

Frese OPTIMA P Compact

DN15-DN20

Application

Frese OPTIMA P Compact pressure independent balancing & control valve with external differential pressure control is used in heating systems in applications with Radiators.

Frese OPTIMA P Compact provides modulating control and ensures differential pressure control over the radiator system, to avoid noise and provide a better control for the radiator valves.



Benefits

Design

- Easy to install and adjust according to pre-defined flow.
- The valves automatically find the hydraulic balance regardless of pressure fluctuations in the system.
- No main circuit or branch balancing valves needed in the system.
- Systems with automatic balancing are flexible, as they do not require readjustment of the "original" circuit in case the system is extended after installation.
- Less time to define the necessary equipment for a hydraulic balanced system.

Installation

- Total number of valves minimized due to the multi functional 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.

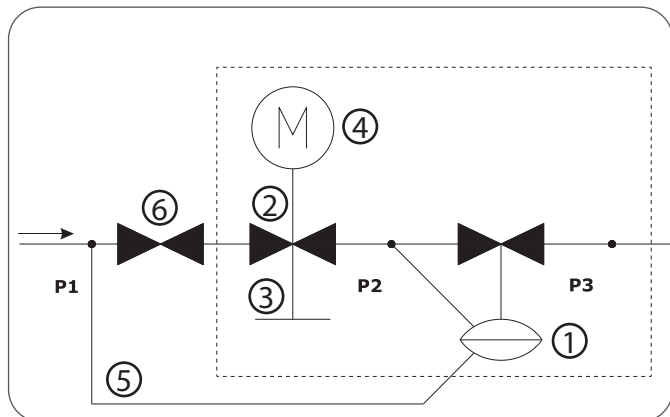
Features

- The presetting function has no impact on the stroke; Full stroke modulation at all times, regardless the preset flow.
- The limitation of the differential pressure across radiator system eliminates noise.
- Automatic balancing eliminates overflows, regardless of fluctuating pressure conditions in the system.
- Thermal actuator On/Off or 0-10V, normally closed.
- Differential pressure operating range up to 800 kPa.
- Leakage rate according to EN1349 Class IV (0,01%).
- Isolation up to 10 Bar when fitted with isolation cap.
- Small dimensions due to compact housing.
- Higher presetting precision due to stepless analogue scale.

Frese OPTIMA P Compact

DN15-DN20

Design

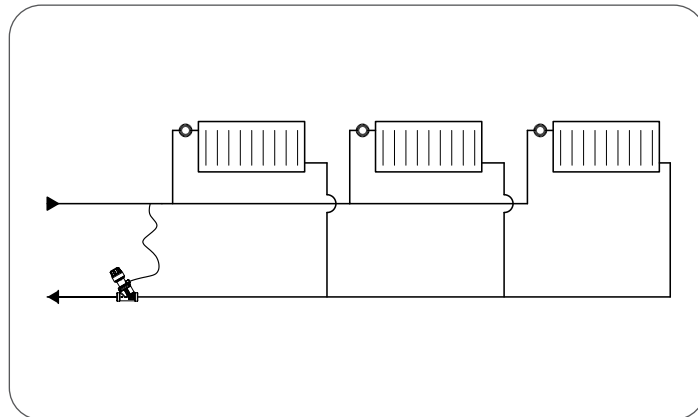


The design of Frese OPTIMA Compact combines high performance with small size and compact construction. The main components of the valve are:

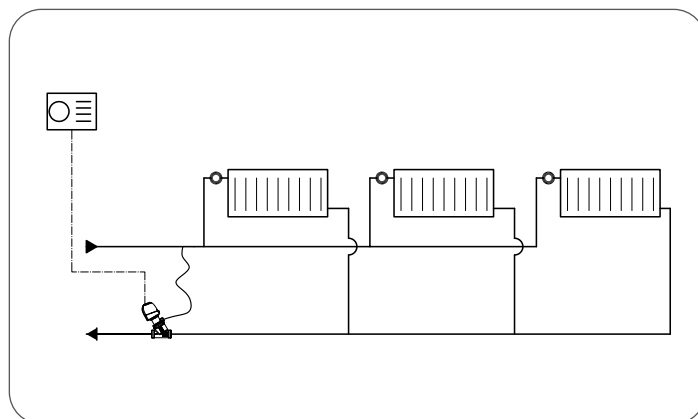
- ① Differential pressure control
- ② Modulating control component
- ③ Presetting scale (not accessible when the actuator is mounted)
- ④ Actuator
- ⑤ Capillary tube
- ⑥ External radiator system



