of field coils.

Inside of the fluid, a voltage U is generated:

$$U = v * k * B * D$$

in which:

v = mean flow velocity

k = factor correcting for geometry

B = magnetic field strength

D = inner diameter of flowmeter

The signal voltage U is picked off by electrodes and is proportional to the mean flow velocity v and thus the flow rate Q . A signal transmitter is used to amplify the signal voltage, filter it and convert it into signals for totalizing, recording and output processing.

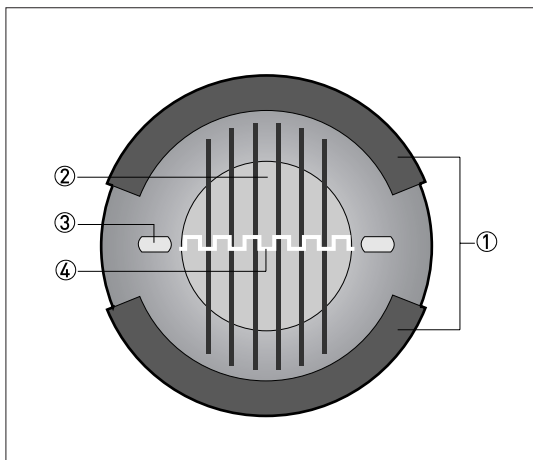


Figure 1-1: Measuring principle

- ① Field coils
- ② Magnetic field
- ③ Electrodes
- ④ Induced voltage (proportional to flow velocity)

2.1 Technical data

- *The following data is provided for general applications. If you require data that is more relevant to your specific application, please contact us or your local sales office.*
- *Additional information (certificates, special tools, software,...) and complete product documentation can be downloaded free of charge from the website.*

Measuring system

Measuring principle	Faraday's law
Application range	Electrically conductive fluids
Measured value	
Primary measured value	Flow velocity
Secondary measured value	Volume flow

Design

Features	Fully welded maintenance-free flow tube
	Flange version with full bore flow flow tube
	Standard as well as higher pressure ratings
	Broad range of nominal sizes
	Industry specific insertion lengths
Modular construction	The measurement system consists of a flow tube and a signal transmitter. It is available as compact and as separate version.
Compact version	With signal transmitter IMT30A: 9700A + IMT30A 4
	With signal transmitter IMT31A: 9700A + IMT31A 4
	With signal transmitter IMT33A: 9700A + IMT33A 4
Remote version	In wall (W) mount version with signal transmitter IMT30A: 9700A + IMT30A N
	In wall (W) mount version with signal transmitter IMT31A: 9700A + IMT31A N
	In field (F) or wall (W) mount version with signal transmitter IMT33A: 9700A + IMT33A H or N
Nominal diameter	With signal transmitter IMT30A: DN10...1200 / 3/8...48"
	With signal transmitter IMT31A: DN10...1200 / 3/8...48"
	With signal transmitter IMT33A: DN10...2000 / 3/8...80"

Measuring accuracy

Maximum measuring error	Depending on signal transmitter and DN size.
	IMT30A: down to 0.5% of the measured value ± 1 mm/s
	IMT31A: down to 0.3% of the measured value ± 1 mm/s
	IMT33A: down to 0.2% of the measured value ± 1 mm/s
	Optionally: optimised accuracy for IMT30A and IMT31A. For more details on optimised accuracy, see the concerning signal transmitter documentation.
	The additional typical measuring deviation for the current output is ± 10 μ A.
	The maximum measuring error depends on the installation conditions.
	For detailed information refer to <i>Measurement accuracy</i> on page 15.
Repeatability	$\pm 0.1\%$ of MV, minimum 1 mm/s
Calibration / Verification	Standard:
	2 point calibration by direct volume comparison.
	Optional:
	Verification to Measurement Instrument Directive (MID), Annex III (MI-001). Check BuyAutomation for availability (Only in combination with signal transmitter IMT33A)
Long term stability	$\pm 0.1\%$ of MV

Operating conditions

Temperature	
For Ex versions different temperatures are valid. Please check the relevant Ex documentation for details.	
Process temperature	PTFE / PFA: -40...+180°C / -40...+356°F for remote versions
	PTFE / PFA: -40...+140°C / -40...+284°F for IMT33A compact versions
	PTFE / PFA: -40...+120°C / -40...+248°F for IMT30A and IMT31A compact versions
	ETFE: -40...+120°C / -40...+248°F
	Soft rubber: -5...+60°C / 23...+140°F
	PU: -5...+65°C / 23...+149°F
	For more information about temperatures see the temperature table in the manual.
Ambient temperature	Standard (with aluminum signal transmitter housing): -40...+65°C / -40...+149°F
	Protect the electronics against self-heating with ambient temperatures above +55°C / +131°F.
	Option (with stainless steel signal transmitter housing): low temperate carbon steel flanges or stainless steel flanges. Check BuyAutomation for availability.
	-40...+55°C / -40...+130°F
Storage temperature	-50...+70°C / -58...+158°F
Measuring range	-12...+12 m/s / -40...+40 ft/s

