

VORTEX FLOWMETER



MODEL: FLOWTEX 12

- Integrated temperature and optional pressure compensation
- Temperature compensation for saturated steam included as standard
- 2-wire technology for all versions
- Excellent long-term stability due to rugged design
- Optimum process reliability thanks to new type of intelligent signal processing (Flodoc)
- Easy to startup (plug & play)



RWTUV



The all-in-one solution

Flowtex 12 is the only vortex flowmeter with integrated pressure (optional) and temperature compensation in 2-wire technology. Flowtex 12 provides accurate measurement of operating, standard volumetric and mass flow of conductive and non-conductive liquids, gases and vapors even with fluctuating pressures and temperatures.

Highlights

- 2-wire device with integrated pressure (optional) and temperature compensation
- Wear resistant, fully welded stainless steel vortex shedding structure with high corrosion, pressure and temperature resistance
- Optimum process reliability thanks to Flodoc Intelligent Signal Processing-stable readings, free of external disturbances
- Maintenance-free sensor design

Applications

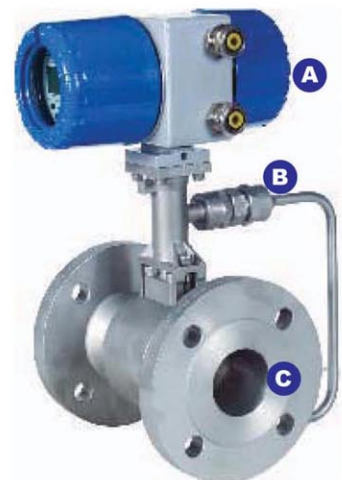
- Vapor, saturated and superheated steam measurement
- Steam boiler efficiency monitoring
- Compressor efficiency monitoring-Free Air Delivery
- Consumption measurement in compressed air
- Net Heat Measurement

Systems

- Measurement of industrial gases
- Burner consumption measurement
- SIP and CI Processes in the food, beverage and pharmaceutical industries

Industries

- Automotive
- Chemical
- Iron, Steel & Metal
- Power plants
- Oil & Gas
- Paper & Pulp
- Water



- A** Converter with Flodoc Intelligent Signal Processing
- B** Pressure sensor (Optional)
- C** Fully welded stainless steel design

Flowtex 12 consists of the Flowtex 10 sensor and the Flowtex 02 converter



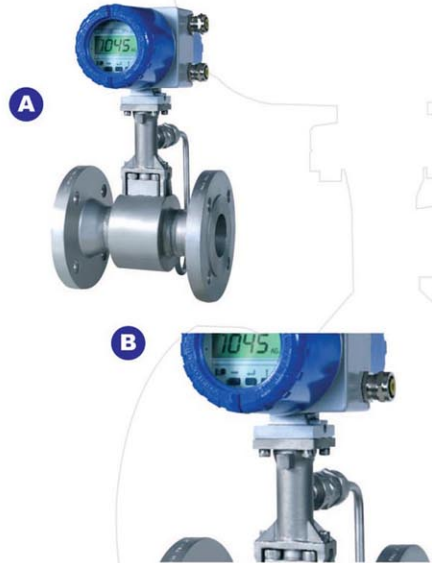
Flowtex 02 converter

A The all-in-one solution for pressure- and temperature-compensated flow measurement

Flowtex 12 options

A Flowtex 12 with integrated pressure and temperature compensation for industrial gases and superheated steam

B Pressure- and temperature compensation



Sensor

A Flange version with integrated temperature compensation for saturated steam

B Sandwich / wafer version, including centering rings for easier installation

C Centering rings for simple installation



A



B



C



Technical Data

Input

Field of application
Operating method / measuring principle
Measured value
Primary measured value :
Secondary measured value :

Measuring accuracy

Percentage Error of actual flow

Repeatability
Stability

Product conditions

Ambient temperature

Storage temperature
Product temperature
Process product
Density
Viscosity
Reynolds' number
Product pressure limit

