

# Applicator Sizing - Flow

## Project :

Customer:

Contact person:

Phone:

eMail:

C.Project No.:

Fax:

## TAG : ---

Timestamp: ---

Review number: ---

Sales order number:

## Sizing Sheet

### General Parameters

Fluid	Sodium hypochlorite 15%		
State	Liquid		
Character	Clean	Atmospheric Pressure	1.0133 bar_a
Abrasiveness	Not abrasive	Standard	EN/DIN/ISO
Fluid Group (PED)	Dangerous Fluid (Fluid group 1)		
Fluid type	Newtonian		

### Operating Conditions

	minimum	nominal	maximum	
Requested Flow	5	5	5	m3/min
	2.987E+5	2.987E+5	2.987E+5	kg/h
Pressure	4	4	4	bar_g
Temperature	25	25	25	°C
Density	995.61	995.61	995.61	kg/m3
Viscosity	3.73858	3.73858	3.73858	cP
Vapor Pressure	0.0277	0.0277	0.0277	bar_a
Design pressure (min/max)	4		4	bar_g
Design temp. (min/max)	25		25	°C

### Flowmeter : Promag P 300

Generation: 3

Device model: 1

Flow Principle	Electromagnetic		
Meter Size	DN 150		
Operating range min.	0.04 m3/min	0.04 m3/min	0.04 m3/min
Operating range max.	10 m3/min	10 m3/min	10 m3/min
Material (sensor) *	PFA-Liner (-20...+150°C)		
Process connection*	PN 16 EN 1092-1, ST 37-2 Flange		
PED category ** :	The Flowmeter is classified in Category II. Devices in this category need to be approved and tested to PED requirements.		

### Extended Order Code

Qty	Item	Description	Extended Order Code
1	Flowmeter	Promag P 300	5P3B1F_*****AD3K*A**+LK

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\*\* The PED category is an Endress+Hauser recommendation and depends on the fluid category, process data as well from the max. permissible pressure of the selected pressure rating. The fluids of the Applicator data base are classified to 67/548/EWG.

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- 1 / 8 -

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## Sizing Sheet

### Sizing and Calculated Results

	minimum	nominal	maximum	
Requested Flow	5	5	5	m3/min
Velocity	4.36	4.36	4.36	m/s
Pressure loss	n.a.	n.a.	n.a.	mbar
Measurement error volume flow***	0.52	0.52	0.52	%
Reynolds No.	181 128	181 128	181 128	

\*\*\*For error calculation, the specified reference conditions for the calibration of the flowmeter according to ISO/IEC 17025 apply. Further information in technical documentation.

### Warning(s)

### Notice(s)

### Message(s)

Print date: 01.16.2025 10:58 AM

- 2 / 8 -

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## Fluid properties sheet

### Fluid

Fluid name	Sodium hypochlorite 15%	State	Liquid
Chemical formula	NaClO	Calculation standard	Supporting Points

### Fluid description

Solid content	0 Vol%
Medium character	Clean
Abrasiveness	Not abrasive
Conductivity	5 to 50 $\mu$ S/cm
Fluid group (PED)	Dangerous Fluid (Fluid group 1)
Fluid type	Newtonian

### Basic fluid parameters

Tc (Critical temperature)	373.8 °C	Tm (Melting point)	-0.16 °C
Pc (Critical pressure)	221 bar	Tb (Boiling point)	99.84 °C
Heating value	0 kWh/Nm <sup>3</sup>		
Temperature / Viscosity		Temperature / Density	
Temperature	Viscosity	Temperature	Density
1 20 °C	5 cP	1 20 °C	998 kg/m <sup>3</sup>
2 50 °C	1 cP	2 80 °C	970 kg/m <sup>3</sup>
Temperature / Heat capacity			
Temperature	Thermal capacity		
1 10 °C	0 kJ/(kg*K)		
2 100 °C	0 kJ/(kg*K)		

### Calculated results

Density nom.	995.61 kg/m <sup>3</sup>	Pressure nom.	4 bar_g
Viscosity nom.	3.73858 cP	Temperature nom.	25 °C
Sound velocity nom.	n.a. m/s		
Vapor pressure nom.	0.0277 bar_a		
Thermal expansion coeff. Beta P	0.0005		
Viscosity coefficient AL	-15.727427		
Viscosity coefficient BL	5 082.4754		

### Reference values: Normal conditions (SI):

Atmospheric pressure 1.0133 bar\_a

### Standard conditions (US):

Atmospheric pressure 1.0133 bar\_a

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- 3 / 8 -

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## Compare sensors sheet

### General Parameters

Fluid	Sodium hypochlorite 15%		
State	Liquid		
Character	Clean	Atmospheric Pressure	1.0133 bar_a
Abrasiveness	Not abrasive	Standard	EN/DIN/ISO
Fluid Group (PED)	Dangerous Fluid (Fluid group 1)		
Fluid type	Newtonian		

