# PV-SIGMA Compact

Spectrum-series, DN15-DN50

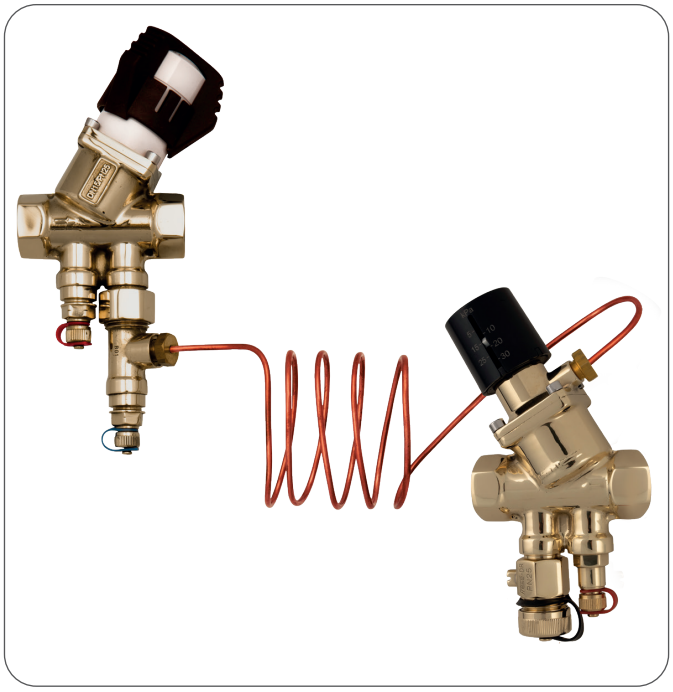
## Application

PV-SIGMA Compact Spectrum-series can be installed in domestic and commercial heating and cooling systems.

The PV-SIGMA Compact Spectrum-series combines the SIGMA Compact dynamic balancing valve positioned in the flow and the PV Compact Spectrum-series differential pressure control valve positioned in the return.

The Frese PV-SIGMA Compact Spectrum-series system ensures 100% flow and differential pressure regulation under all conditions, irrespective of any changes within the system whilst providing simple and trouble free commissioning.

The Frese PV-SIGMA Compact Spectrum-series system operates by limiting the flow and pressure in a system, and thereby ensures the correct energy consumption at the same time as it eliminates the risk of noise caused by excess differential pressure.



## Benefits

- Simple presetting of flow and differential pressure
- High Kv value that achieves a low pressure loss and increased energy efficiency
- Positive close off to prevent rising differential pressure when control valves in the controlled circuit are fully closed
- Flow and differential pressure can be adjusted independently of each other
- Tamper-proof presetting device on top of the valve, meaning there is no need for valve sealing after presetting
- Differential pressure can be set and adjusted on site
- Simple presetting using the scale on the cap
- The PV Compact Spectrum-series eliminates noise caused by high differential pressure whilst the SIGMA Compact limits the flow in a system, ensuring no overflows

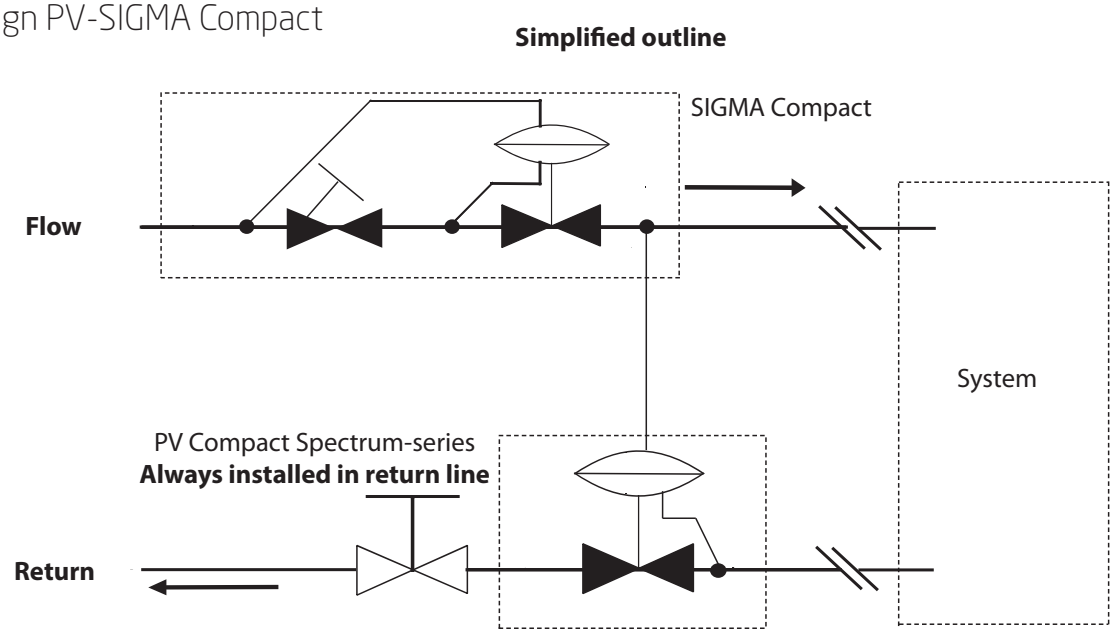
## Features

- Size range: DN15 to DN50
- Maximum flow: 10350 l/h
- Maximum differential pressure 400 kPa
- Setting ranges: 5-30 kPa, 20-60 kPa and 20-80 kPa
- Differential pressure regulation, flow regulation, drain and PT plugs as standard
- Isolation in the flow direction on the SIGMA Compact according to EN1349 Class IV
- Isolation in the return flow using the supplied ball valve
- Compact housings for easy installation

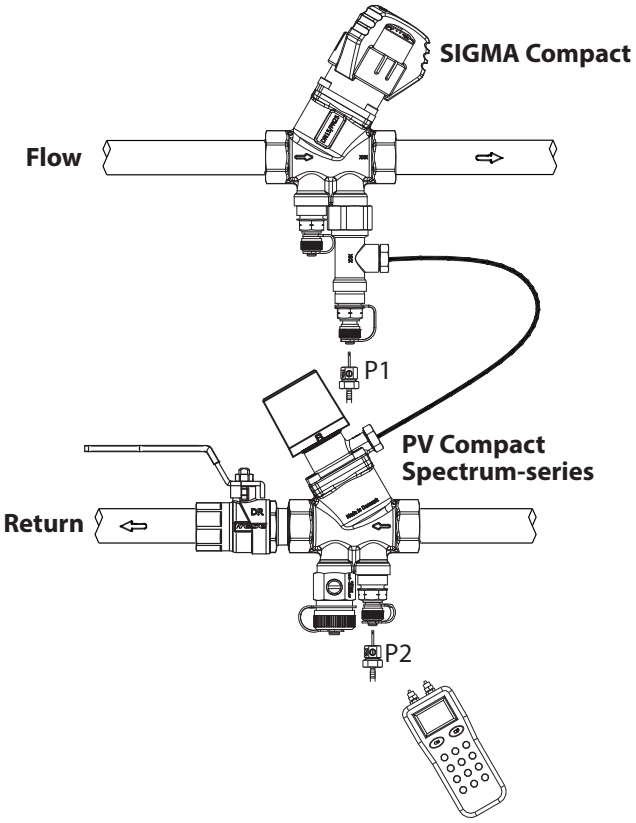
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Design PV-SIGMA Compact




## Measurement of differential pressure across the system




Design flow: The flow limitation is adjusted directly on SIGMA Compact (See Technote for SIGMA Compact or use the Frese APP)

Differential pressure : $\Delta P_S$ is adjusted directly on the scale of PV Compact Spectrum-series
(See Technote for PV Compact Spectrum-series)

The differential pressure of the system ($\Delta P_S$) is measured from P1 to P2

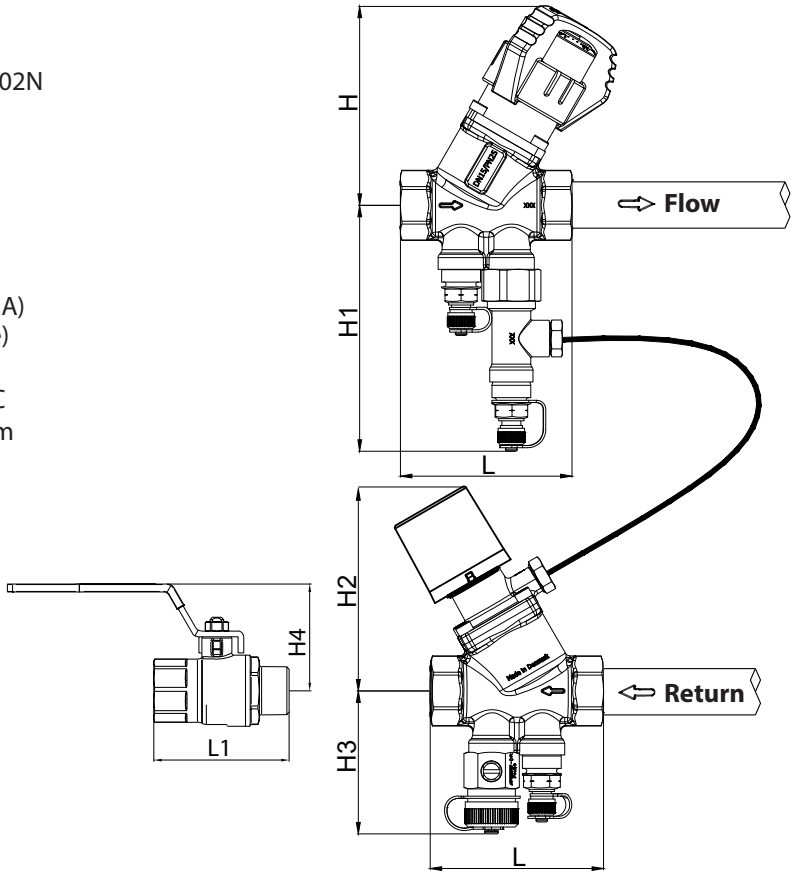
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Technical data

| | |
|---|---|
| **Housing DN15-32:** | DZR Brass, CW602N |
| **DN40-50** | Ductile Iron |
| **DP controller:** | PPS (40% glass) |
| **Flow setting:** | PA6 (20% glass) |
| **Spring:** | Stainless steel |
| **Diaghragm:** | HNBR |
| **O-rings:** | EPDM |
| **Pressure class:** | PN25 (PV+SIGMA)<br>PN16 (Ball valve) |
| **Max. differential pressure:** | 400 kPa |
| **Temperature range:** | -10°C to + 120°C |
| **Capillary tube:** | Ø3, L = 1000 mm |

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.



