Frese ALPHA HCR · Grooved End

Application

The Frese ALPHA HCR (High Corrosion Resistant) Grooved End Valves are particularly designed and manufactured for automatic balancing in Marine, Industrial, Oil and Gas applications.

The Frese ALPHA HCR Cartridges - the third generation cartridges - are an integral part of the Frese ALPHA HCR Grooved End Valve limiting the flow at the specified level even under fluctuating pressure conditions.

The patented design of these cartridges introduces a interchangeable orifice plate for design flexibility and a resistant diaphragm for high accuracy operation.

The high quality alloy ensures a long lifecycle and low maintenance in arduous applications such as seawater.

Available in sizes DN100, DN150 and DN200, Frese ALPHA HCR Grooved End valve guarantees the hydraulic balance of the system regardless pressure fluctuations.

Benefits

Design

- No requirement for balancing valves in the distribution lines and supply lines
- Less time to define the necessary equipment for a hydraulic balanced system
- No impact if the calculated distribution of pressure in the installation is not accurate
- Security that the specified flow is also the real one

Installation

- Minimized commissioning time due to automatic balancing of the system
- Cartridge solution makes flushing procedure very easy
- No need for oversized pumps and oversized control valves
- No requirements for straight diameters of pipe upstream and downstream of the valve
- Can be easily installed where space is limited

Operation

- Balancing of the system takes place automatically even under fluctuating pressure conditions
- Performance optimization
- Distribution/balancing optimization

Features

- Sizes from DN100 to DN200
- P/T plugs for differential pressure verification
- Modifications & extensions of the system do not affect the hydraulic balance in the other parts of the system
- Tamper resistant cartridge independent of flow regulation errors during commissioning and operation of the system
- Self-cleaning cartridge does not allow dirt to compromise the accuracy of the valve
- Resistant diaphragm between the moving parts of the cartridge eliminates friction, noise and impact from water hammer
- Delivered with 3.1 certificate as an option. Other certificates on request.
- Heat treatment acc. to 02747 Part 2#4 a+b
- Pressure test acc. to EN12266

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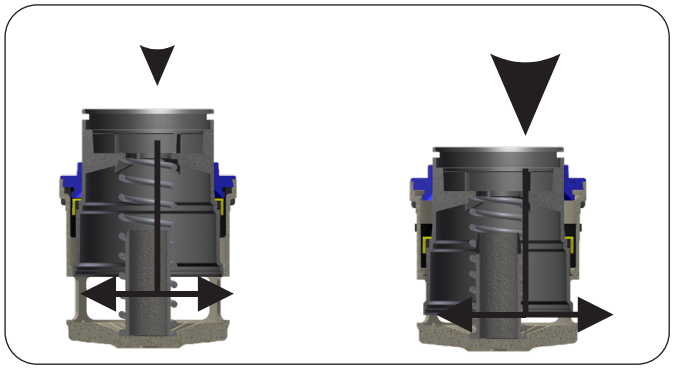
Frese ALPHA HCR Cartridge Operation

When the pressure increases the spring will be compressed and thereby the piston will 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:

$$Q = Kv * \sqrt{\Delta p}$$

Q = Flow (m^3/h)
Kv = 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.

Flow Calculation

The flow through the valve can be identified by measuring the differential pressure (Δp) across the valve:

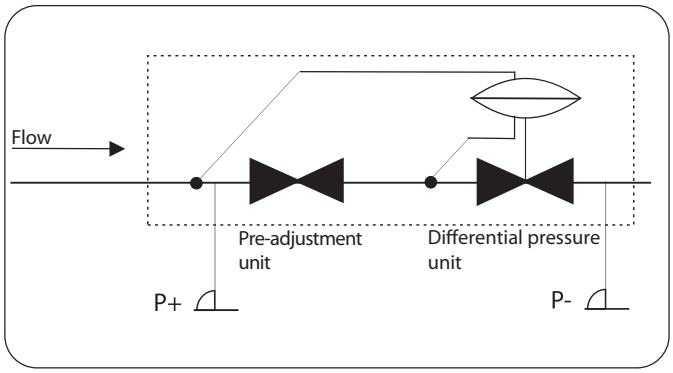
If the measured differential pressure is above the minimum Δp, the flow is the one stated on the graph for the valve.