### Sizing and Calculated Results

	Alternative 1	Current	Alternative 2	
Flowmeter		Promag P 300		
Generation/Device model		3/1		
Flow Principle		Electromagnetic		
Meter Size		DN 150		
Operating range min.		0.04		m3/min
Operating range max.		10		m3/min
Velocity at req. Flow min.		4.36		m/s
Velocity at req. Flow nom.		4.36		m/s
Velocity at req. Flow max.		4.36		m/s
Meas. error vol. at req. flow min.***		0.52		%
Meas. error vol. at req. flow nom.***		0.52		%
Meas. error vol. at req. flow max.***		0.52		%
Meas. error vol. higher accuracy at req. flow min.***		0.25		%
Meas. error vol. higher accuracy at req. flow nom.***		0.25		%
Meas. error vol. higher accuracy at req. flow max.***		0.25		%
Meas. error flat Vol. at req Flow min.***		0.5		%
Meas. error flat Vol. at req Flow nom.***		0.5		%
Meas. error flat Vol. at req Flow max.***		0.5		%
Meas. error flat Spec. Vol. at req Flow min.***		0.2		%
Meas. error flat Spec. Vol. at req Flow nom.***		0.2		%
Meas. error flat Spec. Vol. at req Flow max.***		0.2		%
Warning(s)				

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\*\*\*For error calculation, the specified reference conditions for the calibration of the flowmeter according to ISO/IEC 17025 apply. Further information in technical documentation.

Print date: 01.16.2025 10:58 AM

- 4 / 8 -

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Timestamp: ---

Review number: ---

Sales order number:

## Compare sizes Sheet

### General Parameters

Fluid	Sodium hypochlorite 15%		
State	Liquid		
Character	Clean	Atmospheric Pressure	1.0133 bar_a
Abrasiveness	Not abrasive	Standard	EN/DIN/ISO
Fluid Group (PED)	Dangerous Fluid (Fluid group 1)		
Fluid type	Newtonian		

### Sizing and Calculated Results

	Next Smaller Size	Current Size	Next Bigger Size	
Flowmeter	Promag P 300	Promag P 300	Promag P 300	
Generation/Device model	3/1	3/1	3/1	
Flow Principle	Electromagnetic	Electromagnetic	Electromagnetic	
Meter Size	DN 125	DN 150	DN 200	
Process connection*	PN 16 EN 1092-1, ST 37-2	PN 16 EN 1092-1, ST 37-2	PN 10 EN 1092-1, ST 37-2	
Operating range min.	0.03	0.04	0.08	m3/min
Operating range max.	7.5	10	18.33	m3/min
Velocity at req. Flow min.	6.578	4.36	2.55	m/s
Velocity at req. Flow nom.	6.578	4.36	2.55	m/s
Velocity at req. Flow max.	6.578	4.36	2.55	m/s
Pressure loss at req. Flow min.				mbar
Pressure loss at req. Flow nom.				mbar
Pressure loss at req. Flow max.				mbar
Meas. error vol. at req. flow min.***	0.52	0.52	0.54	%
Meas. error vol. at req. flow nom.***	0.52	0.52	0.54	%
Meas. error vol. at req. flow max.***	0.52	0.52	0.54	%
Meas. error vol. higher accuracy at req. flow min.***	0.23	0.25	0.28	%
Meas. error vol. higher accuracy at req. flow nom.***	0.23	0.25	0.28	%
Meas. error vol. higher accuracy at req. flow max.***	0.23	0.25	0.28	%
Meas. error flat Vol. at req Flow min.***	0.5	0.5	0.5	%
Meas. error flat Vol. at req Flow nom.***	0.5	0.5	0.5	%
Meas. error flat Vol. at req Flow max.***	0.5	0.5	0.5	%
Meas. error flat Spec. Vol. at req Flow min.***	0.2	0.2	0.2	%
Meas. error flat Spec. Vol. at req Flow nom.***	0.2	0.2	0.2	%
Meas. error flat Spec. Vol. at req Flow max.***	0.2	0.2	0.2	%
Reynolds No.	222 487	181 128	138 509	
Warning(s)				

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Print date: 01.16.2025 10:58 AM

