

ALPHA HCR

DN15-DN40

Application

The ALPHA HCR (High Corrosion Resistant) Valves are particularly designed and manufactured for automatic balancing in Marine applications.

An integral part of the ALPHA HCR Valve is the ALPHA Flow Cartridge, which limits the flow to a specified level at all times, including under fluctuating pressure conditions.

The patented design of the flow cartridge introduces a interchangeable orifice plate for design flexibility and a resistant diaphragm for accuracy operation.

The ALPHA HCR valve can also be installed with the ALPHA HCR cartridge for other highly corrosive applications such as seawater or other marine applications.

Available in sizes DN15 to DN40. ALPHA HCR 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

- Valve housing manufactured in RG5, NiAlBr or AISI 316 for highly corrosive applications
- 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 in accordance with EN 10204 as an option. Other certificates on request
- Pressure test according to EN12266

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ALPHA & 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:

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

Q = Flow (m³/h)

K_v = Opening area

Δp = Differential pressure (Bar)

The ALPHA 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:

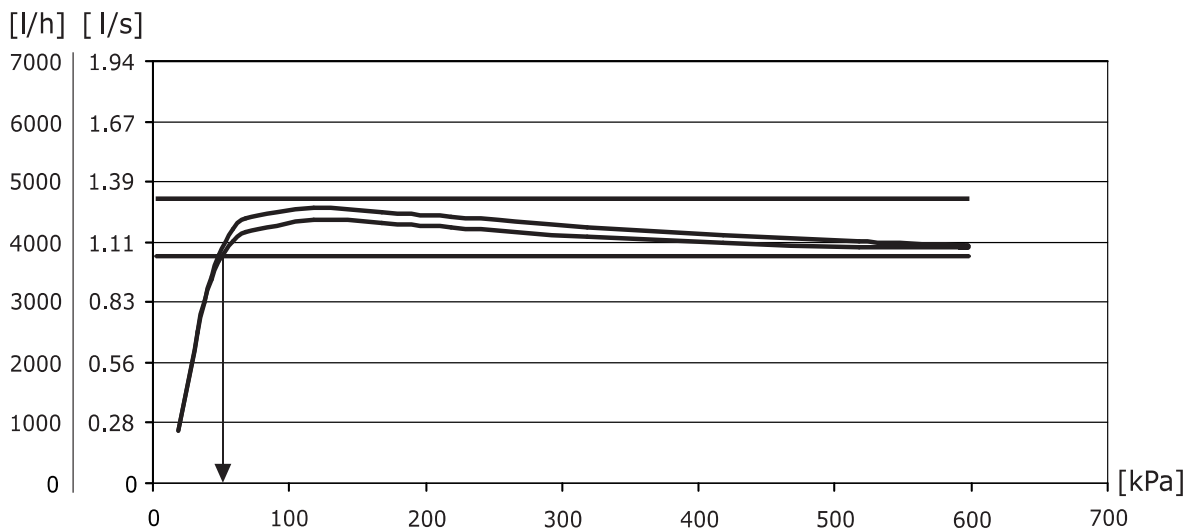
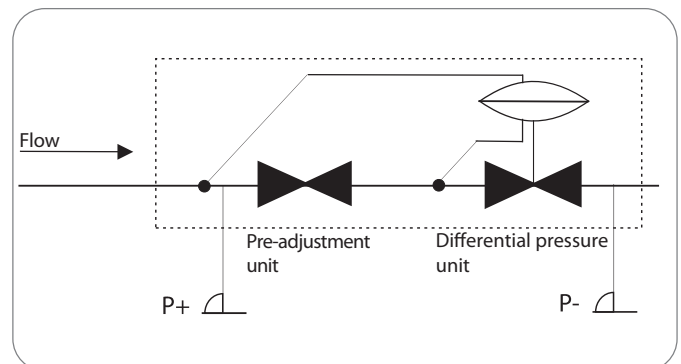
If the measured differential pressure is above the minimum Δp, the flow is the one stated on the graph for the valve.

