

T 8039 EN

Series 240 · Type 3351 Pneumatic On/off Valve



Application

Shut-off valve with tight shut-off for liquids, gases and vapors according to DIN or ANSI standards

Valve size DN 15 to 100 · NPS ½ to 4
Pressure rating PN 16 to 40 · Class 125, 150 and 300
Medium temp. -10 to +220 °C · 14 to 428 °F

Special features

The Type 3351 Pneumatic Control Valve consists of an on/off valve and a pneumatic actuator.

Valve body made of:

- Cast iron
- Spheroidal graphite iron
- Cast steel
- Cast stainless steel

Special features:

- Soft-seated valve plug
- Leakage class VI according to IEC 60534-4 or class VI according to ANSI/FCI 70-2
- Direct attachment of solenoid valves and pneumatic lock-up valve without hook-up through the use of a NAMUR adapter plate
 - ▶ T 8350 for details on the mounted accessories
 - Suitable mounting kits ▶ EB 8039 (section on accessories)

Versions

Standard version for pressure rating PN 16 to 40 (Class 125, 150 and 300), fail-close or fail-open

- **Type 3351** (Fig. 1) · On/off valve with self-adjusting PTFE V-ring packing · Valve size DN 15 to 100 (NPS ½ to 4) · Medium temperatures from -10 to +220 °C (14 to 428 °F)

Further versions:

- Additional manual override · DN 15 to 80 (NPS ½ to 3)
- Higher ambient temperatures
- Version without PTFE for the tobacco industry
- Adjustable packing
- Packings with special materials



Fig. 1: Type 3351 Pneumatic On/off Valve

Functional diagram

Depending on the type of valve seat and the arrangement of the valve plug, the valve has two different fail-safe actions which are used when the pressure acting on the diaphragm is reduced or when the control signal fails:

- **Fail-close action:** the valve is closed upon supply air failure.
- **Fail-open action:** the valve is opened upon supply air failure.

Direction of flow

The direction of the medium flow in the valve depends on the process medium and the selected fail-safe action.

For fail-close valves which are used to control gases and vapors, the medium must flow in the flow-to-close direction ($A \rightarrow B$). Except for the DN 100 version: the medium must flow in the flow-to-open direction ($B \rightarrow A$).

For control applications with liquids, the medium must flow in the flow-to-open direction ($B \rightarrow A$).

In fail-open valves, all media must flow in the flow-to-open direction ($A \rightarrow B$). For versions with the optional manual override, a fail-close valve can be opened and a fail-open valve can be closed in the event of supply air failure.

Table 1: Direction of flow

Fail-safe action	Process medium	Valve size	Flow direction	
			A $\rightarrow$ B	B $\rightarrow$ A
Fail-close	Steam Gas	DN 15 to 80 NPS ½ to 3	FTC ¹⁾	–
Fail-close	Steam Gas	DN 100 NPS 4	–	FTO ¹⁾
Fail-close	Liquid	DN 15 to 100 NPS ½ to 4	–	FTO ¹⁾
Fail-open	Steam Gas Liquid	DN 15 to 100 NPS ½ to 4	FTO ¹⁾	–

- ¹⁾ FTO (flow-to-open)
FTC (flow-to-close)