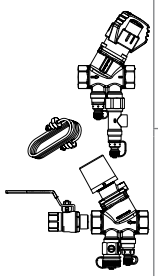

## PV-SIGMA Compact Spectrum-series

| Dimension | | DN15 | | DN20 | | DN25 | | DN32 | DN40 | DN50 |
|---|---|---|---|---|---|---|---|---|---|---|
| Version | | Low | High | Low | High | Low | High | - | - | - |
| Control range | kPa | 5-30 | 20-60 | 5-30 | 20-60 | 5-30 | 20-80 | 20-80 | 20-80 | 20-80 |
| Flow range | l/s | 0.014-0.167 | 0.028-0.278 | 0.028-0.278 | 0.042-0.536 | 0.167-0.583 | 0.208-0.667 | 0.278-1.389 | 0.833-2.056 | 1.389-2.875 |
| | l/h | 50-600 | 100-1000 | 100-1000 | 150-1930 | 600-2100 | 750-2400 | 1000-5000 | 3000-7400 | 5000-10350 |
| | gpm | 0.22-2.64 | 0.44-4.40 | 0.44-4.40 | 0.66-8.50 | 2.64-9.25 | 3.30-10.56 | 4.40-22.01 | 13.21-32.58 | 22.01-45.57 |
| Dimension mm | L | 75 | | 79 | | 78 | 78/100 | 104 | 138 | 138 |
| | L1 | 60 | | 66 | | 78 | | 96 | 103 | 125 |
| | H | 87 | | 87 | | 90 | 90 | 110 | 131 | 131 |
| | H1 | 108 | | 108 | | 108 | 108 | 119 | 121 | 127 |
| | H2 | 87 | | 87 | | 90 | 142 | 142 | 161 | 161 |
| | H3 | 66 | | 66 | | 68 | 72 | 77 | 80 | 86 |
| | H4 | 44 | | 47 | | 55 | | 75 | 82 | 94 |

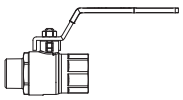
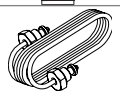
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Product programme

| | Dimension | DN15 | DN20 | DN25 | DN32 | DN40 | DN50 |
|---|---|---|---|---|---|---|---|
| PV-SIGMA Compact Spectrum-series with drain valve, P/T plugs, isolation ball valve and capillary tube. |  | 53-3270<br>Low<br>5-30 kPa | 53-3272<br>Low<br>5-30 kPa | 53-3274<br>Low<br>5-30 kPa | 53-3276<br>20-80 kPa | 53-3277<br>Low<br>20-80 kPa | 53-3278<br>Low<br>20-80 kPa |
| | | 53-3271<br>High<br>20-60 kPa | 53-3273<br>High<br>20-60 kPa | 53-3275<br>High<br>20-80 kPa | | | |

## Accessories

| | Female/Male | Dimensions | Frese no. |
|---|---|---|---|
| Isolation ball valve |  | DN15 | 38-5020 |
| | | DN20 | 38-5022 |
| | | DN25 | 38-5024 |
| | | DN32 | 38-5026 |
| | | DN40 | 38-5028 |
| | | DN50 | 38-5030 |
| 1/2" Female end with P/T-plug | | - | 48-0017 |
| Capillary tube ø3mm x 1000 mm |  | - | 48-0004 |

# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Example: Pre setting the valves

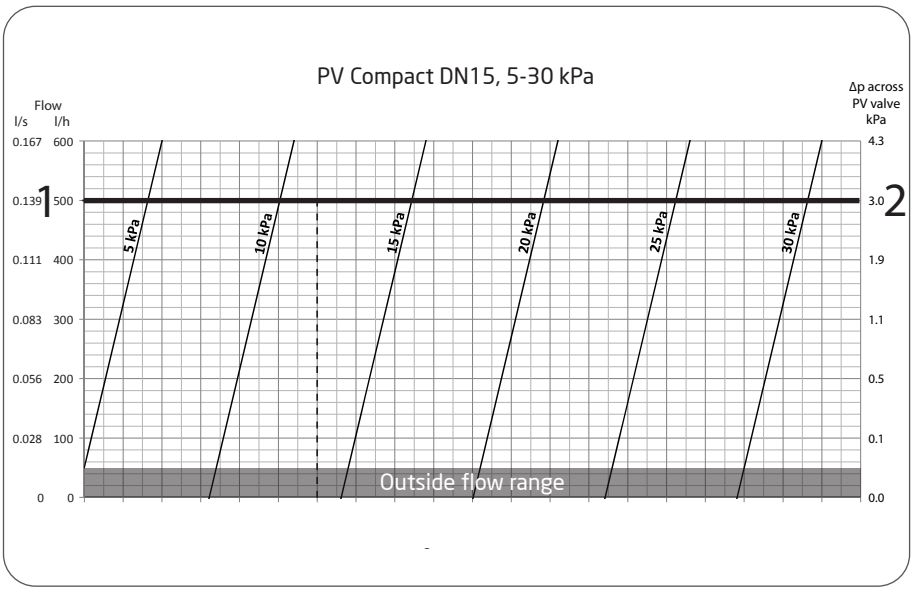
**PV-SIGMA Compact DN15 Low Differential pressure system ($\Delta P_s$)12 kPa**

**Design flow 500 l/h (0,139 l/s)**

**Differential pressure setting PV Compact Spectrum-series**

1. The differential pressure is set directly on the scale and the pressure loss across the valve can be found on the graph or in the Frese APP

2. The minimum pressure drop required will be 3.0 kPa across the valve. ($\Delta P_{V2}$)



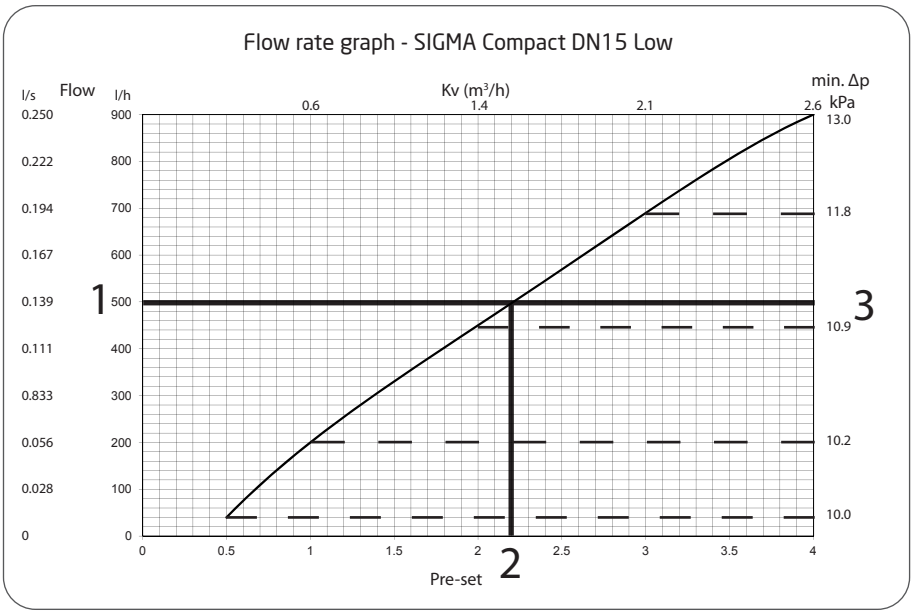

**Flow setting SIGMA Compact DN15 Low**

**Design flow 500 l/h (0,139 l/s)**

1. The design flow is used as the point of reference for the setting. (See the graph)

2. The pre-setting for the valve is found by means of the flow rate graph or the Frese APP
Setting = 2.2

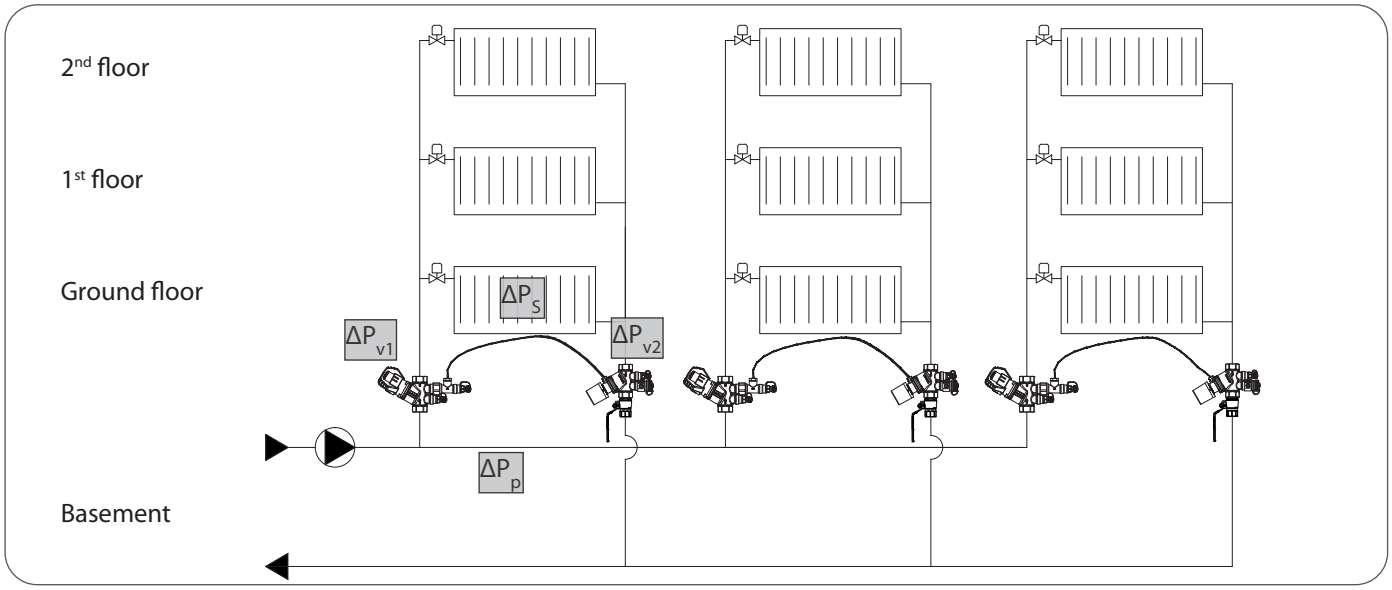
3. The minimum differential pressure required will be 11 kPa across the valve. ($\Delta P_{V1}$)



# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Example: Outline of a heating system - 3 blocks with 3 flats in each




