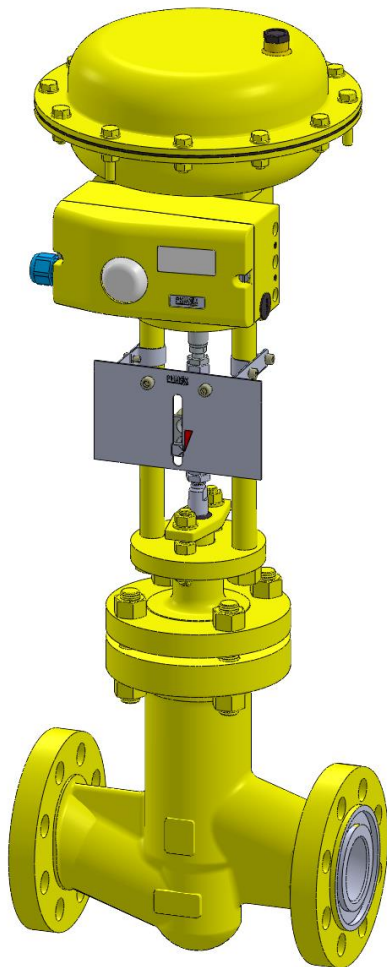




PHÖNIX

STRACK



Globe Valve Type 350EC8-9 Class 300

PHOENIX Armaturenwerke GmbH
Am Stadtbruch 6
34471 Volkmarsen



Model 350EC8-9

Straight Way / Protected Bellows

Applications & Design Features

Applications

Model 350EC8-9 is designed for flow control in critical service applications involving lethal, toxic, corrosive, inflammable, volatile, radiating, or expensive fluids.

The most common applications are

- Dry Chlorine (Cl₂) liquid or gas service temperature -40°C to 120°C / -40°F to 248°F
- Anhydrous Hydrogen Chloride (HCl)
- Anhydrous Hydrofluoric acid (HF)
- Phosgene (COCl₂)
- Vinyl Chloride Monomer (VCM)
- Ethylene Dichloride (EDC)
- Isocyanites (MDI, TDI, HDI, etc.) and fluids of similar nature.

Model 350EC8 (up to DN50/2") and 350EC9 (>DN50/2") are Euro Chlor approved for their compliance with **GEST 17/492**. Design and selected materials also meet the requirements of Chlorine Institute Pamphlet 6 Service Classes I Through VI. The unique valve design guarantees reliable control performance and excellent protection against leaks or fugitive emissions. The stem seal requires virtually no maintenance due to leak free weld connections of the bellows with bonnet and stem. Constant packing monitoring and re-packing is eliminated. In the unlikely event of a bellows failure the backup packing guarantees safe valve performance until the next scheduled shutdown. The modular valve design allows flexibility to meet end user's actuator or accessories preferences.

Design features

Bellows and packing

- bellows protected in extended body against direct impingement from product flow
- multiple walls and hydroformed bellows
- 100.000 bellows operations guaranteed
- packing area integral with bonnet – no welded-in sleeve

Stem

- metal-to-metal back seat provides additional safety in fully open position
- guided stem on top and bottom

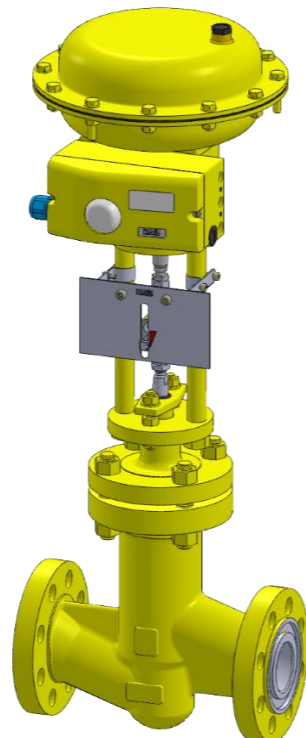
Body and Bonnet

- bodies are one-piece forgings or castings with larger than required wall thickness and integral flanges
- no welds in pressure boundary
- body bonnet joint gasket is fully confined to prevent gasket flow or blowout