Pressure	
EN 1092-1	DN1200...2000: PN 6
	DN200...1000: PN 10
	DN65 and DN100...150: PN 16
	DN10...50 and DN80: PN40
	Other pressures on request
ASME B16.5	3/8...40": 150 lb RF
	Other pressures on request
JIS	DN50...1000 / 2..40": 10 K
	DN10...40 / 3/8...1½": 20 K
	Other pressures on request
Vacuum load	For detailed information refer to <i>Vacuum load</i> on page 23.
Pressure loss	Negligible

Chemical properties	
Physical condition	Electrically conductive liquids
Electrical conductivity	Water: $\geq 20 \mu\text{S/cm}$
	Standard: $\geq 1 \mu\text{S/cm}$
Permissible gas content (volume)	IMT30A: $\leq 3\%$
	IMT31A: $\leq 5\%$
	IMT33A: $\leq 5\%$
Permissible solid content (volume)	IMT30A: $\leq 10\%$
	IMT31A: $\leq 10\%$
	IMT33A: $\leq 70\%$

Installation conditions

Installation	Assure that the flow tube is always fully filled.
	For detailed information refer to the manual of the flow tube and signal transmitter.
Flow direction	Forward and reverse
	Arrow on flow tube indicates positive flow direction.
Inlet run	$\geq 5 \text{ DN}$
Outlet run	$\geq 2 \text{ DN}$
Dimensions and weights	For detailed information refer to <i>Dimensions and weights</i> on page 16.

Materials

Flow tube housing	DN10...15 / 3/8...1/2": with PFA liner, stainless steel 1.4408
	DN10...20 / 3/8...3/4": with PTFE liner; Duplex
	DN25...2000 / 1...80": sheet steel
Measuring tube	Austenitic stainless steel
Flanges	Standard: carbon steel
Liner	Standard
	DN10...15 / 3/8...1/2": PFA
	DN20 / 3/4": PTFE
	DN25...150 / 1...6": PFA
	DN200...1800 / 8...72": ETFE
	Option
	DN10 - DN15 / 3/8 - 1/2": PTFE
	DN200...600 / 8...24": PTFE
	DN200...1800 / 8...72": PU
	DN200...2000 / 8...80": Hard rubber (Ex only)
DN50...600 / 2...24": Soft rubber	
Protective coating	On exterior of the meter: flanges, housing, signal transmitter (compact version) and/or connection box (field version)
	Standard coating
Connection box	Only for remote versions
	Standard: die-cast aluminum
	Option: stainless steel
Measuring electrodes	Standard: Hastelloy® C
	Option: platinum, stainless steel, titanium, tantalum, low noise (coated electrodes)
	Option: conductive rubber (only in combination with soft rubber liner)
Grounding rings	Standard: stainless steel
	Option: Hastelloy® C, titanium, tantalum
	Grounding rings can be omitted with virtual reference option for the signal transmitter IMT33A.
Reference electrode (optional)	Standard: Hastelloy® C
	Option: platinum, stainless steel, titanium, tantalum, low noise
	Other materials on request

Process connections

Flange	
EN 1092-1	DN10...2000 in PN 6...40
ASME	3/8...80" in 150...300 lb RF
JIS	DN10...1000 in JIS 10...20 K
Design of gasket surface	EN 1092-1, ASME, JIS; RF

Electrical connections

For full detail refer to the relevant documentation of the signal transmitter.	
Signal cable (remote versions only)	
Type A (DS)	In combination with the signal transmitter IMT30A, IMT31A and IMT33A
	Standard cable, double shielded. Max. length: 600 m / 1968 ft (dep. on electrical conductivity and flow tube)
Type B (BTS)	Only in combination with the signal transmitter IMT33A
	Optional cable, triple shielded. Max. length: 600 m / 1968 ft (dep. on electrical conductivity and flow tube)
I/O	For full details of I/O options, including data streams and protocols, see technical datasheet of the relevant signal transmitter.

