

# Pneumatic On-off Valve Type 3351



## Application

Control valve including tight seal for process fluids, gases and steam in accordance with DIN or ANSI standards

Nominal size	DN 15 to DN 100 · ½" to 4"
Nominal pressure	PN 16 to PN 40 · Class 150 and 300
Ambient temperatures	-10 to 90 °C · 14 to 194 °F
Medium temperatures	-50 to 250 °C · -20 to 482 °F

The Type 3351 Pneumatic Control Valve consists of an on-off control valve and a pneumatic actuator. Optionally, the valve can be equipped with a bellows seal or insulating section.

Valve body made of

- Cast iron,
- Spheroidal graphite iron,
- Cast steel, or
- Stainless cast steel,
- Valve plug with both metal and soft sealing,
- Leakage rate Class VI in accordance with DIN EN 1349, Class VI in accordance with ANSI B 16-104.

Attachment of solenoid valves and limit switches according to DIN IEC 534-6 and NAMUR recommendation. For details, see Information Sheet T 8350 EN.

## Versions

**Standard version** for nominal pressures PN 10 to PN 40 or ANSI Class 150 and 300 with fail-safe action "valve CLOSED" or "valve OPEN"

- **Type 3351-1** (Fig. 1) · On-off valve with self-adjusting PTFE V-ring packing in nominal sizes DN 15 to DN 100 (½" to 4") for medium temperatures from -10 to 220 °C (14 to 428 °F)
- **Type 3351-1 Bellows version** (Fig. 2) · On-off valve with metal bellows and lip seal in nominal sizes DN 15 to DN 50 (½" to 2") for medium temperatures as listed in Table 1
- **Type 3351-1 Version with insulating section** (Fig. 2) · On-off valve with insulating section, plug stem sealed with PTFE V-ring packing, nominal sizes DN 15 to DN 50 (½" to 2") for medium temperatures as listed in Table 1

## Other versions

- With additional handwheel
- With reinforced spring
- For higher or lower medium temperatures
- For higher ambient temperatures



Fig. 1 · Type 3351-1 Pneumatic On-off Valve



Fig. 2 · Type 3351-1 Pneumatic On-off Valve  
Version with metal bellows or insulating section

### Principle of operation

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

#### Valve "spring closes":

The valve is closed upon supply air failure.

#### Valve "spring opens":

The valve is opened upon supply air failure.

### Direction of medium flow

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

For valves with fail-safe action "spring closes" used to control gases and steam, the medium must flow against the plug in closing direction (A → B).

For liquids, the medium **must** flow against the plug in opening direction (B → A).

For valves with the fail-safe action "spring opens", the medium flows against the plug in the opening direction (A → B) with all types of media.

Using the optional handwheel, valves with fail-safe action "spring closes" can be opened in case of a supply air failure, and valves with fail-safe action "spring opens" can be closed.

