

Control Valve 8020

GS 3 series
1/2" up to 10"



Pneumatic Control Valve for the control and switching of neutral through to highly aggressive media in process engineering, chemical industries and for plant equipment. Ideal for steam and flashing liquids.

- Space saving wafer type construction
- Lowest possible weight
- Quiet operation
- Fast response time
- Control of high differential pressures with small actuators
- Greatly reduced energy consumption rates due to short stroke and low actuating forces
- High Cv-values
- Side mount positioners with various communication protocols including HART, Fieldbus and Device Net



Technical Information

Body design	ANSI flange wafer (self-aligning) for flanges acc. ASME B16.5 RF or DIN EN 1092-1 Form B		
Nominal sizes	1/2" up to 10"		
Nominal pressure acc. EN 1333	PN 40 (fits also to PN 10 - PN 25)	1/2" - 6"	
	PN 100	1/2" - 3"	
	PN 16	8" - 10 "	
Nominal pressure acc. ANSI	ANSI 150	1/2" - 10"	
	ANSI 300	1/2" - 6"	
	ANSI 600	1/2" - 3"	
Nominal pressure acc. JIS for flanges with raised face	10K	1/2" - 2"	
	20K	1/2" - 1 1/2"	
Supply air pressure	max. 90 psi		
Media temperature	Versions from -76°F up to 662°F		
Ambient temperature*	standard diaphragm	-22°F up to +212°F	
	silicone diaphragm	-58°F up to +212°F	
Rangeability / characteristic	40 : 1 linear / 80 : 1 equal percentage		
Leakage	Disc pair	Disc pair	Disc pair
	Carbon-stainless steel	SFC	STN 2
% of Kvs	< 0,0001	< 0,0005	< 0,001
IEC 60534-4	IV-S1	IV-S1	IV
EN 12266-1	D	E	E

* Please consider the limitation of use of the positioner!

Options

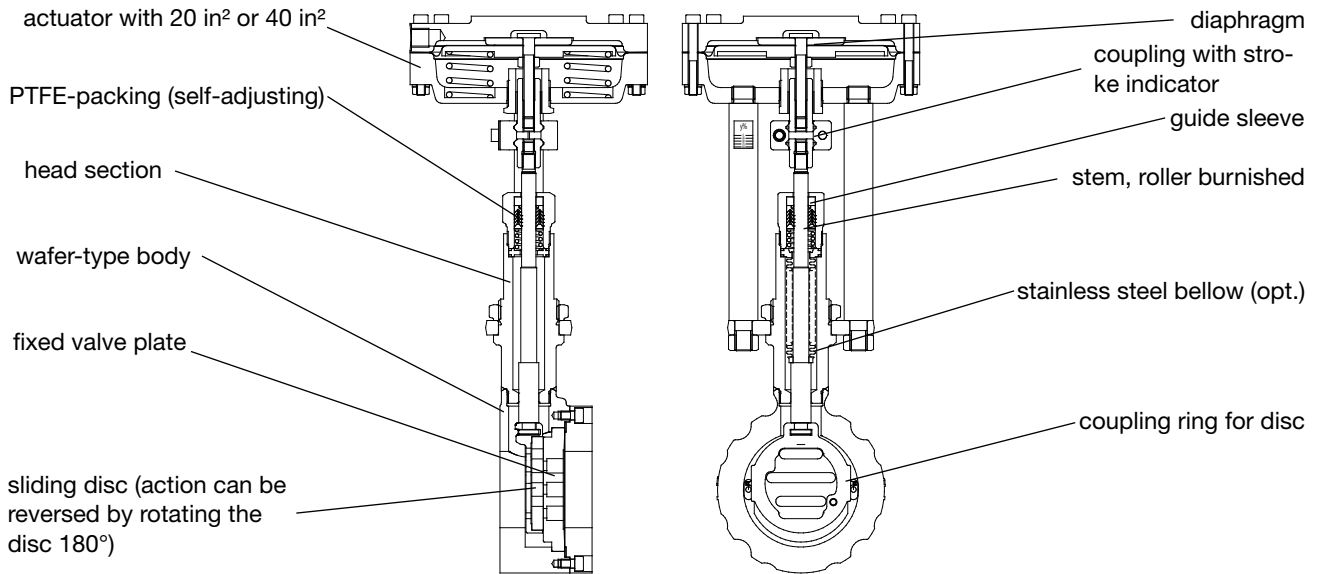
- bellows (stainless steel)
- positioner
 - pneumatic
 - electro-pneumatic
 - electro-pneumatic for hazardous location
- limit switches

Cvs-values see data sheet 8001.