**Total pump pressure**

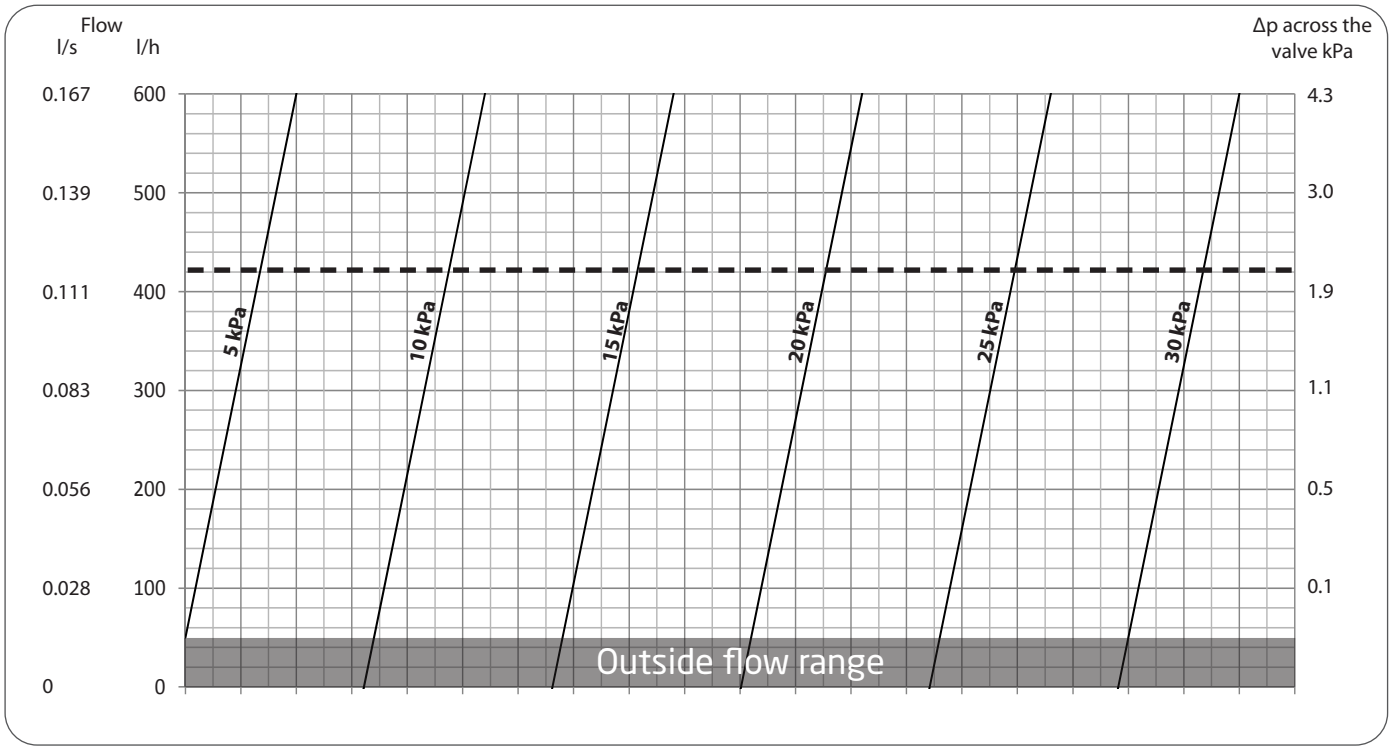
Based on the examples on the previous pages and assuming there are three identical risers in the building, the total required pump pressure for each riser can now be calculated:

$\Delta P_P = \Delta P_S + (\Delta P_{V1+V2}) \Rightarrow \Delta P_P = 12\ kPa + (11\ kPa + 3\ kPa) =$ **26 kPa**

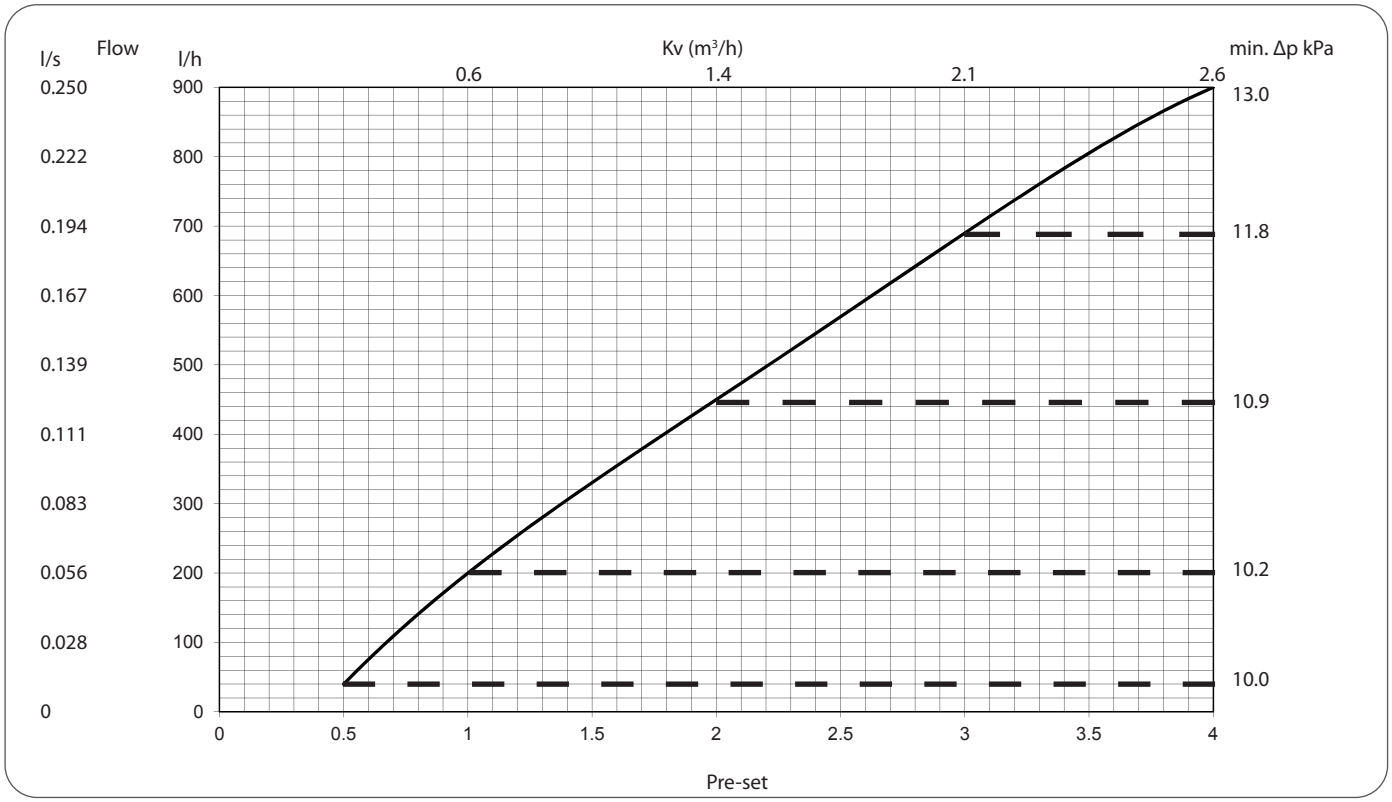
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN15, 5-30 kPa