Design

Inlet run
Outlet run :
Dimensions and weights

Materials

Sensor
Electronics housing
Connection
Flange version
Sandwich version
Sensor gasket

Flow measurement of liquids, gases and vapors
Karman vortex street

Number of shed vortices
Operating and standard volumetric flow, mass flow

Re = 20000 ± 0.75% for liquids
Re = 20000 ± 1% for gases and vapors
10000 < Re < 20000 ± 2 % for liquids, gases and vapors *
± 0,1%
± 0.1% over a period of 1 year

-40°C (-40°F) to +65°C (+149°F) Ex version (in preparation)
-40°C (-40°F) to +85°C (+185°F) non-Ex version
-50°C (-58°F) to +85°C (+185°F)
-40°C (-40°F) to +240°C (+464°F)
liquid, gases, vapor
is taken into consideration when designing
<10 cP, higher viscosities on request
10000...2300000
max. 100 bar, higher pressures on request

= 20 x DN (= 10 x DN when flow straightener is used)
= 5 x DN
see tables on page 5.

1.4404/316L; 1.4539/904L in preparation;
Hastelloy C-2000 in preparation
Aluminium; 1.4404/316L in preparation
EN or ASME flanges
DN 15 to DN 300, 1/2" to 12"
DN 15 to DN 100, 1/2" to 4"
1.4435/316L

* Error pressure- and temperature-compensated Re = 20000 +/- 1.5% for gases and vapors;
10000 < Re < 20000 +/- 2.5% for gases and vapors

Electrical connection

Ex version

14 VDC to 30 VDC

Non-Ex version

14 VDC to 36 VDC

Protection category

IP 66/67

Current output

Measuring range

4 to 20 mA

Over range

20.8 mA +/- 1%

Load : minimum 100 ohms;