Fluid temperature

Rating	PN40	PN 16	PN 100	ANSI 150	ANSI 300	ANSI 600
Body material cpl. stainless steel						
Tmin [°F]	-76	-76	-76	-20	-20	-20
Tmax [°F]	662	662	662	662	662	662
Body material cpl. carbon steel						
Tmin [°F]	-76	-76	14	-4	-4	14
Tmax [°F]	572	572	572	572	572	572
Body material carbon steel with stainless steel body cover						
Tmin [°F]	-76	-76	14	-4	-4	-4
Tmax [°F]	662	662	662	662	662	662

Control Valve 8020-GS3



Options

- bellow (stainless steel)
- positione
- pneumatic
- electro-pneumatic
- electro-pneumatic for hazardous location use (EEX ib II C T5/T6)
- limit switches
- position feedback
- manual handwheel

Admissible Pressures
(For temperatures of up to 100°F for ANSI-classes and up to 250°F for PN-classes)

For temperatures exceeding 100°F (ANSI) or 250°F (PN): consider operation limits

Disc pair: carbon - stainless steel coated
SFC - stainless steel coated

Diaphragm area	20 in ²					40 in ²				
Spring range (psi)	3 to 15	15 to 29	22 to 44	26 to 55	30 to 65	3 to 15	12 to 20	17 to 32	20 to 39	25 to 46
Supply air (psi)	17	41	61	75	87,0	17	30	46	58	67
Size	Admissible differential pressures in psi									
1/2"	65	1480	1480	1480	1480	275	1480	1480	1480	1480
3/4"	55	1480	1480	1480	1480	240	1480	1480	1480	1480
1"	45	1276	1276	1276	1276	200	1276	1276	1276	1276
		(1450)*	(1450)*	(1450)*	(1450)*		(1450)*	(1450)*	(1450)*	(1450)*
1 1/4"	40	1450	1480	1480	1480	165	1480	1480	1480	1480
1 1/2"	30,0	955	1276	1276	1276	125	1276	1276	1276	1276
			(1450)*	(1450)*	(1450)*		(1450)*	(1450)*	(1450)*	(1450)*
2"	-	520	825	1015	1220	85	915	1405	1480	1480
2 1/2"	-	420	655	810	970	70	740	1130	1160	1160
3"	-	245	375	480	565	45	435	655	695	695
4"	-	145	230	290	350	-	260	390	480	480
5"	-	95	145	190	220	-	175	260	320	335
6"	-	75	110	130	160	-	125	190	230	230
8"	-	35	65	80	95	-	75	110	130	145
10"	-	25	40	50	60	-	30	70	85	95
Springconfiguration	Code D	Code 2	Code 3	Code 4	Code 5	Code D	Code 2	Code 3	Code 4	Code 5

Standard

*: figures in brackets for bodys of carbon steel

	Pressure limits ANSI and DIN in psi					
	ANSI150	ANSI 300	ANSI 600	PN16	PN40	PN100
P max. carbon steel	284	741	1480	232	580	1450
P max. stainless steel	276	719	1440			

Disc pair: STN 2

Diaphragm area	20 in ²					40 in ²				
Spring range (psi)	3 to 15	15 to 29	22 to 44	26 to 55	30 to 65	3 to 15	12 to 20	17 to 32	20 to 39	25 to 54
Supply air (psi)	17	41	61	75	87,0	17	30	46	58	67
Size	Admissible differential pressures in psi									
1/2"	45	1480	1480	1480	1480	195	1480	1480	1480	1480
3/4"	35	825	1480	1480	1480	150	1480	1480	1480	1480
1"	25	825	1275	1275	1275	110	1275	1275	1275	1275
			(1480)*	(1480)*	(1480)*		(1480)*	(1480)*	(1480)*	(1480)*
1 1/4"	20	550	855	1060	1260	85	955	1480	1480	1480
1 1/2"	15,0	335	535	655	785	55	595	915	1045	1045
2"	-	190	290	365	435	35	335	510	610	710
2 1/2"	-	145	230	290	350	30	260	405	495	580
3"	-	85	130	160	205	15	145	230	275	335
4"	-	50	80	100	125	-	95	145	175	205
5"	-	35	50	65	80	-	60	95	115	130
6"	-	20	35	50	60	-	45	65	80	95
Springconfiguration	Code D	Code 2	Code 3	Code 4	Code 5	Code D	Code 2	Code 3	Code 4	Code 5