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

Flow Calculation

$Q = K_v \cdot \sqrt{\Delta p}$	Q = m ³ /h Δp = Bar
$Q = K_v \cdot 100 \cdot \sqrt{\Delta p}$	Q = l/h Δp = kPa
$Q = \frac{K_v}{36} \cdot \sqrt{\Delta p}$	Q = l/s Δp = kPa

Simplified Outline



Schematic view of the flow characteristic for cartridge type Frese no. 49-44156. Nominal flow 1.136 l/s / 4.088 l/h. The cartridge enters the pressure range at 47 kPa and maintains the flow at a constant level to 600 kPa.

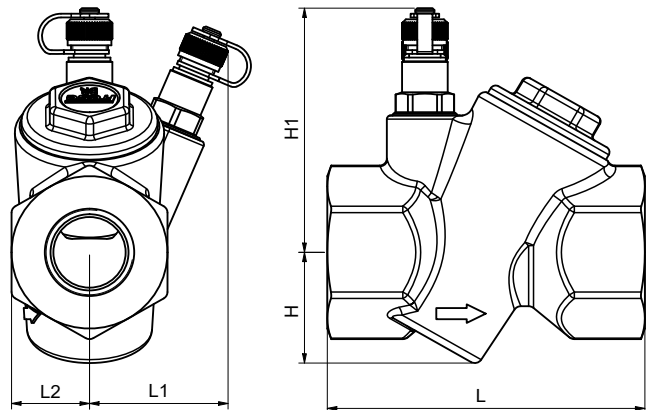
ALPHA HCR

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ALPHA HCR RG5 Valve Housing

Technical Data

Valve housing:	RG5 (EN 1982 CC491K)
P/T plugs:	DZR Brass CW602N
Plug:	DZR Brass CW602N
Pressure class:	PN16
Temperature:	-20°C to +120°C
Flow range:	Refer to cartridge programme
Thread:	ISO 228
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm



Product Programme

Frese no.	Dimensions	L [mm]	L1 [mm]	L2 [mm]	H [mm]	H1 [mm]	Weight [kg]
49-9001U5	DN15	84	36	32	30	66	0.78
49-9011U5	DN20	84	36	40	30	66	0.72
49-9021U5	DN25	84	36	80	30	66	0.62
49-9041U5	DN32	123	36	80	48	79	1.51
49-9051U5	DN40	123	36	80	48	79	1.39

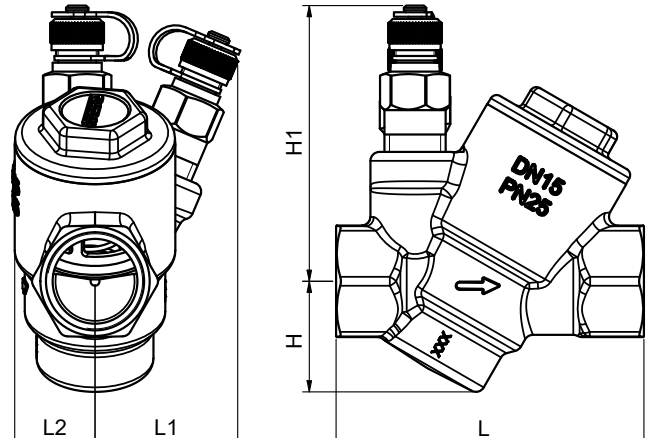
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ALPHA HCR AISI316 Valve Housing

Technical Data

Valve housing:	AISI316 (EN 1.4408)
P/T plugs:	AISI316 (EN 1.4408)
Plug:	AISI316 (EN 1.4408)
Pressure class:	PN25
Temperature:	-20°C to +120°C
Flow range:	Refer to cartridge programme
Thread:	ISO 228
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm



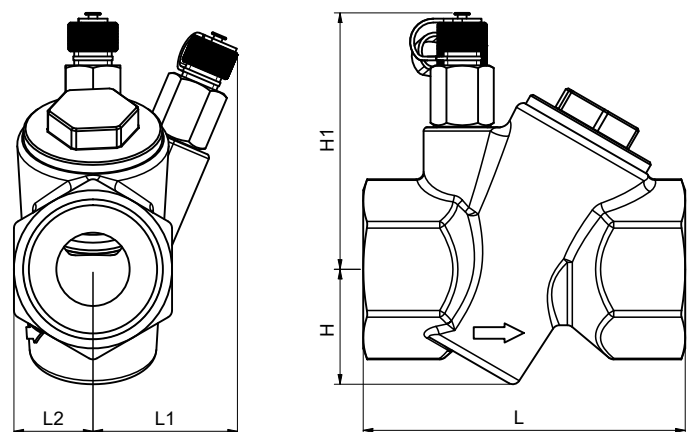
Product Programme

Frese no.	Dimension	L [mm]	L1 [mm]	L2 [mm]	H [mm]	H1 [mm]	Weight [kg]
58-9001M-01	DN15	69	32	18	25	62	0.35
58-9011M-01	DN20	69	32	18	25	62	0.42

