

Galliker Transport AG, Logistikcenter 4, Dagmersellen (CH)

Where precision and flexibility go hand in hand.



View of Logistikcenter 4, Dagmersellen (CH)

With its new logistics centre in Dagmersellen, logistics company Galliker Transport AG is defining new standards in energy efficiency and sustainability. The entire building complex is totally autonomous in terms of heating technology. And all of the company's electricity needs are met using renewable resources.

The new Logistikcenter 4 of Galliker Transport AG in Dagmersellen delivers unparalleled energy efficiency. In terms of heat technology, the entire logistics centre is totally autonomous and is therefore setting new standards in environmental technology and sustainability. Foodstuffs, but also pharmaceutical products, can be kept in ideal storage conditions in an area covering 22,000 square metres in an automated deep-freeze, high-bay warehouse and various storage spaces with different temperature zones.

The first stage of the new competence centre for food and healthcare logistics was completed in the autumn of 2015. All technical systems were commissioned in this phase of the project. The second stage of commissioning will take place in 2017. Extensive building automation was installed in

order to meet the company's energy-related goals. Furthermore, climate conditions have to be met in the food and pharmaceutical industry to ensure an uninterrupted cooling chain. Enough reasons for the installation of the electronic pressure-independent final controlling elements from Belimo.

The goal: flexibility, efficiency and sustainability

Type of building	Storage building and office complex
Project	New building
Sector	Cooling system and use of waste heat
Belimo products	approx. 200 EPIV, various globe valves and butterfly valves
Commissioning	2015 phase 1 2017 phase 2

tored." Because it's hard to access the valves during working hours, they have to ensure dynamic, hydronic balancing and it must be possible for them to be monitored from the control room in real time. The EPIVs from Belimo are therefore the ideal solution for meeting the objectives of Galliker Transport AG.

(which cools down to -28 °C) and the entire refrigeration system is used for the chilled areas and secondly a photovoltaic system runs on the building's roof. If more energy is needed, in winter for example, groundwater is also cooled via the refrigeration system to produce heat. The entire building complex is therefore independent and generates heat without the use of any fossil fuels. A further objective of not wasting any energy can only be met through precise control with monitoring. To achieve this, not only system control is crucial but the processes used in the flow of goods must be known and continually optimised. The fact that some of the storage rooms in the logistics centre are GMP- and GDP-certified explains the precision and flexibility of the storage conditions.



Different customer requirements

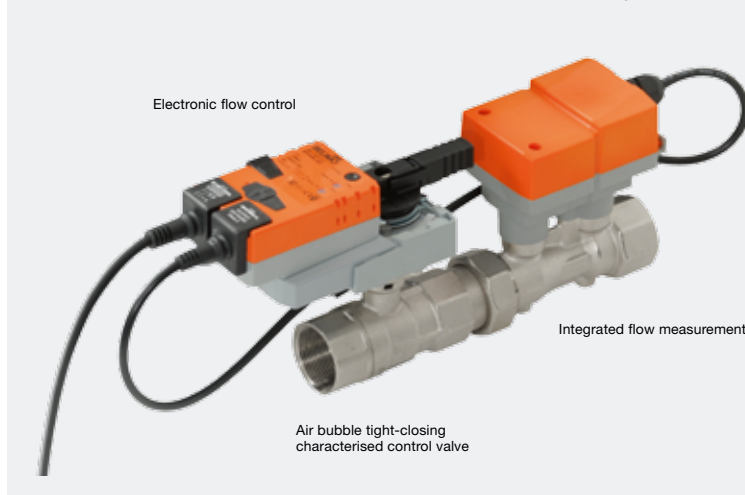
In designing a logistics centre of this kind, even the strategic planning meant a challenge in itself. After all, the stringent requirements for the various rooms in terms of room conditions (temperature and humidity) and accuracy had to be met so that all customer requirements can be satisfactorily fulfilled. "This building is the first of its kind," said Alexander Herde, project manager at Galliker Transport AG. Different temperatures yet constant humidity exist in the various areas. This allows Galliker to guarantee its customers that storage conditions according to different needs will be met. The valves and actuators fitted must therefore operate reliably to consistently provide the flow rates needed. This is the only way to ensure that the perfect room climate is always available for the goods in storage. "Standard valves cannot guarantee this so we opted for the products from Belimo," said Beat Schmutz, Managing Director of SSP Kälteplaner AG. "The EPIV from Belimo is flexible, safe and can be moni-

