

# OPTIMA Compact HCR

DN50-DN80

## Application

OPTIMA Compact HCR pressure independent balancing & control valves (PIBCV) are used in Industrial applications for heating & cooling of processes and process control.

OPTIMA Compact HCR provides modulating control with full authority regardless of any fluctuations in the differential pressure of the system.

OPTIMA Compact HCR combines an externally adjustable automatic balancing valve, a differential pressure control valve and a full authority modulating control valve.

OPTIMA Compact HCR makes it simple to achieve 100% control of the water flow in the system, while creating high stability and energy savings at the same time.

An additional benefit is that no balancing is required if further stages are added to the system, or if the dimensioned capacity is changed.

Energy saving due to optimal control, lower flow and pump pressure. Maximized  $\Delta T$  due to faster response and increased system stability.

## Benefits

### Design

- Less time to define the necessary equipment for a hydraulic balanced system (only flow data are required)
- No need to calculate valve authority - always one
- Flexibility if the system is modified after the initial installation

### Installation

- No further regulating valves required in the distribution pipework when OPTIMA Compact HCR is installed at the units
- Total number of valves minimized due to the 3-in-1 design
- Minimized commissioning time due to automatic balancing of the system
- No minimum straight pipe lengths required before or after the valve

### Operation

- High precision temperature control
- Longer life due to less movements of the actuator

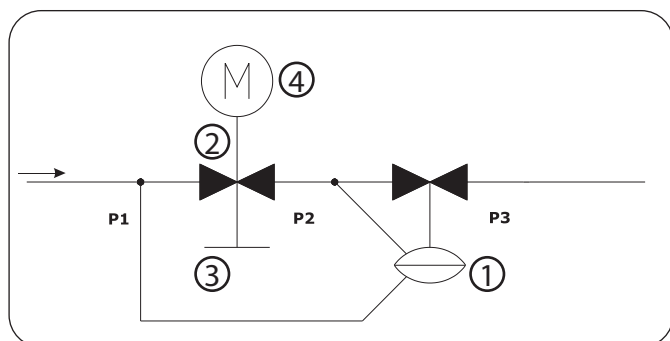


## Features

- The presetting function has no impact on the stroke; Full stroke modulation at all times, regardless the preset flow
- Regulation characteristic remains unchanged regardless of preset flow
- The constant differential pressure across the modulating control component guarantees 100% authority
- Automatic balancing eliminates overflows, regardless of fluctuating pressure conditions in the system
- Motoric actuator 0-10 V, 4-20 mA and 3 point control
- Differential pressure operating range up to 1200 kPa
- High flows with minimal required differential pressure due to advanced design of the valve
- Small dimensions due to compact housing
- Higher presetting precision due to stepless analogue scale

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## Design

The design of OPTIMA Compact HCR combines high performance and a compact design.

The main components of the valve are:

- ① Differential pressure control
- ② Modulating control component
- ③ Presetting scale
- ④ Actuator



## Function

The OPTIMA Compact HCR can be flushed and commissioned before the actuator is installed.

The presetting of the dial is user-friendly requiring only a simple flow vs. presetting graph.

Once the flow is set, the actuator can be mounted and the valve ready to operate.

For lowest energy consumption, check the differential pressure at the index valve to set the pump at minimum speed.