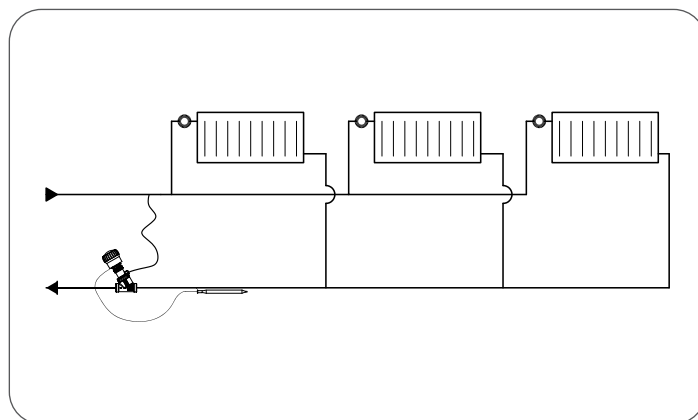
Examples of function in different systems



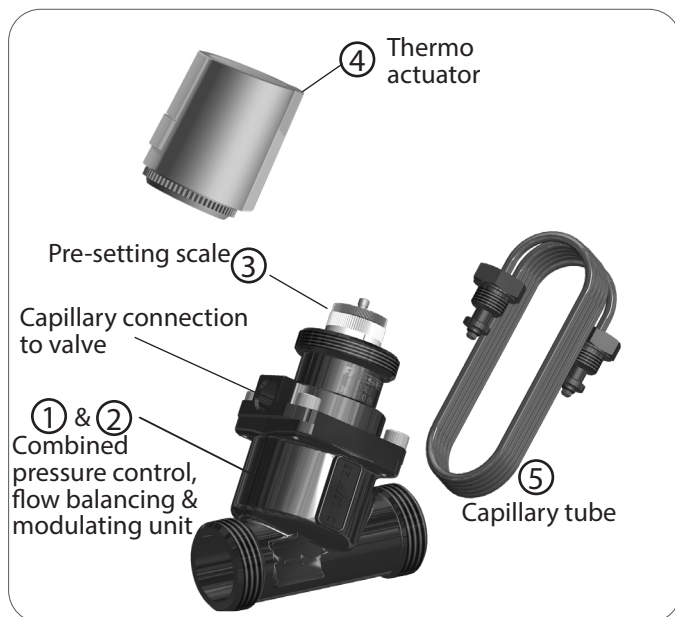
Frese OPTIMA P Compact limits the flow and differential pressure across a radiator system.



Frese OPTIMA P Compact limits the flow and differential pressure across a radiator system and is connected to a room controller for On/Off or modulating control.



Frese OPTIMA P Compact limits the flow and differential pressure across a radiator system and controls the return temperature by the thermostat with remote sensor.



Frese OPTIMA P Compact

DN15-DN20

Example presetting OPTIMA P Compact

1. The rated flow is used as the point of reference for the presetting of dynamic systems. In this example the required design flow is 500 l/h.

2. In the given example we want to maintain 10 kPa in the radiator system (Δp_s) at a flow rate of 500 l/h.

From the intersection of the vertical 10 kPa line and the horizontal line indicating 500 l/h we find the preset value.

