

## PV Compact

DN50-DN200

### Description

The PV Compact is a dynamic, adjustable differential pressure control valve (DPCV) that ensures the differential pressure across the load or circuit is constant.

PV Compact is offered in 2 series:

- The Ultra series has reduced size and weight to offer an easy installation.
- The Standard series has higher Kvs values to offer the lowest possible pressure loss.

### Application

The PV Compact should be installed in the return pipe and can be used in both heating and cooling systems.

### Operation

The PV Compact helps to deliver stable system conditions that provide improved control valve authority for modulating control valves whilst reducing the risk of noise.



### Benefits

- Compact design for ease of installation
- Delivers stable system conditions for improved control valve authority
- Differential pressure can be set and adjusted on site
- Reduces the risk of noise
- Wide range of housings for easy installation
- Integrated P/T Plugs for an efficient commissioning and trouble shooting
- Wide selection of differential pressure ranges
- Can be used as a flow limiter when combined with a partner valve
- Makes the systems flexible - all the circuits can operate independently

### Features

- Maximum differential pressure: 1000 kPa
  - (DN50 with 2 P/T Plugs: 450 kPa)
- Pressure class PN16 or PN25
- Size range DN50 - DN200
- High flow rates up to 261 m<sup>3</sup>/h
- Flange connections ISO 7005-2 / EN 1092-2
- Control ranges:
  - DN50:
    - 20 - 80 kPa
    - 20 - 100 kPa
    - 50 - 200 kPa
    - 150 - 500 kPa
  - DN65-DN100:
    - 20 - 100 kPa
    - 50 - 200 kPa
    - 150 - 500 kPa
  - DN125-DN200:
    - 20 - 100 kPa
    - 90 - 350 kPa

# PV Compact

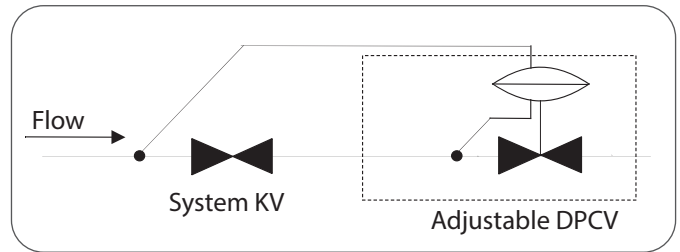
DN50-DN200

## Design

PV Compact consists of a differential pressure regulation unit, an adjustable presetting and a capillary tube for connecting to the inlet pipe line.

PV Compact must be installed in the return line with the capillary tube connected to the inlet line.

## Simplified Outline



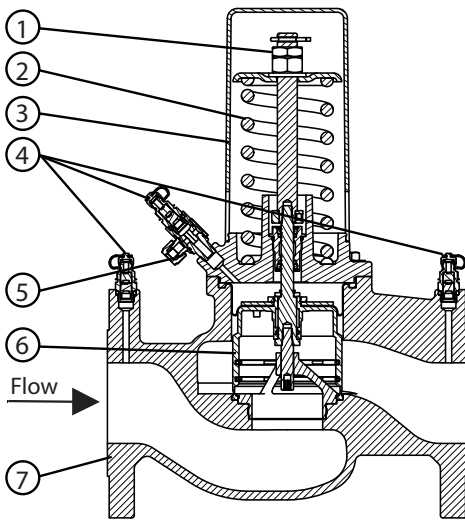
*PV Compact simplified outline*

## Design DN50-DN200 with 3 P/T Plugs & DN50 with 2 P/T Plugs

The valve DN50 is produced with 3 or with 2 P/T plugs.