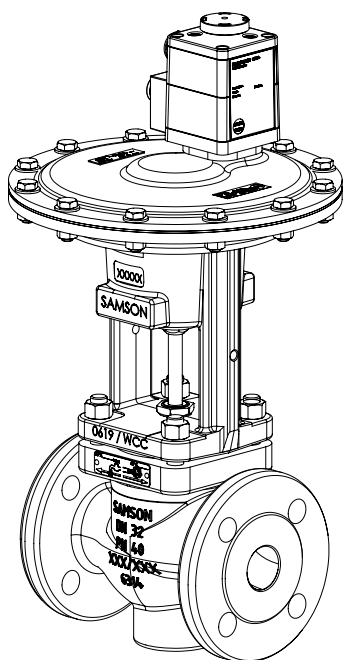


Fig. 2: Type 3351 with directly attached solenoid valve

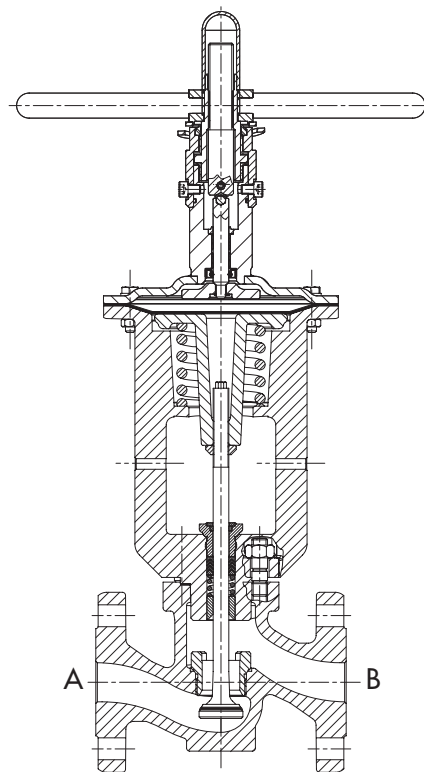


Fig. 3: Type 3351 Pneumatic On/off Valve with manual override - Fail-close version

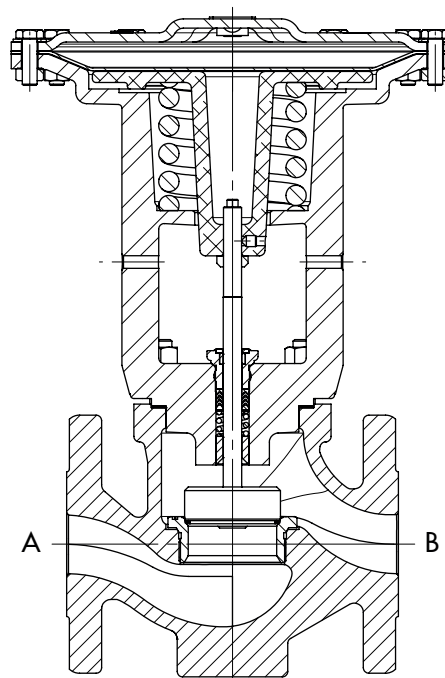


Fig. 4: Type 3351 Pneumatic On/off Valve - Fail-open version

Table 2: Technical data

Version	DIN				ANSI		
Body material	Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400- 18-LT	Cast steel 1.0619	Cast stainless steel 1.4408	Cast iron A126B	Cast steel A216 WCC	Cast stainless steel A351 CF8M
Pressure rating	PN 16	PN 16, 25	PN 16, 25, 40		Class 125	Class 150 and 300	Class 150 and 300
Valve size	DN 15 to 100				NPS ½ to 4		
Connecting flanges	Form B according to EN 1092-2		All forms according to EN 1092-1		FF according to ASME B16.1	All forms according to ASME B16.5	All forms according to ASME B16.5
Temperature ranges in °C (°F) · Permissible operating pressures according to pressure-temperature diagrams (see Information Sheet ► T 8000-2)							
Medium temperature	-10 to +220 °C (14 to 428 °F)				-10 to +220 °C (14 to 428 °F)		
Ambient tem- perature for actu- ator diaphragm:	NBR	-35 to +100 °C (-31 to +212 °F)					
	EPDM	-40 to +150 °C (-40 to +302 °F)					
	FKM	-25 to +200 °C (-13 to +392 °F)					
Leakage class	IEC 60534-4: VI				ANSI/FCI 70-2: Class VI		
Conformity	CE						

Table 3: Materials

Valve	DIN				ANSI		
Body	Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400- 18-LT	Cast steel 1.0619	Cast stainless steel 1.4408	Cast iron A126B	Cast steel A216 WCC	Cast stainless steel A351 CF8M
Seat	1.4006			1.4404/ 1.4401	A182 F6a Cl. 2	A182 F6a Cl. 2	316Ti/316L
Plug	1.4404 · Seal made of reinforced PTFE or PEEK						
Body gasket	Graphite on metal core						
Actuator diaphragm	NBR, EPDM or FKM with fabric reinforcement						
Valve bonnet	Cast iron EN-GJL-250	Cast steel 1.0619	Cast steel 1.0619	Bonnet flange 1.4404 welded to bonnet 1.0619	Cast iron A216B	Cast steel A216 WCC	Bonnet flange 316L welded to bonnet A216 WCC
Guide bushing	1.4104			1.4404	1.4104	1.4104	316L
Packing	V-ring packing: PTFE with carbon · Spring: 1.4310						
Threaded bushing	1.4404 + Carbon				316L + Carbon		