maximum $R = ((U_b - 14 \text{ V}) / 22 \text{ mA})$

Error signal

NAMUR NE43

Maximum

22.0 mA

Multidrop mode

4.0 mA

Digital output

HART

Physical layer

FSK

Equipment category

Transmitter

Pulse output

Pulse output

Pulse frequency max. 0.5 Hz

Power supply non-Ex

24 V DC as NAMUR, or open < 1 mA, maximum 36 V,
closed 100 mA, $U < 2 \text{ V}$

Power supply Ex

24 V DC as NAMUR, or open < 1 mA, maximum 30 V,
closed 100 mA, $U < 2 \text{ V}$

Display and operating interface

Local display

2 lines, 10 characters

Operating and display languages

German, English, French

Approvals

FM

Class 1 Div. 1 *

ERTL

EExd [ia] II CT6 *

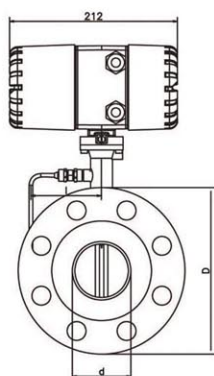
* In preparation



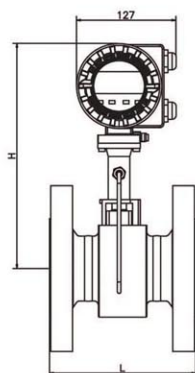
Dimensions and weights

Flange version EN 1092-1

Front view



Side view

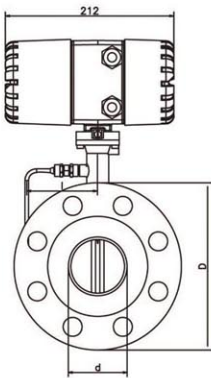


Size		Pressure Rating	Dimensions [mm]				Weight [kg]		
DN	PN		d	D	L	H	With Pressure Sensor	Without Pressure Sensor	
15	40		17,3	95	200	265	144	6,1	5,5
15	100		17,3	105	200	265	144	7,1	6,5
25	40		28,5	115	200	265	144	7,9	7,3
25	100		28,5	140	200	265	144	9,9	9,3
40	40		43,1	150	200	270	144	10,8	10,2
40	100		42,5	170	200	270	144	14,8	14,2
50	16		54,5	165	200	275	144	12,7	12,1
50	40		54,5	165	200	275	144	12,9	12,3
50	63		54,5	180	200	275	144	16,9	16,3
50	100		53,9	195	200	275	144	18,4	17,8
80	16		82,5	200	200	290	154	17,4	16,8
80	40		82,5	200	200	290	154	19,4	18,8
80	63		81,7	215	200	290	154	23,4	22,8
80	100		80,9	230	200	290	154	27,4	26,8
100	16		107,1	220	250	310	164	22	21,4
100	40		107,1	235	250	310	164	25	24,4
100	63		106,3	250	250	310	164	30	29,4
100	100		104,3	265	250	310	164	36	35,4
150	16		159,3	285	300	325	174	35,8	35,2
150	40		159,3	300	300	325	174	41,8	41,2
150	63		157,1	345	300	325	174	59,8	59,2
150	100		154,1	355	300	325	174	67,8	67,2
200	10		206,5	340	300	350	194	54,4	53,8
200	16		206,5	340	300	350	194	54,4	53,8
200	25		206,5	360	300	350	194	63,4	62,8
200	40		206,5	375	300	350	194	72,4	71,8
200	63		204,9	415	300	350	194	92,4	91,8
200	100		199,1	430	300	350	194	114,4	113,8
250	10		260,4	395	380	370	224	83,4	82,8
250	16		260,4	405	380	370	224	85,4	84,8
250	25		258,8	425	380	370	224	97,4	96,8
250	40		258,8	450	380	370	224	113,4	112,8
250	63		255,4	470	380	370	224	134,4	133,8
250	100		248	505	380	370	224	179,4	178,8
300	10		309,7	445	450	395	244	113,4	112,8
300	16		309,7	460	450	395	244	118,4	117,8
300	25		307,9	485	450	395	244	134,4	133,8
300	40		307,9	515	450	395	244	158,4	157,8
300	63		301,9	530	450	395	244	184,4	183,8
300	100		295,5	585	450	395	244	260,4	259,8

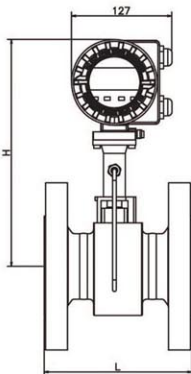
Dimensions and weights

Flange version ASME B16.5

Front view



Side view

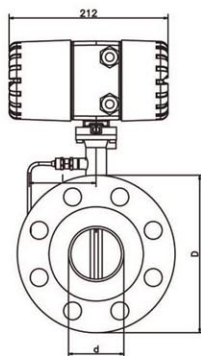


Size	Pressure Rating	Dimensions [mm]					Weight [kg]	
		DN	PN	d	D	L	H	I
1/2	150	15,8	90	200	265	144	5,1	4,5
1/2	300	15,8	95	200	265	144	5,5	4,9
1/2	600	13,9	95	200	265	144	5,7	5,1
1	150	26,6	110	200	265	144	6,8	6,2
1	300	26,6	125	200	265	144	7,8	7,2
1	600	24,3	125	200	265	144	8,1	7,5
1 1/2	150	40,9	125	200	270	144	8,9	8,3
1 1/2	300	40,9	155	200	270	144	11	10,4
1 1/2	600	38,1	155	200	270	144	12	11,4
2	150	52,6	150	200	275	144	11,6	11
2	300	52,6	165	200	275	144	13	12,4
2	600	49,3	165	200	275	144	14,5	13,9
3	150	78	190	200	290	154	20,4	19,8
3	300	78	210	200	290	154	23,4	22,8
3	600	73,7	210	200	290	154	24,4	23,8
4	150	102,4	230	250	310	164	24	23,4
4	300	102,4	255	250	310	164	32	31,4
4	600	97,2	275	250	310	164	41	40,4
6	150	154,2	280	300	325	174	36,8	36,2
6	300	154,2	320	300	325	174	51,8	51,2
6	600	146,3	355	300	325	174	76,8	46,2
8	150	202,7	345	300	350	194	66,4	65,8
8	300	202,7	380	300	350	194	86,4	85,8
8	600	193,7	420	300	350	194	150,4	149,8
10	150	254,5	405	380	370	224	89,4	88,8
10	300	254,5	455	380	370	224	114,4	108,8
10	600	242,9	510	380	370	224	190,4	189,8
12	150	304,8	485	450	395	244	144,4	143,8
12	300	304,8	520	450	395	244	188,4	187,8
12	600	288,9	560	450	395	244	246,4	245,8

