



www.frese.eu/marine



Product Overview 2022

Valves for Marine & Industrial Applications



www.frese.eu/marine

Durable flow and pressure control for the most demanding environments

Over 25 years experience producing dynamic balancing solutions, has positioned Frese as the 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.

Our innovative solutions balance global HVAC systems accurately and efficiently. From cooling systems in the Middle East to heating systems in Scandinavia, our products transform state of the art technology into everyday solutions.

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.

KNOWLEDGE

QUALITY

INNOVATION

MANUFACTURING
EXCELLENCE

CUSTOMER FOCUS

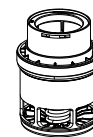
HCR · FLOW LIMITING VALVES	Page	
DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION		
ALPHA HCR Cartridges	4	
ALPHA HCR Wafers.....	6	
ALPHA HCR Grooved Ends	7	
FLOW LIMITING VALVES		
DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION		
ALPHA Cartridges.....	8	
ALPHA and ALPHA NPT.....	10	
ALPHA Wafer	10	
DYNAMIC FLOW LIMITING VALVES • EXTERNALLY ADJUSTABLE		
SIGMA Compact.....	11	
SIGMA Compact Flanged	11	
HCR · PRESSURE INDEPENDENT CONTROL VALVES		
PRESSURE INDEPENDENT CONTROL VALVES		
OPTIMA Compact HCR	13	
ACTUATORS FOR PRESSURE INDEPENDENT CONTROL VALVES		
ACTUATORS FOR PRESSURE INDEPENDENT CONTROL VALVES		
Actuator Programme	14	
Motoric Actuators for OPTIMA Compact	15	
Frese MODBUS System		
Frese MODBUS System	17	
Accessories for Frese MODBUS Converter	17	
ACCESSORIES - PICVS	17	
PRESSURE INDEPENDENT CONTROL VALVES		
PRESSURE INDEPENDENT CONTROL VALVES		
OPTIMA Compact DN10-32 and NPT	18	
Actuators for OPTIMA Compact DN10-DN32.....	18	
OPTIMA Compact DN40-50 and NPT	19	
OPTIMA Compact Flanged.....	19	
COMBIFLOW 6-WAY PICV.....	20	
OPTIMIZER 6-WAY Valve.....	21	
OPTIMIZER Twin Flow Controller	21	
Frese DELTA T Control System.....	21	
3-WAY ROTARY CONTROL VALVES		
OMEGA Compact.....	22	
Actuators and Accessories for OMEGA Compact.....	22	
ISOLATION VALVES		
ISOLATION VALVES		
Butterfly Valves, Ball Valves	24	
Strainer	24	
COMMISSIONING EQUIPMENT		
DIFFERENTIAL PRESSURE		
Differential Pressure Manometer and Accessories.....	25	
MATERIAL CERTIFICATES AND EXTRA SERVICES		27
GENERAL CONDITIONS OF SALE AND DELIVERY		28
TERMS AND CONDITIONS FOR LIMITED PRODUCT WARRANTY		30

DYNAMIC FLOW LIMITING VALVES · CARTRIDGE SOLUTION

ALPHA HCR Cartridges type 50 and 60 - PPS and AISI316

ALPHA HCR Cartridge with orifice plate

Category	Dimension DN	Pressure range kPa	Material
M	50-450 (1000)	47-600 (300)	PPS Glass
M	50-450 (1000)	13-600	AISI316



ALPHA HCR Orifice plates

Category	Dimension DN	Material
M	50-450 (1000)	PPS Glass
M	50-450 (1000)	AISI316



ALPHA HCR orifice plate removal tool

Category	Frese no.	Suitable for
M	08-0289	ALPHA HCR PPS cartridges



ALPHA HCR Cartridges type 20 - Super Duplex

ALPHA HCR Cartridge with orifice plate

Category	Dimension DN	Pressure range kPa	Material
M	25-40	22-600	EN 1.4410



ALPHA HCR Orifice plates

Category	Dimension DN	Material
M	25-40	EN 1.4410



ALPHA HCR Cartridges · Flow Settings

ALPHA HCR Cartridge Type 60 · PPS						ALPHA HCR Cartridge Type 20 · Super Duplex EN 1.4410					
Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv	Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
58-65120	4,000	1.111	17.61	47	5.8	58-20170	56	0.016	0.25	21	0.12
58-65175	7,500	2.083	33.02	47	10.9	58-20230	102	0.028	0.45	21	0.22
58-65200	8,500	2.361	37.42	47	12.4	58-20260	129	0.036	0.57	21	0.28
58-65240	12,500	3.472	55.03	47	18.2	58-20300	180	0.050	0.79	21	0.39
58-65252	13,800	3.833	60.76	47	20.1	58-20350	236	0.066	1.04	21	0.51
58-65264	15,300	4.250	67.36	47	22.3	58-20400	321	0.089	1.41	22	0.68
58-65274	16,300	4.528	71.77	47	23.8	58-20460	422	0.117	1.86	22	0.90
58-65280	18,000	5.000	79.25	47	26.3	58-20510	499	0.139	2.20	22	1.06
58-65303	19,000	5.278	83.66	47	27.7	58-20540	584	0.162	2.57	22	1.25
58-65313	20,300	5.639	89.38	47	29.6	58-20580	668	0.186	2.94	22	1.42
58-65320	21,500	5.972	94.66	47	31.4	58-20620	750	0.208	3.30	22	1.60
58-65333	23,200	6.444	102.15	47	33.8	58-20660	874	0.243	3.85	22	1.86
58-65341	24,300	6.750	106.99	47	35.4	58-20700	1,020	0.283	4.49	22	2.17
58-65349	25,300	7.028	111.39	47	36.9	58-20740	1,081	0.300	4.76	22	2.30
58-65356	27,000	7.500	118.88	47	39.4	58-20770	1,195	0.332	5.26	22	2.55
58-65365	30,500	8.472	134.28	47	44.5	58-20820	1,335	0.371	5.88	23	2.78
58-65385	32,000	8.889	140.89	47	46.7	58-20860	1,483	0.412	6.53	23	3.09
58-65396	34,000	9.444	149.70	49	48.6	58-20880	1,581	0.439	6.96	23	3.30
58-65409	37,500	10.417	165.10	49	53.6	58-20920	1,774	0.493	7.81	24	3.62
58-65413	38,500	10.694	169.51	50	54.4	58-20940	1,833	0.509	8.07	24	3.74
58-65417	39,500	10.972	173.91	50	55.9	58-20990	2,080	0.578	9.16	25	4.16
58-65420	40,500	11.250	178.31	52	56.2	58-21030	2,251	0.625	9.91	26	4.41
58-65425	41,750	11.597	183.82	53	57.3	58-21060	2,319	0.644	10.21	27	4.46
58-65430	43,000	11.944	189.32	54	58.5	58-21090	2,448	0.680	10.78	28	4.63
58-65433	44,000	12.222	193.72	55	59.3	58-21090H	3,000	0.833	13.21	46	4.42
58-65440	48,000	13.333	211.33	60	62.0						

DYNAMIC FLOW LIMITING VALVES · CARTRIDGE SOLUTION
ALPHA HCR Cartridges · Flow Settings

ALPHA HCR Cartridge Type 50 · AISI316					
Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
51-55179	3,820	1.061	16.82	13	10.6
51-55184	3,931	1.092	17.31	13	10.9
51-55189	4,049	1.125	17.83	13	11.2
51-55194	4,199	1.167	18.50	13	11.7
51-55200	4,399	1.222	19.37	13	12.2
51-55206	4,640	1.289	20.43	14	12.4
51-55213	4,951	1.375	21.79	14	13.2
51-55220	5,310	1.475	23.38	14	14.2
51-55227	5,700	1.583	25.09	14	15.2
51-55235	6,209	1.725	27.34	14	16.6
51-55243	6,511	1.808	28.66	14	17.4
51-55251	7,081	1.967	31.18	14	18.9
51-55260	7,901	2.194	34.78	15	20.4
51-55269	8,900	2.472	39.18	16	22.3
51-55279	10,399	2.889	45.79	19	23.9
51-55287	11,355	3.154	49.99	22	24.2
51-55292	12,491	3.470	55.00	23	26.1
51-55298	13,399	3.722	59.00	24	27.4
51-55303	14,762	4.100	64.99	27	28.4
51-55308	15,999	4.444	70.44	29	29.7

ALPHA HCR Cartridge Type 60 · AISI316					
Frese no.	Flow [l/h]	Flow [l/s]	Flow [gpm]	Min. ΔP [kPa]	Kv
51-66285	17,037	4.733	75.02	34	29.2
51-66292	18,148	5.041	79.90	34	31.1
51-66301	18,797	5.221	82.75	35	31.8
51-66305	19,467	5.408	85.72	35	32.9
51-66312	20,464	5.684	90.09	35	34.6
51-66319	21,527	5.980	94.79	36	35.9
51-66326	22,449	6.236	98.84	36	37.4
51-66332	23,482	6.523	103.39	36	39.1
51-66338	24,531	6.815	108.02	37	40.3
51-66344	25,621	7.117	112.81	38	41.6
51-66349	26,528	7.369	116.80	38	43.0
51-66356	27,686	7.690	121.89	38	44.9
51-66362	29,157	8.099	128.37	38	47.3
51-66367	29,954	8.320	131.88	39	48.0
51-66373	30,976	8.605	136.39	39	49.6
51-66379	32,260	8.961	142.04	40	51.0
51-66385	33,565	9.324	147.79	40	53.0
51-66391	34,953	9.709	153.89	40	55.3
51-66393	36,336	10.093	159.98	42	56.1
51-66398	37,685	10.468	165.92	43	57.5
51-66400	38,607	10.724	169.98	44	58.2
51-66407	40,971	11.381	180.39	46	60.4
51-66407H	45,000	12.500	198.13	49	64.3

DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION

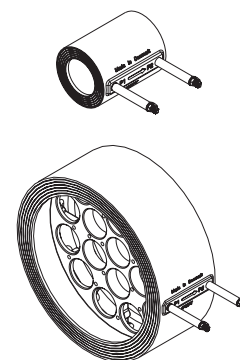
ALPHA HCR Wafer - Nickel Aluminium Bronze

Nickel-Aluminium-Bronze Valves

For Flanges with 4" P/T-plugs, 110°C, PN16/PN25, EN 1982 CC333G-GS. Installation of cartridges included. Please select from cartridge catalogue and order under individual numbers

Category	Frese no.	Dimension DN	PN	Cartridges
M	58-9038T-01	25	25	1
M	58-9058T-01	40	25	1
M	58-9073T-01	50	25	1
M	58-9083T-01	65	25	1
M	58-9093T-01	80	25	1
M	58-9103T-01	100	16*	2
M	58-9163T-01	125	16*	3
M	58-9113T-01	150	16*	4
M	58-9123T-01	200	16*	7
M	58-9133T-01	250	16*	12
M	58-9143T-01	300	16*	15
M	58-9153T-01	350	16*	19
M	58-9173T-01	400	16*	26
M	58-9183T-01	450	16*	33

*PN25 on request



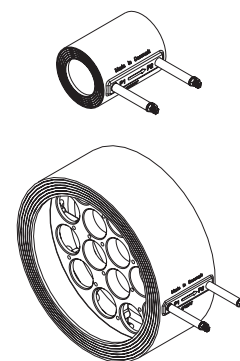
ALPHA HCR Wafer - Stainless Steel 316L

Stainless Steel 316L Valves

For Flanges with 4" P/T-plugs, 110°C, PN16/PN25, EN 10088-2 1.4404. Installation of cartridges included. Please select from cartridge catalogue and order under individual numbers

Category	Frese no.	Dimension DN	PN	Cartridges
M	58-9038L-01	25	25	1
M	58-9058L-01	40	25	1
M	58-9073L-01	50	25	1
M	58-9083L-01	65	25	1
M	58-9093L-01	80	25	1
M	58-9103L-01	100	16*	2
M	58-9163L-01	125	16*	3

*PN25 on request



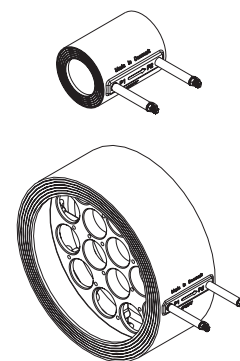
ALPHA HCR Wafer - Stainless Steel 316

Stainless Steel 316 Valves

For Flanges with 4" P/T-plugs, 110°C, PN16/PN25, EN 10088-2 1.4401. Installation of cartridges included. Please select from cartridge catalogue and order under individual numbers

Category	Frese no.	Dimension DN	PN	Cartridges
M	58-9113M-01	150	16*	4
M	58-9123M-01	200	16*	7
M	58-9133M-01	250	16*	12
M	58-9143M-01	300	16*	15
M	58-9153M-01	350	16*	19
M	58-9173M-01	400	16*	26
M	58-9183M-01	450	16*	33

*PN25 on request



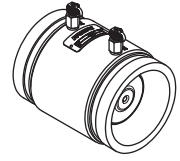
DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION

ALPHA HCR Grooved End

Nickel Aluminium Bronze Valves

For grooved piping systems with 1" P/T-plugs, -20°C to 32°C, PN16, EN 1982 CC333G-GS. Installation of cartridges included. Please select from cartridge catalogue and order under individual numbers

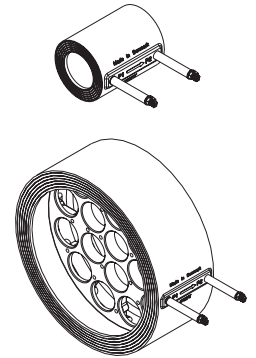
Category	Frese no.	Dimension DN	Cartridges
M	58-9107T-01	100	1
M	58-9117T-01	150	2
M	58-9127T-01	200	4



ALPHA HCR Wafer - Other Materials

ALPHA HCR Wafers in sizes DN25-DN450 are also available in below listed materials. Please contact Frese for price and availability

Suffix	Material name	Material Standard
U	CC4921K (RG7)	EN 1982 CC492K-GC
P	Low Carbon Steel	ASTM A350 LF2
L	Stainless Steel 316L	EN 10088-2 1.4404
K	Stainless Steel 316Ti	EN 10088-2 1.4571
M	Stainless Steel 316	EN 10088-2 1.4401
N	SMO 254	EN 10088-2 1.4547

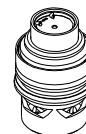


DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION

ALPHA High-Pressure Cartridges

ALPHA Cartridge with orifice plate

Category	Type	Dimension DN	Pressure range kPa	Material
E	10, 11, 20	15/20/25	7-600	Brass DZR
E	30, 40	25L/32/40/50	12-600	Brass DZR
F	50, 60	50-1000	12-600	Stainless Steel AISI 304



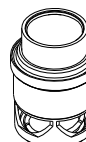
Orifice plates

Category	Type	Dimension DN	Material
E	10, 11, 20	15/20/25	Brass DZR
E	30, 40	25L/32/40/50	Brass DZR
F	50, 60	50-1000	Stainless Steel AISI 304



ALPHA Cartridge without orifice plate

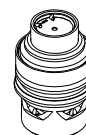
Category	Type	Dimension DN	Pressure range kPa	Material
E	10, 11, 20	15/20/25	7-600	Brass DZR
E	30, 40	25L/32/40/50	12-600	Brass DZR
F	50, 60	50-1000	12-600	Stainless Steel AISI 304



ALPHA Low-Pressure Cartridges

ALPHA Cartridge with orifice plate

Category	Type	Dimension DN	Pressure range kPa	Material
E	10, 11, 20	15/20/25	7-350	Brass DZR
E	30, 40	25L/32/40/50	12-350	Brass DZR



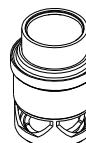
Orifice plates

Category	Type	Dimension DN	Material
E	10, 11, 20	15/20/25	Brass DZR
E	30, 40	25L/32/40/50	Brass DZR



ALPHA Cartridge without orifice plate

Category	Type	Dimension DN	Pressure range kPa	Material
E	10, 11, 20	15/20/25	7-350	Brass DZR
E	30, 40	25L/32/40/50	12-350	Brass DZR



Blind cap for wafer valves

Category	Frese no.	Dimension DN	Material
F	51-05000	100-1000	Stainless Steel AISI 304



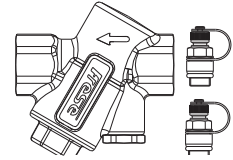
DYNAMIC FLOW LIMITING VALVES • CARTRIDGE SOLUTION

ALPHA DN15-DN50

Female/Female with 1" P/T-plugs

120°C, PN25, DZR

Category	Frese no.	Dimension DN	Cartridge Type
A	49-9001	15	10, 11, 20
A	49-9011	20	10, 11, 20
A	49-9021	25	10, 11, 20
A	49-9031	25L	30, 40
A	49-9041	32	30, 40
A	49-9051	40	30, 40
A	49-9061	50	30, 40

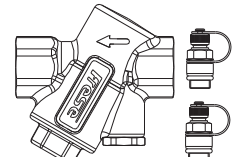


ALPHA NPT 1/2"-2"

Female/Female NPT thread with 1" P/T-plugs

120°C, PN25, DZR Brass

Category	Frese no.	Dimension DN	Cartridge Type
A	49-8001	1/2"	10, 11, 20
A	49-8011	3/4"	10, 11, 20
A	49-8021	1"	10, 11, 20
A	49-8031	1" L	30, 40
A	49-8041	1 1/4"	30, 40
A	49-8051	1 1/2"	30, 40
A	49-8061	2"	30, 40



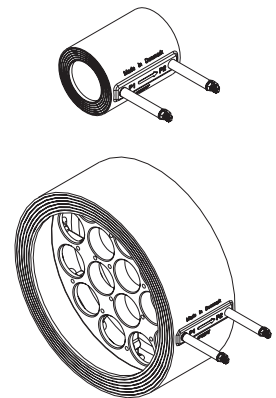
ALPHA Wafer DN50-DN1000

Ductile Iron Valves

For Flanges with 4" P/T-plugs, 110°C, PN16

Installation of cartridges included. Flow cartridges are selected from cartridge catalogue and ordered under individual numbers