Approvals and certificates

CE	
This device fulfils the statutory requirements of the EU directives. The manufacturer certifies successful testing of the product by applying the CE mark.	
	For full information of the EU directive & standards and the approved certifications; please refer to the EU Declaration of Conformity or the website of the manufacturer.
Hazardous areas	
ATEX	Please check the relevant Ex documentation for details.
	Compact version with signal transmitter IMT30A 4: II 2 GD
	Compact version with signal transmitter IMT31A 4: II 2(1)G, IIC T4 Gb and II 2(1)D, IIIC T180°C Db
	Compact version with signal transmitter IMT33A 4: II 2(1)G, IIC T6...T3 Gb and II 2D, IIIC T150°C Db
	Remote version: II 2G, IIC T6...T3 Gb and II 2D, IIIC T180°C Db
FM	In combination with signal transmitter IMT31A 4: Class I, Div 2, groups A, B, C and D; T4
	In combination with signal transmitter IMT33A 4: Class I, Div 2, groups A, B, C and D; T6
	Class II, Div 2, groups F and G
	Class III, Div 2, T6
CSA	In combination with signal transmitter IMT33A: Class I, Div 2, groups A, B, C and D
	Class II, Div 2, groups F and G; T6
IECEX	Compact version with signal transmitter IIC T4 Gb and IIIC T180°C Db
	Compact version with signal transmitter IIC T6...T3 Gb and IIIC T150°C Db
	Remote version with signal transmitter IIC T6...T3 Gb and IIIC T180°C Db
NEPSI	Compact version with signal transmitter or remote version IMT33A N : Check BuyAutomation for availability.
	Ex e ia mb IIC T6...T3 Gb / Ex d e ia mb IIC T4 Gb / Ex d e ia mb [ia Ga] IIC T6...T3 Gb
	Ex d e ia IIC T6...T3 Gb / Ex e ia mb IIC T4 Gb / Ex d e ia [ia Ga] IIC T6...T3 Gb
	Ex e q ia IIC T6...T3 Gb / Ex e ia mb q IIC T3/T4 Gb / Ex d e ia q [ia Ga] IIC T6...T3 Gb
	Ex e ia IIC T6...T3 Gb / Ex d e ia [ia Ga] IIC T6...T3 Gb

Other approvals and standards	
Hygiene	PFA liner is FDA compliant.
BSE/TSE	Bovine spongiform encephalopathy / Transmissible spongiform encephalopathy Declaration on request
Protection category acc. to IEC 60529	Standard:
	IP66/67, NEMA 4/4X/6
	Option:
	IP68, NEMA 6P
	IP68 is only available for separate design and with a stainless steel connection box.
Protective coating	Standard; ISO 12944-2: C3 medium / C4 high
Vibration resistance	IEC 60068-2-64
Random vibration test	IEC 60068-2-34
Shock test	IEC 60068-2-27

2.2 Measurement accuracy

Every electromagnetic flowmeter is calibrated by direct volume comparison. The wet calibration validates the performance of the flowmeter under reference conditions against accuracy limits.

The accuracy limits of electromagnetic flowmeters are typically the result of the combined effect of linearity, zero point stability and calibration uncertainty.

Reference conditions

- Medium: water
- Temperature: +5...+35°C / +41...+95°F
- Operating pressure: 0.1...5 barg / 1.5...72.5 psig
- Inlet section: ≥ 5 DN
- Outlet section: ≥ 2 DN