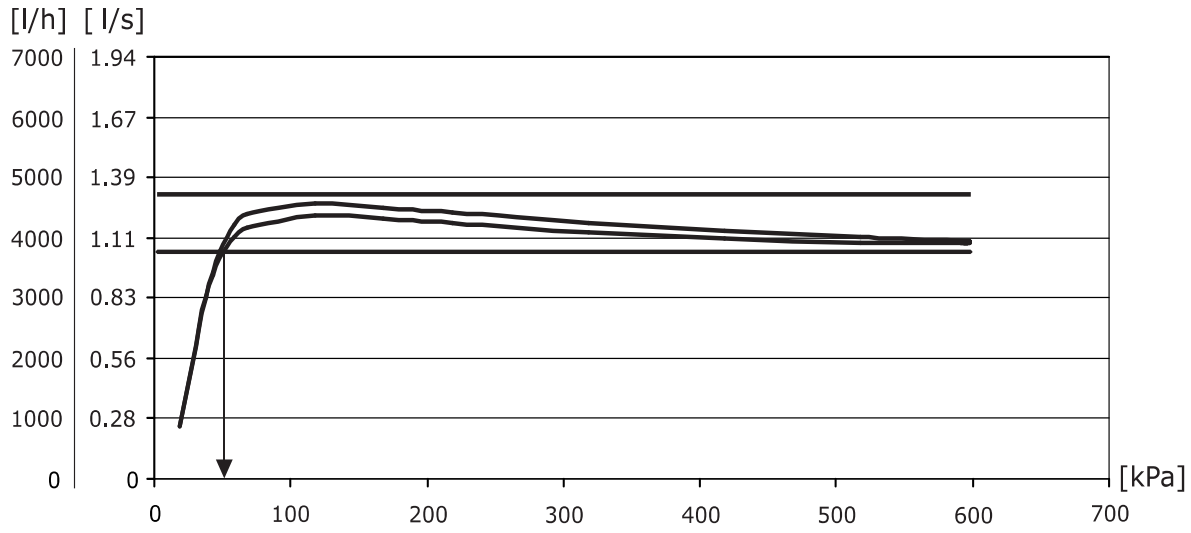
If the measured differential pressure is below the minimum Δp, the flow can be found by using the formulas below.

Flow Calculation

$Q = Kv \cdot \sqrt{\Delta p}$	Q = m3/h Δp = Bar
$Q = Kv \cdot 100 \cdot \sqrt{\Delta p}$	Q = l/h Δp = kPa
$Q = \frac{Kv \cdot \sqrt{\Delta p}}{36}$	Q = l/s Δp = kPa

Simplified Outline





Schematic view of the flow characteristic for cartridge type Frese no. 58-65120. Nominal flow 1.111 l/s / 4,000 l/h. The cartridge enters the pressure range at 47 kPa and maintains the flow at a constant level to 600 kPa.

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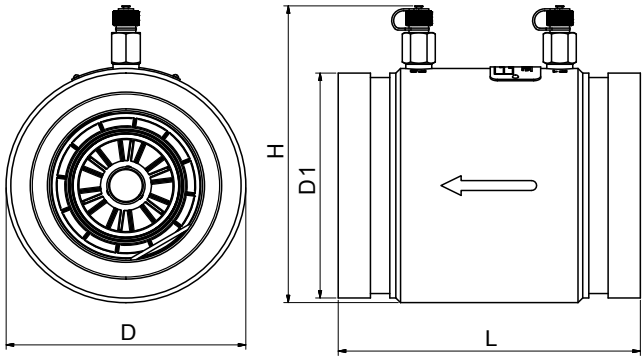
Frese ALPHA HCR Valve Housing, Grooved End Connection

Technical Data

A grooved end type valve can contain up to 4 Frese ALPHA HCR cartridges, depending on the size and the design flow.

Valve housing:	Nickel Aluminium Bronze EN 1982 CC333G-GS ASTM B505 C95800
P/T plugs:	Nickel Aluminium Bronze EN 1982 CC333G-GS
Fasteners:	Duplex Steel
Pressure class:	PN16
Temperature:	-20°C to +50°C
Flow range:	3.8 m³/h - 192 m³/h
Standard:	ANSI/AWWA C606-15



PLEASE NOTE!
The pipe system shall be properly ventilated to avoid risk of air pockets. Seawater for HCR cartridge shall be filtered with filter mesh of max of 5 mm. In case HCR cartridges are immersed in water without flow, special cautions to prevent marine growth is to be taken, to maintain correct functionality of flow limiting valve.