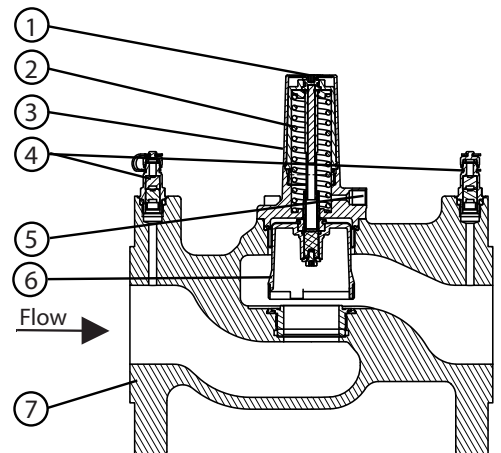
The valve DN50 with 2 P/T Plugs is lighter and more compact. To set the differential pressure on this valve a 4 mm hexagonal key is used. The key must be inserted in the setting screw and rotated the number of turns which can be specified based on the graph.

The setting of the valves with 3 P/T Plugs in sizes DN50-200 is done using a wrench and a differential pressure manometer.



*PV Compact DN50-DN200 with 3 P/T Plugs cross sectional drawing*

- ① Adjustment screw
- ② Spring
- ③ Spring cover
- ④ P/T Plugs
- ⑤ Capillary tube connection
- ⑥ Piston
- ⑦ Housing



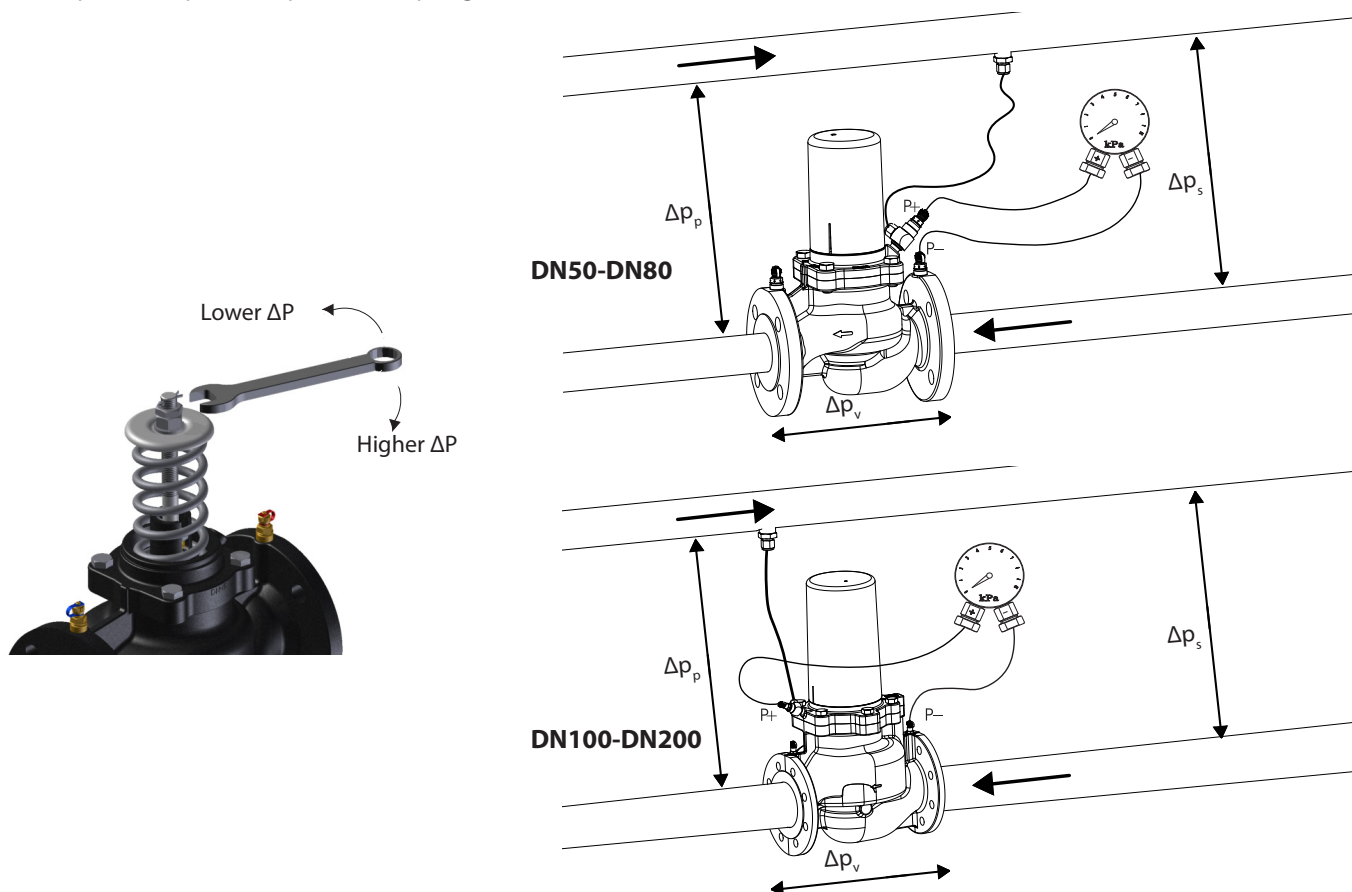
*PV Compact DN50 with 2 P/T Plugs cross sectional drawing*

