Frese Balancing valves

District cooling

District cooling

Application guide

Frese offers a wide selection of products designed to optimize flow in district cooling systems.

Frese PV Compact – differential pressure control valve
Frese Optima Compact – picv valve
Frese Delta T system for DT optimisation
Frese stem heater for Frese Optima Compact operating in sub zero temperature
Frese smart valve for remote control of by-pass units and pressure /temperature reading

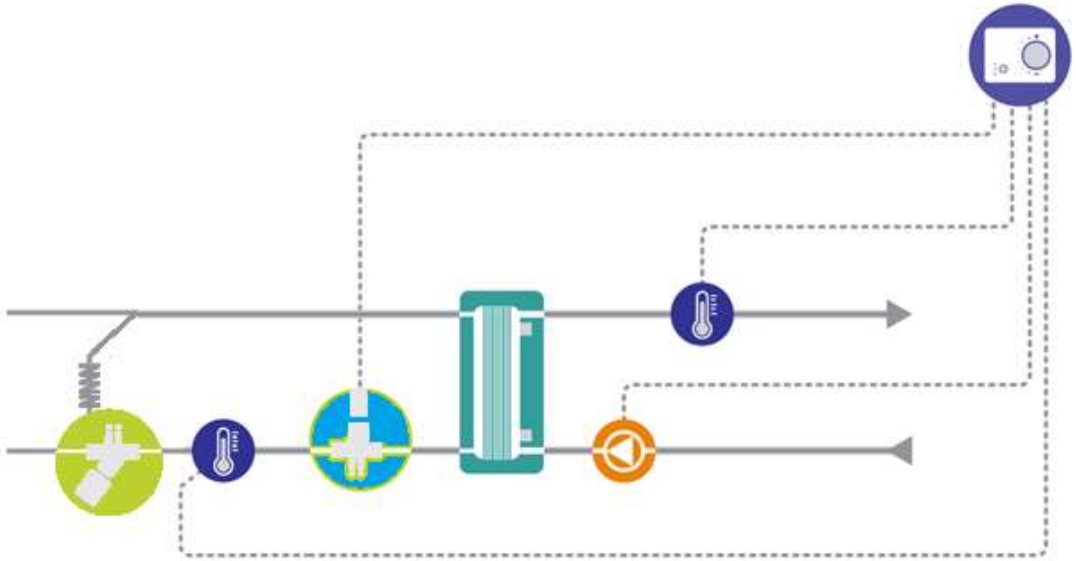
District cooling

Application guide

Frese PV Compact may be used in district cooling systems.
The valve can stabilise the differential pressure over the 2-way control valve to provide stable flow conditions in the substation (through the heat exchanger).

This solution is used if very high differential pressure is expected in the district cooling system.

