

OPTIMA Compact

DN50-DN300, PN25

Application

OPTIMA Compact pressure independent balancing & control valve (PIBCV) is used in heating and cooling systems in applications with Air Handling Units, Heat Exchangers or Mixing Circuits.

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

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

OPTIMA Compact makes it simple to achieve 100% control of the water flow in the building, while creating high comfort 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 ΔT 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 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

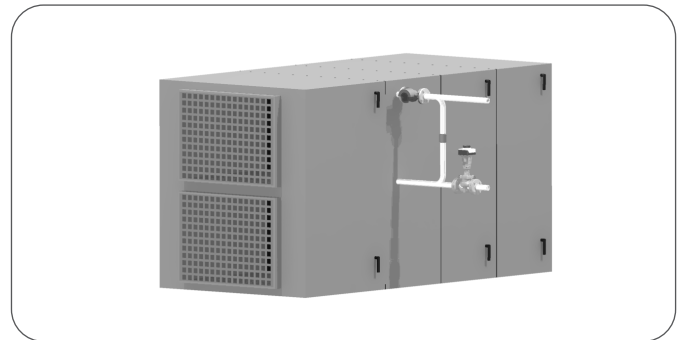
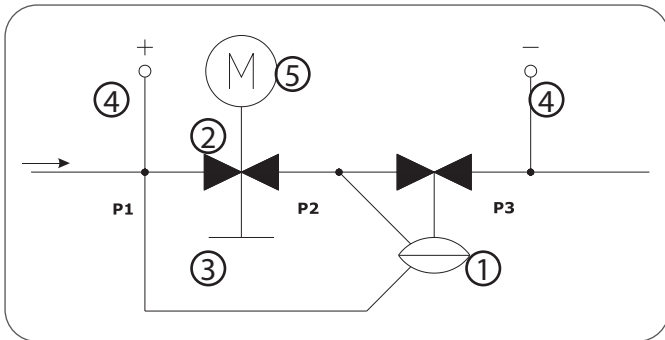
- High comfort for the end-users due to high precision temperature control
- Longer life due to less movements of the actuator

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 and 3 point control
- Differential pressure operating range up to 800 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
- Rangeability > 100:1

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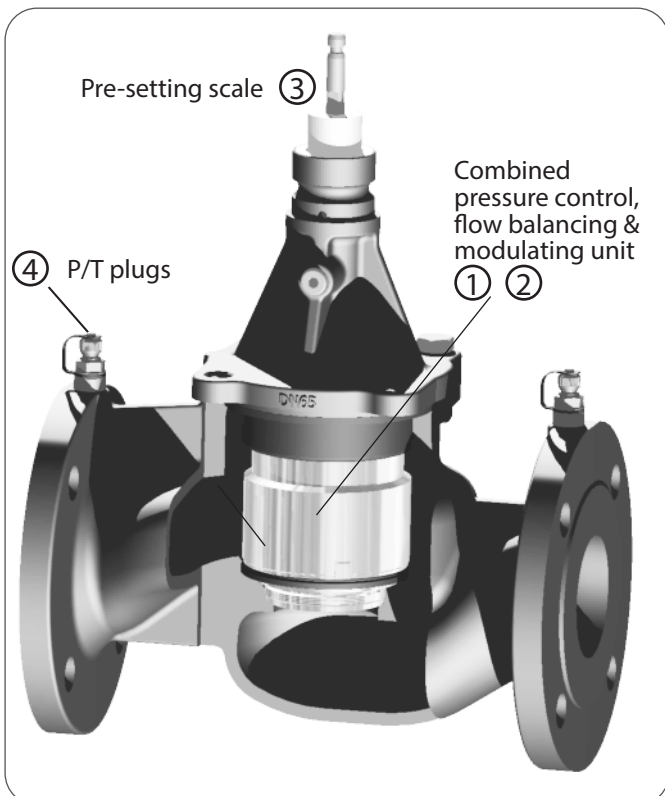
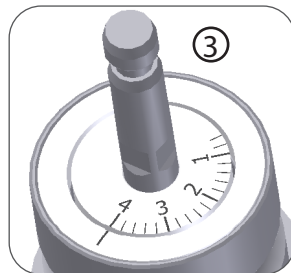


Design

The design of OPTIMA Compact 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 P/T Plugs
- ⑤ Actuator



Function

OPTIMA Compact 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

The OPTIMA Compact (DN50 to DN300) can operate to a maximum differential pressure of 800 kPa (8 bar).

Close Off Pressure

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

- DN50 to DN125: 800 kPa - based on 800N actuator force
- DN150 to DN200: 800 kPa - based on 1100N actuator force
- DN250 to DN300: 800 kPa - based on 2000N actuator force

Manual Operation

Actuators

The actuators can be operated by the manual handle. (5)



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Operation principle

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

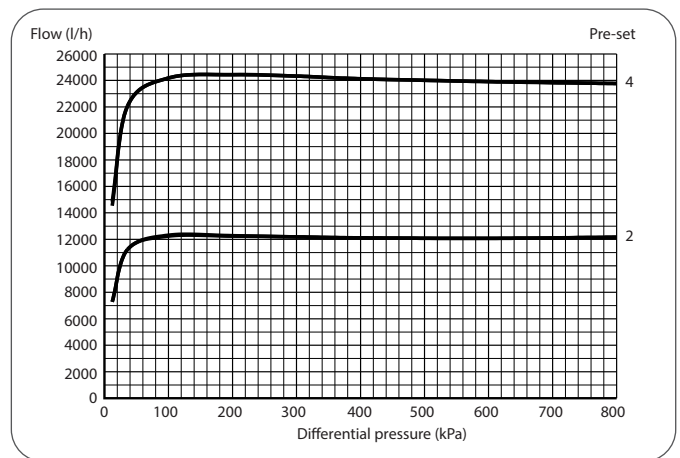
With the OPTIMA Compact there are two independent movements for the presetting and the modulating function. During presetting, the inlet area moves radially without interfering with the length of the stroke. During modulating, the inlet area moves axial taking advantage of the full stroke.

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 800 kPa.

Flow rate vs. Differential Pressure

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

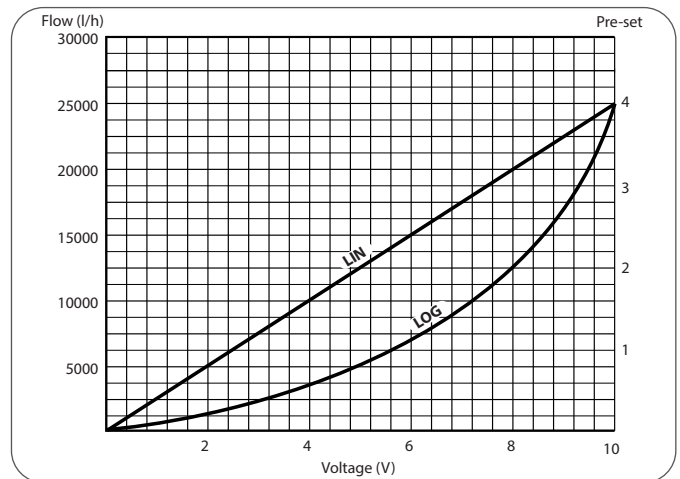


Flow rate vs. Voltage

Preset flow: 25000 l/h

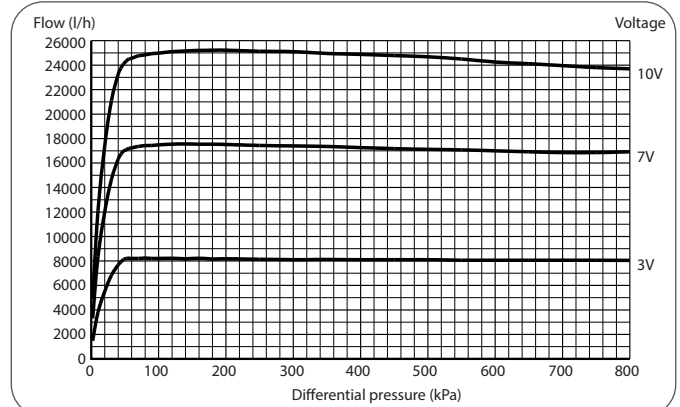
Valve Characteristic:
OPTIMA Compact valve design has a linear control characteristic. The control characteristic is independent of the flow setting and available pressure.

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)

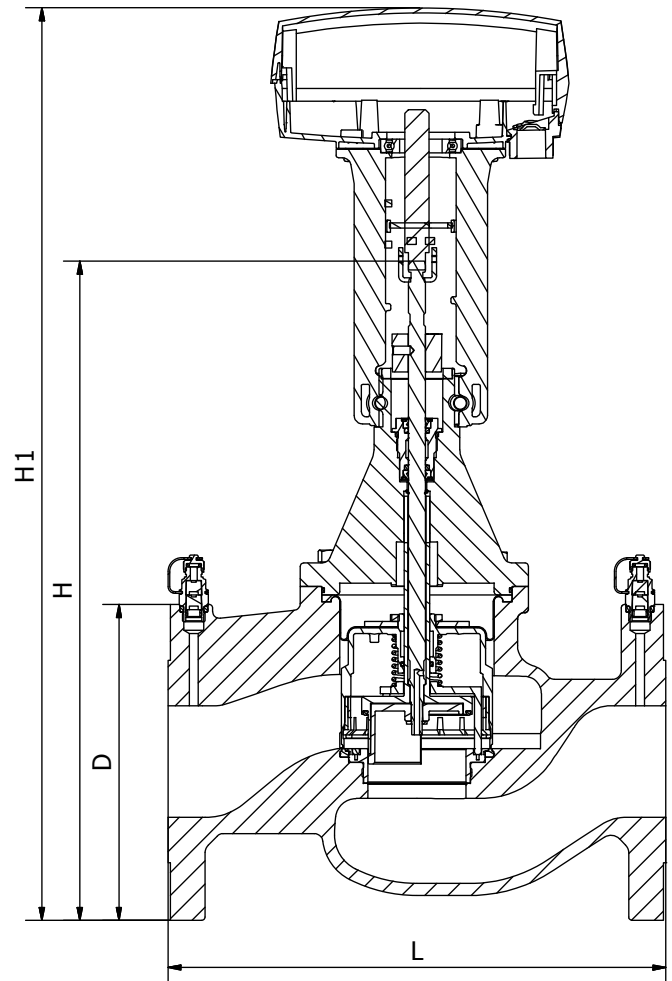


OPTIMA Compact

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Technical data · DN50 - DN80

Valve housing:	GJS-400
DP controller:	Stainless steel
Spring:	Stainless steel
Diaphragm:	Reinforced EPDM
O-rings:	EPDM
Pressure class:	PN25
Stroke:	20 mm
Flange connections:	ISO 7005-2 / EN 1092-2
Max. differential pressure:	800 kPa
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm
Medium temperature range:	0°C to 120°C
With stem heater mounted:	From -10°C



The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene). Frese A/S can accept no responsibility if another actuator is used instead of the Frese actuator. Recommendation: Water treatment to VDI 2035.