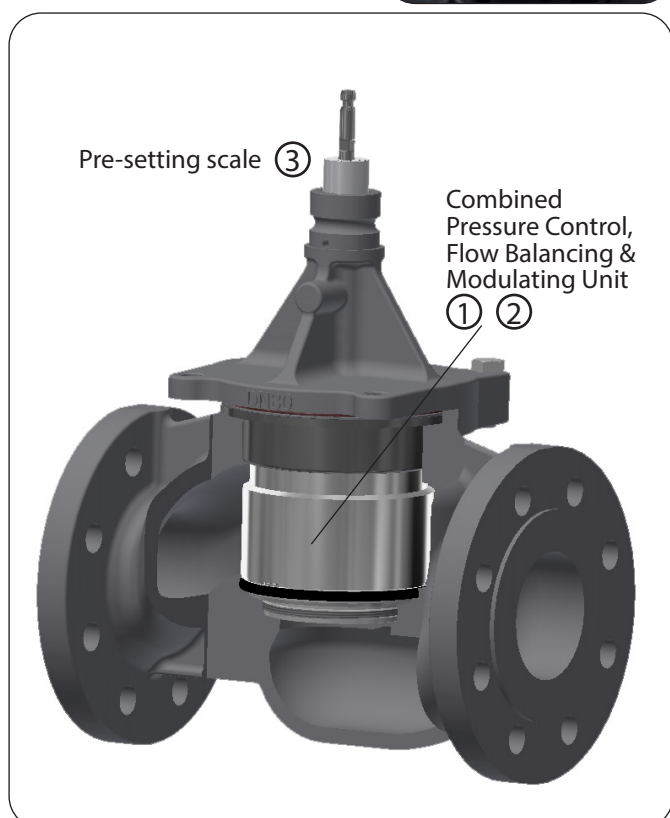
## Operating Pressure

OPTIMA Compact HCR DN50-DN80 can operate to a maximum differential pressure of 1200 kPa (12 bar)

## Close Off Pressure

The OPTIMA Compact HCR is capable of closing against the following differential pressure to EN 1349 Class IV:

DN50-DN80: 1200 kPa - based on 800N actuator force



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## Operation principle

The innovative design of OPTIMA Compact HCR features a modulating control component that retains 100% authority at all times.

With the OPTIMA Compact HCR, there are two independent movements for the presetting and the modulating function.

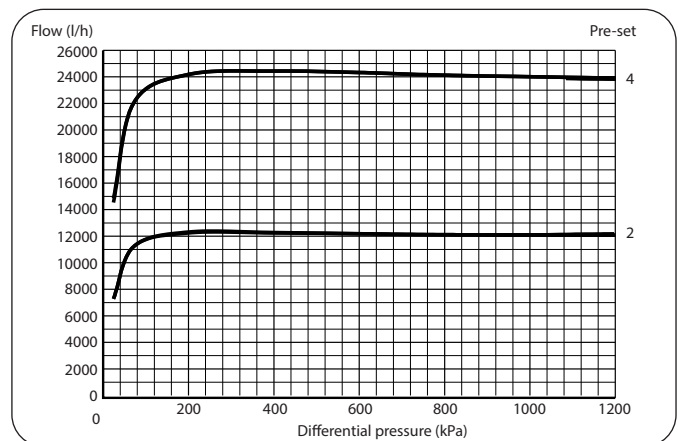
During presetting, the inlet area moves radially without interfering with the length of the stroke. During modulating, the inlet area moves axial taking advantage of the full stroke. Whilst the control component provides proportional

modulation irrespective of the preset flow, the automatic balancing guarantees that the flow will never exceed the maximum preset flow.

Regardless of pressure fluctuations in the system, the maximum flow is kept constant up to a maximum differential pressure of 1200 kPa.