Frese PV Compact



2-way control valve

Frese PV Compact stabilises differential pressure over 2-way control valve

Frese PV Compact

District cooling

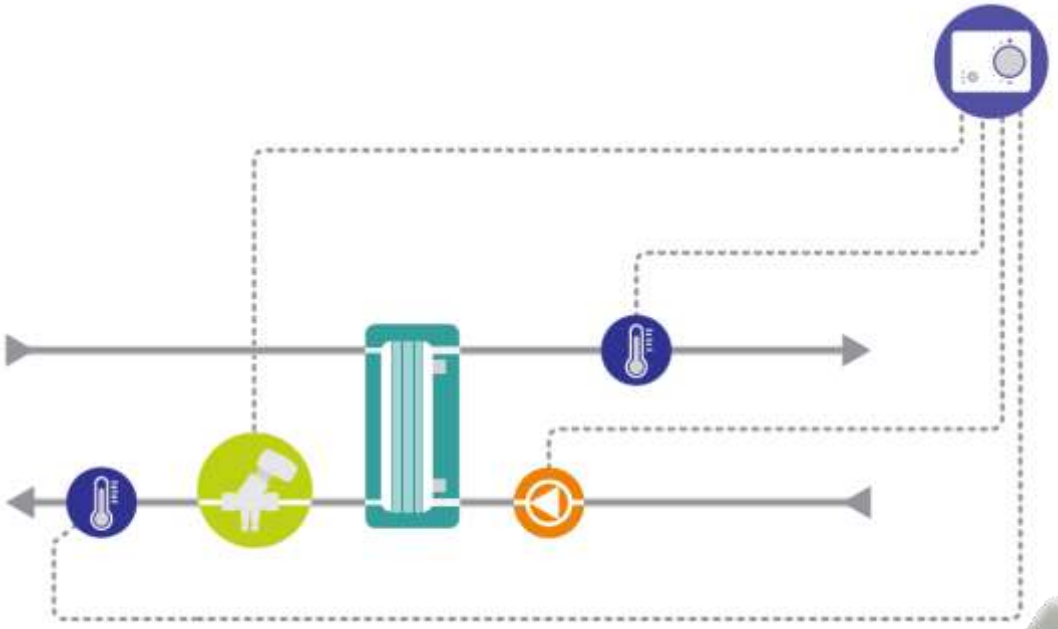
Application guide

Frese Optima Compact may be used in district cooling systems. Thanks to high differential pressure control it can maintain the required flow depending on the current outdoors condition and the required load in the secondary system side.

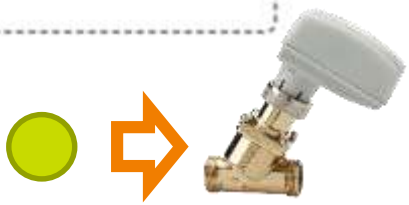
There is no need for a differential pressure control valve!

Frese Optima Compact

Variable flow systems:



Frese Optima Compact controls flow to the heat exchanger.



Frese Optima Compact

District cooling

Application guide

The standard Frese Optima compact offers stable flow conditions at max differential pressure of 8bar = 800kPa.
Also the shut off pressure is as high as 800kPa.

Technical Data · Frese OPTIMA Compact DN10 - DN32

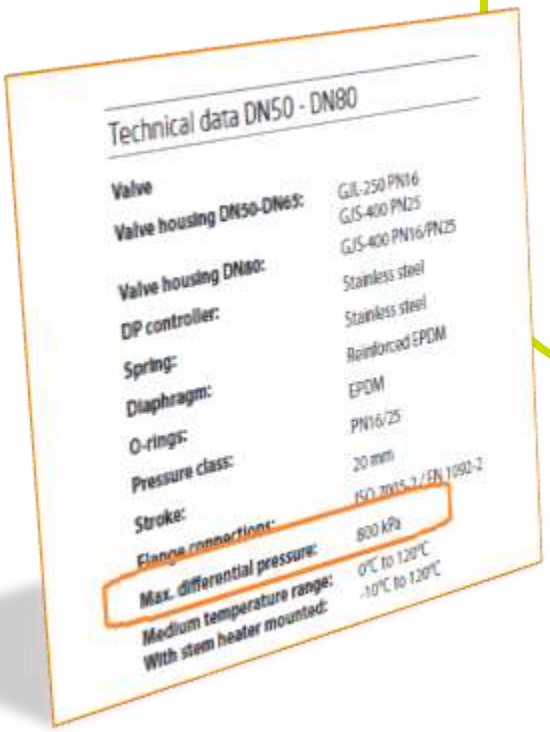
Size Range:	DN10 – DN32
Max. Differential Pressure:	800 kPa
Valve Housing:	DZR Brass
Pressure Class:	PN25
Temperature Range:	0°C to 120°C
Flow Range:	30 l/h to 4,001 l/h
Leakage Rate:	EN1349 Class IV compliant
Actuator Options:	Thermic on/off and modulating Motoric modulating 0-10V DC and 3 POS

Technical Data · Frese OPTIMA Compact DN40 - DN50

Size Range:	DN40 – DN50
Max. Differential Pressure:	800 kPa
Valve Housing:	Ductile Iron
Pressure Class:	PN25
Temperature Range:	0°C to 120°C
Flow Range:	1,370 l/h to 11,500 l/h
Leakage Rate:	EN1349 Class IV compliant
Actuator Options:	Motoric modulating 0-10V DC and 3 POS Motoric Spring Return

Technical Data · Frese OPTIMA Compact DN50 - DN300

Size Range:	DN50 – DN300
Max. Differential Pressure:	800 kPa
Valve Housing:	GJL-250 / GJS-400
Pressure Class:	PN16 / PN25
Temperature Range:	Please refer to technote
Flow Range:	2,480 l/h to 600,000 l/h
Leakage Rate:	EN1349 Class IV compliant
Actuator Options:	Motoric modulating 0-10V DC and 3 PO Motoric Spring Return