Dimension & Weight · DN50-DN80

Dim.		DN50	DN65	DN80
		ISO	ISO	ISO
Dimensions [mm]	L	230	290	310
	H	367	384	413
	H1	508	525	554
	D	165	185	200
Weight [kg]		14.1	19.2	27.5

Flow

Dim.		DN50		DN65		DN80	
Type		LF	HF	LF	HF	LF	HF
Flow	m ³ /h	2.48 - 15.00	3.92 - 24.00	4.38 - 25.00	5.95 - 35.00	5.34 - 34.00	7.02 - 43.00
	l/s	0.689 - 4.167	1.089 - 6.667	1.216 - 6.945	1.654 - 9.724	1.484 - 9.450	1.951 - 11.954
	gpm	10.92 - 66.03	17.28 - 105.65	19.27 - 110.06	26.21 - 154.11	23.53 - 149.78	30.92 - 189.47

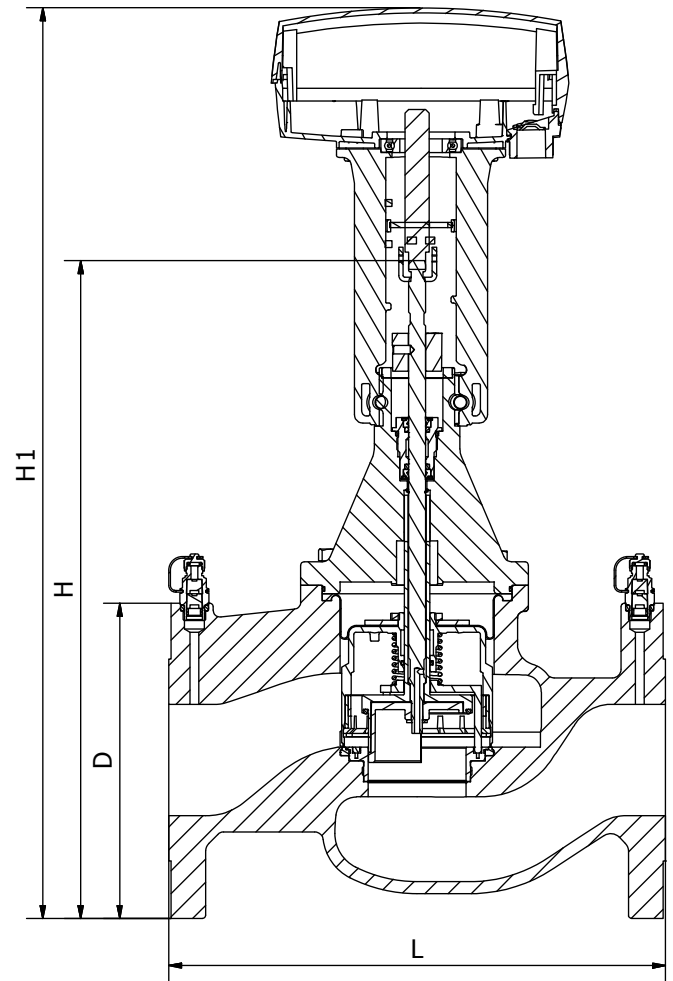
OPTIMA Compact

DN50-DN300, PN25

Technical data · DN100 - DN150

Valve housing:	GJS-400
DP controller:	Stainless steel
Spring:	Stainless steel
Diaphragm:	Reinforced EPDM
O-rings:	EPDM
Pressure class:	PN25
Stroke DN100-DN125	40 mm
Stroke DN150	43 mm
Flange connections:	ISO 7005-2 / EN 1092-2
Max. differential pressure:	800 kPa
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm
Medium temperature range:	
DN100-DN125:	0°C to 120°C
DN150:	0°C to 110°C
With stem heater mounted:	From -10°C

The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene). Frese A/S can accept no responsibility if another actuator is used instead of the Frese actuator. Recommendation: Water treatment to VDI 2035.



Dimension & Weight · DN100 - DN150

Dim.		DN100	DN125	DN150
		ISO	ISO	ISO
Dimensions [mm]	L	350	400	480
	H	566	608	676
	H1	700	747	768
	D	235	270	300
Weight [kg]		50.1	76.4	110.6

Flow

Dim.		DN100		DN125		DN150	
Type		LF	HF	LF	HF	LF	HF
Flow	m ³ /h	12.1 - 68.0	14.8 - 90.0	18.5 - 110.0	23.0 - 135.0	25.6 - 148.0	32.0 - 195.0
	l/s	3.369 - 18.891	4.100 - 25.000	5.139 - 30.556	6.389 - 37.500	7.111 - 41.110	8.889 - 54.168
	gpm	53.41 - 299.41	64.99 - 396.26	81.45 - 484.32	101.26 - 594.39	112.71 - 651.59	140.89 - 858.56

OPTIMA Compact

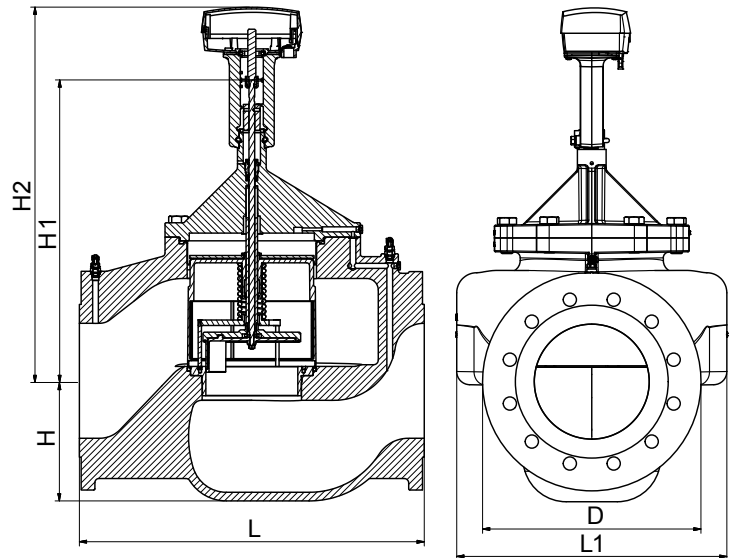
DN50-DN300, PN25

Technical data · DN200 - DN300

Valve

Valve housing:	GJS-400
DP controller:	Stainless steel
Spring:	Stainless steel
Diaphragm:	Reinforced EPDM
O-rings:	EPDM
Pressure class:	PN25
Stroke DN200	43 mm
Stroke DN250-DN300	48 mm
Flange connections:	ISO 7005-2/EN 1092-2
Max. differential pressure:	800 kPa
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm
Medium temperature range:	0°C to 110°C
With stem heater mounted:	From -10°C

Stem heater is not available for the DN250-DN300 actuator, but a heating wire installed on the valve neck will allow for the same minimum temperature.



The pipe system shall be properly ventilated to avoid risk of air pockets. Glycolic mixtures up to 50% are applicable (both ethylene and propylene). Frese A/S can accept no responsibility if another actuator is used instead of the Frese actuator. Recommendation: Water treatment to VDI 2035.

Dimension & Weight · DN200 - DN300

Dim.		DN200	DN250	DN300
Dimensions [mm]	L	600	730	850
	L1	470	549	719
	H	209	229	279
	H1	524	685	685
	H2	650	872	872
	D	380	444	520
Weight [kg]		175	307	470

Flow

Dim.		DN200		DN250		DN300	
Type		LF	HF	LF	HF	LF	HF
Flow	m ³ /h	95 - 210	130 - 280	190 - 475	245 - 600	190 - 475	245 - 600
	l/s	26.39 - 58.33	36.11 - 77.78	52.78 - 131.94	68.06 - 166.67	52.78 - 131.94	68.06 - 166.67
	gpm	418 - 925	572 - 1233	837 - 2091	1079 - 2642	837 - 2091	1079 - 2642

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Technical data actuators · DN50-300

Characteristics:	Electrical, modulating, normally closed
Protection class to EN60529:	IP 54 DN50-200 / IP66 DN250-300
Frequency AC:	50/60 Hz
Supply voltage:	24V AC/DC
Control signal:	0-10V DC or 3-position
Actuating force:	800 N/1500 N/2500 N
Stroke max:	52 mm DN50-200 / 48 mm DN250-300
Running time:	30 s DN50-200 / 288 s DN250-300
Ambient operating conditions:	-10°C to 50°C
Manual operation:	Manual handle
Cable:	Not included
Weight:	1.80 kg DN50-200 / 4.20 kg DN250-300



Types and operation data · actuators

Type	Valve Dimension	Function	Supply voltage	Power Consumption
Type-02	DN50-125	0-10 V / 3-pos	24 V AC +/-25% 24V DC +/- 10%	15 VA (*50VA)
Type-03	DN150-200	0-10 V / 3-pos	24 V AC +/-25% 24V DC +/- 10%	24 VA (*50VA)
Type-10	DN250-300	0-10 V / 3-pos / 2-pos	24 V AC-DC +/-20%	10VA (*18 VA)

*) Max consumption - for transformer sizing

Product programme

Dim.	Type	Flow m ³ /h	Frese no.
DN50	Low Flow	2.5 - 15.0	53-1220-02
	High Flow	3.9 - 24.0	53-1230-02
DN65	Low Flow	4.4 - 25.0	53-1221-02
	High Flow	5.9 - 35.0	53-1231-02
DN80	Low Flow	5.3 - 34.0	53-1222-02
	High Flow	7.0 - 43.0	53-1232-02
DN100	Low Flow	12.1-68.0	53-1223-02
	High Flow	14.8-90.0	53-1233-02
DN125	Low Flow	18.5-110.0	53-1224-02
	High Flow	23.0-135.0	53-1234-02
DN150	Low Flow	25.6-148.0	53-1225-03
	High Flow	32.0-195.0	53-1235-03
DN200	Low Flow	95.0 - 210.0	53-1226-03
	High Flow	130.0 - 280.0	53-1236-03
DN250	Low Flow	190.0 - 475.0	53-1227-10
	High Flow	245.0 - 600.0	53-1237-10
DN300	Low Flow	190.0 - 475.0	53-1228-10
	High Flow	245.0 - 600.0	53-1238-10

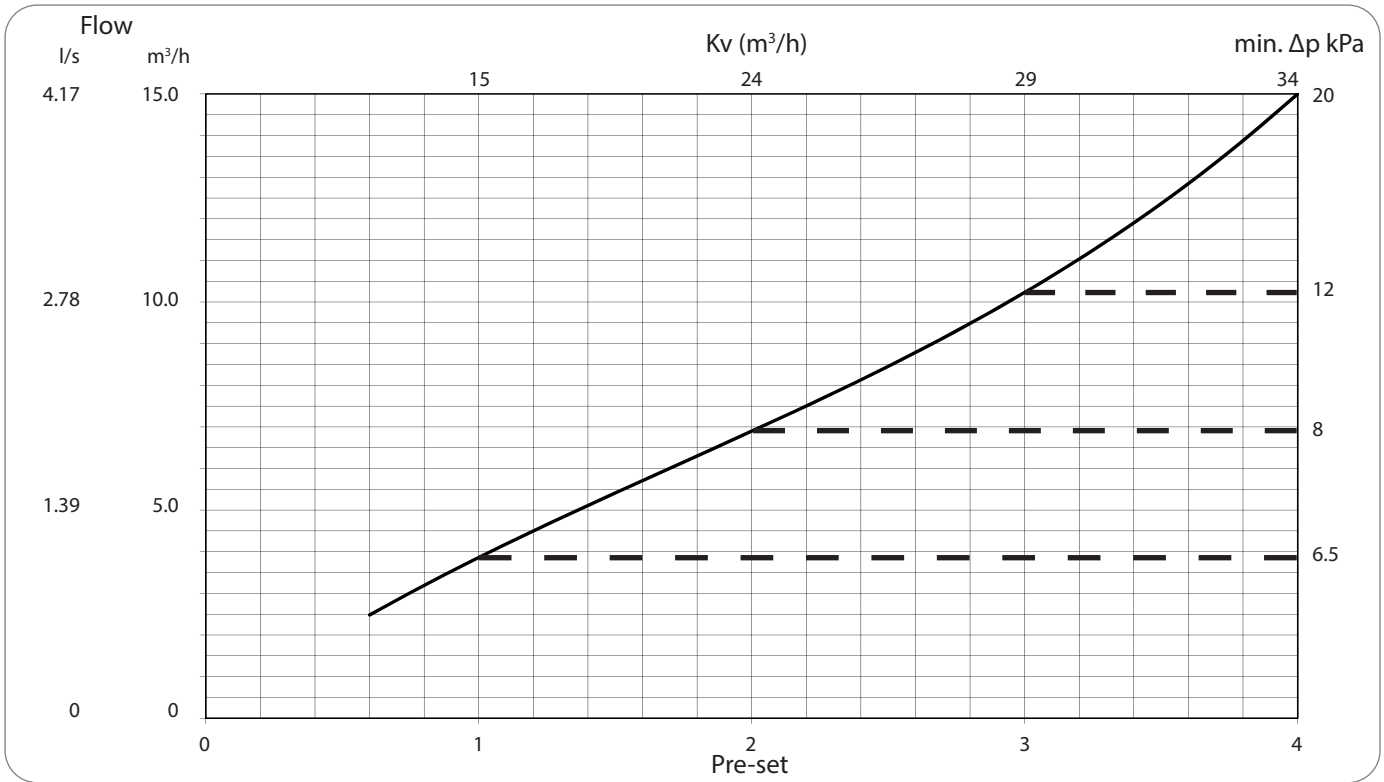
Accessories

Frese no.	Product	Type	Suitable for valves	Suitable for actuators
58-8951	Stem heater	24 VAC, 50 W	DN40-DN200	Type-01 to Type-07