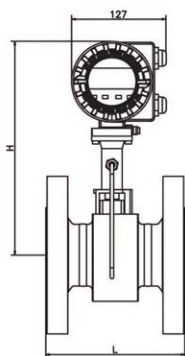
Dimensions and weights

Flange version ASME B16.5

Front view



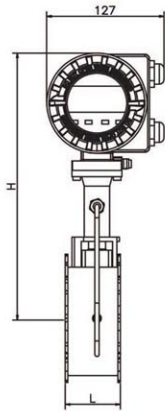
Side view



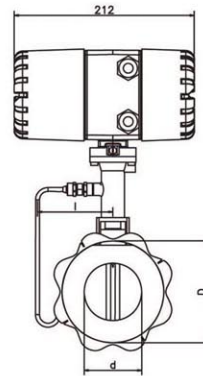
Size	Pressure Rating	Dimensions [mm]					Weight [kg]	
		DN	PN	d	D	L	H	I
1/2	150	0,62	3,54	7,87	10,43	5,67	11,24	9,92
1/2	300	0,62	3,74	7,87	10,43	5,67	12,13	10,8
1/2	600	0,54	3,74	7,87	10,43	5,67	12,57	11,24
1	150	1,05	4,33	7,87	10,43	5,67	14,99	13,67
1	300	1,05	4,92	7,87	10,43	5,67	17,2	15,87
1	600	0,96	4,92	7,87	10,43	5,67	17,86	16,53
1 1/2	150	1,61	4,92	7,87	10,63	5,67	19,62	18,3
1 1/2	300	1,61	6,1	7,87	10,63	5,67	24,25	22,93
1 1/2	600	1,5	6,1	7,87	10,63	5,67	26,46	25,13
2	150	2,07	5,91	7,87	10,83	5,67	25,57	24,25
2	300	2,07	6,5	7,87	10,83	5,67	28,66	27,34
2	600	1,94	6,5	7,87	10,83	5,67	31,97	30,64
3	150	3,07	7,48	7,87	11,42	6,06	44,97	43,65
3	300	3,07	8,27	7,87	11,42	6,06	51,59	50,26
3	600	2,9	8,27	7,87	11,42	6,06	52,79	52,47
4	150	4,03	9,06	9,84	12,21	6,46	52,91	51,59
4	300	4,03	10,04	9,84	12,21	6,46	70,55	69,22
4	600	3,83	10,83	9,84	12,21	6,46	90,39	89,07
6	150	6,07	11,02	11,81	12,8	6,85	81,13	79,81
6	300	6,07	12,6	11,81	12,8	6,85	114,2	112,88
6	600	5,76	13,98	11,81	12,8	6,85	169,31	101,85
8	150	7,98	13,58	11,81	13,78	7,64	146,39	145,65
8	300	7,98	14,96	11,81	13,78	7,64	190,32	189,65
8	600	7,63	16,54	11,81	13,78	7,64	331,57	330,25
10	150	10,02	15,51	14,96	14,57	8,82	197,09	195,77
10	300	10,02	17,91	14,96	14,57	8,82	252,21	239,86
10	600	9,56	20,08	14,96	14,57	8,82	419,76	418,43
12	150	12	19,09	17,72	15,55	9,61	318,34	317,02
12	300	12	20,47	17,72	15,55	9,61	415,35	414,02
12	600	11,37	22,05	17,72	15,55	9,61	543,21	541,89