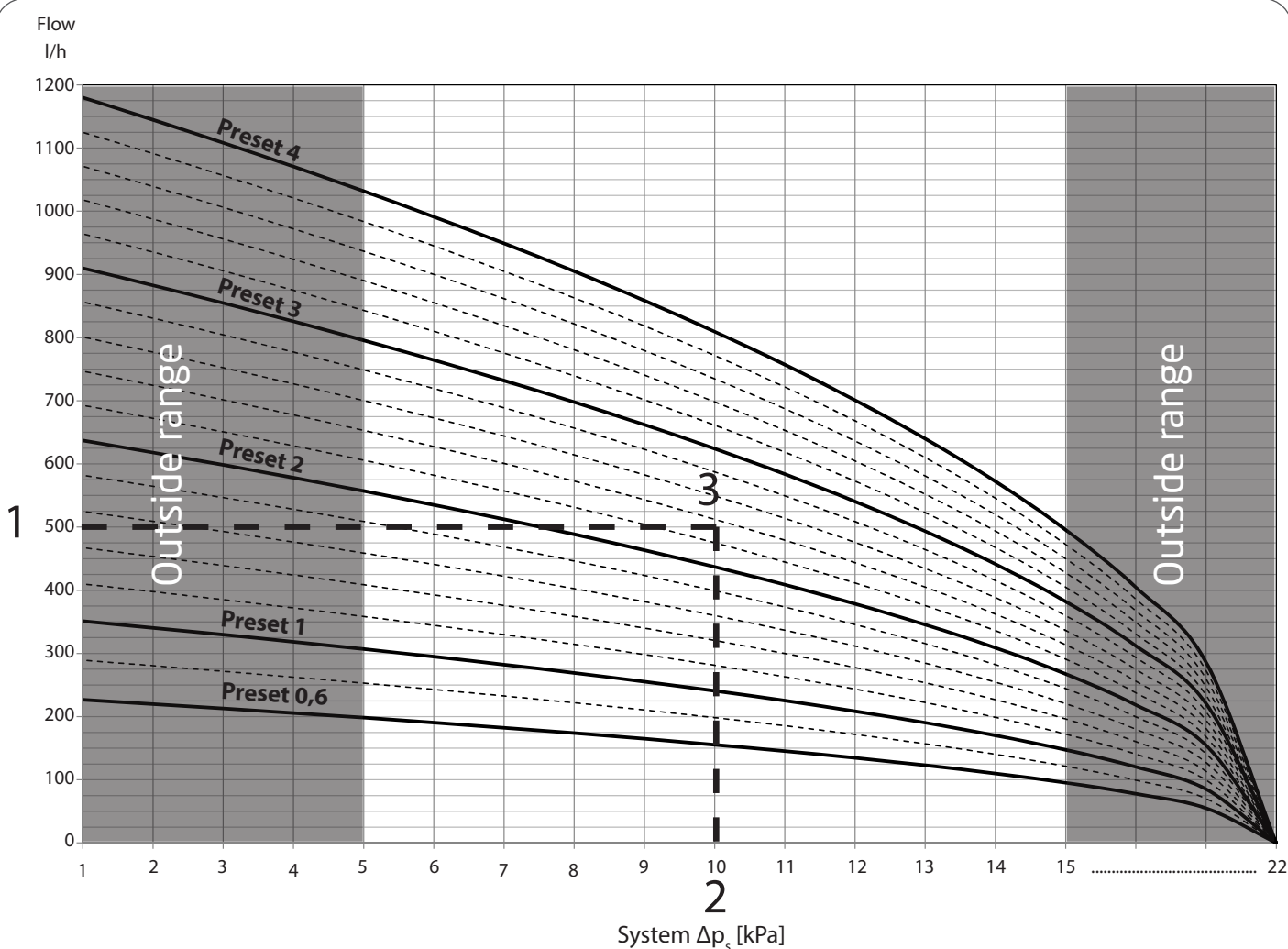
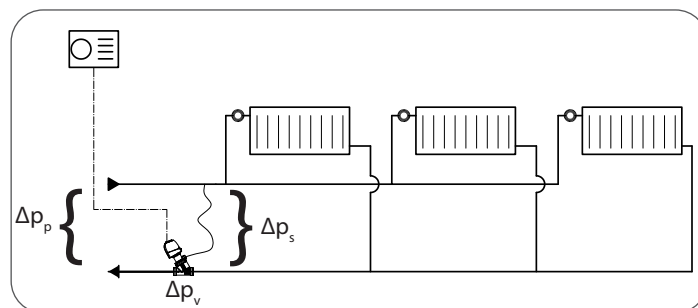
3. The preset value is app. **2.3**.

Function

Frese OPTIMA P Compact maintains a constant differential pressure of 22 kPa, across the system (Δp_s) and the control valve (Δp_v).

The built in differential pressure controller will absorb any excess pump pressure (Δp_p) to provide good modulation and prevent from noise in the radiator system. (Δp_s) + (Δp_v) = 22 kPa.