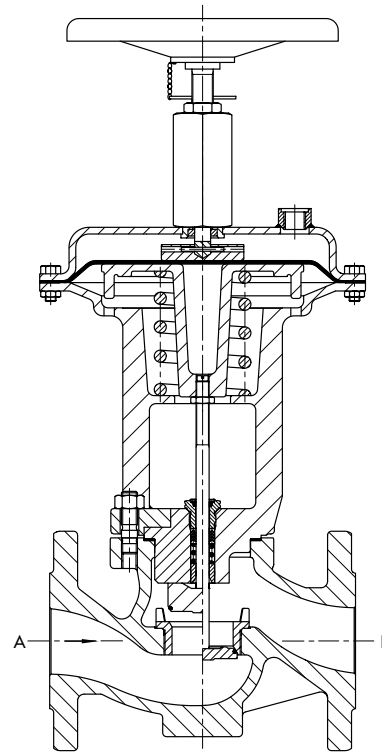


Fig. 3 · Type 3351-1 Pneumatic On-off Valve with handwheel

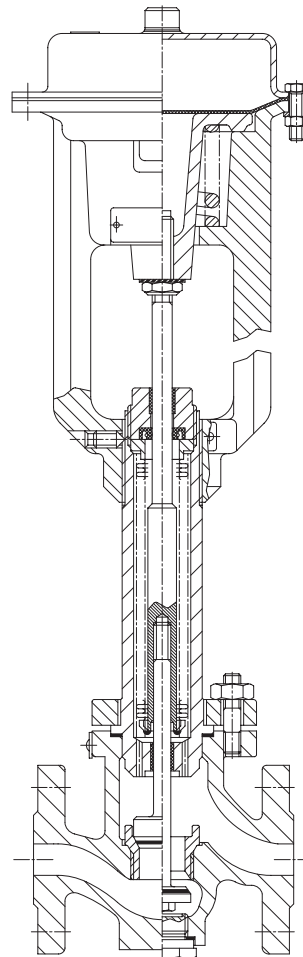


Fig. 4 · Type 3351-1 Pneumatic On-off Valve Bellows version

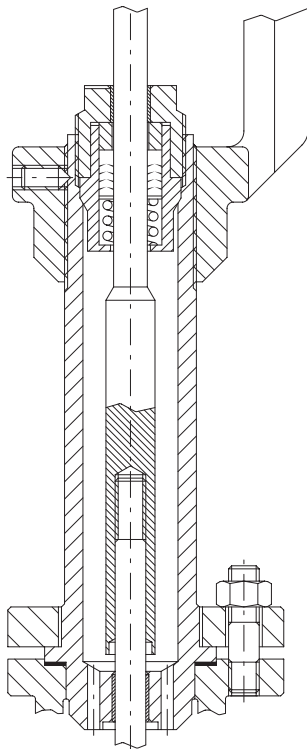


Fig. 5 · Detailed drawing of insulating section

**Table 1 · Technical data**

Version	DIN				ANSI	
Body material	Cast iron EN-JL 1040	Spheroidal graphite iron EN-JS 1024	Cast steel WN 1.0619	Stainless cast steel WN 1.4581	Carbon steel A 216 WCC	Stainless carbon steel A 351 CF8M
Nominal pressure	PN 10, 16	PN 10, 16, 25	PN 10, 16, 25, 40		Class 150 and 300	
Nominal size	Standard	DN 15 ... 100			1/2" ... 4"	
	Bellows/ ins. section	DN 15 ... 50			1/2" ... 2"	
Connecting flanges	Form B acc. to DIN EN 1092-2		Form B1 acc. to DIN EN 1092-1		RF	
<b>Temperature ranges in °C (°F) · Permissible operating pressures acc. to pressure-temperature diagram (see Information Sheet T 8000-2 EN)</b>						
Ambient temperature	-10 ... 90 °C (14 ... 194 °F)				-10 ... 90 °C (14 ... 194 °F)	
Medium temperature	-10 ... 220 °C (14 ... 428 °C)				-10 ... 220 °C (14 ... 428 °F)	
Version high temperatures	-10 ... 250 °C (14 ... 482 °F) <sup>1)</sup>				-10 ... 250 °C (+14 ... 482 °F) <sup>1) 4)</sup>	
Version low temperatures	-	-50 ... 220 °C (-58 ... 428 °F) <sup>2)</sup>		-29 ... 220 °C (-20...428 °F) <sup>4)</sup>	-50 ... 220 °C (-58...428 °F) <sup>3) 4)</sup>	
Leakage class	VI (DIN EN 1349)				Class VI (ANSI B 16-104)	

- 1) With soft-sealing special plug and bellows seal or insulating section  
2) Up to max. 50 % of the nominal pressure and with bellows seal or insulating section  
3) Additional impact test required between -29 °C (-20 °F) and -50 °C (-58 °F)  
4) Only with bellows seal or insulating section