Front view



Side view



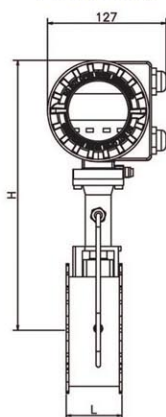
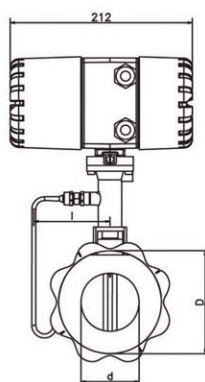
Size	Pressure Rating	Dimensions [mm]				Weight [kg]	
		DN	PN	d	D	L	H
15	100	16	45	65	144	4,1	3,5
25	100	24	65	65	144	4,9	4,3
40	100	38	82	65	144	5,5	4,9
50	100	50	102	65	144	6,6	6
80	100	74	135	65	155	8,8	8,2
100	100	97	158	65	164	10,1	9,5



Dimensions and weights

Sandwich version ASME

Size	Pressure Rating	Dimensions [mm]				Weight [kg]	
		DN	PN	d	D	L	H
1/2	150	0,63	1,77	2,56	5,67	9,04	7,72
1/2	300	0,63	1,77	2,56	5,67	9,04	7,72
1/2	600	0,55	1,77	2,56	5,67	9,04	7,72
1	150	0,94	2,56	2,56	5,67	10,8	9,48
1	300	0,94	2,56	2,56	5,67	10,8	9,48
1	600	0,94	2,56	2,56	5,67	10,8	9,48
1 1/2	150	1,5	3,23	2,56	5,67	12,13	10,8
1 1/2	300	1,5	3,23	2,56	5,67	12,13	10,8
1 1/2	600	1,5	3,23	2,56	5,67	12,13	10,8
2	150	1,97	4,02	2,56	5,67	14,55	13,23
2	300	1,97	4,02	2,56	5,67	14,55	13,23
2	600	1,97	4,02	2,56	5,67	14,55	13,23
3	150	2,91	5,31	2,56	6,1	19,4	18,08
3	300	2,91	5,31	2,56	6,1	19,4	18,08
3	600	2,91	5,31	2,56	6,1	19,4	18,08
4	150	3,82	6,22	2,56	6,46	22,27	20,94
4	300	3,82	6,22	2,56	6,46	22,27	20,94
4	600	3,82	6,22	2,56	6,46	22,27	20,94

Front view

Side view


Flow table Water & Air
Water

Size		Q _{min}	Q _{min}
DN to EN 1092-1	DN to ASME B16.5	[m ³ /h]	[m ³ /h]
15	1/2	0,36	5,07
25	1	0,81	11,4
40	1 1/2	2,04	28,58
50	2	3,53	49,48
80	3	7,74	108,38
100	4	13,3	186,22
150	6	30,13	421,89
200	8	52,66	737,23
250	10	81,43	1140,02
300	12	114,83	1607,61
Values based on water at 20°C			

Air

Size		Q _{min}	Q _{min}
DN to EN 1092-1	DN to ASME B16.5	[m ³ /h]	[m ³ /h]
15	1/2	4,34	57,91
25	1	9,77	130,29
40	1 1/2	24,5	326,63
50	2	42,41	565,49
80	3	92,9	1238,64
100	4	159,62	2128,27
150	6	361,62	4821,57
200	8	631,91	8425,53
250	10	977,16	13028,81
300	12	1377,95	18372,66
Values based on air at 20°C and 1,013 bar abs			