- 5 / 8 -

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## Chart sheet

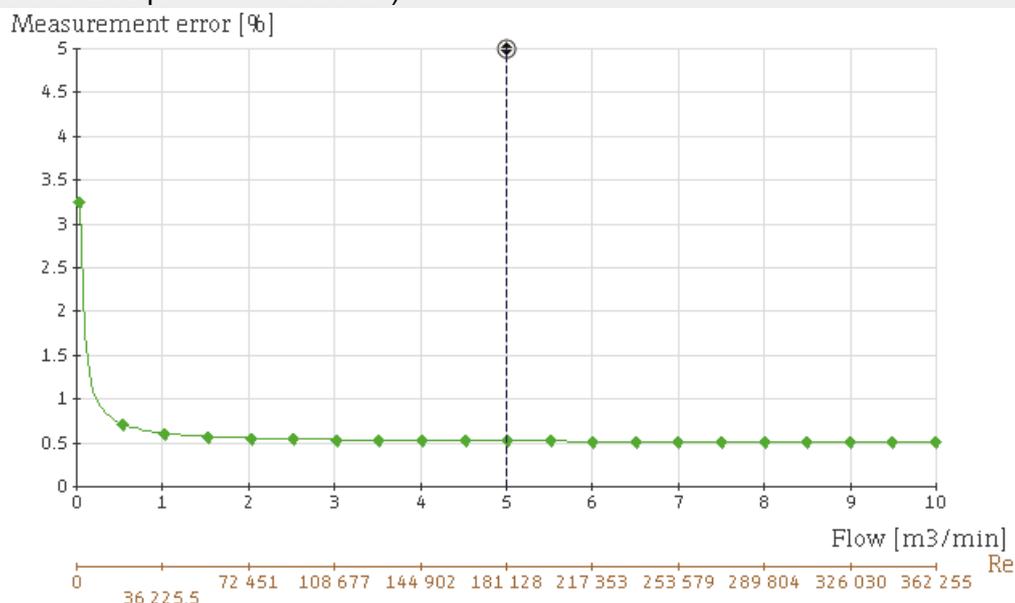
Flowmeter: Promag P 300

Generation: 3

Device model: 1

Flow Principle	Electromagnetic	Fluid	Sodium hypochlorite 15%
Meter Size	DN 150	Pressure	4 / 4 / 4 bar_g
Temperature	25 / 25 / 25 °C	Density	995.61 / 995.61 / 995.61 kg/m3
Viscosity	3.73858 / 3.73858 / 3.73858 cP		
Operating range min.	0.04 m3/min	0.04 m3/min	0.04 m3/min
Operating range max.	10 m3/min	10 m3/min	10 m3/min

## Chart (based on nominal process conditions)



Measurement error volume flow\*\*\*

Requested Flow

Flow rate (%)	Flow rate (m3/min)	Measurement error volume flow(%)***
10	1	0.614681
20	2	0.55734
30	3	0.538227
40	4	0.52867
50	5	0.522936
60	6	0.519113
70	7	0.516383
80	8	0.514335
90	9	0.512742
100	10	0.511468

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- 6 / 8 -

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Applicator®: 11.18.07 / 27.00.12

- 7 / 8 -

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## Corrosion Information

### General Parameters

Fluid	Sodium hypochlorite 15%	Abrasiveness	Not abrasive
State	Liquid	Flow Principle	Electromagnetic
Character	Clean		

### Interpretation of Data, (M) Material:

A:	resistant,	0.05 mm/y (0.002 inches/y)
B:	insufficient resistant,	0.5 mm/y (0.02 inches/y)
C:	not resistant,	1.3 mm/y (0.05 inches/y)
NR:	not recommended	
U:	unknown	

### Interpretation of Data, (P) Plastics:

A:	resistant,	15% vol. Swelling/y;	15% Loss of Tensile Strength/y
B:	insufficient resistant,	30% vol. Swelling/y;	30% Loss of Tensile Strength/y
C:	not resistant,	50% vol. Swelling/y;	60% Loss of Tensile Strength/y
NR:	not recommended		
U:	unknown		

Material (sensor) *	Temperature		
	minimum : 25°C	nominal : 25°C	maximum : 25°C
(P) EPDM	U	U	U
(P) Hard Rubber	NR	NR	NR
(M) Alloy C22/2.4602	B	B	B
(P) Kalrez	A	A	A
(P) Natural Rubber	U	U	U
(P) PEEK, FKM	U	U	U
(P) PFA	A	A	A
(P) PTFE	A	A	A
(P) PU	NR	NR	NR
(P) PVC	B	B	B
(P) PVDF	A	A	A
(M) Platinum	A	A	A
(P) Polyamid	NR	NR	NR
(P) Silicon	NR	NR	NR
(M) Stainless steel 304/1.4301	NR	NR	NR
(M) Stainless steel 316L/1.4404	NR	NR	NR
(M) Stainless steel 316L/1.4435	NR	NR	NR
(M) Stainless steel 316L/316/1.4404	NR	NR	NR
(M) Tantalum	A	A	A
(P) Viton	B	B	B
(P) PEEK, EPDM	B	B	B
(M) Titanium Grade 2	A	A	A

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- 8 / 8 -

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