Technical data DN50 - DN80

Valve	
Valve housing DN50-DN65:	GJL-250 PN16 GJS-400 PN25 GJS-400 PN16/PN25
Valve housing DN80:	Stainless steel
DP controller:	Stainless steel
Spring:	Reinforced EPDM
Diaphragm:	EPDM
O-rings:	PN16/25
Pressure class:	20 mm
Stroke:	ISO 7005-2 / EN 1092-2
Flange connections:	800 kPa
Max. differential pressure:	0°C to 120°C
Medium temperature range:	-10°C to 120°C
With stem heater mounted:	

Frese Optima Compact

EP (Extended Performance)

Frese Optima Compact for high temperature and differential pressure.

New regulation unit to meet the pressure and temperature requirements.

For systems where even greater than 800kPa differential pressure is required Frese A/S has developed Frese Optima Compact EP.
The valve will use the same housing as the standard Frese Optima Compact however the internals will change as they will be made of heavy duty materials to resist the high pressure and the temperature of up to 150°C.

Frese Optima Compact

EP (Extended Performance)

Valves range:
DN50-DN200

Parameters:
- **Max Temperature: 150°C**
- **Max differential and shut off pressure: 12.0 bar**

Applications:
- **District cooling**
- **Industrial applications with water / glycol based systems**

Expected release dates:

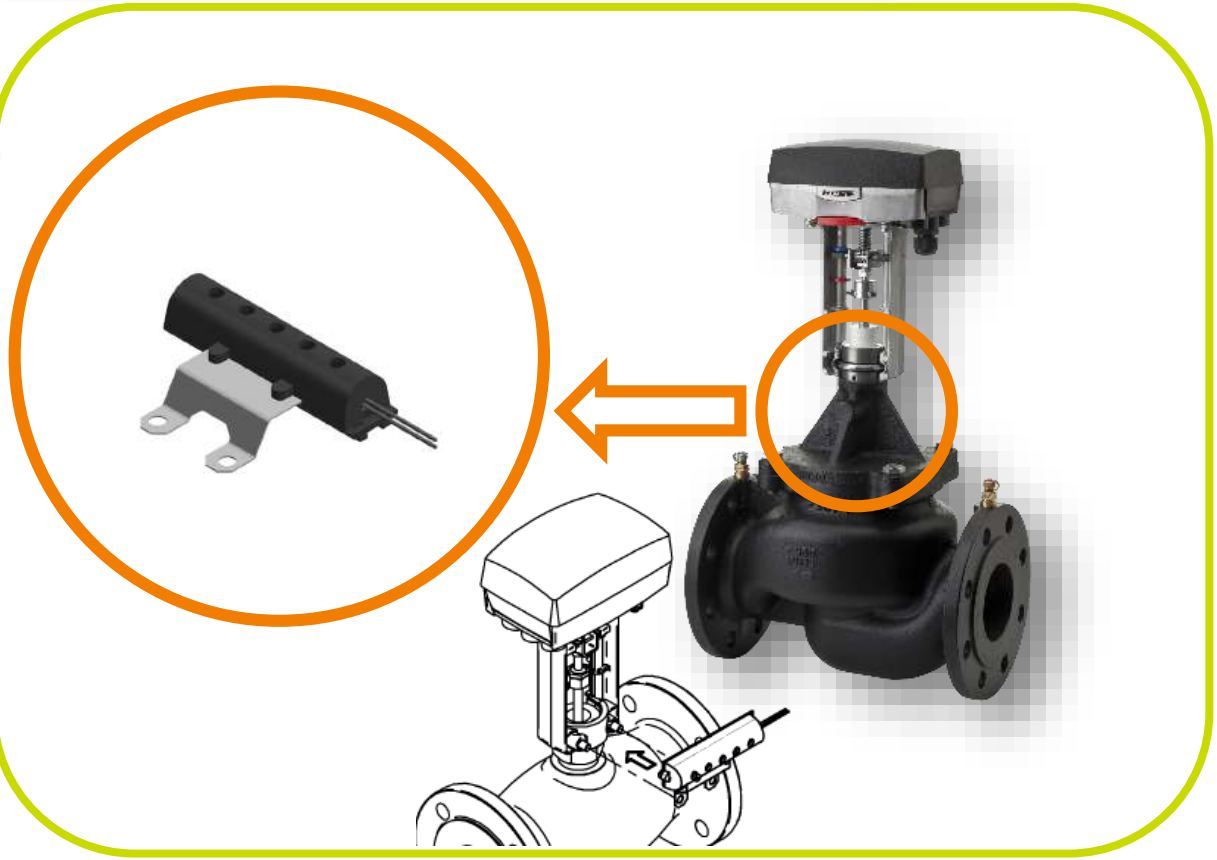
- DN50-DN80 - November 2018
- DN15-50 – Q2 2019
- DN100-200 – Q2/Q3 2019

