DATA SHEET

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*

SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507 · samson@samsongroup.com · www.samsongroup.com

Edition September 2023

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 → B). Except for the DN 100 version: the medium must flow in the flow-to-open direction (B → A).
For control applications with liquids, the medium must flow in the flow-to-open direction (B → A).
In fail-open valves, all media must flow in the flow-to-open direction (A → 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 → B	B → 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)

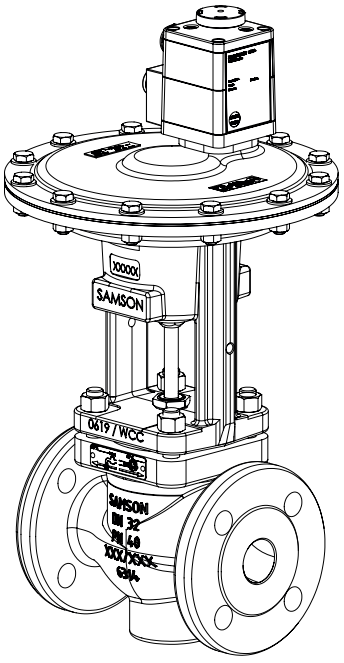


Fig. 2: *Type 3351 with directly attached solenoid valve*

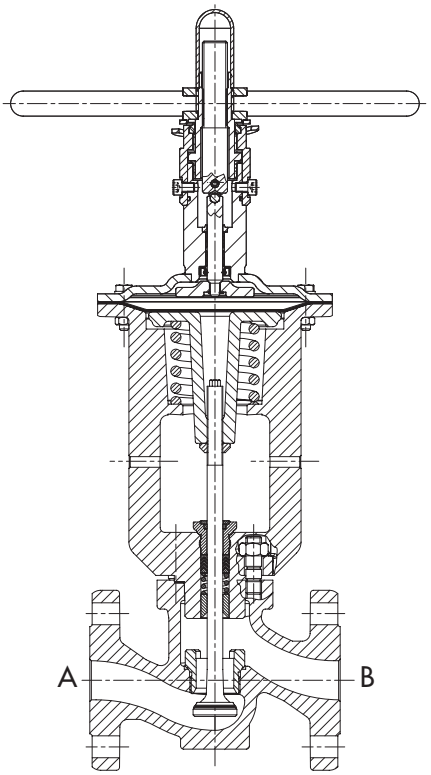


Fig. 3: *Type 3351 Pneumatic On/off Valve with manual override · Fail-close version*

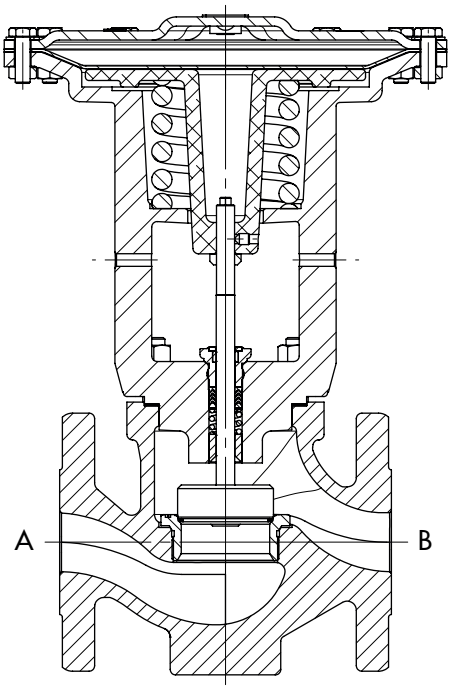


Fig. 4: *Type 3351 Pneumatic On/off Valve · Fail-open version*

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 temperature for actuator 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 · UKCA · EAC						

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 cm²		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