ALPHA HCR NiAlBr Valve Housing

Technical Data

Valve housing:	NiAlBr
P/T plugs:	NiAlBr
Pressure class:	PN16
Temperature:	-20°C to +120°C
Flow range:	Refer to cartridge programme
Thread:	ISO 228
Needles for DP measurement:	Max diameter, $\varnothing 3.2$ mm Length, 25 - 40 mm



Product Programme

Frese no.	Dimension	L [mm]	L1 [mm]	L2 [mm]	H [mm]	H1 [mm]	Weight [kg]
58-9021T-01	DN25	84	37	21	30	66	0.69

ALPHA HCR

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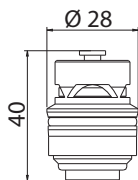
ALPHA HCR Super Duplex Cartridge

Cartridge material:	Super Duplex, EN 1.4410
O-rings:	EPDM 281
Spring:	Hastelloy C276 (high corrosion resistant)
Diaphragm:	HNBR reinforced
Medium temperature:	-20°C to +120°C
Diff. pressure range:	21 - 600 kPa
For Valve Housing:	DN15 - DN25

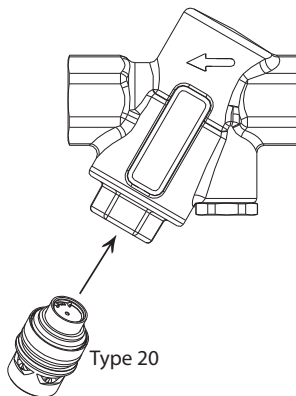
Type 20 - Super Duplex

Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
58-20170	56	0.016	0.25	21	0.12
58-20230	102	0.028	0.45	21	0.22
58-20260	129	0.036	0.57	21	0.28
58-20300	180	0.050	0.79	21	0.39
58-20350	236	0.066	1.04	21	0.51
58-20400	321	0.089	1.41	22	0.68
58-20460	422	0.117	1.86	22	0.90
58-20510	499	0.139	2.20	22	1.06
58-20540	584	0.162	2.57	22	1.25
58-20580	668	0.186	2.94	22	1.42
58-20620	750	0.208	3.30	22	1.60
58-20660	874	0.243	3.85	22	1.86
58-20700	1020	0.283	4.49	22	2.17
58-20740	1081	0.300	4.76	22	2.30
58-20770	1195	0.332	5.26	22	2.55
58-20820	1335	0.371	5.88	23	2.78
58-20860	1483	0.412	6.53	23	3.09
58-20880	1581	0.439	6.96	23	3.30
58-20920	1774	0.493	7.81	24	3.62
58-20940	1833	0.509	8.07	24	3.74
58-20990	2080	0.578	9.16	25	4.16
58-21030	2251	0.625	9.91	26	4.41
58-21060	2319	0.644	10.21	27	4.46
58-21090	2448	0.680	10.78	28	4.63
58-21090H	3000	0.833	13.21	46	4.42

Dimensions



Type 20
Super Duplex



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ALPHA HCR AISI316 Cartridge

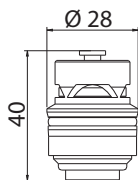
Cartridge material:	AISI316 (EN 1.4408)
O-rings:	EPDM 281
Spring:	Stainless steel
Diaphragm:	HNBR
Medium temperature:	-20°C to +120°C
Diff. pressure range:	9-350 kPa
For Valve Housing:	DN15-DN25

