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# Frese ALPHA HCR Wafer

Seawater Dynamic Balancing



### Pressure Independent Flow Limiting Valve

#### Frese

Over 30 years' experience producing dynamic balancing solutions has positioned Frese as a leading manufacturer of energy saving valves and through our commitment to innovation, we continue to be at the forefront of technological advancements in our areas of expertise.

To support our products, the knowledge, experience and dedication of our employees and partners ensure our solutions are applied correctly to maximise savings and position Frese as the authoritative voice for pressure independent and dynamic solutions.

#### Pressure Independent Flow Limitation

A pressure independent flow limiting valve is an innovative alternative to traditional hydronic balancing methods comprising static balancing valves. A system with pressure independent flow limiting valves provides efficient and accurate flow and differential pressure control ensuring the design flow conditions are achieved at all times irrespective of pressure fluctuations in the system.

The advantages over traditional, static balancing valves include simplified system design, ease of selection, system flexibility and minimised commissioning process. In addition, independent flow limitation offers significant energy saving benefits as a result of the elimination of overflows in the system.

## Frese ALPHA HCR · Pressure Independent Flow Limiting Valve

The Frese ALPHA High Corrosion Resistant Wafer dynamic balancing valve has been developed for use in a wide range of arduous systems for the accurate and efficient distribution of flow. The ALPHA HCR Wafer can be used in various applications including seawater cooling, filtration and water treatment.

To limit the flow and maintain a constant differential pressure, the ALPHA HCR flow cartridge is installed within the valve housing, ensuring the design flow rate is achieved irrespective of fluctuating pressure conditions.

The ALPHA HCR cartridge is removable for ease of maintenance and system flushing and the patented design ensures silent operation when the system is live.

### General Benefits

- Quick and easy selection as only flow data is required
- Design flow rate achieved but not exceeded – always in balance
- Easy to install
- Simplified commissioning process – no proportional balancing
- No requirement for additional balancing valves in the distribution pipework, risers and branches
- No straight pipe requirements upstream and downstream
- Improved response to water hammer due to the shock absorption by the rubber diaphragm of the cartridge

# Frese ALPHA HCR Wafer for Seawater Applications



For over 30 years, Frese has specialised in the design and manufacture of dynamic, pressure independent flow solutions for global heating and cooling applications.

As a valve manufacturer, Frese has been involved with the marine industry since 2002, delivering dynamic balancing valves for various heating and cooling systems for applications including submarines, cruise ships and ferries.

The introduction of the ALPHA HCR Wafer and flow cartridge enables Frese to offer the benefits of dynamic balancing to a variety of new, exciting seawater applications including seawater cooling, filtration and water treatment.

Manufactured from Nickel Aluminium Bronze, the Frese ALPHA HCR Wafer is available in dimensions DN50 to DN450 suitable for flow rates from 3.8 m<sup>3</sup>/h to 1,584 m<sup>3</sup>/h.

The ALPHA HCR Wafer works independently therefore it can be installed in either single or multiple parallel distribution lines. Furthermore, the independent nature of the valve provides total system flexibility with no re-commissioning required should the system be extended. In addition, it is also possible to use back flush processes with the ALPHA HCR dynamic balancing valve if necessary.

## Applications

Applications for the Frese ALPHA HCR dynamic balancing valve include:

- Seawater District Cooling (SWDC)
- Seawater Air Conditioning (SWAC)
- Ballast Water Treatment (BWT)
- Ocean Thermal Energy Conversion (OTEC)
- Seawater SOx scrubbers



# HCR Pressure Independent Flow Limiting Valve



## Technical Data · Frese ALPHA HCR Wafer

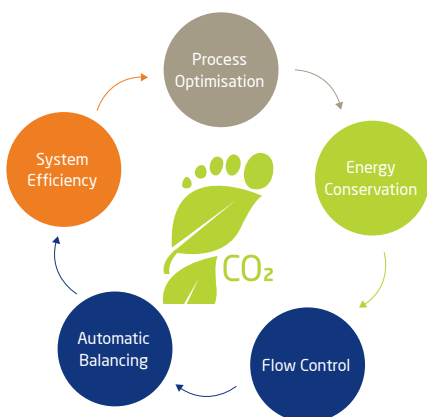
Valve Housing:	Nickel Aluminium Bronze
P/T Plugs	Nickel Aluminium Bronze
Fasteners:	Duplex Steel
Pressure Class:	PN16
Temperature:	-20 to +32°C
Diff. Pressure Range:	13 - 600 kPa
Flow Range:	3.8 m <sup>3</sup> /h - 1,584 m <sup>3</sup> /h



## Technical Data · Frese ALPHA HCR Cartridge

Cartridge Material:	PPS 40% glass-reinforced (Fortron 1140L4 Black)
O-rings:	EPDM 281
Spring:	Hastelloy - C276 (high corrosion resistant)
Diaphragm:	HNBR reinforced
Medium Temperature:	-20 to +32°C (Seawater)