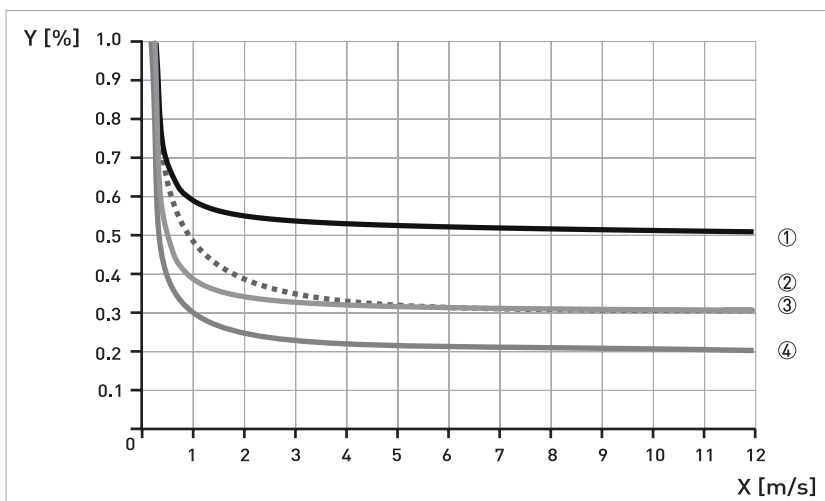


Figure 2-1: Flow velocity vs. accuracy

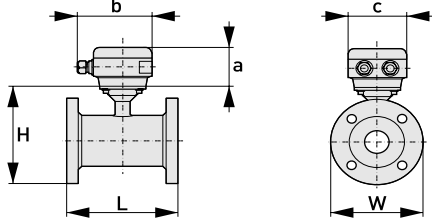
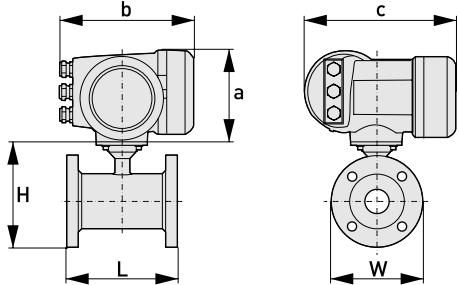
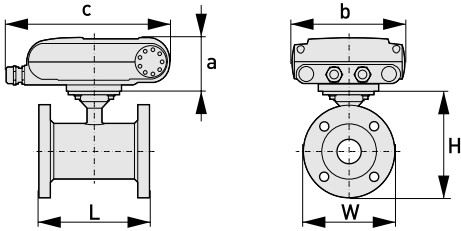
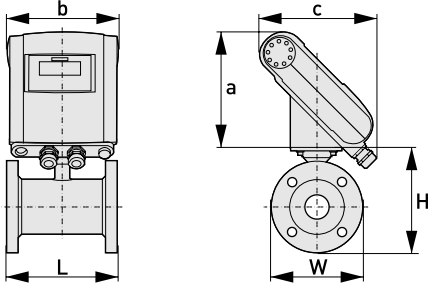
X [m/s] : flow velocity

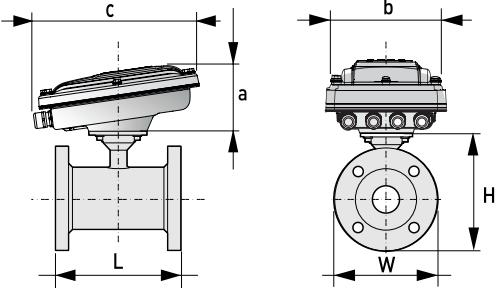
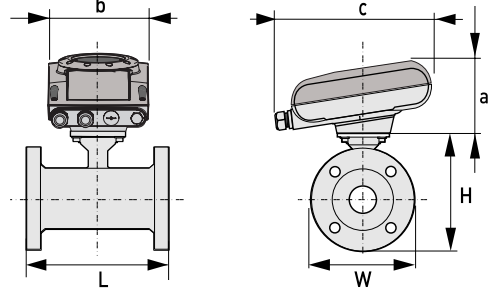
Y [%]: deviation from the actual measured value (mv)

Accuracy

Flow tube diameter	Signal transmitter type	Accuracy	Curve
DN10...1600 / $3/8$...64"	IMT33A	$\pm 0.2\%$ of mv + 1 mm/s	④
DN1800...2000 / > 64"	IMT33A	$\pm 0.3\%$ of mv + 2 mm/s	③
DN10...1200 / $3/8$...48"	IMT31A	$\pm 0.3\%$ of mv + 1 mm/s	②
DN10...1200 / $1/10$...48"	IMT30A	$\pm 0.5\%$ of mv + 1 mm/s	①

2.3 Dimensions and weights

<p>Remote version</p>		<p>a = 88 mm / 3.5"</p> <p>b = 139 mm / 5.5" ①</p> <p>c = 106 mm / 4.2"</p> <p>Total height = H + a</p>
<p>Compact version with: IMT33A</p>		<p>a = 155 mm / 6.1"</p> <p>b = 230 mm / 9.1" ①</p> <p>c = 260 mm / 10.2"</p> <p>Total height = H + a</p>
<p>Compact version with: IMT31A (0°)</p>		<p>a = 82 mm / 3.2"</p> <p>b = 161 mm / 6.3"</p> <p>c = 257 mm / 10.1" ①</p> <p>Total height = H + a</p>
<p>Compact version with: IMT31A (45°)</p>		<p>a = 186 mm / 7.3"</p> <p>b = 161 mm / 6.3"</p> <p>c = 184 mm / 7.3" ①</p> <p>Total height = H + a</p>

Compact version with stainless steel IMT31A (10°)		a = 100 mm / 4" b = 187 mm / 7.36" ① c = 270 mm / 10.63" Total height = H + a
Compact version with: IMT30A (10°)		a = 100mm / 4" b = 157 mm / 6.18" ① c = 260 mm / 10.24" Total height = H + a

① The value may vary depending on the used cable glands.

- All data given in the following tables are based on standard versions of the flow tube only.
- Especially for smaller nominal sizes of the flow tube, the signal transmitter can be bigger than the tube.
- Note that for other pressure ratings than mentioned, the dimensions may be different.
- For full information on signal transmitter dimensions see relevant documentation.