Frese Optima Compact

Stem heater

Valves range:
DN40-DN200

Parameters:
- Min Temperature: when Optima Compact is used with stem heater: -10°C
- Min Temperature: when Optima Compact EP is used with stem heater: -20°C



Frese Optima Compact DN40-200 can be offered with a stem heater. If sub zero media or low ambient temperature are expected in the system Frese Optima Compact must be provided with the stem heater. The stem heater uses 50W of heating power to prevent the ice building on the stem of the valve/actuator.

Frese Delta T

Introduction

What is Frese Delta T ?

Frese Delta T is a supply and return temperature controller with two temperature sensors. Frese Delta T limits the flow through the terminal unit by means of a control valve in order to obtain the minimum required (designed) temperature difference in the supply and return lines of the system and thus enhance it’s efficiency and optimize pump energy consumption.

Frese Delta T

Introduction

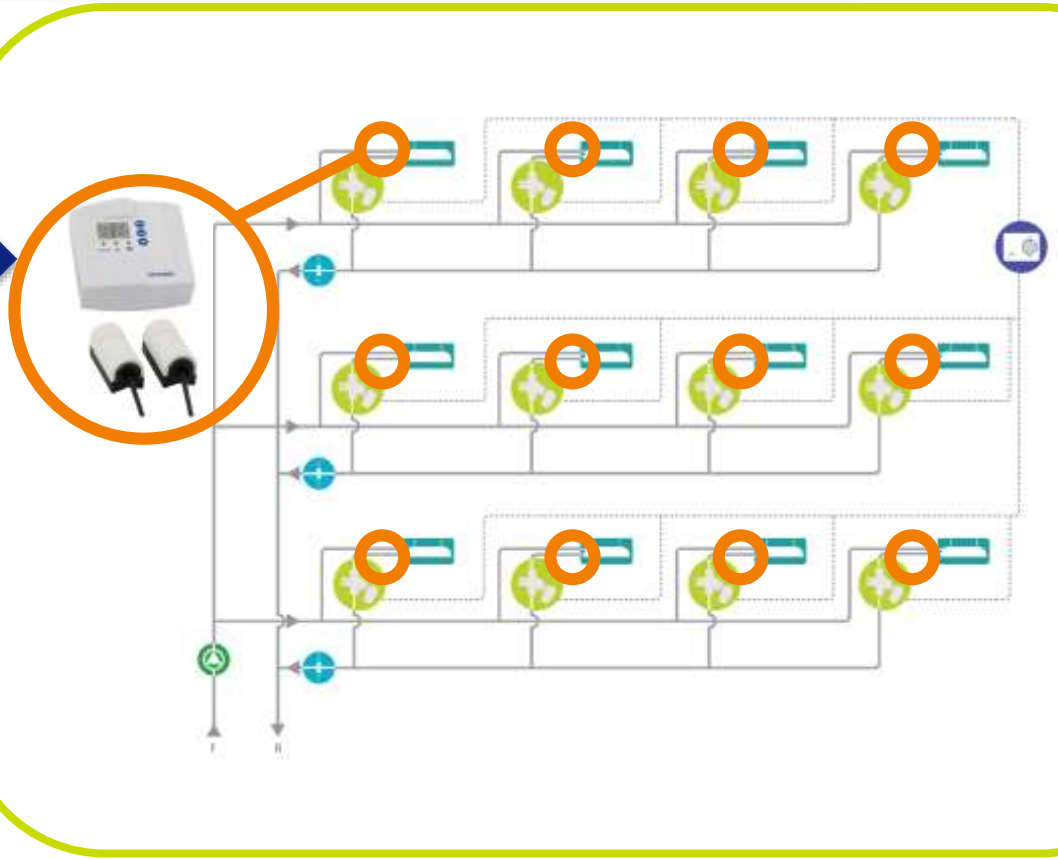
What is Frese Delta T ?