## Flow rate vs. Differential Pressure

**Preset flow: 24000 l/h, 12000 l/h**



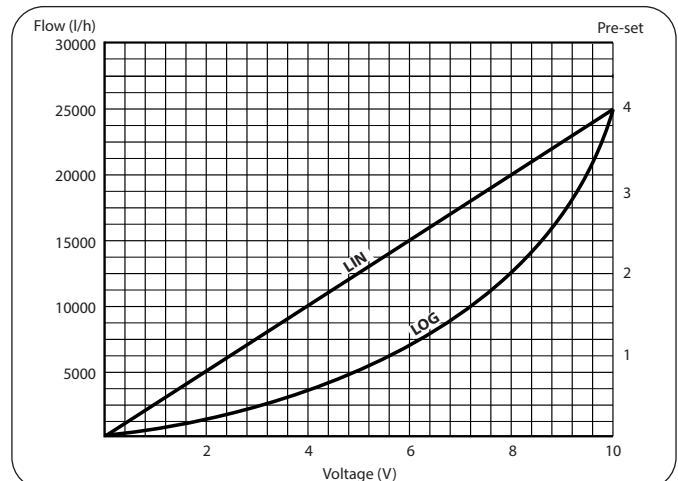
## Flow rate vs. Voltage

**Preset flow: 25000 l/h**

### Valve Characteristic:

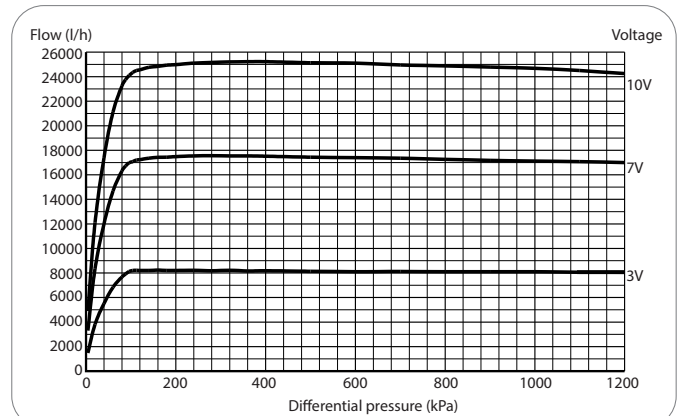
OPTIMA Compact HCR valve design has a linear control characteristic. The control characteristic is independent of the flow setting and available pressure.

Because of the independent characteristic the actuator setting can be used to change the valve response from linear to logarithmic (Equal Percentage).



## Flow rate vs. Differential Pressure

**Voltage: 10V, 7V, 3V**  
(Linear actuator characteristic)



# OPTIMA Compact HCR

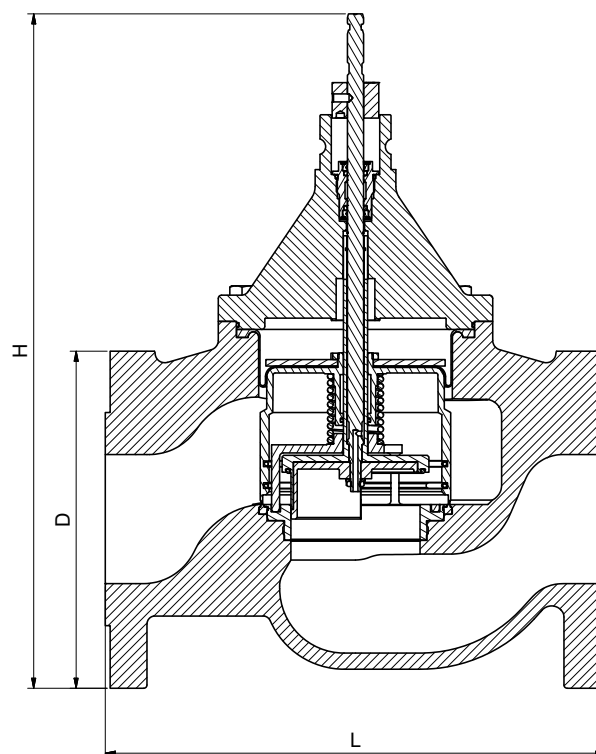
DN50-DN80

## Technical data

<b>Valve housing DN50-DN80:</b>	AISI316 (CF8M)
<b>DP controller:</b>	AISI 316 (CF8M)
<b>Spring:</b>	Stainless steel
<b>Diaphragm:</b>	Reinforced EPDM
<b>O-rings:</b>	EPDM
<b>Pressure class:</b>	PN16/25
<b>Stroke:</b>	20 mm
<b>Flange connections:</b>	ISO 7005-1 / EN 1092-1
<b>Max. differential pressure:</b>	1200 kPa
<b>Medium temperature:</b>	-20°C to 150°C

**When used at temperatures below 0°C, a stem heater must be used, to prevent ice on the spindle**

The pipe system shall be properly ventilated to avoid risk of air pockets.



## Dimension & Weight

Dim.		DN50	DN65	DN80
Dimensions [mm]	L	230	290	310
	H	367	384	413
	D	165	185	200
Flange holes (n) x ø[mm]		(4) x 18	(8) x 18	(8) x 18
Weight [kg]		14.5	18.9	27.3


## Flow

Dim.		DN50	DN65	DN80
Flow	m³/h	3.5 - 24.0	6.0 - 35.0	7.0 - 43.0
	l/s	0.972 - 6.669	1.654 - 9.724	1.951 - 11.954
	gpm	15.41 - 105.72	26.21 - 154.11	30.92 - 189.47

## Product programme

Dim.	Type	Flow m³/h	PN16	PN25
DN50	HCR	3.5 - 24.0	58-8110	58-8130
DN65	HCR	6.0 - 35.0	58-8111	58-8131
DN80	HCR	7.0 - 43.0	58-8112	58-8132

