Frese BYPASS

Optimising your district heating network

Smart Valve Technology

Frese BYPASS

Frese BYPASS provides deep insight into your district energy network, allowing you to optimise energy efficiency by lowering temperature and reducing pressure.

With Frese BYPASS you can monitor, operate and control your systems remotely, thereby ensuring significant savings on energy as well as on your bottom line.

Our aim is to add intelligence to components in district energy networks in order to increase their value to both service providers and customers.

Actual insight with precise data

The central benefit of Frese BYPASS is that it provides actual insight and eliminates some of the uncertainties of pressure and temperature calculations.

We have collaborated closely with several Danish district heating companies in the development of Frese BYPASS and the benefits of actively using your bypass units are obvious. You can reduce heat loss in your network and ensure that your customers always have access to hot water. The new data also allows you to optimise pump operation, avoiding unnecessarily high pressure.

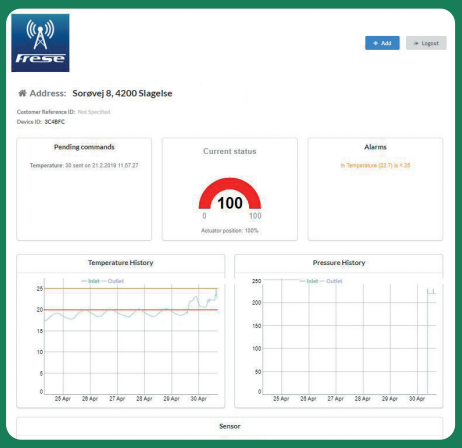
Frese BYPASS is designed with easy operation in mind. It can be retrofitted into existing installations, and because it is wireless and battery operated there is no need for complex or expensive external connections, wi-fi or sim cards. The solution uses the LPWAN network Sigfox, which has its own infrastructure already in place.

Frese FLOWCLOUD®

Frese BYPASS is monitored and operated via the webbased Frese FLOWCLOUD®. With the Frese FLOWCLOUD® dashboard you have one central access point to all your Frese BYPASS units with access to historic graphs of pressure, temperature etc. You can also operate a specific Frese BYPASS as needed.

It is possible to connect information such as name, address and unit ID, which gives you the easy and individual overview you need.

Adding a new Frese BYPASS unit to Frese FLOWCLOUD® is done simply and intuitively by scanning the unique QR code on each Frese BYPASS with a mobile phone or tablet.



Frese BYPASS

Protection class:	IP 43 to EN 60529
Supply:	Lithium Battery 3.6 V, 10.4 Ah
Battery lifetime:	Up to 5 years
Ambient operating conditions:	Temperature 0°C - 50°C Humidity 10-90% r.F.

Temperature-/Pressure Sensor

Temperature sensor range:	0°C - 55°C
Pressure sensor range:	0 bar - 10 bar
Operation temperature range:	0°C - 85°C
Sensor connection:	1/4"

Temperature Sensor

Temperature range:	0°C - 100°C (strap-on) -40°C - 120°C (probe sensor)

External Antenna

Protection class:	IP54 to EN60529
Colour:	Grey RAL 7047
Frequency:	Omni-directional 868 MHz
Ambient operating conditions:	-30°C - +70°C

Frese Motoric Actuator for PICV

Characteristics:	Motoric actuator
Protection class:	IP 54 to EN 60529
Control signal:	3-point
Actuating force:	125 N
Running time:	15 s/mm

OPTIMA Compact PICV

Pressure class:	PN25
Max. differential pressure:	800 kPa
Medium temperature range:	0°C - 120°C

Background: What is Sigfox

How does Sigfox work?

The term "Broadband" has been part of our everyday language for some time. Sigfox exists on the opposite end of the spectrum, so to speak, by using Narrowband technology.

Where Wi-Fi og mobile phone technology lets us send and receive large amounts of data almost instantly, e.g. when we stream videos, Narrowband can only transmit very small data packages of 12 bytes and receive 8 bytes.

This, however, is more than enough for a lot of IoT projects - including Frese FLOWGUARD.

The most important benefits of Narrowband technology can be found in the official name of this type of network: LPWAN – Low-Power Wide-Area Networks.