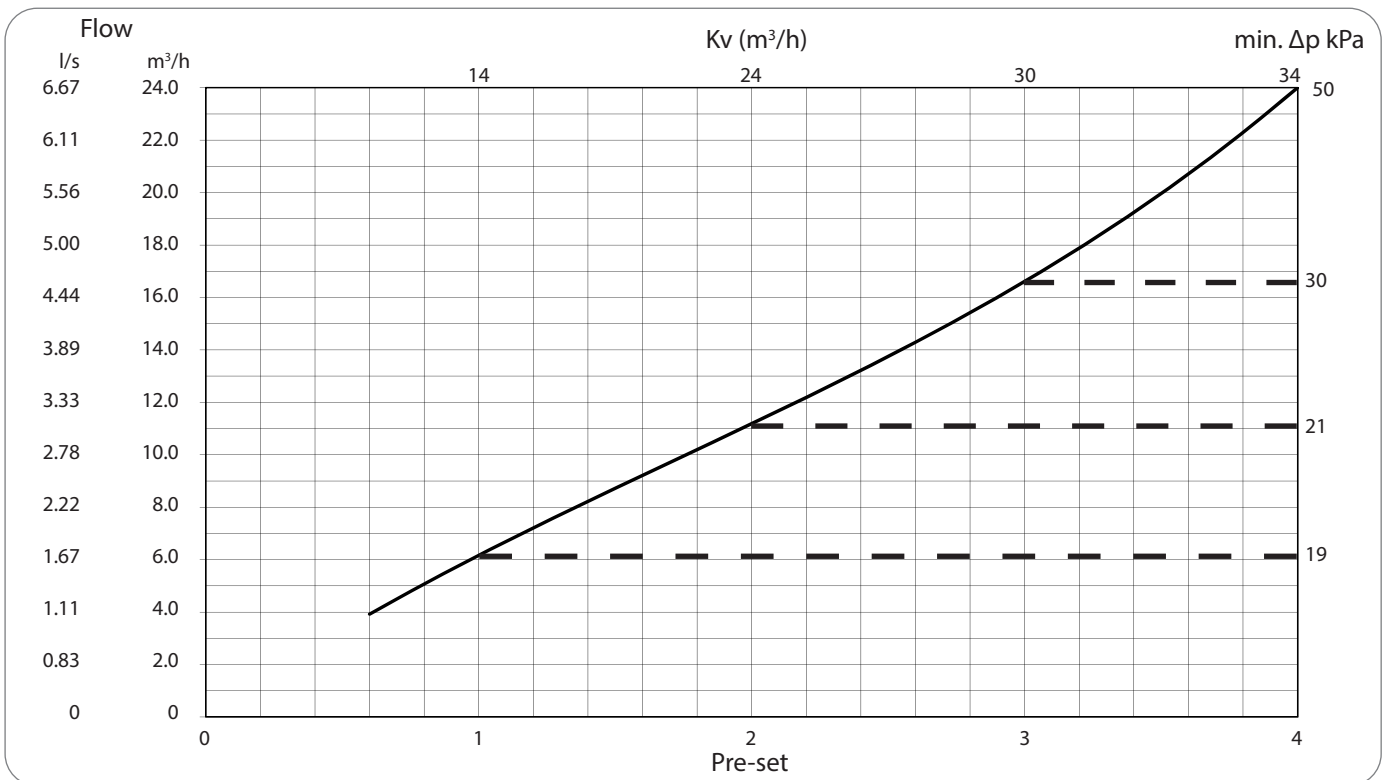
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OPTIMA Compact · DN50 Low Flow