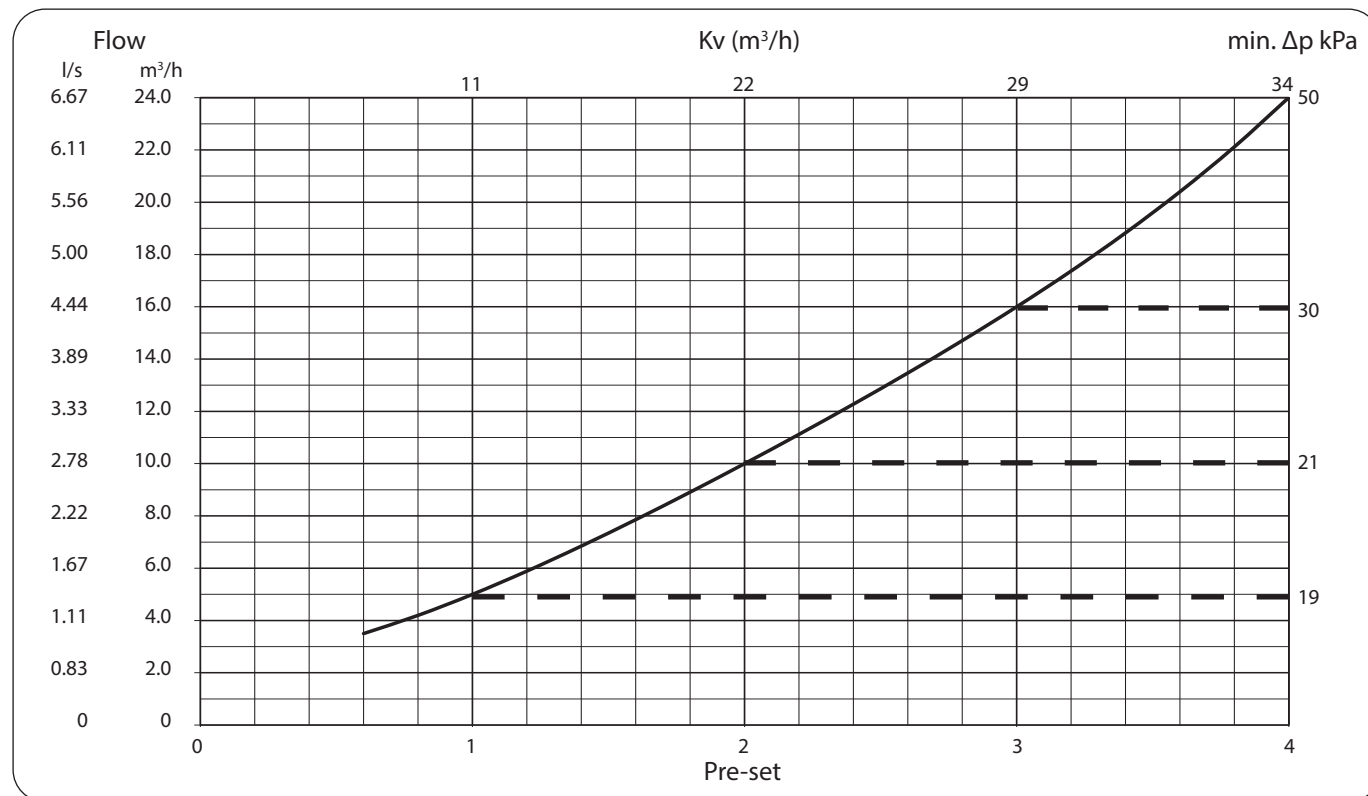
## Accessories

	Description	Item number
	Handwheel for OPTIMA Compact HCR	01-2127