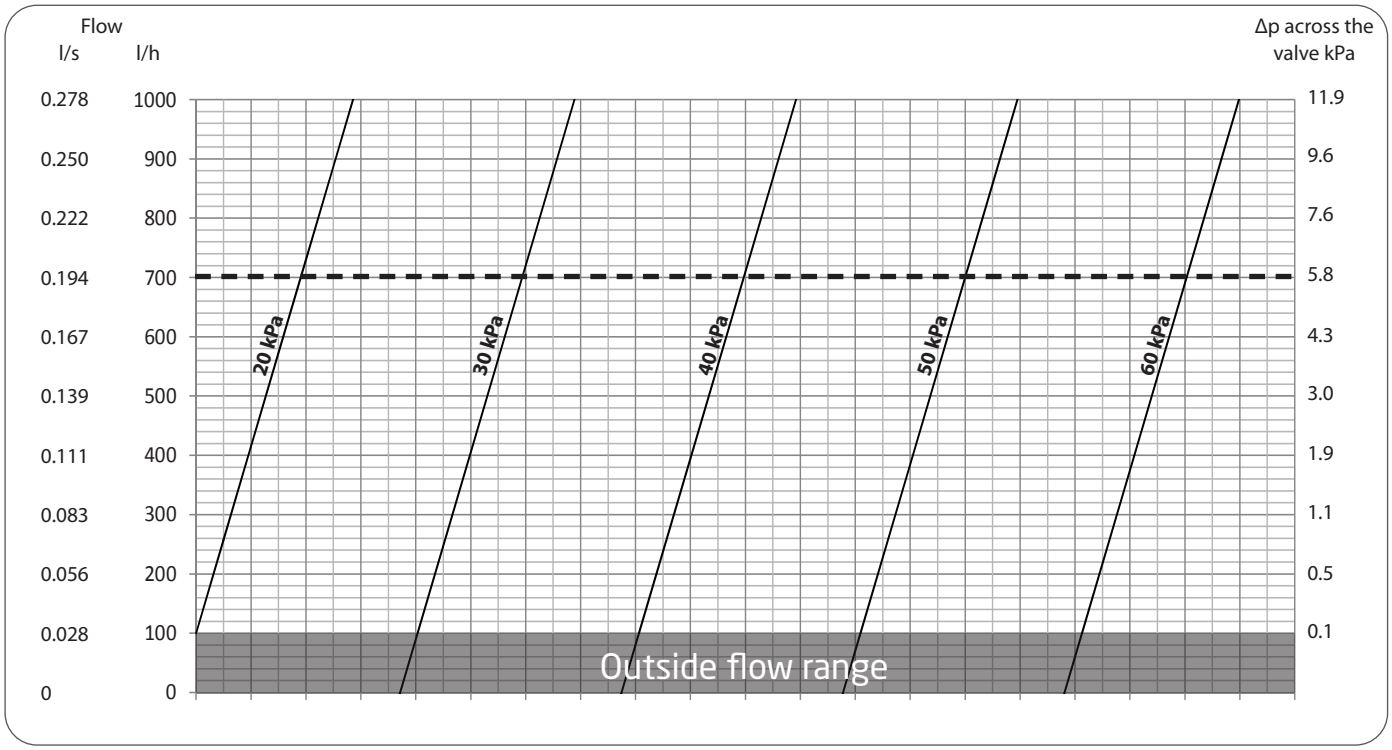

## SIGMA Compact DN15 Low



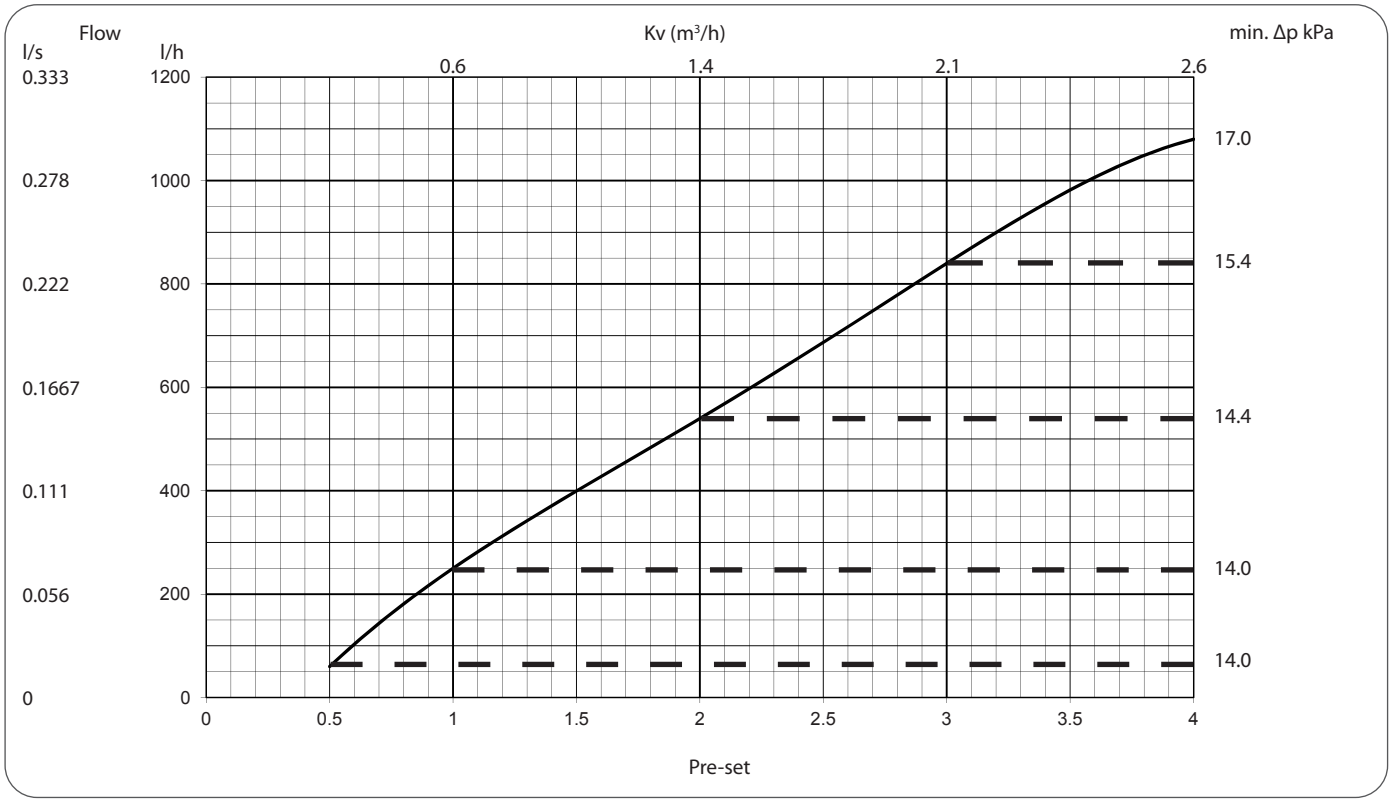
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN15, 20-60 kPa



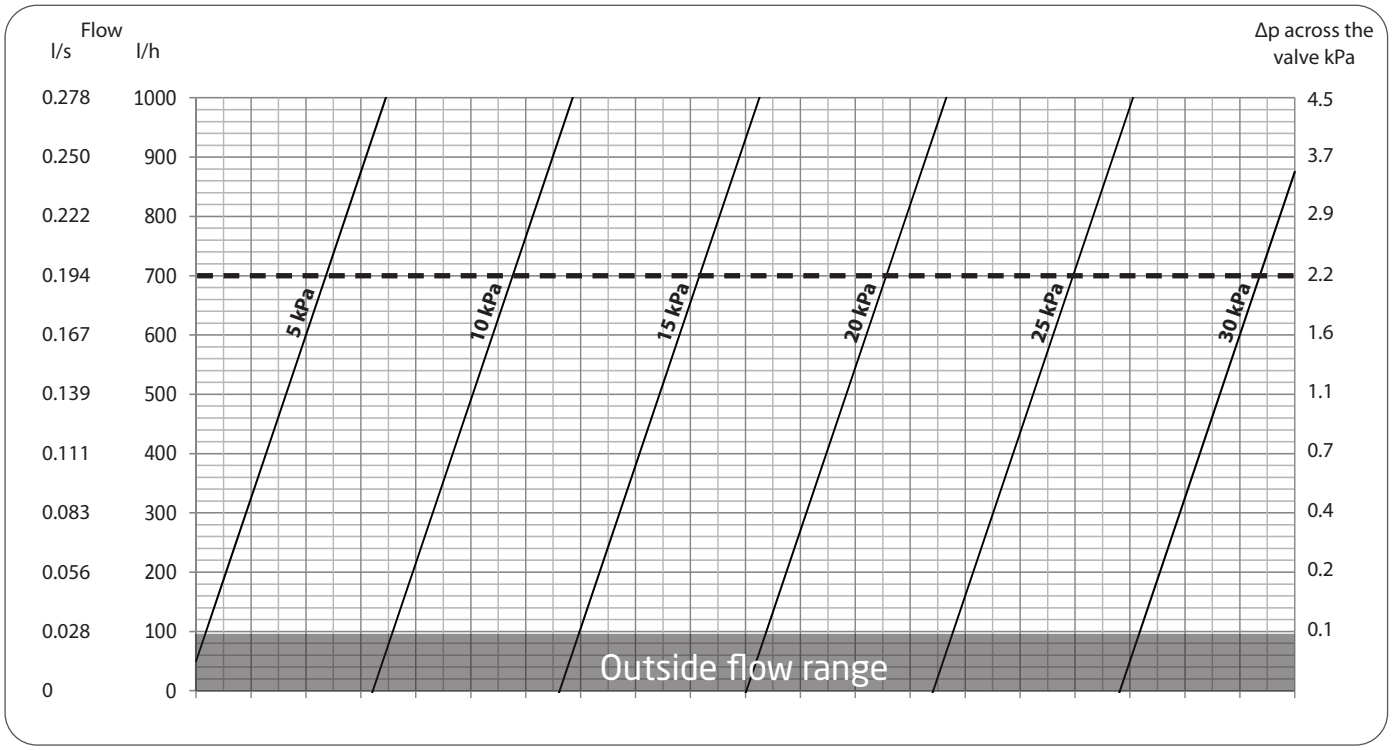

## SIGMA Compact DN15 High



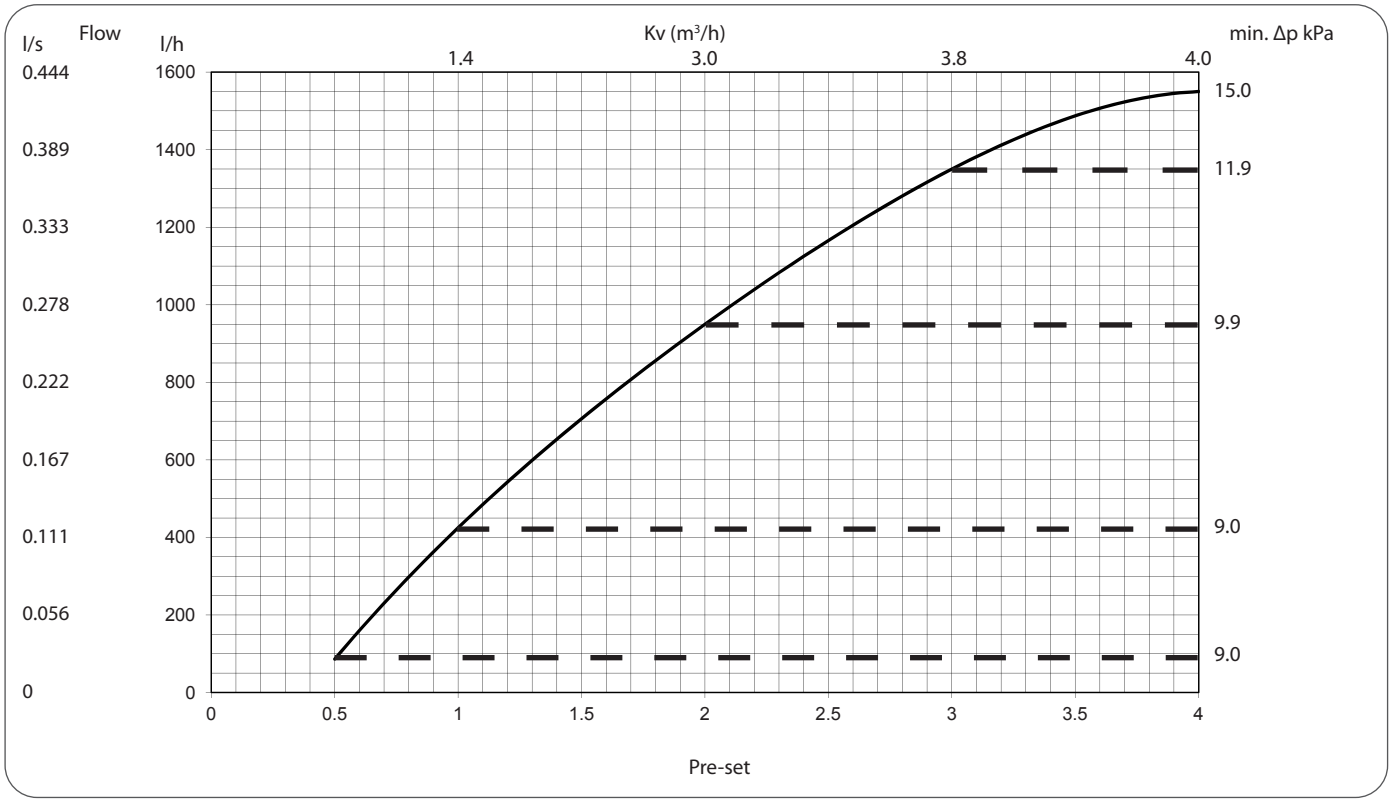
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN20, 5-30 kPa