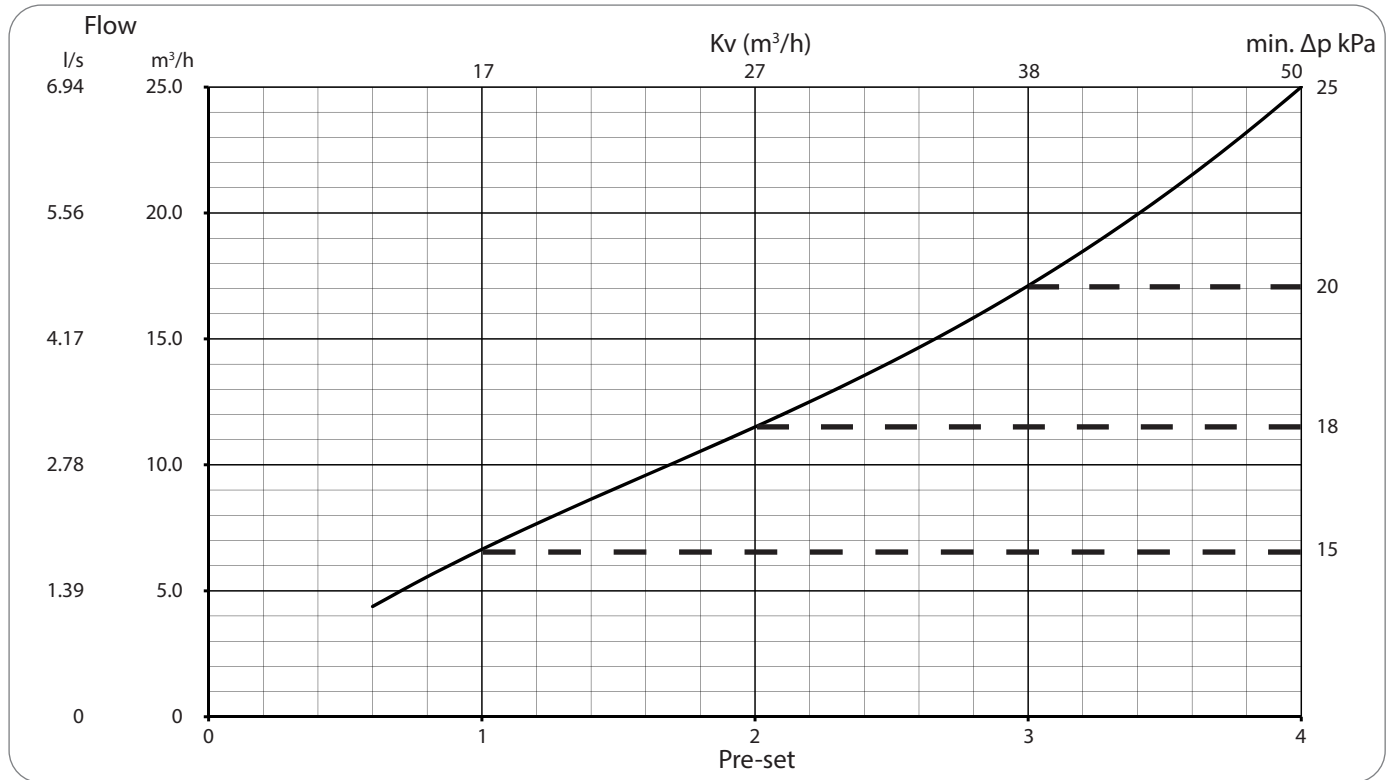
OPTIMA Compact · DN50 High Flow



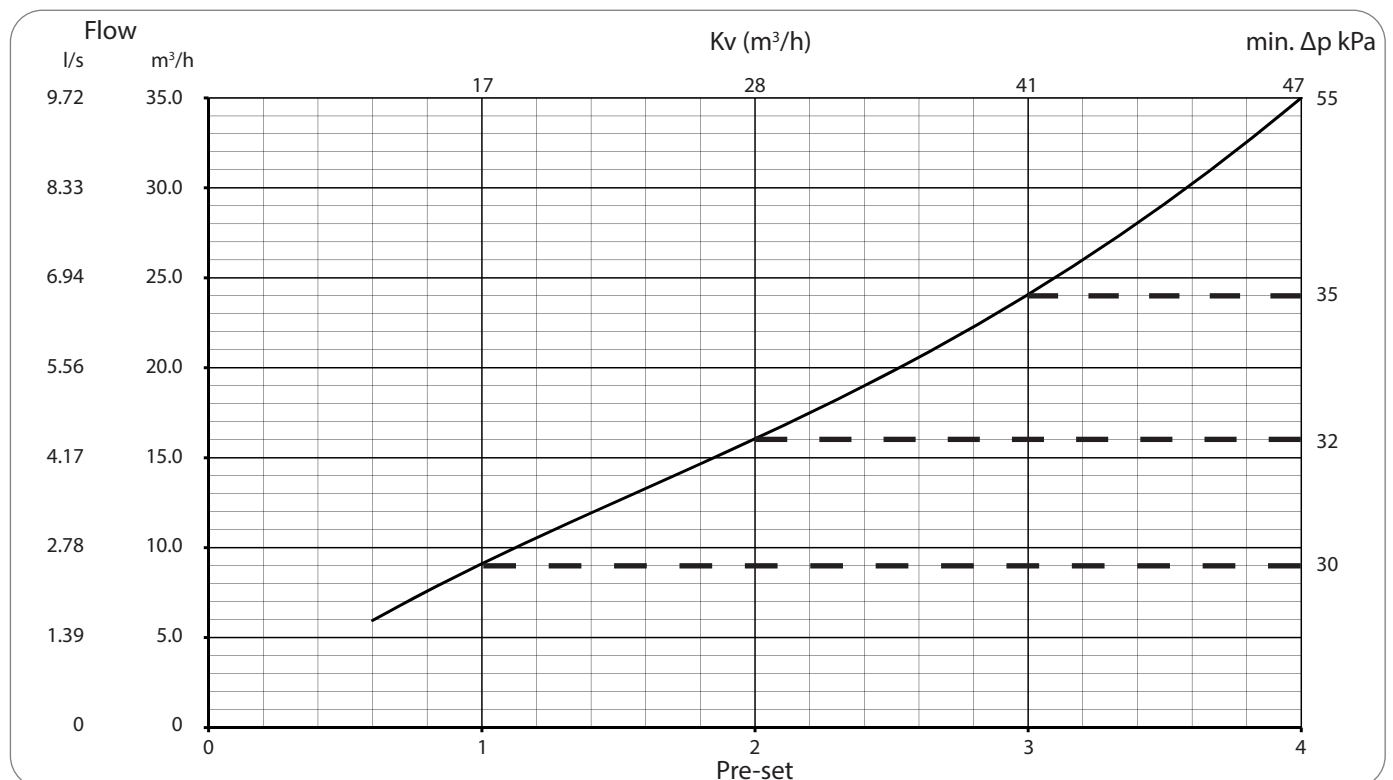
OPTIMA Compact

DN50-DN300, PN25

OPTIMA Compact · DN65 Low Flow



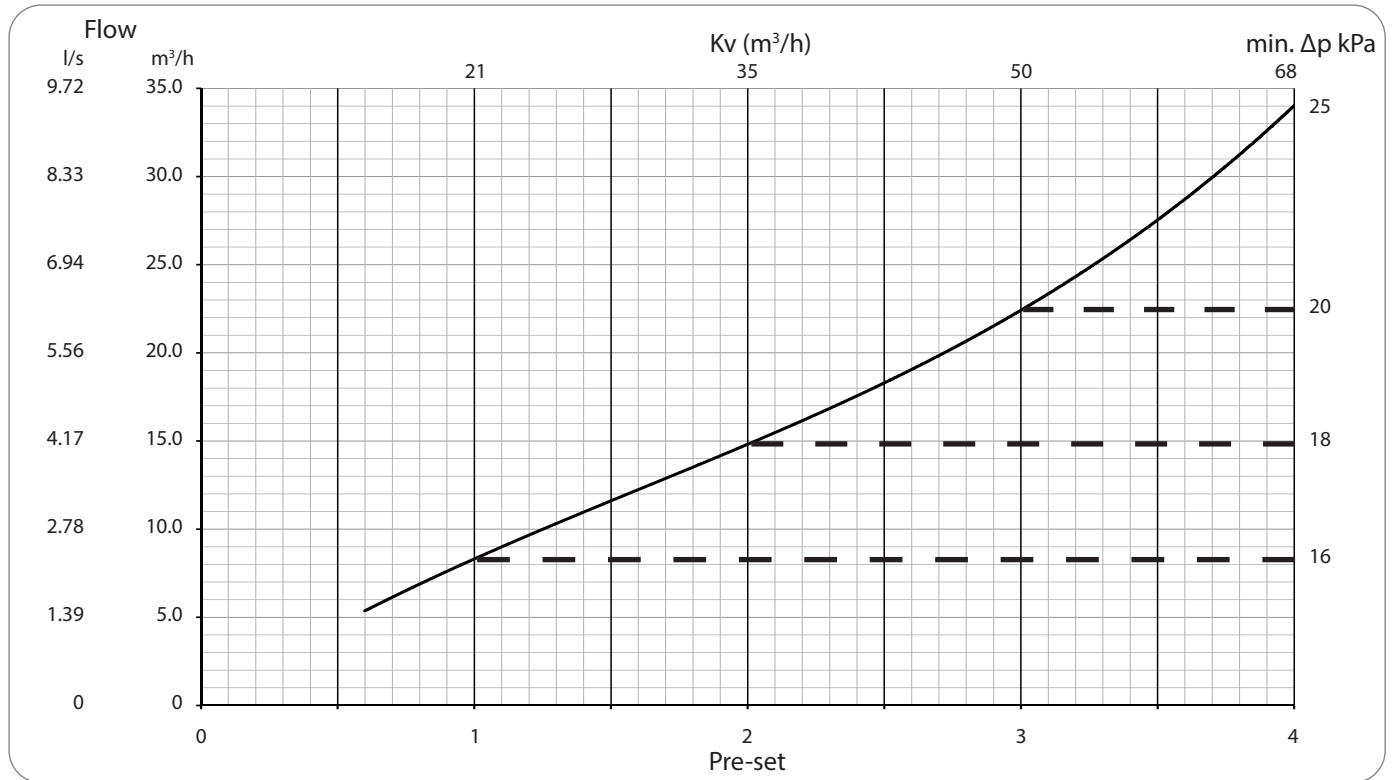
OPTIMA Compact · DN65 High Flow



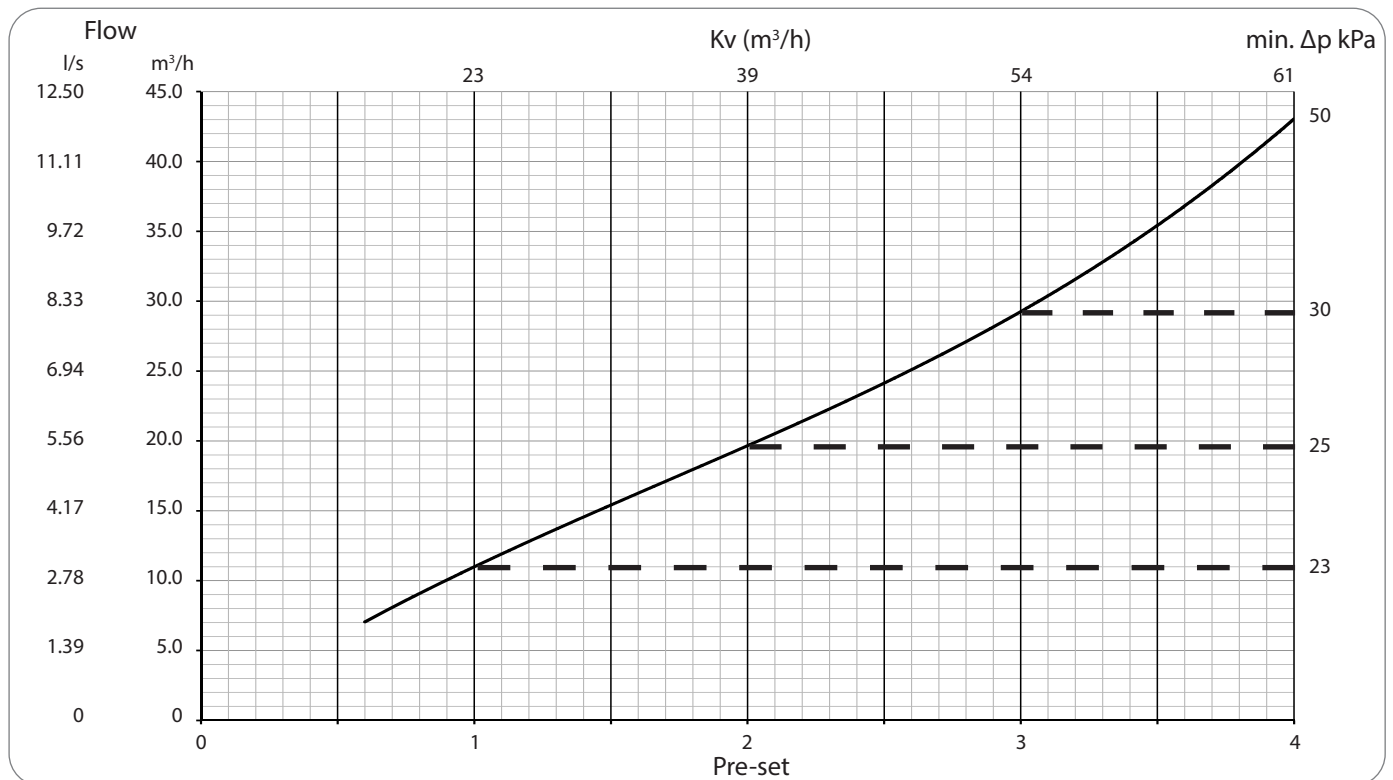
OPTIMA Compact

DN50-DN300, PN25

OPTIMA Compact · DN80 Low Flow

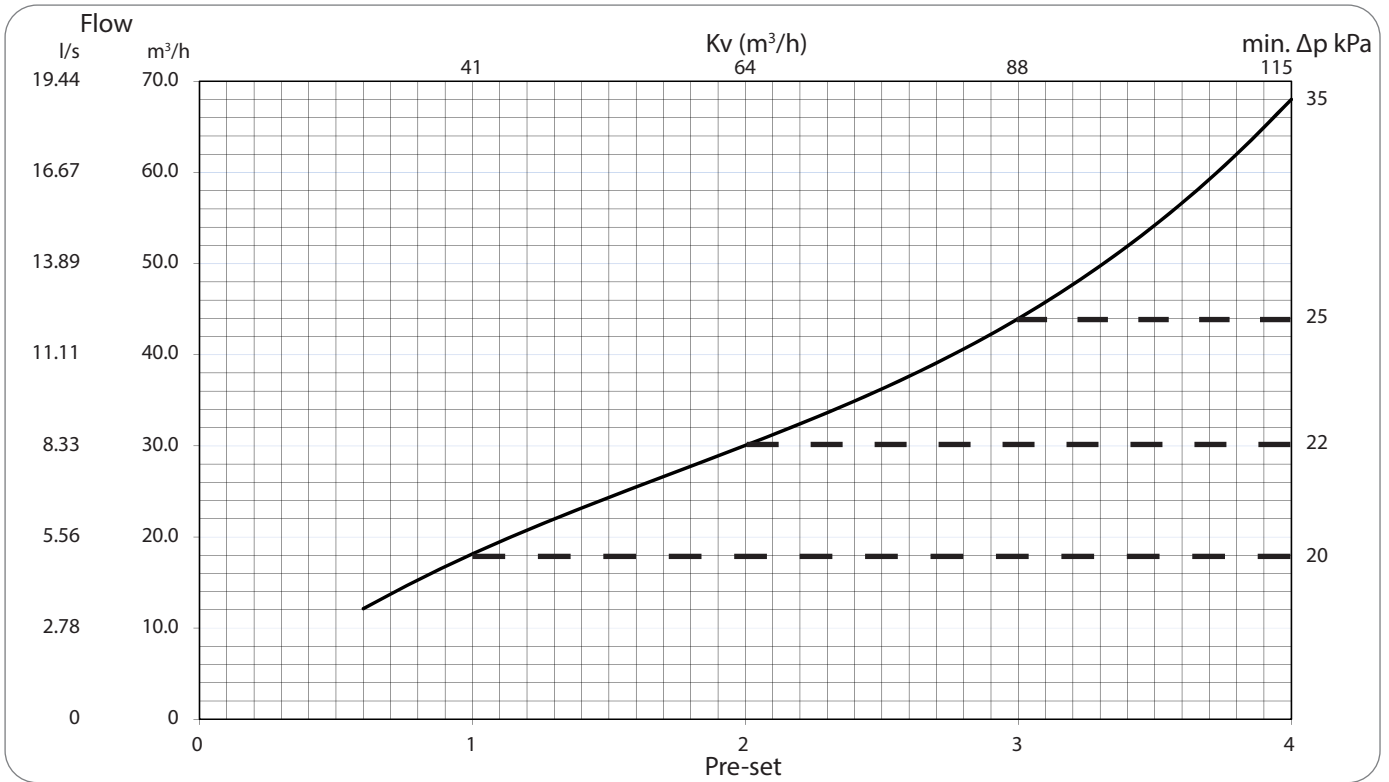


OPTIMA Compact · DN80 High Flow

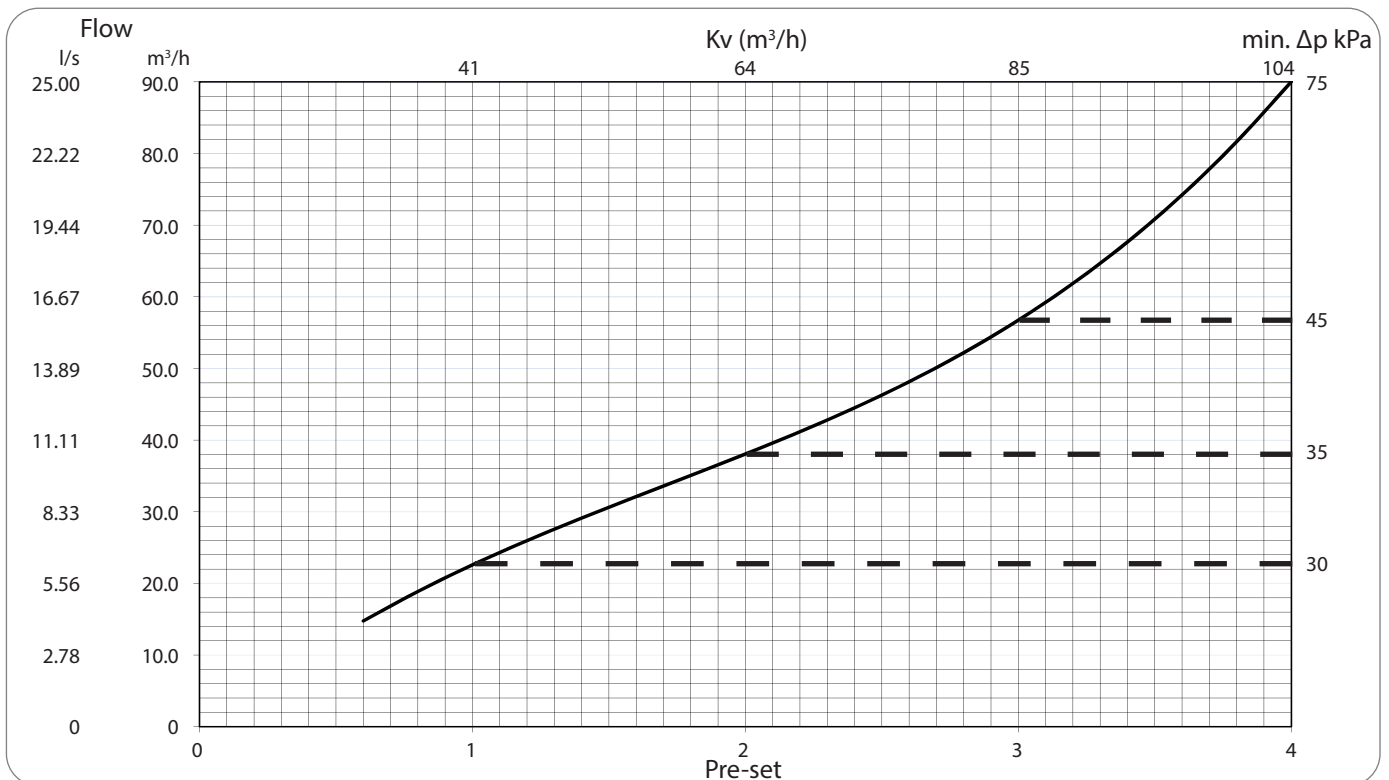


OPTIMA Compact DN50-DN300, PN25

OPTIMA Compact · DN100 Low Flow

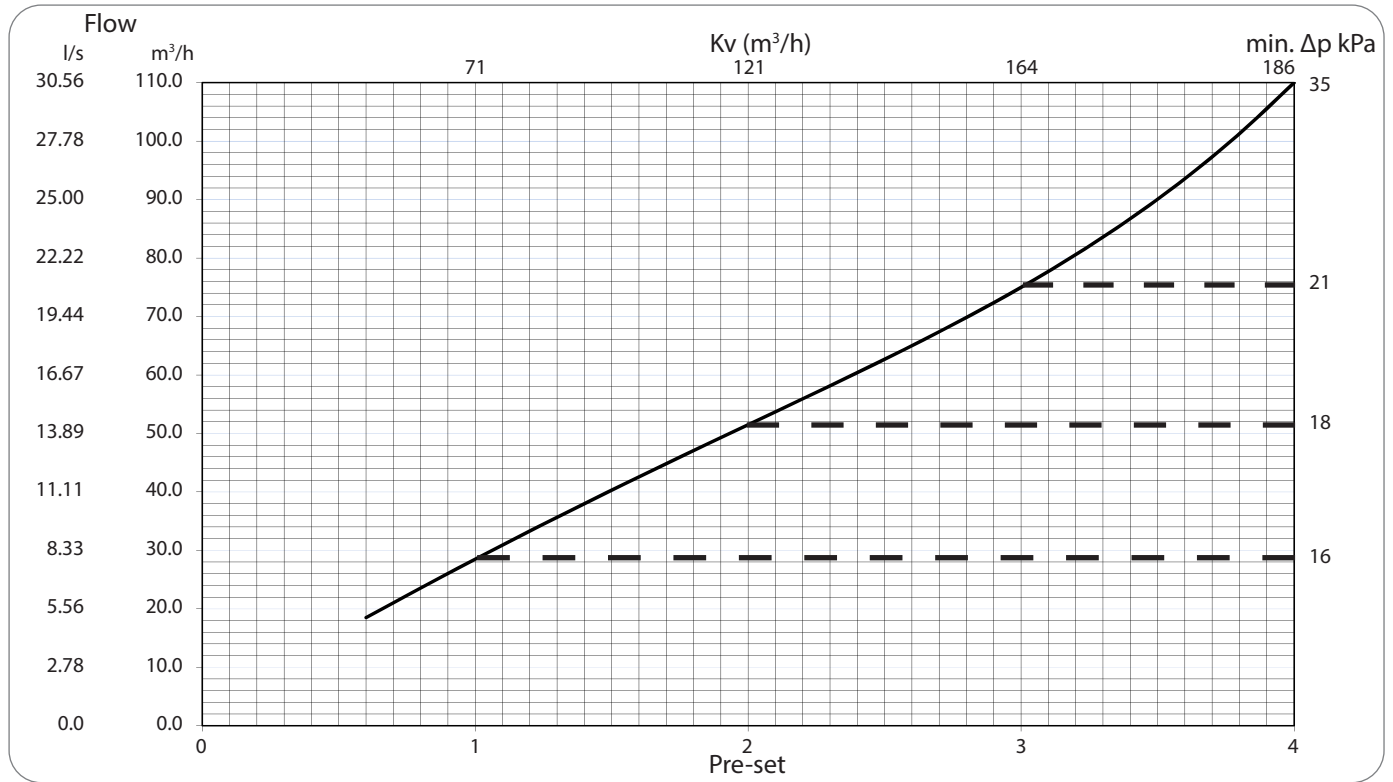


