

Pressure Controller 8042

GS 3 series, 1/2" up to 6"

Pneumatic controller for continuous and discontinuous pressure control of gases and steam.

- High dynamic and control quality
- External or manual set point setting
- Compact and simple design of valve as well as of controller
- Lowest possible weight
- Offset (Droop) < 1%
- Meets the requirements of TA-Luft 2021



Technical Information

Valve

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 6"		
Nominal pressure acc. DIN 2401 for flanges with facing type B	580 psi (fits also to 145 up to 365 psi)	1/2" - 4"	
Nominal pressure acc. ANSI for flanges acc. ASME B16.5 RF	ANSI 150	1/2" - 6"	
	ANSI 300	1/2" - 6"	
Nominal pressure acc. JIS for „raised face“ flanges	10K	1/2" - 2"	
	20K	1/2" - 1 1/2"	
Fluid temperature	Versions from -76°F up to 446°F		
Ambient temperature	+5°F up to +140°F		
Flange gaskets (customer side)	ANSI B16.21 or DIN EN 1514-1 in the respective nominal pressure rating		
Leakage	Disc pair Carbon-stainless steel	Disc pair SFC	Disc pair STN 2
% of Kvs	< 0,0001	< 0,0005	< 0,001
IEC 60534-4	IV-S1	IV-S1	IV
EN 12266-1	E	F	F

Marking ATEX non electric II 2G Ex h IIC T6...T1 X Gb
II 2D Ex h IIIC 85°C...350°C X Db

Specific leakage rate shaft and body sealing ISO FE-BH-CC3-SSA0-t(-40°C/+350°C)-PN40-ISO 15848-1

Controller	
Control pressure ranges	1 - 15 psi (remote operation) 7 - 90 psi (remote operation) 7 - 35 psi (manual operation)
Supply pressure	60 - 90 psi
Temperature range for diaphragm system	140 °F, maximum

* With DN15 with reduction of less than 25%, different leakage rates possible.
K_{vs}-values see data sheet 8001.

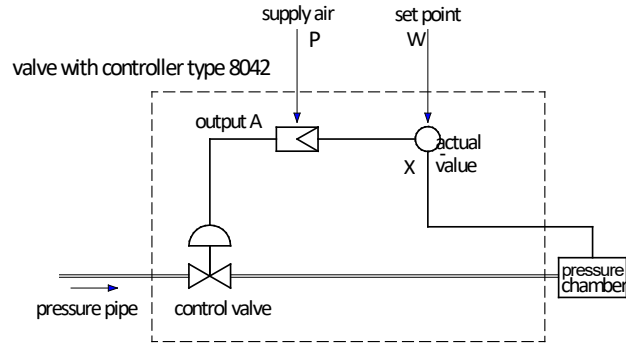
Fluid temperature

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]	446	446	446	446	446	446
Body material cpl. carbon steel						
Tmin [°F]	-76	-76	14	-4	-4	14
Tmax [°F]	446	446	446	446	446	446

Function

The steam or gas pressure from the installation (pressure chamber or pipe) is applied to the controller's diaphragm and compared to the set point signal. As a result of this comparison, supply air is either delivered to the actuator or exhausted. Consequently valve position and flow change, as well as the controlled pressure. The controller can be used for non-continuous processes with varying set points as well as for continuous pressure control (e.g. pressure reduction of steam). Examples can be found at the end of this brochure.

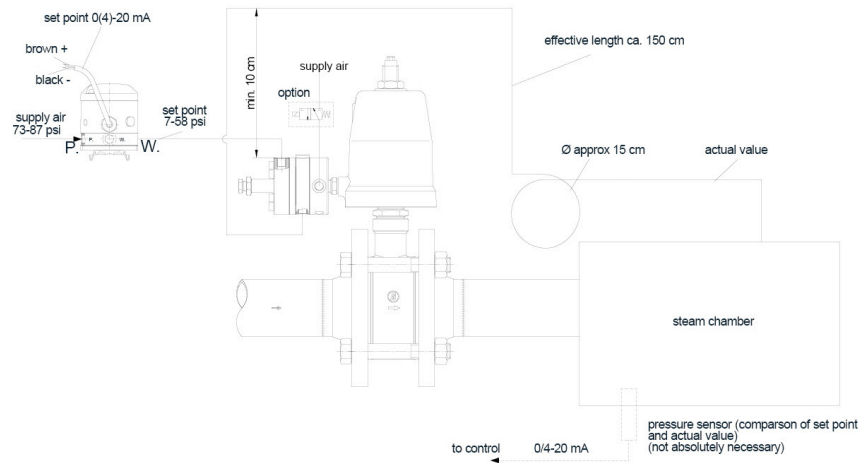
Remark: This proportional controller has a high internal gain and might not replace a conventional control loop with considerable dead times. Practical experience, however, indicates that many different pressure control loops can be handled with this system. To reduce the application risk prior to installation we recommend factory consultation, which is in any case worthwhile due to the potential cost reduction (no pressure gauge and process controller required).



