



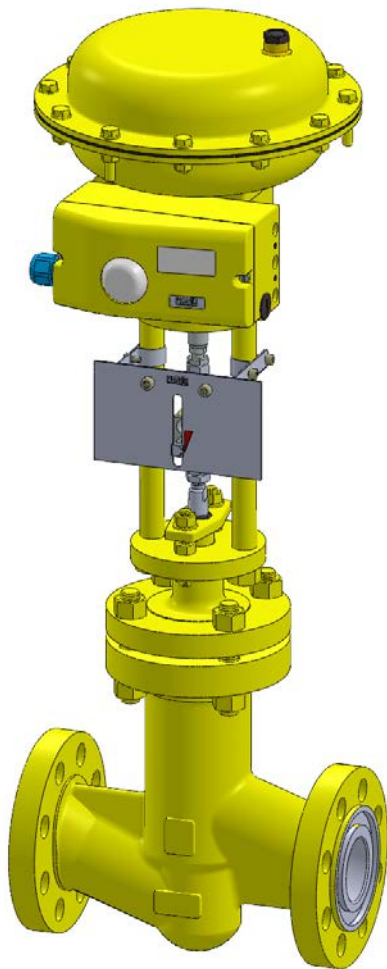
**PHÖNIX**

**STRACK**

**DAUME**  
REGELARMATUREN



**Solent & Pratt**  
Phoenix Ltd



# Globe Valve

## Type 350EC8-9

### PN 40

Phoenix Valve Group  
Am Stadtbruch 6  
34471 Volkmarsen

Phone:  
web:  
eMail:

+49 5693 988 0  
[www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)  
[info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)



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 (Cl<sub>2</sub>) liquid or gas service temperature -40°C to 120°C / -40°F to 248°F
- Anhydrous Hydrogen Chloride (HCl)
- Anhydrous Hydrofluoric acid (HF)
- Phosgene (COCl<sub>2</sub>)
- 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