OPTIMA Compact · DN100 High Flow

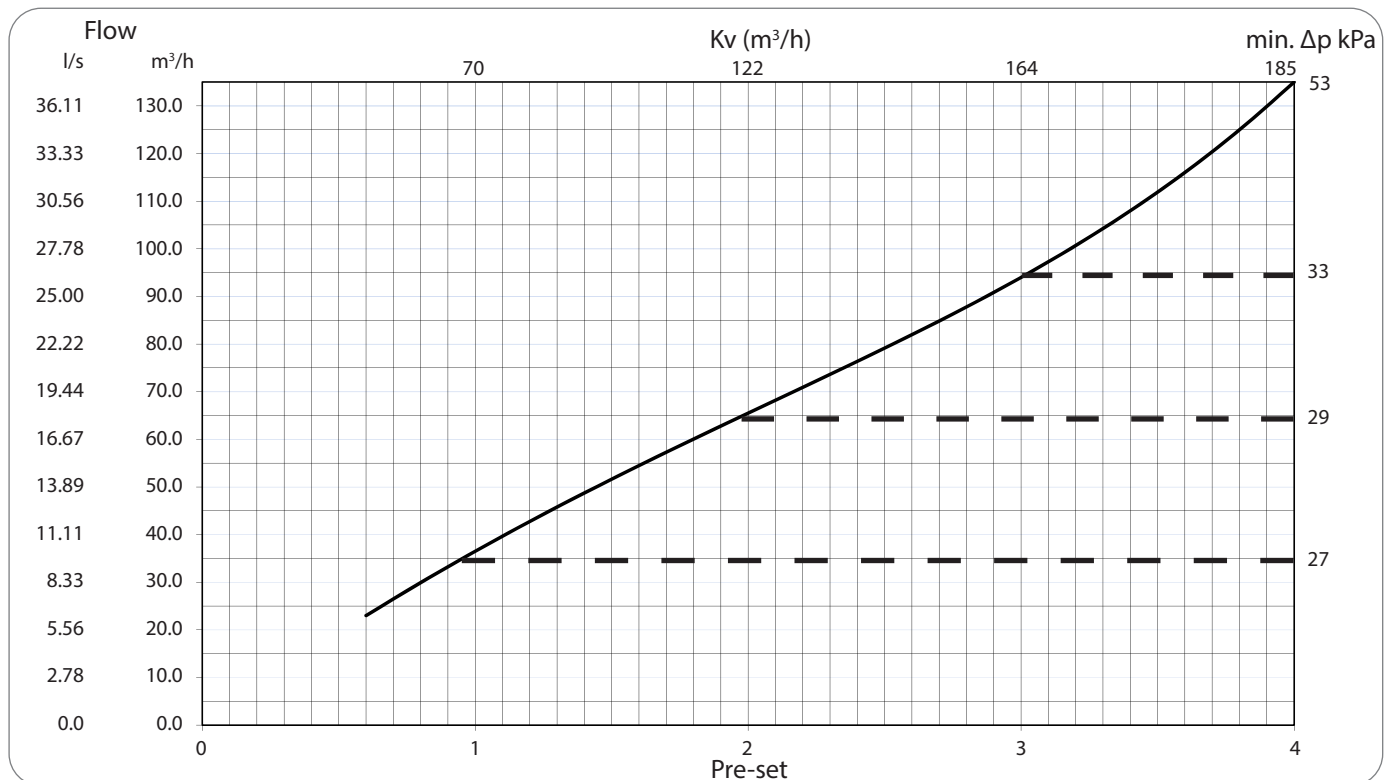


OPTIMA Compact DN50-DN300, PN25

OPTIMA Compact · DN125 Low Flow

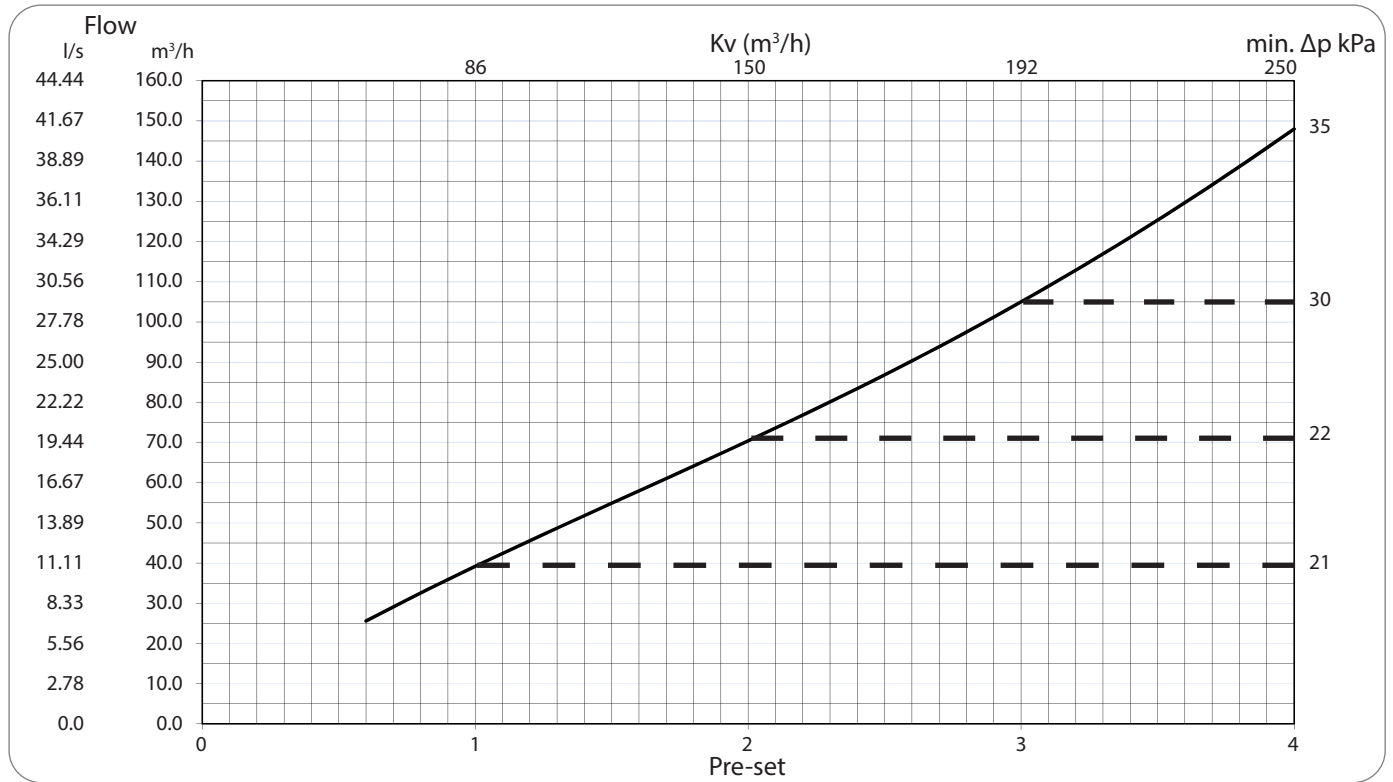


OPTIMA Compact · DN125 High Flow

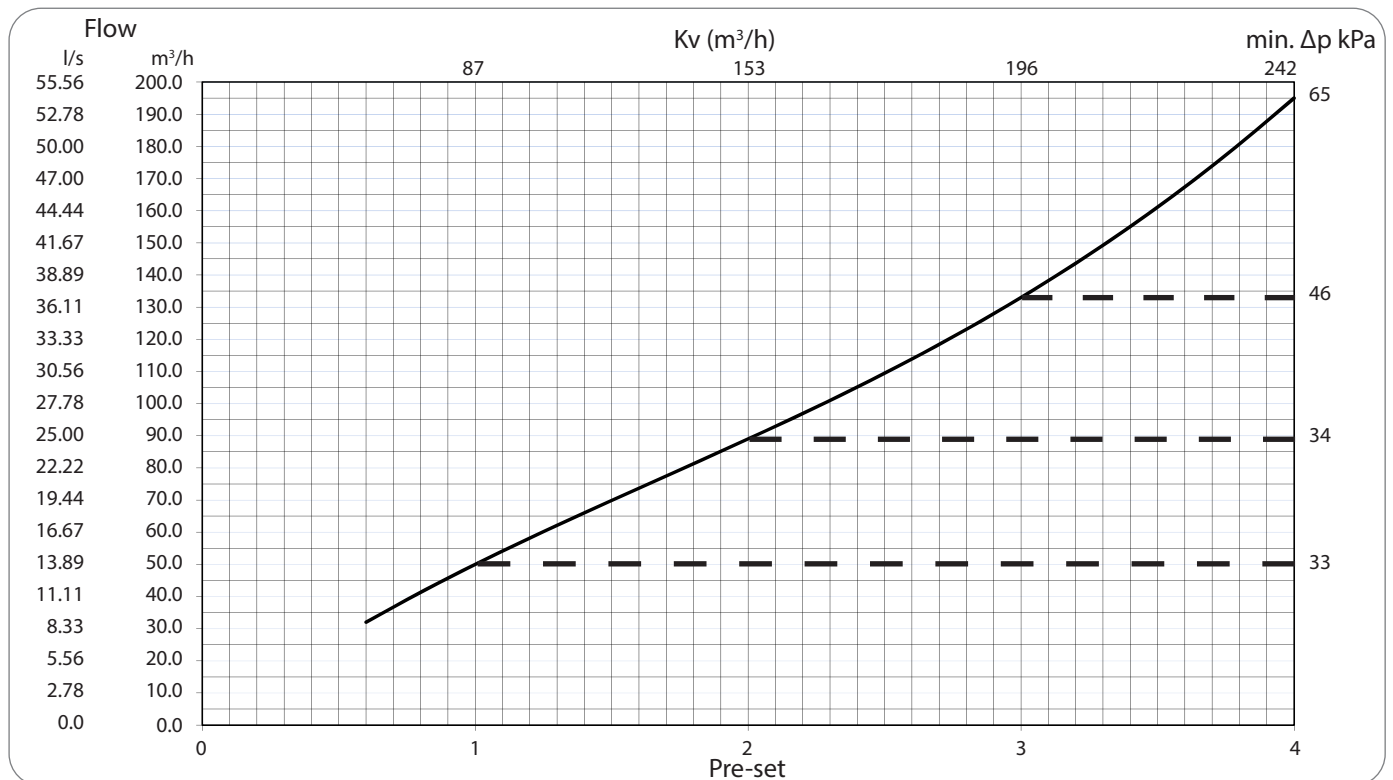


OPTIMA Compact DN50-DN300, PN25

OPTIMA Compact · DN150 Low Flow

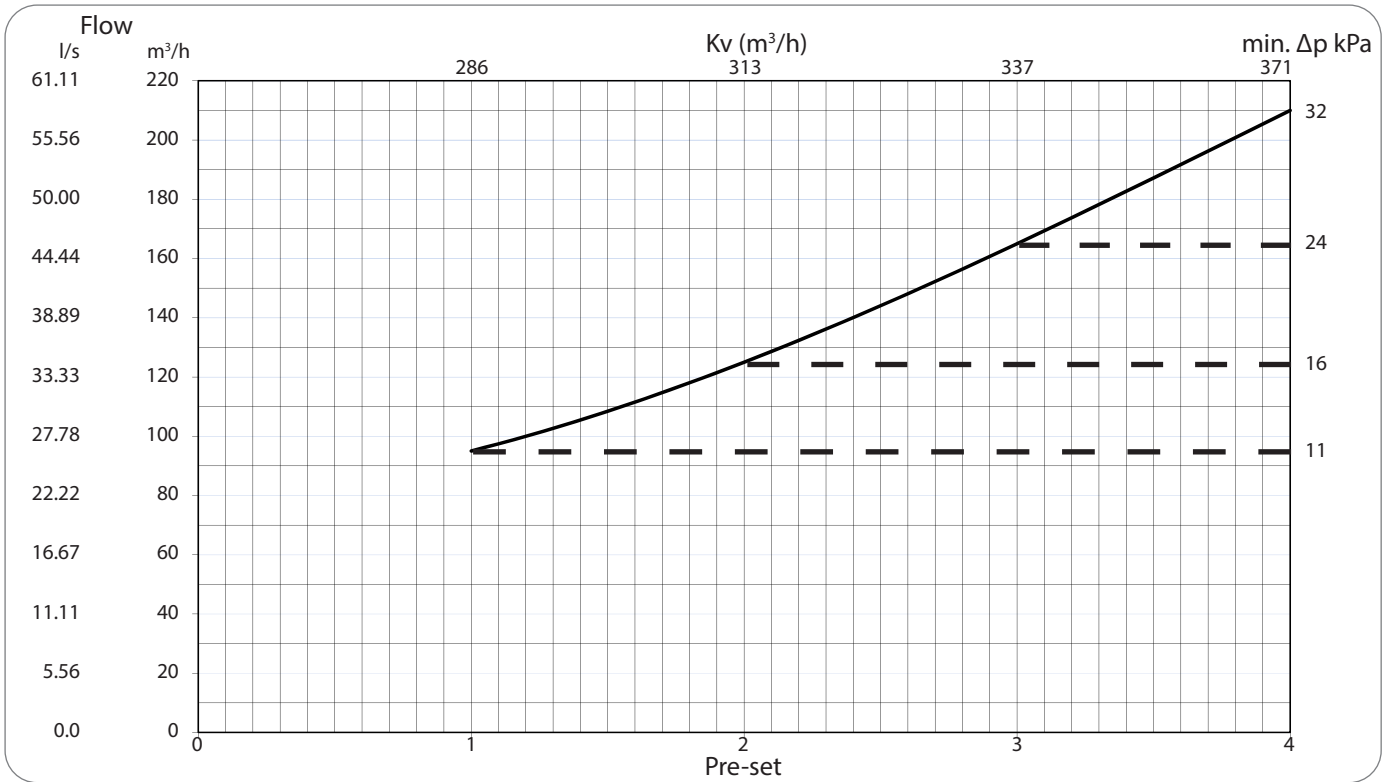


OPTIMA Compact · DN150 High Flow

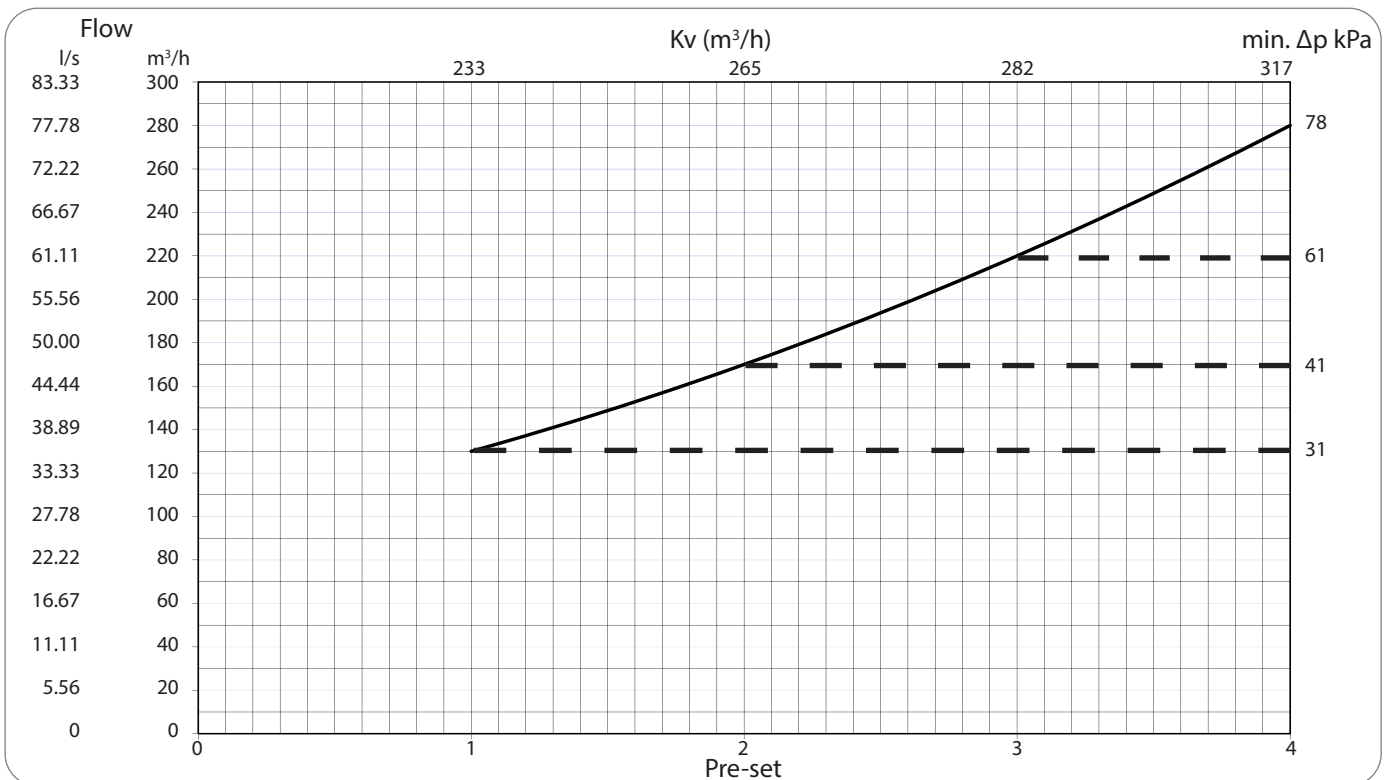


OPTIMA Compact DN50-DN300, PN25

OPTIMA Compact · DN200 Low Flow



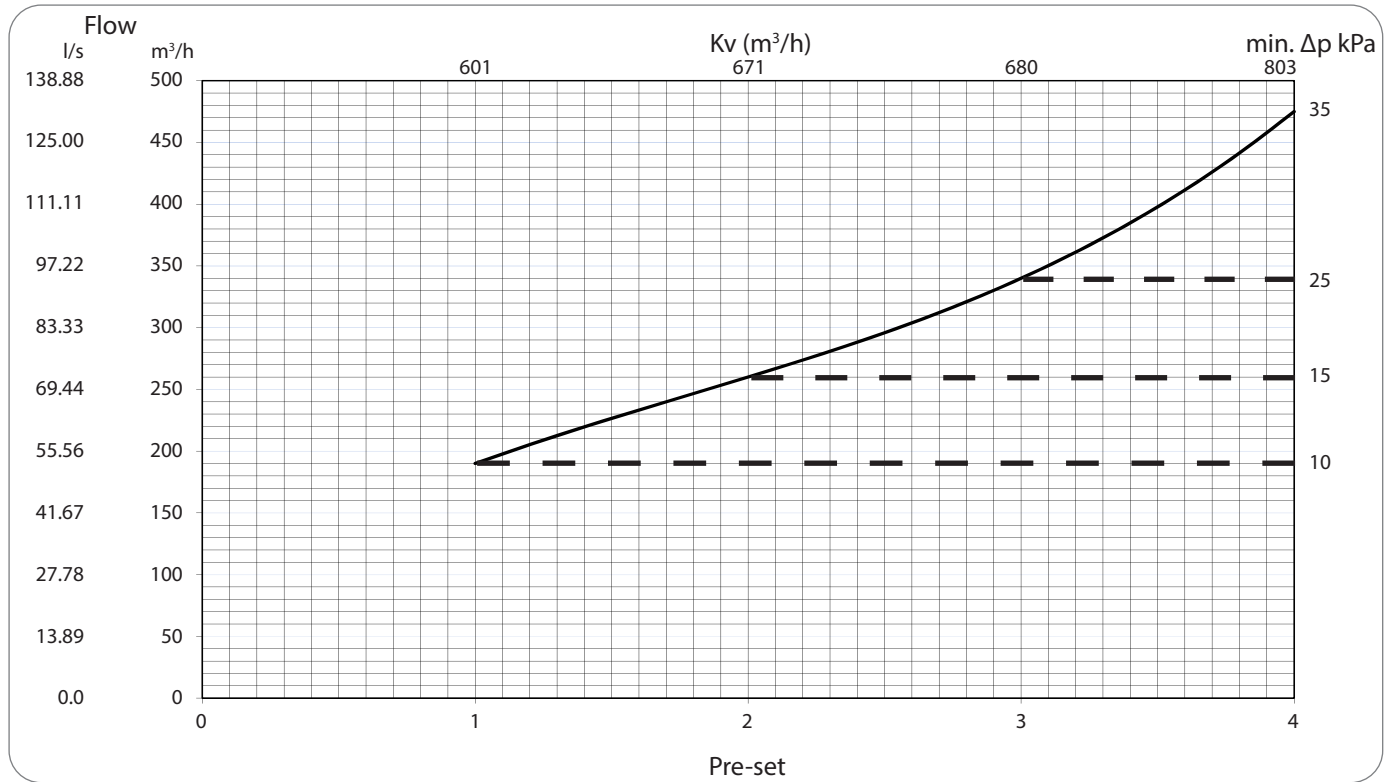