Flow rate limits

Product	Nominal Diameters	Nominal Diameters	Minimum Flow Rates		Maximum Flow Rates	
	to EN	to ASME	[M/S]		[M/S]	
Liquids	DN15 to DN300	DN1/2" to DN 12"	0.5x(998/p) 0.5	or 0.4 *	7x(998/p) 0.47	or 10 **
Gas, vapor	DN15 to DN300	DN1/2" to DN 12"	6x(1.29/p) 0.5	or 2 *	7x(998/p) 0.47	or 80 **

* Please utilize the greater of the two values

** Please utilize the smaller of the two values

Measuring range saturated steam

Pressure [Bar _g]		1		3.5		5.2		7	
Density [kg/m ³]		1,12482		2,39175		3,22667		4,10067	
Flow Rate [kg/h]		min	max	min	max	min	max	min	max
DN to EN 1092-1	DN to ASME B16.5								
15	1/2	5,23	65,13	7,63	138,5	8,86	186,84	9,99	237,45
25	1	11,77	146,55	17,16	311,62	19,93	420,4	22,47	534,26
40	1 1/2	29,51	367,39	43,03	781,2	49,98	1053,91	56,34	1339,38
50	2	51,08	636,07	74,5	1352,5	86,52	1824,84	97,55	2318,87
80	3	111,9	1393,25	163,18	2962,52	189,53	3996,69	213,66	5079,26
100	4	192,27	2393,91	280,38	5090,27	325,66	6867,21	367,12	8727,32
150	6	435,59	5423,39	635,19	11531,97	737,77	15557,6	831,71	19771,65
200	8	761,19	9477,2	1109,97	20151,75	1289,22	27186,37	1453,38	34550,3
250	10	1177,07	14655,07	1716,4	31161,66	1993,6	42039,68	2247,44	53426,86
300	12	1659,85	20665,94	2420,39	43942,81	2811,29	59282,52	3169,24	75340,22

Measuring range for saturated steam

Pressure [Bar _g]		10,5		14		17,5		20	
Density [kg/m ³]		5,78855		7,47056		9,15131		0,3542	
Flow Rate [kg/h]		min	max	min	max	min	max	min	max
DN to EN 1092-1	DN to ASME B16.5								
15	1/2	12,57	293,62	16,22	336,12	19,87	374,28	22,48	399,6
25	1	26,7	660,65	30,33	756,27	33,57	842,14	35,71	899,1
40	1 1/2	66,94	1656,22	76,05	1895,92	84,17	2111,2	89,53	2254
50	2	115,9	2867,41	131,66	3282,41	145,72	3655,12	155	3902,36
80	3	253,86	6280,78	288,39	7189,79	319,19	8006,18	339,52	8547,74
100	4	436,19	10791,79	495,52	12353,69	548,43	13756,42	583,36	14686,93
150	6	988,19	24448,7	1122,59	27987,16	1242,47	31165,04	1321,61	33273,11
200	8	1726,83	42723,28	1961,69	48906,62	2171,17	54459,88	2309,46	58143,65
250	10	2670,28	66065,16	3033,45	75626,77	3357,4	84214,04	3571,24	89910,45
300	12	3765,52	93162,2	4277,65	106645,56	4737,45	118754,96	5036,01	126787,78