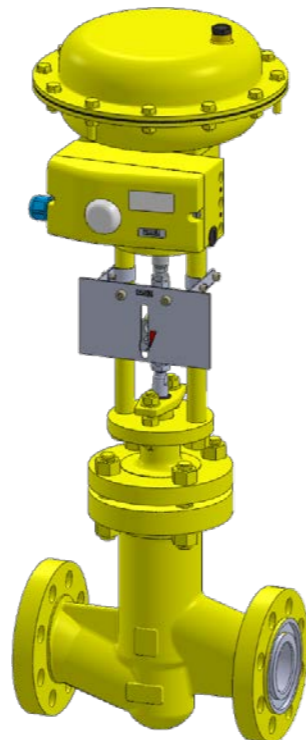
**Body and Bonnet**

- 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

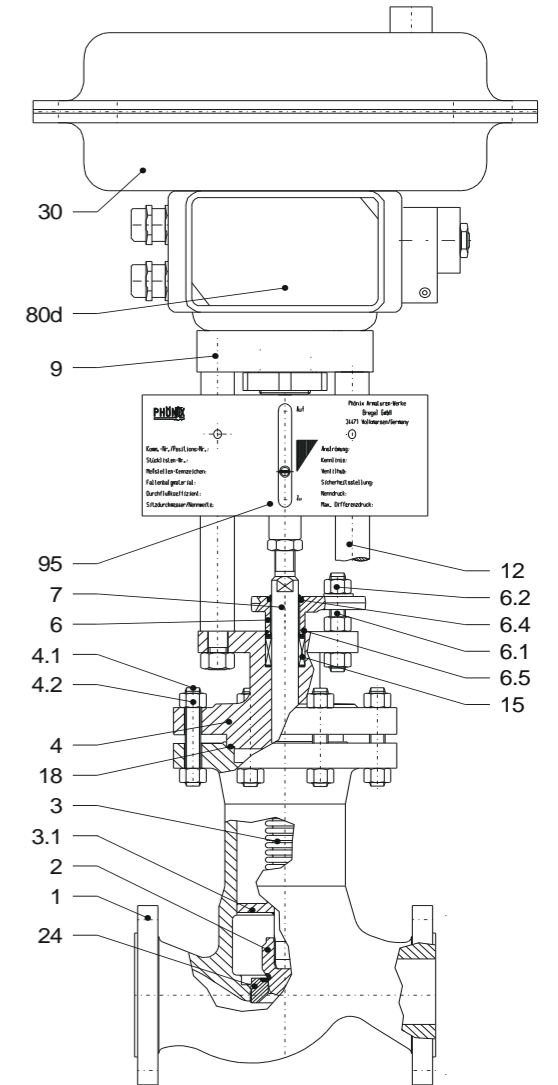


**Options**

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

**Notes**

Phönix 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
1	Body	1.6220
2	Disc Overlay	1.4571 / 1.0566 / 1.0571 Stellite 6 (≈ 42HRC)
3	Bellows	2.4819 <sup>1)</sup>
3.1	Guide ring	2.4819 <sup>1)</sup>
4	Bonnet	1.6220
4.1	Stud bolt	A320 GR. L7
4.2	Hex. nut	A194 GR.7L
6	Gland follower	1.5638
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	1.4571 <sup>2)</sup> / 1.4462/ 1.4122
9	Bridge	1.0460, QPQ-nitrided
12	Pillar	1.4057
15	Packing	PTFE-rings
18	Gasket	Grooved stainless steel / PTFE
24	Screwed-in seat Seat overlay	1.4571 Stellite 21 (≈ 32HRC)
30	Pneumatic actuator	PHÖNIX model MA1 /2 /3 /3T
80d	Position controller	Customer requirements
95	Name plate	Stainless steel

<sup>1)</sup> Trim material 1.4571 / 316Ti optional

<sup>2)</sup> Stem and Disc material 2.4819 / Hastelloy C-276 optional

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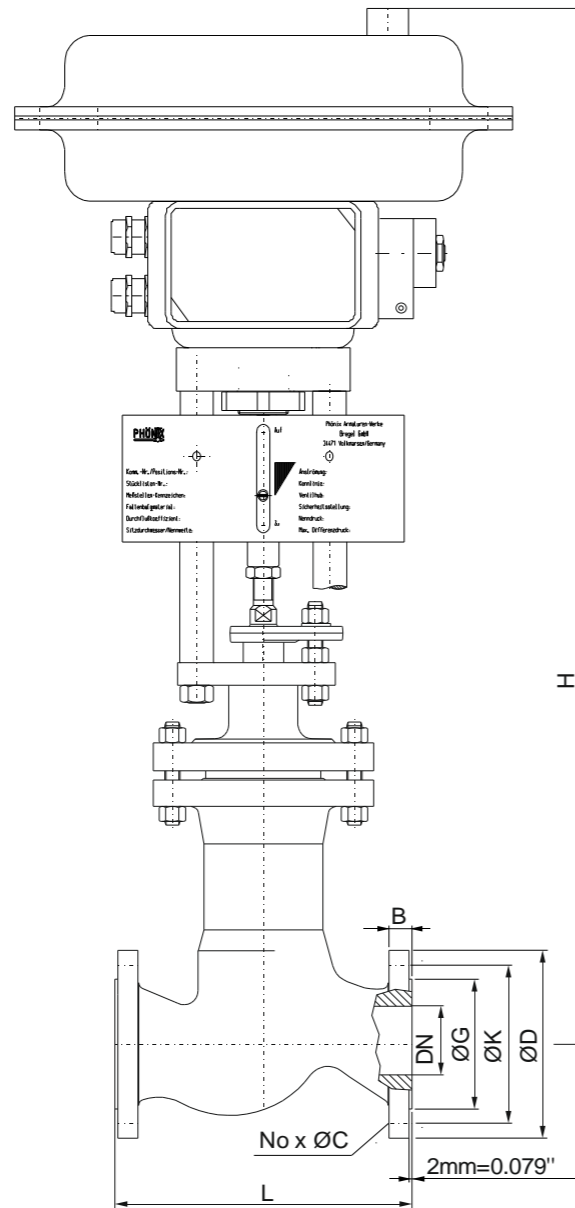
PN40 Sizes DN15 - DN150