Seats

- solid hardfacings for outstanding corrosion and wear resistance
- replaceable disc and seat for flow rate modification

= zero emissions, zero leakage, low maintenance



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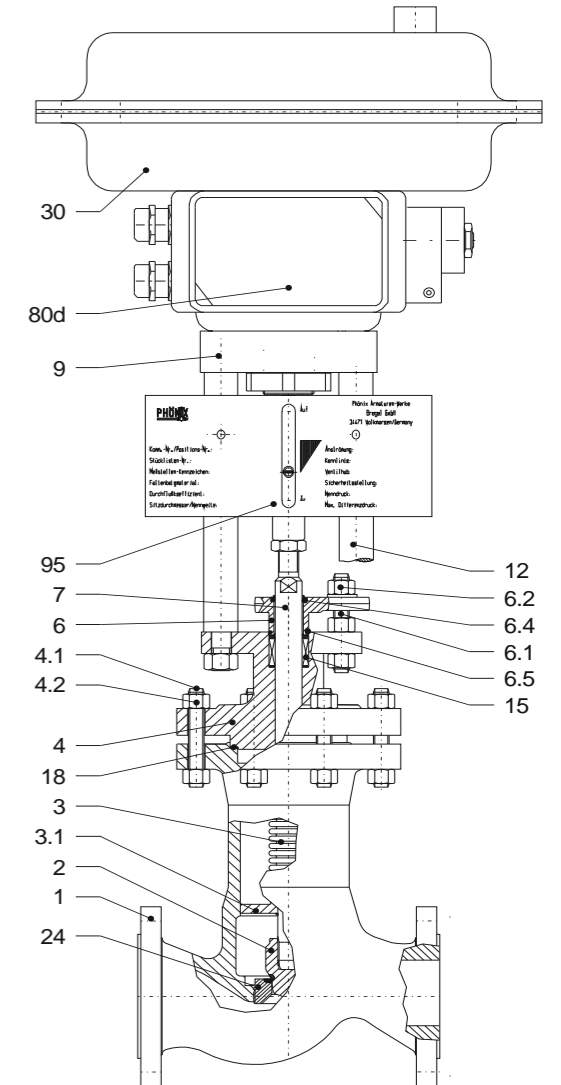
Standard Materials of Construction

Options

Other customer specific designs on request!
Other materials per customer requirements are available!

Notes

PHOENIX reserves the right to change product design and specification without notice!



Materials

Item	Part Name	low temp. Carbon steel -50°C up to 300°C -40°F up to 248°F
1	Body	A 352 LCC
2	Disc Overlay	AISI 316 Ti / A350 LF2 Stellite 6 (≈ 42HRC)
3	Bellows	Hastelloy C276 ¹⁾
3.1	Guide ring	Hastelloy C276 ¹⁾
4	Bonnet	A352 LCC
4.1	Stud bolt	A320 GR. L7
4.2	Hex. nut	A194 GR.7L
6	Gland follower	A352 LC3
6.1	Stud bolt	A320 GR. L7
6.2	Hex. nut	A194 GR.7L
6.4	Wiper	EPDM
6.5	O-Ring	EPDM
7	Lower stem	A479 Gr. 316 Ti ²⁾
9	Bridge	A 105, QPQ-nitrided
12	Pillar	AISI 431
15	Packing	PTFE V-rings
18	Gasket	Grooved stainless steel / PTFE
24	Screwed-in seat Seat overlay	A479 Gr. 316 Ti Stellite 21 (≈ 32HRC)
30	Pneumatic actuator	PHOENIX model MA1 /2 /3 /3T
80d	Position controller	Customer requirements
95	Name plate	Stainless steel