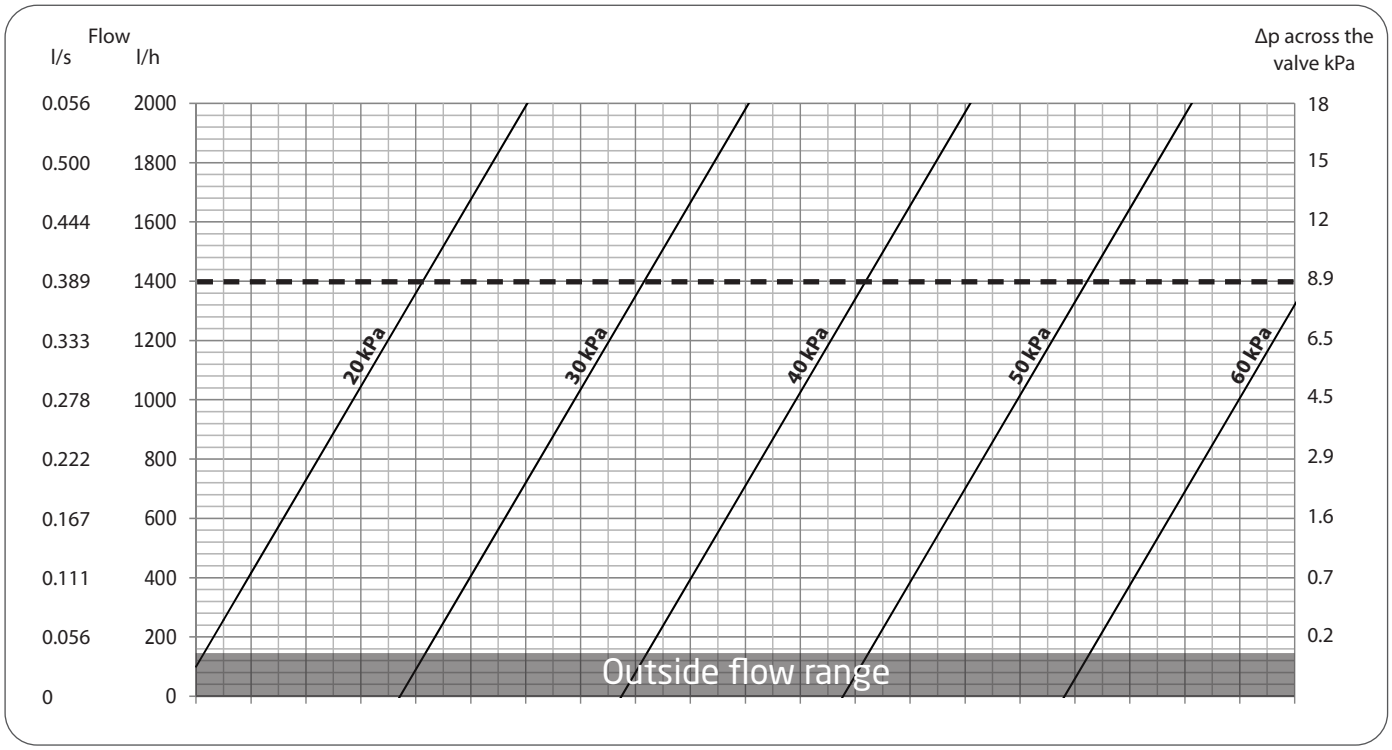

## SIGMA Compact DN20 Low



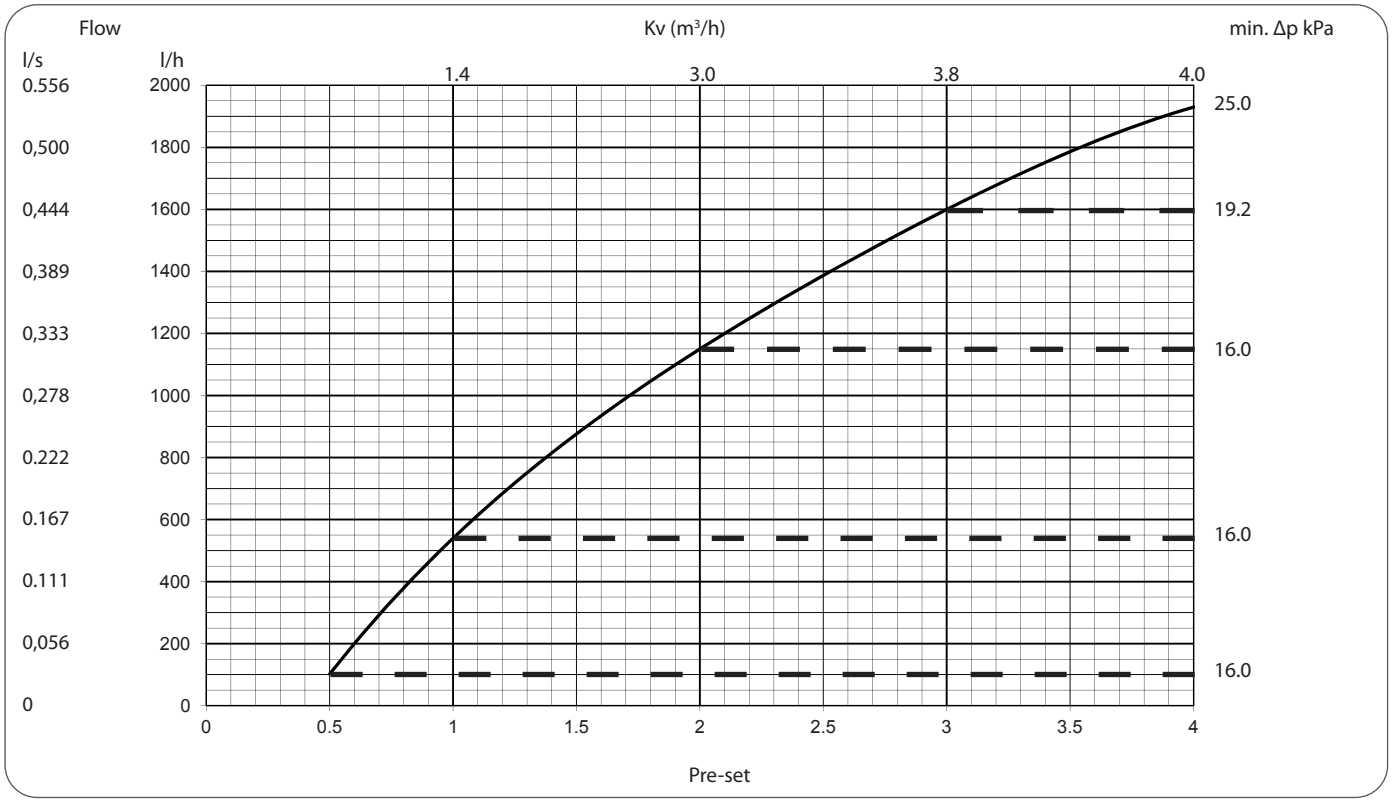
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN20, 20-60 kPa