EN 1092-1

Nominal size		Dimensions [mm]				Approximately weight [kg]
DN	PN [bar]	L		H	W	
		DIN	ISO 13359			
10	40	150	-	106	90	6
15	40	150	200	106	95	6
20	40	150	200	158	105	7
25	40	150	200	140	115	4
32	40	150	200	157	140	5
40	40	150	200	166	150	5
50	40	200	200	186	165	9
65	16	200	200	200	185	9
80	40	200	200	209	200	12
100	16	250	250	237	220	15
125	16	250	250	266	250	19
150	16	300	300	300	285	27
200	10	350	350	361	340	34
250	10	400	450	408	395	48
300	10	500	500	458	445	58
350	10	500	550	510	505	78
400	10	600	600	568	565	101
450	10	600	-	618	615	111
500	10	600	-	671	670	130
600	10	600	-	781	780	165
700	10	700	-	898	895	248
800	10	800	-	1012	1015	331
900	10	900	-	1114	1115	430
1000	10	1000	-	1225	1230	507
1200	6	1200	-	1417	1405	555
1400	6	1400	-	1619	1630	765
1600	6	1600	-	1819	1830	1035
1800	6	1800	-	2027	2045	1470
2000	6	2000	-	2259	2265	1860

150 lb flanges

Nominal size		Dimensions [inch]				Approximately weight [lb]
ASME	PN [psi]	L		H	W	
		DIN	ISO 13359			
3/8"	284	5.91	-	5.08	3.50	12
1/2"	284	5.91	7.87	5.08	3.50	12
3/4"	284	5.91	7.87	5.28	3.88	18
1"	284	5.91	7.87	5.39	4.25	7
1 1/4"	284	5.91	7.87	5.98	4.62	7
1 1/2"	284	5.91	7.87	6.10	5.00	11
2"	284	7.87	7.87	7.05	5.98	18
2 1/2"	284	7.87	7.87	7.72	7.00	24
3"	284	7.87	7.87	8.03	7.50	26
4"	284	9.84	9.84	9.49	9.00	40
5"	284	9.84	9.84	10.55	10.0	49
6"	284	11.81	11.81	11.69	11.0	64
8"	284	13.78	13.78	14.25	13.5	95
10"	284	15.75	17.71	16.3	16.0	143
12"	284	19.69	19.69	18.78	19.0	207
14"	284	27.56	21.65	20.67	21.0	284
16"	284	31.50	23.62	22.95	23.5	364
18"	284	31.50	-	24.72	25.0	410
20"	284	31.50	-	26.97	27.5	492
24"	284	31.50	-	31.38	32.0	675

- Pressures at 20° C / 68° F.
- For higher temperatures, the pressure and temperature ratings are as per ASME B16.5.

300 lb flanges

Nominal size		Dimensions [inch]				Approximately weight [lb]
ASME	PN [psi]	L		H	W	
		DIN	ISO 13359			
3/8"	741	5.91	-	5.24	3.75	15
1/2"	741	5.91	7.87	5.24	3.75	15
3/4"	741	5.91	7.87	5.67	4.62	20
1"	741	5.91	7.87	5.71	4.87	11
1 1/2"	741	7.87	7.87	6.65	6.13	13
2"	741	9.84	7.87	7.32	6.50	22
3"	741	9.84	7.87	8.43	8.25	31
4"	741	11.81	9.84	10.00	10.0	44
6"	741	12.60	11.81	12.44	12.5	73
8"	741	15.75	13.78	15.04	15.0	157
10"	741	19.69	17.71	17.05	17.5	247
12"	741	23.62	-	20.00	20.5	375
14"	741	27.56	-	21.65	23.0	474
16"	741	31.50	-	23.98	25.5	639
20"	741	31.50	-	28.46	30.5	937
24"	741	31.50	-	33.39	36.0	1345

- Pressures at 20° C / 68° F.
- For higher temperatures, the pressure and temperature ratings are as per ASME B16.5.

2.4 Pressure derating

The graphs below refer to the maximum pressure as a function of the temperature for the flanges of the flowmeter (per specified flange material).

Please note that the specified values only refer to the flanges. The maximum value for the flowmeter can further be limited by the maximum value for other materials (i.e. the liner)

For A = Carbon steel A 105 & B = Stainless steel 316L

X/Y axes in all graphs; X = Temperature in [°C] / Y = Pressure in [bar]
 x/y axes in all graphs; x = Temperature in [°F] / y = Pressure in [psi]