OPTIMA Compact · DN200 High Flow



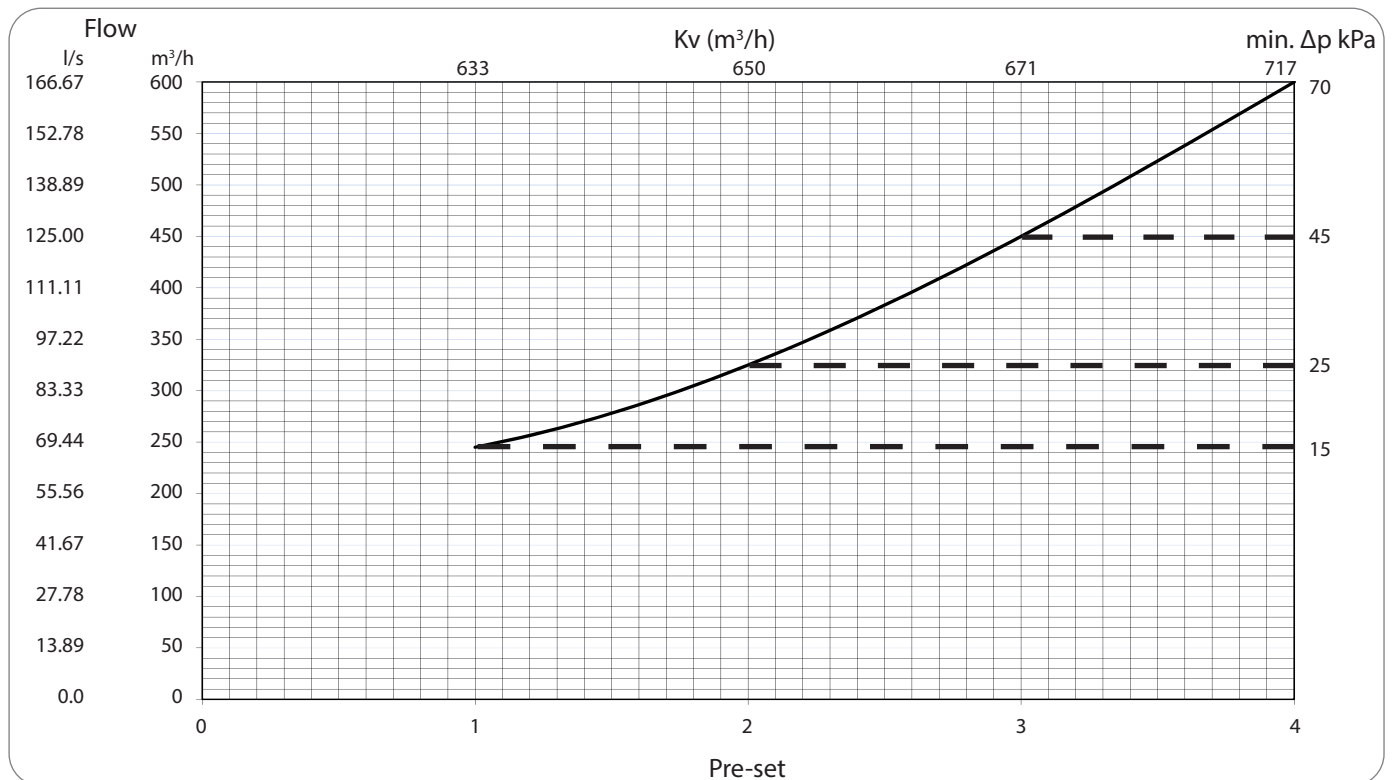
OPTIMA Compact

DN50-DN300, PN25

OPTIMA Compact · DN250 Low Flow

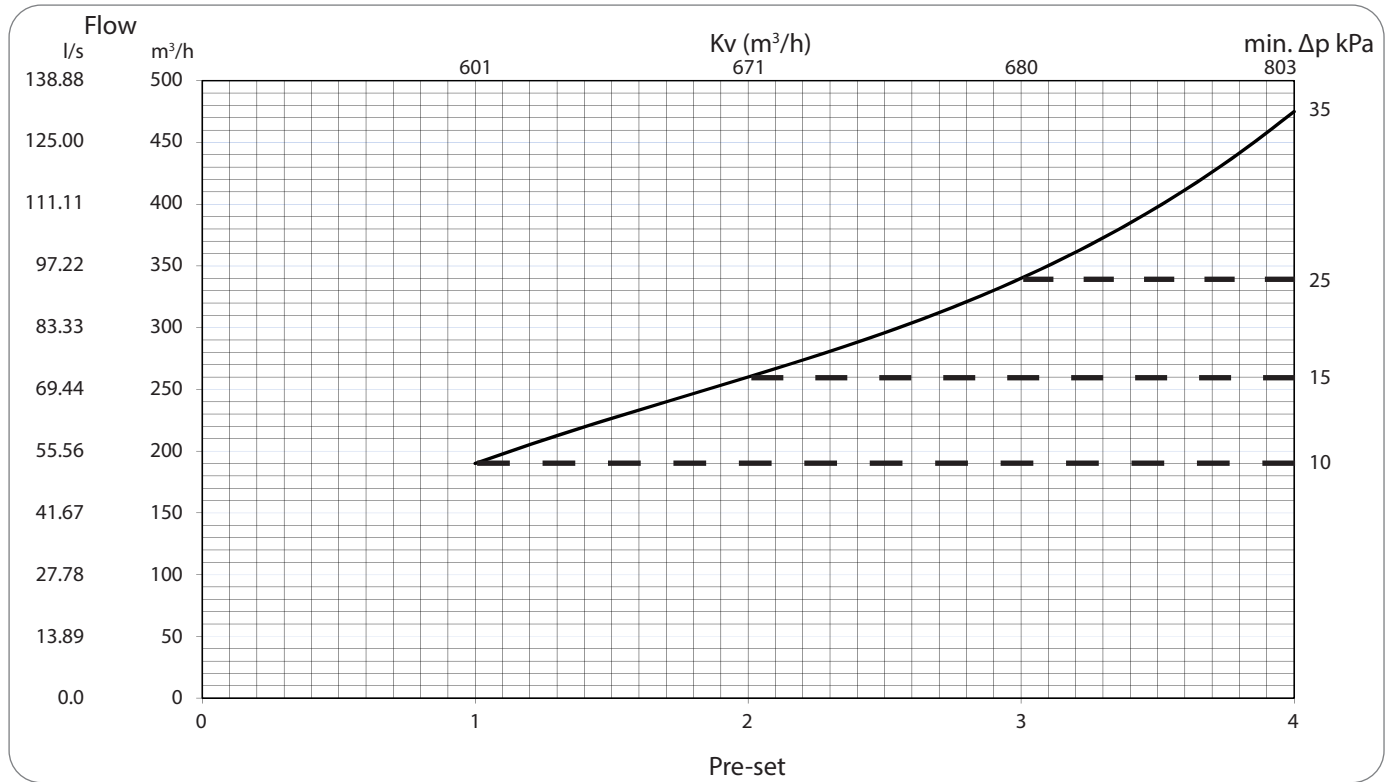


OPTIMA Compact · DN250 High Flow

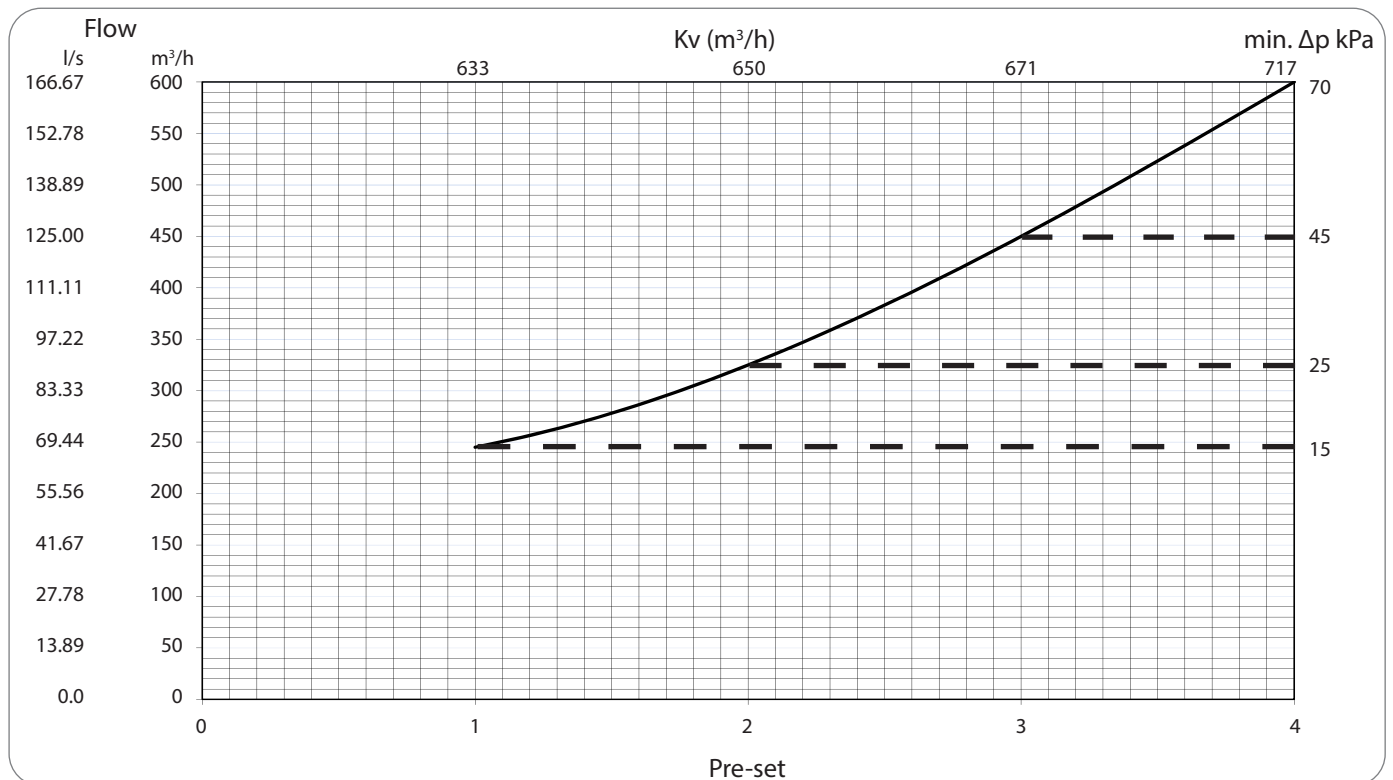


OPTIMA Compact DN50-DN300, PN25

OPTIMA Compact · DN300 Low Flow



OPTIMA Compact · DN300 High Flow



OPTIMA Compact

DN50-DN300, PN25

Setting and Flow · DN50-DN65-DN80

Dim.	DN50 LF			DN50 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	2.5	0.689	10.92	3.9	1.090	17.28
0.8	3.2	0.887	14.06	5.1	1.410	22.34
1.0	3.9	1.073	17.01	6.2	1.713	27.15
1.2	4.5	1.250	19.81	7.2	2.003	31.75
1.4	5.1	1.420	22.51	8.2	2.285	36.21
1.6	5.7	1.586	25.14	9.2	2.560	40.57
1.8	6.3	1.750	27.74	10.2	2.833	44.90
2.0	6.9	1.916	30.36	11.2	3.107	49.24
2.2	7.5	2.084	33.03	12.2	3.386	53.66
2.4	8.1	2.258	35.79	13.2	3.672	58.20
2.6	8.8	2.441	38.69	14.3	3.970	62.92
2.8	9.5	2.635	41.76	15.4	4.283	67.88
3.0	10.2	2.842	45.04	16.6	4.614	73.13
3.2	11.0	3.065	48.57	17.9	4.967	78.72
3.4	11.9	3.306	52.40	19.2	5.346	84.72
3.6	12.8	3.569	56.56	20.7	5.753	91.17
3.8	13.9	3.855	61.09	22.3	6.192	98.13
4.0	15.0	4.167	66.03	24.0	6.667	105.65