This means that if all radiator valves are closing down, the maximum differential pressure can only rise up to 22 kPa. (See graph below)



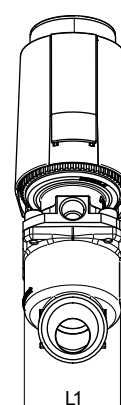
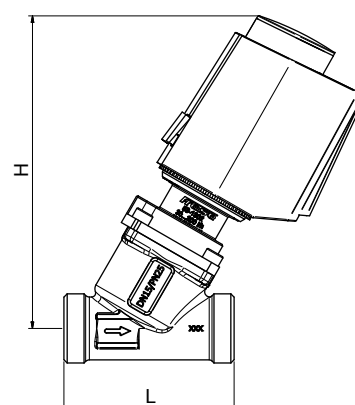
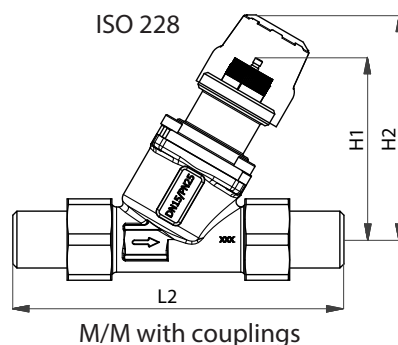
Frese OPTIMA P Compact

DN15-DN20

Technical data

Valve housing:	DZR Brass
DP controller:	PPS 40% glass
Spring:	Stainless steel
Diaphragm:	HNBR
O-rings:	EPDM
Pressure class:	PN25
Max. differential pressure:	800 kPa
Medium temperature range:	0°C to 120°C
Thread	ISO 228

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.
Frese A/S can accept no responsibility if another actuator is used instead of the Frese actuator.



Dimension & Weight

Valve Size		DN15	DN20
Thread		M/M - G 3/4	M/M - G 1
Length [mm]	L	65	70
	L1	38	38
	L2	122	131
	H	121	121
	H1	68	68
	H2	83	83
Weight	kg	0.38	0.40

Flow & differential pressure range

Stroke	mm	2.5 High		4.0 High		5.0 Low		5.0 High	
Δp_s	kPa	5	10	5	10	5	10	5	10
Flow	l/h	93 - 482	73 - 378	93 - 786	73 - 617	59 - 309	45 - 236	198 - 1032	156 - 809
	l/s	0.029 - 0.134	0.020 - 0.105	0.026 - 0.218	0.020 - 0.171	0.025 - 0.086	0.013 - 0.066	0.055 - 0.287	0.043 - 0.225
	gpm	0.41 - 2.12	0.32 - 1.66	0.41 - 3.46	0.32 - 2.72	0.26 - 1.36	0.20 - 1.04	0.87 - 4.54	0.69 - 3.56
Kvs	m³/h	1.3		2.1		0.9		2.7	
Min Δp_p	kPa	25 kPa (required available pump pressure)							
Max Δp_s	kPa	22 kPa (max Δp across system at a flow of 0 l/h)							

Frese OPTIMA P Compact

DN15-DN20

Technical data actuators DN15-20

Characteristics:	Thermo actuators, normally closed
Protection class:	IP 54 to EN 60529
Frequency:	50/60 Hz
Control signal:	0-10V DC or On/Off
Actuating force:	100 N
Stroke:	2.5 - 4.0 - 5.0 mm
Running time:	120 s 0-10V/180 s On/Off
Ambient operating conditions:	0°C to 60°C
Cable length:	1.0 m
Weight:	100 g



On/Off actuator 2.5-4.0 mm stroke, 24V AC-DC/ On/Off 180s	48-5525
On/Off actuator 2.5-4.0 mm stroke 230V AC/ On/Off 180s	48-5526
On/Off actuator 5.0 mm stroke, 24V AC-DC/ On/Off 180s	48-5527
On/Off actuator 5.0 mm stroke 230V AC/ On/Off 180s	48-5528
Modulating actuator 2.5-4.0-5.0 mm stroke 24V AC/0-10V DC 30 s/min	48-5529