# PV Compact

DN50-DN200

## Setting PV Compact DN50-DN200 with 3 P/T Plugs

- The valve is set by removing the plastic cap over the spring.
- Loosen the upper nut and set the  $\Delta P$  by turning the lower nut to the required  $\Delta P$ .
- After setting the valve, the upper nut must be locked against the lower nut, to stop them from turning.
- Replace the plastic cap over the spring.



PV Compact must be installed in the return line with the capillary tube connected to the inlet line. In this case, the purpose of PV Compact is to limit the differential pressure across the supply and the return line.

The differential pressure is measured by a manometer, and PV Compact is adjusted according to the description above, until the required differential pressure is reached.

### Example:

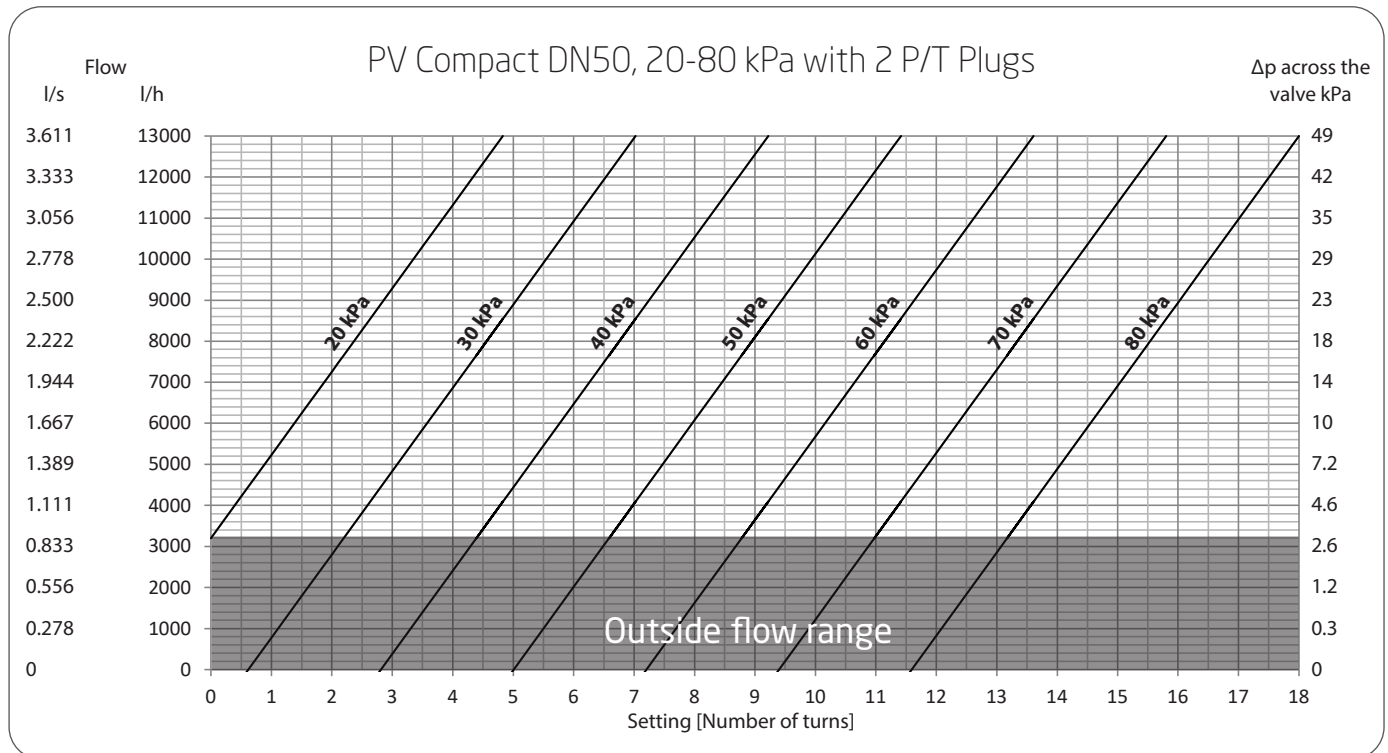
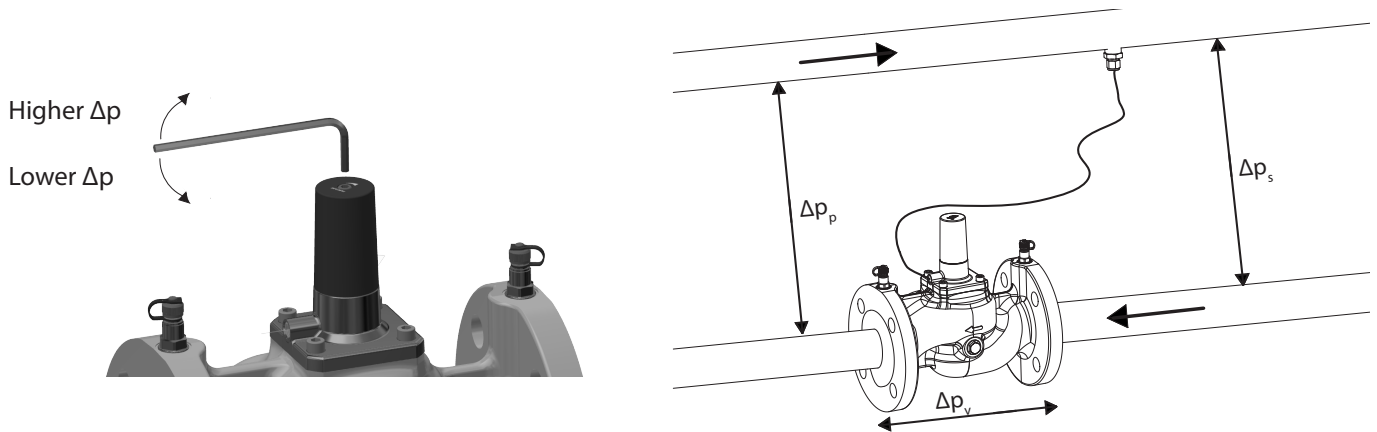
- Pump pressure ( $\Delta P_p$ ) = Differential pressure in system ( $\Delta P_s$ ) + Pressure loss across valve ( $\Delta P_v$ )
- Desired differential pressure in system = 30 kPa
- Flow in system = 10 m<sup>3</sup>/h
- Valve DN50 (Kv=29.0 m<sup>3</sup>/h)
- Pump pressure ( $\Delta P_p$ ) = 30 + ((10/29)<sup>2</sup> \* 100) = 30 kPa + 11.9 kPa = 41.9 kPa

# PV Compact

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## Setting PV Compact DN50 with 2 P/T Plugs

- The valve is easily set by means of a 4 mm hexagonal key.
- By use of the required flow rate and differential pressure, the pre-setting of the valve can easily be determined via the pre-setting graph.
- To set the valve to the desired differential pressure, the valve should be set at the minimum position and then adjusted in accordance with the presetting graph below.