Frese Delta T makes that a hydronic system always operates with the possibly best efficiency. Even at partial loads when the flow to terminal units is much lower compared to sizing conditions Frese Delta T maintains the supply and return temperature difference on the required level. Consequently the flow can be just sufficient to secure the required capacity and at the same time the pump can run on low speed.

Frese Delta T

Application

Where to install?



If Frese Delta T is used in the secondary system side, the DT syndrome in the district cooling system becomes negligible!

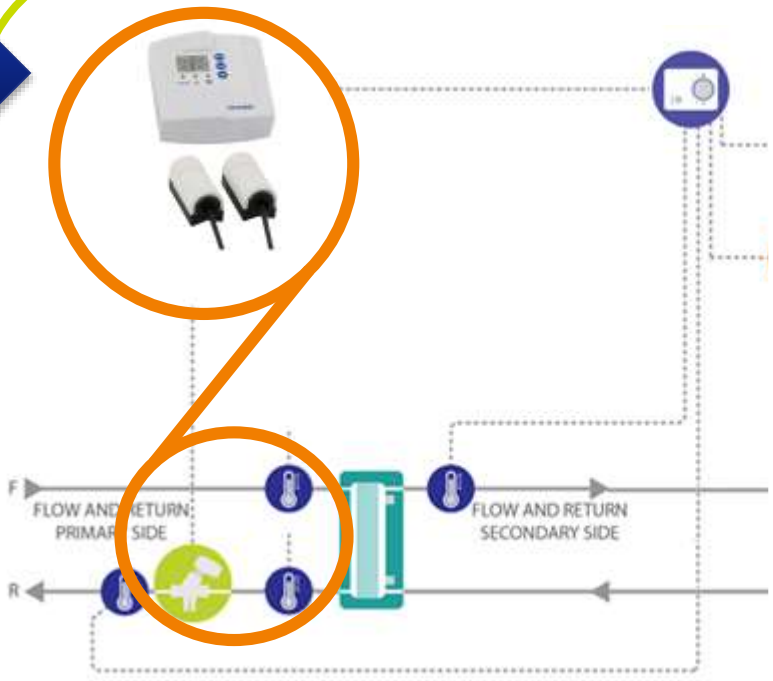
- The controller must be installed at each terminal unit where flow is controlled by a motorized valve.
- One controller can operate one valve.
- Frese DELTA T can be used in plant rooms or at air handling units to control single circuits.

Frese Delta T

Application

Where to install?

This application helps to solve the DT syndrome in the district cooling system but affects the secondary system performance. A compromise needs to be reached.

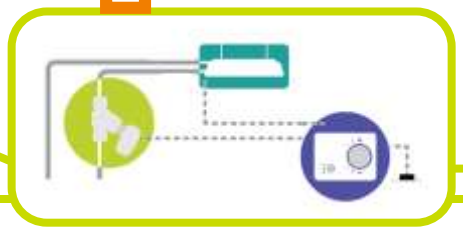


- Frese DELTA T can be used in heat exchanging stations on the primary system side. Frese Delta T needs to be connected to the 2-way control valve (Optima Compact) that controls the temperature of water flowing on the secondary side of the system. By controlling the temperature difference between the supply and return line the optimized ΔT is achieved, the pump pressure and flow in the district cooling system may be reduced and so the cost of running it.