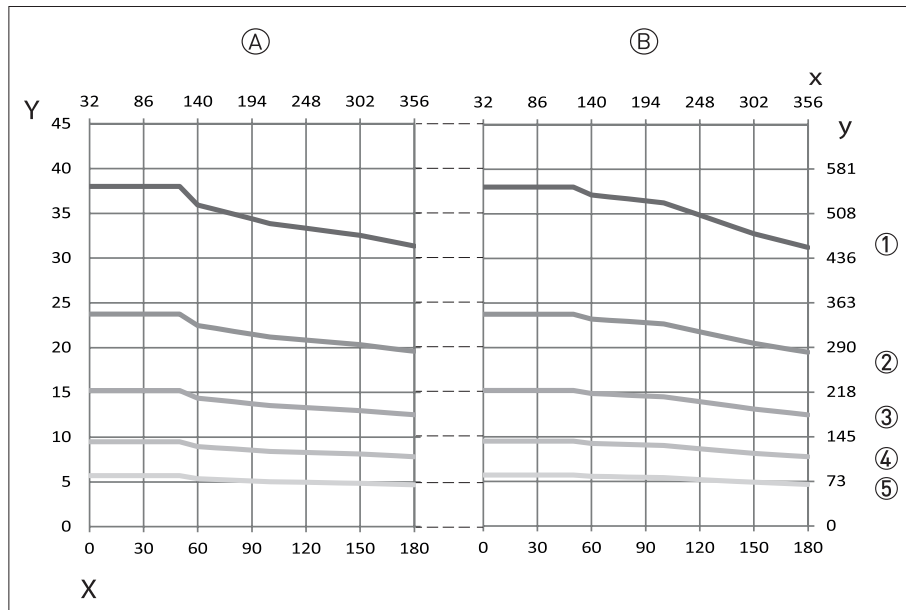


Figure 2-2: Pressure derating; EN 1092-1

- ① PN 40
- ② PN 25
- ③ PN 16
- ④ PN 10
- ⑤ PN 6

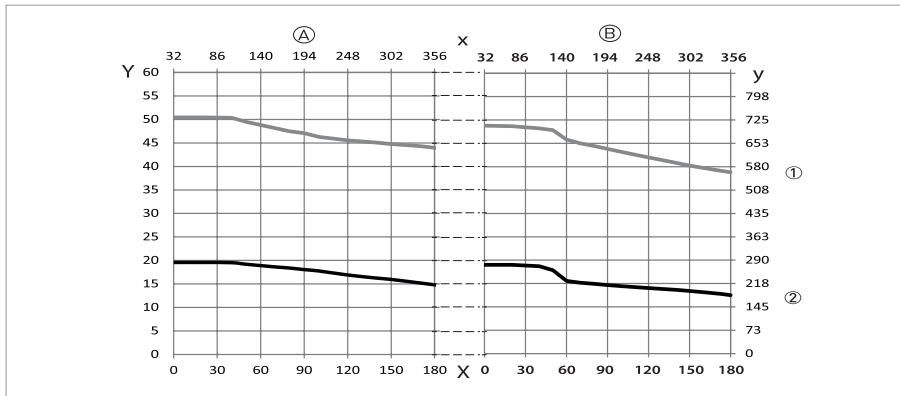


Figure 2-3: Pressure derating; ANSI B16.5

- ① 300 lbs
- ② 150 lbs

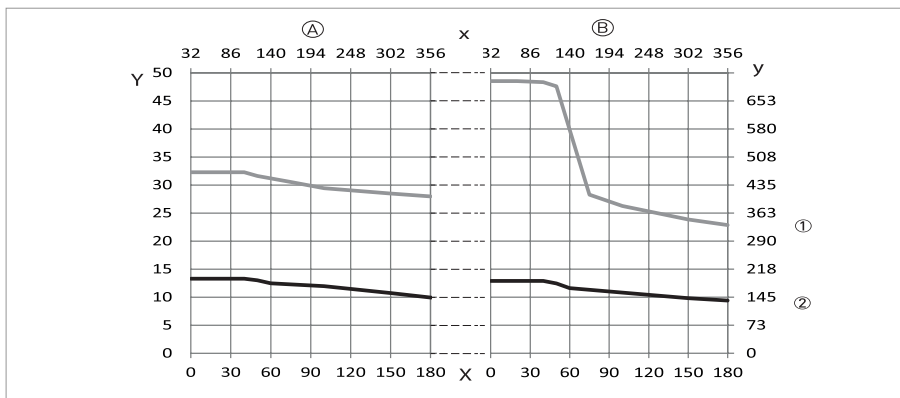


Figure 2-4: Pressure derating; JIS B2220

- ① 20K
- ② 10K

2.5 Vacuum load

Diameter	Max. pressure	Vacuum load in mbar abs. at a process temperature of									
		[mm]	[bar]	40°C	60°C	70°C	80°C	90°C	100°C	120°C	140°C
Liner in PTFE											
DN10...20	50	0	0	0	0	0	0	0	500	750	1000
DN200...300	50	500	750	1000	1000	1000	1000	1000	1000	1000	1000
DN350...600	50	800	1000	1000	1000	1000	1000	1000	1000	1000	1000
Liner in PFA											
DN25...150	50	0	0	0	0	0	0	0	0	0	0
Liner in ETFE											
DN200...2000	150	100	100	100	100	100	100	100	100	-	-
Liner in Hard rubber											
DN200...300	150	250	400	400	400	-	-	-	-	-	-
DN350...2000	150	500	600	600	600	-	-	-	-	-	-
Liner in PU											
DN200...1800	1500	500	600	-	-	-	-	-	-	-	-
Liner in Soft rubber											
DN50..600	40	1000	1000	-	-	-	-	-	-	-	-