**Table 2 · Materials**

Valve	DIN				ANSI	
Body	Cast iron EN-JL 1040	Spheroidal graphite iron EN-JS 1024	Cast steel WN 1.0619	Stainless cast steel WN 1.4581	Carbon steel A 216 WCC	Stainless carbon steel A 351 CF8M
Seat	WN 1.4006			WN 1.4571	410	316Ti
Plug	WN 1.4571 · Sealing ring made of reinforced PTFE					
Body gasket	Metal graphite					
Actuator diaphragm	NBR (nitrile rubber) with fabric insert · Materials for higher ambient temperatures available on request					
<b>Standard version</b>						
Valve bonnet	Spheroidal graphite iron EN-JS 1024	Spheroidal graphite iron EN-JS 1024	Cast steel WN 1.0619	Valve cover WN 1.4571/1.4404 welded to bonnet 1.0619	Cast steel WN 1.0619	Valve cover 316L welded to bonnet 1.0619
Guide bushing	WN 1.4104 nitrided			WN 1.4571	WN 1.4104 nitrided	316Ti
Packing	V-ring packing PTFE with carbon · Spring WN 1.4310					
Threaded bushing	WN 1.4305 nitrided			WN 1.4571	WN 1.4305 nitrided	316Ti
<b>Version with bellows seal or insulating section</b>						
Bellows seal/insulating section	WN 1.0460			WN 1.4404	A105	316L
Actuator flange	Cast iron EN-JL 1040	Cast steel WN 1.0619		Cast steel WN 1.0619		
Guide bushing	Fiber-reinforced plastic					
Sealing	Bellows seal: Metall bellows WN 1.4571 and FKM lip seal					
	Insulating section: PTFE graphite V-ring packing · Spring WN 1.4310					
Drive nut	WN 1.4404 and fiber-reinforced plastic				316L and fiber-reinforced plastic	
Flange bellows/insul. section	WN 1.0460			WN 1.4301	A105	304

**Table 3 · Control pressure and maximum differential pressure · All pressures in bar and psi**

Nominal size (bellows/insul. section up to DN 50/2")	DN	15	20	25	32	40	50	65	80	100
	in	1/2"	3/4"	1"	–	1 1/2"	2"	2 1/2"	3"	4"
Flow rate	K <sub>vs</sub>	6.3	10	14	25	31	40	72	90	170
	C <sub>v</sub>	7.5	12	16	–	36	47	84	105	200
Pneumatic actuator	Effective area in cm <sup>2</sup>	80			240			350		700
	Travel in mm	8			10			12.5		30
Max. supply pressure		6 bar/ 88 psi								
<b>Standard version</b>										
<b>Spring closes</b>										
Min. control pressure to open valve at Δp <sub>max</sub>		4 bar / 58 psi								
Max. perm. differential pressure Δp <sub>max</sub> at	Steam, gas A → B	20 bar/ 290 psi			16 bar/ 235 psi			10 bar/ 145 psi		
	Liquids B → A	16 bar / 235 psi			10 bar/ 145 psi			5 bar/ 73 psi		
<b>Spring opens</b>										
Min. control pressure to close valve at Δp <sub>max</sub>		4.5 bar/ 65 psi								4 bar/ 58 psi
Max. perm. differential pressure Δp <sub>max</sub> for steam, gas, liquids		20 bar/ 290 psi			16 bar/ 235 psi			10 bar/ 145 psi		
<b>Special version "spring closes"</b>										
Min. control pressure to open valve at Δp <sub>max</sub>		5.5 bar/ 80 psi								–
Max. perm. differential pressure Δp <sub>max</sub> for steam, gas, liquids <sup>1)</sup>		30 bar/ 435 psi			20 bar/ 290 psi			7 bar/ 102 psi		–

<sup>1)</sup> For flow direction B → A (see Fig. 3)