Measuring range saturated steam

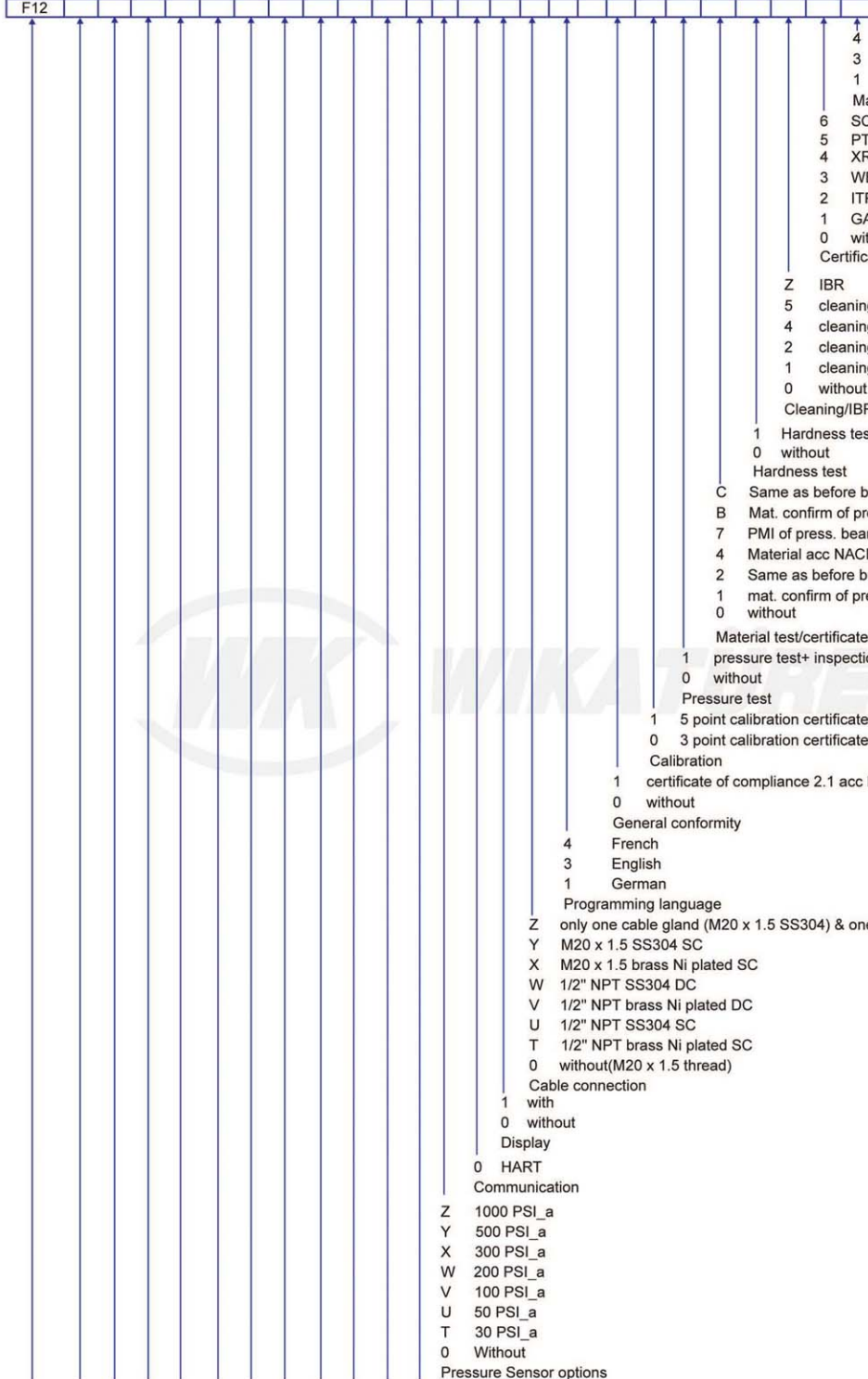
Pressure [PSI _g]		15		50		75		100	
Density [lb/ft ³]		0,072		0,1498		0,2036		0,2569	
Flow Rate [lb/hr]		min	max	min	max	min	max	min	max
DN to EN 1092-1	DN to ASME B16.5								
15	1/2	11,39	143,59	16,79	305,33	19,43	411,92	21,98	523,49
25	1	25,63	323,09	37,78	687	43,72	926,82	49,46	1177,86
40	1 1/2	64,25	809,97	94,71	1722,26	109,6	2323,47	123,99	2952,83
50	2	111,23	1402,29	163,97	2981,75	189,74	4022,64	214,67	5112,24
80	3	243,64	3071,59	359,16	6531,24	415,61	8811,18	470,22	11197,84
100	4	418,62	5277,67	617,11	11222,13	714,12	15139,59	807,94	19240,41
150	6	948,38	11956,52	1398,07	25423,63	1617,83	34298,6	1830,38	43588,97
200	8	1657,27	20893,62	2443,07	44426,95	2827,11	59935,66	3198,52	76170,28
250	10	2562,72	32308,86	3777,85	68699,63	4371,7	92681,52	4946,03	117785,93
300	12	3613,84	45560,54	5327,35	96877,61	6164,78	130695,42	6974,68	166096,57