Diameter	Max. pressure	Vacuum load in psia at a process temperature of									
		[inch]	[psi]	104°F	140°F	158°F	176°F	194°F	212°F	248°F	284°F
Liner in PTFE											
3/8...3/4"	725	0	0	0	0	0	0	0	7.3	10.9	14.5
8...12"	725	7.3	10.9	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
14...24"	725	11.6	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
Liner in PFA											
1...6"	725	0	0	0	0	0	0	0	0	0	0
Liner in ETFE											
8...72"	2176	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-
Liner in Hard rubber											
8...12"	2176	3.6	5.8	5.8	5.8	-	-	-	-	-	-
14...80"	2176	7.3	8.7	8.7	8.7	-	-	-	-	-	-
Liner in PU											
8...72"	21756	7.3	8.7	-	-	-	-	-	-	-	-
Liner in Soft rubber											
2..24"	580	14.5	14.5	-	-	-	-	-	-	-	-

Model	Description
	Schneider Electric® Model 9700A Magnetic Flow Tube
973EA 97HAA 973QA 9701A 971QA 971HA 9702A 972HA 9703A 9704A 9705A 9706A 9708A 9710A 9712A 9714A 9716A 9718A 9720A 9724A 9728A 9732A 9736A 9740A 9748A 9756A 9764A 9772A 9780A	Nominal diameter and liner DN10,3/8" PTFE Flanges 1/2" DN15,1/2" PTFE DN20,3/4" PTFE DN25,1" PFA DN32,1¼" PFA DN40,1½" PFA DN50,2" PFA DN65,2½" PFA DN80,3" PFA DN100,4" PFA DN125,5" PFA DN150,6" PFA DN200,8" ETFE DN250,10" ETFE DN300,12" ETFE DN350,14" ETFE DN400,16" ETFE DN450,18" ETFE DN500,20" ETFE DN600,24" ETFE DN700,28" ETFE DN800,32" ETFE DN900,36" ETFE DN1000,40" ETFE DN1200,48" ETFE DN1400,56" ETFE DN1600,64" ETFE DN1800,72" ETFE DN2000,80" ETFE
-1 -2 -3 -4 -5 -A -B -M -N	Nominal pressure PN 6 EN 1092-1 (DN1200...2000) PN 10 EN 1092-1 (DN200...1000) PN 16 EN 1092-1 (DN65, DN100...1000) PN 25 EN 1092-1 (DN200 ... 600) PN 40 EN 1092-1 (DN10...600) 150 lbs RF ASME B 16.5 (1"...24") 300 lbs RF ASME B 16.5 (1"...24") JIS 20 K (DN25...40 1" ... 1 1/2") & (DN200 ... 600 8"...24") JIS 10 K (DN50...1400 2"...56")
0 1 3 5 A C D F T U V W X Y	Approval ① non Ex Ex zone 1 Ex zone 2 (for IMT33A compact and field only). Only with transmitter model C, D FM Class I DIV 2 (for IMT33A compact and field, IMT31A compact and wall only) cCSAus OL (for IMT33A compact and field, IMT31A compact and wall only). Only with transmitter model 3, 4, C, D NEPSI zone 1 (for IMT33A compact and field only). Only with transmitter model C, D IECEx zone 1 (for IMT33A compact and field, DN700...1200 28"...48") BE-Ex EAC (Belarus; for IMT33A compact and field, IMT31A compact and wall only) RU-Ex EAC (Russia; for IMT33A compact and field, IMT31A compact and wall only) KA-Ex EAC (Kazakhstan; for IMT33A compact and field, IMT31A compact and wall only) RU-EAC (Russia) KA-EAC (Kazakhstan) BE-EAC (Belarus)