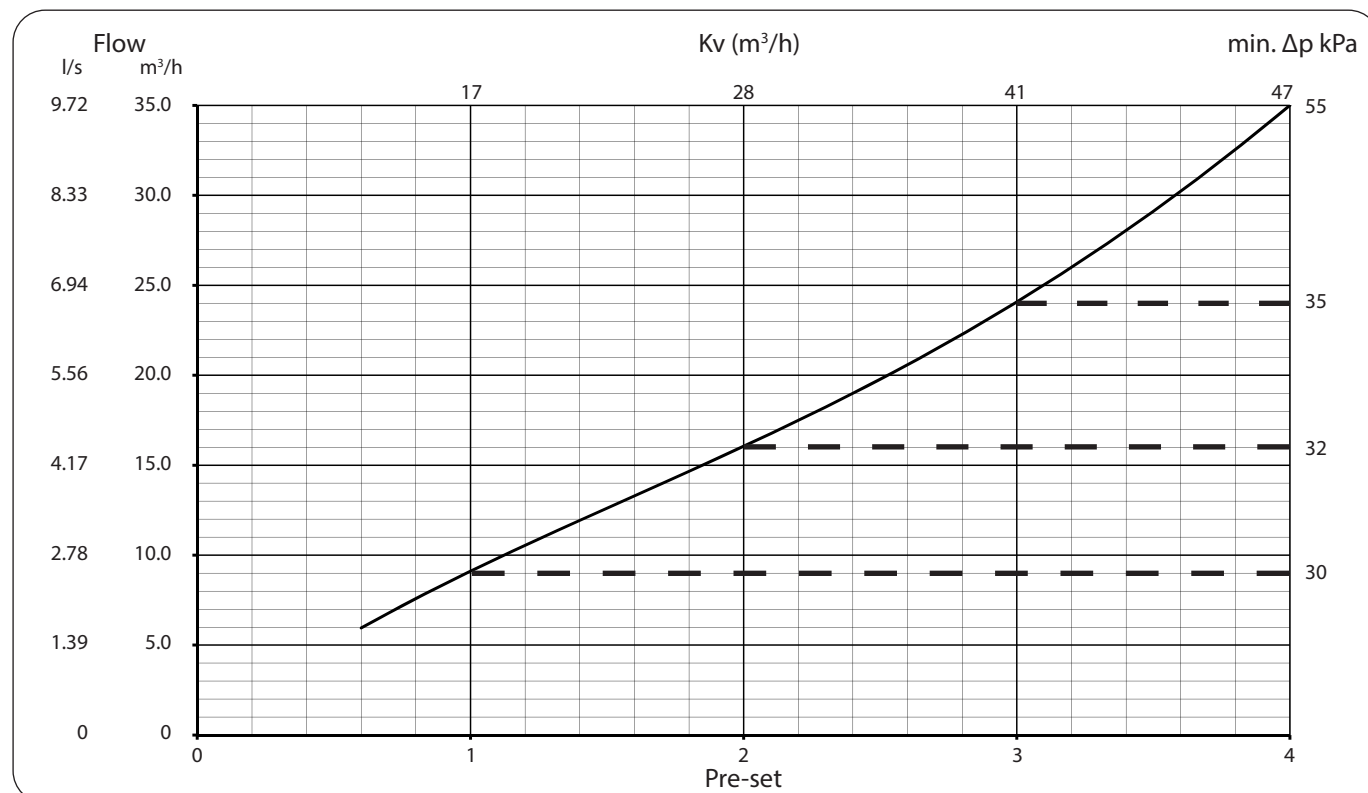
# OPTIMA Compact HCR

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## OPTIMA Compact HCR · DN50