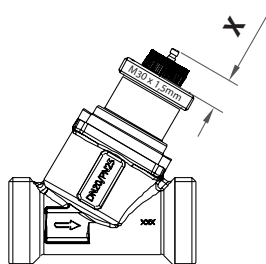
Actuator requirements DN15-20

Dimension "X" in closed position

2.5 mm stroke = 11.4 mm

4.0 mm stroke = 11.4 mm

5.0 mm stroke = 9.3 mm



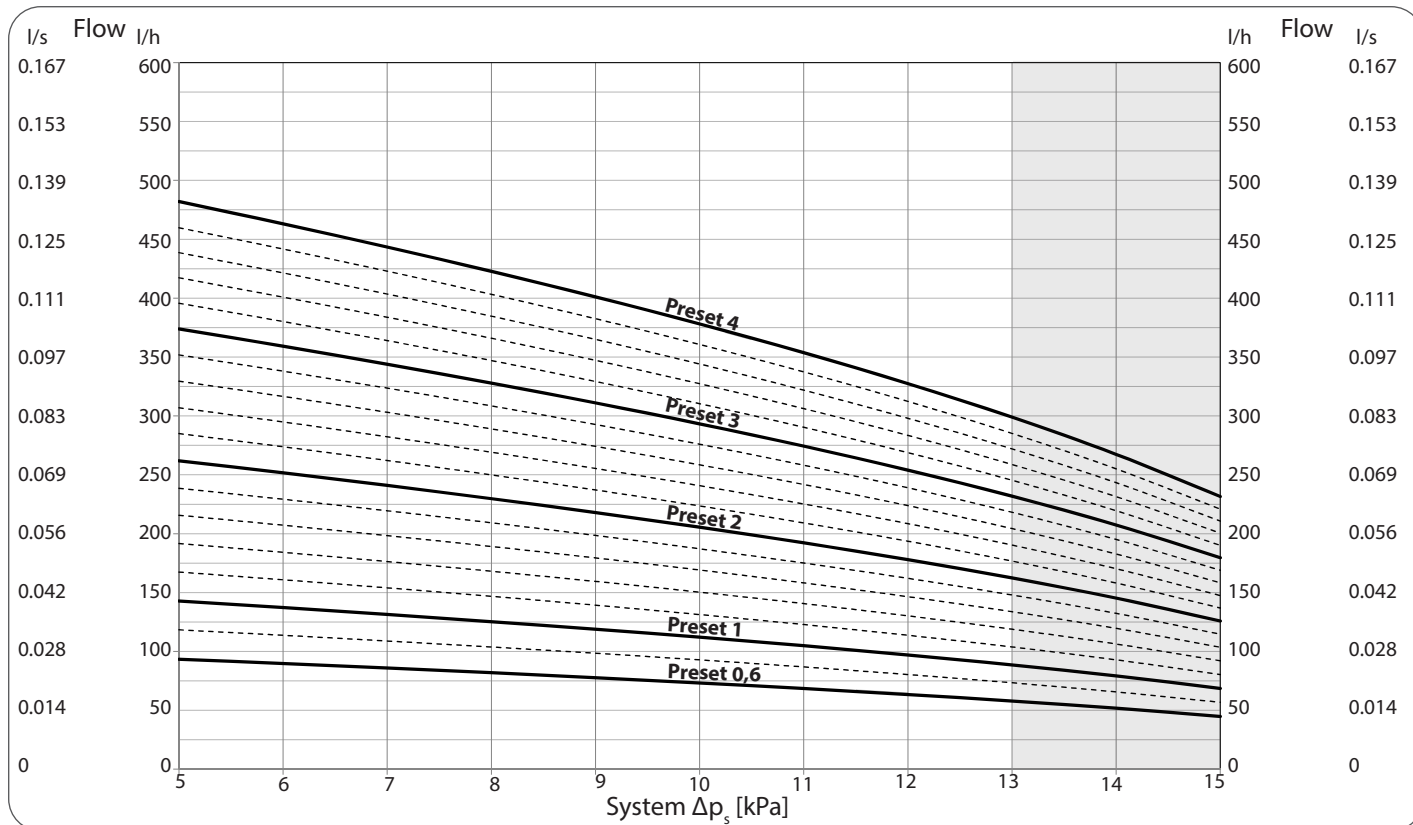
Actuator minimum force: 100N

Actuator connection: M30 x 1.5mm

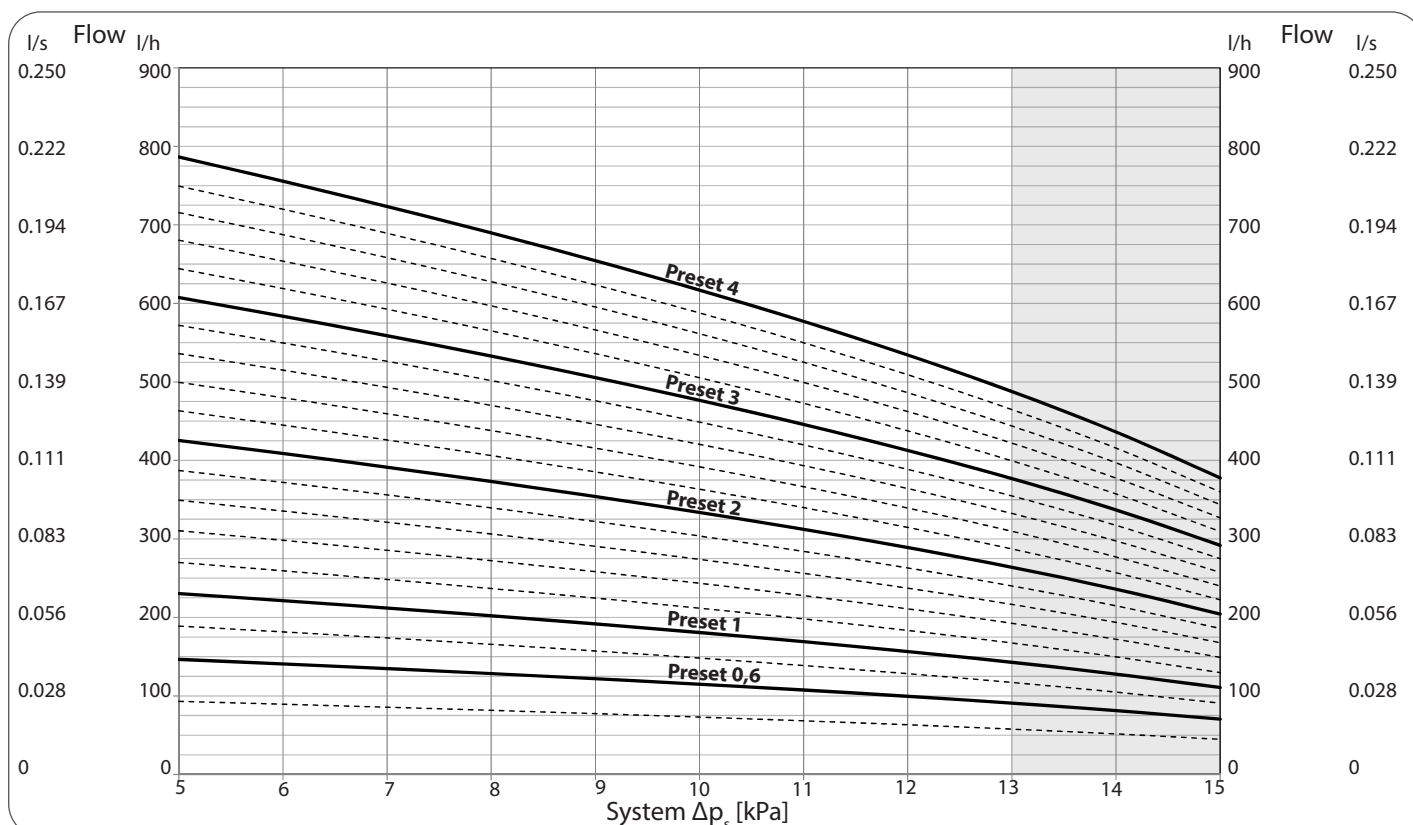
Frese OPTIMA P Compact

DN15-DN20

Frese OPTIMA P Compact High 2.5 DN15/20



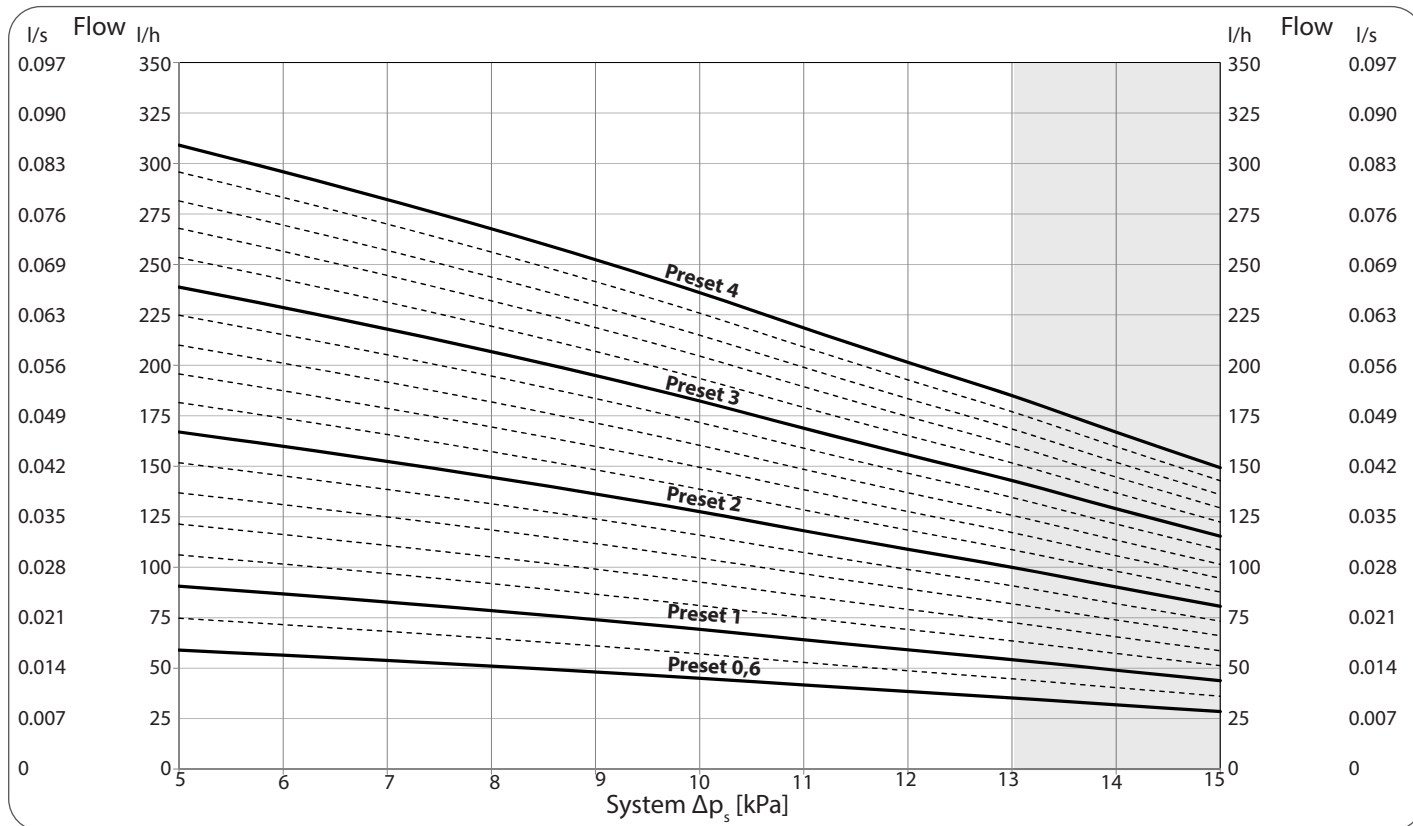