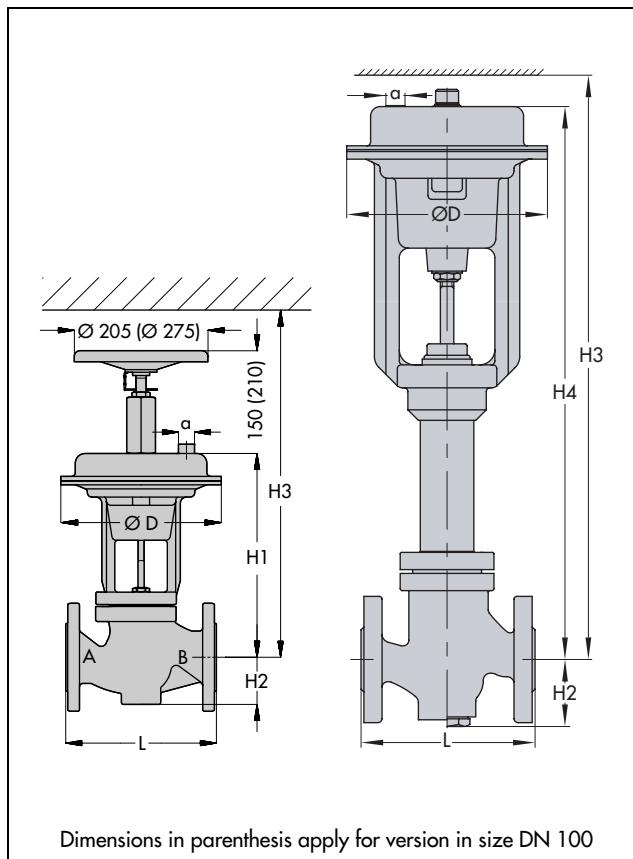
**Table 4 · Dimensions for Type 3351**

Valve	DN	15	20	25	32	40	50	65	80	100	
	in	1/2"	3/4"	1"	–	1 1/2"	2"	2 1/2"	3"	4"	
Length L	PN 10/40	mm	130	150	160	180	200	230	290	310	350
	Class 150	in	7.25			–	8.75	10	10.88	11.75	13.86
		mm	184			–	222	254	276	298	352
	Class 300	in	7.50	7.63	7.75	–	9.25	10.50	11.50	12.50	14.49
mm		191	194	197	–	235	267	292	318	368	
Diaphragm Ø D	mm	150			240			280		390	
Pressure connection	a	G <sup>1</sup> / <sub>4</sub>			G <sup>1</sup> / <sub>4</sub>			G <sup>3</sup> / <sub>8</sub>			
<b>Standard version</b>											
H1	mm	275			300			350		485	
H2	mm	45			72			98		118	
H3 <sup>1)</sup>	mm	380			380			415		565	
<b>Version with bellows seal or insulating section</b>											
H4	mm	415			430			–			
H2	mm	55			80			–			
H3 <sup>1)</sup>	mm	520			535			–			

<sup>1)</sup> Minimum additional height required to disassemble the actuator; version with handwheel: up to DN 80 +150 mm, for DN 100 +210 mm

**Table 5 · Weights for Type 3351**

Standard version	DN	15	20	25	32	40	50	65	80	100	
	in	1/2"	3/4"	1"	–	1 1/2"	2"	2 1/2"	3"	4"	
Weight 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	
<b>Version with bellows seal or insulating section</b>											
Weight approx. kg	PN 10/40	16	17	17	33	34	37	–			
	Class 150	16	17	18	–	31	35	–			
	Class 300	17	18	19	–	33	37	–			



### Ordering text

Type 3351 Pneumatic On-off Valve

Nominal size DN/in

Nominal pressure PN/Class

Body material See Table 1

Fail-safe action Valve CLOSED or  
Valve OPEN

Control pressure ... bar

Handwheel Without / with

Special versions Bellows seal/insulating section  
Version for high or low temperatures

Accessories Solenoid valve and/or  
Electric or pneumatic limit switch

Specifications subject to change without notice.



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