Standard

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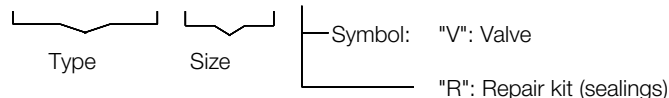
The supply air pressure stated in the table is the minimum supply air pressure that has to be available. This is valid for use without a positioner. When utilizing a positioner the required supply air pressure is determined by the adjustment of the positioner. For the standard version it is 60 psi. The spring configuration „D“ allows the usage of a control valve without a positioner but with limited performance. The valve can be controlled directly by a process controller with a signal of 3 to 15 psi.

Materials

Body	Stainless steel 316 Ti / 318 or CF8M	Carbon steel ASTM A572, A216
Bodycover	Stainless steel 316 Ti or 316 L	
Diaphragm housing	Aluminium, KTL coated	
Packing	PTFE (Carbon filled), spring SST 301	
Actuating stem	Stainless steel 316 Ti, roller burnished	
Bellows	Stainless steel 316 Ti	
Fixed disc	Stainless steel 316 Ti coated	STN2-disc
Sliding disc	Special carbon material	SFC-disc (max. 300°C) STN2-disc
Guide ring for sliding disc	Stainless steel 316 Ti	

Ordering Number System

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16						
8	0	2	0	/			V	P					M					Z			S



1 - 5 : Please quote all 5 sections.
6 - 16: Quote only if required.

1. Function	2. Body design	3. Body materials	4. Pilot function	5. Actuator	6. Special versions	7. Springs	8. Stem sealing
P Control valve with pneumatic actuator (8020)	E GS3 - flangeless design acc. ANSI 150 F GS3 - flangeless design acc. ANSI 300 K GS3 - flangeless design acc. ANSI 600 G GS3 - flangeless design acc. DIN, (145psi - 580 psi) H GS3 - flangeless design acc. DIN, 1450 psi	0 Carbon-Steel ASTM A572 / ASTM A216 1 Stainless Steel 316 Ti / 318 or CF8M 4 body carbon steel ASTM A216 body cover stainless steel	0 spring to close 1 spring to open	6 Diaphragm actuator 20 in ² (NPT) 7 Diaphragm actuator 40 in ² (NPT)	M to state, if some sections 7-16 are quoted	- Standard 1 2 springs 2 4 springs 3 6 springs 4 8 springs 5 10 springs D Set of springs 3 -15 psi (4 springs)	- PTFE-V-shaped seal, self-adjusting (standard) 1 Additional stainless steel bellows 316 Ti
9. Sliding disc	10. Fixed disc	11. Cv-values	12. Flow characteristic	13. Accessories	14. Positioner	15. Signalling equipment	16. Special version
- carbon material B carbon material fibre forced 9 STN2/STN3 S Stainless Steel SFC-coated	- Stainless steel/Stellite 1 STN 2 - plate (only in combination with the position "9") 3 STN 3 - plate (only in combination with the position "9")	- 100 % (Stand.) A red. to 63 % 1 red. to 40 % B red. to 25 % 2 red. to 16 % C red. to 10 % 3 red. to 6,3 % 4 red. to 2,5 % 5 red. to 1 % 6 red. to 20 % 7 red. to 12 % 8 red. to 2 % 9 red. to 0,4 %	- linear 1 equal percentage	Z To state, if in sections 14 and 15 accessories are quoted	- without 1 p/p - without gauges 2 p/p - with gauges 3 i/p - without gauges 4 dto. with gauges 6 i/p - intrinsically without gauges 7 dto. with gauges	- without 0 2 limit switches inductive, M12x1 10-30 V DC PNP 1 2 limit switches inductive, integr. in positioner 2 i/p-converter 5 2 limit switches inductive, M 12x1 10-55 V DC PNP/NPN	S Other special versions have to be quoted in letters