Type 20 - AISI 316

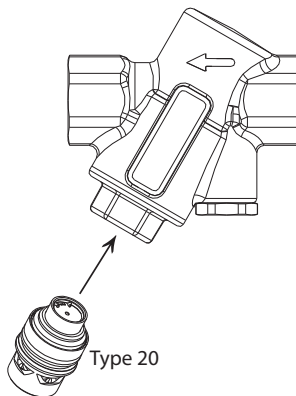
Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
47-20120	20	0.006	0.09	9	0.07
47-20170	40	0.011	0.18	9	0.13
47-20200	60	0.017	0.26	12	0.17
47-20230	80	0.022	0.35	13	0.22
47-20260	105	0.029	0.46	14	0.28
47-20300	135	0.038	0.59	14	0.36
47-20350	180	0.050	0.79	14	0.48
47-20400	240	0.067	1.06	14	0.64
47-20460	310	0.086	1.36	14	0.83
47-20510	410	0.114	1.81	15	1.06
47-20530	450	0.125	1.98	16	1.13
47-20570	500	0.139	2.20	17	1.21
47-20590	550	0.153	2.42	18	1.30
47-20620	600	0.167	2.64	19	1.38
47-20680	700	0.194	3.08	20	1.57
47-20740	800	0.222	3.52	20	1.79

Other flows on request

Dimensions



Type 20
AISI316



Type 20

ALPHA HCR

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ALPHA Cartridge

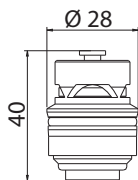
ALPHA Type 10-11-20

Cartridge material:	DZR Brass CW602N
O-rings:	EPDM 281
Spring:	Stainless Steel 1.4310
Diaphragm:	HNBR reinforced
Medium temperature:	-20°C to +120°C
Diff. pressure range:	7 - 600 kPa
For Valve Housing:	DN15-DN25

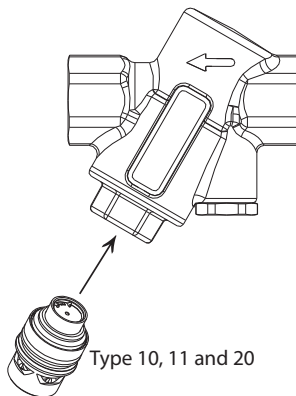
Type 10-11-20 DZR Brass

Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
Type 10					
49-11210	55	0.015	0.24	7	0.21
49-11230	75	0.021	0.33	8	0.27
49-11260	84	0.024	0.39	9	0.28
49-11290	104	0.029	0.46	10	0.33
49-11300	114	0.032	0.50	10	0.36
49-11320	129	0.036	0.57	11	0.39
49-11350	154	0.043	0.68	11	0.46
49-11370	175	0.049	0.77	12	0.51
49-11400	204	0.057	0.90	12	0.59
49-11430	241	0.067	1.06	12	0.70
49-11460	279	0.078	1.23	12	0.81
49-11490	320	0.089	1.41	13	0.89
49-11510	350	0.097	1.54	13	0.97
49-11540	400	0.111	1.76	13	1.11
49-11570	477	0.132	2.10	14	1.27
49-11620	545	0.151	2.40	14	1.46
Type 11					
49-11725	615	0.171	2.71	14	1.64
49-11730	670	0.186	2.95	14	1.79
49-11735	736	0.204	3.24	14	1.97
49-11740	799	0.222	3.52	16	2.00
49-11745	870	0.242	3.83	19	2.00
49-11750	936	0.260	4.12	21	2.04
Type 20					
49-20700	1020	0.283	4.49	22	2.17
49-20740	1081	0.300	4.76	22	2.30
49-20770	1195	0.332	5.26	22	2.55
49-20820	1335	0.371	5.88	23	2.78
49-20860	1483	0.412	6.53	23	3.09
49-20880	1581	0.439	6.96	23	3.30
49-20920	1774	0.493	7.81	24	3.62
49-20940	1833	0.509	8.07	24	3.74
49-20990	2080	0.578	9.16	25	4.16
49-21030	2251	0.625	9.91	26	4.41
49-21060	2319	0.644	10.21	27	4.46
49-21090	2448	0.680	10.78	28	4.63