Because the data packages are so small, and because the units only need to transmit and receive data at certain intervals, they consume very little electricity. This allows them to be battery powered, which makes them relatively cheap and easy to install, since they require no extra investment in electrical installations.

The estimated battery life is 10 years.

Narrowband technology also has very long range and can cover a wide area, so the controller can easily transmit data to a base station several miles away without losing power.

Another benefit of using Sigfox is that it is not based on the mobile phone network. This means that the unit needs no sim card but only an integrated chip, which makes it much less complicated.

Why did we choose Sigfox for Frese FLOWGUARD?

We chose Sigfox for its unified platform which can be used globally. It is an uncomplicared technology and it fits perfectly with Frese's setup, where battery life is important and data packages are small. Frese FLOWGUARD does not need to transmit much data since most of it is based in the controller's firmware.

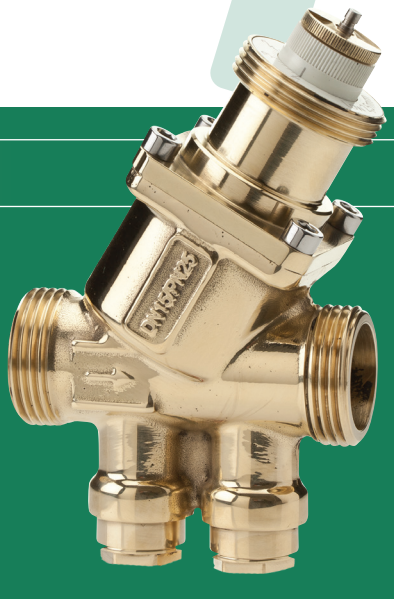
See iotdk.dk/en/sigfox-iot for further technical onfo.
Frese's customers get a solution which is very easy to install, deploy and operate. The necessary infrastructure is already in place, so there is no need to establish new networks. They also avoid the complications of sim cards, since all they need is in the integrated chip.

Sigfox is as close to Plug-andPlay as you can get. That is the most important benefit of this technology.

The financial side of using Sigfox is also to our customers' advantage, since it provides full financial transparency and predictability, ensured by a fixed subscription rate per unit.

OPTIMA Compact · Pressure Independent Control Valve

OPTIMA Compact is the 2nd generation of pressure independent control valves from Frese. It is a dynamic valve which regulates flow and temperature in heating and cooling applications and combines an externally adjustable automatic balancing valve, a differential pressure control valve and a full authority modulating control valve in one compact valve housing.



Benefits

- Compact valve housing ensures easy installation
- Linear and pressure independent coherence between flow and valve position

Case Study · Frese BYPASS and Viborg DHC

Viborg DHC has been a central partner in the development process for Frese BYPASS. The district heating company has conducted a large-scale prototype test by retrofitting around 30 devices into its existing bypass units. Results are already showing on the bottom line.

Since installing the devices in the summer of 2019, Viborg DHC has systematically analysed all the data received, and this has caused the company to make a few changes in its network.

So far, these minor changes have shown major potential in terms of energy efficiency and cost savings.

Insight through precise data

Because Frese BYPASS provides actual insight into each individual installation, it ensures more precise data than the calculations the company usually works with.

- In a specific area of our network we could actually reduce the pressure much more than we had expected. We had set the pressure according to a regular pressure calculation, but data showed that we did not need that level at all. We could reduce the pressure by 0.4 bar in that area, explains Tom Diget, Distribution Manager at Viborg DHC.

This modest change in the district heating network reduced the energy consumption 27,400 kWh, leading to annual savings of DKK 18,400 in this area alone.

Lower temperature - better bottom line

Expectations for Frese BYPASS are even higher when you look at the potential for lowering temperatures in the district heating networks. By placing Frese BYPASS strategically, the return temperature can be raised slightly at the critical points, while the inflow temperature can be lowered throughout the entire network, says Tom Diget:

- That's where the money starts rolling in. Each time we lower the inflow temperature by 1 degree, we save DKK 250,000 in reduced heat loss. That's the real money, and that's what we should be able to do with this solution.

Remote control from the office

Tom Diget has a clear message to his colleagues in the district energy sector:

- Get started and install Frese BYPASS in your network. The data has already been very valuable to us, and at the same time we get a BYPASS solution that we can monitor and control remotely from our office, so we don't have to bother our customers, he says.

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