¹⁾ Trim material 316Ti optional

²⁾ Stem and Disc material Hastelloy C-276 optional

Model 350EC8-9

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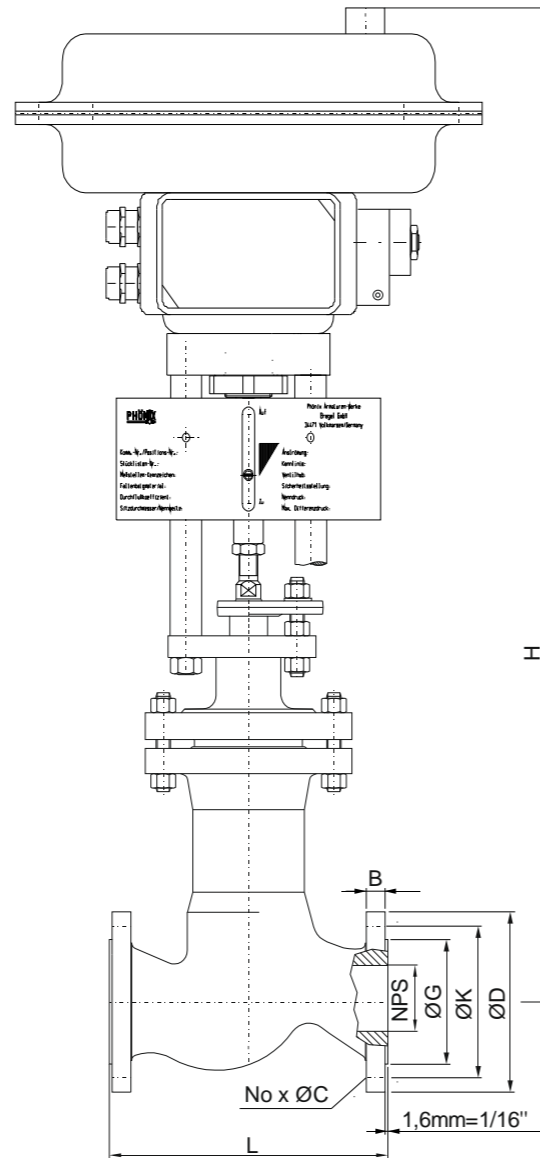
Class 300 Sizes 1/2" - 6"

Testing / Marking

- test and design acc. to GEST 17/492
- TÜV approved strength calculation acc. to DIN EN 12516-2 available for body & bonnet
- standard tests acc. to DIN EN 12266, ISO 5208, resistance and shell strength and leak test acc. to P10 and P11
- leak test on closure acc. to P12 (leakage rate A = tight)
- ASME B16.34 / MSS SP 61 / API 598 / BS 6755

Preservation

- drying at a temperature of 120°C (248°F) for at least 3 hours
- stuffing of drying agents (Silicagel) into the valve
- blanking of inlet and outlet orifice with suitable gaskets and bolted flanges to avoid entry of moisture into the valve
- disc secured in closed position
- unfinished surfaces protected against rust
- lubrication with chlorofluorinated grease



Dimensions & Weights & Flow Coefficients

NPS	Unit	Globe L	Ball L	H	Flange facing type RF				Weight
					ØG	ØK	No x ØC	ØD	
1/2 *	[mm]	152	140	590	35	67	4 x 16	95	22 kg
	[in]	6.0	5.5	23.23	1.38	2.64	4 x 0.63	3.74	49 lbs
3/4 *	[mm]	178	152	590	43	83	4 x 19	117	22 kg
	[in]	7.0	6.0	23.23	1.69	3.27	4 x 0.75	4.61	49
1	[mm]	203	165	590	51	89	4 x 19	124	22 kg
	[in]	8.0	6.5	23.23	2.01	3.50	4 x 0.75	4.88	49
1 1/2	[mm]	229	190	680	73	114	4 x 22	155	41 kg
	[in]	9.0	7.5	26.77	2.87	4.49	4 x 0.87	6.10	90
2	[mm]	267	216	680	92	127	8 x 19	165	41 kg
	[in]	10.5	8.5	26.77	3.62	5.00	8 x 0.75	6.50	90
3	[mm]	318	282	850	127	168	8 x 22	210	129 kg
	[in]	12.5	11.1	33.46	5.00	6.61	8 x 0.87	8.27	284
4	[mm]	356	305	960	157	200	8 x 22	254	163 kg
	[in]	14.0	12.0	37.80	6.18	7.87	8 x 0.87	10.00	359 lbs
6	[mm]	444	403	1480	216	270	12 x 22	318	643 kg
	[in]	17.5	15.9	58.27	8.50	10.63	12 x 0.87	12.52	1418 lbs