Category	Frese no.	Dimension DN	Cartridges
B	49-9103-01	100	2
B	49-9163-01	125	3
B	49-9113-01	150	4
B	49-9123-01	200	7
B	49-9133-01	250	12
B	49-9143-01	300	15
B	49-9153-01	350	19
B	49-9173-01	400	26
B	49-9183-01	450	33
B	49-9193-01	500	40
B	49-9203-01	600	56
B	49-9213-01	800	85
B	49-9233-01	900	112
B	49-9223-01	1000	136

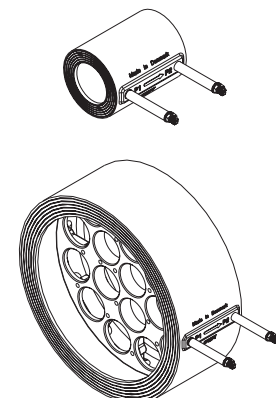


Ductile Iron Valves

For Flanges with 4" P/T-plugs, 110°C, PN25

Installation of cartridges included. Flow cartridges are selected from cartridge catalogue and ordered under individual numbers

Category	Frese no.	Dimension DN	Cartridges
B	49-9073-01	50	1
B	49-9083-01	65	1
B	49-9093-01	80	1
B	49-9540-01	100	2
B	49-9541-01	125	3
B	49-9542-01	150	4
B	49-9543-01	200	7
B	49-9544-01	250	12
B	49-9545-01	300	15
B	49-9546-01	350	19
B	49-9547-01	400	26
B	49-9548-01	450	33
B	49-9549-01	500	40
B	49-9550-01	600	56

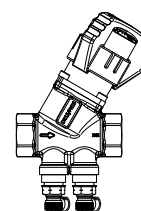


DYNAMIC FLOW LIMITING VALVES • EXTERNALLY ADJUSTABLE

SIGMA Compact DN15-DN50

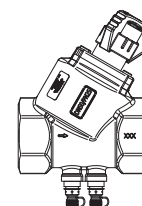
Female/Female with 1" P/T-plugs, 120°C, PN25, DZR

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
L	53-2200	15 Low flow	40 - 900	10 - 400
L	53-2201	15 High flow	60 - 1,080	14 - 400
L	53-2202	20 Low flow	86 - 1,550	10 - 400
L	53-2203	20 High flow	102 - 1,930	16 - 400
L	53-2208	25 Low flow	95 - 2,000	10 - 400
L	53-2209	25 High flow	137 - 2,400	14 - 400
L	53-2205	32	200 - 5,000	16 - 400



Female/Female with 1" P/T-plugs, 120°C, PN25, Ductile Iron

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
L	53-2206	40	719 - 7,400	10 - 400
L	53-2207	50	900 - 10,350	10 - 400

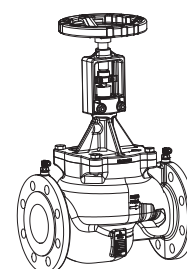


SIGMA Compact DN50-DN300

Flanged with 1" P/T plugs

DN50-DN125 120°C (DN150-DN300, 110°C), PN16, GJL-250/GJS-400

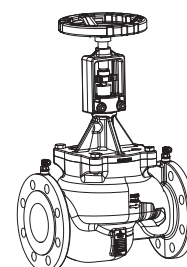
Category	Frese no.	Dimension DN	Flow range l/h
J	53-2400	50 Low flow	2,480 - 15,000
J	53-2410	50 High flow	3,920 - 24,000
J	53-2401	65 Low flow	4,380 - 25,000
J	53-2411	65 High flow	5,950 - 35,000
J	53-2402	80 Low flow	5,340 - 34,000
J	53-2412	80 High flow	7,020 - 43,000
J	53-2403	100 Low flow	12,100 - 68,000
J	53-2413	100 High flow	14,800 - 90,000
J	53-2404	125 Low flow	18,500 - 110,000
J	53-2414	125 High flow	23,000 - 135,000
J	53-2405	150 Low flow	25,600 - 148,000
J	53-2415	150 High flow	32,000 - 195,000
J	53-2406	200 Low flow	95,000 - 210,000
J	53-2416	200 High flow	130,000 - 280,000
J	53-2407	250 Low flow	190,000 - 475,000
J	53-2417	250 High flow	245,000 - 600,000
J	53-2408	300 Low flow	190,000 - 475,000
J	53-2418	300 High flow	245,000 - 600,000



Flanged with 1" P/T plugs

DN50-DN125 120°C (DN150-DN300, 110°C), PN25, GJL-250/GJS-400

Category	Frese no.	Dimension DN	Flow range l/h
J	53-2420	50 Low flow	2,480 - 15,000
J	53-2430	50 High flow	3,920 - 24,000
J	53-2421	65 Low flow	4,380 - 25,000
J	53-2431	65 High flow	5,950 - 35,000
J	53-2422	80 Low flow	5,340 - 34,000
J	53-2432	80 High flow	7,020 - 43,000
J	53-2423	100 Low flow	12,100 - 68,000
J	53-2433	100 High flow	14,800 - 90,000
J	53-2424	125 Low flow	18,500 - 110,000
J	53-2434	125 High flow	23,000 - 135,000
J	53-2425	150 Low flow	25,600 - 148,000
J	53-2435	150 High flow	32,000 - 195,000
J	53-2426	200 Low flow	95,000 - 210,000
J	53-2436	200 High flow	130,000 - 280,000
J	53-2427	250 Low flow	190,000 - 475,000
J	53-2437	250 High flow	245,000 - 600,000
J	53-2428	300 Low flow	190,000 - 475,000
J	53-2438	300 High flow	245,000 - 600,000



HCR - PRESSURE INDEPENDENT CONTROL VALVES



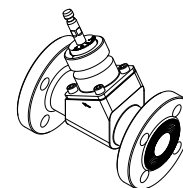
PRESSURE INDEPENDENT CONTROL VALVES

OPTIMA Compact HCR DN15-DN40

Flanged - HNBR (excluding actuator)

120°C, 6 bar, PN16/25/40, EN 10088-2 1.4404, AISI 316L

Category	Frese no.	Dimension DN	Stroke	Flow l/h
M	58-8180	15	5,5	525-2,000
M	58-8181	20	5,5	525-2,000
M	58-8182	25	5,5	850-4,100
M	58-8183	32	5,5	850-4,100
M	58-8184	40	15	2,000-9,500

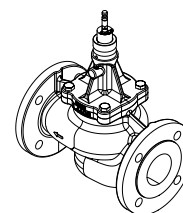


OPTIMA Compact HCR DN50-DN80

Flanged - EPDM (excluding actuator)

150°C, 12 bar, PN16, EN 10088-2 1.4401, AISI 316

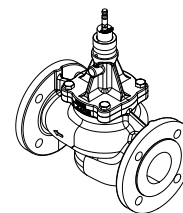
Category	Frese no.	Dimension DN	Stroke	Flow l/h
M	58-8110	50	20	3,500-24,000
M	58-8111	65	20	6,000-35,000
M	58-8112	80	20	7,000-43,000



Flanged - EPDM (excluding actuator)

150°C, 12 bar, PN25, EN 10088-2 1.4401, AISI 316

Category	Frese no.	Dimension DN	Stroke	Flow l/h
M	58-8130	50	20	3,500-24,000
M	58-8131	65	20	6,000-35,000
M	58-8132	80	20	7,000-43,000



ACTUATOR PROGRAMME · FLANGED VALVES

Image	Part Number	Power Supply	Control Signal	Feedback Signal	IP Class	Fail Safe Position	OPTIMA Compact HCR			OPTIMA Compact				
							DN 15-32	DN 40	DN 50-80	DN 40-50***	DN 50-80	DN 100-125	DN 150-200	DN 250-300
	53-1956 Type 11	24V 230V*	0-10V 4-20mA 3-point 24V	0-10V	IP66	Up							•	•
	53-1957 Type 12	24V 230V*	0-10V 4-20mA 3-point 24V	0-10V	IP66	Down							•	•
	53-1299 Type 10	24V 230V*	0-10V 4-20mA 3-point 24V	0-10V	IP66	No							•	•
	58-8901	24V	4-20mA 0-10V	0-10V	IP54	No				•				
	58-8908	230V	3-point 230V	NA	IP54	No				•				
	53-1290	230V	3-point 230V	NA	IP54	No	•	•	•		•			
	53-1291	24V	3-point 24V	NA	IP54	No	•	•	•		•			
	58-8902	24V	4-20mA 0-10V	0-10V	IP54	No	•	•	•		•			
	53-1293	230V	3-point 230V	NA	IP54	No						•	•	
	53-1294	24V	3-point 24V	NA	IP54	No						•	•	
	58-8903	24V	4-20mA 0-10V	0-10V	IP54	No						•	•	
	53-1296 Type 1	24V	0-10V	2-10V	IP54	No				•				
	53-1297 Type 2	24V	0-10V	2-10V	IP54	No	•	•	•		•	•		
	53-1298 Type 3	24V	0-10V	2-10V	IP54	No							•	
	53-1950 Type 4	24V	0-10V	2-10V	IP54	Up				•				
	53-1951 Type 5	24V	0-10V	2-10V	IP54	Down				•				
	53-1952 Type 6	24V	0-10V	2-10V	IP54	Up	•	•	•		•	•		
	53-1953 Type 7	24V	0-10V	2-10V	IP54	Down	•	•	•		•	•		
	58-8923/ 58-8933	230V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No	•	•		•	•			
	58-8922/ 58-8932	24V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No	•	•		•	•			
	58-8921/ 58-8931	230V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No			•			•	•	
	58-8920/ 58-8930	24V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No			•			•	•	
	58-8925/ 58-8935	230V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No							•	•
	58-8924/ 58-8934	24V	0(2)-10V 0(4)-20mA 3-point	0-10V 4-20mA**	IP54/ IP65	No							•	•