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

DN	Unit	Globe		Flange facing type B1					Weight
		L	H	ØG	ØK	No x ØC	ØD	B	
25	[mm]	160	590	68	85	4 x 14	115	18	22 kg
	[in]	6.30	23.23	2.68	3.35	4 x 0.55	4.53	0.71	49 lbs
40	[mm]	200	680	88	110	4 x 18	150	18	41 kg
	[in]	7.87	26.77	3.46	4.33	4 x 0.71	5.91	0.71	90 lbs
50	[mm]	230	680	102	125	4 x 18	165	20	41 kg
	[in]	9.06	26.77	4.02	4.92	4 x 0.71	6.50	0.79	90 lbs
80	[mm]	310	850	138	160	8 x 18	200	24	129 kg
	[in]	12.20	33.46	5.43	6.30	8 x 0.71	7.87	0.94	284 lbs
100	[mm]	350	960	162	190	8 x 22	235	24	163 kg
	[in]	13.78	37.80	6.38	7.48	8 x 0.87	9.25	0.94	359 lbs
150	[mm]	480	1480	218	250	8 x 26	300	28	643 kg
	[in]	18.90	58.27	8.58	9.84	8 x 1.02	11.81	1.10	1418 lbs

- other sizes on request

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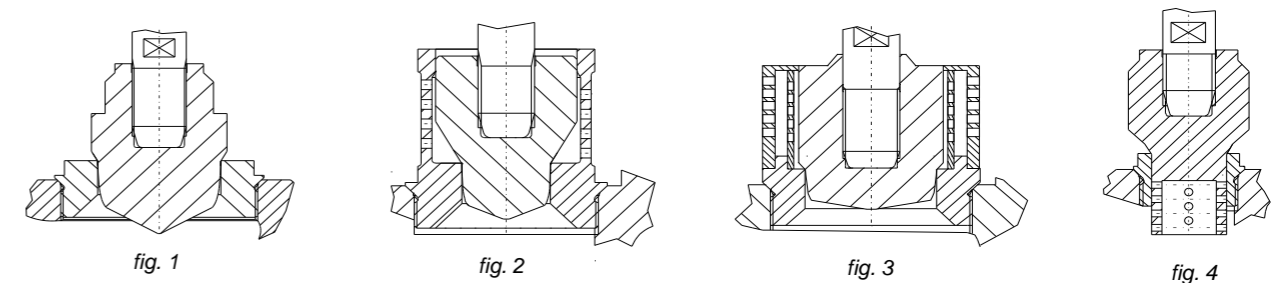
Valve-specific parameters

Flow dynamics parameter \*

DN	15	25	40	50	80	100	150
NPS	½	1	1 ½	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  $\zeta_v$



Parabolic cone without flow divider (fig. 1)

DN	15	25	40	50	80	100	150
NPS	½	1	1 ½	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
$\zeta_v$ [-]	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
$\zeta_v$ [-]	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
$\zeta_v$ [-]	100	25	256	64

Perforated cone without flow divider (fig. 4)

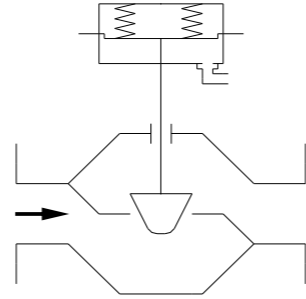
DN	50	80	100	150
NPS	2	3	4	6
Travel [mm]	17	27	31	46
Seat [mm]	25	40	25	40
$K_{VS}$ [m³/h]	10	20	16	36
$C_{VS}$ [USGal/min]	12	23	19	42
$\zeta_v$ [-]	100	25	256	51

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Actuator parameters

Maximum differential pressure [bar]

fail close / flow to open



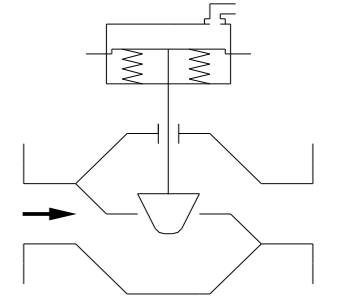
Nominal size	DN NPS	15 / 20 / 25			40		50		80			100		150						
		1/2 / 3/4 / 1			1 1/2		2		3			4		6						
		Seat diameter [mm]																		
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150
			Seat diameter [in]																	
			0.3	0.5	0.8	0.9	1	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	
MA.3T	0.2 - 1.0	2.0																		
	0.4 - 2.0	3.0																		
	0.6 - 3.0	4.5																		