Galliker philosophy applied

Galliker Transport AG is synonymous with cleanliness, control and flexibility. And the new Logistikcenter 4 aims to embody just these characteristics. Alongside good flexibility in terms of customer requirements, Galliker also wants to make flexible use of energy in the new goods warehouse. This means that all energy is supplied in a self-sufficient manner and is sourced from renewable energy alone. So firstly the waste heat from the deep-freeze store



EPIV from Belimo – safe, reliable and with automatic balancing



The EPIV combines four functions in one easy-to-fit unit: measuring, controlling, dynamic balancing and shutting. This is how you increase efficiency during planning, implementation and operation.

Further advantages are:

- Time-saving and safe valve selection in accordance with maximum volumetric flow
- Rapid, simple installation and commissioning
- Dynamic, permanent hydraulic balancing through the valve
- Securing the correct amount of water with differential pressure changes and with partial loads
- Real time information on the measured flow rate

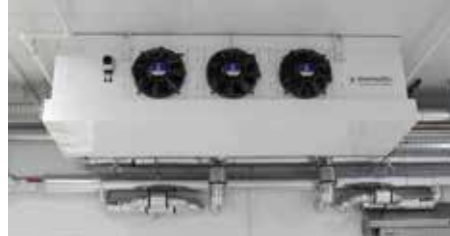
The "small" EPIV is available in nominal diameters of DN 15-50.

The application: precision and reliability

Precision and reliability are imperative for Galliker to offer efficiency, sustainability and flexibility. The building technology system used by SSP Kälteplaner AG is therefore designed for this desired level of efficiency, flexibility, sustainability and reliability throughout. The innovative products from Belimo – most especially the EPIV – supplement and/or underpin these system characteristics by meeting the stringent requirements of the logistics centre in terms of precision and reliability. The EPIVs, globe valves and butterfly valves from Belimo were installed in the two cooling circuits and the warm water circuit.

The two cooling circuits comprise a glycol circuit with a temperature of $-8\text{ }^{\circ}\text{C}$ to dehumidify the warehouse's air and to cool the chilled spaces down to $2\text{ }^{\circ}\text{C}$ and a cold water circuit with water at a temperature of $6\text{ }^{\circ}\text{C}$. To maintain the same temperature and humidity all the way from the floor to the ceiling in the high bays,

recirculating air heating and cooling units are installed on opposite sides of the space to constantly mix the air. Each unit serves one sector in a space. The individual zones are precisely controlled with temperature sensors distributed in the spaces.



The storage spaces and all offices are heated using waste heat from the refrigeration system. The recirculating air units of the $2\text{ }^{\circ}\text{C}$ chilled warehouse have to be periodically defrosted. This is done with a warm glycol circuit, which is also supplied with the waste heat. If too little waste heat is produced in the winter when cooling, groundwater is cooled via the refrigeration

system to produce heat.

The recirculating air heating and cooling units were designed especially for this project and have ingenious functions for regulating the temperature and room humidity as precisely as possible. Thanks to the pressure-independent characterised control valves, the flow of the cooling and heating medium is kept constant and is precisely controlled. These control options make optimum use of the energy while improving the quality of space control at the same time.

Dehumidification is particularly important in the food and pharmaceutical industries because it has a major impact on shelf life. There is also a risk of the cardboard boxes misshaping if they absorb too much moisture. Another benefit of controlling the humidity is that it prevents condensation from forming in the space.