Ordering example:

8020/080VPE103M5 - - - - - Z3
GS3 control valve with pneumatic actuator, 3", ANSI 150, stainless steel, NC, actuator 5" with 10 springs, PTFE-V-shaped seal, disc pair carbon material - stainless steel 316Ti coated, linear characteristics, i/p-positioner ex-proof

Application limitations for GS3 valves in stainless steel

These pressure must not be exceeded for GS-valves from the GS3-series made of stainless steel, even though the actuator power might allow it.

ANSI150

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in stainless steel								max. admissible pressures for GS3-valves in stainless steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2" - 5"	275,0	265,0	235,0	215,0	200,0	175,0	150,0	120,0	275,0	265,0	235,0	215,0	200,0	175,0	150,0	120,0
6"	230,0	230,0	230,0	215,0	200,0	175,0	150,0	120,0	235,0	235,0	235,0	215,0	200,0	170,0	140,0	120,0
8"	230,0	230,0	230,0	215,0	200,0	175,0	150,0	120,0	-	-	-	-	-	-	-	-
10"	150,0	150,0	150,0	145,0	135,0	120,0	105,0	100,0	-	-	-	-	-	-	-	-

Limitation for SFC-sliding discs: 570°F

ANSI300

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in stainless steel								max. admissible pressures for GS3-valves in stainless steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2" - 2 1/2"	720,0	695,0	610,0	560,0	520,0	485,0	460,0	440,0	720,0	695,0	610,0	560,0	520,0	485,0	460,0	440,0
3"	695,0	695,0	610,0	560,0	520,0	485,0	460,0	440,0	530,0	530,0	530,0	505,0	480,0	390,0	320,0	275,0
4"	480,0	480,0	480,0	480,0	480,0	480,0	460,0	440,0	480,0	480,0	480,0	460,0	435,0	355,0	290,0	250,0
5"	335,0	335,0	335,0	335,0	335,0	335,0	335,0	335,0	320,0	320,0	320,0	305,0	290,0	235,0	190,0	165,0
6"	230,0	230,0	230,0	230,0	230,0	230,0	230,0	230,0	230,0	230,0	230,0	225,0	210,0	170,0	140,0	120,0

Limitation for SFC-sliding discs: 570°F

ANSI600

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in stainless steel								max. admissible pressures for GS3-valves in stainless steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2" - 3/4"	1440,0	1395,0	1225,0	1115,0	1035,0	970,0	915,0	880,0	1440,0	1395,0	1225,0	1115,0	1035,0	970,0	915,0	880,0
1"	1275,0	1275,0	1225,0	1115,0	1015,0	925,0	830,0	785,0	1275,0	1275,0	1225,0	1115,0	1015,0	925,0	830,0	785,0
1 1/4"	1440,0	1395,0	1225,0	1115,0	1035,0	970,0	915,0	880,0	1440,0	1395,0	1225,0	1115,0	1035,0	970,0	915,0	875,0
1 1/2"	1275,0	1275,0	1225,0	1115,0	1015,0	925,0	830,0	785,0	1050,0	1050,0	1050,0	1000,0	950,0	770,0	630,0	545,0
2"	1440,0	1395,0	1225,0	1115,0	1035,0	970,0	915,0	880,0	1125,0	1125,0	1125,0	1070,0	1020,0	825,0	675,0	585,0
2 1/2"	1160,0	1160,0	1160,0	1115,0	1035,0	970,0	915,0	880,0	905,0	905,0	605,0	865,0	820,0	665,0	545,0	470,0
3"	695,0	695,0	695,0	695,0	695,0	695,0	695,0	645,0	530,0	530,0	530,0	505,0	480,0	390,0	320,0	275,0