Application Examples

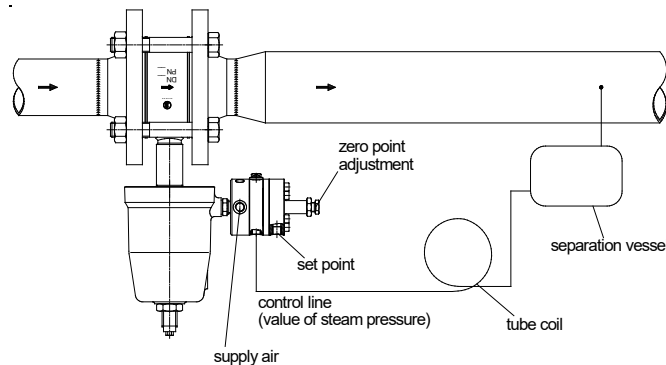
Pressure control in a closed chamber:

The pressure in a steam vessel is to be controlled in accordance with a varying set point signal, which is a current signal determined by the process controller (e.g. a CPS). This signal first is converted to a pressure signal by an i/p-converter and then fed to the pressure controller type 8042. The actual steam pressure is picked up via a pilot line which at the same time takes care of cooling down the medium before it gets into contact with the controller's diaphragm system.



Steam pressure reduction in an energy supply line:

The pressure in a steam supply installation is to be maintained constant in spite of varying flow and upstream pressure. Due to the controller's high dynamic the sketched solution can be used in case of rapidly and strongly changing flows.



Materials

Valve

Body	stainless steel CF8M	carbon steel ASTM A216 WCB
Tube for packing	stainless steel 316 Ti	
Bonnet	brass, chrome plated, for actuator 5" (125 mm): aluminium, corrosion protected	
Packing	PTFE, carbon filled	
Actuating stem	stainless steel 316 Ti, roller burnished	
Fixed disc	stainless steel 316 Ti, Stellite	STN 2
Sliding disc	special carbon material	SFC
coupling ring for sliding disc	stainless steel 318	STN 2

Controller

Body	brass, chrome plated
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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

Size	actuator	max. pressures		P min. (supply)
		control	on/off	
1/2"	3"	365	535	75
3/4"	3"	320	480	75
1"	3"	275	405	75
1 1/4"	3"	230	350	75
1 1/2"	3"	205	320	75
2"	3"	145	230	75
2 1/2"	3"	85	130	75
3"	3"	60	85	75
4"	3"	35	50	75
2"	5"	350	520	60
2 1/2"	5"	205	305	60
3"	5"	130	190	60
4"	5"	85	130	60
5"	5"	60	85	60
6"	5"	45	65	60

Disc pair: STN2

Size	actuator	max. pressures		P min. (supply)
		control	on/off	
1/2"	3"	245	390	75
3/4"	3"	220	350	75
1"	3"	190	290	75
1 1/4"	3"	160	245	75
1 1/2"	3"	145	230	75
2"	3"	100	160	75
2 1/2"	3"	60	85	75
3"	3"	35	50	75
4"	3"	20	30	75
2"	5"	230	365	60
2 1/2"	5"	145	220	60
3"	5"	85	130	60
4"	5"	50	75	60
5"	5"	-	-	-
6"	5"	-	-	-

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

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															
	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	265	235	215	200	175	150	120	275	265	235	215	200	175	150	120
6"	230	230	230	215	200	175	150	120	235	235	235	215	200	170	140	120
8"	230	230	230	215	200	175	150	120	-	-	-	-	-	-	-	-
10"	150	150	150	145	135	120	105	100	-	-	-	-	-	-	-	-

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															
	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	695	610	560	520	485	460	440	720	695	610	560	520	485	460	440
3"	695	695	610	560	520	485	460	440	530	530	530	505	480	390	320	275
4"	480	480	480	480	480	480	460	440	480	480	480	460	435	355	290	250
5"	335	335	335	335	335	335	335	335	320	320	320	305	290	235	190	165
6"	230	230	230	230	230	230	230	230	230	230	230	225	210	170	140	120
8"	230	230	230	145	135	120	105	100	-	-	-	-	-	-	-	-