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Actuator parameters

Maximum differential pressure [bar]

fail open / flow to open



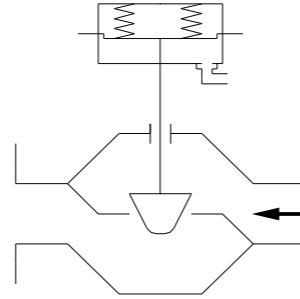
Nominal size	DN NPS	15 / 20 / 25			40		50		80			100		150									
		1/2 / 3/4 / 1			1 1/2		2		3			4		6									
		Seat diameter [mm]																					
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150			
			Seat diameter [in]																				
			0.3	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																					
		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																					
		3.0																					
		3.5																					
		4.0																					
		4.5																					
MA.3	0.4 - 2.0	2.0																					
		2.5																					
		3.0																					
		3.5																					
		4.0																					
		4.5																					
MA.3	0.6 - 3.0	4.5																					
		5.0																					
		5.5																					
		6.0																					
		3.5																					
		4.0																					
MA.3T	0.4 - 2.0	2.0																					
		2.5																					
		3.0																					
		3.5																					
		4.0																					
		4.5																					

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Actuator parameters

Maximum differential pressure [bar]

fail close / flow to close



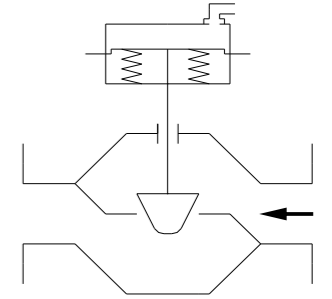
Nominal size	DN NPS	15 / 20 / 25		40		50		80		100		150								
		1/2 / 3/4 / 1		1 1/2		2		3		4		6								
		Seat diameter [mm]																		
Actuator	Spring [bar]	Air supply [bar]	8	13	20	24	25	40	25	40	50	50	63	80	63	80	100	100	125	150
			Seat diameter [in]																	
			0.3	0.5	0.8	0.9	1	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	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							
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		
	5.0																32	21		
MA.3T	0.2 - 1.0	2.0																19	13	
		2.5																31	20	
		3.0																40	27	
		3.5																	35	
4.0																		40		

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Actuator parameters

Maximum differential pressure [bar]

fail open / flow to close



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	3.0	40	40	40	40	20	13	20	13	8										
		3.5					40	33	40	33	24										
		4.0						40	40	40	24										
0.8 - 4.0	4.0									25											
	4.5									34											
MA.2	0.4 - 2.0	2.0									25										
	0.6 - 3.0	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					
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	
		4.0													32		8	0	0	0	
		4.5													40		31	0	0	0	
		5.0														31	26	22	15		
	0.8 - 4.0	3.5														31	40	23	15		
		4.0														31	40	23	15		
		4.5														39			0	0	
1.0 - 5.0	3.5															39			0	0	
	4.0																		16	12	
4.5																			30	20	
MA.3T	0.4 - 2.0	2.0																		16	10
		2.5																		26	17
		3.0																		35	26
0.6 - 3.0	3.5																				
	4.0																				

# Contact us



Volkmarsen, Germany

## Sales and Operations

### Phönix Valve Group GmbH

Volkmarsen, Germany  
Phone: +49 5693 988 0  
Email: [info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)

### Phönix Armaturen Werke-Bregel GmbH

Volkmarsen, Germany  
Phone: +49 5693 988 0  
Email: [info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)

### Strack GmbH

Volkmarsen, Germany  
Phone: +49 5693 988 0  
Email: [info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)

### PAW SARL

Genay Cedex, France  
Phone: +33 437 408 195  
Email: [commercial@phoenix-valvegroup.com](mailto:commercial@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)

### Daume Regelarmaturen GmbH

Volkmarsen, Germany  
Phone: +49 5693 988 0  
Email: [info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)

### Solent & Pratt Phönix Ltd.

Volkmarsen, Germany  
Phone: +49 5693 988 0  
Email: [info@phoenix-valvegroup.com](mailto:info@phoenix-valvegroup.com)  
Website: [www.phoenix-valvegroup.com](http://www.phoenix-valvegroup.com)



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