*with accessory: 07-2925

**with accessory: 07-2939

***threaded version

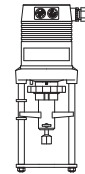
ACTUATORS FOR PRESSURE INDEPENDENT CONTROL VALVES

Motoric Actuators for OPTIMA Compact HCR

HO-Series, 24V AC/DC, IP54

Suitable for OPTIMA Compact og OPTIMA Compact HCR with flanged connections

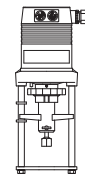
Category	Frese no.	Type	Suitable for	Suitable for
O	58-8922	4-20 mA, 0-10V, 3-P	OPTIMA Compact HCR DN15-DN40	OPTIMA Compact DN40-DN80
O	58-8920	4-20 mA, 0-10V, 3-P	DN50-DN80	DN100-DN200
O	58-8924	4-20 mA, 0-10V, 3-P	N/A	DN250-DN300



HO-Series, 230V AC, IP54

Suitable for OPTIMA Compact og OPTIMA Compact HCR with flanged connections

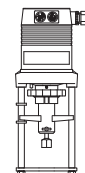
Category	Frese no.	Type	Suitable for	Suitable for
O	58-8923	4-20 mA, 0-10V, 3-P	OPTIMA Compact HCR DN15-DN40	OPTIMA Compact DN40-DN80
O	58-8921	4-20 mA, 0-10V, 3-P	DN50-DN80	DN100-DN200
O	58-8925	4-20 mA, 0-10V, 3-P	N/A	DN250-DN300



HO-Series, 24V AC/DC, IP65

Suitable for OPTIMA Compact og OPTIMA Compact HCR with flanged connections

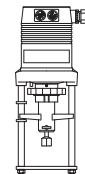
Category	Frese no.	Type	Suitable for	Suitable for
O	58-8932	4-20 mA, 0-10V, 3-P	OPTIMA Compact HCR DN15-DN40	OPTIMA Compact DN40-DN80
O	58-8930	4-20 mA, 0-10V, 3-P	DN50-DN80	DN100-DN200
O	58-8934	4-20 mA, 0-10V, 3-P	N/A	DN250-DN300



HO-Series, 230V AC, IP65

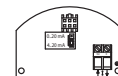
Suitable for OPTIMA Compact og OPTIMA Compact HCR with flanged connections

Category	Frese no.	Type	Suitable for	Suitable for
O	58-8933	4-20 mA, 0-10V, 3-P	OPTIMA Compact HCR DN15-DN40	OPTIMA Compact DN40-DN80
O	58-8931	4-20 mA, 0-10V, 3-P	DN50-DN80	DN100-DN200
O	58-8935	4-20 mA, 0-10V, 3-P	N/A	DN250-DN300



HO-Series, Accessory

Category	Frese no.	Type	Suitable for
O	07-2939	4-20 mA feedback module	HO-Series Actuators

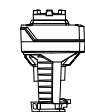


Motoric Actuators for OPTIMA Compact DN40-DN300

Supply voltage 24V AC/DC, IP54

Suitable for OPTIMA Compact with female/female connections

Category	Frese no.	Type	Suitable for dimension
O	53-1296	0-10V 400N Type-01	DN40-DN50
O	58-8901	4-20mA/0-10V 15MM 200N	DN40-DN50



Supply voltage 24V AC/DC, IP54 - Spring return

Suitable for OPTIMA Compact with female/female connections

Category	Frese no.	Type	Suitable for dimension
O	53-1950	0-10V Up 600N Type-04	DN40-DN50
O	53-1951	0-10V Down 600N Type-05	DN40-DN50



ACTUATORS FOR PRESSURE INDEPENDENT CONTROL VALVES

Motoric Actuators for OPTIMA Compact DN40-DN300

Supply voltage 230V AC, IP54

Suitable for OPTIMA Compact with female/female connections

Category Frese no. Type

Suitable for dimension
DN40-DN50

O	58-8908	3-P 200 N
---	---------	-----------



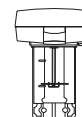
Supply voltage 24V AC/DC, IP54

Suitable for OPTIMA Compact with flanged connections

Category Frese no. Type

Suitable for dimension
DN50-DN125

O	53-1297	0-10V 800N Type-02
O	53-1298	0-10V 1500N Type-03



O	58-8902	4-20 mA 0-10V 800 N
O	58-8903	4-20 mA 0-10V 1100 N
O	53-1291	3-P 24 V 800 N
O	53-1294	3-P 24 V 1100 N

DN50-DN80
DN100-DN200
DN50-DN80
DN100-DN200



Supply voltage 230V AC, IP54

Suitable for OPTIMA Compact with flanged connections

Category Frese no. Type

Suitable for dimension
DN50-DN80
DN100-DN200

O	53-1290	3-P 230 V
O	53-1293	3-P 230 V



Supply voltage 24V AC/DC, IP66

Suitable for OPTIMA Compact with flanged connections

Category Frese no. Type

Suitable for dimension
DN150-DN300

O	53-1299	0-10V DC, 4-20 mA DC, 3-P fl., 2500N Type-10
---	---------	--



Supply voltage 24V AC/DC, IP54 - Spring return

Suitable for OPTIMA Compact with flanged connections

Category Frese no. Type

Suitable for dimension
DN50-DN125

O	53-1952	0-10V Up 900N Type-06
O	53-1953	0-10V Down 900N Type-07



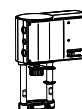
Supply voltage 24V AC/DC, IP66 - Spring return

Suitable for OPTIMA Compact with flanged connections

Category Frese no. Type

Suitable for dimension
DN250-DN300

O	53-1956	0-10V DC, 4-20 mA DC/3-P/2-P fl. Up 2000N Type-11
O	53-1957	0-10V DC, 4-20 mA DC/3-P/2-P fl. Down 2000N Type-12



ACTUATORS FOR PRESSURE INDEPENDENT CONTROL VALVES

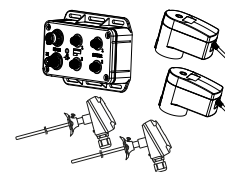
Frese MODBUS System

Frese MODBUS Kit

One kit with all parts needed for two modbus enabled OPTIMA Compacts and two temperature sensors. Valves need to be ordered separately.

Category Frese no. Type

O	58-8999	1 MODBUS converter, 2 actuators, 2 active sensors
---	---------	---



Frese MODBUS Converter

Suitable for two actuators and two active sensors, Protection Class IP54

Category Frese no. Type

O	58-8955	MODBUS converter
---	---------	------------------

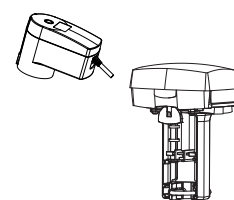


Frese MODBUS System Actuators

Category Frese no. Cable

Suitable for dimension

O	58-8910	1 m, halogen free, incl. connector	DN10-DN32
O	58-8911	3 m, halogen free, incl. connector	DN10-DN32
O	53-1296	Not included**	DN40-DN50
O	53-1297	Not included**	DN50-DN125
O	53-1298	Not included**	DN150-DN200



*Please contact Frese if MODBUS actuator for DN250-DN300 is needed.

** Please order 58-8952

Temperature Sensor for Frese MODBUS System

With 3 meter halogen free cable incl. M8 connector.

Category Frese no. Type

O	58-8954	Temperature Sensor 4-20 mA
---	---------	----------------------------



Cables for Frese MODBUS System

Including M8 connectors.