Table 4: Control pressure and maximum differential pressure · All pressures in bar and psi

Valve size	DN	15	20	25	32	40	50	65	80	100	
	NPS	½	¾	1	–	1½	2	2½	3	4	
Flow coefficient	K _{VS}	6.3	10	14	25	31	40	72	90	170	
	C _V	7.5	12	16	–	36	47	84	105	200	
Pneumatic actuator	Actuator area in cm ²	60			186			255		700	
	Travel in mm	8			10			12.5		30	
Max. supply pressure	DN 15 to 80	8 bar/116 psi									
	DN 100	6 bar/88 psi									
Standard version (PTFE or PEEK plug seal)											
Fail-close											
Min. control pressure to open the valve at Δp _{max}	PTFE	4 bar/58 psi									
	PEEK	5.5 bar/80 psi									
Max. perm. differential pressure Δp _{max} at	Vapors, gases A → B	20 bar/290 psi			16 bar/235 psi			10 bar/145 psi		–	
	Vapors, gases B → A	–									10 bar/145 psi
	Liquids B → A	16 bar/235 psi			10 bar/145 psi			5 bar/73 psi		10 bar/145 psi	
Fail-open											
Min. control pressure to close the valve at Δp _{max}	PTFE/PEEK	4.5 bar/65 psi									
Max. perm. differential pressure Δp _{max}	Vapors, gases, liquids	20 bar/290 psi			16 bar/235 psi			10 bar/145 psi			
Special version for fail-close version with reinforced springs for higher differential pressure Δp (PTFE plug seal only) ¹⁾											
Min. control pressure to open the valve at Δp _{max}		5.5 bar/80 psi								–	
Max. permissible differential pressure Δp _{max} for vapors, gases or liquids ²⁾		30 bar/435 psi			20 bar/290 psi			7 bar/102 psi		–	

¹⁾ The standard version with PEEK is already fitted with reinforced springs. Therefore, a special version with PEEK plug seal for higher differential pressures is not available.

²⁾ For direction of flow B → A (see Fig. 3)

Table 5: Accessories: adapter plate with NAMUR interface according to VDI/VDE 3845, for DN 15 to 80 (NPS ½ to 3):

Version/Type	Order no.
Standard	1400-9638
For Type 3963	1402-0096
For Type 3967	1402-0095 ¹⁾

¹⁾ ► AB 11, information on adapter plate with extended NAMUR interface ¼" for SAMSON Type 3351 On/off Valve

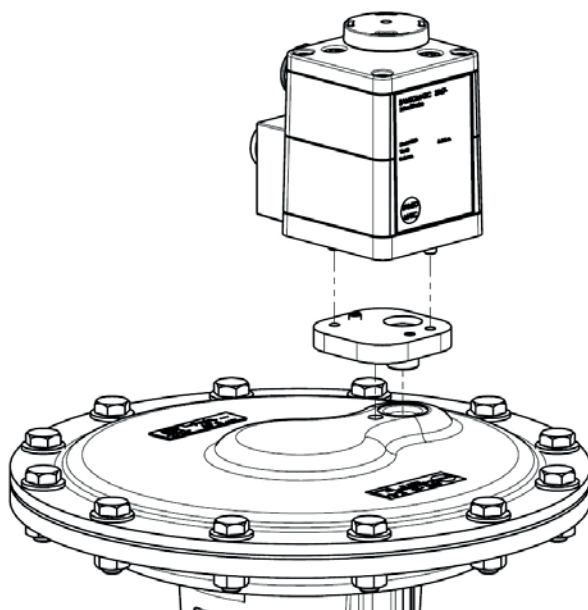
**Fig. 5:** Adapter plate with NAMUR interface