* these nominal sizes are not included in GEST 17/492, construction and material in acc. with GEST 17/492

- other sizes on request

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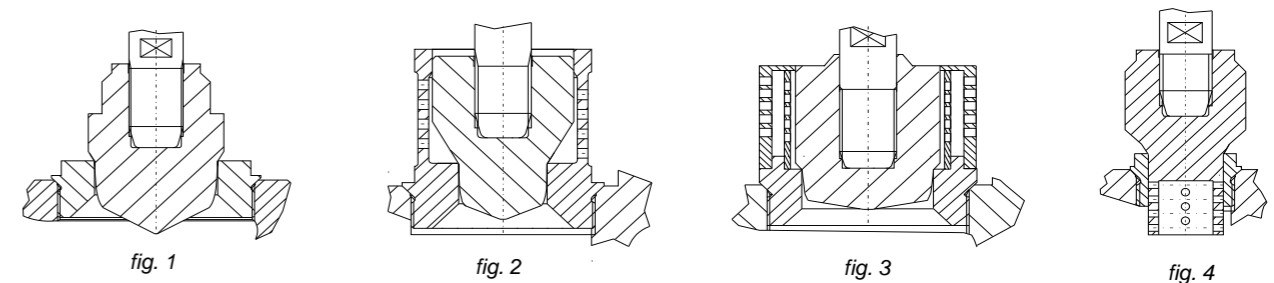
Valve-specific parameters

Flow dynamics parameter *

DN	15	25	40	50	80	100	150
NPS	1/2	1	1 1/2	2	3	4	6
Gas flow limitation X_T	0.58						
Pressure recovery FL^2	0.65						
Begin of cavitation z	0.42	0.42	0.42	0.42	0.35	0.33	0.39

* for standard design only (not for perforated trim, flow divider)

Flow coefficient kv / pressure drop coefficient ζ_v



Parabolic cone without flow divider (fig. 1)

DN	15	25	40	50	80	100	150
NPS	1/2	1	1 1/2	2	3	4	6
Travel [mm]	11	11	17	17	27	31	46
Seat [mm]	8	12.5	8	12.5	20	25	40
K_{VS} [m³/h]	2.2	4.9	2.2	4.9	8.3	16	21
C_{VS} [USGal/min]	2.6	5.7	2.6	5.7	9.6	18.6	24.4
ζ_v [-]	16.7	3.4	129	26	9.1	16	9.3

Parabolic cone with single stage flow divider (fig. 2)

DN	50	80	100	150
NPS	2	3	4	6
Travel [mm]	17	27	31	46
Seat [mm]	25	40	26	40
K_{VS} [m³/h]	16	25	16	36
C_{VS} [USGal/min]	19	29	19	42
ζ_v [-]	39	16	256	51

Parabolic cone with double stage flow divider (fig.3)

DN	50	80	100	150
NPS	2	3	4	6
Travel [mm]	17	27	31	46
Seat [mm]	25	40	25	40
K_{VS} [m³/h]	10	20	16	32
C_{VS} [USGal/min]	12	23	19	37
ζ_v [-]	100	25	256	64

Perforated cone without flow divider (fig. 4)