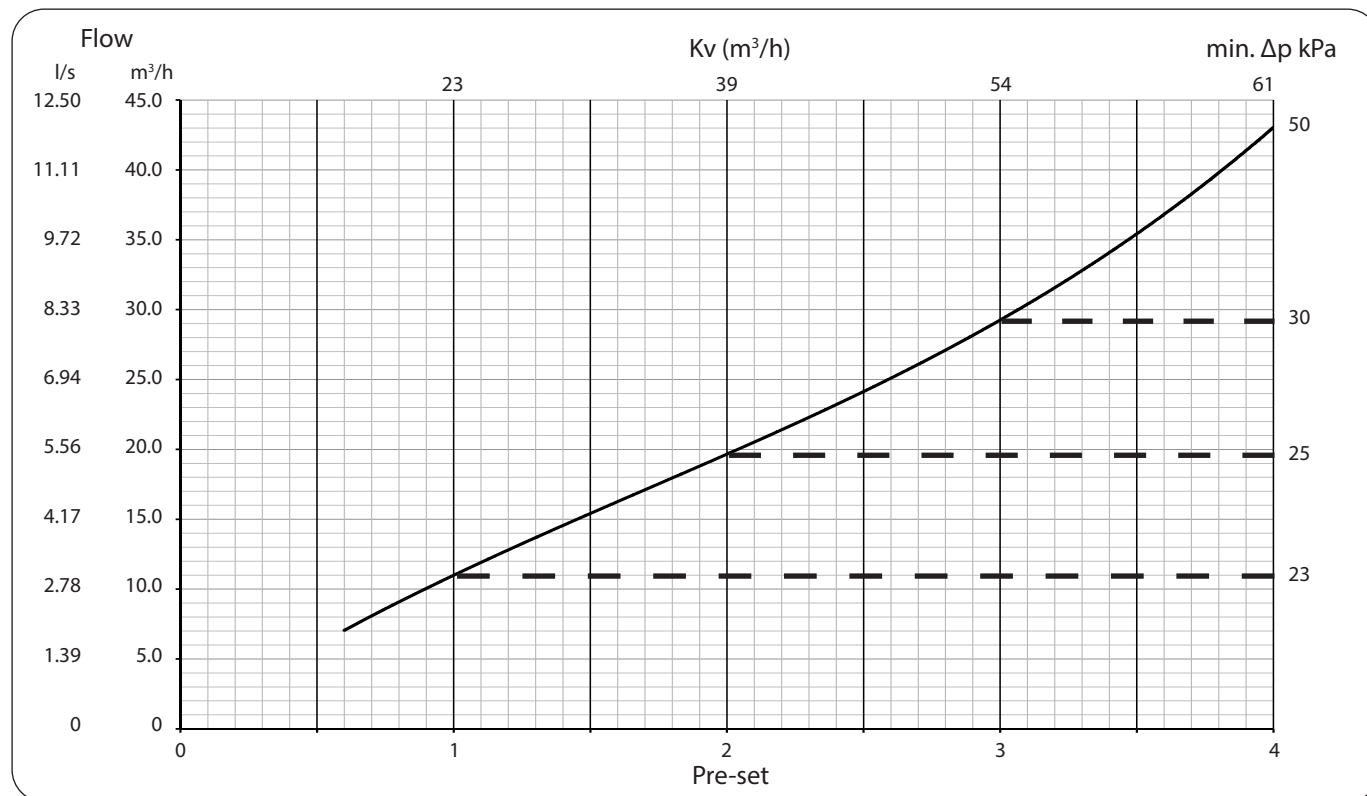
## OPTIMA Compact HCR · DN65



# OPTIMA Compact HCR

DN50-DN80

OPTIMA Compact HCR · DN80



## Setting and Flow

Dim.	DN50			DN65			DN80		
Pre-set	Flow m³/h	Flow l/s	Flow gpm	Flow m³/h	Flow l/s	Flow gpm	Flow m³/h	Flow l/s	Flow gpm
0.6	3.5	0.972	15.41	6.0	1.654	26.21	7.0	1.951	30.92
0.8	4.2	1.166	18.48	7.6	2.108	33.41	9.0	2.513	39.83
1.0	5.0	1.389	22.02	9.1	2.530	40.09	11.0	3.043	48.23
1.2	5.9	1.636	25.94	10.5	2.929	46.42	12.8	3.547	56.23
1.4	6.8	1.902	30.15	11.9	3.314	52.52	14.5	4.034	63.94
1.6	7.9	2.183	34.60	13.3	3.692	58.52	16.2	4.510	71.48
1.8	8.9	2.475	39.24	14.7	4.072	64.53	18.0	4.982	78.96
2.0	10.0	2.778	44.04	16.0	4.458	70.66	19.6	5.457	86.49
2.2	11.1	3.089	48.98	17.5	4.858	76.99	21.4	5.943	94.19
2.4	12.3	3.410	54.06	19.0	5.277	83.63	23.2	6.446	102.17
2.6	13.5	3.741	59.31	20.6	5.719	90.63	25.1	6.973	110.53
2.8	14.7	4.085	64.77	22.3	6.188	98.07	27.1	7.533	119.40
3.0	16.0	4.445	70.47	24.1	6.688	105.99	29.3	8.131	128.88
3.2	17.4	4.825	76.49	26.0	7.222	114.45	31.6	8.775	139.09
3.4	18.8	5.230	82.92	28.0	7.791	123.47	34.1	9.473	150.15
3.6	20.4	5.668	89.85	30.2	8.397	133.08	36.8	10.230	162.15
3.8	22.1	6.144	97.41	32.5	9.042	143.29	39.8	11.055	175.22
4.0	24.0	6.669	105.72	35.0	9.724	154.11	43.0	11.954	189.47

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## Documentation formula

Valve ID (own choice)	Valve type	Dimension	Pre-setting	Verified $\Delta p$ [kPa]	Min. $\Delta p$ (see flow rate graph) [kPa]	Flow

Pump type	Regulation mode	Set point
Installation		
Signature	Date	

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