Model	Description
	Check BuyAutomation for available :
1	System design - Cable connection Compact/Integral design with aluminum transmitter housing /Cable connection at the transmitter
2	Compact/Integral design with stainless steel transmitter housing /Cable connection at the transmitter
4	Separate design with aluminum connection box / ½" NPT cable connection
5	Separate design with aluminum connection box / PF ½ cable connection
6	Separate design with aluminum connection box / M20 x 1.5 A cable connection
A	Separate design with stainless steel connection box / ½" NPT cable connection
B	Separate design with stainless steel connection box / PF ½ cable connection
C	Separate design with stainless steel connection box / M20 x 1.5 cable connection
	Transmitter model
0	without - With system Design: 4, 5, 6, A, B, C
3	IMT31A (compact/integral design)
4	IMT31A (wall mount version)
C	IMT33A (compact/integral design)
D	IMT33A (field mount version)
E	IMT33A (wall mount version)
K	IMT30A (compact/integral design)
L	IMT30A (wall mount version)
	Lining
0	Standard
1	PTFE
2	PTFE - provided for protection rings (multiple sizes and rings)
S	PFA - provided for protection rings (multiple sizes and rings)
5	Hardrubber (EX only)
A	Soft rubber (6 mm)
D	PU - Polyurethane
P	Soft rubber (4 mm)
	Electrodes
1	Stainless steel DIN 1.4571 316 Ti
2	Stainless steel DIN 1.4401 316
3	Hastelloy C4
4	Hastelloy B
5	Tantalum
6	Titanium
7	Platinum
B	Hastelloy C22
H	Conductive rubber
K	Low noise WC (tungstencarbide)
N	Low Noise (aluminum oxide) - Base HC22
U	Low Noise (aluminum oxide) - Base Din 1.4571 316 Ti
V	Low noise WC (tungstencarbide)
	Construction of electrodes
1	fixed
	Housing- / flange material
1	Housing: steel / Flanges: steel St 37-c22/A105
3	Housing: steel / Flanges: stainless steel DIN 1.4404 316 L
4	Housing: steel / Flanges: stainless steel dIN 1.4571 316Ti
A	Housing: 1.4301 304 / Flanges: steel St 37-c22 A 105 (with stainless steel connection box)
C	Housing: 1.4301 304 / Flanges: stainless steel DIN 1.4404 316L (with stainless steel connection box)
D	Housing: 1.4301 304 / Flanges: stainless steel DIN 1.4571 316 Ti (with stainless steel connection box)
U	Duplex / Steel St 37-C22/A105
V	Duplex / Stainless steel 1.4306 304 (L)
W	Duplex / Stainless steel 1.4404 316 (L)

Model	Description
0 1 2 3 4 5	Protection class / dimension (face-to-face) IP66 / 67 / standard dimension IP68 Field / standard dimension (with stainless steel connection box) IP68 Factory / standard dimension (with stainless steel connection box) IP66 / 67 / ISO 13359 dimension IP68 Field / ISO 13359 dimension (with stainless steel connection box) IP68 Factory / ISO 13359 dimension (with stainless steel connection box)
0 1 2 Y	Cable Compact - without / separate DS Separate BTS Separate LIYCY (only for FM / CSA Class 1 DIV 2) Without
0 1 2 3 4 5 6 7 8 Y	Cable length Compact - none / separate - 5 m 15 ft 10 m 30 ft 15 m 45 ft 20 m 60 ft 25 m 75 ft 30 m 90 ft 40 m 120 ft 50 m 150 ft 100 m 300 ft Without
0 2 3 R	Calibration Standard calibration Standard calibration + 316/1.4401 tag plate (120 x 46 mm) Standard calibration + 316/1.4401 tag plate (67 x 25 mm) Extended Calibration (only with IMT30A or IMT31A)
0 4 5 6 7 E N P R	Grounding ring / Materials Without Ring #1 - Tantalum Ring #1 - Titanium Ring #1 - 1.4404 316 L Ring #1 - Hastelloy C22 Ring #3 - 1.4404 316 L Protection ring #2 Titanium Protection ring #2 1.4404 316 L Protection ring #2 Hastelloy C22

Model	Description
0	Finish Standard
H	Version Standard
0	Construction requirements Standard
0	QA / QC requirements Standard
0	Special Standard
0	Ratio of CT-calibration Standard, R = 80
0	Instruction language Standard
0	Warranty Standard

① Note: to maintain certification, make sure the transmitter being used is listed in the description

Contact **Global Customer Support** for the following sizes: 9748A, 9756A, 9764A, 9772A or 9780A with housing and flange material 3 or C

ORDERING INSTRUCTIONS

1. Model Number.
2. Flow Data:
 - a. Maximum, minimum, and normal flow rate.
 - b. Fluid composition and viscosity at operating temperatures.
 - c. Fluid density or relative density (specific gravity).
 - d. Maximum, minimum and normal operating temperatures.
 - e. Maximum, minimum and normal operating pressures.
 - f. Mating pipe schedule.
 - g. Type and location (distance) of upstream disturbance.
3. Calibration Information (analog output only); maximum flow rate 20 mA output.
4. Electric Classification.
5. Optional Selections and Accessories.
6. Customer Tag Data.

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