Heating/cooling control centre



Heating/cooling control centre



Temperature and humidity measurement with wireless link

Recirculating air units for cooling and heating

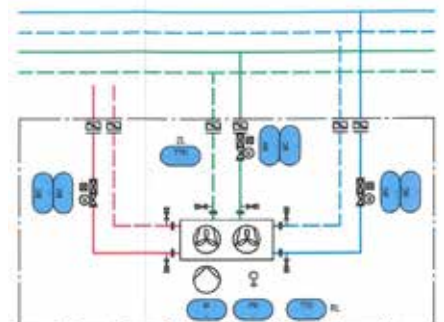
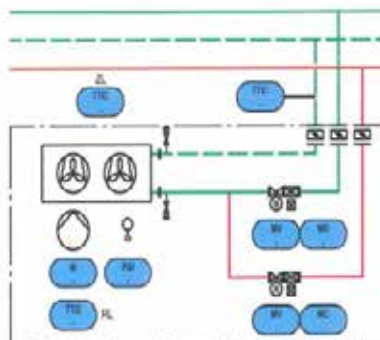
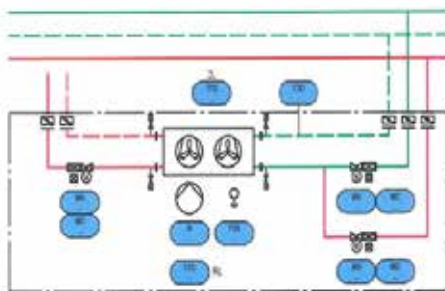
Heating and cooling in the storage spaces is important because the climate zones have to be constantly maintained between $12\text{ }^{\circ}\text{C}$ and $18\text{ }^{\circ}\text{C}$. Compliance with the required volumes for hot water ($42\text{ }^{\circ}\text{C}$) or cold water ($6\text{ }^{\circ}\text{C}$) is guaranteed via one EPIV valve from Belimo each.

Recirculating air units for cooling / defrosting

Recirculating air units and coolers with a defrost function are used in storage spaces where the climate zones are kept constantly below $5\text{ }^{\circ}\text{C}$. Here a water/glycol mix with a temperature of $-8\text{ }^{\circ}\text{C}$ is used for cooling. To ensure that the coolers are kept free from the risk of ice forming, ice formations can be thawed with the hot glycol connection. Again here the EPIV valves from Belimo guarantee the volumetric flows needed.

Recirculating air units for cooling, dehumidifying and heating

To ensure that the humidity in the storage spaces does not exceed 65%, it is important that recirculating air units can dehumidify too. Dehumidification is ensured by linking to the additional $-8\text{ }^{\circ}\text{C}$ refrigeration circuit. Heating and cooling is then handled by two circuits at $38\text{ }^{\circ}\text{C}$ and $6\text{ }^{\circ}\text{C}$.



Galliker Transport AG

Galliker Transport AG was founded in 1918 as a small haulage firm. In the course of its almost 100-year history, it has become an international logistics provider. At present, the company employs 2760 members of staff in six countries. Today, Galliker Transport AG is an independent family-owned company and is currently in the hands of the third generation of the family. Within its four main divisions of Car, Cargo, Food and Healthcare Logistics, alongside the traditional transport and storage business, Galliker also provides other services along the value-added chain. The new Logistikcenter 4 building gives Galliker one of the most state-of-the-art and flexible logistics centres in Europe.

"If problems arose, Belimo staff were on site in a flash and we really appreciated this."

SSP Kälteplaner AG

SSP Kälteplaner AG handled the planning for Logistikcenter 4. The specialist in refrigeration applications for food production, storage and distribution has already completed numerous projects for Galliker Transport AG. The 22-year old company is a specialist in planning complex refrigeration systems and heat recovery systems at home and abroad. Beat Schmutz, Managing Director of SSP Kälteplaner AG, was also the project manager responsible for Galliker. In this role, he worked very closely with Belimo and was full of praise for the collaboration "If problems arose, Belimo staff were on site in a flash. Once responsibilities had been defined, communication was swift and we really appreciated this. The collaboration with Belimo was nothing but positive."

The solution: EPIV from Belimo – the clever way to control the flow rate

The pressure-independent characterised control valve (EPIV) from Belimo is an electronically controlled valve and combines the four functions of measuring, controlling, hydronic balancing and shutting in one ready-to-install unit. This makes rapid installation possible and commissioning/operation of the cooling systems is optimised. The EPIVs control the amount of water dynamically and independently of pressure according to specified control algorithms for individual consumers. During operation, thanks to transparency in terms of energy production and distribution, the system can be optimised very easily. Further benefits include the facts that not only the EPIV is air bubble-tight but also the valve ensures a dynamic and constant hydronic balancing. This again guarantees a correct amount of water flow through the valve at differential pressure changes or at part-load conditions. Furthermore you receive real time information on the flow measured. The electronic pressure-independent characterised control valve EPIV is available in nominal diameters of DN 15 to DN 150. The integrated electronic flow control ensures that the required volumetric flow is secured. The respective measuring values are provided as real time information for building automation. The EPIV can be operated with medium temperatures from -10 °C to 120 °C and with a system pressure (ps) of 1600 kPa. Both conventional communication and communication via the Belimo MP-Bus® is possible with all types.



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