Category Frese no. Type

Suitable for

O	58-8952	Cable, halogen free, 5 m	Actuator DN40-DN200
O	58-8953	Extension Cable, halogen free, 5 m	Actuator & Sensors



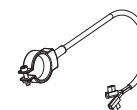
Accessories

Stem Heater

Category Frese no. Type

Suitable for

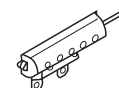
D	58-8956	24 V AC/DC, 10 W	OPTIMA Compact DN10-DN32
---	---------	------------------	-----------------------------



Category Frese no. Type

Suitable for

D	58-8951	24 V AC/DC, 50W	actuators Type-01 to Type-07
---	---------	-----------------	---------------------------------

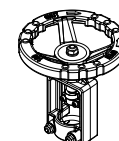


Handwheel for OPTIMA Compact HCR

Category Frese no. Type

Suitable for

J	01-2127	HCR, Aluminum	HCR DN15-80
---	---------	---------------	-------------



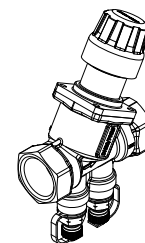
PRESSURE INDEPENDENT CONTROL VALVES

OPTIMA Compact DN10-DN32

Female/Female with 1" P/T plugs

Excl. actuator, 120°C, PN25, DZR

Category	Frese no.	Dimension DN	Stroke	Maximum flow l/h
G	53-1362	15 Low flow	2.5	30-200
G	53-1364	15 High flow	2.5	100-575
G	53-1372	20	2.5	100-575
G	53-1370	15 Low flow	5.0	65-370
G	53-1365	15 High flow	5.0	220-1,330
G	53-1368	20	5.0	220-1,330
G	53-1338	20	5.5	300-1,800
G	53-1339	25	5.5	280-1,800
G	53-1373	25L	5.5	600-3,609
G	53-1374	32	5.5	550-4,001

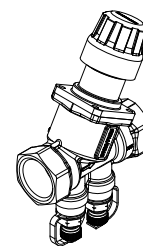


OPTIMA Compact NPT 1/2" to 2"

Female/Female NPT with 1" P/T plugs

Excl. actuator, 120°C, PN25, DZR

Category	Frese no.	Dimension DN	Stroke	Maximum flow l/h
G	53-1390	1/2" Low flow	2.5	30-200
G	53-1392	1/2" High flow	2.5	100-575
G	53-1394	3/4"	2.5	100-575
G	53-1391	1/2" Low flow	5.0	65-370
G	53-1393	1/2" High flow	5.0	220-1,330
G	53-1395	3/4"	5.0	220-1,330
G	53-1369	3/4"	5.5	300-1,800
G	53-1389	1"	5.5	280-1,800
G	53-1396	1"L	5.5	600-3,609
G	53-1397	1 1/4"	5.5	550-4,001



Actuators for OPTIMA Compact DN10-DN32

Thermic actuator, On/Off with halogen free cables

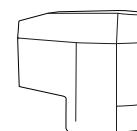
Category	Frese no.	Type	Suitable for valve stroke
D	58-8904	On/Off 230V NC	2.5
D	58-8905	On/Off 230V NC	5.0/5.5
D	58-8913	On/Off 230V NO	2.5/5.0/5.5
D	58-8914	On/Off 24V NO	2.5/5.0/5.5
D	58-8915	On/Off 24V NC	2.5/5.0/5.5



Motoric actuator MPV, modulating with halogen free cables

Supply Voltage : 24V AC/DC, Running time: 15 sec

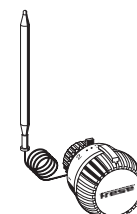
Category	Frese no.	Type	Suitable for valve stroke
D	53-1986	4-20 mA DC, 1 m cable	up to 8.5 mm
D	58-8900	4-20 mA DC, 1 m cable & Wieland Connector	up to 8.5 mm
D	58-8906	2-10 V DC, 3 m cable	up to 8.5 mm
D	58-8907	4-20 mA DC, 2 m cable	up to 8.5 mm
D	58-8909	0-10V DC, 1 m cable	up to 8.5 mm
D	53-1979	0-10V DC, 1 m cable, feedback	up to 8.5 mm
D	53-1980	0-10V DC, 1 m cable, feedback, failsafe open	up to 8.5 mm
D	53-1981	0-10V DC, 1 m cable, feedback, failsafe close	up to 8.5 mm



Thermostat with remote sensor for water and air

Suitable only for OPTIMA Compact with 2.5, 5.0 or 5.5 mm stroke

Category	Frese no.	Type	Suitable for valve stroke
D	53-1990	Thermostat w. remote sensor	2.5
D	53-1994	Thermostat w. remote sensor	5.0
D	53-1995	Thermostat w. remote sensor	5.5



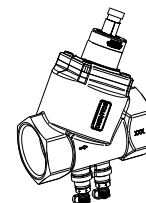
PRESSURE INDEPENDENT CONTROL VALVES

OPTIMA Compact DN40-DN50

Female/Female with 1" P/T plugs (excluding actuator)

120°C, PN25, GJS-400

Category	Frese no.	Dimension DN	Stroke	Maximum flow l/h
J	53-1375	40	15	9,500
J	53-1376	50	15	11,500

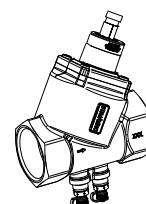


OPTIMA Compact NPT 1 1/2" - 2"

Female/Female NPT with 1" P/T plugs (excluding actuator)

120°C, PN25, GJS-400

Category	Frese no.	Dimension inches	Stroke	Maximum flow l/h
J	53-1398	1 1/2"	15	1,370 - 9,500
J	53-1399	2"	15	1,400 - 11,500

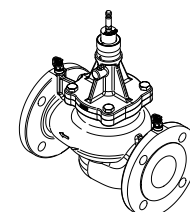


OPTIMA Compact DN50-DN300

Flanged with 1" P/T plugs (excluding actuator)

120°C (DN150, 110°C), PN16, GJL-250/GJS-400

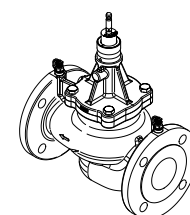
Category	Frese no.	Dimension DN	Stroke	Maximum flow l/h
J	53-1200	50 Low flow	20	15,000
J	53-1210	50 High flow	20	24,000
J	53-1201	65 Low flow	20	25,000
J	53-1211	65 High flow	20	35,000
J	53-1202	80 Low flow	20	34,000
J	53-1212	80 High flow	20	43,000
J	53-1203	100 Low flow	40	68,000
J	53-1213	100 High flow	40	90,000
J	53-1204	125 Low flow	40	110,000
J	53-1214	125 High flow	40	135,000
J	53-1205	150 Low flow	43	148,000
J	53-1215	150 High flow	43	195,000
J	53-1206	200 Low flow	43	210,000
J	53-1216	200 High flow	43	280,000
J	53-1207	250 Low flow	48	475,000
J	53-1217	250 High flow	48	600,000
J	53-1208	300 Low flow	48	475,000
J	53-1218	300 High flow	48	600,000



Flanged with 1" P/T plugs (excluding actuator)

120°C (DN150, 110°C), PN25, GJL-250/GJS-400

Category	Frese no.	Dimension DN	Stroke	Maximum flow l/h
J	53-1220	50 Low flow	20	15,000
J	53-1230	50 High flow	20	24,000
J	53-1221	65 Low flow	20	25,000
J	53-1231	65 High flow	20	35,000
J	53-1222	80 Low flow	20	34,000
J	53-1232	80 High flow	20	43,000
J	53-1223	100 Low flow	40	68,000
J	53-1233	100 High flow	40	90,000
J	53-1224	125 Low flow	40	110,000
J	53-1234	125 High flow	40	135,000
J	53-1225	150 Low flow	43	148,000
J	53-1235	150 High flow	43	195,000
J	53-1226	200 Low flow	43	210,000
J	53-1236	200 High flow	43	280,000
J	53-1227	250 Low flow	48	475,000
J	53-1237	250 High flow	48	600,000
J	53-1228	300 Low flow	48	475,000
J	53-1238	300 High flow	48	600,000





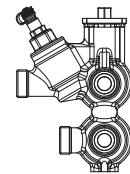
PRESSURE INDEPENDENT CONTROL VALVES FOR 4-PIPE HEATING & COOLING SYSTEMS

COMBIFLOW - 6-Way Pressure Independent Control Valve

COMBIFLOW 6-Way Pressure Independent Control Valve

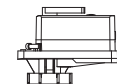
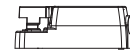
Without couplings and actuator.

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
G	53-1839	15LF	35-925	15-400
G	53-1844	15	210-1,200	20- 400
G	53-1845	20	300-4,200	20- 400



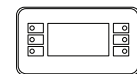
Rotary Actuators for COMBIFLOW 6-Way

Category	Frese no.	Type
D	48-5395	Multi Rotary Actuator, Modbus, BACnet, 0-10V, 4-20mA
D	48-5397	Analog, 24V, 0-10V
D	48-5398	Modbus



COMBIFLOW Modbus Programming Tool

Category	Frese no.	Type
D	48-5399	Modbus for Actuator 48-5398

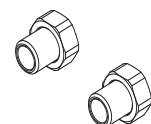


COMBIFLOW Accessories

Couplings for COMBIFLOW 6-Way

Male ends ISO 7/1, DZR Brass

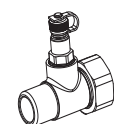
Category	Frese no.	Type	Pcs.
C	43-2330	DN15 (R 1/2 - G 3/4)	2
C	48-0042	DN20 (R 3/4 - G 3/4)	2
C	43-3330	DN20 (R 3/4 - G 1)	2
C	43-3331	DN25 (R 1 - G 1)	2



Couplings for COMBIFLOW 6-Way

Male ISO 7/1 with P/T plugs, DZR Brass

Category	Frese no.	Type	Pcs.
C	48-0038	DN15 (G 1/2 - G 3/4)	1
C	48-0041	DN20 (G 3/4 - G 3/4)	1
C	48-0039	DN20 (G 3/4 - G 1)	1
C	48-0040	DN25 (G 1 - G 1)	1



Please note: Six couplings (3x2 pcs.) are required to install the 6-port valve. One coupling with P/T plug should be used per valve for system commissioning (as standard, the second P/T plug is mounted in the valve)

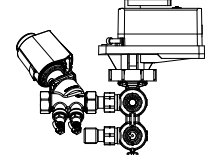
PRESSURE INDEPENDENT CONTROL VALVES

OPTIMIZER 6-way

Pressure Independent 4-pipe Coil Control Unit

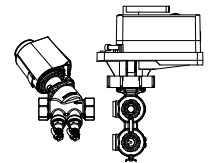
OPTIMIZER control unit, OPTIMA Compact PICV female/female with thermic actuator 0-10 V DC and 6-way control valve male/male with DZR Brass couplings and rotating actuator.