Limitation for SFC-sliding discs: 570°F

PN40

Size	Sliding unit: carbon/SFC - stainless steel, coated							Paarung: STN 2					
	maximum pressures for GS3-valves in stainless steel							maximum pressures for GS3-valves in stainless steel					
	210°F	300°F	390°F	480°F	570°F	660°F	210°F	300°F	390°F	480°F	570°F	660°F	
1/2"-1 1/4"	580	580	580	580	580	580	580	580	580	580	580	580	
1 1/2"	580	580	580	580	580	580	580	580	580	580	580	535	
2"	580	580	580	580	580	580	580	580	580	580	580	580	
2 1/2"	580	580	580	580	580	580	580	580	580	580	535	465	
3"	580	580	580	580	580	580	520	495	480	375	320	275	
4"	480	480	480	480	480	480	465	450	435	350	290	245	
5"	335	335	335	335	335	335	305	305	275	230	190	160	
6"	230	230	230	230	230	230	220	220	205	160	130	115	
8" (only PN16)	230	230	220	190	175	160	-	-	-	-	-	-	
10" (only PN16)	145	130	130	115	100	85	-	-	-	-	-	-	

Limitation for SFC-sliding discs: 570°F

PN100

Size	Sliding unit: carbon/SFC - stainless steel, coated							Paarung: STN 2					
	maximum pressures for GS3-valves in stainless steel							maximum pressures for GS3-valves in stainless steel					
	210°F	300°F	390°F	480°F	570°F	660°F	210°F	300°F	390°F	480°F	570°F	660°F	
1/2"	1450	1450	1450	1350	1220	1145	1450	1450	1450	1350	1220	1145	
3/4"	1450	1450	1290	1175	1060	985	1450	1450	1290	1175	1060	985	
1"	1275	1175	1015	915	825	785	1275	1175	1015	915	825	785	
1 1/4"	1450	1350	1160	1060	945	900	1450	1350	1160	1060	945	870	
1 1/2"	1275	1175	1015	915	825	785	1045	1000	945	770	625	535	
2"	1450	1450	1450	1450	1450	1365	1115	1060	1015	810	665	580	
2 1/2"	1160	1160	1160	1145	1030	970	900	855	810	655	535	465	
3"	695	695	695	695	695	640	520	495	480	375	320	275	

Limitation for SFC-sliding discs: 570°F

Application limitations for GS3 valves in carbon steel

These pressure must not be exceeded for GS-valves from the GS3-series made of carbon steel, even though the actuator power might allow it.

ANSI150

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in carbon steel								max. admissible pressures for GS3-valves in carbon steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2"-5"	285	280	255	230	200	175	150	120	285	280	255	230	200	175	150	120
6"	230	230	230	230	200	175	150	120	235	235	235	225	200	170	140	115
8"	230	230	230	230	200	175	150	120	-	-	-	-	-	-	-	-
10"	150	150	150	145	135	120	105	87	-	-	-	-	-	-	-	-

Limitation for SFC-sliding discs: 570°F

ANSI300

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in carbon steel								max. admissible pressures for GS3-valves in carbon steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2"-2"	740	725	675	655	635	610	285	580	740	725	675	655	635	610	285	545
2 1/2"	740	725	675	655	635	610	285	580	605	605	605	575	545	485	285	470
3"	695	695	675	655	635	610	285	580	530	530	530	505	480	390	285	275
4"	480	480	480	480	480	480	285	475	480	480	480	460	435	355	285	245
5"	335	335	335	335	335	335	285	330	320	320	320	305	290	235	190	155
6"	230	230	230	230	230	230	230	230	230	230	230	225	210	170	140	115

Limitation for SFC-sliding discs: 570°F

ANSI600

Size	Sliding unit: carbon/SFC - stainless steel, coated								Sliding unit: STN2							
	max. admissible pressures for GS3-valves in carbon steel								max. admissible pressures for GS3-valves in carbon steel							
	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F	100°F	120°F	210°F	300°F	390°F	480°F	570°F	660°F
1/2"-1"	1480	1455	1350	1310	1270	1215	1155	1085	1480	1455	1350	1310	1270	1215	1155	1085
1 1/4"	1480	1455	1350	1310	1270	1215	1155	1085	1480	1455	1350	1310	1270	1215	1010	870
1 1/2"	1450	1450	1350	1310	1270	1215	1155	1085	1050	1050	1050	1000	950	770	630	535
2"	1450	1450	1350	1310	1270	1215	1155	1085	1125	1125	1125	1070	1020	825	675	580
2 1/2"	1160	1160	1160	1160	1160	1160	1155	1085	905	905	905	865	820	665	545	460
3"	695	695	695	695	695	695	695	635	530	530	530	535	480	390	320	275