Frese Delta T

Case study

		Flow (l/s)	ΔT (°C)	Coil Power (kW)
2-Way Valve with Delta T Control	Average	0.27	5.1	5.8
2-Way Valve Only	Average	0.44	3.1	5.7



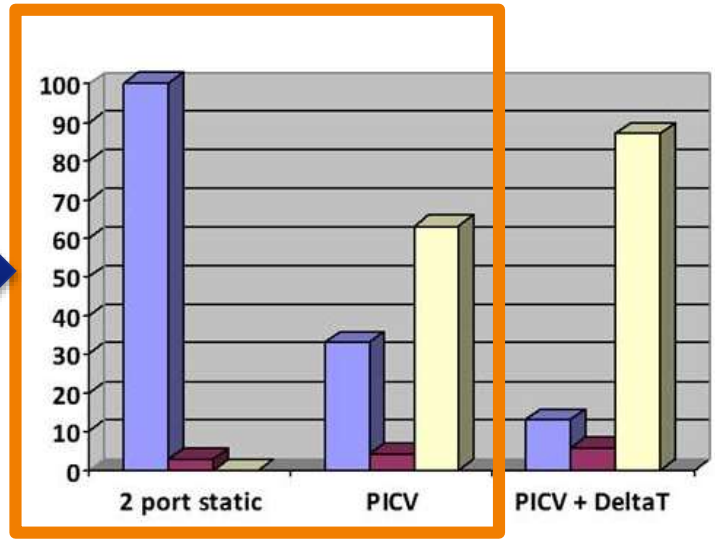
- The average flow is lower
- The Coil ΔT is higher

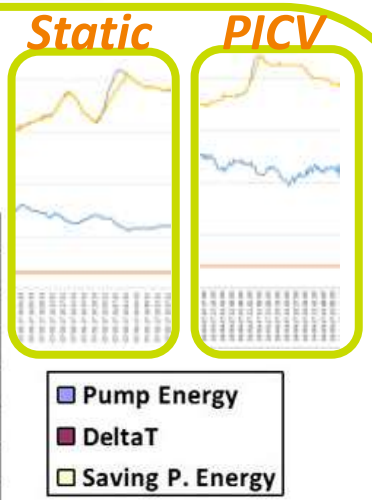
Frese Delta T

Case study

Comparison of:

- 2 way control valve
- Vs
- PICV





$E_{\%}$ saving = 67%

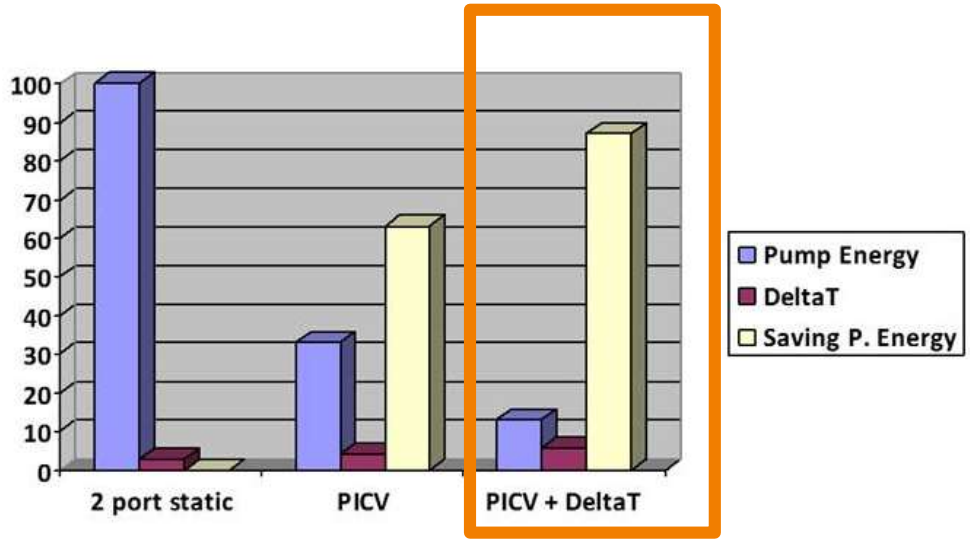
2 way control valve Vs PICV (no Frese Delta T), at 5.2kW :

- 2-way control valve, flow 1600l/h, DT=2.8°C,
- PICV, flow 1100l/h, ΔT=4.1°C,
- Pump energy saving 67%

Frese Delta T

Case study

PICV with Frese Delta T makes that the system is optimized best and the savings are greatest.



$E_{\%}$ saving = 87%

- The test results indicate that the greatest saving in energy has been recorded when Frese Delta T had controlled a picv valve – Frese Optima Compact.
- The flow was reduced from 900l/h when only PICV valve had been used, to 510l/h when Frese Delta T was installed in the circuit, at the load of 3.3kW.
- The temperature difference increased from 3.2°C to 5.5°C.