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
H	53-1846	15 LF	65-370	14-800
H	53-1847	15 HF	220-1,330	14-800
H	53-1848	20	300-1,800	14-800
H	53-1849	25	600-3,609	14-800



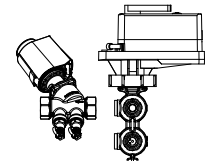
OPTIMIZER control unit, OPTIMA Compact PICV female/female with thermic actuator 0-10 V DC and 6-way control valve male/male with brass couplings and rotating actuator.

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
H	53-1850	15 LF	65-370	14-800
H	53-1851	15 HF	220-1,330	14-800
H	53-1852	20	300-1,800	14-800
H	53-1853	25	600-3,609	14-800



OPTIMIZER control unit, OPTIMA Compact PICV female/female with thermic actuator 0-10 V DC and 6-way control valve male/male and rotating actuator.

Category	Frese no.	Dimension DN	Flow range l/h	Pressure range kPa
H	53-1854	15 LF	65-370	14-800
H	53-1855	15 HF	220-1,330	14-800
H	53-1856	20	300-1,800	14-800
H	53-1857	25	600-3,609	14-800

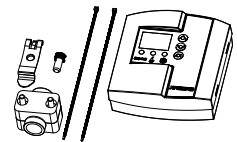


OPTIMIZER Twin Flow Controller

OPTIMIZER Twin Flow Controller

Controller for switching between sizing flows for heating and cooling in 2-pipe systems.

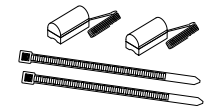
Category	Frese no.	Power Supply	Temperature Range
G	48-5546	24V AC/DC, 1,5VA	0°C - 110°C



Temperature Sensors for OPTIMIZER Twin Flow kontrolenhd

With 2 m cable and 2 cable ties for pipe dimensions up to DN65

Category	Frese no.	Power Supply	Temperature Range
G	48-5547	2 temperature sensors	-40°C - 180°C

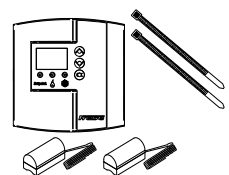


Frese DELTA T Control System

Frese DELTA T Control System

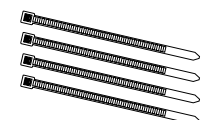
Including 2 temperature sensors with 2 m cable and 2 cable ties for pipe dimensions up to DN65

Category	Frese no.	Power Supply	Temperature range
G	48-5548	24V AC/DC, 1,5VA	0°C-110°C



Cable ties for Frese DELTA T Control System temperature sensors mounting

Category	Frese no.	Length	Pcs
G	07-2823	600 mm	4



3-WAY ROTARY CONTROL VALVES

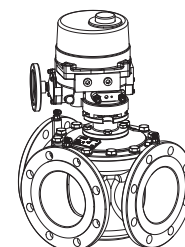
OMEGA Compact

3-way Rotary Control Valve, flanged

100°C, PN16 (DN65 - DN300), PN10 (DN350 - DN800), EN-GJS-400-18LT

Category	Frese no.	Dimension DN
M	58-A065-XXXXX-XX*	65
M	58-A080-XXXXX-XX*	80
M	58-A100-XXXXX-XX*	100
M	58-A125-XXXXX-XX*	125
M	58-A150-XXXXX-XX*	150
M	58-A200-XXXXX-XX*	200
M	58-A250-XXXXX-XX*	250
M	58-A300-XXXXX-XX*	300
M	58-A350-XXXXX-XX*	350
M	58-A400-XXXXX-XX*	400
M	58-A450-XXXXX-XX*	450
M	58-A500-XXXXX-XX*	500
M	58-A550-XXXXX-XX*	550
M	58-A600-XXXXX-XX*	600
M	58-A650-XXXXX-XX*	650
M	58-A700-XXXXX-XX*	700
M	58-A800-XXXXX-XX*	800

*Please see technote or contact Frese for configuration

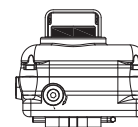


Frese Electric Rotary Actuators - ROL-series

ROL-series, 24V AC/DC, IP 67

Suitable for OMEGA Compact and Frese Butterfly Valves

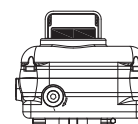
Category	Frese no.	Type	Control
M	58-8936	ROL-S 005	2-P, 3-P
M	58-8938	ROL-S 005	4-20mA, 0-10V
M	58-8940	ROL-S 009	2-P, 3-P
M	58-8942	ROL-S 009	4-20mA, 0-10V



ROL-series, 110-230V AC/DC, IP 67

Suitable for OMEGA Compact and Frese Butterfly Valves

Category	Frese no.	Type	Control
M	58-8937	ROL-S 005	2-P, 3-P
M	58-8939	ROL-S 005	4-20mA, 0-10V
M	58-8941	ROL-S 009	2-P, 3-P
M	58-8943	ROL-S 009	4-20mA, 0-10V

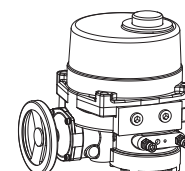


ROL-series, 230V AC, IP 67

Suitable for OMEGA Compact and Frese Butterfly Valves

Category	Frese no.	Type	Torque
M	58-89A009-XXXX*	ROL-L	90
M	58-89A015-XXXX*	ROL-L	150
M	58-89A028-XXXX*	ROL-L	280
M	58-89A060-XXXX*	ROL-L	600
M	58-89A100-XXXX*	ROL-L	1000
M	58-89A200-XXXX*	ROL-L	2000
M	58-89A250-XXXX*	ROL-L	2500
M	58-89A300-XXXX*	ROL-L	3000

*Please see technote or contact Frese for configuration



Accessories - Frese Electric Rotary Actuators - ROL-series

Adapter for ROL-series, Type ROL-L

Category	Frese no.	Type
M	58-89A000-A	OMEGA Compact DN100 to ROL-L 009
M	58-89A000-B	OMEGA Compact DN125 to ROL-L 009
M	58-89A000-C	OMEGA Compact DN150 to ROL-L 009
M	58-89A000-D	OMEGA Compact DN200 to ROL-L 015
M	58-89A000-E	OMEGA Compact DN200 and DN250 to ROL-L 028
M	58-89A000-F	OMEGA Compact DN350 and DN400 to ROL-L 200
M	58-89A000-G	Frese Butterfly Valve DN200 to ROL-L 015 and 028
M	58-89A000-H	Frese Butterfly Valve DN250 to ROL-L 028
M	58-89A000-J	Frese Butterfly Valve DN250 to ROL-L 060
M	58-89A000-K	Frese Butterfly Valve DN300 to ROL-L 060

3-WAY ROTARY CONTROL VALVES

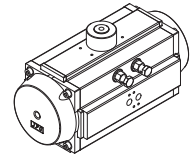
Frese Pneumatic Rotary Actuators - ROP-series

ROP-series, Single Acting

Pneumatic actuator, single acting, suitable for OMEGA Compact

Category	Frese no.	Type	Torque Nm 90°	Torque Nm 0°
M	58-89B095-XXX*	B095	83	53
M	58-89B125-XXX*	B125	270	206
M	58-89B160-XXX*	B160	389	264
M	58-89B240-XXX*	B240	997	739
M	58-89B270-XXX*	B270	1,886	1,343
M	58-89B350-XXX*	B350	3,541	2,386
M	58-89B400-XXX*	B400	5,522	3,782

*Please see technote or contact Frese for configuration

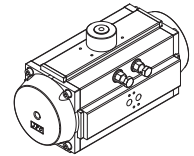


ROP-series, Double Acting

Pneumatic actuator, single acting, suitable for OMEGA Compact

Category	Frese no.	Type	Torque Nm
M	58-89C085-XXX*	C085	117
M	58-89C110-XXX*	C110	150
M	58-89C140-XXX*	C140	190
M	58-89C190-XXX*	C190	600
M	58-89C210-XXX*	C210	1,000
M	58-89C240-XXX*	C240	2,000
M	58-89C270-XXX*	C270	2,500

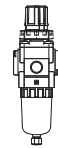
*Please see technote or contact Frese for configuration



Accessories - Frese Pneumatic Rotary Actuators - ROP-series

Pneumatic Filter Regulator

Category	Frese no.	Type
M	58-8957	0.5 - 8.5 bar, with autodrain



Electropneumatic Rotary Positioner

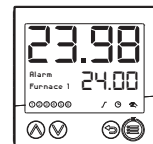
Category	Frese no.	Indicator type
M	58-8959	Flat
M	58-8960	Dome, with limit switch