Dim.	DN65 LF			DN65 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	4.4	1.216	19.27	6.0	1.654	26.21
0.8	5.6	1.544	24.47	7.6	2.108	33.41
1.0	6.6	1.846	29.25	9.1	2.530	40.09
1.2	7.7	2.129	33.73	10.5	2.929	46.42
1.4	8.6	2.399	38.02	11.9	3.314	52.52
1.6	9.6	2.663	42.21	13.3	3.692	58.52
1.8	10.5	2.927	46.39	14.7	4.072	64.53
2.0	11.5	3.195	50.63	16.0	4.458	70.66
2.2	12.5	3.472	55.03	17.5	4.858	76.99
2.4	13.5	3.763	59.64	19.0	5.277	83.63
2.6	14.7	4.071	64.52	20.6	5.719	90.63
2.8	15.8	4.400	69.73	22.3	6.188	98.07
3.0	17.1	4.753	75.32	24.1	6.688	105.99
3.2	18.5	5.132	81.33	26.0	7.222	114.45
3.4	19.9	5.539	87.78	28.0	7.791	123.47
3.6	21.5	5.976	94.71	30.2	8.397	133.08
3.8	23.2	6.445	102.13	32.5	9.042	143.29
4.0	25.0	6.945	110.06	35.0	9.724	154.11

Dim.	DN80 LF			DN80 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	5.3	1.484	23.53	7.0	1.951	30.92
0.8	6.9	1.906	30.21	9.0	2.513	39.83
1.0	8.3	2.301	36.48	11.0	3.043	48.23
1.2	9.6	2.677	42.44	12.8	3.547	56.23
1.4	10.9	3.040	48.19	14.5	4.034	63.94
1.6	12.2	3.396	53.83	16.2	4.510	71.48
1.8	13.5	3.751	59.46	18.0	4.982	78.96
2.0	14.8	4.113	65.19	19.6	5.457	86.49
2.2	16.2	4.486	71.11	21.4	5.943	94.19
2.4	17.6	4.878	77.32	23.2	6.446	102.17
2.6	19.1	5.295	83.93	25.1	6.973	110.53
2.8	20.7	5.744	91.04	27.1	7.533	119.40
3.0	22.4	6.230	98.74	29.3	8.131	128.88
3.2	24.3	6.760	107.15	31.6	8.775	139.09
3.4	26.4	7.341	116.35	34.1	9.473	150.15
3.6	28.7	7.978	126.46	36.8	10.230	162.15
3.8	31.2	8.679	137.57	39.8	11.055	175.22
4.0	34.0	9.450	149.78	43.0	11.954	189.47

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Setting and Flow · DN100-DN125-DN150

Dim.	DN100 LF			DN100 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	12.1	3.369	53.41	14.8	4.100	64.99
0.8	15.3	4.247	67.32	18.9	5.246	83.15
1.0	18.1	5.040	79.88	22.6	6.276	99.48
1.2	20.8	5.764	91.36	26.0	7.216	114.37
1.4	23.2	6.439	102.06	29.1	8.090	128.22
1.6	25.5	7.083	112.26	32.1	8.924	141.44
1.8	27.8	7.713	122.24	35.1	9.743	154.42
2.0	30.0	8.347	132.30	38.1	10.572	167.57
2.2	32.4	9.004	142.71	41.2	11.438	181.29
2.4	34.9	9.701	153.75	44.5	12.364	195.97
2.6	37.6	10.456	165.73	48.2	13.377	212.03
2.8	40.6	11.288	178.91	52.2	14.501	229.85
3.0	44.0	12.214	193.59	56.7	15.763	249.84
3.2	47.7	13.253	210.05	61.9	17.186	272.41
3.4	51.9	14.422	228.58	67.7	18.798	297.94
3.6	56.7	15.739	249.46	74.2	20.622	326.85
3.8	62.0	17.222	272.98	81.7	22.684	359.54
4.0	68.0	18.891	299.41	90.0	25.009	396.40

Dim.	DN125 LF			DN125 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	18.5	5.139	81.45	23.0	6.389	101.26
0.8	23.6	6.543	103.71	29.9	8.312	131.74
1.0	28.5	7.917	125.48	36.5	10.139	160.70
1.2	33.3	9.255	146.69	42.8	11.878	188.26
1.4	38.0	10.558	167.35	48.7	13.539	214.59
1.6	42.6	11.830	187.50	54.5	15.134	239.88
1.8	47.1	13.075	207.24	60.0	16.680	264.38
2.0	51.5	14.305	226.74	65.5	18.194	288.38
2.2	55.9	15.534	246.21	70.9	19.697	312.20
2.4	60.4	16.778	265.94	76.4	21.213	336.23
2.6	65.0	18.059	286.24	82.0	22.767	360.86
2.8	69.8	19.402	307.51	87.8	24.389	386.57
3.0	75.0	20.833	330.20	94.0	26.111	413.86
3.2	80.6	22.385	354.80	100.7	27.966	443.26
3.4	86.7	24.092	381.86	108.0	29.991	475.36
3.6	93.6	25.994	412.01	116.0	32.226	510.79
3.8	101.3	28.133	445.91	125.0	34.714	550.22
4.0	110.0	30.555	484.29	135.0	37.500	594.37

Dim.	DN150 LF			DN150 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
0.6	25.6	7.111	112.71	32.0	8.889	140.89
0.8	32.6	9.049	143.42	41.3	11.480	181.96
1.0	39.2	10.889	172.59	50.0	13.889	220.14
1.2	45.6	12.660	200.66	58.2	16.162	256.16
1.4	51.8	14.389	228.06	66.0	18.341	290.70
1.6	58.0	16.100	255.18	73.7	20.468	324.42
1.8	64.1	17.815	282.37	81.3	22.583	357.94
2.0	70.4	19.555	309.95	89.0	24.723	391.86
2.2	76.8	21.337	338.20	96.9	26.922	426.71
2.4	83.4	23.177	367.36	105.2	29.214	463.04
2.6	90.3	25.088	397.65	113.9	31.630	501.33
2.8	97.5	27.081	429.24	123.1	34.198	542.04
3.0	105.0	29.166	462.28	133.0	36.945	585.59
3.2	112.9	31.348	496.87	143.6	39.897	632.37
3.4	121.1	33.632	533.07	155.1	43.076	682.75
3.6	129.7	36.021	570.94	167.4	46.502	737.05
3.8	138.7	38.515	610.46	180.7	50.194	795.57
4.0	148.0	41.110	651.59	195.0	54.168	858.56

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DN50-DN300, PN25

Setting and Flow · DN200-DN250-DN300

Dim.	DN200 LF			DN200 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
1.0	95	26.39	418	130	36.11	572
1.2	100	27.77	440	137	38.11	604
1.4	105	29.30	464	145	40.22	638
1.6	112	30.98	491	153	42.44	673
1.8	118	32.79	520	161	44.78	710
2.0	125	34.72	550	170	47.22	748
2.2	132	36.77	583	179	49.78	789
2.4	140	38.91	617	189	52.44	831
2.6	148	41.14	652	199	55.22	875
2.8	156	43.46	689	209	58.11	921
3.0	165	45.83	726	220	61.11	969
3.2	174	48.27	765	231	64.22	1018
3.4	183	50.74	804	243	67.44	1069
3.6	192	53.26	844	255	70.78	1122
3.8	201	55.79	884	267	74.22	1176
4.0	210	58.33	925	280	77.78	1233

Dim.	DN250 LF			DN250 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
1.0	190	52.778	837	245	68.055	1079
1.2	205	57.044	904	256	71.233	1129
1.4	220	61.022	967	270	75.089	1190
1.6	233	64.811	1027	286	79.578	1261
1.8	247	68.511	1086	305	84.655	1342
2.0	260	72.222	1145	325	90.278	1431
2.2	274	76.044	1205	347	96.400	1528
2.4	288	80.078	1269	371	102.978	1632
2.6	304	84.422	1338	396	109.967	1743
2.8	321	89.178	1413	422	117.322	1860
3.0	340	94.444	1497	450	125.000	1981
3.2	361	100.322	1590	479	132.956	2107
3.4	385	106.911	1695	508	141.144	2237
3.6	412	114.311	1812	538	149.522	2370
3.8	441	122.622	1944	569	158.045	2505
4.0	475	131.944	2091	600	166.667	2642

Dim.	DN300 LF			DN300 HF		
	Pre-set	Flow m ³ /h	Flow l/s	Flow gpm	Flow m ³ /h	Flow l/s
1.0	190	52.778	837	245	68.055	1079
1.2	205	57.044	904	256	71.233	1129
1.4	220	61.022	967	270	75.089	1190
1.6	233	64.811	1027	286	79.578	1261
1.8	247	68.511	1086	305	84.655	1342
2.0	260	72.222	1145	325	90.278	1431
2.2	274	76.044	1205	347	96.400	1528
2.4	288	80.078	1269	371	102.978	1632
2.6	304	84.422	1338	396	109.967	1743
2.8	321	89.178	1413	422	117.322	1860
3.0	340	94.444	1497	450	125.000	1981
3.2	361	100.322	1590	479	132.956	2107
3.4	385	106.911	1695	508	141.144	2237
3.6	412	114.311	1812	538	149.522	2370
3.8	441	122.622	1944	569	158.045	2505
4.0	475	131.944	2091	600	166.667	2642

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Documentation formula

Valve ID (own choice)	Valve type	Dimension	Pre-setting	Verified Δp [kPa]	Min. Δp (see flow rate graph) [kPa]	Flow
Pump type		Regulation mode			Set point	
Installation						
Signature					Date	

Text for technical specifications

The length of the modulating stroke shall be independent of flow setting. The valve shall have full stroke modulating control at all flow settings and the stroke should not be restricted by the flow setting position.

The modulation and flow setting shall be one combined unit with a linear modulating motion and a rotational flow setting motion.

The valve characterization shall not be changed at different flow settings.

The combined flow setting and modulating control unit shall be pressure independent.

The Pressure Independent Control Valve shall contain a combined flow setting, differential pressure control and modulating bonnet assembly.

The valve housing shall be GJS-400 and pressure class PN25.

The valve shall have a spring made of stainless steel, a Diaphragm made of Reinforced EPDM and O-rings made of EPDM.

The valve shall have flange connections according to EN 1092.

The valve shall have a maximum operating differential pressure of 800 kPa (8 Bar).

The valve shall have an external adjustable analogue step less presetting scale from minimum to maximum flow.

P/T plugs shall be available.

The valve shall be capable of closing against a maximum differential pressure of 800 kPa (8 bar) with a leakage rate at maximum 0,01% of max rated volumetric flow and comply to EN1349 Class IV.

Pressure independent control valves must be tested in accordance with the BSRIA document BTS.1 'Test Method for Pressure Independent Control Valves' and manufacturers must be able to provide the test results upon request.

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