Limitation for SFC-sliding discs: 570°F

PN40

Size	Sliding unit: carbon/SFC - stainless steel, coated						Sliding unit: STN2					
	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

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	565	535	740	725	675	655	635	610	565	535
2 1/2"	740	725	675	655	635	610	565	535	605	605	605	575	545	485	550	470
3"	695	695	675	655	635	610	565	535	530	530	530	505	480	390	319	275
4"	480	480	480	480	480	480	475	475	480	480	480	460	435	355	290	245
5"	335	335	335	335	335	335	330	330	320	320	320	305	290	235	191	155
6"	230	230	230	230	230	230	230	230	230	230	230	225	210	170	141	115
8"	230	230	230	145	135	120	105	87	-	-	-	-	-	-	-	-

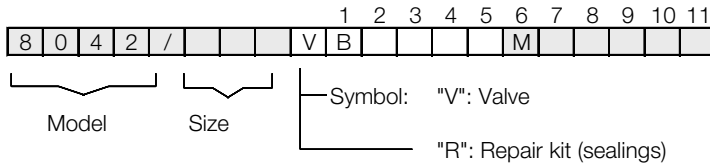
Limitation for SFC-sliding discs: 570°F

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

Ordering Number System (valve including controller)



1 - 5 : Please quote all 5 sections.
6 - 11: Quote only if required.

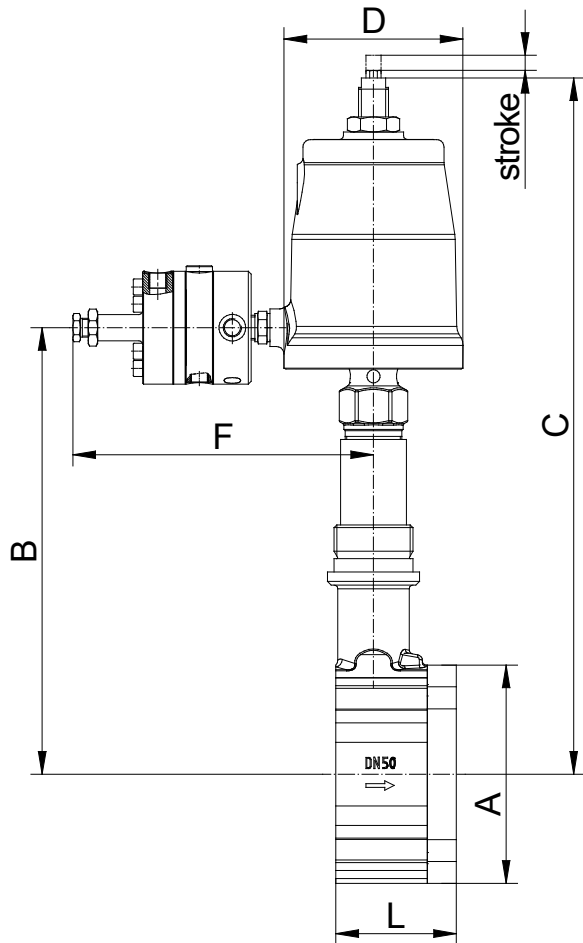
1.	Function	2.	Connection	3.	Body material	4.	Control functions	5.	Actuator	6.	Special versions
B	(long design)	E	GS3-flangeless design acc. ANSI 150	0	C-steel ASTM A216 WCB	A	manually operated 7 - 35 psi (pressure reduction)	8	piston 3" (NPT)	M	Special versions
		F	GS3-flangeless design acc. ANSI 300	1	stainless steel CF8M	B	remote control 7 - 90 psi				
						C	remote control 1 - 15 psi				
						D	manually operated 7 - 35 psi (spring opens, back pressure)				
						X	without regulator				
7.		8.		9.	Moving disc	10.	Fixed disc	11.	Cv-values	12.	Characteristic
-	without significance	-	without significance	-	Carbon 9 STN2/STN3 S SFC	-	Stainless steel 316 Ti/Stellite	-	100% (stand.)	-	linear equal percentage
						1	STN2-plate (only in combination with the position „9“)	1	red. to 63%	1	
						3	STN3-plate (only in combination with the position „9“)	2	red. to 40%		
								3	red. to 25%		
								4	red. to 16%		
								5	red. to 10%		
								6	red. to 6,3%		
								7	red. to 2,5%		
								8	red. to 1%		
								9	red. to 20%		
									red. to 12%		
									red. to 2%		
									red. to 0,4 %		