# PV Compact

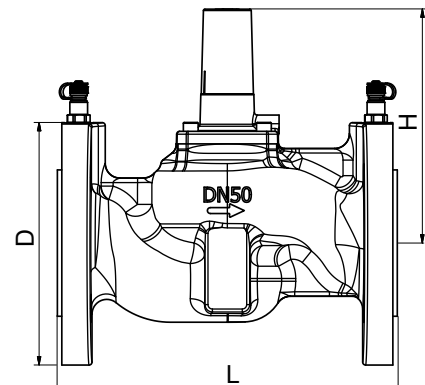
DN50-DN200

## Technical data

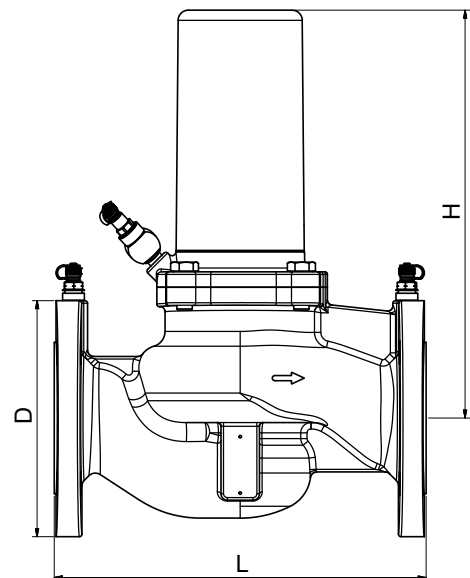
<b>Valve housing/Top cover:</b>	GJL-250 or GJS-400
<b>Top cover:</b>	
<b>(DN50 with 2 P/T Plugs):</b>	DZR Brass CWN602
<b>DP controller:</b>	Stainless steel
<b>(DN50 with 2 P/T Plugs):</b>	PPS 40% glass
<b>Spring:</b>	Spring wire (surface treated)
<b>Spindle assembly:</b>	Stainless steel
<b>Diaphragm:</b>	Reinforced EPDM
<b>(DN50 with 2 P/T Plugs):</b>	HNBR
<b>O-rings:</b>	EPDM
<b>Plastic cap over spring:</b>	PA6.6
<b>(DN50 with 2 P/T Plugs):</b>	ABS
<b>Pressure class:</b>	PN16/PN25
<b>Flange connections:</b>	ISO 7005-2/EN 1092-2
<b>Max. differential pressure:</b>	1000 kPa
<b>(DN50 with 2 P/T Plugs):</b>	450 kPa
<b>Medium temperature:</b>	DN50-DN200 PN16: -10°C to 120°C
	DN50-DN125 PN25: -10°C to 120°C
	DN150-DN200 PN25: -10°C to 110°C
<b>Capillary tube:</b>	ø6mm, L = 2000mm
<b>(DN50 with 2 P/T Plugs):</b>	ø3mm, L = 1000mm

The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene).

Recommendation: Water treatment to VDI 2035.



PV Compact DN50 with 2 P/T Plugs



PV Compact DN50-DN200 with 3 P/T Plugs

## Dimension & Weight · DN50

Series		Ultra		Standard	
Control range	kPa	20 - 80*	20 - 100	50 - 200	150 - 500
	l/s	0.89 - 3.61	0.90 - 3.60	1.42 - 5.70	2.47 - 9.87
Flow rate	m <sup>3</sup> /h	3.2 - 13.0	3.2 - 13.0	5.1 - 20.5	8.9 - 35.5
	gpm	14.1 - 57.2	14.1 - 57.2	22.5 - 90.3	39.2 - 156
Kvs	m <sup>3</sup> /h	18.6		29	
Dim. [mm]	L	230		230	
	D	165		165	
	H	158		272	
Weight	kg	10.7		16	