## Frese Industrial Valves · Helping our customers to become more sustainable

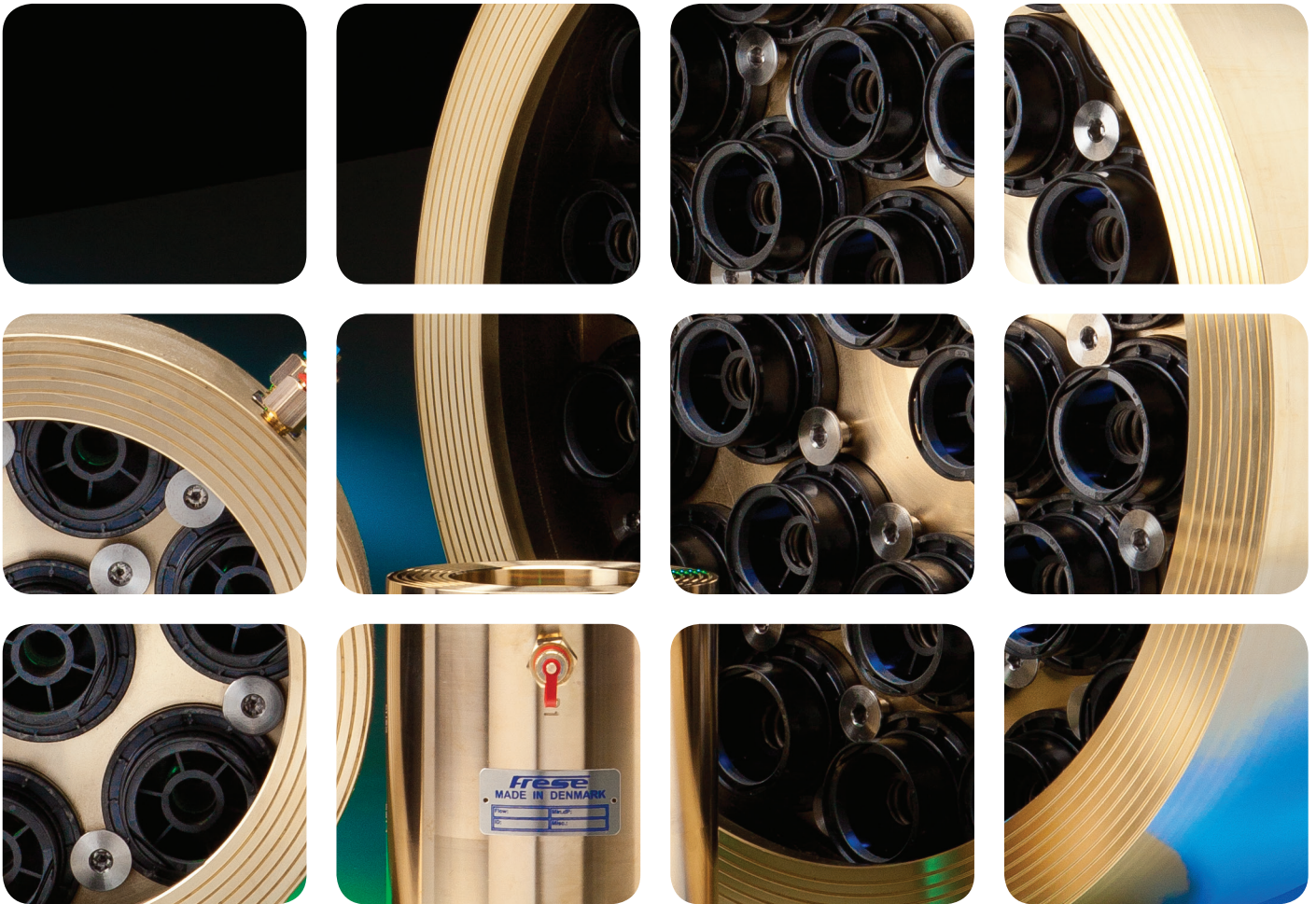


A hydronic system designed and fitted with pressure independent flow limiting valves offers many advantages over traditionally designed, static systems.

These advantages include:

- Simplified system design
- Ease of selection
- System flexibility
- Minimised commissioning process

The major benefit is the significant saving of energy that can be achieved through maximising  $\Delta T$  and eliminating overflows in the system.

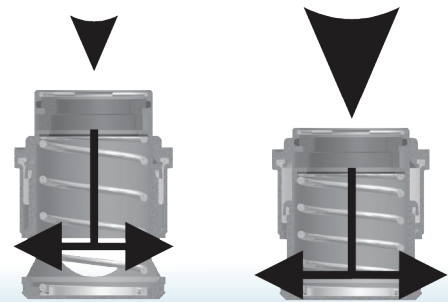


## Frese ALPHA Cartridge

### Operation

When the pressure increases, the spring will be compressed and the piston will respond and reduce the outlet area and vice versa.

The result is a constant flow rate through the valve, independent of pressure fluctuations.



### Function

The following applies to all flow control valves:

$$Q = K_v \cdot \sqrt{\Delta p}$$

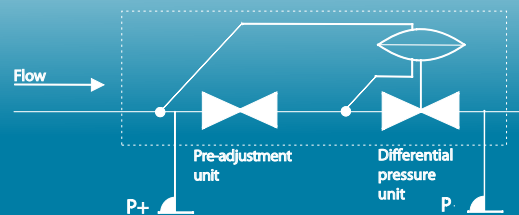
Q = Flow (m<sup>3</sup>/h)

K<sub>v</sub> = Opening area

Δp = Differential pressure (Bar)

The Frese ALPHA HCR cartridge reacts to pressure fluctuations in the system ensuring that the differential pressure across the pre-adjustment unit is kept constant.

This ensures that the maximum flow limit is achieved in accordance with the design.





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