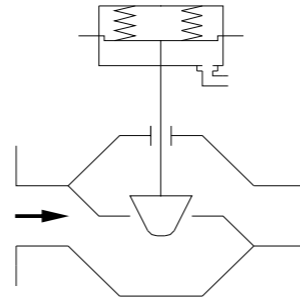
DN	50	80	100	150
NPS	2	3	4	6
Travel [mm]	17	27	31	46
Seat [mm]	25	40	25	40
K_{VS} [m³/h]	10	20	16	36
C_{VS} [USGal/min]	12	23	19	42
ζ_v [-]	100	25	256	51

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Actuator parameters

Maximum differential pressure [bar]

fail close / flow to open



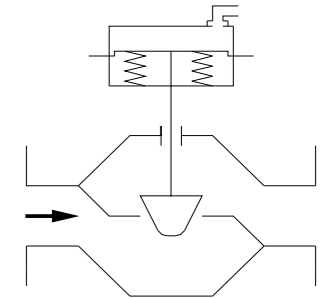
Nominal size	DN NPS	15 / 20 / 25			40		50		80		100		150							
		1/2 / 3/4 / 1			1 1/2		2		3		4		6							
		Seat diameter [mm]																		
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150
			Seat diameter [in]																	
			0.3	0.5	0.8	0.9	1	1.6	1	1.6	2	2	2.5	3	2.5	3	4	4	5	6
MA.1	0.2 - 1.0	2.0	8	5																
	0.4 - 2.0	2.5	40	40	39	26	14	3	14	3										
	0.6 - 3.0	4.0			40	40	36	12	36	12	6									
	0.8 - 4.0	5.0			40	40	40	20	40	20	12									
MA.2	0.2 - 1.0	2.0			38	25	16	4	16	4	2									
	0.4 - 2.0	2.5			40	40	40	22	40	22	13									
	0.6 - 3.0	3.0					22		22	13	2									
	0.8 - 4.0	4.0					40	40	25	11	6									
MA.3	0.2 - 1.0	2.0									26	16	9	5	7	3	2			
	0.4 - 2.0	2.5									40	40	30	18	26	16	9	5	3	
	0.6 - 3.0	3.5											40	31	40	28	17	11	7	4
	0.8 - 4.0	4.5												40		40	26	18	11	7
MA.3T	0.2 - 1.0	2.0															16	13	8	5
	0.4 - 2.0	3.0															40	34	21	14
	0.6 - 3.0	4.0															40	35	24	
0.8 - 4.0	4.5																40	33		

Model 350EC8-9
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Actuator parameters

Maximum differential pressure [bar]

fail open / flow to open



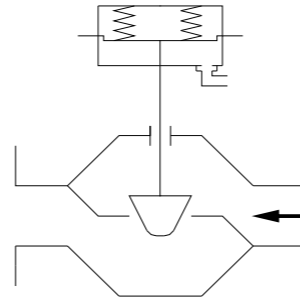
Nominal size	DN NPS	15 / 20 / 25			40		50		80		100		150								
		1/2 / 3/4 / 1			1 1/2		2		3		4		6								
		Seat diameter [mm]																			
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150	
			Seat diameter [in]																		
			0.3	0.5	0.8	0.9	1	1.6	1	1.6	2	2	2.5	3	2.5	3	4	4	5	6	
MA.1	0.6 - 3.0	2.5					12														
		3.0	40	40	40	30	14	3	14	3											
		3.5				40	31	9	31	9	5										
		4.0					40	16	40	16	9										
		4.5						23		23	14										
		5.0						30		30	18										
MA.2	0.4 - 2.0	2.0																			
		2.5							8	8	4										
		3.0								20	20	12									
		3.5									32	32	19								
		4.0									40	40	27								
		4.5											34								
MA.3	0.4 - 2.0	2.0																			
		2.5																			
		3.0																			
		3.5																			
		4.0																			
		4.5																			
MA.3T	0.4 - 2.0	2.0																			
		2.5																			
		3.0																			
		3.5																			
		4.0																			
		4.5																			