Limitation for SFC-sliding discs: 570°F

PN40

Size	Sliding unit: carbon/SFC - stainless steel, coated							Sliding unit: STN2					
	max. admissible pressures for GS3-valves in carbon steel							max. admissible pressures for GS3-valves in carbon steel					
	210°F	300°F	390°F	480°F	570°F	660°F	210°F	300°F	390°F	480°F	570°F	660°F	
1/2" - 2"	580	580	580	580	580	580	580	580	580	580	580	580	
2 1/2"	580	580	580	580	580	580	580	580	580	580	535	460	
3"	580	580	580	580	580	580	520	495	480	375	320	275	
4"	480	480	480	480	480	475	480	450	435	350	290	245	
5"	335	335	335	335	335	330	320	305	275	230	190	155	
6"	230	230	230	230	230	230	230	220	205	160	130	115	
8" (only 235 psi)	230	230	220	190	175	155	-	-	-	-	-	-	
10" (only 235 psi)	145	130	130	115	100	87	-	-	-	-	-	-	

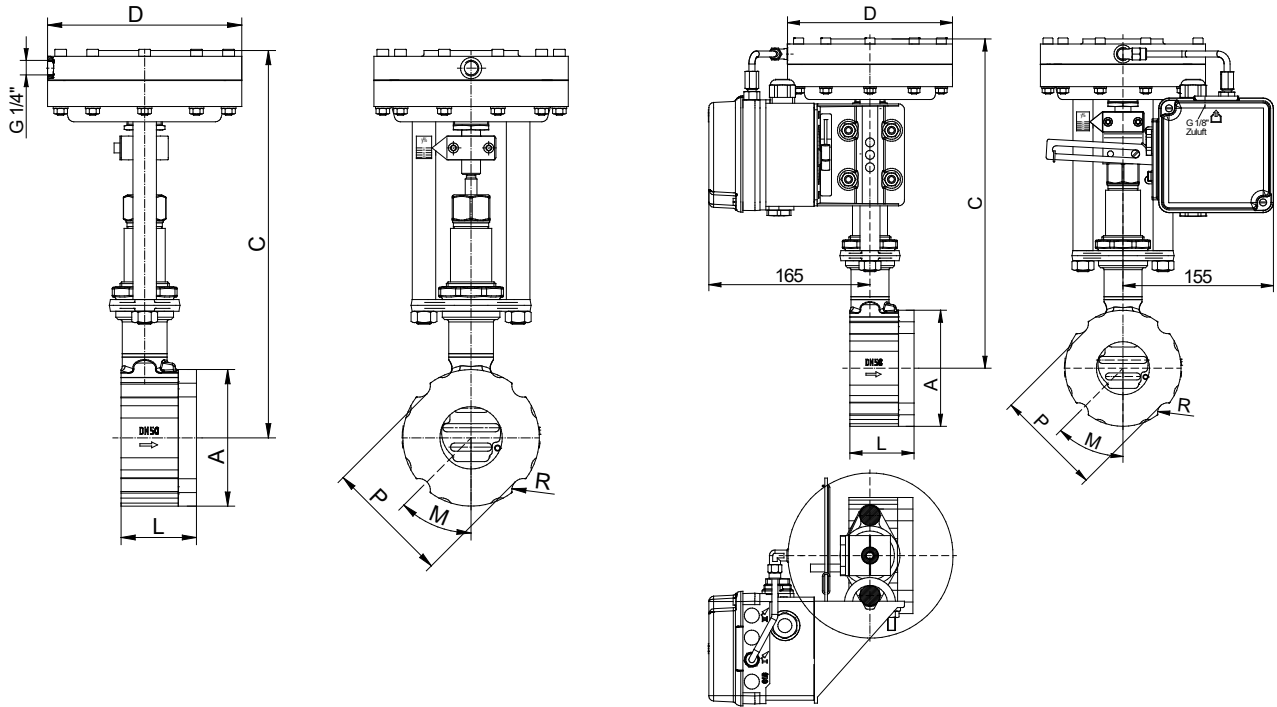
Limitation for SFC-sliding discs: 570°F

PN100

Size	Sliding unit: carbon/SFC - stainless steel, coated							Sliding unit: STN2					
	max. admissible pressures for GS3-valves in carbon steel							max. admissible pressures for GS3-valves in carbon steel					
	210°F	300°F	390°F	480°F	570°F	660°F	210°F	300°F	390°F	480°F	570°F	660°F	
1/2" - 3/4"	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	
1"	1450	1450	1450	1450	1365	1260	1450	1450	1450	1450	1365	1260	
1 1/4"	1450	1450	1450	1450	1450	1435	1450	1450	1450	1220	1000	870	
1 1/2"	1450	1450	1450	1450	1365	1260	1045	1000	945	770	625	535	
2"	1450	1450	1450	1450	1450	1360	1115	1060	1015	810	665	580	
2 1/2"	1160	1160	1160	1160	1160	1100	900	855	810	655	535	460	
3"	695	695	695	695	695	635	520	495	480	375	320	275	

Limitation for SFC-sliding discs: 570°F

Dimensions and Weights



with side-mount positioner

Size	A inch	C inch	Ø D actuator size		L inch	Weight lbs actuator size		Stroke inch