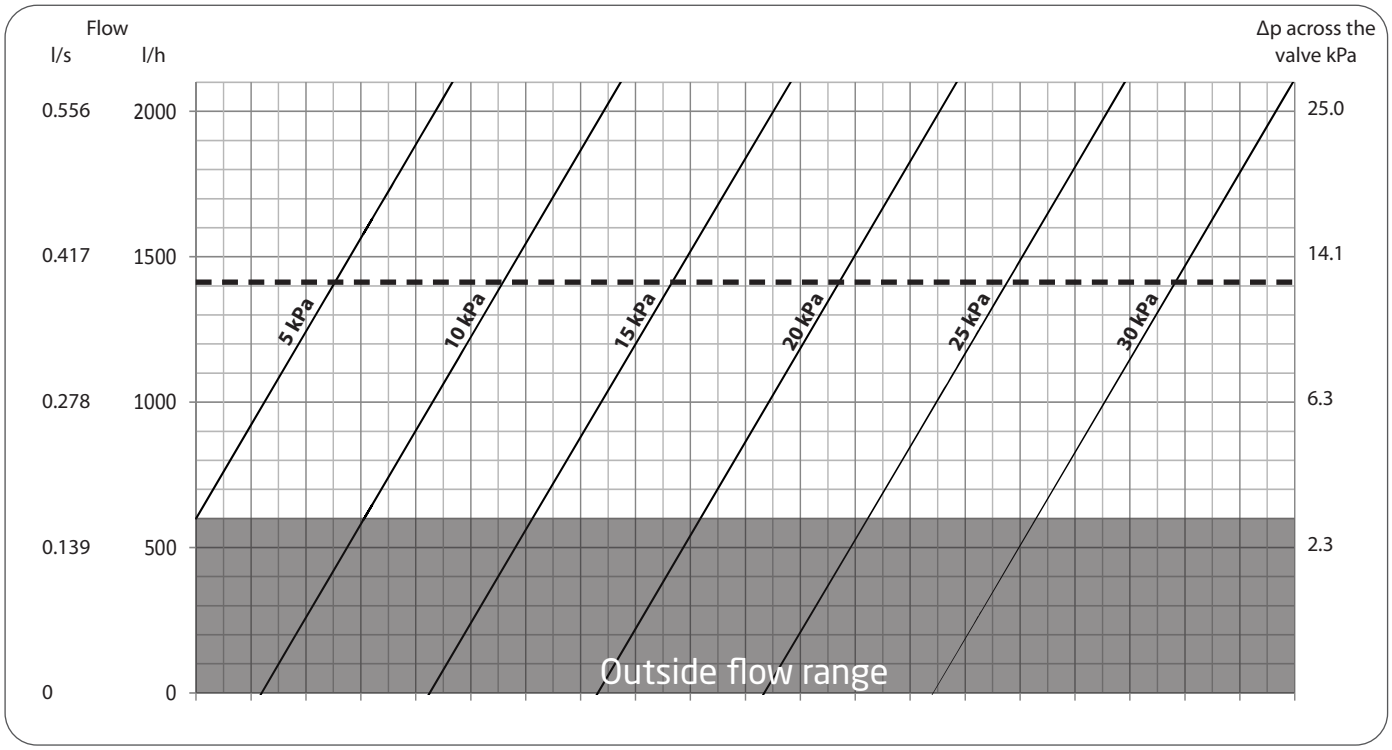

## SIGMA Compact DN20 High



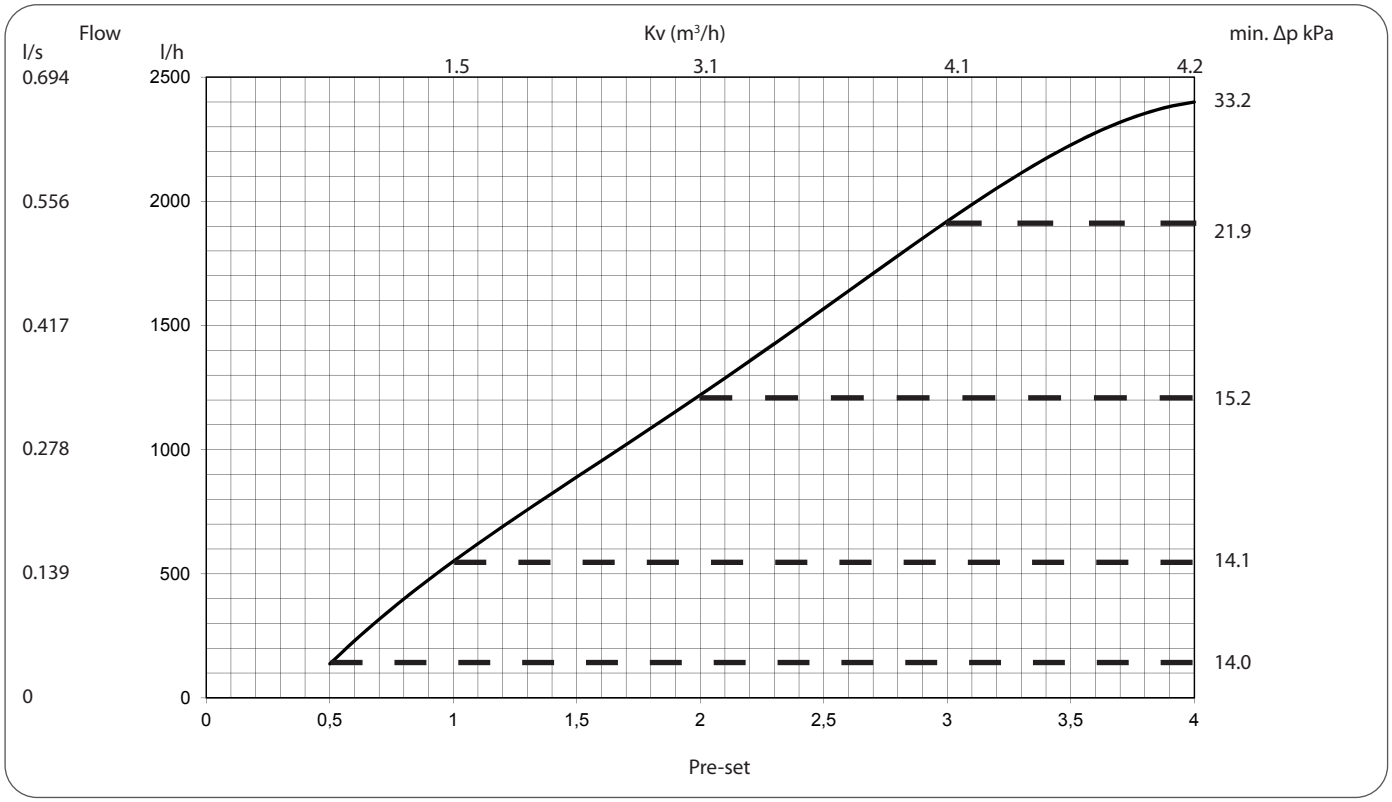
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN25, 5-30 kPa



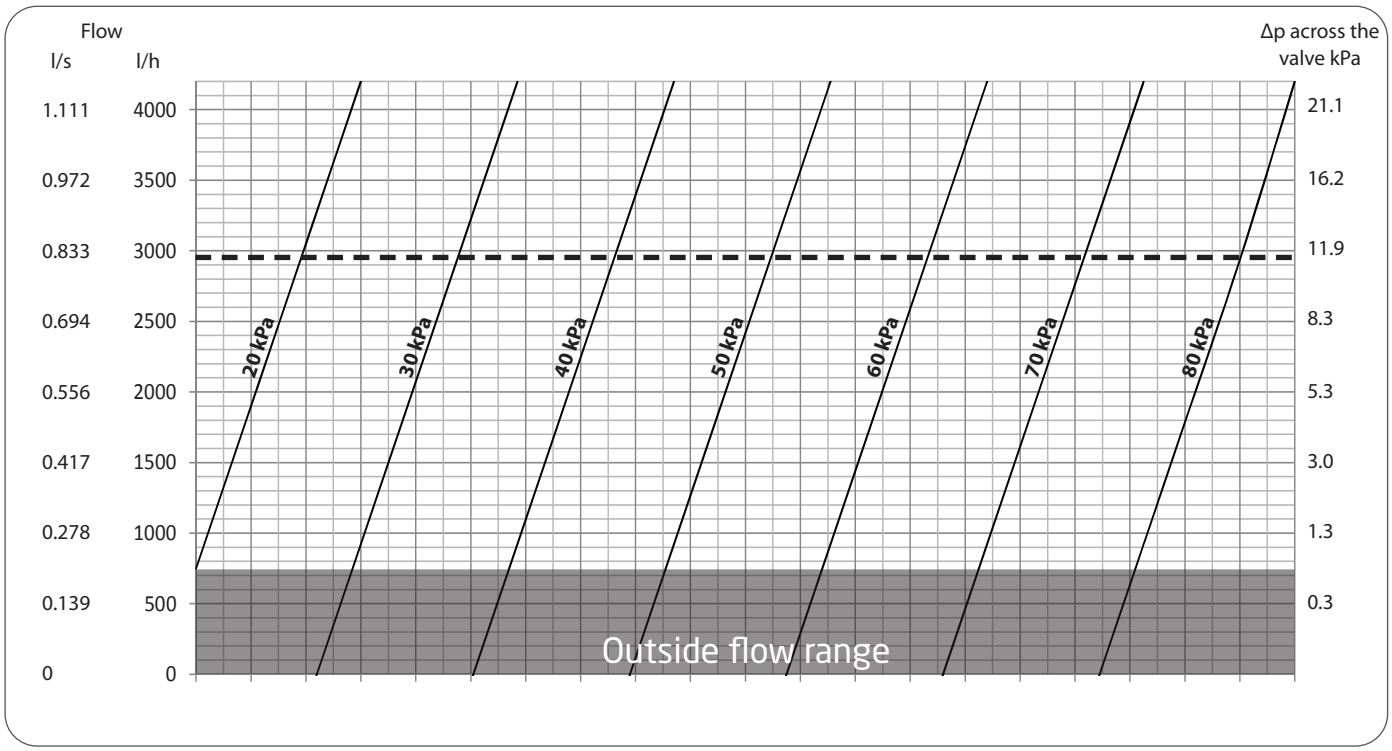

## SIGMA Compact DN25 High



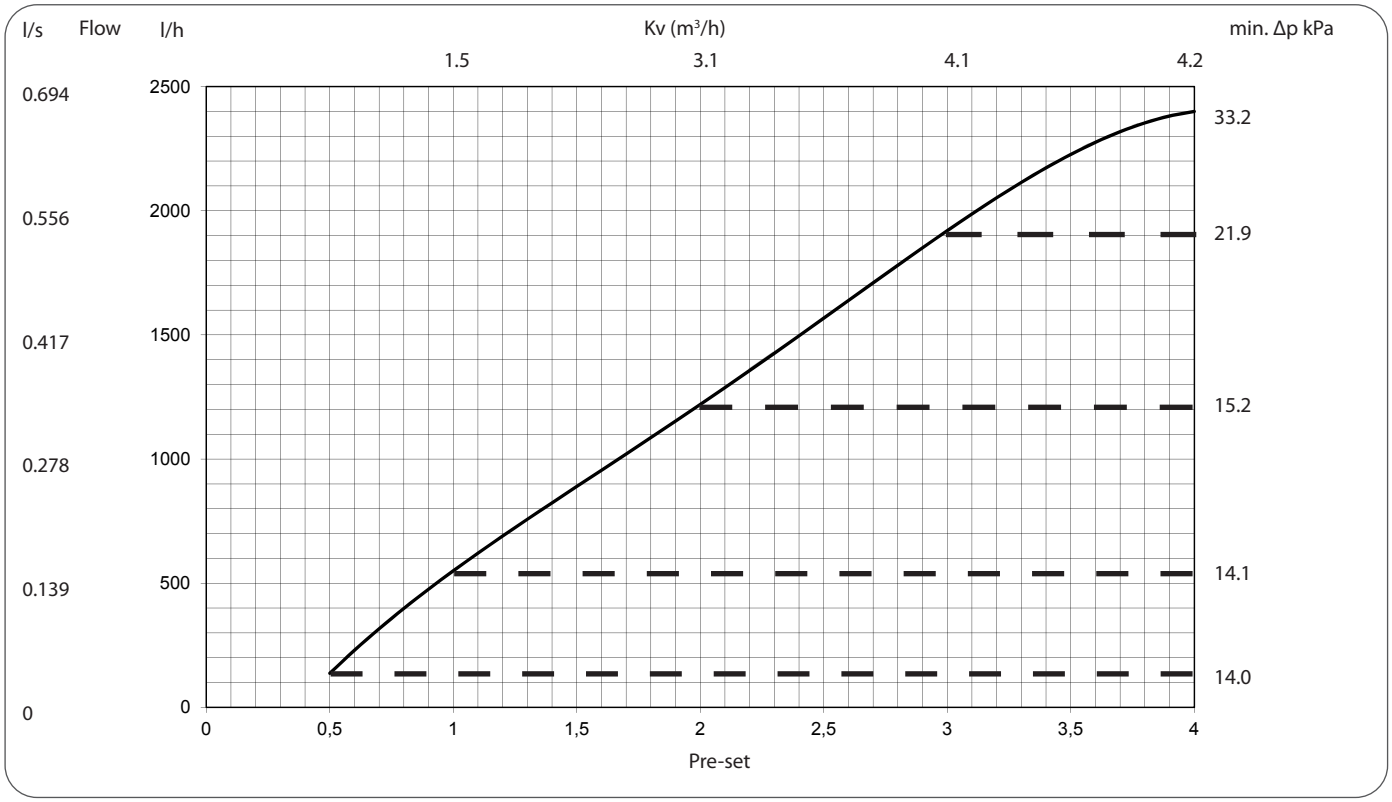
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN25L, 20-80 kPa