\*) PV Compact with 2 P/T Plugs

# PV Compact

DN50-DN200

## Dimension & Weight · DN65

Series		Ultra		Standard		
Control range	kPa	20 - 100	50 - 200	20 - 100	50 - 200	150 - 500
Flow rate	l/s	0.89 - 5.22	1.42 - 5.81	1.30 - 5.22	2.06 - 8.25	3.57 - 14.3
	m <sup>3</sup> /h	3.2 - 18.8	5.1 - 21.0	4.70 - 18.8	7.4 - 29.7	12.9 - 51.4
	gpm	14.1 - 82.8	22.5 - 92.5	20.7 - 82.8	32.6 - 131	56.8 - 226
Kvs	m <sup>3</sup> /h	33.2		42		
Dim. [mm]	L	290		290		
	D	185		185		
	H	272		318		
Weight	kg	18.1		21		

## Dimension & Weight · DN80

Series		Ultra		Standard		
Control range	kPa	20 - 100	50 - 200	20 - 100	50 - 200	150 - 500
Flow rate	l/s	1.31 - 8.33	2.06 - 8.33	2.08 - 8.32	3.29 - 13.2	5.70 - 22.8
	m <sup>3</sup> /h	4.7 - 30.0	7.4 - 30.0	7.5 - 30.0	11.8 - 47.4	20.5 - 82.1
	gpm	20.7 - 132	32.6 - 132	33.0 - 132	52.0 - 209	90.3 - 362
Kvs	m <sup>3</sup> /h	48.2		67		
Dim. [mm]	L	310		310		
	D	200		200		
	H	318		371		
Weight	kg	21.4		31		

## Dimension & Weight · DN100

Series		Ultra		Standard		
Control range	kPa	20 - 100	50 - 200	20 - 100	50 - 200	150 - 500
Flow rate	l/s	2.08 - 14.3	3.28 - 13.8	3.57 - 14.3	5.65 - 22.6	9.78 - 39.1
	m <sup>3</sup> /h	7.5 - 51.4	11.8 - 49.7	12.9 - 51.4	20.3 - 81.3	35.2 - 141
	gpm	33.0 - 226	51.9 - 219	56.8 - 226	89.4 - 358	155 - 621
Kvs	m <sup>3</sup> /h	75.7		115		
Dim. [mm]	L	350		350		
	D	235		235		
	H	371		505		
Weight	kg	35.3		50		

# PV Compact

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## Dimension & Weight · DN125

Series		Ultra	Standard	
Control range	kPa	20 - 100	20 - 100	90 - 350
	l/s	3.58 - 21.1	5.28 - 21.1	11.2 - 44.8
Flow rate	m <sup>3</sup> /h	12.9 - 76.0	19.0 - 76.0	40.3 - 161
	gpm	56.8 - 335	83.7 - 335	177 - 709
Kvs	m <sup>3</sup> /h	121	170	
Dim. [mm]	L	400	400	
	D	270	270	
	H	505	536	
Weight	kg	62.4	77	

## Dimension & Weight · DN150

Series		Standard	
Control range	kPa	20 - 100	90-350
	l/s	7.76-31.1	16.5 - 65.9
Flow rate	m <sup>3</sup> /h	28.0 - 112	59.3 - 237
	gpm	123 - 493	261 - 1040
Kvs	m <sup>3</sup> /h	250	
Dim. [mm]	L	480	
	D	285	
	H	584	
Weight	kg	115	

## Dimension & Weight · DN200

Series		Standard	
Control range	kPa	20 - 100	90 - 350
	l/s	8.54 - 34.2	18.1 - 72.5
Flow rate	m <sup>3</sup> /h	30.7 - 123	65.2 - 261
	gpm	135 - 542	287 - 1150
Kvs	m <sup>3</sup> /h	275	
Dim. [mm]	L	600	
	D	380	
	H	587	
Weight	kg	180	