Product Programme

Frese no. (PN16)	Dimensions	L [mm]	D [mm]	D1 [mm]	H [mm]	Cartridges/ Valve (Pcs.)	Max. flow rate m³/h
58-9107T-01	DN100	150	119	114	151	1	48
58-9117T-01	DN150	150	168	168	199	2	96
58-9127T-01	DN200	150	219	219	251	4	192

By use of couplings the valve dimensions can be converted to the following pipe sizes:

- DN100 can be converted to: DN50-DN65-DN80-DN125-DN150
- DN150 can be converted to: DN100-DN125-DN200
- DN200 can be converted to: DN150-DN250

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Frese ALPHA HCR Cartridge

Technical Data

HCR cartridge material: PPS glass-reinforced

O-rings: EPDM 281

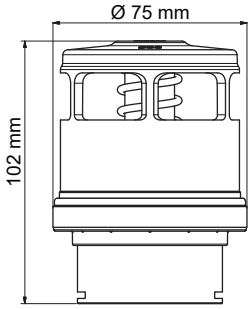
Spring: Hastelloy C276
(high corrosion resistant)

Diaphragm: HNBR reinforced

Medium temperature: -20°C to +50°C (Seawater)

Diff. pressure range: 47 - 600 kPa
(max 300 kPa recommended)

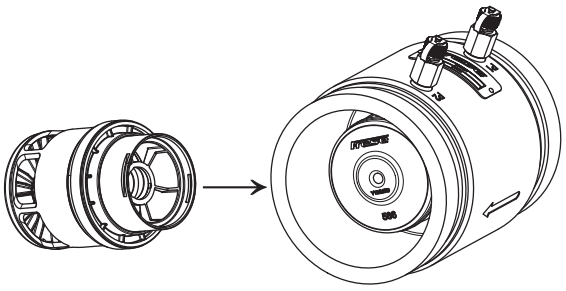
Dimensions



Product Programme

Frese ALPHA HCR Cartridge

Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
58-65120	4000	1.111	17.61	47	5.8
58-65175	7500	2.083	33.02	47	10.9
58-65200	8500	2.361	37.42	47	12.4
58-65240	12500	3.472	55.03	47	18.2
58-65252	13800	3,833	60,76	47	20,1
58-65264	15300	4,250	67,36	47	22,3
58-65274	16300	4,528	71,77	47	23,8
58-65280	18000	5.000	79.25	47	26.3
58-65303	19000	5.278	83.66	47	27.7
58-65313	20300	5.639	89.38	47	29.6
58-65320	21500	5.972	94.66	47	31.4
58-65333	23200	6.444	102.15	47	33.8
58-65341	24300	6.750	106.99	47	35.4
58-65349	25300	7.028	111.39	47	36.9
58-65356	27000	7.500	118.88	47	39.4
58-65365	30500	8.472	134.28	47	44.5
58-65385	32000	8.889	140.89	47	46.7
58-65396	34000	9.444	149.70	49	48.6
58-65409	37500	10.417	165.10	49	53.6
58-65413	38500	10.694	169.51	50	54.4
58-65417	39500	10.972	173.91	50	55.9
58-65420	40500	11.250	178.31	52	56.2
58-65425	41750	11.597	183.82	53	57.3
58-65430	43000	11.944	189.32	54	58.5
58-65433	44000	12.222	193.72	55	59.3
58-65440	48000	13.333	211.33	60	62.0



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Documentation

Documentation	Standard	On request
2.1 Certificate - EN 10204		X
3.1 Certificate - EN 10204		X
3.2 Certificate - EN 10204		X
Corrosion test		X
Dye Penetrant		X
PMI (Magneflux)		X
Ultra Sonic (NDT)		X
Surface treatment		X
Class Society review or inspection		X
Pressure test acc. to EN12266	X	
Heat treatment acc. to 02747 Part 2#4 a+b	X	

Specification Text

- The valve shall comply with Grooved Ends according to ANSI/AWWA C606-15 standards
- The pressure class for the valve housing shall be PN16
- The valve housing shall be made of Nickel Aluminium Bronze - EN 1982 CC333G-GS
- The valve shall contain pressure independent flow cartridges
- The valve shall operate up to a maximum differential pressure of 600 kPa
- The temperature medium (sea water applications) working range for the valve shall be 20°C to +32°C
- The valve shall be supplied with 1" PT plugs
- The PT plugs shall be made of Nickel Aluminium Bronze
- The fasteners shall be made of duplex steel
- The valve shall be fitted with the Frese ALPHA HCR pressure independent flow cartridge
- The Frese ALPHA HCR cartridge should be made of PPS glass-reinforced
- The flow rate should be defined by interchangeable orifice plate within the cartridge
- The cartridge diaphragm should be made of reinforced HNBR
- The cartridge O-rings should be made of EPDM 281
- The cartridge spring shall be made of Hastelloy C276 stainless steel

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