Dimensions



Type 10-11-20
DZR Brass



ALPHA HCR

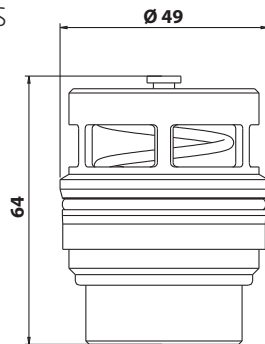
DN15-DN40

ALPHA Cartridge

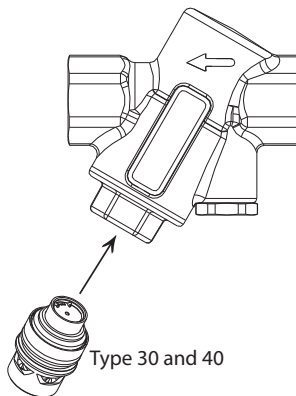
ALPHA Type 30-40

Cartridge material:	DZR Brass CW602N
O-rings:	EPDM 281
Spring:	Stainless Steel 1.4310
Diaphragm:	HNBR reinforced
Medium temperature:	-20°C to +120°C
Diff. pressure range:	7 - 600 kPa
For Valve Housing:	DN32 & DN40

Dimensions



Type 30-40
DZR Brass



Type 30 and 40

Type 30-40 DZR Brass

Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
Type 30					
49-33073	674	0.188	2.97	12	1.95
49-33082	861	0.239	3.79	12	2.49
49-33089	1020	0.283	4.49	12	2.94
49-33094	1136	0.316	5.00	12	3.28
49-33096	1190	0.331	5.24	12	3.44
49-33098	1272	0.353	5.60	13	3.53
49-33102	1349	0.375	5.94	13	3.74
49-33107	1485	0.413	6.54	13	4.12
49-33111	1567	0.435	6.90	14	4.19
49-33112	1631	0.453	7.18	14	4.36
49-33118	1815	0.504	7.99	14	4.85
49-33124	2001	0.556	8.81	15	5.17
49-33125	2044	0.568	9.00	16	5.11
49-33129	2171	0.603	9.56	16	5.43
49-33132	2271	0.631	10.00	17	5.51
49-33135	2380	0.661	10.48	17	5.77
49-33138	2498	0.694	11.00	18	5.89
49-33142	2639	0.733	11.62	18	6.22
49-33148	2871	0.797	12.64	19	6.59
49-33156	3191	0.886	14.05	21	6.96
49-33161	3407	0.946	15.00	22	7.26
49-33163	3486	0.968	15.35	22	7.43
Type 40					
49-44148	3634	1.009	16	20	8.13
49-44152	3860	1.072	17	21	8.03
49-44156	4088	1.136	18	21	8.92
49-44164	4315	1.199	19	21	9.42
49-44168	4542	1.262	20	22	9.68
49-44173	4769	1.325	21	22	10.17
49-44176	4996	1.388	22	23	10.42
49-44182	5450	1.514	24	24	11.12
49-44191	5905	1.640	26	25	11.81
49-44194	6360	1.767	28	26	12.47
49-44200	6813	1.893	30	27	13.11
49-44205	7267	2.019	32	28	13.73
49-44211	7721	2.145	34	30	14.10
49-44217	8176	2.271	36	31	14.68
49-44222	8630	2.397	38	33	15.02
49-44229	9084	2.523	40	34	15.58
49-44235	9538	2.650	42	36	15.90
49-44241	9990	2.776	44	38	16.21
49-44248	10445	2.902	46	40	16.51
49-44250	10900	3.028	48	42	16.82
49-44262	11355	3.154	50	44	17.12

ALPHA HCR

DN15-DN40

ALPHA HCR Dynamic Balancing Valve

Specification Text

- The valve shall comply with thread according to ISO 228 standard
- The pressure class for the valve housing shall be PN16 or PN25
- The valve shall contain pressure independent flow cartridges
- The temperature medium working range for the valve shall be -20°C to 120°C
- The valve shall be supplied with 1" PT plugs in same material as the valve housing
- The valve shall be fitted with the ALPHA or ALPHA HCR pressure independent flow cartridge

ALPHA HCR Cartridge

Specification text

- The ALPHA HCR cartridge should be made of Super Duplex or AISI316
- 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 or stainless steel

ALPHA Cartridge

Specification text

High pressure cartridges (DN15 & DN40)

- The cartridge (for automatic balancing valve) should be made of DZR brass CW602N
- There should be only one differential pressure control range up to 600kPa
- The flow rate should be defined by replaceable orifice plate
- The diaphragm should be made of reinforced HNBR
- The O-rings should be made of EPDM

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