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## Product Programme

Dim	Series	Kvs	Control range kPa	Flow m <sup>3</sup> /h	PN16	PN25
DN50 (With 2 P/T Plugs)	Ultra	18.6	20-80	3.20 - 13.0	53-5200	53-5220
DN50	Standard	29	20-100	3.20 - 13.0	53-3300	53-3320
			50-200	5.10 - 20.5	53-3301	53-3321
			150-500	8.90 - 35.5	53-3302	53-3322
DN65	Ultra	33.2	20-100	3.2 - 18.8	53-5203	53-5223
			50-200	5.1 - 21.0	53-5204	53-5224
	Standard	42	20-100	4.70 - 18.8	53-3303	53-3323
			50-200	7.40 - 29.7	53-3304	53-3324
			150-500	12.9 - 51.4	53-3305	53-3325
			20-100	4.7 - 30.0	53-5206	53-5226
DN80	Ultra	48.2	50-200	7.4 - 30.0	53-5207	53-5227
			20-100	7.50 - 30.0	53-3306	53-3326
	Standard	67	50-200	11.8 - 47.4	53-3307	53-3327
			150-500	20.5 - 82.1	53-3308	53-3328
DN100	Ultra	75.7	20-100	7.5 - 51.4	53-5209	53-5229
			50-200	11.8 - 49.7	53-5210	53-5230
	Standard	115	20-100	12.9 - 51.4	53-3309	53-3329
			50-200	20.3 - 81.3	53-3310	53-3330
			150-500	35.2 - 141	53-3311	53-3331
			20-100	12.9 - 76.0	53-5212	53-5232
DN125	Standard	170	20-100	19.0 - 76.0	53-3312	53-3332
			90-350	40.3 - 161	53-3313	53-3333
	20-100	28.0 - 112	53-3315	53-3335		
DN150	Standard	250	90-350	59.3 - 237	53-3316	53-3336
			20-100	30.7 - 123	53-3318	53-3338
DN200	Standard	275	90-350	65.2 - 261	53-3319	53-3339

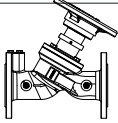
The valve can be ordered with a protective coating in C5 standard. The product will have the item code extension - **ST01**.  
Example: PV Compact DN65 Standard PN16 20-100 kPa with C5 coating has item code **53-3303-ST01**



# PV Compact

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
## Accessories - Partner valves for PV Compact

STBV VODRV	DN50	DN65	DN80	DN100	DN125	DN150	DN200
	53-2565 (Threaded)	53-2506	53-2507	53-2508	53-2509	53-2510	53-2511
Kv Total (Fully open valve)	40	64.1	85.4	119	203	263	504

Kv = m<sup>3</sup>/h at a pressure drop of 1 bar across the fully open valve.

**For more information please refer to the Frese STBV VODRV Technote.**

## Accessories

	Frese no.	Description
	09-2072	P/T-plug and connection for capillary tube (for use with PV Compact DN50 with 2 P/T Plugs)
	48-0033	Connection for capillary tube (for use with PV Compact DN50-DN200)

## Text for technical specifications

The valve should be a dynamic differential pressure control valve with the option of setting the differential pressure on site without suspension of operation.

The valve shall have a control range of 20-80 kPa, 20-100 kPa, 50-200 kPa or 150-500 kPa (DN50-DN100) and a control range of 20-100 kPa or 90-350 kPa (DN125-DN200)

The valve shall operate with a differential pressure up to 450 kPa or 1000 kPa.

The valve should be pressure rated PN16 or PN25.

The valve housing shall be GJL-250 or GJS-400.

The valve shall contain a differential pressure control bonnet assembly.

The valve shall have flange connections according to ISO 7005-2/EN 1092-2

The valve should be permanently marked with an indicator for flow direction.

P/T plugs shall be available.

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