Model 350EC8-9
Straight Way / Protected Bellows

Actuator parameters

Maximum differential pressure [bar]

fail close / flow to close



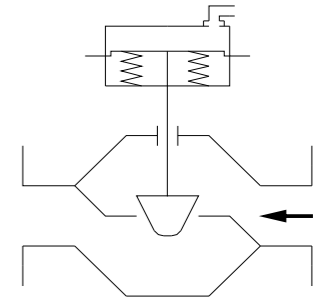
Nominal size		DN	15 / 20 / 25			40		50		80			100		150						
		NPS	1/2 / 3/4 / 1			1 1/2		2		3			4		6						
		Seat diameter [mm]																			
		Seat diameter [in]																			
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150	
MA.1	0.2 - 1.0	2.0	12	9	3																
	0.4 - 2.0	3.0	40	40	40	40	21	13	21	13	8										
	0.6 - 3.0	4.0 4.5					40	40	40	40	30										
MA.2	0.2 - 1.0	2.0					23	15	23	15	10										
	0.4 - 2.0	2.5					40	40	40	40	22										
		3.0									37	7	4								
		3.5									40	7	4								
	0.6 - 3.0	4.0 4.5									26	23	18								
0.8 - 4.0	5.5									40	40	28	23	19	17						
	6.0									40	40	34	23	19	17						
MA.3	0.2 - 1.0	2.0									38	34	30	21	18	15					
	0.4 - 2.0	2.5									40	40	24	40	29	15	19	11	7		
		3.0											39		40	25	29	16	11		
		3.5											40			34	32	22	14		
		4.0														40	32	28	18		
	0.6 - 3.0	4.5														32	29	22			
		3.5															27	15	10		
		4.0															37	21	14		
4.5																40	27	17			
0.8 - 4.0	5.0																32	21			
	5.5																	38	25		
	6.0																	40	28		
MA.3T	0.2 - 1.0	2.0																	19	13	
		2.5																	31	20	
		3.0																	40	27	
		3.5																		35	
		4.0																		40	

Model 350EC8-9
Straight Way / Protected Bellows

Actuator parameters

Maximum differential pressure [bar]

fail open / flow to close



Nominal size		DN	15 / 20 / 25			40		50		80			100		150					
		NPS	1/2 / 3/4 / 1			1 1/2		2		3			4		6					
		Seat diameter [mm]																		
		Seat diameter [in]																		
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150
MA.1	0.6 - 3.0	3.0	40	40	40	40	20	13	20	13	8									
	0.8 - 4.0	3.5						40	33	40	33	24								
		4.0							40		40	24								
MA.2	0.4 - 2.0	4.0										25								
		4.5										34								
	0.6 - 3.0	2.0										25								
		3.0										40								
		4.0										9	6	2						
0.8 - 4.0	4.5										25	22	18	7	4					
	5.0										40	38	24	19	16	13				
	5.5										40	40	24	32	29	16				
	6.0										40	40	24	40	30	16				
1.0 - 5.0	6.0									40	40	32	26	23	19					
MA.3	0.4 - 2.0	2.0										40	40	21	40	25	13			
		2.5												26		9	6			
		3.0												34		40	22	2		
	0.6 - 3.0	3.5												34			22	29	16	11
		2.5													32		8	0	0	0
		3.0													40		31	0	0	0
		3.5															31	26	22	15
	0.8 - 4.0	4.0															31	40	23	15
3.5																39		0	0	
4.0																		16	12	
MA.3T	0.4 - 2.0	2.0																	16	10
		2.5																	26	17
		3.0																	35	26

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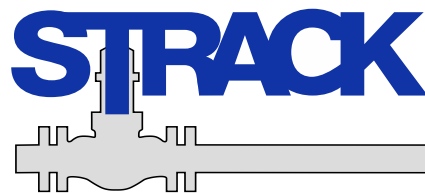


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