Frese OPTIMA P Compact High 4.0 DN15/20



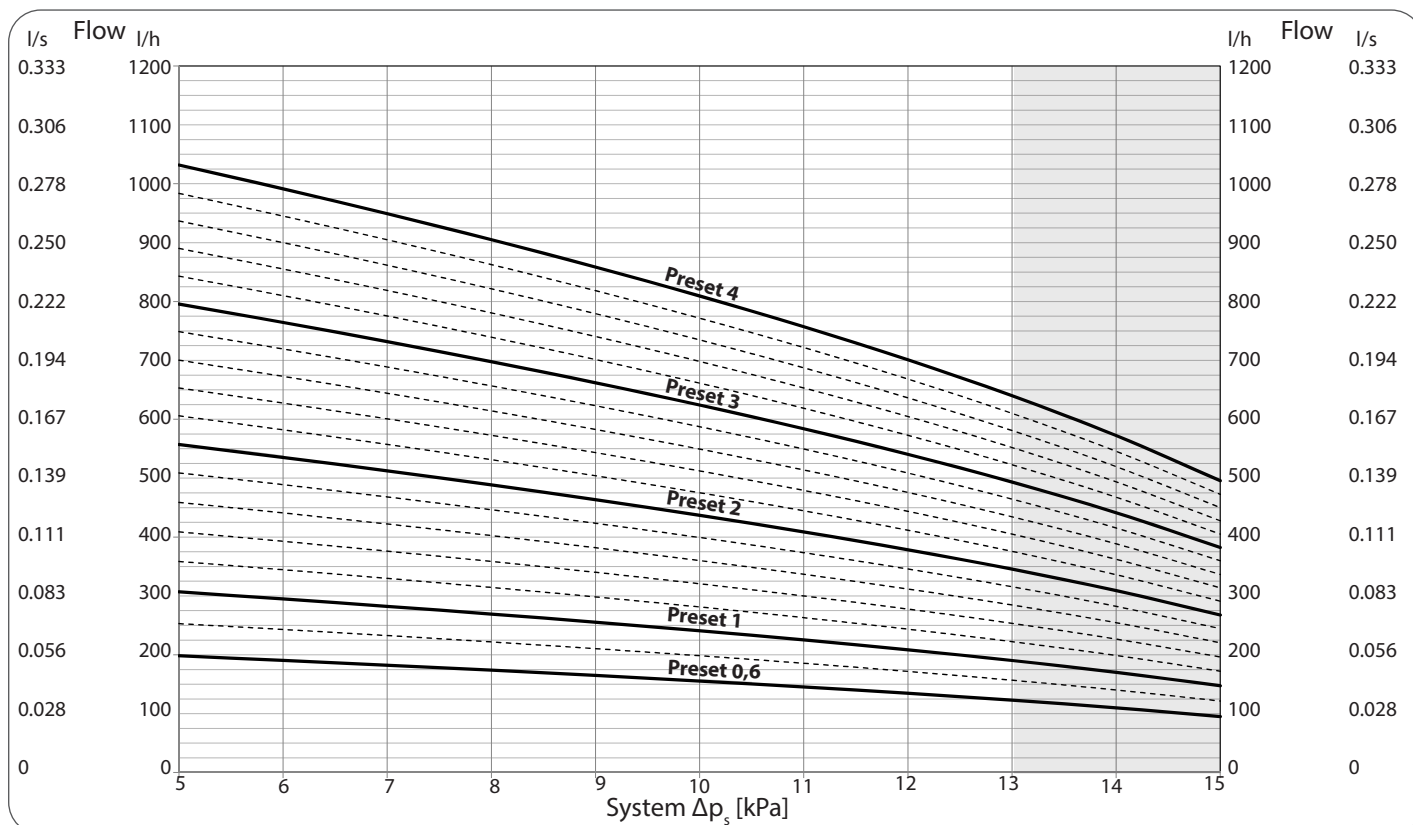
Frese OPTIMA P Compact

DN15-DN20

Frese OPTIMA P Compact Low 5.0 DN15



Frese OPTIMA P Compact High 5.0 DN15/20



Frese OPTIMA P Compact

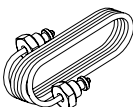
DN15-DN20

Product programme

Size	Type	Flow l/h (5 kPa)	M/M
DN15 25 Pcs/box	High 2.5 mm	93 - 482	53-4100
	High 4.0 mm	93 - 786	53-4101
	Low 5.0 mm	59 - 309	53-4106
	High 5.0 mm	198 - 1032	53-4102
DN20 25 Pcs/box	High 2.5 mm	93 - 482	53-4103
	High 4.0 mm	93 - 786	53-4104
	High 5.0 mm	198 - 1032	53-4105



Accessories

Frese capillary tube ø3mm x 1000 mm 25 Pcs/box		48-0004
Frese damped capillary tube for extreme pressure fluctuations ø3mm x 1000 mm 25 Pcs/box		48-0034
Frese capillary tube ø3mm x 2000 mm 25 Pcs/box		48-0029
Couplings DN15 for M/M incl. gasket. Set with 2 pcs.		43-2330
Couplings DN20 for M/M incl. gasket. Set with 2 pcs		43-3330
Adapter for capillary tube 1/2" 25 Pcs/box		48-0030
Adapter for capillary tube 1/4" 25 Pcs/box		48-0031
Isolation cap 25 Pcs/box		48-0032
Thermostat with remote sensor. Only for 2.5mm stroke		53-1990

Frese A/S assumes no responsibility for errors, if any, in catalogues, brochures, and other printed matter. All stated data are subject to tolerances. 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.

Frese A/S
Tel: +45 58 56 00 00
info@frese.dk