Table 6: Dimensions for Type 3351

Valve		DN	15	20	25	32	40	50	65	80	100
		NPS	½	¾	1	–	1½	2	2½	3	4
Length L	PN 16/40, flange B, B1	mm	130	150	160	180	200	230	290	310	350
	Class 125, FF Class 150, RF	in	7.25			–	8.75	10	10.88	11.75	13.86
		mm	184			–	222	254	276	298	352
	Class 300, RF	in	7.50	7.62	7.75	–	9.25	10.50	11.50	12.50	14.50
		mm	190	194	197	–	235	267	292	318	368
Diaphragm ØD		mm	150			240			280		390
Control pressure connection		a	G ¼			G ¼			DN 65 and 80: G ¼ DN 100: G ⅜		
Standard version											
H1		mm	260			285			328		485
H2		mm	45			72			98		118
H3 ¹⁾		mm	380			380			415		565

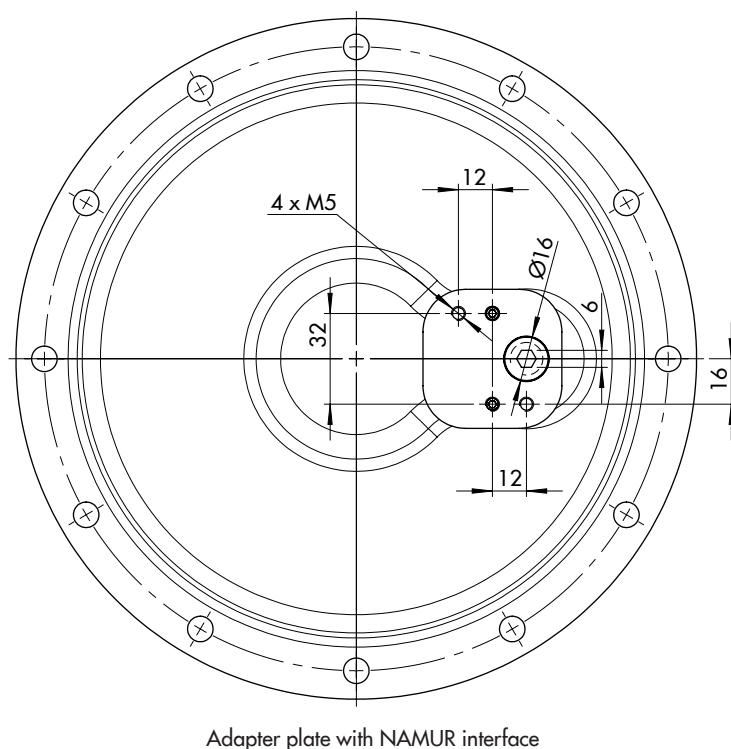
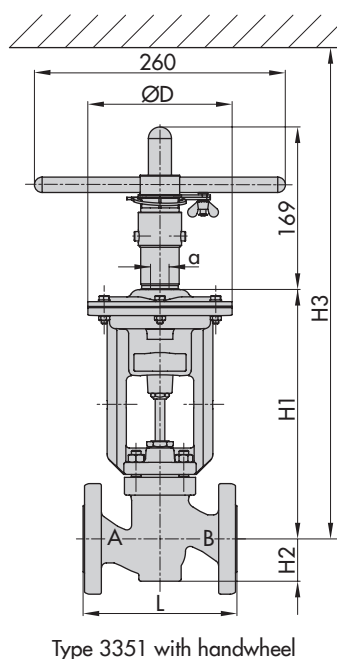
¹⁾ Minimum clearance to remove the actuator; version with handwheel: up to DN 80: +150 mm, DN 100: +210 mm

Table 7: Weights for Type 3351

Standard version	DN	15	20	25	32	40	50	65	80	100
	NPS	½	¾	1	–	1½	2	2½	3	4
Weight ¹⁾ , approx. kg	PN 10/40	11	12	12	25	26	29	48	52	70
	Class 150	11	12	13	–	23	27	47	52	64
	Class 300	12	13	14	–	25	29	50	55	64

¹⁾ Add approx. 2 kg to the specified weight for versions with handwheel.

Dimensional drawings



Ordering text

Type 3351 Pneumatic On/off Valve

Valve size DN/NPS

Pressure rating PN/Class

Body material Refer to Table 3

Fail-safe action Fail-close or fail-open

Control air pressure ... bar

Manual adjuster With/without

Valve accessories Solenoid valve and/or electric or
pneumatic limit switch

Associated Information Sheet ▶ T 8000-X

Associated Data Sheets for
pneumatic actuators ▶ T 8310-1
▶ T 8310-2

Associated Mounting and Operating Instructions
▶ EB 8039