			20 in ²	40 in ²		20 in ²	40 in ²	
1/2"	2.5	12	6.5	8.75	2.2	14.3	19.1	0.24
3/4"	2.85	12.2	6.5	8.75	2.2	14.7	19.6	0.24
1"	3.25	12.4	6.5	8.75	2.2	15.8	20.7	0.24
1 1/4"	3.5	12.6	6.5	8.75	2.2	16.5	21.3	0.24
1 1/2"	3.9	12.8	6.5	8.75	2.2	17.6	22	0.24
2"	4.55	13.2	6.5	8.75	2.5	20.9	26.4	0.31
2 1/2"	5.45	13.6	6.5	8.75	2.7	25.3	30.8	0.31
3"	6	14	6.5	8.75	2.75	27.5	33	0.31
4"	7.25	14.35	6.5	8.75	2.95	34.1	39.6	0.33
5"	8.35	14.95	6.5	8.75	3.15	40.7	46.2	0.33
6"	9.55	15.55	6.5	8.75	3.15	48.4	52.8	0.33
8"	11.9	16.75	6.5	8.75	3.65	85.8	90.2	0.33
10"	14.15	17.7	6.5	8.75	3.8	97.9	102.3	0.33

Dimensions in inch

Flow Coefficients - Cv-values

Ordering code		-	A	1	B	6	2	7	C	3	4	8	5	9
Size	Charact.	100 %	63 %	40 %	25 %	20%	16 %	12 %	10 %	6,3 %	2,5 %	2 %	1 %	0,4%
1/2"	(mod.) linear	4.6	3	2	1.6	-	0.82	0.57	0.51	0.3	0.16	0.09	0.05	-
	eq. perc.	2	-	1.3	-	-	-	-	-	0.12	-	-	-	-
3/4"	(mod.) lin.	7.4	-	-	-	-	1.16	-	-	-	-	0.15	-	-
	eq. perc.	3.5	-	-	-	-	-	-	-	-	-	-	-	-
1"	(mod.) linear	13	7.4	4.6	-	-	1.9	-	1.08	0.72	0.3	-	0.16	0.05
	eq. perc.	5.8	-	2.8	-	1.3	-	-	-	-	-	-	-	-
1 1/4"	(mod.) linear	19	12	-	-	-								
	eq. perc.	9.3	-	-	-	-								
1 1/2"	(mod.) lin.	30	19	13	8.1	-								
	eq. perc.	13	9.9	-	3.2	-								
2"	(mod.) linear	52	32	23	14	12								
	eq. perc.	22	14	-	-	-								
2 1/2"	(mod.) linear	60	41	-	17									
	eq. perc.	35	-	-	9.3									
3"	(mod.) linear	107	67	46										
	eq.perc.	56	41	-										
4"	(mod.) linear	179	110	72										
	eq.perc.	89	56	-										
5"	(mod.) linear	275	-	110										
	eq.perc.	135	-	-										
6"	(mod.) linear	392	246	-										
	eq.perc.	171	104	-										
8"	(mod.) linear	650	408	-										
	eq.perc.	-	-	-										