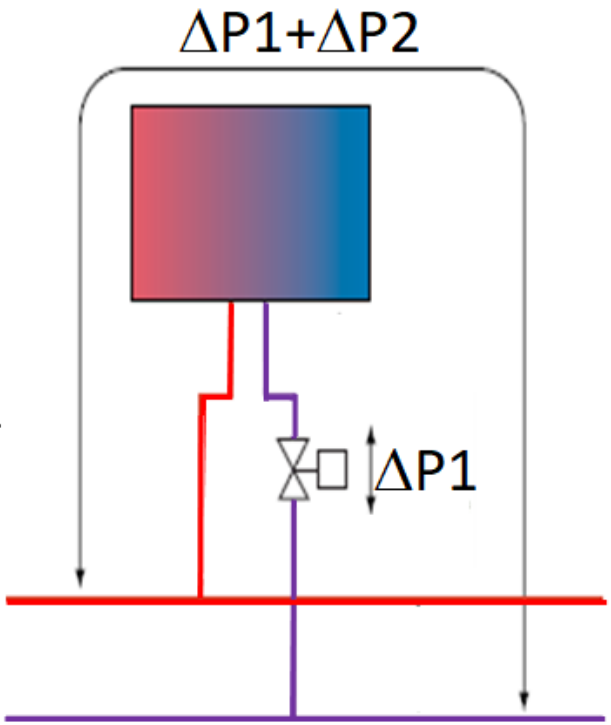
Frese Delta T

Case study – valve authority

Valve authority is critical for Frese Delta T in order to be able to optimize the system.

For this reason it is best to use it with Frese Optima Compact whose authority is always 100%

$$\beta = \frac{\Delta P_1}{\Delta P_1 + \Delta P_2}$$



- β = Valve authority
- ΔP1 - Pressure loss over a fully open control valve
- ΔP2 - Pressure loss in the controlled circuit (without the control valve)

Frese Smart valve

For remotely controlled systems

Frese Optima Compact with a control box using SigFox communication protocol.
The controller is running on batteries and can open and close the valve whose actuator also uses batteries .
It is perfect for application where external power supply is not available.
An APP is provided along with the devices for controlling the valve remotely.

Expected release dates:

- Q1 2019

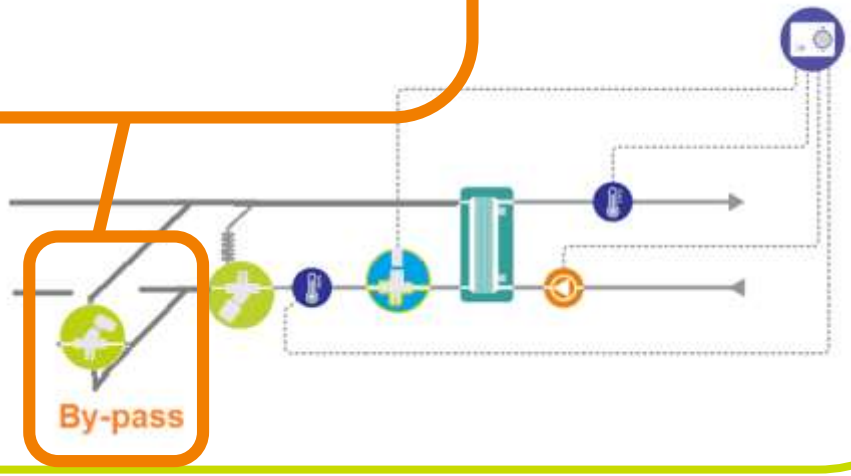
Frese Smart valve

For remotely controlled systems

The device may be provided with a temperature sensor and pressure sensor for leakage detection.
It can be set remotely to different parameters.

Frese A/S is willing to customize the device to the customer's requirements.

Application as a by-pass control based on DT reading



Frese will appreciate your feedback on the required functionality of this device.

Frese Smart valves can be provided with:

- Battery driven controller
- Battery driven actuator
- Temperature sensors for DT control
- Pressure sensor for leakage detection and pump optimisation


frese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QUALITY
INNOVATION
MANUFACTURING EXCELLENCE
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