Ordering Example:

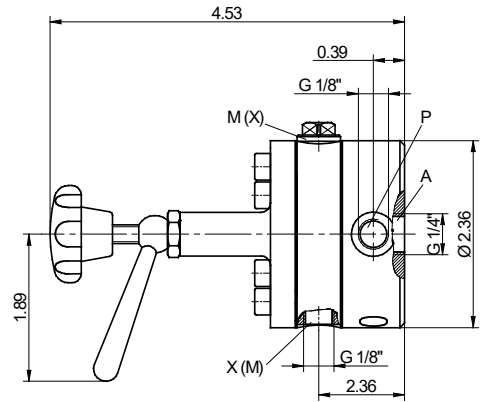
8042/025VBE1B8M - - - -2

GS-stop valve typ 8040, 1", ANSI 150, body material stainless steel, remotely operated, pressure range 5-90 psi, actuator 3", carbon, metallically impregnated, stainless steel 316 Ti, 16% reduced Cv-value, Cv-value 1,9

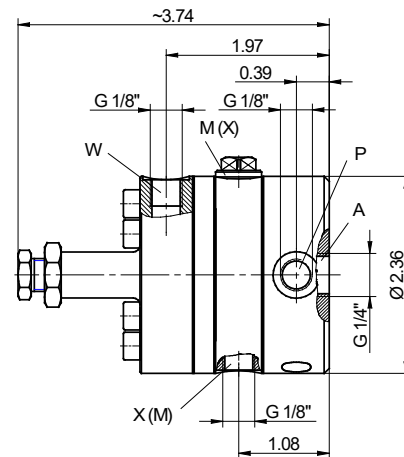
Dimensions and Weights



remotely operated



manually operated



Size	A	8040 with 8042										Stroke
		B		C max		L	F		Weight (lbs)			
		3"	5"	3"	5"		3"	5"	3"	5"		
1/2"	2.5	8.4	8.5	13.5	14.3	2.2	5.5	-	13	16.1	0.24	
3/4"	2.85	8.5	8.6	13.7	14.4	2.2	5.5	-	13.4	16.5	0.24	
1"	3.25	8.7	8.8	13.9	14.6	2.2	5.5	-	14.1	17.2	0.24	
1 1/4"	3.5	8.8	8.9	14	14.7	2.2	5.5	-	14.5	17.6	0.24	
1 1/2"	3.9	9.1	9.1	14.2	14.9	2.2	6.3	-	15.2	18.3	0.24	
2"	4.55	9.4	9.4	14.6	15.3	2.5	6.3	-	18.5	21.6	0.31	
2 1/2"	5.45	9.7	9.8	15	15.7	2.7	6.3	-	21.8	24.9	0.31	
3"	6	10.1	10.2	15.3	16	2.75	6.3	7.3	24.4	27.5	0.31	
4"	7.25	10.6	10.7	15.8	16.5	2.95	-	7.3	31.5	34.5	0.33	
5"	8.35	11.1	11.3	16.4	17.1	3.15	-	7.3	36.5	39.6	0.33	
6"	9.55	11.7	11.7	16.9	17.6	3.15	-	7.3	44.9	48	0.33	

Dimension C „reduced design“ shortened by 1"

Dimensions in inch

Pressure Controller 8042-GS3



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	0.021
	eq. perc.	2	-	1.3	-	0.4	-	-	-	0.12	-	-	-	-
3/4"	(mod.) lin.	7.4	-	-	-	-	1.16	-	-	-	-	0.15	-	-
	eq. perc.	3.5	-	1.7	-	-	-	-	-	-	-	-	-	-
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	-	-	-	0.41	-	-	-	-
1	(mod.) linear	19	12	-	-	-	-	-	-	-	-	-	-	-
1/4"	eq. perc.	9.3	5.45	-	-	-	-	-	-	-	-	-	-	-
1	(mod.) lin.	30	19	13	8.1	-	-	-	-	-	-	-	-	-
1/2"	eq. perc.	13	9.9	-	3.2	-	-	-	-	-	-	-	-	-
2"	(mod.) linear	52	32	23	14	12	-	-	-	-	-	-	-	-
	eq. perc.	22	14	-	-	-	-	-	-	-	-	-	-	3.5
2	(mod.) linear	60	41	-	17	-	-	-	-	-	-	-	-	-
1/2"	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	-	-	-	-	-	-	-	-	-	-	-