Measuring range for saturated steam

Pressure [Bar _g]		10,5		14		17,5		20	
Density [lb/ft ³]		0,3627		0,4682		0,5736		0,6793	
Flow Rate [lb/hr]		min	max	min	max	min	max	min	max
DN to EN 1092-1	DN to ASME B16.5								
15	1/2	27,71	647,32	35,76	741,01	43,81	825,16	49,57	880,97
25	1	58,76	1456,48	66,75	1667,28	73,87	1856,6	76,8	1982,18
40	1 1/2	147,31	3651,32	167,33	4179,78	185,19	4654,39	192,54	4969,22
50	2	255,05	6321,55	289,69	7236,47	320,61	8058,16	333,34	8603,23
80	3	558,66	13846,72	634,55	15850,77	702,27	17650,59	730,15	18844,51
100	4	959,9	23791,79	1090,29	27235,18	1206,66	30327,68	1254,56	32379,11
150	6	2174,63	53900,08	2470,04	61701,05	2733,67	68707,08	2842,2	73354,56
200	8	3800,1	94188,6	4316,32	107820,52	4777	120063,33	4966,64	128184,65
250	10	5876,29	145648,57	6674,55	166728,29	7386,91	185659,96	7680,16	198218,37
300	12	8286,49	205387,25	9412,15	235112,94	10416,7	261809,55	10830,22	279518,87



12345 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- 4 French
- 3 English
- 1 German
- Manual
- 6 SC
- 5 PT
- 4 XR
- 3 WE
- 2 ITP
- 1 GA
- 0 without
- Certificates
- Z IBR
- 5 cleaning class1 + 3.1 (EN 10204)
- 4 cleaning class1
- 2 cleaning class 2 + 3.1 (EN 10204)
- 1 cleaning class 2
- 0 without
- Cleaning/IBR
- 1 Hardness test of press.B.parts+3.1
- 0 without
- Hardness test
- C Same as before but incl. file rec. over 10 years
- B Mat. confirm of press. Bear. Parts +3.1+PMI
- 7 PMI of press. bear. metal parts+ APZ 3.1
- 4 Material acc NACE MR 0175/ISO 15156
- 2 Same as before but incl. file rec over 10 years
- 1 mat. confirm of press. bearing parts+3.1
- 0 without
- Material test/certificates
- 1 pressure test+ inspection certificate3.1acc EN10204
- 0 without
- Pressure test
- 1 5 point calibration certificate
- 0 3 point calibration certificate
- Calibration
- 1 certificate of compliance 2.1 acc EN 10204
- 0 without
- General conformity
- 4 French
- 3 English
- 1 German
- Programming language
- Z only one cable gland (M20 x 1.5 SS304) & one plug
- Y M20 x 1.5 SS304 SC
- X M20 x 1.5 brass Ni plated SC
- W 1/2" NPT SS304 DC
- V 1/2" NPT brass Ni plated DC
- U 1/2" NPT SS304 SC
- T 1/2" NPT brass Ni plated SC
- 0 without(M20 x 1.5 thread)
- Cable connection
- 1 with
- 0 without
- Display
- 0 HART
- Communication
- Z 1000 PSI_a
- Y 500 PSI_a
- X 300 PSI_a
- W 200 PSI_a
- V 100 PSI_a
- U 50 PSI_a
- T 30 PSI_a
- 0 Without

See Table 2