Electric Local Controller

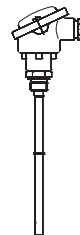
ELCO-100

Category	Frese no.	Type
M	58-8958	Electric Local Controller, Marine type approval



RTD Temperature Sensor

Category	Frese no.	Sensor type	Sensor length [mm]
M	58-8961	PT100	50
M	58-8962	PT100	100
M	58-8963	PT100	150
M	58-8964	PT100	200
M	58-8965	4-20 mA	50
M	58-8966	4-20 mA	100
M	58-8967	4-20 mA	150
M	58-8968	4-20 mA	200



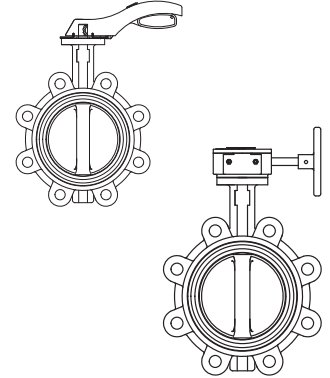
ISOLATION VALVES

Frese Butterfly Valves DN50-DN600

Manual Butterfly Valve, Lug type

110/120°C, valve body: EN-GJS-450/10, disc: AISI316, seat: EPDM, PN16

Category	Frese no.	Dimension DN	Operation
C	38-3000	50	Manual Handle
C	38-3001	65	Manual Handle
C	38-3002	80	Manual Handle
C	38-3003	100	Manual Handle
C	38-3004	125	Manual Handle
C	38-3005	150	Manual Handle
C	38-3006	200	Manual Gear
C	38-3007	250	Manual Gear
C	38-3008	300	Manual Gear
C	38-3009	350	Manual Gear
C	38-3010	400	Manual Gear
C	38-3011	450	Manual Gear
C	38-3012	500	Manual Gear
C	38-3013	600	Manual Gear

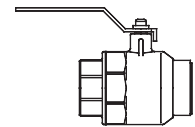


Frese Ball Valves DN15-DN50

Full flow ball valves Female/Male with handle

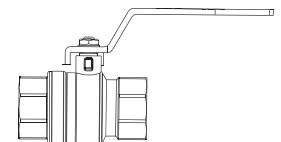
120°C, PN16, DZR

Category	Frese no.	Dimension DN
C	38-5020	15
C	38-5022	20
C	38-5024	25
C	38-5026	32
C	38-5028	40
C	38-5030	50

**Full flow ball valves Female/Female with handle**

120°C, PN16, DZR

Category	Frese no.	Dimension DN
C	38-5032	15
C	38-5033	20
C	38-5034	25
C	38-5035	32
C	38-5036	40
C	38-5037	50



Accessories

Spindle extension for full flow ball valves

Category	Frese no.	Dimension DN
C	46-1072	15/20
C	46-1073	25
C	46-1074	32/40
C	46-1075	50

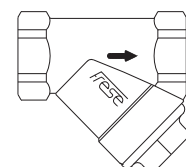


Frese Strainers DN15-DN50

Female/Female strainer, 32 Mesh

120°C, PN16, DZR

Category	Frese no.	Dimension DN
C	41-1132	15
C	41-1142	20
C	41-1152	25
C	41-1162	32
C	41-1172	40
C	41-1182	50



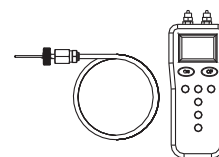
COMMISSIONING EQUIPMENT

Differential Pressure Manometer

Differential Pressure Manometer Kit

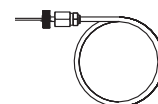
Including Frese Manometer 2023P

Category	Frese no.	Dimension DN
D	48-0022	6mm x 1,500mm

**Differential Pressure Hose Kit**

Fits Frese Manometer 2023P

Category	Frese no.	Dimension DN
C	48-0016	6mm x 1,500mm



Industries



Pharma



Auto & tyre



Dynamic in all environments



Oil & gas

Pulp & paper

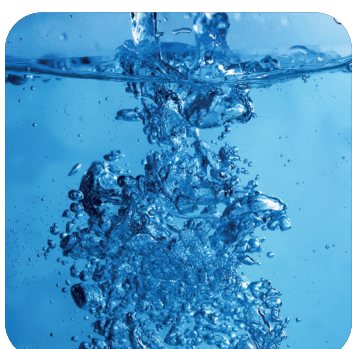


CPG
(Consumer Product Goods)



Mining

Food & beverage



Power

Please visit www.frese.eu/
MARINE
for more details

Water & waste water

Material Certificates

Material Certificates

Certificates available upon request

Category	Frese no.	Description	For types
M	93251	3.1 Certificate acc. EN 10204	Flanged OPTIMA & SIGMA Compact, All HCR Range valves
M	93252	2.2 Certificate acc. EN 10204	All Frese valves
M	93270*	Certificate on Pressure test acc. to EN12266	All Frese valves

*Included in 93251 and 93252 for OPTIMA Compact HCR and ALPHA Wafer HCR

Extra Services

Services

Category	Frese no.	Service
D	G3	Cartridges mounted in valve
D	G4	Frese Tagging Service (Per Valve)
D	G5	Cartridge packaging in box

General Conditions of Sale and Delivery for products supplied by Frese A/S

(in the following referred to as Frese).

The following General Conditions of Sale and Delivery shall apply to all products supplied by Frese, unless otherwise specified in writing between the parties.

Frese assumes no responsibility for errors, if any, in catalogues, brochures, and other printed matter. Frese reserves the right to modify its products without prior notice, including already ordered, if this can occur without changing already stated specifications. All registered trademarks in this material are the property of Frese. All rights reserved.

1. Offers

Offers are not binding on Frese unless accepted by the Buyer within the period of validity stipulated in the offer. If no period of validity is stipulated in the offer, the offer is not binding on Frese until the Buyer's order is accepted by Frese by order confirmation. If Frese's order confirmation does not comply with the purchases additions, amendments, or reservations and this is not acceptable to the Buyer, the Buyer is obliged to notify Frese hereof within a week from receiving the order confirmation. Otherwise Frese's order confirmation shall apply.

2. Delivery - Passing of Risk

If no trade term is specifically agreed on, delivery shall be Ex Works on the address specified by Frese. Where a trade term has been agreed on, it shall be interpreted in accordance with the INCOTERMS in force at the time of entering into the agreement. The risk for the products shall pass to the Buyer upon delivery.

3. Packing

In the absence of another agreement the prices stated in quotation and contract shall include Frese's standard packing.

4. Quantity, Weight

Reservation regarding variations of the ordered weight or quantity shall be subject to the previous distinct agreement between the parties.

5. Product information

The information given in product specifications such as catalogues, circulars, advertisements and illustrated matter constitutes an approximate guide. These data shall not be binding on Frese save to the extent that they are by reference expressly included in the contract between the parties.

Any drawings, rating instructions, application information and documents the Buyer may receive from Frese either before or after entering into the contract whether the information consists of written documents or in electronic form shall remain the property of Frese. Such information and documents are not without Frese's consent to be used for any other purpose than the application and maintenance of the supplied products and must not be copied, reproduced or handed over to any unauthorised third party or in any other way be brought to the knowledge of any unauthorised third party.

The Buyer has the sole responsibility to ensure that the Buyer's computer equipment has the necessary programmes installed to prevent virus. Frese is not liable if electronic instructions may cause danger to the Buyer's computer programmes.

6. Installation and Application Information

The Buyer is under an obligation to follow all instructions and directions, Frese gives concerning the correct application, installation and dimensioning of the products. Furthermore, the Buyer is obliged to pass on any such information to its customers in the same way as it was received.

7. Prices

Frese's prices shall appear from Frese's price list currently in force at the time of entering into the contract. Frese reserves its rights to change the prices in case of material changes in the exchange rate of the currency agreed on, or changing prices on raw material or prices from sub-suppliers. Prices quoted as "NET PRICES" are sold Ex Works and exclusive of all taxes, value added tax, duty and levies.

8. Terms of Payment

Frese's terms of payment are 30 days net after the date of the invoice unless otherwise agreed in writing.

In case the Buyer does not affect payment in due time and in accordance with the agreement, Frese shall be entitled to claim penalty interest as from the date of maturity at Frese's usual interest rate, which is at present 1.5% per month. The Buyer is not entitled to withhold payment or deduct any counterclaim against Frese as security for any claims that the Buyer may have on Frese.

If the Buyer fails to pay the due amount in due time, Frese shall be entitled by written notice to terminate the agreement and claim penalty interest at Frese's usual interest rate as well as liquidated damages from the Buyer for any loss Frese may have suffered.

A handling fee of Euro 15.- will be charged if the order is for less than Euro 100.-.

9. Delivery Time - Delay

The time for delivery is stated by Frese in the offer or the order confirmation to the best of Frese's judgement. If, instead, the parties have agreed on a period of time within which delivery shall take place, such period shall start to run at the time of entering into the contract.

If Frese realizes that Frese will not be able to deliver the products at the agreed delivery time, Frese shall forthwith notify the Buyer thereof stating the reason for the delay and the time when delivery can be expected.