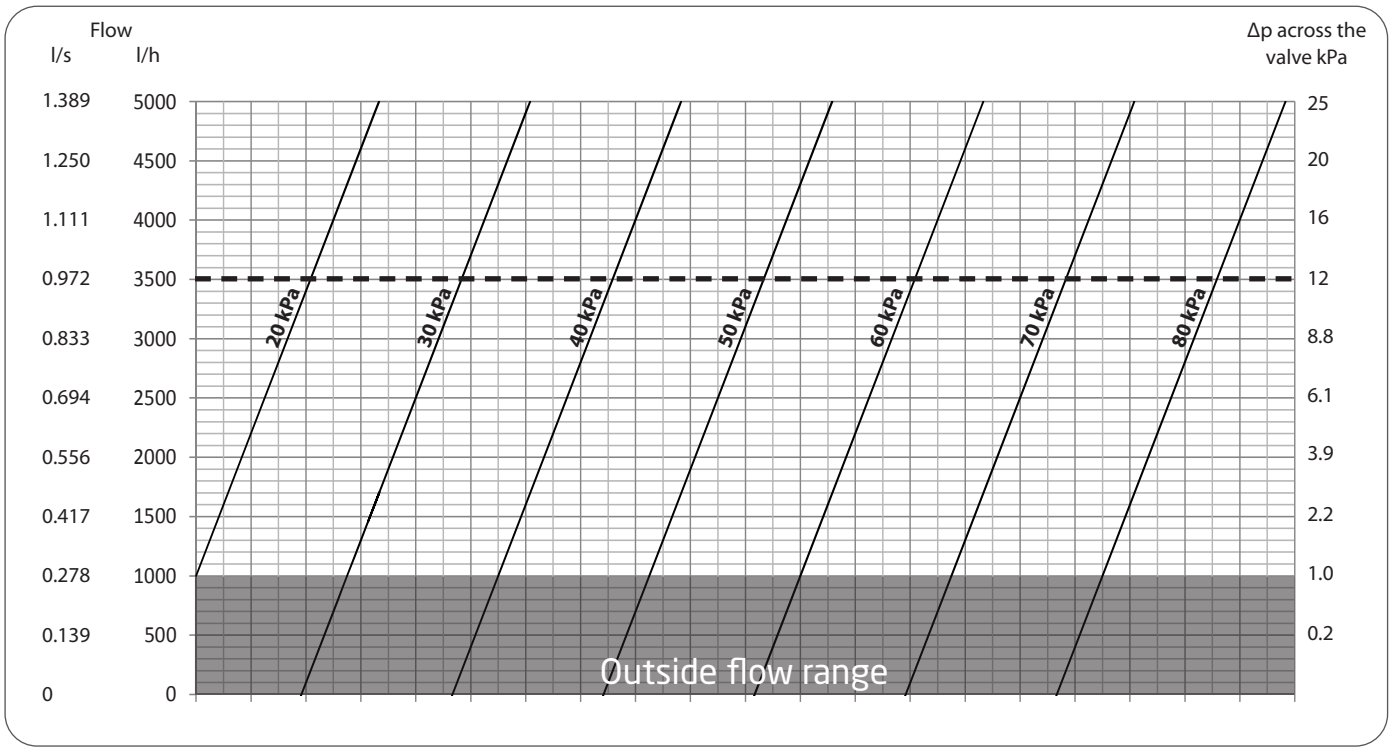

## SIGMA Compact DN25 High



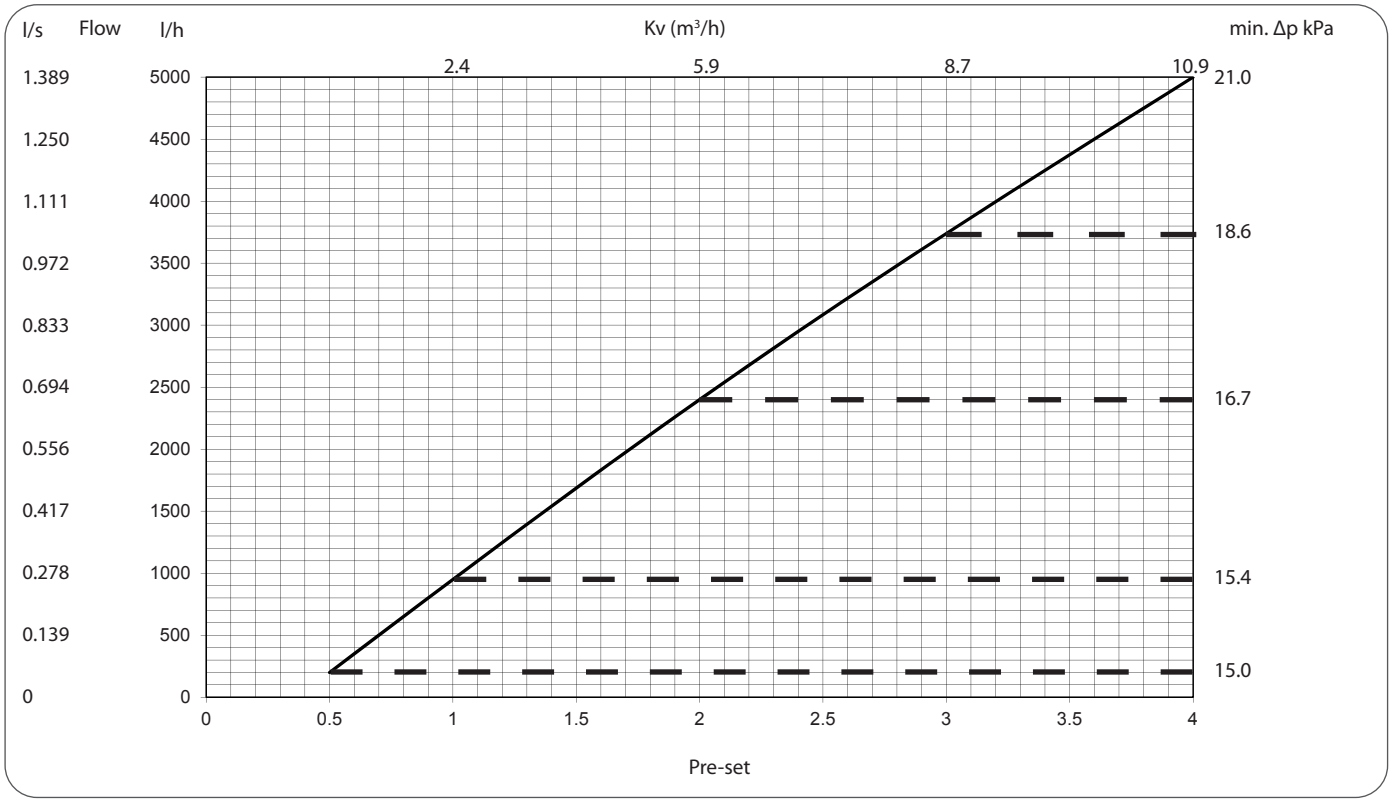
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN32, 20-80 kPa