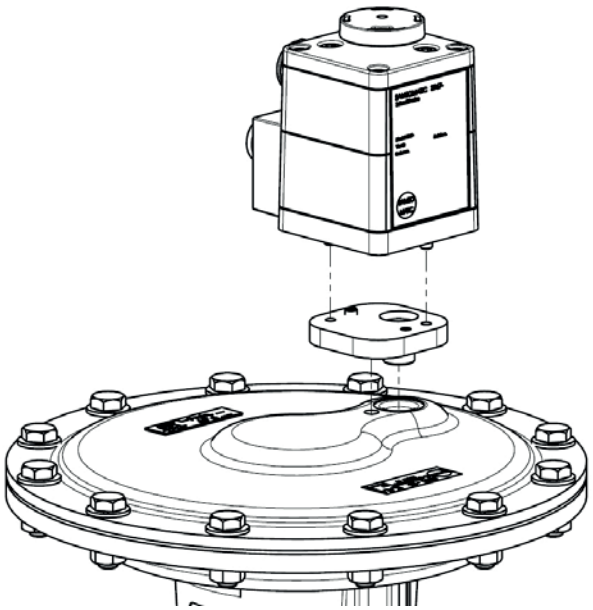


Fig. 5: *Adapter plate with NAMUR interface*

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

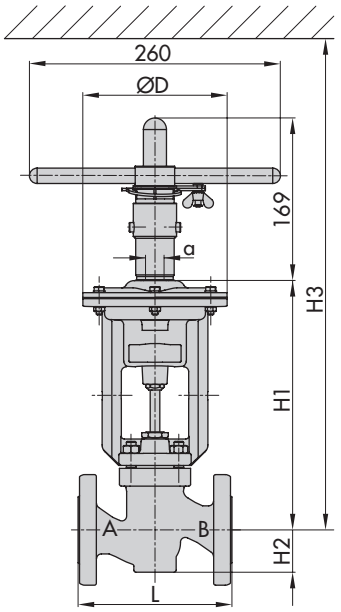
[1] Minimum clearance to remove the actuator; version with handwheel: up to DN 80: +150 mm, DN 100: +210 mm

Table 7: *Weights for Type 3351*

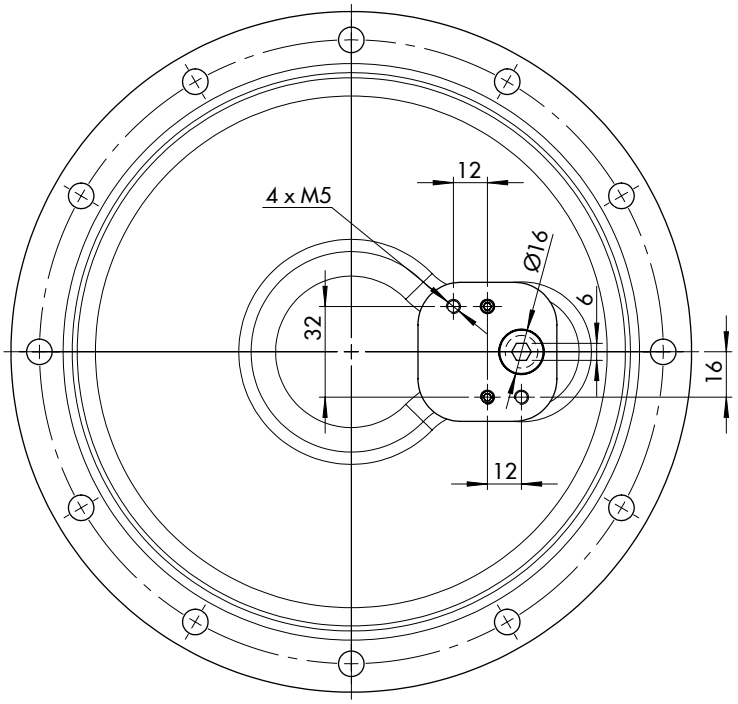
Standard version	DN	15	20	25	32	40	50	65	80	100
	NPS	½	¾	1	–	1½	2	2½	3	4
Weight [1], approx. kg	PN 10/40	11	12	12	25	26	29	48	52	70
	Class 150	11	12	13	–	23	27	47	52	64
	Class 300	12	13	14	–	25	29	50	55	64

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

Dimensional drawings



Type 3351 with handwheel



Adapter plate with NAMUR interface

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