Frese is only responsible for delayed delivery if it has been specifically agreed and if the Buyer has fulfilled its contractual obligations. In no event shall Frese be liable for any special, indirect, consequential, punitive or exemplary damages or losses arising out of any delay irrespective of the cause, including but not limited to loss of profit, loss of production, loss of income, loss of goodwill and loss of data.

10. Exemption from Liability in Case of Force Majeure Events

Frese is not responsible for delayed delivery if the delay is caused by any of the circumstances stated in clause 17 in these general conditions of sale and delivery (force majeure). Frese shall immediately notify the Buyer if Frese intends to invoke force majeure as a reason for delayed delivery, and Frese has to inform the Buyer about the reason for the delayed delivery and when delivery can be expected.

Frese as well as the Buyer are entitled to terminate the contract by written notice to the other party without being liable if performance of the contract by any of the said reasons is delayed more than three months after the originally agreed delivery time.

11. Retention of Ownership until Payment is Made

The products shall remain the property of Frese until payment has been made in full.

12. Liability for Defects and Limited Product Warranty

The Frese A/S Terms and Conditions for Limited Product Warranty in force at time of purchase of the product shall apply and the remedies in the applying warranty terms shall constitute the only remedies available for Buyer in case of defects and warranty claims. Frese disclaims any other warranties with regard to the sold products.

In no event shall Frese be liable for any special, indirect, consequential, punitive or exemplary damages or losses arising out of any breach of contract, breach of warranty, faulty products, delay in delivery, product liability, failure to warn or recall, or otherwise irrespective of the cause, including but not limited to loss of profit, loss of production, loss of income, loss of goodwill, loss of data.

13. Disclaim of Liability

In no event shall Frese be liable for any special, indirect, consequential, punitive or exemplary damages or losses arising out of any breach of contract, breach of warranty, faulty products, delay in delivery, product liability, failure to warn or recall, or otherwise irrespective of the cause, including but not limited to loss of profit, loss of production, loss of income, loss of goodwill, loss of data.

14. Notification

In any case of Frese's failing to comply with the contract, the Buyer is obliged to notify Frese in writing immediately without any delay after delivery time has expired or the defect has become apparent or should have become apparent and in no case later than a week hereafter. The notification shall be substantiated.

If the Buyer fails to notify Frese in compliance with the above, the Buyer forfeits his right to make any claim in respect of the defects or the delayed delivery.

15. Return of Products

Any return of products is to occur not later than six months after the invoice date, and in each case upon the previous agreement with Frese. Only merchantable products in intact, original packing may be returned with reference to invoice no. or delivery note no.

The return of products shall occur at the Buyer's own risk. Frese reserves the right to charge a handling fee of minimum 30%.

16. Product Liability (liability for damage to goods caused by the product)

The Buyer shall indemnify Frese in case Frese is made liable to any third party for any such damage or any such loss caused by the sold products, for which Frese is not liable to the Buyer.

In no event shall Frese be liable for any special, indirect, consequential, punitive or exemplary damages or losses arising out of any product liability, failure to warn or recall irrespective of the cause, including but not limited to loss of profit, loss of production, loss of income, loss of goodwill, loss of data. If any third party makes a claim for damages from either party under this clause, then this party shall immediately inform the other party hereof.

Frese and the Buyer shall be mutually liable to be sued in any law-court or court of arbitration that may be trying a claim for damages against any of the parties due to any defect or loss allegedly caused by the supplied products. Still, the mutual relations between the Buyer and Frese must at all times be settled by the Maritime and Commercial Court in Copenhagen in accordance with clause 19.

17. Marketing

The Customer agrees to the use of their company name, and reference to the products and/or solutions purchased, in Frese Marketing material. The Customer also agrees to receive various Frese Marketing material from time to

time, including newsletters and mail shots, etc... unless the Customer specifically declines this in writing.

18. Exemption from Liability (force majeure)

The following circumstances shall result in exemption from liability in case they prevent the performance of the contract or make the performance unreasonably onerous:

Labour dispute or any other circumstance beyond the control of the parties, e.g. fire, war, mobilization, or substantial military call-ups, requisitions, confiscations, exchange restrictions, riots and unrest, lack of transportation equipment, general shortage of goods, fuel restrictions, and defective or delayed supplies from sub-suppliers due to any of the circumstances mentioned in this clause.

The said circumstances shall only result in exemption if their influence on the performance of the contract was unforeseeable on the commencement date of the contract.

Either party who may want to exempt from liability for any circumstance mentioned in clause 17 must immediately inform the other party in writing, about the occurrence and conclusion of any such circumstance.

In case the exemption from liability does not expire within three months, either party shall have the right to give the other party written notice to cancel the contract.

19. Disputes - Applicable Law - Venue

Disputes regarding the contract or any circumstances connected herewith shall be governed by Danish law and the venue for legal action for the parties shall be the Maritime and Commercial Court in Copenhagen.

Any legal dispute that may arise under this contract shall be settled in accordance with the laws of Denmark.

**Frese A/S
Sorøvej 8
4200 Slagelse
Denmark**

**Phone: +45 58 56 00 00
E-mail: info@frese.dk**

Frese A/S Terms and Conditions for Limited Product Warranty

(Frese A/S in the following referred to as Frese).

1. Frese Branded Products

For OPTIMA Compact pressure independent control valves, SIGMA Compact and ALPHA dynamic flow limiting valves, PV Compact differential pressure control valves, and MODULA bypass units, the following terms apply:

Frese warrants that the products will be free from defects in material and workmanship under normal use for a period of 36 months commencing from the date of purchase. Hereinafter referred to as the "Warranty Period".

In the event that the customer in writing can prove a later date of installation than the date of purchase, the 36 months Warranty Period will commence from such later date of installation.

The Warranty Period will always end at the latest 5 years from the date of purchase regardless of commence date.

Date of installation shall mean the date where the product has been installed in a pipe system or fitted together with another product first time regardless of when operation of the system starts.

For Frese branded actuators, the following terms apply:

Frese warrants that the products will to be free from defects in material and workmanship under normal use for a period of 36 months commencing from the date of purchase.

For all other Frese Branded products, the following terms apply:

Frese warrants that the products will to be free from defects in material and workmanship under normal use for a period of 24 months commencing from the date of purchase.

2. Non-Frese Branded Products

For non-Frese branded products sold by Frese, Frese refers to the warranty terms applying from the producers of such products and devices. Please contact Frese for further information on warranty terms applying to such products and devices.

3. Warranty Claims

In the event of defects covered by this limited warranty, Frese shall in writing be informed of such alleged defects, together with the customers documentation for normal use and operation of the defective product in accordance with the technical documentation and specifications for the product and information regarding the problem encountered within 30 days from the customer or user discovering the alleged defect. Proof of purchase date or proof of installation date if a later commencement date for the Warranty Period is claimed, shall be submitted together with the warranty claim. The defective product shall upon request from Frese be sent to Frese or to any other address designated by Frese with freight paid by the sender. Any warranty claim received by Frese without proper documentation or received after end of the Warranty Period will be rejected.

If Frese accepts that alleged defect is covered under this warranty and the claim has been filed within the Warranty Period, Frese will at its sole discretion replace, repair free of charge, or credit such defective product. If the product is replaced or repaired by Frese, Frese will at its own cost send the new or repaired product to the buyer or user and Frese will reimburse freight costs incurred in sending defective products to Frese.

Repaired or replaced products will be warranted hereunder for the remaining portion of the Warranty Period for the original product plus 2 months.

If the returned product is not defective as covered under this limited warranty, Frese may return the product at buyer or users cost and risk, and may charge a fee for the time and materials used in examining the returned product.

4. Limitations on and Exceptions from Warranty

This limited warranty does not extend to any product that has been damaged or rendered defective as a result of (a) modification, repair, alteration or improper installation, (b) unreasonable or improper use or storage, use beyond or outside rated conditions or specifications, operation outside Frese's instructions, or being otherwise subjected to improper maintenance, negligence or accidents including acts of nature (c) because of any use of the product after user has, or should have, knowledge of any defect in the Product.

A buyer is immediately upon delivery obliged to examine the products for defects. If a product is found to be defect, the buyer shall immediately notify Frese in writing. If the Buyer fails to do so, the buyer or any other user of such product shall not at a later date be entitled to complain about defects that were or would have been ascertained by such an examination. Replacement, repair free of charge or credit of the defective product upon Frese's sole discretion shall constitute the sole and only remedy for the customer under this warranty.

Frese's warranty liability shall not exceed the original purchase price of the defective product. In no event shall Frese be liable for any special, indirect, consequential, punitive or exemplary damages or losses arising out of any defects, breach of warranty or faulty products irrespective of the cause or reason for such liability, including but not limited to loss of profit, loss of production, loss of income, loss of goodwill, loss of data.

The limited warranty provided by Frese is exclusive and in lieu of all other warranties, express or implied including warranties of merchantability and fitness for a particular purpose, whether pertaining to the Product and whether arising by law, custom, conduct, usage or trade. The aforementioned shall not apply to the extent warranty cannot be excluded under applicable law.

**Frese A/S
Sorøvej 8
4200 Slagelse
Denmark**

**Phone: +45 58 56 00 00
E-mail: info@frese.dk**



www.worldwidemetric.com



sales@worldwidemetric.com



732-247-2300