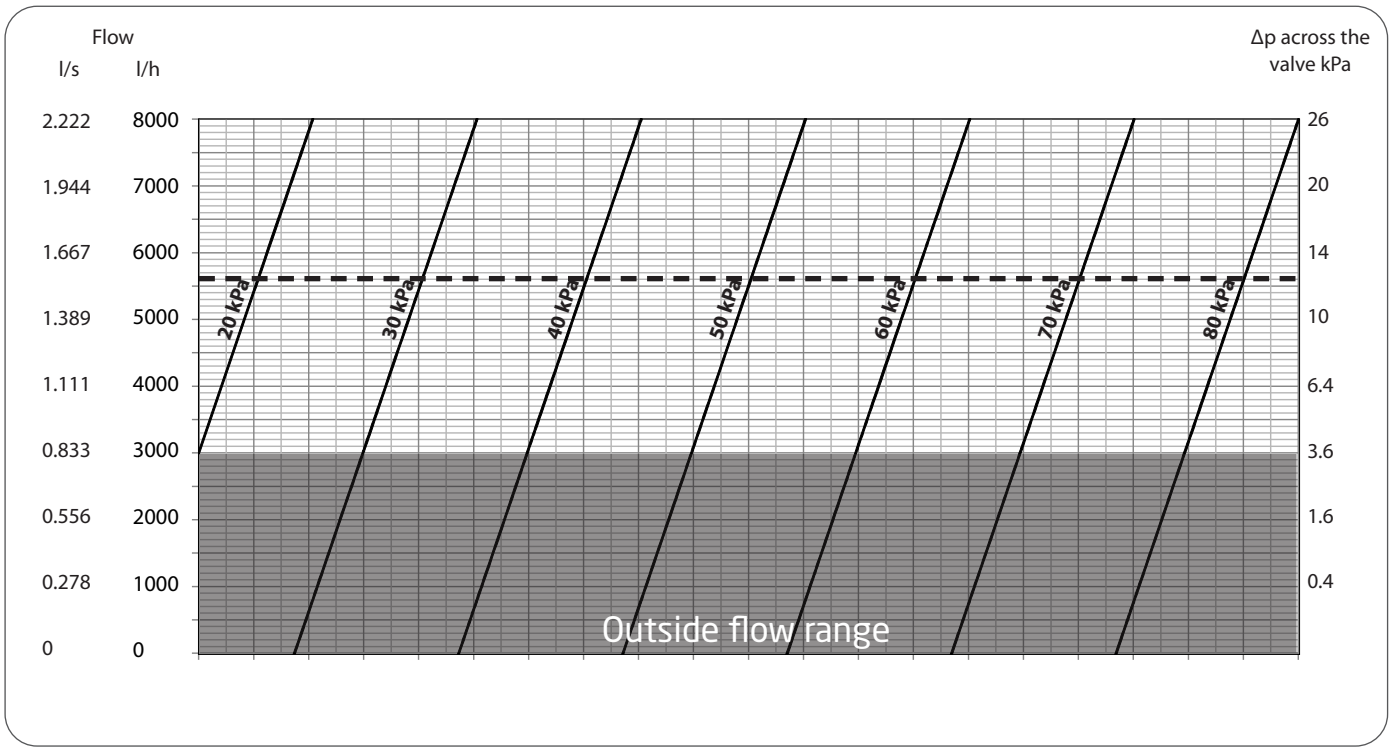

## SIGMA Compact DN32



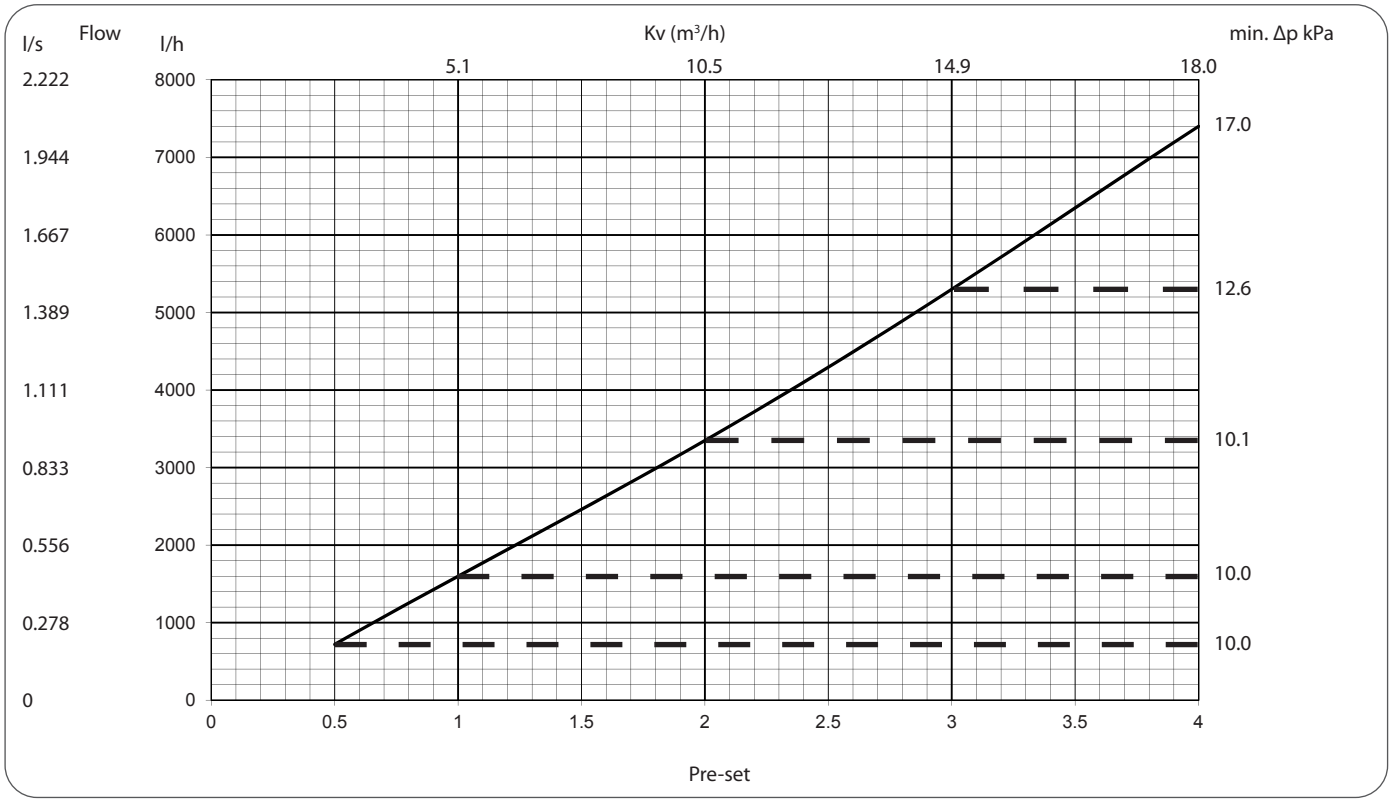
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN40, 20-80 kPa



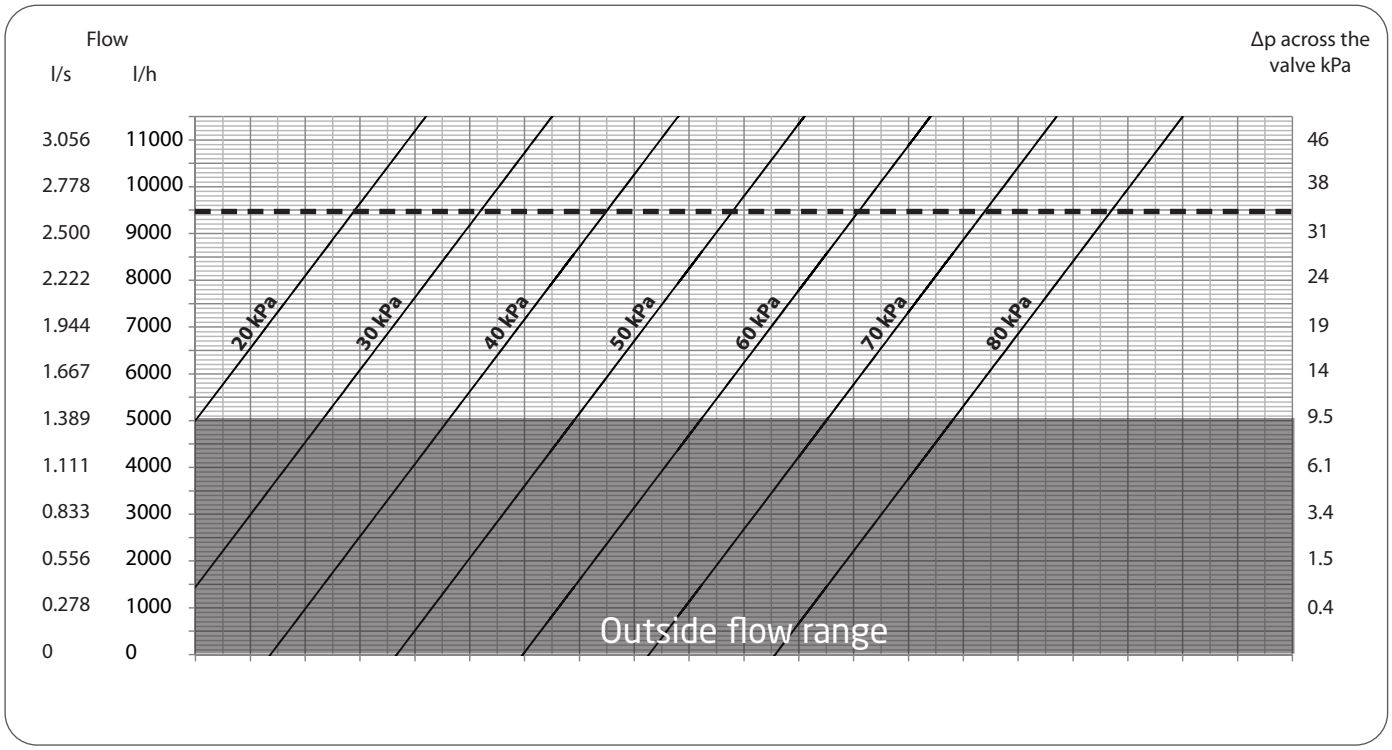

## SIGMA Compact DN40



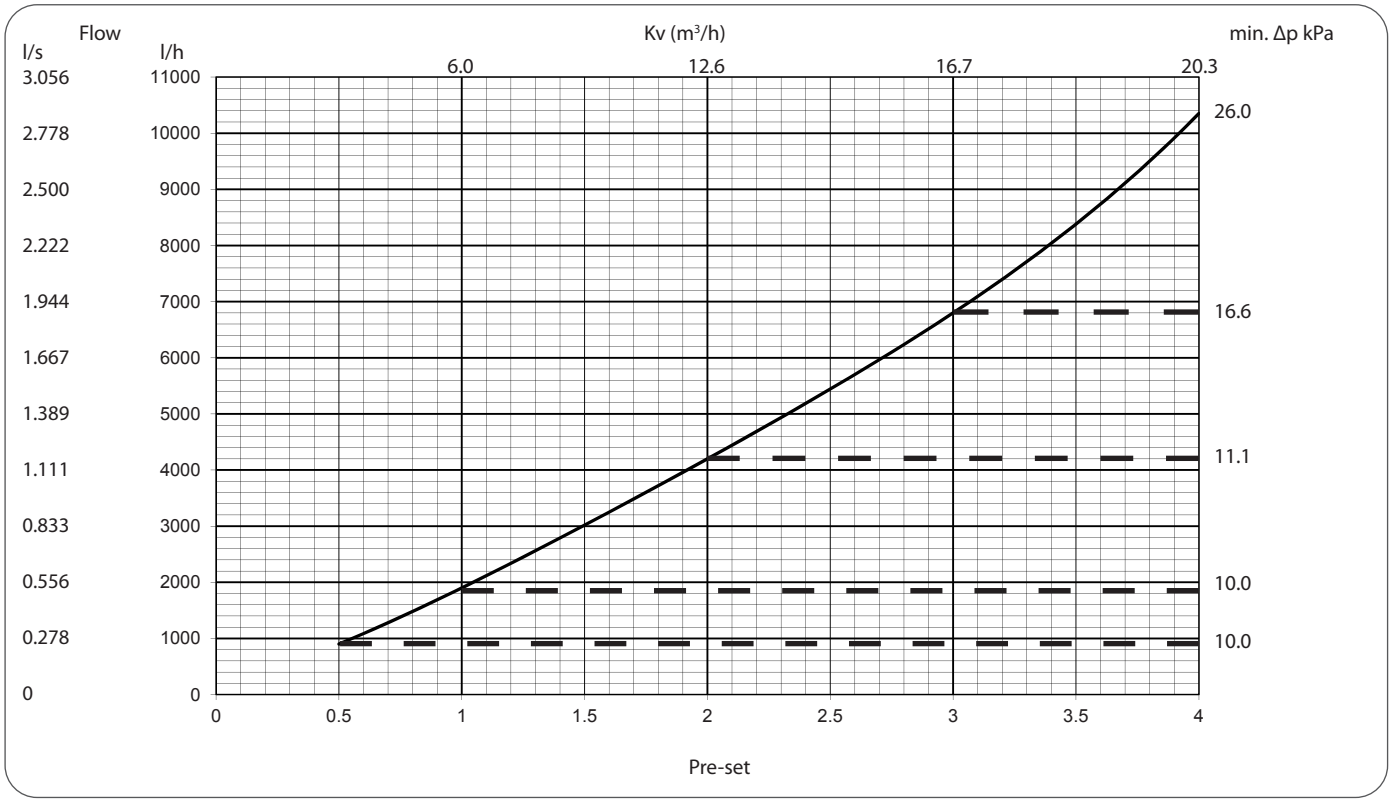
# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## PV Compact DN50, 20-80 kPa




## SIGMA Compact DN50



# PV-SIGMA Compact

Spectrum-series, DN15-DN50

## Specification Text - PV-SIGMA Spectrum-series, Dynamic Pressure & Flow Regulation Set

The valve set shall be a combination of a dynamic differential pressure control valve and an externally adjustable dynamic balancing valve.

The differential pressure and flow shall be adjustable on site without suspension of operation.

The valve set shall limit the flow and differential pressure in a circuit.

The valve set shall include P/T plugs for the verification of differential pressure in circuit and across the valve.

The valve set shall include a drain on the differential pressure control valve.

The differential pressure shall be set by means of a key and following the pointer on the scale.

The dynamic balancing valve shall be adjusted by means of a lockable handle.

The dynamic balancing valve shall be capable of isolation in the flow direction based on EN1349 Class IV leakage tightness.

The valves shall be permanently marked with an indicator for flow direction.

The dynamic pressure and flow regulation set shall have a pressure rating of PN25. (PN16, when a ball valve is used on the return).

The maximum differential pressure shall be 400 kPa.

The valve housing shall be DZR brass CW602N (DN15 to DN32) and Ductile Iron (DN40 to DN50).

The Differential Pressure Control Valve shall have a rubber seat to provide positive close off.

Frese A/S assumes no responsibility for errors, if any, in catalogues, brochures, and other printed matter. Frese A/S reserves the right to modify its products without prior notice, including already ordered products, if this does not alter existing specifications. All registered trademarks in this material are the property of Frese A/S. All rights reserved.

Vexve A/S
Tel: +45 58 56 00 00